

## Module 03: PART 1

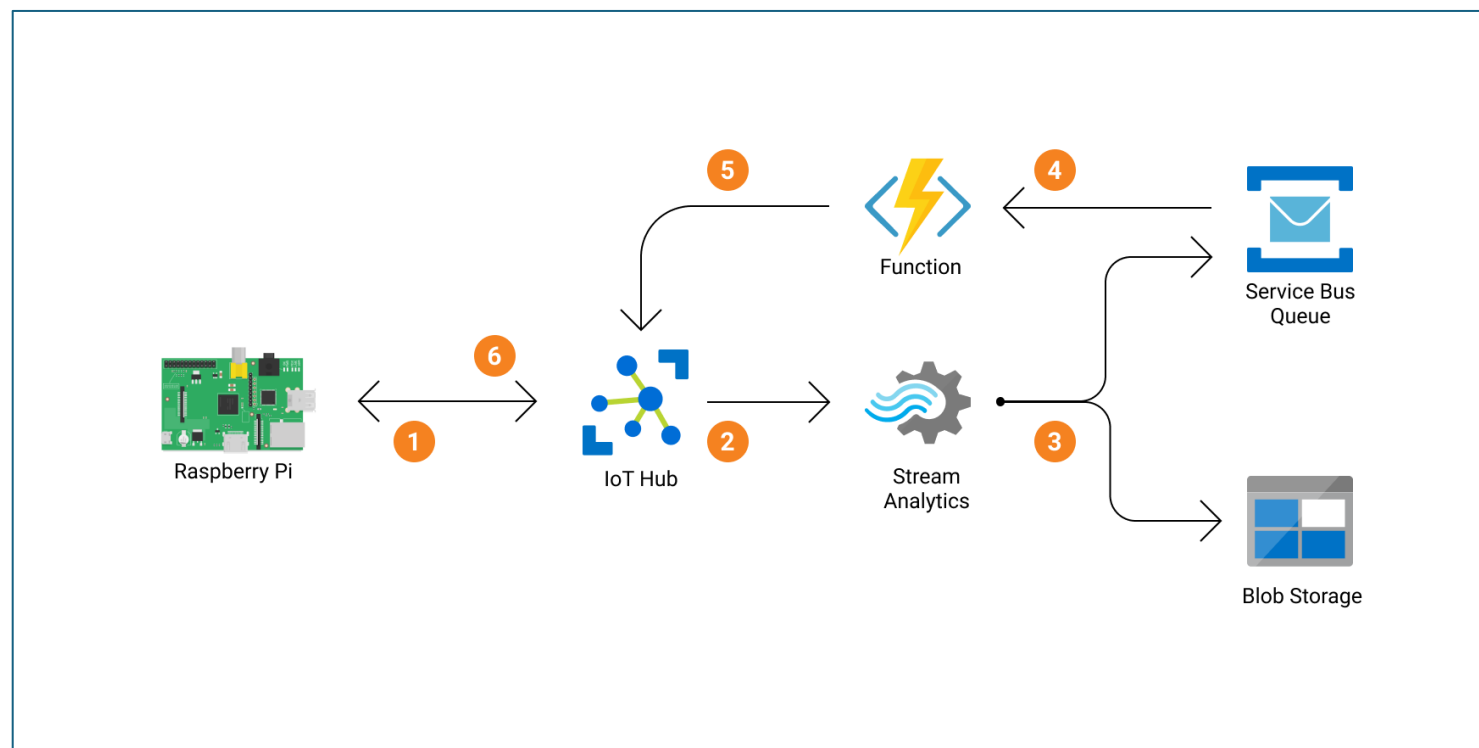
### 1. Internet of Things (IoT) Hub, IoT Central, and Azure Sphere

#### What is Internet of Things?

Internet of Things (**IoT**) is a network of internet connected devices (**IoT Devices**) embedded in everyday objects enabling sending and receiving data such as **settings** and **telemetry**.

#### A. Azure IoT Hub

- Managed service for **bi-directional communication**
- Platform as a Service (**PaaS**)
- Highly secure, scalable and reliable
- Integrates with a lot of Azure Services
- Programmable **SDKs (software development kit)** for popular languages (C, C#, Java, Python, Node.js)
- **Multiple protocols** (HTTPS, AMQP, MQTT)



Home > Create a resource >

## Marketplace

Get Started

Service Providers

Management

Private Marketplace

Private Offer Management

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My solutions

Recently created

Private plans

Categories

Internet of Things (60)

Analytics (27)

AI + Machine Learning (11)

Security (10)

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iot hub

Pricing : All Operating System : All Publisher Type : All Product Type : All Publisher name : All

☒ Azure services only

Showing 1 to 20 of 87 results for 'iot hub'. [Clear search](#)

**IoT Hub**

Microsoft

Azure Service

Connect, monitor and manage IoT devices

Create

**IoT Hub Device Provisioning Service**

Microsoft

Azure Service

Seamless, zero-touch registration of devices to IoT Hub with security that begins at the device and ends with our cloud

Create

**ux4iot for IoT Hub**

Device Insight GmbH

Azure Application

ux4iot lets you directly connect your web application to your IoT devices through IoT Hub

Starts at £59.59/month

Create

**Device Update for IoT Hub**

Microsoft

Azure Service

Securely and Reliably update your devices with Device Update for IoT Hub.

