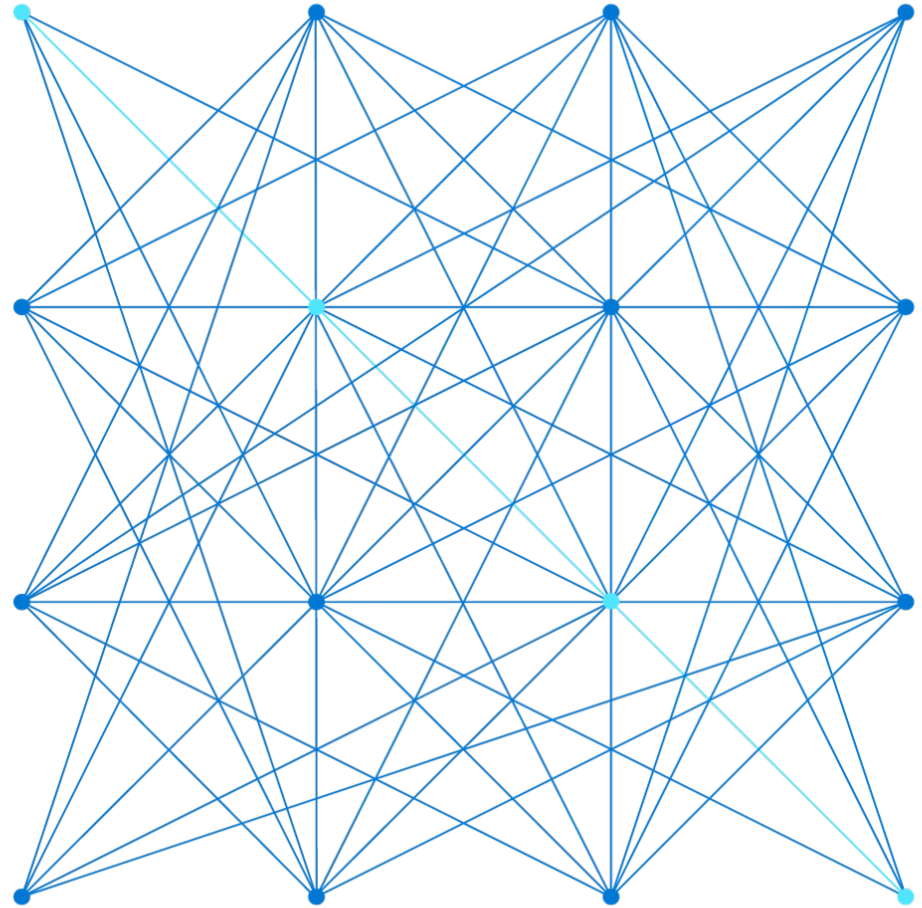


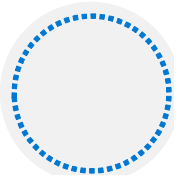
AZ-104T00A

Module 10:

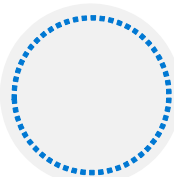
Data Protection



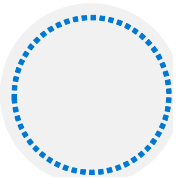
Module Overview



Lesson 01: File and Folder Backups



Lesson 02: Virtual Machine Backups



Lesson 03: Module 10 Lab and Review

Lesson 01: File and Folder Backups



File and Folder Backups Overview



Azure Backup



Recovery Service Vault Backup Options



Demonstration – Backup Azure File Shares



Implementing On-premises File and Folder Backups



Microsoft Azure Recovery Services Agent



Demonstration – Backup Files and Folders

Azure Backup



Azure-based service used to back up and restore data in Microsoft cloud



Automatic Storage Management



Multiple storage options



Unlimited data transfer



Data encryption



Application consistent backup



Long-term retention

Recovery Services Vault Backup Options

Azure Workloads

Where is your workload running?
Azure

What do you want to backup?
Virtual machine

- Virtual machine
- Azure FileShare**
- SQL Server in Azure VM
- SAP HANA in Azure VM

On-Premises Workloads

vmbackuptest- Backup
Recovery Services vault

Where is your workload running?
On-Premises

What do you want to backup?
Files and folders

- ☒ **Files and folders**
- ☐ Hyper-V Virtual Machines
- ☐ VMware Virtual Machines
- ☐ Microsoft SQL Server
- ☐ Microsoft SharePoint
- ☐ Microsoft Exchange
- ☐ System State
- ☐ Bare Metal Recovery

Step: Prepare Infrastructure

[Prepare Infrastructure](#)

