Visual Studio

Using Windows Azure to develop, secure and deploy cloud applications

Microsoft

Agenda

Introduction to the Cloud OS

Windows Azure Overview

Visual Studio Tooling for Windows Azure

Scenarios:

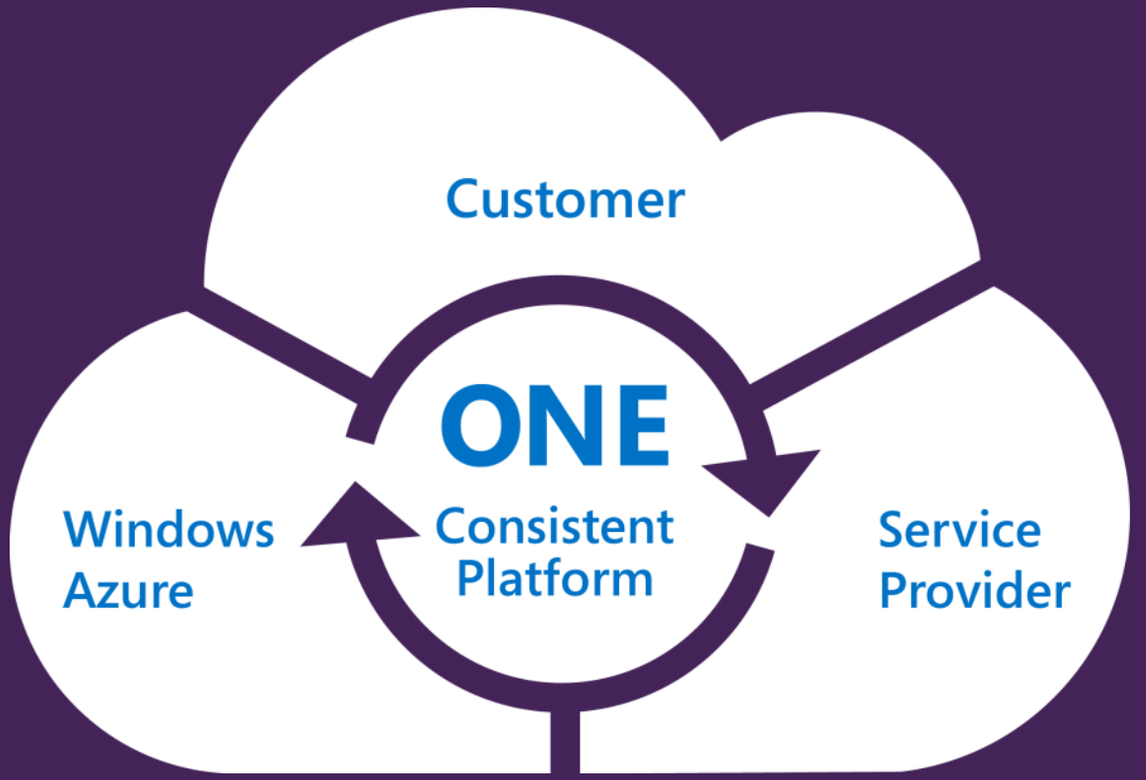
- Dev/Test
- Web
- Mobile
- Hybrid

Cloud OS

Cloud OS Vision

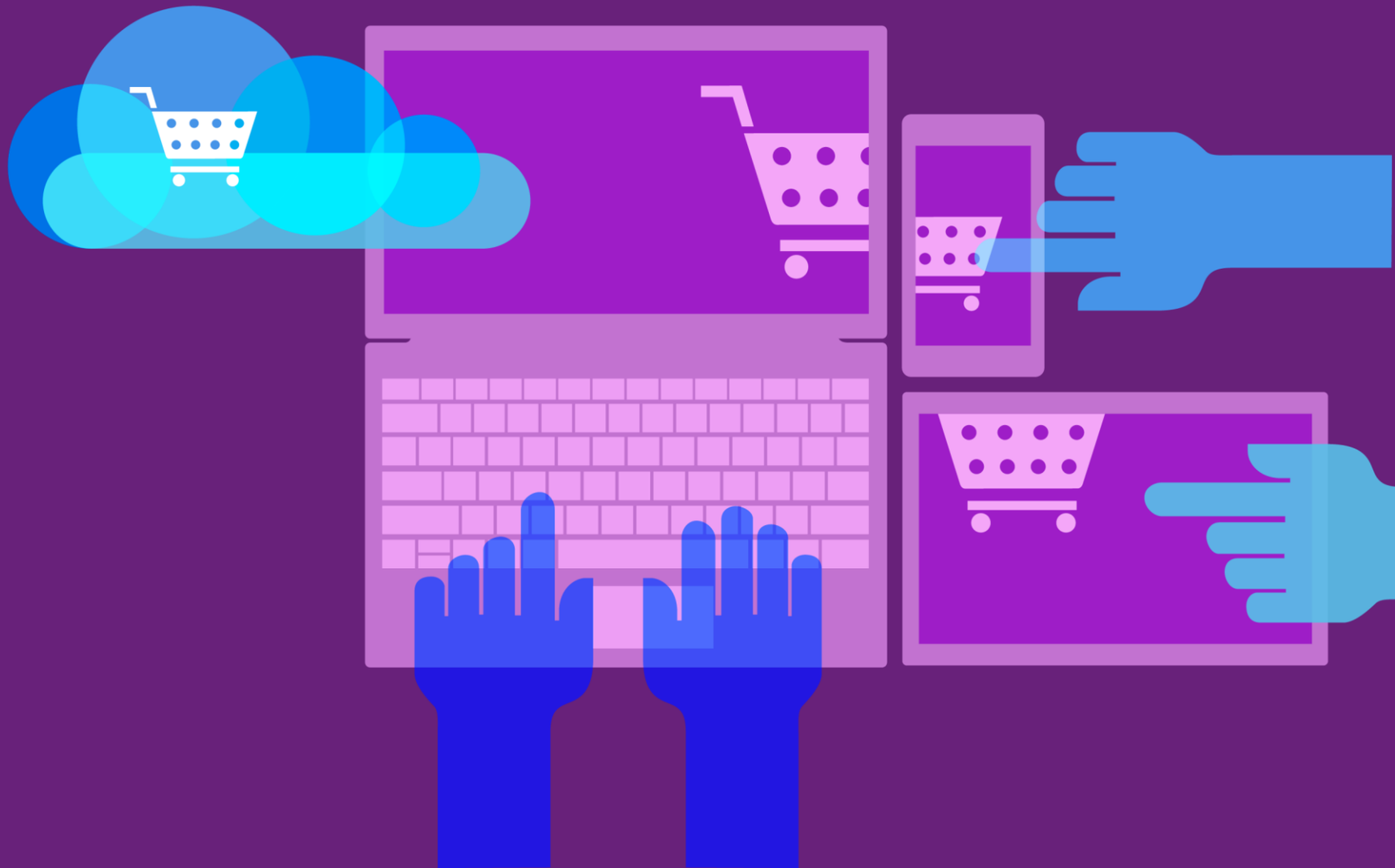
Microsoft's vision of the unified platform for modern business

- transforms the datacenter
- unlocks insights on any data
- empowers people-centric IT
- enables modern business apps



Development Management Identity Data Virtualization

Windows Azure



Cloud Computing

IaaS

Infrastructure-as-a-Service

host

PaaS

Platform-as-a-Service

build

SaaS

Software-as-a-Service

consume

Why consider the Windows Azure cloud?

Time to Market

Open and Flexible

Economics

Windows Azure

app services

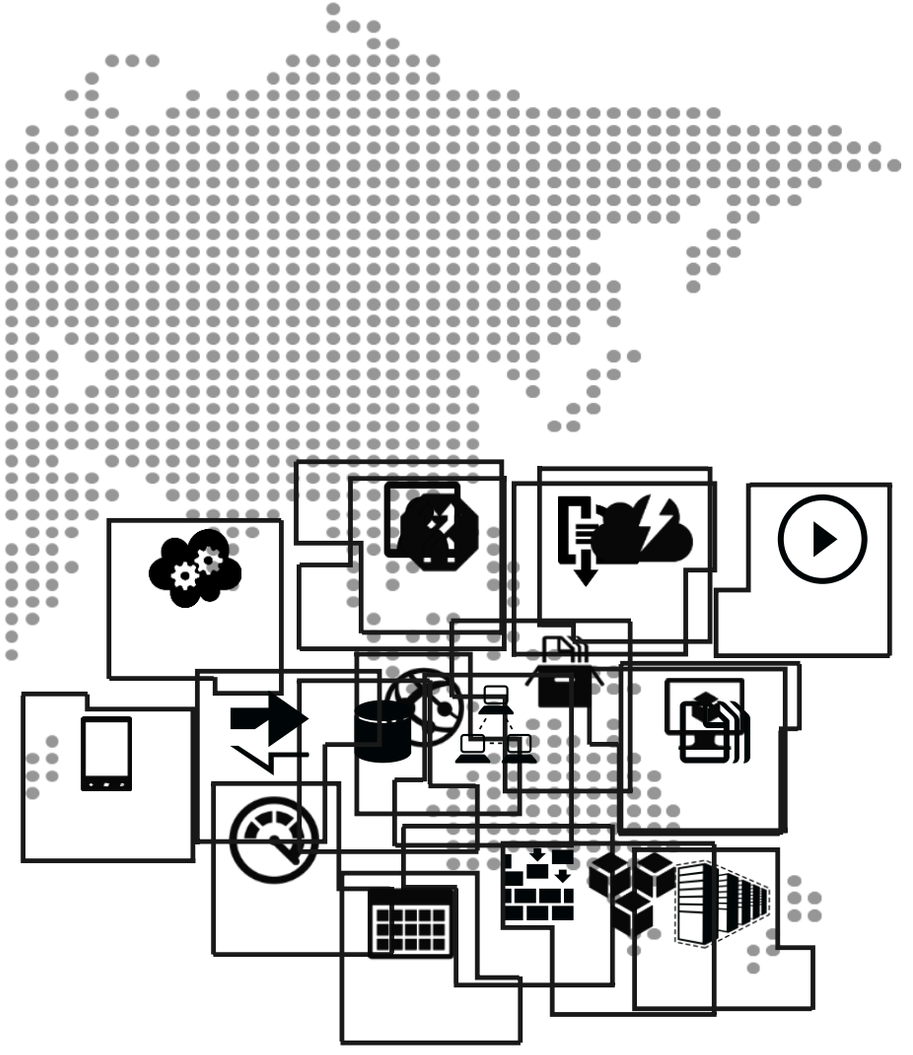
- cloud services
- caching
- identity
- service bus
- media
- mobile services
- web sites
- integration
- hpc
- analytics

