



# Windows Azure and private cloud

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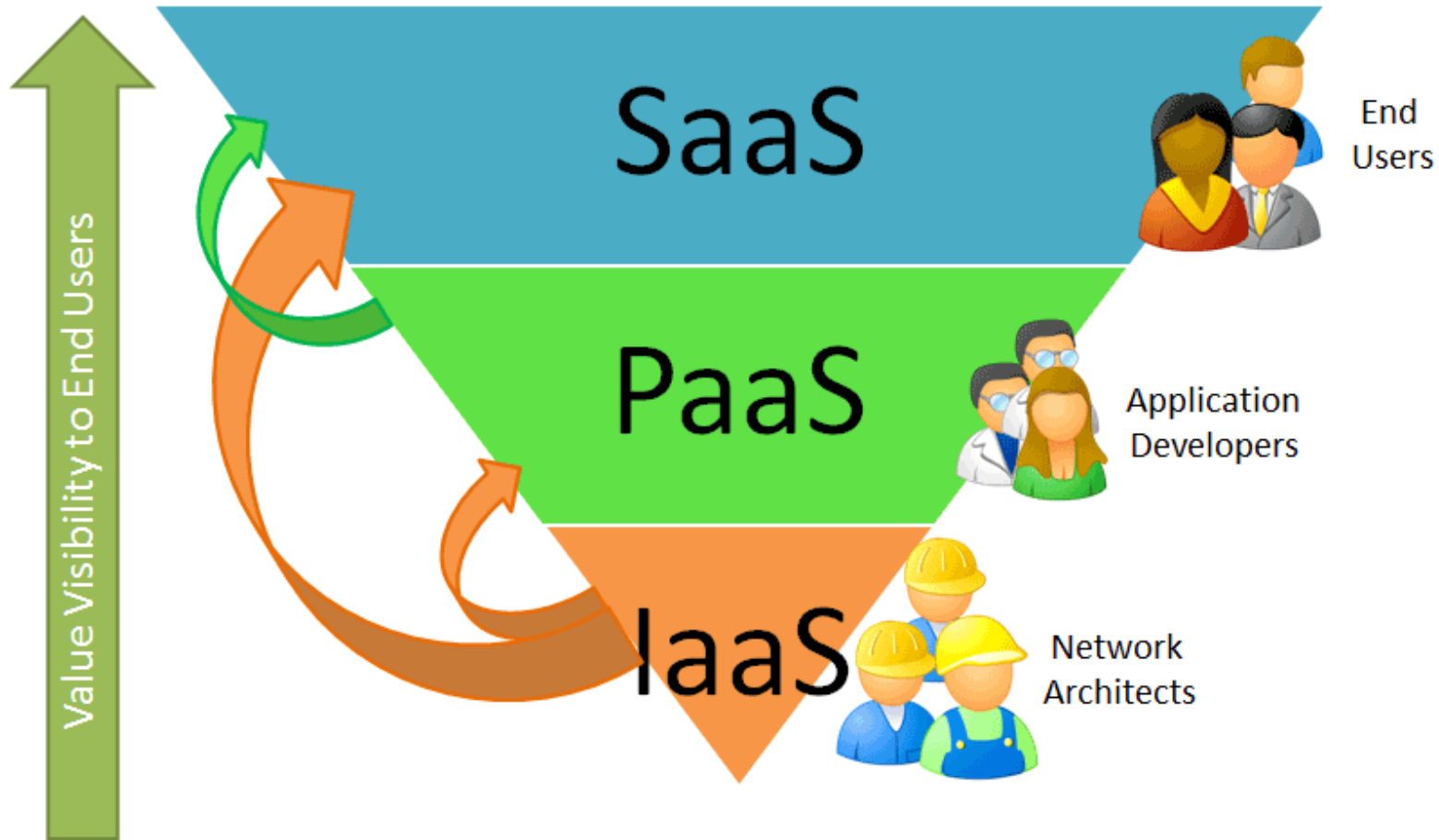


# Agenda

- Cloud Computing Fundamentals
- Windows Azure
- How Windows Azure works
- Private Cloud in your own network



# Cloud Computing Fundamentals






































# Cloud: Efficiency Versus Control

Windows Azure



 = Managed for You	Standalone Servers	IaaS	PaaS	SaaS
Applications				
Runtimes				
Database				
Operating System				
Virtualization				
Server				
Storage				
Networking				

