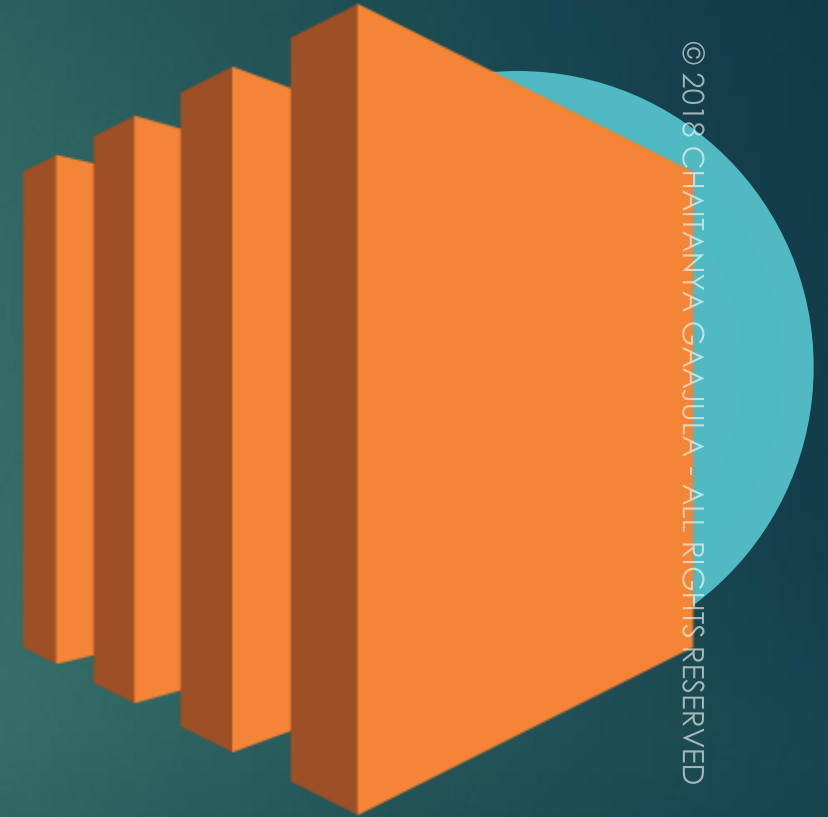


Virtual Machines

Agenda

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- ❖ What is AZURE VM
- ❖ AZURE VM Benefits & Features
- ❖ How to access AZURE VM
- ❖ AZURE VM Purchasing Options
- ❖ AZURE VM Amazon Machine Images
- ❖ AZURE VM Storage for the Root Device
- ❖ AZURE VM Creating AMI
- ❖ AZURE VM Instance Types
- ❖ AZURE VM Resizing
- ❖ AZURE VM Instance Lifecycle
- ❖ Elastic Network Interfaces
- ❖ AZURE VM Pricing
- ❖ Placement Groups
- ❖ AZURE CLI
- ❖ Hands-On Lab



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AZURE VM: Benefits

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Elastic
Web-Scale
Computing

Completely
Controlled

Flexible
Cloud Hosting
Services

Integrated

Reliable

Secure

Inexpensive

AZURE VM: Features

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AZURE VM: How to access AZURE VM

6

Web-based User Interface

Command Line Interface (CLI)

Windows PowerShell

AZURE VM: Purchasing Options

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On-Demand Instances

Pay by the hour

Reserved Instances

Purchase at significant discount (up to 75%).

