Elite Partner Cloud Enablement

Microsoft Azure : March 2nd, 2017

Microsoft

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Program goals

- Program for Microsoft partners in (or considering) the Managed Service Provider Space (MSP) through Azure CSP.
- Accelerate the sale process and ensure the quality of the implementation
- Complementary to existing Microsoft Partner and Virtual Academy content
- Content based on experience from large and complex Microsoft Azure sales and implementations (€100k+ annual)

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About Westcoast CSP

- We have a dedicated cloud team of 25 people working between Ireland and the UK
- Westcoast employee over 1000 people across Europe.
- Our CSP market place platform allows our partners to self provision all Microsoft CSP products within minutes.
- We are presently running an Azure pilot support scheme for new Azure opportunities.
- We are also providing financial support on a opportunity by opportunity basis for both Azure and office 365 on CSP only.

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About Gavin

- Freelance IT Consultant
- 8 years in Microsoft Ireland - Datacentre SSP.
- Pluralsight author:
  - Designing a Hybrid Cloud in Azure
  - Creating a DMZ in Azure
  - Coming soon : Auditing Your Azure Assets for Security and Best Practices

Gavin McShera

@gavinmcshera www.mcshera.com
https://www.pluralsight.com/authors/gavin-mcshera

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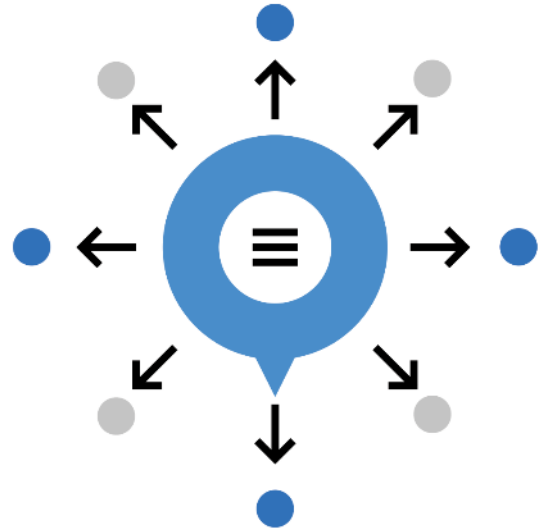
Course Content

Part One (March 2nd)	• Pre-sales information • Compete information • Common Objections	• High level design • Getting the pricing right • Playing to Azures strength
Part Two (March 15th)	• Creating a typical MSP environment • Network, Storage, Compute, Network Security etc	• Advanced performance considerations • Workload Considerations e.g. SQL
Part Three (March 29th)	• Backup and Recovery Options in Azure	• Hybrid Cloud connectivity options • Migrating workloads to Azure



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What do you want from this course?

Digital Transformation

A quick discussion

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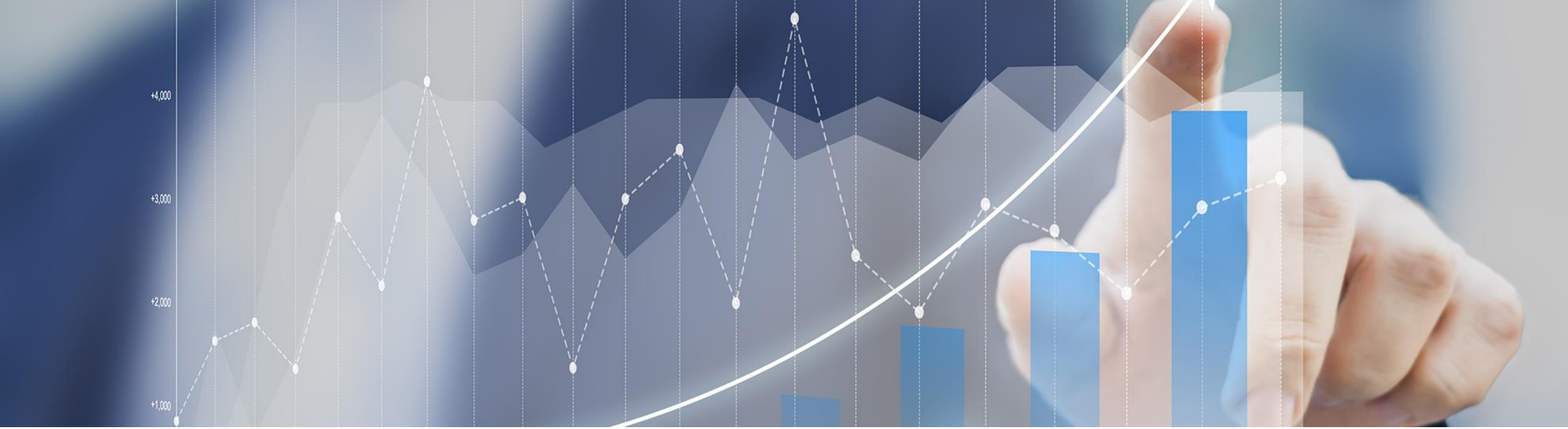
“Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.”

- Gartner IT Glossary

Moving to “the cloud” is not digital transformation. Hosting infrastructure in Azure will not make your customers digitally transformed…

… but infrastructure is the backbone of business operations. It has to be capable of supporting the changes to business models.



Cloud opportunity

Yeah, we know this already … but does your customer understand?

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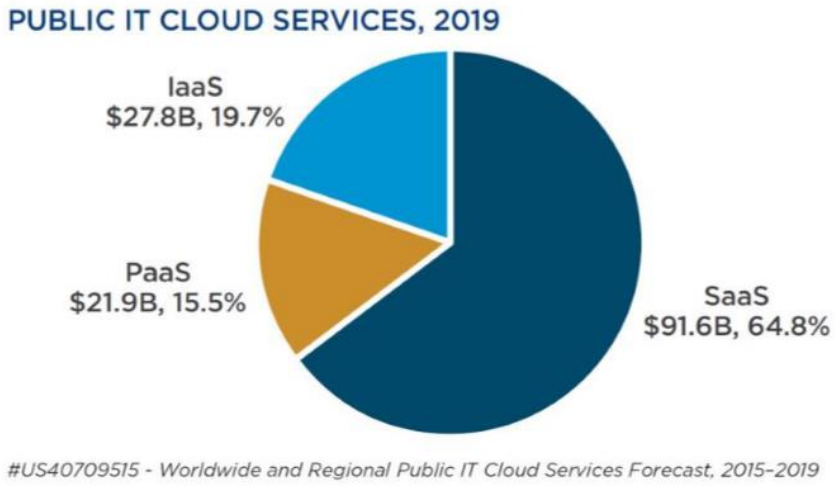
Market opportunity

IDC forecasts that worldwide public IT cloud services revenue (i.e. SaaS, PaaS, and IaaS) will reach $141.2B USD by 2019, a 19.4% compounded annual growth rate (CAGR): almost six times the rate of overall IT spending growth! SaaS still makes up the majority of spending, though PaaS and IaaS are expected to grow at almost twice the rate of SaaS over the next five years.

