

Module 7

Introduction to containers and
serverless computing in Azure

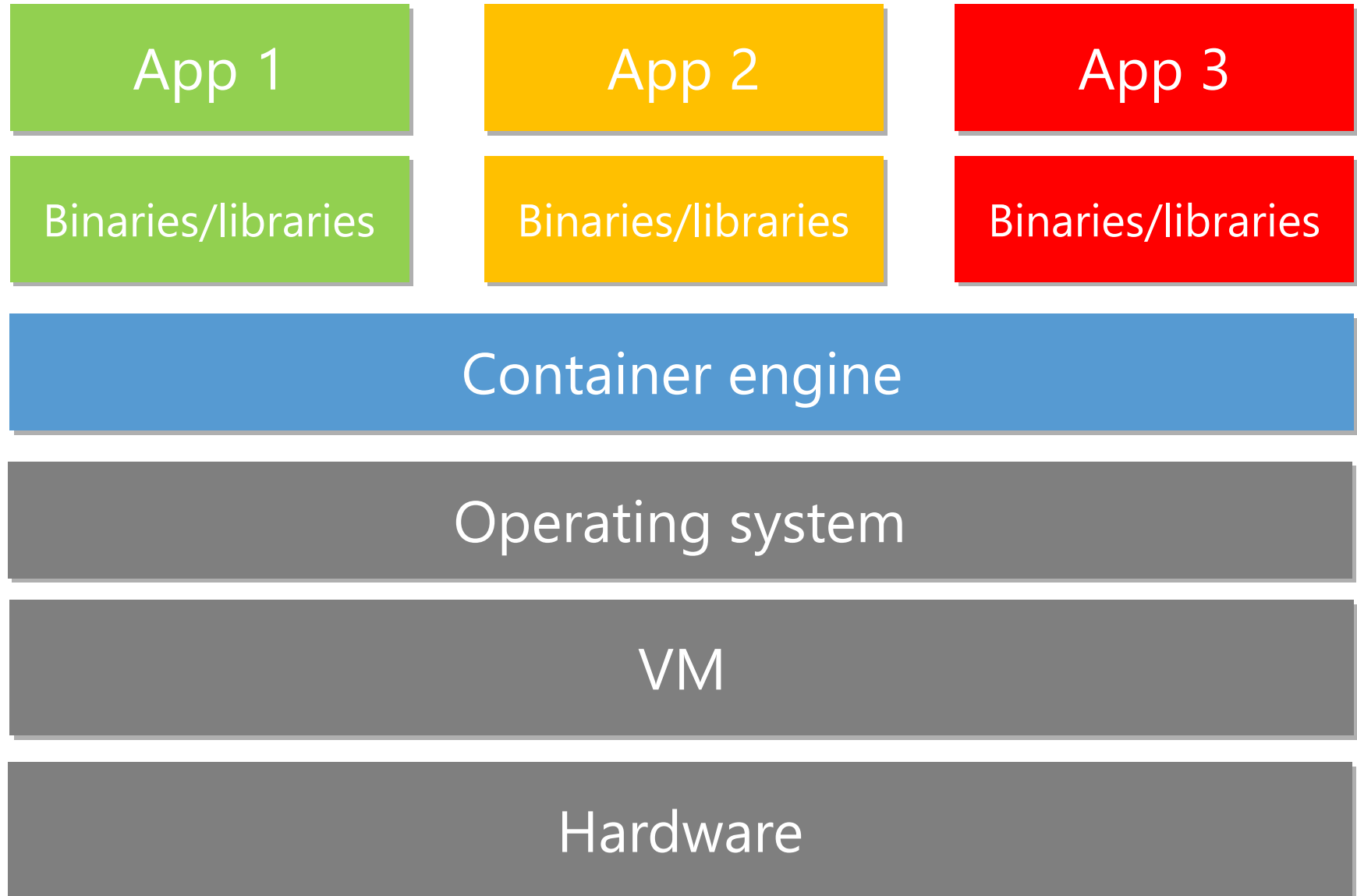
Module Overview

- Implementing Windows and Linux containers in Azure
- Introduction to Azure serverless computing

Lesson 1: Implementing Windows and Linux containers in Azure

- Introduction to containers
- Introduction to Docker
- Implementing Docker hosts in Azure
- Deploying and managing containers on Azure VMs
- Demonstration: Installing a Docker host and containers on an Azure VM
- Creating multicontainer applications with Docker Compose
- Implementing Azure Container Registry

Introduction to containers



Docker terminology:

- Docker Engine
- Image
- Container
- Dockerfile
- Docker Registry

Implementing Docker hosts in Azure

- Install the Docker VM extension:
 - Use an Azure Resource Manager template, Azure PowerShell, or Azure CLI
 - Intended for Windows or Linux Azure VMs
- Provision a Docker Azure VM from Azure Marketplace:
 - Intended for Windows or Linux Azure VMs
- Implement Docker for Azure:
 - Docker CE for Azure (intended for clusters of Azure VMs)
 - Docker Certified Infrastructure for Azure (intended for clusters of Azure VMs)
 - Install Docker CE on Azure VMs (intended for Windows 10 and Linux Azure VMs)
- Run the Docker Machine Azure driver:
 - Intended for Windows and Linux Azure VMs
- Use the NuGet provider:
 - Intended for Windows Azure VMs
- Deploy an AKS cluster:
 - Intended for platform-managed clusters of Linux Azure VMs

Deploying and managing containers on Azure VMs

- Connect to an Azure VM Docker host:
 - Docker Machine
 - RDP
 - SSH
- Use the Docker client to:
 - Create containers
 - Stop containers
 - Remove containers
 - Create images
 - Browse for images
- Alternatively, deploy Azure Container Instances

Demonstration: Installing a Docker host and containers on an Azure VM

In this demonstration, you will learn how to install a Docker host and containers on an Azure VM

Creating multicontainer applications with Docker Compose

- Install Docker Compose:
 - Included by default when using:
 - Azure Marketplace Docker images
 - The Azure VM Docker extension
 - Docker Machine
- Create **docker-compose.yml**:
 - Include all containers
 - Specify container dependencies
 - Specify deployment parameters
- Run **docker-compose up**

Implementing Azure Container Registry



Azure Container Registry service settings:


- Unique name in the **azurecr.io** namespace
- Managed SKU:
 - Basic
 - Standard
 - Premium
- Authentication:
 - The built-in admin user account:
 - You must enable it (disabled by default)
 - The account has two passwords (to facilitate password rotation)
 - Full permissions to the registry
 - Azure AD service principals:
 - You must create them
 - Permissions configurable through RBAC

Lesson 2: Introduction to Azure serverless computing

- Introduction to Logic Apps
- Introduction to Azure Functions
- Introduction to Service Bus
- Introduction to Event Grid and Event Hubs

Introduction to Logic Apps

 Twitter Connector 

 Search Tweets

Specify a query to retrieve tweets.

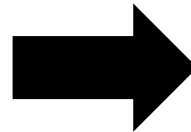
▼ body



Tweet Text


Retweet Count


Tweeted By


...




 Dropbox Connector 



 Upload File

File Path
 

Content
 

Content Transfer Encoding
 

Overwrite

Introduction to Azure Functions

- Methods of execution:
 - Triggers
 - Webhooks
 - Timer
- Language of choice:
 - C#, F#, Node.js, Java, Python, PHP
- Flexible pricing:
 - Consumption plan
 - App Service plan
- Integration:
 - Azure: Cosmos DB, Event Hubs, Event Grid, Mobile Apps (tables), Notification Hubs, Service Bus, and Storage
 - Non-Azure: GitHub (webhooks), on-premises (using Service Bus), Twilio (SMS)

Introduction to Service Bus

- Service Bus supports four communication services:
 - Queues – part of Azure messaging infrastructure:
 - Queuing
 - Publish/subscribe
 - Web service remoting
 - Integration patterns
 - Topics
 - Relays
 - Notification Hubs
- Implementation of Service Bus involves:
 - Creating a namespace
 - Defining communication services within the namespace

Introduction to Event Grid and Event Hubs

Area	Event Grid	Event Hubs	Service Bus
Purpose	Reactive programming (reacting to status changes)	Big data pipeline	High-value enterprise messaging
Primary use case	Distribution of discrete events	Telemetry and distributed data streaming	Order processing and financial transactions

Lab: Implementing containers on Azure VMs

- Exercise 1: Implementing Docker hosts on Azure VMs
- Exercise 2: Deploying containers to Azure VMs
- Exercise 3: Deploying multicontainer applications to Azure VMs with Docker Compose

Logon Information

Virtual machine: **10979F-MIA-CL1**

User name: **Admin**

Password: **Pa55w.rd**

Estimated Time: 30 minutes

Lab Scenario

Adatum Corporation plans to implement some of its applications as Docker containers on Azure VMs. To optimize this implementation, you intend to combine multiple containers by using Docker Compose. Adatum would also like to deploy its own private Docker registry in Azure to store containerized images. Your task is to test the functionality of tools that facilitate deployment of Docker hosts and Docker containers.

Lab Review

- Which method would you use when deploying Docker hosts on Azure VMs?

Module Review and Takeaways

- Review Question