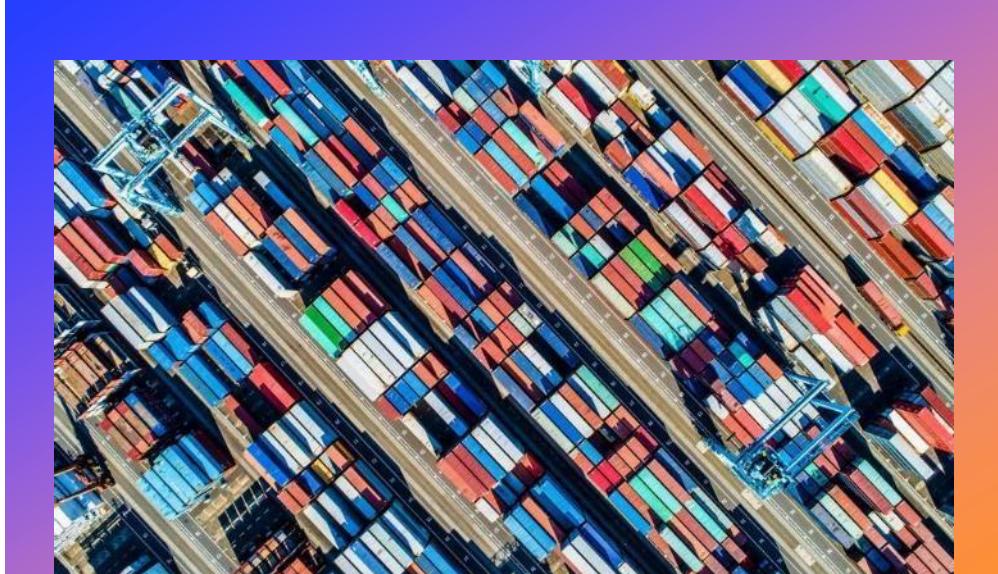




# **WEEK 5**

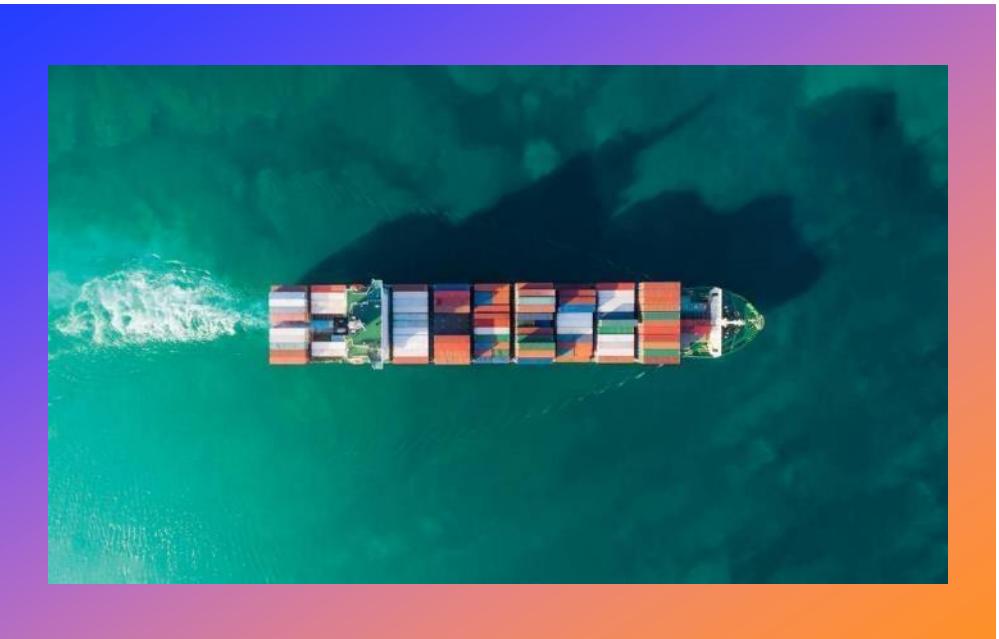
# **MANAGEMENT TOOLS**

Taha Yiğit ALKAN



# Agenda

- Azure Portal
- Powershell
- Azure CLI
- Azure Cloud Shell
- Azure Arc
- Infrastructure as Code
- ARM Templates



