Azure Reference Architectures

Our reference architectures are arranged by scenario. Each architecture includes recommended practices, along with considerations for scalability, availability, manageability, and security. Most also include a deployable solution or reference implementation.

Jump to: AI | Big data | IoT | Microservices | Serverless | Virtual networks | VM workloads | SAP | Active Directory | Web apps

AI and machine learning

Training of Python scikit-learn models

Recommended practices for tuning the hyperparameters of a scikit-learn Python model.

Distributed training of deep learning models

Run distributed training of deep learning models across clusters of GPU-enabled VMs.

Batch scoring of Python models

Batch score many Python models in parallel on a schedule using Azure Machine Learning.

Batch scoring for deep learning models

Automate running batch jobs that apply neural style transfer to a video.

Real-time scoring of Python and deep learning models

Deploy Python models as web services to make real-time predictions, using regular Python models or deep learning models.

MLOps for Python models using Azure Machine Learning

Implement a CI/CD and retraining pipeline using Azure DevOps and Azure Machine Learning.

Batch scoring of R machine learning models

Perform batch scoring of R models using Azure Batch.

Real-time scoring of R machine learning models

Implement a real-time prediction service in R using Microsoft Machine Learning Server running in Azure Kubernetes Service (AKS).

Batch scoring of Spark models on Azure Databricks

Build a scalable solution for batch scoring an Apache Spark classification model using Azure Databricks.

Real-time recommendation API

Train a recommendation model using Azure Databricks and deploy it as an API using Azure Machine Learning.

Enterprise-grade conversational bot

How to build an enterprise-grade conversational bot using the Azure Bot Framework.

Big data solutions

Enterprise BI with SQL Data Warehouse

ELT (extract-load-transform) pipeline to move data from an on-premises database into SQL Data Warehouse.

Automated enterprise BI with Azure Data Factory

Automate an ELT pipeline to perform incremental loading from an on-premises database.

Stream processing with Azure Databricks

Stream processing pipeline that joins records from two streams, enriches the result, and calculates a rolling average.

Stream processing with Azure Stream Analytics

End-to-end stream processing pipeline that correlates records from two data streams to calculate a rolling average.

Internet of Things

Azure IoT reference architecture

Recommended architecture for IoT applications on Azure using PaaS (platform-as-a-service) components.

Microservices

Microservices on Azure Kubernetes Service (AKS)

Recommended architecture for deploying microservices on AKS.

Microservices architecture on Azure Service Fabric

Recommended architecture for microservices on Service Fabric.

Serverless applications

Serverless web application

A serverless web application that serves static content from Blob Storage and implements an API using Azure Functions.

Event processing using Azure Functions

An event-driven architecture that ingests a stream of data and uses Functions to processes the data.

Virtual networks

Hybrid network using a virtual private network (VPN)

Connect an on-premises network to an Azure virtual network.

Hybrid network using ExpressRoute

Use a private, dedicated connection to extend an on-premises network to Azure.

Hybrid network using ExpressRoute with VPN failover

Use ExpressRoute with a VPN as a failover connection for high availability.

Hub-spoke network topology

Create a central point of connectivity to your on-premises network, while isolating workloads.

Hub-spoke topology with shared services

Extend a hub-spoke topology by including shared services such as Active Directory.

DMZ between Azure and on-premises

Use network virtual appliances to create a secure hybrid network.

DMZ between Azure and the Internet

Use network virtual appliances to create a secure network that accepts Internet traffic.

Highly available network virtual appliances

Deploy a set of network virtual appliances (NVAs) for high availability in Azure.

VM workloads

N-tier application with SQL Server

Virtual machines configured for an N-tier application using SQL Server on Windows.

Multi-region N-tier application

N-tier application in two regions for high availability, using SQL Server Always On availability groups.

N-tier application with Cassandra

Virtual machines configured for an N-tier application using Apache Cassandra on Linux.

SharePoint Server 2016 farm

Highly available SharePoint Server 2016 farm on Azure with SQL Server Always On availability groups.

SAP

SAP NetWeaver

SAP NetWeaver on Windows, in a high availability environment that supports disaster recovery.

SAP S/4HANA

SAP S/4HANA on Linux, in a high availability environment that supports disaster recovery.

SAP HANA on Azure Large Instances

HANA Large Instances are deployed on physical servers in Azure regions.

Extend on-premises Active Directory to Azure

Integrate with Azure Active Directory

Integrate on-premises AD domains with Azure Active Directory.

Extend an on-premises Active Directory domain to Azure

Deploy Active Directory Domain Services (AD DS) in Azure to extend your on-premises domain.

Create an AD DS forest in Azure

Create a separate AD domain in Azure that is trusted by your on-premises AD forest.

Extend Active Directory Federation Services (AD FS) to Azure

Use AD FS for federated authentication and authorization for components running in Azure.

Web applications

Basic web application

Web application with Azure App Service and Azure SQL Database.

Highly scalable web application

Proven practices for improving scalability in a web application.

Highly available web application

Run an App Service web app in multiple regions to achieve high availability.

Web application monitoring on Azure

Monitor a web application hosted in Azure App Service.