

Microsoft Azure: Infrastructure as a Service (IaaS)

Module 2 - Azure Resource Manager (ARM)

Overview

Microsoft Confidential

Why Azure Resource Manager?

Today's challenge – it's difficult to...

- Set and manage permissions – only co-admin and service admin
- Monitor and have alerting rules – limited to Management Services and basic KPI in portal
- Billing – through the billing portal
- Deployment – complex PowerShell to gather all components for an application
- Visualize a group of resources in a logical view, including monitoring/billing

Microsoft Confidential

Current Portal - Resource Centric Views



Microsoft Confidential

Current Portal - Individual Resources



- Provision resources in isolation
- Deployment becomes more complex
- Management of app is challenging
- Proper use of resources becomes more abstract
- Isolation makes communications a challenge

Microsoft Confidential

Benefits of ARM

- Desired-state deployment
- Faster deployments
- Role-based access control (RBAC)
- Resource-provider model
- Common interface for Azure and Azure Stack

Microsoft Confidential

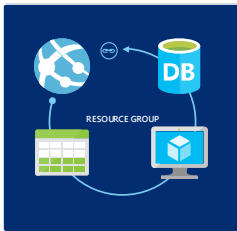
Resource Groups

A Resource Group is a Unit of Management

- Application Lifecycle Containment – Deployment, update, delete and status
- Declarative solution for Deployment – “Config as Code”
- Grouping – Metering, billing, quote: applied and rolled up to the group
- Consistent Management Layer
- Access Control – Scope for RBAC permissions

Microsoft Confidential

Azure Resource Groups



- Tightly coupled containers of multiple resources of similar or different types
- Resource groups can span regions
- Every resource **must** exist in one and only one resource group

Resource Group Lifecycle

Question:

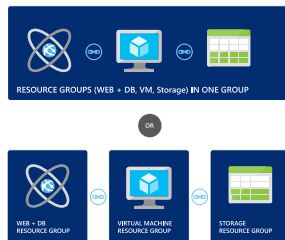
Should these resources be in the same group or a different one?

Hint:

Do they have common lifecycle and management?

Answer:

It's up to you.



MICROSOFT CONFIDENTIAL

Organizational Concepts

Resource groups

- Tightly coupled to a container of resources
- Follows RBAC rules
- 1 resource group at a time

Tags

- Loosely coupled user or system defined categorization
- Arbitrary boundaries
- 15 tags to use as needed

Resource groups and tags are the building blocks from which users define **applications**.

MICROSOFT CONFIDENTIAL

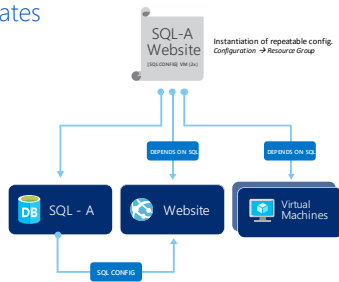
Deployment Templates

What?

- Source file, can be checked-in
- Specifies resources, dependencies and connections
- Parameterized input/output

Why?

- Ensure Idempotency
- Simplify orchestration
- Provide cross-resource configuration and update support



MICROSOFT CONFIDENTIAL

Demo: Resource Groups and Templates

Module 2 - Azure Resource Manager (ARM)

Resource Providers

Microsoft Confidential

ARM Definitions

- Resource - Atomic unit of deployment
- Resource group - Collection of resources
- Resource provider - Manages specific kinds of resources
- Resource type - Specifies the type of resource

MICROSOFT CONFIDENTIAL

Resource Providers

- Used to deploy specific types of resources
- Identified by provider namespace
 - e.g., Microsoft.Compute, Microsoft.Storage, Microsoft.Web (~25 Microsoft or Customer namespaces)
- Resource types
 - Each provider namespace manages one or more resource types: e.g., virtualMachines
 - Different regional availability and apiVersions
- PowerShell
 - Get-AzureLocation
 - Get-AzureProvider

MICROSOFT CONFIDENTIAL

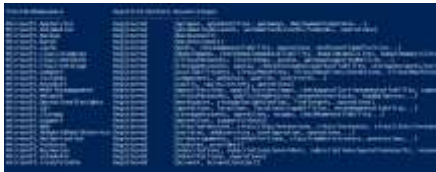
Resource Provider Types (examples)

Resource Type	Usage
Microsoft.Compute/virtualMachines	Virtual Machines (VMs) ~ (V2)
Microsoft.Storage/storageAccounts	Storage accounts (V2)
Microsoft.Compute/availabilitySets	
Microsoft.Network/networkInterfaces	Virtual network interface card (NIC)
Microsoft.Network/loadBalancers	Azure Load Balancer or Internal Load Balancer
Microsoft.Network/virtualNetworks	Virtual networks (V2)
Microsoft.ClassicStorage	V1 storage – not managed by ARM
Microsoft.ClassicCompute	V1 VMs – not managed by ARM

Many more!

How do I know what resources providers are available?

Using PowerShell, log in to your Azure account and then run
Get-AzureRmResourceProvider



How can I see what Resource Providers are in use in my subscription?

Go to <https://resources.azure.com> and log in using your Azure Credentials



Resource Definition

- Name
 - Unique for resource group and resource type (e.g., Microsoft.Compute/VirtualMachines)
- Id
 - Unique across Azure
 - /subscriptions/GUID/resourceGroups/myRG/providers/Microsoft.Compute/virtualMachines/vmName
- Location
- ResourceType
- ResourceGroup
- Properties
 - Additional properties specific to the resource provider

MICROSOFT CONFIDENTIAL

Module 2 - Azure Resource Manager (ARM)

Tools

Microsoft Confidential

Tools typically used by IT with ARM

- PowerShell
- Troubleshooting in the portal
- Visual Studio

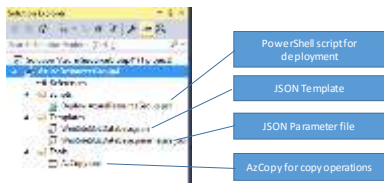
Visual Studio

- Provides a new template from the gallery
- Allows the deployment of a resource group
- Generates scripts to deploy application

Template options

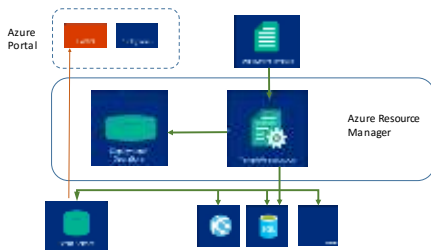


Files Generated by Template



Demo: Visual Studio Deployment

Troubleshooting Deployments



Demo: Troubleshooting

- Event Viewer in the Azure Portal
- Deployment operations in the Azure Portal
- Deployment logs in PowerShell