What is Azure?

Azure is Microsoft's cloud platform—your data center, on demand.

- **A Global Network of Microsoft-Managed Data Centers**
- **Let's you Build, Deploy, and Scale Applications, Services, and Infrastructure**
- **Pay only for what you use--compute, storage, networking, identity, and more**
- **Offers Thousands of Services: From VMs to AI to Kubernetes**
- **Accessible via Portal, CLI, APIs, or Code**

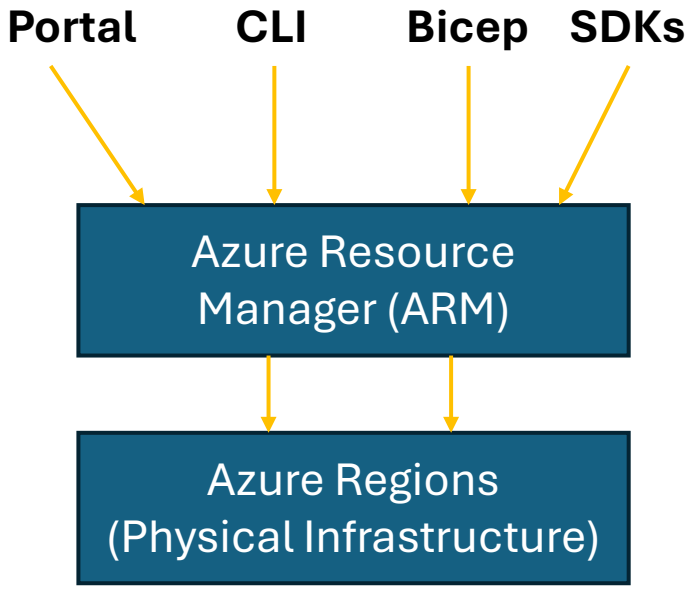
Resources On Demand

Azure is where you rent compute, storage, and services by the minute, instead of building your own data center

Develop a passion for learning.

The Azure Platform – A Global, Consistent Control Plane

- **Azure is built on a global control plane powered by the Azure Resource Manager (ARM).**
- **Every service, deployment, and setting flows through ARM—regardless of the tool used.**
- **Regions house the physical infrastructure, but ARM provides consistent APIs and behavior everywhere.**
- **You can manage Azure through:**
  - **The Azure Portal (GUI)**
  - **Azure CLI and PowerShell**
  - **SDKs (Python, .NET, etc.)**
  - **Infrastructure as Code (Bicep, Terraform)**



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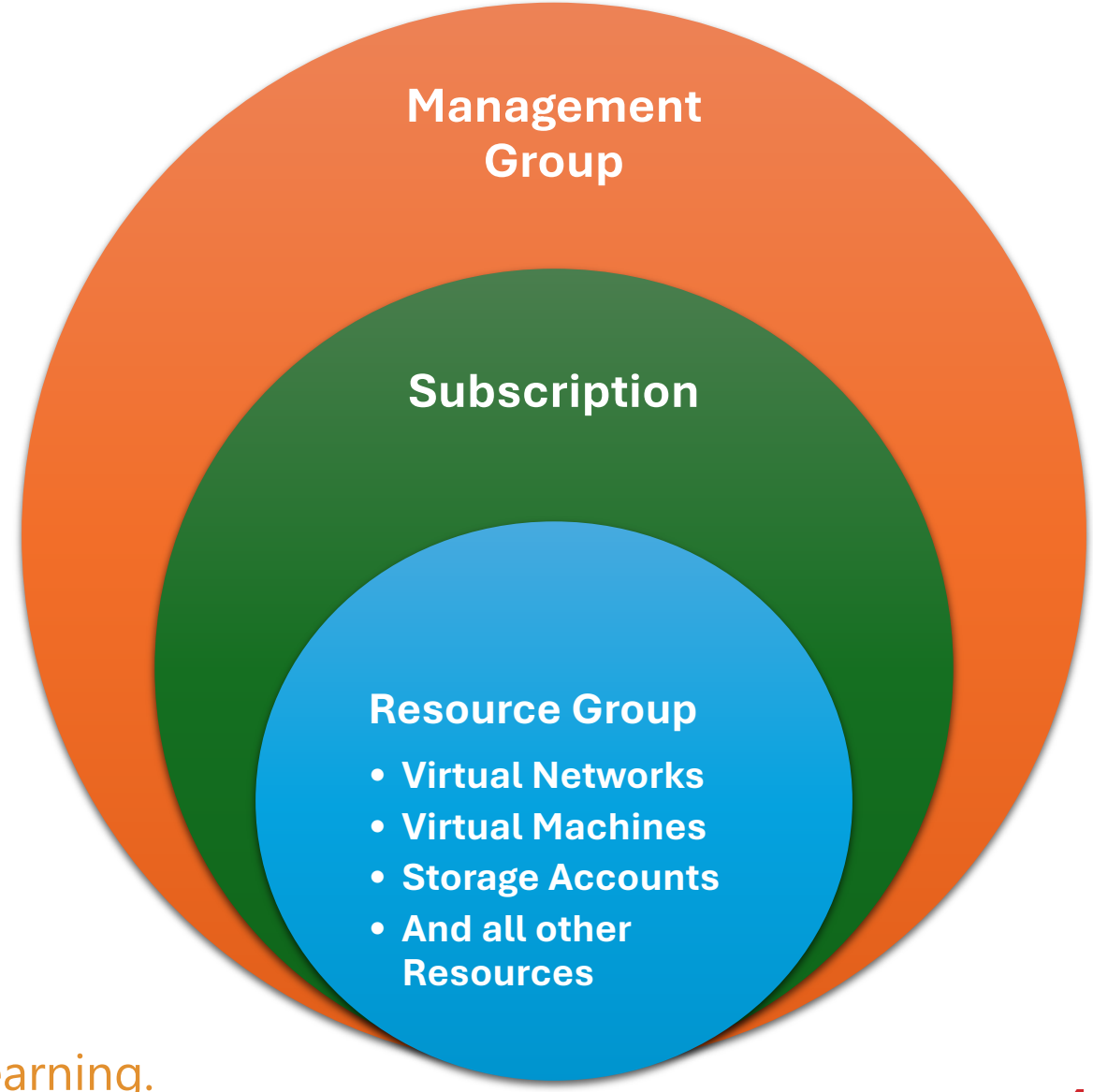
How Azure Sees the World

