

OFFICIAL MICROSOFT LEARNING PRODUCT

20537A

**Configuring and Operating a Hybrid Cloud
with Microsoft Azure Stack**

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¹ IDC, Value of Certification: Team Certification and Organizational Performance, November 2006

Acknowledgements

Microsoft Learning would like to acknowledge and thank the following for their contribution towards developing this title. Their effort at various stages in the development has ensured that you have a good classroom experience.

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Module 1

Overview of Azure Stack

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Module Review and Takeaways	8

Lesson 1

What is Azure Stack?

Contents:

Question and Answers

3

Question and Answers

Question: What do subscriptions contain in Azure Stack?

Answer: Subscriptions contain the plans and offers that tenants subscribe to (or purchase).

Lesson 2

Comparing Azure Stack with Microsoft Azure

Contents:

Question and Answers

5

Question and Answers

Question: Who owns the infrastructure with Azure Stack?

Answer: You own the on-premises Azure Stack infrastructure. Microsoft owns the public cloud infrastructure.

Lesson 3

Comparing Azure Stack to Windows Azure Pack

Contents:

Question and Answers

7

Question and Answers

Question: System Center is required for Azure Stack.

☐ True

☐ False

Answer:

☐ True

☒ False

Module Review and Takeaways

Review Question(s)

Question: Azure Stack is only a Private Cloud Services solution.

☐ True

☐ False

Answer:

☐ True

☒ False

Tools

Module 2

Foundational Components of Microsoft Azure Stack

Contents:

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Module Review and Takeaways	6
Lab Review Questions and Answers	7

Lesson 1

Windows Server 2016 and System Center 2016

Contents:

Question and Answers

3

Question and Answers

Question: In a four-node implementation of Azure Stack, Azure Stack can withstand a maximum failure of one node.

☐ True

☐ False

Answer:

☐ True

☒ False

Lesson 2

Identity and authentication

Contents:

Question and Answers

5

Question and Answers

Question: Which identity providers does Azure Stack support?

Answer: Azure Stack supports the following identity providers:

- AD FS
- Azure AD

Module Review and Takeaways

Review Question(s)

Question: In order to access resources in a connected Azure Stack environment you must have an account in Microsoft Azure.

☐ True

☐ False

Answer:

☒ True

☐ False

Tools

Storage Quality of Service (Storage QoS) was mentioned earlier in this module in regards to Storage Spaces Direct. You can find out more information about how Windows Server 2016 uses Storage QoS by browsing the following website: <https://aka.ms/moc-10995A-pg020>

Lab Review Questions and Answers

Lab: Reviewing the Azure Stack Infrastructure

Question and Answers

Lab Review

Question: You need to provide access for a support engineer to access the Azure Stack infrastructure resources. What are two methods you can adopt to facilitate this?

Answer:

1. Enabled ADFS between your organizations domain and the Azure Stack domain.
2. Create an account in the Azure Stack domain and provide the engineer with the account credentials.

Module 3

Deploying Microsoft Azure Stack

Contents:

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Lesson 3: Installing Azure Stack	4
Module Review and Takeaways	6
Lab Review Questions and Answers	7

Lesson 1

Azure Stack Architecture

Contents:

Question and Answers

3

Question and Answers

Question: You are limited to a single region when you use the Azure Stack Development Kit.

☐ True

☐ False

Answer:

☒ True

Lesson 3

Installing Azure Stack

Contents:

Question and Answers

7

Question and Answers

Planning the Azure Stack Installation

Question: What type of Services do you think you will be offering to tenants?

Answer: The core of Azure Stack is based on software-defined storage, compute, and network. Currently this means IaaS, SQL as a Service, and WebApps while other services will be coming online at a later date.

Module Review and Takeaways

Best Practice

When deploying the Azure Stack Development Kit, ensure you read the latest documentation thoroughly prior to commencing the installation. Microsoft regularly updates the Azure Stack Development Kit installation process so it might change between deployments.

From the Azure Stack Development Kit host, ensure you can access the Internet without having to specify any Proxy server settings because this is crucial for the virtual machines that run Azure Stack.

Review Question(s)

Question: Do you think your organization will be able to deploy an Azure Stack Development Kit?

Answer: Answers might vary.

Real-world Issues and Scenarios

The Azure Stack Development Kit is not designed for production workloads and Microsoft does not support it for those workloads. It is for evaluation purposes only. While it does demonstrate the capabilities of how tenants would use Azure Stack, it does not show off its full capabilities when it comes to zero-downtime updating.

