

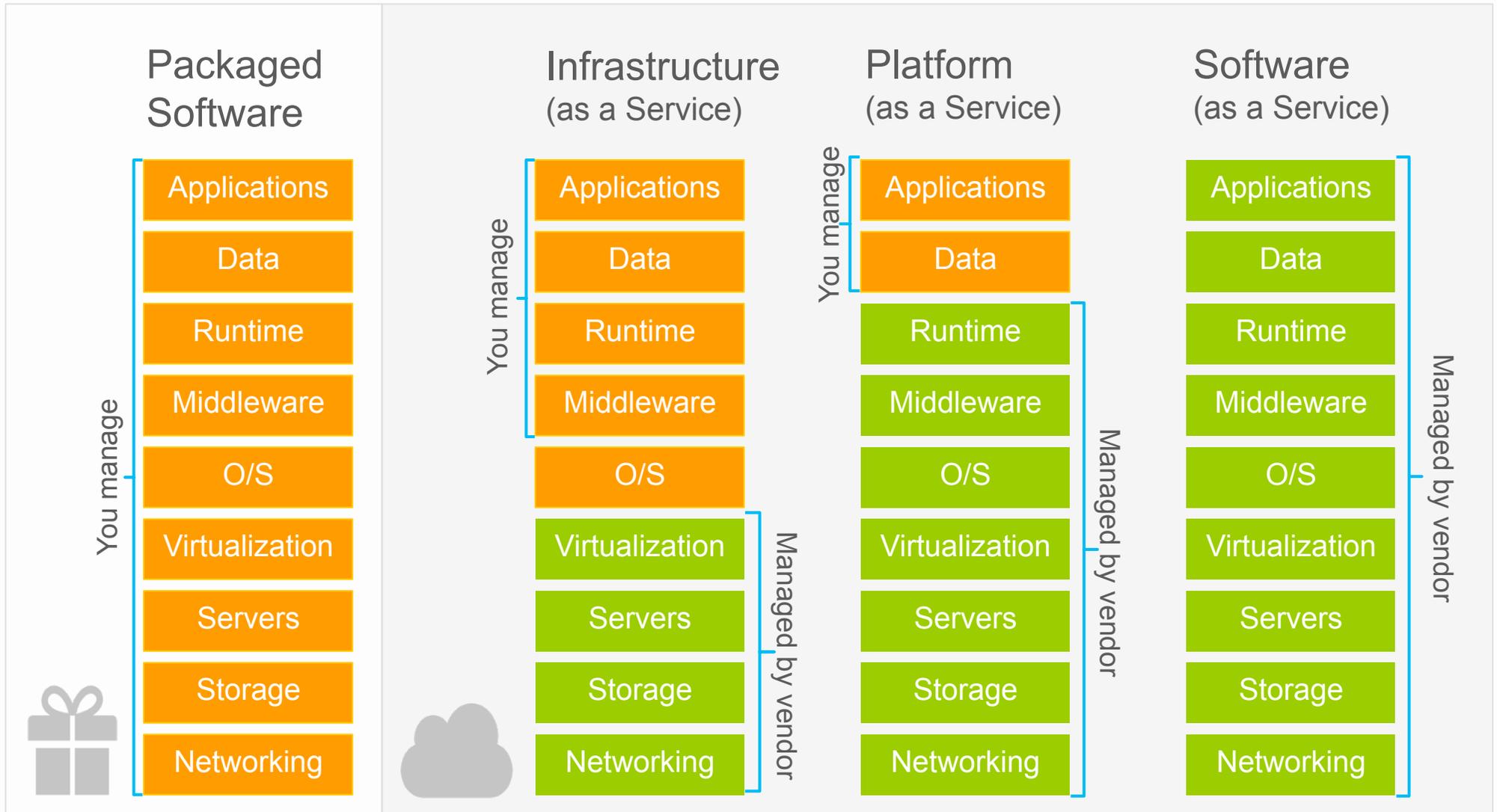
Windows Azure Overview

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MS Azure Educator Grant



Cloud Computing



Windows Azure

- Operating system distributed on thousand of machines
 - Infrastructure abstraction (hardware, network,..)
 - Hosts and executes services
 - Data storage



