**MS Azure Migration**

Azure migration one of the important concept in order to setup move physical and virtual services/resources from on premises to Azure Cloud

**What do we mean by migration?**

In addition to using Site Recovery for disaster recovery of on-premises and Azure VMs, you can use the Site Recovery service to migrate them. What's the difference?

* For disaster recovery, you replicate machines on a regular basis to Azure. When an outage occurs, you fail the machines over from the primary site to the secondary Azure site, and access them from there. When the primary site is available again, you fail back from Azure.
* For migration, you replicate on-premises machines to Azure, or Azure VMs to a secondary region. Then you fail the VM over from the primary site to the secondary, and complete the migration process. There's no failback involved.

**Migration scenarios**

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| **Scenario** | **Details** |
| **Migrate from on-premises to Azure** | You can migrate on-premises VMware VMs, Hyper-V VMs, and physical servers to Azure. To do this, you complete almost the same steps as you would for full disaster recovery. You simply don't fail machines back from Azure to the on-premises site. |
| **Migrate between Azure regions** | You can migrate Azure VMs from one Azure region to another. After the migration is complete, you can configure disaster recovery for the Azure VMs now in the secondary region to which you migrated. |
| **Migrate AWS to Azure** | You can migrate AWS instances to Azure VMs. Site Recovery treats AWS instances as physical servers for migration purposes. |

**Breaking Down Azure Migration Phases**

Microsoft recommends a four-step migration process for migrating to Azure:

* Discover: Catalog your software and workloads
* Assess: Categorize applications and workloads
* Target: Identify the destination(s) for each of your workloads
* Migrate: Make the actual move

**Discover**

Discovery involves identifying all existing workloads and applications in your infrastructure so you can prepare them for migration. It’s an extensive and tedious process, but critical to success.

Missed applications and workloads can become headaches later on, so you’ll want to make sure your application inventory is complete and up-to-date.

Review these areas during the preparation phase:

**Virtual Networks**

To maintain the same datacenter performance, security and stability while managing costs, analyze your on-premises workloads in your existing virtual or physical environment and compare them to equivalent resources in Azure. Be sure to address networking requirements, how many subnets you’ll need to provision, and whether you’ll provide your own DNS servers via Active Directory.

**Storage Solution**

Purchasing new storage every time you reach capacity is a constant burden. There are a few types of Azure storage to consider depending on the nature of your data.

* **Standard vs. premium:** Regular Azure storage has a certain IOPS maximum for each virtual disk. Premium storage delivers high-performance, low-latency disk support for virtual machines with input/output-intensive workloads.
* **Hot vs. cold:** How you store your data in Azure depends on how often users access it. A multi-temperature data management solution will help you conserve costs. Hot data requires fast storage, while data that is rarely accessed (cold data) is stored on the slowest storage.

**Compute**

The cloud gives you instant access to computing resources. When planning, you should look into Azure Autoscale. The autoscaling feature dynamically scales applications to meet changing performance requirements.

Azure virtual machines will also give you more control over your computing environment. An Azure VM gives you the flexibility of virtualization without having to buy and maintain costly physical hardware.

**Assess**

Once you have a better understanding of Azure products and how they fit into your migration strategy, it’s time to evaluate your existing infrastructure. Here are some tools to help:

**Microsoft’s Virtual Machine Readiness Assessment tool**

This tool automatically inspects your on-premises environment, whether physical or virtualized, and provides a checklist for moving your workloads to the cloud. After the assessment, the tool generates a report detailing the workload attributes/configuration that are ready to move and what requires further investigation before moving. The report also provides additional resources to resolve issues and prepare the workload for a move to Azure.

**Microsoft Assessment and Planning (MAP) toolkit**

The MAP Toolkit is an agentless inventory, assessment and reporting tool that securely assesses IT environments for various platform migrations including Windows 8.1, Windows 7, Office 2013, Office 2010, Office 365, Windows Server 2012 and Windows 2012 R2, SQL Server 2014, Hyper-V, Microsoft Private Cloud Fast Track and Azure. Since version 8.0, MAP Toolkit can assess environments and provide readiness information for both physical and virtualized workloads migrating to Azure.

Both of these tools can help you carefully review and document all applications, workloads and processes you currently use, including:

* **Current Infrastructure:**Map your virtual and physical system configurations to an equivalent Azure instance. Evaluate specs like CPUs, disk size and storage demand.
* **Current Network Architecture and Capacity:**Assessing your network architecture and capacity will help you evaluate bandwidth to replicate changes made on virtual machines. Use a capacity planning tool or bandwidth assessment tool to determine whether replicating a virtual machine would kill your network.
* **Performance Requirements:**You need to know what IOPS you’ll require to avoid lags and maintain the same performance in your new Azure environment.
* **High Availability/Resilience Requirements:**You need a system that will function in the event of failure. Thoroughly document your disaster recovery processes, resiliency configurations and recovery time objectives to ensure your data can be restored easily in your new environment.
* **Maintenance Process:**Once you move to Azure, what maintenance steps need to happen to continue running effectively? Determine how your maintenance process will need to change in the new cloud environment.

