SHAREPOINT 2013 FARM AZURE DEPLOYMENT

PROJECT SCOPE

June 16, 2013

Index

OVERVIEW

1. Project Background and Description

The client plans to install a SharePoint 2013 farm in Azure and wants to know the global pricing model. The client also wants to know if an Azure environment can be taken off line and used on premise. The steps needed to do this must be globally described. Finally the client wants to know the minimal steps needed to get a SP 2013 Azure farm in the air to start creating the first Team sites. References and sources are used when no information could be added to the already available information online to answer the questions and requirements of the client. With the given companion documents and references it should be made more easy and clear how the needed Azure VM SharePoint 2013 farms must be deployed and managed.

The importance of SharePoint farm planning and design cannot be overstated. Inadequate planning and as a result, poor farm design, is the main reason that SharePoint farms fail to live up to user expectations and meet an organization's goals and objectives for deploying SharePoint. Planning and design issues also contribute to a significant number of product support calls related to capacity and performance (Aiken & Wesley).

2. Project Scope

- Several architectures will be analyzed based on the basic requirements given.
- The steps needed to take an Azure environment off line and on premise will be analyzed.
- The steps needed to get a simple SP 2013 Azure farm up and running for first team sites will be analyzed.

3. High-Level Requirements

These basic requirements are:

1. The customer needs to know the global prices of Azure SP 2013 Farm environments of different sizes [1]
    - Basic assumption is 2000 users and simple use of the farm.
    - Not answered is what the data transfer will be over the line.
    - The assumption is made that no high volume artifacts will be pushed and pulled.
2. The customer needs to know the steps necessary to run Azure virtual machines on premise [2]
3. The Customer needs to know the minimal amount of steps to create an Azure SP 2013 environment to enable users to create Team sites. [3]

4. Deliverables

Several deliverables are given in this chapter:

1. Overview of several possible Azure SP 2013 farm architectures and prices
2. Overview of the steps needed to take Azure SP 2013 environment on premise
3. Several solutions for the minimal steps to create an Azure SP 2013 environment which enable users to create team sites

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[1] It must be very clear that the pricing model given is nothing more than a direction, although close to the actual costs they do not reflect the final costs precisely.

[2] A rough indication is given on what is needed to do this transfer. The processes around this transfer will be the most important part.

[3] Only the simplest farm is used in this description. The more elaborate farms need further analysis.

4.1 Overview of several possible Azure SP 2013 farm architectures and prices

First of all must be mentioned that this analysis is a brief and global one. The timescale to do a thorough analysis of the needed farm solution and the related pricing model would take more time than given. Microsoft sources are used to come up with some rough indications and all sources are properly referenced.

Small server farm

A small server farm consists of at least two Web servers and a database server. One of the Web servers hosts the Central Administration site and services and the other handles additional tasks, such as handling content requests. This farm can be scaled out to three tiers by using a dedicated application server.

Medium server farm

A medium server farm usually has two or more Web servers, two application servers, and at least two database servers.

Large server farm

A large server farm is the result of scaling out a medium farm to meet capacity and performance requirements or in preparation for implementing a SharePoint 2013 solution. A three-tier topology typically uses dedicated servers on each tier and servers are grouped according to their role.

4.1.1 Farm 1: One server <500 users

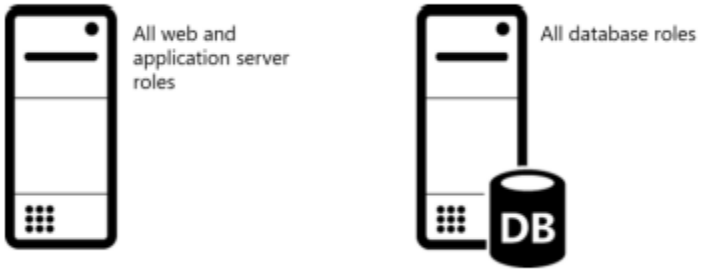
Source: Aiken & Wesley, 2013 -- Pricing: See Appendix A – Figure 5

This farm consists out of one server where all the roles are installed and configured. Also the database is installed on the same server. Needless to say that this has no redundancy, fault tolerance, load balancing and other elements normally associated with proper deployed Azure SP 2013 farms. When all elements are on one server, performance degrades quickly.

4.1.1.1 Unforeseen Costs

With the VM itself there are no real unforeseen costs. The **unforeseen costs will be the needed scale out** when requirements change. Of course these are probably the biggest when the client starts small: a scale out will be needed quite early after deployment. Network bandwidth is another one. But if you buy in big upfront, this unforeseen element can be avoided. Another thing to keep in mind are the needed licenses on the machine for SharePoint, SQL and other applications. When the user base grows, this license landscape will change and so does the pricing model.