- **Azure organizes your environment into hierarchical scopes:**
  - Management Groups (optional)
  - Subscriptions (Billing Boundary)
  - Resource Groups (logical containers)
  - Resources (VMs, Vnets, Storage, etc.)
- You apply RBAC, Policies, and Tags at any Scope Level
- ARM Provides declarative deployment and ensures resources are deployed in the correct order.
- Tools like Bicep let you describe your desired state and let Azure handle the rest.

Resources, Groups, and Scopes



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Azure Resource Manager (ARM)

Brand new JSON-based API that is built on resource providers

Resources belong to a resource group and share a common life-cycle

Cloud services not used for IaaS (but still for PaaS)

JSON-based deployments are declarative, idempotent and understand dependencies between resources to govern creation order

Azure Resource Manager (ARM)

Massive parallelism

Tags used to organize resources which are also visible in billing

Can also use PowerShell and the modern Azure Portal

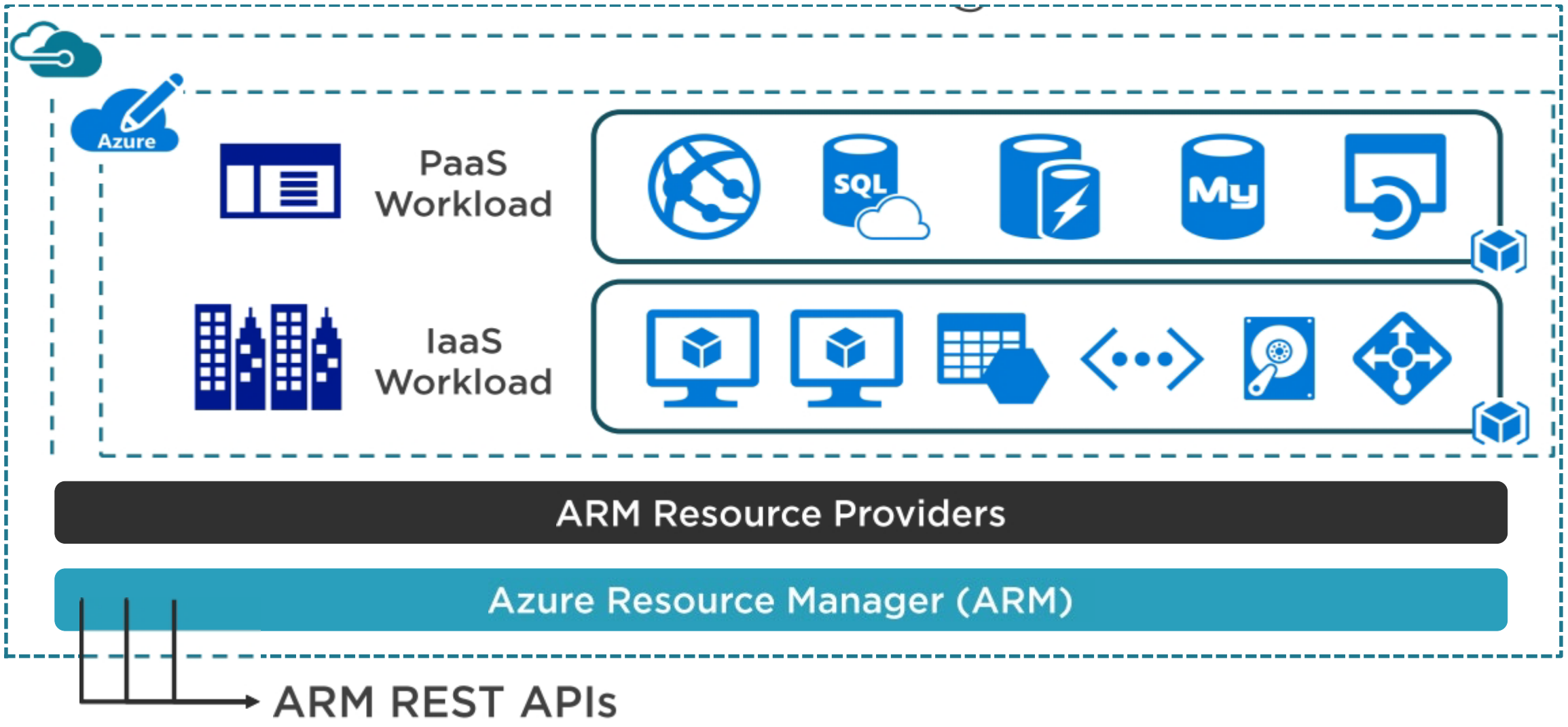
Resource Groups

- Every ARM resource exists in one, and only one, resource group
- While resource groups are created in a region they can contain resources from outside the region
