SHOOTING FOR THE CLOUDS: AN IN-DEPTH LOOK AT CLOUD COMPUTING

#ILTA2015
#ILTACloud

ILTACON 2015

- Rich Lilly

- Michael Kemps

AMAZON WEB SERVICES (AWS)

AND

MICROSOFT AZURE

WADING THROUGH A SEA OF OPTIONS: PLATFORMS

- Variety of providers and platforms

- Differences in ease of use

- Making the right decision for your firm

DECISIONS, DECISIONS

Source: Gartner (July 2014)

CONSIDERATIONS BEFORE JUMPING IN

- Number of users, future growth and expansion
- Uptime requirements by firm
- Amount of data, type of data
- Current equipment lifecycle, server and application versions
- Disaster Recovery Initiatives
- Mobility
- Other Cloud Providers, i.e. SaaS, IaaS
- Telephony (VoIP)
- Security Compliance, firm and client requirements and nature of data stored locally

AMAZON CONTRACTUAL COMMITMENTS?

Amazon EC2 Pricing Options

amazon web services

📦 Pay for what you use:

- 📦 **On-Demand (OD)** : Hourly rate
- 📦 **Reserved Instances (RI)**: One-time upfront fee in exchange for significantly lower hourly fee (up to 65% savings) and a capacity reservation
- 📦 **Spot (SP)**: Bid for unused EC2 capacity, in exchange for up to 92% savings

📦 Plus AWS Free Usage Tier for new customers getting started with EC2

AZURE
CONTRACTUAL COMMITMENTS?

Azure is available for purchase in 140 countries around the world, and we support billing in 24 currencies. You can purchase Azure resources using one of three ways:

Pay-As-You-Go Subscriptions
- Pay-As-You-Go subscriptions are our most popular and flexible payment plan. There are no minimum purchases or commitments and you can cancel anytime. You can pay for them by credit-card as well as by invoice.

Microsoft Resellers
- You can work with the same resellers that you already purchase Microsoft software from using the Open Volume License Program. If you already have purchased Azure from a reseller and have an Open license key, you can activate your Azure subscription or add more credits to it here.

Enterprise Agreements
- Large organizations often sign up for a Microsoft Enterprise Agreement (EA). By making an upfront usage commitment to Azure they earn several additional benefits—including flexible billing options and our very best prices.

AMAZON
REGIONS: WHERE IS MY DATA?

AZURE
REGIONS: WHERE IS MY DATA?

- Data is paired between "sister" datacenters to keep with local compliance/data governance standards in place
  - Cannot replicate out of region unless the organization creates a tunnels and sets up themselves
- Not all services are offered in every region, but generally, features are adding across various regions in phases
- Microsoft also allows customers access to Preview features that are not Generally Available but can test them before they go live (Optional)
- Additional locations coming onboard in Canada as well as India
- Microsoft does hold Datacenter tours, reach out to your Microsoft reps!

AZURE
REGIONS: WHERE IS MY DATA?

Locations

Azure operates out of 17 regions around the world. Geographic expansion is a priority for Azure because it enables our customers to achieve higher performance and it supports their requirements and preferences regarding data location.

AZURE REGION	LOCATION
Central US	Iowa
East US	Virginia
East US 2	Virginia
US Gov Iowa	Iowa
US Gov Virginia	Virginia
North Central US	Illinois
South Central US	Texas
West US	California
North Europe	Ireland
West Europe	Netherlands
East Asia	Hong Kong
Southeast Asia	Singapore
Japan East	Saitama Prefecture
Japan West	Osaka Prefecture
Brazil South	Sao Paulo State
Australia East	New South Wales
Australia Southeast	Victoria

