Azure Infrastructure Overview

This document outlines a typical Azure infrastructure setup used for deploying scalable, secure, and high-availability cloud-based applications. The components are modular, allowing flexibility and extensibility based on project needs.

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1. Core Components

1.1 Azure App Service

- **Purpose**: Hosts web applications, APIs, and mobile backends.
- **Features**:
    - Auto-scaling
    - Custom domains and SSL
    - Integrated with DevOps CI/CD pipelines
- **SKU Example**: Premium P1v2 for production workloads

1.2 Azure SQL Database

- **Purpose**: Relational data storage for structured application data.
- **Options**:
    - Serverless (auto-pause/resume based on demand)
    - Provisioned compute tiers (for predictable workloads)
- **Backup**: Automated backups with Point-In-Time Restore

1.3 Azure Blob Storage

- **Purpose**: Stores unstructured data like documents, images, logs, and CSVs.
- **Tiers**: Hot, Cool, and Archive depending on access frequency

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2. Networking

2.1 Azure Virtual Network (VNet)

- **Purpose**: Provides a secure network boundary for resources.
- **Subnets**: Organize and segment application layers (web, API, database)

2.2 Application Gateway / Azure Front Door

- **Purpose**: Provides web application firewall (WAF), SSL termination, load balancing

- **Benefits**:
    - Global routing
    - Path-based routing for APIs vs frontend
    - DDoS protection

2.3 Private Endpoints

- **Purpose**: Secures services like SQL, Blob, and Key Vault with VNet-only access

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3. Identity and Security

3.1 Azure Active Directory (AAD)

- **Purpose**: Centralized identity management
- **Usage**:
    - Authentication for users and applications
    - Role-Based Access Control (RBAC)

3.2 Azure Key Vault

- **Purpose**: Stores secrets, certificates, and encryption keys securely

3.3 Network Security Groups (NSGs)

- **Purpose**: Controls traffic flow to subnets and virtual machines

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4. Monitoring and Management

4.1 Azure Monitor

- **Includes**:
    - Application Insights: Real-time telemetry and diagnostics
    - Log Analytics: Query and analyze logs across Azure

4.2 Azure Advisor

- **Purpose**: Provides best practices on performance, security, and cost optimization

4.3 Azure Policy

- **Purpose**: Enforces organization-specific governance and compliance rules

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5. DevOps and Automation

5.1 Azure DevOps / GitHub Actions

- **Usage**:
    - Build and deploy pipelines (CI/CD)
    - Infrastructure as Code (IaC) using Bicep, ARM templates, or Terraform

5.2 Azure Automation / Logic Apps

- **Purpose**: Runbook automation, scheduled tasks, and workflow orchestration

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6. Optional Add-Ons

- **Azure API Management (APIM)** – Publish and secure APIs
- **Azure Functions** – Serverless compute for background tasks
- **Azure Redis Cache** – High-speed in-memory caching
- **Azure Cosmos DB** – NoSQL globally distributed database