

Port your AWS knowledge to Azure

김대우 부장

Technology Evangelist

Microsoft

daewoo.kim@



Microsoft Azure



어플리케이션 혁신

클라우드로 혁신을 가속



데이터와 인텔리전스

의사결정과 어플리케이션 인사이트



개방과 유연성

자유롭게 구축하고, 어느 곳이나 배포



신뢰

비즈니스 보호

더 빠르고 쉽게 앱을 구축

Build on PaaS



Existing frameworks



Web and mobile



Microservices



Serverless Compute

Build on IaaS



Storage

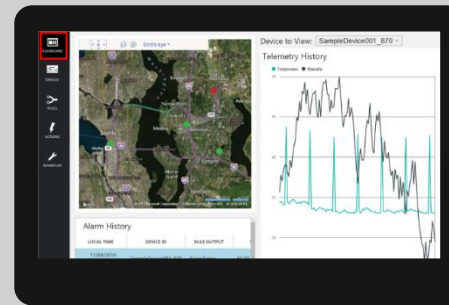


Virtual machines



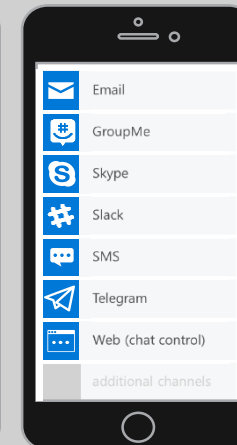
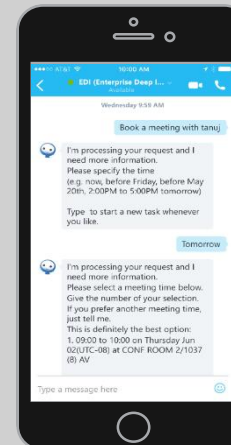
Networking

Azure IoT Suite

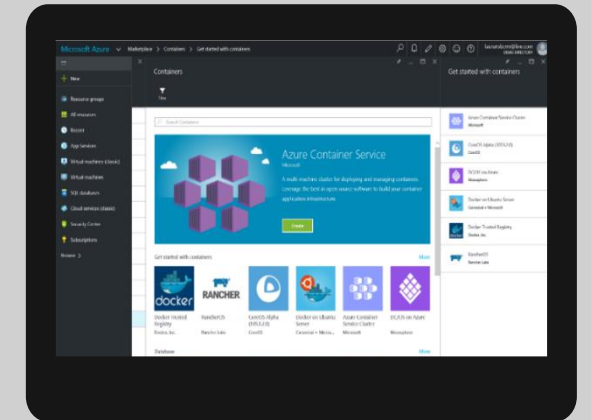


Bot framework

Cognitive Services



Azure Marketplace



다양한 오픈소스 솔루션을 구축하고 실행

Any tool, application, framework

Applications



DevOps



Frameworks



Databases & middleware



Containers



Infrastructure



Port your AWS
Knowledge and
Experience

개발자의 시선

용어 정리

Description	Microsoft Azure	Amazon Web Services
Billing container	구독(Subscription)	계정(Account)
Security Principal	Subscription/Account Admin	Root Account
Access Control	Role Based Access Control (RBAC)	Identity and Access Management (IAM)
Directory Service	Azure Active Directory (AD)	AWS Directory Service
Geo locations	지역(Region)	지역(Region)
User Interfaces	관리 포털(Management Portal)	관리 콘솔(Management Console)
Management & Monitoring	Azure Diagnostics + App Insights	Cloud Watch
Infrastructure as Code	Azure Resource Manager	Cloud Formation
Grouping Mechanism	Resource Groups	Resource Groups
Metadata	Tags	Tags
Automation	Azure SDK, PowerShell + CLI	AWS SDK, PowerShell + CLI

과금 비교

Azure


- Global availability and Billing support in 24 Currencies
- Billing for Azure Services is Per Minute
- All Data going into an Azure Datacenter is free, while Egress Data has a fee
- Subscription Types: Pay-As-You-Go, Compute Pre-Purchase with EA, Cloud Solution Providers.
- Azure Hybrid Use Benefits allows for running Windows VMs on Azure for Base Computing Price if Customer has Software Assurance



AWS

- Global availability, with some billing support in other currencies, but can only be paid via credit card
- All Data going into an Azure Datacenter is free, while Egress Data has a fee
- Four Ways to pay for EC2: On-Demand, Reserved Instances, Spot Instances or Dedicated Hosts.
- On-Demand is billed Hourly, Reserved Instances discounted based on term, Dedicated Host provide software savings (On-Demand or Reserved Instances)

가격 계산기

 Virtual Machines

REGION:
West US

TYPE:
Windows

PRICING TIER:
Basic

INSTANCE SIZE:
A0 1 cores 0.75 GB RAM 20 GB disk \$0.018/hr

1


 ×

744

 = \$13.39/MO

Virtual Machines Hours

<https://azure.microsoft.com/en-us/pricing/calculator>

 **amazon** web services **SIMPLE MONTHLY CALCULATOR** [Need Help?](#)

Get Started with AWS: [Learn more about our Free Tier](#) or [Sign Up for an AWS Account](#)

Reset All

FREE U

Choose

Amazon EC2

Amazon S3

Amazon Route 53

Amazon CloudFront

Amazon RDS

Amazon DynamoDB

Amazon ElastiCache

Select Billing Option
Instance Type: t1.micro
Operating System: Linux
Usage: 100 % Utilized/Month

Per Instance Prices & Projected Costs (all in USD)

Select	Name	Upfront Price	Effective Hourly Cost	Effective Monthly Cost	1 Year Cost	3 Year Cost
<input checked="" type="radio"/>	On-Demand (No Contract)	---	0.020	14.64	175.68	527.04
<input type="radio"/>	1 Yr No Upfront Reserved	0.00	0.014	10.22	122.64	367.92
<input type="radio"/>	1 Yr Partial Upfront Reserved	62.00	0.012	8.82	105.80	317.40
<input type="radio"/>	1 Yr All Upfront Reserved	103.00	0.012	8.59	103.00	309.00
<input type="radio"/>	3 Yr Partial Upfront Reserved	100.00	0.009	6.43	---	231.40
<input type="radio"/>	3 Yr All Upfront Reserved	217.00	0.008	6.03	---	217.00

Close

<http://calculator.s3.amazonaws.com/index.html>

인증 비교

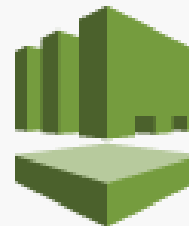
Azure

Azure Active Directory

Multi-tenant PaaS solution for Identity
Integrated with Microsoft Accounts
(@hotmail.com, @outlook.com, etc.)
Multi-factor Authentication Available

Rich support for SaaS application
integration

Free tier supports up to 500K Objects
(paid tiers unlimited)



AWS

Identity Access Management

Manage Users, Groups, Roles, Policies
Multi-factor Authentication Available
Roles are assigned to Resources

AWS Directory Service (for AD Integration)

