Chapter 5
Compute Services Implementation

Episode 5.01
Launching an EC2 Linux Instance Lab

DEMO

- Launching a Linux Instance

Episode 5.02
Configuring an EC2 Linux Instance Lab

DEMO

- Configuring a Linux Instance

Episode 5.03
Setting up an EC2 Windows Instance Lab

DEMO

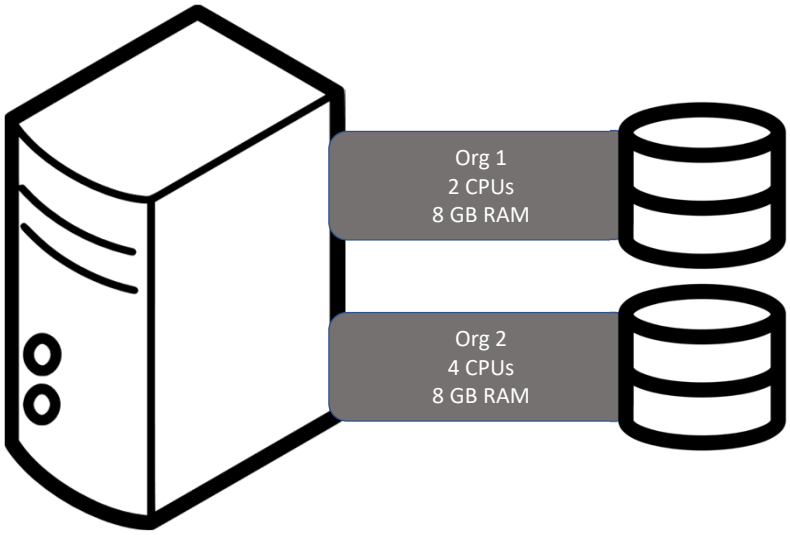
- Launching a Windows Instance
- Configuring a Windows Instance

Episode 5.04
Shared Tenancy

Shared Tenancy

- Multiple instances on a physical machine
- Multiple organizations/applications share the time on the machine
- Default behavior of an instance

Shared Tenancy Illustrated



Shared Tenancy Benefits

- Reduced costs
- Simpler deployment

Shared Tenancy

- Multiple customers share the time and space on the physical machine
- Default instance behavior

Shared Tenancy Considerations

- Pros
  - Reduced costs
  - Simpler deployment
- Cons
  - Lower performance
  - Less control

Shared Tenancy Hindrances

- Lower performance
- Less control

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- Creating a shared instance

Episode 5.05
Dedicated Hosts

Dedicated Hosts

- The hosts run the virtual machines
- Dedicated hosts are physical machines
- Used by only one AWS customer

Dedicated Hosts

- Physical machines
  - Run the virtual machines
- Used by one customer
- Must be explicitly configured
- Not available in free tier

Dedicated Host Benefits

- Better licensing management and reporting
- Allow placement of instances on specific hosts for compliance management
- Control host placement during restarts

Dedicated Host Considerations

- Pros
  - More accurate licensing management
  - More detailed reporting
  - Compliance management
  - Determine host placement during instance restarts
- Cons
  - Costs more

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- https://aws.amazon.com/ec2/dedicated-hosts/getting-started/

Episode 5.06
Dedicated Instances

Dedicated Instances

- Runs on a physical machine
  - Only instance running on that machine
  - On restart, may be moved
- Used by one customer
- Must be explicitly configured
- Not available in free tier

Dedicated Instances

- Pros
  - Runs on hardware dedicated to the customer
  - Provides performance advantage of a dedicated host
- Cons
  - Less accurate licensing management
  - Doesn't allow placement determination

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- https://aws.amazon.com/ec2/purchasing-options/dedicated-instances/

Episode 5.07
AMI Virtualization

Amazon Machine Image (AMI)

- A blueprint with the details of server configuration
- Like older localized imaging solutions in some ways
- The term instance indicates the use of the AMI
- Each instance is an instance of an AMI

Amazon Machine Image (AMI)

- Blueprint with server configuration details
- Similar to localized imaging solutions

Amazon Machine Image (AMI)

- The term “instance” indicates the use of the AMI
- All instances are created from an AMI
- Sources
  - Amazon (free)
  - AWS Marketplace (free/$)
  - Community (free)

AMI Launch Permissions

- Who can launch an instance of an AMI?
  - Public: Anyone
  - Explicit: Specified
  - Implicit: Owner
- Must be set
  - Defaults to implicit

AMI Launch Permissions

- Who can launch an instance?
- Public: All AWS accounts
- Explicit: Specific AWS accounts
- Implicit: The owner of the AMI can launch it

AMI Creation

- Many come with AWS
- AMIs can be created from the existing AMIs
- AMIs can be created from scratch
- AMIs can be pulled from other public sources
- They may be purchased from the AWS Marketplace

AMI Creation

- Use existing AWS AMIs
- Customize existing AMIs
- Create from scratch
- Use from other public sources
  - Use with caution!
- Select from AWS Marketplace

HVM and PC AMIs

- Hardware Virtual Machine (HVM) AMIs fully virtualizes the hardware
  - Requires hardware-assisted virtualization
- Paravirtual (PV) AMIs run on hosts without specific support for virtualization
  - Do not perform as well as HVM AMIs

HVM AMIs

- Hardware Virtual Machine (HVM)
  - AMIs fully virtualizes the hardware
  - Requires hardware-assisted virtualization

PV AMIs

- Paravirtual (PV)
  - Run on hosts without specific support for virtualization
  - Doesn't perform as well as HVM AMIs

Instance Root Volume

- Contains the boot sector
- Boot sector initiates the boot loader
- Boot loader launches the OS

Instance Root Volume

- Instance store-backed AMI
  - Root volume is stored in S3
  - No support for the stop action
  - On failure, data in the instance store is lost
- EBS-backed AMI
  - Root volume stored in an EBS volume
  - Support for the stop action
  - On failure, data in the EBS volume is not lost