Windows Server RIP

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Abstract

Sie fragen sich, was an Cloud Computing so revolutionär sein soll? Besuchen Sie Rainer Stropek in dieser Session und sehen Sie, warum Windows Azure so grundlegend anders ist, als alles, was wir bisher von Rechenzentren gekannt haben. Netzwerk, Server, Load Balancer, Fabric, CDN - was ist dran an dem "Betriebssystem für die Cloud"?

Ever asked yourself why Cloud Computing is considered a „disruptive technology“? Come and join Rainer Stropek in this session ans see, why Windows Azure is so fundamentaly different than everything you used to know from your on-premise data center. Network, servers, load balancers, fabric, CDN – after the session you will have a clear understanding about Microsoft‘s „operating system for the cloud“.

Parts of this slide deck has originally been developed by Rainer Stropek together with Max Knor, Technical Global Alliance Manager, Global Partner Team, Developer & Platform Evangelism, Microsoft Corp.

Introduction

- software architects gmbh
- Rainer Stropek

  Developer, Speaker, Trainer

  MVP for Windows Azure

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  twitter FOLLOW ME @rstropek

http://www.timecockpit.com

http://www.software-architects.com

AIT

time cockpit

CloudProTEAM


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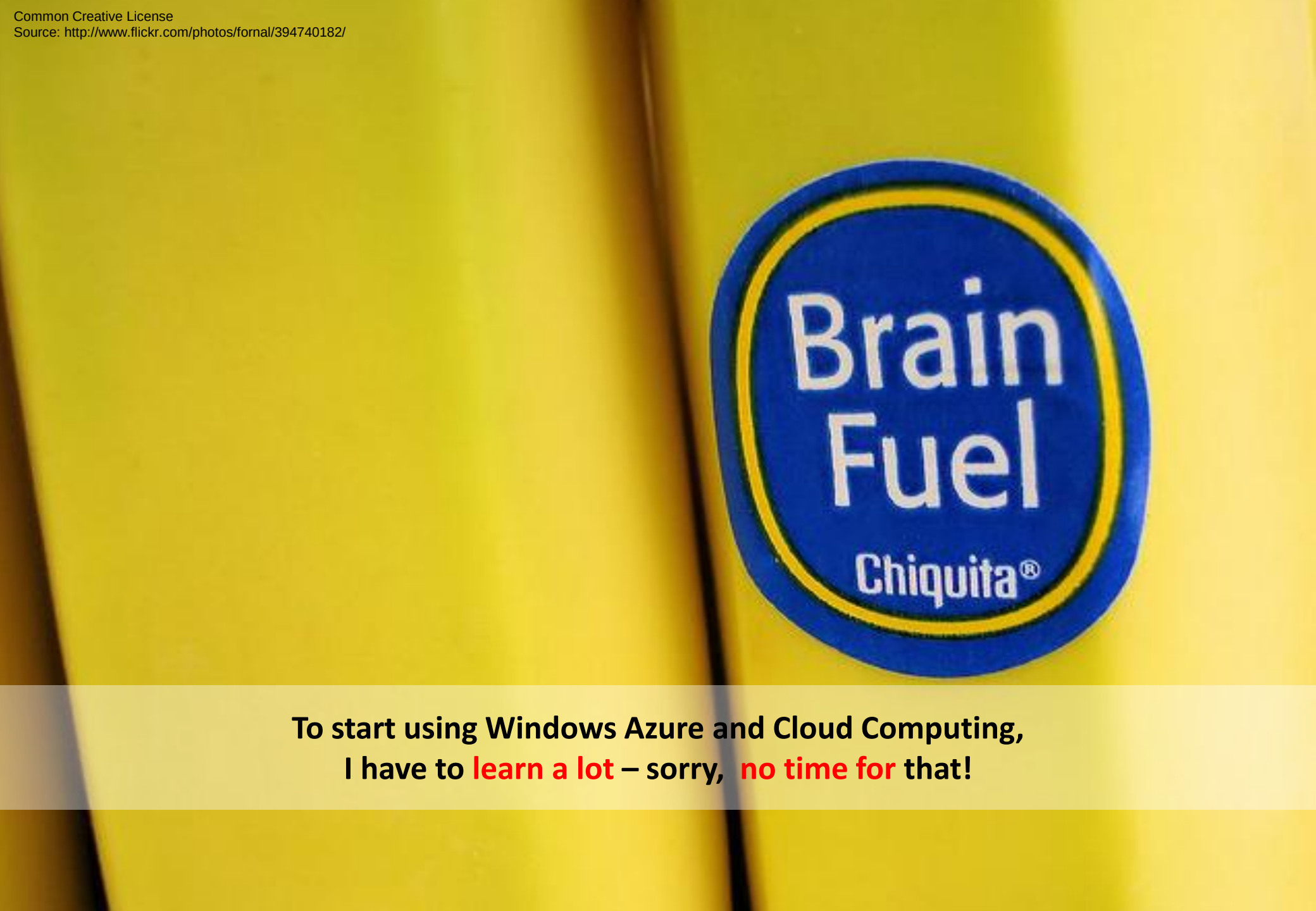


To start using Windows Azure and Cloud Computing,
I have to learn a lot – sorry, no time for that!