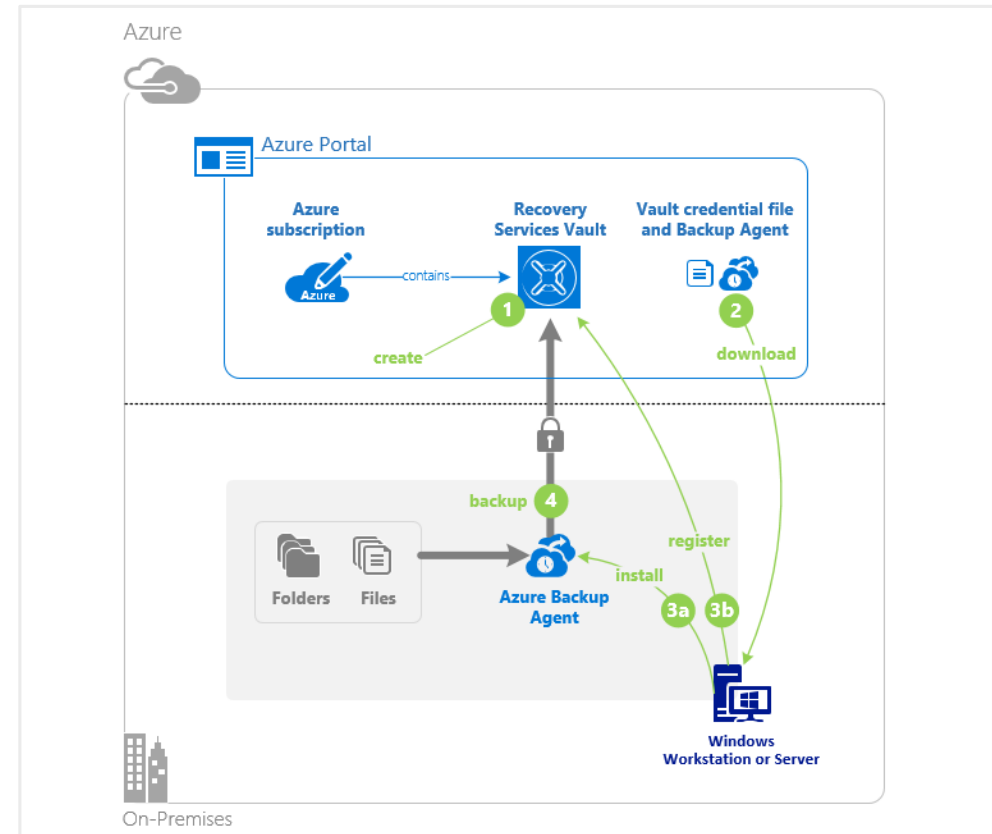
Implementing On-premises File and Folder Backup

1. Create the recovery services vault

2. Download the agent and credential file

3. Install and register agent

4. Configure the backup



Microsoft Azure Recovery Services Agent (MARS)

The screenshot shows the Microsoft Azure Backup console. At the top, there's a header "Microsoft Azure Backup" with a cloud and checkmark icon. Below it, a message states: "Microsoft Azure Backup supports scheduled backups of files and folders to an c". A warning icon and text follow: "Backups have not been configured for this server. Click 'Schedule Backup' in the Actions pane to config". Below this, it says: "You can also Configure Notifications from Alerts blade to receive email alerts for backup failures. [Learn More](#)."

The "Jobs (Activity in the past 7 days, double click on the message to see details)" section has two tabs: "Jobs" and "Alerts". The "Jobs" tab is active, showing a table with the following data:

Status	Time	Message	Description
✓	2/28/2019 6:48 AM	Recovery	Job completed.
✓	2/28/2019 6:45 AM	Recovery	Job completed.
✓	2/28/2019 6:41 AM	Backup	Job completed.

The "Actions" pane on the right contains the following options: "Backup" (selected), "Register Server", "Schedule Backup", "Recover Data", "Change Properties", "Open Portal", "Privacy & Cookies", "View", and "Help".

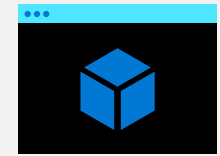
Backup or recover files and folders on physical or virtual Windows OS (VMs can be on-premises or in Azure)

No separate backup server required

Not application aware; file, folder, and volume-level restore only

No support for Linux

Lesson 02: Virtual Machine Backups



Virtual machine backups overview



Virtual Machine Data Protection



Workload Protection Needs



Virtual Machine Snapshots



Recovery Services Vault VM Backup Options



Implementing VM Backups



Implementing VM Restore



Azure Backup Server



Backup Component Comparison



Soft Delete



Azure Site Recovery



Azure to Azure Architecture

Virtual Machine Data Protection

Snapshots

Azure backup

Azure Site Recovery

Managed snapshots provide a quick and simple option for backing up VMs that use Managed Disks

Azure Backup supports application-consistent backups for both Windows and Linux VMs