- Resources can be moved between resource groups

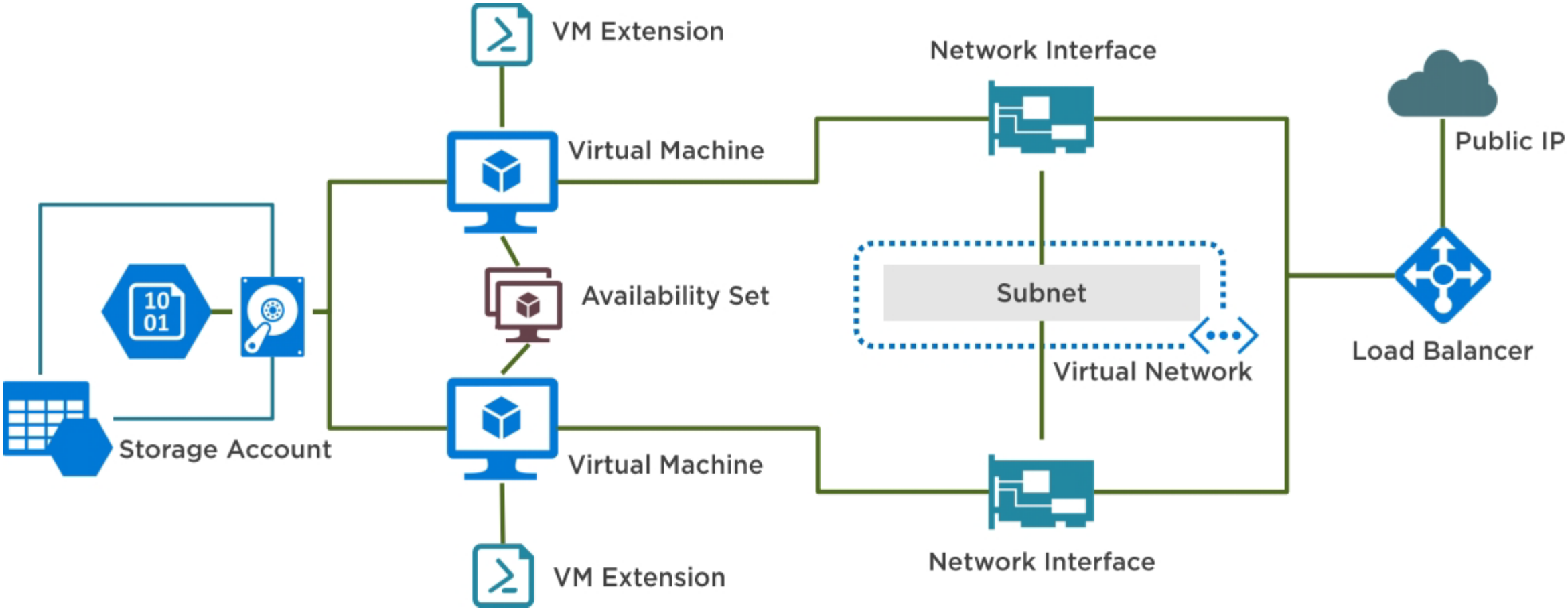
Resource Groups

- All resources in your group should share same lifecycle.
  - Deploy, Update, and Delete together
- Resource groups can be heterogeneous or homogeneous
- Resource groups are not a boundary of access

Azure resource manager architecture



Resources and Dependencies



Resource Group Limits

- 800 resource groups per subscription
- 800 resources per resource type per resource group
- 15 tags per resource group
- Bound by subscription

LAB: Deploy a VM via the Portal Interface

Get Started with Azure Portal!

- Traditionally, we'd build resources using Bicep Templates, or IaC tools like Terrafrom
- To cement our understanding of the tool, we'll use the Portal to provision a VM.
- To build a VM, we'll also need to deploy its dependencies:

- **Resource Group**
- **Virtual Network**
- **Subnet**
- **Network Interface (NIC)**
- **Storage / Disks**
- **Virtual Machine Image**

Pro Tip for IaC:

When writing a Bicep or ARM Template, you must declare and manage these dependencies in the correct order--often using *dependsOn* explicitly or letting Azure infer it through resource references.