4.1.2 Farm 2: Two servers <= 10.000 users



Source: Aiken & Wesley, 2013 -- Pricing: See Appendix A – Figure 5

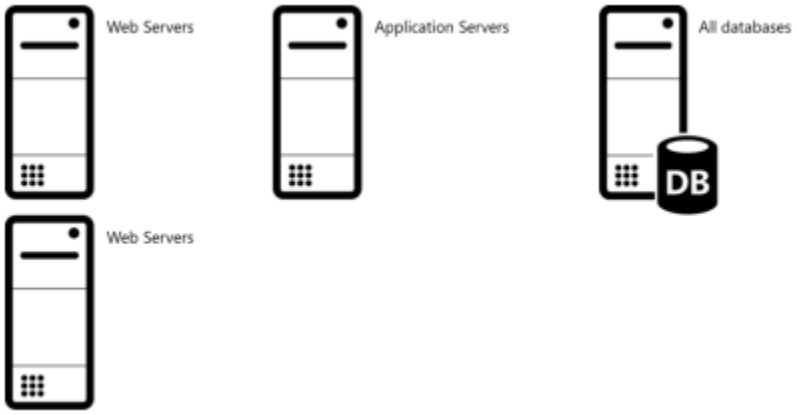
This farm consists out of two server, one for the SharePoint related elements (WFE and Application Server) and one for Database related functionality. Needless to say that this has no or limited redundancy, fault tolerance, load balancing and other elements normally associated with proper deployed Azure SP 2013 farms.

4.1.2.1 Unforeseen costs

With the VM itself there are no real unforeseen costs. The **unforeseen costs will be the needed scale out** when requirements change. Of course these are probably the biggest when the client starts small: a scale out will be needed quite early after deployment. Network bandwidth is another one. But if you buy in big upfront, this unforeseen element can be avoided. Another thing to keep in mind are the needed licenses on the machine for SharePoint, SQL and other applications. When the user base grows, this license landscape will change and so does the pricing model.

4.1.3 Farm 3: Three or four servers >= 10.000 users

With this farm more can be done with load balancing, fault tolerance, redundancy and so on. More than four servers are not described in this pricing model. More than four servers are for the high performance environments, although with four heavy servers high performance can also be realized for small to medium solutions.



Source: Aiken & Wesley, 2013 -- Pricing: See Appendix A – Figure 5

4.1.3.1 Unforeseen costs

With the VM's itself there are no real unforeseen costs. The unforeseen costs will be the needed scale out when requirements change. Of course these are probably the biggest when the client starts small: a scale out will be needed quite early after deployment. Network bandwidth is another one. But if you buy in big upfront, this unforeseen element can be avoided. Another thing to keep in mind are the needed licenses on the machine for SharePoint, SQL and other applications. When the user base grows, this license landscape will change and so does the pricing model.

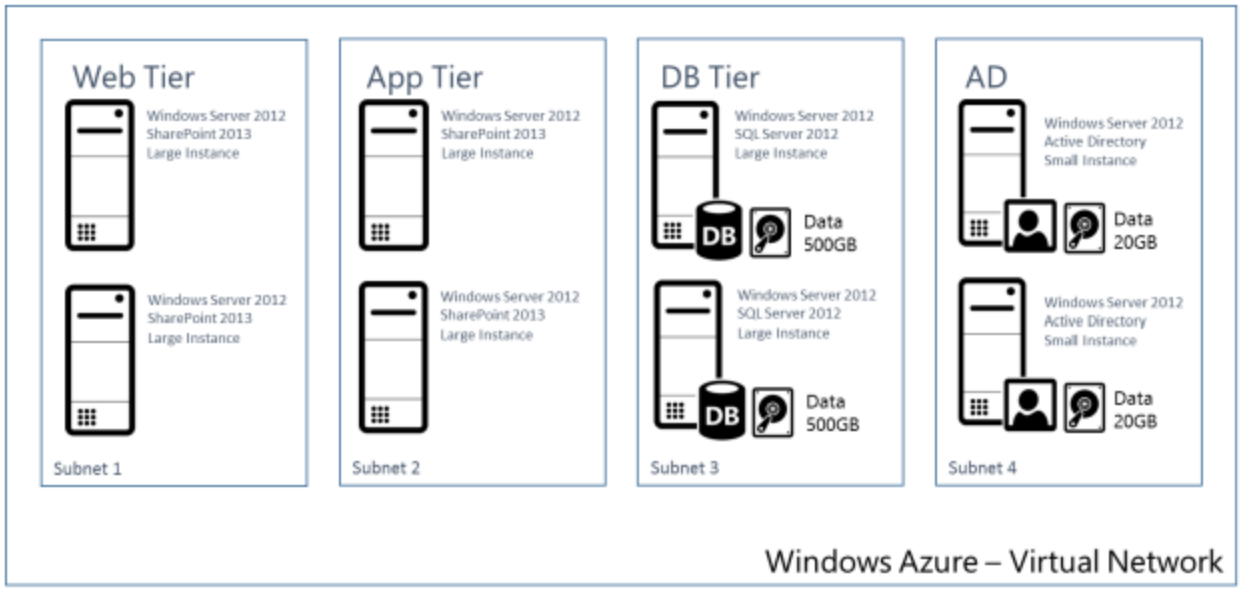
Interesting unforeseen costs with more complex Azure SP 2013 environments are the configuration and maintenance costs. Although these are also applicable of course for the less complex environments, the configuration, maintenance, monitoring, security and backup costs will grow aligned with the grow of complexity of the Azure SP 2013 farm infrastructure. Often this is not calculated when a scale out take place.