**Target**

Now that you’ve audited your existing environment, it’s time to map out how to get your servers in Azure.

The three likeliest targets for your workloads are:

* Microsoft Azure
* A Cloud OS Network
* Office 365

You’ll likely migrate productivity and communication-related workloads to Office 365. This may include moving email to Microsoft Exchange Online, document management to SharePoint Online and moving instant messaging, voice, video and shared application communications to Skype for Business Online (now Microsoft Teams).

**Factors like speed, ease of migration, cost and desired functionality** will inform the cloud destination for your workloads. For instance, websites would benefit most from the speed of Azure data centers, elasticity of the storage, processing power and memory. These factors help keep sites responsive even during peak demand.

**Virtual machines are another component to consider**. VMs are on the other side of an Internet connection and subject to the unpredictable nature of Internet latency. Most companies prefer to migrate non-critical VMs to less expensive cloud resources. You’ll want to put VMs in the cloud that won’t be adversely impacted by latency and don’t require frequent connections to other resources.

**Operating systems are another consideration**. Is the workload you wish to migrate running an Azure-supported operating system?

Make sure the VM you’re migrating doesn’t exceed 32 cores, or the maximum 448GB allowable memory.

**Still have workloads running on physical servers?** The terms for converting physical server workloads into a VM aren’t always straightforward. Working with a proven partner can streamline the process.

**Migrate**

Now that you’ve audited and prepared your existing workloads and applications, you’re ready to migrate to Azure.

**Steps which we need to perform:**

**Phase 1: Assess Cloud Readiness**

There are very few tools on the market for assessing an application’s cloud readiness. It is therefore best for users themselves to measure four key attributes of an application to determine its compatibility for Azure:

**Platform**

The state of the technologies underpinning an application—the hardware, operation systems, application server subsystems, and actual build code (all in all, the “platform”)—will dictate how flawlessly an application can migrate.

**Data**

The clash between traditional application data storage options and relatively more modern systems like NoSQL creates mismatches in IT landscapes that must be harmonized before digital assets are pushed to Azure.

**Connectivity**

Azure will benefit users insofar as they have sufficient network bandwidth to perform accordingly. Make sure to have solid service level agreements in place with providers before pulling the trigger on a cloud migration.

**Security and Compliance**

Though major cloud infrastructures like Azure are afforded considerable resources to outfit their data centres for optimal security, applications must nevertheless be built with effective identity management, access control, and managed security offerings to safeguard users on Azure. Consistent and continual application risk assessment is critical to operating in the public cloud.

**Phase 2: Plan Azure Migration**

The more thorough your application cloud readiness assessment, the more reliable your overall migration planning strategy. Experts advise charting a plan (or, rather, setting a go-to-cloud target) around three distinct options: (1) “lift and shift”; (2) application evolution; and (3) application rearchitecting.

**Lift and Shift**

“Lift and Shift” is the cloud migration strategy for replicating on-premise environments as closely as possible in public clouds. Examples include designing the same networking environments; uploading virtual machine images from each server; and enabling connectivity to and from the various virtual machines in a manner nearly identical to the physical environments.

**Application Evolution**

There’s a good chance your application won’t need to be completely re-designed to conform to Azure. If you’re lucky, there will be many elements to applications that need only linear upgrades (e.g., Microsoft SQL to Azure SQL; Office 365 identity management to Azure Active Directory). Locate areas requiring minor configuration changes to save time and energy (while also freeing up budget…).

**Application Rearchitecting**

Designing applications as “cloud-first” is not the challenge it once was. If your applications *do*require re-structuring to align with Azure, the Azure Container Service and corresponding features such as the Azure App Services (a way to quickly build, deploy, and scale enterprise-grade web, mobile, and API apps for any platform) will simplify the design of integrated cloud application architectures.

**Phase 3: Prepare for Cloud Transformation**

An enterprise's Azure migration will doubly need a solid Proof of Concept (“POC”) and a Pilot Test to convince stakeholders of its merits. The objective of both is to expose, in clear terms, how Azure will (or won't) change the operation of the business.

A valuable POC can bring about consensus among stakeholders to eliminate any ambiguity in regards to how to launch a transformation. For example, if resources are to be shared across network connectivity (say, in the case of a hybrid application), a POC proving the connectivity between Azure regions and the home office will be valuable.

Furthermore, a Pilot Test lets users observe and interact with the new system—albeit, on a reduced scale—to locate potential hazards. Demo environments might include a single web server, a single application server, and a single database instance. Though a pilot demands more effort than a POC, it offers a much greater chance of user participation and project transparency.

**Phase 4: Migrate to azure**

A migration is finally undertaken during this phase. Depending on how you and your team evaluated and planned your enterprise applications, there will be a  potential to utilize automation capabilities (tools, templates, and processes) to minimize efforts.

Azure’s Resource Template Technology allows you to migrate infrastructures and services in a reusable format to speedily execute migrations at will.  Such automation tools can be tweaked to specification, too.

As you move workloads to Azure, keep track of all affected stakeholders and systems using Modern Enterprise Architecture Management methodologies like Tag Groups, Service Lifecycle tracking, and Fact Sheet subscriptions.