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# ITS

ICT Services and System Development (ITS)

Using Microsoft Azure in a hybrid cloud scenario

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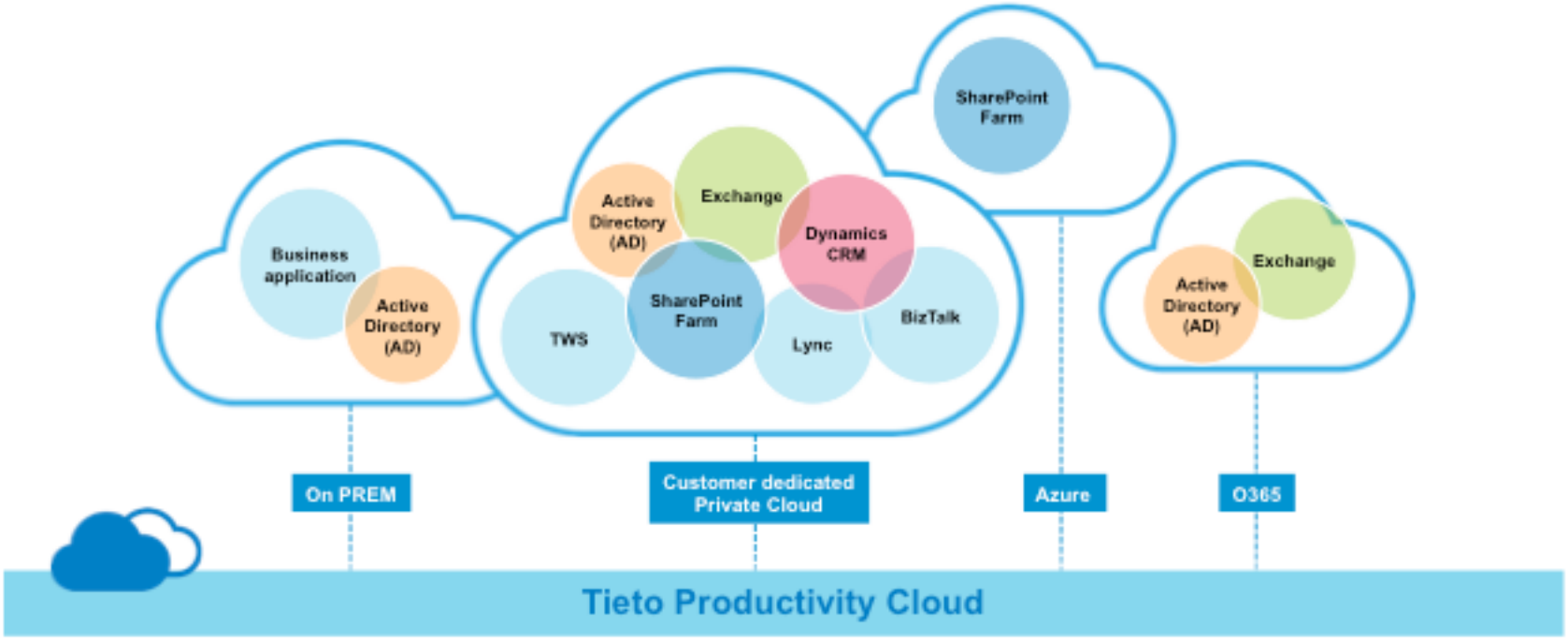
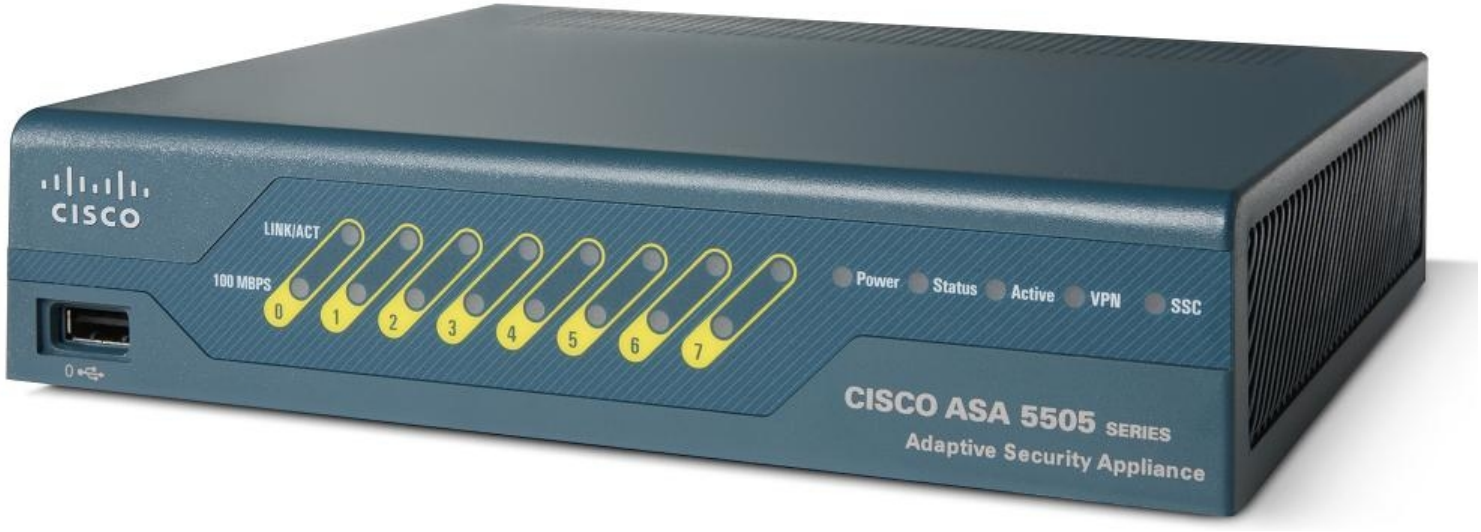
# What’s a hybrid cloud scenario?