This means that there are extra costs when less complex Azure SP 2013 environments need to scale out: the complexity of the environment asks for extra resources, time, operational/tactical/strategic planning, alignment with governance and what not. So it is not only unforeseen in scale out, but also unforeseen in everything that comes along with the scale out.

If the more complex Azure SP 2013 farm is combined with on a premise Hyper-V infrastructure and procedures, then the alignment between these infrastructures will also grow. In short, the unforeseen costs are the biggest outside the Azure SP 2013 farm elements. Azure can be made quite steady in price calculation. It are the other actions; (Azure) infrastructure, scale out elements, resources needed, alignment with governance, operational/tactical/strategic planning, monitoring, maintenance, security, backup, transfers and licensing (to name some) which will be the unforeseen costs. They grow as the complexity of the Azure SP 2013 farm infrastructure grows.

4.1.4 Farm topologies reflected in Azure virtual network

In the previous paragraphs we saw the reflections of several possible farms, from very small to medium. Down picture gives us an example how this can be reflected in Azure. For the 1-Tier farm we need at least the Large Instance, preferable more but that's not reflected in the calculation. For the 2-Tier farm we need at least the Large Instances. For the Three or more Tier farm we need 2 Large Instances and a Small Instance. All possibilities can be scaled out. The scale up is a different story and not included in this analysis.



Source: Aiken & Wesley, 2013

4.1.5 Extra Azure VM Benefits[4]

- Minimal experience necessary. While on premise virtual farms built on Hyper-V or VMWare require extensive planning and experience, Windows Azure can spin up virtual machines in minutes, not weeks, of technical prep work.
- Little up-front capital expenditure. In contrast to a concerted Hyper-V rollout that could run in excess of thousands of dollars in hardware and licensing, we can turn on an Azure VM for a cost of $60-115 USD per month in most instances.
- Unmatched uptime and availability. There are not many customers with on premise servers that exceeds a 95-percent uptime per month. The older the systems get, the worse they are. Azure has stellar uptime from my experience so far.
- Disgusting bandwidth for inbound/outbound traffic. Most recent customer VMs can be clocked in at over 110Mbps downstream and 60Mbps upstream. If you have such bandwidth readily available onsite, you're luckier than 97 percent of organizations out there.
- Remote access from anywhere, anytime. Sure, traditional servers have had remote desktop for some time. But there is always configuration needed, along with static IPs, for this to function, especially when more than one server is in use. Azure provides you with a simple pre-configured FQDN for connection purposes on every VM you create.
- No licensing worries. An on premise VM environment invariably has licensing issues to wrangle with no matter how you slice it. Higher level needs on Azure may necessitate licensing, but stock virtual machines are fully licenses and ready to roll for production needs.

Source: Wlodarz, 2013

Leveraging Azure means you have access to some of the fastest pipelines to the backbone of the internet. Microsoft's data center infrastructure is arguably one of the best in the world. (Wlodarz, 2013).

4.1.5.1 Microsoft VM prices against Amazon

On the raw pricing front, Microsoft seems to be undercutting Amazon's price levels just enough to make it worth mentioning. Here is a **pricing comparison taken on May 7, 2013 based on the latest publicly available rates between each service for Windows Server virtual machines**. Amazon's US East pricing was used, since this represents the generally cheapest price levels for Amazon cloud services in the USA (Wlodarz, 2013).

	MS Azure	Amazon EC2
Instance Name	Medium VM	M1 Medium Instance
Memory	3.5GB	3.75GB
Processors	2 x 1.6GHz	2 EC2 Compute Units *
Cost per hour	$0.16	$0.18
Cost per month ^	$115.20	$131.04

**** 1 EC2 unit equates to 1-1.2Ghz of processing power, per Amazon.***
^ Based on a 720hr per month cycle.

The same numerical advantage sits in Microsoft's court even if you size up a beefier VM, from the respective "Extra Large" class that each provider offers:

[4] *Some extra benefits for Azure VM's are given with price related information.*

	MS Azure	Amazon EC2
Instance Name	Extra Large VM	M1 Extra Large
Memory	14GB	15GB
Processors	8 x 1.6GHz	8 EC2 Compute Units *
Cost per hour	$0.64	$0.73
Cost per month ^	$460.80	$524.16

**** 1 EC2 unit equates to 1-1.2Ghz of processing power, per Amazon.***

^ Based on a 720hr per month cycle.

Just to make it clear that Azure is going for the cheapest solution now and in the future. At the time of writing the **VM's can be charged per minute**, instead of per hour like the other vendors have. Pricing models around this per minute counting must be properly analysed with the relevant stakeholders.

4.2 Overview of the steps needed to take Azure SP 2013 environment on premise

4.2.1 Windows Azure Virtual Machines

Windows Azure Virtual Machine enables you to create a virtual machine running Windows Server or Linux. After you create a virtual machine in Windows Azure, you can access it like any other server and you can delete and re-create it whenever you need to. You can use a virtual machine in Windows Azure to deploy the Windows Server 2008 R2 or Windows Server 2012. Windows Azure virtual machines are built from virtual hard disks (VHD). These VHDs are the same as the VHDs used by Hyper-V, and can be transferred to and from your existing environment. Windows Azure also allows you to create multiple virtual machines and then load balance traffic from the internet between them (Aiken & Wesley, 2013).