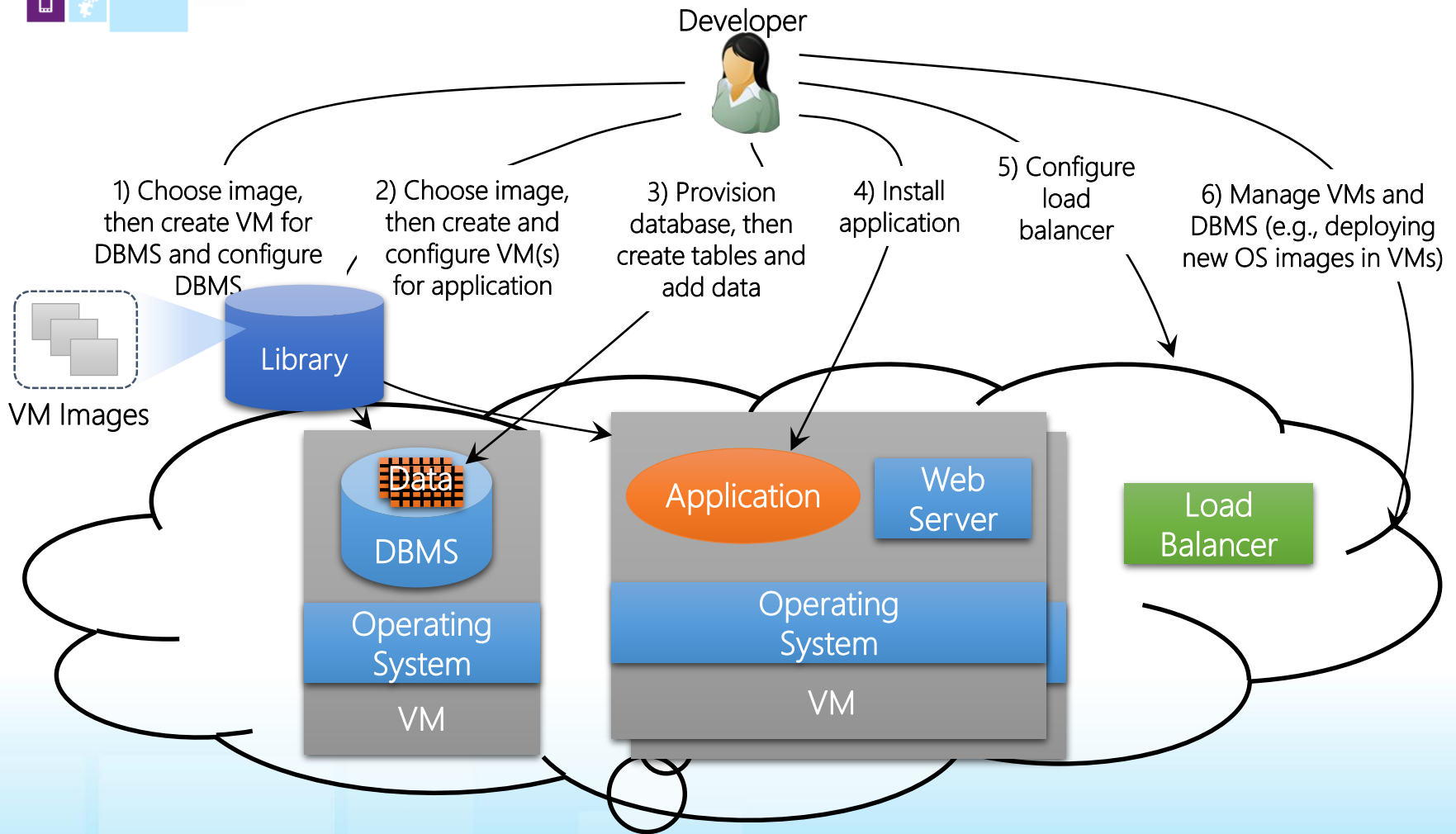
Efficiency



Control + Cost

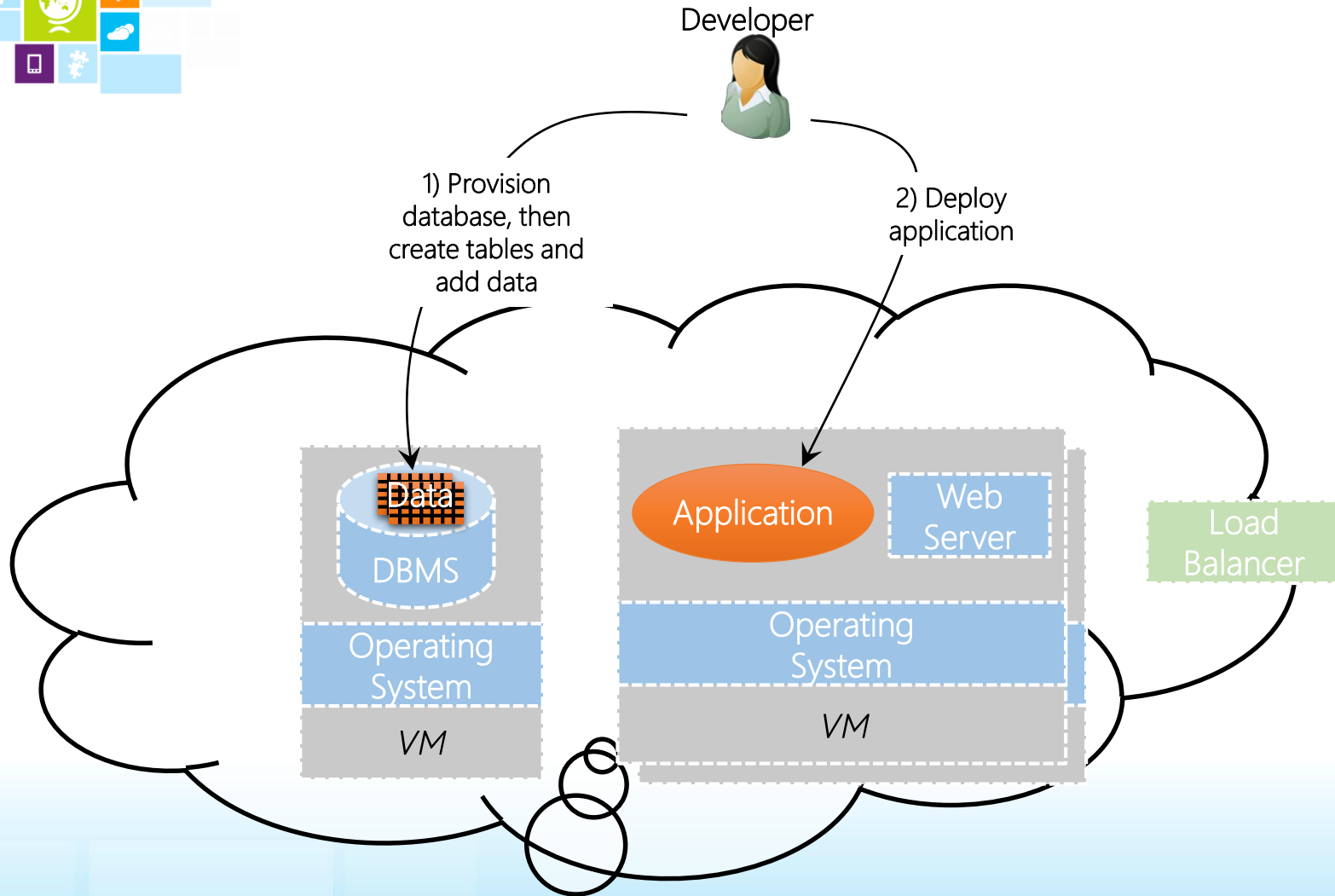


# IaaS





# PaaS

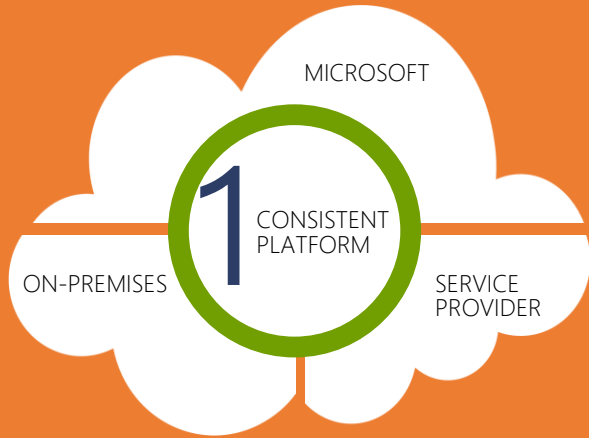




# Microsoft Cloud Consistency Vision - Applications

One Consistent Platform ...

