CYBERSTRONGER CHALLENGE LABS

LAB NAME	LAB DESCRIPTION
Access a Private Storage Container from an ASP.NET Web App [Guided]	In this challenge, you will write code to access an Azure storage account with a private container, upload files to the account, generate a SAS token for the container, and test private access to the account. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Access a Public Storage Container from an ASP.NET Web App [Guided]	In this challenge, you will write code to access an Azure Storage account used by the web app. First, you will write code in Visual Studio to create a container that has public blob access, and then you will upload test files to the container. Next, you will write code to retrieve the URLs of the uploaded files. Finally, you will test the configuration by using a test page provided with the web app. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Access an Azure SQL Database by Using Azure AD Authentication [Guided]	In this challenge, you will provision a new Azure SQL database that uses Azure Active Directory (Azure AD) authentication for data security. First, you will deploy an Azure SQL database. Next, you will enable Azure AD authentication. Finally, you will test the data security access.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Access Document-Based Data in MongoDB by Using Node.js [Guided]	In this Challenge Lab, you will create a utility that loads, reads, and modifies sales order data in a MongoDB database. First, you will create a collection in MongoDB, and then you will load JSON sales order data from files into the collection. Next, you will retrieve sales orders from the collection, and then modify data in the collection. Finally, you will add exception handling to catch errors thrown while interacting with the data. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Access File Data by Using C# [Guided]	In this challenge you will use C# to process data from files. You will read data from comma-separated value (CSV) files, process individual records, and manipulate sets of data with C#. Finally, you will write data to a CSV file. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Access File Data by Using Node.js [Guided]	In this Challenge Lab you will write code to read a JSON file containing a customer record into an object, and then return the object representing the customer. Next, you will write code that will read a file with multiple lines each representing a product record, then clean each line, then convert each line into an object, and then return an array of the objects representing the products. Finally, you will process multiple comma-separated values (CSV) files that contain transaction data, filter the data, sort the data, slice the data, and return an array with all remaining transactions.
Access File Data by Using Python [Guided]	In this challenge you will use Python to process data from files. You will read data from comma-separated value (CSV) files, process individual records, and manipulate sets of data with Python. Finally, you will write data to a CSV file. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Access MongoDB Data by Using C# [Guided]	In this Challenge Lab, you create a utility that loads, reads, and modifies sales order data in a MongoDB&reg database. First, you will create a collection in MongoDB, and then you will load JSON sales order data from files into the database. Next, you will retrieve sales orders from the database, and then write data to the database. Finally, you will add exception handling to catch any errors thrown while interacting with the data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Access MongoDB Data by Using Python [Guided]	In this challenge you will read and write document-based data using Python and MongoDB. First they will load data into a MongoDB database using the MongoDB shell. Then they will write Python code to read and write data stored in MongoDB. Finally they will add code to handle common errors that occur while working with MongoDB. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Access Relational Data by Using C# [Guided]	In this Challenge Lab, you will create a utility that interacts with a relational database. First, you will write C# code that connects to the database. Next, you will write code that reads data from the database, and then you will write code that writes data to the database. Finally, you will add exception handling to catch errors thrown while interacting with the data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Access Relational Data by Using Node.js [Guided]	In this Challenge Lab, you will learn how to access relational data by using Node.js. First, you will load a relational database, and then you will write Node.js code that connects to the database. Next, you will write code that retrieves data from the database, and then you will write code that modifies data in the database. Finally, you will add exception handling to catch any errors thrown while interacting with the data. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Access Relational Data by Using Python [Guided]	In this challenge, you will create a utility that interacts with a relational database. First, you will load a relational database, and then you will write Python code that connects to the database. Next, you will write code that reads data from the database, and then you will write code that writes data to the database. Finally, you will add exception handling to catch any errors thrown while interacting with the data.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Add a Custom Domain [Guided]	In this challenge, you will add a custom domain to a Microsoft 365 subscription, review the online service configuration of the domain, and then remove the custom domain.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Add and Manage Domain Controllers [Guided]	In this challenge, you will manage domain controllers by deploying a new domain controller to an existing domain and configuring it as a Global Catalog server, installing Active Directory Domain Services (AD DS) binaries to a member server, promoting the member server to a domain controller, and verifying creation of Domain Name Server (DNS) SRV records for the new domain controller.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Address Dates, Times, and Datetime Functions in MySQL [Guided]	In this challenge you will write several MySQL queries by using date and time functions. First, you will develop queries that return the current system date and time. Next, you will develop more specific queries that will use the FORMAT function for formatting date and time data. Finally, you will explore queries that use the DATEDIFF and DATEADD functions for performing calculations on date and time data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Analyze Network Communications [Guided]	In this Challenge Lab, you will evaluate network speeds and discover information about systems within a network. First, you will perform several Internet speed tests. Next, you will perform a local network speed test. Finally, you will discover other computers, identify open ports, determine operating systems, and discover active services by performing nmap scans.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Arrange and Interact with the Bot Framework [Guided]	This course is in development. Details coming soon.
Assess Database Performance by Using Query Performance Insight [Guided]	In this challenge, you will create an Amazon Simple Storage Service (Amazon S3) bucket that will contain assets for a website that you will be hosting. The website must be accessible to a group of web administrators. First, you will create an Amazon S3 bucket to store the assets, and then you will create a user account for the web administrator. Next, you will create an Identity and Access Management (IAM) policy that provides full control of the bucket, and then you will create a new group. Finally, you will assign the IAM policy to the group, and then you will add the web administrator to the group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Assign Environment and Shell Variables in Linux [Guided]	In this challenge, you will automate administration tasks by using variables. First, you will define environment variables by using bash, and then you will use the variables in Linux commands. Next, you will define shell variables, and then you will use the variables in Linux commands. Finally, you will define shell variables by using command substitution.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Assigning Admin Roles [Guided]	In this challenge, you will assign Admin roles to various users.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Automate Administration Tasks by Using Linux Shell Scripts [Guided]	In this challenge, you will automate administration tasks by using bash shell scripts. First, you will create a shell script that displays the day of the week, and then you will create a shell script search utility to locate files.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Automate Database Maintenance Tasks by Using SQL Server Agent [Guided]	In this challenge, you will configure maintenance jobs by using SQL Server Agent in an Azure virtual machine that hosts SQL Server. First, you will create an Azure storage account to host backups. Next, you will access the Azure virtual machine, and then you will enable SQL Server Agent. Finally, you will create a SQL Server Agent job.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Automate Snapshots by Using DLM [Guided]	In this challenge, you will configure automated snapshots of the Elastic Block Store (EBS) volumes on your web servers. First, you will create tags for your volumes. Next, you will create an Amazon Data Lifecycle Manager (DLM) lifecycle policy that uses an hourly schedule, and then you will verify that a snapshot was created. Finally, you will replace the root volume on a web server by using a snapshot.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Automate the Deployment of an Azure Virtual Machine by Using an Azure Resource Manager Template [Guided]	In this challenge, you will automate the deployment of an Azure virtual machine by using an Azure Resource Manager (ARM) template. First, you will deploy a virtual machine that runs Windows by using a modified Azure Resource Manager quickstart template, and then you will save the existing deployment to a new ARM template. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Autoscale a Web App [Guided]	In this challenges, you will configure and test autoscale for an Azure web app.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
AZ-104T00-A Microsoft Azure Administrator [Azure Pass Required]	This course teaches IT Professionals how to manage their Azure subscriptions, secure identities, administer the infrastructure, configure virtual networking, connect Azure and on-premises sites, manage network traffic, implement storage solutions, create and scale virtual machines, implement web apps and containers, back up and share data, and monitor your solution.

AZ-104T00-A Microsoft Azure Administrator [No Azure Pass Required]	This course teaches IT Professionals how to manage their Azure subscriptions, secure identities, administer the infrastructure, configure virtual networking, connect Azure and on-premises sites, manage network traffic, implement storage solutions, create and scale virtual machines, implement web apps and containers, back up and share data, and monitor your solution.
AZ-204T00-A Developing Solutions for Microsoft Azure [Azure Pass Required]	This course teaches developers how to create end-to-end solutions in Microsoft Azure. Students will learn how to implement Azure compute solutions, create Azure Functions, implement and manage web apps, develop solutions utilizing Azure storage, implement authentication and authorization, and secure their solutions by using KeyVault and Managed Identities. Students will also learn how to connect to and consume Azure services and third-party services, and include event- and message-based models in their solutions. The course also covers monitoring, troubleshooting, and optimizing Azure solutions.
AZ-204T00-A Developing Solutions for Microsoft Azure [No Azure Pass Required]	This course teaches developers how to create end-to-end solutions in Microsoft Azure. Students will learn how to implement Azure compute solutions, create Azure Functions, implement and manage web apps, develop solutions utilizing Azure storage, implement authentication and authorization, and secure their solutions by using KeyVault and Managed Identities. Students will also learn how to connect to and consume Azure services and third-party services, and include event- and message-based models in their solutions. The course also covers monitoring, troubleshooting, and optimizing Azure solutions.
AZ-500T00-A Microsoft Azure Security Technologies [Azure Pass Required]	In this course students will gain the knowledge and skills needed to implement security controls, maintain the security posture, and identify and remediate vulnerabilities by using a variety of security tools. The course covers scripting and automation, virtualization, and cloud N-tier architecture.Includes access to the Microsoft course labs aligned with the AZ-500T00-A: Microsoft Azure Security Technologies course and supporting Challenge Labs.
AZ-500T00-A Microsoft Azure Security Technologies [No Azure Pass Required]	In this course students will gain the knowledge and skills needed to implement security controls, maintain the security posture, and identify and remediate vulnerabilities by using a variety of security tools. The course covers scripting and automation, virtualization, and cloud N-tier architecture.Includes access to the Microsoft course labs aligned with the AZ-500T00-A: Microsoft Azure Security Technologies course and supporting Challenge Labs.
AZ-801T00 Configuring Windows Server Hybrid Advanced Services [Azure Pass Required]	This course teaches IT Professionals to configure advanced Windows Server services using on-premises, hybrid, and cloud technologies. The course teaches IT Professionals how to leverage the hybrid capabilities of Azure, how to migrate virtual and physical server workloads to Azure IaaS, and how to secure Azure VMs running Windows Server. The course also teaches IT Professionals how to perform tasks related to high availability, troubleshooting, and disaster recovery. The course highlights administrative tools and technologies including Windows Admin Center, PowerShell, Azure Arc, Azure Automation Update Management, Microsoft Defender for Identity, Azure Security Center, Azure Migrate, and Azure Monitor.
AZ-801T00 Configuring Windows Server Hybrid Advanced Services [No Azure Pass Required]	This course teaches IT Professionals to configure advanced Windows Server services using on-premises, hybrid, and cloud technologies. The course teaches IT Professionals how to leverage the hybrid capabilities of Azure, how to migrate virtual and physical server workloads to Azure IaaS, and how to secure Azure VMs running Windows Server. The course also teaches IT Professionals how to perform tasks related to high availability, troubleshooting, and disaster recovery. The course highlights administrative tools and technologies including Windows Admin Center, PowerShell, Azure Arc, Azure Automation Update Management, Microsoft Defender for Identity, Azure Security Center, Azure Migrate, and Azure Monitor.
AZ-900T00-A Microsoft Azure Fundamentals [Azure Pass Required]	This two-day course will provide foundational level knowledge on cloud concepts; core Azure services; security, privacy, compliance, and trust; and Azure pricing and support. Note: This course provides an Azure pass and time for students to participate in hands-on labs. If you do not need hands-on experience, consider the AZ-900T01: Microsoft Azure Fundamentals (1 day) course. The content for both courses align to the AZ-900 exam objective domain.

AZ-900T00-A Microsoft Azure Fundamentals [No Azure Pass Required]	This two-day course will provide foundational level knowledge on cloud concepts; core Azure services; security, privacy, compliance, and trust; and Azure pricing and support. Note: This course provides an Azure pass and time for students to participate in hands-on labs. If you do not need hands-on experience, consider the AZ-900T01: Microsoft Azure Fundamentals (1 day) course. The content for both courses align to the AZ-900 exam objective domain.
Azure Cost Management [Guided]	In this challenge, you will control costs related to Azure resources. First, you will review the options on the Subscriptions page in the Azure portal. Next, you will review the Azure cost management options. Finally, you will create a cost management budget and alert.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Back Up Active Directory and SYSVOL [Guided]	In this challenge, you will back up the Active Directory (AD) database and SYSVOL folders, by using snapshots and Windows Server Backup, create and view an Active Directory snapshot, install the Windows Server Backup feature, and perform a backup of the AD environment.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Back Up and Restore Data in Linux [Guided]	In this challenge, you will back up and restore data. First, you will create files and directories. Next, you will create a backup by using tar, and then you will create a compressed backup that excludes a file. Finally, you will restore data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Backup and Restore Data in Windows [Guided]	In this challenge, you will back up and restore data. First, you will create files and folders. Next, you will install the Windows Server Backup program, and then you will back up data. Finally, you will restore data by using Windows Server Backup.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Backup and Restore Files with CPIO in Linux [Guided]	In this challenge, you will use the cpio backup and restore utility to protect your files, and use the md5sum file to ensure the integrity of your backup jobs. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Backup and Restore Files with Tar in Linux [Guided]	In this challenge, you will utilize tar and gzip to backup and restore files. You will also verify the integrity of files utilizing the md5sum utility. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Backup Windows Server 2019 by Using Azure Backup [Guided]	In this challenge, you will back up Windows Server 2019 by using Azure Backup. First, you will create an Azure Recovery Services vault. Next, you will deploy the Microsoft Azure Recovery Services agent. Finally, you will schedule a backup job by using Microsoft Azure Backup.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Build a Network by Using the VPC Wizard [Guided]	In this challenge, you will create a custom VPC with public and private subnets, and an Internet and NAT Gateway, and then you will associate route tables with the correct subnets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Build VPC Resources Manually [Guided]	In this challenge, you will create a custom VPC with public and private subnets, and an Internet and NAT Gateway. You will then associate route tables with the correct subnets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Access Data by Using C#? [Advanced]	In this challenge, you will use C# to read and write data from a relational database and a non-relational database. First, you will write code that updates data in a MariaDB database, and then you will export data to JSON files. Next, you will write code that imports documents into a MongoDB® collection, and finally you will write code that combines data from the relational and document-based databases.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Access Data by Using C#? [Expert]	In this challenge, you will use C# to read and write data from a relational database and a non-relational database. First, you will write code that updates data in a MariaDB database, and then you will export data to JSON files. Next, you will write code that imports documents into a MongoDB® collection, and finally you will write code that combines data from the relational and document-based databases.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Access Data by using Python? [Advanced]	In this challenge you will use Python to read and write data from a relational database, and a non-relational database. You will read and write relational data from a MariaDB database, and interact with non-relational data from a MongoDB database. You will implement exception handling to deal with common errors that occur while accessing data. Note: Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Access Data by using Python? [Expert]	In this challenge you will use Python to read and write data from a relational database, and a non-relational database. You will read and write relational data from a MariaDB database, and interact with non-relational data from a MongoDB database. You will implement exception handling to deal with common errors that occur while accessing data. Note: Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Add Server Access for a Group? [Advanced]	In this challenge, you will configure shared access to a server. First, you will add three user accounts. Next, you will create a new group, and then you will add the user accounts to the new group. Finally, you will verify that the new users can access the server via SSH.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Administer a Windows Server 2019 Hybrid Environment? [Advanced]	In this challenge, you will administer a Windows Server 2019 environment. First, you will register Windows Admin Center with Microsoft Azure, and then you will configure Azure Update Management by using Windows Admin Center. Next, you will deploy the Microsoft monitoring agent on Windows Server 2019, and then you will enable Azure Monitor for VMs and implement Azure File Sync. Next, you will configure a point-to-site VPN between Windows Server 2019 and Microsoft Azure. Finally, you will implement synchronization between Azure AD and Active Directory Domain Services.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Administer and Monitor Windows Server 2016? [Expert]	In this challenge, you will administer local and remote servers that run Windows Server 2016. First, you will configure log files, and then you will configure monitoring. Next, you will administer a server by using Windows PowerShell. Finally, you will configure a server by using a PowerShell Desired State Configuration (DSC) script.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Administer Computers by Using Windows Admin Center? [Advanced]	In this challenge, you will deploy Windows Server 2019 Server Core. First, you will install and configure Windows Server 2019 Server Core, and then you will install Features on Demand in Server Core. Next, you will join a Server Core computer to a domain. Finally, you will promote the Server Core computer to an Active Directory domain controller.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Administer Windows Server 2016 Remotely? [Advanced]	In this challenge, you will manage multiple remote Windows servers. First, you will execute noninteractive Windows PowerShell® commands that will run on a remote computer. Next, you will establish an interactive PowerShell session. Finally, you will use Server Manager to manage remote servers.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Aggregate Data by Using Transact-SQL? [Advanced]	In this challenge, you will write several Transact-SQL (T-SQL) queries by using data types and functions. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will develop queries that use string parsing to extract data. Next, you will develop more specific queries that will use the FORMAT function for formatting date and time data. Finally, you will explore queries that use the DATEDIFF and DATEADD functions for performing calculations on date and time data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Aggregate Data from Multiple Tables in Transact-SQL? [Expert]	In this challenge, you will write several Transact-SQL queries to summarize data from multiple tables. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will write a query by using inner and outer joins. Next, you will develop a query that uses the DATEDIFF and DATEADD functions for performing calculations on date and time data. Finally, you will develop a query that aggregates data by using the GROUP BY and HAVING clauses.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Automate Administrative Tasks in Linux by Using Cron and Scripting? [Advanced]	In this challenge, you will use command line tools to manage user accounts, groups and group memberships, including the creation of an administrator account, and add a GUI tool to manage users. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Automate and Manage Custom, Scalable Azure VM–Based Infrastructure Solutions? [Expert]	In this challenge, you will configure high availability by using availability zones and autoscale. First, you will convert a virtual machine that contains a web app into a scale set that uses availability zones for high availability. Next, you will configure autoscale. Finally, you will deploy an update to the scale set by using a custom script extension.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Automate Database Maintenance Tasks? [Advanced]	In this challenge, you will automate maintenance tasks for a SQL Server database. First, you will create a Recovery Services vault by using the Azure portal. Next, you will restore a SQL Server database on an Azure virtual machine, and then you will configure Azure Backup for the SQL Server database. Finally, you will create a SQL Server Agent job to perform a data integrity check by using Database Command Console (DBCC) commands.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Automate Deployment of Azure Virtual Machines? [Advanced]	In this challenge, you will deploy an Azure virtual machine by using a modified Azure Resource Manager quickstart template. Next, you will configure Azure Cloud Shell, and then you will deploy a virtual machine by using Azure PowerShell commands. Finally, you will deploy a virtual machine by using Azure CLI 2.0 commands. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Automate Processes by Using AWS Services? [Advanced]	In this challenge, you will automate processes by using AWS services. First, enable AWS Config rules to verify compliance with allowed Amazon Elastic Cloud Compute (EC2) instance types and Amazon Simple Storage Service (S3) bucket encryption, and then enable AWS SM to support host management. Next, create an AWS CloudFormation stack that includes an Amazon Virtual Private Cloud (VPC), EC2 instances, and an S3 bucket, and then you will create an EventBridge rule that sends an email by using the Amazon Simple Notification Service (SNS) whenever a Systems Manager automation executes. Finally, check for compliance, and then you will add a remediation to the Config rules.

Can You Automate the Build of EC2 Instances Behind an Elastic Load Balancer? [Advanced]	In this challenge, you will automate the creation of a highly available website that will load balance traffic across multiple web servers. First, you will create an IAM role, and then you will create two EC2 instances. Next, you will install a web server by using AWS System Manager Run Command. Finally, you will create a target group that contains the two EC2 instances, and then you will create an elastic load balancer that uses the target group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Back Up and Restore Data in Windows and Linux? [Advanced]	In this challenge, you will manage Linux and Windows file servers. First, you will create files and directories on the Linux virtual machine. Next you will back up and restore those resources by using the tar command. Finally, you will install Windows Server Backup, and then you will back up and restore resources by using Windows Server Backup.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Build a Network Foundation in AWS? [Advanced]	In this challenge, you will create a custom VPC with public and private subnets, and an Internet and NAT Gateway. You will then associate route tables with the correct subnets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Build a Website by Using an Amazon S3 Bucket? [Advanced]	In this challenge, you will create a static website by using an Amazon Simple Storage Service (Amazon S3) bucket. First, you will create an Amazon S3 bucket, and then you will configure version control for the bucket. Next, you will create a static website, and then you will configure public access for the bucket. Finally, you will enable transfer acceleration for the bucket, and then you will create a lifecycle rule that will archive old content automatically.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Build an Application in C#? [Expert]	In this Challenge Lab, you will build a C# application that uses simple variables and arrays, performs looping and branching, and uses logic to display data. First, you will create a console application, and then you will create arrays to store data. Next, you will perform calculations by using data from the arrays and a for and foreach looping structure, and then you will output data to the console. Finally, you will use a do while loop and conditional logic to control the display of data.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Can You Build and Manage a vSphere Infrastructure? [Expert]	In this challenge, you will configure new VMware ESXi hosts and a new VMware vCenter Server. First, you will configure the management network interfaces on multiple ESXi hosts, and then you will create a virtual datacenter and add the ESXi hosts to be managed. Next, you will join a vCenter server to an Active Directory domain, and then you will configure the identity source and assign an Active Directory user to the vCenter server Administrators group. Finally, you will create a file-based backup of a vCenter server, and then you will configure networking and storage on the hosts.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure a Load-Balanced Virtual Machine Scale Set? [Advanced]	In this challenge, you will configure a load-balanced virtual machine scale set by using a custom image. First, you will deprovision a source virtual machine, and then you will deallocate the virtual machine. Next, you will generalize a virtual machine, and then you will create an image by using the generalized virtual machine. Finally, you will use the image to create a scale set that has a load balancer.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Configure a Multi-Subnet Environment? [Advanced]	In this challenge, you will configure a multi-subnet environment using DHCP relay and router configuration.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure a New vCenter Server That Contains Multiple ESXi Hosts? [Advanced]	In this challenge, you will configure new VMware ESXi hosts and a new VMware vCenter Server. First, you will configure the management network interfaces on multiple ESXi hosts, and then you will create a virtual datacenter and add the ESXi hosts to be managed. Next, you will create license keys and assign them to assets, and then you will join a vCenter server to an Active Directory domain. Finally, you will configure the identity source and assign an Active Directory user to the vCenter server Administrators group, and then you will create a file-based backup of a vCenter server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure a Resilient EC2 Server Farm? [Expert]	In this challenge, you will configure a web server farm that can scale to meet future demand. First, you will configure the supporting resources, and then you will create a custom Amazon Machine Image (AMI) based on an existing instance. Next, you will create a launch template, and then you will configure an Auto Scaling group. Finally, you will install a web server by using AWS System Manager Run Command, and then you will configure load balancing for the server farm.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure a Resilient Enterprise That Has Mobile Clients? [Expert]	In this challenge, you will configure a resilient enterprise with Direct Access, DFS replication and DHCP Failover.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure a Resilient Website That Uses Monitoring and Automatic Remediation? [Expert]	In this challenge, you will build a web server that is monitored for memory usage and internal server errors. First, create and secure a new Amazon Elastic Cloud Compute instance that runs as a web server, and then you will connect to the instance by using EC2 Instance Connect. Next, configure the Amazon CloudWatch logs agent on the web server to monitor memory usage and HTTP access logs, and then you will use the custom memory metric to create a CloudWatch alarm that will trigger a restart of the instance. Finally, you will configure a log filter for internal server errors, and then you will create a CloudWatch alarm by using a custom log metric.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab before you start.
Can You Configure a vSphere Cluster? [Advanced]	In this challenge, you will create and configure a vSphere cluster. First, you will create a cluster that contains four VMware ESXi hosts, and then you will configure vSphere high availability and vSphere Distributed Resource Scheduler (DRS) on the cluster. Next, you will create a datastore cluster, and then you will configure Storage DRS and DRS rules. Finally, you will configure a VMware vSAN cluster.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Configure a vSphere Cluster? [Expert]	In this Challenge Lab, you will create and configure a vSphere cluster. First, you will create a cluster that contains four VMware ESXi hosts, and then you will configure vSphere high availability and vSphere Distributed Resource Scheduler (DRS) on the cluster. Next, you will create a datastore cluster, and then you will configure Storage DRS and DRS rules. Finally, you will configure a VMware vSAN cluster, and then you will configure a VMware Tools product locker.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.

Can You Configure a Yum Repository in Linux? [Advanced]	In this challenge, you configure an Apache web server as a yum repository and install software from the repository on a remote client. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure ACL Permissions in Linux? [Advanced]	In this challenge, you will use Access Control Lists to assign different levels of access to resources for different users and groups.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Active Directory in a Complex Environment? [Advanced]	In this challenge, you will configure multiple user principal name (UPN) suffixes and apply them to specific user accounts, configure a trust relationship between two different forests, and test the trust relationship. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Advanced Permissions in Linux? [Expert]	In this challenge, you will configure advanced Linux permissions using SGID and the sticky bit.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Alerts and Archiving for Log Files in Linux? [Advanced]	In this challenge, you will use Logwatch and Logrotate to manage Linux log files.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure an Active Directory Domain Services Infrastructure? [Advanced]	In this challenge, you will add a domain controller to an existing domain, configure a Global catalog server, deploy a Read-Only Domain Controller (RODC), and configure a Password Replication Policy (PRP).Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure an API Management Solution? [Advanced]	In this challenge, you will create an Azure API Management instance to host your APIs. First, you will create an Azure API Management instance, and then you will create an Azure function app. Next, you will create an HTTP trigger function in the function app, and then you will create an API by importing the function app. Finally, you will create a mock API, and then you will secure a published API by using a product and subscription. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure an Auto Scaling Group and a Load Balancer? [Advanced]	In this challenge, you will configure a website that can scale from two to four load balanced instances based upon demand. First, you will create a target group, and then you will create an Application Load Balancer that uses the target group. Next, you will create a launch template, and then you will configure an Auto Scaling group that will scale out when the CPU load of the instances is 80 percent or higher. Finally, you will test the Auto Scaling group and the load balancer. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure an Autoscale Alert on a VM Scale Set? [Expert]	In this challenge, you will create and deploy an Azure VM Scale Set with Autoscale for High Availability and Scalability.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure and Control Network Traffic? [Advanced]	In this challenge, you will configure and control network traffic. First, you will configure Azure virtual network peering. Next, you will configure an Azure VNet-to-VNet connection. Finally, you will configure an Azure load balancer. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Configure and Monitor Servers by Using Windows PowerShell? [Advanced]	In this challenge, you will manage a server by using Windows PowerShell. First, you will document basic information by using comma-separated values (CSV) and HTML files, and then you will deploy the Web Server (IIS) role service by using PowerShell Desired State Configuration (DSC).Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Azure Virtual Networking? [Advanced]	In this challenge, you will control virtual network traffic. First, you will create a virtual network. Next, you will implement Azure virtual network routing. Finally, you will implement network security groups and application security groups.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Devices by Using Group Policies? [Advanced]	
Can You Configure Drive Encryption by Using LUKS and BitLocker? [Advanced]	In this challenge, you will implement LUKS drive encryption on a Linux system and BitLocker drive encryption on a Windows system. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Enterprise High Availability? [Advanced]	In this challenge, you will configure a Hyper-V host cluster and network load balancing (NLB). First, you will install the Hyper-V role on two servers, and then you will install the Failover Clustering feature. Next, you will configure a highly available virtual machine, and then you will install Internet Information Services (IIS) on the web servers. Finally, you will load balance network traffic to the web servers in the web farm by using NLB, and then you will verify that traffic is being balanced according to your load balancing rules. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Governance over Azure Active Directory Security Principals? [Advanced]	In this challenge, you will configure governance over Azure Active Directory security principals. First, you will implement Azure policy, and then you will implement role-based access control (RBAC). Next, you will create an RBAC custom role. Finally, you will implement a user-assigned managed identity for an Azure virtual machine.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure iSCSI, SMB, and NFS in Windows Server 2016? [Advanced]	In this challenge, you will configure storage by using iSCSI, Server Message Block (SMB), and Network File System (NFS). First, you will deploy and configure an iSCSI target. Next, you will configure an iSCSI client. Finally, you will configure SMB and NFS shares by using iSCSI storage spaces.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Kickstart Installations in Linux? [Advanced]	In this challenge, you will examine, create and test Kickstart configuration files. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Linux IPv4 Routing? [Advanced]	In this challenge, you will configure IP routing on a multi-homed Linux machine. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Linux Rsyslog Forwarding? [Advanced]	In this challenge, you will configure rsyslog forwarding between two Linux hosts. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Linux Time Sources? [Advanced]	In this challenge, you will set time zone and date/time values, and install and configure the network time protocol (NTP) to enable reliable time synchronization between network hosts. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Configure Multiple Layers of High Availability in Windows Server 2016? [Expert]	In this challenge, you will configure high availability by using a Hyper-V host cluster and failover clustering, configure iSCSI shared storage, install the Hyper-V role and the Failover Clustering feature, create a cluster, add a highly available virtual machine to the cluster, install failover clustering and file services on two servers by using an iSCSI SAN for shared storage, and create a cluster by using the two servers. Note: Once you begin the challenge, you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Multi-Scope Network Security? [Advanced]	In this challenge, you will create Azure virtual machines that use multi-scope network security. First, you will create a virtual network that includes two subnets, and then you will create a network security group. Next, you will create two virtual machines, one for each subnet. Finally, you will verify the network security configuration. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Can You Configure Multi-Scope Resource Permissions? [Expert]	In this challenge, you will configure role-based access control (RBAC) roles that will allow users to create and deploy Azure resources. First, you will assign roles at the resource group scope for two users. Next, you will create a virtual network as one of the users, and then you will create a virtual machine as the other user. Finally, you will assign a role at the resource scope, and then you will verify the security configuration.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Network Security to Allow Application Traffic? [Advanced]	In this challenge, you will configure a secure network that contains multiple Azure virtual machines in a multi-tier architecture. First, you will create a virtual network for each tier, and then you will implement peering for internal communication. Next, you will create a virtual machine for each tier. Finally, you will configure a network security group (NSG) for the web tier, and then you will test the configuration. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Remote Administration by Using Putty and SSH? [Expert]	In this challenge, you will use PuTTY and SSH on Windows and Linux to provide secure remote administration. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Remote Connectivity? [Advanced]	In this challenge, you will configure remote assistance tools, including Remote Assistance and Microsoft Remote Desktop, and then manage Windows remotely using Server Manager. First, you will configure Remote Assistance, and then you will create an invitation. Next, you will save and share the invitation, and then you will establish a Remote Assistance connection. Next, you will connect Server Manager to other computers. Finally, you will enable remote desktop access, and then you will grant remote access to a non-administrative user. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Rights Management? [Advanced]	In this challenge, you will configure rights management for Exchange and SharePoint online.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Security for SSH in Linux? [Expert]	In this challenge, you will harden the SSH service with recommended settings, key-based authentication, an alternate port number, and the examination of log files. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Configure Services in a Kubernetes Cluster? [Advanced]	In this challenge, you will create services in a Kubernetes cluster. First, you will retrieve information about a ClusterIP Service, and then you will create a ClusterIP Service. Next, you will use the ClusterIP Service to connect to an application, and then you will create a NodePort Service that provides external connectivity to the application. Finally, you will connect to the application from a web browser to verify that the NodePort Service allows access to the application.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Can You Configure Standard Linux and Windows Permissions? [Advanced]	In this challenge, you will configure permissions for files and folders. First, you will configure permissions for Linux resources. Next, you will configure ownership of Linux resources. Finally, you will configure permissions for Windows resources, and then you will configure ownership of Windows resources.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Storage in Windows Server 2016? [Advanced]	In this challenge, you will configure storage on three file servers. First, you will configure basic disk partitions. Next, you will configure dynamic disks, and then you will manage data deduplication. Finally, you will deploy Storage Spaces.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure System and Data Recovery? [Advanced]	In this Challenge Lab, you will configure system and data recovery. First, you will enable system protection. Next, you will work with restore points. Finally, you will implement File History.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure the Firewall in Linux and Windows? [Advanced]	In this challenge, you will configure the firewall service to permit specified network connections. First, you will configure a firewall rule on a Linux server to allow telnet connections, and then you will to connect to the telnet service from a second Linux server. Next, you will configure the firewall on a Windows server to allow Remote Desktop connections. Finally, you will connect to a Windows server from another Windows server by using Remote Desktop.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Update Management in Linux and Windows? [Advanced]	In this challenge, you will manage updates on servers that run Linux and Windows. First, you will check for available Linux software package updates, and then you will apply software package updates on a Linux server. Next, you will configure a Linux server to install updates automatically. Finally, you will start the Windows Update service, and then you will configure Windows Update settings on a Windows server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Configure Windows 10 Networking? [Advanced]	In this Challenge Lab, you will configure and troubleshoot networking. First, you will manually configure TCP/IP settings on Windows 10 and then you will configure DHCP. Next you will configure alternate configuration, and finally you will troubleshoot networking using tools like Event Viewer, network diagnostics, and ping.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Control Azure Active Directory Authentication and Access? [Advanced]	In this challenge, you will control Azure Active Directory (Azure AD) authentication and access. First, you will create a new Azure AD tenant, and then you will create two new users. Next, you will enable per-user multi-factor authentication (MFA) for one of the new users. Finally, you will create a conditional access policy that requires MFA when a specified user accesses an Azure Management application.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Create a C# Console Application That Uses Variables? [Advanced]	In this challenge lab, you will create a console application that uses variables. First, you will create a console application, and then you will write code to output text and Unicode characters to the console. Next, you will declare and assign values to variables of different types, and then you will output those values to the console. Finally, you will output a text string and the current date to the console.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Create a Custom AMI Based on a New EC2 Instance? [Advanced]	In this challenge, you will create a web server template. First, you will create a key pair, and then you will create a security group. Next, you will create an EC2 instance that uses a user data script to install an Apache web server, and then you will add an additional EBS volume to store data. Finally, you will create an Amazon Machine Image (AMI) from the web server instance, and then you will test the new web server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Create a Resilient System by Using a Launch Template and an Auto Scaling Group? [Advanced]	In this challenge, you will create a resilient set of servers that can be easily duplicated. First, you will create a key pair, and then you will create a security group. Next, you will create a new Amazon Machine Image (AMI) by using an existing instance, and then you will create a launch template. Finally, you will create an Auto Scaling group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Create a Scheduled Linux Backup Script? [Advanced]	In this challenge, you will create a Linux backup script that creates a .tar backup archive and appends to a backup log file, and schedule the backup script using cron.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Create a Serverless API by Using Azure Functions? [Advanced]	In this challenge, you will create a serverless API by using Azure Functions. First, you will create a function app. Next, you will create a function in the function app by using the HTTP trigger template, and then you will customize the HTTP trigger function. Finally, you will configure a function app to act as a front-end proxy for the API, and then you will test the function proxy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Create a Website with Cross Region Replication and Logging? [Expert]	In this challenge, you will create a bucket for logs files, create a static website, and turn on version control and logging of files that are changed. You will then encrypt all content that is uploaded both in the website bucket and in the log bucket and replicate the website to another region. Finally, you will create a notification to email you when new content is put in the replication website bucket.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Create an Online Support Bot that Can Answer Common Questions? [Expert]	This course is in development. Details coming soon.
Can You Create and Configure Virtual Switches? [Advanced]	In this challenge, you will configure networking in your vSphere environment. First, you will create a standard virtual switch that has a VMkernel adapter configured for VMware vSphere vMotion, and then you will add your VMware ESXi hosts to a new distributed virtual switch. Next, you will add new port groups to the distributed virtual switch, and then you will migrate virtual machines to the correct port groups. Finally, you will configure each port group on a separate virtual LAN (VLAN), and then you will create a backup of your distributed virtual switch.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Create and Manage a Virtual Machine? [Advanced]	In this challenge, you will create and manage virtual machines. First, you will create a virtual machine, and then you will install Windows and VMware Tools in the virtual machine. Next, you will clone a virtual machine, and then you will convert it to a template. Finally, you will deploy a new virtual machine from the template, and then you will create and manage virtual machine snapshots.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Can You Create and Manage Active Directory Users and Groups? [Advanced]	In this challenge, you will create an Active Directory security group, create an Active Directory user account and add it to the group, restrict group membership using Group Policy, and perform a variety of management tasks on user accounts.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Create and Manipulate Tables in a Database? [Expert]	In this Challenge Lab, you will create and manipulate tables by using Transact-SQL (T-SQL). First, you will create database tables by using Data Definition Language (DDL), and then you will create primary and foreign keys. Next, you will manipulate rows in the tables by using Data Manipulation Language (DML), and then you will create a view, Finally, you will create a stored procedure that uses an input parameter, and then you will extract data by using a MERGE statement.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Can You Create Database Objects by Using T-SQL? [Advanced]	In this challenge lab, you will create views and stored procedures by using Transact-SQL (T-SQL). First, you will create a view by using Data Definition Language (DDL). Next, you will create a stored procedure that uses an input parameter. Finally, you will create a stored procedure that uses an output parameter.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Create Database Tables by Using T-SQL? [Advanced]	In this challenge lab, you will create and access multiple tables by using Transact-SQL (T-SQL). First, you will create tables by using Data Definition Language (DDL). Next, you will create primary and foreign keys, and then you will add rows to the tables by using Data Manipulation Language (DML). Finally, you will develop a SELECT statement that uses data type conversion. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Create Files from Parts of Other Files? [Advanced]	In this challenge, you will redirect output of commands to create files.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Create Objects in a Kubernetes Cluster? [Advanced]	In this challenge, you will create cluster objects in a Kubernetes cluster by using imperative and declarative methods. First, you will create a pod, and then you will create a deployment by using imperative commands. Next, you will generate a pod definition .yaml file, and then you will create a pod by using declarative commands. Finally, you will generate a Deployment definition .yaml file, and then you will create a Deployment by using declarative commands. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Create, Manage, and Monitor Azure Virtual Machines and Storage? [Expert]	In this challenge, you will implement, manage, and monitor Azure storage and virtual machines. First, you will create and manage an Azure storage account, and then you will configure monitoring for an Azure storage account. Next, you will deploy an Azure virtual machine. Finally, you will configure monitoring for an Azure virtual machine.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Deliver Secure Services to Your Organization? [Expert]	In this challenge, you will implement an Azure API Management Instance, modify/test App Service Securing, and then import, test and publish an API. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy a Certificate Authority and Issue Certificates? [Advanced]	In this challenge, you will install the Window Server Certification Authority role and configure an Enterprise root CA. Next, you will customize a certificate template and use it to automatically issue code signing certificates to Active Directory users.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy a Kubernetes Cluster? [Expert]	In this challenge, you will deploy resources in a Kubernetes cluster. First, you will retrieve information about the cluster. Next, you will create cluster resources, and then you will organize cluster resources in a namespace. Finally, you will update cluster resources, and then you will roll back a Deployment. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy a Scalable Azure Solution by Using ARM Templates? [Advanced]	In this challenge, you will create and deploy multiple virtual machines in a multi-tier architecture by using Azure Resource Manager (ARM) templates. First, you will create and connect multiple virtual networks by using ARM templates. Next, you will create and connect virtual machines and a load balancer by using ARM templates. Finally, you will verify bi-directional connectivity for the multi-tier web application.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy a Web App with Database Authentication by Using Azure AD? [Expert]	In this challenge, you will deploy an Azure Web App using Azure SQL Database with Azure Active Directory authentication.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy an Apache Web Server in Linux? [Expert]	In this challenge, you will install and configure Apache web server, and configure Apache for cgi scripting and file downloads. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy an Azure Web App That Uses an Azure SQL Database? [Advanced]	In this challenge, you will develop an Azure web app that uses an Azure SQL database. First, you will create an Azure SQL database, and then you will create a web app. Next, you will create a deployment slot for testing and a database connection string, and then you will test code by using the deployment slot. Finally, you will swap the code to the production deployment slot, and then you will test the web app in production.NOTE: Before you begin, please ensure you have set aside enough time to complete this challenge as you will not be able to pause, save, or return to your progress.
Can You Deploy an End-to-End Solution in AWS? [Expert]	In this challenge, you will configure a repeatable environment for a publicly available website by using the Amazon S3 and EC2 services. First, you will create a Virtual Private Cloud (VPC) environment for the EC2 instances. Next, you will create an Amazon S3 bucket that will hold the static web content for the website and create a custom EC2 launch template that includes the web server engine and an initial homepage for the website. Finally, you will deploy a web server based on the custom launch template and verify that the website is publicly available from the new EC2 instance.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Deploy and Administer Windows Server 2019? [Expert]	In this challenge, you will deploy and administer Windows Server 2019. First, you will implement Windows Server 2019 Server Core, and then you will implement Windows Admin Center in Windows Server 2019. Next, you will monitor a Windows Server 2019 server by using Task Manager, Resource Monitor, Reliability Monitor, and Performance Monitor, and then you will configure an event subscription. Finally, you will configure System Insights by using Windows Admin Center.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy and Configure Server Core? [Advanced]	In this challenge, you will deploy Windows Server 2016 by using the Server Core option. First, you will install the operating system by using the Server Core deployment option. Next, you will configure the operating system. Finally, you will configure a deployment share by using the Microsoft Deployment Toolkit (MDT), and then you will create a new task sequence.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy and Configure Windows Server 2016 Storage and Server Core? [Expert]	In this challenge, you will manage storage and deployment processes. First, you will create partitions and volumes, and then you will configure data deduplication. Next, you will configure Storage Spaces and iSCSI storage, and then you will share the storage by using Server Message Block (SMB) and Network File System (NFS). Finally, you will deploy Windows Server 2016 by using the Server Core installation option, and then you will configure a deployment share by using the Microsoft Deployment Toolkit (MDT).Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy and Configure Windows Server 2019 Server Core? [Advanced]	In this challenge, you will deploy Windows Server 2019 Server Core. First, you will install and configure Windows Server 2019 Server Core, and then you will install Features on Demand in Server Core. Next, you will join a Server Core computer to a domain. Finally, you will promote the Server Core computer to an Active Directory domain controller. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy Azure Virtual Machines for Multi-Tier Apps? [Advanced]	In this challenge, you will create and deploy multiple Azure virtual machines for a web app in a multi-tier architecture. First, you will create multiple virtual networks. Next, you will create multiple virtual machines. Finally, you will verify connectivity for a multi-tier web app.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Deploy Hybrid-Cloud Azure Solutions by Using ARM Templates? [Expert]	In this challenge, you will create and deploy a multi-tier web application using ARM templates.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Design a Cloud Network in AWS? [Advanced]	In this challenge, you will verify your skills while creating a cloud network with both private and public subnets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Design a Data Movement Solution by Using Azure Data Factory? [Expert]	In this challenge, you will design a new Azure data factory instance that supports data pipelines. First, you will create a storage account that uses an Azure Data Lake Storage hierarchical namespace, and then you will create an Azure SQL database and an Azure Synapse Analytics SQL pool. Next, you will deploy an Azure data factory, and then you will author multiple data pipelines in a data movement solution. Finally, you will debug and publish the data pipelines.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Design a Database Solution? [Advanced]	In this Challenge Lab, you will configure a highly available MySQL database in an Amazon RDS DB instance to store data for a customer-facing website. First, create security groups to control access to the database servers, and then you will create subnet groups for the database servers in each region. Next, you will create a MySQL Amazon RDS DB instance, and then you will create an Amazon Elastic Compute Cloud (Amazon EC2) instance that runs a PHP website to connect to the database server. Finally, you will create a read replica of the database in another region for disaster recovery, then you will create a web server in the 2nd region to test access to the read replica.
Can You Design an Azure Synapse Analytics Solution? [Advanced]	In this challenge, you will design a new Azure Synapse Analytics SQL pool. First, you will deploy a Synapse SQL pool on a new logical server. Next, you will design the SQL pool for performance by using workload management, and then you will query the data in the data warehouse tables. Finally, you will monitor and audit the data access. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Design an Elastic, Highly-Available Architecture? [Advanced]	In this Challenge Lab, you will create a scalable and resilient website that contains a dashboard for monitoring. First, you will create security groups for a load balancer and an Auto Scaling group, and then you will create a launch template that you will use to create Amazon Elastic Cloud Compute (Amazon EC2) instances. Next, you will create an Auto Scaling group, and then you will attach the Auto Scaling group to a new Application Load Balancer. Finally, you will connect to the website through the load balancer, and then you will create a CloudWatch dashboard to monitor the load balancer. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge
Can You Design an Encryption Solution by Using Azure SQL Database? [Advanced]	In this challenge, you will design an Azure SQL database solution that is enabled for secure access by using Always Encrypted. First, you will deploy an Azure Storage account for auditing. Next, you will deploy an Azure SQL database on a new logical server, and then you will create a virtual machine that hosts SQL Server. Finally, you will encrypt a column that contains sensitive data by using Always Encrypted.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Design and Implement ARM VM Storage? [Advanced]	In this challenge, you will create an Azure VMs with attached data disks then resize and snapshot one data disk. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Develop a Batch Processing Solution by Using Azure Data Factory and Data Lake? [Advanced]	In this challenge, you will provision a new Azure data factory that supports a data pipeline that will transform data. First, you will create a storage account that uses a Data Lake Storage hierarchical namespace, and then you will design a batch processing solution. Next, you will deploy an Azure data factory, and then you will create a data pipeline that will transform data into a blob data file. Finally, you will enable access control list (ACL) and role-based access control (RBAC) security for the data lake.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Develop a Batch Processing Solution by Using Azure Data Factory, Azure Synapse, and Azure Data Lake? [Expert]	In this challenge, you will develop a batch processing solution by using Azure Data Factory, Azure Synapse, and Azure Data Lake. First, create a storage account that uses a Data Lake Storage hierarchical namespace, and then design a batch processing solution. Next, you will deploy an Azure data factory, and then you will create a data pipeline that will transform data into a blob data file. Finally, create a dedicated SQL pool that uses SQL auditing by using Synapse Studio, and then you will create a second data pipeline to populate the dedicated SQL pool. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Can You Develop an Azure Mobile App That Uses an Azure SQL Database? [Advanced]	In this challenge, you will create and deploy an Azure mobile app by using a development vm that hosts Visual Studio. First, you will create an Azure SQL database to host the mobile app data, and create the mobile app back end by using an App Service web app that is connected to the Azure SQL database. Next, you will configure a development environment on an Azure vm and deploy the mobile app back end by using VS 2017. Finally, you will deploy the mobile app front end by using Apache Cordova, and test the mobile app by using the Android emulator in Visual Studio. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Discover Network Services by Using Nmap? [Expert]	In this challenge, you will use Nmap to gather information about network services.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Document the Server in Linux? [Advanced]	In this challenge, you will use built in Linux utilities to document the server's processor, memory, storage, networking, software and OS configurations. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Enable Always Encrypted by Using SQL Server? [Advanced]	In this challenge, you will create a VM with SQL Server, an Azure SQL Database and enable Always Encrypted using SSMS. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Enable Cross-Region Replication and Archiving? [Advanced]	In this challenge, you will create a bucket for logs files that replicates across regions into IA. You will then use a lifecycle policy in the new region to archive the files in Glacier after 30 days and deletes them after one year. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Enable Disk Encryption by Using BitLocker and Key Vault? [Advanced]	In this challenge, you will create and configure cryptographic key in an Azure Key Vault, and then configure an Azure Key Vault Access Policy and enable Azure Disk Encryption on VM. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Enable Secure Virtual Machines and Application Services? [Advanced]	In this challenge, you will enable secure virtual machines and application services. First, you will create a virtual machine, and then you will install the Microsoft Antimalware extension. Next, you will deny RDP traffic for the virtual machine, and then you will enable Azure Disk Encryption. Finally, you will deploy a web app, and then you will enable Application Insights for security monitoring. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Can You Enable Security for an Azure SQL Database? [Advanced]	In this challenge, you will enable security for an Azure SQL database. First, you will create an Azure SQL database. Next, you will enable Azure Defender for SQL, and then you will perform a vulnerability assessment. Finally, you will enable database auditing by using a storage account for the audit log.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Enumerate Network Services by Using Port Scanning in Linux? [Advanced]	In this challenge, you conduct network scanning to discover MAC addresses, IP addresses, and listening ports on a target server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Establish Connectivity for Internet-Based Clients? [Advanced]	In this challenge, you will verify DNS resolution and connectivity for Internet-based clients and connect through a WAP reverse proxy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start