Windows® Azure™

SERVICES

SERVICES

Applications



Developer Tools



Programming Model



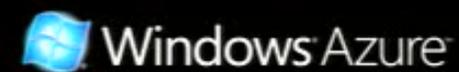
Application Services



Relational Database



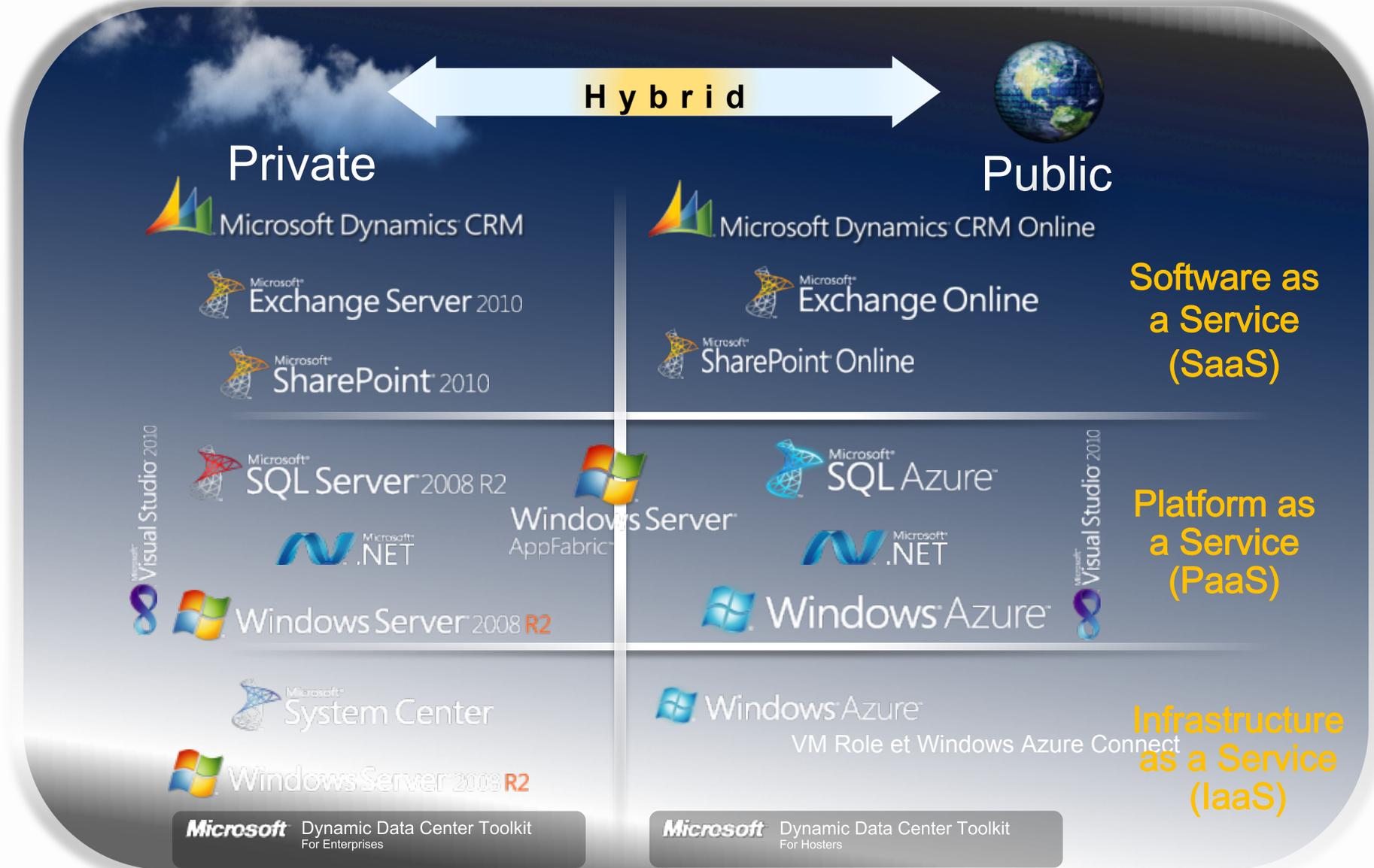
Operating System



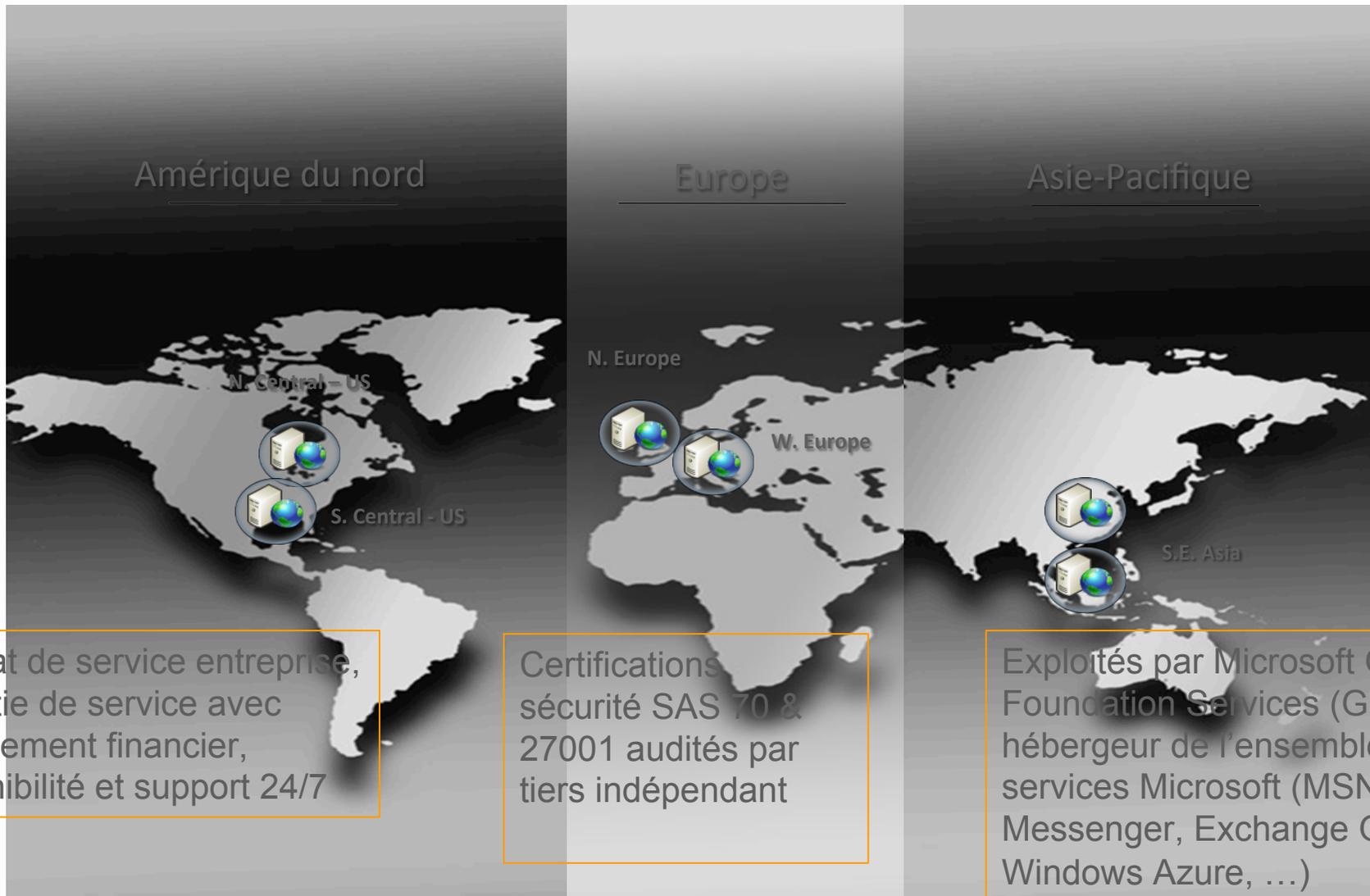
Systems Management



From datacenter ... to Cloud



Datacenters of Microsoft Cloud

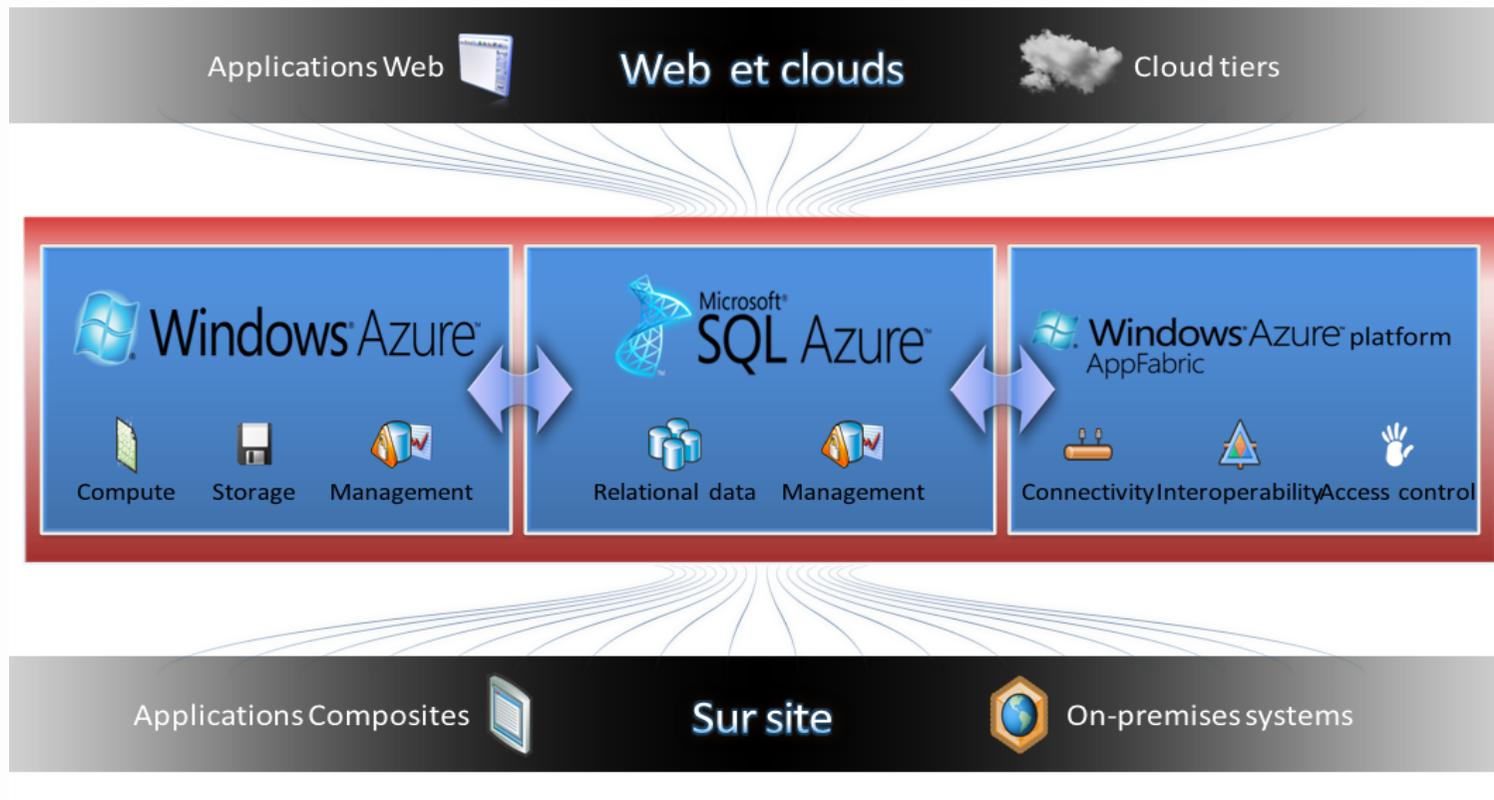


Contrat de service entreprise, garantie de service avec engagement financier, disponibilité et support 24/7

Certifications sécurité SAS 70 & 27001 audités par tiers indépendant

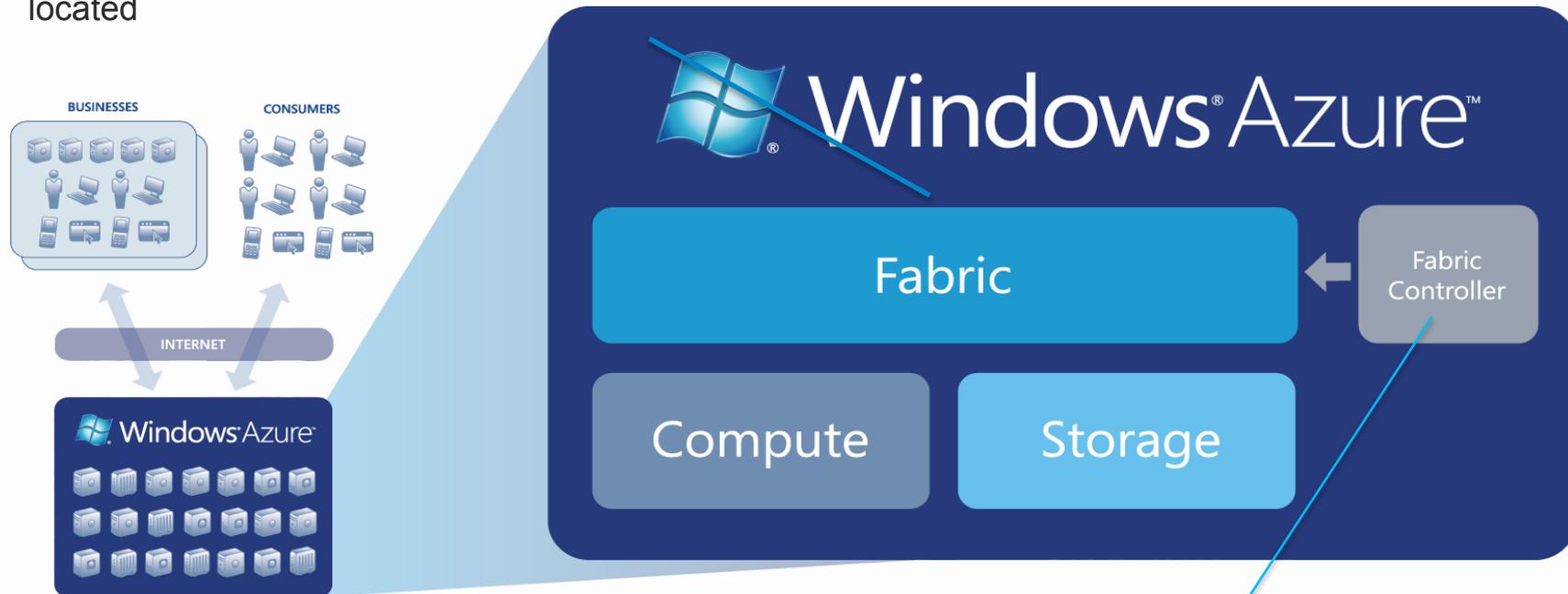
Exploités par Microsoft Global Foundation Services (GFS), hébergeur de l'ensemble des services Microsoft (MSN, Messenger, Exchange Online, Windows Azure, ...)

Global view of the Windows Azure platform



Architecture Windows Azure

Services for creating applications on the cloud that require advanced functions but also hybrid applications that are partially executed « on-premises » and on Windows Azure: **access control** based on claims, federates systems (windows live id, facebook, connect ..); **service bus**, **cache** (velocity) distributed, geo-located



The Fabric Controller communicates with servers in the factory. It manages Windows Azure, monitors applications, decides where to execute new applications for optimizing the use of the hardware

<https://portal.appfabriclabs.com>

Windows Azure roles

- ✓ Services and solutions are built with any combination of Web Roles and Worker Roles
- ✓ Interprocess communication roles via HTTP / HTTPS, TCP / IP, and ports other than 80 and 443
- ✓ Developed with the Microsoft or non-Microsoft: ASP.NET, WCF, other tools. NET, but also Java, Python, Ruby, etc..