-Source: The Booming Cloud Opportunity eBook - IDC



IaaS delivers maximum compatibility for your customers. If your customers are using commercially available software, then IaaS is the only model that will work (for now).

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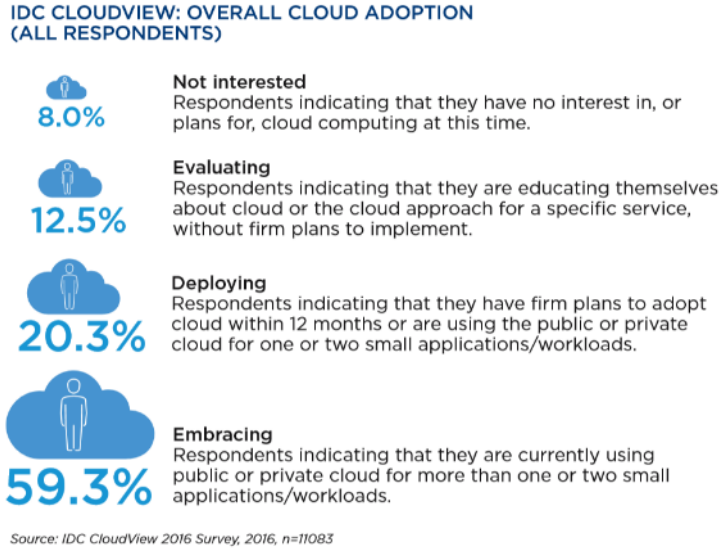
Market opportunity

"This predicted growth in the market signals that the technology/sector has matured. That the barriers to entry and the big concerns have been understood or/and addressed. Cloud hosting/computing is a mainstream solution/technology."

Im still not 100% convinced that all barriers have been removed ☺



Be proactive when positioning your solution to customers. Identify and address the common concerns and/or risks. Don't wait for the customer to ask.

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Pre-sales and compete

Lead with the answers to the common questions and concerns

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Concerns and blockers – Industry Level

Some of the most common concerns that we have encountered:

Location:	What part of the world will my data/services be? Can it go anywhere else?
Access:	Who has access to my data? Can other parties (government, law enforcement etc) have access without my knowledge?
Lock-in:	How easy is it for me to move to another platform/hosting solution?
Audit:	How can we keep track of who did what and when and where and why? Keeping track of things in the software defined datacentres. Can I conduct my own penetration testing?

Are you able to answer all of these questions?

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Location(s)

- In general, the data replication policies stay within geographic regions. This is critical for compliance. Particularly for international data protection laws regarding transfers of customer data across borders. The rules are known as **EU Model Clauses.** https://www.microsoft.com/en-us/trustcenter/privacy/where-your-data-is-located
- If you enable replication in an Azure Datacentre be sure you understand where the data is replicating. E.g. Dublin to Amsterdam. https://docs.microsoft.com/en-us/azure/best-practices-availability-paired-regions
- BREXIT will make things interesting for customers operating in Ireland and UK. GDPR regulations (due 2018) will mean that data moving between Ireland and the UK is considered an international transfer.
- Microsoft are compliant with all of the standards. Their compliance does not extend to you and/or your customers.

Access to Data

- When considering access to data you have to account for the following:
  - Microsoft Access
  - Third Party Access on behalf of Microsoft
  - External party i.e. Government and/or Law Enforcement
  - Your own team access
- Recommend you refer to all of the main points in any contract you have with customers. Reference the Microsoft documents directly to allow you to pass on the terms and conditions. https://www.microsoft.com/en-us/trustcenter/Privacy/Who-can-access-your-data-and-on-what-terms
- Important to also consider Service Termination. "What happens if/when I leave?" https://www.microsoft.com/en-us/trustcenter/privacy/you-own-your-data#leave

Vendor Lock in

- This is a tough one. We all want "sticky" customers and recurring revenue. However, it is important that your customers know that subscription/rental/cloud/outsource does not mean lock-in
- The Azure subscription and/or CSP is transferrable by Microsoft between CSP Partners.
- Technology wise it is possible to transfer from Azure to AWS/Google/IBM and on-premise. Infrastructure as a Service (IaaS) does not really lock customers to a provider. Containerisation (eventually) will make it easier and faster to move.
- PaaS is VERY vendor/platform specific. PaaS = Vendor Lock in.

Audit

- This term can also mean compliance from client perspective. There is a very large list of externally validated authorities.

  https://www.microsoft.com/en-us/trustcenter/compliance/complianceofferings

- You can get the audit reports here :

  https://www.microsoft.com/en-us/trustcenter/guidance/risk-assessment#Audit-reports

- Penetration testing requires notification and consent.

  https://security-forms.azure.com/penetration-testing/terms

Summary Links

1. Location(s)

   "Customer data may be replicated within a selected geographic area for enhanced data durability in case of a major datacentre disaster, and in some cases, will not be replicated outside it." - https://www.microsoft.com/en-us/trustcenter/privacy/where-your-data-is-located

2. Security, privacy and transparency

   https://www.microsoft.com/en-us/TrustCenter/Security/default.aspx

   https://www.microsoft.com/en-us/trustcenter/Privacy/Who-can-access-your-data-and-on-what-terms

   https://security-forms.azure.com/penetration-testing/terms

3. Compliance and Certification (third party)

https://azure.microsoft.com/en-us/support/trust-center/

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Microsoft Azure Locations (February 2017)

(Useful slide to have for your proposals)

Concerns and blockers – Partner level

Some of the most common concerns that we have encountered:

Roles and duties:	Segregation of duties and who does what? E.g. Who will secure the environment?
Backup and Recovery:	Who will backup and recover my data? How does this work?
Co-location:	Do we need co-location services? If not, why?
Validation:	What certification do you have? Can you prove you can manage my environment and data responsibly?