Azure Site Recovery protects your VMs from a major disaster scenario when a whole region experiences an outage

Workload Protection Needs

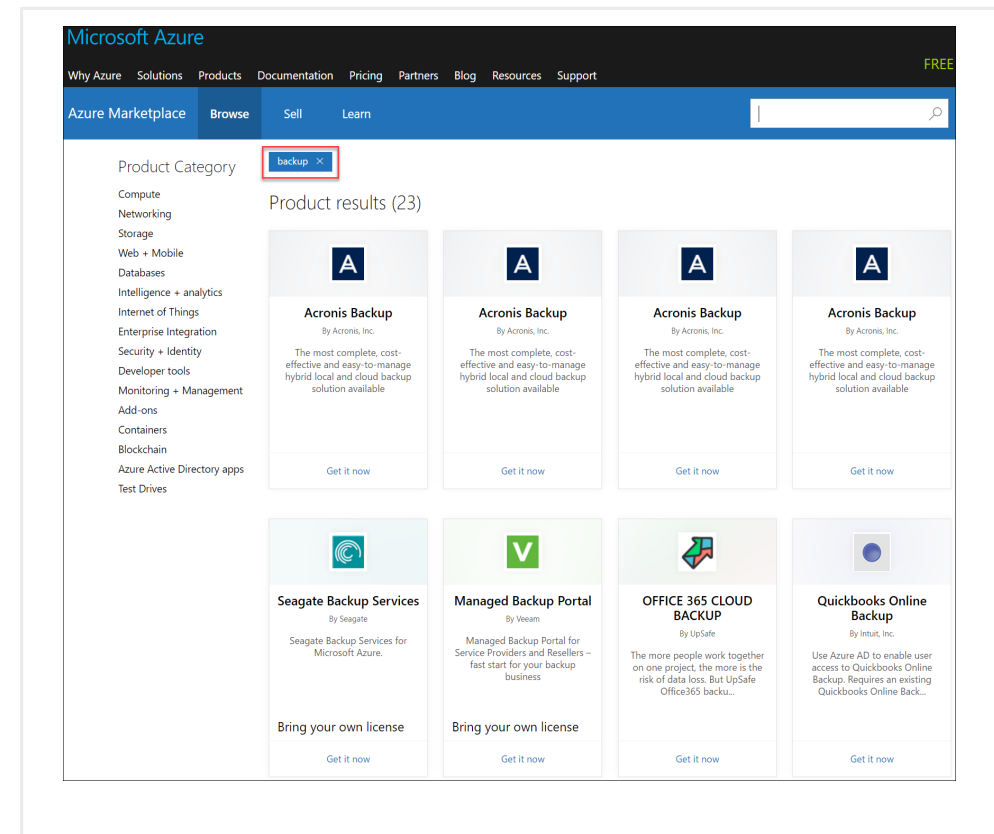
Many backup options are available

How the workload is being protected today?

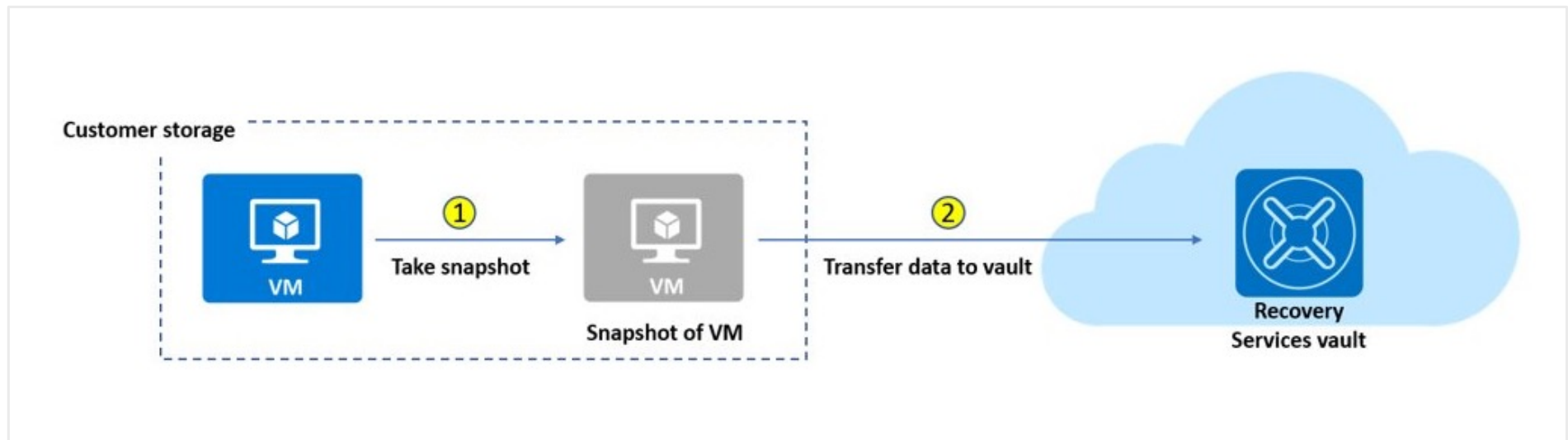
How often is the workload is backed up?