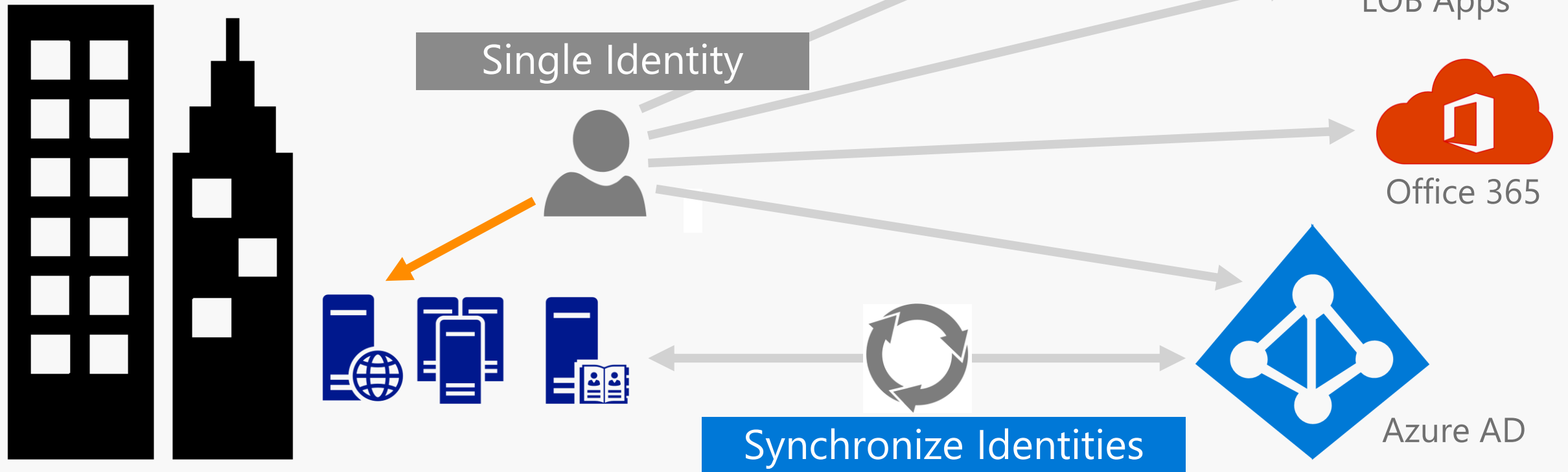
Supports 50K Users | 200K Objects

Azure Active Directory를 이용한 인증

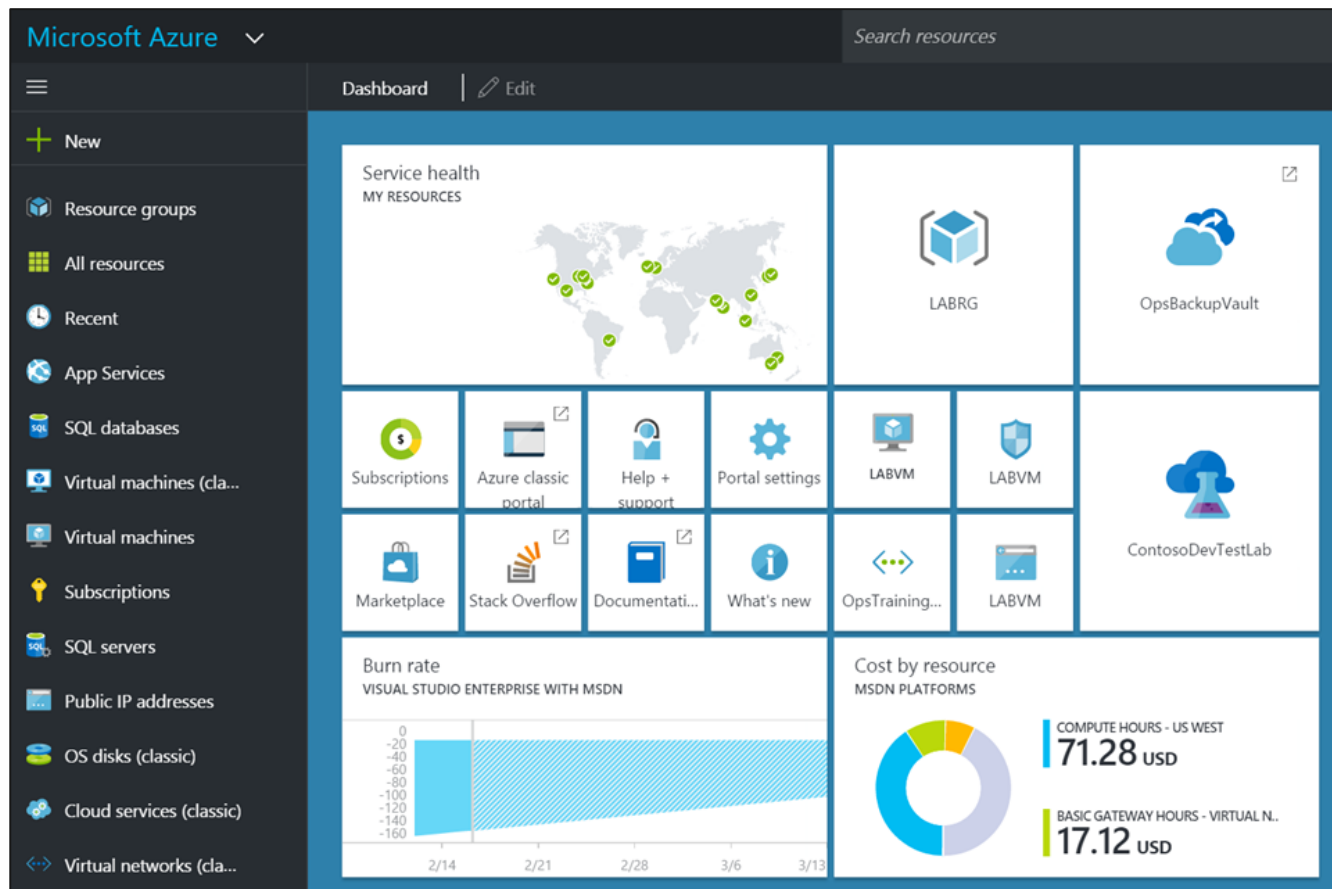
혜택

- 사용자는 오직 하나의 아이디만 관리
- 하나의 인증 계정으로 모두 관리

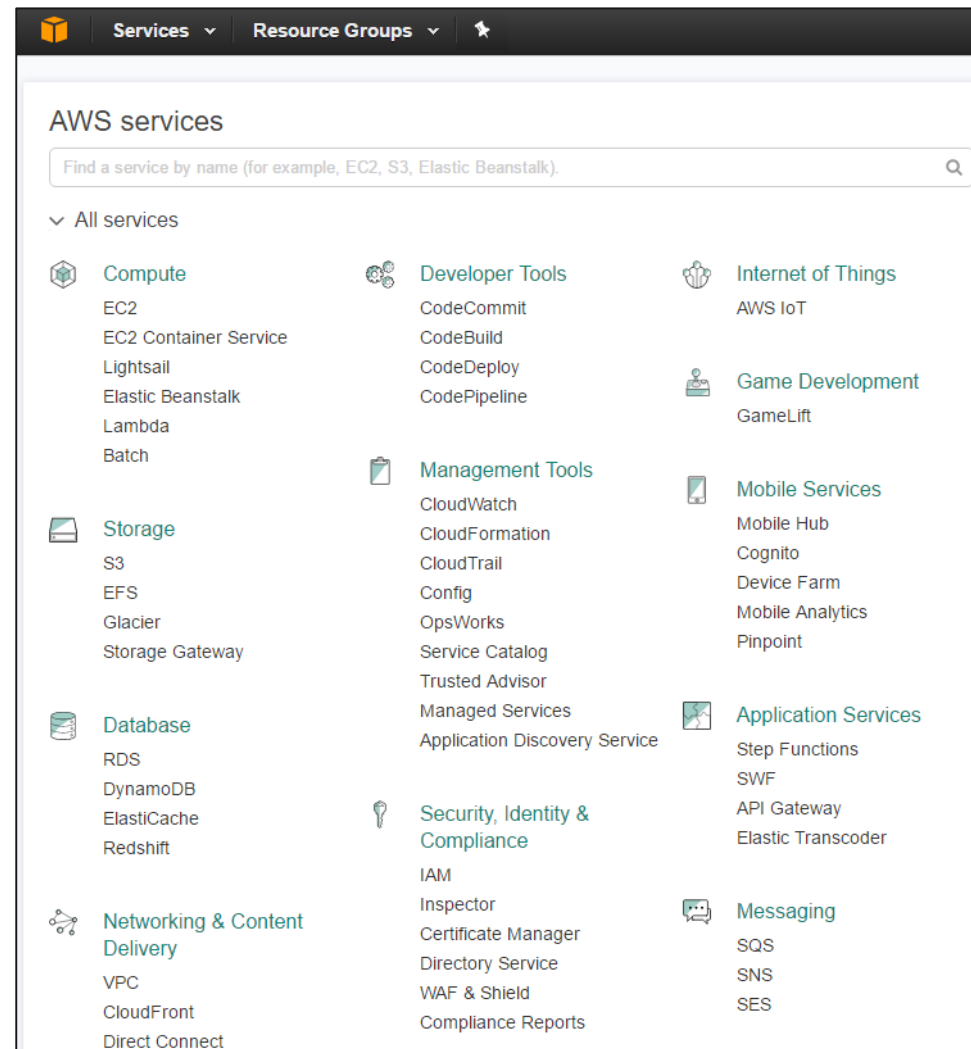
Enterprise



Azure & AWS 관리



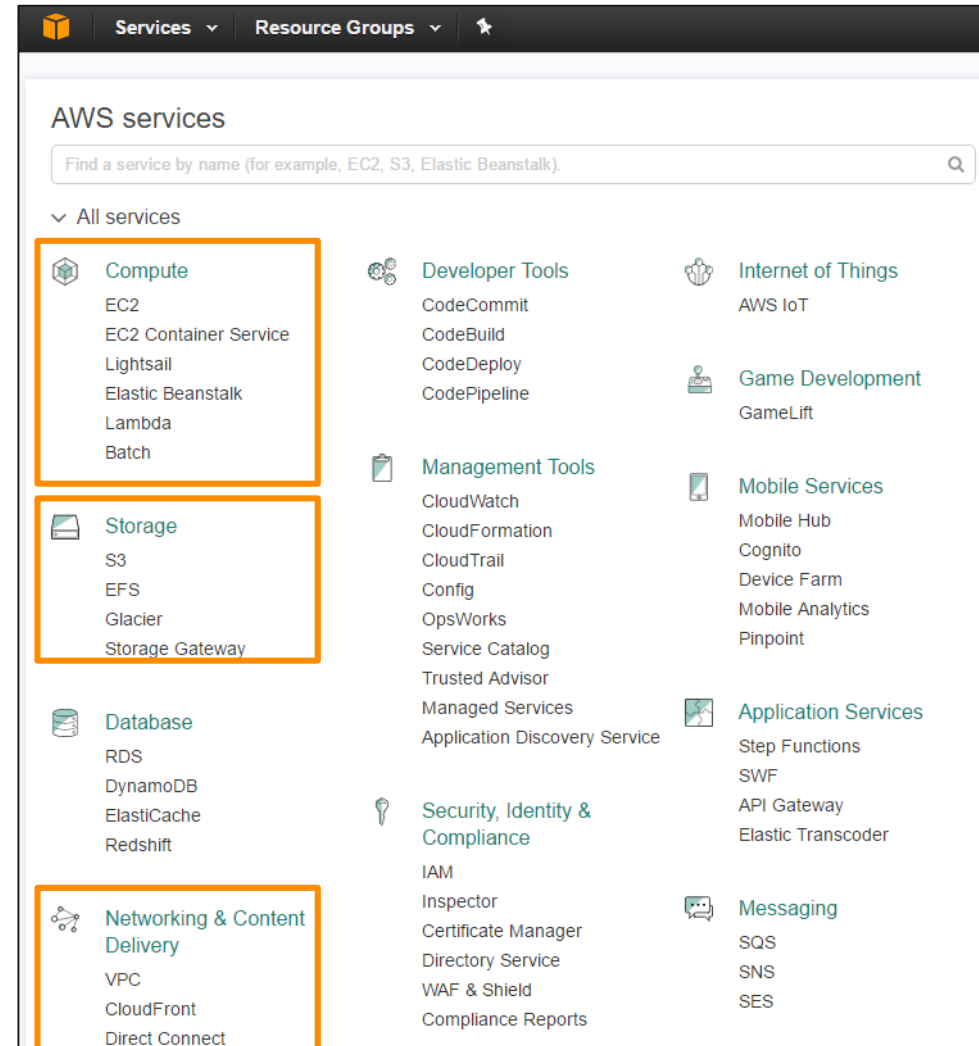
<https://portal.azure.com>



<https://aws.amazon.com/console/>

Azure & AWS IaaS 서비스

Networking
Compute
Storage



서비스 지역

Azure Regions

38 Regions Worldwide, 30 Online...huge capacity around the world...growing every year



- 100+ datacenters
- Top 3 networks in the world
- Second Largest Dark Fiber Network