What we can extract from the above paragraph is that an on premise virtual infrastructure can run parallel with the Cloud Azure environment. VHD's can be transferred between Azure and the Cloud quite easily and the most important element will be the procedures defined to make this a smooth process. Governance should be the guidance here.

4.3 What are the minimal steps to create an Azure environment to enable users to create a Team Site?

4.3.1 Create Azure SP 2013 environment with One Tier.

This example is given because it gives the client the opportunity to create a SharePoint 2013 Azure environment in the fastest way possible. There was no further requirement given and the three-tier farm description would have created more questions and this answer needed to be formulated before Wednesday the 19th of June. For the author there was not enough time given to dive into the three tier farm environment installation of SP 2013 without asking more questions and doing more analysis[5].

[5] *It is advisable that the analysis of multi-Tier farm will be done as soon as possible. The one Tier solution should be for testing purposes only. Perhaps Cloudshare would be a better solution for this or the Trial image in the gallery from Microsoft itself. They are briefly mentioned in described in succeeding paragraphs.*

Two variants are given:

1. Single Tier integrated database[6]
2. Single Tier with SQL Server (first possible and simplest SP 2013 Farm deployment)

The steps for installing the above variants are well described by Microsoft. It would be a waste of time and energy to re-write it in this document. The relevant documents are included in the bibliography of this document. The sources are mentioned in this paragraph. The documents are companion documents of this document.

Source documents:

1. Install SharePoint 2013 on a single server with a built-in database.pdf
2. Install SharePoint 2013 on a single server with SQL Server (will be a farm)
3. *Install SharePoint 2013 across multiple servers for a three-tier farm.pdf* [7]

4.3.2 Create Azure SP 2013 environment with Three Tiers

We will not dive too deep into this variant, although a source document on how to do this is given as an example. It's another document than the instructions from the Microsoft SharePoint Website and comes from an IT Pro at Microsoft. This document could give the client a head start in creating the multi-tier variant of the Azure SharePoint 2013 farm and is given for that reason. The basic steps to build such an environment are given, but for a thorough explanation of them we refer to the document itself.

- Register a DNS Server in Windows Azure
- Define a Virtual Network in Windows Azure
- Configure Windows Server Active Directory in a Windows Azure VM
- Configure SQL Server 2012 in a Windows Azure VM
- Configure SharePoint Server 2013 in a Windows Azure VM
- Export / Import Lab Environment via PowerShell

Source: Keith Mayer, 2013

Source document:

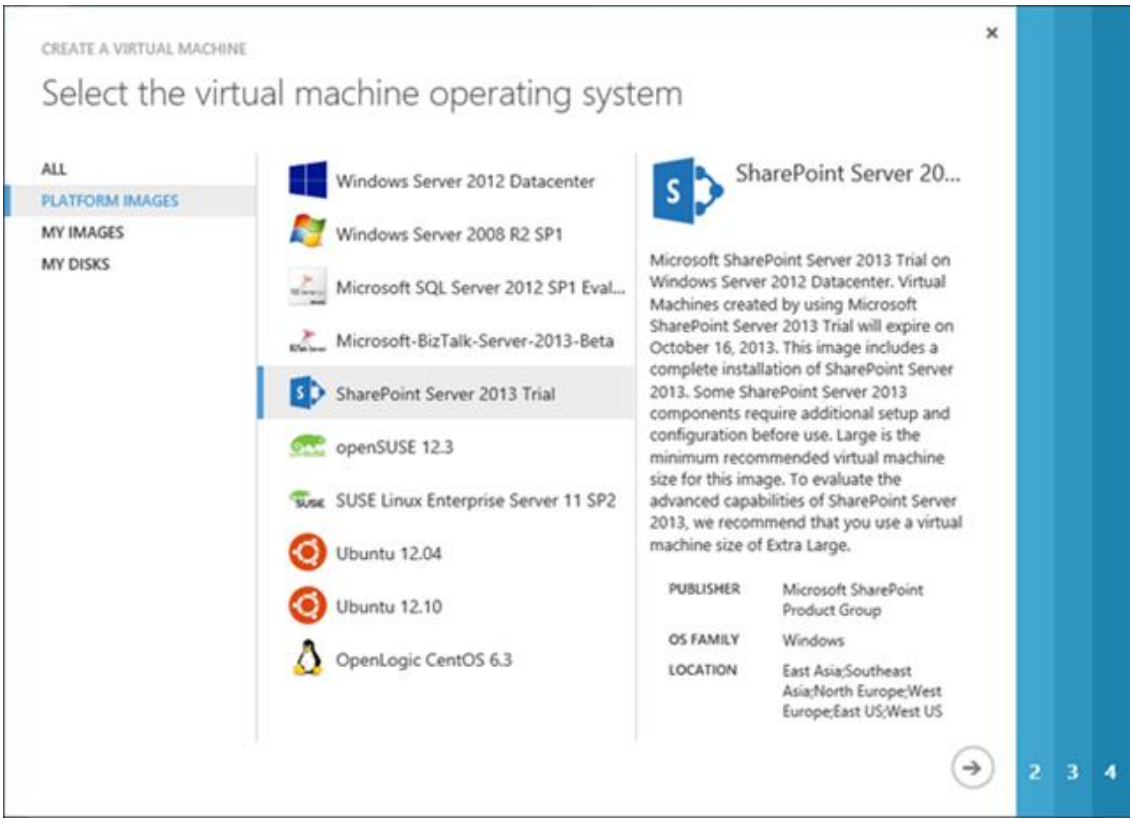
Step-by-Step_ Build a FREE SharePoint 2013 Lab in the Cloud with Windows Azure Infrastructure Services.pdf