What types of backups are being done?

Is disaster recovery protection in place?



Virtual Machine Snapshots



Use snapshots taken as part of a backup job

Reduces recovery wait times – don't wait for data transfer to the vault to finish

Configure Instant Restore retention (1 to 5 days)

Recovery Services Vault VM Backup Options

Azure Workloads

Where is your workload running?
Azure

What do you want to backup?
Virtual machine

- ☒ Virtual machine
- ☐ Azure FileShare
- ☐ SQL Server in Azure VM
- ☐ SAP HANA in Azure VM

On-Premises Workloads

vmbackuptest - Backup
Recovery Services vault

Where is your workload running?
On-Premises

What do you want to backup?
4 selected

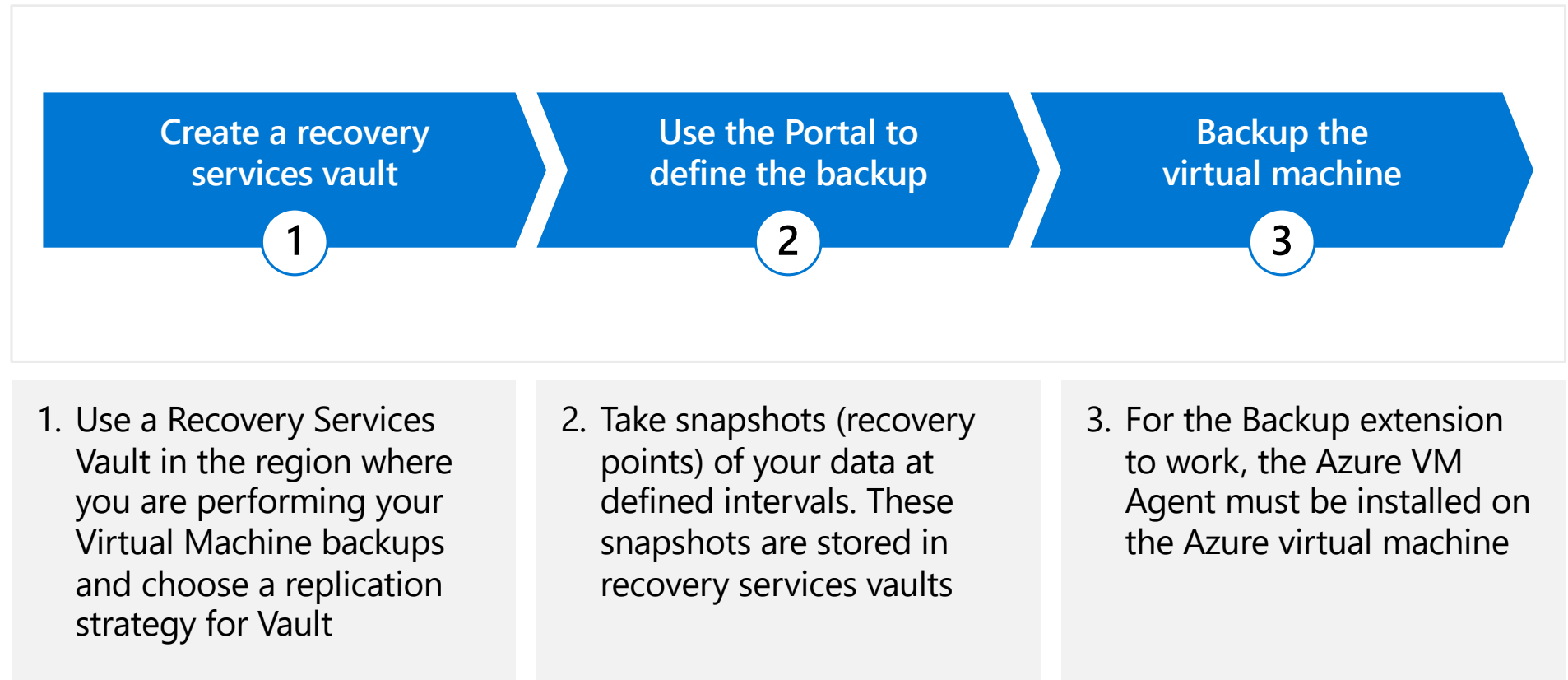
- ☐ Files and folders
- ☒ Hyper-V Virtual Machines
- ☒ VMware Virtual Machines
- ☐ Microsoft SQL Server
- ☐ Microsoft SharePoint
- ☐ Microsoft Exchange
- ☒ System State
- ☒ Bare Metal Recovery

