Azure Discovery Day

Arjun Ramakrishnan
Sr. Product Marketing Manager
Microsoft
Digital transformation

1. Engage your customers
2. Transform your products
3. Empower your employees
4. Optimize your operations
GOING DIGITAL

1 million/hour new devices coming online by 2020

12 years average age of S&P 500 corporations by 2020

60% computing in the public cloud by 2025
Azure Discovery Day

Amit Ghodke
Sr. Premier Field Engineer
Microsoft
What can you do in Azure?
Storage
Microsoft Azure Storage Abstractions

Blobs
Simple named files along with metadata for the file.

Files
Exposes blob storage as an SMB 2.1 file share

Tables
Structured storage. A table is a set of entities; an entity is a set of properties.

Queues
Reliable storage and delivery of messages for an application.
Microsoft Azure Storage

- Highly durable and scalable
- Multiple copies of your data
- Financially backed SLAs
Automatic Storage Redundancy

Windows Azure Storage
Defend against regional disasters

Melbourne DC
Sydney DC

Geo replication enabled by default

> 600 KM
Premium Storage

- SSD based storage
- Add up to 64 TB of storage per VM
- Capable of >80,000 IOPS per VM
- Less than 1ms read latency
Cool Storage

Generally Available
Low-cost Blob storage
As low as $0.01 per gigabyte
Public Preview: Storage Service Encryption

Encrypt Block and Page Blobs
256-bit AES encryption
Fully managed encryption process
Import/Export Your Data

Fast data transfer to Azure
Encrypted data transfer
Efficient recovery
Office 365 Import Service

Customer

100 Terabytes

Import service

Bitlockered HDD

COURIER SERVICE

Bitlockered HDD

Export service

BLOB STORAGE

Azure Datacenter
Hybrid Cloud Storage
StorSimple
Networking
## Hybrid Networking Scenarios

<table>
<thead>
<tr>
<th>Cloud</th>
<th>Customer</th>
<th>Segment &amp; Workloads</th>
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<tbody>
<tr>
<td>![Cloud Icon]</td>
<td>![Customer Icon]</td>
<td><strong>Secure point-to-site connectivity</strong>&lt;br&gt;Virtual network (Point-to-Site)</td>
</tr>
<tr>
<td>![Cloud Icon]</td>
<td>![Customer Icon]</td>
<td><strong>Secure site-to-site VPN connectivity</strong>&lt;br&gt;Virtual network (Site-to-Site)</td>
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<tr>
<td>![Cloud Icon]</td>
<td>![Customer Icon]</td>
<td><strong>Private site-to-site connectivity</strong>&lt;br&gt;ExpressRoute</td>
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Virtual Network and ExpressRoute

Scenario 1: IPSec VPN over internet
- Connect via an encrypted link over public internet

Scenario 2: Exchange Provider
- Peer at an ExpressRoute location, an Exchange Provider facility

Scenario 3: Network Service Provider
- Connection from a WAN provided by Network Service Provider. Azure becomes another site on the customer’s WAN network.

Virtual Network - Compute only.
ExpressRoute - Provides customer choice and include access to compute, storage, and other Azure services.
Networking

- Reserved IPs
- Multiple NIC’s
- Forced Tunneling
- Network Security Groups
- Virtual Network Appliances
- Multiple load balanced IPs per VM
- Create virtual networks with private or public IP ranges
- High performance S2S VPN gateways (200Mbps vs 100Mbps)
Identity
Azure Active Directory

- Simple connection
- Self-service
- Single sign on

Windows Server Active Directory
Other Directories
On-premises

Microsoft Azure Active Directory
B2C & B2B

Azure
Public cloud
Office 365
SaaS
Cloud

On-premises

Simple connection

Self-service

Single sign on

Username
Password
AAD Connect

- Connects On-Premises AD to Azure AD
- Sync's Users, Contacts and Groups
- Supports multi-forest topologies
- Supports "Staging Mode" for warm standby
- Choose between Password Synchronisation or ADFS
- Facilitates AAD premium features (writeback passwords, users, groups, and devices)
Identity Synchronization with password (hash) sync

Flexible Authentication Options

User attributes are synchronized using Identity Synchronization services including a password hash, Authentication is completed against Azure Active Directory.