Instances are always available

1-year to 3 year terms

Spot Instances

Highest bidder uses instance at a significant discount (up to 90%)

Spot blocks supported

Dedicated Instance

Pay, by the hour, for instances that run on single tenant hardware

Dedicated Hosts

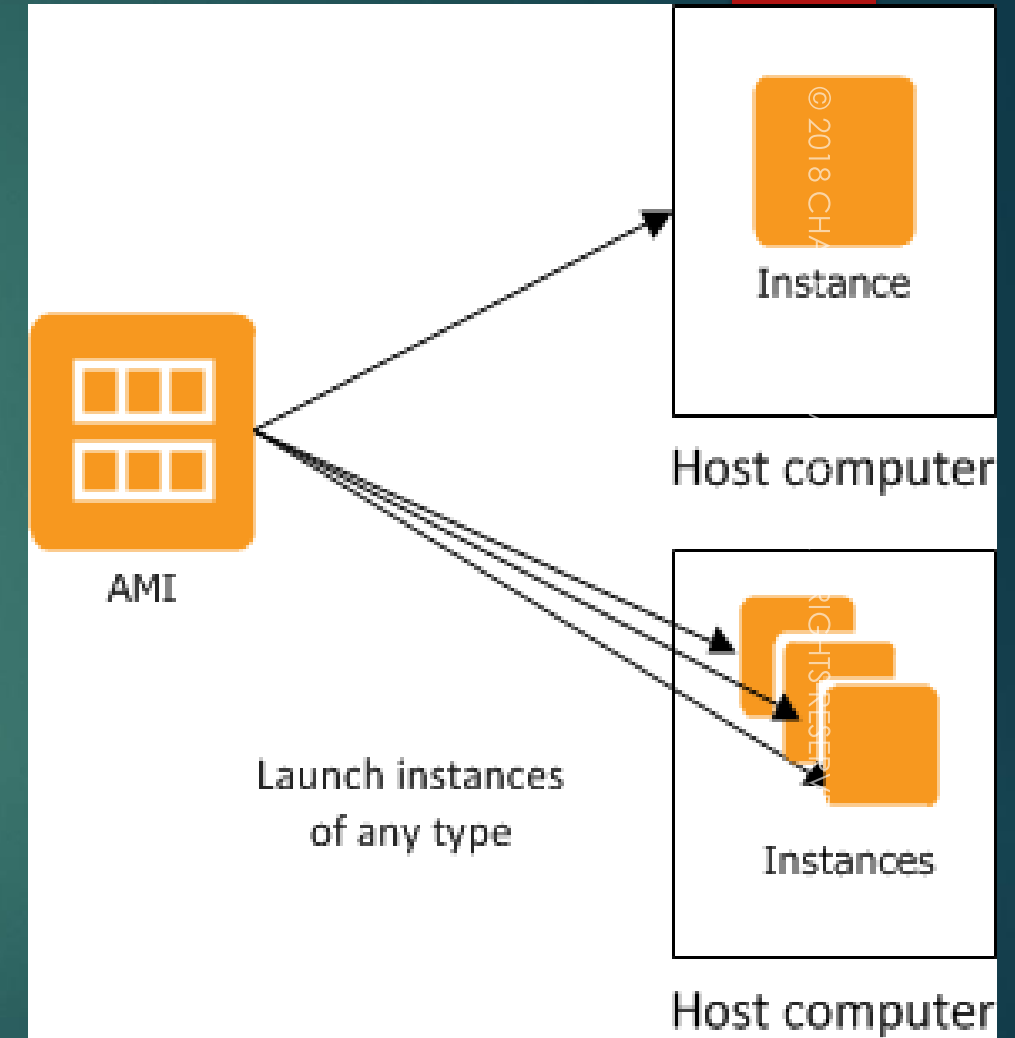
Physical host is fully dedicated to your instances.

Bring your per-socket, per-core, or per-VM software licenses to reduce cost.

AZURE VM: Amazon Machine Images

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- ❑ An Amazon Machine Image (AMI) provides the information required to launch an instance.
- ❑ An AMI includes the following:
 - A template for the root volume for the instance (for example, an operating system, an application server, and applications)
 - Launch permissions that control which AZURE accounts can use the AMI to launch instances
 - A block device mapping that specifies the volumes to attach to the instance when it's launched.