Just another
Windows Server

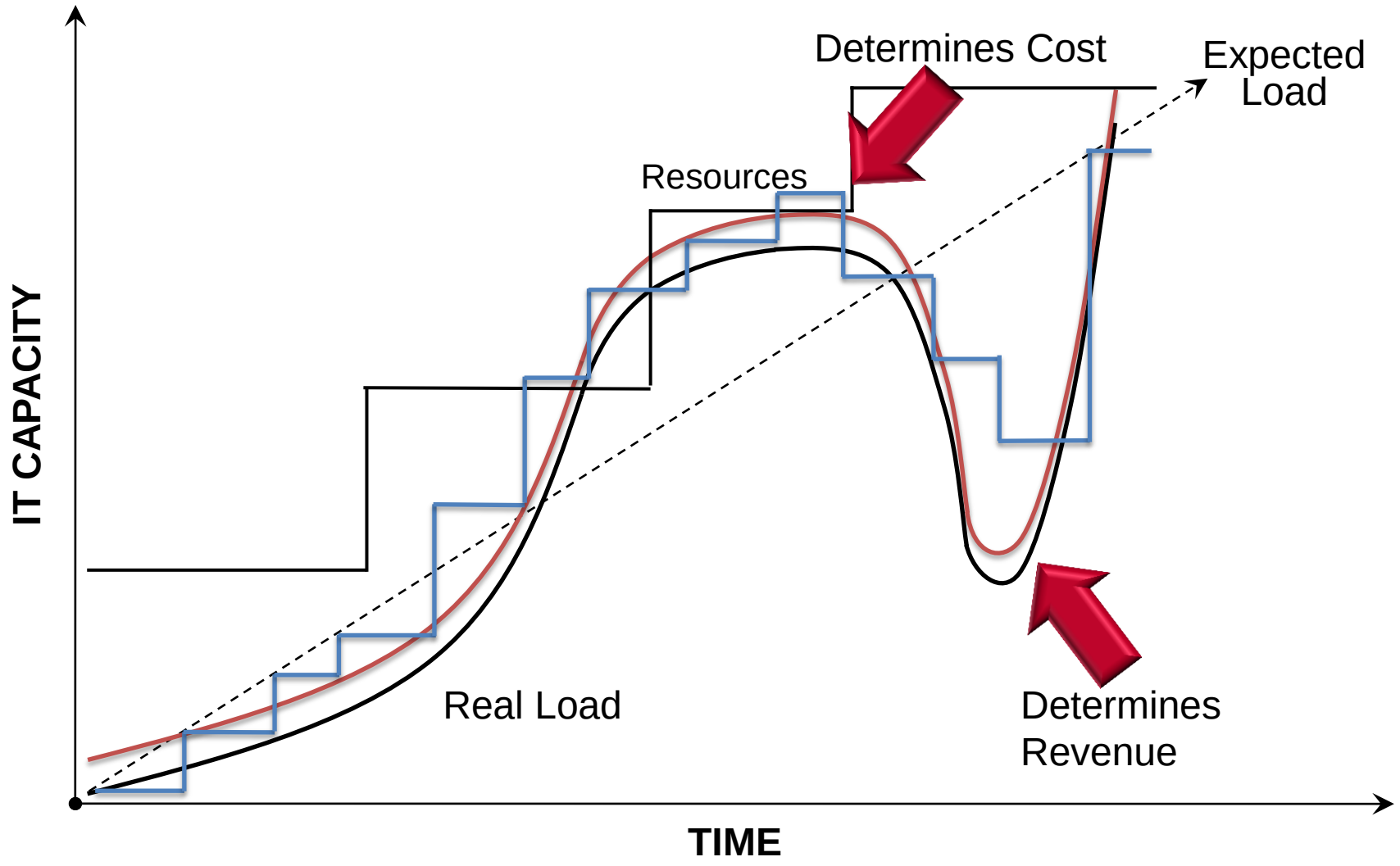
Just another
Server Cluster

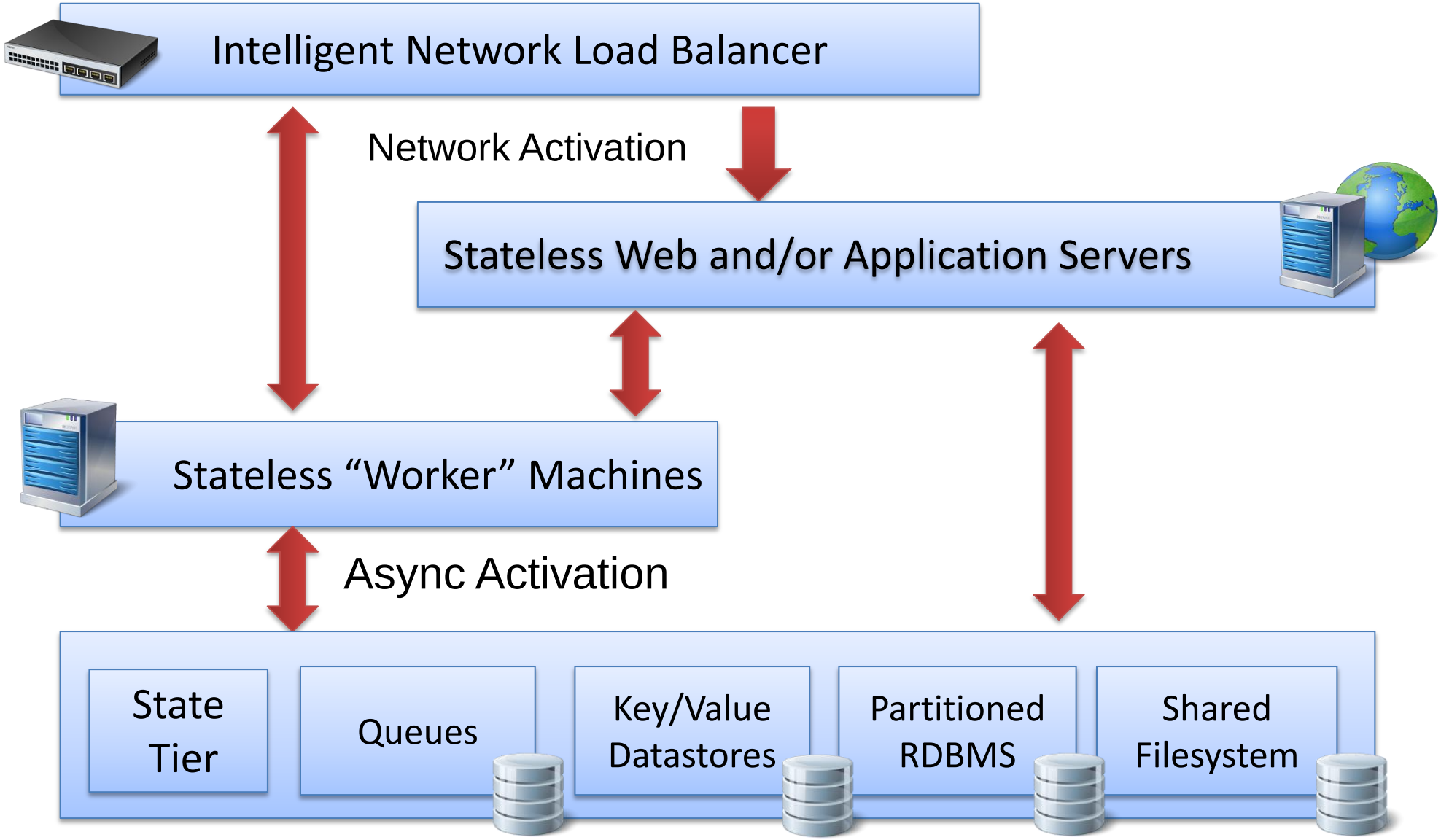
Just another
IIS

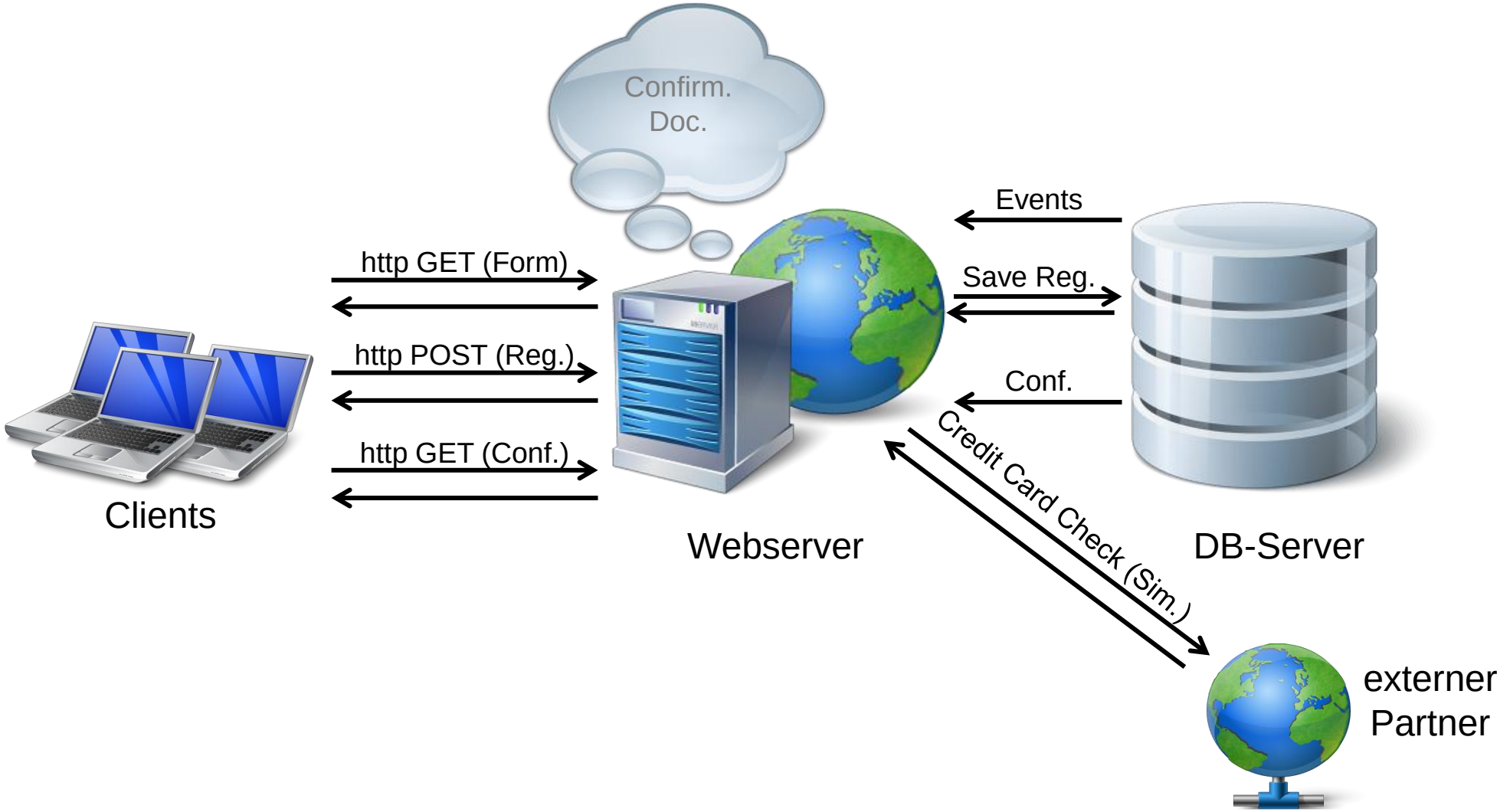
Just another
Web Farm

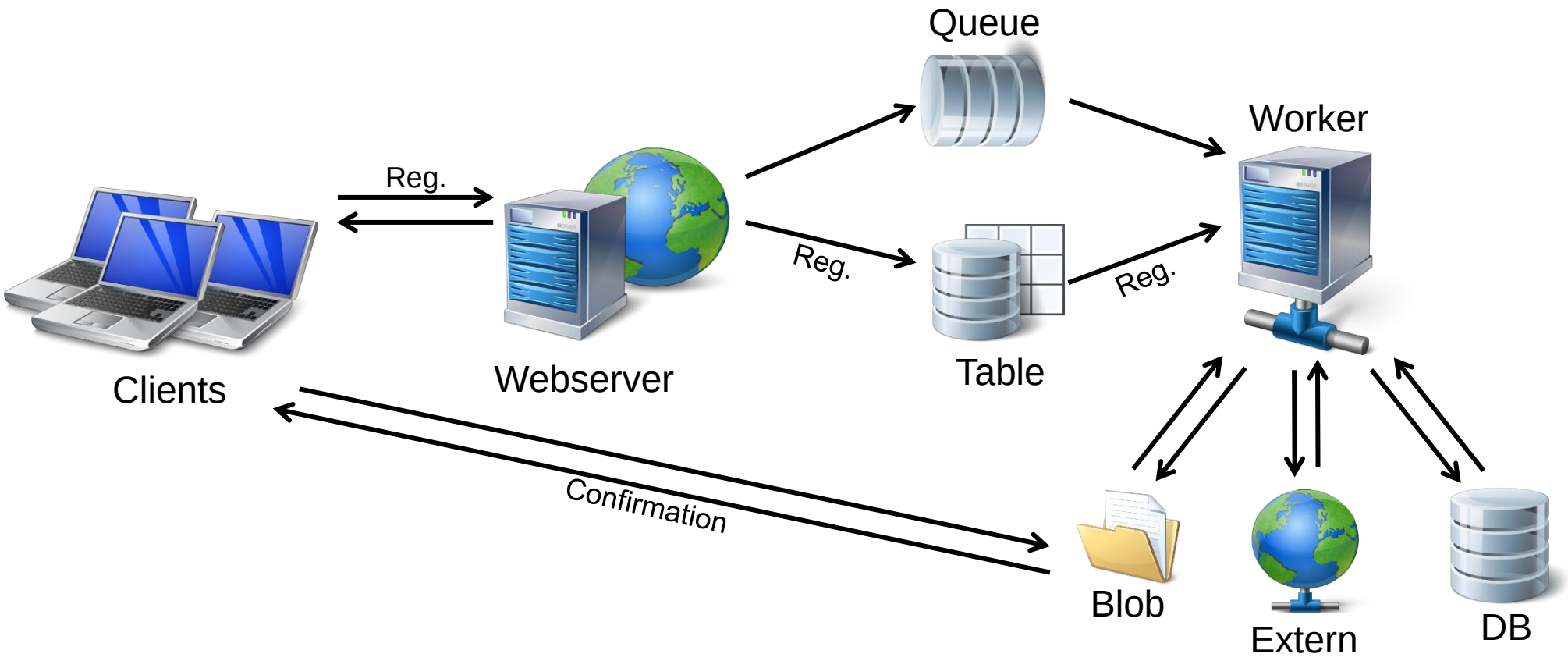
Just another
SQL Server

Just another
SQL Server Cluster


Determines Cost
Expected Load
Resources
IT CAPACITY
Real Load
Determines Revenue
TIME

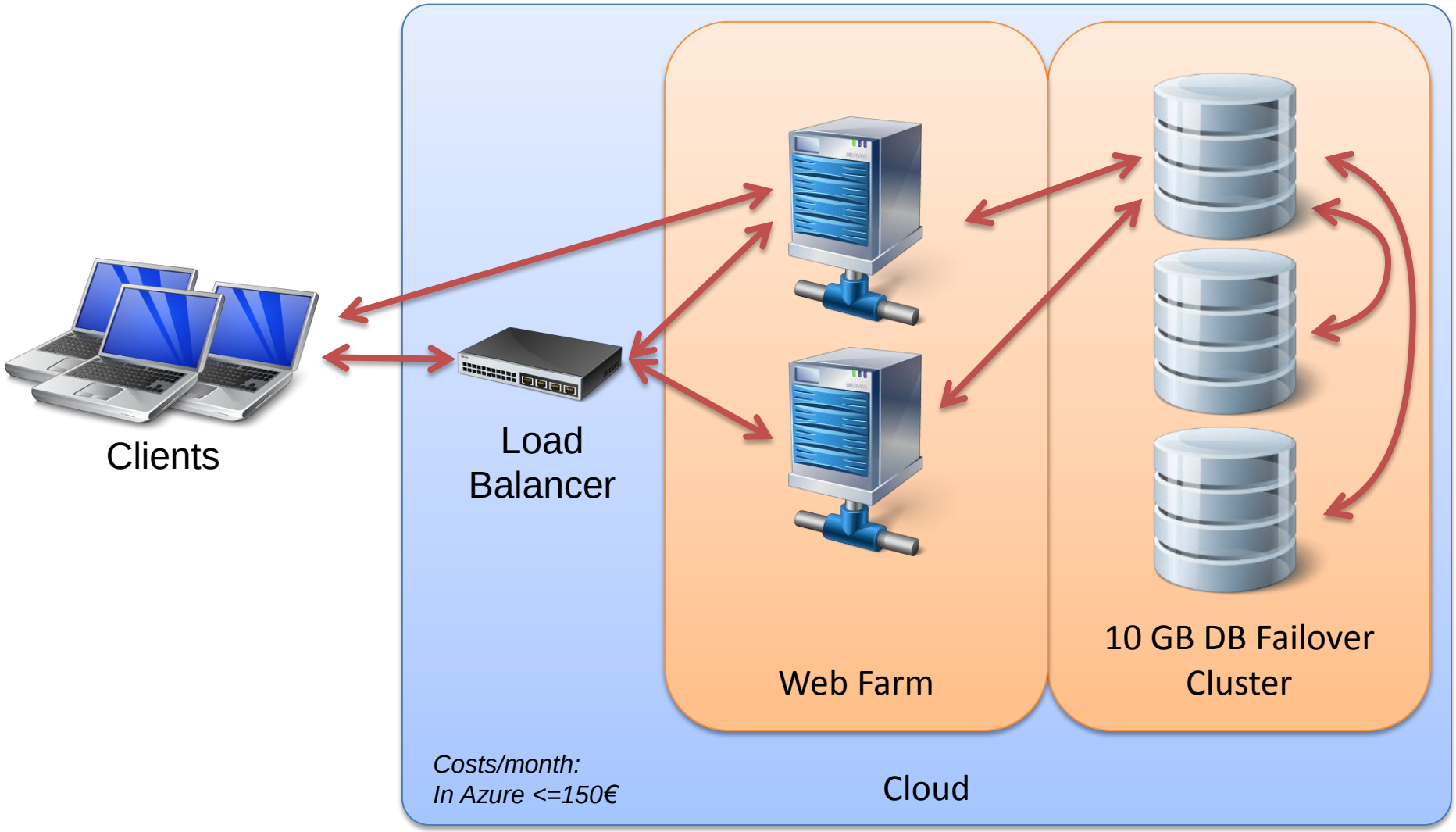

Intelligent Network Load Balancer
Network Activation
Stateless Web and/or Application Servers
Stateless “Worker” Machines
Async Activation
State Tier
Queues
Key/Value Datastores
Partitioned RDBMS
Shared Filesystem


Confirm.
Doc.
Events
Save Reg.
Conf.
http GET (Form)
http POST (Reg.)
http GET (Conf.)
Credit Card Check (Sim.)
Clients
Webserver
DB-Server
externer
Partner


Queue
Worker
Reg.
Reg.
Reg.
Clients
Webserver
Table
Confirmation
Blob
Extern
DB


Common Creative License
Source: http://www.flickr.com/photos/alancleaver/2638883650/
Sorry, can‘t use Azure in my projects,
it‘s too expensive!

Check out next issue of dot.net magazine:
Top tips to get more for your money in Windows Azure



Windows Compute Emulator

- *Windows Azure Compute Emulator* aka DevFabric
  - Part of Windows Azure SDK → free
- Simulates Windows Azure during development process
  - For debugging
  - To reduce cost
  - To develop offline
- Emulator ≠ Windows Azure
  - Emulator can access resources on local machine
  - Local resources will not be available in the cloud
  - → Tests in emulator do not replace tests in the real cloud

Windows Compute Emulator

- Prerequisites
  - Windows Azure SDK and Azure-Tools für VS
  - Visual Studio 2010
  - IIS and SQL Server 2008 R2 (see also MSDN)
- Installation
  - Installation of SDK and Tools
  - Configure emulator (see also MSDN)
- You can only access apps in emulator locally
  - Tip: Various blog article in the web describe who to make apps in emulator available over the network (e.g. Emmanuel's Blog)

demo

Windows Compute Emulator

Local development environment for the cloud

Occupy Roles Wisely

Web Role	Worker Role	VM-Role
• IIS (since 1.4)	• `While (true) { }`	• Custom

- Web Role for...
  - ...anything that should be hosted in IIS
  - ...multiple web sites in a single role
- Worker Roles for...
  - ...any kind of background work
  - Remember: Can be combined with web role
- VM-Role only if...
  - ...you are unable to automate role setup (startup tasks)
  - ...software necessary for role setup is unstable
  - ...software necessary for role setup needs UI

Care About Storage Types, you must!

Storage	Web Edition	Business Edition
Per GB stored and transactions **$0.15 GB/month** $0.01/10k transactions	Per database/month **$9.99/month** (1-5 GB DB/month)	Per database/month **Starting at $99.99/month** (10-50 GB DB/month)

- Think about...
  - ...storage volume needed
  - ...number of transactions
  - ...programming effort
- Background information for Azure Storage Pricing

- ...client capabilities
- ...necessary performance
- ...necessary throughput
- ...static/dynamic nature

When To Use What??

