

# Survey of Cloud Computing and Azure Foundation

Services in Azure

# Topics

What is Microsoft Azure?

Virtual Machines

Cloud Services

App Service

Modules of Azure Service

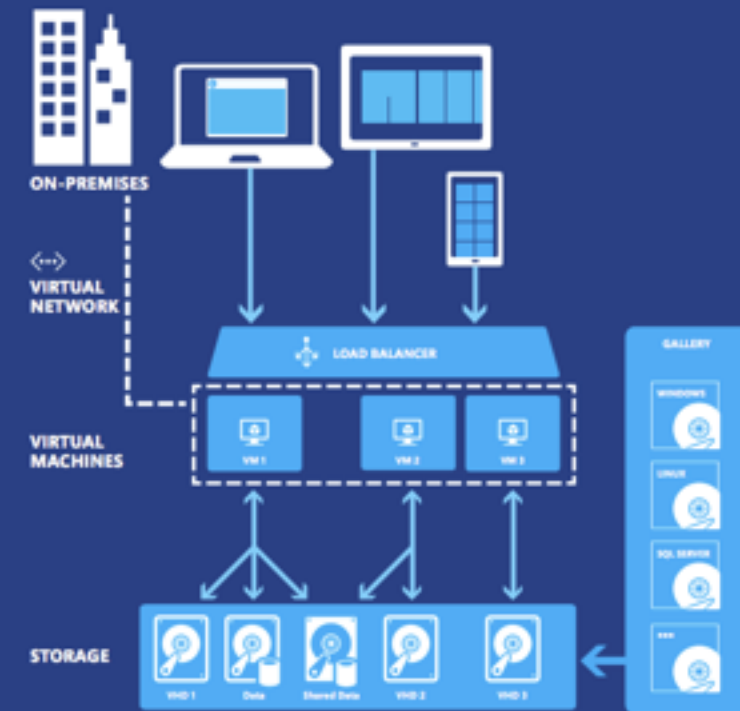
What is the Azure Portal?

# What is Microsoft Azure?

Azure is a flexible, open, and secure public and hybrid cloud

## Virtual Machines

VMs are basic cloud building blocks. Get full control over a virtual machine with virtual hard disks. Install and run software yourself. Configure multiple machines with different roles to create complex solutions. VMs are nearly identical to conventional (real) servers, and are the easiest way to move existing workloads to the cloud.



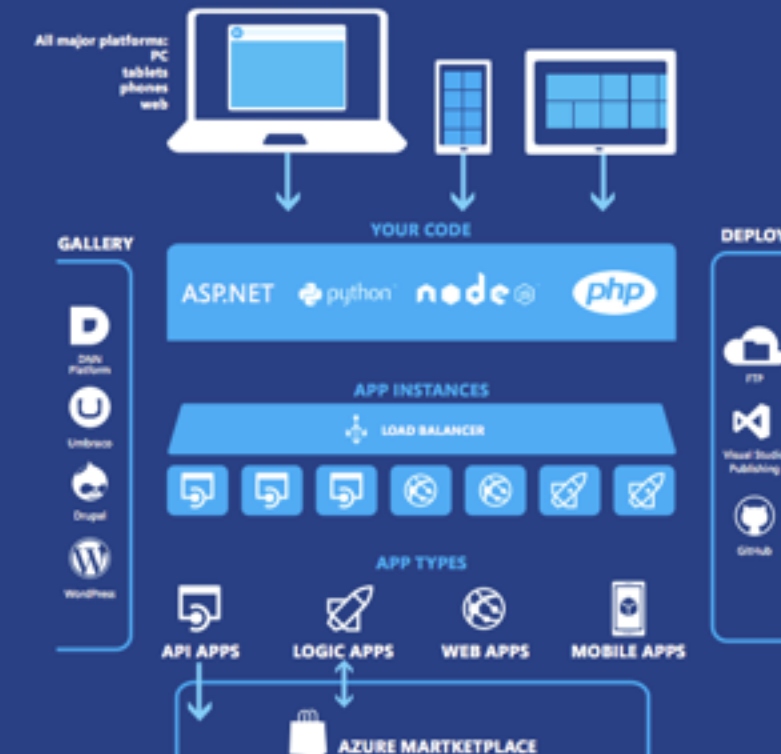
## Cloud Services

Easily access and manage these general purpose VMs. We maintain and update each VM as needed with system updates. You configure the VM size as needed, and scale out as many copies as needed. Two types of VMs: worker roles and web roles—worker roles are made for computing and running services. The web role is simply a worker role with IIS already installed and configured.



