Microsoft Networking Academy
with the C+E Global Black Belts

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Before we get started

• Welcome customers and partners!!!
• Material is public information ➔ No NDA info here.
• Use the IM window for questions.
• Agenda is posted at http://aka.ms/mna (and emailed to interested parties!)
• Sessions are recorded and posted here:
  • http://aka.ms/mna-ch9
Microsoft Networking Academy

• Runs every 4 week with typical agenda:
  • Partner-Focused Sessions
    • Azure Networking and Security Updates (10 minutes)
    • Partner Spotlight of the week (20-30 minutes)
    • Q&A (10 minutes)
  • Deep Dive Sessions
    • Short introduction (5 minutes)
    • Deeper dive topic of the week (35-45 minutes)
    • Q&A (10 minutes)
• Email GBB-ANF@microsoft.com to receive detailed schedules for the upcoming sessions!
• Recordings available on Channel 9!
Agenda for October 20th, 2017

• Intro and announcement
• Great Content :
  • Ignite 2017 review
  • Operations Management Suite – Network Performance Monitor (OMS NPM for short!)
  • A10 presentation on vThunder (30 Gbps!)
• Open Q&A
Ignite 2017 Review
New Networking Features and Announcements

Security
- DDoS Protection
- VNet Service Endpoints
- Application Security Groups
- Application Gateway and WAF enhancements
- Network Security Groups—Service Tags, Augmented Rules

Monitoring
- Azure Monitor—Network metrics and diagnostics
- Resource Health Check for network resources
- OMS Network Performance Monitor for ExpressRoute
- Network Watcher—Flow log analytics, connectivity checker
- Traffic Manager—Traffic View, Real User Measurements

Connectivity
- Global VNet Peering
- ExpressRoute IPv6 support, Route Filters, Merged Public & Microsoft peerings
- VPN P2S for Apple Mac, AD authentication
- VPN get BGP routes, download device scripts
- Azure DNS Private Zones

Availability
- New Azure Load Balancer
- Internal Load Balancer HA Ports

Performance
- Accelerated Networking for more VM SKUs
- 30 Gbps VM to VM bandwidth world’s fastest
- DPDK partner enablement
- VPN gateway SKUs – up to 6 X faster
Azure Availability Zones

- **Availability Zones** - fault-isolated locations within a region. Independent power, networking, and cooling

- Build highly available applications with the latency of a region. Complimentary to region pairs that provide DR capabilities

- **Networking features for AZs**
  - Load balancing support
  - AZ-aware VPN, App and ER gateways
VNet Service Endpoints (preview) : How it works:

- Directly extends VNet to multi-tenant
- Azure services (Ex: SQL PaaS and Storage)
- Access Storage and SQL accounts only from VNets
- On-premises through NAT IPs:
- ER public peering or the Internet
- Service IPs, DNS entries remain public

This feature is available in preview for the following Azure services and regions:
**Azure Storage:** WestCentralUS, WestUS2, EastUS, WestUS, AustraliaEast, and AustraliaSouthEast
**Azure SQL Database:** WestCentralUS, WestUS2, and EastUS.
Load balancer Standard SKU (preview)

- Create load balanced deployments with greater scale, resiliency, and ease
- Cross-zone load balancing: High availability
- 1000 VM Scale Set instances
- Diagnostic insights: health probe status, counters for packets, syn packets, outbound SNAT connections
- Pricing: based on rules configured

Regions: East US 2, Central US, North Europe, West Central US, West Europe, Southeast Asia
NVA High Availability – with HA Ports