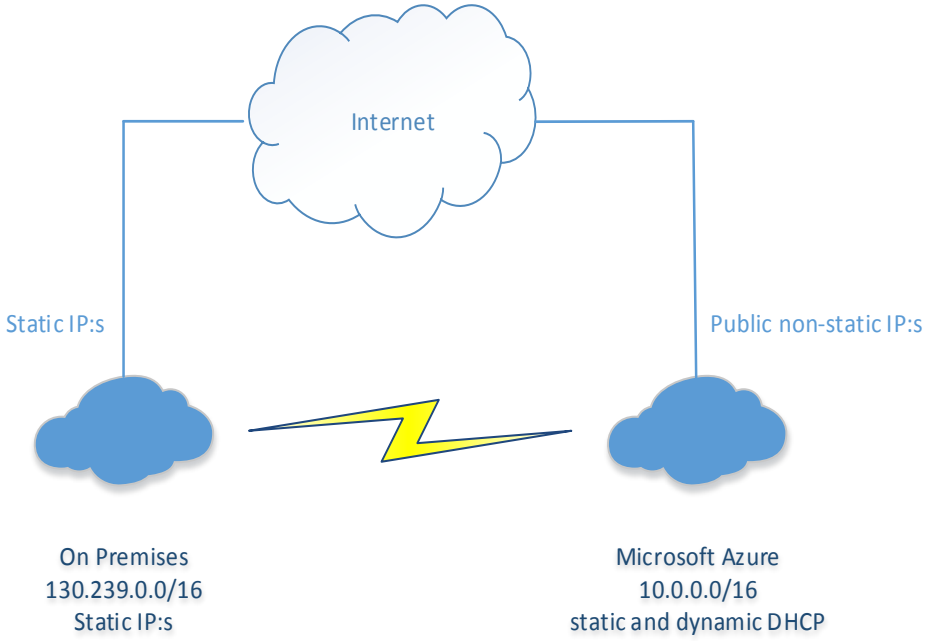
# Where to start?

- Setup a virtual network in Azure
- < €300
- 100 Mbit/s



# Routing

- Decide how to setup your routing.
- Make sure that your services connects to services within the same site to avoid costs for outgoing network traffic.
- Consider to replicate data to Azure for services hosted in Azure



# DNS

- We use Unix Bind for forward and reverse lookup & Microsoft Dynamic DNS for Active Directory for our on premises network.
- Azure can use both static and dynamic DHCP for all internal resources, but you don’t get a hostname to work with.
- However, if your resource is joined to your Active Directory domain, you get Dynamic DNS for that resource.
- At the same time, Azure Endpoints are non-static internet facing IP:s that can change over time. However, the hostname remains the same.
- DNS will play a keyrole for your Azure deployment.

# High availability and disaster recovery

- With two (or more) virtual machines you get 99.95% SLA.
- To get better performance and avoid traffic costs, setup your core infrastructure and replicate data into Azure.
- If you don’t have use for your core infrastructure in the cloud yet, you might consider it as a disaster recovery solution.
- Two domaincontrollers with one VPN-connection and network traffic will cost you around €150 per month.