data services

- SQL database
- HDInsight
- table
- blob storage

infrastructure services

- virtual machines
- virtual network
- vpn
- traffic manager
- cdn

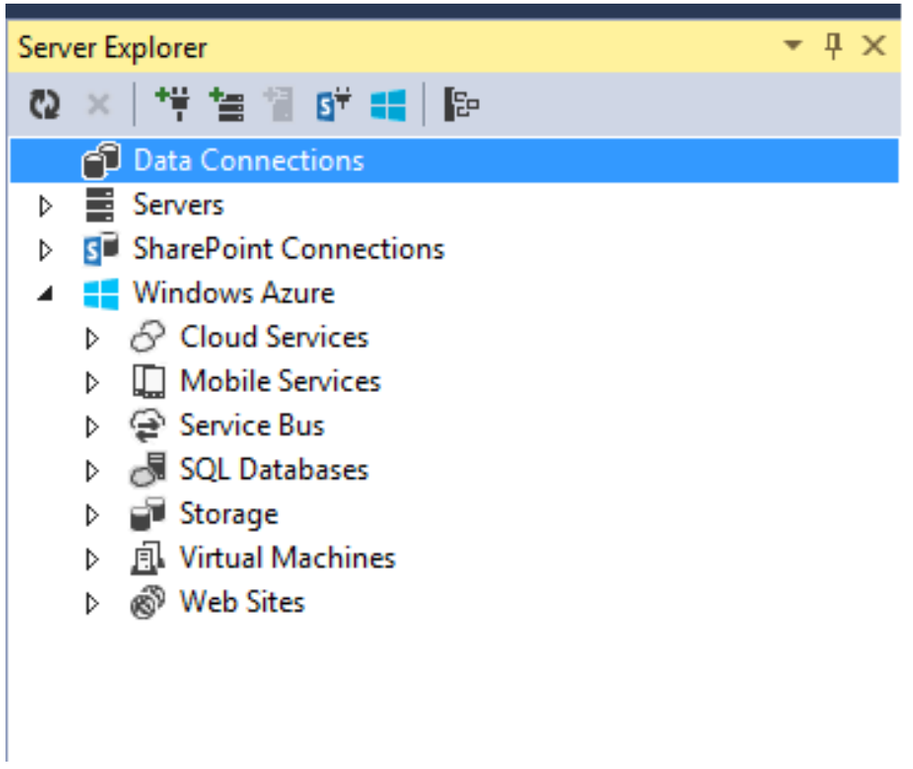


Visual Studio tooling for Windows Azure

Visual Studio Server Explorer

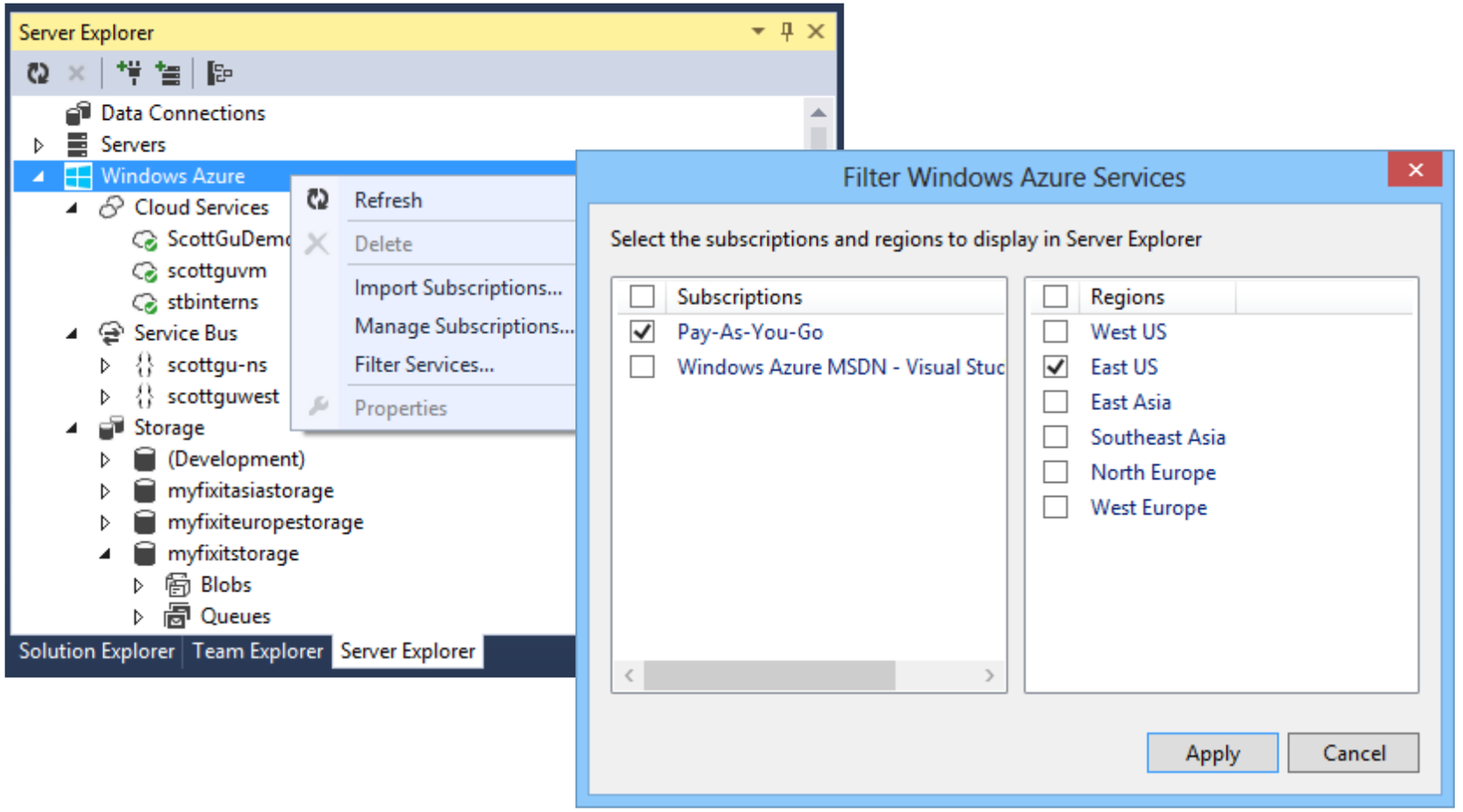
All services are now contained under a single Windows Azure node

