Container Networking
Albert Greenberg, Corporate Vice President, Microsoft

Representing the work of the Azure Networking team
Azure Momentum

>90% of Fortune 500 use Microsoft Cloud

- 120K new customers/month
- 150 billion Azure SQL queries/day
- 715 million Azure Active directory users
- 120 billion Azure website hits/month
Microsoft ❤️ Linux
Container Momentum

ONS 2016
SONiC—Open source switch stack
Foray into open container networking

February 2017—Kubernetes generally available on Azure Container Services

OCP 2017
SONiC—Containerization
Azure SDN Momentum: Rich and Scalable VNets

2013:
- Virtual networks
- Public load balancing
- Managed NAT

2014:
- Internal load balancing
- VPN based on premise connectivity

2015:
- Network security groups
- Service chaining
- Private peering
- Multi-NIC
- Reserved IP
- Instance IP

2016+:
- Container support
- Application gateway
- Accelerated networking
- Virtual network peering
- IPv6
- Mac persistence
- Netwatcher
- Multiple IPs per NIC
Announcing

Azure VNet for Containers
One SDN
Public Preview

Open SDN solution for containers in Azure

Connects containers to Azure network

One SDN, connectivity, security, network and infrastructure management

Available with Azure Container Service (ACS)
Azure Container Service + SDN

ACS—deploys and manages the infrastructure to run containers

ACS—creates clusters with chosen orchestrators

Orchestrators can now plug in to Azure SDN stack with a single click
Container networking so far

**Bridge/NAT Mode**
Orchestrator Default
Connectivity within containers in same Host
Connectivity outside the host requires NAT

**Overlay network Mode**
Connectivity with containers outside the same host
Double encapsulation: performance degradation
Two networking stacks
Azure VNet for containers—now

Connected to entire network (container, VM, on-premises)

Native support for containers on Azure’s virtual network - all offloads supported with native performance

Unified network policies for all workloads
### Azure VNet for containers—ecosystem

<table>
<thead>
<tr>
<th>Orchestrator/Plugin</th>
<th>For CNI (Kubernetes, DC/OS) and CNM (Docker Engine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform</td>
<td>For Linux and Windows</td>
</tr>
<tr>
<td>Cloud</td>
<td>For Azure and Azure Stack for on premises</td>
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</tbody>
</table>

Container orchestrator  Cloud network
Preview – Accelerated Networking for Linux

One accelerated SDN for both VMs and Containers

25Gbps and up to 10x lower latency for Linux VMs, containers, and network appliances

Support released upstream in Linux kernel

See the Accelerated SDN in Azure talk tomorrow
Takeaways

**One SDN**
On premises & Cloud
VMs & Containers
Linux & Windows
Benefits:
- Battle tested
- Designed to scale

**Performance**
High performance networks – Azure Accelerated Networking
Low-latency, high-bandwidth connections on Linux and Windows

**Integration**
Click of a button, fully integrated to ACS
Open Source

Azure VNet for Containers

A single Azure open-source project for all things container networking on Azure

https://github.com/Azure/azure-container-networking
Demo Setup

Kubernetes Cluster Subnet
10.240.0.0/12

Master
10.240.255.5

Linux Agent
Pod1 (nginx)
Pod2 (nginx)

Linux Agent
Pod3 (nginx)

Database Subnet 10.10.10.0/24

SQL VM
10.10.10.4

HR VM
10.10.10.5

Azure VNet
Deepak Bansal (AZUR...)

Meeting start time: Sunday, April 2, 2017 9:05:57 AM

Organizer: Deepak Bansal (AZURE)
Innovations in the switch world

Abstraction | SAI

Serviceability | SONiC
Announcing Alibaba Joins SONiC Community

http://azure.github.io/SONiC/
Summary

Azure VNet for Containers
- Public Preview
- Open Source
- Accelerated on Linux and Windows

New SONiC Partners
- Alibaba Group