Can You Execute a Runbook Against a Hybrid Runbook Worker? [Advanced]	In this challenge, you will use Azure Automation Accounts coupled with Log Analytics (OMS) to allow the execution of runbooks written in PowerShell to automate monitoring and management across a hybrid infrastructure. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Extract, Label, and Organize Data? [Expert]	In this challenge, you will remove unnecessary lines from a file, save the output as a new file, rearrange the columns in an existing file, save the output as a new file, and filter file names by using wild cards, and then you will translate a file to uppercase.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Generate an Online Chat that Picks the Appropriate Action from a List? [Advanced]	This course is in development. Details coming soon.
Can You Generate an Online Support Bot that Can Answer Common Questions? [Expert]	This course is in development. Details coming soon.
Can You Generate an Online Text Analysis Service? [Advanced]	This course is in development. Details coming soon.
Can You Harden a Linux Web Server? [Expert]	In this challenge, you will secure SSH access to a server. First, you will create a new group, and then you will create two new users and add the users to the new group. Next, you will configure passwordless authentication, and then you will prevent the root user from logging in via SSH. Finally, you will restrict SSH access to users from a specified network, and then you will configure SSH to run on a non-standard port.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Harden a Server By Restricting Access Per Protocol? [Advanced]	In this challenge, you will add blacklisted IP addresses to your web server, and you need to allow access to the server from a specific network only. First, you will allow access to a web server for everyone. Next, you will add blacklisted IP addresses to the web server, and then you will test access to the web server from a blacklisted IP address. Finally, you will allow access to a server from a specified network.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Harden the SSH Service on a Linux Server? [Advanced]	In this challenge, you will improve the security posture of your organization. First, you will determine which services are actively responding to network requests. Next, you will configure the service to run on a non-standard port by modifying the service configuration file for the running service. Finally, you will ensure that the root account is not allowed to log in by using a remote connection.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Harden Virtual Machines in Azure? [Advanced]	In this challenge, you will create an Azure virtual machine that adheres to security best practices. First, you will create a virtual network, and then you will create a network security group. Next, you will create an application security group, and then you will create an Azure virtual machine. Finally, you will create an Azure key vault, and then you will enable Azure Disk Encryption.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Harden Windows Hosts? [Expert]	In this challenge, you configure Windows firewall rules, Group Policy security settings, IPSec and a PPTP VPN server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Implement a Database Migration Strategy? [Advanced]	In this challenge, you will implement a database migration strategy for a SQL Server database. First, you will configure an Azure virtual machine that hosts SQL Server, and then you will deploy Azure SQL databases in an elastic pool. Next, you will allow access to the Azure SQL databases. Finally, you will migrate a database from SQL Server to Azure SQL Database.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement a Highly Available and Secure Azure SQL Database? [Advanced]	In this challenge, you will provision a new highly available Azure SQL database that uses Azure Active Directory (Azure AD) authentication and Dynamic Data Masking for data security. First, you will deploy an Azure SQL database as the primary database and enable Azure AD authentication. Next, you will enable Dynamic Data Masking for selected columns and test secure data access. Finally, you will create a failover group that includes a secondary database in another region and test a database failover.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement a Highly Available Website? [Expert]	In this challenge, you will configure, deploy a highly available, and secure website by using Amazon Web Services. First, you will establish a secure network environment by using a network access control list (ACL) and a security group, and then you will configure a redundant Amazon Simple Storage Service (Amazon S3) bucket to store static assets. Next, you will create a fleet of web servers running on an Amazon Elastic Compute Cloud (EC2) instance in a virtual private cloud (VPC) by using an Auto Scaling group. Finally, you will create an Application Load Balancer to use with the Auto Scaling group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement a Multi-Layer Security Model? [Advanced]	In this Challenge Lab, you need to implement a secure application within a VPC environment. The application will consist of 2 layers, a web server and an application server. You need to implement appropriate security measures using Network ACLs and Security Groups to protect both layers of the application. First, you will create security groups for the web and application layers. Next, you will create a network ACL for the subnets. Then, you will create EC2 instances for the web and application servers. Finally, you will test access to the application through the Network ACL and Security Groups.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before
Can You Implement a Repeatable Compute Layer by Using EC2? [Advanced]	In this challenge, you will configure a repeatable AWS Elastic Compute Cloud (EC2) environment by using a custom launch template. First, you will launch a custom EC2 instance that contains a pre-installed web server, and then you will attach an extra Amazon Elastic Block Storage (EBS) data disk. Next, you will create an Amazon Machine Image (AMI) based on an existing instance, and then you will create a launch template based upon the custom AMI. Finally, you will launch a new web server EC2 instance by using the custom launch template.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement a Secure Azure Virtual Machine Network? [Advanced]	In this challenge, you will create a secure network for your Azure virtual machines. First, you will reconfigure an existing incoming security rule to filter the destination to only the back-end subnet by using a new application security group, and then you will create a firewall and route table. Next, you will configure the firewall by using an application rule, and then you will add a network rule to allow domain name system (DNS) queries. Finally, you will configure Azure to support Network Watcher.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Implement an Azure SQL Database by Using Secure Distribution? [Advanced]	You are a database administrator. You need to provision a new Azure SQL database that is geo-replicated for high availability and dynamic data masking for security. In this challenge, you will first deploy an Azure SQL database as the primary database. Next, you will apply dynamic data masking to appropriate columns in the database, and then you will create a geo-replicated database in another region as the secondary database. Finally, you will test the data security access of the geo-replicated database.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement an End-to-End Solution in AWS? [Expert]	In this Challenge Lab, you will create a scalable website that has a backend database and a dashboard for monitoring. First, you will create security groups and Network Access Control Lists (ACLs) to secure the network environment, and then you will create an Amazon RDS DB instance running MySQL. Next, you will create a launch template that you will use to create Amazon Elastic Cloud Compute (Amazon EC2) instances, and then you will create an Auto Scaling group and an Application Load Balancer. Next, you will configure the website to use the database, and then you will connect to the website through the load balancer. Finally, you will create a CloudWatch dashboard to monitor the load balancer and the RDS instance.
Can You Implement and Govern an Azure AD Environment? [Expert]	In this challenge, you will implement and govern an Azure Active Directory (Azure AD) environment. First, you will synchronize accounts from Active Directory Domain Services (AD DS) to a new Azure AD tenant, and then you will implement self-service password reset (SSPR). Next, you will implement Azure Policy and role-based access control (RBAC), and then you will implement a user-assigned managed identity for an Azure virtual machine. Finally, you will enable per-user multi-factor authentication (MFA).
Can You Implement and Manage Group Policy? [Advanced]	In this challenge, you will create new Organizational Units (OUs), move users to the OUs, create and edit a Group Policy Object (GPO), link it to an OU, configure Group Policy processing to control the application of a GPO to specific users, implement a GPO backup and restore process, and create a Group Policy central store. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Azure Data Protection? [Advanced]	In this challenge, you will implement Azure data protection. First, you will enable backups of an Azure virtual machine. Next, you will create a virtual machine unmanaged disk snapshot. Finally, you will migrate a virtual machine that has unmanaged disks to use managed disks, and then you will create a virtual machine managed disk snapshot.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Backup Solutions for Windows Server 2019? [Advanced]	In this challenge, you will back up the Windows Server 2019 system state by using Microsoft Azure Backup and Windows Server Backup. First, you will install Windows Server Backup, and then you will perform an interactive backup. Next, you will create an Azure Recovery Services vault, and then you will deploy the Microsoft Azure Recovery Services (MARS) agent. Finally, you will schedule a backup job by using Microsoft Azure Backup. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Data Distribution for Azure Synapse Analytics? [Advanced]	In this challenge, you will enable table distribution for Azure Synapse Analytics. First, you will deploy a dedicated SQL pool in Azure Synapse Analytics. Next, you will design a table distribution and partitioning strategy, and then you will create a table distribution and partitioning solution. Finally, you will populate a table by using partition switching and a staging table. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Can You Implement Data Movement by Using Azure Data Factory? [Advanced]	In this challenge, you will provision a new Azure data factory that supports a data pipeline. First, you will deploy an Azure data factory. Next, you will create a storage account that uses a Data Lake Storage hierarchical namespace, and then you will create a data pipeline. Finally, you will author a copy data activity that will send data output through the data pipeline, and then you will test the data pipeline.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Data Security for Azure Synapse Analytics? [Advanced]	Can You implement data security for Azure Synapse Analytics. First, you will deploy a dedicated SQL pool in Azure Synapse Analytics. Next, you will design a security strategy for data privacy. Finally, you will implement dynamic data masking and auditing, and then you will test the secure data access solution.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Can You Implement End-To-End Encryption by Using Azure SQL Database? [Advanced]	In this challenge, you will implement an end-to-end encryption solution by using Azure SQL Database. First, you will access an Azure SQL database by using the Azure portal. Next, you will access an Azure SQL database by using a virtual network service endpoint, and then you will encrypt a column that contains sensitive data by using Always Encrypted. Finally, you will configure Azure Disk Encryption on an Azure virtual machine.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement End-To-End Security by Using Azure SQL Database? [Expert]	In this challenge, you will implement an end-to-end security solution by using Azure SQL Database. First, you will deploy an Azure virtual machine that hosts SQL Server, and then you will deploy an Azure SQL database. Next, you will enable SQL auditing, and then you will create a virtual network service endpoint. Next, you will encrypt a column by using Always Encrypted, and then you will configure Azure Disk Encryption on an Azure virtual machine. Finally, you will create an alert rule for monitoring an Azure SQL database.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Failover Clustering on Windows Server 2019? [Advanced]	In this challenge, you will implement failover clustering on Windows Server 2019. First, you will remotely install the failover clustering feature on two servers, and then you will deploy a two-node failover cluster.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement High Availability in Windows Server 2016? [Advanced]	In this challenge, you will configure Hyper-V Replica and failover clustering by installing Hyper-V on two servers that will represent Hyper-V servers in two different data centers, verifying failover after replicating a virtual machine between the two Hyper-V servers, installing failover clustering and file services on two servers by using an iSCSI SAN for shared storage, creating a cluster by using the two servers, and verifying high availability after simulating a server failure.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Metrics, Alarms, and Filters? [Advanced]	In this challenge, you will configure CloudWatch logs for a website so that you will be notified when anyone attempts to access the admin page of the website. First, you will verify that the web server is running, and then you will connect to the console of the Elastic Cloud Compute (EC2) instance by using EC2 Instance Connect. Next, you will configure the CloudWatch logs agent on the web server, and then you will configure a log filter that will become a custom metric. Finally, you will use the custom metric to create a CloudWatch alarm, and then you will test the alarm.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Can You Implement Microsoft 365 Security and Threat Management? [Advanced]	In this challenge, you will implement modern device services. First, you will create a compliance policy for your Mobile Users group, and then you will create a Conditional Access policy requiring device compliance for access to Exchange Online. Next, you will join your Windows® 10 device to Azure® Active Directory (Azure AD) as a member of the Mobile Users group and enroll with Microsoft Intune®. Finally, you will verify that your device is compliant and can access Exchange Online.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Modern Device Services? [Advanced]	In this challenge you will create compliance policy and configure conditional access policies. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Secure Access to a Service? [Advanced]	In this challenge, you will configure a web server that runs on an Amazon Elastic Compute Cloud (EC2) instance in a virtual private cloud (VPC). First, you will create a security group, and then you will configure a network access control list (ACL) that allows HTTP, HTTPS, and ICMP IPv4 traffic to reach the web server. Next, you will create an Amazon EC2 instance that runs a web server. Finally, you will test connectivity to the web server from the internet.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Security for an Azure Cosmos DB Account and a Storage Account? [Advanced]	In this challenge, you will implement security for an Azure Cosmos DB account and a storage account. First, you will deploy an Azure Cosmos DB account, and then you will create a container in a new database. Next, you will create a storage account, and then you will create a container in the storage account. Finally, you will generate a shared access signature (SAS) key for secure access to the storage account, and then you will assign a role to a user for secure access to the Azure Cosmos DB account.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Security for an Azure Web App? [Advanced]	In this challenge, you will allow developers to create a secure web app. First, you will configure account security by using role-based access control. Next, you will create a web app. Finally, you will create a new virtual network, and then you will integrate the web app with the virtual network.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Virtualization on Windows Server 2019? [Advanced]	In this challenge, you will implement virtualization on Windows Server 2019. First, you will implement Hyper-V and then you will manage Hyper-V servers by using Windows Admin Center. Next, you will implement Hyper-V storage migration and Hyper-V live migration, and then you will configure Hyper-V replica and perform a planned failover. Finally, you will create Hyper-V VHD set files, and then you will configure Windows Server 2019 as a Windows Container Host. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Windows Server 2019 Hybrid Administration? [Expert]	In this Challenge Lab, you will administer a Windows Server 2019 environment. First, you will register Windows Admin Center with Microsoft Azure, and then you will enable Azure Update Management. Next, you will deploy the Microsoft monitoring agent on Windows Server 2019, and then you will enable Azure Monitor for VMs and implement Azure File Sync. Next, you will configure a point-to-site VPN between Windows Server 2019 and Microsoft Azure. Finally, you will implement synchronization between Azure AD and Active Directory Domain Services.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.