AMAZON
SERVER INSTANCES:
SELECTION AND GROWTH

Instance Category	Instance Name	Cores	RAM (GB)
Small	m3.medium	1	3.75
Medium	m3.large	2	7.5
Medium	c3.large	2	3.75
Medium	m2.xlarge	2	17.1
Large	m3.xlarge	4	15
Large	c3.xlarge	4	7.5
Large	m2.2xlarge	4	34.2
Large	i2.xlarge	4	30.5
Extra Large	m3.2xlarge	8	30
Extra Large	c3.2xlarge	8	15
Extra Large	m2.4xlarge	8	68.4
Extra Large	i2.2xlarge	8	61
Extra Extra Large	c3.4xlarge	16	30
Extra Extra Large	i2.4xlarge	16	122
Extra Extra Large	hs1.8xlarge	16	117
Extra Extra Large	c3.8xlarge	32	60
Extra Extra Large	i2.8xlarge	32	244

AZURE
SERVER INSTANCES:
SELECTION AND GROWTH

AMAZON
HOW IS STORAGE
CONFIGURED?

Amazon Elastic Block Store (EBS)

Elastic Block Storage: Persistent Storage for EC2
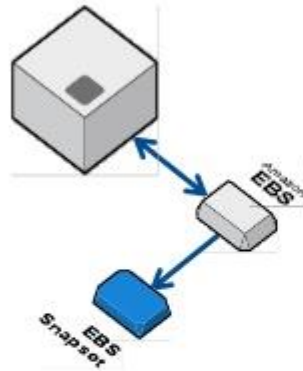
High performance block storage device
Mount as drives to instances
Persistent and independent of instance lifecycle

Feature	Details
High performance file system	Mount EBS as drives and format as required
Flexible size	Volumes from 1GB to 1TB in size
Secure	Private to your instances
Available	Replicated within an Availability Zone
Backups	Volumes can be snapshotted for point in time restore
Monitoring	Detailed metrics captured via Cloud Watch

AMAZON
HOW IS STORAGE CONFIGURED?

Standard and Provisioned IOPS Volume Types

	Standard Volumes	**Provisioned IOPS Volumes**
Optimized for	Workloads with low or moderate IOPS needs and occasional bursts.	Transactional workloads requiring consistent IOPS.
Volume Attributes	Up to 1 TB, average 100 IOPS per volume. Best effort performance. Can be striped together for larger size and higher IOPS.	Up to 1TB, 4,000 IOPS per volume. Consistent IOPS. Can be striped together for larger size and higher IOPS.
Workloads	File server, Log processing, Websites, Analytics, Boot, etc.	Business applications, MongoDB, SQL server, MySQL, Postgres, Oracle, etc.

AZURE
HOW IS STORAGE CONFIGURED?

	LOCALLY REDUNDANT STORAGE (LRS)	ZONE REDUNDANT STORAGE (ZRS)	GEOGRAPHICALLY REDUNDANT STORAGE (GRS)	READ-ACCESS GEOGRAPHICALLY REDUNDANT STORAGE (RA-GRS)
How it works	Makes multiple synchronous copies of your data within a single datacenter	Stores three copies of data across multiple datacenters within or across regions. For block blobs only.	Same as LRS, plus multiple asynchronous copies to a second datacenter hundreds of miles away	Same as GRS, plus read access to the secondary datacenter
Total copies	3	3	6	6
Why use it	For economical local storage or data governance compliance	An economical, higher durability option for block blob storage	For protection against a major datacenter outage or disaster	Provides read access to data during an outage, for maximum data availability and durability
Availability SLA	99.9% read/write	99.9% read/write	99.9% read/write	99.9% write 99.99% read

AZURE
HOW IS STORAGE CONFIGURED?

- Block Blobs
- Files (Preview)
- Page Blobs & Disks
- Tables & Queues
- Storage Transactions
- Additional offerings: Premium storage, Import/Export service

AMAZON
WHAT ABOUT ENCRYPTION?

- Key Management Service (KMS) with Hardware Secure Module (HSM) integration

- Server-side encryption configured at EBS volume creation

- Client-side encryption supported with client-managed encryption keys and tools

AMAZON
VOLUME ENCRYPTION

AZURE
WHAT ABOUT ENCRYPTION?