Create

**Insights Hub**

SIEMENS

Siemens DI Software

SaaS

Insights Hub is an industrial IoT as a service solution with advanced analytics and AI

Starts at Free

Subscribe

**IoT Edge Metrics Collector**

Microsoft

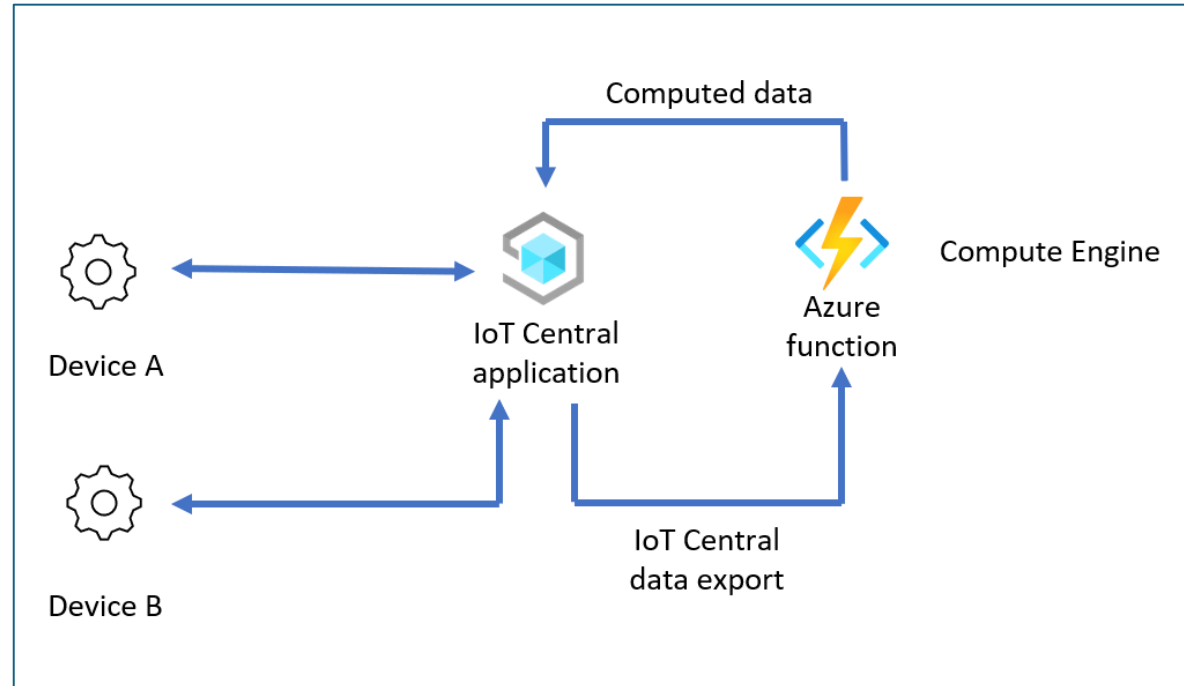
IoT Edge Modules

Collect Prometheus metrics from IoT Edge modules and transport them to Azure Monitor or IoT Hub

Create

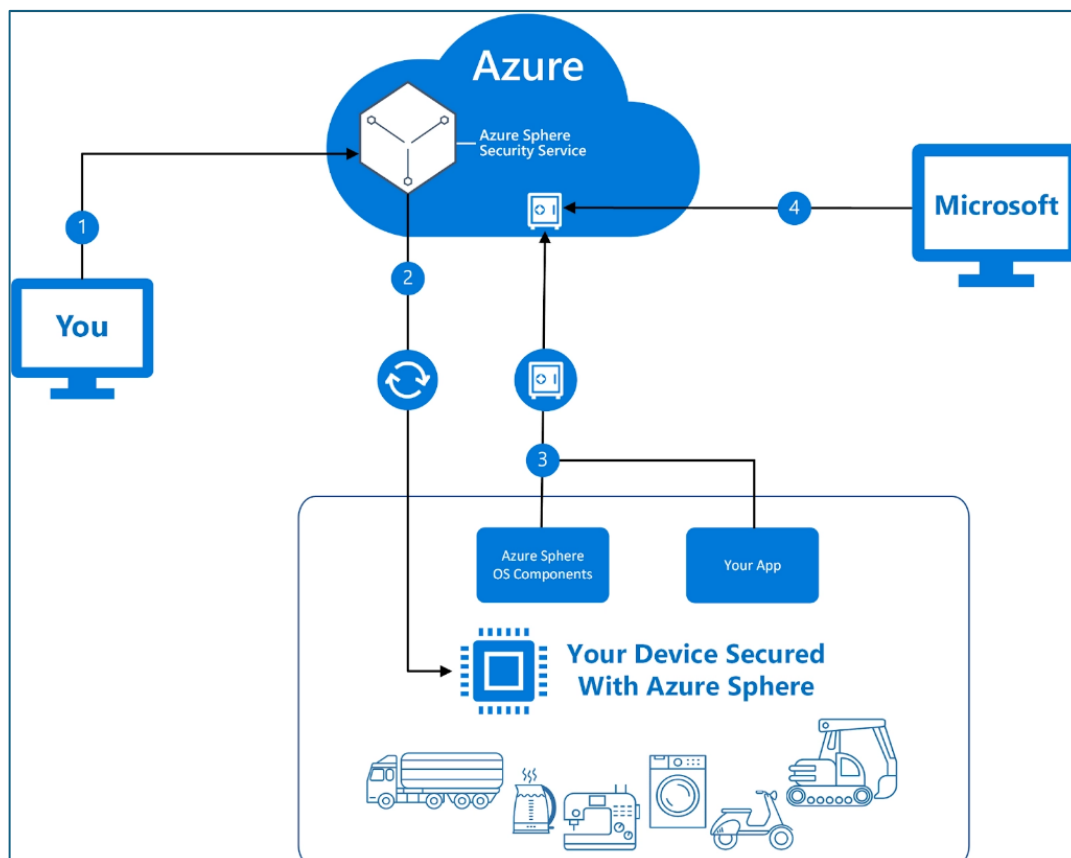
## B. Azure IoT Central

1. IoT App Platform - Software as a Service (SaaS)
2. Industry specific app templates
3. No deep technical knowledge required
4. Service for connecting, management and monitoring IoT devices
5. Highly secure, scalable and reliable
6. Built on top of the IoT Hub service and 30+ other services



## C. Azure Sphere

- Secure end-2-end IoT Solutions
  - Azure Sphere certified chips (microcontroller units - MCUs)
  - Azure Sphere OS based on Linux
  - Azure Security Service trusted device-to-cloud communication



## 2. Azure Synapse Analytics, HDInsight, and Azure Databricks

### What is Big Data?

**Big Data** is a field of technology that helps with the **extraction, processing and analysis of information** that **is too large or complex** to be dealt with by traditional software.

