

Infrastructure as a Service (IaaS)

Virtual Machines

Availability Set

- 2 fault domains for classic
- 3 fault domains for Resource Manager deployments
- 5 update domains

Scale Set

- Max 100 VMs
- Max 1000 VMs with placement groups (auto scale)
- Managed disks needed for large scale sets

VM Series

- AGeneral purpose
- FCompute optimised
- D,E,GMemory optimised
- LStorage optimised
- NGraphic GPU optimised
- HHigh performance computing

High Performance Compute

HPC Workload Series

- AGeneral purpose
- NGraphic GPU optimised
- HHigh performance computing

HPC Pack

- Windows Server 2012, 2016, and Linux
- Create HPC clusters on-prem

Cloud-native HPC solution

- HPC head node and compute nodes
- Virtual Machine Scale Sets (VMSS)
- VMs using RDMA are placed in same VMSS
- Virtual Network
- Azure Blob Storage for node disks

Hybrid HPC solution

- + ExpressRoute to connect cloud with on-prem
- + VPN Gateway endpoint between cloud and on-prem

Azure Web Apps

App Service Plans

Free and Shared

- Basic
 - Up to 3 instances (manual)
- Standard
 - Up to 10 instances (auto scale)
 - 5 Slots
 - Daily backups
 - Azure Traffic Manager
- Premium
 - Up to 20 instances (auto scale)
 - 20 Slots
 - Daily backups
 - Azure Traffic Manager
- Isolated
 - App Service Environment (ASE) – scalable, secure
 - Up to 100 instances/plan or 100 plans with one instance

Redis Cache

Basic

- Ideal for development, testing, and non-critical work
- No SLA

Standard

- Ideal for production and cost effective
- Data replication between two nodes
- High availability SLA

Premium

- Redis persistence
- Create workloads > 53GB
- Ability to isolate

Content Delivery Network (CDN)

Cache static content to multiple regions

Web APIs

Multiple programming languages

- ASP.NET, Core, Angular, React.js

Securing Web API

- Azure AD
- Azure AD B2C – with Facebook and Google providers
- Active Directory Federated Services (ADFS)
- API Management – policies, API keys, throttling, ...

Traffic Manager

Routing methods

- Performance
- Weighted
- Priority
- Geographic

Handle load & locate closest geo region at DNS level

Scalability

Up

- Select different (better) Service Plan

Out

- Scale out Web App manually or automatically

Serverless and Microservices

Functions

Serverless compute service
Event-driven actions and triggers

- HTTP-based API endpoints (HTTP triggers)
- Timer triggers

Programming Languages

- C#, F#, Node.js, Java, PHP, PowerShell, Batch, JavaScript, Python, Typescript

Plans

- Consumption App Service Plan (cost effective)
- Other App Service Plans

Containers

Azure Container Instances (ACI)

- One ACI = one Docker container
- Role Based Access Control (RBAC)
- Short-running workloads

Azure Container Services (AKS)

- Load balancing
- Orchestration
- Long running workloads

API Management

Service that exposes different apps as APIs
API Gateway

- Bridge between app and outside world
- Enhanced security, policies, authentication
- Caching, throttling

API Management Portal

- Define custom APIs
- Package APIs into open or protected products

Developer Portal

- Developers can access APIs and documentation

Service Fabric

Orchestration Platform

- Cloud and on-prem
- Container orchestration

Lifecycle Management

- Service developer (creates microservices)
- Application developer (creates applications)
- Application administrator (creates config & packages)
- Operator (deploys, monitors, maintains)

Logic Apps

Workflow Driven
Integration with cloud and on-prem services

- BizTalk, ...

Deployments vs Migrations

Cloud Infrastructure Ready

- Host on VMs as-is

Cloud DevOps Ready

- Use containers to develop and deploy
- Decouple application from infrastructure

Cloud Optimised

- Modernise mission critical applications



Storage Options	SQL Databases	MySQL	PostgreSQL	Cosmos DB	Blob	Table	Queue	File	Disk	Data Lake Store	SQL Data Warehouse
Relational data	X	X									
Object-relational data			X								
Unstructured data				X	X						
Semi-structured data						X					
Queue messages							X				
Files on disk								X			
High-performance files on disk									X		
Store large data					X			X	X	X	X
Store small data	X	X	X	X		X	X	X	X		
Geographic data replication	X			X							