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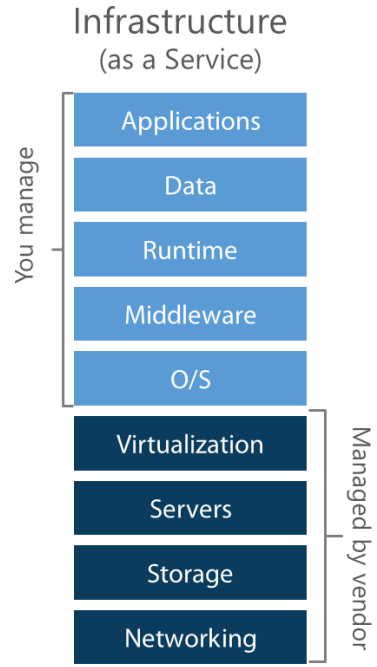
Roles and Duties

- Confusion between what Microsoft will do and what you, the partner/provider, will look after is common. Be clear from the start.
- Remember that Microsoft will perform ongoing maintenance tasks. You will get some notification but cannot influence timing. Design accordingly.
- Recommend you review your current Managed Service terms and conditions. Important to update them for cloud services and remove irrelevant references e.g. server hardware, SAN etc.



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Backup and Recovery

- If you are going to manage the backup and recovery make sure your client is responsible for the verification and validation.
- Schedule and sign-off recovery process before going live.
- Have agreed test restores in your contracts. It might seem like a pain but its critical your customer validates the restore process.
- Strongly recommend that ALL Recovery Service Vaults are GEO-REPLICATED.
- Restore performance can be slow. Be very careful with Recovery Time Objective (RTO)

Validation

- If you are offering a managed service to your customer, what compliance standards do you adhere to?
- Recommend looking at: ISO/IEC 20000-1:2001 and potentially ISO/IEC 27001:2013 . 20000 is Service Management and 27001 is Information Security Management

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The big concern(s):

- How will the solution/platform be managed?
- How stable and reliable is the platform (Azure)?
- How secure is the overall solution?
- How do your people and Microsoft combine when delivering the service/solution?

Have you had to compete with another cloud platform/vendor before?

What were the common questions/concerns?

Azure Compete – General approach

- AWS and Google are the main competition.
- AWS has a big lead … don't be concerned about that.
- IBM and other traditional hosters also compete well.

"Azure is frequently chosen for strategic adoption by organizations with a strong commitment to Microsoft technologies." - Gartner

IaaS Magic Quadrant – August 2016
https://www.gartner.com/doc/reprints?id=1-2G2O5FC&ct=150519

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Azure Compete – General approach

- The connection between IaaS and PaaS is good.
- Bring in SaaS products from Microsoft and you have an enterprise level of integration.
- This integration also has a roadmap. When choosing platform its critical to have a clear view of future.
- If you are building applications, the combination of IaaS and PaaS is very compelling.

IaaS Magic Quadrant – August 2016

https://www.gartner.com/doc/reprints?id=1-2G2O5FC&ct=150519

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Azure Compete – Price comparison

- It is really difficult to compare Azure with other cloud providers
- Comparisons with AWS and Google are complex
- Comparisons with traditional hosting and/or hosted private cloud are also difficult
- Side-by-side detailed comparison leads to a price and tech war
- Actual pricing will always vary from publicly listed figures – vendors apply discount. AWS and Azure have reserved instance discounts. Googles discounts are automatic and based on sustained usage.

I don’t think cloud can EVER be “cheaper” than on-premise. Subscription models are completely different to CAPEX

Price/Performance ratios are very similar.

Detailed comparisons are possible. Azure and Google tend to be cheaper than AWS. It is very easy to skew the results in favour of one platform or the other.

Azure Pricing:

- If you are pricing up a solution avoid breaking down the costs into the smallest blocks. i.e. a full bill of materials (BOM).
- If you show the BOM your customers will be able to see your margin. Give the general specifications and capacity
- Price based on maximum’s and not on usage.

More on this later…

Azure Compete – AWS

- If you really have to go head to head with AWS
- Comparisons on each offering :
  - https://docs.microsoft.com/en-us/azure/guidance/guidance-azure-for-aws-professionals-service-map
- SQL server pricing is significantly cheaper in Azure than AWS. Big differences at SQL Enterprise level when SQL licensing bought through VM.
- Some of the CPU specs on AWS equivalents are slower that Azure … for now.
- AWS has reserved minimum disk performance. Azure does not.

Azure Compete – Google

- SSD on Google is fast but more expensive than Azure
- SQL is still in preview on GCP. SQL costs are additional to Windows cost. Calculated on a per hour. Cost comparisons are hard
  - Azure: DS12v2: 4 Core, 28GB – SQL Enterprise = $2.133 per hour
  - GCP: n1-highmem-4: 4 Core, 26GB – SQL Enterprise = $0.252 (compute) + ($0.399x4=$1.596 – SQL) = $1.848 per hour
- Googles pricing model is relatively simple compared to Azure and AWS.
- Google discounts are automatic based on usage.

The pricing war:

- Each vendor has a report showing that they are the cheapest
- Microsoft uses IDC, Google uses ESG, and AWS have two or three.
- It’s a messy game to get into … someone can (and will) pull some sort of discounting out of their hat

Service Level Agreements

Things that will cause you problems in a managed service

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Service Level Agreements

- With Azure and your managed services be VERY clear on the Service Level Agreements (SLA)
- You have to pass the Microsoft terms contractually through to your customers
- SLA's are financially backed. They do not offer loss of revenue return. Just a percentage of the charge for the service usage (called an SLA credit)
- Microsoft's service SLAs are very particular and they do change
- The sum of the services used to build the Azure environment will determine the SLA e.g. Compute, storage, network, etc.

Service Level Agreements

Virtual Machine SLA :

- 99.9% for single VM (but only with Premium Storage)
- 99.95% for 2 or more VMs in an Availability Group
- Cost is a balancing act here: e.g. a single Domain Controllers on Premium Storage or two Domain Controllers on Standard storage in an availability set.
- https://azure.microsoft.com/en-us/support/legal/sla/virtual-machines/v1_4/

Service Level Agreements

Storage SLA :

- 99.9% for (Read and Write) on Redundant Storage (LRS), Zone Redundant Storage (ZRS), and Geo Redundant Storage (GRS) Accounts.
- 99.99% for **READ** Access-Geo Redundant Storage (RA-GRS) on the READ if you retry in the secondary site. Its 99.9% on the **WRITE** to RA-GRS.
- No SLA on the time for the asynchronous write
- https://azure.microsoft.com/en-us/support/legal/sla/backup/v1_0/
- Backup (Recovery Service Vaults) have a 99.9% SLA for the availability of the service.

Service Level Agreements

Site Recovery SLA :

- "For each Protected Instance configured for On-Premises-to-On-Premises Failover, we guarantee at least 99.9% availability of the Site Recovery service.
- For each Protected Instance configured for On-Premises-to-Azure planned and unplanned Failover, we guarantee a four-hour Recovery Time Objective for unencrypted Protected Instances, and a six-hour Recovery Time Objective for encrypted Protected Instance, depending on the size of the Protected Instance."