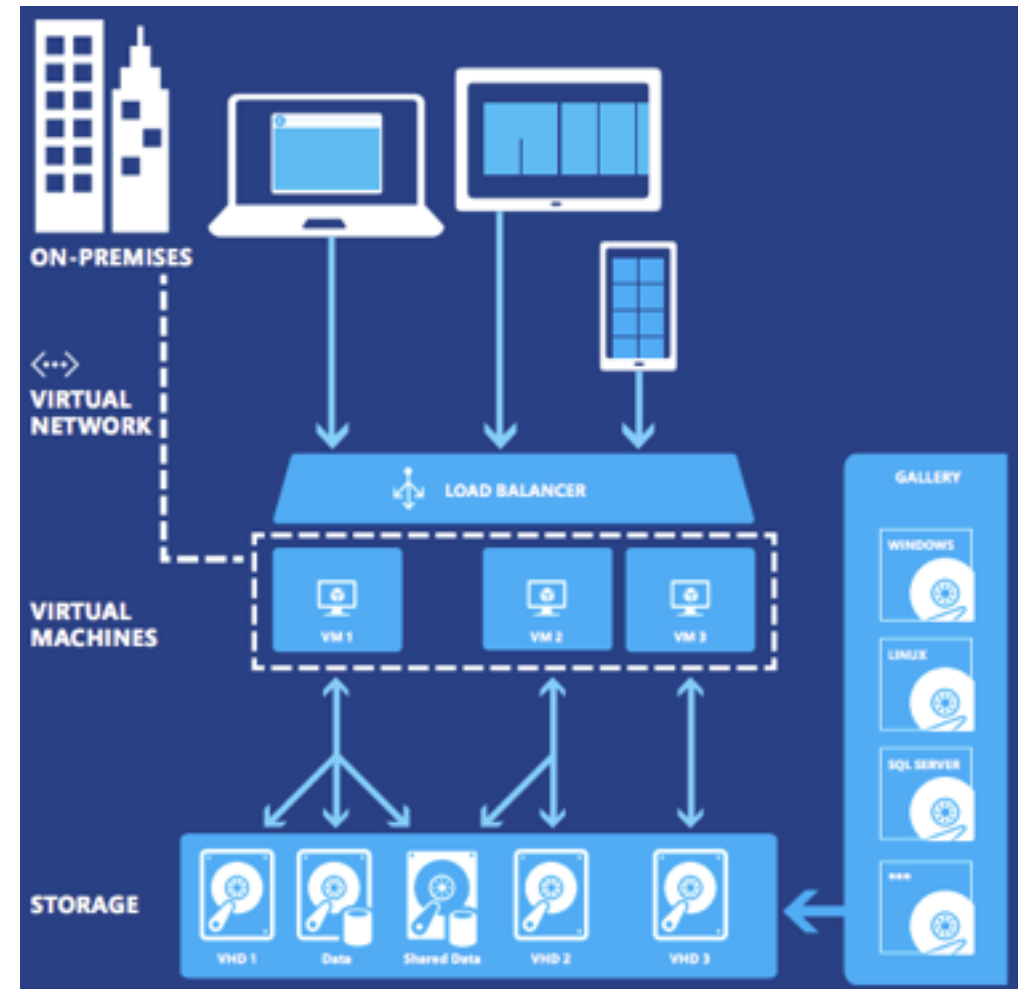
## App Service

Azure App Service is a high productivity solution for developers who need to create enterprise-grade web and mobile app experiences. App Service provides a complete platform as a service solution that enables you to deploy and elastically scale applications in the cloud, and seamlessly integrate them with on-premises resources and SaaS based applications.