Tools

Common Issues and Troubleshooting Tips

Common Issue	Troubleshooting Tip
The Azure Stack Development Kit install fails when connecting the Azure AD.	Check your Internet connection is transparent. Ensure the time zone of Hyper-V host is set to (UTC-8:00) Pacific Time (US & Canada)
CPU reports SLAT is not enabled.	Check the BIOS settings because SLAT can be disabled in the BIOS.
CPU States	Ensure all the C states for the CPU have been disabled. This prevents the CPU cores from being <i>parked</i> .
Azure Stack Development Kit Installation Failure	When you install the Azure Stack Development Kit, double-check the parameters that you require. For example, the Azure Stack Development Kit installer assumes DHCP will be available for the second required IP address. If this not available, you must pass the installer the required NatIPv4Address, NatIPv4DefaultGateway, and NatIPv4Subnet parameters.

Lab Review Questions and Answers

Lab: Confirming prerequisites and installing Microsoft Azure Stack

Question and Answers

Lab Review

Question: How many CPUs must be present in the Azure Stack host for you to deploy the Azure Stack Development Kit?

Answer: You must have two physical CPUs with at least six cores per processor.

Module 4

Offering Microsoft Azure Stack Resources

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Lesson 2: Microsoft Azure Stack Marketplace	4
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Lab Review Questions and Answers	7

Lesson 1

Working with Plans and Offers

Contents:

Question and Answers

3

Question and Answers

Question: You can apply quotas only to base plans.

☐ True

☐ False

Answer:

☐ True

☒ False

Lesson 2

Microsoft Azure Stack Marketplace

Contents:

Question and Answers

5

Question and Answers

Question: What are the three elements that each Azure Stack Marketplace has?

Answer

- Azure Resource Manager Template.
- Metadata.
- Formatting Information.

Module Review and Takeaways

Review Question(s)

Question: For delegated providers to use delegated offers, the offers must be configured with a Status of **Public**.

☐ True

☐ False

Answer:

☐ True

☒ False

Tools

In addition to the Azure Stack resources available on TechNet, several other online resources also are available. One of the most useful resources is the Azure Stack Wiki. This is a OneNote online resource that includes updated information about all Azure Stack features, concepts, and capabilities. You can access the Azure Stack Wiki by visiting the following website.

<https://aka.ms/moc-10995A-pg043>

Lab Review Questions and Answers

Lab: Managing Offers and Plans in Microsoft Azure Stack

Question and Answers

Lab Review

Question: You have created a plan and offer in the Azure Stack Portal for tenants to subscribe to. When a tenant opens the Azure Stack Portal and attempts to get a new subscription, the new offer is not displayed. What could be the reason for this?

Answer: By default, offers are created with a Status of **Private**. This means tenants cannot subscribe to them unless a service administrator manually creates the subscription. For tenants to be able to subscribe to an offer, its Status must be changed to **Public**.

Module 5

Microsoft Azure Stack and DevOps

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Lesson 1

Technologies used in Microsoft Azure Stack for DevOps

Contents:

Question and Answers

3

Question and Answers

Understanding Azure Resource Manager

Question: What type of API is presented through Azure Resource Manager?

Answer: Representational State Transfer (REST) APIs.

What PowerShell Desired State Configuration?

Question: Do you see a place in your organization for PowerShell DSC?

Answer: Answers may vary.

Question: You can apply PowerShell DSC only to Windows operating systems.

☐ True

☐ False

Answer:

☐ True

☒ False

Understand how SDKs and Tags are used in Microsoft Azure Stack

Question: What is the maximum number of tags that you can apply per resource?

☐ 10

☐ 15

☐ 20

☐ 25

☐ 30

Answer:

☐ 10

☒ 15

☐ 20

☐ 25

☐ 30

Question: Tags applied to a resource group are inherited by resources in the resource group.

☐ True

☐ False

Answer:

☐ True

☒ False

Lesson 2

Azure Resource Manager Templates

Contents:

Question and Answers

6

Question and Answers

What is an Azure Resource Manager template?

Question: You can only deploy resources in an Azure Resource Manager template to the same region where the resource group resides?

☐ True

☐ False

Answer:

☐ True

Module Review and Takeaways

Best Practice

Ensure you use a code repository for all of your ARM templates.

Use a parameters file for your deployments, and store this file so that you can easily redeploy if required.

Review Question(s)

Question: How can you ensure a user cannot deploy an Azure Resource Manager template to a specific region?

Answer: Azure policies can ensure that the region being deployed to is on a list of permitted regions for a subscription.

Real-world Issues and Scenarios

An Azure Resource Manager Template by itself cannot deploy software and make configuration changes. An ARM template requires additional knowledge such as a PowerShell DSC Configuration or a script.