Can You Implement Windows Server 2019 on Azure Virtual Machines? [Advanced]	In this challenge, you will implement Windows Server on Azure virtual machines. First, you will create Azure security groups, create two virtual machines, and then associate the virtual machines to the application security groups. Next, you will protect a virtual machine by using Just-in-time access. Finally, you will manage a virtual machine by using Azure Policy guest configuration, Run Command, PowerShell remoting, and the serial console.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Implement Windows Server 2019 Virtualization, Disaster Recovery, and High Availability? [Expert]	In this Challenge Lab, you will implement virtualization, disaster recovery and high availability on Windows Server 2019. First, you will perform an interactive backup by using Windows Server Backup, and then you will schedule a backup job by using Azure Backup. Next, you will implement Hyper-V, and then you will manage Hyper-V servers by using Windows Admin Center. Next, you will implement Hyper-V storage migration and Hyper-V live migration, and then you will configure Hyper-V replica and perform a planned failover. Next, you will create Hyper-V VHD set files, and then you will configure Windows Server 2019 as a Windows Container Host. Finally, you will configure ADD Services to support a failover cluster, and then you will create a two-node failover cluster.
Can You Implement, Manage, and Monitor Azure Storage? [Advanced]	In this challenge, you will implement, manage, and monitor Azure Storage. First, you will create an Azure storage account, and then you will upload a document to a container in the storage account. Next, you will configure storage account security mechanisms. Finally, you will configure monitoring for a storage account.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Install and Configure a Kubernetes Cluster? [Advanced]	In this challenge, you will install and configure a Kubernetes cluster. First, you will install the Docker and Kubernetes cluster components. Next, you will initialize the Kubernetes cluster, and then you will join worker nodes to the cluster. Finally, you will configure cluster admin privileges, and then you will install a cluster overlay network plug-in.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Install and Configure a Linux DNS Server? [Advanced]	In this challenge, you will install a DNS server on Ubuntu Linux, create a DNS zone and resource records, and configure a Linux client to use the DNS server and test name resolution. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Install Windows 10? [Advanced]	In this challenge, you will perform an in-place upgrade from Windows 8 to Windows 10. First, you will create new local files for testing. Next, you will upgrade the operating system from Windows 8 to Windows 10. Finally, you will verify that the local files were transferred as part of the upgrade.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Can You Integrate Blob Storage into a Web App? [Advanced]	In this challenge, you will write code to access an Azure storage account with a private container and a public container, upload files to the both containers, generate a SAS token for the container, and test access to the account.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Integrate Relational Data into a Web App? [Advanced]	In this challenge, you will write code to access relational data stored in Azure. You will write code to upload and download data from an Azure SQL Database and an Azure Database for MySQL. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Integrate Storage? [Expert]	In this challenge, you will write code to access an Azure storage account with a private container and a public container, upload files to the both containers, generate a SAS token for the container, and test access to the account. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Loop Through an Array in a C# Application? [Advanced]	In this challenge lab, you will control the flow of code in an application by using looping. First, you will create a console application, and then you will create an array to hold a collection of data. Next, you will iterate through the data in the array by using a for loop, and then you will iterate through an array by using a for each loop. Finally, you will iterate through an array by using a do while loop.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Maintain an Active Directory Domain Services Database? [Advanced]	In this challenge students will perform tasks related to maintaining an Active Directory Domain Services database. First, they will configure an Active Directory snapshot. Next, they will perform an offline defragmentation of the Active Directory database. Finally, they will back up the Active Directory database and the SYSVOL folder structure.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Maintain Windows 10? [Expert]	In this Challenge Lab, you will manage and maintain Windows. First, create and use a system restore point, and then you will configure and use file history. Next, install Windows Server Update Services, and then you will use a new Group Policy Object to configure automatic updates. Next, attach a task to a System event, and you will block an application from running by using the Registry Editor. Next, create and trigger a task. Next, you will configure Remote Assistance and create an invitation, and then you will establish a Remote Assistance connection. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage a Content Library and Migrate a Virtual Machine? [Advanced]	In this challenge, you will manage a content library and migrate a virtual machine. First, you will modify the hardware on a virtual machine, and then you will create and subscribe to a published content library. Next, you will create a template stored in a content library, and then you will use the template to deploy a new virtual machine. Finally, you will configure VMware vSphere vMotion networking, and then you will migrate a virtual machine.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage a Serverless Compute Environment? [Advanced]	In this challenge, you will provision an Azure Function App and an Azure Logic App. The Function App will be triggered by a Storage Account Blob Container and it will add a message to a Queue, and the Logic App will also be triggered by Storage Account Blob Container and will insert a row in a SQL Server database table. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage a Web App? [Advanced]	In this challenge, you will deploy a line of business web application, provision a web app, configure autoscale for the web app, and deploy a web job to support the web app.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Access in Linux and Windows? [Expert]	In this challenge, you will configure access for both Linux and Windows servers. First, you will configure password requirements in Linux, and then you will configure ownership and permissions in Linux. Next, you will configure password requirements in Windows. Finally, you will configure ownership and permissions in Windows.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Manage Active Directory Domain Services? [Expert]	In this challenge, you will delegate the management of password settings by testing password management permissions for non-administrative accounts, delegating password management over an entire domain by using the Delegation of Control Wizard, and restricting delegated password management to a specific Organizational Unit (OU).Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Active Directory Password Policy Settings and Account Lockout Policy Settings? [Advanced]	In this challenge, you will configure a domain password policy and an Account Lockout Policy by configuring the account lockout policy, configuring the domain password policy, creating a fine-grained password policy, and delegating control of password management.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage an Active Directory Domain Services Environment? [Expert]	In this challenge, you will deploy a read-only domain controller (RODC) and configure a domain-wide password replication policy (PRP), create an Active Directory snapshot, create a user principal name (UPN) suffix and assign it to a user, and create a forest trust relationship.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage an Azure Active Directory Hybrid Environment? [Advanced]	In this challenge, you will manage an Azure Active Directory (Azure AD) hybrid environment. First, you will create a new Azure AD tenant, and then you will synchronize accounts from Active Directory Domain Services (AD DS) to the new tenant by using use Azure AD Connect. Next, you will create an Azure AD user account, and then you will add the new user to a new group. Finally, you will activate an Azure Premium P2 trial for the new tenant, and then you will enable and test self-service password reset (SSPR) for the new group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Apache Spark Jobs in a Pipeline by Using Azure Synapse Analytics? [Advanced]	In this challenge, you will manage Apache Spark jobs in a pipeline by using Synapse Studio. First, you will create an Apache Spark pool in an Azure Synapse workspace, and then you will design a stream processing solution. Next, you will create an Event Hubs namespace, and then you will create an event hub for event streaming. Finally, you will create an Apache Spark job in Synapse Studio, and then you will add an Apache Spark job to a Synapse pipeline.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage Azure Network Connectivity and High Availability? [Expert]	In this challenge, you will configure Azure networking and high availability. First, you will create an Azure virtual network (VNet), and then you will implement Azure virtual network routing and Azure security groups. Next, you will configure Azure virtual network peering, and then you will configure VNet-to-VNet connections. Finally, you will implement Azure backups for an Azure virtual machine, and then you will create an Azure virtual machine snapshot.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Directories and Files in Linux? [Advanced]	In this challenge, you create and delete directories, create, copy, move, rename and delete files, and compare file management between standard user accounts and the root user. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage IoT Devices with the Azure IoT Hub? [Advanced]	In this challenge, you will provision an Azure IoT hub, register an emulated device with IoT hub, and test the ability of the IoT hub to communicate with the device.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Manage Kubernetes Cluster Resources? [Expert]	You need to manage resources in a Kubernetes cluster. First, you will create a ClusterIP Service, and then you will create a NodePort Service. Next, you will label cluster resources, and then you will manage pod scheduling by using taints and tolerations. Finally, you will schedule pods to a node by using node affinity rules, and then you will create a DaemonSet.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage Kubernetes Resources? [Advanced]	In this challenge, you will manage resources in a Kubernetes cluster. First, you will add labels to pods, and then you will annotate a Deployment. Next, you will taint a node to manage pod scheduling to that node. Finally, you will manage pod scheduling by creating a Deployment that contains a toleration.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage Multiple Users? [Advanced]	In this challenge, you will import multiple users and assign them licenses.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Office 365? [Expert]	In this challenge, you will create users, add them to roles, manage password policies for the users, assign the users mailboxes and SharePoint online profiles.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage PaaS Storage Services to Support an Application? [Advanced]	In this challenge, you will deploy storage services to support a custom application, deploy a Storage Table and a Storage Queue. and configure a web application to use both services. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Password Requirements in Windows and Linux? [Advanced]	In this challenge, you will manage password settings on Linux and Windows servers. First, you will configure system-wide password settings in Linux, and then you will configure Linux password settings on a per-user basis. Next, you will configure Windows password settings. Finally, you will configure additional Windows login security settings.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Platform Services for a Custom Application? [Expert]	This challenge is currently in development. Details will be published soon.
Can You Manage Pod Scheduling in a Kubernetes Cluster? [Advanced]	In this challenge, you will manage pod scheduling in a Kubernetes cluster by using nodeSelector and node affinity rules. First, you will create a Deployment that schedules pods by using the Kubernetes nodeSelector feature. Next, you will schedule a pod by using a required node affinity. Finally, you will schedule a pod by using a preferred node affinity. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage Processes in Linux? [Advanced]	In this challenge, you will manage Linux processes using multiple tools, and gather process information, kill, foreground, background, sleep, and renice processes on the Linux system.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Resources in a Kubernetes Cluster? [Advanced]	In this challenge, you will manage resources in a Kubernetes cluster. First, you will create a namespace, and then you will create a pod ReplicaSet in the namespace. Next, you will create a Deployment in a namespace, and then you will update a Deployment. Finally, you will roll back a Deployment to its previous state, and then you will delete a namespace.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Manage Security and Host Profiles in a vSphere Environment? [Advanced]	In this challenge, you will manage security and host profiles in your vSphere environment. First, you will configure VMware vCenter Server to communicate with a Key Management Server (KMS), and then you will encrypt a virtual machine. Next, you will configure host customizations for a host profile, and then you will import updates into VMware vCenter Lifecycle Manager. Finally, you will remediate hosts that use a single Lifestyle Manager image in a cluster, and then you will configure a VMware Tools product locker.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage Security for Virtual Machines and Databases? [Expert]	In this challenge, you will manage security for virtual machines and databases. First, you will create a virtual machine, and then you will enable security recommendations for the virtual machine. Next, you will enable Azure Defender for SQL for a new Azure SQL database, and then you will perform a vulnerability assessment. Finally, you will deploy an Azure Cosmos DB account, and then you will use role-based access control (RBAC) to control security access to the Azure Cosmos DB account.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage Users and Groups in Windows and Linux? [Advanced]	In this challenge, you will manage local user accounts and groups on both Linux and Windows servers. First, you will manage local users and groups on a server running Linux by using the command prompt. Next, you will manage local users and groups on a server running Windows by using Windows PowerShell. Finally, you will manage local users and groups in Windows by using Local Users and Groups in the Computer Management Microsoft Management Console (MMC) tool.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Users in Linux? [Advanced]	In this challenge, you will use command line tools to manage user accounts, groups and group memberships, including the creation of an administrator account, and add a GUI tool to manage users. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Users, Groups, and Devices [Advanced]	In this challenge lab, you will manage local groups, manage local user accounts, join a computer to a domain, and configure sign in options on a Windows 10 workgroup computer. First, you will create a local group, and then you will manage local group membership. Next, you will configure a new organizational unit to support the use of Group Policy to create a local group; use Group Policy preferences to create a new local group that contains a new user account, and then you will perform a Group Policy update to apply the policy. Then configure a custom wallpaper by using local Group Policy, and join a computer to the domain, then you will sign into that computer by using a domain user account. Finally, you will configure Windows 10 to automatically start an application after sign in.
Can You Manage Virtual Machine Policies and Resources? [Advanced]	In this challenge, you will manage virtual machines policies and resources. First, you will create categories and tags, and then you will assign the categories and tags to virtual machines. Next, create storage policies, and then you will enforce the policies on virtual machines. Finally, you will configure resource controls by using CPU shares and resource pools.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Can You Manage Virtual Machines? [Expert]	In this challenge, you will create and manage virtual machines. First, you will create a virtual machine, and then you will install the Windows operating system and install VMware Tools. Next, you will provision new virtual machines by using clones and templates, and then you will modify and migrate virtual machines between hosts and storage. Finally, you will manage virtual machines by using tags, and then you will configure resource pools to manage virtual machine resources.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Manage vSphere Storage? [Advanced]	In this challenge, you will manage storage on a VMware ESXi host. First, you will configure a new virtual switch that contains a VMkernel port for storage traffic, and then you will add a Network Filesystem Storage (NFS) datastore to a host. Next, you will configure the software iSCSI adapter on the host, and then you will create a Virtual Machine File Share (VMFS) datastore. Finally, you will extend a VMFS datastore to span across multiple LUNs and expand a VMFS datastore to increase available space, and then you will upload a file to a folder in a datastore.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Windows and Linux Systems? [Expert]	In this challenge, you will manage network servers that run Linux and Windows. First, you will back up and restore a server that runs Linux, and then you will back up and restore a server that runs Windows. Next, you will configure the firewall in Linux, and then you will configure Windows Firewall. Finally, you will manage software updates in Linux, and then you will configure the Windows Update service.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage Windows Security? [Advanced]	
Can You Manage Windows Updates? [Advanced]	In this challenge, you will manage Windows updates. First, you will review installed updates, and then you will uninstall an update. Next, you will install Windows Server Update Services. Finally, you will create a new Group Policy Object (GPO), and then you will edit the GPO to configure automatic updates. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manage, Monitor, and Secure Azure Platform Services? [Expert]	In this challenge, you will provision, manage and secure resources for a line of business web application, provision an Azure Web App, an Azure Web Job, an Azure Storage Account, and an Azure Key Vault, configure monitoring for the web app, configure security for the storage account and a pre-existing Azure SQL Database, and use the key vault to store connection strings for the web app.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manipulate Data and Create a Shell Script in Linux? [Expert]	In this challenge, you will simplify Linux administration tasks by using the command line. First, you will control data streams, and then you will create shell and environment variables. Next, you will manipulate data by using the xargs, sed, and awk command-line utilities, and then you will perform operations by using shell operators. Finally, you will create a shell script utility, and then you will create a symbolic link.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Manipulate Data in a Database? [Advanced]	In this Challenge Lab, you will manipulate data by using Transact-SQL (T-SQL). First, you will insert data into a table by using Data Manipulation Language (DML). Next, you will update data in a table, and then you will delete data from a table. Finally, you will extract data by using an INSERT SELECT statement, and then you will combine results by using the UNION and INTERSECT set operators.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Can You Migrate a Database and Monitor Query Performance? [Expert]	In this challenge, you will implement a database migration strategy for a SQL Server database. First, you will configure an Azure virtual machine that hosts SQL Server, and then you will deploy and allow access to Azure SQL databases in an elastic pool. Next, you will migrate a database from SQL Server to Azure SQL Database, and then you will configure Azure Backup for a SQL Server database. Finally, you will add an index for query performance, and then you will analyze query performance by using Query Performance Insight.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Monitor a Web App? [Advanced]	In this challenge, you will configure monitoring for an Azure Web App, configure and test Application Insights, set up logging, and configure alerts for the web app.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Monitor an Azure Virtual Machine? [Advanced]	In this challenge, you will monitor an Azure virtual machine. First, you will create a Log Analytics workspace. Next, you will configure the Log Analytics workspace to collect data from an Azure virtual machine. Finally, you will create an Azure virtual machine activity log alert. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Monitor and Manage a vSphere Environment? [Advanced]	In this challenge lab, you will monitor resource usage and alarms. First, you will monitor the CPU load caused by virtual machines, and then you will monitor the disk load. Next, you will create a custom alarm, and then you will modify the alarm settings. Finally, you will configure alarm actions, and then you will manage vSphere by using PowerCLI cmdlets.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge before you start.
Can You Monitor and Manage Windows? [Advanced]	In this Challenge Lab, you will configure and analyze Event Logs, view performance data on your computer, prepare management tools, configure the local registry, and schedule tasks. First, you will configure management of remote event logs by customizing the Windows Firewall, and then you will connect to a remote event log by using Event Viewer. Next, you will attach a task to a System event. Next, you will enable the default System Performance Data Collector Set by using Performance Monitor and display the resulting report. Next, you will create and configure a custom Microsoft Management Console (MMC) with local and remote focused snap-ins. Next, you will configure the registry to block applications from running on the virtual machine. Finally, you will create and trigger a task.
Can You Monitor Virtual Machines by Using Extensions and Azure Monitor? [Advanced]	In this challenge, you will monitor a virtual machine by using extensions and Azure Monitor. First, you will create a virtual machine by using a custom deployment Azure Resource Manager (ARM) template, and then you will deploy a Desired State Configuration (DSC) script extension to the virtual machine. Next, you will create an alert rule to notify you when the average CPU threshold on the virtual machine exceeds 90 percent. Finally, you will delete the existing DSC extension, and then you will create a custom script extension to configure a new web app on the virtual machine.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Monitor Windows Server 2019? [Advanced]	In this challenge, you will monitor Windows Server 2019. First, you will monitor a Windows Server 2019 server by using Task Manager, Resource Monitor, and Reliability Monitor, and then you will monitor the server by using Performance Monitor. Next, you will configure an event subscription that forwards events from a remote computer to the server by using Event Viewer. Finally, you will configure System Insights on the server by using Windows Admin Center. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Navigate and Search in a Manpage? [Advanced]	In this challenge, you will use the man page to learn about controlling processes.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Optimize a Batch Processing Solution by Using Azure Data Factory and Azure Data Lake? [Advanced]	In this challenge, you will optimize an Azure data factory that supports a data pipeline to transform data. First, you will create a storage account that uses a Data Lake Storage hierarchical namespace, and then you will design a batch processing solution. Next, you will run a performance benchmark to optimize and ingest data for a data lake. Finally, you will deploy an Azure data factory, and then you will create a data pipeline that will transform data into blob data files.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Optimize a Batch Processing Solution by Using Azure Data Factory, Azure Synapse Analytics, and Azure Data Lake? [Expert]	In this challenge, you will optimize a batch processing solution by using Azure Data Factory, Azure Synapse Analytics, and Azure Data Lake. First, create a storage account that uses a Data Lake Storage hierarchical namespace, and then design a batch processing solution. Next, run a performance benchmark to optimize and ingest data for a data lake by using the AzCopy utility, and then deploy an Azure data factory that contains a data pipeline to transform data into a blob data file. Finally, create a data pipeline in Azure Synapse Studio to populate a new, dedicated SQL pool, and then you will create a data pipeline to run a performance benchmark by using a data factory.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab.
Can You Optimize and Monitor an Azure SQL Database? [Advanced]	In this challenge, you will optimize and monitor an Azure SQL database for data performance and security. First, you will deploy an Azure SQL database, and then you will configure SQL auditing. Next, you will create an alert rule for monitoring, and then you will enable automatic tuning options for optimization. Finally, you will test data access, and then you will view the audit log.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Optimize and Monitor Azure Synapse Analytics? [Advanced]	In this challenge, you will optimize and monitor a new Azure Synapse Analytics SQL pool. First, you will deploy a Synapse SQL pool. Next, you will optimize the SQL pool, and then you will query the data in the data warehouse tables. Finally, you will monitor the data access.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Optimize Query Performance? [Advanced]	In this challenge, you will optimize query performance in an Azure SQL database. First, you will create an Azure virtual machine that hosts SQL Server, and then you will create an Azure SQL database. Next, you will verify the Query Store configuration on the Azure SQL database, and then you will generate some test data in the Azure SQL database. Finally, you will add an index for query performance, and then use Query Performance Insight to analyze query performance.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Perform a Network Vulnerability Assessment by Using Nmap? [Advanced]	In this challenge, you will install nmap and then use the tool to conduct a variety of network scans. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Perform Command-Line Tasks by Using Shell Operators and a Shell Script? [Advanced]	In this challenge, you will perform command-line tasks by using shell operators. First, you will determine file attributes by using file test operators, and then you will compare variables by using relational operators. Next, you will perform logical operations by using Boolean operators, and then you will perform arithmetic operations on operands by using arithmetic operators. Finally, you will create a search utility by using a script.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Perform Post-Installation Configuration? [Advanced]	In this Challenge Lab, you will perform post-installation configuration tasks. First, you will disable autofill for a username and password in Microsoft Edge, and then you will configure the Windows desktop by locking and unlocking the Start menu. Next, you will access the Microsoft Store, and then you will block access to it. Finally, you will configure application control policies, and then you will create a custom view in Event Viewer.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Can You Populate Azure SQL Database by Using Azure Data Factory? [Advanced]	In this challenge, you will design a new Azure data factory instance that supports a data pipeline. First, you will deploy an Azure data factory. Next, you will create an Azure SQL database that will hold the data output from a pipeline, and then you will author multiple activities in a data pipeline. Finally, you will debug and publish the data pipeline.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Populate Azure Synapse Analytics by Using Azure Data Factory? [Expert]	In this challenge, you will populate an Azure Synapse Analytics SQL pool by using an Azure data factory data pipeline. First, you will create a storage account that uses an Azure Data Lake Storage hierarchical namespace, and then you will create an Azure Synapse Analytics SQL pool. Next, you will deploy an Azure data factory, and then you will create a data pipeline. Finally, you will author copy data activities that will send data output through the data pipeline, and then you will test the data pipeline.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Process Incoming IoT Data in Real Time? [Advanced]	In this challenge, you will process incoming IoT data in real time. You will use IoT consumer groups and Stream analytics to process messages coming through an IoT hub.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Provision a Cognitive Services Computer Vision API, Connect it to an Application, Analyze the Results? [Advanced]	In this challenge, you will create a Computer Vision API, test the API, access the API, Keys, connect the API to an application, run the application, and analyze the results.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Provision a Serverless Container-Based Environment? [Advanced]	In this challenge, you will provision a container-based environment. The environment will include a container registry, a container instance, and a container-based web app.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Provision an End-to-End IoT Solution? [Expert]	In this challenge, you will provision an Azure IoT hub. You will then use an IoT device emulator to send data to the hub. Finally, you will send commands from the hub to the device emulator. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Provision Data Storage for a Web App? [Expert]	In this challenge, you will provision all data components for a line of business application. This includes Azure storage, Azure SQL database, Cosmos DB, and search. Each of these resources will be properly configured and tied into a line of business web application. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Provision NoSQL Data for a Web App? [Advanced]	In this challenge, you will provision an Azure Cosmos DB account and database, and configure a web app to use the database, provision an Azure Search service and configure it to index the Cosmos DB database, and configure a web app to use the Search service. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Provision Public and Private Blob Storage for a Web App? [Advanced]	In this challenge, you will provision a storage account with a private container and a public container, provision a key vault to securely store the storage account key, and configure a web app to use the storage account via the key stored in the key vault. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Provision Relational Databases for a Web App? [Advanced]	In this challenge, you will provision an Azure SQL Database and an Azure Database for MySQL, populate it with data using the Azure Cloud Shell, and configure a web app to use the databases. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Query Data by Using Transact-SQL? [Advanced]	In this challenge, you will write several Transact-SQL (T-SQL) queries for a database table. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will develop a query that performs calculations by using expressions and column aliases. Next, you will develop more specific queries that return filtered data from a table by using the SQL query WHERE clause. Finally, you will explore queries that sort and limit the results by using ORDER BY, OFFSET, and FETCH.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Query Data from a MySQL Database? [Advanced]	In this challenge you will write several MySQL queries for a database table. First, you will develop a query that performs calculations by using expressions and column aliases. Next, you will develop more specific queries that return filtered data from a table by using the SQL query WHERE clause. Finally, you will explore queries that sort and limit the results by using ORDER BY and LIMIT modifiers.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Query Data from Multiple Tables in Transact-SQL? [Advanced]	In this challenge, you will write several Transact-SQL queries to query data from multiple tables. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will write a query by using inner joins. Next, you will develop more specific queries that include joining tables by using outer joins. Finally, you will develop a query that combines data from multiple result sets by using a UNION set operator.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Remediate Issues by Using Monitoring and Availability Metrics? [Advanced]	In this challenge, you will create a solution that will automatically start an Amazon Elastic Cloud Compute (Amazon EC2) instance when it stops. First, you will create a new Lambda execution role, and then you will create a Lambda function to start a specific EC2 instance. Next, you will create a new Amazon EventBridge rule to monitor the EC2 instance state and execute the Lambda function if the instance stops. Finally, you will test the rule by manually stopping the EC2 instance.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Restore Users and Configure Password Expiration Policies? [Advanced]	In this challenge, you will delete and then restore specific users and configure a new password expiration interval for these users.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Secure a Website with an SSL/TLS Certificate? [Advanced]	In this challenge, you will enable HTTPS for a web site and require trusted client PKI certificates.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Secure Access to an S3 Bucket? [Advanced]	In this challenge, you will create an Amazon S3 bucket to store static assets for a website, and then you will configure cross-region replication (CRR) to a new bucket. Next, you will enable public access to the bucket, and then you will create a user account for the web administrator. Next, you will create an Identity and Access Management (IAM) policy that provides full control of the bucket, and then you will create a new group. Finally, you will assign the IAM policy to the group, and then you will add the web administrator to the group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Secure Azure Platform Services? [Advanced]	In this challenge, you will secure an Azure SQL Database and an Azure Storage Account, enforce encryption and firewall rules for an Azure SQL Database, enforce encryption and firewall rules for a storage account, and provision an Azure Key Vault and use it to store connection strings for a web app. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Secure DNS Resource Records and Windows NTFS Volume File Objects? [Advanced]	In this challenge, you will enable DNSSEC on clients and server and protect data at rest using Microsoft Encrypting File System.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Secure Host Settings through Firewall Settings and Group Policy? [Advanced]	In this challenge, you will configure the Windows firewall, configure Group Policy password and file system auditing settings.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Secure Network Access? [Advanced]	In this challenge, you enable IPSec to secure LAN traffic, and you configure a PPTP VPN server and client.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Serve a Simple, Static Website with S3? [Advanced]	In this challenge, you will create an S3 bucket with version control to be a static website. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Store and Analyze IoT Data? [Advanced]	In this challenge, you will use Cosmos DB and Time Series Insights to analyze IoT data. You will then use Cosmos DB to perform a variety of analyses on the raw IoT data. Finally you will generate charts and other analytic assets with Time Series Insights. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Troubleshoot Apache Spark Jobs in a Pipeline by Using Azure Synapse Analytics? [Advanced]	In this challenge, you will troubleshoot Apache Spark jobs in a pipeline by using Synapse Studio. First, you will create an Apache Spark pool in a Synapse Analytics workspace, and then you will design a stream processing solution. Next, you will create an Azure Event Hubs namespace and an event hub for event streaming, and then you will create an event subscription by using Azure Event Grid. Finally, you will create and troubleshoot an Apache Spark job in Synapse Studio, and then you will add an Apache Spark job to a Synapse pipeline.Note: Once you begin the challenge lab you will not be able to pause, save, or exit and return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Troubleshoot Linux Network Issues? [Expert]	In this challenge, you will configure Linux DNS client settings for name resolution using tools and files such as host, nslookup, dig, getent, /etc/hosts, /etc/resolv.conf and /etc/nsswitch.conf. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Use Access Logging for Bucket Management and Monitoring? [Advanced]	In this challenge, you will create an S3 bucket to allow the distribution of files to the public. It will allow the upload and download of content but not the deletion, and setup logging of all activity in the bucket. The logs will be held in a separate S3 bucket.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use Branching and Conditional Logic in a C# Application? [Advanced]	In this challenge lab, you will control the flow of code in your application by using use Boolean operators, logical expressions, and branching techniques. First, you will create a console application, and then you will assign values to variables by using an if statement. Next, you will assign variables by using a switch statement. Finally, you will display selected data by using the conditional logical AND and OR operators.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Can You Use Data Types and Functions in a MySQL Database? [Advanced]	In this challenge you will write several MySQL queries by using data types and functions. First, you will develop queries that use string parsing to extract data. Next, you will develop queries that will use numeric expressions and functions. Finally, you will explore queries that use data and time expressions and functions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can you Use Data Types and Functions in Transact-SQL? [Advanced]	In this challenge, you will write several Transact-SQL (T-SQL) queries by using data types and functions. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will develop queries that use string parsing to extract data. Next, you will develop more specific queries that will use the FORMAT function for formatting date and time data. Finally, you will explore queries that use the DATEDIFF and DATEADD functions for performing calculations on date and time data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use Find and Locate to Search for Files in Linux? [Advanced]	In this challenge, you will search for files by using the find and locate commands. Files will be found by criteria such as name, size, recent modification, etc.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use Linux Command-Line Tools to Simplify Administration Tasks? [Advanced]	In this challenge, you will simplify Linux administration tasks by using command-line tools. First, you will manage the standard input and output data streams by using redirection, and then you will control the standard input and output data streams by using pipes and filters. Next, you will define shell and environment variables. Finally, you will manipulate files by using the xargs command, and then you will edit text files by using the sed and awk command-line utilities.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use Managed Identities? [Advanced]	In this challenge, you will enable System-assigned and user-assigned managed identities using a VM and assign appropriate permissions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use Monitoring Tools in Windows Server 2016? [Advanced]	In this challenge, you will manage Event Viewer log file entries and Performance Monitor data by creating new log file entries, filtering the results, creating and copying a custom data collector set by using Performance Monitor, managing processes by using Task Manager, the Services console, and the tasklist command, and documenting reliability metrics for the server by using Reliability Monitor.Once you begin the challenge, you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Can You Use PKI to Secure a Network Environment? [Expert]	In this challenge, you will create a private PKI certificate authority, configure website HTTPS, enable DNSSEC, and protect data at rest through Microsoft Encrypting File System.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use PowerShell to Gather Computer Information in Windows? [Advanced]	In this challenge, you will gather system information by creating simple PowerShell scripts.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use RBAC and Design a Custom Role? [Advanced]	In this challenge, you will configure account security using Role Based Access Control (RBAC) and then design a custom role.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use the GREP and Sort Commands Together? [Advanced]	In this challenge, you will use grep and sort together to produce specific sorted output.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use the Sysinternals Suite to Review Permissions on a Windows System? [Advanced]	In this challenge you will use the Sysinternals AccessChk and AccessEnum tools to verify permissions, as well as the Icacles tool to set and verify permissions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Can You Use Wireshark to Intercept Network Traffic? [Advanced]	In this challenge, you will use Wireshark to intercept and read network traffic.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Certificates and Trust Authority [Guided]	This challenge is in development. Details coming soon.
Challenge Labs - All Access Pass	The All Access Pass is a 365 day subscription that will include access to hundreds of IT Pro challenges related to multiple platforms and technologies, such as Microsoft Azure, PowerShell and Linux, with AWS, Google, and Cyber Security will be coming soon. New challenges are continually being released, and you will gain automatic access to them through the All Access Pass.
Change the Size of an Azure VM by Using PowerShell [Guided]	In this challenge, you will create and run a PowerShell script to change the size of an Azure VM.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Clone Virtual Machines and Manage Templates [Guided]	In this challenge, you will clone virtual machines and manage templates. First, you will clone a running virtual machine, and then you will convert the cloned virtual machine to a template. Next, you will create a customization specification. Finally, you will deploy a virtual machine by using the Open Virtual Appliance (OVA) template file and the customization specification that you created. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Collect Log Data from Linux Computers [Guided]	In this challenge, you will collect log data from a Linux computer. First, you will create a Log Analytics workspace, and then you will enable the Log Analytics virtual machine extension on an existing Linux virtual machine. Next, you will collect syslog and performance data from the virtual machine. Finally, you will view the collected data. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Collect Log Data from Windows Computers [Guided]	In this challenge, you will collect log data from a Windows virtual machine. First, you will create a Log Analytics workspace, and then you will enable the Log Analytics virtual machine extension on an existing Windows virtual machine. Next, you will collect event and performance data from the log files on the virtual machine. Finally, you will view the collected data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Collect Metrics and Logs by Using the CloudWatch Agent [Guided]	In this challenge, you will configure the CloudWatch agent to collect metrics and logs for a website. First, you will verify that the web server is running, and then you will connect to the console of the Amazon Elastic Cloud Compute (EC2) instance by using EC2 Instance Connect. Next, you will configure the CloudWatch agent on the web server. Finally, you will review the CloudWatch metrics and logs.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Combining Data Using Unions in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries to combine data by using the UNION set operator. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will develop a query that combines data from two result sets. Next, you will develop more specific queries that will combine result sets by removing and retaining duplicates. Finally, you will explore queries that will sort the combined result sets.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start
Combining Data with UNIONS [Guided]	In this challenge you will write several MySQL queries to combine data by using the UNION set operator. First, you will develop a query that combines data from two result sets. Next, you will develop more specific queries that will combine result sets by removing and retaining duplicates. Finally, you will explore queries that will sort the combined result sets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Compare Values by Using Boolean Operators in C# [Guided]	In this challenge lab, you will compare literals and variables in your application. First, you will create a simple C# console application, and then you will compare literals and variables by using the equality and inequality operators. Next, you will compare numerical values by using comparison operators. Finally, you will change a Boolean value by using the logical negation operator.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure a DHCP Relay Agent [Guided]	In this challenge, you will verify DNS resolution and connectivity for Internet-based clients and connect through a WAP reverse proxy. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Distributed Virtual Switch [Guided]	In this challenge, you will configure a distributed virtual switch to allow network configurations to be shared across multiple VMware ESXi hosts. First, you will create a distributed virtual switch, and then you will add ESXi hosts to the switch. Next, you will migrate virtual machines from the default standard virtual switch to the distributed virtual switch, and then you will add additional hosts and port groups to the distributed virtual switch. Finally, you will back up a distributed virtual switch, and then you will restore the switch.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure a Forest Trust Relationship [Guided]	In this challenge, you will configure a trust relationship between two different forests, review the DNS configurations for the forests, configure a forest trust with selective authentication, and configure a server for selective authentication, and then test the forest trust.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Hierarchical Namespace for Azure Data Lake [Guided]	In this challenge, you will configure a hierarchical namespace for Azure Data Lake. First, you will deploy a storage account that uses Azure Data Lake Storage. Next, you will design a hierarchical namespace for a data lake, and then you will create a container for blob data by using a hierarchical namespace. Finally, you will run performance benchmarks to optimize and ingest data for a data lake.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure a Linux VM by Using Bash [Guided]	In this challenge, you will configure a Linux VM using Azure Bash shell.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Local Security Policy on Server 2016 [Guided]	In this challenge, you will use the Windows Server Local Security Policy to configure local password requirements, auditing, and additional security settings. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Multi-Zone DNS Environment [Guided]	In this challenge, you will create a DNS sub-zone where the root zone will have a delegation record for the child zone and the child zone will have a forwarder to the parent zone.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Near Real-Time Metric Alert [Guided]	In this challenge, you will configure a near real-time metric alert. First, you will create a Linux virtual machine. Next, you will create an action group, and then you will create a near real-time metric alert that uses the action group. Finally, you will test the alert.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Network Security Group in a Virtual Network [Guided]	In this challenge, you will configure a network security group to allow secure shell (SSH) connections to a virtual machine. First, you will create an application security group, and then you will create a network security group. Next, you will associate the network security group to a subnet in the virtual network, and then you will associate the application security group to the network interface on the virtual machine. Finally, you will add an inbound security rule, and then you will verify that you can connect to the virtual machine in the subnet by using SSH.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a NoSQL Database by Using Amazon DynamoDB [Guided]	In this challenge lab, you will create an Amazon DynamoDB table that will be used to access data for a Python application. First, you will create a DynamoDB table, and then you will create an Identity and Access Management (IAM) policy to allow access to the DynamoDB table. Next, you will create an IAM role to allow access to the DynamoDB table, and then you will create an Amazon Elastic Compute Cloud (Amazon EC2) instance to run a Python application. Finally, you will install the Boto3 and pandas Python libraries in the AppServer instance, and then you will connect to the console of the Amazon EC2 instance to test access to the DynamoDB table from the Python application.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge

Configure a Point-to-Site Virtual Private Network (VPN) Connection between Windows Server 2019 and Azure [Guided]	In this challenge, you will configure a point-to-site Virtual Private Network (VPN) connection between Windows Server 2019 and Azure. First, you will install a User certificate on your server. Next, you will create a VPN client connection to Azure. Finally, you will connect to Azure by using the VPN connection.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure a Relational Database by Using Amazon RDS [Guided]	In this challenge lab, you will configure a MySQL database in an Amazon RDS DB instance to store data for a customer-facing website. First, you will create a security group to control access to the database server, and then you will create an Amazon RDS DB instance. Next, you will create an Amazon Elastic Compute Cloud (Amazon EC2) instance that runs a PHP website, and then you will install the MySQL command-line tools in the instance. Finally, you will create a table that contains data, and then you will test access to the database from the web server.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure a Route Table Using the Azure Portal [Guided]	In this challenge, you will create a route table using Azure Marketplace and define static routes. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Security Group [Guided]	In this challenge, you will create a security group that will only allow specific traffic into a web server you are running. First, you will create a security group. Next, you will create an Amazon Elastic Compute Cloud (Amazon EC2) instance that uses the security group. Finally, you will test access to the web server through the security group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Server by Using Windows PowerShell Desired State Configuration [Guided]	In this challenge, you will configure a server by using PowerShell Desired State Configuration (DSC), create a DSC configuration script, compile a MOF file, and deploy the configuration. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Standard Virtual Switch [Guided]	In this challenge, you will configure standard virtual switches to enable network connectivity. First, you will remove the default virtual machine port group from an existing switch, and then you will create a new virtual switch that has a virtual machine port group. Next, you will add an additional virtual machine port group to the switch, and then you will modify the active and standby network interface cards (NICs) for a single port group. Finally, you will create a new switch that has a VMkernel port configured for VMware vSphere; vMotion.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Tier-0 Gateway [Guided]	In this Challenge Lab, you will create uplink segments. First, you will confirm that there is no connectivity between the East-West and North-South networks. Next, you will create two uplink segments for traffic to flow between the Tier-1 and Tier-0 gateways, and then you will create a Tier-0 gateway and connect it to the existing Tier-1 Gateway. Finally, you will test connectivity to confirm the functionality of the Tier-0 Gateway.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Configure a Tier-1 Gateway [Guided]	In this Challenge Lab, you will create a Tier-1 gateway. First, you will confirm that there is no connectivity between the Web Segment, the App Segment, and the DB Segment. Next, you will create a Tier-1 Gateway, and then you will attach it to the three segments. Finally, you will test connectivity to confirm the functionality of the Tier-1 Gateway.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.

Configure a vCenter Server [Guided]	In this challenge, you will configure a server running VMware vCenter Server to manage your VMware ESXi hosts. First you will create a virtual datacenter, and then you will add the ESXi hosts to be managed. Next, you will create a folder to organize the hosts, and then you will move the hosts into the folder. Finally, you will configure VMware vSphere and vCenter Server licensing , and then you will enable lockdown mode and join a vCenter server to an Active Directory domain.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Virtual Machine by Using a Custom Script Extension [Guided]	In this challenge, you will automate the configuration of a web app on a new server. First, you will create a storage account, and then you will create a Windows virtual machine. Next, you will create the configuration files. Finally, you will apply a PowerShell Desired State Configuration (DSC) extension, and then you will verify that the web app loads.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure a Virtual Machine by Using a PowerShell DSC Extension [Guided]	In this challenge, you will automate the configuration of a web app on a new server. First, you will create a storage account, and then you will create a Windows virtual machine. Next, you will create the configuration files. Finally, you will apply a PowerShell Desired State Configuration (DSC) extension, and then you will verify that the web app loads. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Virtual Machine Scale Set [Guided]	In this challenge, you will configure an Azure virtual machine scale set. First, you will create a scale set that uses load balancing and a common Linux operating system disk image. Next, you will increase the number of virtual machines in the scale set. Finally, you will stop and deallocate a virtual machine instance.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure a Virtual Network Service Endpoint [Guided]	In this challenge, you will configure access to an Azure Key Vault service endpoint from the back-end tier of an application. First, you will create a secret in a key vault, and then you will create an outbound security rule for the back-end subnet in a virtual network. Next, you will configure a virtual network service endpoint to provide access to the key vault secret. Finally, you will verify that you can access the service endpoint.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure a Windows PPTP VPN [Guided]	In this challenge, you configure a Microsoft Windows Server PPTP VPN with static VPN client IP addressing.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Access and Protection [Advanced]	In this Challenge Lab, you will configure NTFS permissions, configure share permissions, configure and manage local storage, manage and optimize storage, and manage advanced file and folder permissions. First, you will create a new file named sample.txt, and then you will view the security properties of the file. Next, you will deny NTFS permissions to a user, and then you will grant NTFS permissions to a user. Next, you will create a new folder share and set share permissions, and then you will create and format a volume. Next, you will create a Storage Space, and then you will manage Defragmentation. Finally, you will configure Storage Sense and view storage usage, and then you will manage file ownership.
Configure Account Lockout Policy Settings [Guided]	In this challenge, you will configure a domain Account Lockout Policy by configuring the policy and then test it, unlocking the account that violated the policy, and performing these same tasks programmatically.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Amazon S3 Event Logging and Handling [Guided]	In this challenge, you will configure a bucket to send a notification when new content is added.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an Alias in Linux [Guided]	In this challenge, you will use the alias command to configure your environment for less administrative effort. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an Amazon EventBridge Rule That Sends an Automated Email by Using the Simple Notification Service [Guided]	In this challenge, you will monitor an Amazon Elastic Compute Cloud (Amazon EC2) instance and generate an email if the instance is stopped. First, you will create a new Amazon Simple Notification Service (Amazon SNS) topic, and then you will create an email subscription. Next, you will create an Amazon EventBridge rule to monitor your EC2 instance for state changes. Finally, you will stop the EC2 instance, and then you will verify that you received an email when the state changed.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure an Amazon EventBridge Rule That Triggers an Action [Guided]	In this challenge, you will configure an Amazon EventBridge rule that will send an email when an Amazon Elastic Cloud Compute (Amazon EC2) instance shuts down. First, verify that the EC2 instance is running, and then subscribe to an Amazon Simple Notification Service (Amazon SNS) topic. Next, create an Amazon EventBridge rule to monitor the status of the EC2 instance and generate a notification when the instance is stopped. Finally, simulate a failure of the EC2 instance, and then you will verify that you received an email notification.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start
Configure an Application Security Group [Guided]	In this challenge, you will create an Azure virtual machine that uses an application security group. First, you will create a virtual network. Next, you will create an application security group, and then you will create a network security group. Finally, you will create an Azure virtual machine to be used as a web server, and then you will test the security configuration.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an Azure Distributed Denial of Service Protection Plan [Guided]	In this challenge, you will protect your Azure virtual network from distributed denial of service (DDoS) attacks. First, you will create an Azure DDoS protection plan. Next, you will create and configure an Azure virtual network. Finally, you will associate the Azure DDoS protection plan to your Azure virtual network.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an Azure Lock [Guided]	In this challenge, you will protect Azure resources from modification and deletion. First, you will apply locks to an Azure resource, and then you will test the locks. Next, you will apply a lock to a resource group. Finally, you will test the inheritance of the lock.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an Azure SQL Database Elastic Pool [Guided]	In this challenge, you will provision Azure SQL databases in an elastic pool. First, you will deploy two Azure SQL databases in a new elastic pool. Next, you will review the database resource utilization in the elastic pool. Finally, you will scale up the elastic pool.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure an Azure VNet-to-VNet Connection [Guided]	In this challenge, you will configure a VNet-to-VNet connection between two Azure virtual networks. First, you will review the existing network configuration. Next, you will create two virtual network gateways. Finally, you will create two virtual network gateway connections, and then you will verify that the virtual network gateways are connected.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an Elastic Load Balancer [Guided]	In this challenge, you will balance the traffic between multiple EC2 instances of an application. First, you will create a key pair, and then you will create a security group. Next, you will create two EC2 instances, and then you will create a target group. Finally, you will register the web servers with the target group, and then you will create an elastic load balancer that uses the target group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an FTP Server with Linux [Guided]	In this challenge, you will install and configure an FTP server, and test the functionality of the FTP service. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an S3 Bucket and Website [Guided]	In this challenge, you will create multiple S3 buckets, enable version control, server access logging, S3 encryption, public access, public website hosting, and will upload files to serve as a static website.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure an SNS Notification for a CloudWatch Alarm [Guided]	In this challenge, you will configure Amazon CloudWatch to generate an alarm and then send you a notification when 404 errors reach a specific level. First, create an Amazon Simple Notification Service (SNS) topic, and then create an email subscription for the topic. Next, create a CloudWatch metric and alarm for 404 errors on an Amazon Elastic Cloud Compute (Amazon EC2) instance, and then simulate errors on a website by attempting to connect to a nonexistent page. Finally, monitor the CloudWatch alarm until it is triggered, and then verify that you received a notification email.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure you have enough time to complete the challenge lab before you start
Configure and Analyze Event Logs [Guided]	In this challenge, you will configure management of remote event logs by customizing the Windows Firewall, and then you will connect to a remote event log by using Event Viewer. Next, you will attach a task to a System event. Finally, you will modify local Group Policy to add a user to the list of users that have permission to manage security auditing on folders, force a Group Policy update, and then verify that the user can enable auditing on a folder. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure and Manage Linux Print Queues and Jobs [Guided]	In this challenge, you will install the Common Unix Printing System (CUPS), and configure a print queue and then submit a print job to the print queue. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure and Manage Services [Guided]	In this challenge, you will create and filter custom views along with configuring network settings. First, you will use event viewer to create a custom view. Next you will use event viewer to filter current custom views. Finally, you will set up a private network profile, and then you will enable network discovery.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.