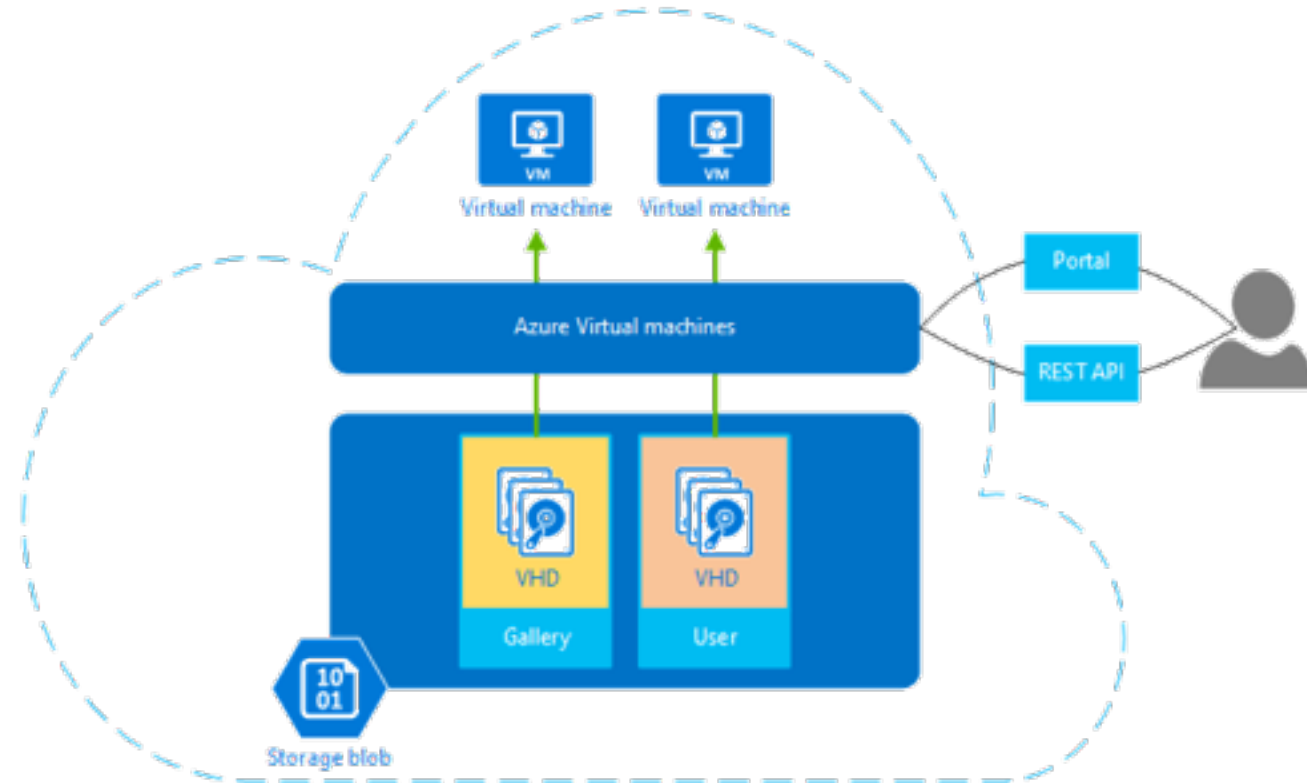
# Virtual Machines

- Basic cloud building blocks
- Full control over virtual machines
- Install and run user applications
- Gallery of VM images available



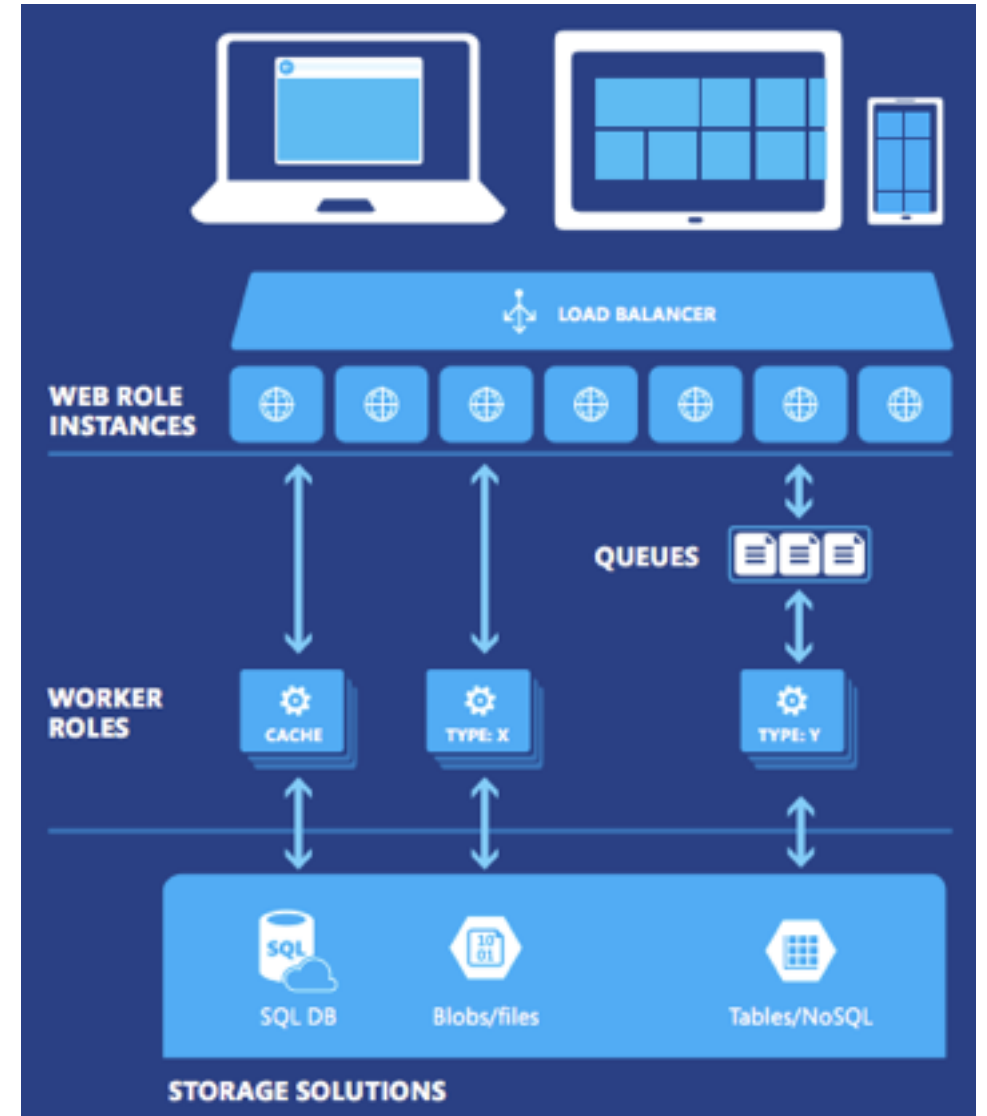
# Azure Virtual Machines – IaaS

- IaaS Service
- VHD (Virtual Hard Disk) for persistent storage
- Different types of VMs can be configured together to provide complex solutions