... For Application Delivery





# Windows Azure

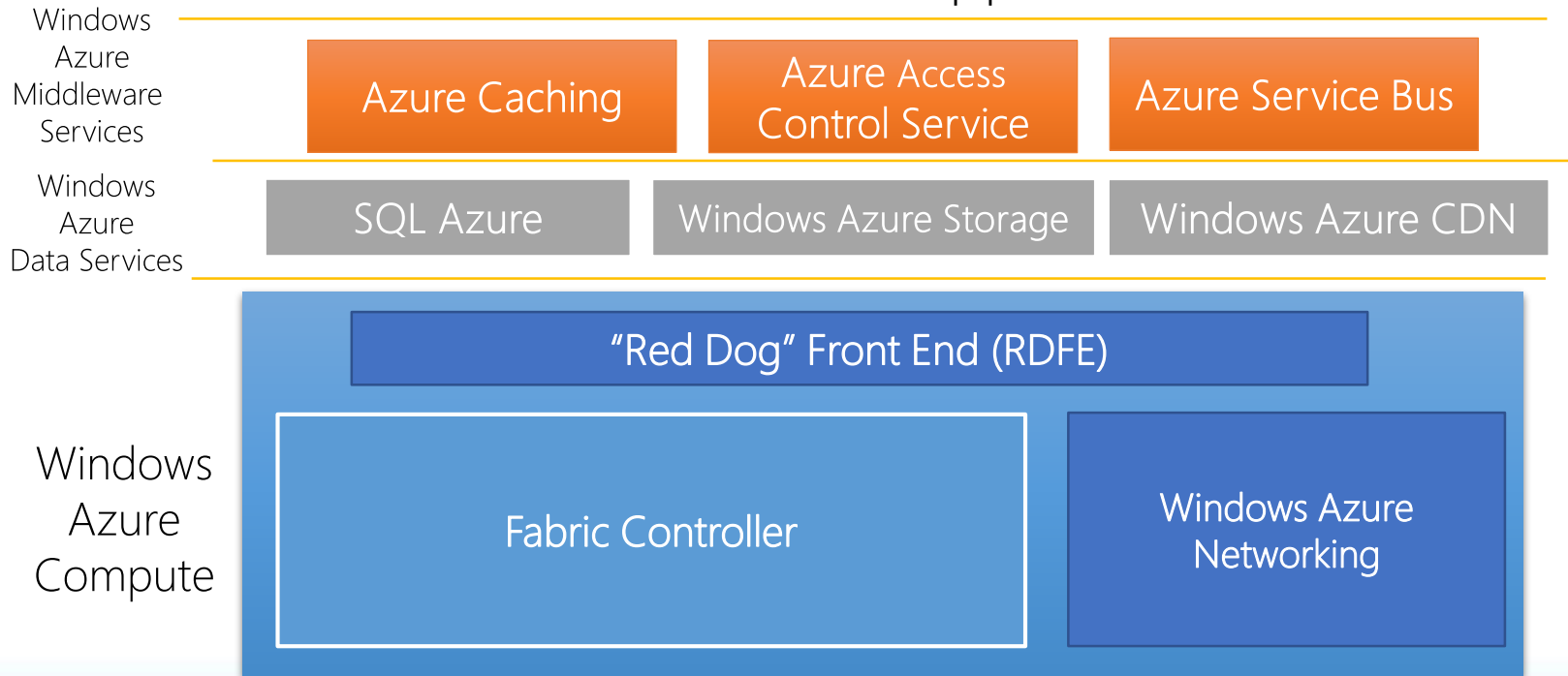
- Windows Azure is an OS for the data center
  - Handles resource management, provisioning, and monitoring
  - Manages application lifecycle
  - Allows developers to concentrate on business logic
- Provides common building blocks for distributed applications
  - Reliable queuing, simple structured storage, SQL storage
  - Application services like access control, caching, and connectivity





# Windows Azure Platform

## Windows Azure Applications





# The Windows Azure Service Model



# The Windows Azure Service Model

- A Windows Azure application is called a “service”
  - Definition information
  - Configuration information
  - At least one “role”
- Roles are like DLLs in the service “process”
  - Collection of code with an entry point that runs in its own virtual machine
- Windows Azure compute SLA requires two instances of each role
  - 99.95% for connectivity to two instances
  - Achieved with update and fault domains