**The three V's rule:** Big data typically has one of the following characteristics

- **Velocity** - how fast the data is coming in or **how fast we are processing** it
  - Batch
  - Periodic
  - Near Real Time
  - Real Time
- **Volume** - how **much data we are processing**
  - Megabytes
  - Gigabyte
  - Terabytes
  - Petabytes
- **Variety** - **how structured/complex** the data is
  - Tables
  - Databases
  - Photo, Audio
  - Video, Social Media

### **A. Azure Synapse Analytics**

- Big data analytics platform (**PaaS**)
- Multiple components
  - Spark
  - Synapse SQL
    - SQL pools (dedicated – pay for provisioned performance)
    - SQL on-demand (ad-hoc – pay for TB processed)
  - Synapse Pipelines (**Data Factory – ETL**)
  - Studio (unified experience)

### **B. Azure HDInsight**

- Flexible multi-purpose big data platform (**PaaS**)
- Multiple technologies supported (**Hadoop**, **Spark**, **Kafka**, **HBase**, **Hive**, **Storm**, **Machine Learning**)

### **C. Azure Databricks**

- Big data collaboration platform (**PaaS**)
- Unified workspace for notebook, cluster, data, access management and collaboration
- Based on Apache Spark
- Integrates very well with common Azure data services

### 3. Artificial Intelligence & Machine Learning

#### What is Artificial Intelligence?

**Artificial Intelligence (AI)** is the simulation of human intelligence & capabilities by computer software.

#### What is Machine Learning?

**Machine Learning** is a subcategory of AI where a computer software is “taught” to draw conclusions and make predictions from data.

#### Azure Machine Learning

- Cloud-based platform for creating, managing and publishing machine learning models
- Platform as a Service (PaaS)
- Machine Learning Workspace – top level resource
- Machine Learning Studio – web portal for end-2-end development
- Features
  - **Notebooks** – using Python and R
  - **Automated ML** – run multiple algorithms/parameters combinations, choose the best model
  - **Designer** – graphical interface for no-code development
  - **Data & Compute** – management of storage and compute resources
  - **Pipelines** – orchestrate model training, deployment and management tasks

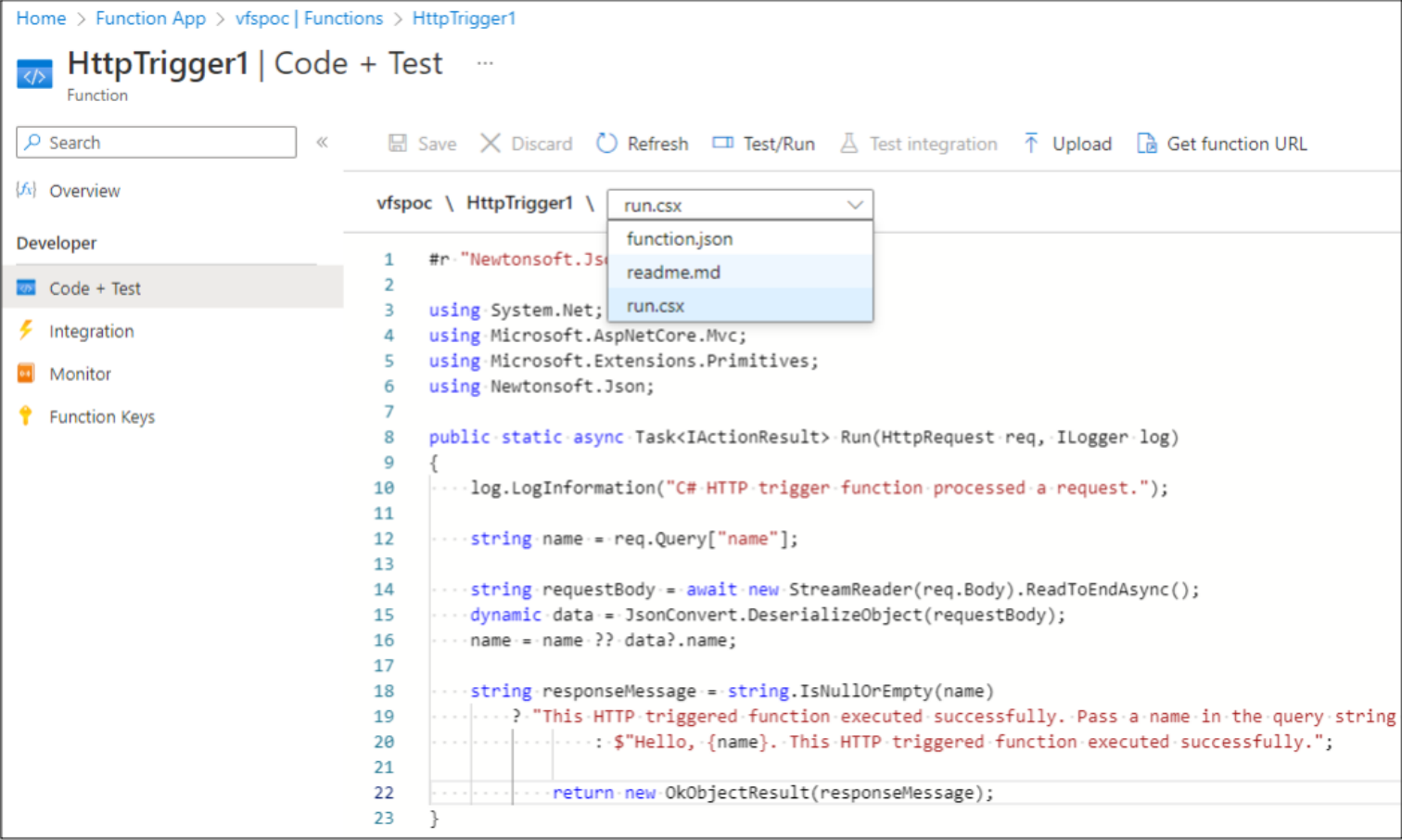
# 4. Serverless Computing

## What is Serverless?

**Serverless computing** is cloud-hosted execution environment that allows customers to run their applications in the cloud while [completely abstracting underlying infrastructure](#).