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# AZURE PORTAL

# Azure Portal

Great way to manage azure  
resources  
(Up to certain scales)

# Powershell and CLI/Bash

- Downloadable SDKs (local machine)
- Built-in portal
- Windows env vs. Unix/Linux env



Microsoft Azure Search resources, services, and docs (G+) ≡ Logout Cloud Shell Notifications Settings Help Support 20195175002@oakdeniz.ü

Azure services 1. Select cloud shell

Create a resource Azure AD B2C Resource groups Function App Policy App Services Static Web Apps SQL databases Azure DevOps organizations More services

Resources Recent Favorite

Name	Type	Last Viewed
CloudComputingWeek3	Resource group	7 days ago
Deneme20195175002	Function App	7 days ago
DefaultResourceGroup-EUS	Resource group	7 days ago

You have no storage mounted X 2. Create a new storage

Azure Cloud Shell requires an Azure file share to persist files. [Learn more](#)

This will create a new storage account for you and this will incur a small monthly cost. [View pricing](#)

Azure Cloud Shell will register your subscription with Microsoft.CloudShell resource provider.

\* Subscription Cloud Computing Subscription Show advanced settings

Creating... Close

Microsoft Azure    Search resources, services, and docs (G+)

Azure services

You can use PowerShell or Bash +

PowerShell Bash Cloud Shell. Succeeded. terminal...

Welcome to Azure Cloud Shell

Type "az" to use Azure CLI  
Type "help" to learn about Cloud Shell

Storage fileshare subscription 629743ed-8a0d-4521-9ca6-afe44ee1460b is not registered to Microsoft.CloudShell Namespace. Please follow these instructions "<https://aka.ms/RegisterCloudShell>" to register. In future, unregistered subscriptions will have restricted access to CloudShell service.

MOTD: Azure Cloud Shell now includes Predictive IntelliSense! Learn more: <https://aka.ms/CloudShell/IntelliSense>

VERBOSE: Authenticating to Azure ...  
VERBOSE: Building your Azure drive ...

Automatically authenticates and configures environment

PS /home/taha> az

Welcome to Azure CLI!

Use `az -h` to see available commands or go to <https://aka.ms/cli>.

Telemetry

The Azure CLI collects usage data in order to improve your experience.  
The data is anonymous and does not include commandline argument values.  
The data is collected by Microsoft.

You can change your telemetry settings with `az configure`.

A screenshot of the Microsoft Azure CLI interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and various icons for account management and help. Below the navigation is a toolbar with icons for creating resources, managing storage, databases, and more. The main area is a terminal window titled "PowerShell". It displays a welcome message: "You can change your telemetry settings with `az configure`." followed by a decorative ASCII tree. Below the tree, it says "Welcome to the cool new Azure CLI!" and "Use `az --version` to display the current version." It then lists base commands with their descriptions, such as "account" for subscription management, "acr" for Container Registry management, "ad" for Active Directory management, "advisor" for Azure Advisor management, "afd" for Azure Front Door management, "ai-examples" for AI-powered examples, "aks" for Kubernetes management, "ams" for Media Services management, "apim" for API Management services, "appconfig" for App Configuration management, "appservice" for App Service plans, and "aro" for Red Hat OpenShift clusters.

Microsoft Azure Search resources, services, and docs (G+/-) See all

Navigate

Bash | ⌂ ? ⚙️ 🖊️ { } 🔍

```
Requesting a Cloud Shell.Succeeded.
Connecting terminal...

Storage fileshare subscription 629743ed-8a0d-4521-9ca6-afe44ee1460b is not registered to Microsoft.CloudShell Namespace. Please follow these instructions "https://aka.ms/RegisterCloudShell" to register. In future, unregistered subscriptions will have restricted access to CloudShell service.

taha [ ~ ]$ az functionapp list
[
  {
    "appServicePlanId": "/subscriptions/629743ed-8a0d-4521-9ca6-afe44ee1460b/resourceGroups/CloudComputingWeek3/providers/Microsoft.Web/serverfarms/ASP-CloudComputingWeek3-acbf",
    "availabilityState": "Normal",
    "clientAffinityEnabled": false,
    "clientCertEnabled": false,
    "clientCertExclusionPaths": null,
    "clientCertMode": "Required",
    "cloningInfo": null,
    "containerSize": 1536,
    "customDomainVerificationId": "A47A3F899C6D66E8AE6854784C2E762C77C7A380EAB9A6FB7813FF77245AD503",
    "dailyMemoryTimeQuota": 0,
    "defaultHostName": "deneme20195175002.azurewebsites.net",
    "enabled": true,
    "enabledHostNames": [
      "deneme20195175002.azurewebsites.net",
      "deneme20195175002.scm.azurewebsites.net"
    ],
    "extendedLocation": null,
    "hostNameSslStates": [
      {
        "hostName": "deneme20195175002.azurewebsites.net",
        "sslState": "Disabled"
      }
    ]
  }
]
```