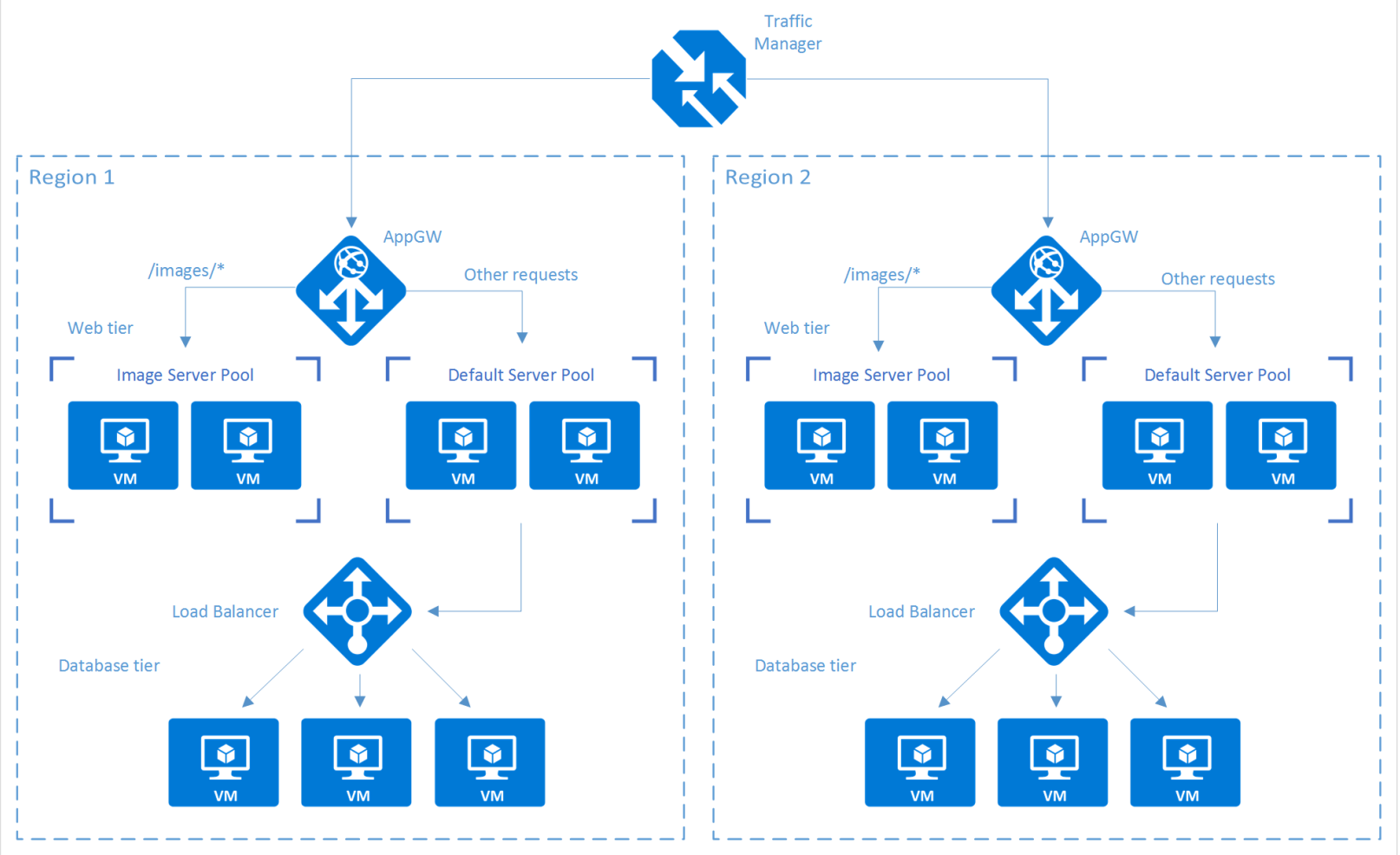


Azure Service Bus Queues	Azure Storage Queues
Message lifetime < 7 days	Message lifetime > 7days
Guaranteed (first in–first out) ordered	Queue size >80 GB
Duplicate detection	Transaction logs
Message size ≤1 MB	Message size ≤64 KB



Service for Msg/Events	Event Grid	Event Hubs	IoT Hub	Topics	Service Bus Queues	Storage Queues
Event ingestion	X	X	X			
Device management			X			
Messaging	X	X	X	X	X	X
Multiple consumers	X	X	X	X		
Multiple senders	X	X	X	X	X	X
Use for decoupling		X	X	X	X	X
Use for publish/subscribe	X					
Max message size	64 KB	256 KB	256 KB	1 MB	1 MB	64 KB

Containerisation	Azure Container Services	Azure Container Instances	Azure Service Fabric
For production deployments of complex systems (with a container orchestrator)	X		
For running simple configurations (possibly without orchestrator)		X	
For long-running workloads on containers	X		
For short-running workloads on containers		X	
For orchestrating a system based on containers	X		X
Orchestrating with open-source orchestrators (DC/OS, Docker Swarm, Kubernetes)	X		
Orchestrating with built-in orchestrator			X



Service	Azure Load Balancer	Application Gateway	Traffic Manager
Technology	Transport level (Layer 4)	Application level (Layer 7)	DNS level
Application protocols supported	Any	HTTP and HTTPS	Any (An HTTP endpoint is required for endpoint monitoring)
Endpoints	Azure VMs and Cloud Services role instances	Any Azure Internal IP address or public internet IP address	Azure VMs, Cloud Services, Azure Web Apps, and external endpoints
Vnet support	Can be used for both Internet facing and internal (Vnet) applications	Can be used for both Internet facing and internal (Vnet) applications	Only supports Internet-facing applications
Endpoint Monitoring	Supported via probes	Supported via probes	Supported via HTTP/HTTPS GET