Step: Prepare Infrastructure
[Prepare Infrastructure](#)



Multiple servers can be protected using the same Recovery Services vault


Implementing VM Backups



Implementing VM Restore

Once you trigger the restore operation, the Backup service creates a job for tracking the restore operation

The Backup service also creates and temporarily displays notifications, so you monitor how the backup is proceeding

 **ContosoWebFE1**
Backup Item

[Backup now](#) [Restore VM](#) [File Recovery](#) [Stop backup](#) [Resume backup](#)

Alerts and Jobs

[View all Alerts](#) (last 24 hours)
[View all Jobs](#) (last 24 hours)

Backup status

Backup Pre-Check ✓ Passed
Last backup status ✓ Success 3/12/2020, 12:20:38 AM

Restore points (30)

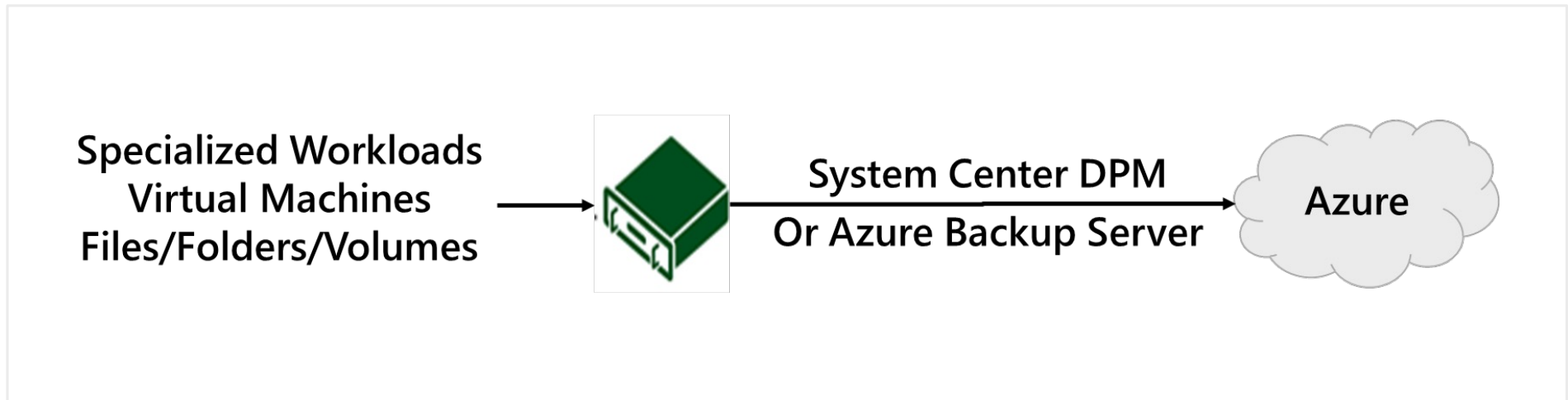
CRASH CONSISTENT
30

APPLICATION CONSISTENT
0

FILE-SYSTEM CONSISTENT
0

Time	Consistency
3/12/2020, 12:20:42 AM	Crash Consistent
3/11/2020, 12:20:59 AM	Crash Consistent

Azure Backup Server



App-aware backups, file/folder/volume backups, and machine state backups (bare-metal, system state)

Each machine runs the DPM/MABS protection agent, and the MARS agent runs on the MABS/DPM