[6] *The single Tier with integrated DB is indeed the environment with the least amount of steps to get it up and running. It has some downsize elements which should be discussed with the proper stakeholders.*

[7] *This document is added for information purposes only. It is not the fastest way possible to enable the client to let the users create Team Sites. Although it is the client who must decide which variant is the most preferred ones.*

4.3.3 Use SharePoint 2013 Image in the Azure Gallery (Trial)[8]

- To get started with SharePoint 2013 on Windows Azure navigate to the Windows Azure Portal (https://manage.windowsazure.com/) and sign-in with your credentials.
- Select + New.
- Select Compute click Virtual Machine and click From Gallery
- On the Create Virtual Machine Dialog click Platform Images and then click SharePoint Server 2013 Trial.
- Click -> Next.
- Complete the remaining details to provision your virtual machine.



NOTE

Extra Large, A6, or A7 are the recommended virtual machine sizes recommended for use with SharePoint Server 2013.The virtual machine contains a complete installation of SharePoint Server 2013 and expires on October 16, 2013. To continue using the virtual machine after October 16, 2013 you will need to convert the installation to use a Retail or Volume License key. SharePoint Server 2013 and prerequisites are preinstalled with links to SharePoint 2013 Central Administrations, the SharePoint 2013 Management Shell, and SharePoint Products Configuration on the desktop. SQL Server 2008 R2 with Service Pack 1 or SQL Server 2012 is required to complete the configuration (Baer, 2013).

[8] *When choosing this variant a technical discussion of the roadmap ahead must be done with the relevant stakeholders*

4.3.4 Use Cloud Service like Cloudshare to host the SharePoint environment

Cloudshare.com is a provider of virtual machines in the cloud. It offers a very easy way to spin off your environment by just one click against reasonable prices. When the machines do not need a permanent link and must be only up during development time**, they cost about 400 dollars a year**. When the servers need to be up they offer CloudShare ProPlus with auto-suspend disabled, starting at $699 per month. This will give us plenty opportunities to make the VM's part of our overall infrastructure.

Cloudshare offers the SharePoint 2013 RTM Enterprise Edition Small farm with separate SQL Server and Active Directory Servers with just one click of the mouse and 5 minutes waiting time.

- Explore SharePoint 2013 RTM in less than 60 seconds.
- Own a SharePoint 2013 RTM farm for all of your development and testing needs.
- Validate your integrations with external tools and solutions prior to launching into production.

See Appendix A, figure 6 for a view on the VM's created when choosing for the SharePoint 2013 RTM environment.
See Appendix A, figure 7 for the configuration panel of the SharePoint RTM VM Cloudshare

5. Affected Parties[9]

Down elements are assumptions.

1. The users of the client will be affected.
2. Several processes of the client will be affected
3. The pricing model of the client related to the SP 2013 farm architecture will be affected
4. The infrastructure architecture and roadmap of the client will be affected
5. The strategic and tactical choices of the management layers of the client will be affected.
6. The customers of the client will be affected in the way of information sharing and service delivery.
7. Management will be affected because of the change in information exposure and sharing.

6. Affected Business Processes or Systems[10]

Down elements are assumptions.

1. The way of creating project sites will be affected
2. The way of sharing information will be affected.
3. The way business is being done will be affected
4. The way document management is being done will be affected.
5. The way archiving is being done will be affected
6. The way internal and external applications are exposed will be affected.
7. The integration of all business information will be affected.
8. The speed of knowledge transfer will be affected.
9. The throughput of essential information will be affected.
10. The transparency of essential information will be increased.

There will be more elements affected, not mentioned.

[9] *Some basic affected parties are given and they should be properly analyzed by the business itself. They can form guidance.*

[10] *Some basis processes are given and they should be properly analyzed by the business itself. They can form guidance.*

7. Specific Exclusions from Scope[11]

1. No detailed farm solutions will be described. For this much more information is needed.
    a. The assumption is that the simplest farm is subject of this analysis.
    b. For more complex farms much more discussions and analysis is needed.
2. No high performance SP 2013 Azure farms will be described. More time and information is needed.
    a. For a more detailed definition a better analysis of the needed infrastructure is necessary.
3. No failover or redundancy farms will be described. For this more time and information is needed.
    a. For a more detailed description a better definition of the infrastructure is needed.
4. No extensive pricing model will be given, only a rough indication of the simple farm(s) given.
    a. For a more detailed picture a better definition of the farm is needed.
5. No Scale up or Scale out plans are given. More time and information is needed.
6. No detailed transfers between on premise and Azure VM's are given.
    a. Only the basic description of the possibility is given.
    b. For a better and more detailed description of the steps more time and analysis is needed.
        i. Probably major time will be done in procedure descriptions and Hyper-V infrastructure.