# Role Types

- There are currently three role types:
  - Web Role: IIS7 and ASP.NET in Windows Azure-supplied OS
  - Worker Role: arbitrary code in Windows Azure-supplied OS
  - VM Role: uploaded VHD with customer-supplied OS
- VM Role: is it a VM?
  - No, because it is stateless
  - Good for:
    - Long install (5+ minutes)
    - Manual install/config
    - Fragile install/config



# Windows Azure Storage



# Windows Azure Storage Fundamentals

- Storage characteristics
  - Durable – replicated three times
  - Scalable (capacity and throughput)
  - Highly available
- Simple and familiar programming interfaces
  - REST (HTTP and HTTPS)
  - .NET accessible



# High Availability and Windows Azure Services



# The Fabric Controller (FC)

- The “kernel” of the cloud operating system

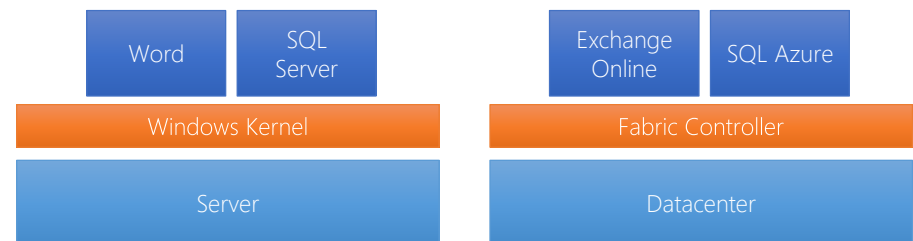
- Manages datacenter hardware
- Manages Windows Azure services

- Four main responsibilities:

- Datacenter resource allocation
- Datacenter resource provisioning
- Service lifecycle management
- Service health management

- Inputs:

- Description of the hardware and network resources it will control
- Service model and binaries for cloud applications







# Node and Role Health Maintenance

- FC maintains service availability by monitoring the software and hardware health
  - Based primarily on heartbeats Automatically “heals” affected roles

Problem	Fabric Detection	Fabric Response
Role instance crashes	FC guest agent monitors role termination	FC restarts role
Guest VM or agent crashes	FC host agent notices missing guest agent heartbeats	FC restarts VM and hosted role
Host OS or agent crashes	FC notices missing host agent heartbeat	Tries to recover node FC reallocates roles to other nodes
Detected node hardware issue	Host agent informs FC	FC migrates roles to other nodes Marks node “out for repair”