- China Operated by 21Vianet
- Germany Operated by Deutsche Telekom
- 2.5x AWS, 7x Google DC Regions

- Operational
- Announced/Not Operational

AWS 지역(Regions)과 (가용영역)Availability Zones

18 월드와이드 지역, 16 온라인, 47 가용영역, 42 온라인 (2016년 12월 기준)



Region & Number of Availability Zones

AWS GovCloud (2)

US West

Oregon (3), Northern California (3)

US East

Northern Virginia (5), Ohio (3)

Canada

Central (2)

South America

São Paulo (3)

Europe

Ireland (3), Frankfurt (2), London (2)

Asia Pacific

Singapore (2), Sydney (3), Tokyo (3), Seoul (2), Mumbai (2)

China

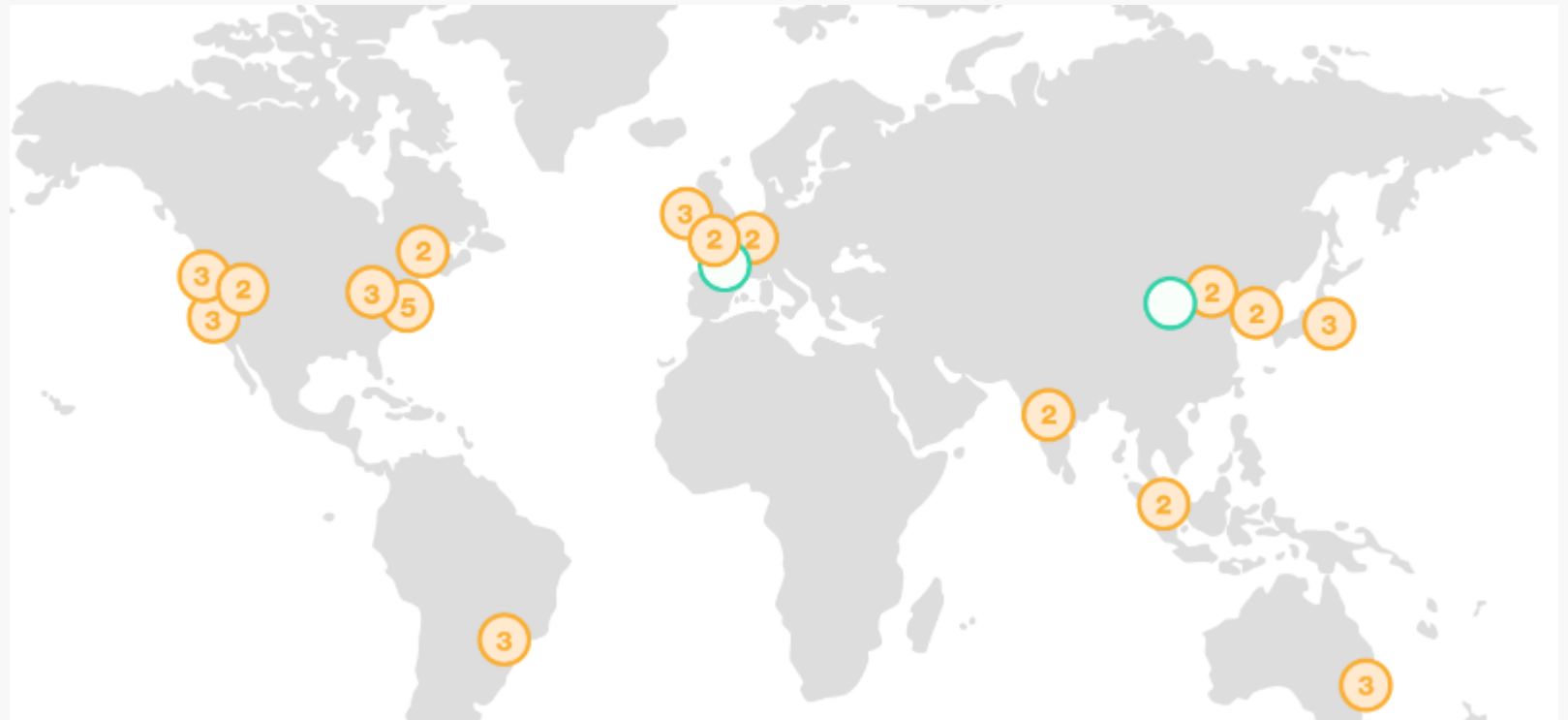
Beijing (2)