8. Implementation Plan[12]

1. The simplest farm can be created, installed and configured within a couple of days.
    a. Also the needed tests can be done in this time-frame.
    b. Perhaps the trial image in the gallery is enough for the test.
    c. An analysis of Cloudshare can be beneficial because it offers fully installed SP 2013 environments with SLA's, permanent access and more.
2. More complex farms can be done in one week, **but do have some remarks**.
    a. First we need a better analysis of what is needed.
    b. When there is a clear plan and infrastructure architecture, deployment is made easy.
    c. We need the analysis of functionalities, storage, security, accessibility, size, volume etc.
    d. We need a better analysis of the needed structure reflected in site collections, sites, content types, lists, libraries, workflows and more.

9. High-Level Timeline/Schedule[13]

This should be discussed with the proper stakeholders.

A remark can be given though.

- When the client choses for the Single Tier or Two Tier variant it can be done an tested within a couple of days
    - A discussion is needed tough concerning failover, security, redundancy, backup, scale out, scale up and other downsize elements of these variants.
- When the client choses for the three or more Tiers variant, then further discussion is needed on failover, redundancy, security, Networks, subnets, affinities and so on.
- When the client choses for the Cloudshare variant, then things will be done the fastest and most secure. All things are configured by Cloudshare.
    - A discussion and further analysis is needed with the relevant stakeholders about AD link, redundancy, security, failover, VM transfers, backup, VPN's and so on.

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[11] *There are probably more exclusions possible. These reflect the most basic ones.*

[12] *This is only a very rough implementation plan and should be discussed with the proper stakeholders.*

[13] *This is only a very rough high level timeline and schedule and should be discussed with the proper stakeholders.*

- The SharePoint 2013 image from the Azure Gallery will give the client a boost in time and creates the opportunity to kick off a showcase minutes while sticking to the Azure technology.
    - This is positive for scale out.
    - Discussion is needed with relevant stakeholders concerning failover, redundancy, subnets, VPN, AD, DNS, backup, Image transfers and more.

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APPROVAL AND AUTHORITY TO PROCEED

We approve the project as described above, and authorize the team to proceed.