Tools

Chef: <https://aka.ms/moc-10995A-pg057>

Puppet: <https://aka.ms/moc-10995A-pg058>

Common Issues and Troubleshooting Tips

Common Issue	Troubleshooting Tip
Deployment Failed	There can be many reasons why a deployment would fail. Look for "Code: <reason failure>" within the failures. One example could be "RequestDisallowedByPolicy". This would be explained by the presence of a policy that does not allow the resources to be deployed as requested.
Invalid Template	The Azure Resource Manager template is not well-formed. We recommend that you load the template into Visual Studio and determine the problem with the template.
Storage Account Already Taken	If you see this error code, then the storage account is already taken, and you will not be able to provision using the requested name.

Lab Review Questions and Answers

Lab: Debugging and Deploying ARM Templates

Question and Answers

Lab Review

Question: Can you parameterize all the values required by an Azure Resource Manager template?

Answer: Yes

Module 6

Infrastructure as a Service and Microsoft Azure Stack

Contents:

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Lab Review Questions and Answers	4

Module Review and Takeaways

Best Practice

You should only assign a public IP address to a network adapter when it is absolutely required. If you are assigning a public IP, then ensure there is an NSG attached to either the NIC itself or the subnet where you deploy the VM.

Review Question(s)

Question: What Windows operating systems are support for Azure Stack guests?

Answer:

- Windows Server 2008 R2 SP1
- Windows Server 2012 Datacenter
- Windows Server 2012 R2 Datacenter
- Windows Server 2016 Datacenter

Tools

Common Issues and Troubleshooting Tips

Common Issue	Troubleshooting Tip
You have assigned a public IP address to a VM but cannot create an RDP connection or SSH connection.	Check the NSG to ensure the source IP address you are connecting from is permitted access and the required TCP port is permitted.
Subnet not large enough for all the required network adapter/VMs	When creating a subnet, remember that the first four IP addresses are used by Azure. For example, in the subnet 192.168.10.0/29, IP addresses 192.168.10.0-192.168.10.3 are used by Azure, leaving only 192.168.10.4-192.168.10.6 available for use within the subnet.

Lab Review Questions and Answers

Lab: Provisioning Storage and Virtual Machines in Microsoft Azure Stack

Question and Answers

Lab Review

Question: What are added to a Subscription when you create one in the Azure Stack Portal?

Answer: Offers

Module 7

Platform as a Service and Microsoft Azure Stack

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Lesson 3: App Service Resource Provider	6
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Module Review and Takeaways	12
Lab Review Questions and Answers	13

Lesson 1

Understanding Platform as a Service

Contents:

Question and Answers

3

Question and Answers

Question: What are the three chargeback processes cloud service providers use for PaaS services?

Answer:

- Consumption
- Quota
- Combination of consumption and quota

Lesson 2

SQL Server and MySQL Server Providers in Microsoft Azure Stack

Contents:

Question and Answers

5

Question and Answers

Question: After installing the SQL Server Resource Provider, what must you do before tenants can provision databases using it?

Answer: Add a hosting server.

Lesson 3

App Service Resource Provider

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Question and Answers

Question: What function does the Website Controller role provide in App Service?

Answer: This role server is responsible for provisioning and managing the other roles in the App Service.

Demonstration: Deploying Additional Worker Roles for App Services

Demonstration Steps

1. Open **Internet Explorer**.
2. Navigate to **<https://adminportal.local.azurestack.external>**.
3. Login to Azure Stack using the **AzureStackAdmin** credentials.
4. In the **Microsoft Azure Stack – Administration** portal, click > on the navigation pane.
5. Under the **Administration** section, click **Resource Providers**.
6. In the **Resource Providers** blade, click **App Service**.
7. In the **App Service Management** blade, under **Settings**, click **Roles**.
8. In the **Roles** blade, click + **New Role Instance**.
9. In the **New Role Instance** blade, ensure **Role Instances** is set to **1**, the **Role Type** is set to **Web Worker** and **Worker Tier** is set to **Medium**.
10. Click **OK**.

The deployment will commence, the **Roles** blade will show an information message "**Deploying role instances...**"

Lesson 4

Azure Key Vault

Contents:

Question and Answers

9

Question and Answers

Question: Name three types of information that can be secured using Key Vault.

Answer

- Storage Account keys (as discussed in Module 6)
- Shared Access Signature URLs (as discussed in Module 6)
- Usernames
- Passwords
- License keys
- Certificate PFX files
- License files
- SQL connection strings

Lesson 5

Azure Functions

Contents:

Question and Answers

11

Question and Answers

Question: Name three methods of triggering a Function.