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ALL ITEMS

WEB SITES  
0

VIRTUAL MACHINES  
1

CLOUD SERVICES  
0

SQL DATABASES  
0

STORAGE  
1

NETWORKS  
0

SERVICE BUS  
0

MEDIA SERVICES  
0

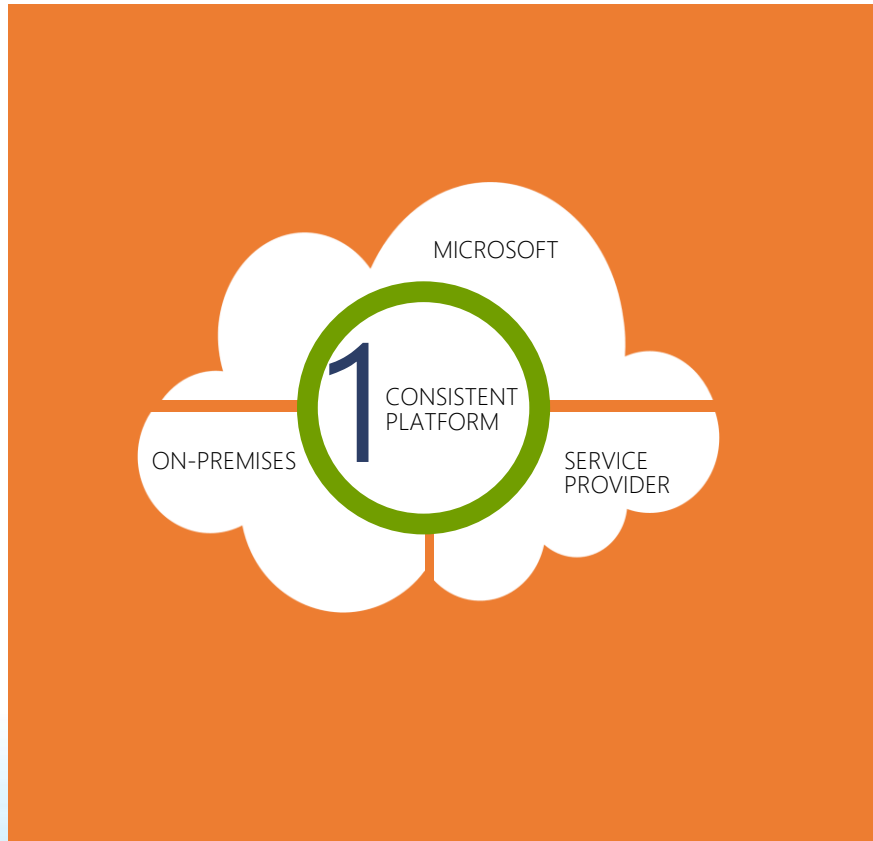
SETTINGS

## all items

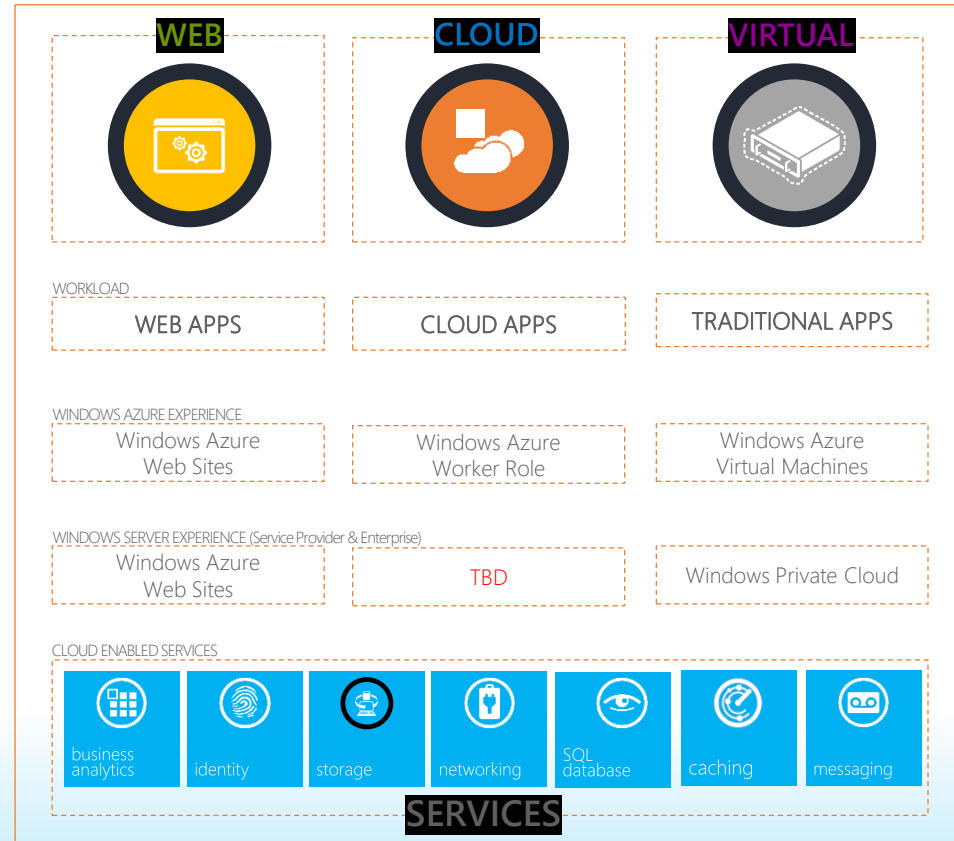
NAME	TYPE	STATUS	SUBSCRIPTION	LOCATION
JoeAzureVM51	Virtual Machine	Running	Windows Azure MSDN - Visual St...	East Asia
portalvhdsh081nn36x7p6	Storage Account	Online	Windows Azure MSDN - Visual St...	East Asia



One Consistent Platform ...