# Azure Arc

Allows manage all on-prem infrastructure, anywhere

There is no charge!

# Azure Arc



## Infrastructure

- Virtual Machines
- Kubernetes clusters
- VMware vCenters

## Data Services

- SQL Server instances
- PostgreSQL
- SQL Managed Instances

## Application Services

- App Services
- Event Grid Topics
- Functions

## Add a Kubernetes cluster with Azure Arc

...

### Before you add your cluster to Azure Arc, you'll need

#### To identify or create a Kubernetes cluster

- **A new or existing Kubernetes cluster**  
The cluster must use Kubernetes version 1.13 or later (including OpenShift 4.2 or later and other Kubernetes derivatives)  
[Learn how to create a Kubernetes cluster](#)
- **Access to ports 443 and 9418**  
Make sure the cluster has access to these ports, and the required [outbound URLs](#)
- **Connectivity method**  
You can connect to the internet over a public endpoint, through a proxy server, or over a private endpoint. An Azure Arc Private link scope is required to connect over a private endpoint.  
[Create an Azure Arc Private link scope](#)

#### To set up your local machine

- **Azure CLI**  
An Azure CLI script will be generated that you will run locally to connect your cluster.  
[Learn how to install the Azure CLI on your local machine](#)
- **A new or existing Kubernetes cluster**  
Install the latest connectedk8s and k8s-configuration, k8s-extension, customlocation CLI extensions.  
[Learn how to install these extensions](#)
- **Kubeconfig file with cluster admin permissions**  
The file should be accessible via your CLI tooling. [Learn how to get a kubeconfig file](#)

# Infrastructure as Code (IaC)

**Infrastructure (n):**

All the servers, storage, database settings, network settings, firewalls, load balancers, etc.

# HOW DO YOU “BACKUP” YOUR INFRASTRUCTURE SETUP?

# IaC



Define your infrastructure  
in a configuration file



Re-deploy resources  
using configuration files

# DESIRED STATE CONFIGURATION (DSC)

Using automation to ensure your configuration doesn't drift from the original setup

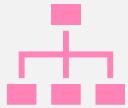
# IaC Options

- ARM Templates (JSON)
- Bicep
- Terraform (3<sup>rd</sup> party, cross-platform)
- Chef, Puppet (Open source)
- PowerShell Scripts
- Other type of code (SDKs)