SQL Azure

- Strong programmming model needed
- Need for complex ACID transactions

KO:

- Restricted storage amount acceptable (currently max. 50GB/DB)
- TDS is possible (soon no-code OData will be an option)

Windows Azure Storage

- Price sensitive (~1/65th compared to SQL Azure)
- Auto-scale out → Fast
- Large storage volumes (many, many TBs)
- REST/HTTP needed
- CDN needed
  - Possible with SQL Azure + web role, too – not without code
- NTFS needed (Drives)
- Queues needed

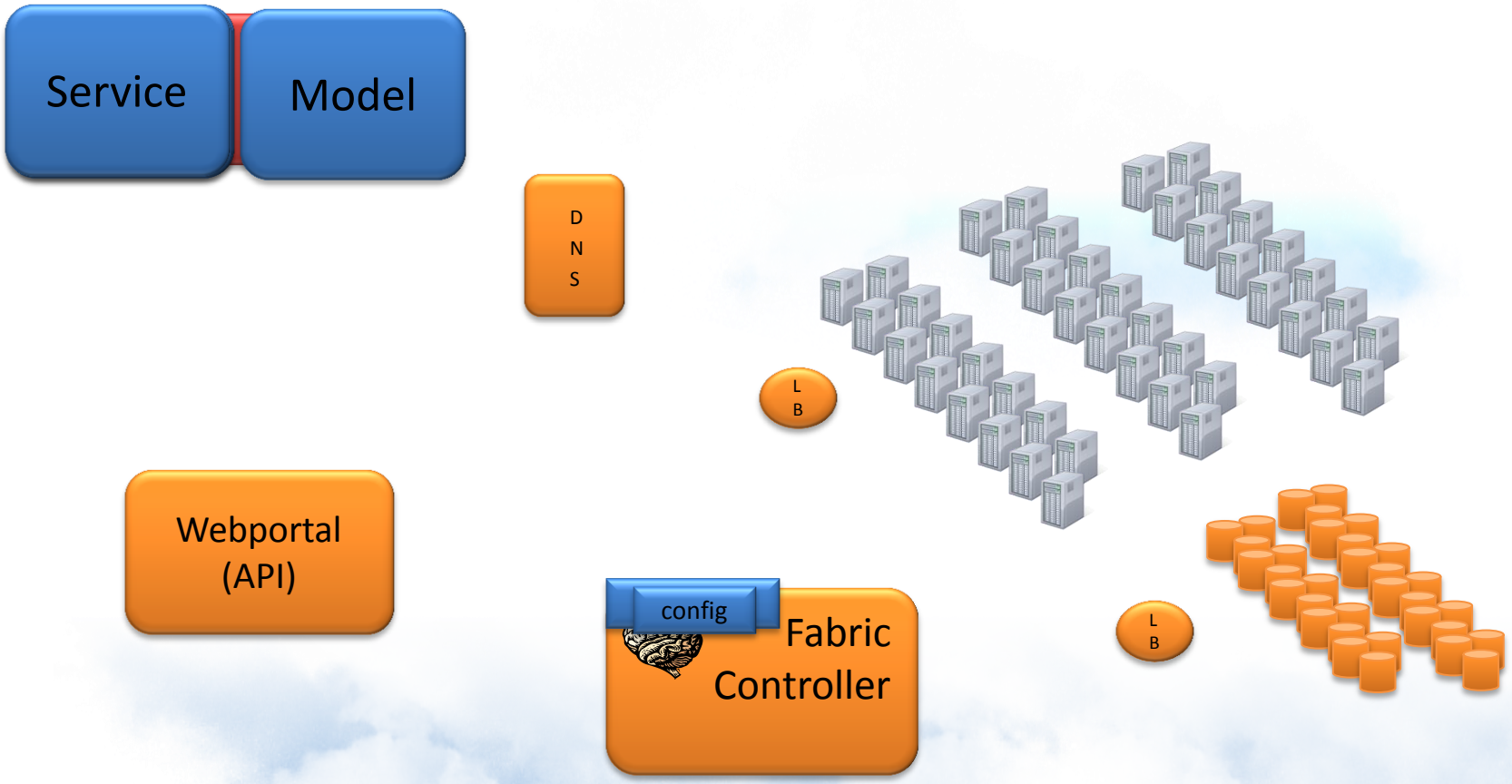

Cloud Computing is nothing else than hosting – nothing new!

demo

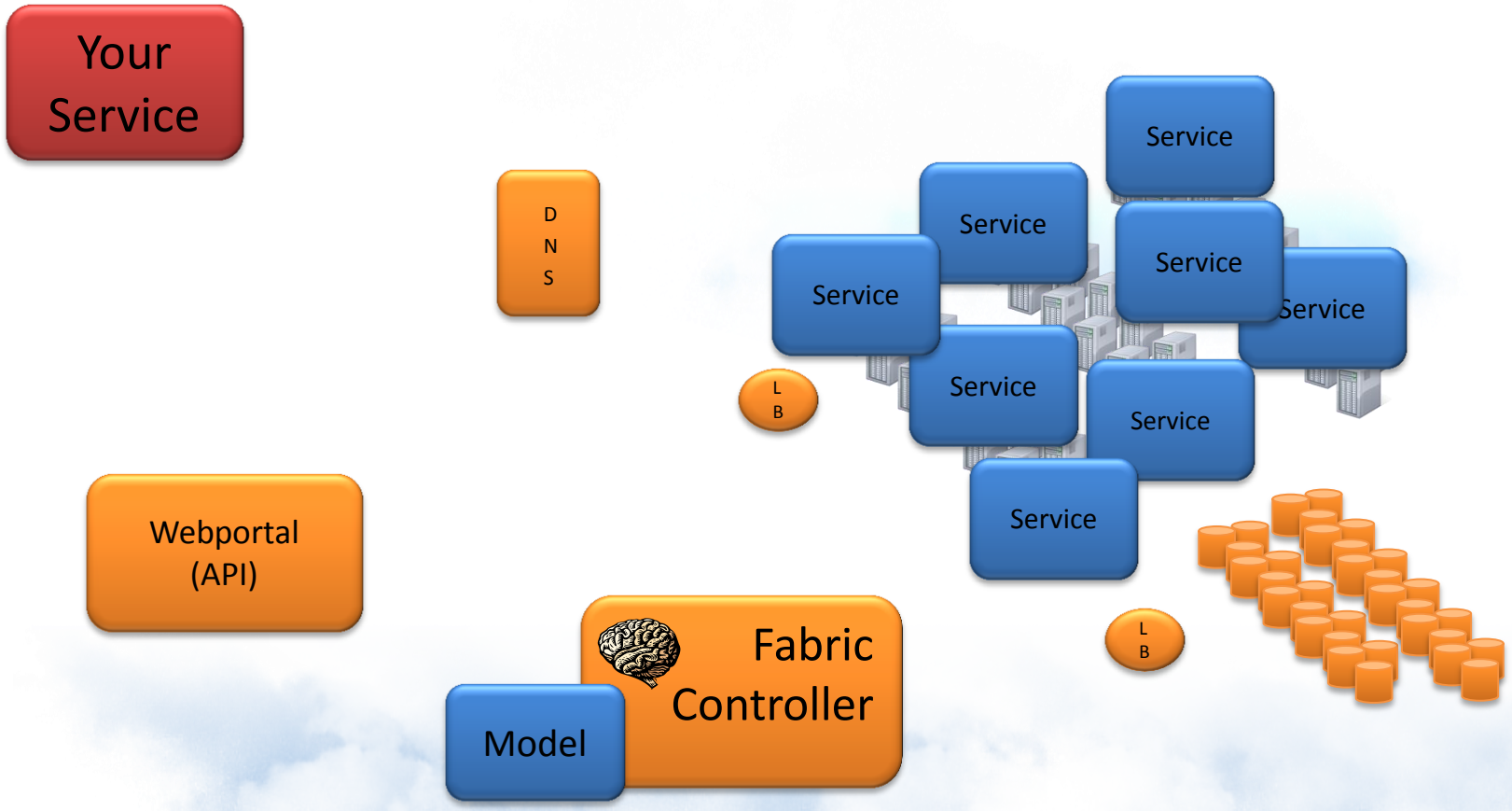
Webfarm

Windows Azure Compute Emulator

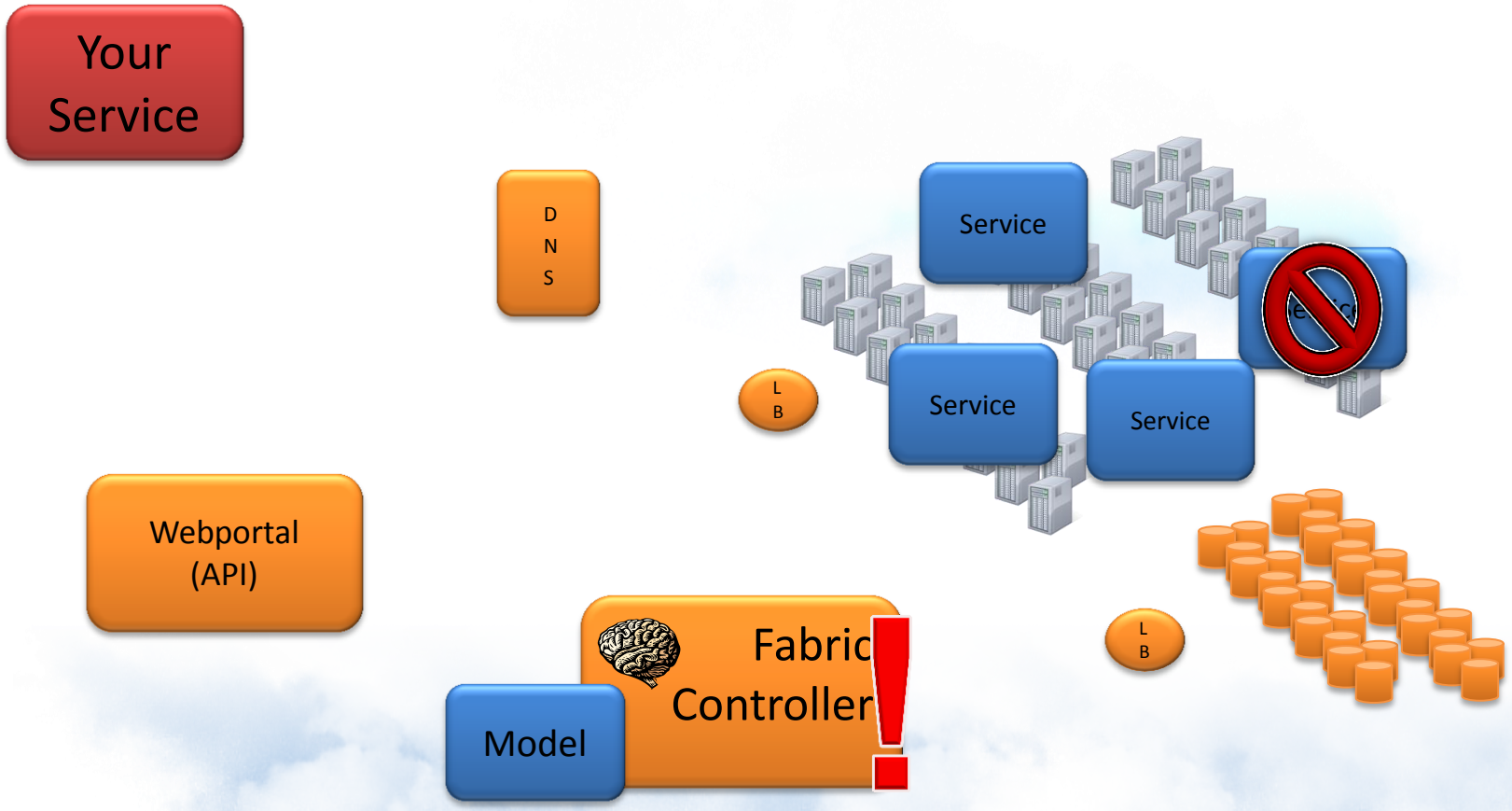
Service Deployment



Service Scaling



Service Monitoring & Recovery



Microsoft‘s SLAs → No Silver Bullet

You get credits, not compensation for damage

$$\frac{\text{Maximum Connectivity Minutes} - \text{Connectivity Downtime}}{\text{Maximum Connectivity Minutes}} = \text{Monthly Connectivity Uptime Percentage}$$

ii. Monthly Connectivity Uptime Service Levels

Monthly Uptime Percentage	Service Credit*
<99.95%	10%
<99%	25%

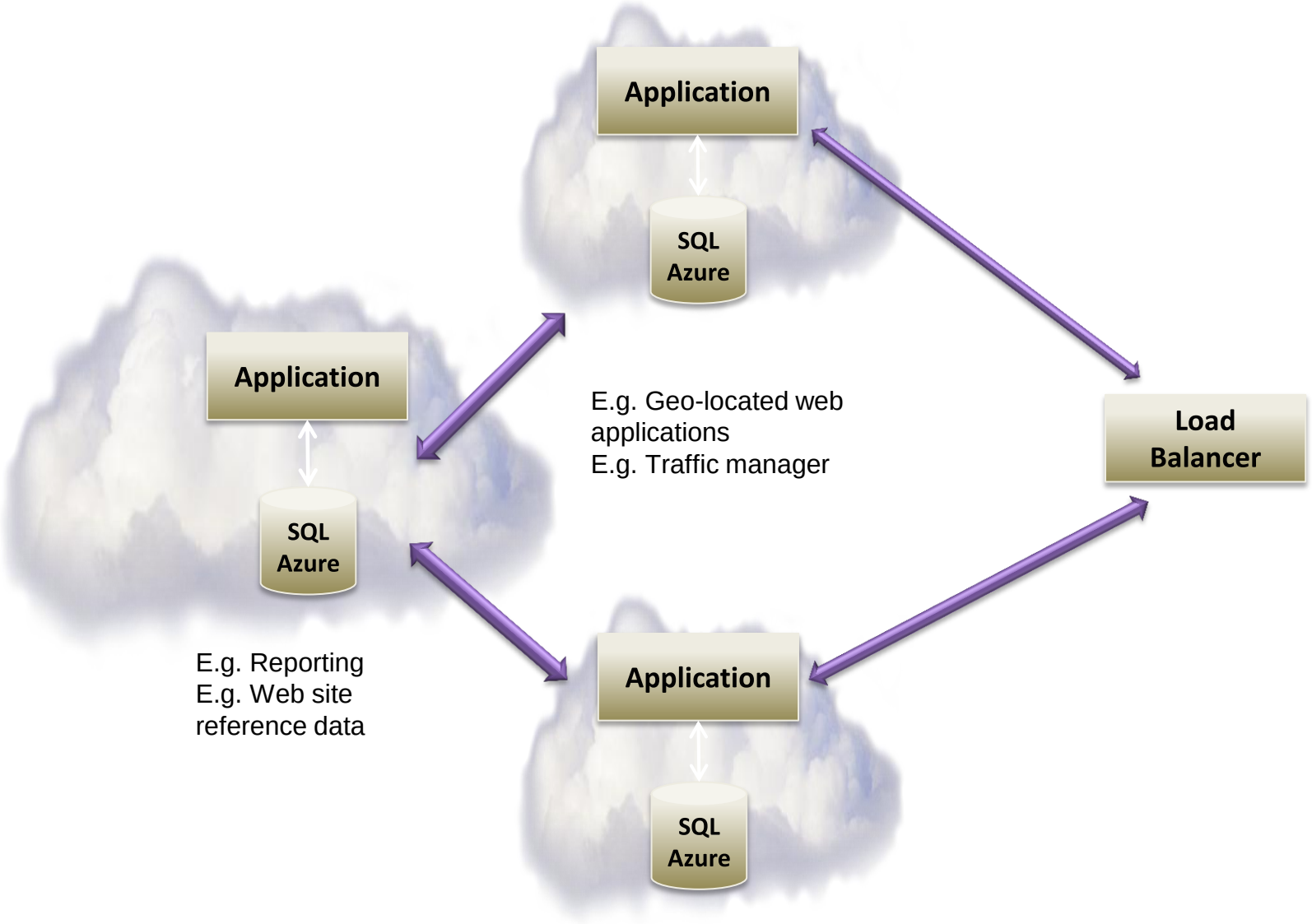
*Service credit applies only to Windows Azure Compute Services (i.e., not Windows Azure Storage or other Windows Azure platform services)