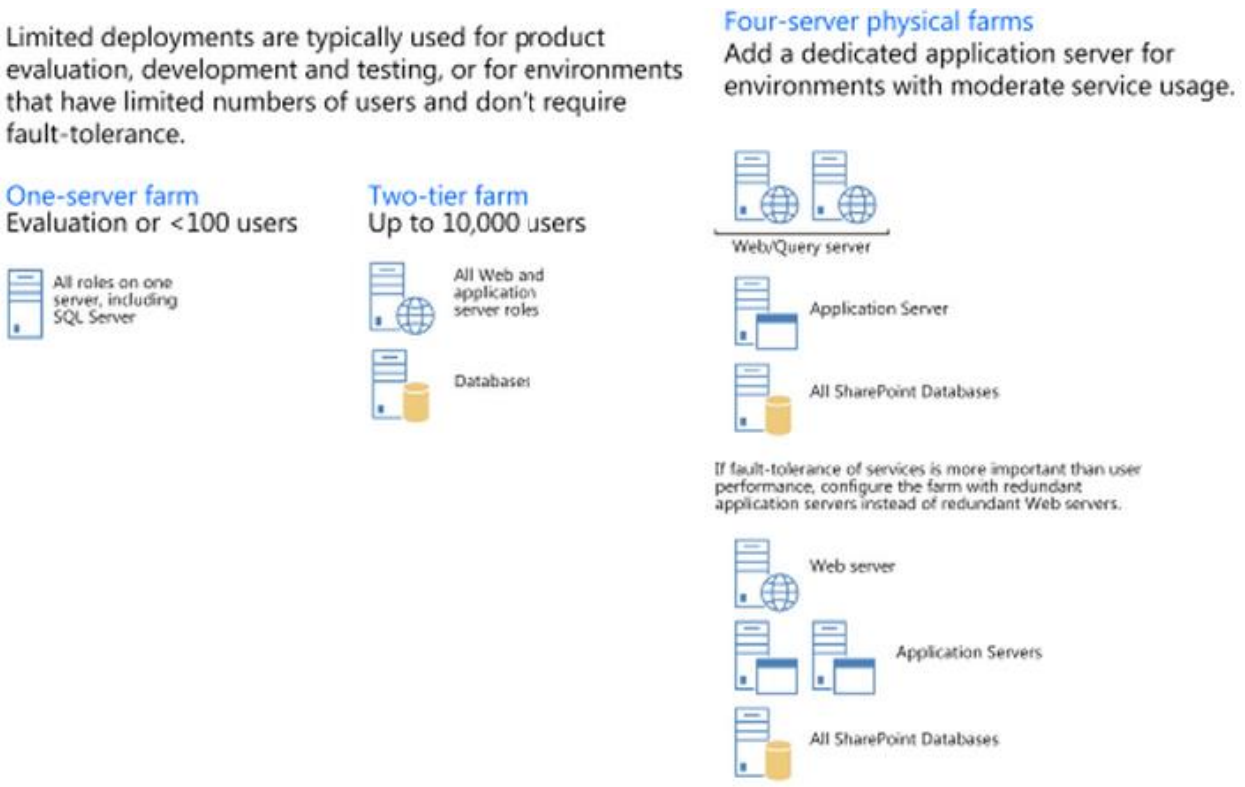
Name	Title	Date

Approved By _____ Date _____

Approved By _____ Date _____

APPENDIX A

Figure 1: Small to medium Farm SP 2013 topology



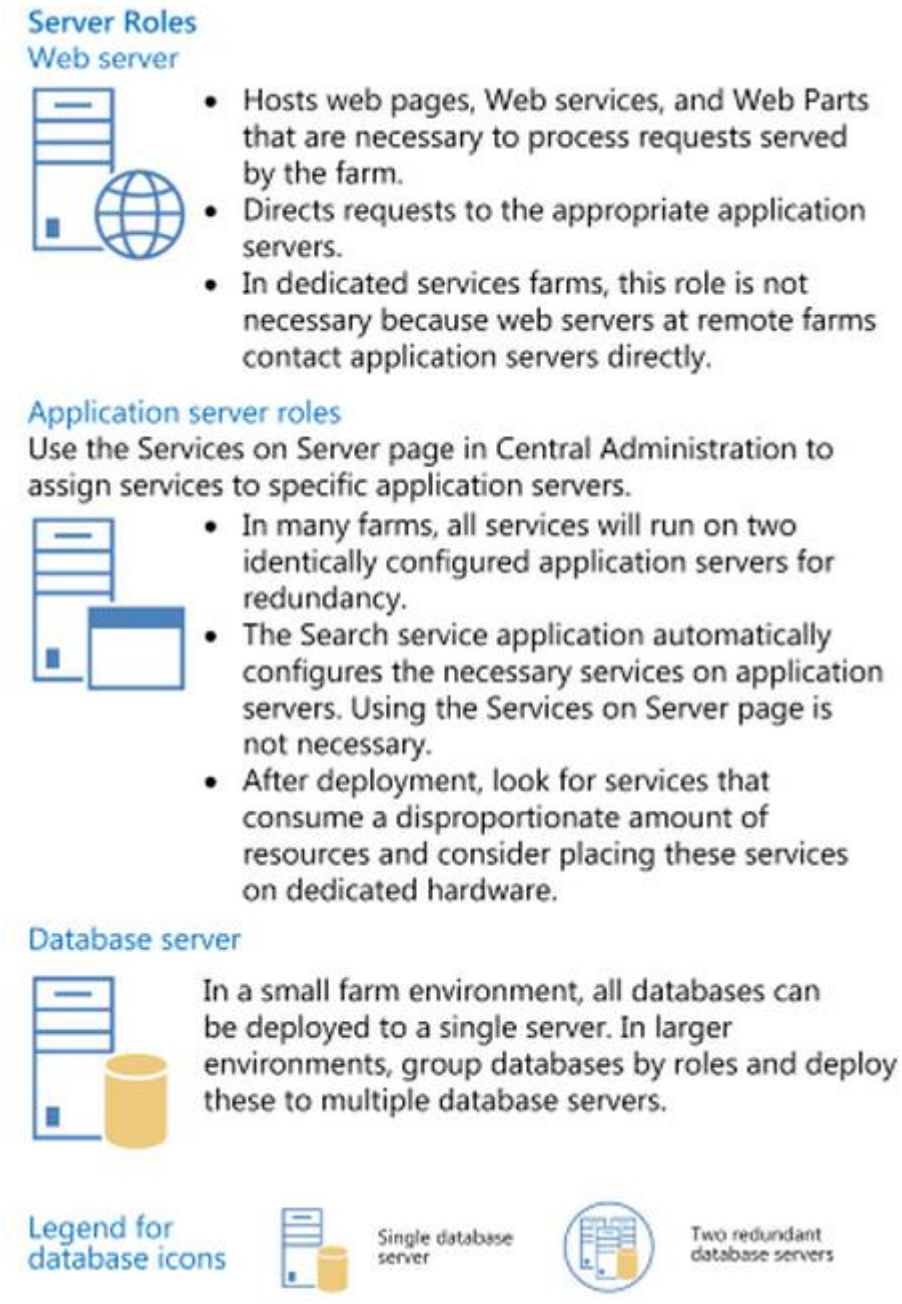
Source : Technical diagrams for SharePoint 2013

Figure 2: Simple pricing model Azure

Sharepoint farm pricing							
Virtual Machine Prices			SQL Server Enterprise			Bandwidth	
Type	Pr p.m		Type	Pr p.m		Type	Pr p.m
XS	14.4		XS	1221.12		Outbound	
S	64.8		S	1261.44		1000Gb	119.4
M	129.2		M	1313.28		500Gb	60
L	259.2		L	1416.96			
XL	414.72		XL	2833.92		Backup	
A6	587.52		A6	1797.12		Size	Pr p.m
A7	1175.04		A7	3595.35		1000 Gb	248
						500 Gb	126.25

Source : Azure online pricing calculator – Virtual Machines

Figure 3: Server roles and characteristics



Source : Technical diagrams for SharePoint 2013

Figure 4: Standard Instances Pricing model Virtual machine

Standard Instances

Provide optimal set of compute, memory and IO resources for running a vast array of applications. Detailed configuration of the instances is available here.