AZURE VM: Storage for the Root Device

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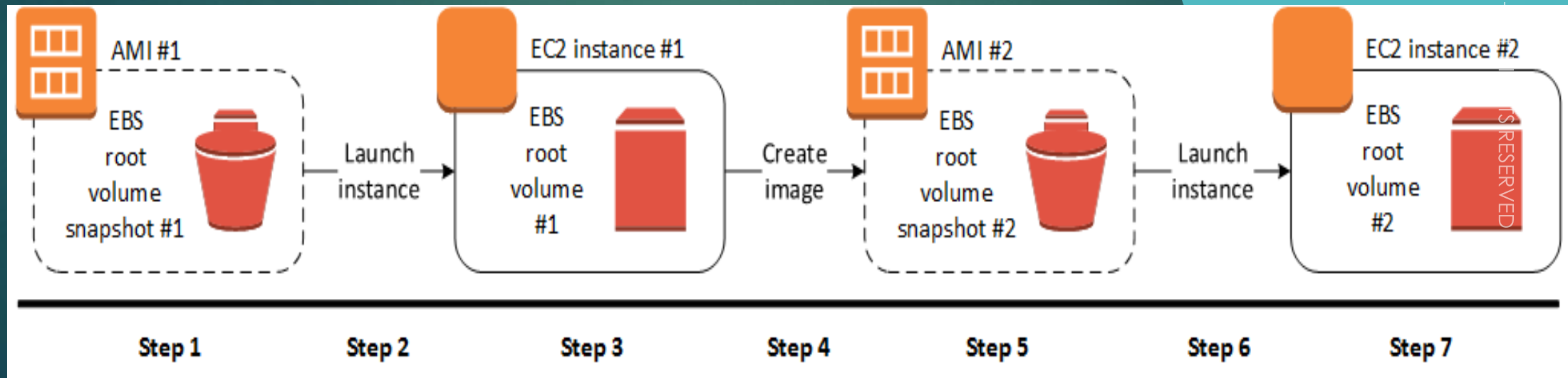
Characteristic	EBS Backed	Instance-Store Backed
Boot Time	Usually < 1 minute	Usually < 5 minutes
Size Limit	16 TiB	10 GiB
Data Persistence	The root volume is deleted when the instance terminates or EBS volumes persists after instance termination	Data on any instance store volumes persists only during the life of the instance
Charges	Instance usage ✓ EBS volume usage ✓ Storing your AMI as an EBS snapshot	Instance usage ✓ Storing AMI in S3
Stopped State	Can be stopped	Cannot be stopped

AZURE VM: Creating AMI

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- ☐ Select an appropriate EBS-backed AMI
- ☐ Launch an instance
- ☐ Update an instance
- ☐ Create image
- ☐ Launch an instance from your new AMI

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AZURE VM: Instance Types

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- ❑ The instance type specifies the hardware of the host computer used for your instance.
- ❑ Each instance type offers different compute, memory, and storage capabilities.
- ❑ Amazon AZURE VM dedicates some resources of the host computer, such as CPU, memory, and instance storage, to a particular instance.
- ❑ Amazon AZURE VM shares other resources of the host computer, such as the network and the disk subsystem, among instances.
- ❑ If each instance on a host computer tries to use as much of one of these shared resources as possible, each receives an equal share of that resource.
- ❑ However, when a resource is under-utilized, an instance can consume a higher share of that resource while it's available.

