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helpful?

level. You can choose the best region for your needs based on technical and regulatory considerations: service capabilities, data residency, compliance requirements, and latency. **Terminology**

Microsoft Azure services are available globally to drive your cloud operations at an optimal

region	through a dedicated regional low-latency network.
geography	An area of the world containing at least one Azure region. Geographies define a discrete market that preserve data residency and compliance boundaries. Geographies allow customers with specific data-residency and compliance needs to keep their data and applications close. Geographies are fault-tolerant to withstand complete region failure through their connection to our dedicated high-capacity networking infrastructure.
Availability Zone	Unique physical locations within a region. Each zone is made up of one or more datacenters equipped with independent power, cooling, and networking.
recommended region	A region that provides the broadest range of service capabilities and is designed to support Availability Zones now, or in the future. These are designated in the Azure portal as Recommended .

terms or concepts. Term or **Description** concept region

To better understand regions and Availability Zones in Azure, it helps to understand key A set of datacenters deployed within a latency-defined perimeter and connected

A region that extends Azure's footprint within a data residency boundary where a recommended region also exists. Alternate regions help to optimize latency and provide a second region for disaster recovery needs. They are not designed to support Availability Zones (although Azure conducts regular assessment of these regions to determine if they should become recommended regions). These are designated in the Azure portal as **Other**. A core Azure service that is available in all regions when the region is generally available.

alternate (other) region foundational service mainstream An Azure service that is available in all recommended regions within 12 months of the region/service general availability or demand-driven availability in service alternate regions. An Azure service that is demand-driven availability across regions backed by specialized service customized/specialized hardware.

An Azure service that is deployed regionally and enables the customer to specify regional service the region into which the service will be deployed. For a complete list, see

Products available by region.

An Azure service for which there is no dependency on a specific Azure region. non-regional service Non-regional services are deployed to two or more regions and if there is a regional failure, the instance of the service in another region continues servicing customers. For a complete list, see Products available by region.

A region is a set of datacenters deployed within a latency-defined perimeter and connected

through a dedicated regional low-latency network. Azure gives you the flexibility to deploy

applications where you need to, including across multiple regions to deliver cross-region

An Availability Zone is a high-availability offering that protects your applications and data

protects applications and data from datacenter failures. Zone-redundant services replicate

resiliency. For more information, see Overview of the resiliency pillar.

from datacenter failures. Availability Zones are unique physical locations within an Azure region. Each zone is made up of one or more datacenters equipped with independent power, cooling, and networking. To ensure resiliency, there's a minimum of three separate zones in all enabled regions. The physical separation of Availability Zones within a region

Availability Zones

Regions

your applications and data across Availability Zones to protect from single-points-of-failure. With Availability Zones, Azure offers industry best 99.99% VM uptime SLA. The full Azure SLA explains the guaranteed availability of Azure as a whole. An Availability Zone in an Azure region is a combination of a fault domain and an update domain. For example, if you create three or more VMs across three zones in an Azure region, your VMs are effectively distributed across three fault domains and three update domains. The Azure platform recognizes this distribution across update domains to make

sure that VMs in different zones are not scheduled to be updated at the same time.

Build high-availability into your application architecture by co-locating your compute,

• **Zonal services** – where a resource is pinned to a specific zone (for example, virtual

storage, networking, and data resources within a zone and replicating in other zones. Azure services that support Availability Zones fall into two categories:

Availability Zone 1

virtual machine placement.

machines, managed disks, Standard IP addresses), or • **Zone-redundant services** – when the Azure platform replicates automatically across zones (for example, zone-redundant storage, SQL Database). To achieve comprehensive business continuity on Azure, build your application architecture using the combination of Availability Zones with Azure region pairs. You can synchronously replicate your applications and data using Availability Zones within an Azure region for high-availability and asynchronously replicate across Azure regions for disaster recovery protection. **Azure Region**