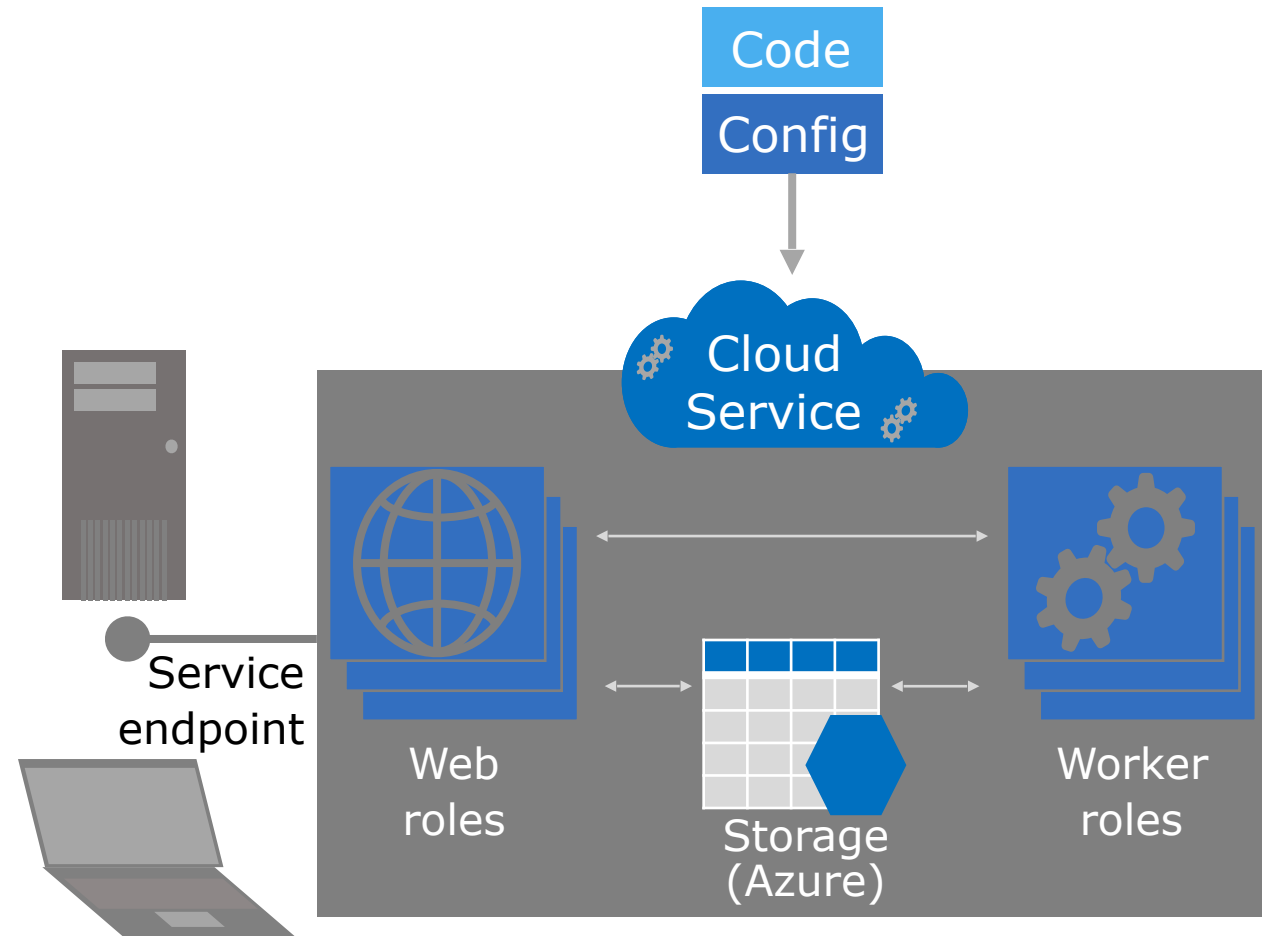
# Cloud Service

- General purpose VMs available to user
- Users configure size of VM to fit their needs
- Vendor maintains VM with system update