User attributes are synchronized using Identity Synchronization tools, Authentication is passed back through federation and completed against Windows Server Active Directory.
Azure AD Application Gallery

- Federation in the cloud
- Instantly configure your favorite SaaS app for single sign-on
- Over 2500 3rd party pre-configured SaaS apps to choose from
Azure AD Application Proxy

- A no DMZ solution
- A cloud based proxy hosted in Azure
- No extra server infrastructure On-Premises required
- Make On-Premises web apps available in a secure manner to authenticated users
- On-Premises web apps do not need to be exposed to the internet
Azure DNS

- Host and manage your public DNS domains in Azure
- Rapid updates to DNS records
- Global footprint & ultra-available
- Anycast fast query performance
Compute
Announcing

New N family of virtual machines

Latest NVIDIA GPU
Superfast RDMA network
High-end remote visualization
Announcing
New F family of virtual machines

2 GB RAM & 8 GB (SSD) per CPU core
2.4-GHz Intel Xeon E5-2673 v3 (Haswell) processor
Clock speeds as high as 3.1 GHz
G series virtual machines

Optimized for data workloads

Up to:
32 CPU cores
450 GB RAM
6.5 TB local SSD

Latest generation Intel processor
Scale-up options

Highest value

NSD Storage
35% faster than D
Intel E5-2673 v3 CPUs

Computer-intensive fastest CPUs

GB Optical DAS
Remote visualization
NVIDIA GPUs
Compute-intensive + RDMA

Largest virtual machines
Fastest storage in the public cloud
VM Scale Sets

- Generally Available
- Reliably deploy and update at large scale
- Scale automatically
- Simplify networking
- Support hyperscale workloads
What’s New About IaaS v2

• **v2: ARM APIs**
  • Tags and RBAC at granular levels
  • More asynchronous operations - massive and parallel deployment of VMs
  • Dependencies
  • Network resource types are separate from compute
  • 3 Fault Domains in Availability Sets
  • Part of Azure-consistent private cloud. Deploy same JSON template in Azure or Azure Stack
Management models for IaaS

Classic Model (v1)
- Cloud Service
  - VM w/ IP Address
  - Load Balanced Endpoint w/ IP Address
- Storage Account
  - Disk (blob)
- Virtual Network
  - Subnet-1

Resource Manager (V2)
- Resource Group
  - VM
  - NIC
  - VM IP Address
  - VNet
  - Load Balancer
  - LB IP Address
- Storage Account
  - Disk (blob)
- Network Security Group ACLS
  (deployed to VM, NIC, or Subnet)
VM Availability Sets

- Update domains are honored by host OS updates
Question...
How long would it take to create this SharePoint environment today in Dev/Test?

SharePoint Server Farm
Microsoft
You can now easily deploy a highly available SharePoint server farm in Azure. This is designed to help you achieve new levels of reliability and performance, delivering features and capabilities that simplify administration, protect communications and information.

Create
Visual Studio ARM Project Template

• Visual Studio 2013 Update 4 or Visual Studio 2015
• Azure SDK 2.8.x
• New ‘Azure Resource Group’ project available
• GUI JSON Editor
```json
{
    "contentVersion": "1.0.0.0",
    "parameters": {
        "newStorageAccountName": {
            "type": "string",
            "metadata": {
                "description": "This is the name of the storage account"
            }
        },
        "vmName": {
            "type": "string",
            "metadata": {
                "description": "This is the name of the Virtual Machine"
            }
        },
        "vmSize": {
            "type": "string",
            "defaultValue": "Standard_D2",
            "metadata": {
                "description": "This is the size of the Virtual Machine"
            }
        },
        "imagePublisher": {
            "type": "string",
            "defaultValue": "MicrosoftWindowsServer",
            "metadata": {
                "description": "Image Publisher"
            }
        },
        "imageOffer": {
            "type": "string",
            "defaultValue": "WindowsServer",
            "metadata": {
                "description": "Image Offer"
            }
        },
        "imageSKU": {
            "type": "string"
        }
    }
}
```
Dev-Test Labs

Generally Available
Self-service without the worry
Quickly get to "ready to test"
Create once, use everywhere
Integrates with your existing toolchain
Containers
Containers Introduction

What:
- Virtualization Technology
- Host applications (processes)
- Shared kernel architecture

Why:
- Fast Start
- Hyper Density
- Portable
- Potential to change how application are written and datacenters operate.
## Container Images

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<th>Container Host</th>
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<td>Application 1</td>
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<tr>
<td>Prerequisites VSRD</td>
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<tr>
<td>Base OS Image</td>
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<td>Application 2</td>
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Enterprise Mobility & Security
What is EMS E3?