Configure and Query Cognitive Services Computer Vision API [Guided]	In this challenge, you will configure the Azure Cognitive Services Computer Vision API service to analyze and recognize images. First, you will provision the Azure Cognitive Services Computer Vision API service, and then you will acquire the API endpoint and service key. Next, you will test the Computer Vision API service to ensure that the service describes and analyzes test images. Finally, you will review service performance metrics in the Azure portal.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure and Query the Cognitive Services Face API [Guided]	In this challenge, you will configure the Azure Cognitive Services Face API service to detect faces and emotions. First, you will provision the Azure Cognitive Services Face API service, and then you will acquire the API endpoint and service key. Next, you will test the Face API service to ensure that the service detects faces and emotions. Finally, you will review service performance metrics in the Azure portal.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure and Test the Firewall in Linux [Guided]	In this challenge, you will configure the Windows firewall. First, you will display the default firewall settings, and then you will configure the firewall to permit traffic. Next, you will display firewall configurations by using Windows PowerShell and then you will add the FTP service. Finally, you will configure the firewall for FTP connections, and then you will display firewall log file information.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure and Test the Firewall in Windows [Guided]	In this challenge, you will configure the Windows firewall. First, you will display the default firewall settings, and then you will configure the firewall to permit traffic. Next, you will display firewall configurations by using Windows PowerShell and then you will add the FTP service. Finally, you will configure the firewall for FTP connections, and then you will display firewall log file information.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure and Use GUI Administration Tools in Linux [Guided]	In this challenge, you will install and configure GUI administrative tools. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Application Insights [Guided]	In this challenge, you will configure Application Insights for an existing web application, turn Application Insights on for a web app, and monitor the web app using Application Insights. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Application Insights and App Service Logs for a Web App [Guided]	In this challenge, you will create and deploy an Azure web app that includes Application Insights and App Service logs. First, you will create a web app, and then you will deploy the source code for the web app. Next, you will enable Application Insights for monitoring. Finally, you will enable App Service logs for auditing and debugging.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Application Settings [Guided]	In this challenge you will configure application settings to disable notifications and configure security settings. First, you will configure Focus assist. Next, you will configure application control policies by using security settings. Finally, you will configure application control policies by using group policy.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure Authentication for an Azure Web App [Guided]	In this challenge, you will create an Azure web app that uses authentication. First, you will create an Azure web app. Next, you will deploy a sample web app, and then you will test the web app. Finally, you will enable authentication by using Azure Active Directory.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure AWS Auto Scaling [Guided]	In this challenge, you will configure Auto Scaling for your web servers. First, you will create a security group for a launch template, and then you will configure a launch template. Next, you will create an Elastic Load Balancer, and then you will create an Auto Scaling group. Finally, you will create a scheduled action for the Auto Scaling group.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure AWS Systems Manager Patch Manager [Guided]	In this challenge, you will configure patch management by using the Patch Manager capability in AWS Systems Manager. First, you will view the predefined baselines for managing patches, and then you will create new baselines for Windows Server and Amazon Linux systems. Next, you will organize Amazon Elastic Cloud Compute (Amazon EC2) instances into patch groups, and then you will scan for compliance. Finally, you will install any missing patches in the instances in the patch group, and then you will review the patch management dashboard and reporting information.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure Azure Disk Encryption [Guided]	In this challenge, you will enable Azure Disk Encryption on an Azure virtual machine. First, you will create a virtual machine. Next, you will add a data disk to the virtual machine. Finally, you will enable Azure Disk Encryption.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Azure Disk Encryption for an Azure Virtual Machine That Hosts SQL Server [Guided]	In this challenge, you will configure an Azure virtual machine that is enabled for secure access by using Azure Disk Encryption. First, you will create an Azure key vault by using the Azure portal. Next, you will configure Azure Disk Encryption on an Azure virtual machine. Finally, you will verify the encryption.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Azure File Sync [Guided]	In this challenge, you will synchronize files between an on-premises file server and Azure. First, you will create an Azure file share, and then you will deploy an Azure Storage Sync service resource. Next, you will install the Azure File Sync agent on your on-premises server, and then you will register the server with Azure File Sync. Finally, you will create a sync group, add a server endpoint to the sync group, and then you will verify synchronization between the on-premises server and the Azure file sync. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure Azure Monitor Alerts [Guided]	In this challenge, you will provision a new virtual machine scale set that uses autoscaling. First, you will deploy a virtual machine scale set from a template. Next, you will define autoscale alerts. Finally, you will test the autoscale alerts.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Azure Role Based Access Control [Guided]	In this challenge, you will grant a user the permissions needed to create a virtual network in a specific resource group. First, you will assign an Azure built-in role to a user in the resource group, and then you will test the role assignment. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Azure SQL Database Auditing [Guided]	In this challenge, you will configure an Azure SQL database to use auditing for data security. First, you will access a pre-existing Azure SQL database. Next, you will configure auditing at the server level, and then you will configure auditing at the database level. Finally, you will test the security access, and then you will view the audit log.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Azure Virtual Network Peering [Guided]	In this challenge, you will configure network peering between two Azure virtual networks. First, you will review the existing environment. Next, you will configure Azure virtual network peering. Finally, you will create two virtual machines by using Azure PowerShell, and then you will use the virtual machines to test the virtual network peering connections.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Basic and Dynamic Disks [Guided]	In this challenge, you will configure flexible and redundant storage. First, you will configure basic disk partitions, and then you will configure dynamic disk volumes. Next, you will configure the NTFS and Resilient File System (ReFS) file systems. Finally, you will use mount points and drive letters to organize storage.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Blob Storage with Private Access [Guided]	In this challenge, you will create an Azure storage account with a private container, and then configure a web app to use that container for storage. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Blob Storage with Public Access [Guided]	In this challenge, you will create an Azure storage account with a public container, upload files to the account, and test public access to the account.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Centralized Event Logs in Windows Server 2019 [Guided]	In this challenge, you will configure centralized event log files for your file servers. First, you will manage Event Viewer entries. Next, you will configure an Event Viewer subscription. Finally, you will configure Event Viewer archiving.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Client IP Settings [Guided]	In this challenge students will learn how to configure a client's IP settings.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Continuous Deployment by Using GIT and Deployment Slots [Guided]	In this challenge, you will deploy a web app with configure Continuous Deployment using GIT and Deployment Slots. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Custom Certificate Templates and Deployment Options [Guided]	In this challenge, you will configure a custom PKI certificate template; then you will configure certificate auto-enrollment using Microsoft Group Policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Custom DNS Zone for Private Domain [Guided]	In this challenge, you will use PowerShell to add a Private domain DNS Zone into Azure.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Data De-Duplication [Guided]	In this challenge, you will maximize storage efficiency by creating duplicate files, installing the Data Deduplication role, executing deduplication jobs, and configuring deduplication schedules and exclusions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Data Transfer and Storage Options for an S3 Bucket [Guided]	In this challenge, you will configure data transfer and storage options. First, you will create a new Amazon Simple Storage Service (S3) bucket. Next, you will enable transfer acceleration. Finally, you will classify stored files, and then you will configure file storage to use the most cost-effective storage tiers.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Diagnostic Settings on an Azure Virtual Machine [Guided]	In this challenge, you will configure diagnostic settings on an Azure virtual machine. First, you will create a Log Analytics workspace, and then you will enable the Log Analytics virtual machine extension on a virtual machine. Next, you will create a diagnostic setting for an Azure virtual machine by using the Azure portal. Finally, you will manage virtual machine extensions by using Azure PowerShell.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Distributed Intrusion Detection [Guided]	In this Challenge Lab, you will configure Distributed Intrusion Detection to monitor and analyze traffic for suspicious activity. First, you will enable IDS signature auto update to ensure that signature files are regularly updated. Next, you will enable and configure Distributed Intrusion Detection on a vSphere cluster. Finally, you will generate malicious traffic and view the intrusion detection events.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Configure DNS Client Settings for Linux on Azure [Guided]	In this challenge, you will configure Azure Linux virtual machines to use both Azure-provided DNS and custom DNS servers. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Domain and Local Password Policy Settings [Guided]	In this challenge, you will configure local and domain password policies by configuring and testing a local password policy, configuring and testing a domain password policy, and implementing a Fine-Grained Password Policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Dynamic Data Masking by Using Azure SQL Database [Guided]	In this challenge, you will implement dynamic data masking for data security. First, you will access an Azure SQL database, and then you will configure the firewall settings. Next, you will apply dynamic data masking to the email and account number columns by using Transact-SQL. Finally, you will test the data security access.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Exchange Online [Guided]	In this challenge, you will configure an Exchange sharing policy, configure Exchange mailboxes and trace message.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure File and Folder Permissions [Guided]	In this challenge you will manage advanced file and folder permissions. First, you will determine the effective access of a user on a file. Next, you will configure and use Advanced File and Folder Permissions. Finally, you will manipulate file permission inheritance, and then you will manage and use conditional access.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure File Encryption and Access Logging [Guided]	In this challenge, you will configure a bucket to encrypt files at rest and log access to the bucket.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Geo-Replication for Your Database [Guided]	In this challenge you will create a new Azure SQL Database and enable it for Geo-Replication.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Global Virtual Network Peering [Guided]	In this challenge, you will configure a virtual network peering between the virtual networks for two applications hosted in different Azure regions. First, you will review existing Azure resources, and then you will verify that you are unable to add virtual network peerings between the existing virtual networks. Next, you will remove overlapping address spaces in the virtual network configuration. Finally, you will configure global virtual network peering between the two virtual networks. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure Group Policy Processing [Guided]	In this challenge, you will configure Group Policy processing to control application of existing Group Policy Objects (GPOs) to specific users by using the link enabled, block inheritance options, enforce a GPO, implement security filtering, and test the results for each scenario. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Group Policy Settings and Preferences [Guided]	In this challenge, you will configure Group Policy settings and preferences by modifying the computer configuration settings of the Default Domain Controllers Policy Group Policy Object (GPO), modifying the user configuration settings and configure preferences in existing GPOs, and applying the edited GPOs and view the results. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure High Availability by Using an Elastic Load Balancer [Guided]	In this challenge lab, you will configure Elastic Load Balancing for two Amazon Elastic Compute Cloud (Amazon EC2) instances. First, you will create a security group for a load balancer, and then you will modify the security group for the web server. Next, you will configure two EC2 instances as web servers, and then you will create a target group that includes the EC2 instances. Finally, you will create a load balancer for the EC2 instances, and then you will test the load balancer.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure High Availability for a VMware vSphere Cluster [Guided]	In this challenge, you will configure high availability for a vSphere cluster. First, you will configure redundancy for the management network on the VMware ESXi hosts. Next, you will create a cluster, and then you will add hosts to the cluster. Finally, you will configure high availability on the cluster, and then you will evaluate the failover actions taken by vSphere when failures occur.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure Hyper-V Replica on Windows Server 2019 [Guided]	In this challenge, you will implement Hyper-V Replica on Windows Server 2019. First, you will configure a Windows Server 2019 computer as a Hyper-V Replica server, and then you will configure the server firewall to allow replication traffic. Next, you will enable replication of a Hyper-V virtual machine. Finally, you will perform a planned failover of a virtual machine.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure I/O Controls [Guided]	In this challenge, you will manage storage and network I/O resources. First, you will establish a storage I/O performance baseline, and then you will enable vSphere Storage I/O Control on a datastore. Next, you will create VM storage policies, and then you will assign the VM storage policies. Finally, you will enable vSphere Network I/O Control on a distributed virtual switch, and then you will configure network resource pools.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure IP Addresses [Guided]	In this Challenge Lab, you will manage a Windows IP configuration. First, you will manually configure Windows 10 IP settings. Next, you will configure Windows 10 DHCP settings. Finally, you will configure Alternate Configuration settings to assign a static IPv4 address if a DHCP server cannot be contacted. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure IP Routing with Linux on Azure [Guided]	In this challenge, you will configure IP routing for Linux virtual machines deployed in the Azure cloud such that inter-subnet traffic is sent through a network virtual appliance (NVA). Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure IPSec [Guided]	In this challenge, you will secure LAN traffic using IPSec.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure IPv4 and IPv6 Addressing for Linux [Guided]	In this challenge, you will configure Linux to properly communicate on the network, by configuring and test IPv4 settings on a Linux interface, and performing the same task for IPv6 settings. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure iSCSI Storage in vSphere [Guided]	In this challenge, you will configure iSCSI storage on a VMware ESXi host. First, you will configure a new virtual switch that contains a VMkernel port for iSCSI storage traffic, and then you will add a software iSCSI adapter to a host. Next, you will bind a VMkernel port to the software iSCSI adapter. Finally, you will configure multipathing to increase bandwidth and provide redundancy for the storage traffic.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure iSCSI Targets and Initiators [Guided]	In this challenge, you will configure iSCSI storage by adding the iSCSI Target Server role, creating iSCSI targets, connecting to the iSCSI storage by using an iSCSI initiator, bringing the storage online, and mapping network drives, and then you will configure mount points.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Links in Linux [Guided]	In this challenge, you will configure hard links and symbolic links between files in different parts of the filesystem. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Linux Firewall ACL Rules [Guided]	In this challenge, you configure password policy and general security settings through Group Policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Local Storage [Guided]	In this challenge students will learn how to configure local storage in Windows 10. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Maintenance Windows by Using AWS Systems Manager [Guided]	In this challenge, you will create maintenance windows in AWS Systems Manager to perform maintenance tasks on your AWS Elastic Cloud Compute (Amazon EC2) resources. First, you will create two new maintenance windows, and then you will register targets against the windows. Next, you will register a Run Command task on one of the windows, and then you will run a patch automation on the other window. Finally, you will verify that the Run Command task executed successfully.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure Microsoft Store for Business and Deploy Apps [Guided]	In this challenge you will set up Conditional Access for your organization. Next, you will configure Microsoft Store for Business, and then add apps that are available to your users. Finally, you will deploy a Microsoft Store app by using Microsoft Intune, and then verify your users have access to the app.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Microsoft Store Settings [Guided]	In this challenge you will block access to the Microsoft store and change a virtual machine's policy to prevent non-administrators from sideloading. First, you will block access to the Microsoft store. Next, you will sideload an application, and then you will create a group policy to prevent non-administrators from sideloading. Finally, you will test the new group policy to verify its success.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure Monitoring by Using Azure Monitor [Guided]	In this challenge, you will review information about your Azure resources and applications by using Azure Monitor. First, you will view the Azure activity log. Next, you will create an Azure alert. Finally, you will review Azure Monitor options.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Monitoring of an Azure VM by Using Log Analytics [Guided]	In this challenge, you will install OMS (Log Analytics) and configure details to be collected from an Azure VM. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Multiple User Principal Name Suffixes [Guided]	In this challenge, you will add a new user principal name (UPN) suffix to the domain by using Active Directory Domains and Trusts, apply the UPN suffix to a user account, and associate a specific UPN to all existing users in a specific OU, by using Windows PowerShell.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Network Connectivity for Linux on Azure [Guided]	In this challenge, you will configure Azure virtual machine network resources including network interfaces as well as dynamic and static private and public IP addresses. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Network File Sharing by Using SMB and NFS [Guided]	In this challenge, you will share resources on the network. First, you will configure Server Message Block (SMB) shared folders, and then you will access the shared folders from a client. Next, you will manage shared folders by using Windows PowerShell. Finally, you will configure Network File System (NFS) shared folders, and then you will access NFS shared folders.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Network Load Balancing for a Web Farm [Guided]	In this challenge, you will configure network load balancing (NLB) in a network that contains two web servers. First, you will install Internet Information Services (IIS) on the web servers. Next, you will install NLB by using Windows® PowerShell, and then you will configure NLB to load balance network traffic to the web servers in the web farm. Finally, you will create custom load balancing rules, and then you will verify that traffic is being balanced according to your load balancing rules. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Network Services [Guided]	In this Challenge Lab, you will configure common network services. First, you will configure Domain Name Services (DNS), including defining forward and reverse lookup zones and resource records. Finally, you will configure DHCP and create a DHCP scope.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure NFS Storage in vSphere [Guided]	In this challenge, you will configure Network Filesystem Storage (NFS) storage on your vSphere hosts. First, you will configure a new virtual switch for NFS storage traffic, and then you will add an NFS datastore to a host. Next, you will mount an ISO image from the NFS datastore on a virtual machine, and then you will access the files. Finally, you will add an additional host to the existing NFS datastore, and then you will unmount an NFS datastore from a host.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure NTFS Permissions [Guided]	In this challenge you will learn how to configure NTFS permissions. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Password Management in Linux [Guided]	In this challenge, you will configure passwords. First, you will create user accounts, and then you will assign basic passwords. Next, you will manage password settings by using the /etc/login.defs configuration file. Finally, you will test password quality by using the pwscore command.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Password Management in Windows [Guided]	In this challenge, you will manage security on Linux file servers. You need to configure standard Linux permissions to control access to files and directories. First, you will display the default Linux permissions, and then you will configure permissions by using absolute mode. Next, you will configure permissions by using symbolic mode. Finally, you will configure file and directory ownership.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Patch Management in Linux [Guided]	In this challenge, you will configure patch management on your system. First, you will check for available updates. Next, you will upgrade a subset of software packages, and then you will install and configure a software package to automate system updates. Finally, you will verify that updates have been applied to the system.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Printers and External Devices [Guided]	In this challenge you will create a local printer, share it to a network, and then create and share a printer to a domain. First, you will create a local printer, and then you will share it to a network. Next, you will create a separate printer, and then you will share it to a domain. Finally, you will access the printer via a domain-joined virtual machine, and then you will verify that it deployed successfully. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.

Configure Query Store to Collect Performance Data [Guided]	In this challenge, you will configure the Query Store feature in SQL Server to collect and analyze performance information data for an Azure SQL database. First, you will verify the Query Store configuration in a pre-existing Azure SQL database. Next, you will generate some test data in the Azure SQL database. Finally, you will analyze query performance by using Query Store.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure RBAC Access for VM Contributor [Guided]	In this challenge, you will create an account in Azure AD and configure RBAC VM contributor for that account. You will then use Powershell to create a Virtual Machine and verify the account can stop and start the VM. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Remote Access [Guided]	In this challenge lab, you will learn how to configure remote assistance tools, including Server Manager and Remote Desktop. First, you will prepare the challenge lab environment for remote management, and then you will connect to remote computers by using Server Manager. Next, you will install and configure Microsoft Remote Desktop, and then you will establish a Remote Desktop connection. Finally, you will share access to local folders by using a Remote Desktop connection, and then you will configure and customize Remote Desktop settings.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure remote assistance tools [Guided]	In this challenge, you will configure remote assistance tools, including Remote Assistance and Microsoft Remote Desktop. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Remote Desktop Access [Guided]	In this challenge, you will configure remote desktop access. First, you will enable remote desktop access, and then you will grant remote access to a non-administrative user. Next, you will configure remote desktop settings to save windows credentials, and then you will change screen size and color ratio settings. Finally, you will change connection speed for a remote desktop connection, and then you will modify remote desktop server authentication settings.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Route Tables in a Virtual Network [Guided]	In this challenge, you will ensure that all traffic between the front-end and back-end subnets of the virtual network are routed through a firewall virtual appliance. First, you will create the route tables and routes, and then you will then associate them to the subnets. Next, you will enable IP forwarding on the virtual appliance. Finally, you will verify that traffic is being routed through the virtual appliance.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure RSYNC and SSH File Management with Linux [Guided]	In this challenge, you will use rsync and ssh to transfer files between two Linux systems. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Secure HTTP Services [Guided]	In this Challenge Lab, you will learn how to secure HTTP traffic. First, you will verify a web server configuration and test the site. Next, you will enable authentication for the web site. Finally, you will configure a certificate and configure HTTPS.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.

Configure Security by Using the Azure Kubernetes Service [Guided]	In this challenge, you will deploy secure, containerized applications by using the Azure Kubernetes Service (AKS). First, you will create an AKS cluster, and then you will assign a role-based access control (RBAC) role to the cluster. Next, you will connect to the AKS cluster as the administrator by using Azure Cloud Shell. Finally, you will deploy an application as a developer in the AKS cluster, and then you will verify the security of the cluster.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Security for an Azure Cosmos DB Account [Guided]	In this challenge, you will configure security for a new Azure Cosmos DB account. First, you will deploy an Azure Cosmos DB account, and then you will create a container in a new database. Next, you will add items to the container, and then you will configure security for the account. Finally, you will test secure access to the Azure Cosmos DB account.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Security for an IAM User [Guided]	In this challenge, you will create an Identity and Access Management (IAM) user that has full administrator access. First, you will create an IAM user, and then you will create a user group. Next, you will assign a user to the group, and then you will attach a policy to the group. Finally, you will implement multi-factor authentication (MFA) for the root account.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure Security Recommendations for Virtual Machines [Guided]	In this challenge, you will configure security recommendations for an Azure virtual machine. First, you will configure a virtual machine for security. Next, you will enable security recommendations for the virtual machine. Finally, you will enable Azure Disk Encryption.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure Security Settings by Using Microsoft Group Policy [Guided]	In this challenge, you configure password policy and general security settings through Group Policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Segments in NSX [Guided]	In this Challenge Lab, you will create segments for various types of network traffic. First, you will create network segments for App-Services, DB-Services, and Web-Services. Next, you will connect virtual machines hosted in vSphere and KVM to the newly created segments. Finally, you will test network connectivity with the segments and across the vSphere and KVM hosts.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Configure Shared Permissions [Guided]	In this challenge you will learn how to configure shared permissions in Windows 10. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure SharePoint Online [Guided]	In this challenge, you will configure the properties of a SharePoint online site collection, configure site permissions, and user profiles.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Sign-In Options [Guided]	In this challenge, you will configure sign in options on a Windows 10 workgroup computer. First, you will configure Windows 10 to automatically sign in by using a specific user account, and then you will configure Windows 10 to automatically start an application after sign in. Next, you will create a service account for use by an application that cannot sign in locally to the computer, and then you will configure Windows 10 to enable sign in with a PIN. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure SQL Server in an Azure Virtual Machine [Guided]	In this challenge, you will configure SQL Server in an Azure virtual machine. First, you will create a virtual machine by using an image that contains SQL Server. Next, you will configure the SQL Server instance in the virtual machine by using Microsoft SQL Server Management Studio (SSMS) 2018. Finally, you will create a database in the SQL Server instance.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.Reference HD notebook for all Tab specific information required
Configure SSH to Connect Without Passwords [Guided]	In this challenge, the user will set up a connection to an SSH server to use a key pair and disable the ability to log in using passwords.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Standard Linux Permissions [Guided]	In this challenge, you will configure standard Linux permissions to control access to files and directories. First, you will display the default Linux permissions, and then you will configure permissions by using absolute mode. Next, you will configure permissions by using symbolic mode. Finally, you will configure file and directory ownership.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Standard Permissions in Linux [Guided]	In this challenge, you will configure standard Linux permissions for the user, group and other identities. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Standard Windows Permissions [Guided]	In this challenge, you will control access to files and folders. First, you will display resource permissions, and then you will configure permissions by using File Explorer. Next, you will configure permissions by using Windows PowerShell. Finally, you will configure permissions by using the icacls command-line utility.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Static Routes [Guided]	In this Challenge Lab, you will configure static routes between a main office and two branch offices. First, you will configure the IP addresses and interfaces for three routers, and then you will configure static routes between the routers in your network. Next, you will configure the Routing Information Protocol (RIP) on the routers in your network, and then you will configure a floating static route to use as a backup. Finally, you will break the connection between your main router and a router in a backup location in a branch office, and then you will verify that you are able to connect from your main router to the backup location by using the floating static route.
Configure Storage by Using EBS [Guided]	In this challenge, you will configure storage by using Amazon Elastic Block Store (EBS) to create a volume that you can attach to an Amazon Elastic Compute Cloud (EC2) instance. First, you will create an EBS volume. Next, you will modify the EBS volume. Finally, you will attach the EBS volume to an EC2 instance.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Storage DRS on a Datastore Cluster [Guided]	In this challenge, you will manage virtual machine storage by using datastore clusters. First, you will create a datastore cluster that contains three datastores, and then you will enable Storage DRS. Next, you will check for recommendations, and then you will configure Storage DRS anti-affinity rules. Finally, you will automate Storage DRS, and then you will remove a datastore from a datastore cluster.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure Storage Spaces [Guided]	In this challenge, you will manage storage capacity by using Storage Spaces by creating storage pools, creating virtual disks from the storage pool capacity, configuring new volumes, and assigning drive letters and mount points to the volumes. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Storage Spaces Direct [Guided]	In this challenge, you will configure a cluster by using the Scale-Out File Server feature and Storage Spaces Direct. First, you will install the Remote Server Administration Tools (RSAT) and the File Services and Failover Clustering features on three servers, and then you will create a cluster. Next, you will enable Storage Spaces Direct on the three members of the cluster node, and then you will create a storage pool. Finally, you will create a volume by using Cluster Shared Volumes, and then you will create a file share on the scale-out file server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Switch VLANs [Guided]	In this Challenge Lab, you will configure two separate VLANs. First, you will configure two VLANs, and then you will display the configuration of the VLANs. Next, you will configure an interface as an access point, and then you will configure an interface as a trunk port. Finally, you will configure encapsulation for the trunk port, and then you will configure the allowed VLANs on a trunk.
Configure Sync Settings [Guided]	In this Challenge Lab, you will configure sync settings for your organization. First, you will enable Configure sync settings by using the Settings app, and then you will configure Microsoft Edge browser sync settings. Next, you will use Group Policy to configure sync settings for on premises domain members. Finally, you will configure an Intune configuration profile to configure sync settings for Azure cloud devices.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Configure System Insights by Using Windows Admin Center [Guided]	In this challenge, you will configure System Insights by using Windows Admin Center. First, you will configure System Insights, and then you will configure forecasting for CPU capacity, networking capacity, total storage consumption, and volume consumption.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure the Display of a File [Guided]	In this challenge, you will learn about three powerful text (like logs) viewing tools: head; tail; and nl, as well as awk. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure the Hybrid Runbook Worker Solution [Guided]	In this challenge, you will create and link an automation account and Log Analytics resource, and install a Monitoring Agent and register a VM to the Hybrid Runbook Worker.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure the Local Registry [Guided]	In this challenge, you will configure the local registry. First, you will make a backup of the local registry, and then you will configure the registry to block applications from running on the virtual machine. Finally, you will restore the registry from a backup.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure the NSX Distributed Firewall [Guided]	In this Challenge Lab, you will test the IP Connectivity. First, you will confirm that all connectivity is allowed between the virtual machines. Next, you will create security groups that contain the virtual machines on which you wish to restrict traffic, and then you will create the firewall policy and rules. Finally, you publish the new firewall policy and test connectivity to confirm the functionality of the firewall rules.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Configure the NSX Gateway Firewall [Guided]	In this Challenge Lab, you will test Connectivity. First, you will test connectivity via Ping and SSH between the management network and the virtual machines segments. Next, you will create a firewall policy and rule to block SSH traffic at the Tier-0 Gateway, and then you will test the rule. Next, you will add an additional firewall rule to block ICMP traffic. Finally, you will test connectivity to confirm the functionality of the additional firewall rule.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Configure Update Management for On-Premises Systems by Using Azure Automation Accounts [Expert]	In this challenge, you will configure the required infrastructure requirements in Azure to support automation and reporting for updates to on-premises based systems. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Update Management in Windows [Guided]	In this challenge, you will manage Windows updates. First, you will enable the Windows Update service by using Windows PowerShell, and then you will display the default Windows Update settings. Next, you will review the installed updates by using Control Panel, and then you will display installed updates by using the Windows Management Instrumentation (WMI) command-line tool. Finally, you will configure automatic updates by using Group Policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure User Account Control [Guided]	In this challenge you will configure User Account Control (UAC). First, you will determine whether UAC is in effect, and then you will alter UAC configuration via Group Policy Object. Next, you will disable UAC via Group Policy Object, and then you will enable UAC via Group Policy Object. Finally, you will alter UAC for a local administrator, and then you will alter the PowerShell Execution Policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure User Profiles [Guided]	In this Challenge Lab, you will configure user profiles. First, you will configure a local user profile, and then you will configure and test a roaming user profile. Next, you will use Group Policy to configure folder redirection. Finally, you will test folder redirection.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Configure vCenter Server Permissions [Guided]	In this challenge, you will configure restricted permissions that allow to perform specific management tasks. First, you will add an Active Directory domain as an identity source, and then you will add Active Directory user accounts to the vCenter Server Administrators group. Next, you will create a custom role, and the you will assign permissions to the custom role. Finally, you will assign permissions to an Active Directory user, and then you will verify access for the user.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Virtual Network Connectivity by Using Peering [Guided]	In this challenge, you will create multiple virtual networks and peering connections for secure bidirectional communication. First, you will create an Azure virtual network by using the Azure portal. Next, you will create an Azure virtual network by using Azure Cloud Shell. Finally, you will configure virtual network peering connections for secure bidirectional communication.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Virtual Networks [Guided]	In this challenge, you will create and deploy multiple Azure Virtual Networks using VNET Peering for a multi-tier application.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure vLANs on a Virtual Switch [Guided]	In this challenge, you will configure a virtual LAN (VLAN) to isolate traffic on your virtual switches. First, you will create a virtual switch that has two port groups, and then you will migrate virtual machines to the port groups. Next, you will test connectivity to verify that all of the virtual machines can communicate with each other, and then you will assign a different VLAN to each port group. Finally, you will test connectivity again to verify that only the virtual machines in the same VLAN can communicate with each other. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure VMware vSphere Distributed Resource Scheduler [Guided]	In this challenge, you will create and configure a cluster that uses VMware vSphere Distributed Resource Scheduler (DRS). First, you will create a cluster, and then you will add the VMware ESXi hosts. Next, you will configure DRS on a cluster, and then you will configure the placement of the virtual machines. Finally, you will review DRS recommendations, and then you will configure DRS rules.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure VRF Lite [Guided]	In this Challenge Lab, you will configure VRF lite (Virtual Routing and Forwarding) to allow multiple isolate tenant networks to share a single Tier-0 Gateway. First, you will create uplink trunk segments for each tenant, and then you will deploy multiple VRF gateways. Next, you will deploy new Tier-1 gateways that connect to each VRF, and then you will create network segments for the Tier-1 gateways. Finally, you will attach VMs to the VRF segments, and then you will test connectivity.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Configure vSphere Monitoring and Alarms [Guided]	In this challenge, you will monitor resource usage and alarms. First, you will monitor the CPU load caused by virtual machines, and then you will monitor the disk load. Next, you will create a custom alarm. Finally, you will modify the alarm settings, and then you will configure alarm actions.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure Web App Load Balancing [Guided]	In this challenge, you will create and deploy a load balanced Azure web app. First, you will deploy two Azure web apps in different locations. Next, you will implement geographic load balancing by using Azure Traffic Manager. Finally, you will test the configuration.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Web Application Proxy [Guided]	In this challenge, you will configure a Web Application Proxy to allow Internet based traffic into an internal Web Server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Windows 10 by Using Provisioning Packages [Guided]	In this challenge, you will create and run a provisioning package from Windows Configuration Designer. First, you will create a provisioning package by using Windows Configuration Designer, and then you will export the provisioning package to the desktop. Next, you will run the provisioning package on the virtual machine. Finally, you will verify the success of the provisioning package.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Configure Windows 10 Settings by Using Group Policy [Guided]	In this challenge, you will implement system configurations and enforce restrictions by using Group Policy. First, you will create an organizational unit (OU), and then you will apply a Group Policy. Next, you will create a logon and logoff script. Finally, you will configure a Group Policy with scripts, and then you will test and troubleshoot the scripts. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Windows Admin Center to Monitor On-Premises Computers by Using Azure Monitor [Guided]	In this challenge, you will monitor on-premises Windows Server 2019 computers by using Azure Monitor. First, you will deploy the Microsoft Monitoring Agent to an on-premises Windows Server 2019 server, and then you will deploy the agent to a Hyper-V virtual machine. Next, you will enable Azure Monitor for VMs. Finally, you will register Windows Admin Center in Microsoft Azure, and then you will set up the Azure Monitor tool in Windows Admin Center.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure Windows Admin Center to Support Management of Azure Hybrid Services [Guided]	In this challenge, you will implement Azure Hybrid Services by using Windows Admin Center. First, you will register Windows Admin Center with Microsoft Azure, and then you will enable Update Management in an Azure automation account. Next, you will update the Updates extension in Windows Admin Center, and then you will determine which Azure hybrid services can be managed by using Windows Admin Center. Finally, you will configure Azure Update Management by using Windows Admin Center.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Configure Windows Defender Antivirus [Guided]	In this challenge you will learn how to configure Windows Defender Antivirus. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Windows Defender Firewall [Guided]	In this challenge, you will configure the Windows 10 firewall to support various scenarios. First, you will enable network discovery and file and printer advanced sharing settings to control shared folder access. Next, you will configure Windows Defender Firewall to control shared folder access. Finally, you will configure Windows Defender Firewall to control ICMP ping communications.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Windows Defender on a Windows System [Guided]	In this challenge, you will use Windows Defender to manage potentially malicious software.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configure Windows Firewall ACL Rules [Guided]	In this challenge, you will configure Windows firewall settings using the GUI and PowerShell.4Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Configure Windows Server 2019 as a Windows Container Host [Guided]	In this challenge, you will configure Windows Server 2019 as a Windows container host. First, you will install Docker on a Windows Server 2019 server. Next, you will deploy a container image by using Docker. Finally, you will manage container images by using Windows Admin Center.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configuring Cross Region Replication for an S3 Bucket [Guided]	In this challenge, you will be setting up replication between two S3 buckets in different regions and using S3 IA for cost control. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Configuring VPN Services [Guided]	In this Challenge Lab, you will configure encrypted communications by using a local IP Security (IPSec) policies. First, you will capture plaintext communications by using Wireshark. Next, you will create local IPSec policies. Finally, you will capture encrypted communications by using Wireshark to verify that the IPSec policies are being enforced.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Connect to an EC2 Instance by Using RDP [Guided]	In this challenge, you will create a Windows Server virtual machine by using Amazon Elastic Compute Cloud (EC2). First, you will create a new key pair that you will use to decrypt the password for an EC2 instance. Next, you will create a security group to allow access to an EC2 instance, and then you will create an EC2 instance by using a Windows Server Amazon Machine Image (AMI). Finally, you will download an RDP file to your local computer, and then you will connect to the EC2 instance by using the RDP file.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Construct an Online Text Analysis Service [Guided]	This course is in development. Details coming soon.
Control Data Streams in Linux [Guided]	In this challenge, you will manage Linux data streams. First, you will redirect the standard output (stdout) and standard error (stderr) streams to a file. Next, you will evaluate command errors, and then you will suppress error streams. Finally, you will manipulate data streams by using pipes and filters.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a Basic Script in Windows PowerShell [Guided]	In this challenge, you will use PowerShell to write a script that displays the Top 10 processes by Working Set. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a C# Console Application That Uses Literals and Variables [Guided]	In this challenge lab, you will create a console application by using literals and variables. First, you will create a simple console C# application. Next, you will configure the output of the application by using literals. Finally, you will change the application code to use variables instead of literals. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Create a CloudWatch Alarm [Guided]	In this challenge, you will configure Amazon CloudWatch to generate an alarm when CPU utilization reaches a specific level. First, you will create a CloudWatch alarm to monitor CPU utilization on an Amazon Elastic Cloud Compute (Amazon EC2) instance, and then you will connect to the console of the EC2 instance by using EC2 Instance Connect. Next, you will install a stress testing tool, and then you will run a stress test to simulate load. Finally, you will monitor the CloudWatch alarm until it is triggered. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Create a CloudWatch Dashboard [Guided]	In this challenge, you will configure a custom CloudWatch dashboard that will display multiple metrics on a single page. First, you will verify that the web servers are running behind a load balancer. Next, you will create a CloudWatch metric filter for memory usage on each web server. Finally, you will create a custom CloudWatch dashboard to display the memory, CPU, and load balancer metrics.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create a Command-Line Applet to Analyze Text [Guided]	In this challenge, you will create a command-line tool that analyzes text messages, measures the sentiment of each message, and outputs the results to a console or a file. You will create a console project in Visual Studio and add the AAI TextAnalytics library to the solution. You will then create an associated unit test project to check your work and configure an Azure Text Analytics service, integrating the service credentials into the project. Finally, you will add simple command-line parsing to handle parameters for input and output stream and test the solution by using the unit test project. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a Command-Line Tool To Access an Azure QnA Maker Service [Guided]	In this challenge, you will maintain and train a QnA Maker solution that responds to Qs by using answers from a supplied FAQ dataset. First, you will create an Azure QnA Maker resource to host a knowledge base. Next, you will use VS to create a command-line app project, and then you will link it to a library that handles QnA knowledge base management actions. Finally, you will use command-line switches to add the code to manage an FAQ dataset hosted in the QnA Maker service, and then you will populate and train the QnA Maker by using a full set of QnA in a sample file.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Create a Command-Line Tool to Query and Train an Azure Personalizer Service [Guided]	In this challenge, you will create and train a personalizer solution that responds to requests from customers. First, you will create an Azure Personalizer service to provide a ranked response from a set of actions a customer can take, and then you will use Visual Studio to create a command-line application project. Next, you will add a method to train the personalizer by using training data from a file. Finally, you will add a method to interactively train the personalizer will, and then you will test the solution. Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create a Custom AMI by Using an Existing EC2 Instance [Guided]	In this challenge, you will create an Amazon Machine Image (AMI) to use as a web server template. First, you will create a key pair, and then you will create a security group. Next, you will create an AMI by using the web server instance. Finally, you will create an Amazon Elastic Cloud Compute (EC2) instance by using the custom AMI, and then you will test the new web server instance.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a Custom Text Analysis Service [Guided]	In this challenge, you will create a custom service in Azure that determines the sentiment of phrases in a stream of text. First, you will use Visual Studio to create an Azure function project that handles text in an HTTP POST, and then you will add the AAI TextAnalytics library to the solution. Next, you will create a unit test that will inject test phrases locally, pass in hard-coded strings, and then compare the results to known values. Finally, you will publish the function to an Azure function app, and then you will test the function against the Azure service by using the unit test.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Create a Kubernetes Cluster Deployment [Guided]	In this challenge, you will create a Deployment in a Kubernetes cluster. First, you will create a pod ReplicaSet, and then you will create a Deployment. Next, you will scale the Deployment, and then you will perform a rolling update of the Deployment. Finally, you will roll back the Deployment update to its previous state, and then you will delete the Deployment.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a Launch Template [Guided]	In this challenge, you will create a launch template, and then you will launch an Amazon Elastic Cloud Compute (Amazon EC2) instance from the template. First, you will configure a key pair, and then you will configure a security group. Next, you will create a launch template based on an Amazon Machine Image (AMI), and then you will launch an EC2 instance by using the template. Finally, you will establish an SSH terminal connection to the EC2 instance by using PuTTy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a Library to Analyze Text by Using Azure Cognitive Services [Guided]	In this challenge, you will determine the sentiment of text phrases by using the Azure Text Analytics service. First, you will create a Core .NET library project in Visual Studio, and then you will create an associated unit test project to check your work. Next, you will configure a new Text Analytics Service in Azure, and then you will integrate the API into the library project. Finally, you will submit hard-coded text strings to the Text Analytics service, and then you will review the sentiment results.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a Library To Manage an Azure QnA Maker Service [Guided]	In this challenge, you will create a library that can manage a QnA Maker service in Azure. The service must respond to supplied questions by using answers from a pre-loaded FAQ dataset. First, you will create an Azure QnA Maker service that you will use to create and maintain a knowledge base. Next, you will create a Core .NET library project in Visual Studio that performs create, read, update, and delete operations on the QnA Maker service. Finally, you will attach a unit test that verifies the correct operation of the library and the QnA Maker service.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create a Menu Script [Guided]	In this challenge, you will use PowerShell to create a menu script that displays a list of choices to run several PowerShell commands.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a Module by Using PowerShell [Guided]	In this challenge, you will use PowerShell to create a parameterized function to display the uptime of one or more computers. The function will be saved as a PowerShell module.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create a New Virtual Machine in VMware vSphere [Guided]	In this challenge, you will create a new virtual machine. First, you will create a new virtual machine, and then you will install Windows 10 as a guest operating system. Next, you will install VMware Tools. Finally, you will synchronize the time on the virtual machine with the VMware ESXi host.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Create a Scalable Website That Uses an Elastic Load Balancer [Guided]	In this challenge lab, you will create a scalable and resilient website. First, you will create security groups for a load balancer and an Auto Scaling group. Next, you will create a launch template that you will use to create Amazon Elastic Cloud Compute (Amazon EC2) instances, and then you will create an Auto Scaling group. Finally, you will attach a new load balancer to the Auto Scaling group, and then you will connect to the website through the load balancer.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Create a vSAN Cluster [Guided]	In this challenge, you will create a vSAN cluster. First, you will configure vSAN networking by creating VMKernel network adapters on your VMware ESXi hosts, and then you will enable vSAN on a cluster. Next, you will configure disk groups, and then you will configure vSAN licensing. Finally, you will create and implement a vSAN storage policy, and then you will remove a host from a vSAN cluster.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create a Web App Bot to Query an Azure QnA Maker FAQ Dataset [Guided]	In this challenge, you will create a web app bot that provides answers to questions by using an FAQ dataset. First, you will create a Core .NET web app bot in Visual Studio. Next, you will create an Azure QnA Maker service that will answer questions received by the bot. Finally, you will deploy the bot to Azure, and then you will test the bot to verify that it provides answers to questions.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create an Advanced Module in PowerShell [Guided]	In this challenge, you will use PowerShell to write an advanced module with a function that includes pipeline input and custom formatted output.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create an Apache Spark Job in Synapse Studio [Guided]	In this challenge, you will create an Apache Spark job in Synapse Studio. First, you will create an Apache Spark pool in an Azure Synapse workspace. Next, you will design a stream processing solution. Finally, you will create an Apache Spark job, and then you will add an Apache Spark job to a Synapse pipeline.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create an API Management Instance [Guided]	In this challenge, you will create an Azure API Management service instance to host your APIs. First, you will create an instance of the Azure API Management service. Next, you will add an API to the instance, and then you will ensure that the API responds to HTTPS requests. Finally, you will publish the API, and then you will configure monitoring of the API Management instance. The Azure API Management service can take approximately 20-40 minutes to provision.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create an Assembly to Analyze Text Sentiment [Guided]	This course is in development. Details coming soon.
Create an Auto Scaling Group [Guided]	In this challenge, you will create an Auto Scaling group that will allow a set of servers to recover from a failure. You must have two virtual machines running at all times. First, you will create a key pair, and then you will create a security group. Next, you will create a launch configuration. Finally, you will create an Auto Scaling group, and then you will test the Auto Scaling group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Create an Azure Function App [Guided]	In this challenge, you will use the Azure Functions service to create a function app that will start document processing when a file is uploaded to Azure storage. First, you will create a function app, and then in the function app, you will create a function that is triggered by blob storage. Next, you will define a storage queue message as an output of the function. Finally, you will test the function app by uploading a document.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create an Azure Logic App [Guided]	In this challenge, you will develop an Azure Logic App using messaging services. First, you will deploy a logic app, and then you will test the Logic App by consuming queue messages.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create an Azure Virtual Machine Alert [Guided]	In this challenge, you will create an alert for an Azure virtual machine. First, you will create an action group. Next, you will create an activity log alert rule. Finally, you will test the alert rule. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create an Azure Virtual Machine Snapshot [Guided]	In this challenge, you will create virtual machine snapshots. First, you will create a virtual machine unmanaged disk snapshot. Next, you will migrate a virtual machine that has unmanaged disks to use managed disks, and then you will create two virtual machine managed disk snapshots. Finally, you will create a virtual machine managed disk snapshot by using Azure PowerShell. Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create an EC2 Instance by Using a Launch Template [Guided]	You are a systems architect. You need to create a template that you can use to create Amazon Web Services (AWS) EC2 instances. The template must support version control. In this challenge, you will first create a key pair, and then you will create a security group. Next, you will create a launch template, and then you will use the launch template to create an EC2 instance. Finally, you will create a new version of the template that will install an Apache web server, and then you will create a new EC2 instance that contains an Apache web server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create an Enum in Java [Guided]	In this challenge lab, you will define an enum that holds a set of constant values. First, you will create an enum class. Next, you will add static values to the enum class, and then you will retrieve values from the emum by using a for-each loop. Finally, you will print a message that contains the values in the enum, and then you will test the output.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Create an HTML Report [Guided]	In this challenge, you will use PowerShell to create a script that produces a well-formatted and easily readable HTML report from several PowerShell commands.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create an Instance by Using a Custom AMI [Guided]	In this challenge, you will replicate an existing web server. First, you will create a key pair, and then you will create an Amazon Machine Image (AMI) from an existing instance. Next, you will create an EC2 instance from the custom AMI, and then you will add a new volume. Finally, you will tag the Elastic Block Store (EBS) volumes on the new instance.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Create an Object Lifecycle Policy for Amazon S3 Documents [Guided]	In this challenge, you will change the storage class on files manually. Then you will setup a lifecycle policy to automatically maintain log files. The files will first be moved into S3 IA after 30 days, then to Glacier after 60 days, then deleted after one year. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Configure an Azure QnA Maker Service [Guided]	In this challenge, you will provision a QnA Maker Service, access the QnA Maker Service Portal, upload a QnA Maker Knowledge Base set, and test the service.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Configure an EC2 Instance That Uses a User Data Script [Guided]	In this challenge, you will create an EC2 instance that contains an Apache web server. First, you will create a key pair to allow remote access to the server. Next, you will create a security group that allows SSH and HTTP traffic. Finally, you will create an EC2 instance that uses a user data script to install an Apache web server, and then you will test the web server.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create and Manage Group Policy Objects [Guided]	In this challenge, you will create and manage a GPO infrastructure by creating GPOs and linking them to various Active Directory OUs, confirming GPO health and implementing a GPO backup and restore process, and creating a Group Policy central store. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Manage Linux Users and Groups [Guided]	In this challenge, you will manage Linux users and groups using standard command-line tools. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Manage System Restore Points [Guided]	In this challenge, you will create and manage system restore points. First, you will create a system restore point named Test, and then you will create files on the desktop and four new registry keys. Next, you will perform a system restore, and then you will verify the results. Finally, you will configure System Restore to create automatic system restore points.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Manage VMFS Datastores [Guided]	In this challenge, you will create and manage vSphere Virtual Machine File Share (VMFS) datastores. First, you will create a VMFS 6 datastore on a local hard drive, and then you will create a VMFS 6 datastore by using an iSCSI LUN. Next, you will create a VMFS datastore that only uses a portion of the total disk space on a LUN, and then you will expand a datastore to increase the available space and extend a datastore to span across multiple LUNs. Finally, you will delete an older VMFS 5 datastore that is no longer needed, and then you will upload an ISO file to a VMFS 6 datastore.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Manipulate an ArrayList in Java [Guided]	In this Challenge Lab, you will create and manipulate an ArrayList. First you will create a project that contains two new classes, and then you will declare, instantiate, and initialize a list as an ArrayList. Next, you will populate the ArrayList, and then you will modify the contents of the ArrayList by using the toLowerCase method. Finally, you will iterate over a list by using a for loop and a for-each loop, and then you will iterate over a list by using the forEach method of the List interface.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.