iii. Monthly Role Instance Uptime Service Levels

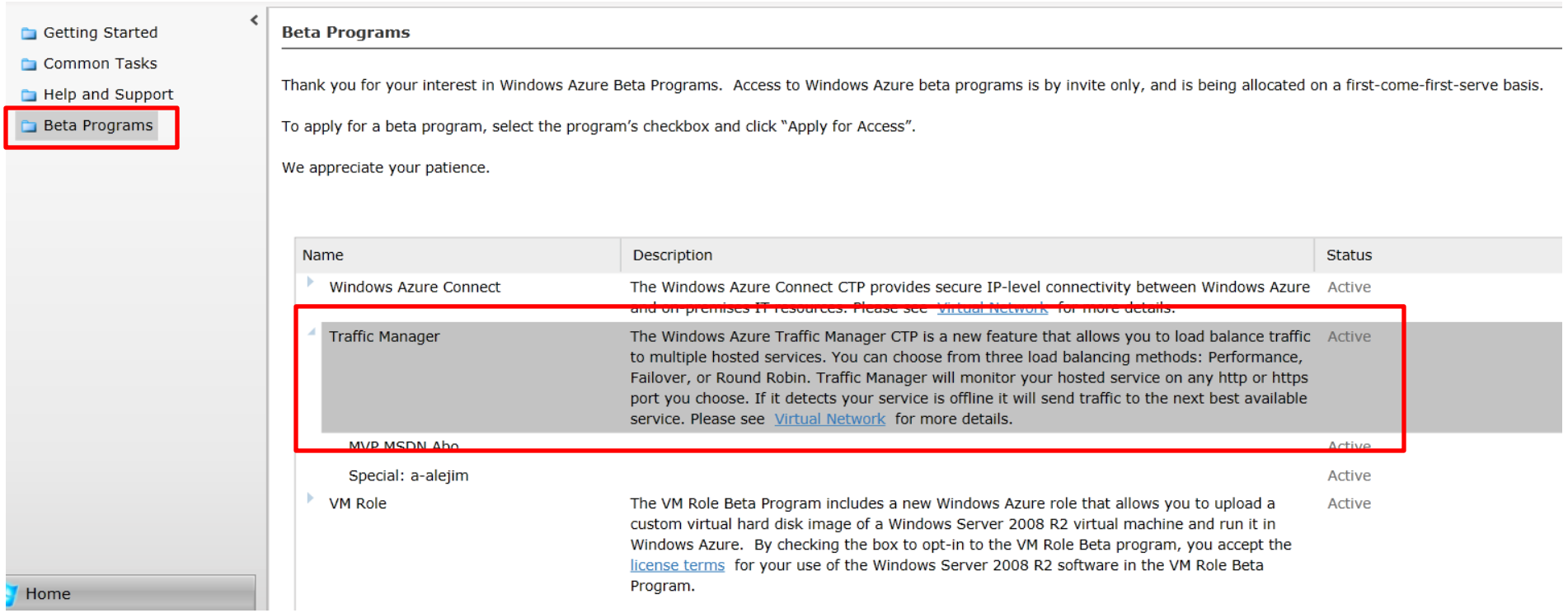
Monthly Uptime Percentage	Service Credit*
<99.9%	10%
<99%	25%

*Service credit applies only to Windows Azure Compute charges (i.e., not Windows Azure Storage or other Windows Azure platform services)

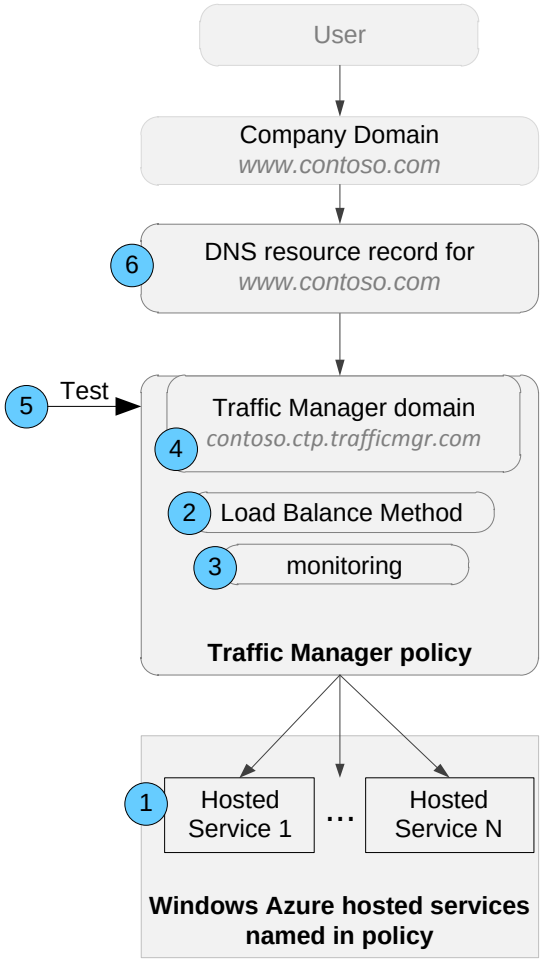
Backup still important!

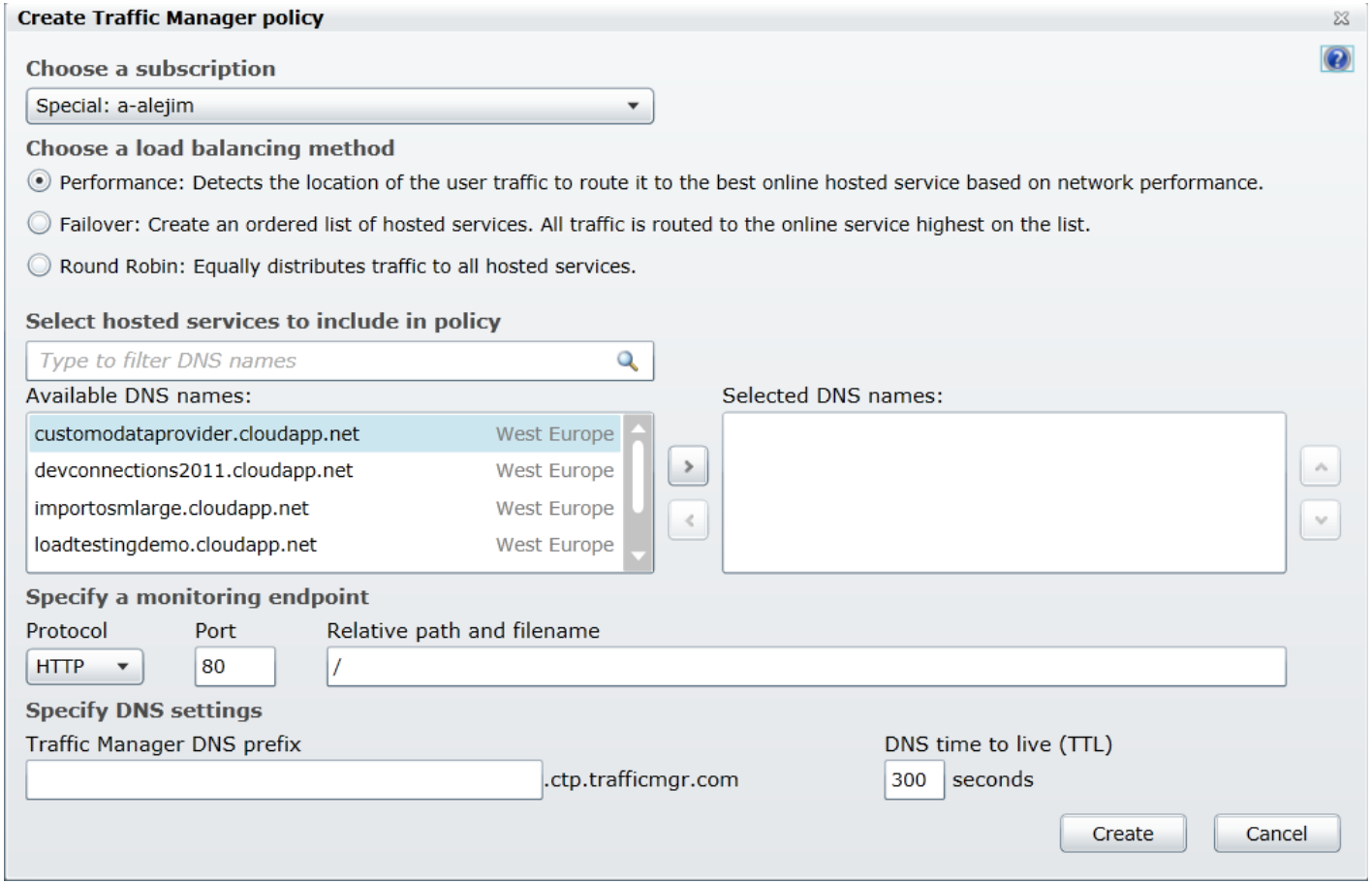

Application
SQL Azure
Application
SQL Azure
Application
SQL Azure
Load Balancer
E.g. Geo-located web applications
E.g. Traffic manager
E.g. Reporting
E.g. Web site reference data

Windows Azure Traffic Manager



Windows Azure Traffic Manager



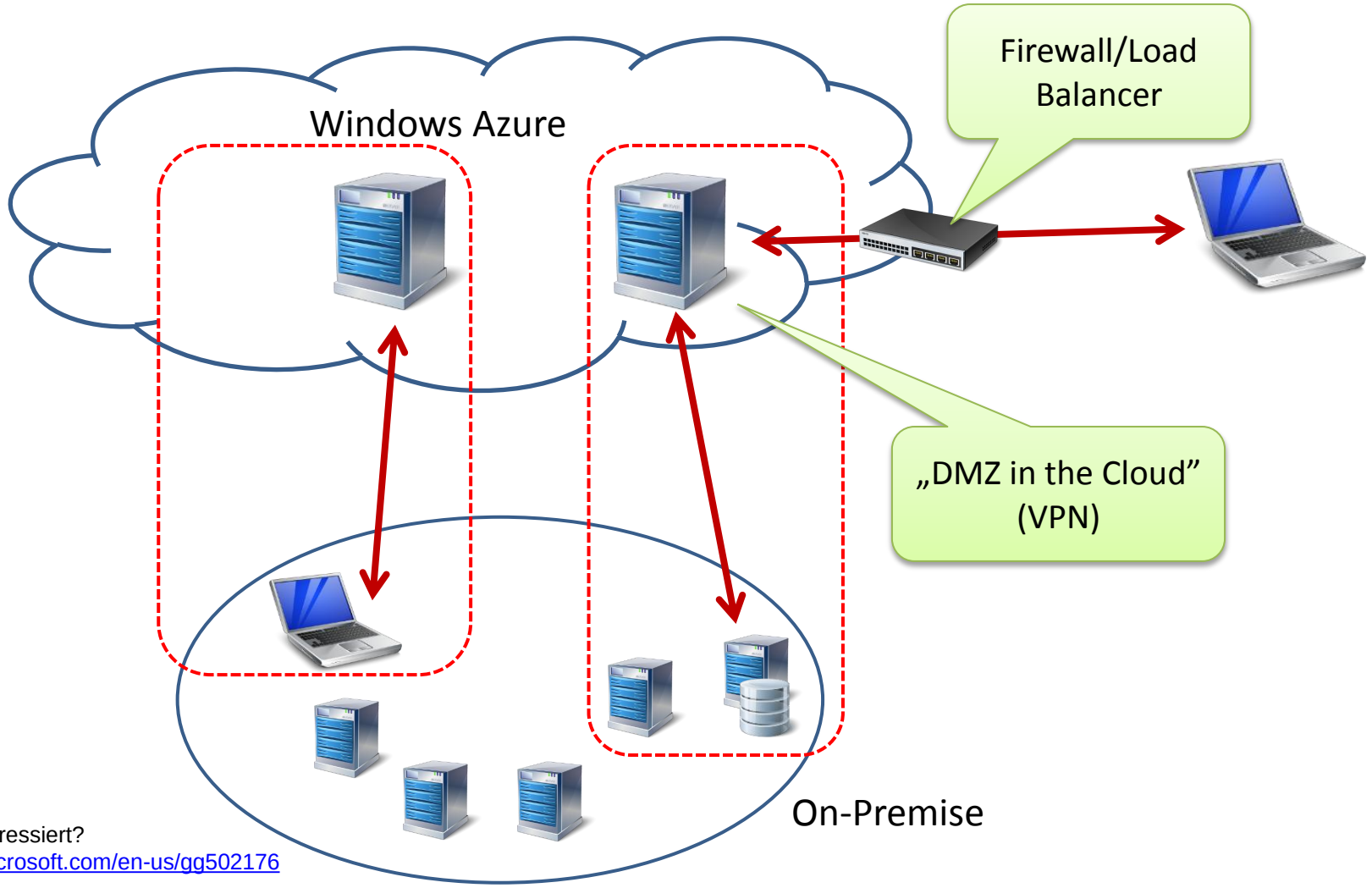


Cloud Computing is a security risk!