## A . Azure Functions

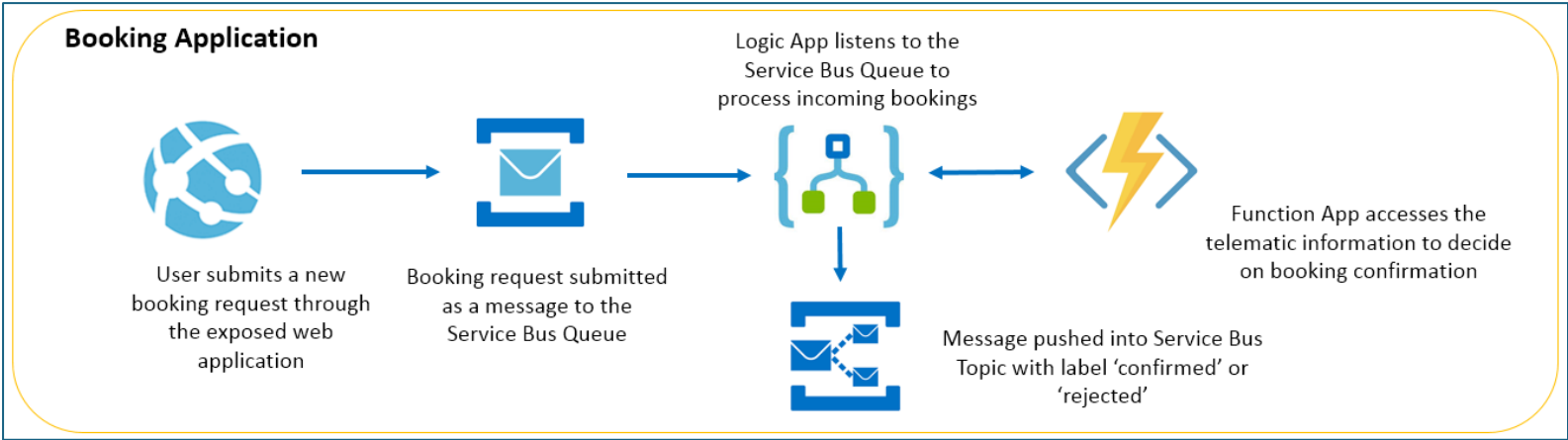
- **Serverless coding** platform (Functions as a Service, **FaaS**)
- Designed for **nano-service architectures** and **event-based applications**
- Scales up and down very quickly
- Highly scalable
- **Supports popular languages** and frameworks (.NET & .NET Core, Java, Node.js, Python, PowerShell, etc.)