New Region (coming soon)

Paris

Ningxia



<https://aws.amazon.com/about-aws/global-infrastructure>

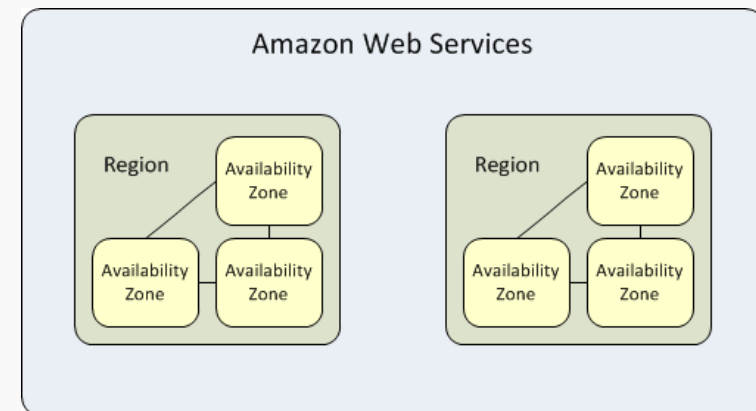
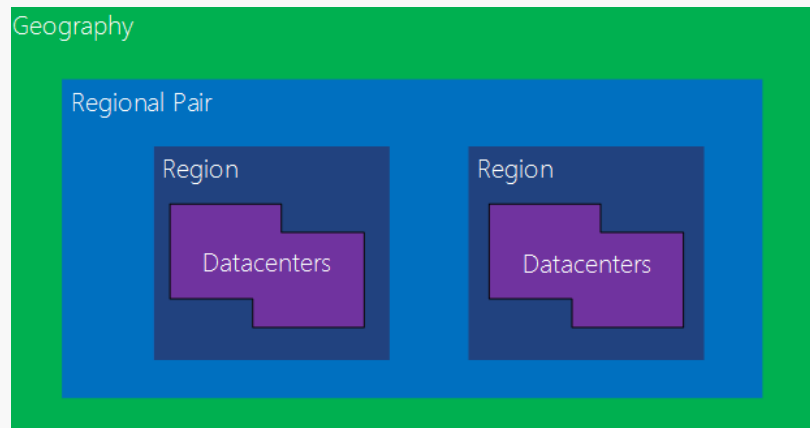
Azure & AWS 지역

Azure (38 지역, 30 온라인)

- Region pairs in a geo-political area for cross-region DR scenarios
- A region is a massive Microsoft owned and purpose built Data Center (DC)
- DC's have multiple layers of hardware and software redundancy for HA
- Region to Region traffic over Microsoft backbone

AWS (18 지역, 16 온라인)

- No geo-political region pairs, regions are not disaster proof
- A region is a collection of smaller owned and Colo DC's called Availability Zones (AZ's) – 47 in total
- AZ's are well connected across flood plains and within a short car journey for HA
- Region to Region traffic over public internet



<https://www.microsoft.com/en-us/cloud-platform/global-datacenters>

Networking

Networking



Azure Virtual Network



VPC



Azure Load Balancer



Application Gateway



Elastic Load Balancing

*** Part of Compute in AWS*



Azure Content Delivery Network



CloudFront



Azure Express Route



AWS Direct Connect



Azure Traffic Manager



Azure DNS



Amazon Route 53

99.95% SLA - ExpressRoute

Network Security Groups(네트워크 보안 그룹)

- VM과 서브넷 레벨 네트워크 접근 관리
- 기본 인터넷 접근성 제공
- IG & 라우팅 테이블 생성/수정 필요 없음

VPC & Virtual Network 비교

Azure – Virtual Network

Private subnets, routing tables, SNAT is automatic vs Internet Gateway, but you can provide your own via routing

Key Capabilities

- Custom Routing
- Network Security Groups (Subnet or VM)
- Hybrid Connectivity with IPSEC VPN, PPTP (point-to-site), Peering, and ExpressRoute.
- Bring your own DNS at virtual network or VM

AWS – Virtual Private Cloud

More traditional approach with Public and Private Subnets along with an Internet Gateway, NAT Instance and Routing Tables

Key Capabilities

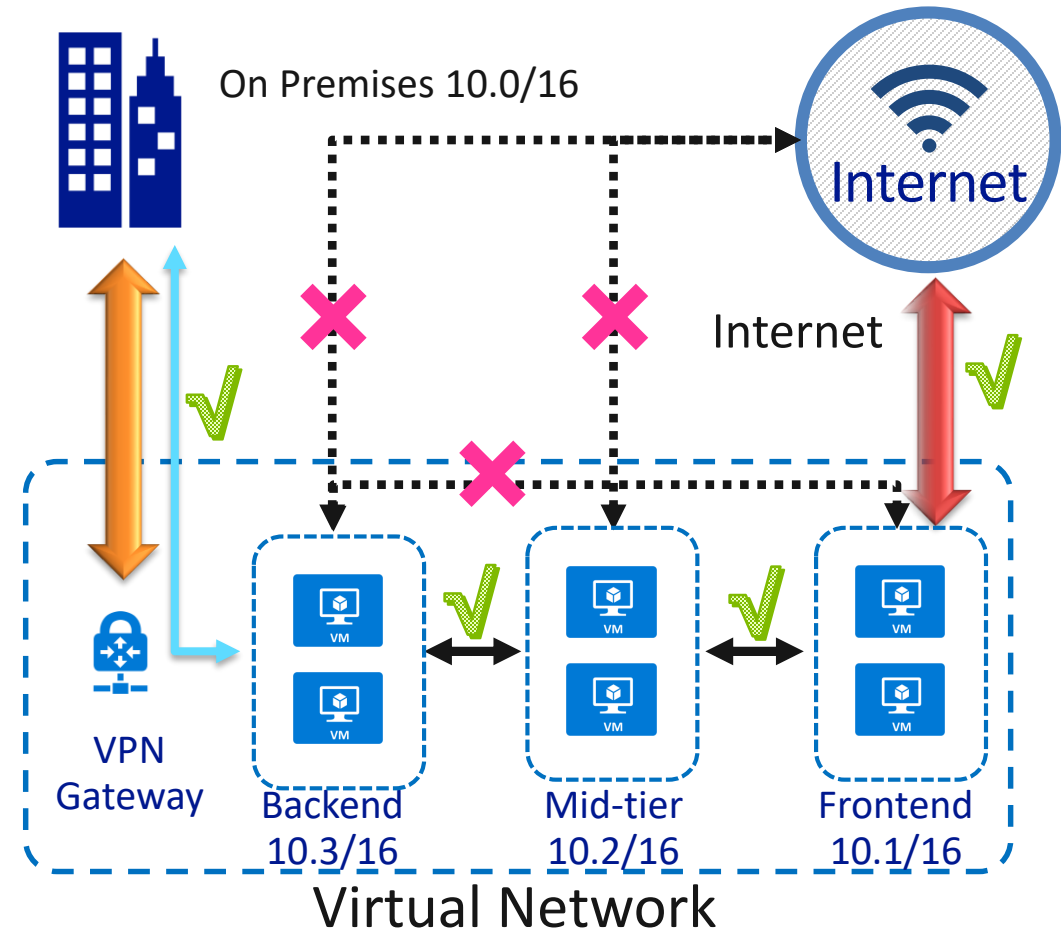
- Custom Routing
- Security Groups (Subnet)
- ACLs (VM)
- Hybrid Connectivity with VPN/VPN Peering, and Direct Connect
- Bring your own DNS, NetBIOS, NTP with DHCP Option Sets