- Microsoft Azure Storage Client-Side Encryption Goes into General Availability (Aug 10, 2015)

- Azure Virtual Machine Disk Encryption using CloudLink

- Key management through Azure Key Vault with HSM integration

AMAZON
BACKUP AND DISASTER RECOVERY

AMAZON
BACKUP AND DISASTER RECOVERY

AZURE
BACKUP AND DISASTER RECOVERY

Gets the list of IaaS VMs from the Azure fabric — 1. Discover

Installs the extention on selected VMs before backup — 2. Register

Sets up the backup + retention policy — 3. Protect

1.Discover: This step gets a list of all IaaS VMs in the same region that have not already been protected.

2.Register: This one-time step installs the backup extension into the selected VMs in preparation for backup.

3.Protect: This step involves setting the backup and retention policy for the VM. As per the backup policy, the initial replication of the VM's data will automatically be done, and will be followed by incremental backup at the predefined schedule.

AZURE
BACKUP AND DISASTER RECOVERY

AZURE
BACKUP AND DISASTER RECOVERY

Replication

Hyper-V   Hyper-V

1 Hyper-V to Hyper-V
(on-premises)

Replication

SAN   SAN

Hyper-V   Hyper-V

2 Hyper-V to Hyper-V
(on-premises)

Replication

Hyper-V   Microsoft
                 Azure

3 Hyper-V to Microsoft Azure

Replication

VMware or physical   VMware

4 VMware or physical to VMware
(on-premises)

Replication

VMware or physical   Microsoft
                            Azure

5 VMware or physical to
Microsoft Azure
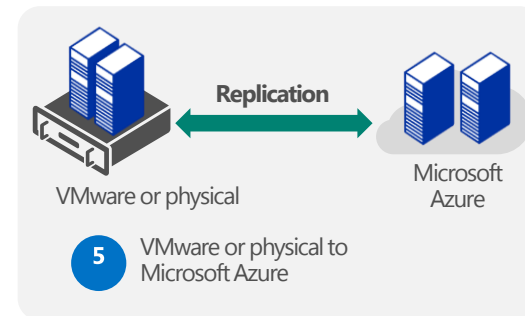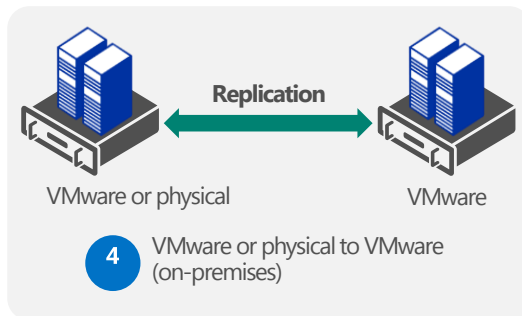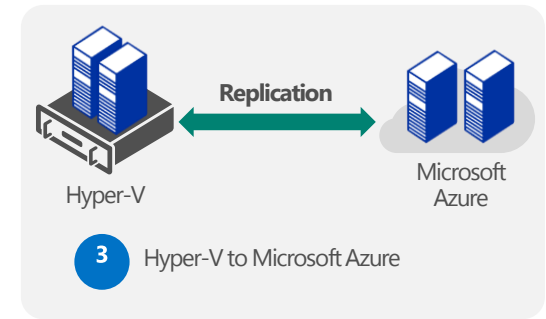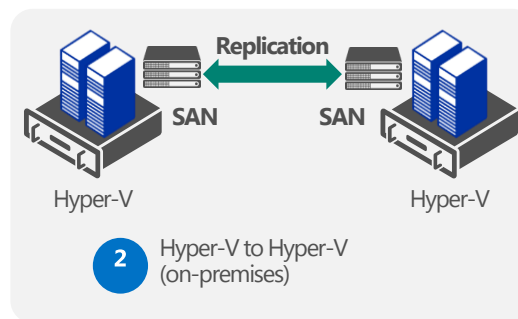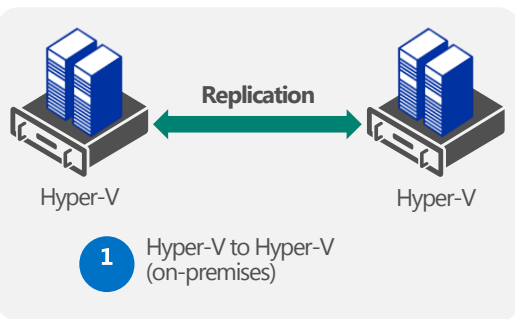
AMAZON
MONITORING AND METRICS
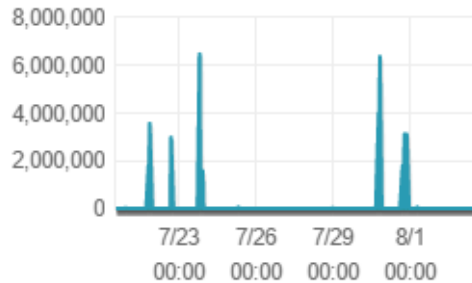