WEB ROLE

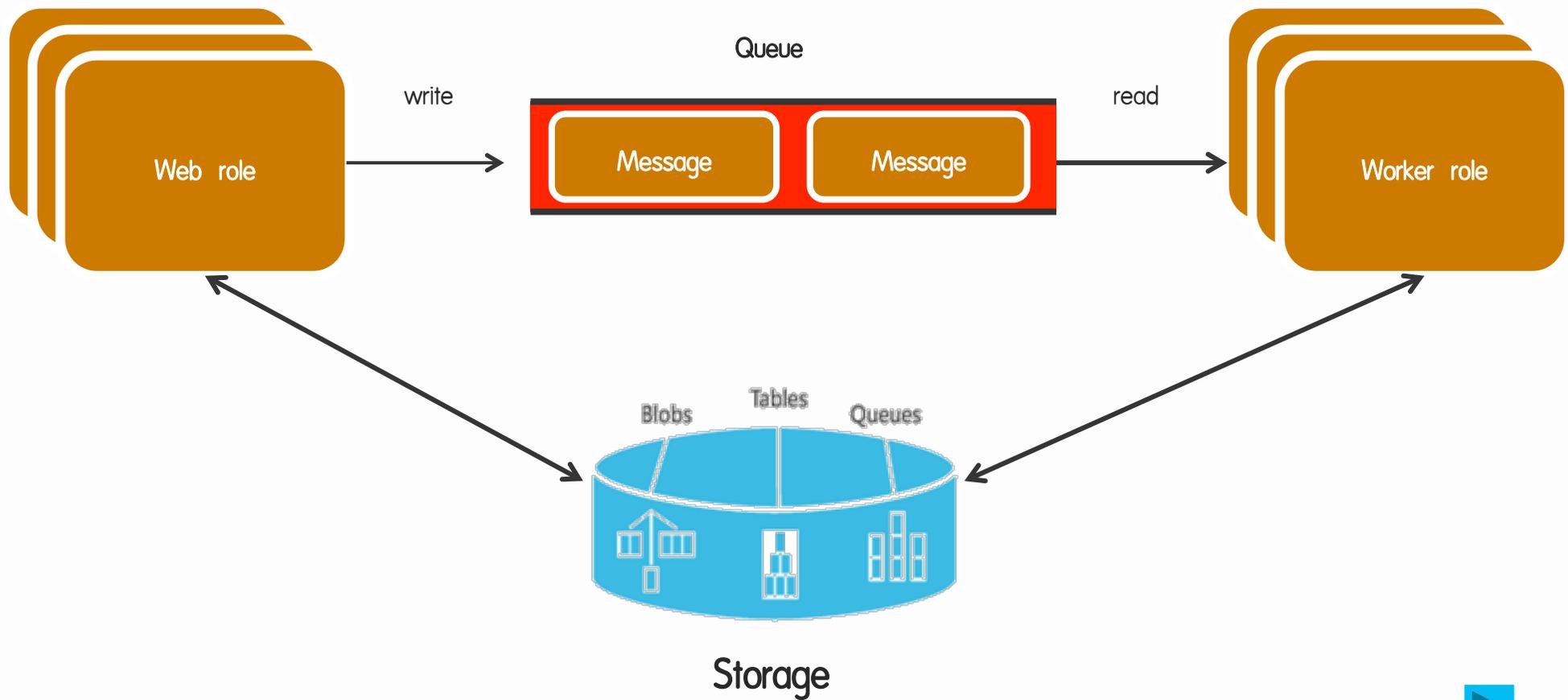
- ✓ Interacts with end users or Web services
- ✓ Communicates with Worker Roles directly or via queues (Queues)