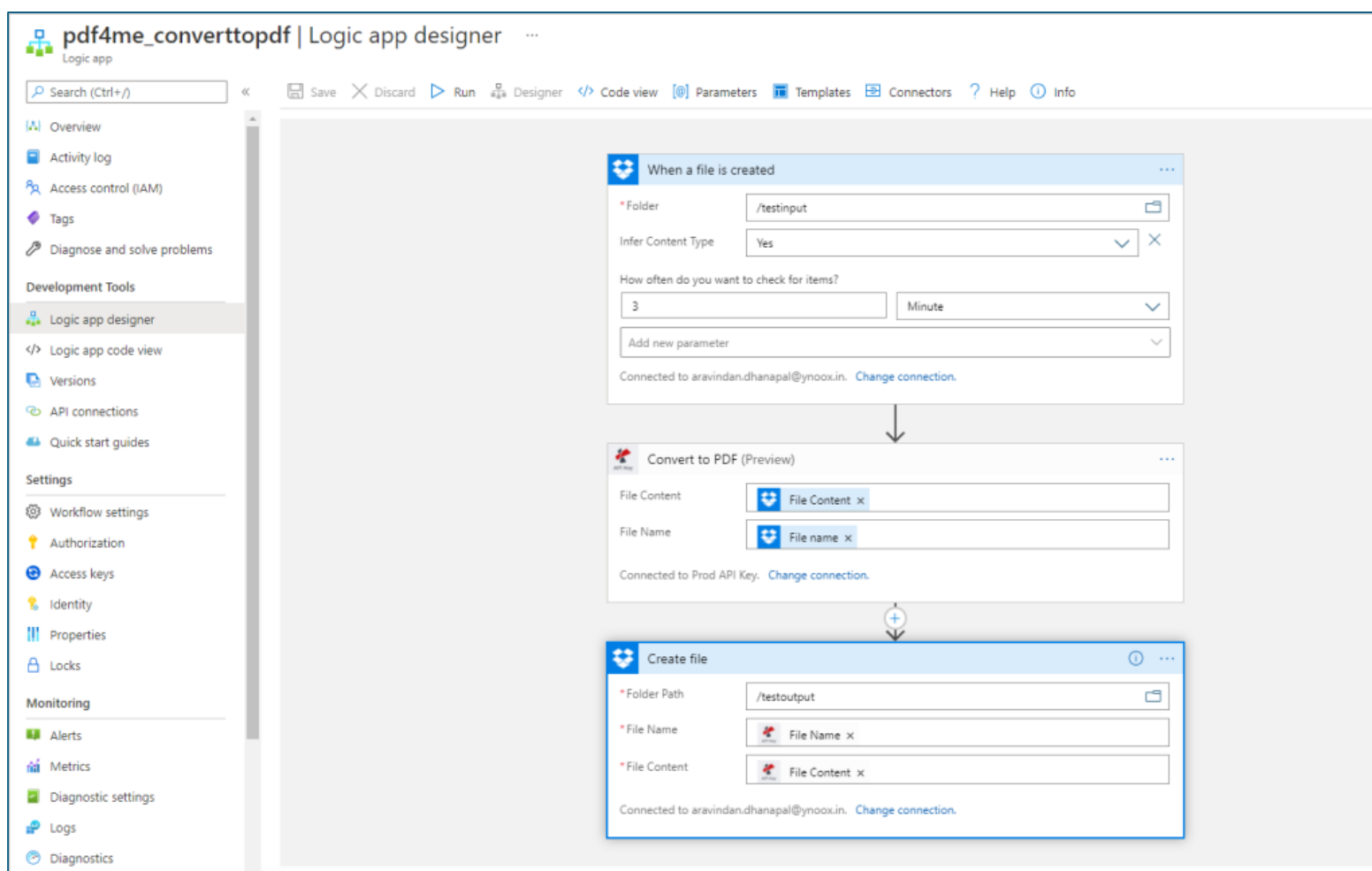
## B. Azure Logic Apps

- Serverless enterprise integration service (**PaaS**)
- 200+ connectors for popular services
- Designed for orchestration of
  - **business processes**,
  - **integration workflows for applications**, data, systems and services
- **No-code solution**

Example 1:



Example 2:



## 5. Develop your apps with DevOps and GitHub

### What is DevOps?

**DevOps** is a set of practices that combine both development (**Dev**) and operations (**Ops**).

DevOps aims to **shorten the development life cycle** by providing **continuous integration** and **delivery** (CI/CD) capabilities while **ensuring high quality** of deliverables.

### A. Azure DevOps

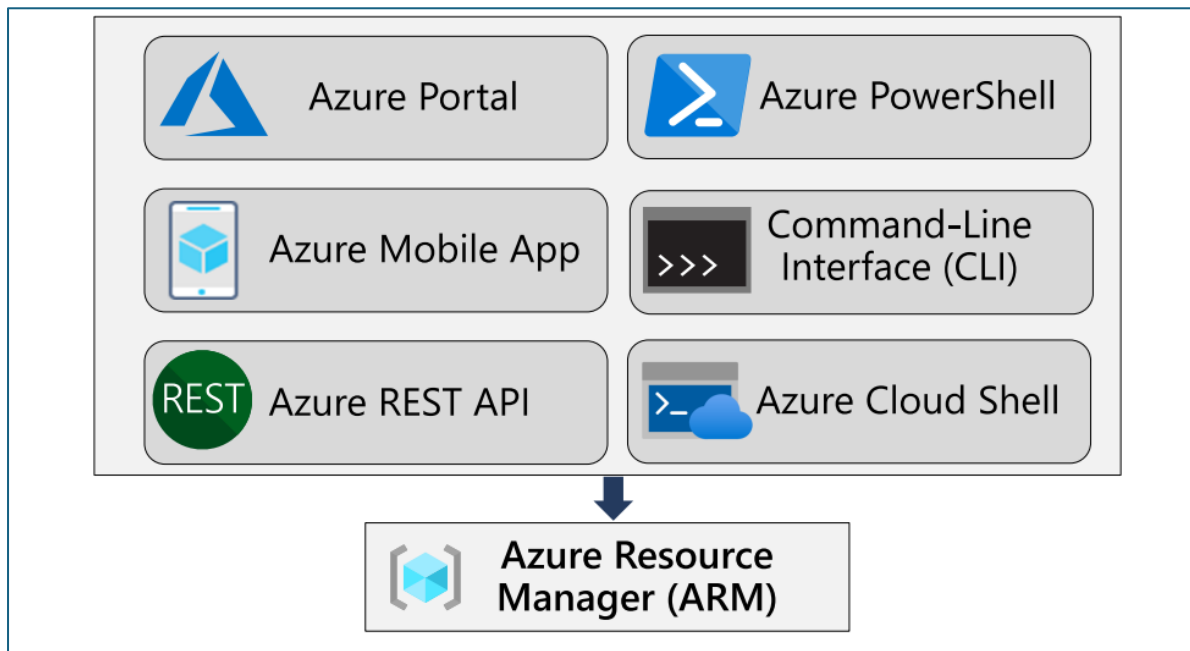
- **Collection of services** for building solutions using DevOps practices
- Services included
  - **Boards** – tracking work
  - **Pipelines** – building CI/CD workflows (build, test and deploy apps)
  - **Repos** – code collaboration and versioning with Git
  - **Test Plans** – manual and exploratory testing
  - **Artifacts** – manage project deliverables
- Extensible with **Marketplace** – over 1000 of available apps
- Evolved from **TFS** (Team Foundation Server), through **VSTS** (Visual Studio Team Services)

### B. Azure DevTest Labs

- Service for creation of sandbox environments for developers/testers (PaaS)
- Quick setup of self-managed virtual machines
- Preconfigured templates for VMs
- Plenty of additional artifacts (tools, apps, custom actions)
- Lab policies (quotas, sizes, auto-shutdowns)
- **Share** and **automate** labs via custom images
- Premade plugins/API/tools for CI/CD pipeline automation

## Module 03: PART 2

### 1 . Azure Management Tools:



#### A. Azure Portal

- Public **web-based interface for management** of Azure platform
- Designed for self-service
- Customizable
- **Simple tasks**

#### B. Azure PowerShell

- PowerShell and module
- **Designed for automation**
- **Multi-platform with PowerShell Core**
- Few command like:
  - **Connect-AzAccount** – log into Azure
  - **Get-AzResourceGroup** – list resource groups
  - **New-AzResourceGroup** – create new resource group
  - **New-AzVm** – create virtual machine