VS OAuth with WLID



Visual Studio Server Explorer

Subscription and Region Filtering Support



Demo

Visual Studio tooling for Windows
Azure

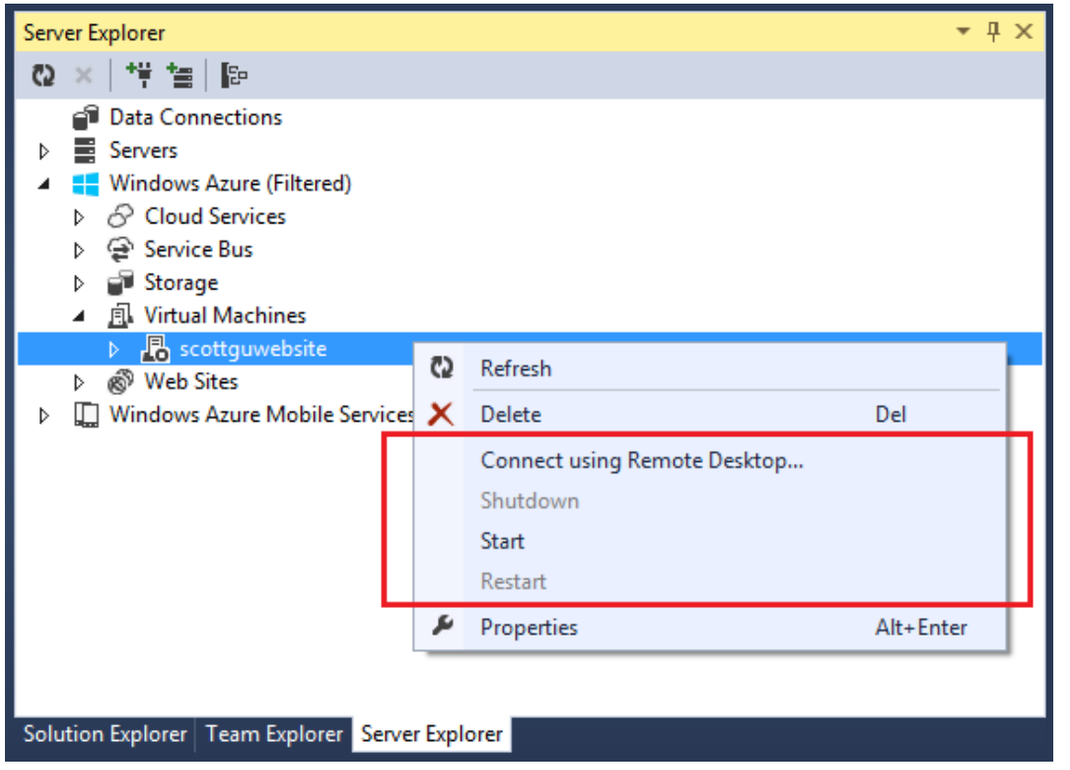
Dev/Test

Windows Azure for Dev/Test

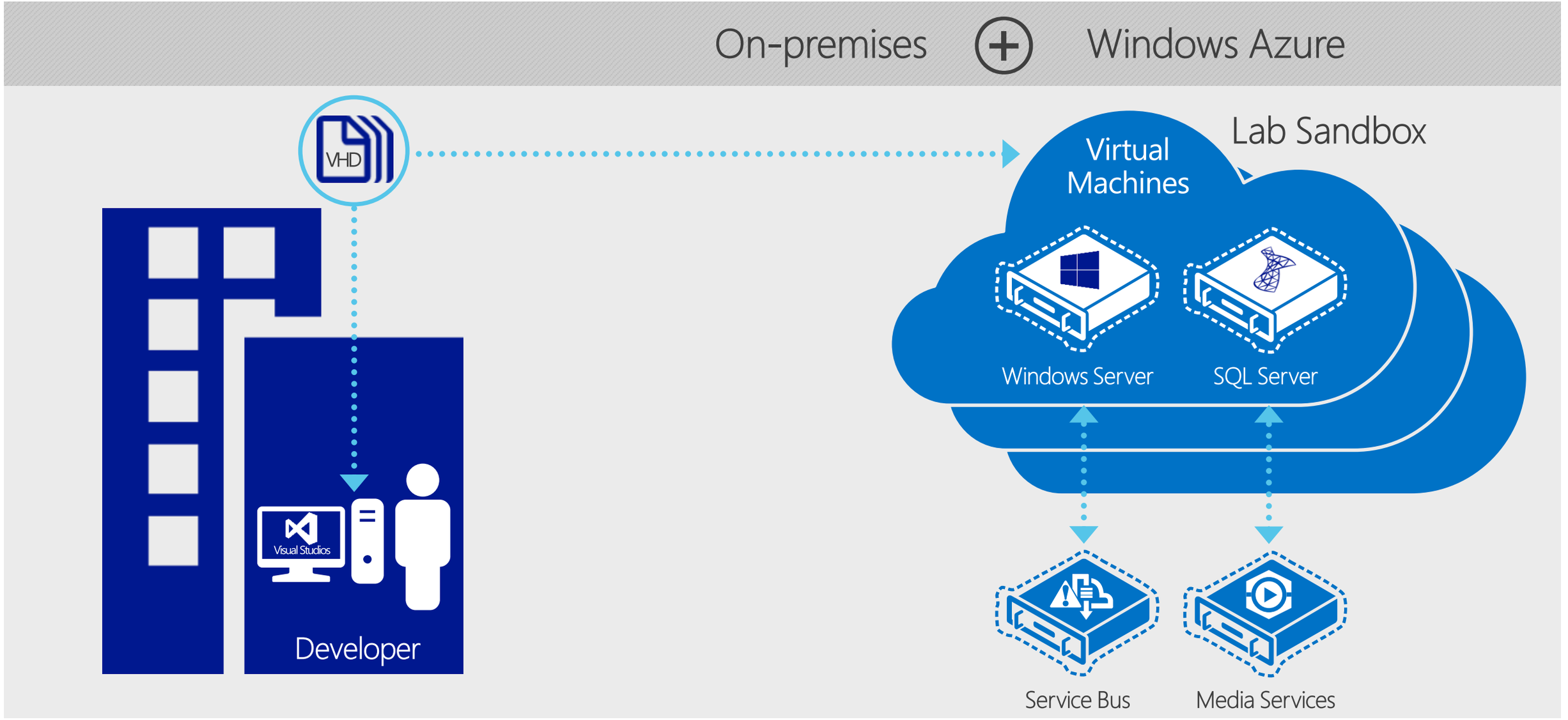
- Sandbox environments for application development and testing on supported OS
- QA and application compatibility on new O/S (e.g., WS 2012) or software (e.g., SQL Server 2012)
- Stress & load testing
- SharePoint 2013 dev/test sandbox
- Reproduction and bug fixing for s/w and app stack failures
- Environment for doing training, learning and application demos
- TFS: Customized TFS setup with < 2200 users; testing TFS upgrades and roll-outs

Virtual Machines from Visual Studio

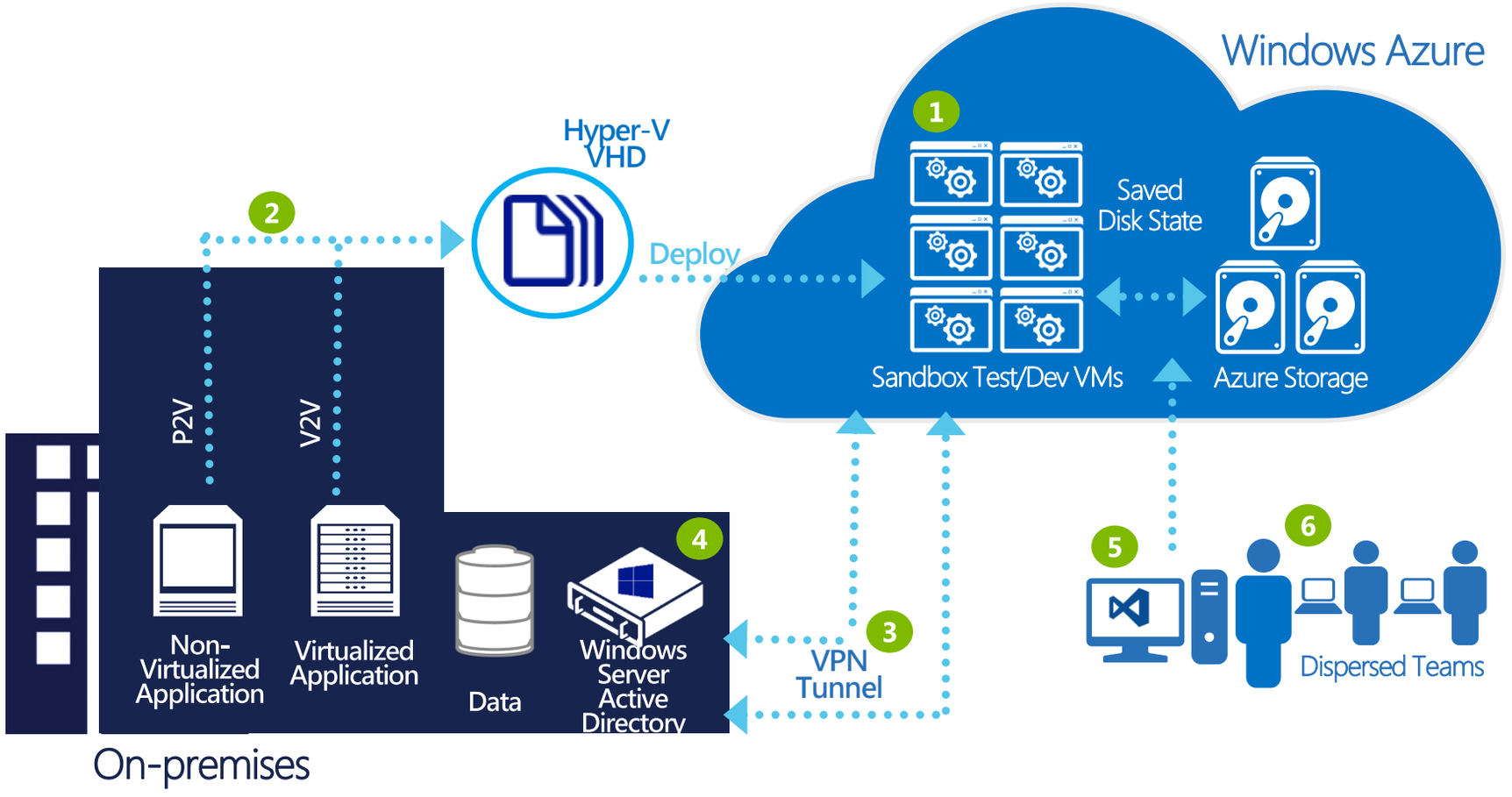
Stop/Start Virtual Machines within Visual Studio



Dev/Test


On-premises
Windows Azure
VHD
Visual Studios
Developer
Lab Sandbox
Virtual Machines
Windows Server
SQL Server
Service Bus
Media Services

Dev/Test



1. Test/Dev VMs in the cloud
2. Leverage existing skillset to move test/dev to cloud
3. Connectivity with on-premises data and applications
4. Common identity
5. Common dev tools and frameworks for on-premise & cloud
6. Accessed by a geographically dispersed team

Demo

Spin up a dev/test environment from Visual Studio

Web

Web Sites

It's easy to deploy and administer high-density scalable website hosting services

Scalable

- High-density and secure web hosting
- Open publishing methods and protocols
- Integrated and open solution

Automated

- Lowers customer onboarding costs and streamlines upselling
- Upsell from shared to reserved