Create and Manipulate Arrays in Java [Guided]	In this challenge lab you will create and manipulate arrays. First, you will create a new project, and then you will create two new classes. Next, you will declare, instantiate, and initialize an array, and then you will loop through the array by using a for-each loop. Finally, you will create an instance of the array in a test class, and then you will run the test class.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Manipulate Tables by Using T-SQL [Guided]	In this challenge lab, you will create and access multiple tables by using Transact-SQL (T-SQL). First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will create tables by using Data Definition Language (DDL). Next, you will access the tables by using Data Manipulation Language (DML). Finally, you will create primary and foreign keys.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Publish a Content Library [Guided]	In this challenge, you will create a content library to store objects and synchronize them to other sites. First, you will create a local content library that has publishing enabled, and then you will create a template that is stored in a content library. Next, you will subscribe to the content library from another site, and then you will deploy a virtual machine by using the template. Finally, you will import an ISO file, and then you will synchronize the file between content libraries. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create and Test a Cognitive Services Text Analytics Service [Guided]	In this challenge, you will detect the sentiment and language of text statements by using the Azure Cognitive Services Text Analytics API. First, you will configure a Cognitive Services Text Analytics service. Next, you will test the service to ensure that it detects the sentiment of statements. Finally, you will test the service to ensure that it identifies the language in which the statements are written.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Test an Azure Web App Bot [Guided]	In this challenge, you will create a Web App Bot and then configure and test the Bot.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create and Use Task Sequences [Guided]	In this challenge, you will use the Microsoft Deployment Toolkit (MDT) to configure Light Touch installations of Windows 10 for your organization by using task sequences in MDT deployment shares. First, you will mount the Windows 10 installation media to the challenge environment, and then you will use the MDT Deployment Workbench to create a new deployment share. Next, you will add operating system installation files to the deployment share, and then you will create a standard client upgrade task sequence. Finally, you will modify the task sequence, and then you will update the deployment share.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Azure Resource Locks on a Web App [Guided]	In this challenge, you will create an Azure web app that includes resource locks. First, you will create a web app that uses Linux. Next, you will deploy the source code for the web app from a Docker Hub container image. Finally, you will enable resource locks, and then you will test the configuration of the web app.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Create Bar Charts by Using RStudio [Guided]	In this Challenge Lab, you will analyze and visualize categorical data by using base R and RStudio. First, you will load the built-in Titanic dataset, and then you will create a basic bar chart that shows the frequencies of the passenger class and crew on the Titanic. Next, you will create a horizontal bar chart, and then you will add labels, a title, and colors to a bar chart. Finally, you will pivot two columns of data by using a matrix variable, and then you will plot a stacked bar chart.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Create Branching Logic in Python [Guided]	In this Challenge Lab, you will create branching logic in Python. First, you will define an if statement that evaluates whether a number is even or odd by using the modulo operator, and then you will generate different outcomes based on the result of the evaluation. Next, you will determine whether a value is part of a list by using an if else statement, and then you will return different values based on the evaluation of the conditions in the if else statement. Finally, you will evaluate a condition in an if statement by using the logical and operator, and then you will evaluate a different condition in an if statement by using the logical or operator.
Create Buckets, Versioning, and Permissions [Guided]	In the challenge, you will create an S3 Bucket that has version control enabled, upload a file, and then make the file publicly accessible.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Cluster Objects by Using Declarative Commands [Guided]	In this challenge, you will create objects in a Kubernetes cluster by using imperative commands. First, you will create pods by using the run command. Next, you will create an application deployment by using the create command, and then you will configure the deployment by using the scale command. Finally, you will retrieve detailed pod information, and then you will delete the application deployment and the pods that are running in the default namespace.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Cluster Objects by Using Imperative Commands [Guided]	In this challenge, you will create objects in a Kubernetes cluster by using imperative commands. First, you will create pods by using the run command. Next, you will create an application deployment by using the create command, and then you will configure the deployment by using the scale command. Finally, you will retrieve detailed pod information, and then you will delete the application deployment and the pods that are running in the default namespace.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Conditional Access Policies for Intune Enrolled Devices [Guided]	In this challenge, you will create Conditional Access policies for Microsoft Intune®-enrolled devices. First, you will verify a group, and then you will configure your organization's security defaults to use Conditional Access policies. Next, you will create a Conditional Access policy that requires Multi-Factor Authentication (MFA) to access the Exchange Online resource. Finally, you will verify that MFA is required to access the Exchange Online resource.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create EC2 Instances by Using Auto Scaling [Guided]	In this challenge, you will configure and deploy Elastic Compute Cloud (EC2) instances by using an Auto Scaling group. First, you will create a security group for a launch template, and then you will configure a launch template. Next, you will create an Auto Scaling group. Finally, you will test the Auto Scaling group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Hyper-V VHD Set Files on Windows Server 2019 [Guided]	In this challenge, you will create Hyper-V VHD Set files on Windows Server 2019. First, you will create a Hyper-V VHD Set file by using Hyper-V Manager. Next, you will create a Hyper-V VHD Set file by using Windows PowerShell. Finally, you will convert an existing Hyper-V .vhdx file to a Hyper-V VHD Set file.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Create Linux Virtual Machines in an Availability Set [Guided]	In this challenge, you will implement redundancy for a front-end server tier to maintain application availability during update reboots and in the event of power source or network switch failures. First, you will create an availability set. Next, you will create an SSH key pair. Finally, you will create two Linux virtual machines in the availability set. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Metric Filters [Guided]	In this challenge, you will configure the Amazon CloudWatch agent to collect logs for a website so that you can monitor invalid access attempts. First, you will verify that the web server is running, and then you will connect to the console of the Amazon Elastic Cloud Compute (Amazon EC2) instance by using EC2 Instance Connect. Next, you will configure the CloudWatch agent on the web server. Finally, you will create a metric filter from the logs by using CloudWatch, and then you will review invalid access attempts by using a graph.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Create Performance Monitor Data Collector Sets [Guided]	In this challenge, you will create Performance Monitor Data Collector Sets. First, you will review the default Data Collector Sets in Performance Monitor, and then you will create a Data Collector Set. Next, you will save the Data Collector Set as a template, and then you will use the template to create a new Data Collector Set. Finally, you will create a Data Collector Set that will be used to collect specific performance-related data from the server.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Persistent Resources by Using Kubernetes DaemonSets [Guided]	In this challenge, you will create persistent resources in a Kubernetes cluster by using DaemonSets. First, you will identify the DaemonSets that are running in the cluster, and then you will display detailed information about a DaemonSet. Next, you will create a DaemonSet by using a definition file. Finally, you will delete a DaemonSet pod, and then you will verify that the DaemonSet created a new pod to replace the deleted pod.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Create Role-Based Access Control Custom Roles [Guided]	In this challenge, you will create custom role-based access control (RBAC) roles. First, you will create a custom role by using Azure PowerShell, and then you will create a custom role by using the Azure portal. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Scheduled Jobs with Windows PowerShell [Guided]	In this challenge, you will use PowerShell to create scheduled jobs.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Create Static Methods in Java [Guided]	In this challenge lab, you will create static methods to generate random integers. First, you will create a method that will generate a number between zero and a specified maximum. Next, you will generate a number between a specified minimum and maximum number. Finally, you will create a test class, and then you will verify that the methods return the expected results. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Create Stored Procedures by Using T-SQL [Guided]	In this challenge lab, you will create and execute stored procedures by using Transact-SQL (T-SQL). First, you will create a stored procedure by using Data Definition Language (DDL). Next, you will execute a stored procedure by using an input parameter. Finally, you will execute a stored procedure by using an output parameter.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Customize Interaction by Using the Personalizer Resource [Guided]	This course is in development. Details coming soon.

Customize the Windows Desktop [Guided]	In this challenge, you will customize the Start menu, by adding a remote desktop app to a group, and then you will remove a group from the Start menu. Next, you will enable Cortana, and then you will add Cortana to the taskbar. Finally, you will prevent toast notifications. Note: Please ensure that you have set aside enough time to complete the challenge before you start.
Define a Kubernetes ClusterIP Service [Guided]	In this challenge, you will define a ClusterIP Service in a Kubernetes cluster. First, you will identify services that are running in the cluster. Next, you will create a Deployment, and then you will create a ClusterIP Service that will provide access to an application defined by the Deployment. Finally, you will access an application by using a ClusterIP Service, and then you will describe the attributes that couple a ClusterIP Service to a pod. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Define a Kubernetes NodePort Service [Guided]	In this challenge, you will define a NodePort Service in a Kubernetes cluster. First, you will create a pod Deployment. Next, you will create a NodePort Service to provide external access to an application that is defined by the Deployment, and then you will scale the Deployment. Finally, you will access an application from an external production network. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Define and Use Functions in Python [Guided]	In this Challenge Lab, you will define functions in an application. First, you will define a function that calculates the mean of a list of numbers, and then you will define a function that calculates the factorial of a number by using recursion. Next, you will calculate the number of possible seats in a room by using the factorial function. Finally, you will define a function that delegates actions to another function to reduce redundancy
Delegate Password Settings Management [Guided]	In this challenge, you will delegate password settings management by testing password management permissions for non-administrator accounts, delegating password management over an entire domain by using the Delegation of Control Wizard, and restricting delegated password management to a specific Organizational Unit.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy a Microsoft Azure Virtual Machine Infrastructure [Guided]	In this challenge, you will create and tag Microsoft Azure virtual machine infrastructure resources such as a storage account, virtual network and network security group. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy a Private Certificate Authority [Guided]	In this challenge, you will install and configure an Enterprise Root Certification Authority.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy a Web Job [Guided]	In this challenge, students will provision, deploy and test an Azure web job. The web job will be deployed to an existing web application. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy Active Directory Domain Services in Windows Server 2019 Server Core [Guided]	In this challenge, you will deploy Active Directory Domain Services in Windows Server 2019 Server Core. First, you will install the Active Directory Domain Services role in a Server Core server. Next, you will use the Active Directory Domain Services Configuration Wizard to create a Windows PowerShell script for AD DS deployment. Finally, you will promote a Server Core server to an Active Directory domain controller by using the PowerShell script.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Deploy an Application by Using Azure Kubernetes Service [Guided]	In this challenge, you will deploy a Kubernetes containerized application by using Azure Kubernetes Service (AKS). First, you will create an AKS cluster. Next, you will connect to the AKS cluster by using Azure Cloud Shell. Finally, you will run an application as a container in the AKS cluster.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy an ARM Template That Contains a PowerShell DSC Extension [Guided]	In this challenge, you will replace a hard-coded version number of a PowerShell Desired State Configuration (DSC) extension in an Azure Resource Manager (ARM) template that creates a web app. First, you will edit an ARM template. Next, you will deploy the template. Finally, you will verify that the web app loads successfully.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy an Azure Virtual Machine [Guided]	In this challenge, you will deploy and manage Azure virtual machines. First, you will deploy a Windows virtual machine, and then you will view the properties of an existing virtual machine to understand which properties can be managed.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy an Azure Virtual Machine by Using Azure CLI 2.0 [Guided]	In this challenge, you will deploy an Azure virtual machine. First, you will create an Azure virtual machine by using Azure CLI 2.0 commands. Next, you will connect to the new virtual machine by using a remote desktop connection. Finally, you will install an IIS web server on the new virtual machine. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy an Azure Virtual Machine by Using Azure PowerShell [Guided]	In this challenge, you will deploy an Azure virtual machine. First, you will create an Azure virtual machine by using Azure PowerShell commands. Next, you will connect to the new virtual machine by using a remote desktop connection. Finally, you will install an IIS web server on the new virtual machine. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy an Azure VM by Using PowerShell [Guided]	In this challenge, you will Configure Azure Cloud Shell for use with PowerShell. You will configure mandatory variable, a virtual network, and then create and deploy a virtual machine. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy an Azure Web App by Using Deployment Slots [Guided]	In this challenge, you will develop an Azure web app by using deployment slots. First, you will create a web app, and then you will create an Azure SQL database and a database connection string for the web app. Next, you will create a staging deployment slot, and then you will deploy and test code by using the staging deployment slot. Finally, you will swap the code to the production deployment slot, and then you will test the web app in production.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy an IPAM Environment [Guided]	In this challenge, you will deploy an IPAM environment, collect DNS and DHCP Server information and manage DHCP and DNS from the IPAM console.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy and Configure a Read-Only Domain Controller [Guided]	In this challenge, you will deploy a Read-Only Domain Controller (RODC) by staging a delegated installation of an RODC, promoting a member server to an RODC, and configuring a domain-wide password replication policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Deploy and Configure an NSX Manager Virtual Appliance [Guided]	In this Challenge Lab, you will deploy and configure NSX Manager virtual appliances. First, you will deploy an NSX Manager virtual appliance by using an .ova file, and then you will add a license key. Next, you will configure a VMware vCenter server as a compute manager, and then you will add an additional NSX Manager virtual appliance. Finally, you will configure a virtual IP address for a VMware NSX-T cluster, and then you will verify that you can connect to the NSX-T cluster by using the virtual IP address.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Deploy and Configure Windows Server Core [Guided]	In this challenge, you will deploy Windows Server Core. First, you will install Server Core, and then you will configure the virtual machine. Next, you will join the server to an Active Directory domain, and then you will share a folder. Finally, you will configure the system for remote administration. Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Deploy Azure Synapse Analytics [Guided]	In this challenge, you will provision a new Azure Synapse Analytics SQL pool. First, you will deploy a Synapse SQL pool. Next, you will configure the SQL pool. Finally, you will test the data access.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy NSX Edge Nodes [Guided]	In this Challenge Lab, you will deploy edge nodes to enable connectivity between the physical and virtual network environments. First, you will deploy two individual edge nodes. Finally, you will create an edge cluster from the newly deployed edge nodes.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Deploy Resources by Using an Azure Resource Manager Template [Guided]	In this challenge, you will create an Azure virtual machine by using an Azure Resource Manager (ARM) template. First, you will create an Azure virtual machine by using an ARM template. Next, you will create an Azure virtual machine that includes a data disk by modifying an ARM template. Finally, you will add a new network security group (NSG) to an existing subnet by using an ARM template.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy Ubuntu Linux Virtual Machines in Microsoft Azure [Guided]	In this challenge, you will deploy an Ubuntu Linux virtual machine in the Microsoft Azure cloud, and ensure that remote SSH administration from an on-premises station works correctly.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy Windows Admin Center in Windows Server 2019 [Guided]	In this challenge, you will deploy and configure Windows Admin Center on a Windows Server 2019 server. First, you will install Windows Admin Center on a Windows Server 2019 server, and then you will use Windows PowerShell to verify the installation. Next, you will create an Active Directory security group, and then you will add a user to the group. Finally, you will review the configuration options on the Settings page in Windows Admin Center, and then you will assign the gateway administrators role to a security group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy Windows Admin Center in Windows Server 2019 Server Core [Guided]	In this challenge, you will deploy Windows Admin Center in Windows Server 2019 Server Core. First, you will review the details of a certificate that is installed in the local certificate store on a Windows Server 2019 Server Core computer. Next, you will install Windows Admin Center on the Windows Server 2019 Server Core computer. Finally, you will connect to Windows Admin Center from a remote computer.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Deploy Windows Server 2019 on an Azure Virtual Machine [Guided]	In this challenge, you will deploy Windows Server 2019 on an Azure virtual machine. First, you will deploy a virtual machine that runs Windows Server 2019 by using the Azure portal, and then you will deploy a virtual machine that runs Windows Server 2019 and that is preconfigured as a Dev/Test computer. Next, you will deploy a virtual machine that runs Windows Server 2019 by using Azure PowerShell. Finally, you will save an existing virtual machine deployment to a new ARM template on your local computer, and then you will view the downloaded template files. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy Windows Server 2019 Server Core [Guided]	In this challenge, you will deploy Windows Server 2019 Server Core. First, you will install Windows Server 2019 Server Core. Next, you will configure Server Core, and then you will install Features on Demand in Server Core. Finally, you will join a server running Server Core to an Active Directory domain.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Deploy Workloads on Azure Resource Manager Virtual Machines [Guided]	In this challenge, you will create an image of an Azure virtual machine that hosts Microsoft Visual Studio. First, you will create a virtual machine, and then you will add a data disk to the virtual machine. Next, you will capture an image of a generalized version of the virtual machine in Azure. Finally, you will create a virtual machine from the image, and then you will create a snapshot of a data disk.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design a Data Security Solution by Using a Private Endpoint [Guided]	In this challenge, you will design an Azure SQL database solution that is enabled for secure access by using a private endpoint. First, you will deploy an Azure SQL database on a new logical server that is not accessible from the public network. Next, you will create a virtual machine in a virtual network. Finally, you will create a private endpoint that allows secure private access from the virtual network.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design a Data Security Solution by Using a Service Endpoint [Guided]	In this challenge, you will design a data security solution by using a service endpoint. First, you will create a virtual machine in a virtual network by using an image that contains SQL Server. Next, you will create a service endpoint that allows secure access to a pre-existing Azure SQL database from the virtual network. Finally, you will test secure data access. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design a Mapping Data Flow by Using Azure Data Factory [Guided]	In this challenge, you will design a new Azure data factory instance that supports a data pipeline. First, you will deploy an Azure data factory. Next, you will create an Azure SQL database that will hold the data output from a pipeline, and then you will author a mapping data flow activity in a data pipeline. Finally, you will test the data pipeline. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design a VPC and Associated Subnets [Guided]	In this challenge, you will learn how to create a Virtual Private Cloud (VPC) and private subnets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design an Access Policy for a Storage Account [Guided]	In this challenge, you will design a blob storage solution that uses an access policy for security. First, you will deploy a storage account and create a container for blob data. Next, you will design an access policy for security. Finally, you will verify the access policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Design an Always Encrypted Solution by Using Azure SQL Database [Guided]	In this challenge, you will design an Azure SQL database solution that is enabled for secure access by using Always Encrypted. First, you will deploy an Azure SQL database on a new logical server. Next, you will create a virtual machine in a virtual network. Finally, you will encrypt a column that contains sensitive data by using Always Encrypted.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design an Azure Cosmos DB Account for High Availability [Guided]	In this challenge, you will provision a new Azure Cosmos DB account that is designed for high availability. First, you will deploy an Azure Cosmos DB account. Next, you will create a container in a new database, and then you will add items to the container. Finally, you will enable high availability, and then you will test the configuration.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design an Azure SQL Database for Disaster Recovery [Guided]	In this challenge, you will provision a new Azure SQL database that is enabled for automatic failover to support disaster recovery. First, you will deploy an Azure SQL database as the primary replica. Next, you will create a failover group that includes a secondary replica in another region. Finally, you will test a failover operation.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design an Azure Stream Analytics Solution [Guided]	In this challenge, you will provision a new Azure Stream Analytics job that supports event streaming. First, you will create an event hub for input. Next, you will create a storage account that uses an Azure Data Lake Storage hierarchical namespace to hold the output. Finally, you will create a Stream Analytics job to stream the events.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design an Azure Synapse Analytics SQL Pool [Guided]	In this challenge, you will provision a new Azure Synapse Analytics SQL pool that uses workload management. First, you will create a Synapse SQL pool. Next, you will design the SQL pool for performance by using workload management. Finally, you will verify the workload management design.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design Azure App Service Web Apps [Guided]	In this challenge, you will develop an Azure web app by using deployment slots. First, you will create a web app, and then you will create an Azure SQL database and a database connection string for the web app. Next, you will create a deployment slot for staging, and then you will deploy and test code by using the staging deployment slot. Finally, you will swap the code to the production deployment slot, and then you will verify the web app in production.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Design Role-Based Access Control (RBAC) for Azure Data Lake Storage [Guided]	In this challenge, you will design an Azure Data Lake Storage solution that uses role-based access control (RBAC). First, you will deploy a storage account that uses an Azure Data Lake Storage hierarchical namespace. Next, you will design a container for blob data. Finally, you will design RBAC for the data lake.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Develop an Always Encrypted Solution by Using Azure SQL Database [Guided]	IIn this challenge, you will develop an Azure SQL database solution that is enabled for secure access by using Always Encrypted. First, you will access an Azure SQL database by using the Azure portal. Next, you will access the Azure SQL database by using SQL Server 2019 in an Azure virtual machine, and then you will encrypt a column that contains sensitive data by using Always Encrypted. Finally, you will verify the encryption by using secure data access.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.

Develop an Azure App Service Mobile App [Guided]	In this challenge, you will create an Azure mobile app. First, you will create an App Service web app that will serve as the mobile app back end, and then you will configure a connection to a pre-existing Azure SQL database. Next, you will configure a development environment on an Azure virtual machine, and then you will deploy the mobile app back end by using Visual Studio 2017. Finally, you will deploy the mobile app front end by using Apache Cordova, and then you will test the mobile app by using the Android emulator in Visual Studio.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Develop Azure Logic Apps by Using Messaging Services [Guided]	In this challenge, you will develop Azure Logic Apps using messaging services. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Display Manpage Information by Using Sections [Guided]	In this challenge, you will use man to learn how to find and search the different sections of the man pages.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Distribute Installation in Linux [Guided]	In this challenge, you will install CentOS7 and Ubuntu18. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Edit Data by Using Linux Command-Line Tools [Guided]	In this challenge, you will update data in a file. First, you will use the sed stream editor utility to edit text data. Next, you will edit text data by using the awk command-line utility. Finally, you will create comma-separated values (CSV) and tab-separated values (TSV) files by using the sed utility. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Edit Text Files in Linux [Guided]	In this challenge, you will learn to utilize the vim and nano text editors. You will also be using a variety of file management tools to manage your text files. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable an Azure Monitor Metric Alert for Azure SQL Database [Guided]	In this challenge, you will develop an Azure SQL database solution that uses Azure Monitor metric alerts. First, you will access an Azure SQL database by using the Azure portal. Next, you will create an alert rule to monitor usage of the database. Finally, you will verify the alert rule.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Auditing for Azure Synapse Analytics [Guided]	In this challenge, you will enable auditing for Azure Synapse Analytics. First, you will deploy a dedicated SQL pool in Azure Synapse Analytics. Next, you will design a data auditing strategy. Finally, you will implement auditing, and then you will test auditing of data access.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Enable Automatic Tuning in Azure SQL Database [Guided]	In this challenge, you will configure an Azure SQL database to use automatic tuning for performance. First, you will access a pre-existing Azure SQL database. Next, you will configure automatic tuning at the server level, and then you will configure automatic tuning at the database level. Finally, you will verify the automatic tuning.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Azure Backup for a SQL Server Database [Guided]	In this challenge, you will enable Azure Backup for a SQL Server database. First, you will create a Recovery Services vault by using the Azure portal, and then you will create a backup policy. Next, you will create a SQL Server database on an Azure virtual machine, and then you will configure Azure Backup for the SQL Server database. Finally, you will verify the backup.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Enable Azure Data Lake Storage [Guided]	In this challenge, you will configure Azure Data Lake Storage. First, you will deploy a storage account that uses an Azure Data Lake Storage hierarchical namespace. Next, you will configure a container for blob data. Finally, you will upload data into the data lake. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start..
Enable Azure Defender for SQL in an Azure SQL Database [Guided]	In this challenge, you will create a new Azure SQL database and enable Azure Defender for SQL. First, you will create an Azure SQL database. Next, you will enable Azure Defender for SQL. Finally, you will verify the security features of Azure Defender for SQL.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Azure SQL Database Auditing [Guided]	In this challenge, you will provision a new Azure SQL database that uses auditing for data security. First, you will deploy an Azure SQL database. Next, you will enable auditing at the server level, and then you will enable auditing at the database level. Finally, you will test the security access, and then you will view the audit log.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Azure Virtual Machine Scale Sets for High Availability and Scalability [Guided]	In this challenge, you will create and deploy multiple Azure virtual machine scale sets acting as web server and app server tiers. First, you will create a virtual machine scale set for the web server tier. Next, you will use an Azure Resource Manager (ARM) template to create a virtual machine scale set for the app server tier. Finally, you will verify connectivity to the virtual machine scale set for the web server tier.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Client SSL/TLS [Guided]	In this challenge, you will configure an IIS web site to allow access only to trusted client devices.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Database Auditing with Azure SQL Database [Guided]	In this challenge, you will create a new Azure SQL database that uses database auditing. First, you will create an Azure SQL database. Next, you will enable database auditing by using a storage account for the audit log. Finally, you will review the audit log.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable DNSSEC [Guided]	In this challenge, you will configure DNSSEC to harden DNS client and server interactions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Dynamic Data Masking by Using Azure SQL Database [Guided]	In this challenge, you will create a new Azure SQL Database and enable it for Dynamic Data Masking.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Dynamic Data Masking for Azure Synapse Analytics [Guided]	In this challenge, you will enable dynamic data masking for Azure Synapse Analytics. First, you will design a data security strategy. Next, you will access a dedicated SQL pool in Azure Synapse Analytics. Finally, you will implement and test dynamic data masking.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.

Enable Geo-Replication of an Azure SQL Database [Guided]	You are a database administrator. You need to provision a new Azure SQL database that is geo-replicated for high availability and load balancing. In this challenge, you will first deploy an Azure SQL database as the primary replica. Next, you will create a geo-replicated database in another region as the secondary replica. Finally, you will test a forced failover operation.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable High Availability by Using Availability Sets [Guided]	In this challenge, you will configure high availability by using availability sets. First, you will create an availability set. Next, you will deploy two Azure virtual machines to the availability set. Finally, you will configure load balancing.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable High Availability of an Azure SQL Database [Guided]	In this challenge, you will provision a new Azure SQL database that is enabled for automatic failover to support high availability. First, you will deploy an Azure SQL database to serve as the primary database. Next, you will create a failover group that includes a secondary database in another region. Finally, you will test a database failover.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Network Security in AWS [Guided]	In this challenge, you will establish a secure network environment for an application service that will be hosted on AWS. First, you will enable the assignment of public IP addresses to a subnet in a virtual private cloud (VPC). Next, you will create a network access control list (ACL) for the public subnet, and then you will create a network ACL for the private subnet. Finally, you will create new Amazon Elastic Compute Cloud (Amazon EC2) instances that use the network ACLs, and then you will test access to the EC2 instances through the network ACLs.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Enable Partitioning for Azure Synapse Analytics [Guided]	In this challenge, you will enable partitioning for Azure Synapse Analytics. First, you will design a data partitioning strategy, and then you will access a dedicated SQL pool in Azure Synapse Analytics. Next, you will implement data partitioning, and then you will run a query to verify that the partitions were created. Finally, you will switch a partition from a staging table.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Enable Security for Azure Data Lake [Guided]	In this challenge, you will enable security for Azure Data Lake. First, you will deploy a storage account that uses Azure Data Lake Storage. Next, you will create a container for blob data by using a hierarchical namespace, and then you will design access control list (ACL) and role-based access control (RBAC) security for the data lake. Finally, you will enable ACL and RBAC security for the data lake, and then you will test the secure solution. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Enable SSL/TLS on a Website [Guided]	In this challenge, you will configure a web site with a PKI certificate to enable HTTPS connectivity. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enable Table Distribution for Azure Synapse Analytics [Guided]	In this challenge, you will enable table distribution for Azure Synapse Analytics. First, you will deploy a dedicated SQL pool in Azure Synapse Analytics. Next, you will design a table distribution strategy. Finally, you will create a table distribution solution, and then you will verify data access.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Enable VM Backup by Using Recovery Services Vault [Guided]	In this challenge, you will enable VM Backup using Recovery Services Vault. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enroll Devices in Microsoft Intune [Guided]	In this challenge, you will enroll devices in Azure® Active Directory (Azure AD) and Microsoft Intune®. First, you will verify auto-enrollment requirements and settings. Next, you will configure the auto-enrollment Group Policy for a single PC. Finally, you will auto-enroll a device in Intune and troubleshoot auto-enrollment of devices.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Enumerate Objects in the Pipeline Using Windows PowerShell [Guided]	In this challenge, you will use PowerShell to enumerate objects in the pipeline. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Escalate Privileges in Linux [Guided]	In this challenge, you will exploit the misconfiguration of the find and the Vim commands, and then elevate your privileges to those of the administrator.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Establish a Command Line Applet to Evaluate Text [Guided]	This challenge is in development. Details coming soon.
Establish Internet and NAT Gateways in AWS [Guided]	In this challenge, you will create internet and NAT gateways and will create route tables to provide routing for your subnets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Establish IPv6 Connectivity [Guided]	In this challenge, you will configure an IPv6 router and systems on both sides of the router to communicate with IPv6.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Evaluate and deploy Windows 10 Enterprise security features [Guided]	In this challenge, you will evaluate and deploy Windows 10® Enterprise security features. First, you will use Microsoft Intune® configuration profiles to implement Credential Guard. Next, you will implement Microsoft Defender Application Control (MDAC). Finally, you will implement Windows AppLocker via Intune.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Evaluate AWS Config Rules [Guided]	In this challenge, you will evaluate resources in your environment by using AWS managed rules and the AWS Config service. First, you will enable the AWS Config service, and then you will create a new Amazon Simple Storage Service (Amazon S3) bucket. Next, you will review the AWS Config resources. Finally, you will enable AWS managed rules to evaluate your resources.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Evaluate Conditions by Using an If Else Structure in C# [Guided]	In this challenge lab, you will make your applications perform different tasks based on different conditions by using an if else statement. First, you will create a simple C# console application, and then you will determine the current year and date by using the C# DateTime object. Next, you will determine the current quarter of the year by using an if and an else if statement. Finally, you will determine the appropriate text to write to the console by using an if statement.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Evaluate Network Logging [Guided]	In this Challenge Lab, you will perform network log management and analysis and automate log tasks by using a script. First, you will perform log management and analysis by using a script. Next, you will use Snort as a network traffic logging tool. Finally, you will configure centralized logging. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.