# Cloud Services - PaaS

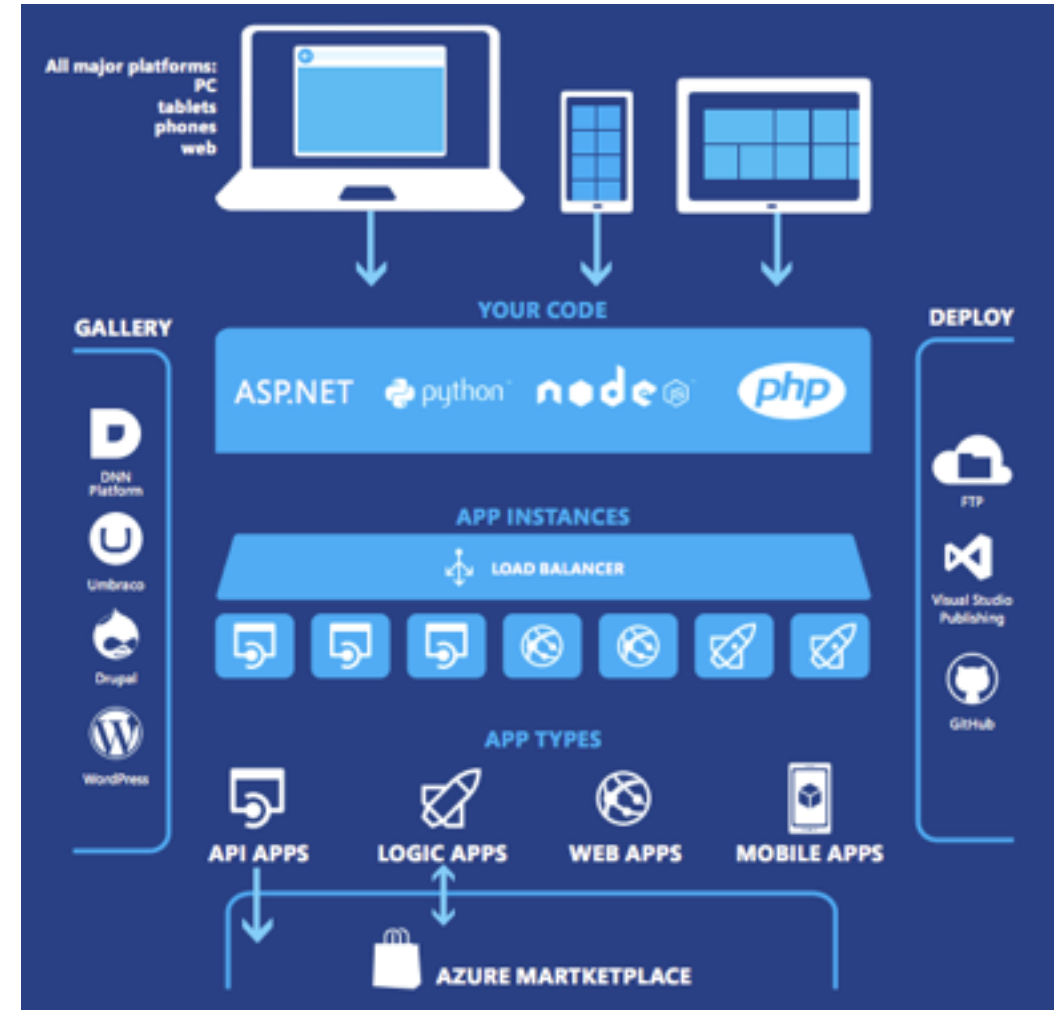
- PaaS service
- More flexibility over VMs than App Services
- Multiple worker role and/or web role VMs allowed for single application
- Single service access point for application end-user



# App Service

## Features

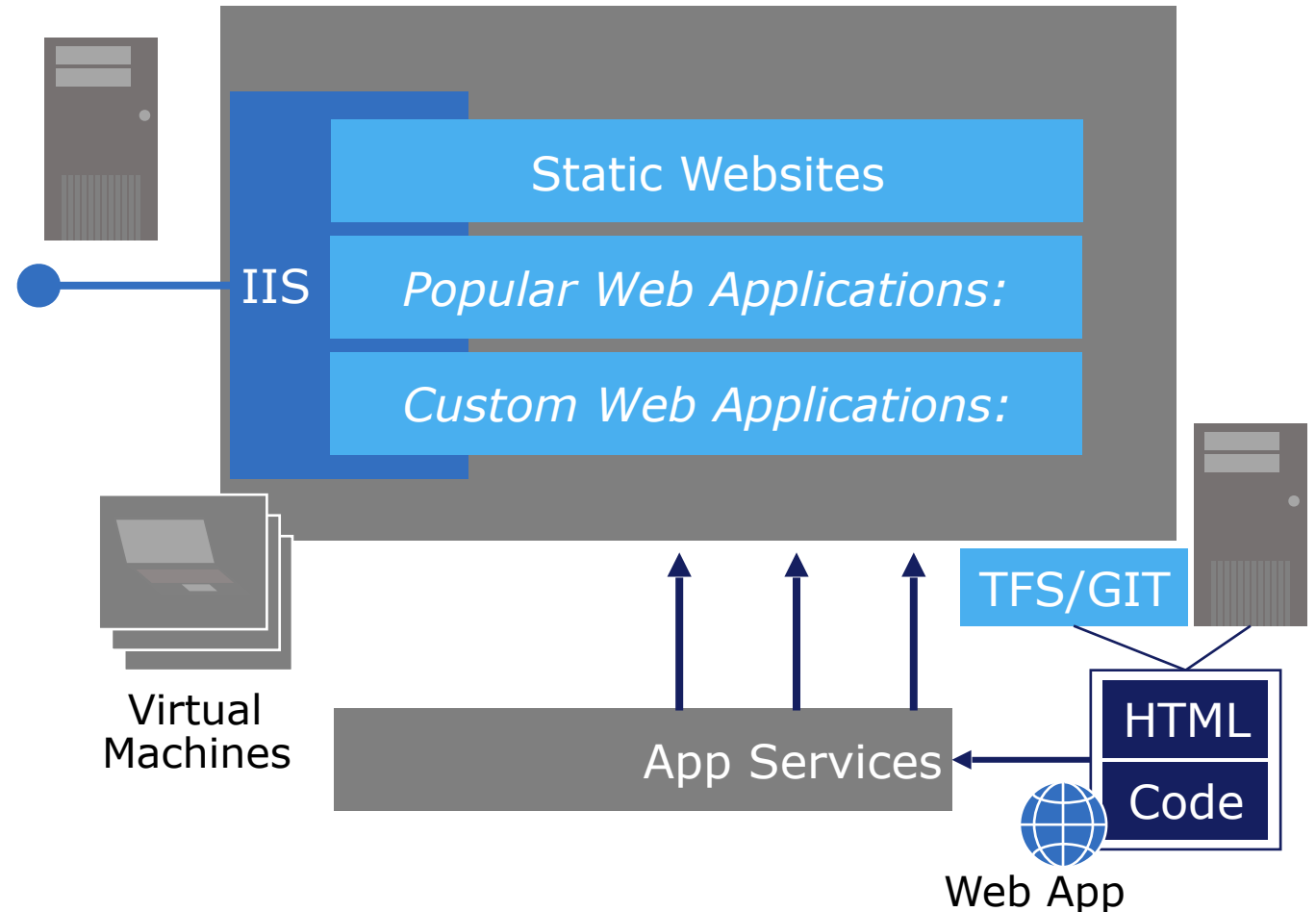
- Multiple languages and frameworks
- Global scale with high availability
- Connections to SaaS platforms and on-premises data
- Security and compliance
- Application Templates
- DevOps optimization