COMPUTE INSTANCE NAME	VIRTUAL CORES	RAM	PRICE PER HOUR
Extra Small (A0)	Shared	768 MB	**$0.02** (~$15/month)
Small (A1)	1	1.75 GB	**$0.09** (~$67/month)
Medium (A2)	2	3.5 GB	**$0.18** (~$134/month)
Large (A3)	4	7 GB	**$0.36** (~$268/month)
Extra Large (A4)	8	14 GB	**$0.72** (~$536/month)

* Based on 744 hours per month

Source : Virtual Machines and Cloud Service Sizes for Windows Azure – Pricing Details

Can differ slightly with excel example given.

Figure 5: Global pricing model all farm solutions given

Pricing model									
Tiers		Instance	Amount	Pr p.m	Subtotal	Total p.m	Bandwidth	Backup	Grand Total
1 Tier		Large	1	259	259	259	60	127	446
2 Tier		Large	2	259	518	518	60	127	705
3 Tier		Large	2	259	518		60	127	187
		Small	1	65	65	583	60	127	770
4 Tier		Large	3	259	777		60	127	187
		Small	1	65	65	842	60	127	1029

Source : Azure online pricing calculator – Virtual Machines

Figure 6: Cloudshare Sharepoint 2013 RTM environment

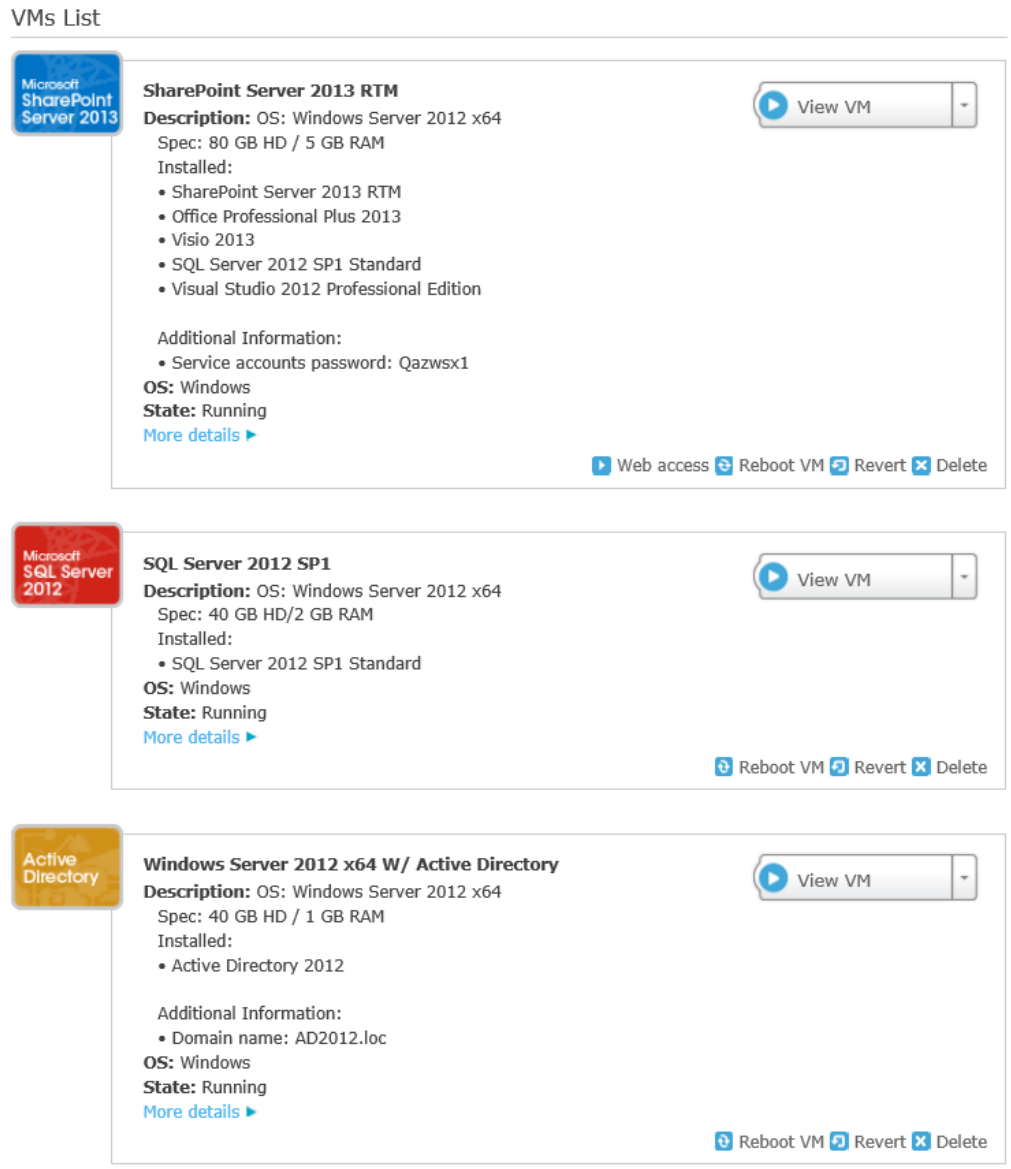


Figure 7: Cloudshare SharePoint RTM Environment virtual configuration panel