# AZURE RESOURCE MANAGER



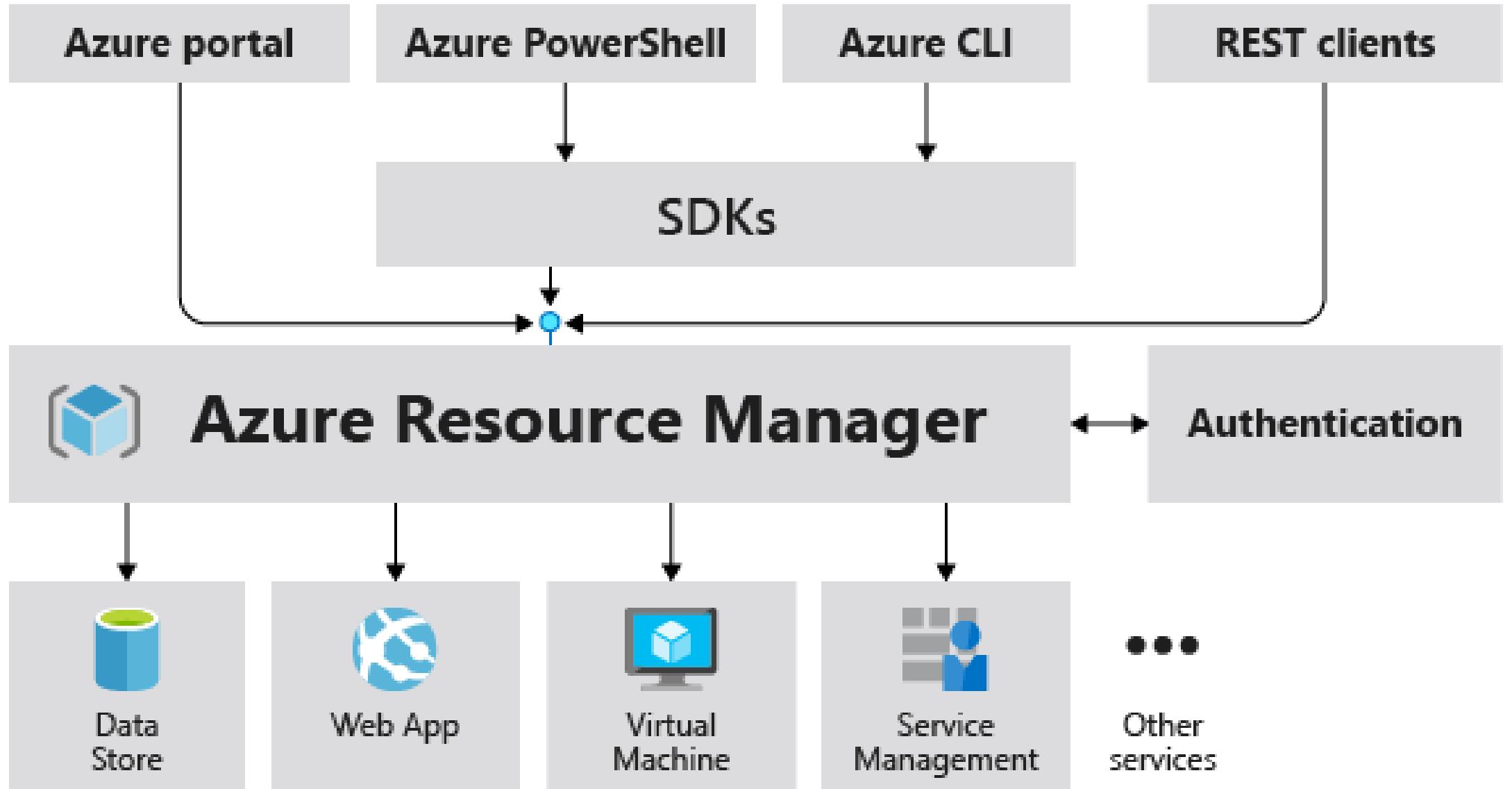
The deployment and management service



Management layer that allows you to create, update, and delete resources called “deployments”



All actions that you take to manage your Azure resources goes through the ARM layer



# Example ARM Template

```
"resources": [
    {
        "name": "[parameters('storageAccountName')]",
        "type": "Microsoft.Storage/storageAccounts",
        "apiVersion": "2022-05-01",
        "location": "[parameters('location')]",
        "properties": {
            "minimumTlsVersion": "[parameters('minimumTlsVersion')]",
            "supportsHttpsTrafficOnly": "[parameters('supportsHttpsTrafficOnly')]",
            "allowBlobPublicAccess": "[parameters('allowBlobPublicAccess')]",
            "allowSharedKeyAccess": "[parameters('allowSharedKeyAccess')]",
            "defaultToOAuthAuthentication": "[parameters('defaultOAuth')]",
            "accessTier": "[parameters('accessTier')]",
            "publicNetworkAccess": "[parameters('publicNetworkAccess')]",
            "allowCrossTenantReplication": "[parameters('allowCrossTenantReplication')]",
            "networkAcls": {
                "bypass": "[parameters('networkAclsBypass')]",
                "defaultAction": "[parameters('networkAclsDefaultAction')]",
                "ipRules": []
            },
            "dnsEndpointType": "[parameters('dnsEndpointType')]",
            "encryption": {
                "keySource": "[parameters('keySource')]"
            }
        }
    }
]
```

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# THANK YOU

Taha Yiğit ALKAN  
[yigitalkan@akdeniz.edu.tr](mailto:yigitalkan@akdeniz.edu.tr)