Network Security Groups

- 네트워크 세그먼트 및 DMZ 시나리오 생성 가능
- 사용자 정의 Inbound/Outbound 규칙 생성
- 기본 Inbound/Outbound 규칙 제공
- "허용/거부" 필터 설정 가능
- 개별 주소, 개별 프리픽스, 와일드 카드 설정 가능
- 서비스 또는 사용자 정의 프로토콜/포트 선택 가능
- 가상머신 또는 서브넷과 조합 가능
- 포털, 파워셸 또는 ARM으로 구성 가능

AWS using two methods to secure network traffic: Security Groups (Stateful) for Instances and Network ACLs (Stateless) for Subnets.



VPN 연결 옵션 비교

Azure

- VPN Gateway that connects to on-premises device or appliance for private IP connectivity
- ExpressRoute for Permanent & Private VNET to VNET (VPN Gateway)
- Connectivity to other VNETs in the same or other regions using IPSEC VPN Gateways
- Uses Microsoft backbone for connectivity so disabling encryption is supported

VNET to VNET Peering

- Connectivity to other VNETs in the same regions

Point-to-Site

- Connectivity from a single machine to a VNET using PPTP

AWS

On-Premises-to-VPC

- VPN Gateway that connects to on-premises device or appliance for private IP connectivity
- DirectConnect for Permanent & Private VPC to VPC (VPN Gateway)
- Connectivity to other VPCs in the same region or other regions using IPSEC VPN gateways.
- Uses public Internet for connectivity

VPC Peering

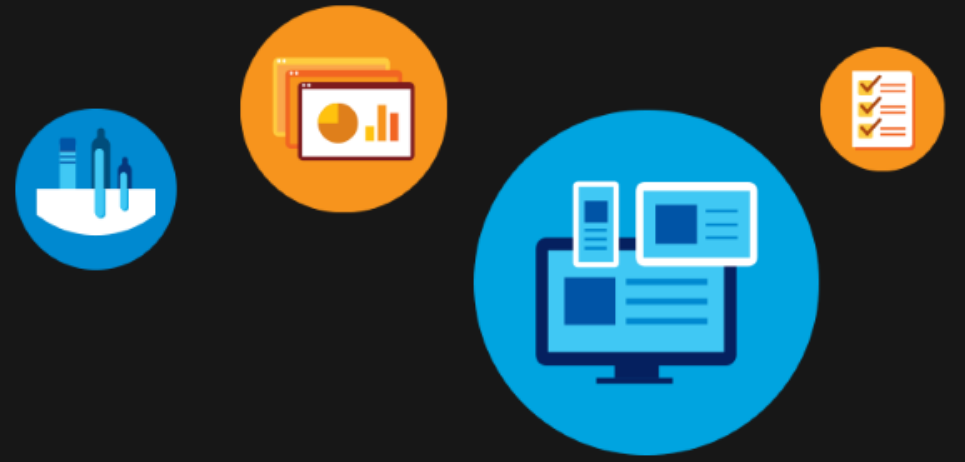
- Connectivity to other VPCs in the same region

VPC Endpoints

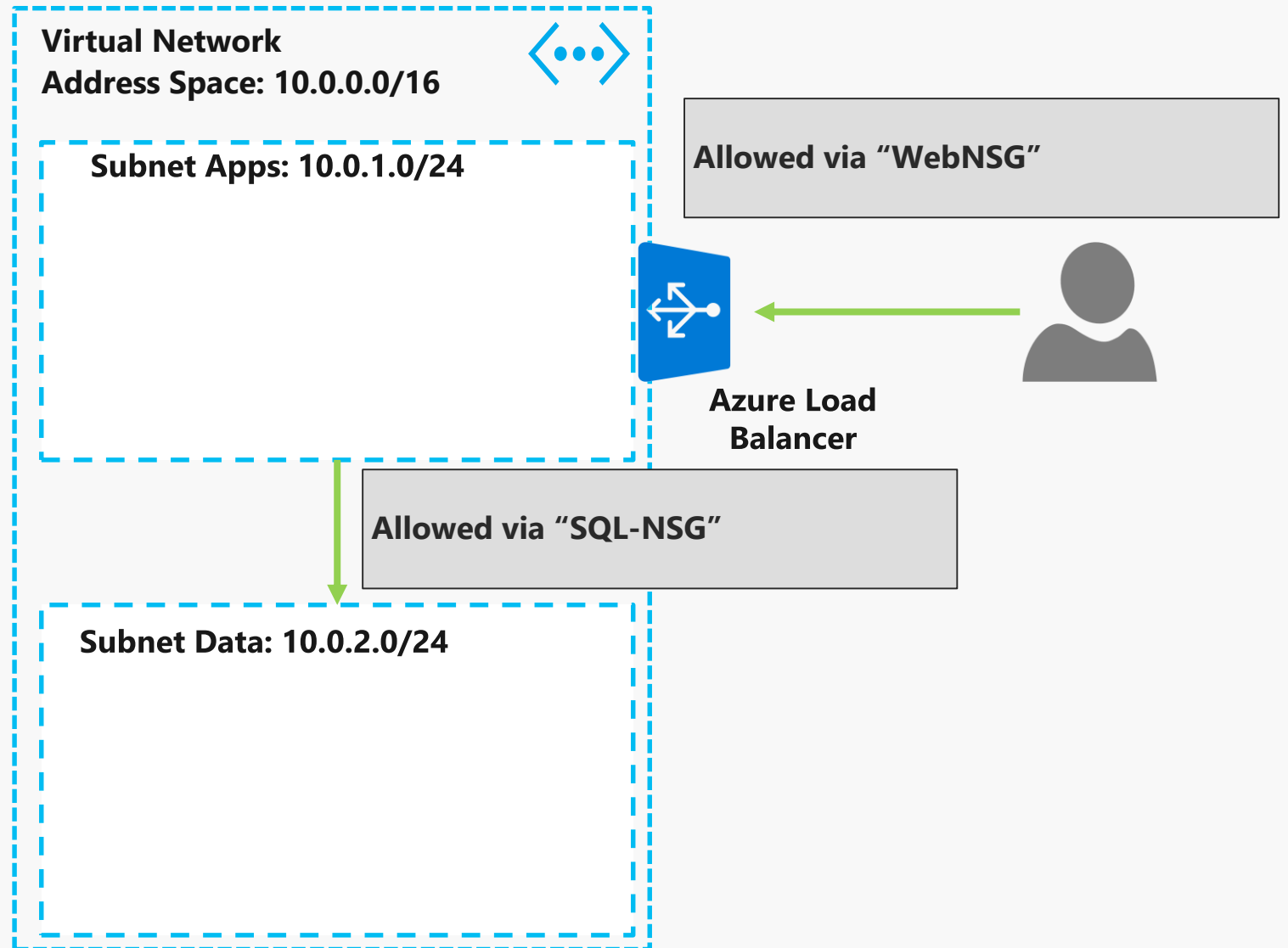
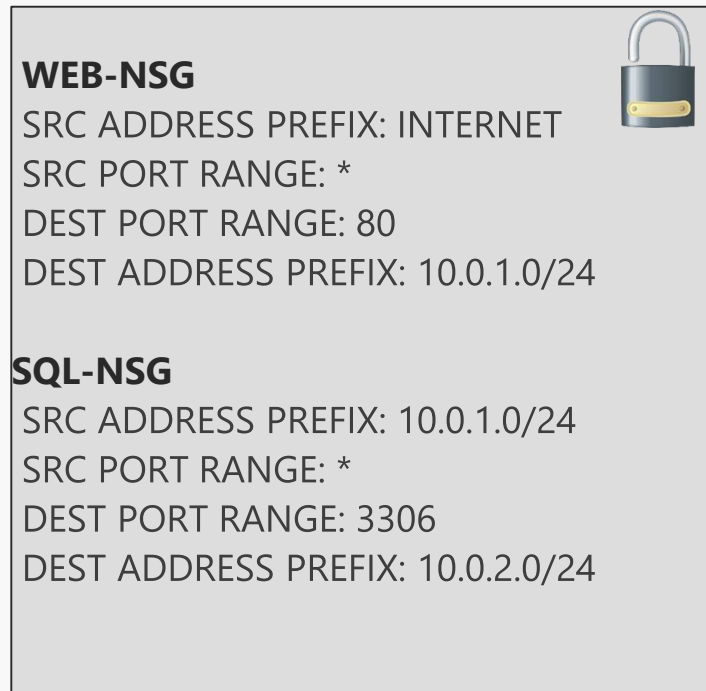
- Connectivity to S3 via a private non-Internet connection