Flexible

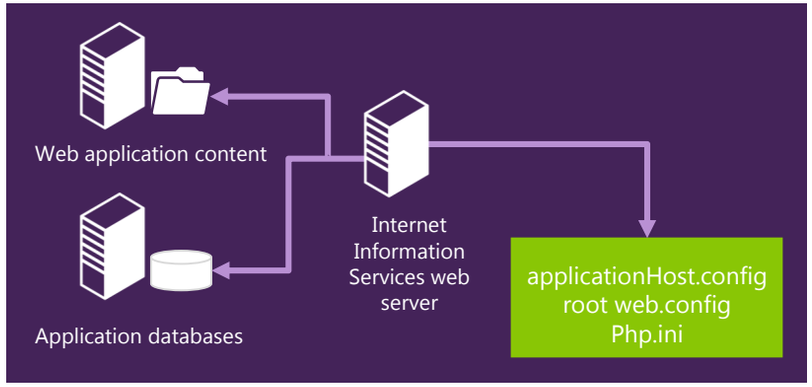
- Support for PHP, Node.js, and ASP.NET
- Metering and throttling of resources
- Fully integrated into Web App Gallery

Evolving from machine-centric to distributed model

Traditional machine-centric model

With multiple web applications, challenges for service providers include:

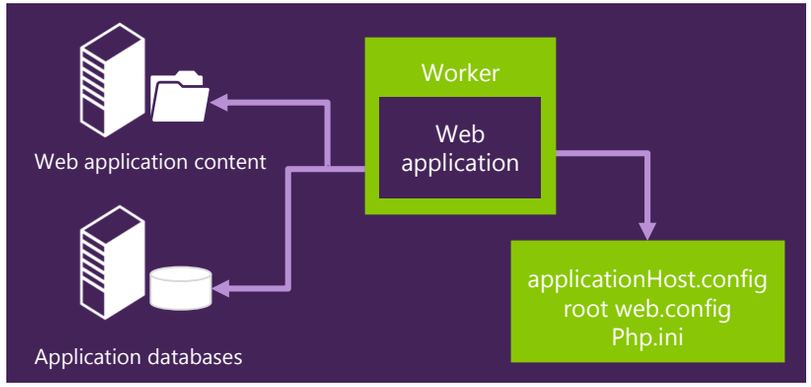
- Increased load and management complexities
- Security - Isolating stored data, authentication & authorization mechanisms
- Scaling - Auto-scaling platform compute, scaling platform storage
- Provisioning tenant resources
- Lack of support for multiple SSL web sites; applications have affinity to single servers



Distributed model

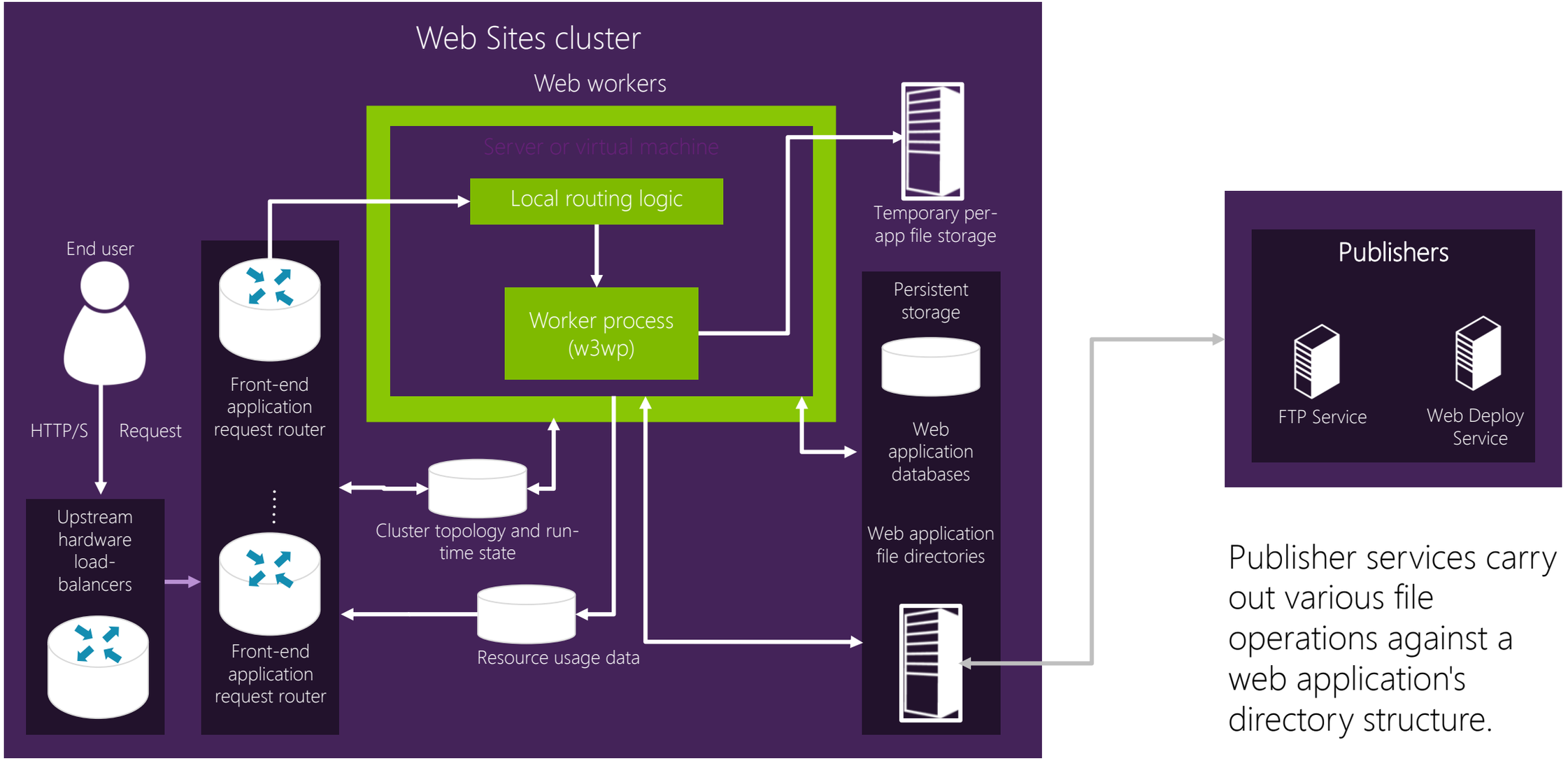
Web Sites allocates a web application to a specific process (or processes):

- Distributes load by allocating web applications to specific processes
- Enhances management by requiring no change to code for existing applications
- Provides a scalable and elastic resource pool capable of running an arbitrary set of web applications
- Provides multiple SSL Web sites that use unique server certificates for HTTPS binding; applications are freed from affinity to single servers