# App Service - PaaS

- PaaS service
- Optimal for quick web and mobile apps development
- Popular web apps – Drupal, Wordpress, etc.
- Custom web apps – ASP.NET, PHP, Node.js, etc
- Integration with SAP, Oracle EBS, SQL Server, and PeopleSoft via BizTalk Services



# Why App Service - Web Apps?

- Services optimized to rapidly build, deploy and manage enterprise grade websites
- Jump-start using large list of existing templates
- Automatically scale depending on usage and traffic
- Integration and versioning with Visual Studio Team system, Github, TeamCity, Hudson or BitBucket
- Tools for staged deployment and verification
- Easy connection and access to on-premises data



Web Apps

# Other Options

Azure also offers other compute hosting models for more specialized purposes

Model	Description
Mobile	Optimized to provide a cloud back-end for apps that run on mobile devices.
Batch	Optimized for processing large volumes of similar tasks, ideally workloads which lend themselves to running as parallel tasks on multiple computers.
HDInsight (Hadoop)	Optimized for running MapReduce jobs on Hadoop

# Azure Service Modules - 1

Azure provides a broad collection of integrated services

Compute	Web and Mobile	Data and Storage	Analytics
Virtual Machines Cloud Services Batch RemoteApp Service Fabric Azure Container Service	App Service Logic Apps Web Apps Mobile Services API Management Mobile Engagement	DocumentDB SQL Database Redis Cache Storage StorSimple Search SQL Data Warehouse SQL Server Stretch Database	HDInsight Machine Learning Data Factory Data Catalog Data Lake Store Data Lake Analytics

# Azure Service Modules - 2

Azure provides a broad collection of integrated services

Networking	Media and CDN	Hybrid Integration	Identity and Access Management
Virtual Network ExpressRoute Application Gateway Traffic Manager Azure DNS Load Balancer VPN Gateway	Media Services Content Delivery Network	BizTalk Services Service Bus Backup Site Recovery	Azure Active Directory Multi-Factor Authentication Azure Active Directory Domain Services Azure Active Directory B2C

# Azure Service Modules - 3

Azure provides a broad collection of integrated services

Developer	Management	Intelligence	Internet of Things
Visual Studio Application Insights Azure DevTest Labs	Key Vault Scheduler Automation Log Analytics Security Center	Cognitive Services	Machine Learning Stream Analytics Push Notification Event Hubs Internet of Things Azure IoT Hub