Security

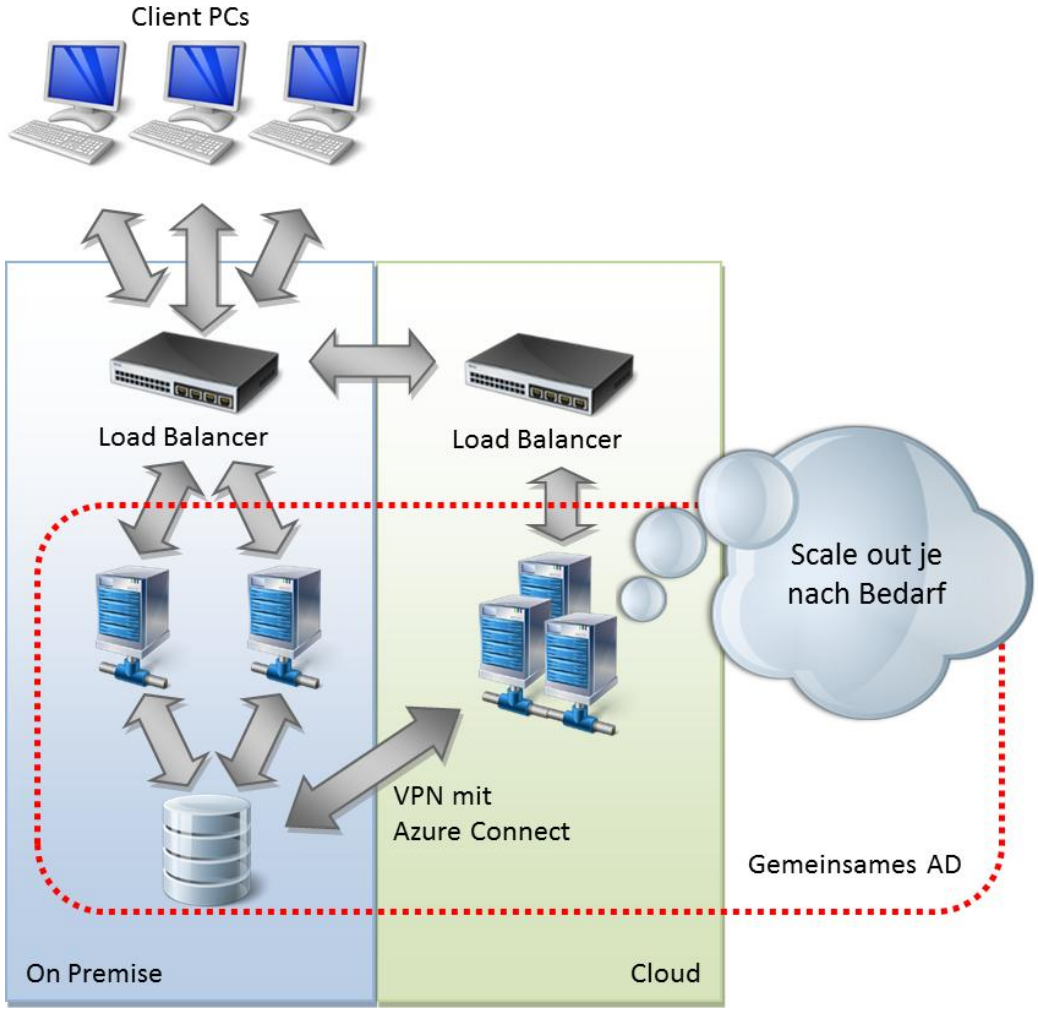
- Data protection
  - Consider relevant data protection laws
  - Possible solution: Windows Azure Connect
- Security
  - Cloud maybe better than on-premise
  - Privacy – certificates, encryption, etc.
  - Availability – clusters, fail-over scenarios, etc.
  - Physical security of data centers

Windows Azure Connect (in CTP)



An Details interessiert?
http://msdn.microsoft.com/en-us/gg502176

Scale Into The Cloud



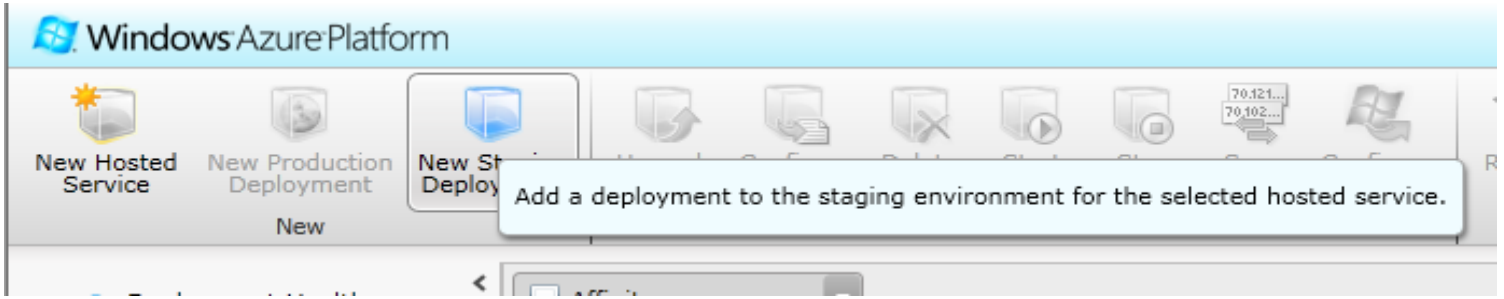
demo

Windows Azure Connect

Access on-premise resources from the cloud

Deployment in Azure is so complex – unusable!

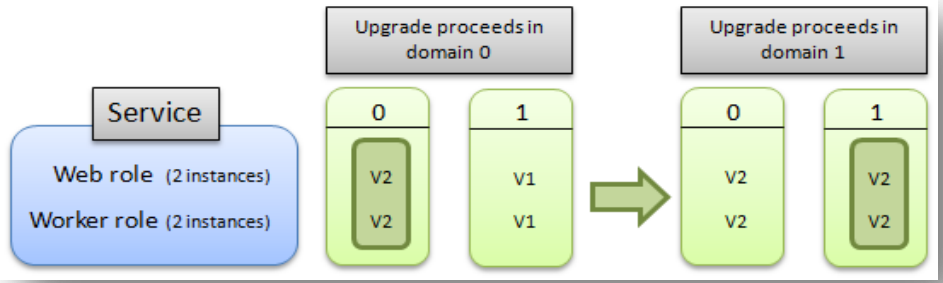
„Production“ and „Staging“



- Production
  - `http://<myapp>.cloudapp.net`
- **Staging**
  - `http://<guid>.cloudapp.net`
  - For testing purposes, to prepare a new version

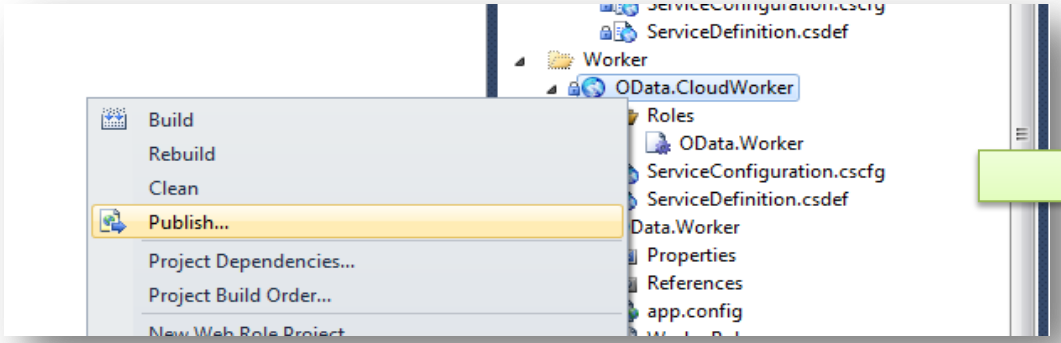
Deployment Types

- In-Place Update
  - Can be done for prod and staging
  - Service model must not change (e.g. same number of roles)

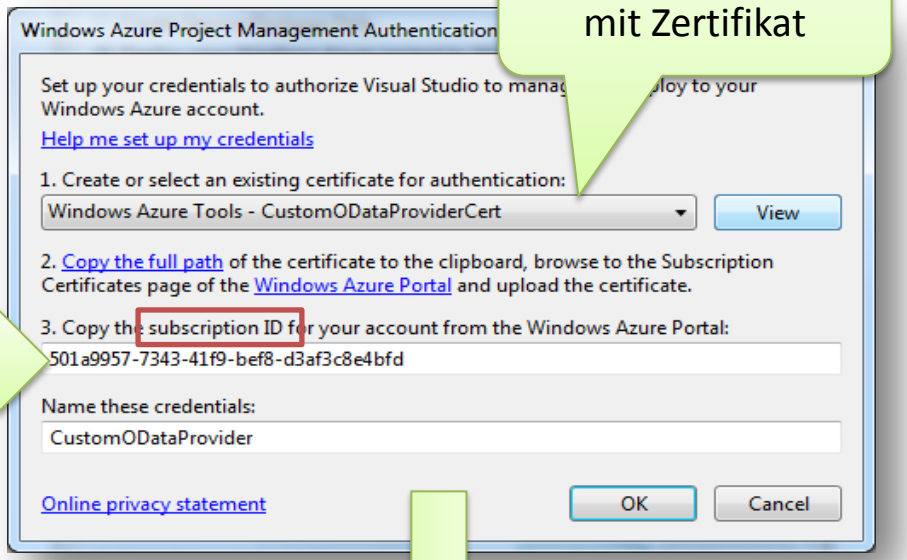


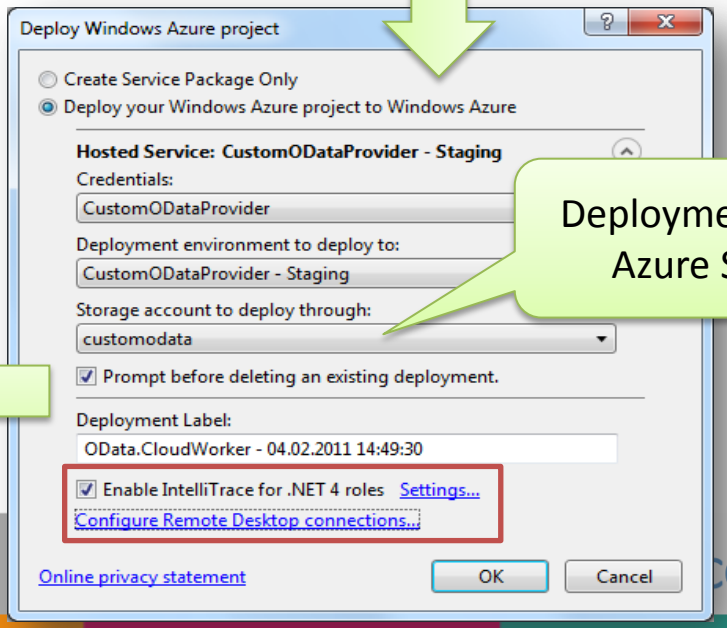
- **VIP Swap** (Virtual IP Swap)
  - Switches between Prod ↔ Staging
  - Service model may change, endpoints must not change