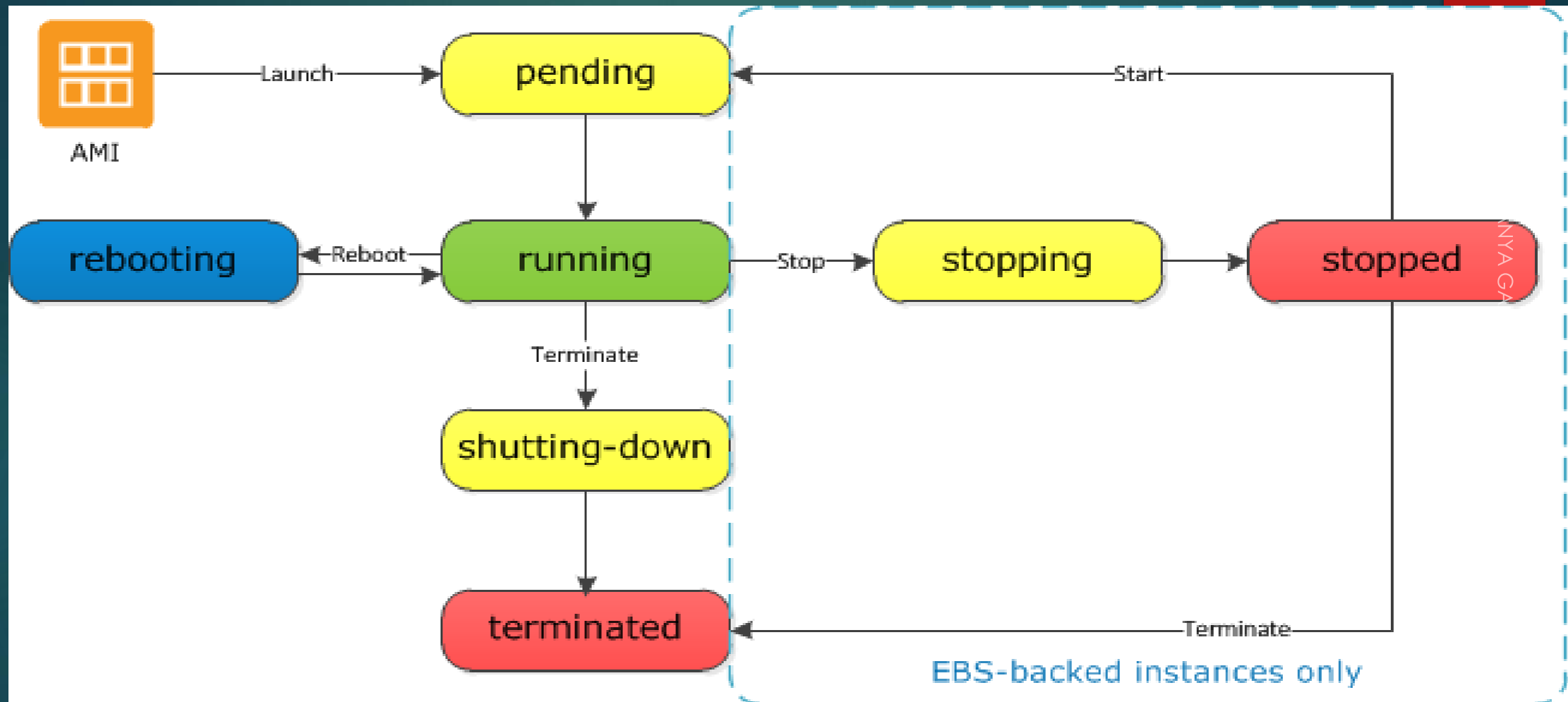
AZURE VM: Resizing

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- ❑ If the root device for your instance is an EBS volume, you can change the size of the instance simply by changing its instance type, which is known as resizing.
- ❑ You must stop your Amazon EBS-backed instance before you can change its instance type.
- ❑ After resizing, the instance ID does not change.
- ❑ If instance has a public IPv4 address, AZURE release the address and give it a new public IPv4 address.
- ❑ The instance retains its private IPv4 addresses, any Elastic IP addresses.