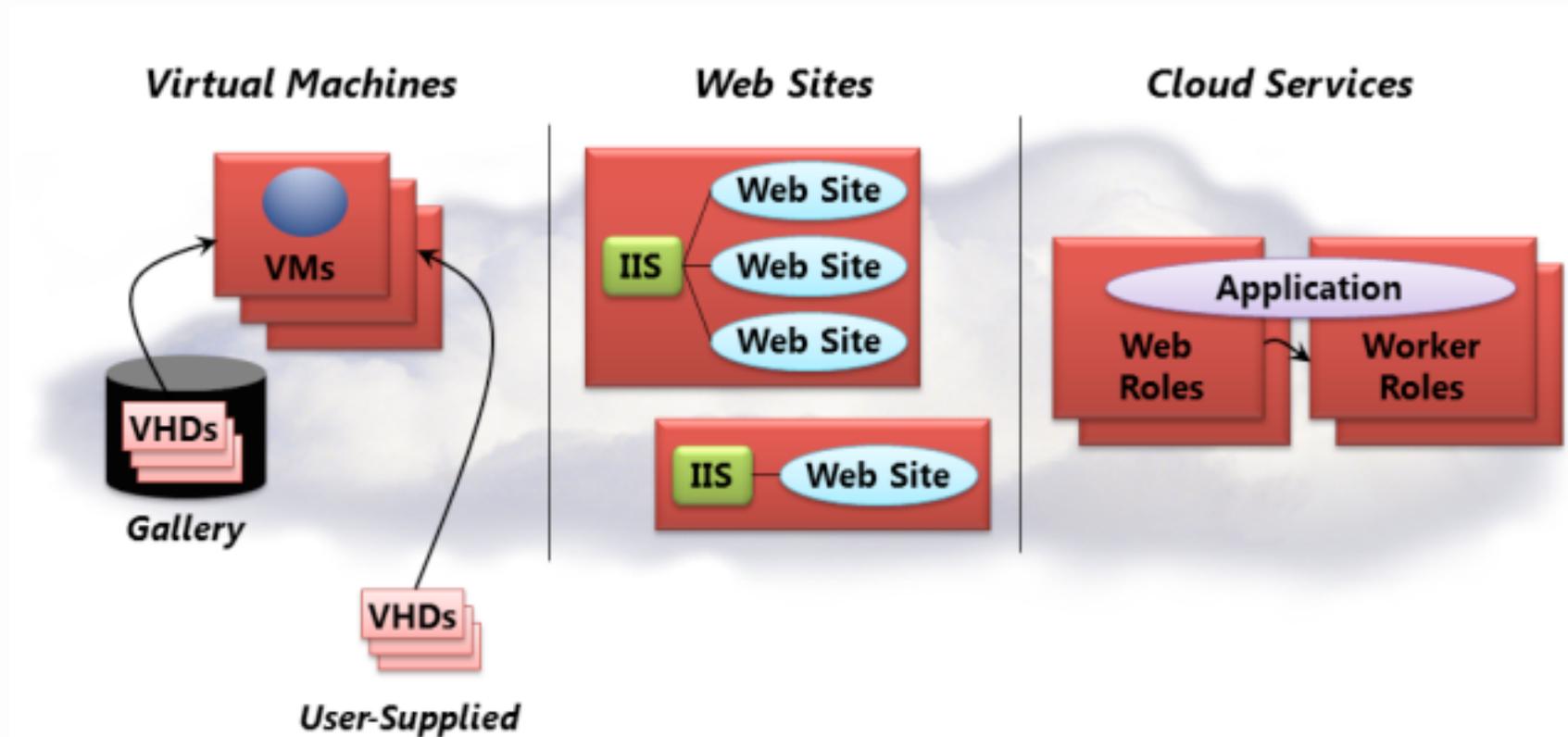
WORKER ROLE

- ✓ Work on the basis of queues to determine the tasks
- ✓ Similar to a "batch" or a Windows Service

Windows Azure Compute



Approaches for executing applications



They can be used separately. You can also combine them to create an application that uses two or more of these options together.

Windows Azure execution models

- Windows Azure Virtual Machines provides a general-purpose computing environment 
- Windows Azure Web Sites offers low-cost web hosting 
- Windows Azure Cloud Services is the best choice for creating scalable, reliable applications with low administration costs 

You can use these technologies separately or combine them as needed to create the right foundation for your application. The approach you choose depends on what problems you're trying to solve.

Data management



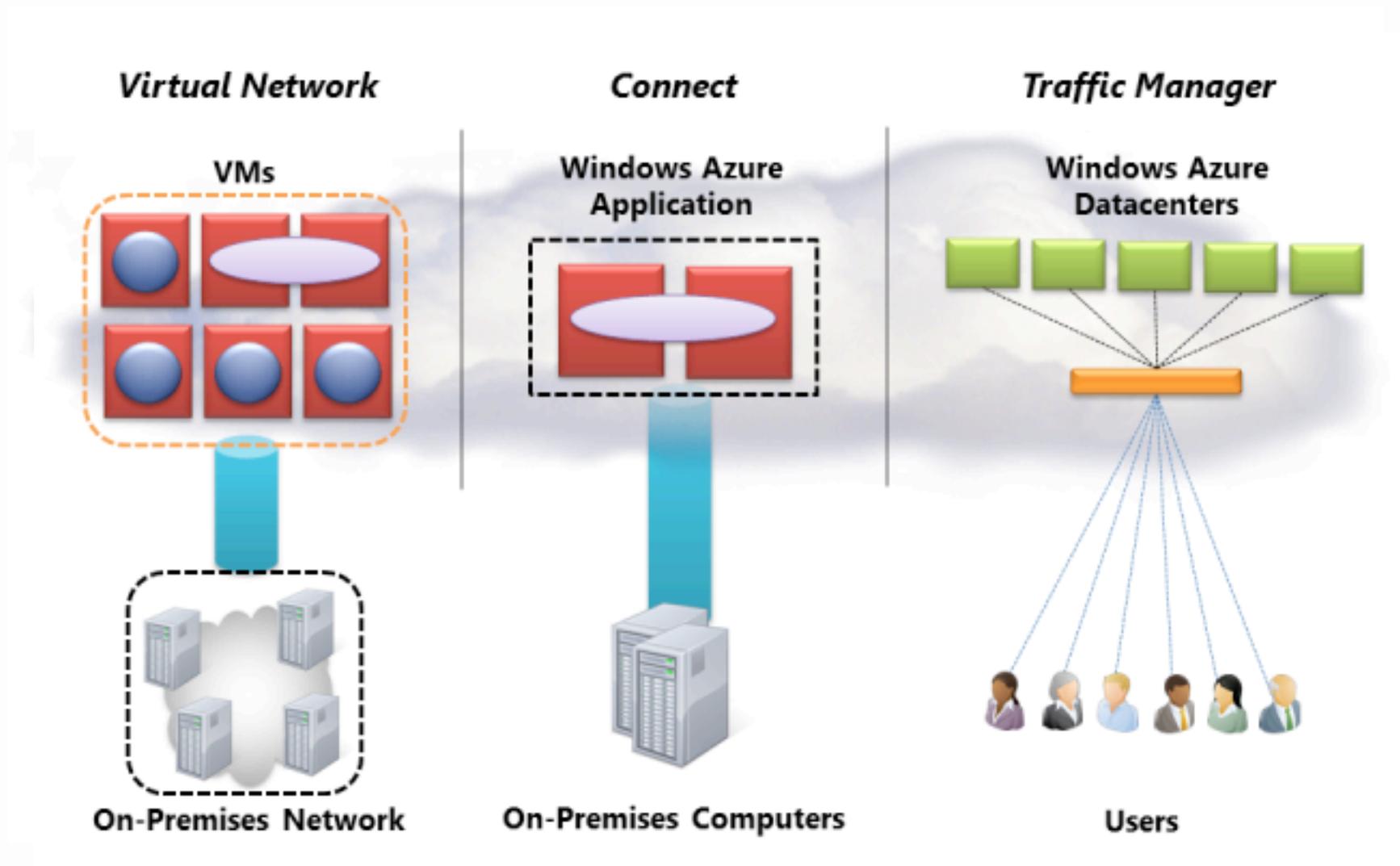
Applications need data, and different kinds of applications need different kinds of data

Windows Azure provides different ways to store and manage data:

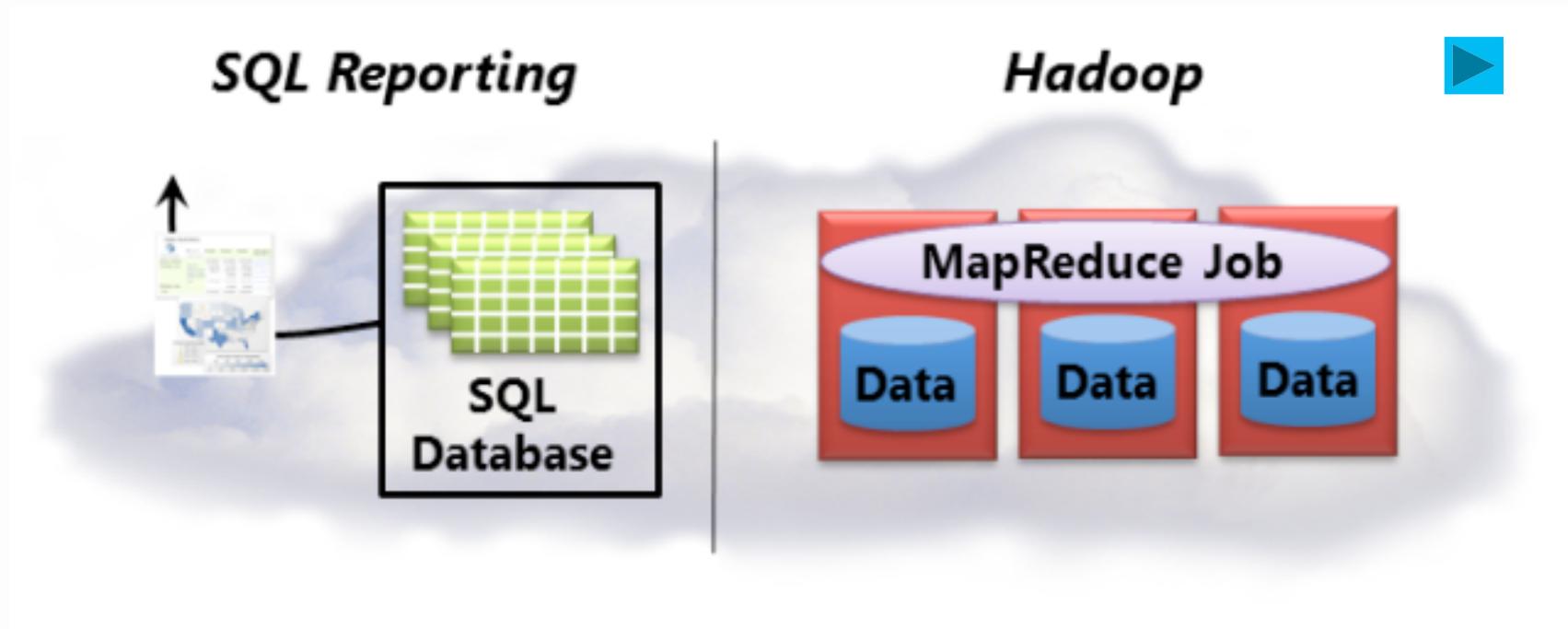
- run **SQL Server or another DBMS** in a VM
 - Not limited to relational systems
 - you can run NoSQL technologies such as MongoDB and Cassandra
 - It requires handling the administration of that DBMS
- **three data management options : SQL Azure, Tables (Key-value), Blobs**



Networking



Business Analytics



For business analytics, Windows Azure provides reporting and support for big data

Autres Composants Windows Azure

<i>Execution Models</i>	Virtual Machines	Web Sites	Cloud Services		
<i>Data Management</i>	SQL Database	Tables	Blobs		
<i>Networking</i>	Virtual Network	Connect	Traffic Manager		
<i>Business Analytics</i>	SQL Reporting	Hadoop			
<i>Messaging</i>	Queues	Service Bus			
<i>Caching</i>	Caching	CDN			
<i>Identity</i>	Windows Azure Active Directory				
<i>High-Performance Computing</i>	HPC Scheduler				
<i>Media</i>	Media Services				
<i>Commerce</i>	Marketplace				
<i>SDKs</i>	.NET	Java	PHP	Python	Node.js

Summary

Windows Azure provides a comprehensive set of services that you can selectively compose to build your cloud apps

Global Data Center Footprint

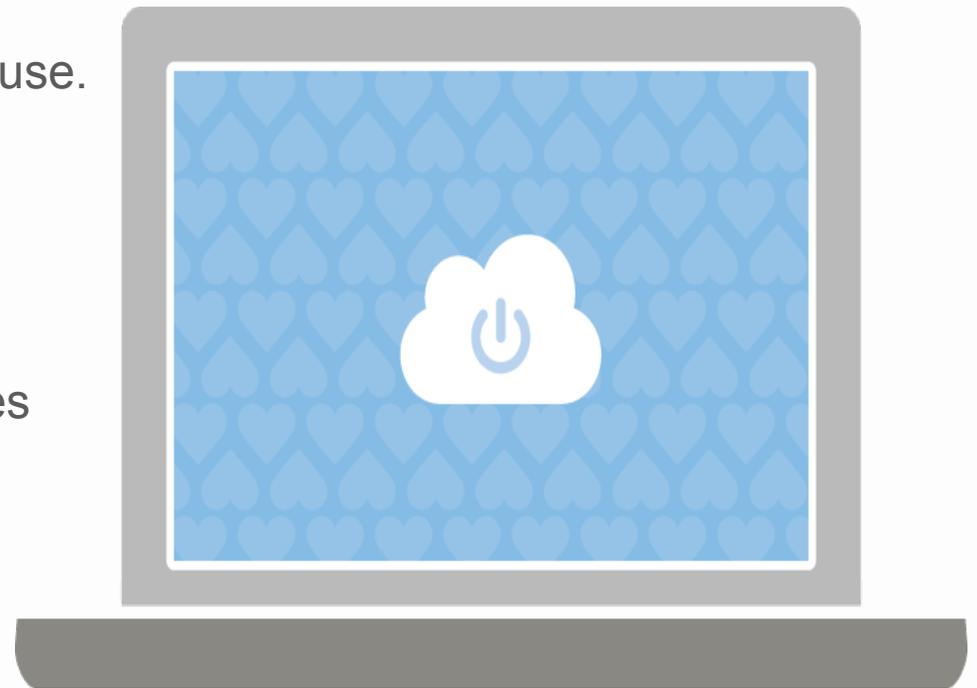
99.95% Monthly SLA. Pay only for what you use.