Evaluate Security Policy, Guides and Templates [Guided]	In this Challenge Lab, you will evaluate security policy, guides and templates. First, you will evaluate and customize security policy templates. Next you will access security benchmarks and configuration guides. Finally, you will use security templates to manage a Windows Server configuration, which will entail using the Microsoft Policy Analyzer to perform security baseline template review and gap analysis; creating, linking, and importing security baseline template settings; applying a WMI filter; and customizing a GPO.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Evaluate SSH Remote Management Security [Guided]	In this Challenge Lab, you will learn how to use Secure Shell Protocol (SSH) to establish secure communications between systems. First, you will set up SSH on Kali Linux™. Next, you will establish a connection by using password authentication. Finally, you will configure SSH to use public key authentication, and then establish a connection by using a user's private SSH key.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Evaluate the Output of Enumeration Tools [Guided]	In this Challenge Lab, you will use and evaluate the output of enumeration and network scanning tools and utilities. First, you will enumerate information by using netcraft.com, and then you will enumerate information by using the recon-ng tool. Next, you will use nmap to enumerate other computers, identify open ports, determine OS, and discover active services. Finally, you will perform service discovery and banner grabbing (i.e., enumeration). Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Evaluate Variables by Using Logical Expressions in C# [Guided]	In this challenge lab, you will apply rules in your application by using logical expressions. First, you will create a simple C# console application, and then you will evaluate Boolean variables by using the conditional logical AND operator. Next, you will evaluate Boolean variables by using the conditional logical OR operator. Finally, you will evaluate integer variables by using the logical AND, XOR, and OR operators.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Evaluating Credential Security [Guided]	In this Challenge Lab, you will evaluate the security of user account credentials. First, you will use Wireshark to capture FTP credentials, and then you will create user accounts with passwords. Next, you will perform a dictionary-based password crack, and then you will perform a brute force password crack. Finally, you will perform password guessing.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Examine Log Files to Block Bad Actors [Guided]	In this challenge, you will read log files containing forensic evidence of events that occur on a Linux system, find failed login attempts on your servers in system log files and use those entries to protect your server by adding blocks for the offending IP address, and remove the IP address to reinstate access to the other system.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Examine Network Communications by Using Wireshark [Guided]	In this challenge lab, you will examine network communications by using Wireshark. First, you will learn to use the basic features of Wireshark, and then you will explore the use of display filters. Next, you will use Wireshark to follow a TCP stream and an HTTP stream, and then you will use Wireshark capture filters. Finally, you will explore the headers of captured network traffic by using Wireshark.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Examine Strings and String Functions in MySQL [Guided]	In this challenge, you will be writing MySQL queries that manipulate strings. First you will extract character counts from fields, and then you will convert strings to upper and lower case. Next you will replace characters in strings, and then parse strings. Finally, you will find the location of white spaces in strings.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Execute Commands and Automation Documents by Using the AWS Systems Manager Service [Guided]	In this challenge, you will configure AWS Systems Manager to manage the hosts for Amazon Elastic Cloud Computer (Amazon EC2) instances. First, you will create a new Amazon Simple Storage Service (Amazon S3) bucket, and then you will configure Systems Manager by using the Quick Start option. Next, you will verify that the EC2 instance is part of the managed fleet, and then you will review the built-in documents. Finally, you will run and verify command documents, and then you will run and verify automation documents.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Execute Network Reconnaissance [Guided]	In this Challenge Lab, you will execute network reconnaissance. First, you will discover local network configuration details. Next, you will use nmap to discover other computers, identify open ports, determine OS, and then you will discover active services. Finally, you will perform service discovery and banner grabbing.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Extract Data by Using T-SQL [Guided]	In this challenge lab, you will extract data by using Transact-SQL (T-SQL). First, you will extract data by using a SELECT INTO statement. Next, you will extract data by using an INSERT SELECT statement. Finally, you will combine data from two tables by using the UNION set operator, and then you will extract common data from two tables by using the INTERSECT set operator.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Filter Data in MySQL [Guided]	In this challenge you will write several MySQL queries by using filtering. First, you will develop queries that return filtered data from a table by using the SQL query WHERE clause. Next, you will develop more specific queries that use the BETWEEN and LIKE logical operators. Finally, you will explore queries that filter data based on NULL values. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Filter Data in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries by using filtering. First, you will launch Microsoft SQL Server Management Studio, and then you will develop queries that return filtered data from a table by using the WHERE clause. Next, you will develop more specific queries which use the BETWEEN and LIKE logical operators. Finally, you will explore queries that filter data based on NULL values. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Filter Objects in the Pipeline Using Windows PowerShell [Guided]	In this challenge, you will use PowerShell to filter objects in the pipeline. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Find Vulnerabilities [Guided]	In this Challenge Lab, you will perform an uncredentialed vulnerability scan, and then you will perform credentialed vulnerability scans. Next, you will explore Greenbone Security Assistant (GSA) vulnerability scan results, and then you will schedule a GSA vulnerability scan. Finally, you will export a GSA scan report.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Find Vulnerabilities [Guided]	In this Challenge Lab, you will perform an uncredentialed vulnerability scan, and then you will perform credentialed vulnerability scans. Next, you will explore Greenbone Security Assistant (GSA) vulnerability scan results, and then you will schedule a GSA vulnerability scan. Finally, you will export a GSA scan report.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Force Users to Change Password Upon First Sign In [Guided]	In this challenge, you will create a new user account, and then you will set the password to expire when the user first signs in so that the user is required to create a new password. NOTE: Before you begin, please ensure you have set aside enough time to complete this challenge as you will not be able to pause, save, or return to your progress.
Gain Remote Access to a Windows System [Guided]	In this Challenge Lab, you will learn methods that can be used to gain remote access and remote control over a Windows system. First, you will use Metasploit to gain remote access to Windows. Finally, you will use netcat to gain remote access to Windows. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Generate a Q&A Bot to Answer FAQs [Guided]	This course is in development. Details coming soon.
Generate and Use SSH Keys for Azure Linux Virtual Machine Authentication [Guided]	In this challenge, you will configure SSH public key authentication for an existing Linux virtual machine.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Active Directory Domain Services [Getting Started]	In this lab, you will learn the fundamentals of managing Active Directory Domain Services by creating and managing Active Directory Groups, creating and managing Active Directory Users, creating and managing Organizational Units, and creating and managing Group Policy Objects.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Active Directory Infrastructure Management [Getting Started]	In this lab, you will configure an Active Directory® infrastructure, promote a server to a read-only domain controller, configure a domain-wide password replication policy, configure multiple user principal name suffixes and assign them to users, perform an offline defragmentation of the Active Directory database, manage Active Directory sites and monitor Active Directory Domain Services replication, configure a forest trust relationship, configure an Active Directory backup, and restore deleted objects to Active Directory.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Administering Relational Databases on Azure (Series A) [Getting Started]	In this lab, you will administer an Azure relational database solution. First, you will deploy an Azure SQL database as a primary database, and then you will enable auditing and dynamic data masking. Next, you will create a failover group that includes a secondary database in another region. Next, you will deploy an Azure virtual machine that hosts SQL Server, and then you will access an Azure SQL database by using a virtual network service endpoint. Finally, you will encrypt data by using Always Encrypted, and then you will configure Azure Disk Encryption on an Azure virtual machine.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Administering Relational Databases on Azure (Series B) [Getting Started]	In this lab, you will administer an Azure relational database solution. First, you will deploy an Azure SQL database in an elastic pool, and then you will query the database. Next, you will create a second database in the elastic pool, then you will analyze query performance by using Query Performance Insight. Finally, you will deploy an Azure virtual machine that hosts SQL Server, and then you will migrate a SQL Server database to Azure SQL Database.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Getting Started with Advanced Windows PowerShell [Getting Started]	In this lab, you will create Windows® PowerShell® scripts, modules, and workflows, by creating a PowerShell script and a module, and then you will create an HTML report, creating custom error messages, and then you will debug a script by using a breakpoint, and configuring a server by using PowerShell Desired State Configuration, and then you will create a PowerShell workflow.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Amazon Simple Storage Service (S3) [Getting Started]	In this lab, you will create a development network using the VPC Wizard, manually create a VPC for a production network, create an Internet Gateway, create public subnets for a production network, and create and associate a public route table.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with AWS Cloud Fundamentals [Getting Started]	In this lab, you will configure and deploy a highly available and secure website by using Amazon Web Services (AWS). First, you will configure network security for your environment, and then you will create and configure an Amazon Simple Storage Service (Amazon S3) bucket to store static assets. Next, you will create a fleet of EC2 instances by using an Auto Scaling group. Finally, you will integrate an Application Load Balancer into the Auto Scaling group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with AWS Elastic Compute Cloud [Getting Started]	In this lab, you will configure a scalable, load-balanced web server farm by using Amazon Web Services (AWS). First, you will configure an Amazon Elastic Compute Cloud (Amazon EC2) instance, and then you will create a custom Amazon Machine Image (AMI) based on the instance. Next, you will create a launch template, and then you will configure an Auto Scaling group. Finally, you will install a web server by using AWS System Manager Run Command, and then you will configure load balancing for the server farm.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with AWS Secure Architecture Configuration [Getting Started]	In this lab, you will configure a secure Amazon Web Services (AWS) virtual private cloud (VPC) architecture for a web server. First, you will configure an AWS VPC environment following AWS best practices for security and reliability. Next, you will create an Auto Scaling Group that contains a load balancer to host multiple web servers in the VPC. Finally, you will test your environment to make sure that it is functioning.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with AWS Tech Essentials [Getting Started]	In this lab, you will configure an Amazon Web Services environment. First, you will create an Amazon Simple Storage Service (Amazon S3) bucket to host a publicly accessible website. Next, you will build a custom Virtual Private Cloud (VPC) that will support public and private workloads. Finally, you will create a re-usable Amazon Elastic Compute Cloud (Amazon EC2) solution by using a custom AMI and a launch template.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Getting Started with Azure Active Directory [Getting Started]	In this lab, you will manage an Azure Active Directory (Azure AD) environment. First, you will install and configure Azure AD Connect and implement self-service password reset, and then you will create role-based access control custom roles. Next, you will implement managed identities for Azure virtual machines, and then you will implement multi-factor authentication (MFA) for a user. Finally, you will implement an Azure conditional access policy that requires MFA, and then you will implement Azure Policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Getting Started with Azure Architect Technology Solutions [Getting Started]	In this lab, you will configure geo-replication for your database, enable dynamic data masking using Azure SQL database, enable VM backup using recovery services vault, use Azure storage explorer in the Azure portal, and configure continuous deployment using GIT and deployment slots.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Azure Automation Services [Getting Started]	In this lab, you will learn how to configure Cloud Shell to use Bash and PowerShell to automate tasks, how to use the in browser script editor to create, save and execute scripts, configure disk encryption with Azure Key Vault and PowerShell, and configure update management using Log Analytics.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Azure Infrastructure Solutions [Getting Started]	In this lab, you will configure an Azure infrastructure. First, you will deploy highly available virtual machines that use availability sets, and then you will deploy a scalable virtual machine infrastructure with virtual machines that use scale sets. Next, you will configure scale rules for scale sets, and then you will configure real-time metric alerts. Finally, you will configure virtual machines by using a custom script extension, a PowerShell Desired State Configuration (DSC) extension, and an Azure Resource Manager (ARM) template, and then you will use a managed disk to create a snapshot and a virtual machine.Note: Once you begin, you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Azure IoT Solutions [Getting Started]	In this lab, you will configure an Azure IoT data solution. First, you will provision an IoT hub, and then you will configure an IoT device connection. Next, you will connect a Raspberry Pi IoT device to an IoT hub, and then you will provision an Azure Stream Analytics job. Finally, you will create an Azure storage account that contains a table, and then you will design a Stream Analytics query that will retrieve messages from the IoT hub devices in real time.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Azure Network Security [Getting Started]	In this lab, you will implement secure network services and create an Azure API Management instance to host and publish your APIs. First, you will implement an API Management instance, and then you will create a virtual machine. Next, you will configure security groups for the virtual machine, and then you will configure secure remote access to the virtual machine. Finally, you will create an Azure web app that uses role-based access control, and then you will deploy an API to the Azure API Management instance. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Azure Networking and High Availability [Getting Started]	In this lab, you will implement Azure network and high-availability features. First, you will create an Azure virtual network (VNet), and then you will implement Azure virtual network routing and Azure security groups. Next, you will configure Azure virtual network peering, and then you will configure a VNet-to-VNet connections. Finally, you will implement Azure backups for an Azure virtual machine, and then you will create Azure virtual machine snapshots.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Azure Platform Protection [Getting Started]	In this lab, you will configure authentication for a web app, and then you will create resource locks on the web app. Next, you will configure virtual network connectivity by using peering, then you will create a virtual machine that uses application and network security groups for security. Finally, you will create a key vault, and then you will configure Azure Disk Encryption.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Getting Started with Azure Secure Data & Applications [Getting Started]	In this lab, you will configure security for an Azure web app, virtual machine, database, and storage account. First, you will configure Application Insights for a web app, and then you will configure security for an Azure virtual machine. Next, you will create an Azure SQL database that uses Azure Defender for SQL, and then you will configure security for a storage account by using a shared access signature (SAS) key. Finally, you will configure security for an Azure Cosmos DB account.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Getting Started with Azure Storage [Getting Started]	In this lab, you will manage data stored in Azure. First, you will provision a storage account that provides public access to files in a container, and then you will create an Azure Cognitive Search service. Next, you will set up an Azure Cosmos DB account, and then you will import data into a Cosmos DB database. Finally, you will create a web app, and then you will use the web app to search for and display results from the data in your database.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Azure Storage, Virtual Machines, and Monitoring [Getting Started]	In this lab, you will create and monitor Azure® storage accounts and virtual machines. First, you will implement and manage access to Azure storage accounts, and then you will configure monitoring of an Azure storage account. Next, you will automate the deployment of Azure virtual machines. Finally, you will configure monitoring of Azure virtual machines.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Azure Web App Management and Monitoring [Getting Started]	In this lab, you will manage and monitor an Azure web app by provisioning an App Service and an App Service Plan, configuring autoscale options for the web app, configuring Azure Active Directory authentication for the web app, configuring App Service alerts, and viewing Application Insights data for your web app. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Cloud Slice Azure Architecture [Getting Started]	This challenge lab is currently in development. Details will be published soon.
Getting Started with Cloud Slice Storage Developer [Getting Started]	This challenge lab is currently in development. Details will be published soon.
Getting Started with Cybersecurity Defensive Tools [Getting Started]	In this lab, you will manage log files in Windows Server and Linux. You will configure security tools and audit permissions. You will confirm file integrity. Finally, you will manage secure remote administration. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Cybersecurity Offensive Tools [Getting Started]	In this lab, you will capture network traffic, identify network services,and gather system information. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Data Center Virtualization - Series 1 [Getting Started]	In this lab, you will build and manage a VMware vSphere infrastructure. First, you will install VMware ESXi hosts, and then you will configure management connectivity. Next, you will configure a VMware vCenter server to manage your vSphere environment, and then you will configure a network by using standard and distributed virtual switches. Finally, you will configure access to Network Filesystem Storage (NFS) and iSCSI storage devices.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Getting Started with Data Processing and Security [Getting Started]	In this lab, you will implement data security for a dedicated SQL pool by using Azure Synapse Analytics, and then you will implement data security for an Azure Data Lake Storage Gen2 account. Next, you will develop a batch processing solution by using an Azure data factory, and then you will implement data security for an event hub. Finally, you will create an Apache Spark job in a pipeline by using an Azure Synapse Analytics workspace.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Getting Started with Data Storage, Monitoring, and Optimization [Getting Started]	In this lab, you will optimize data distribution for a dedicated SQL pool by using Azure Synapse Analytics, and then you will optimize a hierarchical namespace for an Azure Data Lake Storage Gen2 account. Next, you will optimize a batch processing solution by using an Azure data factory, and then you will monitor streaming events for an event hub. Finally, you will monitor an Apache Spark job by using an Azure Synapse Analytics workspace.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Getting Started with Designing an Azure Data Solution [Getting Started]	In this lab, you will design an Azure data solution. First, you will design an Azure Cosmos DB account, and then you will design an Azure SQL database and an Azure Synapse Analytics SQL pool. Next, you will design an Azure Data Lake Storage solution, and then you will design an event streaming solution by using an Azure stream analytics job and an Azure event hub. Finally, you will design a data pipeline in an Azure data factory.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Hybrid Cloud ARM [Getting Started]	In this lab, you will design Azure App Service Web Apps, deploy workloads on ARM virtual machines, monitor ARM virtual machines, design and implement Kubernetes applications on Azure Kubernetes Service (AKS), and develop Azure Logic Apps using messaging services.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Hybrid Cloud Solutions [Getting Started]	In this lab, you will configure an Azure hybrid cloud solution. First, you will deploy an Azure web app by using deployment slots, and then you will enable load balancing for the web app. Next, you will configure virtual networks, and then you will enable high availability by using an availability set. Finally, you will configure an Azure virtual machine scale set to provide high availability and scalability.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Getting Started with Implementing an Azure Data Solution [Getting Started]	In this lab, you will implement an Azure data solution. First, you will provision an Azure Cosmos DB account, and then you will provision an Azure SQL database. Next, you will enable Azure Data Lake Storage, and then you will implement event streaming by using an Azure event hub. Finally, you will create an Azure data factory, and then you will create a pipeline and a copy data activity in the Azure data factory.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Kubernetes Cluster Administration [Getting Started]	In this lab, you will install and configure a fully functional three-node Kubernetes cluster. First, you will install Kubernetes cluster components on three Linux virtual machines, and then you will initialize a Kubernetes cluster. Next, you will retrieve cluster information, and then you will create a pod and a Deployment. Finally, you will update and roll back a Deployment, and then you will delete cluster resources.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Kubernetes Cluster Resource Management [Getting Started]	This challenge lab is currently in development. Details will be published soon.

Getting Started with Linux Administration [Getting Started]	In this lab, you will manage Linux services, including SSH, FTP, Rsync, Scp, and Cron, manage users and groups, including privilege escalation, password security, and aliases, and document the server's configuration.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Linux Command Line Fundamentals [Getting Started]	In this lab, you will manage files by using the Linux command line, display file names by using the ls command and wildcards, display file content by using the head, tail, more, tac, cat, and nl commands, create files and append content to files by using redirection, the touch command, and the echo command, install and refer to the Linux manpages, manipulate file content by using the awk, sort, and grep commands, and display the output of the dd, du, and df commands. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Linux Data Management [Getting Started]	In this lab, you will manage text files and directories in Linux, manage storage space, and configure standard, ACL, and advanced permissions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Linux Deployment [Getting Started]	In this lab, you will deploy GUI administration tools to create users and to manage Kickstart answer files, manage software, processes, and services, and configure the server to host a web site by using Apache. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Linux System Administration Tasks [Getting Started]	In this lab, you will perform fundamental Linux command-line administration tasks. First, you will analyze and control Linux data streams, and then you will create shell and environment variables. Next, you will manipulate data by using the xargs, sed, and awk command-line utilities. Finally, you will perform operations by using shell operators, and then you will create a shell script utility.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Linux+ [Getting Started]	In this lab, you will perform administrative tasks in a virtual machine that runs Linux® by configuring and deploying a virtual machine by using Microsoft Azure®, configuring a virtual server that runs Ubuntu Linux, generating a public and private RSA key pair by using PuTTY Key Generator, configuring printing, managing users and user groups, creating a scheduled backup, and configuring time and time zones by using the Azure command-line interface (CLI), and performing network security scans by using Nmap and configuring system log message forwarding.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Linux+2 [Getting Started]	In this lab, you will configure a network that contains one virtual machine running Windows® 10 and two virtual machines running Ubuntu Linux® by verifying the network address settings on two Microsoft Azure® virtual machines that run Ubuntu Linux®, creating a secondary network interface, and then you will configure a custom DNS zone in Azure, and configuring IPv4 and IPv6 network addresses and routing on two computers that run Linux.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Managing Access in Linux and Windows [Getting Started]	In this lab, you will configure access in Linux and Windows. First, you will create Linux users and groups, and then you will manage passwords in Linux. Next, you will configure Linux permissions, and then you will create Windows users and groups. Finally, you will manage passwords in Windows, and then you will configure Windows permissions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Getting Started with Managing Linux and Windows Systems [Getting Started]	In this lab, you will manage Linux and Windows network servers. First, you will create a backup in Linux, and then you will configure a Linux firewall. Next, you will configure automatic software package updates in Linux, and then you will perform backup and restore operations in Windows. Finally, you will configure the Windows Firewall, and then you will configure the Windows Update service.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Office 365 Identity and Services [Getting Started]	In this lab, you will learn the fundamentals of creating Office 365 subscription as well as common management activities for some of the main services.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with PKI Essentials [Getting Started]	This challenge lab is currently in development. Details will be published soon.
Getting Started with Security and Permissions [Getting Started]	In this lab, you will configure security and permissions in an Ubuntu Linux environment, perform a port scan of a Linux server, edit the /etc/ssh/sshd_config file to secure SSH access, create an administrative user, create additional groups and add users to the groups, edit the /etc/hosts.allow and the /etc/hosts.deny files to increase security on the Linux server, and use Nmap to verify that the TCP port has been successfully changed. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Security Concepts in Windows and Linux Environments [Getting Started]	In this lab, you will configure fundamental computer security settings in Windows and Linux environments. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Storage in Windows Server 2016 [Getting Started]	In this lab, you will configure storage in Windows Server 2016. First, you will configure partitions, volumes, and data deduplication, and then you will configure Storage Spaces by using a storage pool and a virtual disk. Next, you will configure iSCSI storage, and then you will configure shared folders by using Simple Message Block (SMB) and Network File System (NFS). Finally, you will deploy Windows Server 2016 Datacenter Server Core manually, and then you will create a deployment image for automated deployments by using the Microsoft Deployment Toolkit (MDT).Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Windows PowerShell [Getting Started]	In this lab, you will use PowerShell to create and manage local user accounts.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Windows Server 2016 High Availability [Getting Started]	In this lab, you will configure high availability by using Windows Server 2016, install the Hyper-V role on two different servers that will represent Hyper-V servers in two different datacenters, replicate a virtual machine between the two Hyper-V servers, install the File Services role and the Failover Clustering feature, configure a file server failover cluster, and test high availability and failover scenarios. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Windows Server 2019 Deployment and Administration [Getting Started]	In this lab, you will deploy and administer Windows Server 2019. First, you will implement Windows Server 2019 Server Core, and then you will deploy Active Directory Domain Services. Next, you will implement Windows Admin Center, and then you will manage computers by using Windows Admin Center. Finally, you will monitor Windows Server 2019, and then you will configure System Insights in Windows Admin Center.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Windows Server 2019 Virtualization, High Availability, and Disaster Recovery [Getting Started]	This challenge lab is currently in development. Details will be published soon.

Getting Started with Windows Server Monitoring [Getting Started]	In this lab, you will manage local and remote servers. First, you will use Event Viewer to display log file entries, and then you will use Performance Monitor to display system performance. Next, you will use the task list command and Reliability Monitor to gather additional system data. Finally, you will remotely administer the servers by using Windows PowerShell and Server Manager, and then you will deploy the Web Server by using Desired State Configuration (DSC).Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Getting Started with Windows Server Networking [Getting Started]	In this challenge, you will verify IPv4 connectivity, DNS resolution and services, establish DHCP failover, configure a DNS secondary zone, configure a Web Application Proxy, configure a VPN connection, and configure DFS. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Handle Errors and Exceptions in Python [Guided]	In this challenge lab, you will handle errors and exceptions in your code. First, you will find a logical error in a function, and then you will refactor the function so that it does not cause any errors. Next, you will write code that contains an error, and then you will add a try/except block to handle exceptions. Finally, you will add a try/except block that handles multiple exceptions, and then you will add an else clause to handle code that must run without any exceptions.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Handle Exceptions in Java [Guided]	In this challenge lab, you will handle exceptions by using try/catch blocks. First, you will add a try/catch block to handle a FileNotFoundException, and then you will display a message that provides information about the exception. Next, you will add a try-with-resources block, and then you will add a catch block to handle an IOException. Finally, you will verify that the methods return the expected results when there are no exceptions, and then you will verify that the exceptions provide the expected output.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Harden a Server by Limiting Access to a Single Subnet [Guided]	In this challenge, you will limit access to a system to a single subnet by editing the /etc/hosts.deny file and denying all traffic to this system, editing the /etc/hosts.allow file and allowing SSH traffic to this system from a single subnet, demonstrating that access has been limited, and allowing your subnet access to the system and test connectivity.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Harden Network Security [Guided]	In this Challenge Lab, you will perform tasks to secure or harden the network, including adding communication encryption and filtering unwanted activities. First, you will capture plaintext communications by using Wireshark, and then you will configure IPSec policies. Next, you will capture encrypted communications by using Wireshark. Finally, you will configure Windows Defender Firewall to control ICMP ping communications.
Hosting a Static Website Using S3 [Guided]	In this challenge, you will create and configure an Amazon S3 Bucket with version control to serve a static website.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Identify Attack Types [Guided]	In this challenge, you will identify attack types in a scenario-based format. These attack types represent many of the hands-on challenges in this series.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Identify Non-Secure Network Traffic [Guided]	In this challenge, you will capture and analyze HTTP and FTP network traffic.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Identify Standard Security Practices [Guided]	In this challenge, you will identify standard security practices in scenario-based questions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Identify the Source of a Performance Problem in Windows Server 2019 [Guided]	In this challenge, you will identify the source of a performance problem on a Windows Server 2019 server. First, you will use a Performance Monitor Data Collector Set to capture performance data generated by a typical server workload. Next, you will analyze the collected data. Finally, you will use the same Data Collector Set to capture values generated by a busy workload on the server, and then you will compare the data collected to the original baseline values.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Identify Tools and Practices for Security Configurations [Guided]	In this challenge you will identify log file management tools, antimalware concepts, encryption concepts, remote administrations practices, and baseline configurations.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Identify Use Case for Asymmetric and Symmetric Encryption and Hash Cryptography [Guided]	In this challenge, you will identify general encryption concepts, symmetric encryption attributes, asymmetric encryption attributes, and hash cryptography.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement a Database Migration Strategy [Guided]	In this challenge, you will implement a database migration strategy for a SQL Server database. First, you will test access to an Azure SQL database by using the Azure portal. Next, you will create a database from a backup on an Azure virtual machine that hosts SQL Server. Finally, you will migrate the database from SQL Server to Azure SQL Database.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement a Fault Tolerant File Service by Using EFS [GUIDED]	In this challenge, you will configure an Amazon Elastic File System (Amazon EFS) for your server infrastructure. First, you will create a file system, and then you will map a file share to a Linux bastion host. Next, you will map the EFS file system to the web servers, and then you will add files to the file share. Finally, you will configure the web servers to use the content in EFS, and then you will verify fault tolerance.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement a Network Access Control List [Guided]	In this challenge, you will create a secure network Access Control List (ACL) that will only allow specific traffic into a subnet. First, you will create a network ACL. Next, you will create an EC2 instance on the subnet that is associated with the network ACL. Finally, you will test access to the web server through the network ACL.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement a Network Security Group [Guided]	In this challenge, you will create and configure a network security group. First, you will create a network security group. Next, you will associate the network security group to a subnet. Finally, you will add security rules to the network security group. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Implement a Security Monitoring Process [Guided]	In this challenge lab, you will implement a security monitoring process by using AWS CloudTrail. First, you will set up CloudTrail to track management events, and then you will configure a topic by using the Amazon Simple Notification Service (SNS). Next, you will configure monitoring for Amazon CloudWatch Logs by using a metric filter, and then you will configure an alarm for a log group. Finally, you will review the management events in the CloudTrail trail, and then you will review the CloudWatch alarms and graphs.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement a Windows PowerShell Workflow [Guided]	In this challenge, you will use PowerShell to add roles and features to Windows Server with PowerShell Workflow.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement an Azure Conditional Access Policy [Guided]	In this challenge, you will implement an Azure conditional access policy. First, you will create a new Azure Active Directory (Azure AD) tenant. Next, you will create an Azure AD user account. Finally, you will create a conditional access policy that requires multi-factor authentication (MFA) when a specific user connects to the Azure portal, and then you will test the policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement an Azure Function App [Guided]	In this challenge, you will create an HTTP trigger function in a function app. First, you will create a function app. Next, you will create an HTTP trigger function in the function app. Finally, you will test the function app.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Implement an Azure Load Balancer [Guided]	In this challenge, you will implement an Azure load balancer. First, you will create an Azure load balancer. Next, you will configure a backend pool for the load balancer, and then you will configure an HTTP health probe. Finally, you will create a load balancing rule.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement an IAM Policy [Guided]	In this challenge lab, you will create an AWS Identity and Access Management (IAM) policy to manage an Amazon Simple Storage Service (Amazon S3) bucket. First, you will create an IAM policy, and then you will create a user group. Next, you will add a user account to the group, and then you will create an S3 bucket. Finally, you will add an object to the bucket, and then you will attempt to delete both the object and the bucket.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement and Manage Azure Storage [Guided]	In this challenge, you will create and work with Azure storage accounts, create a storage account by using the Azure portal, create a container that is configured for public access, upload a document to the container, create a storage account and a container by using Windows PowerShell, install Azure Storage Explorer, and use it to upload a document to Azure Storage.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Azure Backup for Azure Virtual Machines [Guided]	In this challenge, you will implement Azure backup for your Azure virtual machines. First, you will back up an Azure virtual machine by using the Azure portal. Next, you will enable backups on an Azure virtual machine by using Azure PowerShell. Finally, you will enable backups on an Azure virtual machine by using Azure CLI 2.0.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Implement Azure Policy [Guided]	In this challenge, you will implement Azure Policy. First, you will view a policy definition. Next, you will assign the policy. Finally, you will test the Azure policy. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you startIn this challenge, you will implement Azure Policy. First, you will view a policy definition. Next, you will assign the policy. Finally, you will test the Azure policy.
Implement Azure Virtual Network Routing [Guided]	In this challenge, you will implement virtual network routing. First, you will create a route table that contains a route and that is associated to a subnet, and then you will deploy three virtual machines to three different subnets. Next, you will configure traffic to be routed from one subnet to another through a network virtual appliance. Finally, you will test the routing of network traffic.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Azure Virtual Networking [Guided]	In this challenge, you will implement virtual networking. First, you will create an Azure virtual network by using the Azure portal. Next, you will create an Azure virtual network by using Azure PowerShell commands. Finally, you will create an Azure virtual network by using an Azure CLI 2.0 command.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement BranchCache and DFS for a Branch Office [Guided]	In this challenge, you will implement BranchCache and DFS for a branch office.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Caching in AWS by Using DAX [Guided]	In this challenge, you will implement caching for an application. First, you will deploy an Amazon DynamoDB Accelerator (DAX) cluster, and then you will configure an Identity and Access Management (IAM) role by using a policy. Next, you will launch an Amazon Elastic Cloud Compute (Amazon EC2) instance for your application, and then you will configure the EC2 instance. Finally, you will run the application, and then you will review the response times for the DAX cluster.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Implement Custom Error Handling [Guided]	In this challenge, you will use PowerShell to write a script that uses custom error handling techniques.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement DHCP [Guided]	In this Challenge Lab, you will configure, use, troubleshoot, and manage Dynamic Host Configuration Protocol (DHCP). First, you will configure DHCP settings on Windows 10. Next, you will configure IPv4 Alternate Configuration settings, and then you will manage DHCP scopes. Finally, you will configure a DHCP reservation. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement DirectAccess [Guided]	In this challenge, you will implement a DirectAccess Server and allow DA Clients.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Domain Trusts [Guided]	In this Challenge Lab, you will learn how to configure and test domain trusts. First, you will configure Domain Name System (DNS) for domain trusts, and then you will set up the Hexelo-RD domain. Next, you will create shared folders in two domains, and then you will establish a domain trust. Finally, you will confirm cross-domain resource access over a domain trust.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Implement Dynamic Data Masking by Using Azure SQL Database [Guided]	In this challenge, you will provision a new Azure SQL database that uses dynamic data masking for data security. First, you will deploy an Azure SQL database. Next, you will apply dynamic data masking to the email and account number columns. Finally, you will test the data security access. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Elastic Load Balancing Between EC2 Instances [Guided]	In this challenge, you will configure Elastic Load Balancing for two Amazon Elastic Compute Cloud (Amazon EC2) instances. First, you will configure two EC2 instances as web servers. Next, you will create a target group that includes the EC2 instances. Finally, you will create a load balancer for the EC2 instances.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Encryption [Guided]	In this challenge you will manage encryption using EFS and BitLocker. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Encryption at Rest [Guided]	In this challenge lab, you will protect data in transit and at rest by using encryption. First, you will create an Amazon Key Management Service (KMS) key to manage the security of data at rest. Next, you will modify the key policy to allow the Amazon CloudTrail service to interact with KMS, and then you will create a CloudTrail trail that logs server-side encryption by using KMS. Finally, you will encrypt the data in an S3 bucket by using a KMS key.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement Failover Clustering for Highly Available File Server for General Use [Guided]	In this challenge, you will configure a highly available Failover Cluster File Server including Quorum, networking and storage settings.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Failover Clustering on Windows Server 2019 [Guided]	In this challenge, you will implement failover clustering on Windows Server 2019. First, you will remotely install the failover clustering feature on two servers, and then you will deploy a two-node failover cluster.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement File Encryption [Guided]	In this challenge lab, you will manage storage encryption using Encrypting File System (EFS) and BitLocker, as well as support encrypted file transfers by using Secure Shell (SSH). First, you will configure an EFS Recovery Agent on a Windows 10 virtual machine, and then you will encrypt files by using EFS. Next, you will break a user account's ability to access their own EFS-encrypted files, and then you will use a Data Recovery Agent (DRA) to recover access to EFS encrypted files. Next, you will implement BitLocker on a Windows 10 data drive, and then you will disable BitLocker on a Windows 10 data drive. Finally, you will use SSH to transfer files through an encrypted communication session.
Implement File Hashing [Guided]	In this challenge lab, you will use hashing and hashes to verify the integrity of files. First, you will perform hash operations against local files. Next, you will use hashes to confirm a download. Finally, you will use the National Software Reference Library database of file hashes to evaluate files. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement Group Policy [Guided]	In this challenge lab, you will manage Group Policy Objects (GPOs) for Windows systems. You need to implement system configurations and enforce restrictions by using Group Policy. First, you will create an organizational unit (OU), and then you will manage OU membership. Next, you will create and link a GPO to the OU, and then you define settings in the GPO. Next, you will display applied GPOs and their relative settings, and then you will create a local Group Policy to restrict access to the Registry Editor and Control Panel for all non-administrative users. Next, you will create logon and logoff scripts, and then you will configure a GPO to deploy the logon and logoff scripts. Finally, you will test and troubleshoot the scripts.

Implement Health Checks by Using ELB and Route 53 [Guided]	In this challenge, you will configure health checks for your environment. First, you will create a target group for an Application Load Balancer, and then you will configure health checks for the target group. Next, you will create a listener that will route requests from the load balancer to the target group, and then you will configure health checks for your load balancer by using Route 53. Finally, you will configure an Amazon (SNS) topic to notify you when a failure occurs, and then you will monitor health checks while simulating a web server failure.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement High Availability and Disaster Recovery Options in Hyper-V [Guided]	In this challenge, you will implement Hyper-V Replica and implement storage migration.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Hyper-V Live Migration Without a Failover Cluster on Windows Server 2019 [Guided]	In this challenge, you will implement Hyper-V live migration between Windows Server 2019 servers. First, you will configure constrained delegation for two Hyper-V host computers. Next, you will configure the two Hyper-V host computers for live migration. Finally, you will perform a live migration of a Hyper-V virtual machine by using Hyper-V Manager, and then you will perform a live migration of a Hyper-V virtual machine by using Windows PowerShell.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement Hyper-V on Windows Server 2019 [Guided]	In this challenge, you will implement Hyper-V on Windows Server 2019. First, you will add the Hyper-V role to a Windows Server 2019 computer, and then you will create a Hyper-V virtual private switch. Next, you will create a Hyper-V virtual hard disk, and then you will deploy a Hyper-V virtual machine. Finally, you will manage the Hyper-V virtual machine by using Windows Admin Center.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Hyper-V Storage Migration on Windows Server 2019 [Guided]	In this challenge, you will implement Hyper-V storage migration on Windows Server 2019. First, you will review the configuration of the Hyper-V host computer. Next, you will migrate virtual machine storage to a new location by using Hyper-V Manager. Finally, you will migrate virtual machine storage to a new location by using Windows PowerShell.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Identity and Access Management [Guided]	In this challenge, you will create an Amazon Simple Storage Service (Amazon S3) bucket that will contain assets for a website that you will be hosting. The website must be accessible to a group of web administrators. First, you will create an Amazon S3 bucket to store the assets, and then you will create a user account for the web administrator. Next, you will create an Identity and Access Management (IAM) policy that provides full control of the bucket, and then you will create a new group. Finally, you will assign the IAM policy to the group, and then you will add the web administrator to the group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Implicit and Explicit Data Type Conversion in MySQL [Guided]	In this challenge you will write several MySQL queries by using implicit and explicit data type conversions. First, you will develop queries that use implicit data type conversion. Next, you will develop more specific queries which use explicit data type conversion. Finally, you will explore queries that perform data type conversion for date data types and use the CONCAT function for data concatenation.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Implement Implicit and Explicit Data Type Conversions in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries by using implicit and explicit data type conversions. First, you will launch Microsoft SQL Server Management Studio, and then you will develop queries that use implicit data type conversion. Next, you will develop more specific queries which use explicit data type conversion. Finally, you will explore queries that perform data type conversion for date data types and use the CONCAT function for data concatenation.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Information Protection [Guided]	In this challenge you will plan information protection solution, implement sensitivity labels, monitor label alerts, deploy AIP label clients, configure IRM and WIP. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Integration Between Active Directory Domain Services and Azure Active Directory [Guided]	In this challenge, you will synchronize Active Director; Domain Services (AD DS) user accounts to a new Azure Active Directory (Azure AD) tenant. First, you will create a new Azure AD tenant. Next, you will configure a global administrator account to use for Azure AD synchronization. Finally, you will install and configure Azure AD Connect.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement IoT Hub Endpoints and Consumer Groups [Guided]	In this challenge, you will implement IoT hub consumer groups to associate different data processors with partitioned IoT data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Local Policy [Guided]	In this challenge, you will configure local Group Policy settings on a Windows 10 workgroup computer. First, you will enable an object access policy to audit users access, and then you will configure auditing for a folder. Next, you will verify an event in the Windows event log. Finally, you will create a local Group Policy to restrict access to the Registry Editor and Control Panel for all non-administrative users, and then you will test the policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Managed Identities for Azure Virtual Machines [Guided]	In this challenge you will implement managed identities. First, you will enable a system-assigned managed identity, and then you will disable the identity. Next, you will create a user-assigned managed identity, and then you will assign a role to the managed identity. Finally, you will add the user-assigned managed identity to a virtual machine.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Modern Device and App Services [Advanced]	In this challenge, you will implement modern device and app services. First, you will create a Microsoft 365® Apps deployment for Windows® 10 and later devices. Next, you will join your Windows 10 device to Azure® Active Directory (Azure AD) and enroll it in Microsoft Intune®. Finally, you will verify that your device has received the app deployment.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Multi-Factor Authentication for an Azure Active Directory User [Guided]	In this challenge, you will implement Multi-Factor Authentication (MFA) for a user in a new Azure Active Directory (Azure AD) tenant. First, you will create a new tenant, and then you will connect to the new tenant. Next, you will create a user account, and then you will enable per-user MFA for the new user. Finally, you will test MFA.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Implement Name Resolution [Guided]	In this Challenge Lab, you will implement domain name resolution. First, you will manipulate name resolution by using a hosts file. Next, you will use nslookup to confirm local DNS resolutions. Finally, you will configure DNS by creating forward and reverse lookup zones and defining A (address) and PTR (pointer) records.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement Network Security Groups and Application Security Groups [Guided]	In this challenge, you will create and configure network security groups and application security groups. First, you will create an application security group, and then you will create a network security group that you will associate to a subnet. Next, you will create security rules, and then you will create and configure virtual machines. Finally, you will associate the virtual machine network interfaces to application security groups, and then you will test the security rules associated to the application security groups. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Network Security Solutions for Data Flow [Guided]	In this Challenge Lab, you will learn how to implement network activity monitoring and use a protocol analyzer. First, you will use Resource Monitor to identify active network connections and the associated remote IP addresses, and then you will monitor network data flow by using TCPView. Next, you will track network data flow with NetWorx, and then you will use Wireshark® to observe network data flow. Finally, you will use Wireshark display filters to evaluate network data flow.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement New Security Policies [Guided]	In this Challenge Lab, you will implement new security policies. First, you will create a new domain Group Policy Object (GPO) to implement new security changes throughout the domain, and then you will define and enforce GPO settings related to account lockout, password policies, and auditing. Next, you will create a GPO to prohibit access to the Control Panel, PC settings, and the Registry Editor, and then block the GPO from applying to the Domain Admins group. Finally, you will verify that GPO settings have been applied by testing them on a Windows® domain client.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Implement Protection for Data and Infrastructure [Guided]	In this Challenge Lab, you will protect data and other sensitive information in your AWS environment. First, you will create an Amazon Elastic Cloud Compute (Amazon EC2) key pair to provide a secure connection to an instance. Next, you will add the key to the AWS Systems Manager Parameter Store by using the AWS Management Console, and then you will upload a key to the Parameter Store by using the AWS Command-Line Interface (CLI). Finally, you will store a set of access key credentials in the AWS Secrets Manager.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure you have enough time to complete the challenge lab before you start
Implement Remote Assistance [Guided]	In this Challenge Lab, you will configure and use remote assistance tools, including Windows Remote Assistance, Microsoft Remote Desktop, and Virtual Network Computing (VNC). First, you will create, save, and share a Remote Assistance invitation. Next, you will configure and use Remote Assistance, and then you will enable and use Microsoft Remote Desktop. Finally, you will use VNC to remotely connect to Linux from Windows®.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Implement Remote Server Administration by Using Windows Admin Center [Guided]	In this challenge, you will administer computers remotely by using Windows Admin Center. First, you will configure a computer to allow remote connectivity by using Windows Admin Center. Next, you will manage the computer by using the Remote Desktop tool in Windows Admin Center. Finally, you will manage the computer by using the PowerShell tool in Windows Admin Center.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Role-Based Access Control [Guided]	In this challenge, you will implement role-based access control (RBAC). First, you will assign the Reader role to an Azure user. Next, you will test the role assignment. Finally, you will assign the Network Contributor role to an Azure user, and then you will test the Network Contributor role assignment.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Scaling for an Amazon RDS Instance [Guided]	In this challenge, you will implement scaling for an Amazon Relational Database Service (RDS) instance. First, you will create security groups, and then you will deploy a MySQL DB instance. Next, you will create an Amazon Elastic Cloud Compute (Amazon EC2) instance to act as a server, and then you will add data to the database. Finally, you will scale the RDS instance vertically and horizontally, and then you will verify that you can access the data.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Implement Security by Using an IAM Role [Guided]	In this challenge, you will create an Identity and Access Management (IAM) role that you will use to access an Amazon Simple Storage Service (Amazon S3) bucket from an Elastic Compute Cloud (EC2) instance. First, you will create an Amazon S3 bucket to store objects, and then you will create a role to provide access to the bucket from an EC2 instance. Next, you will create an IAM policy that provides full control of the bucket, and then you will assign the policy to the role. Finally, you will create a new EC2 instance that will use the role, and then you will sign in to the EC2 instance and test the role.
Implement Security by Using Security Groups [Guided]	In this challenge, you will configure a web server that is accessible from the internet and an application server that is only accessible from the web server. First, you will create security groups to allow traffic into the web server and the application server. Next, you will create new Amazon Elastic Compute Cloud (Amazon EC2) instances that use the security groups. Finally, you will test access to the EC2 instances through the security groups.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Implement Security for an Azure Web App [Guided]	In this challenge, you will deploy an Azure web app that uses Azure Active Directory authentication. First, you will create an Azure web app. Next, you will deploy code from a public GitHub repository to the web app. Finally, you will modify the security configuration of the web app, and then you will test the secure web app. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Implement Self-Service Password Reset [Guided]	In this challenge, you will implement self-service password reset (SSPR) for selected users in a new Azure Active Directory (Azure AD) tenant. First, you will create a new tenant, and then you will configure a group of users who will be permitted to use SSPR. Next, you will implement SSPR for the Azure AD group. Finally, you will test SSPR.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Snort as a Network Intrusion Detection System [Guided]	In this Challenge Lab, you will use Snort to evaluate network communications. First, you will install Snort, and then you will use Snort as a sniffer. Next, you will use Snort as a packet logger. Finally, you will use Snort as a network intrusion detection system.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Implement Storage Spaces Direct in a Scale Out File Server Cluster [Guided]	In this challenge, you will create a Scale Out File Server Cluster and implement Storage Spaces Direct.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement the Simple Storage Service [Guided]	In this challenge, you will configure a multi-region Simple Storage Service (S3) bucket that will store static website assets. First, you will create an S3 bucket, and then you will enable cross-region replication (CRR). Next, you will make the bucket public. Finally, you will add resources to the bucket, and then you will test access to the bucket.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement VPN Connectivity [Guided]	In this challenge, you will implement a Remote Access Server to allow VPN access from clients. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement vSphere Replication [Guided]	In this challenge, you will replicate virtual machines between locations. First, you will deploy a vSphere Replication appliance in multiple sites, and then you will register the appliance in each site with the vCenter server in each site. Next, you will create a site pair between two vCenter servers, and then you will configure a virtual machine replication job. Finally, you will perform a virtual machine recovery by using a replica.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Implement Windows Server Backup on Windows Server 2019 [Guided]	In this challenge, you will implement Windows Server Backup on Windows Server 2019. First, you will install Windows Server Backup. Next, you will create a scheduled backup. Finally, you will perform an interactive backup.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Implement Wireshark [Guided]	In this Challenge Lab, you will implement Wireshark. First, you will install Wireshark. Next, you will perform a basic network traffic capture. Finally, you will customize the Wireshark interface, and then you will manage the Wireshark profile.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Improve Query Performance by Using an Index [Guided]	In this challenge, you will configure an Azure SQL database to use an index to improve performance. First, you will access a pre-existing Azure SQL database, and then you will run a query to stress test the database. Next, you will configure an index to improve the performance of the query. Finally, you will run the stress test query again, and then you will verify that the performance improved.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Ingest IoT Data by Using Azure IoT Hub [Guided]	In this challenge, you will provision an Azure IoT hub, and send data to the IoT hub from a device emulator, and confirm that data has been ingested into the IoT hub. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Initialize a Kubernetes Cluster [Guided]	In this challenge, you will initialize a Kubernetes cluster. First, you will initialize a Kubernetes cluster control plane. Next, you will join worker nodes to the cluster. Finally, you will configure cluster admin privileges, and then you will install a cluster overlay network plug-in.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.Reference HD notebook for all Tab specific information required