Flexibility and granular scheduling options

Manage backups for multiple machines in a protection group

Backup Component Comparison

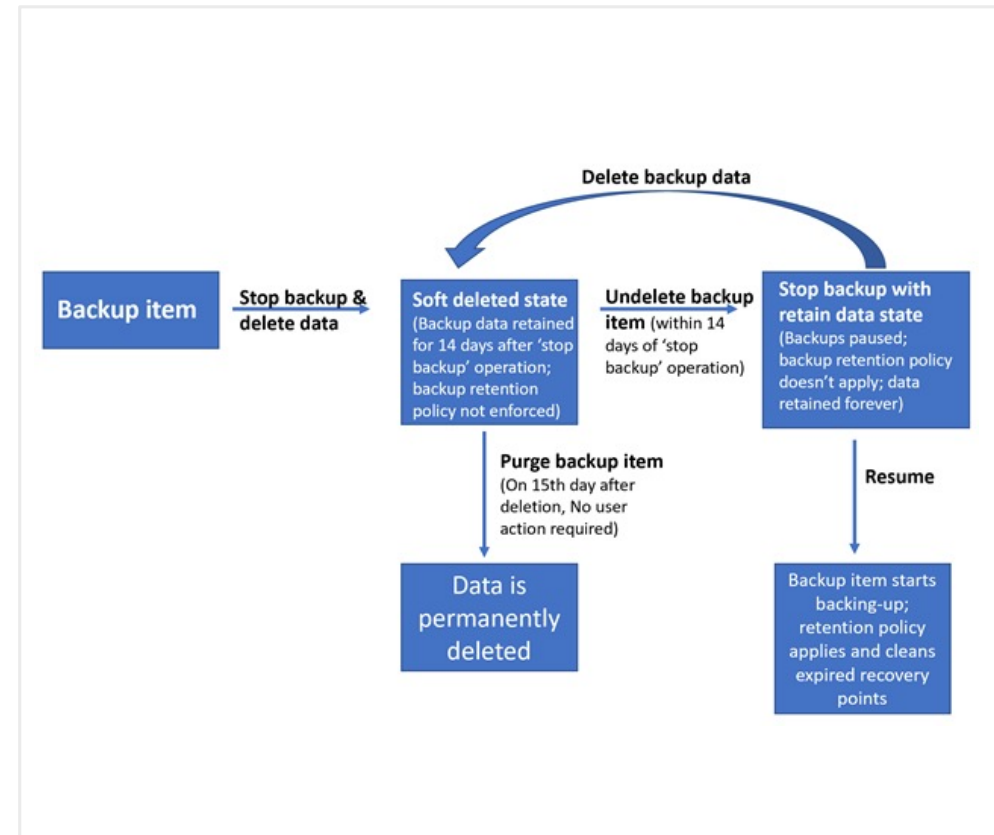
Component	Benefits	Limits	Protects	Backup Storage
Azure Backup (MARS) agent	<ul style="list-style-type: none">• Backup files and folders on physical or virtual Windows OS• No separate backup server required	<ul style="list-style-type: none">• Backup 3x per day• Not application aware• File, folder, and volume-level restore only• No support for Linux	<ul style="list-style-type: none">• Files• Folders	<ul style="list-style-type: none">• Recovery services vault
Azure Backup Server (MABS)	<ul style="list-style-type: none">• App aware snapshots• Full flex for when to backups• Recovery granularity• Linux support on Hyper-V and VMware VMs• Backup and restore VMware VMs• Doesn't require a System Center license	<ul style="list-style-type: none">• Cannot backup Oracle workloads• Always requires live Azure subscription• No support for tape backup	<ul style="list-style-type: none">• Files• Folders• Volumes• VMs• Applications• Workloads	<ul style="list-style-type: none">• Recovery services vault• Locally attached disk

