**Project Summary**

Designed and deployed a scalable, highly available web architecture using **Azure Load Balancer** to distribute traffic across both **Windows** and **Linux virtual machines**, each serving distinct web content. Demonstrated real-world skills in infrastructure provisioning, load balancing, network security, port mapping, and cross-platform server configuration.

**🔧 Tech Stack**

| **Category** | **Tools / Technologies** |
| --- | --- |
| **Cloud Platform** | Microsoft Azure |
| **Compute** | Azure Virtual Machines (Linux & Windows) |
| **Networking** | Azure Public Load Balancer, NSG, VNet |
| **Web Servers** | IIS (Windows), Apache2 (Linux) |
| **OS Used** | Windows Server 2019, Ubuntu 20.04 LTS |
| **Access** | RDP, SSH, Azure Cloud Shell |
| **Scripting** | PowerShell, Bash |
| **Monitoring** | Azure Health Probes |

**🧱 Key Features & Implementation Steps**

1. **Infrastructure Setup**
   * Created a **Windows VM** with IIS Web Server hosting a custom HTML page.
   * Created a **Linux VM** (Ubuntu 20.04) with Apache2 serving a different HTML page.
   * Both VMs were deployed under the same **Virtual Network** and **Subnet**.
2. **Web Server Configuration**
   * Configured Windows VM to serve content using **IIS** via port 80.
   * Configured Linux VM to serve content using **Apache2** via port 80.
   * Added personalized HTML content to verify source machine when accessed.
3. **Load Balancer Setup**
   * Created an **Azure Public Load Balancer** to handle traffic on port 80.
   * Configured a **Backend Pool** and added both VM NICs.
   * Created a **Health Probe** to monitor HTTP (TCP 80) response.
   * Created a **Load Balancing Rule** to forward frontend traffic to backend VMs.
4. **Security & Connectivity**
   * Configured **NSG rules** to allow HTTP (port 80) traffic.
   * Managed firewall rules in both Windows (via PowerShell) and Linux (via ufw).
   * Ensured connectivity using **Test-NetConnection**, curl, and browser tests.
5. **Testing & Validation**
   * Accessed the Load Balancer IP through a browser.
   * Verified that requests were routed to either the **Windows** or **Linux** VM randomly.
   * Ensured high availability and distribution using **refresh cycles**.

**📄 Outcomes**

* Demonstrated the ability to architect and manage real-world cloud deployments.
* Showcased cross-platform server management and load balancing in Azure.
* Practiced DevOps principles: automation-ready infra, monitoring (via probes), and scalable design.

**🔚 Sample Output in Browser**

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http://<LoadBalancer-IP>

* ➤ "Hello from Aryaman’s Azure VM Web Server – Windows"
* ➤ "Hello from Linux VM! 🌐 – Apache Server"

**🧠 Key Skills Demonstrated**

* ✅ Azure VM provisioning (Linux + Windows)
* ✅ Load Balancer setup and backend pool management
* ✅ NSG & firewall rule configuration
* ✅ Port mapping, web server deployment
* ✅ Real-time debugging using CLI tools
* ✅ Network troubleshooting (netstat, curl, PowerShell)