**DEVICE & APP MANAGEMENT**
- Microsoft Intune
  - Manage Android, iOS and Windows devices

**IDENTITY MANAGEMENT**
- Azure Active Directory Premium P1
  - Protect and manage identities

**DATA PROTECTION**
- Azure Information Protection P1
  - Protect information at the file level

**SECURITY**
- Advanced Threat Analytics
  - Detect threats and exploits fast with behavioral analytics
What is EMS E5?

**DEVICE & APP MANAGEMENT**
- Microsoft Intune
  - Manage Android, iOS and Windows devices

**IDENTITY MANAGEMENT**
- Azure Active Directory Premium P2
  - Protect and manage identities

**DATA PROTECTION**
- Azure Information Protection P2
  - Protect information at the file level

**SECURITY**
- Advanced Threat Analytics
  - Detect threats and exploits fast with behavioral analytics

**SECURITY**
- Cloud App Security
  - Discover, Investigate, secure and control cloud usage
<table>
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<tr>
<th>Enterprise Mobility + Security</th>
<th>Managed mobile productivity</th>
<th>Information protection</th>
<th>Identity-driven security</th>
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</table>
| **Identity and access management** | **Azure Active Directory Premium P2**  
Identity and access management with advanced protection for users and privileged identities  
*(includes all capabilities in P1)* | **Azure Information Protection Premium P2**  
Intelligent classification and encryption for files shared inside and outside your organization  
*(includes all capabilities in P1)* | **Microsoft Cloud App Security**  
Enterprise-grade visibility, control, and protection for your cloud applications |
| **Managed mobile productivity** | **Microsoft Intune**  
Mobile device and app management to protect corporate apps and data on any device | **Azure Information Protection Premium P1**  
Encryption for all files and storage locations  
Cloud-based file tracking | **Microsoft Advanced Threat Analytics**  
Protection from advanced targeted attacks leveraging user and entity behavioral analytics |
| **Identity-driven security** | **Azure Active Directory Premium P1**  
Secure single sign-on to cloud and on-premises apps  
MFA, conditional access, and advanced security reporting | | |
AAD Premium Features

- Self-Service Group and app Management/Self-Service application additions/ Dynamic Groups
- Self-Service Password Reset/Change/Unlock with on-premises write-back
- Multi-Factor Authentication (Cloud and On-premises (MFA Server))
- MIM CAL + MIM Server
- Cloud App Discovery
- Connect Health
- Automatic password rollover for group accounts
Azure AD Multi-Factor Authentication

- Secure cloud or On-Premises resources
- Using existing personal or company provided phones
- Users manage their own authentication methods and phone numbers
- Verification options include phone call, text message, or mobile app notification
Enterprise mobility management with Intune

- Mobile device management
- Mobile application management
- PC management

Microsoft Intune
Azure RMS ecosystem

Office apps, RMS sharing app, SDKs on all platforms like Windows, iOS, Android, Windows Phone and Mac OS

Azure RMS provides the Rights Management capabilities for Office 365, providing easy enablement and enforcement of information protection policies

Connect to on-premises Exchange and SharePoint for the simplest way to get Rights Management running in your organization

Offer: BYO Key

Document Tracking and Revocation

Leverage a common identity across Active Directory and Azure Active Directory

Connect to Windows Server File Services
Operations Management Suite
Enable a unified view of all your IT assets whether on-premises or in the cloud.

- Log Analytics
- Automation
- Backup
- Site Recovery
- System Center*
Azure Backup - Files

- Backups are encrypted
- Efficient use of storage through compression
- Restore to the same server or different
- Integrates with DPM
- Retain data for up to 99 years
Azure Backup – VM’s

- Agentless backup
- No shut down of VM required
- No On-Premises resources required
- Perform scheduled daily or weekly backups
Azure Site Recovery

Replicate and protect physical, VMware, AWS and Hyper-V VMs to Azure

- Migration cutovers to Azure in as little as minutes
- Automated asset discovery and migration
- On the fly conversion of source VM
- Auto-provisioned target Azure VM’s
- Near zero downtime and data loss
- Failback to VMware infrastructure from Azure
- Runbook authoring in Azure
- High availability engine
- Integrate into other systems
- Store secure credentials
- Desired State Configuration
- Source Control
- Hybrid Worker
- Script Gallery
Azure App Service
Web Apps

- Just websites, hosted on VMs
- Choose between Free/Shared/Basic/Standard
- Sites can auto-scale quickly to handle high traffic loads
- Built-in load balancing and traffic manager provide high availability
- Develop and deploy your own, or choose from a gallery
- Create a Hybrid Web App by linking to a Virtual Network

Frameworks
- ASP.NET
- Python
- Node.js
- PHP

Databases
- MySQL
- SQL Database
- Tables

Galleries
- DNN Platform
- Drupal
- WordPress

Tools
- Visual Studio Publishing
- FTP
- GitHub

Deployment
- Standard
- 1 Site
- to
- 500 Sites
Cloud Services

- Designed to support applications that are scalable, reliable, and cheap to operate
- Architect your solution to be placed into Web or Worker roles
- Roles are VMs, unlike Web Apps you have more control over these VMs
- Install your own software on Cloud Service VMs and remote into them
- Auto-scale and built-in load balancer
- Scale up to 350 instances per cloud service
- Production and Staging environments provided
Mobile Services
Azure Websites

→ Unique integrated offering
→ Build intelligent web and mobile apps

Azure App Service

Web Apps
Mobile Apps
Logic Apps
API Apps
Traffic Manager

www.contoso.com
Data Insights
Azure SQL Database

Scale up 350x

Database Throughput Units (DTUs)