Deployment mit VS

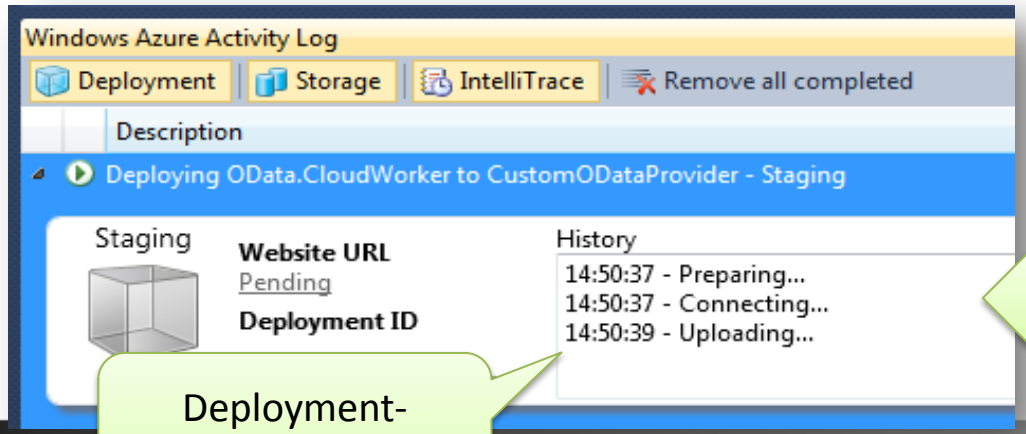


Authentifizierung mit Zertifikat





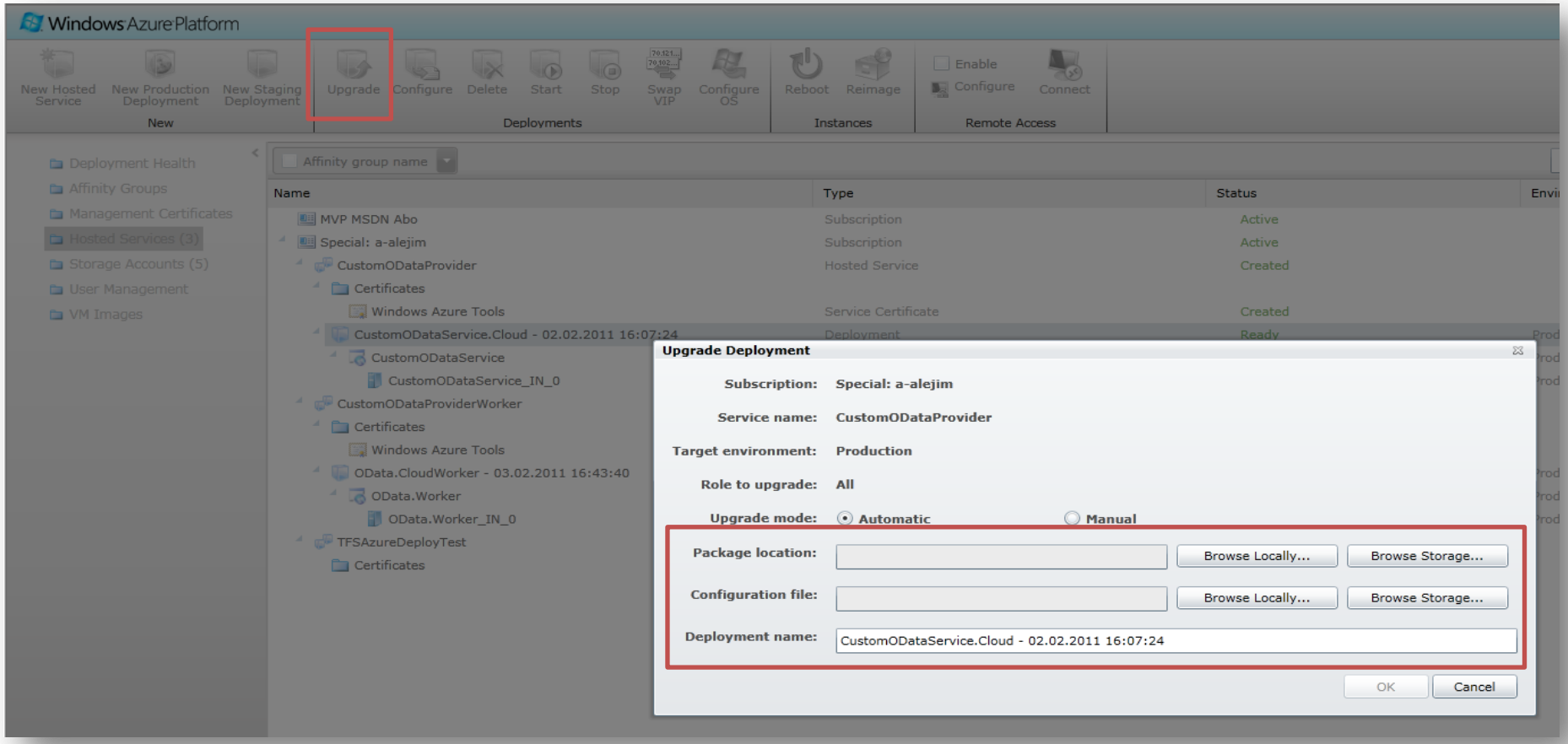
Deployment über Azure Store



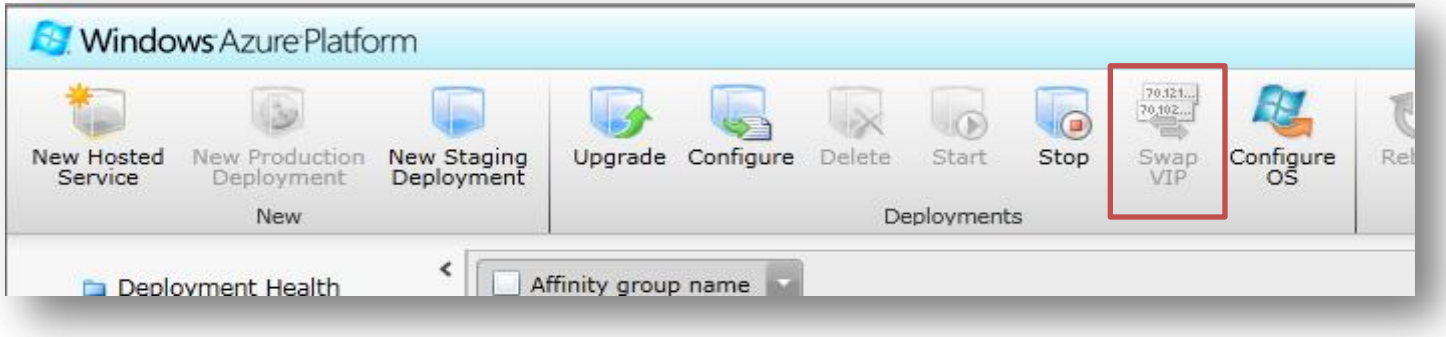
Deployment-prozess in VS

Deployment über das Portal

http://windows.azure.com



VIP Swap



- Prod contains V_x
- Deploy V_{next} to Staging
  - Connect Staging with Staging-DB
  - Final QA
  - Connect Staging with Prod-DB
  - Final QA, Warm-up
- Perform VIP Swap, now V_{next} is online
- Stop Staging **and delete it**

demo

VIP Swap

Prod ↔ Staging

Generic Roles

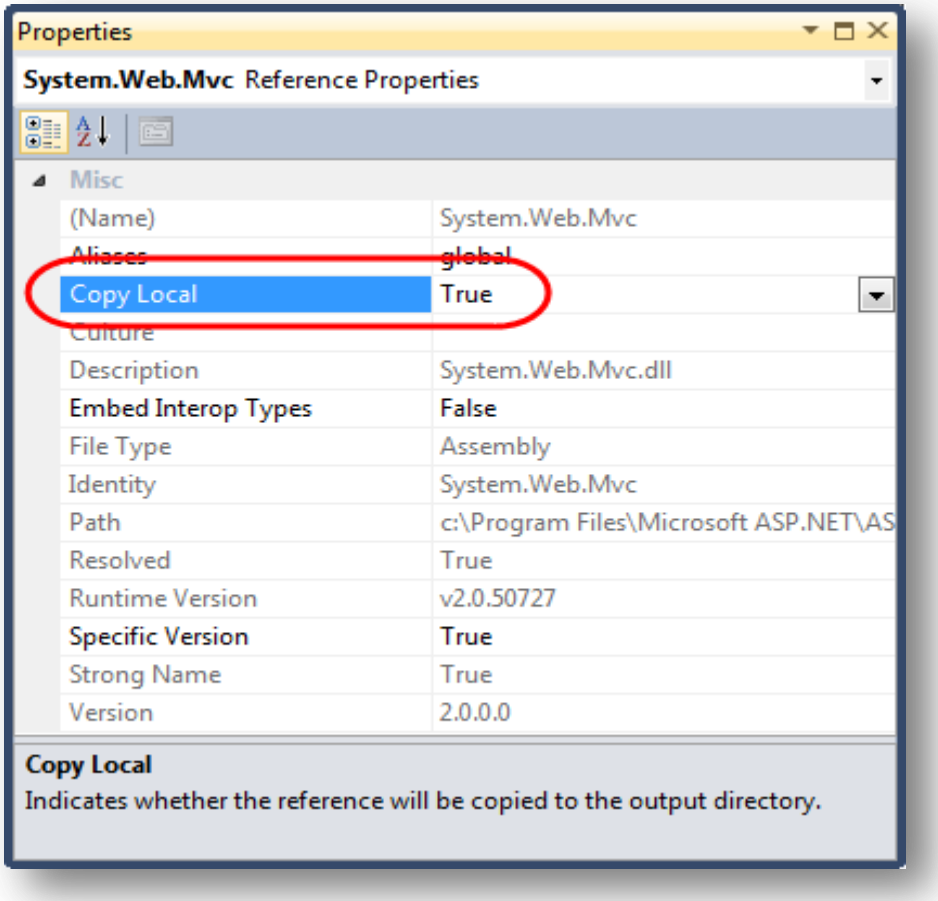
- Load Assemblies at runtime e.g. from Blob-Store
- Possible for Web- and Worker-Rolles
  - Web Role: Windows Azure Accelerator for Web Roles
  - Worker Role: You can easily build that yourself
- More information
  - Blogartikel von Rainer Stropek
  - AppDomain-Klasse
  - Assembly-Klasse

My application needs

non-Microsoft components – they are not installed in Azure!

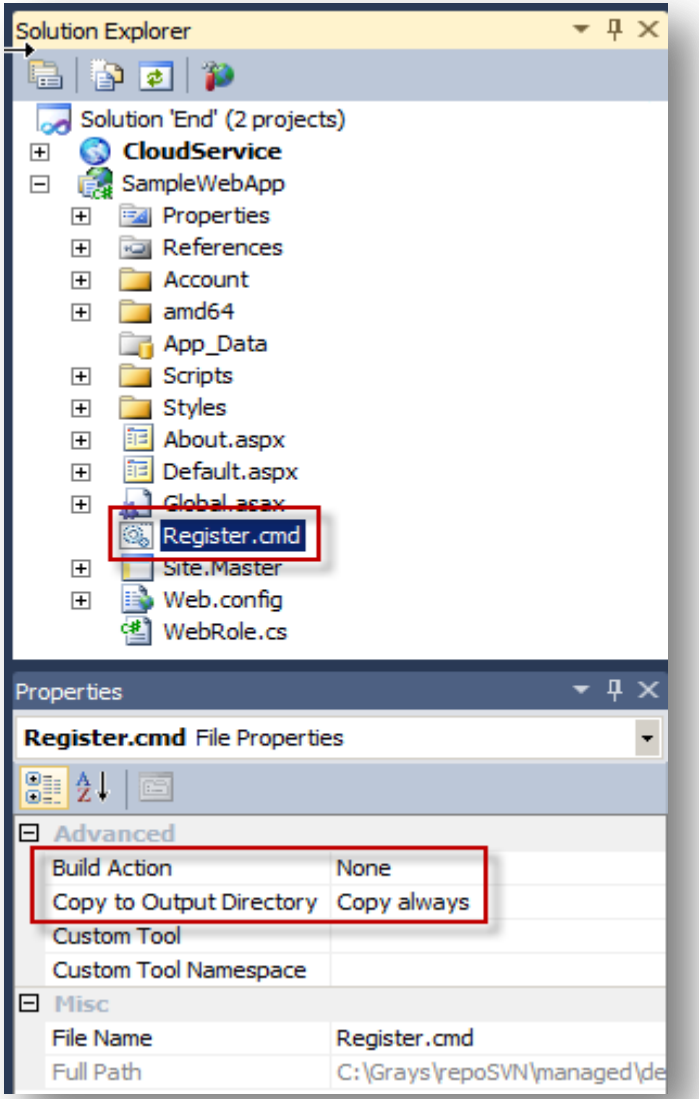
Assemblies

- `Copy Local = true` for additional referenced Assemblies
- How to deploy other files: see [Adding Files to your Windows Azure Service Package]



Startup Scripts

```
<ServiceDefinition [...]>
  <WebRole name="SampleWebApp">
    <Startup>
      <Task commandLine="Register.cmd"
            executionContext="elevated"
            taskType="simple" />
    </Startup>
  </WebRole>
</ServiceDefinition>
```



ServiceDefinition.csdef

```
<Startup>
  <Task commandLine="DACFramework\install_dac.cmd" executionContext="elevated" taskType="simple" />
</Startup>
```

Install_dac.cmd

```
REM Cleanup old log files (just in case)
erase DACFramework\install*.txt
erase DACFramework\install_SQLSysClrTypes.txt > DACFramework\install_log.txt

REM Install DAC components using MSIEXEC
msiexec /i DACFramework\SQLSysClrTypes.msi /qn /l* DACFramework\install_SQLSysClrTypes.txt
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\SharedManagementObjects.msi /qn /l* DACFramework\install_SharedManagementObjects.txt
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\DACFramework.msi /qn /l* DACFramework\install_DACFramework.txt
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\SqlDom.msi /qn /l* DACFramework\install_SqlDom.txt
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\TSqlLanguageService.msi /qn /l* DACFramework\install_TSqlLanguageService.txt
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\SqlCmdLnUtils.msi /qn /l* DACFramework\install_SqlCmdLnUtils.txt
if ERRORLEVEL 1 goto InstallError

REM Success
echo INSTALLATION SUCCESSFULLY COMPLETED >> DACFramework\install_log.txt
goto EndOfScript

:InstallError
REM Handle installation error
echo INSTALLATION ERROR (ERRORLEVEL=%ERRORLEVEL%) >> DACFramework\install_log.txt
goto :EndOfScript

:EndOfScript
```

ServiceDefinition.csdef

```
<Startup>
  <Task commandLine="DACFramework\install_dac.cmd" executionContext="elevated" taskType="simple" />
</Startup>
```