Flexible & Open Compute Options

Virtual Machines, Web Sites, & Cloud Services

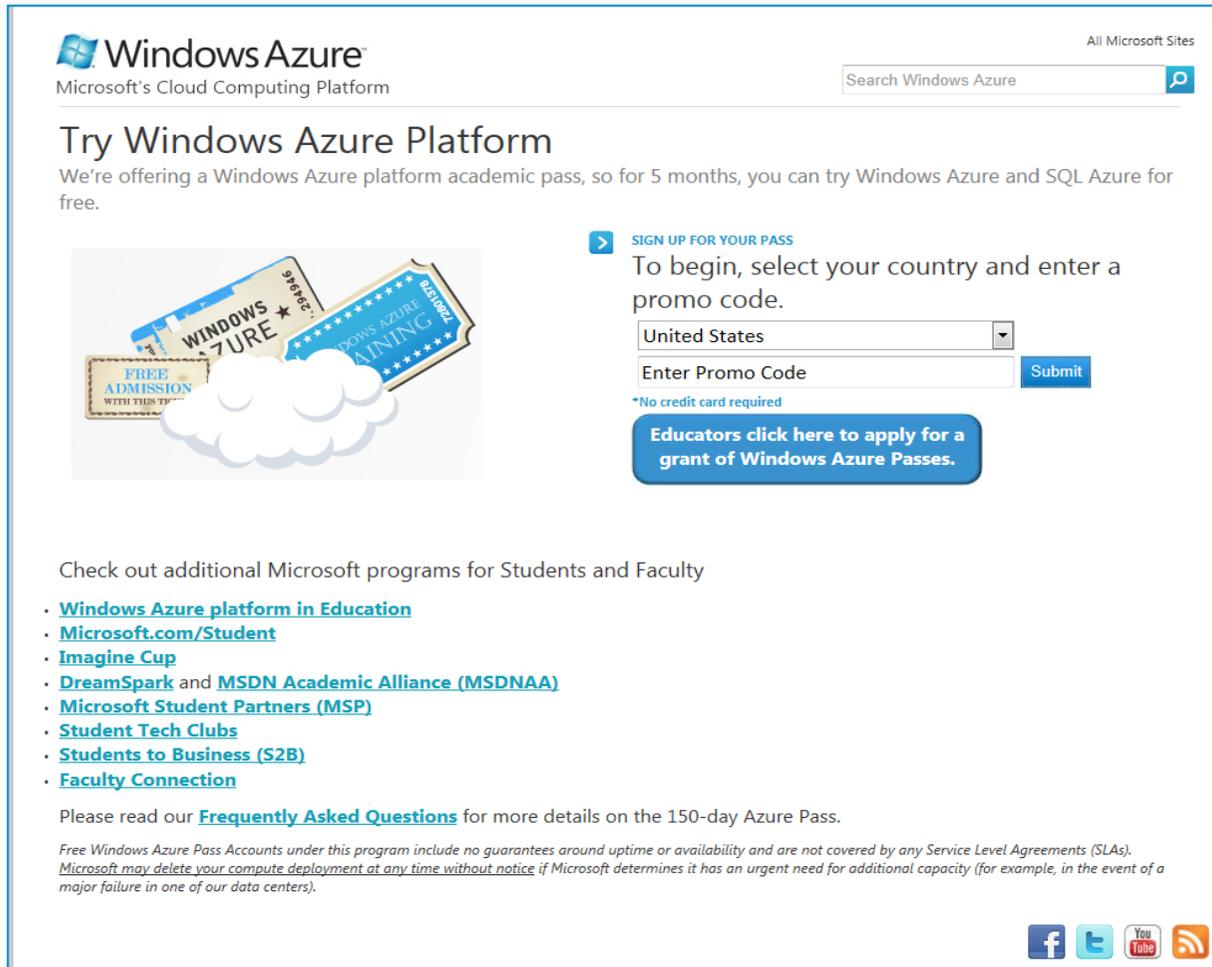
Managed Building Block Services

SQL Database, Cache, Service Bus, & more



AzureU Pass

www.WindowsAzurePass.com/azureu



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Educators click here to apply for a grant of Windows Azure Passes.

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- [DreamSpark](#) and [MSDN Academic Alliance \(MSDNAA\)](#)
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- [Student Tech Clubs](#)
- [Students to Business \(S2B\)](#)
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Please read our [Frequently Asked Questions](#) for more details on the 150-day Azure Pass.

Free Windows Azure Pass Accounts under this program include no guarantees around uptime or availability and are not covered by any Service Level Agreements (SLAs). Microsoft may delete your compute deployment at any time without notice if Microsoft determines it has an urgent need for additional capacity (for example, in the event of a major failure in one of our data centers).

Facebook, Twitter, YouTube, RSS

Windows Azure

- 3 small compute instances
- 3GB of storage
- 250,000 storage transactions

SQL Azure

- Two 1GB Web Edition database

AppFabric

- 100,000 Access Control transactions
- 2 Service Bus connections

Data Transfers (per region)

- 3 GB in
- 3 GB out

Create Virtual Machines

- specify which VHD to use and the VM's size. You then pay for each hour the VM is running.
 - Windows Azure Virtual Machines offers a gallery of standard VHDs (Windows Server 2008 R2, Windows Server 2012, and Windows Server 2008 R2 with SQL Server,
 - Linux images provided by Microsoft partners.
 - to upload and create VMs from your own VHDs as well.

Any changes made while a VM is running can be persistently stored ; It's also possible to copy the changed VHD out of Windows Azure, then run it locally

Use of Virtual Machines

- to create an inexpensive development and test platform that you can shut down when you've finished using it.
- To create and run applications that use whatever languages and libraries you like. Those applications can use any of the data management options that Windows Azure provides, and you can also choose to use SQL Server or another DBMS running in one or more virtual machines.
- to use Windows Azure VMs as an extension of your on-premises datacenter, running SharePoint or other applications.



Windows Azure Web sites



A web environment to help managing web sites or web applications

Websites: either moving an existing IIS (internet information services) website into Windows Azure Web or create a new one directly in the cloud

Managing websites:

- load balance requests across instances
- offers both a shared option, where your website runs in a virtual machine with other sites, and a way for a site to run in its own VM

For development it supports .NET, PHP, and Node.js, along with SQL Database and (from ClearDB, a Microsoft partner) MySQL for relational storage.

Node.js is a server side software system designed for writing scalable Internet applications, notably web servers.[1] Programs are written on the server side in JavaScript, using event-driven, asynchronous I/O to minimize overhead and maximize scalability.[2]