Microsoft Azure

NVA Pool

Zookeeper Cluster

Passive NVA

Active NVA

Express Route

Gateway

Destination NextHop

NextHop

Virtual Network

Ingress Traffic

Egress Traffic

Health Probe

Orchestration

Supports N-Active deployment

NVA High Availability – with HA Ports

Azure ILB

Ports {1…65535}

Protocols {TCP + UDP}

Simplified Configuration

Supports N-Active deployment

Express Route

Gateway
## Load Balancer SKU Choices

<table>
<thead>
<tr>
<th>Metric</th>
<th>Load Balancer Basic</th>
<th>Load Balancer Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>Up to 100 Backend instances</td>
<td>Up to 1000 backend instances</td>
</tr>
<tr>
<td>LB Scope</td>
<td>Non-zonal Frontend Ips</td>
<td>Zonal redundant and Zonal Frontend Ips</td>
</tr>
<tr>
<td>Fault Tolerance</td>
<td>Works in a Availability set</td>
<td>Works in Availability set and Availability zones</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Basic NAT and Probe health status</td>
<td>Integrated Front end and Backend health metrics</td>
</tr>
<tr>
<td>NVA</td>
<td>-</td>
<td>Supports HA Ports</td>
</tr>
<tr>
<td>Cost</td>
<td>Free</td>
<td>Charged at GA</td>
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</table>
Network Security Groups
Cornerstone of Network Security

<table>
<thead>
<tr>
<th>Action</th>
<th>Name</th>
<th>Source</th>
<th>Destination</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allow</td>
<td>AllowInternetToWeb</td>
<td>Internet</td>
<td>10.0.0.10/24</td>
<td>HTTP(TCP/80)</td>
</tr>
<tr>
<td>Allow</td>
<td>AllowWebToApp</td>
<td>10.0.0.10/24</td>
<td>10.1.0.20/24</td>
<td>HTTPS(TCP/8443)</td>
</tr>
<tr>
<td>Allow</td>
<td>AllowVNet</td>
<td>VirtualNetwork</td>
<td>VirtualNetwork</td>
<td>Any</td>
</tr>
<tr>
<td>Deny</td>
<td>DenyAllInBound</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
</tr>
</tbody>
</table>

Cloud
Consistent security configuration at scale

Platform
Building block for Distributed Applications

Secured
Workload Secured at each Instance/VM
New Capabilities for NSG’s – Keeping your apps secure at scale

**Service Tags**: Easily restrict network access to just the Azure services you use.
- Maintenance of IP addresses underlying each tag is provided by Azure.

**Predefined Tags**: VirtualNetwork, AzureLoadBalancer, Internet, AzureTrafficManager, Storage, Sql

**Augmented Rules**: Simplify security definition—more complex policies in fewer rules.
- multiple sources, destinations, tags and ports in a single rule.
- Limits increased: Now 4000 IP address ranges (CIDR) per NSG.

**Public Preview Regions**: USWestCentral, USEast, USWest, USWest2, AustraliaEast, AustraliaSouthEast, UKSouth

<table>
<thead>
<tr>
<th>Action</th>
<th>Name</th>
<th>Source</th>
<th>Destination</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allow</td>
<td>AllowStorage</td>
<td>VirtualNetwork</td>
<td>Storage</td>
<td>Any</td>
</tr>
<tr>
<td>Allow</td>
<td>AllowAzureTM</td>
<td>VirtualNetwork</td>
<td>AzureTrafficManager</td>
<td>Any</td>
</tr>
<tr>
<td>Allow</td>
<td>AllowSQL</td>
<td>VirtualNetwork</td>
<td>Sql EastUS</td>
<td>Any</td>
</tr>
<tr>
<td>Allow</td>
<td>AllowMyExtRange</td>
<td>10.0.1.0/24, 192.168.2.12/25</td>
<td>13.68.120.64/28, 137.116.1.0/25, 191.237.160.224/28</td>
<td>80, 8080, 443</td>
</tr>
<tr>
<td>Deny</td>
<td>DenyAllOutBound</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
</tr>
</tbody>
</table>
New Capabilities for NSG’s – Keeping your apps secure at scale

**Application Security Groups**: Network security as natural extension of application architecture.

- Apply security policy to application-specific groups of VMs & NICs
- Define once and reuse at scale
- Platform handles complexity of IP addresses and multiple rules sets allowing developers to focus on business logic.