# Get to know your application

- CPU, memory and I/O.
- Storage.
- Network traffic.
- How does it handle sessions if you want to scale out.
- Other applicationspecific behaviours.

# Price comparison

- For IaaS there’s a little difference between our on premises hosting and Azure prices. In our price comparison we found out that it’s a matter of 5-10€ per server and month running 24x7.
- How did we compare?

| | **On premises** | **Azure** |
|---|---|---|
| Shared CPU | - | 768 MB RAM |
| 1 CPU | (1 GB RAM) | (1.75 GB RAM) |
| 2 CPU | (4 GB RAM) | (3.5 GB RAM) |
| Customer may change size at any time | No | Yes |
| Storage (GB) | -/20/100 | 127 + 20/70/135 |
| IOPS | Not specified | 500 |
| Start-up costs | €230, License not included | TBD. License included (Windows) |
| Network traffic (in/out) | 0 | €0/0,09 / GB |
| Network speed | Shared capacity | 5/100/200 Mbit/s |
| Type of storage | Replicated SAN | 3xStorage |
| Time to delivery | 3 days | TBD |
| Loadbalancing | No | Yes |
| Autoscaling | No | Yes |
| Availability sets | Manually | Yes |
| Pay for offline VM:s | Yes | No |

# Price comparison – network traffic

| | |
|---|---|
| 0-10 TB | €450 |
| 10-50 TB | €2.800 |
| 50-150 TB | €6.000 |
| 150-500 TB | €14.000 |
| 500- (Microsoft says ”contact us”) | |

- The main difference in costs is network traffic.
- There is a number of Swedish universities that’s implementing Microsoft Azure at this point. Maybe we will see a cooperation in connecting the Swedish university network to Microsoft datacenters.

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# Servers for test and development

- We have around 300 servers for test and development.
- Almost all of them are being used during office hours (08.00-17.00.) Most of these servers could be offline 73% of the time!
- The network traffic usage to these servers is really low which makes them good candidates to be placed in the cloud.

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# Possible savings

| Number of servers | Yearly savings (Linux) | Yearly savings (Windows) |
|---|---|---|
| 40 | €18571 | €29434 |
| 80 | €37142 | €58867 |
| 120 | €55714 | €88301 |
| 160 | €74285 | €117734 |
| 200 | €92856 | €147168 |
| 240 | €111427 | €176602 |
| 280 | €129998 | €206035 |
| 320 | €148570 | €235469 |

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# To accomplish ”pay as you go”

- It is possible to set a schedule for each service in Azure when it should be available.
- If someone needs access to a system outside of the scheduled time, users can get access to manage services in Azure through a webportal.
- Access is provided through the Swedish identity federation account (SWAMID) which involves higher education institutions and government agencies in Sweden.
- If one needs more (or less) capacity, the virtual machine size could be changed by the user.

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# Screenshot from webportal

| Service name | Name | Status | |
|---|---|---|---|
| dc2visorlocal | dc2 | Updating... | Edit |
| umu-igwww01 | umu-igwww01 | Updating... | Edit |
| umu-kardiasql01 | umu-kardiasql01 | Updating... | Edit |
| driblo | driblo | Updating... | Edit |
| kardia-lb-sd-stage | umu-kardiasd01 | Updating... | Edit |
| kardiabiztalkt | kardiabiztalkt | Updating... | Edit |
| its-azureportal | its-azureportal | Updating... | Edit |
| umu-igdb01 | umu-igdb01 | Updating... | Edit |
| its-kardiabiztalkdev01 | Biztalk-utv | Updating... | Edit |
| its-azuresoft | its-azuresoft | Updating... | Edit |
| umu-kardiabiz01 | umu-kardiabiz01 | Updating... | Edit |
| ansmagtest | ACTestserver | Updating... | Edit |
| its-azuredpm01 | its-azuredpm01 | Updating... | Edit |
| umu-ad11 | umu-ad11 | Updating... | Edit |
| kardia-lb-int-stage | umu-kardiaint01 | Updating... | Edit |
| kardiabiztalkt | kardiabiztalky | Updating... | Edit |
| kardia-lb-int-stage | umu-kardiaint02 | Updating... | Edit |
| its-l3-sdplus | its-l3-sdplus | Updating... | Edit |

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# Summary & questions