**Microsoft Azure Fundamentals – Day 2 Notes**

*(Regions, Resource Groups, IaaS/PaaS/SaaS, and Hands-On Exercises)*

**1. Azure Free Tier Account Creation**

**Steps to Create**

1. Sign up at [azure.microsoft.com/free](https://azure.microsoft.com/free).
2. Use a personal/work email (avoid school emails for trial extensions).
3. **Verify identity** via credit card (no charges unless you upgrade).

**Free Tier Limits**

* **$200 credit** for 30 days.
* **12 months free** for select services (e.g., Linux VMs, Blob Storage).

**2. Azure Regions & Availability Zones (AZs)**

**Key Concepts**

| **Term** | **Definition** | **Example** |
| --- | --- | --- |
| **Region** | Physical data center locations | East US, West Europe |
| **Availability Zone (AZ)** | Isolated data centers within a region (for fault tolerance) | East US has 3 AZs (AZ1, AZ2, AZ3) |

**Why It Matters?**

* **Disaster recovery**: If **East US AZ1** fails, your app runs on **AZ2**.
* **Latency**: Deploy closer to users (e.g., India users → **Central India** region).

**3. IaaS vs. PaaS vs. SaaS**

| **Model** | **Control Level** | **Azure Example** |
| --- | --- | --- |
| **IaaS** | You manage OS, apps, data | Azure VMs (Virtual Machines) |
| **PaaS** | Azure manages OS, runtime | Azure App Service (Web Apps) |
| **SaaS** | Fully managed software | Office 365, Microsoft Teams |

**Real-World Analogy**:

* **IaaS** = Renting a blank apartment (you furnish it).
* **PaaS** = Renting a furnished apartment (just move in).
* **SaaS** = Staying in a hotel (everything is handled).

**4. Azure Resources & Resource Manager**

**Definitions**

* **Resource**: Any Azure service (e.g., VM, Storage Account, SQL Database).
* **Resource Manager**: The "brain" of Azure that deploys/manages resources.

**Example Workflow**

1. You request a VM via Azure Portal/PowerShell.
2. **Resource Manager** checks permissions and deploys it.

**5. Resource Groups (RG)**

**What is an RG?**

A **logical container** for related resources (e.g., all resources for a "Finance App").

**Best Practices**

| **Do’s** | **Don’ts** |
| --- | --- |
| Group by **project/environment** (Dev/Prod) | Mix unrelated resources (e.g., Dev + Prod DBs) |
| Use **naming conventions** (e.g., rg-financeapp-prod) | Use vague names (rg-test123) |

**Can a Resource Be in Multiple RGs?**

❌ **No**. A resource belongs to **only one RG** (but can interact with others).

**6. Combining Resources**

**Why Combine?**

* **Cost tracking**: All expenses for a project in one RG.
* **Lifetime management**: Delete the RG → all resources deleted.

**How to Group?**

1. **By Application**:
   * RG: rg-ecommerce-app
   * Resources: VM (frontend), SQL DB (backend), Storage (images).
2. **By Environment**:
   * RG: rg-finance-dev / rg-finance-prod.

**7. Hands-On Exercises Recap**

**1. Create a Resource Group**

1. Go to **Azure Portal** → "Resource groups" → **+ Create**.
2. Name: rg-myfirstproject.
3. Region: **East US** (or your preferred region).

**2. Deploy a VM in the RG**

1. Search for "Virtual Machines" → **+ Create**.
2. Select your **RG (**rg-myfirstproject**)**.
3. Choose **Ubuntu Server 20.04 LTS** (Free Tier eligible).