Soft Delete

Backup data is retained for 14 additional days

Recover soft deleted backup items using an 'Undelete' operation

Natively built-in for all the recovery services vaults



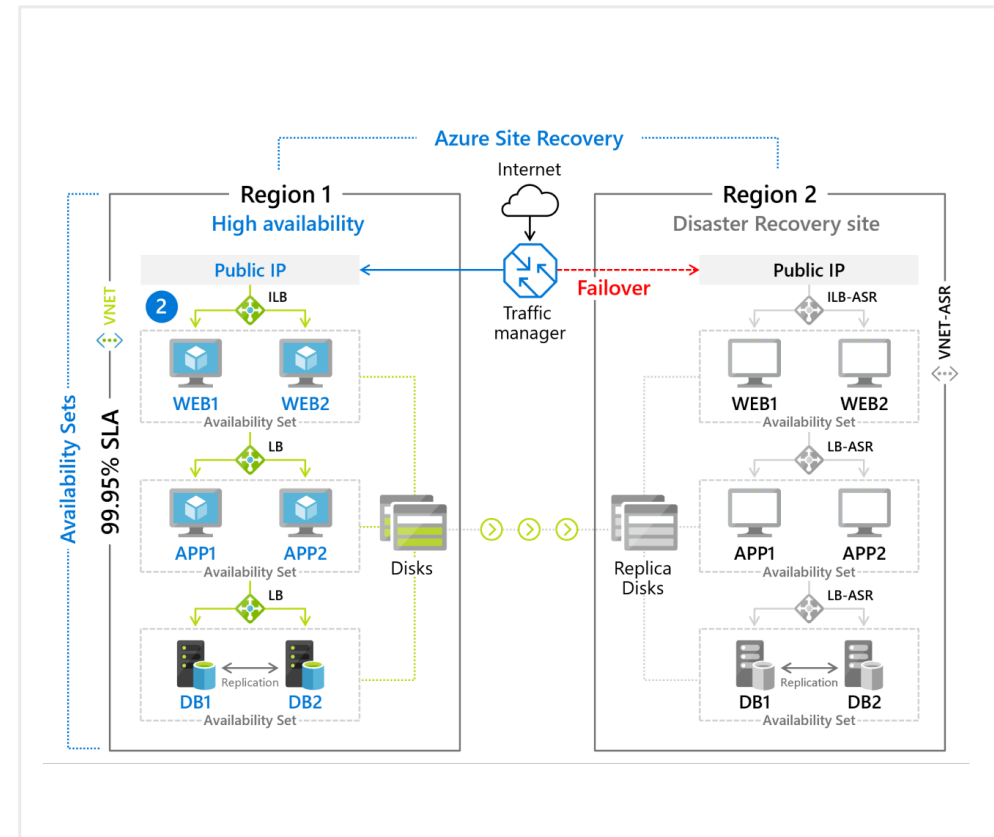
Azure Site Recovery

Replicate Azure VMs from one Azure region to another

Replicate on-premises VMware VMs, Hyper-V VMs, physical servers (Windows and Linux), Azure Stack VMs to Azure

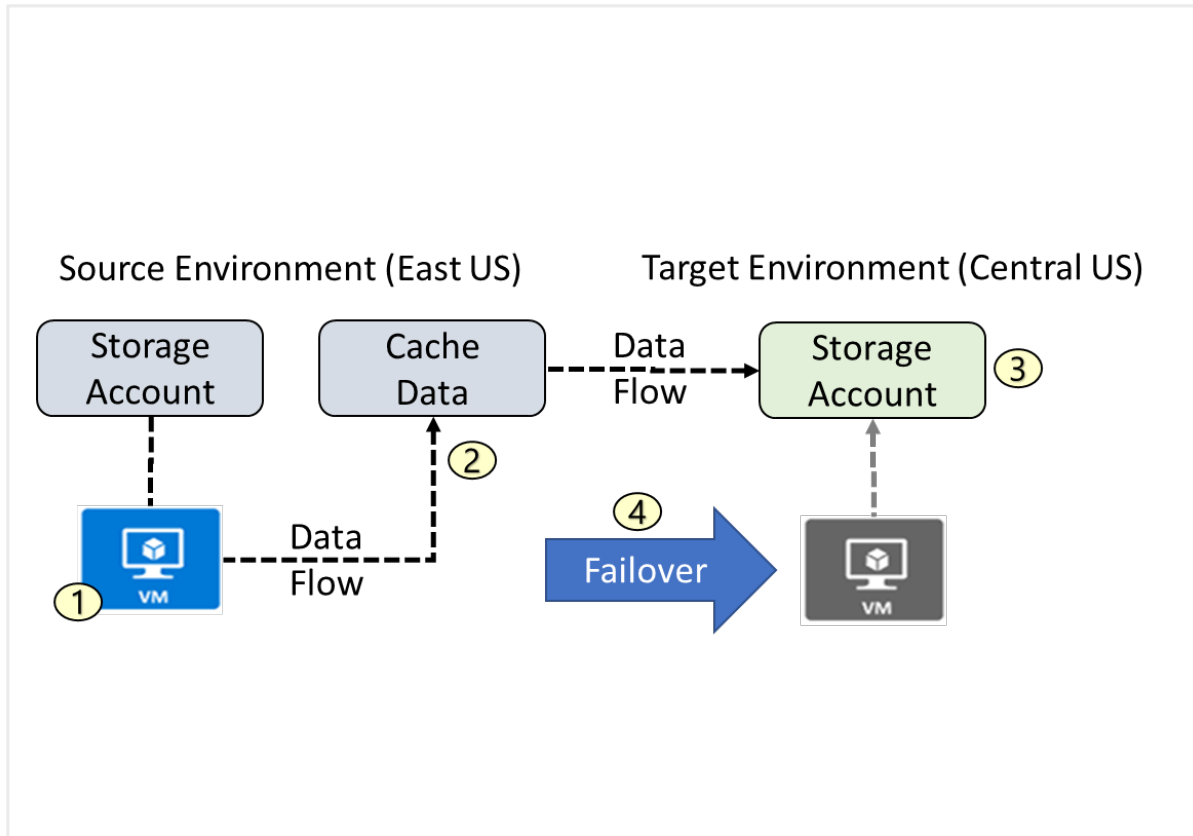
Replicate AWS Windows instances to Azure

Replicate on-premises VMware VMs, Hyper-V VMs managed by System Center VMM, and physical servers to a secondary site

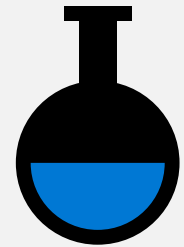


Azure to Azure Architecture

1. VM is registered with Azure Site Recovery
2. Data is continuously replicated to cache
3. Cache is replicated to the target storage account
4. During failover the virtual machine is added to the target environment



Lesson 03: Module 10 Lab and Review



Lab 10 – Backup virtual machines

Lab scenario

You have been tasked with evaluating the use of Azure Recovery Services for backup and restore of files hosted on Azure virtual machines and on-premises computers. In addition, you want to identify methods of protecting data stored in the Recovery Services vault from accidental or malicious data loss