Demo Networking



VNET 생성



Compute

Compute ㄱ|ㄴ



Azure Virtual Machine



EC2



Azure Functions



Web Jobs



Logic Apps



Lambda



Azure Container Service



EC2 Container Service



Azure Site Recovery



Azure Backup



AWS Server Migration Service
***recently added & moved over to DMS*



Azure Web Apps



Elastic Beanstalk



Azure Marketplace



Lightsail
***recently added*

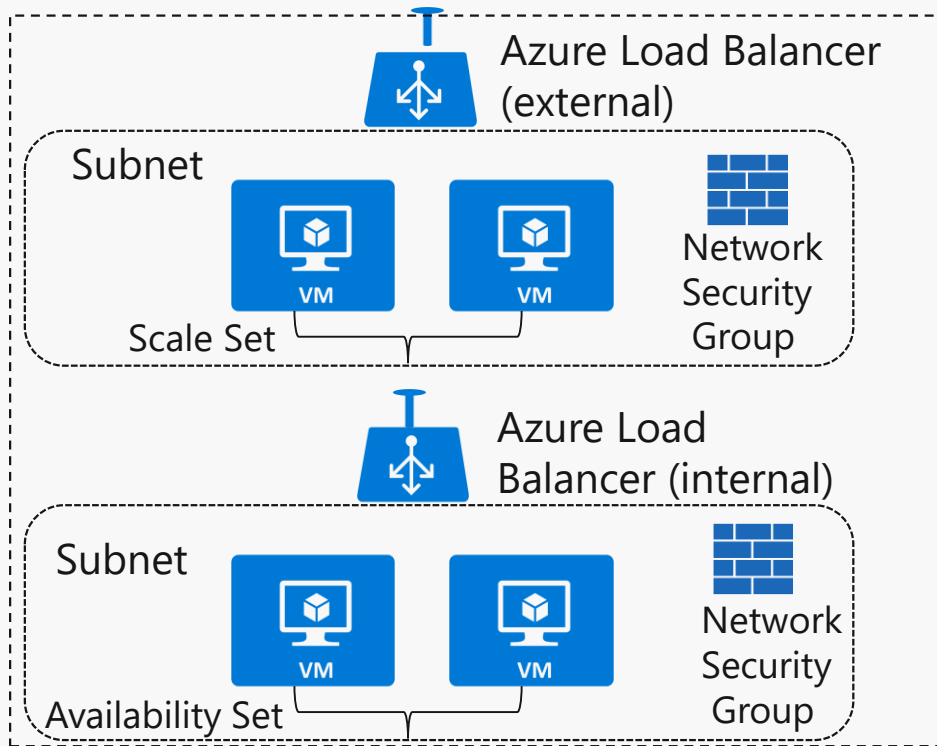
You can specify username/password
You can specify machine name
VMs support VHD format
VM Publicly accessible by default

- No need to create/update IG & Routing Tables

Azure와 EC2 Virtual Machines 비교

Virtual Network

Public IP

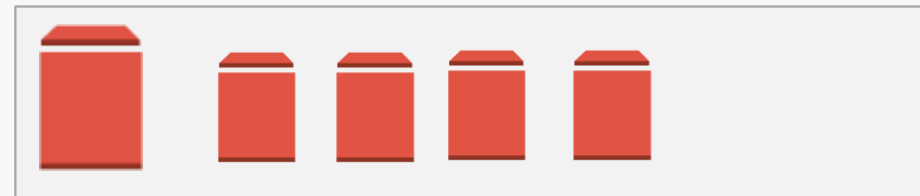
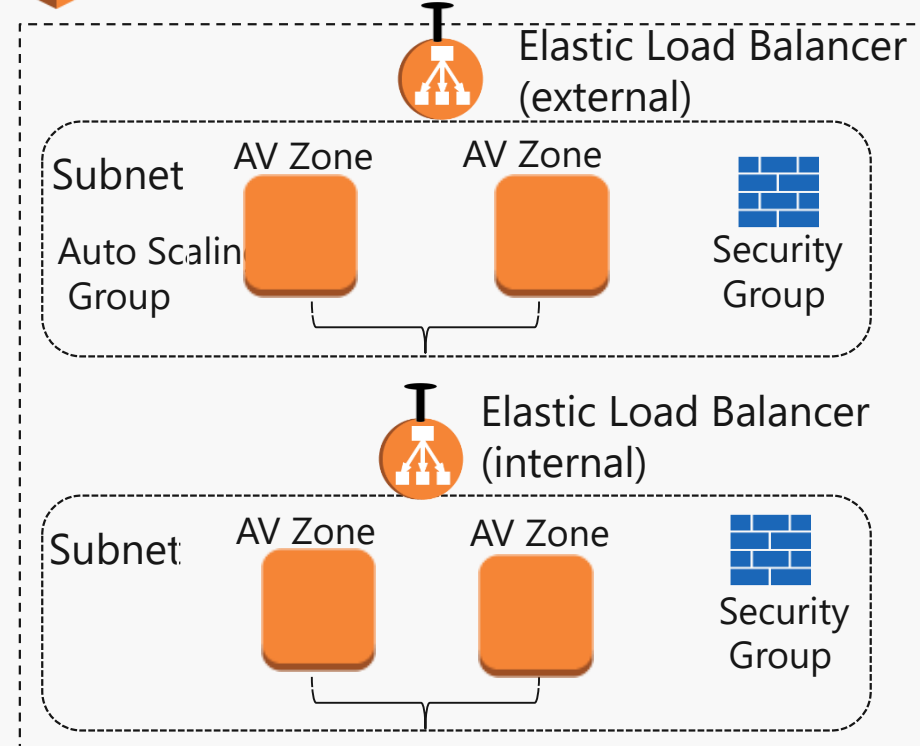