# Popular Products in Azure

## Virtual Machines



Provision Windows and Linux Virtual Machines in minutes

## App Service



Create web and mobile apps for any platform and any device

## SQL Database



Managed relational SQL Database-as-a-service

## Storage



Durable, highly available and massively scalable cloud storage

## Cloud Services



Create highly available, infinitely scalable cloud applications and APIs

## DocumentDB



Managed NoSQL document database-as-a-service

## Azure Active Directory



Synchronize on-premises directories and enable single sign-on

## Backup



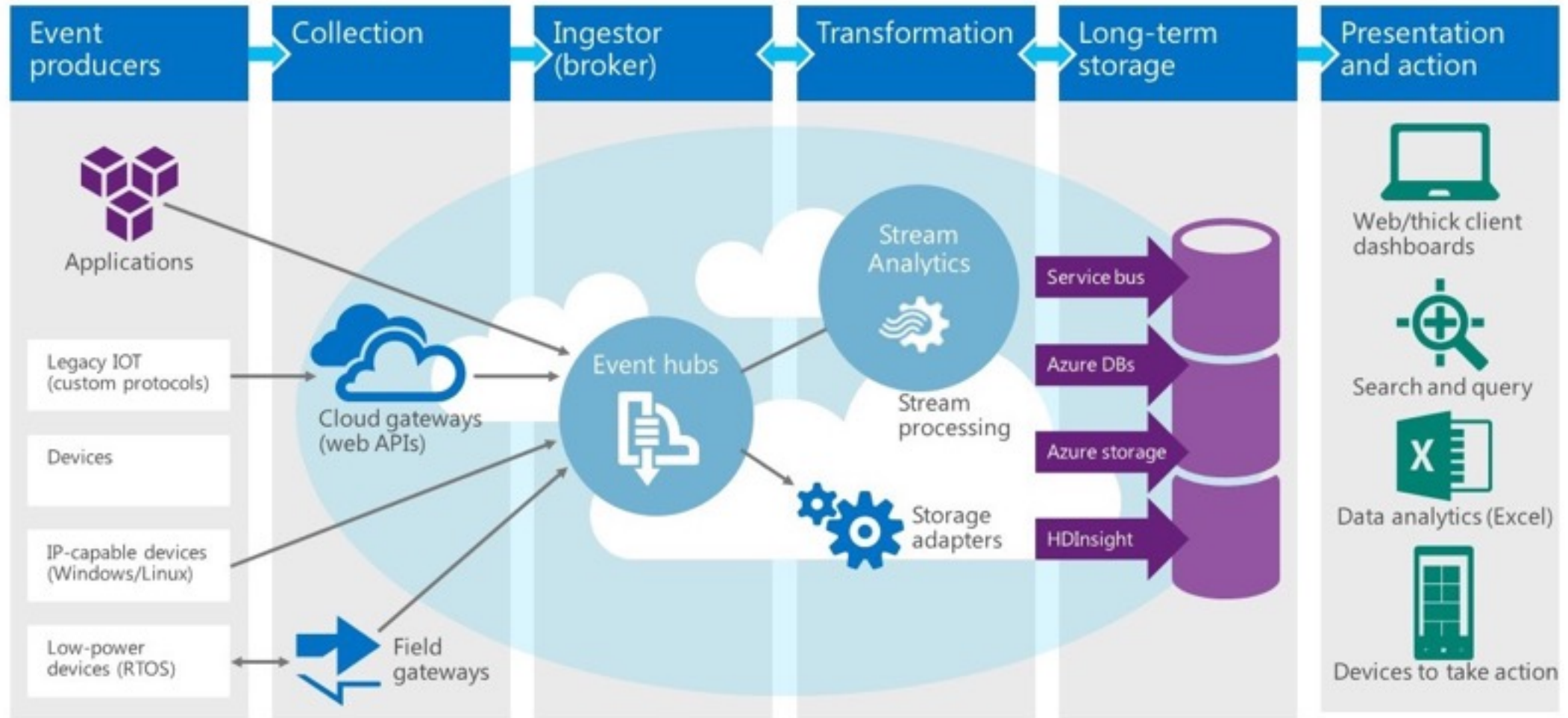
Simple and reliable server backup to the cloud

# NoSQL vs. SQL DB

	NoSQL	SQL
Model	Non-relational – Stores data in JSON documents, key/value pairs, wide column stores, or graphs	Relational – Stores data in a table
Data	Offers flexibility as not every record needs to store the same properties. Good for semi-structured data.	Great for solutions where every record has the same properties. Good for structured data.
Schema	Dynamic or flexible schemas – database is schema-agnostic and the schema is dictated by the application. This allows for agility and highly iterative development.	Strict schema – Schema must be maintained and kept in sync between application and database
Transactions	ACID transaction support varies per solution.	Supports ACID transactions.
Consistency	Consistency varies per solution, some solutions have tunable consistency	Strong consistency supported.