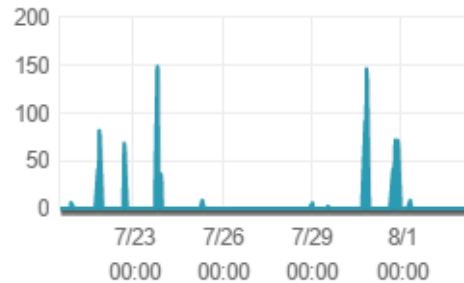**CPU Utilization** (Percent)
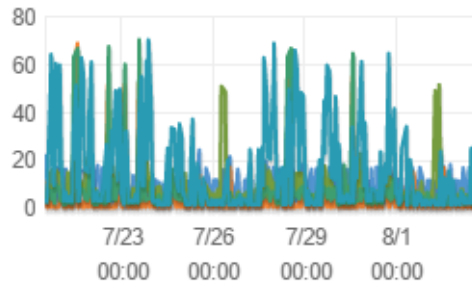
Disk Reads (Bytes)
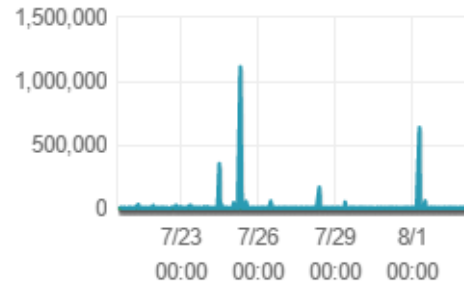
Disk Read Operations (Operations)
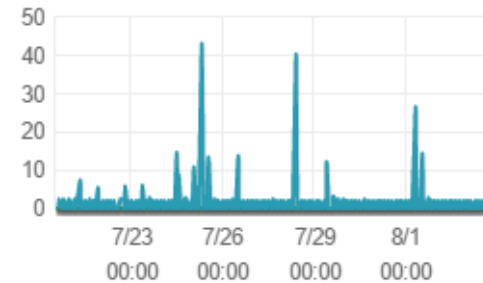
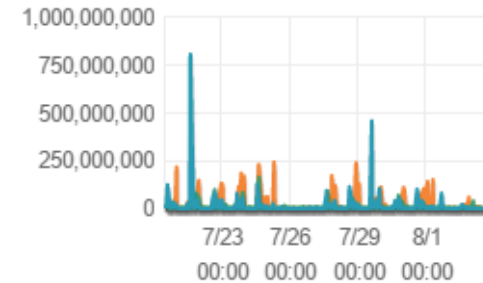**Disk Writes** (Bytes)

Disk Write Operations (Operations)

Network In (Bytes)

AZURE
MONITORING AND METRICS

QUESTIONS?