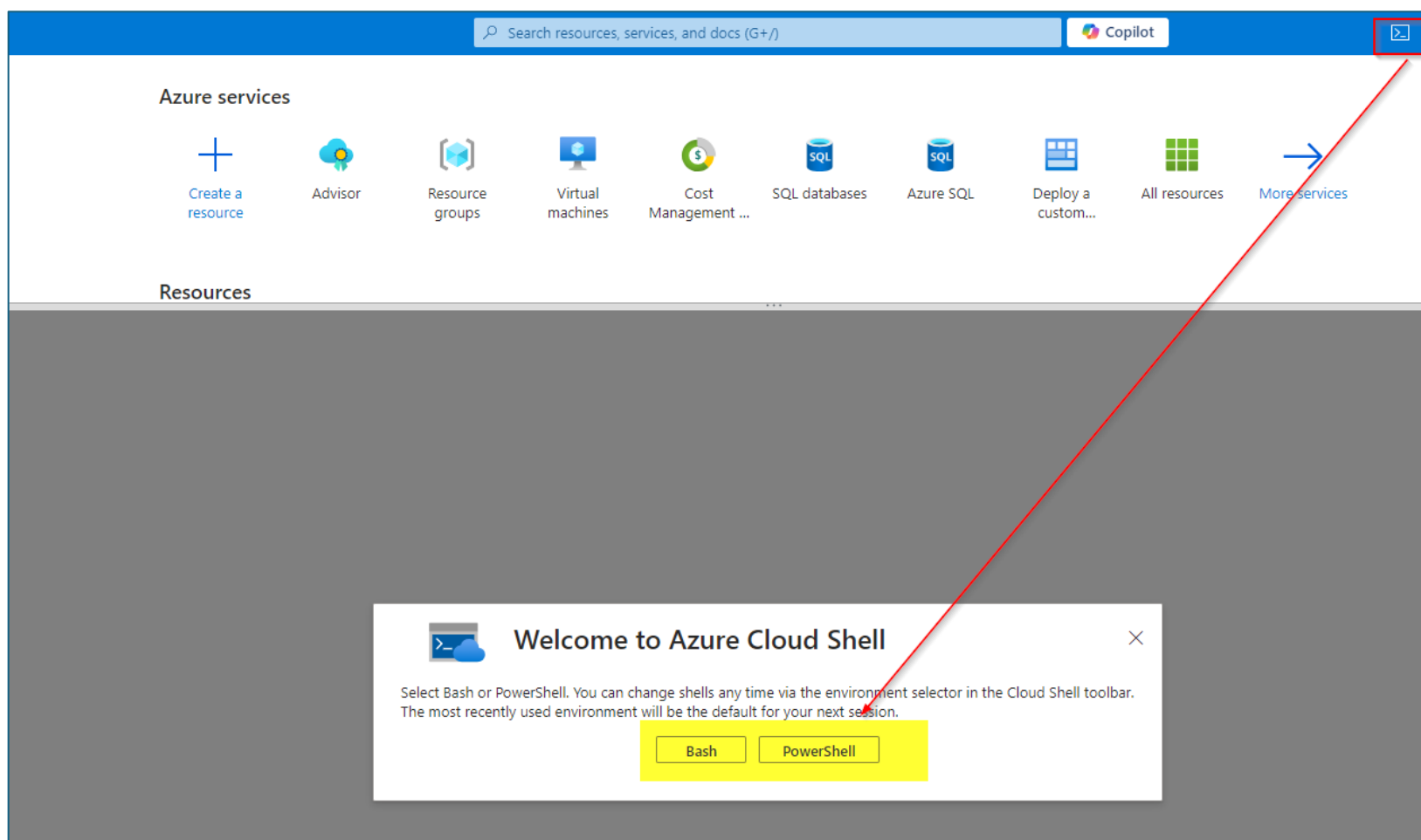
#### C. Azure CLI

- **Command Line Interface for Azure**
- Designed for automation
- **Multi-platform** (Python)
- Few command like:
  - **az login** – log into Azure
  - **az group list** – list resource groups
  - **az group create** – create new resource group
  - **az vm create** – create virtual machine

- Native OS terminal scripting

## D. Azure Cloud Shell

- Cloud-based scripting environment
- Completely free
- Supports both Azure PowerShell and Azure CLI
- Dozen of additional tools
- Multiple client interfaces
  - Azure Portal integration (portal.azure.com)
  - Shell Portal (shell.azure.com)
  - Visual Studio Code Extension
  - Windows Terminal
  - Azure Mobile App
  - Microsoft Docs integration



## 4. Azure Advisor

- **Personalized consultant** service
- Designed to provide **recommendations** and **best practices** for
  - **Cost** (SKU sizes, idle services, reserved instances, etc.)
  - **Security** (MFA settings, vulnerability settings, agent installations, etc.)
  - **Reliability** (redundancy settings, soft delete on blobs, etc.)
  - **Performance** (SKU sizes, SDK versions, IO throttling, etc.)
  - **Operational Excellence** (service health, subscription limits, etc.)
- **Actionable** recommendations



Create a resource

Home

Dashboard

All services

FAVORITES

All resources

Resource groups

App Services

Function App

SQL databases

Azure Cosmos DB

Virtual machines

Load balancers

Storage accounts

Virtual networks

Microsoft Entra ID

Monitor

Advisor

Microsoft Defender for Cloud

Cost Management + Billing

Help + support

Search resources, services, and docs (G+ /)

Copilot

Azure services

Create a resource

Advisor

Resource groups

Virtual machines

Cost Management ...

SQL databases

Azure SQL

Deploy a custom...