-Quote from https://azure.microsoft.com/en-us/support/legal/sla/site-recovery/v1_0/

Service Level Agreements

Site Recovery SLA :

"Monthly Recovery Time Objective and Service Levels for On-Premises-to-Azure Failover

- "Recovery Time Objective (RTO)" means the period of time beginning when Customer initiates a Failover of a Protected Instance experiencing either a planned or unplanned outage for On-Premises-to-Azure replication to the time when the Protected Instance is running as a virtual machine in Microsoft Azure, excluding any time associated with manual action or the execution of Customer scripts.
- "Monthly Recovery Time Objective" for a specific Protected Instance configured for On-Premises-to-Azure replication in a given billing month is four hours for an unencrypted Protected Instance and six hours for an encrypted Protected Instance. One hour will be added to the monthly Recovery Time Objective for each additional 25GB over the initial 100GB Protected Instance size."

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Service Level Agreements:

- Realistically you can only position a 99.9% SLA
- 99.9% is far above what most can (really and consistently) achieve with traditional hosting
- This level of SLA has direct link to co-location … sometimes you might not need co-location
- Co-location comes into its own when you cannot achieve the RTO your customer needs e.g. large VM and dataset restore

Lunch Break

Next: High level designs and getting pricing right

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Designing Solutions in Azure

Pre-sales and proposal design

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What Challenges are you facing?

Challenges

- The skills required for Azure design (any cloud platform) require more in-depth knowledge of networking, storage and security. It's a software defined datacentre.
- Every mistake can have a direct impact on cost to you and your client. Build contingency into your pricing. More on this later.
- It is critical to have by-the-book supported configurations.
- Designing before building is the only way to ensure quality design that meets all support and technical requirements
- The Azure Documentation from Microsoft is not great. Its getting better. But there is a hell of lot to get through. https://docs.microsoft.com/en-us/azure/guidance/ ← Only time will tell how up-to-date this is kept.

  "***This content is in active development. It is useful today, so we are making it available for preview. We value your feedback" – Quote from Microsoft***

Azure designs get too complicated, with too many variables, to not plan everything out before building….

EXCEL will become your best friend:

Standard VMs						Standard Disks							
Servername	Description	VM Size	CPU	MEM	SQL VM	OS Storage GB	Data Storage GB	Data Disks	Storage Type	Cost Per Hour	Hours Per Mon	Compute Cost Per	Compute Cost Per Year
VPX #1	Netscaler Appliance (Linux)	Standard_A2	2	3.5	N	20			Standard	0.101	744	€75.14	€901.73
VPX #2	Netscaler Appliance (Linux)	Standard_A2	2	3.5	N	20			Standard	0.101	744	€75.14	€901.73
dc01	WS2012 R2 Domain Controller	Standard_A2_v2	2	3.5	N	127	100	1 x 100GB	Standard	0.110	744	€81.84	€982.08
dc02	WS2012 R2 Domain Controller	Standard_A2_v2	2	3.5	N	127	100	1 x 100GB	Standard	0.110	744	€81.84	€982.08
Broker#1	Citrix XenApp Delivery Controller	Standard_D2_v2	2	7	N	127			Standard	0.206	744	€153.26	€1,839.17
Broker#2	Citrix XenApp Delivery Controller	Standard_D2_v2	2	7	N	127			Standard	0.206	744	€153.26	€1,839.17
HotPin	HotPin Application Server	Standard_A1_V2	1	1.75	N	127			Standard	0.052	744	€38.69	€464.26
Syslog	Syslog	Standard_A1_V2	1	1.75	N	127			Standard	0.052	744	€38.69	€464.26
SFTP #1	SFTP inbound in DMZ	Standard_A1_V2	1	1.75	N	127			Standard	0.052	744	€38.69	€464.26
Manage #1	Management box	Standard_A2_v2	2	3.5	N	127			Standard	0.110	744	€81.84	€982.08
Monitor #1	Monitoring Gateway	Standard_A2M_V2	2	16	N	127			Standard	0.177	744	€131.69	€1,580.26
qualsys01	Qualsys Service	Standard_A1_v2	1	1.75	N	127			Standard	0.052	744	€38.69	€464.26
wsus01	Patch Management	Standard_A2_v2	2	3.5	N	127	1024	1 x 1024GB	Standard	0.110	744	€81.84	€982.08
Total			22			1437	1224					€1,070.62	€12,847.39

Premium VMs and Premium Storage						Premium SSD Disks with allocated VM (Maximums based on VM and Disk combination)							
Servername	Description	VM Size	CPU	MEM	SQL VM	OS Storage GB	Data Storage GB	Data Disks	Storage Type	Cost Per Hour	Hours Per Mon	Compute Cost Per	Compute Cost Per Year
sql01	SQL Node 1 - SQL Server 2014 Standard Edition	Standard_DS2_v2	2	7	Y	127	512	0 x P20 [2,300 IOPS/150MBps]	Premium	0.543	744	€403.99	€4,847.90
XenAppServer#1	Citrix XenApp Application Server	Standard_DS3_v2	4	14	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.412	744	€306.53	€3,678.34
XenAppServer#2	Citrix XenApp Application Server	Standard_DS3_v2	4	14	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.412	744	€306.53	€3,678.34
XenAppServer#3	Citrix XenApp Application Server	Standard_DS3_v2	4	14	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.412	744	€306.53	€3,678.34
XenAppServer#4	Citrix XenApp Application Server - Test/Dev	Standard_DS3_v2	4	14	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.412	744	€306.53	€3,678.34
App Server #1	App Server	Standard_DS2_v2	2	7	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.206	744	€153.26	€1,839.17
App Server #2	App Server	Standard_DS2_v2	2	7	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.206	744	€153.26	€1,839.17
App Server #3	App Server	Standard_DS2_v2	2	7	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.206	744	€153.26	€1,839.17
App Server #4	App Server	Standard_DS12_v2	4	28	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.490	744	€364.56	€4,374.72
fs01	WS2012R2 File Server	Standard_DS2_v2	2	7	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.490	744	€364.56	€4,374.72
fs02	WS2012R2 File Server	Standard_DS2_v2	2	7	N	127	512	1 x P20 [2,300 IOPS/150MBps]	Premium	0.490	744	€364.56	€4,374.72
Total			11			1397	5632					€3,183.58	€38,202.91

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Challenges

- The relationship between Compute and Storage
- The relationship between storage speeds (IOPS) and VM connectivity to storage (ThroughPut)
- Virtual Machine performance versus Cost
- The relationship between VM CPUs and the cost other software e.g. SQL
- Securing the perimeter in Azure
- Network Security Groups and Network design considerations
- Backup and Storage configuration – throughput to and from Vaults

We will cover the technical details in depth at the next course.
For now we need to understand …

Choosing the right compute, network, storage etc. in order to understand the costs ….