... For Application Delivery





Code Name "Tofino"

CONTOSO\dweisman



ALL  
RESOURCES



WEB  
SITES



VIRTUAL  
MACHINES



CLOUD  
SERVICES



STORAGE



NETWORK



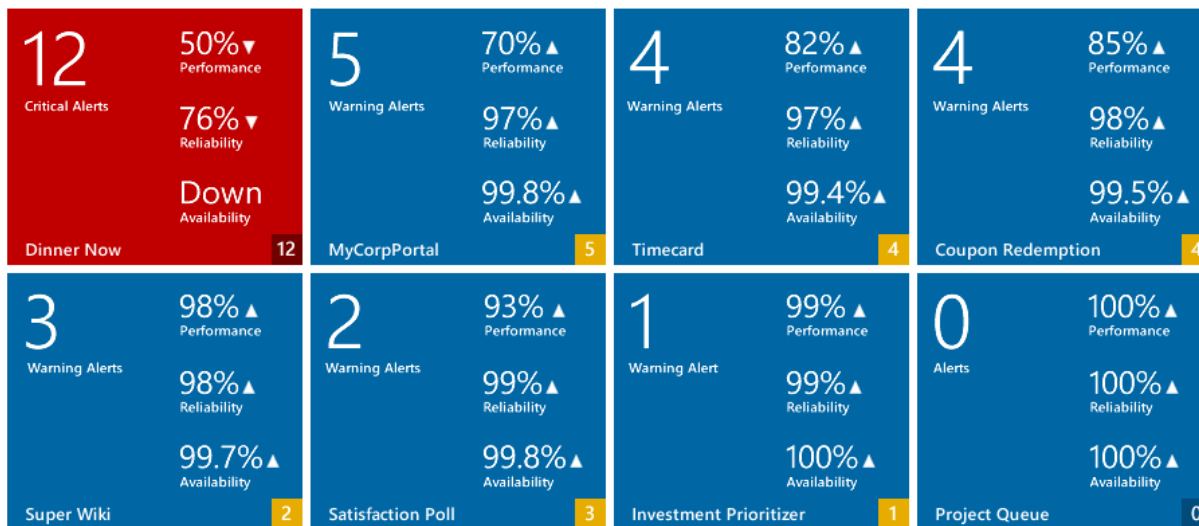
DATABASE

## Cloud Services

APPLICATIONS SUBSCRIPTIONS

Sort Applications by: Alerts -

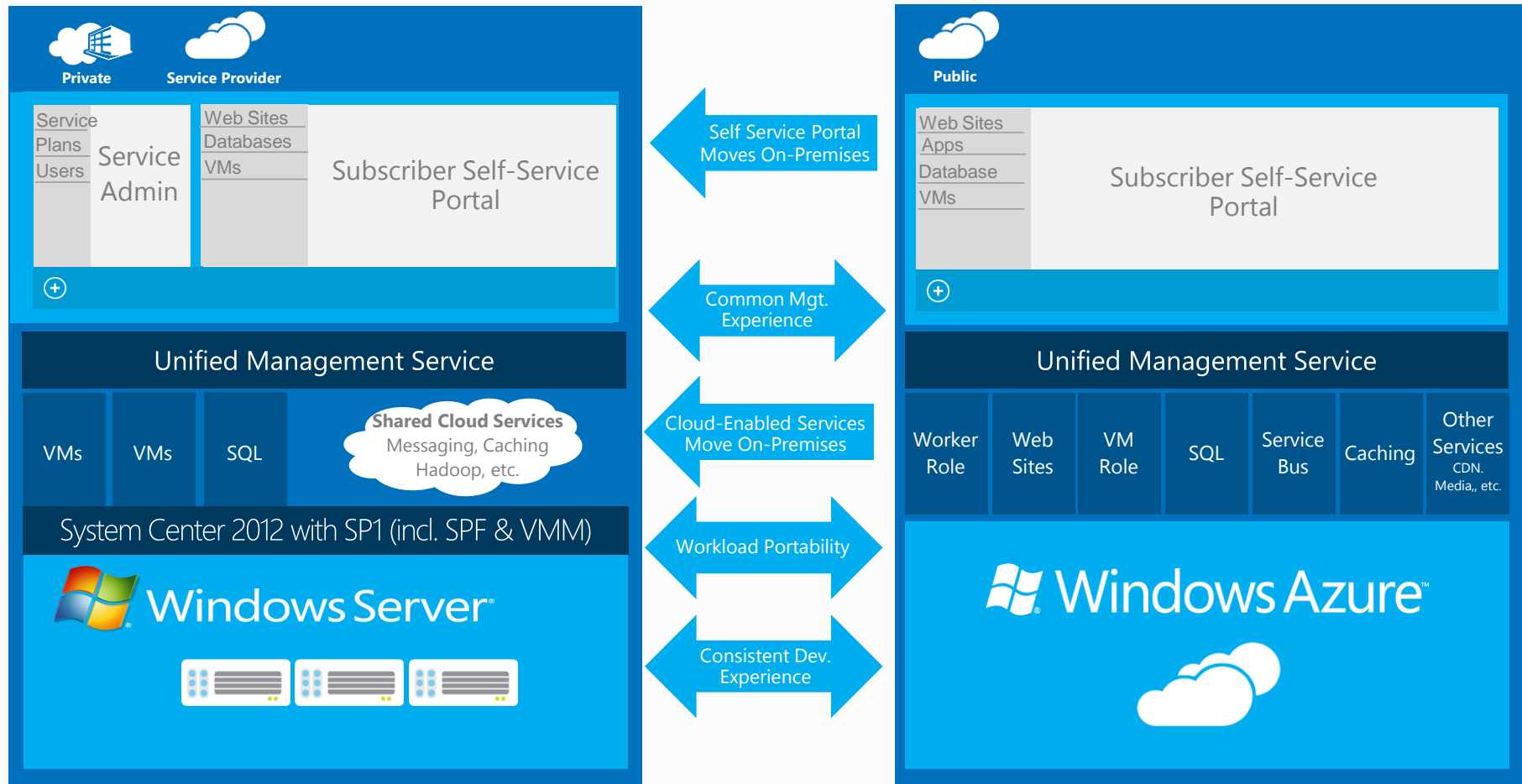
over the last 7 days



+ NEW



# Cloud Application Consistency with Initial Katal Delivery





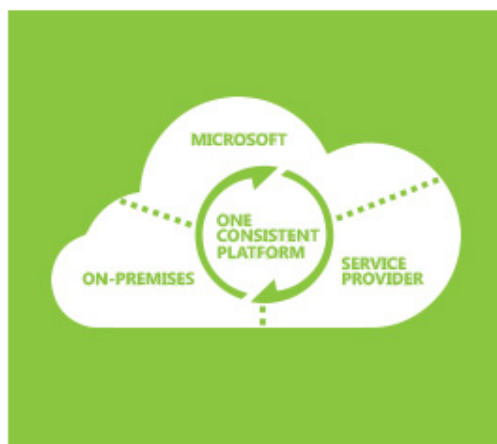
Microsoft

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# Bringing Windows Azure Services to Windows Server for Hosting Service Providers

Free Download

Microsoft is committed to delivering customers a consistent platform regardless of deployment location and calls this vision the Cloud OS. As part of this strategy, Microsoft is now enabling Hosting Service Providers to use Windows Server and System Center to deliver the same great experiences already found in Windows Azure. The first two of these finished services are high density website hosting and virtual machine provisioning and management. Hosting Service Providers enable these modules through the new Service Management API and optional portal, which will continue to add more services from Microsoft and 3rd party providers over time.



Web Sites