Publishing in Web Sites

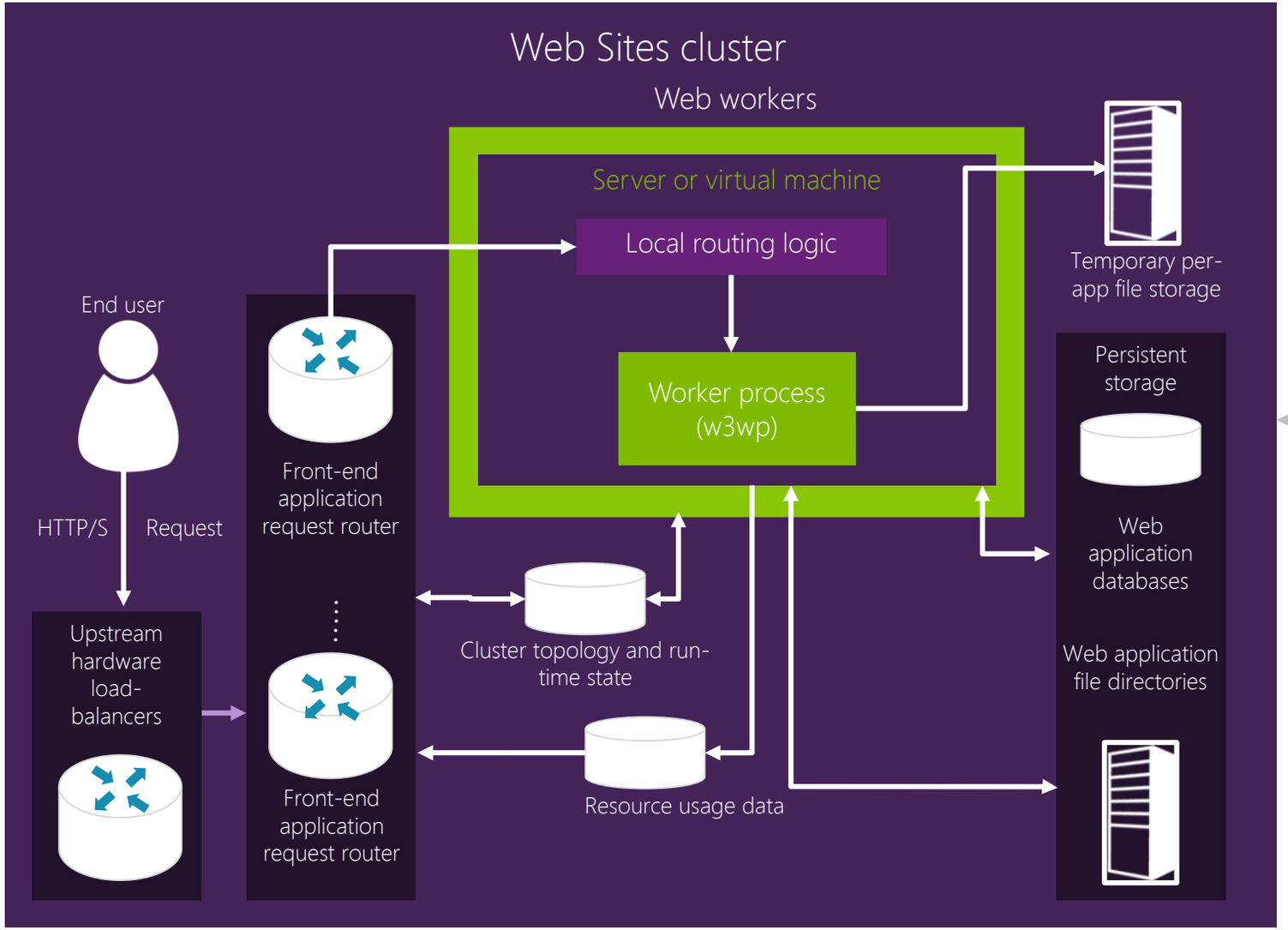
Using FTP and Web Deploy Services

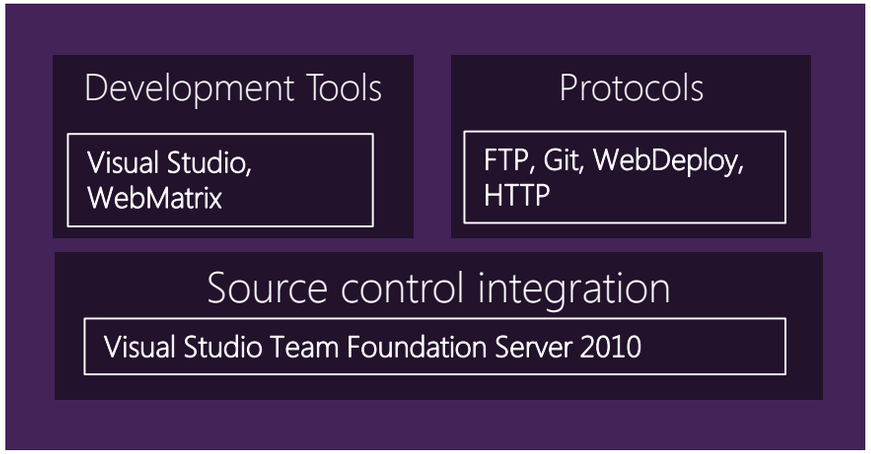


Publisher services carry out various file operations against a web application's directory structure.

Development tools and protocols support

Decrease onboarding costs and increase customer satisfaction





Developer tools and protocols

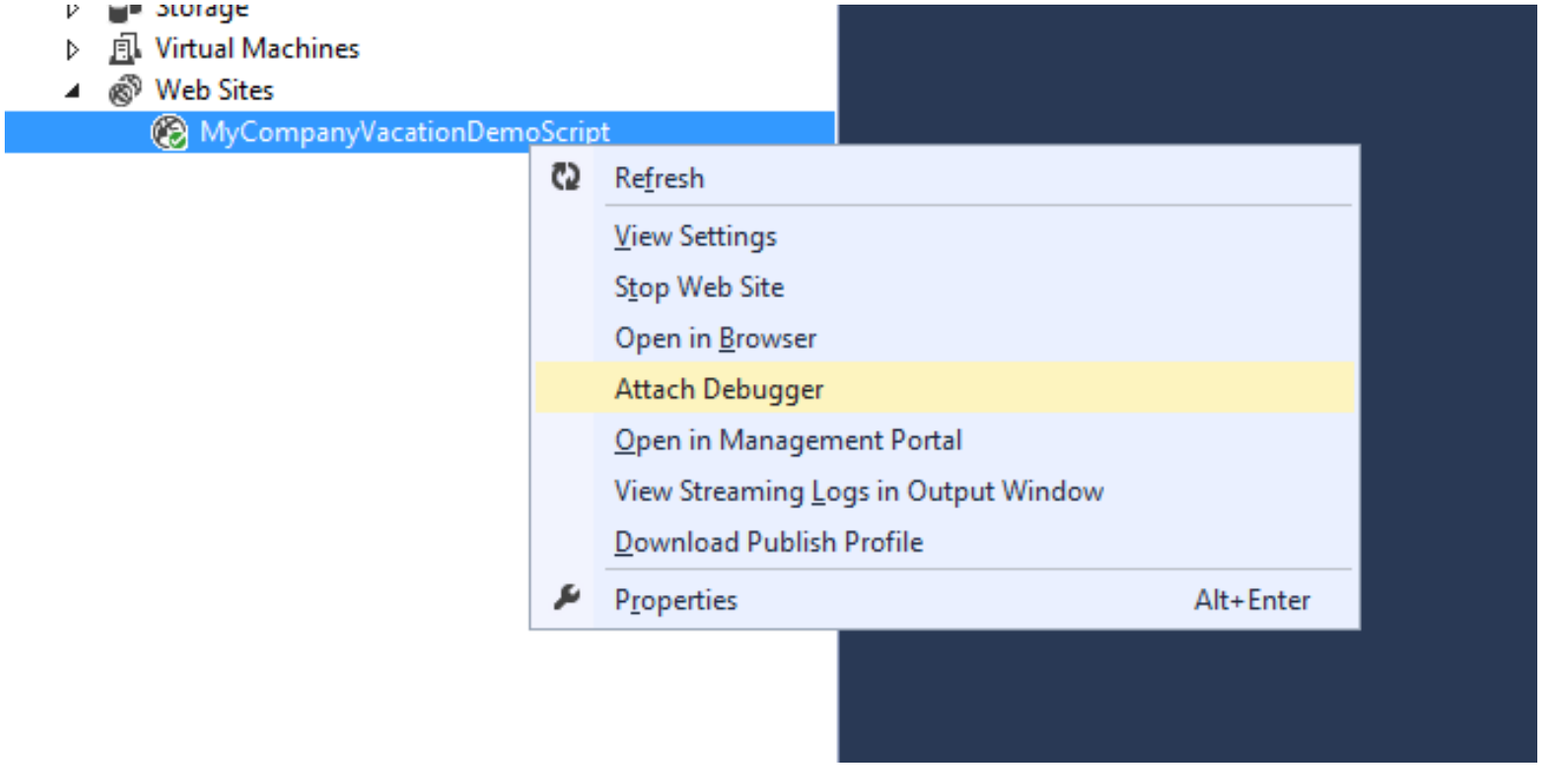
Best Visual Studio experience

Remote Debugging

Remote Debugging

Web Sites

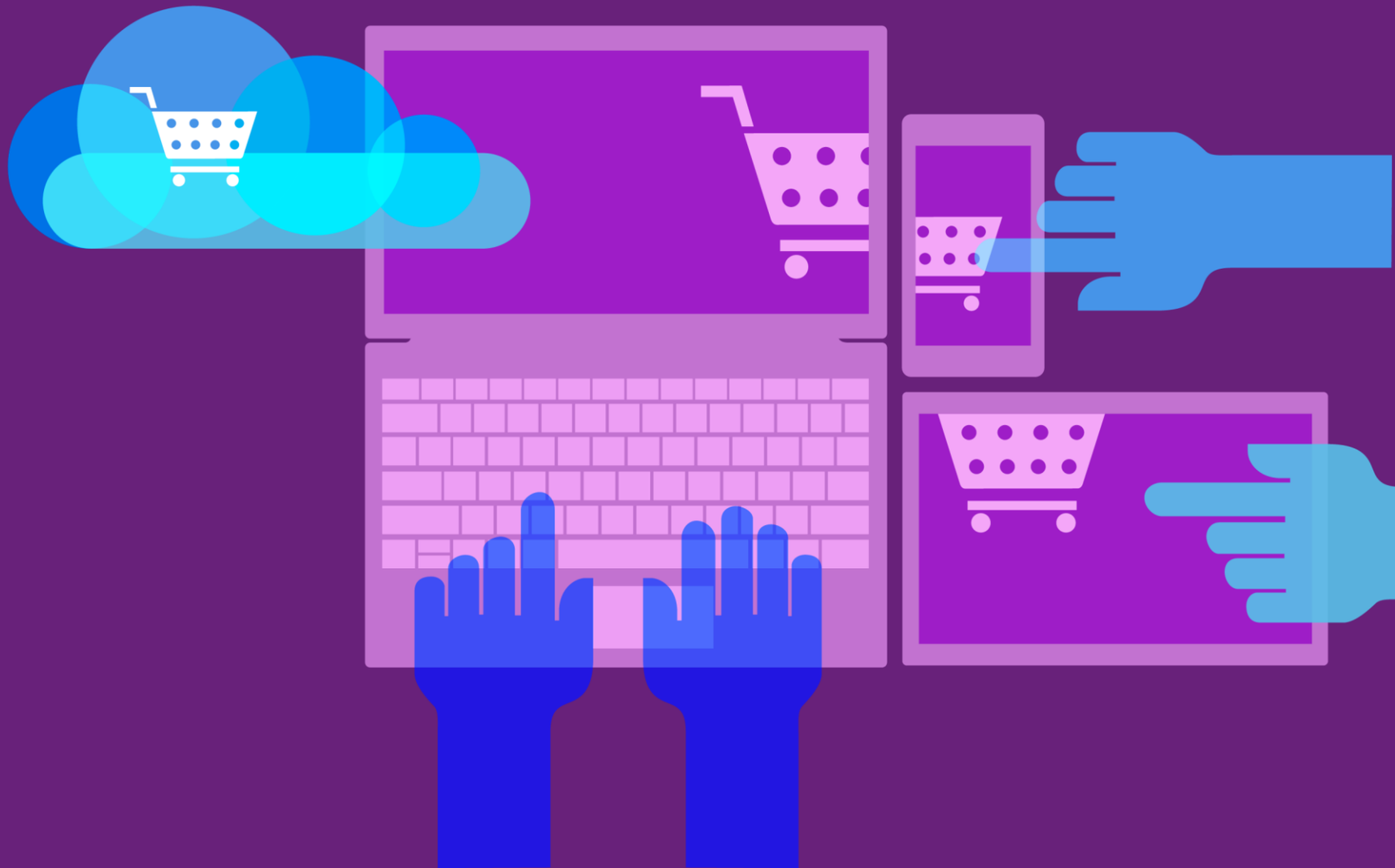
Cloud Services



Demo

Web Sites from Visual Studio

Mobile



Mobile Development with Windows Azure

Windows Azure provides two platform services that accelerate mobile development

Mobile Services and Notification Hubs

Mobile Services supplies a scalable and secure backend for mobile apps. With Mobile Services, it's easy to store data in the cloud, authenticate users, send push notifications, and add business logic.