Staring the design process

Topics we will cover:

- Designing over a long period … challenges with rapidly changing environment
- Network design considerations. You have to get it right from the start
- Choosing the right Virtual Machine types
- SLAs, availability and the impact on design/cost
- Tracking costs as you design

Services, functionality and limitations are changing MONHTLY…

Long running designs - challenges

Some of this might seem basic but its worth considering/implementing:

- Make all designs time dependant based on an agreed cut-off date (do the same for pricing)
- Cross reference all requirements with service descriptions (example)
  - Data Encryption at rest – customer requirement
  - Storage Encryption Service (SES) was decided upon
  - Customer then wanted Managed Storage
  - Managed Storage does not support SES. You cannot enable it.
  - Then customer asked about Azure Disk Encryption (ADE) and Managed Storage. ADE on Managed Storage works but you cannot backup the VM (for now)

Tracking Costs

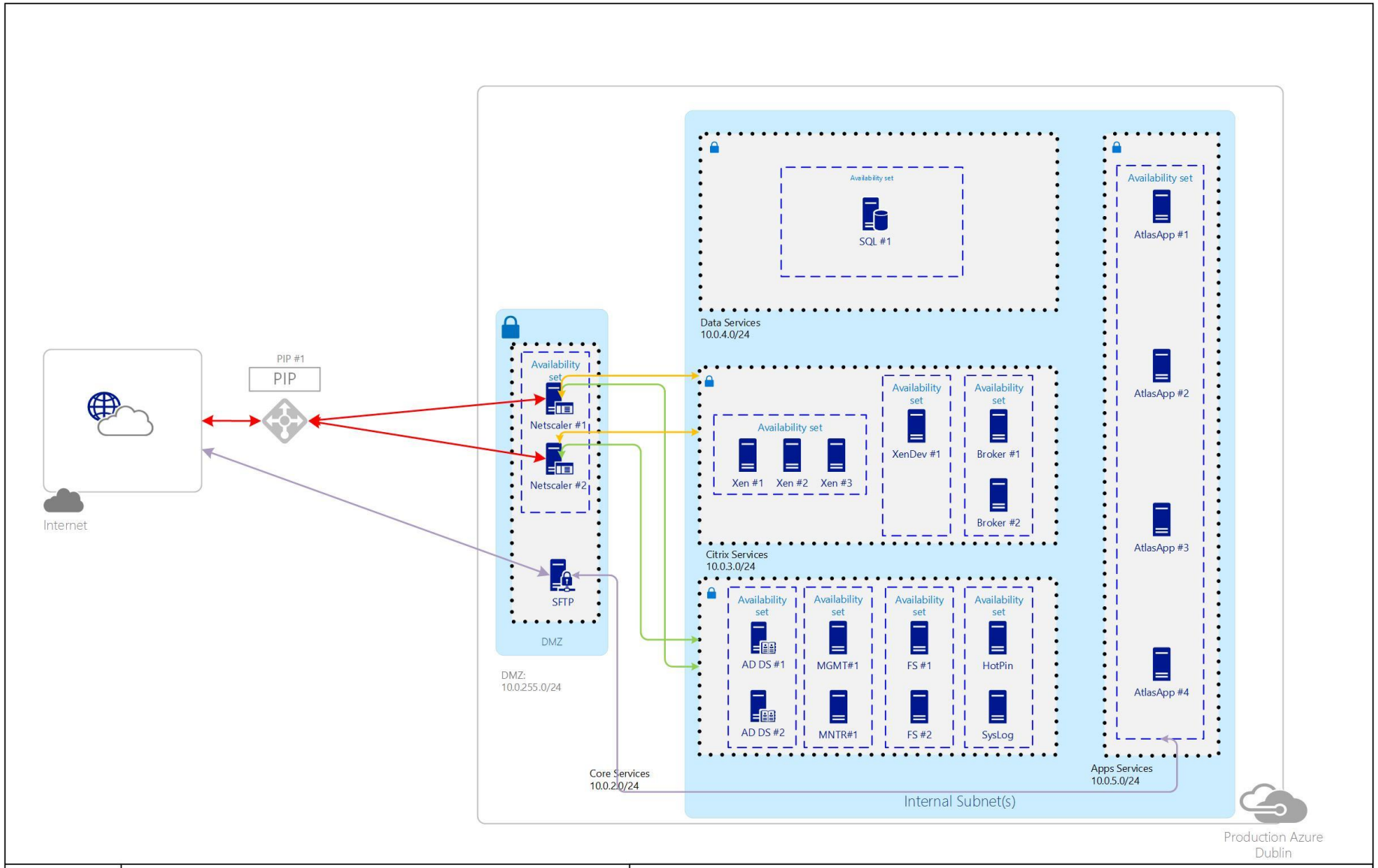
The major cost items include:

- Compute
- Storage
- Backup Data and Agent costs
- Outbound Network traffic

Minor cost items:

- Public IP's, Storage Transactions etc. ←Difficult to calculate and track

Lets walk through some high level designs …



Citrix XenApp Services
LDAP/RADIUS/MGMT
HTTPS
SFTP

Sample Citrix Azure Design – Single Microsoft Datacentre in North Europe (Dublin). Showing the main network and subnet. Overlay with Virtual Machines, Availability Sets and Network Security Groups.