Azure Storage: Premium (SSD) or Standard
Disk Format: Fixed VHD – Max 1 TB per disk
Span disks for larger volumes (up to 64



Virtual Private Cloud

Elastic IP



EBS Volumes: Provisioned IOPs, General
Purpose SSD, or magnetic.
AMI Format, up to 16 TB per Volume

Azure & AWS VM 크기 비교

인스턴스 목적

B - Balanced Compute/Memory **G** - GPU Video

C - Compute Optimized **S** - Storage

M - Memory Optimized

디스크 타입

S - SSD **H** - HDD

네트워크 확장성

D - Default (speed varies)

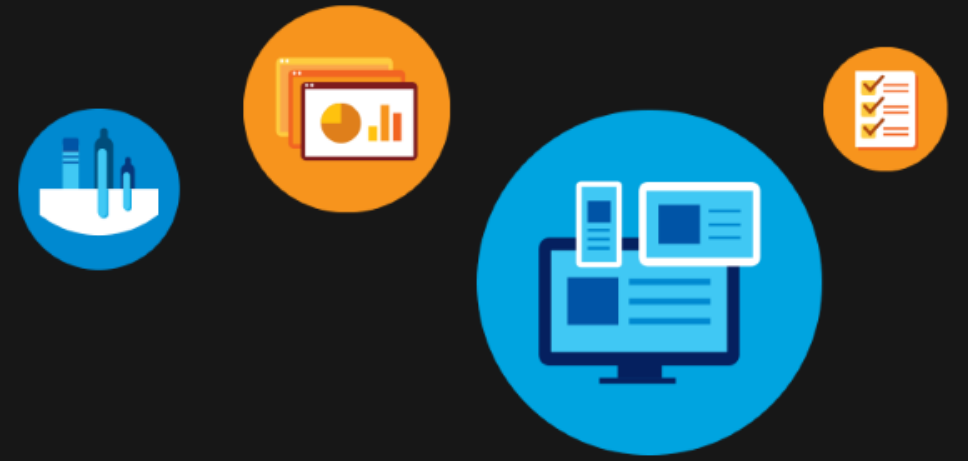
E - Enhanced Networking

Azure VM Series	Processor	Purpose	Disk	Network	AWS VM
A	Xeon	B	H	D	T2
A & D	Ivy Bridge	B	S	D	M3
D	Haswell	B	H	E	M4
DS & H	Ivy Bridge	C	S	E	C3
F	Haswell	M	S	E	X1
D	Haswell	C	H	E	C4
D & G	Ivy Bridge	M	S	E	R3
NV	Sandy Bridge	G	S	D	G2
NC	Broadwell	G	S	E	P2
G	Ivy Bridge	S	S	E	I2
G	Haswell	S	S	E	D2

<https://aws.amazon.com/ec2/instance-types>

<https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-windows-sizes>

Demo Compute



EC2 – Azure VM 생성 / 리소스 템플릿 VM 생성

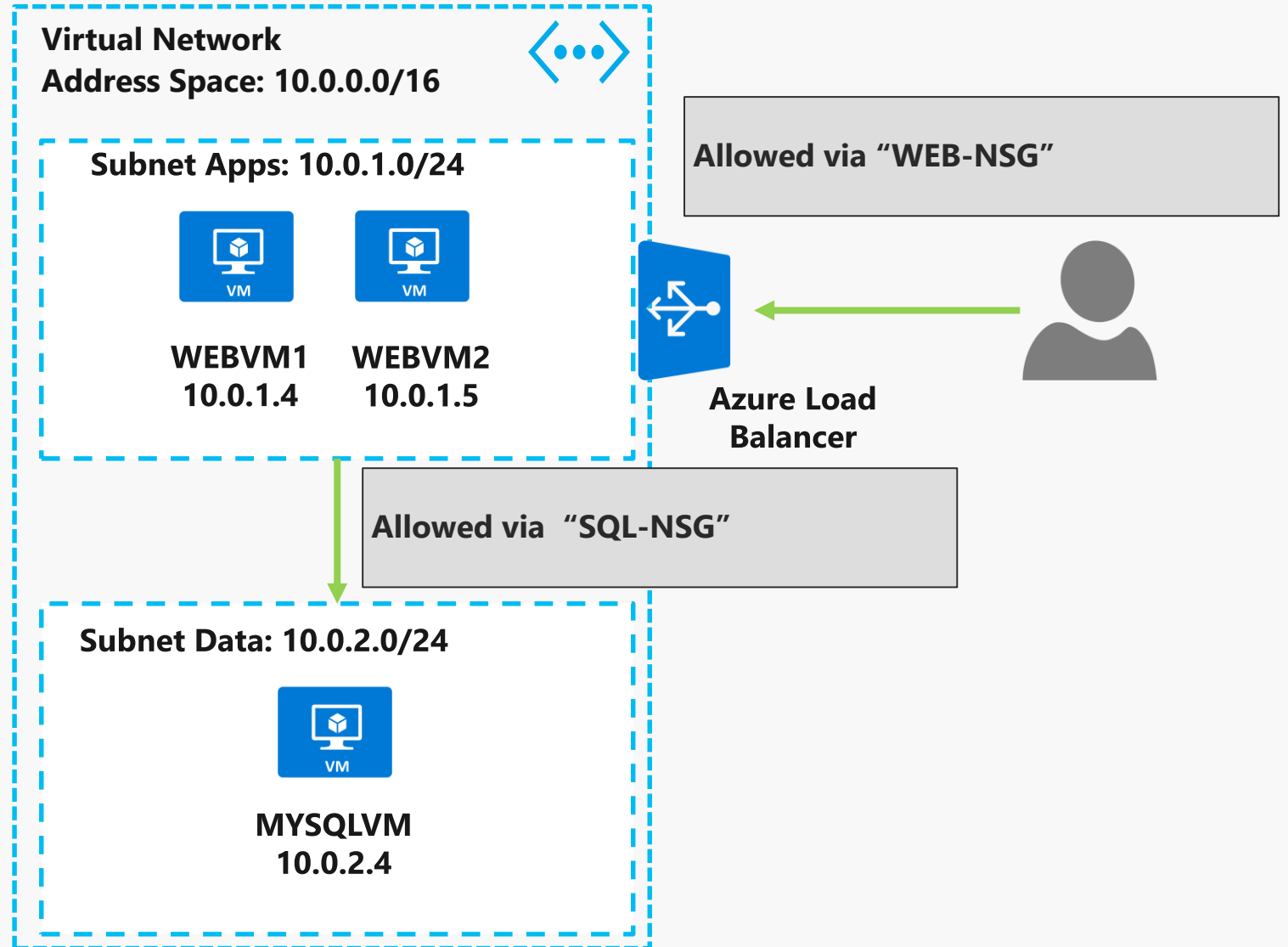
Environment

WEB-NSG

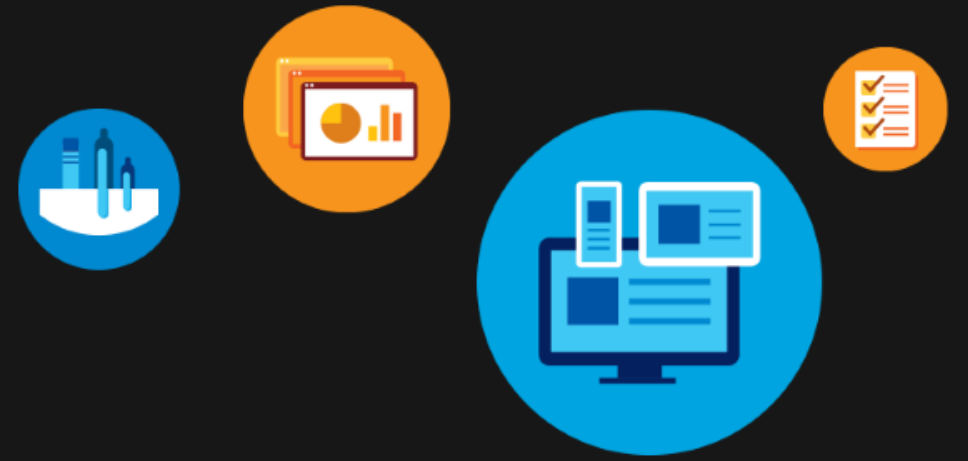
SRC ADDRESS PREFIX: INTERNET
SRC PORT RANGE: *
DEST PORT RANGE: 80
DEST ADDRESS PREFIX: 10.0.1.0/24