Objectives

Task 1:

Provision the lab environment

Task 2:

Create a Recovery Services vault

Task 3:

Implement Azure virtual machine-level backup

Task 4:

Implement File and Folder backup

Task 5:

Perform file recovery by using Azure Recovery Services agent

Task 6:

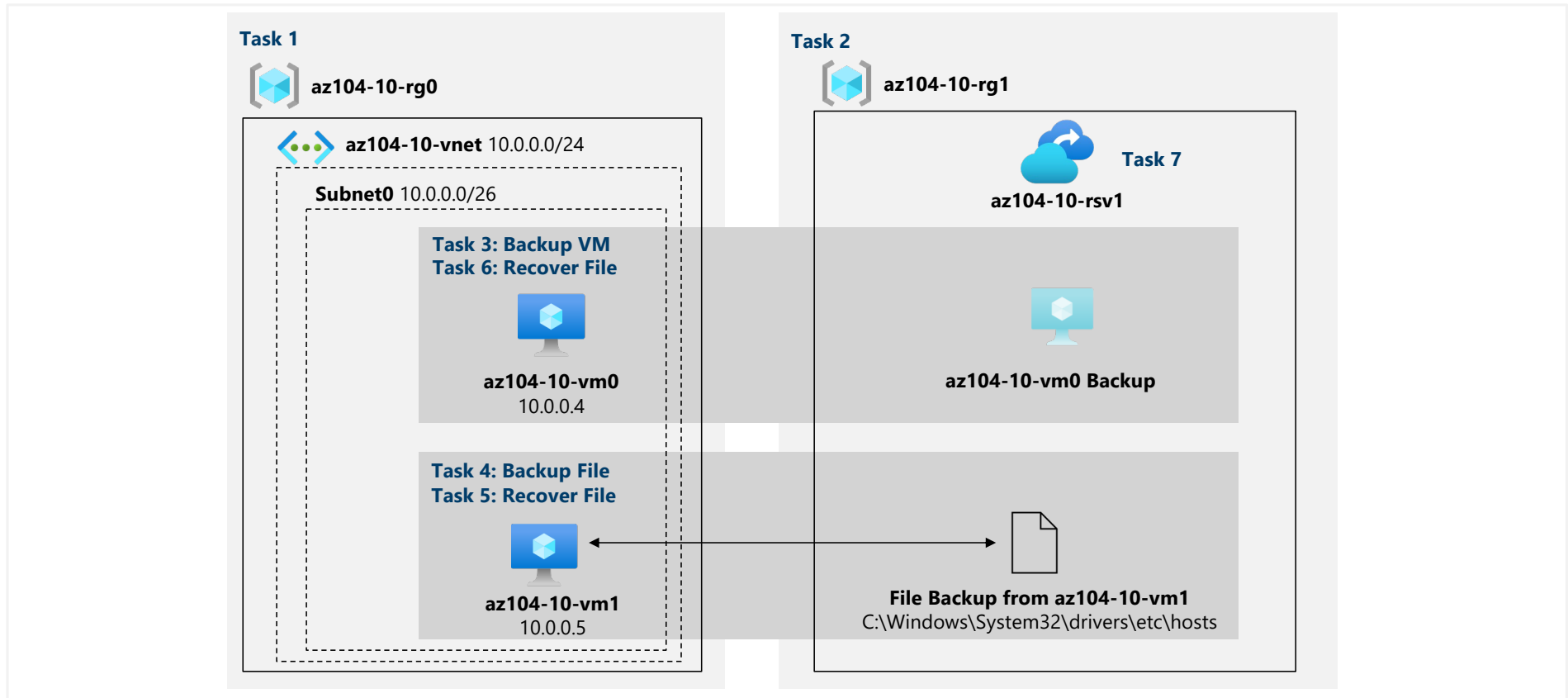
Perform file recovery by using Azure virtual machine snapshots

Task 7:

Review the Azure Recovery Services soft delete functionality

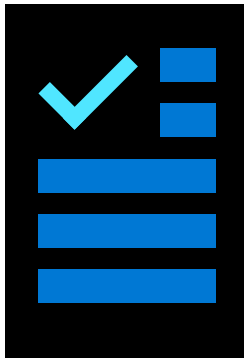
Next slide for an architecture diagram 

Lab 10 – Architecture diagram



Module Review

Module Review Questions



Microsoft Learn Modules (docs.microsoft.com/Learn)

Protect your virtual machines by using Azure Backup

Back up and restore your Azure SQL database

Protect your Azure infrastructure with Azure Site Recovery

Protect your on-premises infrastructure from disasters with Azure Site Recovery

End of presentation