Windows Azure Cloud services

To support scalable, reliable, and low-admin applications

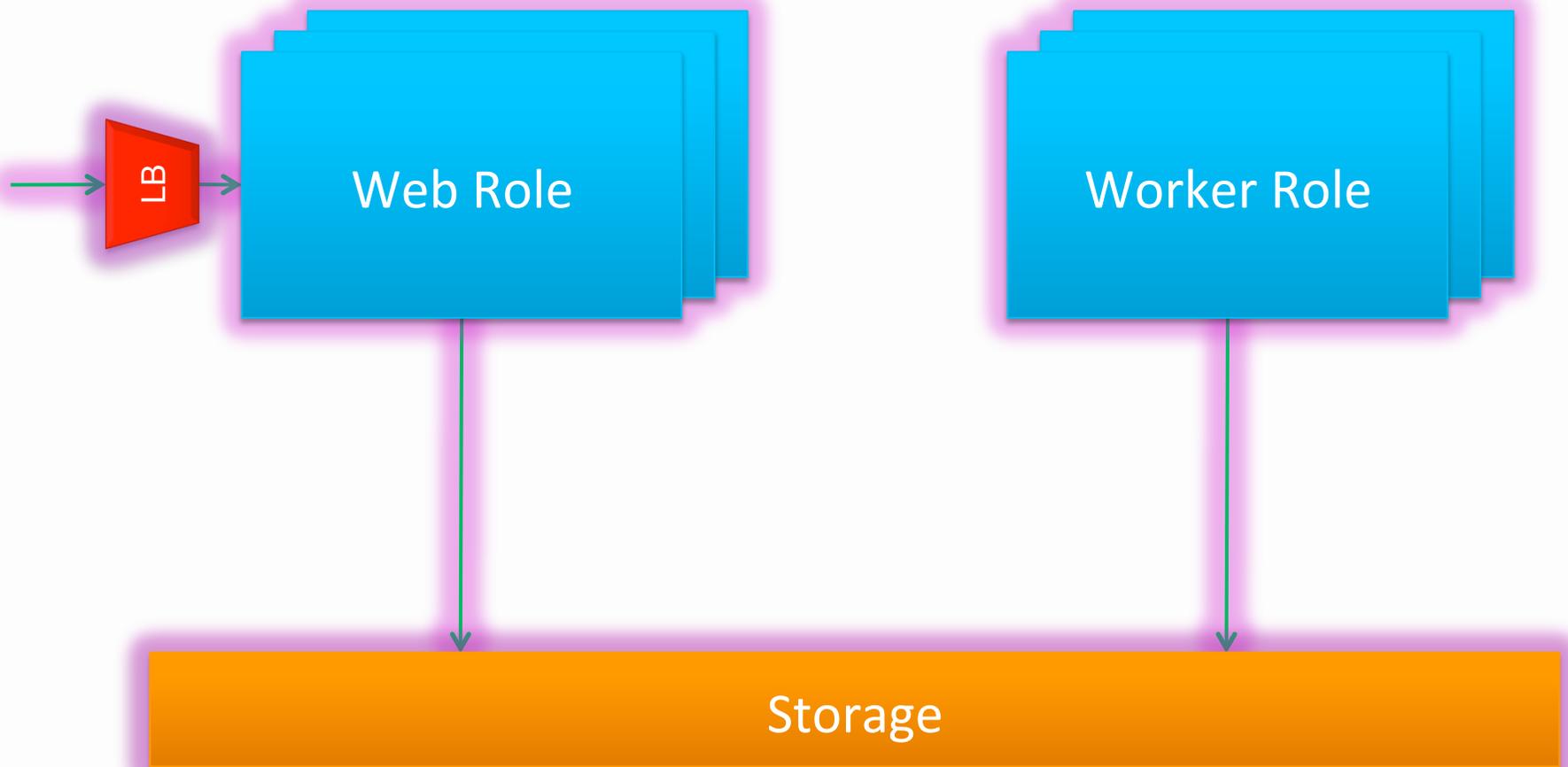
How ?

- Create an application using the technology you choose, such as C#, Java, PHP, Python, Node.js, or something else
- Execute your code in virtual machines (referred to as instances) running a version of Windows Server

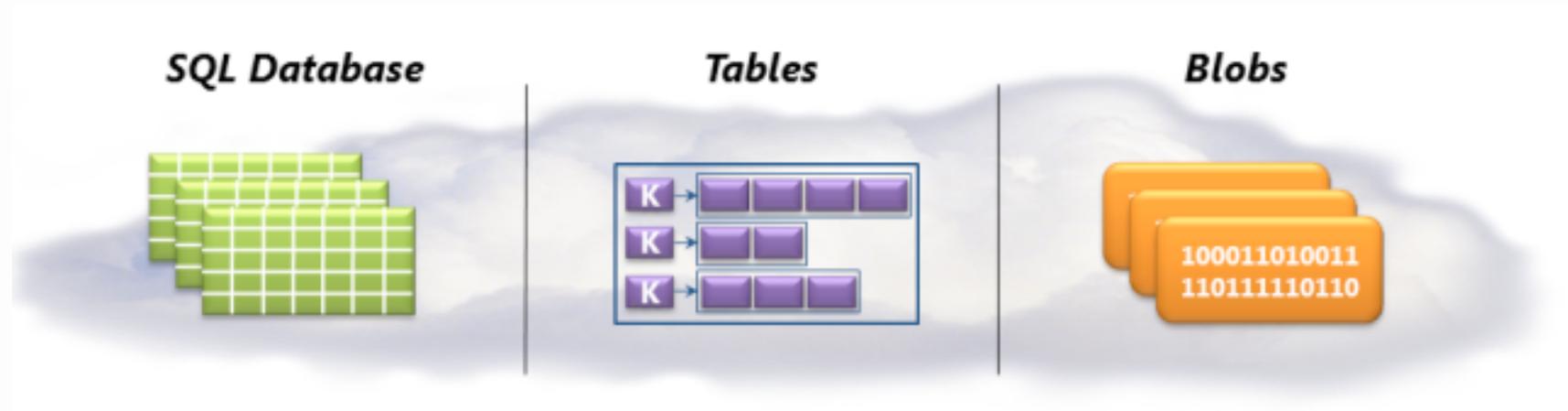


Typical application architecture

Web et worker roles



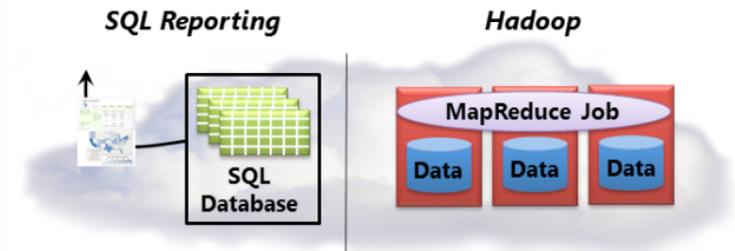
Data management options



- the PaaS service **SQL Azure** to manage SQL Databases
- **Windows Azure Tables:** Big sets of typed data for no complex SQL queries. Key-value storage for this data offering fast access.
- **Blobs** to store unstructured binary data. Like Tables, Blobs provides inexpensive storage, and a single blob can be as large as one terabyte.



Hadoop



- An Apache open source project, this technology stores data using the Hadoop Distributed File System (HDFS)
- then lets developers create MapReduce jobs to analyze that data
- Windows Azure lets HDFS distribute data across multiple virtual machines, then spreads the logic of a MapReduce job across those VMs
- Just as with on-premises Hadoop, data is processed locally-the logic and the data it works on are in the same VM-and in parallel for better performance
- The Apache Hadoop-based Service for Windows Azure supports other components of the technology as well, including Hive and Pig, and Microsoft has also created an Excel plug-in for issuing Hive queries

