Microsoft Azure Essentials

Microsoft

Azure Essentials Track Summary

Azure Infrastructure

Learn the essential compute, storage, networking, management, monitoring and security components of Azure and how to seamlessly manage your infrastructure in the cloud with Microsoft.
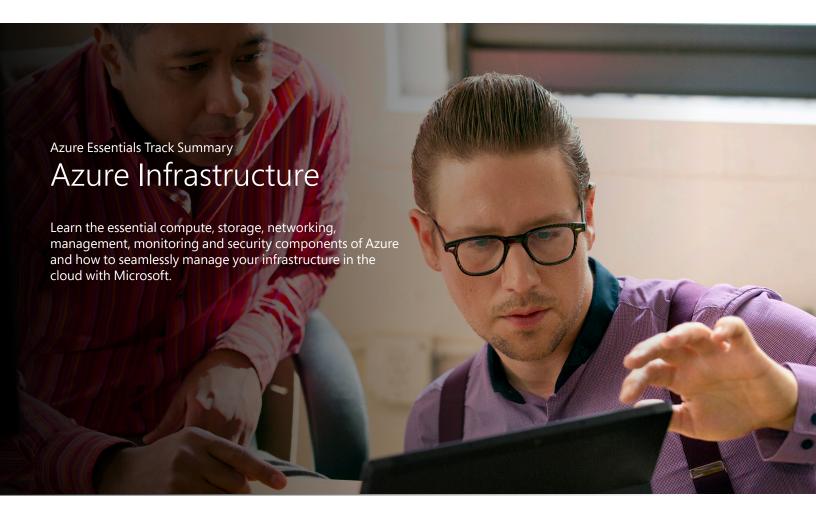
If you're new to Azure as a solution to Infrastructure as a Service (IaaS), this quick summary will break down some of the essentials to plan and implement your solutions on Azure IaaS. Think of this as a primer to your deeper learning.

If you are new to Cloud computing the first question you may have is "what's the difference between IaaS and PaaS?" The simplest way to distinguish between the two models is by taking a look at what's managed by Microsoft as a Cloud vendor and what is managed by you. With PaaS, we run your compute and application services and you manage your applications and data. With IaaS, we manage your compute, storage and networking infrastructure for you and you manage everything else.

Azure offers a robust set of services that comprehensively supports both PaaS and IaaS scenarios. Using IaaS services, Azure becomes the equivalent of your physical data center in the Cloud. We operate over 40 regions globally and growing. A region represents a collection of data centers, which allows

us to respect your data sovereignty needs and provide a robust failover model. You can choose the regions where your infrastructure runs so that it's closest to your data and customers. Access can be over the internet or, to optimize your connection to the service, you can establish a fast and private connection to Azure via Express Route.

In IaaS, compute, storage and networking services resemble those you are familiar with in your data center, but there are some new concepts that help you create resilient and elastically scalable solutions.

COMPUTE

As an IT Professional, you will be familiar with deploying solutions to on-premises infrastructure using Virtual

Machines (VM). Anything you run in compute in a VM on-premises, whether on Windows or Linux, you can easily run in Azure. You only pay for what you use. Azure also offers a large catalog of pre-defined first- and third-party reference VM images that you can deploy. Or you can define your own from within Azure, or deploy images that you have already have. During this specification phase, you can establish a Resource Group to contain your VM configurations, storage and networking requirements within a group. Or, you can choose from hundreds of pre-defined Azure Resource Manager templates available on GitHub that make it easy to configure a complex application in a few clicks. You'll need to specify an Azure location to host your VM and the size of VM you require. Azure offers a range of VM types, differing in the power and performance they offer. You can easily switch between VM types at any time, so only choose what you need.

For example: while doing Dev/Test you may only need the entry-level A-family Virtual Machine for your application. Then, for a higher performance when in production, you may want to switch to using D-family Virtual machines, or a family optimized to the needs of specific workloads. You can learn more about compute sizes at the link below.

An important step in defining your Compute is considering availability and redundancy. Grouping two or more Virtual Machines together in an Availability Set will protect your workloads against downtime. Azure will automatically place Virtual Machines in the same Availability Set across different hardware resources to avoid any single point of failure. Along with Availability Sets, Azure provides several other options such as Traffic Manager, Scale sets and Availability Zones to make your applications highly resilient, available, and scalable.