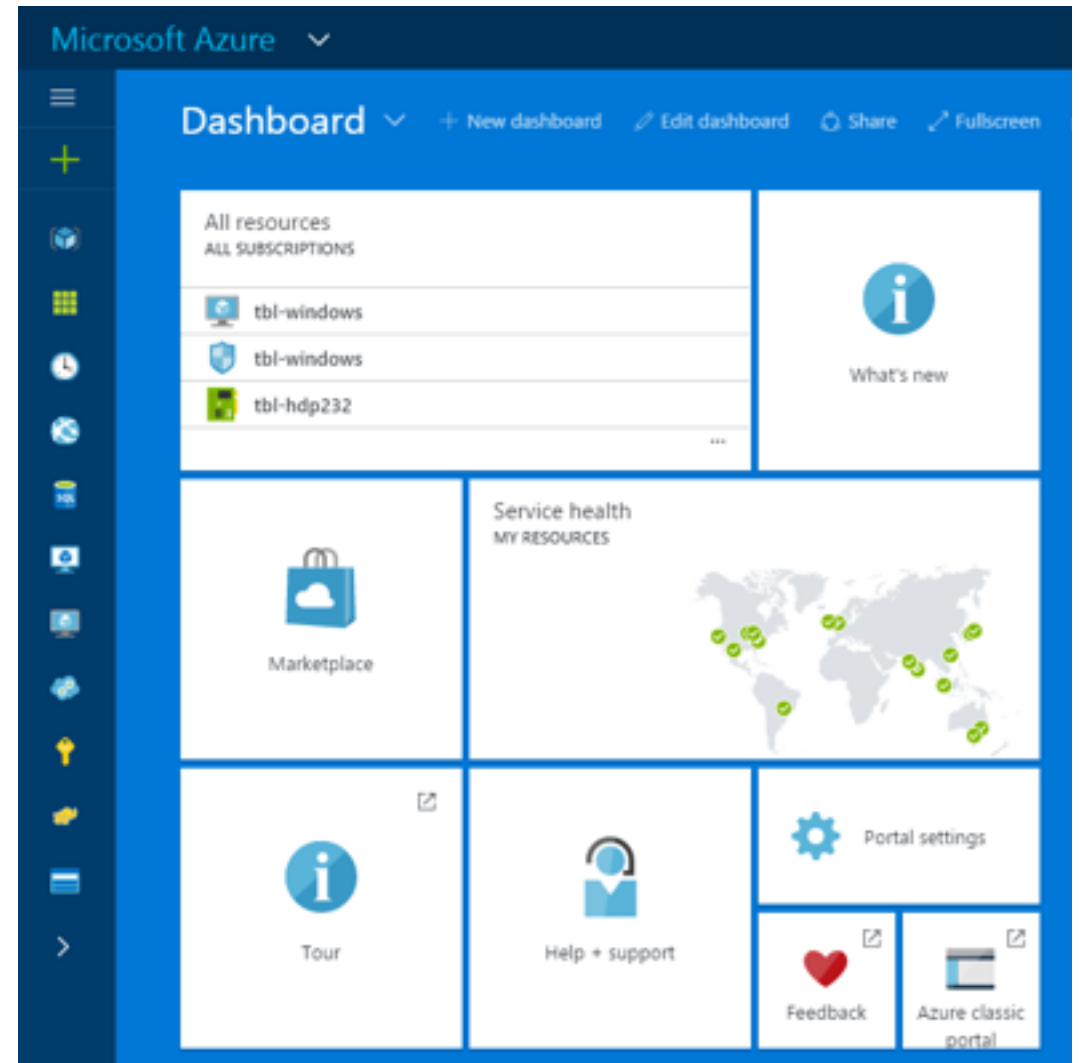


# Azure Services Work Together



# Access Services Through Azure Portal

- The Microsoft Azure portal is the central location where Azure resources and services are provisioned and managed
- Marketplace for solutions
- Customized start screen



# Creating a Resource in Azure Portal

The screenshot shows the Azure Portal's 'Create' page. The left sidebar contains navigation links: HOME, NOTIFICATIONS (4), BILLING, and HELP. The main content area is divided into 'Browse' and 'Recent' sections. The 'Browse' section has a list of categories: Compute, Web + Mobile, Data + Storage, Data Analytics, Networking, Media + CDN, Hybrid integration, Identity, Developer Services, and Management. The 'Recent' section shows items like Storage, Virtual Network, Web App, Windows Server 2012 R2 Datacenter, and WordPress. A 'Featured items in the selected category' section displays various services like Windows Server 2012 R2 Datacenter, Ubuntu Server 14.04 LTS, SQL Server 2014, SharePoint Server Farm, Oracle Database 12c Enterprise Edition, and Cloud Service. A 'Create VM' sidebar on the right shows fields for Host Name, User Name, Password, Pricing Tier, Optional configuration, Resource group, Subscription, and Location. Annotations include: 'Featured categories from the marketplace' pointing to the 'Browse' list; 'Recently created items' pointing to the 'Recent' list; 'Featured items in the selected category' pointing to the featured items section; 'Link to the full marketplace' pointing to the 'Azure Marketplace' link at the bottom; 'Click here to create anything' pointing to the '+ NEW' button; and 'Fill out a few fields and click \'Create\'' pointing to the 'Create' button in the 'Create VM' sidebar.

Featured categories from the marketplace

Recently created items

Featured items in the selected category

Link to the full marketplace

Click here to create anything

Fill out a few fields and click 'Create'

# Role-Based Access Control in Azure Portal

Azure Role-Based Access Control (RBAC) enables fine-grained access management for Azure.

- Built-in roles
  - Owner has full access to all resources including the right to delegate access to others.
  - Contributor can create and manage all types of Azure resources but can't grant access to others.
  - Reader can view existing Azure resources.

# Summary

In this lesson, you have learned:

- Key capabilities in Microsoft Azure
  - Virtual Machines
  - Cloud Services
  - App Service
- Modules of Azure Service
- How Azure portal service is utilized