Install_dac.cmd

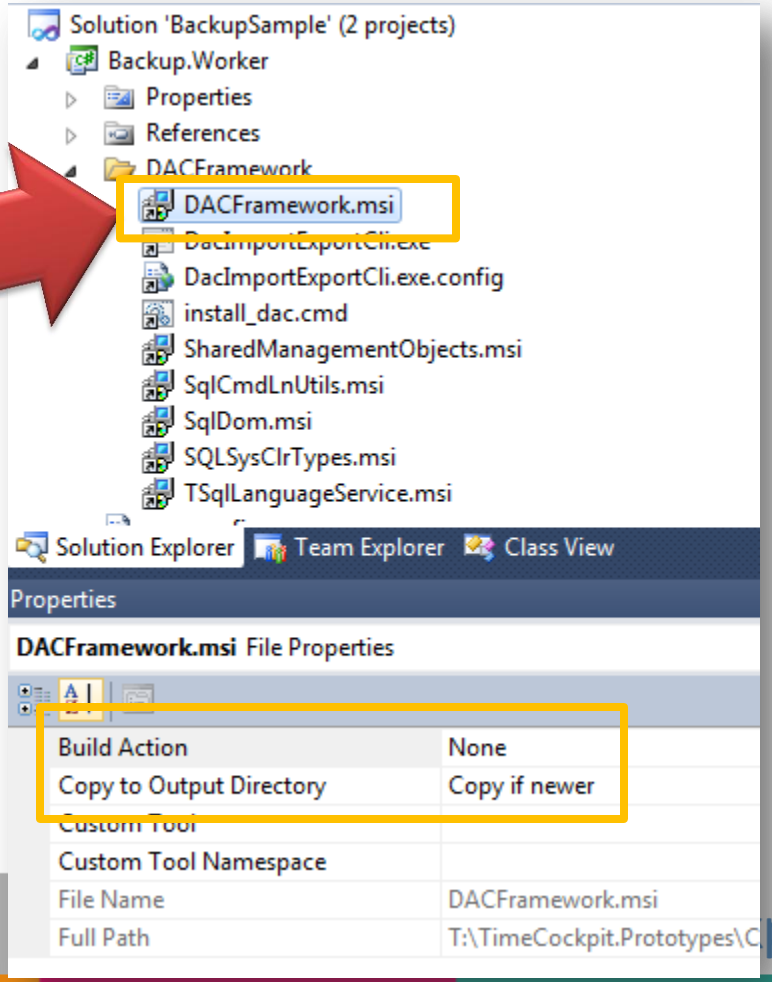
```
REM Cleanup old log files (just in case)
erase DACFramework\install*.txt
erase DACFramework\install_SQLSysClrTypes.txt > DACFramewor

REM Install DAC components using MSIEXEC
msiexec /i DACFramework\SQLSysClrTypes.msi /qn /l* DACFrame
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\SharedManagementObje
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\DACFramework.msi /
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\SqlDom.msi /qn /l* DACFramework\ins
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\TSqlLanguageService.msi /qn /l* DAC
if ERRORLEVEL 1 goto InstallError
msiexec /i DACFramework\SqlCmdLnUtils.msi /qn /l* DACFramew
if ERRORLEVEL 1 goto InstallError

REM Success
echo INSTALLATION SUCCESSFULLY COMPLETED >> DACFramework\in
goto EndOfScript

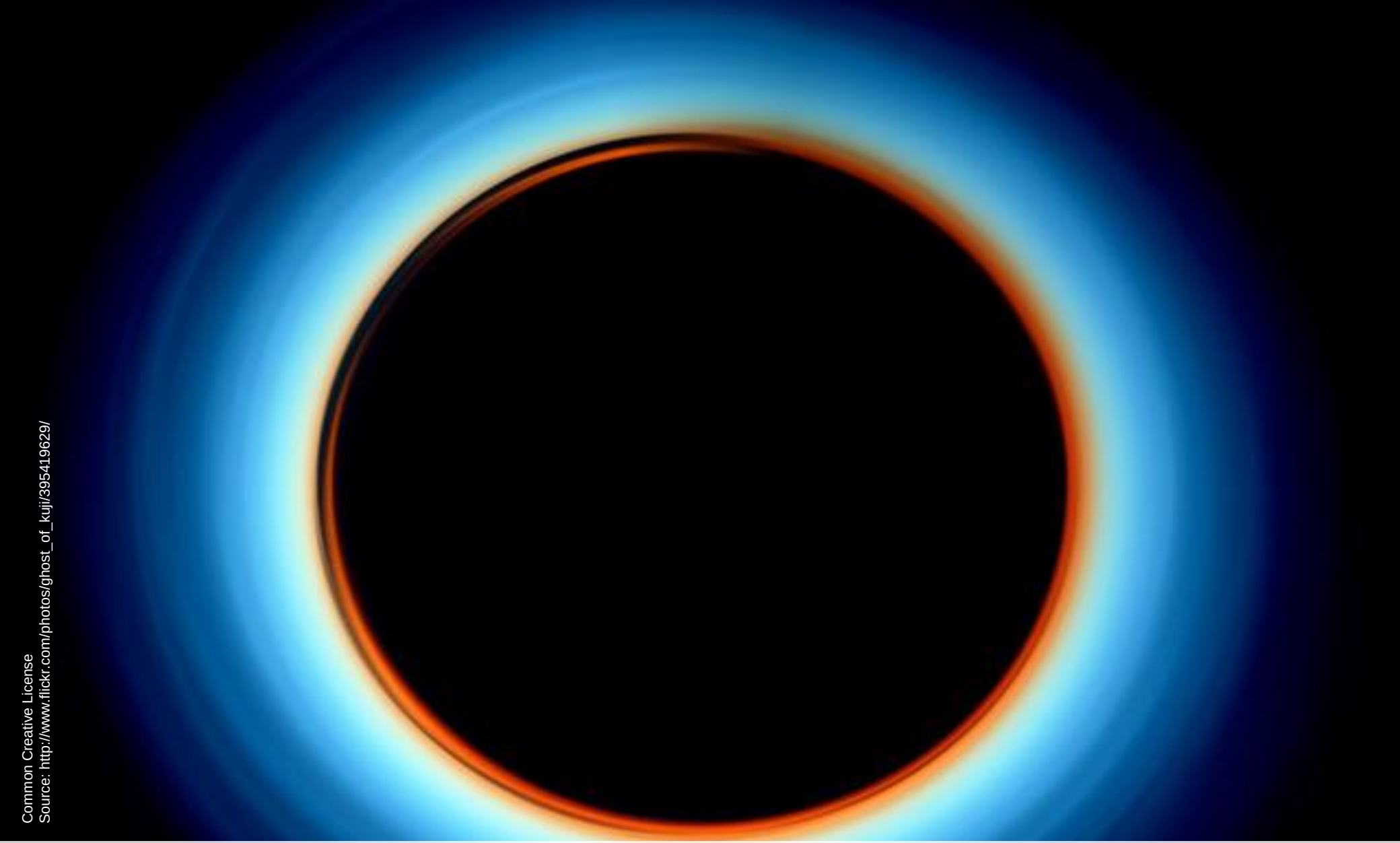
:InstallError
REM Handle installation error
echo INSTALLATION ERROR (ERRORLEVEL=%ERRORLEVEL%) >> DACFra
goto :EndOfScript

:EndOfScript
```



Automation

Startup tasks, deployment, build, etc.



Azure is a black hole –
you cannot check what‘s going on inside!

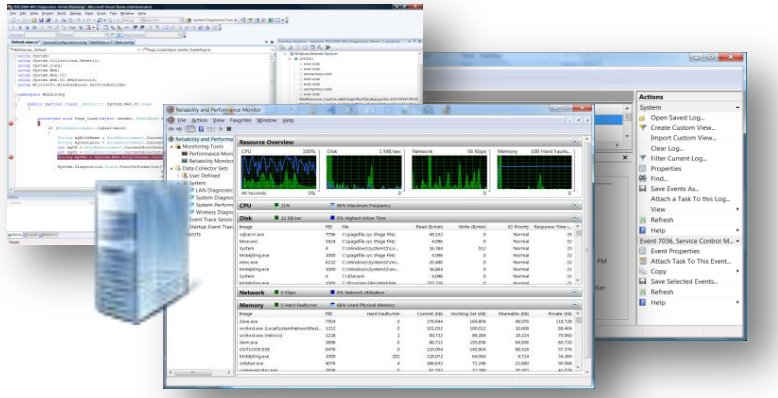
Monitoring On-Premise vs. Cloud

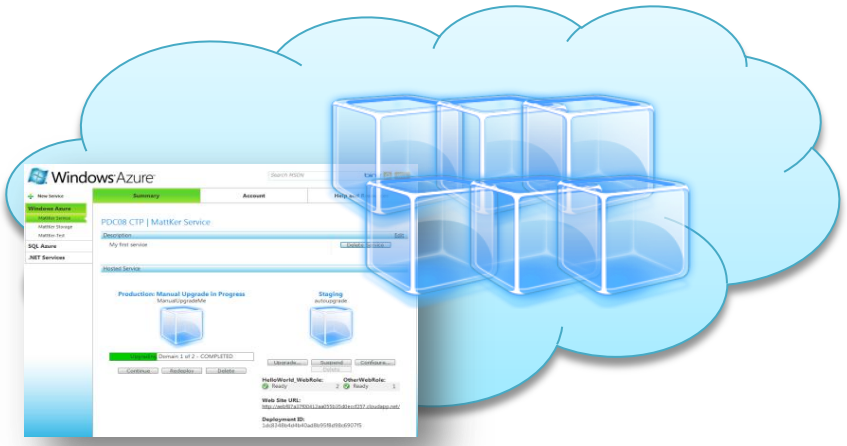
On-Premise

- Static environment
- Well known
- Small number of servers

Cloud

- Dynamic environment
- Many instances, elastic
- Many nodes

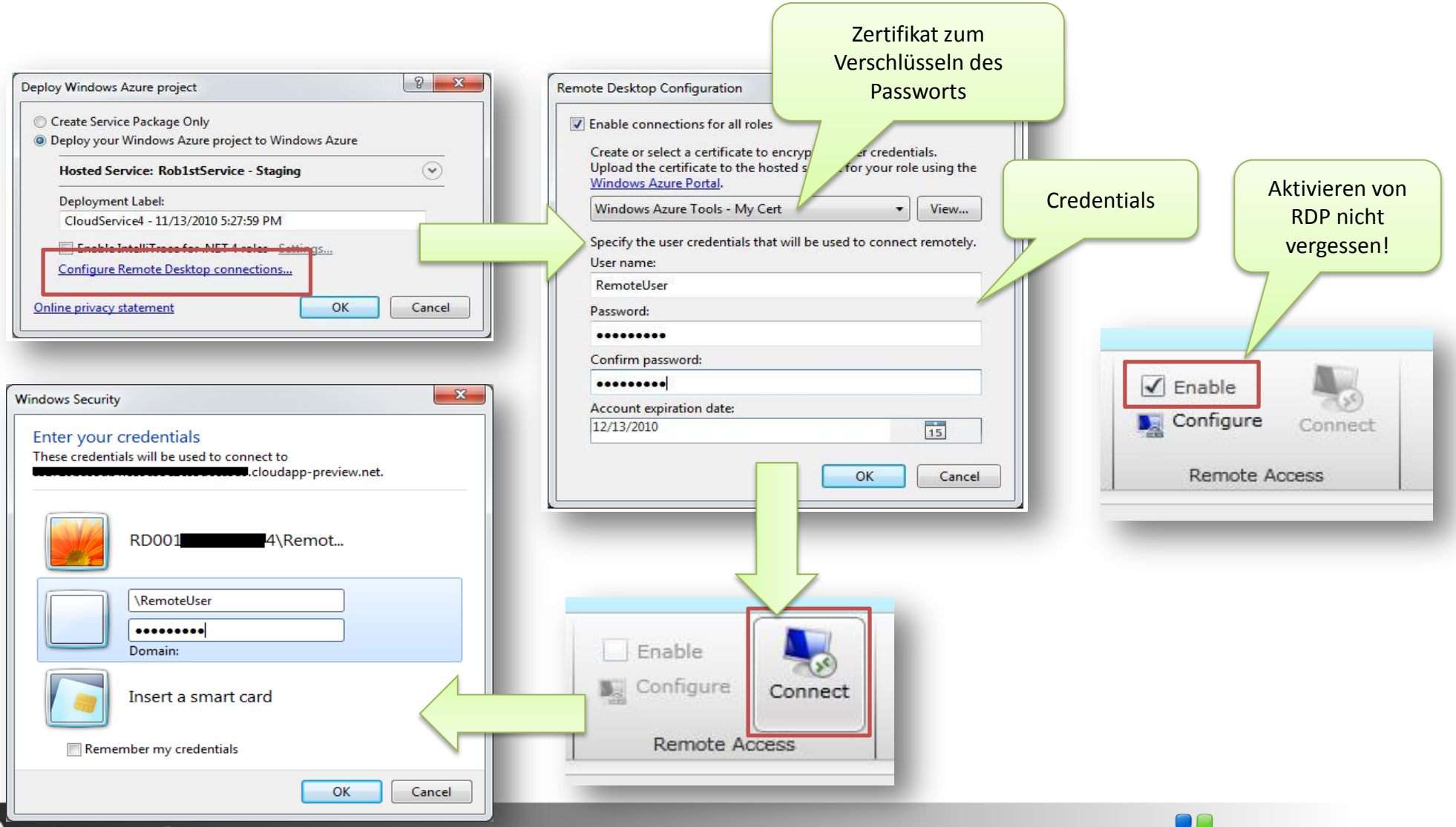




RDP vs. Diagnostics

- Remote Access with RDP
  - During development
  - Troubleshooting in specific situations
- Diagnostics
  - Continuous monitoring
  - Long term statistics („Telemetry”)
  - Monitoring of the whole system instead of a single instance

Remote Connection (RDP)