Notification Hubs is a broadcast push service that makes it easy to send personalized push at scale with low latency from almost any app backend.

Mobile Services Overview

Windows Store
iOS
Android

Windows Phone 8
iOS
Android
HTML 5/JS

SDKs

REST API

Store Data in the Cloud

SQL

Table Storage

Blob Storage

Mongo DB

User Authentication

Facebook

Twitter

Microsoft

Google

Active Directory

Push Notifications

WNS & MPNS

APNS

GCM

Notification Hubs

Scripts:

table

scheduled

custom API

Source Control

Server-Side Code

Use server scripts to add custom logic to your mobile application as well as connect to other Windows Azure or third party services

Table

Tied to a CRUD operation on a SQL database

Ideal for actions triggered by events

JSON payloads only

Scripts can call other scripts and require user-submitted modules

Scheduled

Script runs on demand or on a user-defined schedule

Ideal for database cleanup, image resizing, periodic communications, etc.

Scripts can call other scripts and require user-submitted modules

Custom API

Scripts are not associated with a table

Ideal for most scenarios

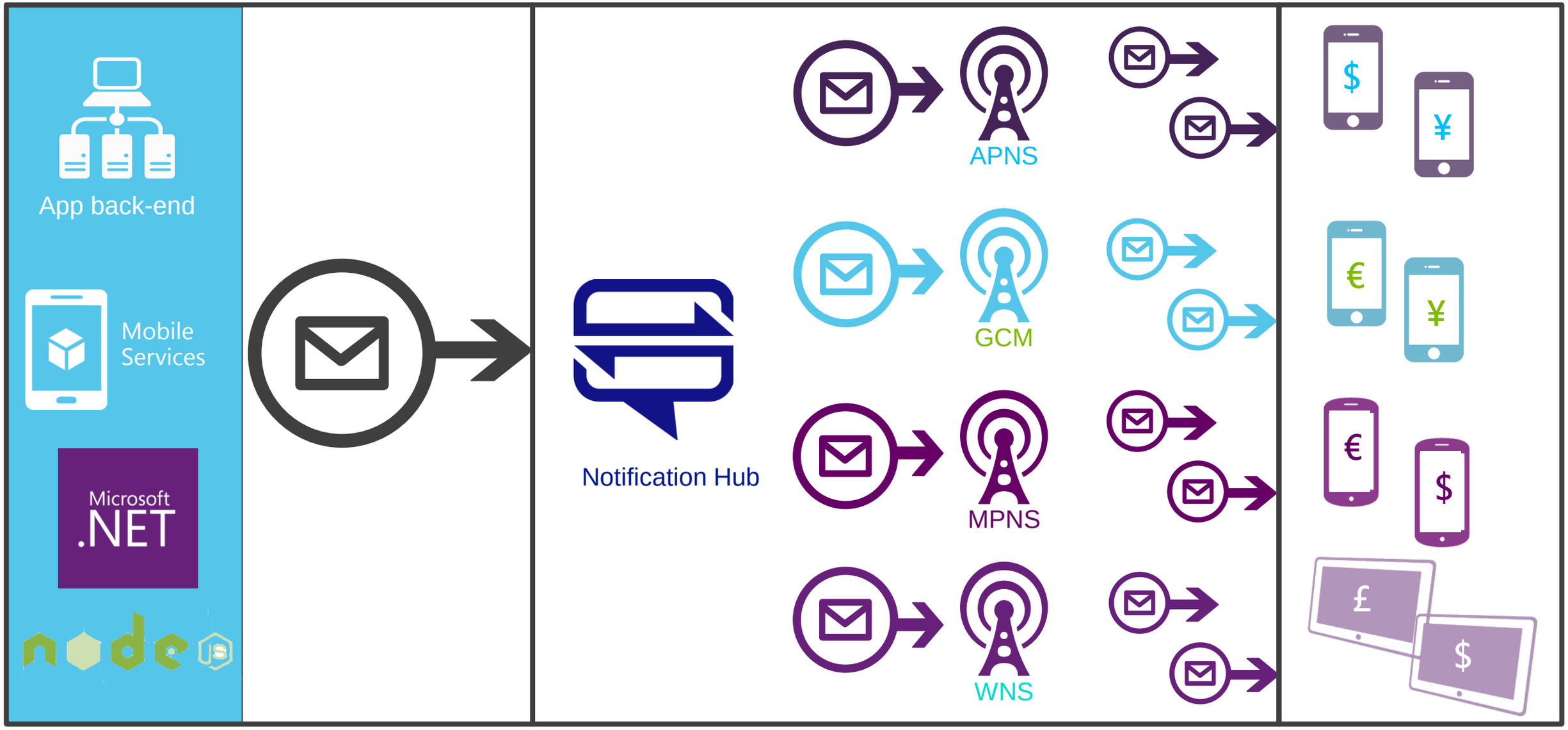
Supports additional payloads like XML

Scripts can call other scripts and require user-submitted modules

Demo

Mobile Services from Visual Studio

Notification Hubs Overview



Platform protocols and storing device info

Without NH…

Each platform (Windows Store, iOS, Android) has a different push notification service

Different capabilities and protocols for each PNS

After opening communication channels, still have to store and update device info with platform specific protocols

Additional complexity for personalization based on interests, device, and format

With NH…

No platform specific protocols; backend communicates only with the NH

Avoid storing device information in the backend; NH maintains registry of devices and associated tags

Broadcast notifications to millions of devices across platforms with a single call rather than sending multiple messages based on platform, device, interests and preferences

Massive Scale, Low Latency

Without NH…

Spin up tens or hundreds of virtual machines in parallel

Shard your application

Route different subsets of registrations to various VMs

Backend sends millions of notifications to account for different platforms, interests, formats, app versions, etc.

With NH…

Specify a set of tagged registrations (or no tags to reach all registered devices)

Specify a message and a payload

Send one message to the NH

NH automatically routes the message to the millions of designated registrations within minutes.

NH cleans up device registry to reflect uninstalls

Notification Hubs Overview

Registering New Devices with your Notification Hub

1

User downloads app from public or private app store.

Notification Hub

2

Notification Hub associates:

- interest tags (e.g. male, photography, Seattle)
- format template (e.g. Spanish, Euro, Celsius)

with each registration

3

Installed app, NH maintains:

- tags
- template

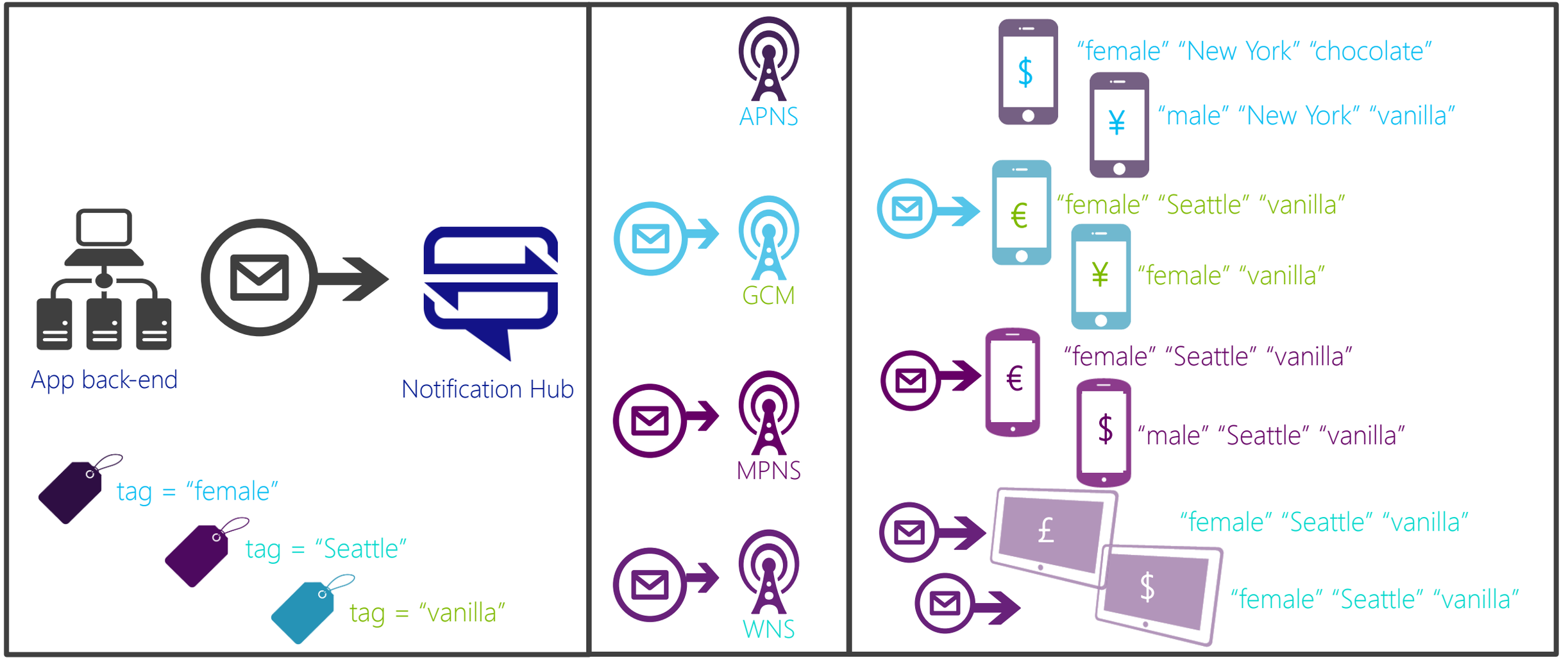
User Management

Uninstalled app, NH:

- purges the registration
- stops sending messages

Notification Hubs Overview

Sending a Cross-Platform Push Notification based on tags



Notification Hubs Overview

Template is applied on the client as users receive the message

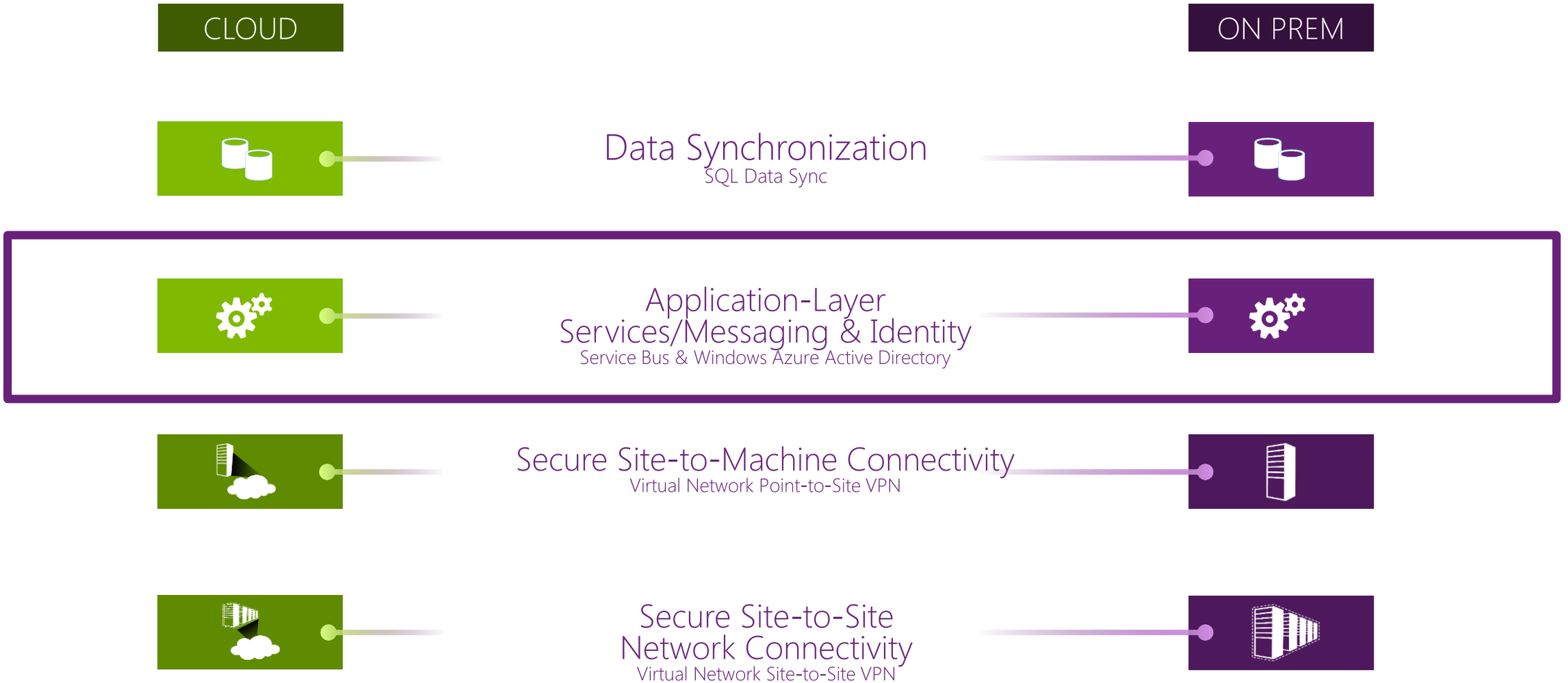
Demo

Push Notification from Visual Studio

Hybrid

Investments in Hybrid

Core technologies that enable a truly hybrid application platform



Windows Azure Service Bus

Service Bus Relay

Scenario: You have on-premise systems that you need to communicate with directly from outside your organization…

Solution: Internal Web Services are exposed securely via the Relay which passes calls into the on-premise service and back to the calling clients

Service Bus Queues

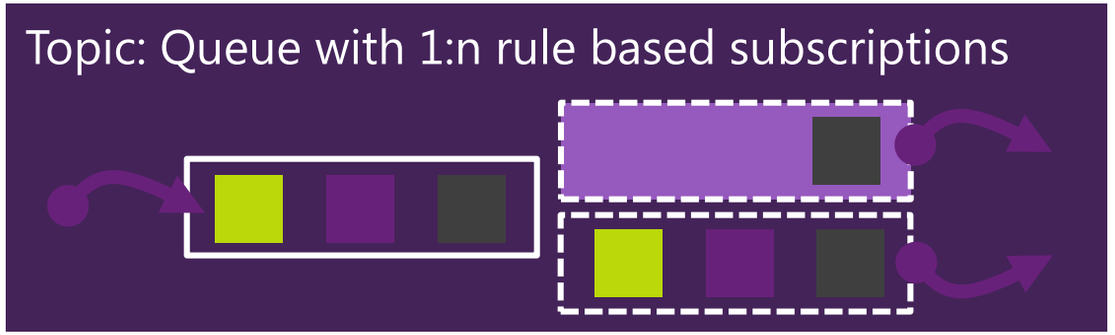
Scenario: Multiple systems and remote clients need to send business events to head office which processes these messages under varying load.

Solution: Queues decouple senders from receivers, multiple receivers can handle varying load, simple to add new senders without impact.