B  S0  S1  S2  S3  P1  P2  P4  P6  P11

BASIC  STANDARD  PREMIUM
Manual Backup to Azure Storage

Secure your Data
Benefits of Backing Up to Azure Storage

- Flexible, reliable, limitless off-site storage
- Backup Archive
- 1-time backup
- No overhead of hardware management
- By-pass Azure VM attached disk limit
- Cost
Managed Backup to Azure

More options to store your database
Managed Backup to Azure

• What is it?
  • An agent that manages and automates SQL Server backup policy

• Benefits
  • Simple + flexible
    • Minimal input – control retention period
    • Manages entire instance, or individual DBs
  • Leverages Backup to Azure (page blob)
    • Supports backup encryption
    • Inherently off-site & geo-redundant
    • Minimal storage cost/hardware management
  • Intelligence built-in
    • Retention
    • Context-aware – e.g. workload/throttling
    • Backups consider log accumulation

Example:
EXEC smart_admin.sp_set_db_backup
  @database_name='TestDB',
  @retention_days=30,
  @credential_name='MyCredential',
  @encryption_algorithm='NO_ENCRYPTION',
  @enable_backup=1
GO
Stretch Your SQL Server

Current landscape
Stretch mindset
How it works
Only on SQL Server 2016

Be flexible
Keep, keep, keep!

Business owners, end-users, ...

Cut, cut, cut!

Storage admins, budget owners, ...

DBA
StretchDB – automatic scaling

On-premises

On-premises SQL Server instance

DB in SAN/Local Storage

On-premises application(s)

Storage Shard 1

Ord_detail archive table

Txn_detail table (cold rows only)

Storage Shard 2

Ord_detail archive table

Txn_detail table (cold rows only)

Azure

Compute

Transparent scaleout
Hadoop / HDInsight

Why do it?
How to do it?

Be Bold
Introducing Apache Hadoop

Apache Open Source Project
Highly scalable distributed file system (HDFS)
Distributed processing on data nodes

Data Volumes

Data Variety

Data Velocity
Hadoop is a platform with portfolio of projects

- Governed by Apache Software Foundation (ASF)
- Comprises core services of MapReduce, HDFS, and YARN
- In addition to the core, includes functions across:
  - Data services which allow you to manipulate and move data (Hive, HBase, Pig, Flume, Sqoop)
  - Operational services which help manage the cluster (Ambari, Falcon, and Oozie)

http://Hortonworks.com/hdp/whats-new

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<th>Security</th>
<th>Operations</th>
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<td>Batch Mapreduce, Pig</td>
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<td>Script Hive/Tez, HCatalog</td>
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<td>YARN: data operating system</td>
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<td>Cluster: Knox</td>
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PowerBI

What is it? Really?
Lets clear some cloud around it

POWERFUL data visualization
See all your data in a single pane of glass
Live dashboards and interactive reports

- Monitor live dashboards for the data that matters most
- Track your data in real-time with support for streaming data
- Drill through to underlying reports to explore and discover new insight
- Pin new visualizations and KPIs to monitor performance
Power BI Overview

**Business analyst tools**
- Excel
- Power BI Desktop

**On-premises data**
- SQL Server analysis services
- Databases and other data sources

**Microsoft cloud**
- Azure data services
- Dynamics

**Microsoft cloud**
- Office 365
- Partner apps

**Non-Microsoft cloud**
- Non Microsoft cloud software systems (e.g., SaaS applications, IoT scenarios, and data streams)

**Web browser**
- Web browser with Power BI interface

**Mobile apps**
- Apps for Windows, iOS, Android
Azure ML

Overview of Machine Learning
Overview of Azure ML

POWERFUL data visualization
Microsoft Azure Machine Learning
Features and Benefits

Reduce complexity to broaden participation

• Accessible through a web browser, no software to install;
• Collaborative work with anyone, anywhere via Azure workspace
• Visual composition with end2end support for data science workflow;
• Best in class ML algorithms;
• Extensible, support for R OSS.
Microsoft Azure Machine Learning

Features and Benefits

Rapid experimentation to create a better model

Immutable library of models, search discover and reuse;

Rapidly try a range of features, ML algorithms and modeling strategies;

Quickly deploy model as Azure web service to our ML API service.
What next?
Try Azure App Service

https://trywebsites.azurewebsites.net/

Select app type
- Web App
- Mobile App
- API App
- Logic App
Migrating IIS to Azure

- Windows Server 2003 is EOL
- 22M instances still running worldwide
- 17% are running IIS
- 1 in 6 instances use SQL 2005
- 53% are non-virtualized physical instances

https://www.migratetoazure.net/
Get started
Visit azure.microsoft.com

http://aka.ms/try-azure
http://aka.ms/azuredd