Answer

- Blob Trigger
- Event Hub Trigger
- Generic Webhook
- GitHub Webhook
- HTTP Trigger
- Queue Trigger
- Service Bus Queue Trigger
- Service Bus Topic Trigger
- Timer Trigger

Module Review and Takeaways

Review Question(s)

Question: What function does the Publisher role provide in App Service?

Answer: This role is responsible for publishing the DevOps-created content for web apps. It is the File Transfer Protocol (FTP) endpoint and is responsible for integration with code repositories such as GitHub.

Tools

Lab Review Questions and Answers

Lab: Configuring Platform as a Service in Azure Stack

Question and Answers

Lab Review

Question: What are the first two tasks that must be performed when configuring Azure Stack to provision SQL Server databases?

Answer

1. Install the SQL Server resource provider.
2. Configure a hosting server for the SQL Server resource provider.

Module 8

Monitoring in Microsoft Azure Stack

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Lesson 1

Field Replaceable Unit

Contents:

Question and Answers

3

Question and Answers

Question: Name two of the Fault Domain types that Windows Server 2016 supports.

Answer:

- Site
- Rack
- Chassis
- Node

Lesson 2

Azure Stack Control Plane Monitoring

Contents:

Question and Answers

5

Question and Answers

Question: What can you do in the Azure Stack portal to provide quicker access to the Alerts?

Answer: Right-click the **Alerts** tile and then click **Pin to dashboard**.

Lesson 4

Monitoring Guest Workloads in Microsoft Azure Stack

Contents:

Question and Answers

9

Question and Answers

Question: Azure Stack monitors guest workloads and applications.

☐ True

☐ False

Answer:

☐ True

☒ False

Lesson 5

Troubleshooting Azure Stack

Contents:

Question and Answers

11

Question and Answers

Question: Why is it important to start the Azure Stack infrastructure virtual machines in a specific order?

Answer: You must perform the startup order for Azure Stack virtual machines in a specific order. If do not, services might fail to respond or stop because dependent services running on other virtual machines might not have started in time. This can also result in errors occurring in the Azure Stack Portal.

Module Review and Takeaways

Best Practice

Review Question(s)

Question: To monitor Azure Stack with Operations Manager, you must install an Operations Manager agent on each Azure Stack virtual machine.

☐ True

☐ False

Answer:

☐ True

☒ False

Tools

The Microsoft Azure Management Pack that was referenced in this module can also be used to monitor Azure Stack. For more information and a download link for the Microsoft Azure Management Pack, refer to the following website. <https://aka.ms/moc-10995A-pg080>

Lab Review Questions and Answers

Lab: Troubleshooting and Monitoring Microsoft Azure Stack and Guest Operating Systems

Question and Answers

Lab Review

Question: What are the three tasks that you must complete to monitor Azure Stack with Operations Manager?

Answer: To monitor Azure Stack with Operations Manager, you must perform the following tasks:

1. Import the Microsoft Azure Management Pack.
2. Configure the Microsoft Azure Management Pack.
3. Configure the Microsoft Azure Monitoring Management Pack Template.

Module 9

Licensing Microsoft Azure Stack and Billing Tenants

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Module Review and Takeaways	6
Lab Review Questions and Answers	7

Lesson 1

How to License and Pay for Azure Stack

Contents:

Question and Answers

3

Question and Answers

Question: What are the two options available for licensing Azure Stack?

Answer

Cloud Solution Provider: If you obtain your Azure services through a Microsoft CSP, you can obtain an Azure Stack license from your chosen CSP. A CSP can associate the tenant in CSP to the Azure Stack deployment.

Enterprise Agreement: You can include Azure Stack in your EA with Microsoft and because Azure Stack is an extension of Azure, customers can use their Azure Monetary Commit within their EA to pay for Azure Stack consumption. Through an EA, customers can register their Azure Stack consumption to an EA-based Azure subscription. Note that if your EA is related to Azure in US Government, Germany, or China, you should speak to your Microsoft Account Manager because these will be handled differently.

Lesson 2

Azure Consistent Usage API

Contents:

Question and Answers

5

Question and Answers

Question: Which resource provider is used to obtain usage information for provider based usage?

Answer: Microsoft.Commerce Resource Provider.

Module Review and Takeaways

Review Question(s)

Question: When troubleshooting an issue with a production installation of Azure Stack, how does Microsoft obtain information about the Azure Stack environment?

Answer: Via the Emergency Console.

Tools

Lab Review Questions and Answers

Lab: Obtaining Usage Information

Question and Answers

Lab Review

Question: How do you determine what resources have been consumed after extracting usage data from Azure Stack?

Answer: You must correlate the MeterID with the relevant MetreID for each resource consumed.