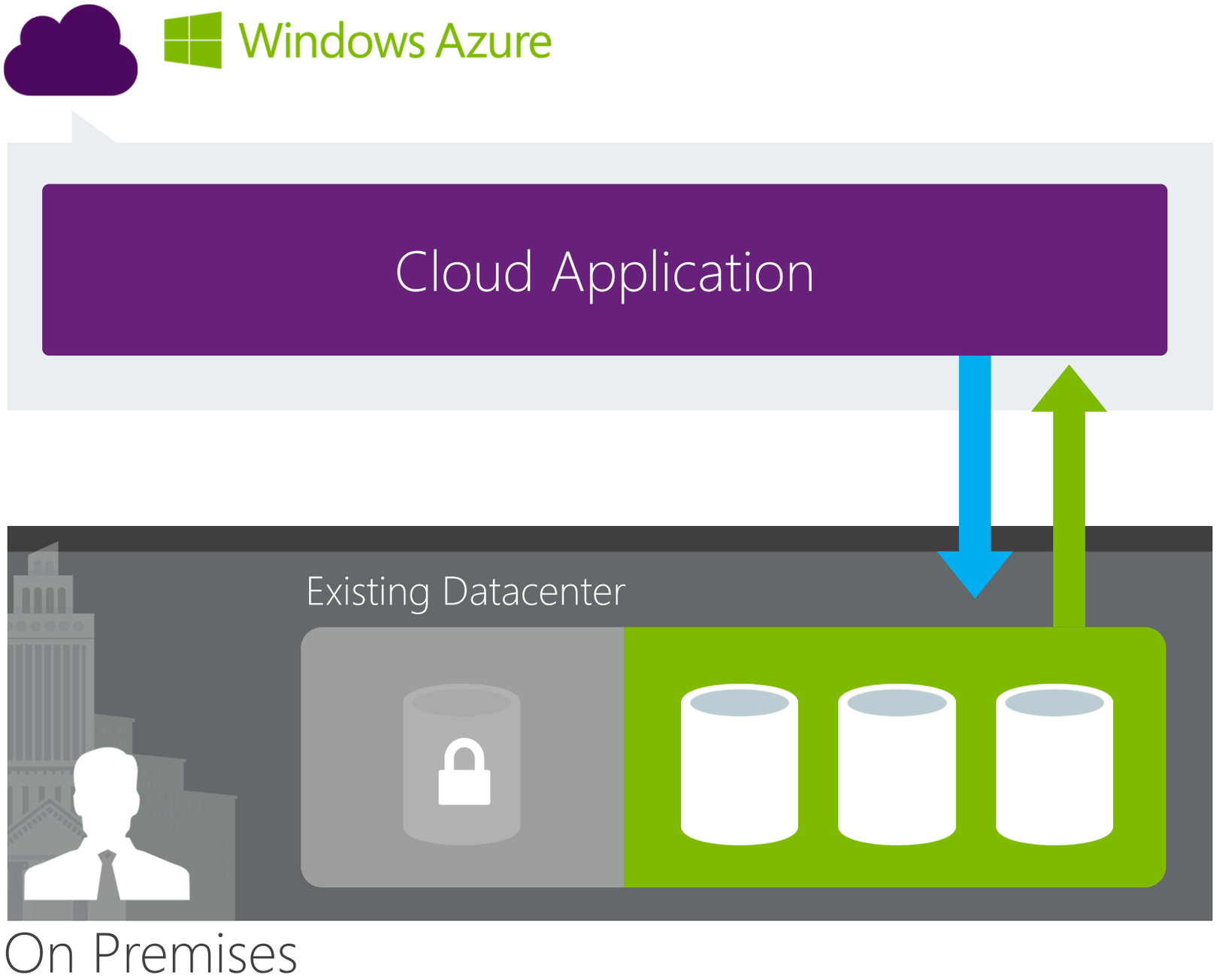
Service Bus Topics

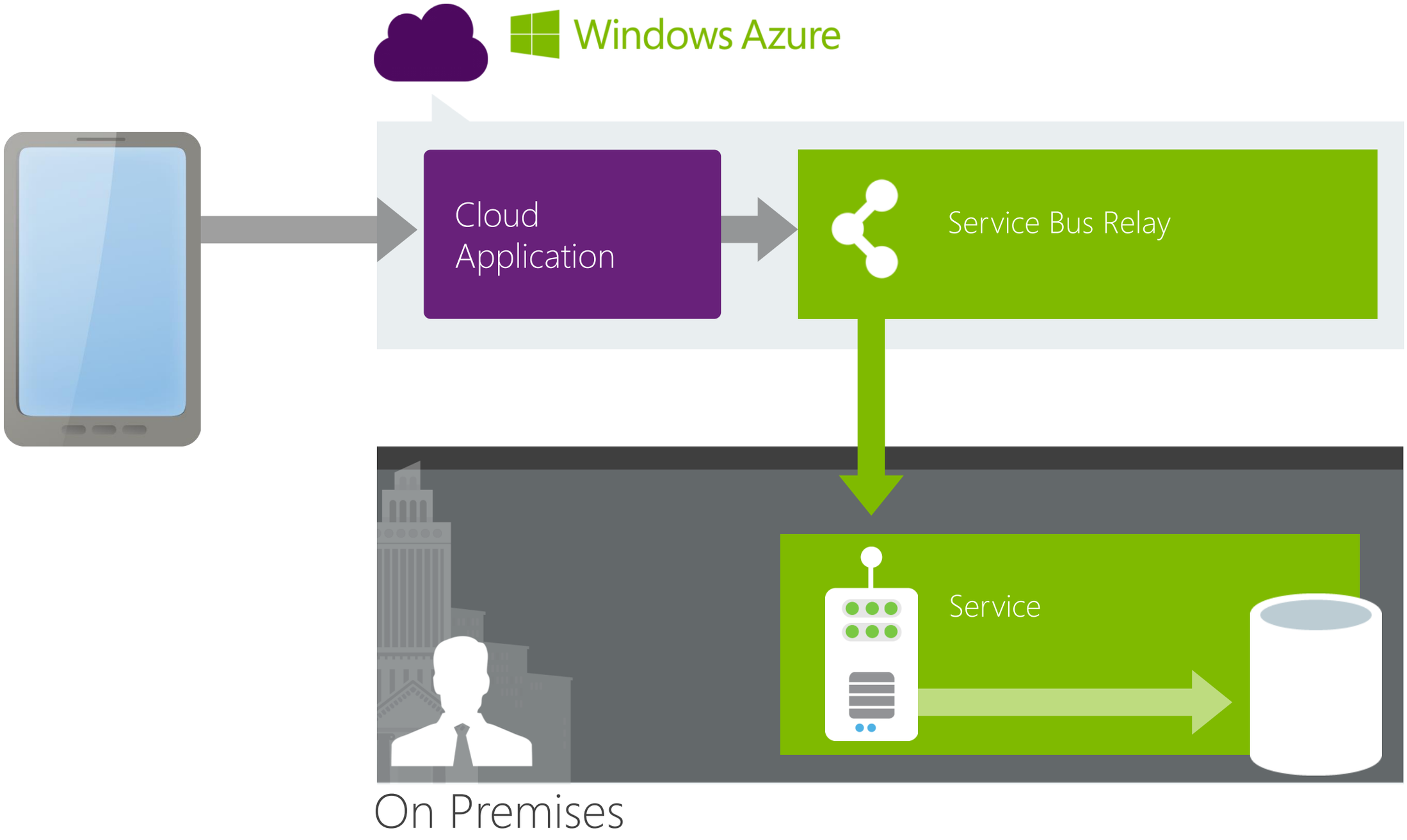
Scenario: Multiple actions have to be taken as a result of incoming messages from external systems but these actions frequently change.

Solution: Topics are special queues that have subscriptions which contain rules to determine which messages a subscription will contain.

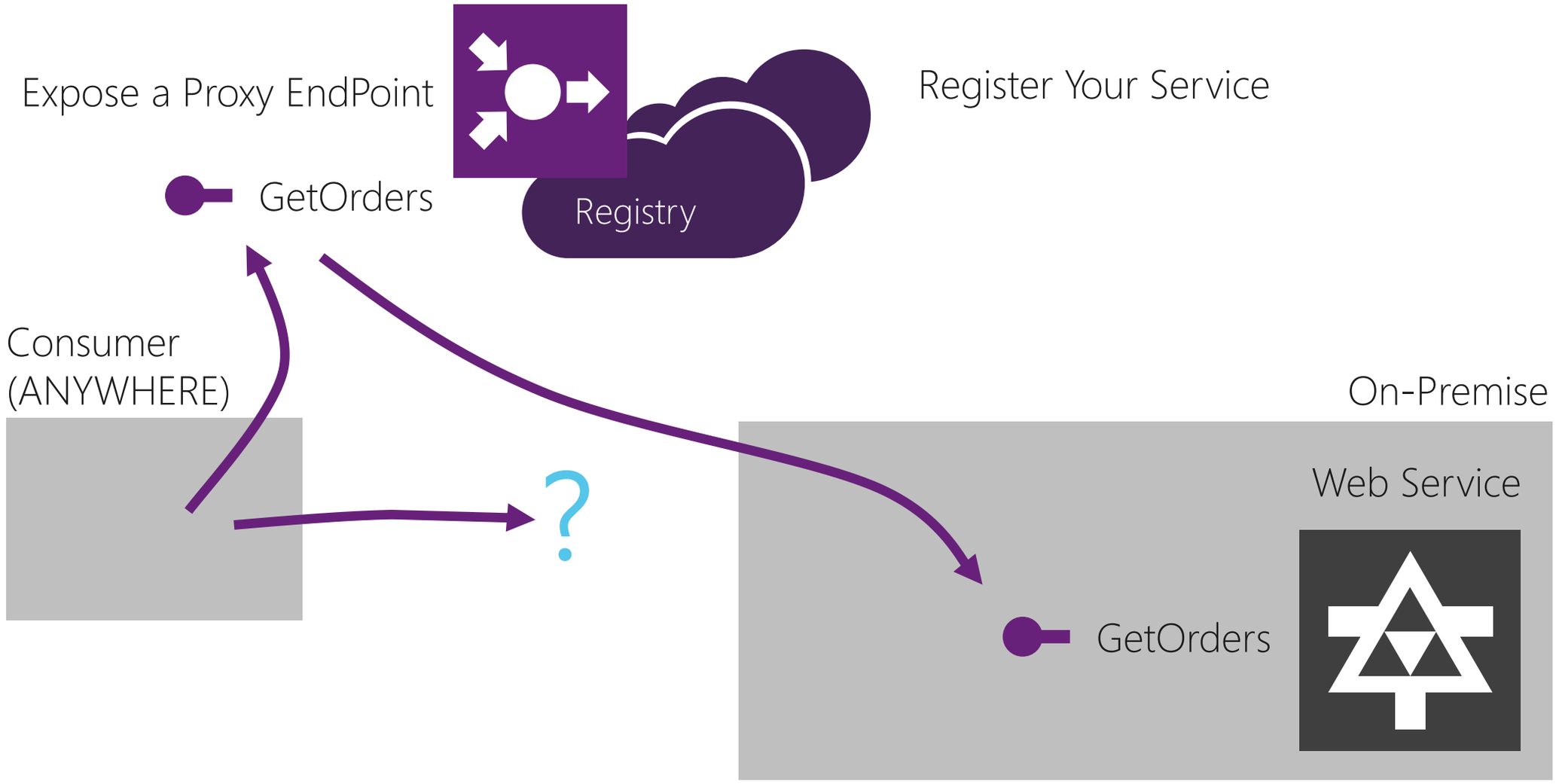


Service Bus Relay




Windows Azure
Cloud Application
Service Bus Relay
Service
On Premises

Service Bus Relay



Windows Azure Active Directory

Office365 services needed access to customer directories to provide best-in-breed experiences

Offer identity services to Organizations without on-premises directories

Run at internet scale

Offer multi-tenancy

Internet-scale multi-tenant directory

Build concurrently with Office 365

Extends Windows Server Active Directory into cloud

Cloud-based directory and identity services

Protocols to connect with Azure AD

	Purpose	Details
REST/HTTP directory access	Create, Read, Update, Delete directory objects and relationships	Compatible with OData V3 Authenticate with OAuth 2.0
OAuth 2.0	Service to service authentication Delegated access	JWT token format
SAML 2.0	Web application authentication	SAML 2.0 token format Used with Office 365 Services
WS-Federation 1.3	Web application authentication	SAML 1.1 token format Used with Office 365 Services

Demo

Windows Azure Active Directory

Summary

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

Global Data Center Footprint

99.95% Monthly SLA. Pay only for what you use

Flexible & Open Compute Options

Virtual Machines, Web Sites, Mobile Services & Cloud Services

Integrate with OnPrem

Manage workloads with your existing Tools

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http://aka.ms/vsAzure

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