STORAGE

Azure offers multiple storage types to support both new and existing business applications. You may only need to store small amounts of data, or you may need to store petabytes. Like Compute, you pay only for what you use, and you can scale up and down based on your needs.

For IaaS-based solutions, three storage types are important: Blob, Disk and File storage.

BLOB STORAGE

Azure Blobs provide highly scalable, unstructured storage. You can use them to store just about anything, including text files and documents. Blobs can be made private, or available for public access. You can select from both Hot and Cool blob storage tiers. The Hot tier provides high performance, low latency access. The Cool tier can offer significant cost savings, when you don't require frequent access.

DISK STORAGE

If you wish to attach data disks to your Virtual Machines, Azure offers conventional Hard Disk Drive options, and also Solid-State Drives for your I/O-intensive applications.

FILE STORAGE

Using Azure Files is like having a conventional File Share in the cloud. You may need this if you are migrating applications onto Azure that require support for traditional SMB file storage.

DISASTER RECOVERY

As part of your disaster recovery plan, you can set up your Azure storage to synchronize stored data across two, geographically separated regions, hundreds of miles apart. This means your data is durable even in the event of a complete regional outage or a disaster.

In addition, you can use Azure Site Recovery to protect your entire environment. Azure Site Recovery automates the replication of the virtual machines to a secondary Azure region, based on policies that you set. This will not only replicate your entire Azure IaaS solution, you can also use it to replicate your on-premises systems too.

When it comes to Azure networking, the on-premise concepts you are familiar with also apply in the cloud. When you deploy your Virtual Machines, you do so into a Virtual Network. This becomes your private network address space in which your machines can seamlessly communicate with each other.

For security, you can segment this further, so that you have separate subnets and you can use IP-based Access Control Lists (ACLs) within the subnets. Also, you can apply

load balancing and other common networking concepts, just as you would in your on-premises environments. For hybrid connectivity, you can connect the virtual machines in Azure to Active Directory and on-premises resources, using the Azure Network Gateway.

MANAGEMENT AND SECURITY

Once deployed, you can monitor the health and availability of your IaaS services and your applications through the Azure Portal. Through Azure Monitor, you can easily create dashboards to surface only what you want to monitor. You can use Azure Log Analytics and Azure Application Insights to explore Azure log data and application performance data. Also, you can set up alerts around specific SLAs that you may be tracking.

For granular access control, Role-based Access Control (RBAC) allows you to set different job roles into Resource Groups. You can use these to define the level of access users have when administering Azure. Additionally, for proactive resource optimization, Azure Advisor analyses your resources based on usage and provides personalized recommendations that can be reviewed and implemented easily.

In terms of security one of the most important things you'll want to do is enable Azure Security Center.

This provides a view of the security state of all of your Azure resources. At a glance, you can verify that the appropriate security controls are in place and configured correctly, and quickly identify any resources that require attention - for example, production Virtual Machines that are not using encryption. You can also set up alerts and receive recommendations on how to mitigate a threat.

Azure Infrastructure
Quickstart Topics

CREATE A VIRTUAL MACHINE

Azure virtual machines can be created through the Azure portal. This method provides a browser-based user interface for creating and configuring virtual machines and all related resources. Learn how to create a virtual machine and install a webserver on the VM.

CREATE A STORAGE ACCOUNT

An Azure storage account provides a unique namespace in the cloud to store and access your data objects in Azure Storage. A storage account contains any blobs, files, queues, tables, and disks that you create under that account. Learn how to use each of these options to create your new storage account.

CREATE A VIRTUAL NETWORK

A virtual network enables Azure resources, such as virtual machines (VM), to communicate privately with each other, and with the internet. After creating a virtual network, you deploy two VMs into the virtual network. You then connect to one VM from the internet, and communicate privately between the two VMs. Learn how to create a virtual network with this Quickstart.

Continue Learning

Take advantage of additional learning experiences and tools with these useful resources.

AZURE LEARNING PATHS

Azure Administrator

Azure Solution Architect

MICROSOFT MECHANICS

Hybrid infrastructure Automation with Azure Resource Manager Templates

An Overview of Azure Monitor

Application Insights - Live telemetry across the app lifecycle

Protection via Azure Security Center: Detection and response review

Azure Stack integrated systems - how to bring Azure to your data center

HANDS-ON LABS

Self-paced Labs

ONLINE COURSES

Microsoft Azure Virtual Networks

Microsoft Azure Storage