Install a Web Server by Using AWS System Manager Run Command [Guided]	In this challenge, you will install Apache on multiple instances at the same time. First, you will create an IAM role for Run Command to use when accessing the server. Next, you will create two running instances, and then you will attach the role to the running instances. Finally, you will install Apache on multiple instances at one time.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Install and Configure Azure AD Connect [Guided]	In this challenge, you will configure synchronization of your Active Directory Domain Services (AD DS) user accounts to a new Azure Active Directory (Azure AD) tenant. First, you will create a new Azure AD tenant. Next, you will configure a global administrator account to use for Azure AD synchronization. Finally, you will install and configure Azure AD Connect.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Install and Configure ESXi [Guided]	In this challenge, you will install vSphere ESXi on a new server and configure the management network for remotes access. First, you will install ESXi, and then you will configure the management network by using the Direct Console User Interface (DCUI). Next, you will connect to the newly installed ESXi host by using a web browser, and then you will assign a license to the host. Finally, you will configure a Network Time Protocol (NTP) server, and then you will enable SSH and join the host to an Active Directory domain.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Install and Manage Windows Admin Center Extensions [Guided]	In this challenge, you will install and manage Windows Admin Center extensions. First, you will install an extension on the Windows Admin Center server, and then you will use Windows PowerShell to install and uninstall a Windows Admin Center extension.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Install Kubernetes Cluster Components [Guided]	In this challenge, you will prepare an orchestrated container environment by installing Kubernetes cluster components. First, you will ensure that the provisioned Linux virtual machines and network environment satisfy the Kubernetes cluster installation requirements. Next, you will install Docker and Kubernetes cluster components. Finally, you will verify the Kubernetes component installation.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Install Roles and Features by Using PowerShell DSC [Guided]	In this challenge, you will use PowerShell to install Roles and Features on Windows Server using PowerShell DSC.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Integrate a Cosmos DB SQL API Database [Guided]	In this challenge, you will write code to access an Azure storage account with a private container, upload files to the account, generate a SAS token for the container, and test private access to the account.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Integrate a Cosmos DB Table API Database [Guided]	In this challenge, you will write code to access a Cosmos DB database from a web app by using the Azure Cosmos DB Table API. First, you will write code to populate an existing database table with sample data. Next, you will write code to retrieve data from the table. Finally, you will test the configuration by using a test page provided with the web app.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Integrate a MySQL Database [Guided]	In this challenge, you will write code to access an Azure Database for MySQL, create a table in a MySQL database, upload data to the database, and retrieve data from the database. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Integrate a SQL Server Database [Guided]	In this challenge, you will write code to access an Azure SQL Database, create a SQL table, upload data to the table, and retrieve data from the table.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Intercept and Obtain Passwords [Guided]	In this Challenge Lab, you will learn how to intercept and obtain passwords. First, you will create user accounts with passwords, and then you will perform a dictionary-based password crack. Next, you will perform a brute force password crack, and then you will perform password guessing. Next, you will configure an account lockout. Finally, you will lock and unlock a user account.Note: Once you begin the Challenge lab, you will not be able to pause, save, or exit and then return to your Challenge lab. Please ensure that you have set aside enough time to complete the Challenge lab before you start.
Lab 0: Setting up a Microsoft 365 Trial Account [PRE-REQ]	In this lab, you will provision an Office 365 trial subscription that you will use for the challenges in the Microsoft 365 Identity and Services challenge series. First, you will sign up for a new Microsoft account, and then you will explore the Office 365 subscription offerings. Next, you will sign up for an Office 365 E5 trial subscription, and then you will deploy an Office 365 tenant. Finally, you will populate the tenant with users and groups for use in subsequent challenges, and then you will configure auditing for your subscription and set up auto-enrollment for Microsoft Intune.
Log Virtual Machine Network Traffic by Using Network Watcher [Guided]	In this challenge, you will monitor virtual machine network traffic by using Network Watcher. First, you will configure Azure to support network security group (NSG) flow logs. Next, you will enable an NSG flow log. Finally, you will download and review an NSG flow log file. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Manage a Collection of Data in C# by Using a Do While Loop [Guided]	In this challenge lab, you will to manage collections of related data. First, you will create a simple C# console application, and then you will create a single-dimensional array to manage string data. Next, you will assign data to the array, and then you will iterate through the array by using a do while loop. Finally, you will create a two-dimensional string array, and then you will iterate through the array by using a do while loop.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage a Collection of Data in C# by Using a For Loop [Guided]	In this challenge lab, you will manage collections of related data. First, you will create a simple C# console application, and then you will create a single-dimensional array to manage string data. Next, you will assign data to the array, and then you will iterate through the array by using a for loop and incrementation. Finally, you will create a two-dimensional string array, and then you will iterate through the array by using a for loop.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage a Collection of Data in C# by Using a Foreach Loop [Guided]	In this challenge lab, you will manage collections of related data. First, you will create a simple C# console application, and then you will create a single-dimensional array to manage string data. Next, you will assign data to the array, and then you will iterate through the array by using the a foreach loop. Finally, you will create a two-dimensional string array, and then you will iterate through the array by using a foreach loop.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Manage a Collection of Data in C# by Using an Array [Guided]	In this challenge lab, you will manage collections of related data. First, you will create a simple C# console application, and then you will create a single-dimensional array to manage string data. Next, you will create a two-dimensional string array. Finally, you will use the properties of an array.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage a vCenter Server Appliance [Guided]	In this challenge, you will configure a VMware vCenter Server Appliance. First, you will create a file-based backup of the vCenter server, and then you will configure the vCenter server to forward logs to a remote syslog server. Next, you will configure the vCenter server to synchronize time settings with a Network Time Protocol (NTP) server, and then you will configure the password expiration settings. Finally, you will enable SSH connectivity to a vCenter server, and then you will test the connection.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage a Windows 10 Environment [Guided]	In this challenge, you will manage a Windows 10 environment. First, you will create and configure a custom Microsoft Management Console (MMC). Next, you will add a remote connection to the MMC. Finally, you will create an MMC that contains a taskpad view, and then you will add tools to the taskpad view.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Access to Azure Storage [Guided]	In this challenge, you will create and work with Azure storage accounts. First, you will create a storage account by using the Azure portal, and then you will create a container that is configured for public access. Next, you will upload a document to the container, and then you will create a storage account and a container by using Windows PowerShell. Finally, you will install Azure Storage Explorer, and then you will use it to upload a document to Azure Storage.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Active Directory Groups [Guided]	In this challenge, you create distribution and security groups and change group type, manage group membership with the GUI, PowerShell and Group Policy, and enumerate group membership with PowerShell. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Active Directory Sites [Guided]	In this challenge, you will implement Active Directory sites and replication, modify the default site, and then they will create an additional site and subnets, configure Active Directory Domain Services (AD DS) replication, move a domain controller to the new site, and monitor AD DS site replication.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Active Directory Users [Guided]	In this challenge, you will create user accounts using both the GUI and bulk import, and delete an existing account, manage inactive and disabled accounts, and automate password resets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage an Azure Event Hub [Guided]	In this challenge, you will create an Event Hubs namespace and then design a stream processing solution. Next, you will create an event hub for event streaming, and then configure security for the event hub.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Manage an Azure VM by Using Cloud Shell [Guided]	In this challenge, you will configure Azure Cloud Shell for use with PowerShell and connect to Azure Virtual Machine, install Windows Web Server, and test the connection to web service. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.Launch

Manage and Optimize Storage [Guided]	In this challenge you will learn how to manage and optimize storage in Windows 10. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Auditing [Guided]	In this challenge lab, you will manage auditing for the IT environment. First, you will review effective permissions. Then, you will define a file system audit policy. Finally, you will configure centralized logging.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage AWS Logs by Using CloudTrail [Guided]	In this challenge, you will manage AWS logs by using CloudTrail. First, you will enable CloudTrail logging. Next, you will generate log entries. Finally, you will examine and download the logs, and then you will review the event history.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Manage Azure Active Directory Users and Groups [Guided]	In this challenge, you will manage Azure Active Directory (Azure AD) users and groups. First, you will create an Azure AD tenant, and then you will create a new user account. Next, you will create a new Azure AD group, and then you will add a user to the group. Finally, you will sign into the Azure portal as the new user, and then you will change the user password.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Azure Resource Deployment by Using an Azure Resource Manager Template [Guided]	In this challenge, you will deploy resources by using Azure Resource Manager (ARM) templates. First, you will export an ARM template by using the Azure portal. Next, you will use a custom template to deploy a virtual machine. Finally, you will display the Azure API by using the Azure Resource Explorer. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Azure Resource Groups [Guided]	In this challenge, you will manage Azure resource groups. First, you will view resources in an Azure resource group. Next, you will create a resource in an Azure resource group. Finally, you will view the management options available on the resource menu pages of an Azure resource.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Branching Logic by Using a Switch-Case Structure in C# [Guided]	In this challenge lab, you will make your applications perform different tasks based on different conditions by using a switch-case structure. First, you will create a simple C# console application, and then you will determine the current year and date by using the C# DateTime object. Next, you will assign variable values by using a switch statement. Finally, you will write a message to the console by using the variable values set in the switch statement.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Certificates by Using Windows Admin Center [Guided]	In this challenge, you will manage computer certificates by using Windows Admin Center. First, you will explore the Certificates tool in Windows Admin Center. Next, you will manage a certificate by using the Certificates tool. Finally, you will display certificate-related events by using the Certificates tool. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Manage Computers by Using Windows Admin Center [Guided]	In this challenge, you will manage multiple computers by using Windows Admin Center. First, you will add multiple computers as managed nodes in Windows Admin Center, and then you will manage computers by using Windows Admin Center tools.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Data Types by Using T-SQL [Guided]	In this challenge lab, you will select and convert data types by using Transact-SQL (T-SQL). First, you will create a table by using appropriate data types, and then you will insert rows into the table by using Data Manipulation Language (DML). Next, you will develop queries that use implicit and explicit data type conversions. Finally, you will format date data types.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Dates and Times in C# [Guided]	In this challenge lab you will learn the techniques used to perform basic operations on dates and times. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Device Compliance [Guided]	In this challenge students will plan and create compliance policy, device compliance, attack surface reduction and security baselines. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Disk Partitions and File Systems [Guided]	In this Challenge Lab you will configure and manage disk partitioning and file systems on local storage devices. First, you will create a volume, format a drive, and assign a drive letter, and then you will configure and use the Recycle Bin. Next, you will manage defragmentation, and then you will perform disk cleanup. Finally, you will perform storage error checking.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Encryption by Using an Azure Key Vault [Guided]	In this challenge, you will secure an Azure storage account by using Azure Key Vault. First, you will create and configure an Azure key vault. Next, you will create a customer-managed encryption key. Finally, you will configure a storage account to use the customer-managed encryption key.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Failover Clustering in a Hyper-V Host Cluster [Guided]	In this challenge, you will configure a Hyper-V host cluster by using two Hyper-V servers by installing Hyper-V on two servers, installing the Failover Clustering feature, configuring a highly available virtual machine, and verifying that the virtual machine is still available after a Hyper-V host failure.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Host Profiles [Guided]	In this challenge, you will manage host profiles to simplify the configuration of your hosts. First, you will create a host profile, and then you will assign the host profile to multiple hosts. Next, you will introduce configuration changes to the host profile, and then you will check the hosts for compliance and remediate them. Finally, you will introduce a configuration change that requires customization for each host, and then you will bring the hosts into compliance with the host profile.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Manage Information Governance [Guided]	In this challenge you will manage information governance. First, you will verify data classification and verify classification labeling. Next, you will verify restoring deleted content. Finally, you will implement records management and verify data retention labels and policies in Microsoft 365.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage IoT Devices with the Azure IoT Hub [Guided]	In this challenge, you will provision an Azure IoT hub, register an emulated device with IoT hub, and test the ability of the IoT hub to communicate with the device. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Kubernetes Pod Scheduling by Using Node Selector and Node Affinity [Guided]	In this challenge, you will manage pod scheduling in a Kubernetes® cluster by using nodeSelector and node affinity rules. First, you will create a Deployment that schedules pods by using the Kubernetes nodeSelector feature. Next, you will schedule a pod by using a required node affinity. Finally, you will schedule a pod by using a preferred node affinity. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Linux User Accounts, Folder Sharing, and Access Control [Guided]	In this challenge lab, you will manage common operations on a Linux virtual machine. First, you will create and manage users on Linux, and then you will manage files and directories on Linux. Next, you will access a Windows® share from a Linux virtual machine, and then you will configure ownership on Linux directories and files. Finally, you will set permissions on Linux directories and files. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Local Accounts by Using Windows PowerShell [Guided]	In this challenge, you will use PowerShell to create and manage local user accounts.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Local Groups [Guided]	In this challenge, you will manage local groups. First, you will create a local group, and then you will manage local group membership. Next, you will configure a new organizational unit to support the use of Group Policy to create a local group. Finally, you will use Group Policy preferences to create a new local group that contains a new user account, and then you will perform a Group Policy update to apply the policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Local User Accounts [Guided]	In this challenge, you will manage local user accounts. First, you will create three local user accounts. Next, you will confirm their successful creation. Finally, you will create a local group, and then you will add a custom wallpaper using local group policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Microsoft 365 Governance and Compliance [Advanced]	In this Challenge Lab, you will learn about managing Microsoft 365® governance and compliance. First, you will configure data classification and classification labeling, and then you will assess compliance and implement records management. Next, you will implement sensitivity labels and policies and verify data loss prevention (DLP) policies. Finally, you will verify eDiscovery.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Network Settings by Using Windows PowerShell [Guided]	In this challenge, you will use PowerShell commands to manage Network Settings.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Manage Numbers in C# [Guided]	In this challenge lab, you will manipulate and manage numerical data in your applications. First, you will create a C# console application. Next, you will add numerical data values, and then you will output strings and numbers by using implicit type conversion. Finally, you will perform mathematical operations on integer and decimal data types by using data type casting, and then you will increment and decrement numerical variables by using C# operators. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Objects in Kubernetes by Using Labels, Selectors, and Annotations [Guided]	In this challenge, you will manage objects in a Kubernetes cluster by using labels, selectors, and annotations. First, you will create a pod, and then you will add a label to a pod. Next, you will display the pods that are running in the cluster by using a filter that is based on the pod labels. Finally, you will identify objects by using a label selector, and then you will annotate a cluster object.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Organizational Units [Guided]	In this challenge, you will create and manage an Active Directory organizational unit (OU) structure. You will create new OUs, move existing accounts to various OUs, and delete unused OUs.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Passwords [Guided]	In this lab challenge, you will configure password expiration policies.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Pod Scheduling in a Kubernetes Cluster by Using Taints and Tolerations [Guided]	In this challenge, you will manage pod scheduling in a Kubernetes cluster by using taints and tolerations. First, you will apply a taint to a node, and then you will create a Deployment. Next, you will review the scheduling of a replica pod and the pod tolerance to a tainted node, and then you will create a Deployment in which replica pods contain a toleration. Finally, you will evict a pod by using a taint, and then you will remove a taint from a node. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Search and Investigation [Guided]	In this challenge students will plan auditing, eDiscovery, insider risk management, and Content Search. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Security Reports and Alerts [Guided]	In this challenge, you will manage security reports and alerts. First, you will use Microsoft Secure Score to assess Office 365 tenant security. Next, you will investigate how to identify and triage incidents. Finally, you will create an alert policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Server Startup Options in Linux [Guided]	In this challenge, you will configure the server to start to the GUI and the CLI, as well as to Rescue mode. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Services in Linux [Guided]	In this challenge, you will manage services in CentOS7 using the systemctl command. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

CYBERSTRONGER CHALLENGE LABS

Manage Shared Access Signature Keys [Guided]	In this challenge, you will allow users to access an Azure storage account by using shared access signature (SAS) keys. First, you will create a storage account, and then you will create a container. Next, you will generate a SAS key, and then you will verify that you can access the container by using the SAS key. Finally, you will create an access policy, and then you will revoke the policy.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Software with RPM and APT in Linux [Guided]	In this challenge, you will manage software in CentOS7 with RPM, and in Ubuntu with APT. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Software with YUM in Linux [Guided]	In this challenge, you will configure a YUM software repository. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Storage in Linux [Guided]	In this challenge, you will manage the partition structure on the CentOS7 installation. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Strings in C# [Guided]	In this challenge lab, you will manipulate and manage data in words and phrases. First, you will create a C# console application. Next, you will create string data by using the newline and tab characters, and then you will create strings that contain special characters and Unicode characters. Finally, you will concatenate strings, and then you will combine multiple values into a single string by using an interpolation expression. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage System Configuration Settings [Guided]	In this Challenge Lab, you will manage system configuration settings. First, you will perform a system reset, and then you will manage device drivers. Next, you will configure region settings, and then you will evaluate hardware compatibility and prerequisites for an operating system update. Finally, you will determine application requirements, and then you will check on the progress of the Windows reset.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Tags and Storage Policies [Guided]	In this challenge, you will manage datastores by using tags and storage policies. First, you will create categories and tags, and then you will assign them to virtual machines. Next, you will assign tags to datastores, and then you will create a storage policy to manage the placement of your virtual machines. Finally, you will ensure that your virtual machine storage complies with your storage policy.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Manage the Flow of Execution by Using Loops in Python [Guided]	In this challenge lab, you will manage the flow of execution in your code by using looping structures. First, you will iterate over a range by using a for loop, and then you will define an if statement in a for loop. Next, you will stop the iteration of a for loop by using a break statement, and then you will manage the output of the for loop by using an else clause. Finally, you will add a return statement to a function, and then you will control the flow in a for loop by using a continue statement. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Users and Groups [Guided]	In this challenge, you will create Office 365 users and security groups. You will also assign licenses.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Manage Users and Groups by Using Windows PowerShell [Guided]	In this challenge, you will manage Office 365 users and groups using Windows PowerShell.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Users and Groups in Linux [Guided]	In this challenge, you will manage user accounts and group memberships. First, you will create local user accounts, and then you will modify the account settings. Next, you will create local groups, and then you will modify the group settings. Finally, you will add members to groups, and then you will remove members from the groups.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Users and Groups in Windows [Guided]	In this challenge, you will use both Windows PowerShell and the Local Users and Groups tool to manage user and group accounts. First, you will create, modify, and delete local user accounts by using Windows PowerShell. Next, you will create, modify, and delete local groups by using Windows PowerShell. Finally, you will manage local user accounts and groups by using Local Users and Groups in the Computer Management Microsoft Management Console (MMC) tool.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Users and Roles [Guided]	In this Challenge Lab, you will configure access control for multiple administrators. First, you will create groups in Active Directory (AD), and then you will add users to the new groups. Next, you will add Active Directory as an identity source in the NSX manager. Finally, you will assign user groups to the pre-defined roles available in NSX, and then you will test the various permissions.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Manage Users, Groups, and Devices in Active Directory Domain Services [Guided]	In this challenge, you will join a computer to a domain. First, you will verify that a computer object for the computer exists in an Active Directory domain, and then you will join the computer to the domain. Next, you will create an Active Directory group that contains a new user account and a computer account. Finally, you will sign in to the domain-joined computer by using an Active Directory user account.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Virtual Machine Resources [Guided]	In this challenge, you will manage virtual machine resources. First, you will configure CPU Scheduling Affinity to cause contention for CPU resources between multiple virtual machines, and then you will evaluate the CPU performance of the virtual machines. Next, you will adjust the CPU shares to prioritize one virtual machine over another. Finally, you will manage access to the CPU resources by using resource pools instead of configuring each virtual machine individually.Note: Once you begin the challenge, you will not be able to pause, save, or return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Manage Virtual Machine Snapshots [Guided]	In this challenge, you will manage virtual machine snapshots in your vSphere environment. First, you will create a snapshot of a running virtual machine that includes the virtual machine's memory, and then you will create a snapshot of a running virtual machine that does not include the virtual machine's memory. Next, you will modify the hardware on a virtual machine by using a snapshot. Finally, you will manage multiple snapshots on a single virtual machine, and then you will delete a snapshot. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Manage vSphere by Using Command-Line Tools [Guided]	In this challenge, you will manage and monitor a vCenter Server environment by using command-line tools. First, you will monitor CPU, memory, disk, and network utilization by using the esxtop utility. Next, you will manage a vCenter server by using VMware vSphere PowerCLI cmdlets. Finally, you will create a log bundle.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage vSphere Security [Guided]	In this challenge, you will manage vSphere security. First, you will configure VMware vCenter Server to communicate with a Key Management Server (KMS), and then you will generate a request for a new SSL certificate for the vCenter server. Next, you will submit the request to a certificate authority (CA), and then you will save the newly generated certificate. Finally, you will replace the self-signed certificate in vCenter Server with the new SSL certificate, and then you will encrypt a virtual machine.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Windows 10 Performance [Guided]	In this challenge, you will view performance data on your computer. First, you will display resources being used by a computer by using Resource Monitor. Next, you will enable the default System Performance Data Collector Set by using Performance Monitor, and then you will create a custom Data Collector Set. Finally, you will use Reliability Monitor to display reliability history data for a computer.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manage Windows Server 2019 on an Azure Virtual Machine by using Azure Policy Guest Configuration [Guided]	In this challenge, you will manage Windows Server 2019 on Azure virtual machines by using Azure Policy Guest Configuration. First, you will enable the system assigned managed identity on existing Azure virtual machines, and then you will add a user to the local Administrators group on one virtual machine. Next, you will enable the Guest Configuration Azure resource provider, and then you will assign Guest Configuration policy definitions. Finally, you will trigger an on-demand compliance scan, and then you will display the results.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Windows Server 2019 on an Azure Virtual Machine by Using PowerShell Remoting [Guided]	In this challenge, you will manage Windows Server 2019 in an Azure virtual machine by using PowerShell remoting. First, you will verify the existence of a new inbound port rule assigned to the virtual machine. Next, you will configure PowerShell remoting on the virtual machine. Finally, you will use PowerShell remoting to display a filtered list of services running on the virtual machine.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Windows Server 2019 on an Azure Virtual Machine by Using Run Command [Guided]	In this challenge, you will run PowerShell scripts in an Azure virtual machine by using the Run Command feature. First, you will display the IP configuration for the virtual machine, and then you will disable and re-enable Windows Updates. Next, you will restore the default RDP Authentication mode settings, and then you will enable PowerShell remoting. Finally, you will disable Network Level Authentication, and then you will run a command to display a list of services on the virtual machine.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Manage Windows Server 2019 on an Azure Virtual Machine by Using the Serial Console [Guided]	In this challenge, you will manage a Windows Server 2019 Azure virtual machine by using a serial console connection. First, you will create an Azure storage account. Next, you will configure boot diagnostics on the Azure virtual machine by using the new storage account. Finally, you will configure the operating system boot options in the virtual machine by using the Azure Serial Console.Note: Once you begin the challenge lab, you will not be able to pause, save, or return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manage Windows Updates [Guided]	In this challenge, you will configure Windows Update options. First, you will review installed updates, and then you will uninstall an update. Next, you will install Windows Server Update Services. Finally, you will create a new Group Policy Object (GPO), and then you will edit the GPO to configure automatic updates. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Managing Log Files on a Windows Server [Guided]	In this challenge, you will view and manage log files by using Event Viewer in Windows.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Manipulate Strings in Python [Guided]	In this challenge lab, you will You are a Python developer. You need to manipulate strings. First, you will concatenate strings to form a sentence, and then you will trim strings by using string methods. Next, you will split and join strings, and then you will format strings. Finally, you will change the capitalization of strings by using string methods.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Manually Request a PKI Certificate [Guided]	In this challenge, you will use the CertMgr MMC tool to request a computer certificate; then, you will export the certificate and private key for backup purposes.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Microsoft 365 Mobility and Security [Expert]	In this Challenge Lab, you will demonstrate your ability to manage Microsoft 365® Mobility and Security. First, you will verify access to resources by using Conditional Access policies and compliance policies, and then you will verify app deployment and device enrollment. Next, you will verify incident investigation with Cloud App Security, and then you will assess compliance. Finally, you will implement records management, verify data loss prevention (DLP) policies, and then you will verify eDiscovery.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Migrate a Load Balanced Application by Using a Blue/Green and Canary Deployment Strategy [Guided]	In this challenge lab, you will migrate an app by using a blue/green and canary strategy. First, configure and test a blue app environment that uses two Amazon Elastic Cloud (Amazon EC2) instances, and then you will configure a parallel green app environment that uses two EC2 instances. Next, perform canary testing by using an Application Load Balancer, and then you will migrate fifty percent of the traffic to the green version. Finally, direct all traffic to the green EC2 instances and decommission the blue EC2 instances by using a CloudFormation change set.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Migrate a VMware Virtual Machine [Guided]	In this challenge, you will migrate virtual machines. First, you will create a VMkernel port that is enabled for vSphere vMotion on each host, and then you will perform a cold migration of a virtual machine. Next, you will perform a vMotion migration, and then you will perform a storage vMotion migration. Finally, you will perform a shared-nothing vMotion migration, and then you will perform a cross vCenter Server export migration.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Migrate an Azure Virtual Machine by Using a Recovery Services Vault [Guided]	In this challenge, you will migrate an Azure virtual machine between two separate regions. First, you will create a Recovery Services vault. Next, you will create security rules that use service tags to allow access to specific Azure services. Finally, you will migrate a virtual machine to the Recovery Services vault, and then you will monitor the migration process.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Modify a Virtual Machine [Guided]	In this challenge, you will modify virtual machines in your vSphere environment. First, you will increase the size of the hard disk on a virtual machine, and then you will mount an existing hard disk on a virtual machine. Next, you will modify the hardware on a virtual machine, and then you will mount a raw device mapping (RDM) disk. Finally, you will add an additional network adapter to a virtual machine. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Modify Data by Using T-SQL [Guided]	In this challenge lab, you will modify data by using Transact-SQL (T-SQL). First, you will insert data into a table by using Data Manipulation Language (DML). Next, you will update data in a table, and then you will delete data from a table. Finally, you will merge data from a source table into a target table.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Modify Display Filter Functionality [Guided]	In this Challenge Lab, you will modify Wireshark display features. First, you will install Wireshark. Next, you will perform a traffic capture, and then you will work with display columns. Finally, you will use the Wireshark conversations, name resolution, and coloring rules features. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Monitor a Server by Using Windows Server Monitoring Tools [Guided]	In this challenge, you will monitor server performance and stability. First, you will display performance data by using Task Manager, display performance information by using Resource Monitor, and display and archive server stability information by using Reliability Monitor.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Monitor an Apache Spark Job in Synapse Studio [Guided]	In this challenge, you will monitor an Apache Spark job in Synapse Studio. First, you will create an Apache Spark pool in a Synapse Analytics workspace, and then you will design a stream processing solution. Next, you will create an Apache Spark job in Synapse Studio, and then you will publish the job. Finally, you will troubleshoot a failed Apache Spark job, and then you will monitor the Apache Spark job.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Monitor an Azure Virtual Machine [Guided]	In this challenge, you will create an Azure virtual machine that you will use to verify your monitoring strategy. First, you will create a virtual machine that has boot diagnostics enabled. Next, you will monitor the startup metrics by using boot diagnostics, and then you will monitor selected metrics on the virtual machine. Finally, you will perform guest-level monitoring, and then you will create an alert rule.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Monitor and Resolve Security Issues by Using Security Center [Guided]	In this challenge, you will review and resolve issues in Security Center for a virtual machine. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Monitor Applications by Using CloudWatch [Guided]	In this challenge lab, you will monitor applications by using an Amazon CloudWatch dashboard. First, you will connect to the web servers that are running behind a load balancer. Next, you will create a CloudWatch metric filter for 404 errors on each web server, and then you will create a custom CloudWatch dashboard to display the memory, CPU, and load balancer metrics. Finally, you will test the dashboard by simulating activity.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Monitor Azure Storage [Guided]	In this challenge, you will implement and manage Azure Storage. First, you will configure diagnostic settings for a storage account. Next, you will configure metrics charts for a storage account. Finally, you will create an alert for a storage account.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Monitor Communication Between Virtual Machines by Using Network Watcher [Guided]	In this challenge, you will monitor communication between two virtual machines. First, you will verify that the Network Watcher Agent extension for Windows is installed on the virtual machines. Next, you will verify that Network Watcher is enabled in the same region as the virtual network that is used by the virtual machines. Finally, you will create a connection monitor.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Monitor Data in an Azure Data Factory Pipeline[Guided]	In this challenge, you will monitor a new Azure data factory that supports a data pipeline. First, you will create a storage account to store diagnostic settings, and then you will design a monitoring solution for data storage and data processing. Next, you will deploy an Azure data factory, and then you will create a data pipeline. Finally, you will publish and monitor the data pipeline.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Monitor Network Traffic by Using Wireshark [Guided]	In this Challenge Lab, you will use Wireshark to examine network communications. First, you will learn to use the basic features of Wireshark, and then you will explore the use of display filters. Next, you will follow a TCP stream and an HTTP stream, and then you will use capture filters. Finally, you will explore the headers of captured network traffic.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Monitor Stream Events by Using Event Hub [Guided]	In this challenge, you will monitor an event hub that supports event streaming. First, you will create a storage account for storing diagnostics, and then you will design a monitoring solution for stream processing. Next, you will create an event hub for event streaming, and then you will configure an event grid subscription. Finally, you will monitor stream events for the event hub. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Monitor Windows Server 2016 by Using Windows PowerShell [Guided]	In this challenge, you will gather information and monitor Windows Server 2016 by using PowerShell. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Monitor Windows Server 2019 [Guided]	In this challenge, you will monitor Windows Server 2019. First, you will monitor applications and services by using Task Manager, and then you will display resource information by using Resource Monitor. Next, you will manage system stability information by using Reliability Monitor. Finally, you will monitor server performance by using Performance Monitor.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Obtain Root Credentials in Linux [Guided]	In this challenge, you will add a user to sudoers and perform administrative tasks. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Organize Kubernetes Cluster Resources by Using Namespaces [Guided]	In this challenge, you will organize resources in a Kubernetes cluster by using namespaces. First, you will create a namespace, and then you will create resources in a namespace. Next, you will change a namespace context, and then you will determine which cluster resources have been deployed in a namespace. Finally, you will delete a namespace.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform a Backup and Restore [Guided]	In this Challenge Lab, you will protect files with backup options to allow for restoration. First, you will prepare for backup operations, and then you will configure Windows File History and perform a backup. Next, you will delete a file and restore it from backup, and then you will enable Volume Shadow Copy Service. Finally, you will use a system restore point to recover a lost file.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform a Clean Installation of Windows 10 [Guided]	In this challenge, you will install Windows 10 on a new computer. First, you will install Windows 10 by using a new partition on the main disk drive. Next, you will set up Windows 10, and then you will create a new user profile. Finally, you will verify the configuration of the new disk.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Perform a Database Consistency Check by Using DBCC [Guided]	In this challenge, you will ensure data integrity in an Azure SQL database solution by performing database consistency checks. First, you will access an Azure SQL database by using the Azure portal. Next, you will update the Azure SQL database by using SQL Server in an Azure virtual machine, and then you will check the data integrity of the Azure SQL database by using Database Console Command (DBCC) statements. Finally, you will initiate a point-in-time restore of the Azure SQL database.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform an Attacker-in-the-Middle (AitM) Exploitation [Guided]	In this Challenge Lab, you will perform an Attacker in the Middle (AitM) exploitation. First, you will configure Burp Suite for AitM, and then you will perform an initial AitM-related compromise of the target client. Next, you will use AitM to intercept and manipulate client plaintext requests, and then you will compromise a client with a false certificate authority. Finally, you will perform an AitM interception and modification of TLS encrypted HTTPS sessions.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.