SQL-NSG

SRC ADDRESS PREFIX: 10.0.1.0/24
SRC PORT RANGE: *
DEST PORT RANGE: 3306
DEST ADDRESS PREFIX: 10.0.2.0/24



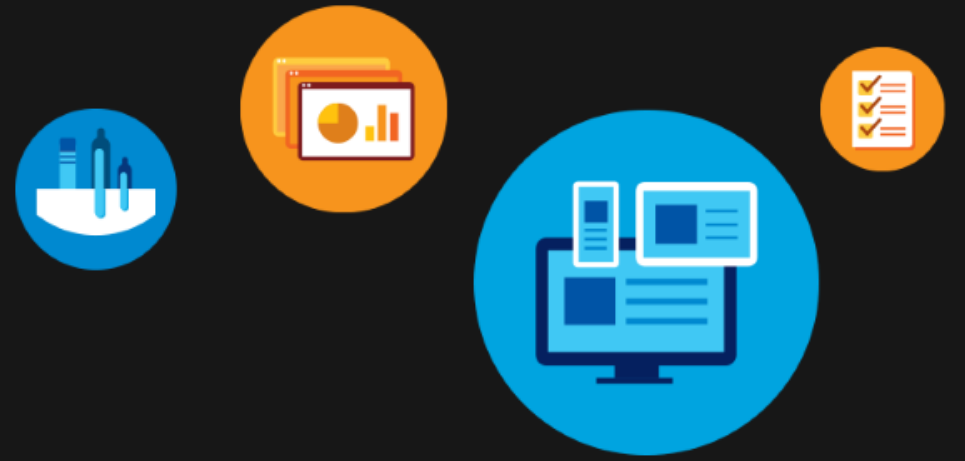
Demo Compute



AWS Elastic Beanstalk – Azure App Service

Demo Compute

AWS Lambda – Azure Functions



Storage

저장소 비교



Azure Blob Storage



S3



Azure Import/Export
Service



Snowball



Azure File Storage



EFS



Azure Backup



Azure Cool Storage



Glacier



Azure StorSimple



Storage
Gateway

S3 Natively supports static website

- Technically possible in Blob Storage
- No way to define default document

EFS uses NFS (*Linux Only*)

Azure File Storage uses SMB 3.0

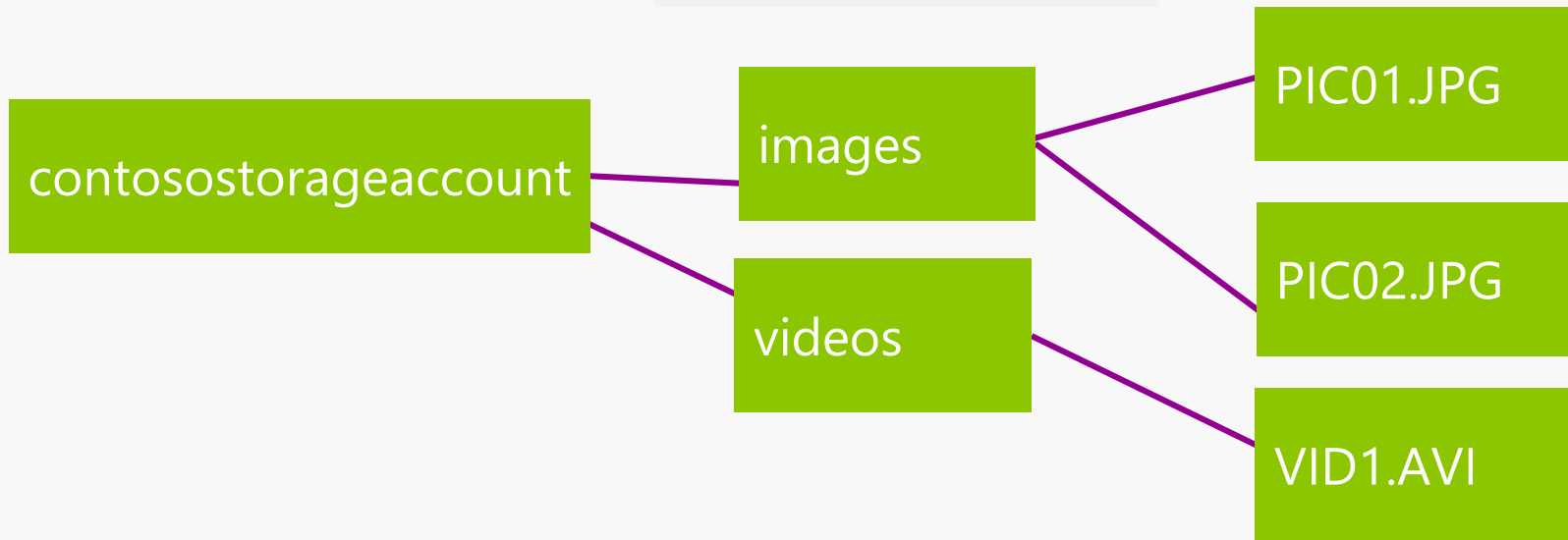
Blob 저장소 컨셉

http://<account>.blob.core.windows.net/<container>/<blobname>

저장소 계정 ↑

컨테이너 ↑

blob ↑



Blob Type

- Block
- Page

Bucket



Object



Path-style URL

http://s3.amazonaws.com/<container>/<blobname>

Virtual-hosted-style URL http://<container>.s3.amazonaws.com/<blobname>

Azure 프리미엄 저장소

Consistent low latency SSD based with predictable IO throughput

Suitable for high-performance IO-intensive database workloads

Single digit milliseconds latencies

Supports up to 1 TB blob/disk size

- Stripe up to 32 disks for a total of 32TB and more than 80,000 IOPS
- Premium Storage Disks work in with any VM Size with S in the Name (FS, DS, GS)

DS and GS instance sizes are similar to EC2 optimized instances.



Disk Types	Disk Size	IOPS per Disk	Throughput per Disk
P10	128 GB	500	100 MB/sec
P20	512 GB	2300	150 MB/sec
P30	1024 GB	5000	200 MB/sec

Demo Storage



More Resources

Getting started Tutorials for Azure Scenarios

<https://azure.microsoft.com/en-us/get-started>

Free Microsoft Training at Microsoft Virtual Academy

<https://mva.microsoft.com>

Over 1400 sessions from recent Ignite event

<https://myignite.microsoft.com/sessions>

Azure Training from Opsgility

www.opsgility.com (use Discount Code **TRYOPSGILITY**)

Get started with Azure for free

<https://azure.microsoft.com/free>

Training and certification for Azure

<https://azure.microsoft.com/en-us/community/training/>

Azure Documentation

<https://docs.microsoft.com/en-us/azure/>

Questions?

We want your feedback —
please submit evaluations!