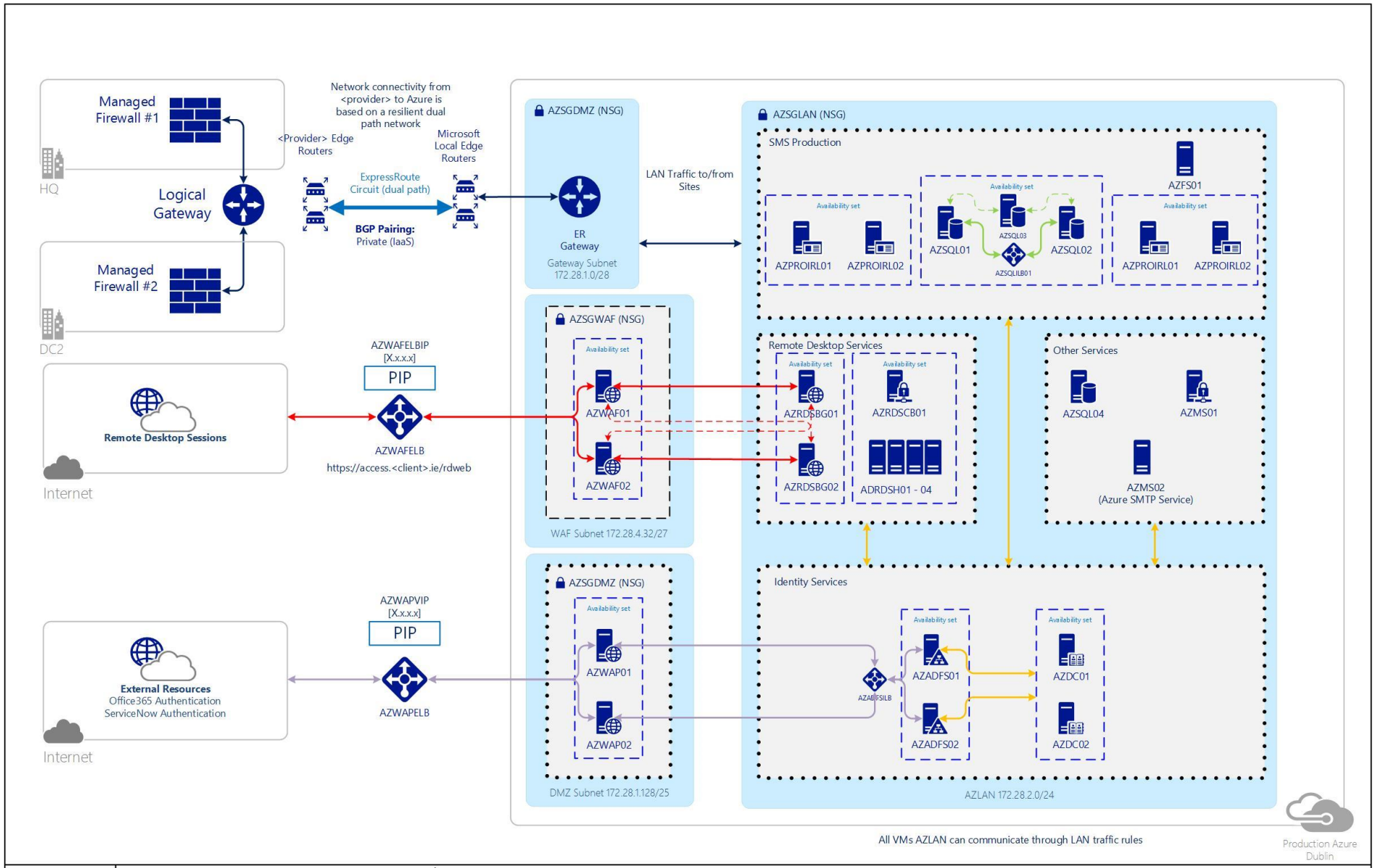


Diagram showing sample Azure datacentre in Dublin. High level view of network traffic.

Lets look at a sample design and price sheet for a real Azure environment …

Network

EVERY Azure network needs to consider/cater for the following:

- Gateways – ExpressRoute and/or VPN
- DMZ
- Perimeter devices
- Internal and External Load Balancers
- Role separation
- Make sure the address space is routable to your clients network. Even if it's not a current requirement
- Network Ingress is free. Egress has a cost.

Name	Address Space	Resource Group	Location	Name Servers
vnet01	10.0.0.0/16	abc-network-rg	North Europe	10.0.2.4;10.0.2.5

Subnet	Address Space	Virtual Network	Description
DMZ	10.0.255.0/24	vnet01	DMZ Services
GatewaySubnet	10.0.1.0/24	vnet01	Reserved for future VPN/ExpressRoute
Core	10.0.2.0/24	vnet01	Core shared services for VNET
XenApp	10.0.3.0/24	vnet01	All XenApp Services
Data	10.0.4.0/24	vnet01	All SQL and Data Services
abc	10.0.5.0/24	vnet01	All abc Application Services

Storage Design and Cost

The common mistakes include:

- Assuming that Compute includes storage costs

INSTANCE	CORES	RAM	DISK SIZES [1]	PRICE
A1 v2	1	2.00 GiB	**10** GB	€0.035/hr
A2 v2	2	4.00 GiB	**20** GB	€0.074/hr
A4 v2	4	8.00 GiB	**40** GB	€0.155/hr
A8 v2	8	16.00 GiB	**80** GB	€0.323/hr
A2m v2	2	16.00 GiB	**20** GB	€0.118/hr
A4m v2	4	32.00 GiB	**40** GB	€0.246/hr
A8m v2	8	64.00 GiB	**80** GB	€0.516/hr

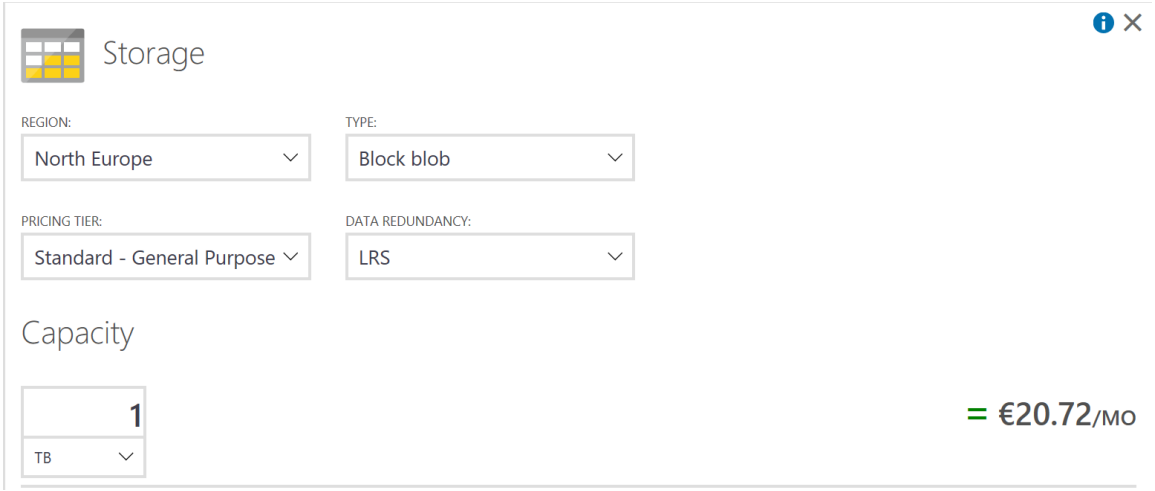
[1] Storage values for disk sizes use a legacy "GB" label. They are actually calculated in gibibytes, and all values should be read as "X GiB"