Availability Zone 2

(i) Important The Availability Zone identifiers (the numbers 1, 2 and 3 in the picture above) are logically mapped to the actual physical zones for each subscription independently. That means that Availability Zone 1 in a given subscription might refer to a different physical zone than Availability Zone 1 in a different subscription. As a consequence, it's recommended to not rely on Availability Zone IDs across different subscriptions for

Azure's approach on availability of Azure services across regions is best described by

• Recommended region - A region that provides the broadest range of service

• Alternate (other) region - A region that extends Azure's footprint within a data

not designed to support Availability Zones (although Azure conducts regular

• Mainstream – Available in all recommended regions within 12 months of the

• **Specialized** – Targeted service offerings, often industry-focused or backed by

To see which services are deployed in a given region, as well as the future roadmap for

preview or general availability of services in a region, see Products available by region.

As mentioned previously, Azure classifies services into three categories: foundational,

mainstream, and specialized. Service categories are assigned at general availability. Often,

services start their lifecycle as a specialized service and as demand and utilization increases

may be promoted to mainstream or foundational. The following table lists the category for

• Some services are non-regional. For information and a list of non-regional services, see

services as foundational, mainstream, or specialized. You should note the following about

• Older generation virtual machines are not listed. For more information, see

documentation at Previous generations of virtual machine sizes.

Mainstream

Azure Bastion

Azure Cache for Redis

Azure Cognitive Search

Azure Data Explorer

Azure Data Share

Azure Database for

PostgreSQL

Service

Azure Database for MySQL

Azure Database Migration

region/service general availability; demand-driven in alternate regions (many are

customized/specialized hardware. Demand-driven availability across regions (many are

assessment of these regions to determine if they should become recommended

capabilities and is designed to support Availability Zones now, or in the future. These

residency boundary where a recommended region also exists. Alternate regions help

to optimize latency and provide a second region for disaster recovery needs. They are

expressing services made available in recommended regions and alternate regions.

Availability Zone 3

Azure services are grouped into three categories: foundational, mainstream, and specialized services. Azure's general policy on deploying services into any given region is primarily driven by region type, service categories, and customer demand: • Foundational – Available in all recommended and alternate regions when the region is generally available, or within 12 months of a new foundational service becoming

already deployed into a large subset of alternate regions).

already deployed into a large subset of recommended regions).

Comparing region types

generally available.

Recommended

Alternate

the table:

Foundational

Azure SQL Database

Cloud Services: Av2-Series

Cloud Services: Dv2-Series

Cloud Services: Dv3-Series

Cloud Services: Ev3-Series

Cloud Services: Instance Level

Cloud Services: Reserved IP

IPs

Cloud Services

V

Services by category

Products available by region.

Region and service categories

are designated in the Azure portal as **Recommended**.

regions). These are designated in the Azure portal as **Other**.

If a service offering is not available in a specific region, you can share your interest by contacting your Microsoft sales representative. **Foundational Specialized Availability Region type** Non-Mainstream regional **Zones**

Demand-

driven

Demand-

Demand-

Specialized

Azure Digital Twins

Azure Lab Services

Azure NetApp Files

Azure Time Series Insights

Azure VMware Solution by

Cloud Services: A8 - A11

Cloud Services: G-Series

Virtual Machines: NDs-Series

Virtual Machines: NDv2-Series

Virtual Machines: NV-Series

Virtual Machines: NVv3-Series

Virtual Machines: NVv4-Series

Virtual Machines: SAP HANA on

Azure Large Instances

Visual Studio App Center

(Compute Intensive)

Azure Quantum

CloudSimple

N/A

driven

driven

Account Storage Azure API for FHIR **API** Management **App Configuration** Azure Blockchain Service **Application Gateway** Azure Backup App Service Azure Blueprints Azure Cosmos DB Azure Database for MariaDB **Automation** Azure Data Lake Storage Gen2 **Azure Active Directory** Azure Dedicated HSM **Domain Services** Azure ExpressRoute **Azure Analysis Services** Azure Dev Spaces