All resources

More services

Resources

RecentFavorite

Name	Type	Last Viewed
FIS Azure Enterprise CorpSys 2	Subscription	4 weeks ago
vwmazcxoptdb	Virtual machine	6 months ago
AMBIT-CLO-MANG-SERV-NA3	Resource group	6 months ago
vwmazcxoptapps	Virtual machine	6 months ago

See all

Navigate

Subscriptions

Resource groups

All resources

Dashboard

Tools

Microsoft Learn  
Learn Azure with free online training from Microsoft

Azure Monitor  
Monitor your apps and infrastructure

Microsoft Defender for Cloud  
Secure your apps and infrastructure

Cost Management  
Analyze and optimize your cloud spend for free

All services >

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Search

Subscription equals FIS Azure Enterprise CorpSys 2Recommendation Status equals ActiveResource Group equals AllType equals AllAdd filter

Overview

Getting started

Advisor score

Workbooks

Assessments (Preview)

Recommendations

Monitoring

Settings

Support + troubleshooting

Cost1Score0%

You are following all of our cost recommendations

See list of cost recommendations

Security2Score0%

You are following all of our security recommendations

See list of security recommendations

Reliability3Score0%

You are following all of our reliability recommendations

See list of reliability recommendations

Operational excellence4Score0%

You are following all of our operational excellence recommendations

See list of operational excellence recommendations

Performance5Score0%

You are following all of our performance recommendations

See list of performance recommendations

Get started in Advisor

Advisor provides Microsoft best practices to help you improve your workloads, identify cost saving opportunities or explore best practices.

Get started

Tips & tricks

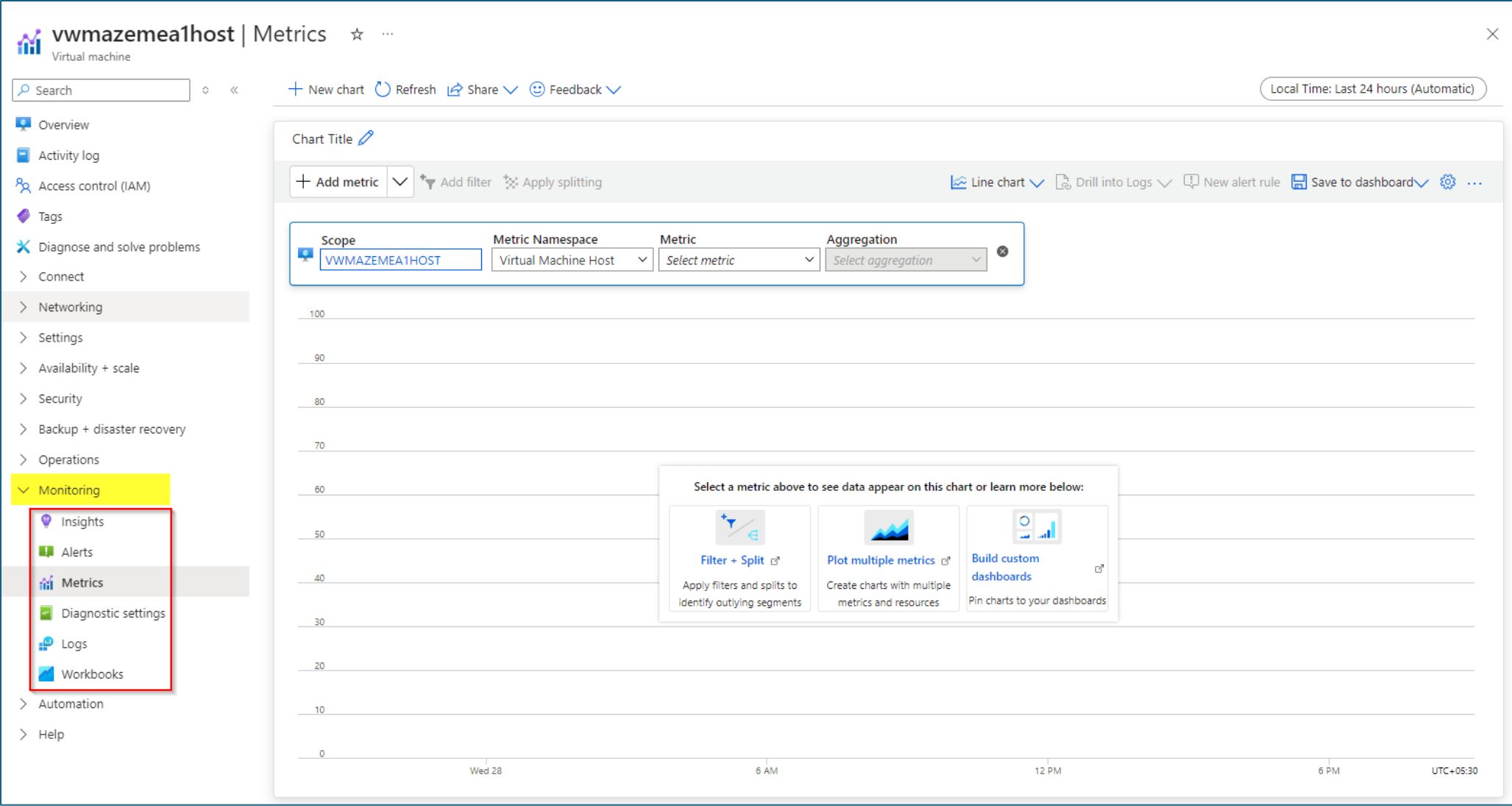
You can customize Advisor to process recommendations for resources that matter to you the most.

Explore workbooks in Advisor gallery to get additional optimization insights.

## 5. Azure Monitor

Azure Monitor Azure Monitor maximizes the availability and performance of applications and services by collecting, analyzing, and acting on telemetry from cloud and on-premises environments.

