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AZ-900

Service Catalogue

Directory Services
- Azure AD

Management & Governance
- Application Insights
- Security & Compliance
- Cost Management
- Azure Advisor
- Azure Monitor
- Billing
- Azure Service Health

Big Data
- Azure Data Lake Analytics
- Azure HDInsight
- Azure Databricks

Artificial Intelligence
- Azure Machine Learning Service - Coding Required
- Azure Machine Learning Studio - SAAS

Internet of Things (IoT)
- IoT Edge
- IoT Central
- IoT Hub

Web
- Azure Notification Hubs
- Azure SignalR Service
- Azure API Management
- Azure Search
- Web Apps

Storage
- Disk Storage
- Blob Storage
- File Storage
- Queue Storage

Databases
- Azure Database for MySQL
- Azure SQL Data Warehouse
- Azure Database Migration Service
- Azure Database for PostgreSQL
- Azure Cosmos DB
- Azure SQL Database
- Azure Database for MariaDB
- Azure Cache for Redis
- SQL Server on VMs

Compute
- Azure App Service
- Containers
- Virtual Machines
- Functions
- Cognitive Services

Mobile
- Notification Hub

DevOps
- Azure DevOps
- Azure DevTest Labs

Networking
- Load Balancer
- Azure Firewall
- Azure Application Gateway
- Network virtual appliances (NVAs)
- DDOS Protection

Firewalls

Resource Management

Tags

Resource Groups
Logical container for resources.

Helps with management, viewing billing spend and access management

Resource naming convention
Use common naming convention organisation-wide

Role Based Access Control (RBAC)

Resource Locks
- Read-Only
- Delete

Subscriptions

Constraints
- 1 bill generated each month per subscription
- Multiple subscriptions allowed per account
- Hard limits per account e.g. 10 express route circuits per subscription
- Spending limits can be set

Types
- Azure free subscription
- Azure Pay-As-You-Go subscription
- Azure Enterprise Agreement
- Azure for Students subscription

Benefits of Cloud Computing
- Cost Effective
- Capital Expenditure (CapEx) vs Operation Expenditure (OpEx)
- Secure
- Reliable
- Scalable
- Elastic
- Less Management Overheads
- Global

Pricing

Savings
- Infrastructure Costs
  - Spending Limits
  - Reserved Instances
  - Low-cost Locations / Regions
  - VM Sizing
  - Shutdown VM's
  - Migrate to PAAS / SAAS
- Licensing
  - Constrained instance size
  - **Bring Your Own Licensing (BYOL)** Requires use of MS SQL Server images
  - Choice of OS (Windows vs Linux)
  - **Azure Hybrid Benefit:** Re-use existing Windows and SQL Server licenses
  - **SQL Server Developer Edition**

Pricing Calculator
- Export to Excel
- Share link

Factors
- **Location**
- **Resource Type**
- **Azure Billing Zones** geographical grouping of Azure Regions for billing purposes

Purchasing Options
- **Enterprise** Commitment to spend a negotiated amount annually. Customised pricing
- **Web Direct** General public pricing, paid each month
- **Cloud Solution Provider (CSP)** Third party on-selling cloud services

Total Cost of Ownership (TCO) Calculator
Predict savings by migrating to Azure

SLA's
- Performance Targets
- Uptime and Connectivity Guarantees
- Service Credits

Support

Azure Feedback Forum

Azure Knowledge Center

Paid

Developer
- Scope - Trial & Non-Prod workloads
- Support during business hours via email
- < 8 hour response
- General architectural guidance

Standard
- Scope - Production workloads
- 24x7 access to support via phone & email
- < 1 hour response
- General architectural guidance

Professional Direct
- Scope - Business critical dependence
- 24x7 access to support via phone & email
- < 1 hour response
- Architectural advice based on best practice
- Operations Support - onboarding services, service reviews, Azure advisor consultations
- Azure engineering web seminars
- ProDirect Delivery Manager

Premier
- Scope - Dependence across multiple products
- 24x7 access to support via phone & email
- < 15 min response
- Customer specific architectural advice
- Technical account manager service reviews & reporting
- Azure engineering web seminars & training
- Designated technical account manager
- Azure Event Management (fee)