Azure Diagnostics

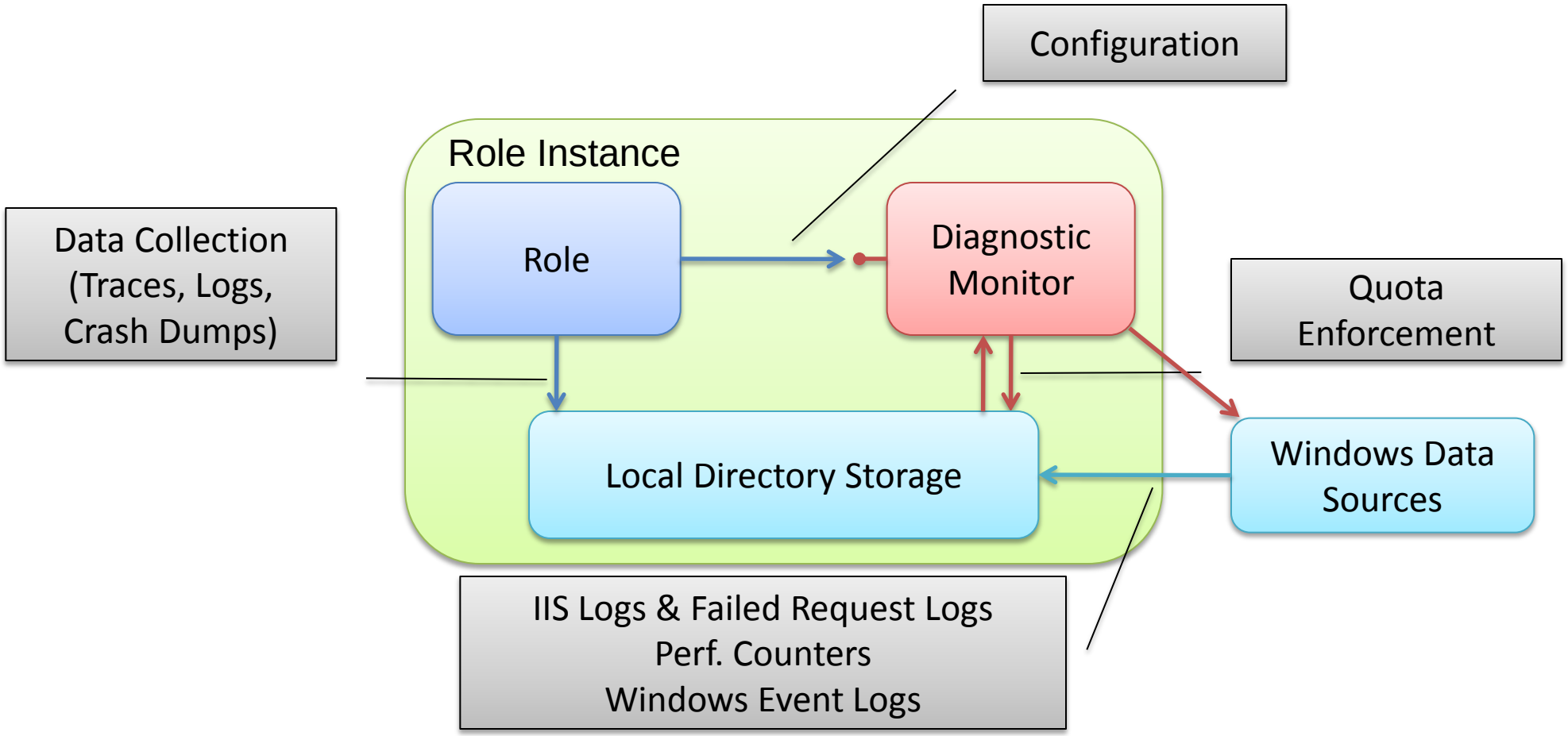


Image Source: Microsoft PDC 09, Session SVC15, Matthew Kerner

Azure Diagnostics

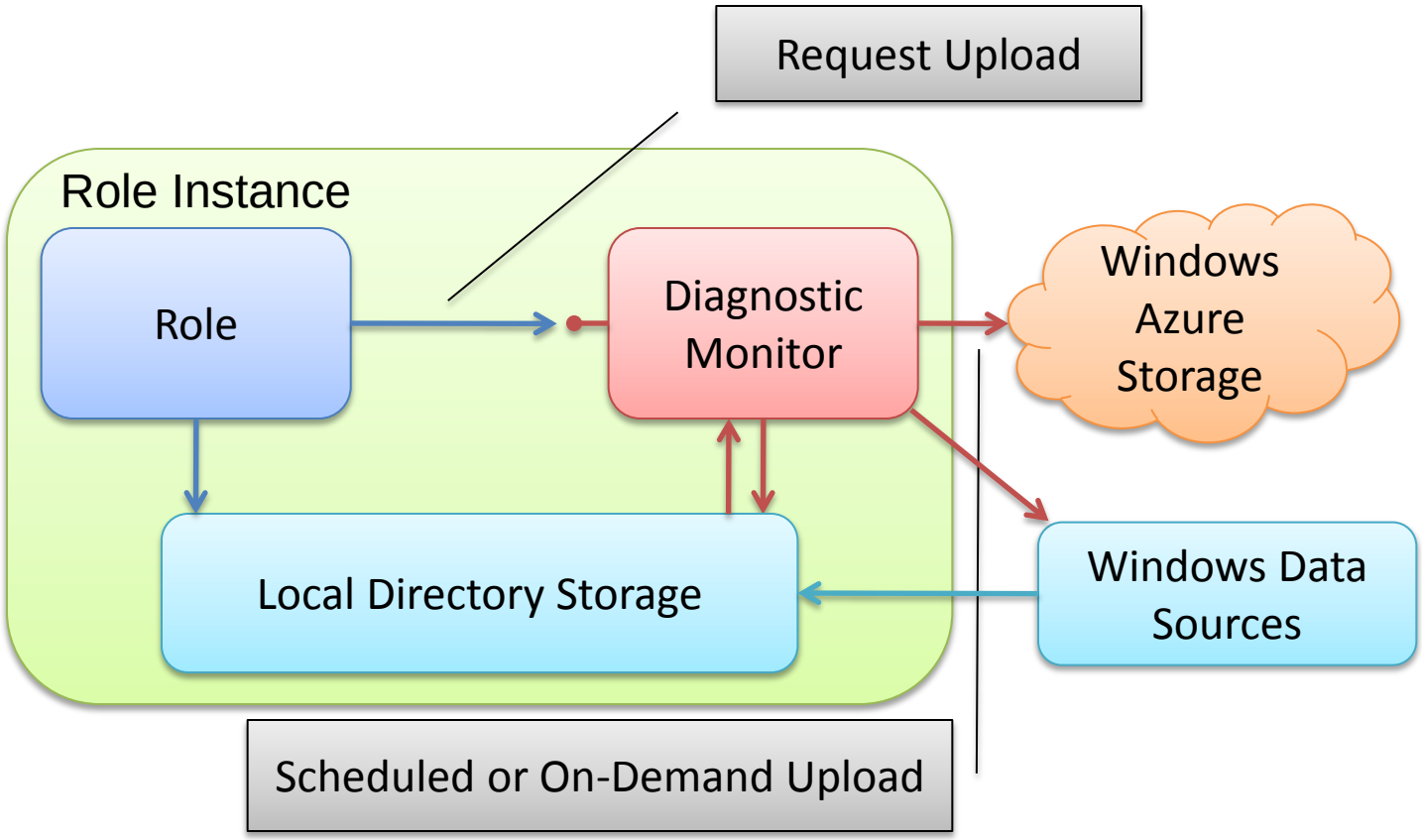
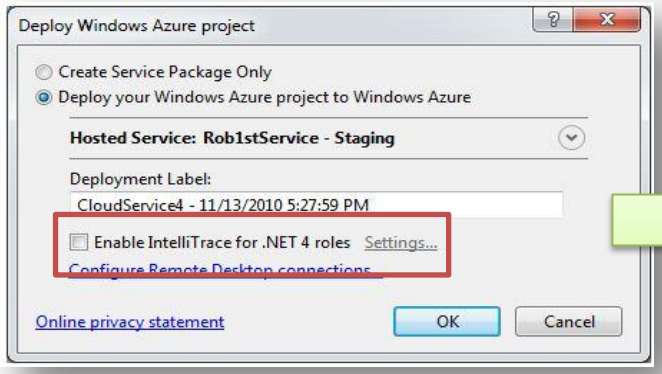
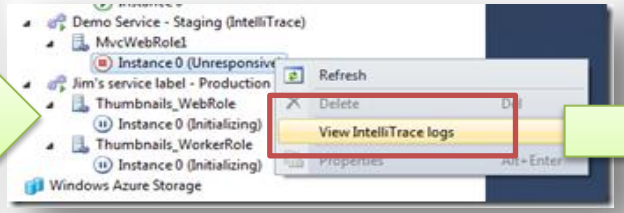


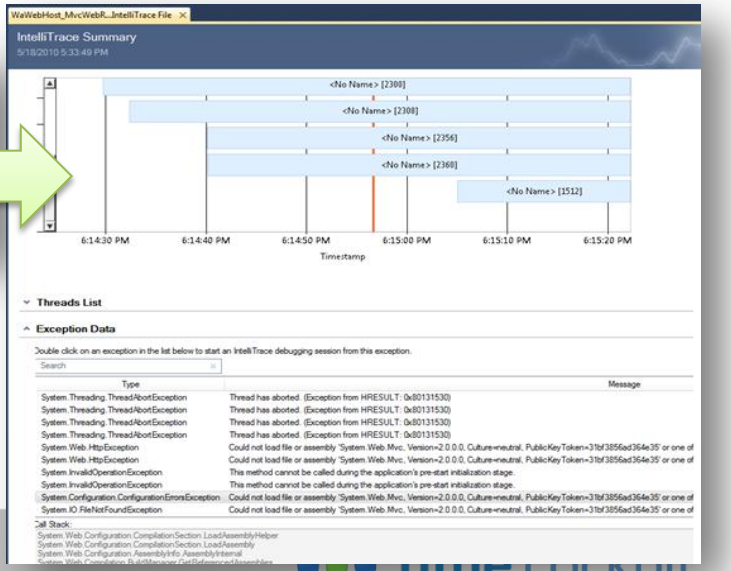
Image Source: Microsoft PDC 09, Session SVC15, Matthew Kerner

IntelliTrace in Azure

- Logging for specific events (e.g. exceptions) that happened in Azure
- You can open logs in VS (ex-post analysis)
- IntelliTrace-data is stored in Windows Azure Storage







Mission Impossible?

```
<?xml version="1.0" encoding="UTF-8" ?>
- <osm version="0.6" generator="pbf2osm">
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    <node id="172541" lat="52.5655270" lon="13.3362226" version="2" changeset="728814" user="bahnpirat" uid="13203" timestamp="2009-03-03T14:1
    <node id="172542" lat="52.5660003" lon="13.3375554" version="3" changeset="728814" user="bahnpirat" uid="13203" timestamp="2009-03-03T14:1
    <node id="172543" lat="52.5663124" lon="13.3394369" version="4" changeset="3410834" user="toaster" uid="10549" timestamp="2009-12-20T01:32
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  - <node id="172545" lat="52.5670070" lon="13.3466339" version="5" changeset="5701736" user="Woschl" uid="121042" timestamp="2010-09-06T19:3
      <tag k="highway" v="traffic_signals" />
    </node>
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      <nd ref="172540" />
      <nd ref="172541" />
      <nd ref="172542" />
      <tag k="access" v="permissive" />
      <tag k="highway" v="residential" />
      <tag k="maxspeed" v="5" />
      <tag k="name" v="Wolkenburgweg" />
      <tag k="postal_code" v="14169" />
    </way>
  - <way id="30770008" version="3" changeset="2121805" uid="6669" user="Elwood"
      <nd ref="172542" />
      <nd ref="172543" />
      <tag k="access" v="permissive" />
      <tag k="highway" v="residential" />
      <tag k="maxspeed" v="5" />
      <tag k="name" v="Lohrbergweg" />
      <tag k="postal_code" v="14169" />
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  - <way id="30770010" version="1" changeset="99086" uid="72235" user="Basstoelpel" timestamp
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      <tag k="highway" v="footway" />
    </way>
  </osm>
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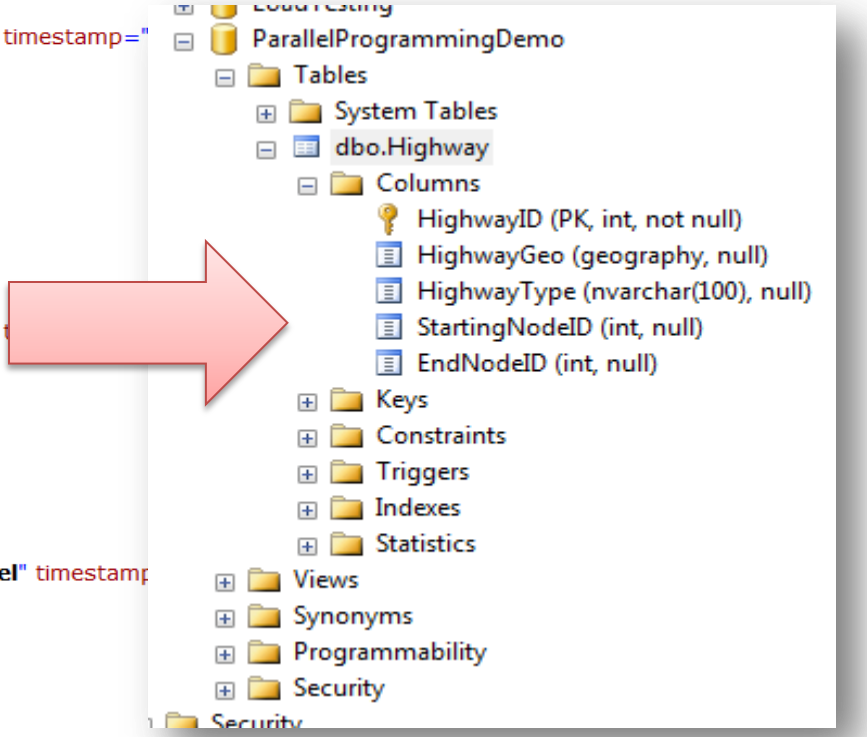

demo

RDP into Worker-Role

Import OpenStreetMap in SQL Azure

Summary

On-prem server is dead!

- Elastic
- Can do (nearly) everything that your on-prem server can
- High availability
- No or at least less maintenance cost

Long live on-prem server!

- You need something that the platform cannot provide
- Laws
- Existing investments


NRW Conf
Moving the IT Community


time cockpit