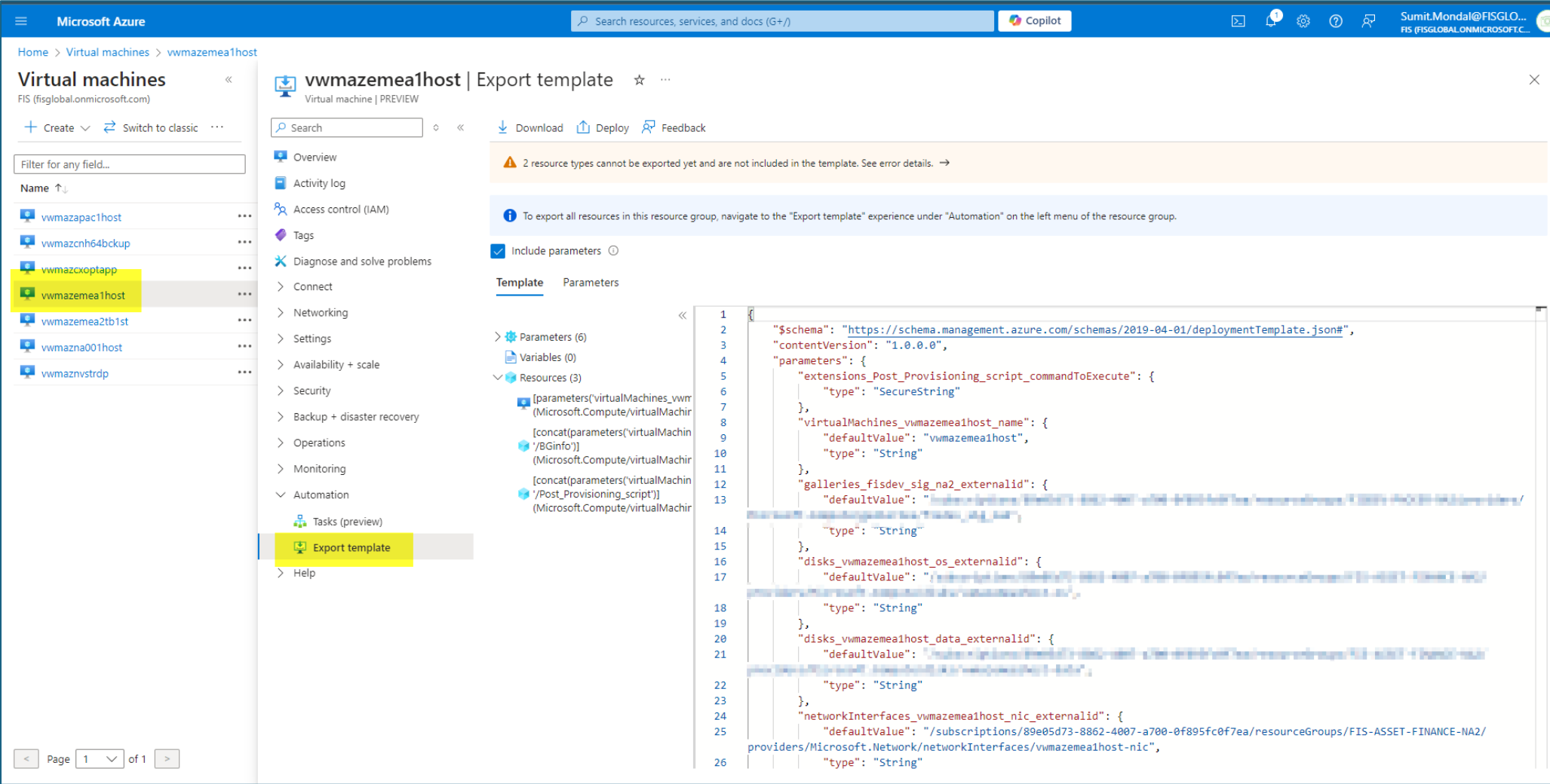
- Application Insights
- Log Analytics
- Smart Alerts
- Automation Actions
- Customized Dashboards



## 6.Azure Resource Manager:

Azure Resource Manager (ARM) templates [Azure Resource Manager \(ARM\) templates](#) are JavaScript Object Notation ([JSON](#)) files that can be used to [create and deploy Azure infrastructure](#) without having to write programming commands.

- Declarative syntax
- Repeatable results
- Orchestration (Orchestrator functions define function workflows using procedural code. No declarative schemas or designers are needed)
- Modular files
- Built-in validation
- Exportable code



# 7.Azure Service Health:

Evaluate the impact of Azure service issues with personalized guidance and support, notifications, and issue resolution updates.

Microsoft Azure

Search resources, services, and docs (G+)

Home >

Service Health | Service issues

Search (Ctrl+)

Save View

Delete View

Add service health alert

ACTIVE EVENTS

Service issues (4)

Planned maintenance (3)

Health advisories (5)

Security advisories (1)

HISTORY

Health history

RESOURCE HEALTH

Resource health

ALERTS

Health alerts

Subscription

28 selected

Region

28 selected

Service

170 selected

Issue Name	Tracking ID	Service(s)	Region(s)	Start Time	Updated
Availability issues – Storage	DTTL-HP8	Storage	West US,West US 2	2020-06-24T00:00:00Z (6 days ago)	3 hours ago
Allocation Failures – Virtual Machi...	TTTL-H90	SQL Database;Virtual...	East US,West Central...	2020-06-24T00:00:00Z (6 days ago)	3 hours ago

No permissions to read Service Health events for 22 subscription(s). To view Service Health events, users must have the [reader role](#) on a subscription.

See 2 service issue(s) outside of your filter.

Service issue : Availability issues – Storage

Summary

Potential impact

Issue updates

Tracking ID

DTTL-HP8

Share the below link with your team or use it for reference in your problem management system

https://app.azure.com/h/DTTL-HP8/76c813

Impacted service(s)

Storage

Impacted region(s)

West US; West US 2

Impacted subscription(s)

Last update (3 hours ago)

Customers may have experience difficulties connecting to resources hosted in Central India. A number of Storage and Compute scale units had gone offline, impacting Virtual Machines and other Azure services with dependencies on these.

See all updates

Potential impact

60 resource(s) in 1 subscription(s)

View details

Download the issue summary as a PDF.

Request root cause

Track this issue on mobile.

Quickly connect with our problem-solving experts.

Twitter @AzureSupport

Contact Azure Support if you need additional help with this issue.

Create a support request

Was this helpful?