Create high scale, multi-tenant website hosting services that are simple to deploy and administer. operating tens of



Virtual Machines

Create extensible 'Infrastructure as a Service' offerings for Windows Server and Linux Virtual Machines. Leverage the

Service Management  
Portal and API

Administer Web Sites and Virtual Machine services on Windows Server while also offering customers the same



# Conclusion

- Platform as a Service in Windows Azure is all about reducing management and operations overhead
- The Windows Azure Fabric Controller is the foundation for Windows Azure's PaaS
  - Provisions machines
  - Deploys services
  - Configures hardware for services
  - Monitors service and hardware health
- It is extremely easy to use Windows Azure and Windows Azure alike environment in your own network





# Resources

- Windows Azure
  - <http://www.windowsazure.com/en-us/>
- Bring Windows Azure Services to Windows Server
  - <http://www.microsoft.com/hosting/en/us/services.aspx>
- Download installation guide
  - [http://download.microsoft.com/download/E/6/6/E666B18B-B0DE-483C-A7B1-F2645F90DB43/Service Management Portal Service Management API Web%20Sites Installation Guide Beta.pdf](http://download.microsoft.com/download/E/6/6/E666B18B-B0DE-483C-A7B1-F2645F90DB43/Service%20Management%20Portal%20Service%20Management%20API%20Web%20Sites%20Installation%20Guide%20Beta.pdf)



# Q&A