AZURE VM: Instance Lifecycle

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AZURE VM: Reboot, Stop, and Terminate

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Characteristic	Reboot	Stop/start (EBS- backed instances only)	Terminate
Host computer	✓The instance stays on the same host computer	The instance runs on a new host computer	None
Private and public IPv4 addresses	✓These addresses stay the same	The instance keeps its private IPv4 address. ✓The instance gets a new public IPv4 address	None
Elastic IP addresses (IPv4)	The Elastic IP remains associated with the instance	The Elastic IP remains associated with the instance	The Elastic IP is disassociated from the instance
Instance store Volumes	The data is preserved	The data is erased	✓The data is erased
Root device volume	The volume is preserved	The volume is preserved	The volume is deleted by default
Billing	The instance billing hour doesn't change.	You stop incurring charges for an instance as soon as its state changes to stopping. Each time an instance transitions from stopped to running, it starts a	✓You stop incurring charges for an instance as soon as its state changes to

AZURE VM: Instance Termination

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- ❑ After you terminate an instance, it remains visible in the console for a short while, and then the entry is automatically deleted.
- ❑ By default, Amazon EBS root device volumes are automatically deleted when the instance terminates.
- ❑ By default, any additional EBS volumes that you attach at launch, or any EBS volumes that you attach to an existing instance persist even after the instance terminates.
- ❑ If you want to prevent your instance from being accidentally terminated using Amazon AZURE VM, you can [enable termination protection](#) for the instance

AZURE VM: Elastic IP

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- ❑ An Elastic IP address is a public IP address (static) that you can allocate to instance.
- ❑ You can disassociate an Elastic IP address from a resource, and re-associate it with a different resource.
- ❑ A disassociated Elastic IP address remains allocated to your account until you explicitly release it.
- ❑ To ensure efficient use of Elastic IP addresses, a hourly charge is associated if an Elastic IP address is not associated with a running instance, or if it is associated with a stopped instance or an unattached network interface.
- ❑ You are not charged for one Elastic IP address associated with the running instance, but you are charged for any additional Elastic IP addresses associated with the instance.
- ❑ By default, all AZURE accounts are limited to 5 Elastic IP addresses per region.

AZURE VM: Elastic Network Interfaces

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- ❑ An elastic network interface is a virtual network interface that you can attach to an instance in a VPC.
- ❑ You can create a network interface, attach it to an instance, detach it from an instance, and attach it to another instance.
- ❑ Every instance has a default network interface, called the **primary network interface (eth0)**. You cannot detach a primary network interface from an instance.
- ❑ You can create and attach additional network interfaces. The maximum number of network interfaces that you can use varies by instance type.
- ❑ A network interface can include the following attributes:
 - A primary private IP address & one or more secondary private IP addresses
 - One Elastic IP address per private IP address
 - One public IP address
 - One or more security groups
 - A MAC address

AZURE VM: Understanding AZURE VM Billing

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- ❑ If instance is billed by the hour, you are billed for a minimum of one hour each time a new instance is started—when it enters the running state.
- ❑ If your instance is billed by the second, you are billed for a minimum of 60 seconds each time a new instance is started—when it enters the running state.
- ❑ Instances that are in any other state—such as stopped, pending, etc.—are not billed.

AZURE VM: Limitation

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Resource	Default Limit
EIP per region	5
Running On-Demand t2.micro instances	20
Reserved Instances	20

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AZURE CLI

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- ▶ AZURE CLI is an open source tool built that provides commands for interacting with AZURE services. With minimal configuration, you can start using all of the functionality provided by the AZURE Management Console from your favorite terminal program.
- ▶ Linux shells – Use common shell programs such as Bash, Zsh, and tsch to run commands in Linux, macOS, or Unix.
- ▶ Windows command line – On Microsoft Windows, run commands in either PowerShell or the Windows Command Processor.
- ▶ Remotely – Run commands on Amazon AZURE VM instances through a remote terminal such as PuTTY or SSH, or with Amazon AZURE VM systems manager

Hands-On Lab

AZURE AMI: Demonstration

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❑ Custom AMI

- Creating Custom AMI
- Registering & Deregistering AMI
- Making an AMI Public
- Launch AMI from other account

❑ Marketplace

- <http://Azure.amazon.com/marketplace>
- Type of AMIs
- Software & Hardware Cost

❑ Instance

- Launch an Instance
- Configure Web Server
- Connect an Instance
- Configure Static IP Address