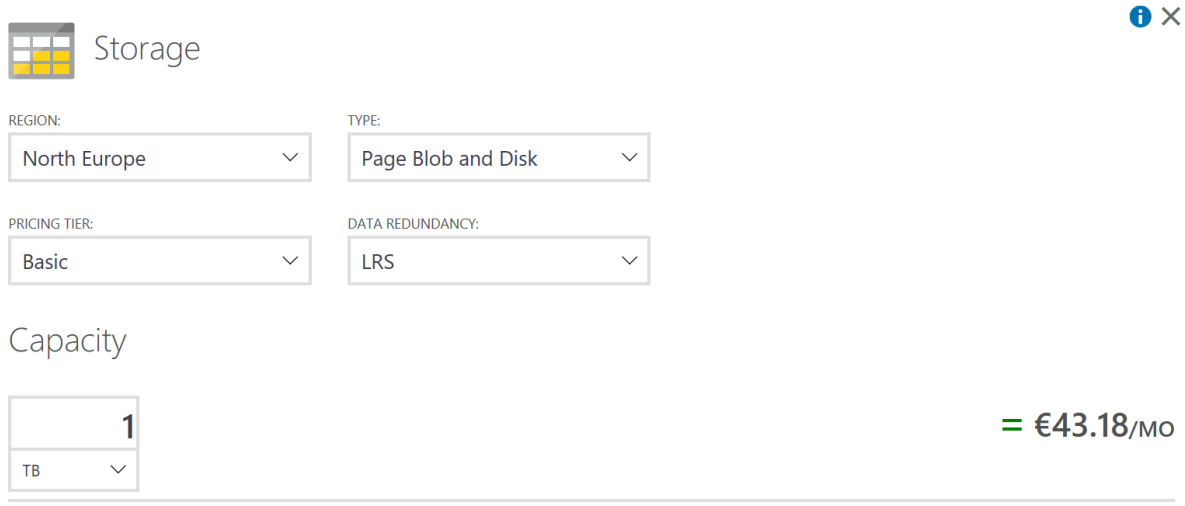
The "Disk Sizes" refer to the temporary SSD storage. Does NOT include the storage cost for the OS disk

Storage Design and Cost

The common mistakes include:

- Not selecting the right storage type





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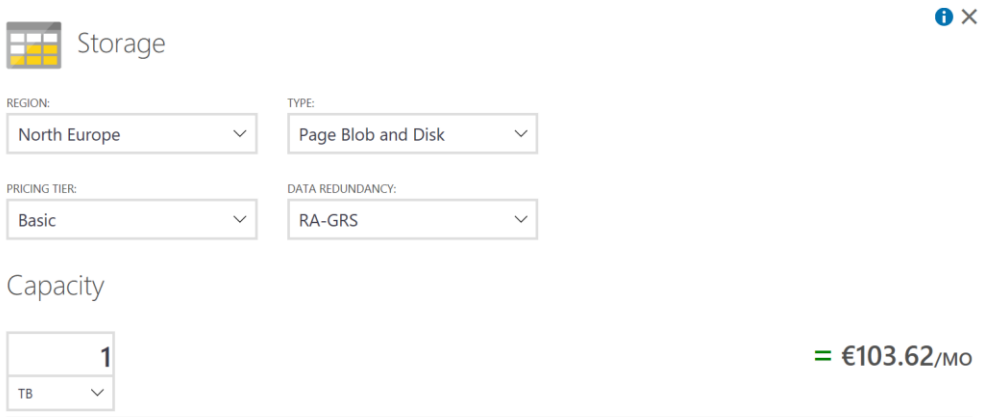
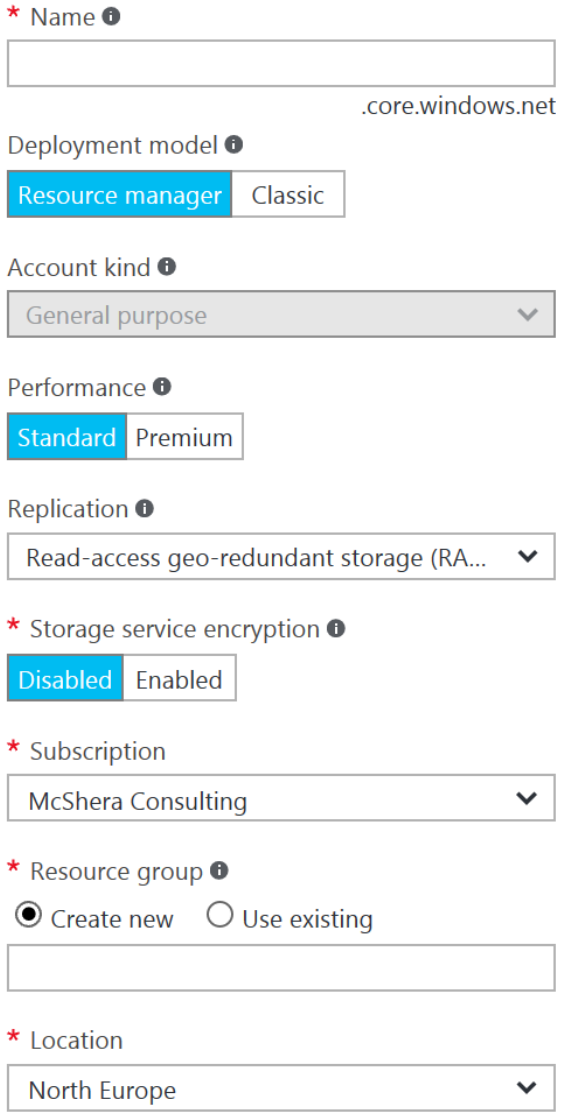
Storage Design and Cost

The common mistakes include:

- This is more of build issue … the default when creating a New Storage Account is RA-GRS. Look what that does to the cost!





Storage Design and Cost

- Think back to our SLA information earlier. If you want a single VM SLA then you MUST use Premium Storage.
- Treat your storage account like they are LUNs. Spread your VMs across the storage for availability and performance. There are limits to a storage accounts i.e. 20,000 IOPS per account and a maximum number of VHDs.

Update: Managed Storage Changes Everything!

Managed Disks

- The arrival of Managed Storage has changed the approach to Storage completely. This service is still evolving.
- Managed storage performance is supposed to be the same, if not better than the current storage account methods. Im still testing …
- I expect to see larger disk sizes, better IOPS and reserved IOPS to appear through Managed Storage. Storage Accounts might become legacy.

Managed Disks

- Managed Standard disks move from pay-per-use to pay-as-allocated. The same way Premium disks are priced
- Standard disk sizes and pricing … prices are promotional and include 50% discount.
- There is a per read and/or write transaction cost for Standard (un)Managed. Not for Premium. Around €0.003 per 100,000 transactions.