Disk Storage **Azure Databricks** Cloud Services: H-Series Cognitive Services: Anomaly **Event Hubs Azure DDoS Protection** Detector Azure DevTest Labs Cognitive Services: Custom Key Vault Vision Load balancer Azure Firewall Manager Cognitive Services : Speaker Recognition Service Bus **Azure Firewall** Data Box Heavy Service Fabric **Azure Functions** Data Catalog Virtual Machine Scale Sets Azure HPC Cache Data Factory: Data Factory V1 Virtual Machines Azure IoT Hub Data Lake Analytics Virtual Machines: Av2-Series Azure Kubernetes Service Machine Learning Studio (AKS) Microsoft Genomics Virtual Machines: Bs-Series Azure Machine Learning Virtual Machines: DSv2-Series Azure Private Link Remote Rendering Virtual Machines: DSv3-Series Azure Red Hat OpenShift **Spatial Anchors** Virtual Machines: Dv2-Series **Azure Site Recovery** StorSimple Virtual Machines: Dv3-Series Azure Spring Cloud Service Video Indexer Virtual Machines: ESv3-Series Azure Stack Hub Virtual Machines: A8 - A11 (Compute Intensive) Virtual Machines: Ev3-Series **Azure Stream Analytics** Virtual Machines: DASv4-Series Virtual Machines: F-Series **Azure Synapse Analytics** Virtual Machines: DAv4-Series Virtual Machines: DCsv2-series Virtual Machines: FS-Series Azure SignalR Service Virtual Machines: Instance Level Batch Virtual Machines: EASv4-Series IPs Virtual Machines: EAv4-Series Virtual Machines: Reserved IP Cloud Services: M-series Virtual Machines: G-Series Virtual Network Cognitive Services Cognitive Services: Computer **VPN** Gateway Virtual Machines: GS-Series Vision Cognitive Services: Content Virtual Machines: HBv1-Series Moderator Virtual Machines: HBv2-Series Cognitive Services: Face Cognitive Services: Language Virtual Machines: HCv1-Series Understanding Cognitive Services: Speech Virtual Machines: H-Series Services Virtual Machines: LS-Series Cognitive Services: QnA Maker Virtual Machines: LSv2-Series **Container Instances** Virtual Machines: Mv2 -series **Container Registry Data Factory** Virtual Machines: NC-Series Virtual Machines: NCv2-Series **Event Grid HDInsight** Virtual Machines: NCv3-Series

Logic Apps

Media Services

Network Watcher

Notification Hubs

Power BI Embedded

Premium Blob Storage

Premium Files Storage

Storage: Archive Storage

Virtual Machines: Fsv2-Series

Virtual Machines: M-Series

All Azure management services are architected to be resilient from region-level failures. In

smaller failure radius compared to an entire region failure. Azure can recover from a zone-

level failure of management services within the region or from another Azure region. Azure

There is no additional cost for virtual machines deployed in an Availability Zone. 99.99% VM

uptime SLA is offered when two or more VMs are deployed across two or more Availability

Zones within an Azure region. There will be additional inter-Availability Zone VM-to-VM

data transfer charges. For more information, review the Bandwidth pricing page.

performs critical maintenance one zone at a time within a region, to prevent any failures

impacting customer resources deployed across Availability Zones within a region.

the spectrum of failures, one or more Availability Zone failures within a region have a

Ultra Disk Storage

Virtual WAN

Services resiliency

Get started with Availability Zones • Create a virtual machine

Create a zone redundant virtual machine scale set

Add zone redundant region for Azure Cosmos DB

Getting Started Azure Cache for Redis Availability Zones

Create an Azure Active Directory Domain Services instance

Add a Managed Disk using PowerShell

frontend

Pricing for VMs in Availability Zones

 Zone-redundant storage SQL Database Event Hubs geo-disaster recovery • Service Bus geo-disaster recovery Create a zone-redundant virtual network gateway

• Create an Azure Kubernetes Service (AKS) cluster that uses Availability Zones

• Load balance VMs across zones using a Standard Load Balancer with a zone-redundant

Load balance VMs within a zone using a Standard Load Balancer with a zonal frontend

 Regions that support Availability Zones in Azure Quickstart templates **Feedback**

Next steps

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