Policy & Compliance

Certification
- UK Government G-Cloud
- Service Organization Controls (SOC) 1, 2, and 3
- Criminal Justice Information Services (CJIS)
- Cloud Security Alliance (CSA) STAR Certification
- General Data Protection Regulation (GDPR)
- EU Model Clauses
- Health Insurance Portability and Accountability Act (HIPAA)
- International Organization for Standardization (ISO)
- International Electrotechnical Commission (IEC) 27018
- Multi-Tier Cloud Security (MTCS) Singapore
- National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF

Governance & Resource Management
- **Azure Policy** - Create and, manage standards for resources in Azure
- **Azure Initiative** - Group of Policy Definitions
- JSON configuration file
- Accessible through Portal, PowerShell, Azure CLI, and template
- **Management Groups** - Define policies across multiple subscriptions
- **Azure Blueprint** - Packages ARM templates + policies definitions + RBAC

Compliance

Compliance Manager
Dashboard showing your level of compliance, and recommendations for improvement

Microsoft Privacy Statement
Explains what, why and how data is processed

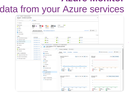
Trust Center
Contains resources regarding Microsoft Security, Privacy, Compliance and transparency practices

Service Trust Portal
Central portal for compliance management

Monitoring

Azure Advisor
Provides recommendations on HA, Security, Performance and Cost

Azure Monitor
Collect and analyse data from your Azure services



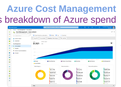
Service Health

Resource Health
Provides you details with about the current and past state of your resources

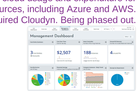
Azure Status
Global view of health of Azure services

Service Health
Customisable dashboard to track the state of your Azure services
- Service Issues - Current issues
- Health History - Historic health
- Health Advisories - Detected health issues
- Health Alerts
- Planned Maintenance

Azure Cost Management
Shows breakdown of Azure spend



Cloudyn
Tracks cloud usage and expenditure for cloud resources, including Azure and AWS. MS acquired Cloudyn. Being phased out.



Cloud Service Types
- Infrastructure as a Service (IAAS)
- Platform as a Service (PAAS)
- Software as a Service (SAAS)

Management
- **Updates** https://azure.microsoft.com/en-us/updates/
- **API's**
- **Azure Mobile App**
- **Azure Cloud Shell**
- **Azure CLI**
- **PowerShell**
  - Integrated
  - https://shell.azure.com/
- **Azure Portal**
  - Feature Preview - https://preview.portal.azure.com/
  - Dashboards
    - Export JSON
    - Share - Publish as Resource
  - Blades

Cloud Deployment Models
- Public
- Private
- Hybrid

Architecture

Geography
Discrete market typically containing two or more regions, that preserves data residency and compliance boundaries.

Region - Geographical area containing at least 1 or more data centers

Region Pair -
Each Region is paired with another region within the same geography

- **Update Domain**
- **Fault Domain**
- **Availability Set** - Grouping of VM's in single data center. Protects against server rack failure.
- **Availability Zone**
  Physically separated datacenters within a Region. Protects against data center failure.

Sovereign Clouds
- **Azure US Government** - Available to US government and US contractors
- **Azure Germany** - Isolated instance to meet EU data residency, security, and compliance needs
- **Azure China** - Operated by 21Vianet

Security

Advanced Threat Protection
https://portal.atp.azure.com/
Available through CSP or Azure E5 licence

Microsoft Azure Information Protection
Classification of content
Can be purchased standalone, or comes with Enterprise level O365 subscriptions

Shared Security Model

Azure Security Center

Azure Key Vault
Centralised store for secrets

Encryption
- At Rest
- Transport

Identity Access Management

Azure Active Directory
- Pricing
- Role Based Access (RBAC)
- Multi-Factor Authentication (MFA)
- Single Sign-On (SSO)
- B2B / B2C

Identities
- **Identity** - Thing to be authenticated
- **Principal** - Identity acting in a certain role e.g. standard user vs admin user
- **Service Principal** - Identity used by a service

Network

Firewalls
- **Azure Firewall** Managed, cloud-based, network security service. No packet filtering
- **Azure Application Gateway** Load balancer including Web Application Firewall (WAF). Packet filtering
- **Network virtual appliances (NVAs)** Suited to custom configurations. Similar to hardware firewall.

DDOS Protection
- Basic
- Standard

- **Network Security Groups (NSG)** Firewall
- **ExpressRoute**
- **Virtual Private Network (VPN)**