Lab	Description
Perform an Effective Capture [Guided]	In this Challenge Lab, you will perform Wireshark tasks related to packet capture, including capture filters. First, you will install Wireshark. Next, you will capture and save network traffic. Finally, you will use, define, and edit capture filters. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Perform an In-Place Upgrade to Windows 10 [Guided]	In this challenge, you will perform an in-place upgrade from Windows 8 to Windows 10. First, you will create new local files for testing. Next, you will upgrade the operating system from Windows 8 to Windows 10. Finally, you will verify that the local files were transferred as part of the to the upgrade.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Perform an Offline Defragmentation of the Active Directory Database [Guided]	In this challenge, you will perform offline defragmentation of the Active Directory database by stopping Active Directory Domain Services service, compacting the database, and restarting the Active Directory Domain Services service.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Application Source Code Verification [Guided]	In this challenge lab, you will learn how to download open-source code, verify the download, compile the application, and execute the compiled tool.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Automatic Remediation by Using an AWS Config Rule [Guided]	In this challenge, you will configure an AWS Config rule to ensure that public access to Amazon Simple Storage Service (Amazon S3) buckets is automatically disabled. First, you will create an Amazon Identity and Access Management (IAM) role for automation, and then you will create an S3 bucket that is noncompliant. Next, you will create an AWS Config rule to automatically remediate any noncompliant S3 buckets. Finally, you will test the AWS Config rule.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Perform Conditional Decision Making in a Linux Shell Script [Guided]	In this challenge, you will create a shell script file search utility that can be executed from any location. First, you will create a shell script that will perform decision making by using a conditional statement. Next, you will make the script executable from any location. Finally, you will create a symbolic link.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Discovery Scanning and Network Reconnaissance [Guided]	In this challenge lab, you will perform discovery scanning and network reconnaissance. First, you will discover local network configuration details. Next, you will use nmap to discover other computers, identify open ports, determine operating systems, and discover active services. Finally, you will perform service discovery and banner grabbing. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Perform DOS Attacks [Guided]	In this Challenge Lab, you will to perform DOS attacks. First, you will execute a DOS using Metasploit. Next, you will perform a DOS attack using nmap. Finally, you will launch a DOS using hping3. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Email Header Analysis [Guided]	

Perform File Recovery [Guided]	In this challenge, you will perform a file recovery. First, you will create folders on a server computer, and then you will configure sharing options. Next, you will run file history, and then you will configure a backup. Finally, you will restore a file by using the previous version tab in the file's properties, and then you will restore a file by using File History.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Forensic Analysis on a Suspect's System [Guided]	In this Challenge Lab, you will download and extract a forensic image test file. Next, you will use Autopsy® to create a case file and import a forensic image. Finally, you will locate, recover, analyze, and display numerous graphics files from the forensic image.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Forensic Analysis on a Suspect's System [Guided]	In this Challenge Lab, you will download and extract a forensic image test file. Next, you will use Autopsy® to create a case file and import a forensic image. Finally, you will locate, recover, analyze, and display numerous graphics files from the forensic image.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Lateral Movement [Guided]	In this Challenge Lab, you will learn about the attacker tactic known as lateral movement and how attackers might perform a lateral movement operation against a network. First, you will gain remote control access over a network boundary server to inject meterpreter, and then you will use meterpreter to set up a routing function to redirect additional attack functions to a private network. Next, you will perform network reconnaissance to locate an internal target supporting a telnet service. Finally, you will gain access to the internal system through a telnet shell.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Perform Linux Command-Line Operations by Using Boolean and Arithmetic Operators [Guided]	In this challenge, you will evaluate variables by using Linux shell operators. First, you will perform logical operations by using Boolean operators, and then you will perform arithmetic operations by using arithmetic operators.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Linux Command-Line Operations by Using File Test and Relational Operators [Guided]	In this challenge, you will evaluate file attributes and perform variable comparisons by using Linux shell operators. First, you will determine file attributes by using file test operators, and then you will perform variable comparisons by using relational operators.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Network Analysis [Guided]	In this Challenge Lab, you will learn how to evaluate network speeds and discover information about systems within a network. First, you will perform Internet speed tests. Next, you will perform a local network speed test. Finally, you will use the nmap command to discover other computers, identify open ports, determine operating systems, and discover active services.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Perform Network Troubleshooting [Guided]	In this challenge lab, you will troubleshoot various network communication issues. First, you will troubleshoot networking by using Event Viewer, and then you will troubleshoot networking by using Windows Network Diagnostics. Next, you will troubleshoot networking by using ping. Finally, you will identify processes with network connectivity and the remote IP addresses accessed by using Resource Monitor. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Perform Open Source Intelligence [Guided]	In this Challenge Lab, you will perform open-source intelligence (OSINT)-gathering operations. First, you will perform Google dorking, and then you will perform OSINT gathering by using netcraft.com. Next, you will perform a background search on a person, and then you will gather OSINT by using the recon-ng tool. Finally, you will perform OSINT gathering by using the OSRFramework, and then you will explore the OSINT Framework.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Perform Open Source Intelligence [Guided]	In this Challenge Lab, you will perform open source intelligence (OSINT) gathering operations. First, you will perform Google Dorking, and then you will perform OSINT using netcraft.com. Next, you will perform a background search on a person, and then you will gather OSINT using the recon-ng tool. Finally, you will perform OSINT gathering using the OSRFramework, and then you will explore the OSINT Framework.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Perform Password Cracking [Guided]	In this challenge, you will evaluate the risk of password cracking to your IT environment. First, you will create user accounts with passwords, and then you will perform a dictionary-based password crack. Next, you will perform a brute force password crack, and then you will perform password guessing. Finally, you will configure account lockout, and then you will lock and unlock a user account. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Perform Vulnerability Scanning [Guided]	In this challenge lab, you will perform vulnerability scanning by using Greenbone Security Assistant (GSA). First, you will perform an uncredentialed vulnerability scan, and then you will perform a credentialed vulnerability scan. Next, you will explore GSA vulnerability scan Results, and then you will schedule a GSA vulnerability scan. Finally, you will export a GSA scan report to a PDF file.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Perform Vulnerability Scans [Guided]	In this Challenge Lab, you will perform vulnerability discovery. First, you will perform an uncredentialed vulnerability scan, and then you will perform a credentialed vulnerability scan. Next, you will explore GSA Vulnerability Scan Results, and then you will schedule a GSA vulnerability scan. Finally, you will export a GSA scan report.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Perform Web Server Vulnerability Scans [Guided]	In this Challenge Lab, you will discover weaknesses and exploitable elements in web servers, websites, and applications. First, you will scan for vulnerabilities in web services by using Nikto. Next, you will scan for vulnerabilities in web services by using Nmap, Wapiti, SSL Labs, and a cloud-based scanner. Finally, you will scan for vulnerabilities in web services by using Legion. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Plan and implement data loss prevention (DLP) [Guided]	In this challenge students will plan for DLP, configure DLP policies and monitor DLP.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Plan and Implement Threat Protection with Microsoft Defender [Guided]	In this challenge, you will plan and implement threat protection by using Microsoft Defender. First, you will set up Microsoft Defender for Endpoint. Next, you will configure Microsoft Defender for Office 365® policies. Finally, you will implement Microsoft Defender for Identity.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Plan Device Management [Guided]	In this challenge, you need to create a configuration profile for Microsoft Intune® enrolled devices. First, you will verify the group that you will assign a configuration profile, and then you will configure Intune auto-enrollment in Azure® Active Directory (Azure AD). Next, you will join your device to Azure AD, and then verify it is enrolled in Intune. Finally, you will create a configuration profile, and then you will verify the profile is assigned to your device.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Plan for Compliance Requirements [Guided]	In this challenge students will plan compliance solutions and industry requirements and assess compliance. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Plan Microsoft Cloud App Security [Guided]	In this challenge you will plan and implement Cloud App Security to manage access to cloud apps with application connectors, configure Cloud App Security policies, review and respond to Cloud App Security alerts and monitor for unauthorized cloud applications.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Plan Windows 10 deployment [Guided]	In this challenge, you will plan Windows® 10 deployments. First, you will investigate Desktop Analytics and use it to create a deployment plan. Next, you will deploy a Windows 10 Enterprise E5 license by using Windows 10 Enterprise Subscription Activation and Azure® Active Directory (Azure AD). Finally, you will create an Update Ring Profile and a Feature Update Profile to specify how and when your Windows 10 devices receive updates. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Prepare the NSX infrastructure [Guided]	In this Challenge Lab, you will prepare the infrastructure to begin using NSX in your environment. First, you will create transport zones for overlay and VLANs. Next, you will create an IP address pool to distribute addresses to the transport nodes and other NSX components. Finally, you will add a vSphere host cluster and two KVM hosts as transport nodes.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Prepare Windows Server 2016 Deployments by Using MDT [Guided]	In this challenge, you will automate and standardize the deployment process. First, you will configure a deployment share by using the Microsoft Deployment Toolkit (MDT). Next, you will import an operating system, and then you will import an application to deploy. Finally, you will create a new task sequence to manage the deployment process.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Pre-stage Cluster Computer Objects in Active Directory Domain Services on Windows Server 2019 [Guided]	In this challenge, you will prestage cluster computer objects in Active Directory Domain Services (AD DS). First, you will prestage a cluster name object in AD DS. Next, you will create a group, and then you will grant permissions to the group to allow its members to create a cluster. Finally, you will grant permissions to allow a cluster to automatically create virtual computer objects in an organizational unit.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Process IoT Data with Azure Stream Analytics [Guided]	In this challenge, you will provision an Azure Stream Analytics instance, configure Stream Analytics to process messages coming into an Azure IoT hub, and define endpoints to route messages.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Protect an Azure Virtual Machine That Runs Windows Server 2019 by Using Azure Security Groups [Guided]	In this challenge, you will protect Azure virtual machines that run Windows Server 2019 by using Azure security groups. First, you will create an application security group, and then you will create a network security group that you will associate to a subnet. Next, you will create security rules, and then you will create virtual machines that run Windows Server 2019. Finally, you will associate the virtual machine network interfaces to application security groups, and then you will test the security rules associated to the application security groups.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Protect Azure Virtual Machines That Run Windows Server 2019 by Using Just-In-Time Access [Guided]	In this challenge, you will implement just-in-time (JIT) virtual machine access. First, you will enable Azure Defender. Next, you will enable JIT virtual machine access, request access to the virtual machines, and then open remote desktop connections to the virtual machines. Finally, you will audit JIT virtual machine access activity.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Protect Virtual Machines by Using Azure Site Recovery [Guided]	This challenge lab is currently in development. Details will be published soon.
Provision a Container-Based Web App [Guided]	In this challenge, you will provision an Azure Web App that hosts a containerized web application. You will configure the web app and test it. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision a Function App [Guided]	In this challenge, you will provision an Azure Function App. The Function App will be triggered by a Storage Account Blob Container and it will add a message to a Queue. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision a Logic App [Guided]	In this lab, you will configure an Azure infrastructure. First, you will deploy highly available virtual machines that use availability sets, and then you will deploy a scalable virtual machine infrastructure with virtual machines that use scale sets. Next, you will configure scale rules for scale sets, and then you will configure real-time metric alerts. Finally, you will configure virtual machines by using a custom script extension, a PowerShell (DSC) extension, and an (ARM) template, and then you will use a managed disk to create a snapshot and a virtual machine.Note: Once you begin your lab, you will not be able to pause, save, or return to your lab. Please ensure you have set aside enough time to complete the lab before you start.
Provision an Azure Cognitive Search Service [Guided]	In this challenge, you will configure an Azure Cognitive Search service. First, you will create a Cognitive Search service instance. Next, you will index a Cosmos DB database. Finally, you will test the search service by using a web app test page.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision an Azure Container Instance [Guided]	In this challenge, you will provision an Azure Container Instance which will host a container with a custom service. You will test the service with a python script and monitor the containers performance.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision an Azure Container Registry [Guided]	In this challenge, you will provision an Azure Container Registry. You will load two images into the registry. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision an Azure Cosmos DB [Guided]	In this challenge, you will provision a Cosmos DB with the Table API, configure a web app to connect to and populate the table, and run queries against the database. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Provision an Azure Cosmos DB Account [Guided]	You are a database administrator. You need to provision a new Azure Cosmos DB account that has restricted access. First, you will deploy an Azure Cosmos DB account. Next, you will create a container in a new database, and then you will add items to the container. Finally, you will restrict access by using role-based access control (RBAC), and then you will test the configuration. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision an Azure Database for MySQL Database [Guided]	In this challenge, you will provision an Azure MySQL Database and populate it with data using the Azure Cloud Shell. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision an Azure SQL Server Database [Guided]	In this challenge, you will provision an Azure SQL Database, an Azure storage account, and import a SQL Server database from an export file.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision an Azure Storage Queue [Guided]	In this challenge, you will provision an Azure Storage Queue. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision an Azure Storage Table [Guided]	In this challenge, you will provision an Azure Storage Table. The table will hold data for a custom application. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision an Azure Virtual Machine That Hosts SQL Server [Guided]	In this challenge, you will deploy an Azure virtual machine that hosts Microsoft SQL Server. First, you will create an Azure virtual machine that hosts SQL Server. Next, you will add a data disk to the virtual machine. Finally, you will create a database by using the new data disk.Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Provision an Office 365 E5 Trial Subscription (Setup Lab)	This setup lab is a prerequisite for the Microsoft 365: Identity and Services Challenge Series and only to be completed once. You will use the credentials and the tenant domain you create in this lab for all challenges within this series.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Provision and Maintain AWS Resources by Using CloudFormation [Guided]	In this challenge, you will provision and maintain AWS resources by using AWS CloudFormation. First, you will download a CloudFormation template, and then you will deploy a stack based on the template. Next, you will create a CloudFormation change set, and then you will execute the change set to create an Amazon Simple Storage Service (Amazon S3) bucket and an Amazon Elastic Cloud Compute (Amazon EC2) instance. Finally, you will detect changes to the EC2 instance by using CloudFormation drift detection, and then you will delete the CloudFormation stack.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Provision Azure Data Factory [Guided]	In this challenge, you will provision a new Azure data factory instance that supports a data pipeline. First, you will deploy an Azure data factory. Next, you will create an Azure SQL database that will hold the data output from a pipeline, and then you will author a copy data activity in a data pipeline. Finally, you will test the data pipeline.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Provision Web Apps [Guided]	In this challenge, you will provision Azure web apps via the Azure Portal, Azure PowerShell, and an ARM template. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Query Data from a Single Table in MySQL [Guided]	n this challenge you will write several MySQL queries for a database table. First, you will launch MySQL Workbench, and then you will develop a query that returns data from a table. Next, you will develop more specific queries that will use column names and calculations. Finally, you will explore queries that use column aliases and distinct values.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Query Data from a Single Table in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries for a database table. First, you will launch Microsoft SQL Server Management Studio, and then you will develop a query that returns data from a table. Next, you will develop more specific queries which will use column names and calculations. Finally, you will explore queries that use column aliases and distinct values.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Querying Multiple Tables Using Inner Joins in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries to join data from multiple tables. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will develop a query that joins two tables. Next, you will develop more specific queries that include joining tables by using table aliases. Finally, you will explore queries that join more than two tables.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Querying Multiple Tables Using Joins in MySQL [Guided]	In this challenge you will write several MySQL® queries to join data from multiple tables. First, you will develop a query that joins two tables. Next, you will develop more specific queries that include joining tables by using table aliases. Finally, you will explore queries that join more than two tables.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Querying Multiple Tables Using Outer Join Types in MySQL [Guided]	In this challenge you write several MySQL queries to join data from multiple tables by using outer joins. First, you will launch MySQL Workbench, and then you will compare inner and outer joins. Next, you will develop more specific queries that include joining tables by using multiple outer joins. Finally, you will explore queries that join tables using multiple join types.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Querying Multiple Tables Using Outer Joins in Transact-SQL [Guided]	In this challenge lab, your will write several Transact-SQL queries to join data from multiple tables by using outer joins. First, you will launch Microsoft® SQL Server® Management Studio (SSMS), and then you will compare inner and outer joins. Next, you will develop more specific queries that include joining tables by using multiple outer joins. Finally, you will explore queries that join tables using multiple join typeNote: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start
Read and Write to a File in Java [Guided]	In this challenge lab, you will create a class that will read and write files. First, you will create a method that reads a file by using the Scanner class, and then you will use the method to return a string that represents the entire file. Next, you will write the string to the file by using the BufferedWriter class, and then you will create a test class. Finally, you will verify that the methods return the expected results.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Recover Windows 10 [Guided]	In this challenge, you will recover a Windows 10 system. First, you will roll back feature updates, and then you will roll back quality updates. Next, you will use Startup Repair in Windows Recovery Environment to enable safe mode. Finally, you will simulate a boot failure by deleting Windows Boot Manager (bootmgr), and then you will rebuild bootmgr.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Recreate Data Content [Guided]	In this Challenge Lab, you will manipulate a Wireshark capture so that the content may be exported. First, you will install Wireshark. Next, you will extract files from web traffic. Finally, you will extract files from Windows SMB share traffic.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Recreate Data Flows [Guided]	In this Challenge Lab, you will manage a Wireshark capture so that the data flow may be recreated and examined. First, you will install Wireshark, and then you will perform a network traffic capture. Next, you will examine the capture by following a TCP stream, and then you will follow an HTTP stream. Finally, you will examine data flow of captured traffic by using various Wireshark statistics tools, including Protocol Hierarchy, Packet Lengths, I/O Graphs, DNS statistics, and Flow Graph.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Remotely Administer Servers by Using Windows GUI Tools [Guided]	In this challenge, you will use Server Manager to view and configure remote machines.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Remotely Administer Servers by Using Windows PowerShell [Guided]	In this challenge, you will manage remote servers by using Windows PowerShell by executing noninteractive PowerShell commands that will run on a remote virtual machine, establishing a remote connection to a virtual machine, and executing PowerShell commands on the remote virtual machine by using the remote session.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Remove a User Account [Guided]	In this challenge, you will remove a user account from a system. First, you will disable the user account, copy the user's file to a secure location, and then remove the user's account from the system.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Reset the Root Password in Linux [Guided]	In this challenge, you will reset an unknown root password.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Restore Objects in Active Directory [Guided]	In this challenge, you will restore Active Directory (AD) objects that have been accidentally deleted by enabling the Active Directory Recycle Bin, deleting objects, using the Active Directory Recycle Bin to restore objects to the AD database, and deleting an Organizational Unit, and then restore the deleted OU from a previous backup.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Retrieve Data by Using a View [Guided]	In this challenge lab, you will create and retrieve data from views by using Transact-SQL (T-SQL). First, you will create a view by using Data Definition Language (DDL), and then you will grant permission for a test user to access the view. Next, you will impersonate the test user to verify security. Finally, you will create a view by using a complex schema, and then you will create a simplified query by using the view.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Retrieve Kubernetes Core Component Information by Using kubectl [Guided]	In this challenge, you will retrieve information about the components of a Kubernetes cluster. First, you will retrieve cluster information. Next, you will determine the nodes and pods running in the cluster. Finally, you will retrieve information about the cluster control plane and cluster node components. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Run a Network Scan by Using Nmap [Guided]	In this challenge, you will scan network hosts for open ports and OS information using nmap.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Run Background Jobs in Windows PowerShell [Guided]	In this challenge, you will use PowerShell to run background jobs. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Run Commands by Using Azure Cloud Shell [Guided]	In this challenge, you will run Azure PowerShell cmdlets and command-line interface (CLI) 2.0 commands. First, you will configure Azure Cloud Shell for first-time use. Next, you will use PowerShell cmdlets to create a virtual network. Finally, you will use CLI 2.0 commands to create a virtual network. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Schedule Tasks [Guided]	In this challenge, you will schedule tasks. First, you will create a task, and then you will configure a trigger and an action for the task. Next, you will create a basic task. Finally, you will display the properties of a basic task in preparation for editing, and then you will delete the task.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Schedule Tasks Using Windows PowerShell [Guided]	In this challenge, you will use PowerShell to create scheduled tasks. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Search for Data by Using Grep [Guided]	In this challenge, you will learn to select specific lines from files or output.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Search for Files by Using Wildcards [Guided]	In this challenge, you will use File Name Generators To Select specific Files.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Search Linux Manpages by Using the Command Line [Guided]	In this challenge, you will use the command line tools of grep and man with the correct options and arguments to find the command line corresponding to an objective.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Secure a Storage Account [Guided]	In this challenge you will secure a storage account. You will set up a Service Endpoint, configure firewall rules, restrict traffic to HTTPS, and generate a Shared Access Signature to provide limited access to the storage account for a Web App.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Secure Azure SQL Server [Guided]	In this challenge, you will secure a storage account. You will set up a Service Endpoint, configure firewall rules, restrict traffic to HTTPS, and generate a Shared Access Signature to provide limited access to the storage account for a Web App.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Set an Azure Alert for a Web App [Guided]	In this challenge, you will set up an Azure Alert for an Azure Web App. You will then create an action group and target web app alerts to the group.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Setup and Interact with the Bot Framework [Guided]	This course is in development. Details coming soon.
Simplify Linux Administration Tasks by Using Xargs [Guided]	In this challenge, you will organize files and directories on a Linux server. First, you will create multiple files by using the xargs command. Next, you will use xargs to create new files based on file names that are contained in a database file. Finally, you will move multiple files in a directory by using xargs, and then you will delete the files.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Sort and Limit Query Results in MySQL [Guided]	In this challenge, you will write several MySQL queries by using sorting and limiting. First, you will develop queries that return sorted data from a table by using the ORDER BY clause. Next, you will develop more specific queries that use expressions and aliases for sorting. Finally, you will explore queries that limit the sorted results by using TOP, OFFSET, and FETCH.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Sort and Limit Query Results in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries by using sorting and limiting. First, you will launch Microsoft SQL Server Management Studio, and then you will develop queries that return sorted data from a table by using the ORDER BY clause. Next, you will develop more specific queries which use expressions and aliases for sorting. Finally, you will explore queries that limit the sorted results by using TOP, OFFSET and FETCH. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Sort and Select Objects in the Pipeline Using Windows PowerShell [Guided]	In this challenge, you will use PowerShell to sort and select objects in the pipeline.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Sort Files [Guided]	In this challenge, you will learn to sort lines of files or output.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Sort Objects by Using a Comparator and a TreeSet [Guided]	In this Challenge Lab, you will implement the java.lang.Comparable and java.lang.Comparator interfaces to define comparisons for objects in a TreeSet. First, you will import a project that contains the existing classes you will need, and then you will modify a class to implement the Comparable interface. Next, you will sort objects by using a TreeSet. Finally, you will create a new class that implements the Comparator interface, and then you will sort objects by using the new Comparator class and a TreeSet.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Store Data in Python Data Structures [Guided]	In this Challenge Lab, you will store data by using data structures. First, you will create and populate a set, and then you will create and populate a dictionary. Next, you will iterate through a set by using a for loop, and then you will evaluate a tuple by using an if statement. Finally, you will update the value in a tuple, and then you will add items to a list.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Store IoT Data with Cosmos DB [Guided]	In this challenge, you will provision an Azure Cosmos DB database and populate it with IoT data. You will then use native Cosmos DB capabilities to analyze the data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Store Sensitive Data in Azure Key Vault [Guided]	In this challenge, you will store sensitive data in a key vault. You will first provision a key vault. Then you will set access policy for the key vault. You will store a connection string as a secret in the key vault and configure a web app to use the secret. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Stream Events by Using Azure Event Hubs [Guided]	In this challenge, you will provision a new event hub that supports event streaming. First, you will deploy an Event Hubs namespace. Next, you will create an event hub for event streaming. Finally, you will configure security for the event hub.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Summarize and Group Data in MySQL [Guided]	In this challenge you will write several MySQL queries to summarize and group data. First, you will develop a query that summarizes data by using the GROUP BY clause. Next, you will develop more specific queries that include multiple aggregate functions to summarize data. Finally, you will explore queries that filter data by using the HAVING clause.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Summarize and Group Data in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries to summarize and group data. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will develop a query that summarizes data by using the GROUP BY clause. Next, you will develop more specific queries that include multiple aggregate functions to summarize data. Finally, you will explore queries that filter data by using the HAVING clause.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Test and Mitigate Default Port Vulnerabilities in Linux [Guided]	In this challenge, you will verify what services are exposed to your external connection and learn how you can change your default ports to secure your services.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Test Network Security by Using Metasploit [Guided]	In this challenge lab, you will use Metasploit to test the security of your network. First, you will discover targets by using Metasploit. Finally, you will use Metasploit to exploit a target through a UNC link.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Transform Data by Using Azure Data Factory [Guided]	In this challenge, you will provision a new Azure data factory that supports a data pipeline that will transform data. First, you will design a batch processing solution, and then you will add directories to a storage account that uses a Data Lake Storage hierarchical namespace. Next, you will deploy an Azure data factory, and then you will create a data pipeline. Finally, you will author a copy data activity that will transform data into a blob data file, and then you will test and publish the data pipeline.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Troubleshoot an EC2 Instance by Using a CloudWatch Alarm [Guided]	In this challenge, you will configure CloudWatch to generate an alarm when memory usage reaches a specific level, and then automatically restart an Amazon Elastic Cloud Compute (Amazon EC2) instance. First, create a CloudWatch alarm for memory usage on an EC2 instance, and then you will connect to the console of the EC2 instance by using EC2 Instance Connect. Next, install a stress testing tool, and then run a stress test to simulate memory usage. Finally, monitor the CloudWatch alarm until it is triggered, and then you will verify that the EC2 instance restarts.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.

Troubleshoot Group Policies on Devices [Guided]	In this challenge students will learn how to troubleshoot group policies on devices. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Troubleshoot IPv4 Connectivity [Guided]	In this challenge, you will troubleshoot and verify IPv4 connectivity and routing between subnets.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Troubleshoot Network Issues [Guided]	In this challenge lab, you will troubleshoot various network communication issues. First, you will troubleshoot networking by using Event Viewer, and then you will troubleshoot networking by using Windows Network Diagnostics. Next, you will troubleshoot networking by using ping. Finally, you will identify processes with network connectivity and the remote IP addresses accessed by using Resource Monitor. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Troubleshoot Networking [Guided]	In this challenge students will learn how to troubleshoot networking. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Troubleshoot Startup/Boot Process [Guided]	In this challenge, you will troubleshoot the startup and boot process. First, you will corrupt the Windows boot manager (bootmgr), and then you will repair bootmgr. Next, you will access advanced startup to start the virtual machine in safe mode, and then you will run the SFC utility to check/repair problems. Finally, you will reset the virtual machine back to defaults by using the Reset this PC option.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Understand C# Algorithms and Data Structures [Guided]	In this Challenge Lab, you will use pattern matching to build data-driven algorithms. First, you will create a console application. Next, you will create a class representation of a Country object, and then you will create a Classifier class that will use pattern matching to classify instances of Country objects into 4 categories according to their land area. Finally, you will create instances of Country objects, and then you will use the Classifier class.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Understand C# Class Encapsulation [Guided]	In this Challenge Lab, you will create a console application, and then you will write code to create class representations of a Person object and an Employee object that inherits from the Person class. Next, you will use your console application to create instances of Person and Employee objects. Finally, you will compare C# access modifiers.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Understand C# Class Inheritance and Polymorphism [Guided]	In this Challenge Lab, you will be using Visual Studio® Code and the C# programming language. First, you will create a console application, and then you will write code to create a class representation of a StableIsotope object. Next, you will write code to create a class representation of a RadioactiveIsotope object that inherits from the StableIsotope class. Finally, you will write code to create class representations of an AlphaDecayIsotope object, a BetaDecayIsotope object, and a GammaDecayIsotope object which will all inherit from the RadioactiveIsotope class and use polymorphism.

Understand C# Exception Handling [Guided]	In this Challenge Lab, you will use the C# try-catch and try-catch-finally exception handling statements. First, you will create a console application. Next, you will use your console application to capture input of the user's annual income. Finally, you will use the C# try-finally, try-catch, and try-catch-finally exception handling when performing calculations using the user's income.Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Understand the Fundamentals of C# Classes [Guided]	In this Challenge Lab, you will be using Visual Studio® Code and the C# programming language. First, you will create a console application, and then you will write code to begin the creation of a class representation of a Person object. Next, you will add code that defines the features that a Person has (properties), the things that a Person can do (methods), and the things that can happen to a Person (events). Finally, you will use the new Person class in your console application.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Update vSphere Software Components [Guided]	In this challenge, you will update your vSphere software components. First, you will import updates into a vSphere Lifecycle Manager depot. Next, you will configure a cluster to be managed by a single image, and then you will remediate the VMware ESXi hosts to bring them into compliance with the image. Finally, you will upgrade VMware tools on multiple virtual machines, and then you will update a vCenter Server.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Use a Password Cracking Utility in Linux [Guided]	In this challenge, you will use John the Ripper to audit passwords. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Arrays in Windows PowerShell [Guided]	In this challenge, you will use arrays in PowerShell. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Azure CLI Tools to Manage Azure Linux Virtual Machines [Guided]	In this challenge, you will download and install the Microsoft Azure CLI (command-line interface) tools for remote Linux virtual machine management. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Azure Storage Explorer [Guided]	In this challenge, you will create a Storage Account, upload BLOB data, and create a Snapshot using Azure Storage Explorer. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Azure Time Series Insights to Analyze IoT Data [Guided]	In this challenge, you will provision an Azure Time Series Insights instance to analyze IoT data, generate charts based on time-based analysis, and then create a dashboard to display the IoT data analysis.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Banner Grabbing Techniques to Enumerate Services on a Linux Server [Guided]	In this challenge, you will use telnet, ftp, curl, ssh and Firefox to gather system information by using banner grabbing.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Breakpoints to Analyze and Debug a Script [Guided]	In this challenge, you will use PowerShell to analyze and debug an existing script with Breakpoints.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Use Display Filters [Guided]	In this Challenge Lab, you will use the Wireshark display filter feature. First, you will install Wireshark. Next, you will perform tasks related to display filters, including using simple display filters for common application layer protocols, using header value specific display filters, using logical expressions as part of a display filter, and editing display filters. Finally, you will use display filters. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Use EFS to Encrypt Files on NTFS Volumes [Guided]	In this challenge, you will protect data at rest using Windows Encrypting File System.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Event Viewer and Performance Monitor [Guided]	In this challenge, you will maintain log files and performance information, manage Event Viewer entries, configure an Event Viewer subscription, configure Event Viewer archiving, display Performance Monitor results, and configure a Performance Monitor data collector set.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use hping for Enumeration [Guided]	In this challenge you will gain understanding of Responder and its analysis mode for gathering information. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use IP Addressing [Guided]	In this Challenge Lab, you will manage the IP configurations of Windows® and Linux. First, you will manually configure IPv4 settings of Windows 10, and then you will configure Dynamic Host Configuration Protocol (DHCP) settings on Windows 10. Next, you will enable alternate configuration for the static IPv4 address of Windows 10. Finally, you will manually configure IPv4 settings on Linux.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Linux and Windows Network Command-Line Tools [Guided]	In this challenge lab, you will learn how to use various command-line tools for configuring, testing, and troubleshooting network connectivity on Linux and Windows. First, you will configure IPv4 on Linux by using ip, ifconfig, and route, and then you will use the ipconfig Windows command-line tool. Next, you will use various Windows network command-line tools, including tracert, netstat, telnet, hostname, whoami, arp, getmac, net, and netstat, and then you will use nslookup to verify local DNS resolutions. Finally, you will troubleshoot networking by using ping.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Linux and Windows Network Command-Line Tools [Guided]	In this challenge lab, you will learn how to use various command-line tools for configuring, testing, and troubleshooting network connectivity on Linux and Windows. First, you will configure IPv4 on Linux by using ip, ifconfig, and route, and then you will use the ipconfig Windows command-line tool. Next, you will use various Windows network command-line tools, including tracert, netstat, telnet, hostname, whoami, arp, getmac, net, and netstat, and then you will use nslookup to verify local DNS resolutions. Finally, you will troubleshoot networking by using ping.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Use Linux Tools and Commands [Guided]	In this Challenge Lab, you will perform tasks using Linux commands. First, you will perform a variety of tasks by using common Linux commands, including sudo, pwd, cd, ls, less, clear, history, touch, echo, cat, head, tail, grep, man, cp, mv, rm, and nano, and then you will set Linux permissions by using the chmod command. Next, you will configure IPv4 on Linux by using the ip, ifconfig, and route commands. Finally, you will perform a variety of task using Linux system commands, including top, htop, ps, kill, and apt.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Managed Identities [Guided]	In this challenge you will enable a System-assigned managed identity using a VM and assign appropriate permissions. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Nmap for enumeration [GUIDED]	In this challenge you will gain understanding of Nmap scanner by scanning a subnet to enumerate devices.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Operating System Tools and Features [Guided]	In this Challenge Lab, you will use a variety of common Windows tools and features. First, you will explore the Windows Administrative Tools and Computer Management interfaces, and then you will use Task Scheduler to create a task. Next, you will check the system for memory issues, and then you will review effective permissions. Next, you will configure Windows File History, and then you will perform a backup. Finally, you will configure application control policies by using Local Group Policy.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Use Responder for Enumeration [GUIDED]	In this challenge you will gain understanding of Responder and its analysis mode for gathering information. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Security Assessment Tools [Guided]	In this Challenge Lab, you will learn about port scanning and Security Content Automation Protocol (SCAP)-compliant vulnerability scanning. First, you will use nmap to discover other computers, identify open ports, determine operating systems, and discover active services. Next, you will perform an uncredentialed vulnerability scan, and then you will perform a credentialed vulnerability scan. Finally, you will explore Greenbone Security Assistant (GSA) vulnerability scan results.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Security Monitoring Tools [Guided]	In this Challenge Lab, you will collect failed sign in attempts on domain computers. First, you will create a sign in failure, and then you will review the event in the event log. Next, you will configure a server as a collector for events, and then you will configure two source computers that will send the events to the collector. Finally, you will review the events on the collector. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Use SSH for Remote Access [Guided]	In this Challenge Lab, you will learn how to use Secure Shell Protocol (SSH) to establish secure communications between systems. First, you will configure SSH on Kali Linux. Next, you will establish an SSH connection by using password authentication. Finally, you will configure SSH to use public key authentication, and then establish a connection with a user's private SSH key.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Use Strings and String Functions in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries by using strings and string functions. First, you will launch Microsoft SQL Server Management Studio, and then you will develop queries that return string character counts and use UPPER and LOWER functions. Next, you will develop more specific queries which replace characters in a string and use string parsing to extract data. Finally, you will explore queries that search for characters in a string by using the CHARINDEX function.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Tcpdump to Intercept Network Traffic [Guided]	In this challenge, you will use tcpdump to intercept and read network traffic.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use the Arachni Web Application Scanner [Guided]	In this challenge lab you will gain understanding of Arachni by performing basic scan against vulnerable web server. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use the Nikto Web Application Scanner [Guided]	In this challenge, you will gain understanding of Nikto by performing basic scan against vulnerable web server. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Variables in Windows PowerShell [Guided]	In this challenge, you will use variables in PowerShell. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Use Various Control Panel Applets [Guided]	In this Challenge Lab, you will use a variety of common tools, utilities, and features of the Windows Control Panel. First, you will configure proxy settings by using Internet Options, and then you will configure default applications. Next, you will manage user accounts, and then you will manually add a printer. Finally, you will uninstall an application, and then you will install a Windows application.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Use Various Windows System Utilities [Guided]	In this challenge lab, you will use common Windows system tools and utilities. First, you will use the Registry Editor to change the background wallpaper, and then you will use the Services console to manage services. Next, you will explore Notepad features and capabilities. Finally, you will use File Explorer in exciting ways.Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Use Windows and Linux Network Command-Line Tools [Guided]	In this challenge lab, you will use various command-line tools for configuring, testing, and troubleshooting network connectivity on Windows and Linux. First, you will use the ipconfig Windows command-line tool, and then you will configure IPv4 on Linux by using ip, ifconfig, and route. Next, you will use various Windows network command-line tools, including tracert, netstat, and telnet, and then you will troubleshoot networking by using ping. Finally, you will use nslookup to verify local DNS resolutions. Note: Once you begin the challenge lab, you will not be able to pause, save, or exit and then return to your challenge lab. Please ensure that you have set aside enough time to complete the challenge lab before you start.
Use Windows Command-Line Tools [Guided]	In this Challenge Lab you will use a variety of Windows command-line tools. First, you will use the ipconfig Windows command-line tool. Next, you will troubleshoot networking by using ping. Finally, you will use various Windows command-line tools, including tracert, netstat, shutdown, telnet, dism, sfc, tasklist, and taskkill, and then you will use nslookup to confirm local DNS resolutions. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Use Wireshark to Discover Evidence of Network Attacks [Guided]	In this Challenge Lab, you will locate information from network traffic to discover facts or uncover evidence of attacks. First, you will use Wireshark to capture FTP credentials. Next, you will use Wireshark to determine details from a network traffic capture, such as MAC addresses, DNS server addresses, IP resolutions from FQDNs, and whether HTTP traffic is encrypted. Finally, you will use Wireshark to discover evidence of a password guessing attack. Note: Once you begin the Challenge Lab, you will not be able to pause, save, or exit and then return to your Challenge Lab. Please ensure that you have set aside enough time to complete the Challenge Lab before you start.
Using Encryption to Secure Information [Guided]	In this challenge, you will create an asymmetric key pair for the SSH service, view a web certificate, and verify file integrity by using MD5 hashes.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Using the Burp Suite Web Application Scanner [Guided]	In this challenge lab examine you will web traffic to a web server. First, you will configure your localhost as a proxy for Burp Suite Community Edition. Next, you will enable intercepting and forward web server requests. Finally, you will intercept and modify requests to the destination web server. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Using the OWASP Zed Attack Proxy Web Application Scanner [Guided]	In this challenge you will gain understanding of OWASP Zed Attack Proxy by performing basic scans against a vulnerable web server. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Utilize Network Analysis Tools [Guided]	In this Challenge Lab, you will capture network traffic and perform network analysis on the captured communications. First, you will capture network traffic by using tcpdump, including displaying captured data, controlling name lookups during capture, using capture filters, and saving a capture to a file. Next, you will analyze a tcpdump pcap file by using Wireshark, including using display filters, following TCP streams, following HTTP streams, and searching for string content in the capture. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Validate Aggregate Functions in MySQL [Guided]	In this challenge you will write several MySQL queries by using aggregate functions. First, you will develop a query that returns data by using the COUNT aggregate function. Next, you will develop more specific queries that use the MIN and MAX aggregate functions. Finally, you will explore queries that perform calculations by using the SUM and AVG aggregate functions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Validate Aggregate Functions in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL queries by using aggregate functions. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will develop a query that returns data by using the COUNT aggregate function. Next, you will develop more specific queries that use the MIN and MAX aggregate functions. Finally, you will explore queries that perform calculations by using the SUM and AVG aggregate functions.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
View Azure Service Health Options [Guided]	In this challenge, you will manage Azure Service Health. You will view the resource menu pages on the Azure Service Health dashboard.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Vim Fundamentals in Linux [Guided]	In this challenge, you will work with the Vim text editor. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.

Work with Custom XML Data [Guided]	In this challenge, you will use PowerShell to export and import custom XML data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Work with Date and Time Functions in Transact-SQL [Guided]	In this challenge, you will write several Transact-SQL (T-SQL) queries by using date and time functions. First, you will launch Microsoft SQL Server Management Studio (SSMS), and then you will develop queries that return the current system date and time. Next, you will develop more specific queries that will use the FORMAT function for formatting date and time data. Finally, you will explore queries that use the DATEDIFF and DATEADD functions for performing calculations on date and time data.Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.
Work with Managed Disk Snapshots [Guided]	In this challenge, you will create a new test virtual machine that is based on an existing managed disk. First, you will prepare to create a snapshot, and then you will create a snapshot of an existing managed disk. Next, you will create a managed disk from the snapshot. Finally, you will create a virtual machine from the new managed disk. Note: Once you begin the challenge, you will not be able to pause, save, or exit and then return to your challenge. Please ensure that you have set aside enough time to complete the challenge before you start.
Work with Object Variables in Windows PowerShell [Guided]	In this challenge, you will utilize object variables in PowerShell. Note: Once you begin a challenge you will not be able to pause, save, or return to your progress. Please ensure you have set aside enough time to complete the challenge before you start.