	S4	S6	S10	S20	S30
Disk Size	32 GB	64 GB	128 GB	512 GB	1,024 GB
Price per month (promotional)	€0.648	€1.269	€2.483	€9.176	€17.28

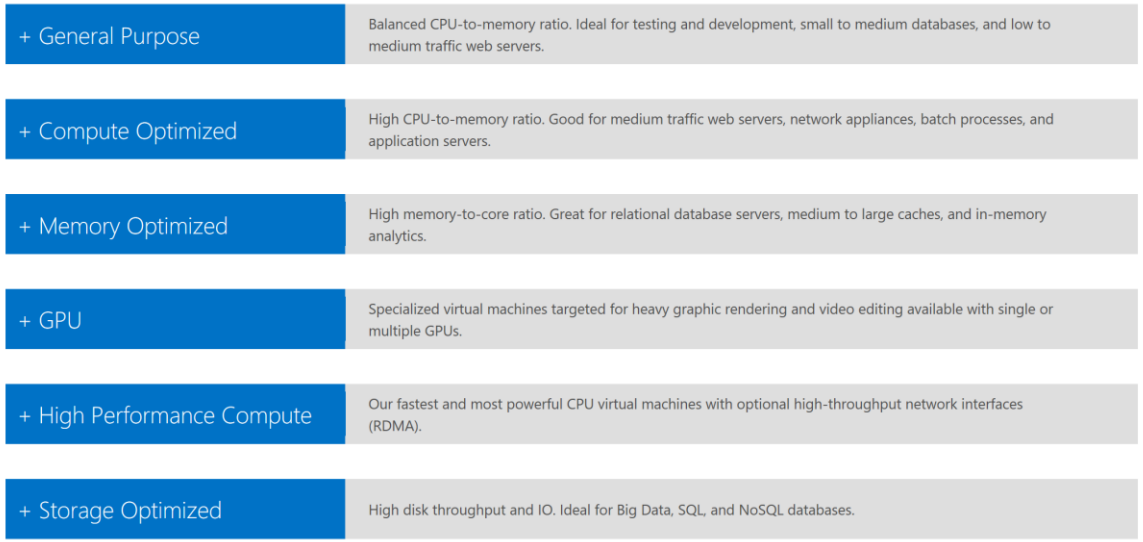
Storage for Backup

- Azure uses Recovery Services Vaults to retain backup data.
- Strongly recommend using Geo-Redundant Storage for all backup vaults. Its highly unlikely something would happen to data in an Azure datacentre … but don't take that risk.
- Backup costs are a combination of instance costs (agents) and the total amount of data.
- Actual storage required for Backup data depends on the retention required and the compression achieved. In short, its very difficult to determine in advance.
- Recommend giving pricing to customers based on scales/ranges e.g. Up to xTB

Back to the spreadsheet

Choosing the right Virtual Machines

- There have been some attempts to make it easier to pick the right VM
- Main categories are →
- In reality its still:
  - A and Av2 Series
  - D and Dv2 Series
  - F Series
  - G Series
  - NC Series
  - NV Series
- Regions are still limited e.g. G and N not available in North Europe.
- Premium storage variants have same compute costs e.g. D2v2 is same as DS2v2



https://azure.microsoft.com/en-us/pricing/details/virtual-machines/windows/

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Choosing the right Virtual Machines

- There is a pattern with VM sizes and cost
- Costs tend to double as you go up the band

INSTANCE	CORES	RAM	DISK SIZES [1]	PRICE
D1 v2	1	3.50 GiB	**50** GB	€0.103/hr
D2 v2	2	7.00 GiB	**100** GB	€0.206/hr
D3 v2	4	14.00 GiB	**200** GB	€0.412/hr
D4 v2	8	28.00 GiB	**400** GB	€0.824/hr
D5 v2	16	56.00 GiB	**800** GB	€1.567/hr

INSTANCE	CORES	RAM	DISK SIZES [1]	PRICE
D11 v2	2	14.00 GiB	**100** GB	€0.245/hr
D12 v2	4	28.00 GiB	**200** GB	€0.49/hr
D13 v2	8	56.00 GiB	**400** GB	€0.911/hr
D14 v2	16	112.00 GiB	**800** GB	€1.64/hr
D15 v2	20	140.00 GiB	**1,000** GB	€2.05/hr

- At the top end you have to really think about the application and what it needs for performance. The more cores the more expensive things become for applications e.g. SQL server.

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Lets price something up and go through it from start to finish.
Any suggestions?

Some General Rules for Azure Design

- Lift and shift for applications with performance or capacity issue(s) will not work. Fresh re-implementation is the best approach for getting the most out of Azure
- Disk design and layout is critical to VM performance AND to costs. Stripping, cache settings, standard v's premium v's managed v's unmanaged etc
- Make sure that the applications are certified for Azure or at least on the Server Virtualisation Validation Program (SVVP).
  - https://support.microsoft.com/en-ie/help/2721672/microsoft-server-software-support-for-microsoft-azure-virtual-machines
  - https://www.windowsservercatalog.com/svvp.aspx

Next Course

Deep dive into the build process

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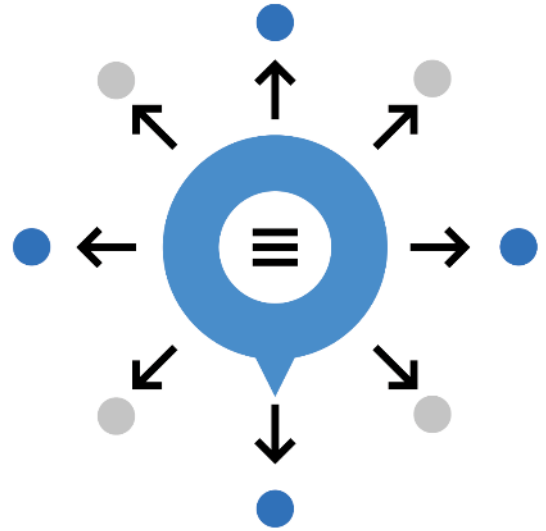
Course Content

Part One (March 2nd)	• Pre-sales information • Compete information • Common Objections	• High level design • Getting the pricing right • Playing to Azures strength
Part Two (March 15th)	• Creating a typical MSP environment • Network, Storage, Compute, Network Security etc	• Advanced performance considerations • Workload Considerations e.g. SQL
Part Three (March 29th)	• Backup and Recovery Options in Azure	• Hybrid Cloud connectivity options • Migrating workloads to Azure



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