The features are available only in the following region: West Central US.
Global VNet peering

In-region VNet Peering

- Large private networks in Azure through peered Vnets
- Enables hub and spoke architectures in Azure

Global VNet Peering

- Global private networks in Azure through peered V Nets
- Private: no internet, through Backbone
- High bandwidth cross-region connectivity

Peering virtual networks in different regions is currently in preview in US West Central, Canada Central, and US West 2.
Azure DDoS Protection service

- Simplified provisioning for all protected resource types on a vNet
- Always-on monitoring
- Automatic network attack mitigation
- Adaptive tuning based on Azure’s unique platform insights
- Application layer protection with Azure AppGW WAF and Azure DNS
- Integration with Azure Monitor for analytics, insights, and alerting

Free Preview will start in East US, West US, West Central US—expand globally in next few months
New features

**IPv6 support**
Office 365 & Azure public services

**Monitoring**  Preview
Resource Health Check (RHC)
Circuit metrics in Azure Monitor
Customer monitoring through Network Performance Monitor (NPM)

**Merging of Microsoft Peering and Azure Public Peering**  Preview
Azure public services on Microsoft Peering
Azure regions selectable through route filters
Bi-directional connections for services hosted on Azure
Azure Public Peering supported in near future
ExpressRoute & VPN

Performance
- 6x VPN throughput
- Improved UltraPerf ExpressRoute gateways (latency)

Monitoring
- Azure Monitor for ExpressRoute & VPN
- OMS Network Performance Monitoring for ExpressRoute
- Network Watcher for VPN
- Resource Health Check for ExpressRoute & VPN

Security & compliance
- Custom IPsec/IKE policy for VPN

ExpressRoute Peering
- Merging Microsoft & Azure Public Peering

Enterprise grade P2S
- Mac (OSX) support for P2S
- AD (radius)-based authentication

Routing & connectivity
- ExpressRoute IPv6 for O365 & Azure public services
- ExpressRoute route filter for Microsoft peering
- ExpressRoute connection weight
- Multi-site for policy-based firewalls
- VPN BGP routes & peering status
What’s New?

💡 **Load Balancer**
- New Load Balancer, SKUs
- Pool up to 1000 instances in VNet, incl. 1000 instance VMSS
- Multiple VMSS
- Zone-redundant data path with single IP
- Zonal frontends
- Cross-zone load balancing
- Cross-zone VMSS
- HA Ports for NVAs and more
- Advanced analytics (Traffic Counters, Per Endpoint health probe status, Continuous in-band data plane health, Inbound connection attempts, Outbound connections)

💡 **Application Gateway**
- SSL Policy with cipher suites
- Redirection
- Multitenant (WebApp) backend
- Health probe enhancements
- Multiple VMSS
- Path override
- Idle timeout and domain label
- WAF: OWASP ModSecurity CRS 3.0
- WAF: Rule configurability
- WAF ASC and OMS log analytics

💡 **Traffic Manager**
- Real User Measurements
- Traffic Flow
- EDNS Client Subnet
- Azure Monitor Metrics
- Fast Failover
- Geographic Routing
Network Performance Monitor for ExpressRoute

Monitor

- Continuously monitor connectivity from on-premises to Azure services
- Continuously monitor connectivity to PaaS and SaaS services (Office 365, Azure Storage)
- Connection metrics, latency, packet loss

Analyze and Alert

- OMS log analytics
- Alert and act on key events

Localize networking issues
Performance

30 Gbps VM to VM bandwidth world’s fastest
Accelerated Networking for more VM SKUs
DPDK partner enablement
VPN gateway SKUs—up to 6 X faster
World’s fastest VMs in public clouds

30 Gbps VM to VM bandwidth!

Accelerated Networking

Support expanded to 4 core VMs

No additional cost
Data Plane Data Kit (DPDK) Developer Preview

Industry standard high performance packet processing

Geared for network intensive applications such as Network Virtual Appliances

Open to partners now AzureDPDK@Microsoft.com
High Performance Virtual Appliance (vThunder) in Azure

Saurabh Sureka, Senior Product Manager, Cloud and Software
Jeevan Sharma, Sr. Solutions Architect
Leah McLean, Cloud and Software Manager
A10: At The Heart of It All – Secure App Services

5,000+ Customers in 72 Countries
A10 & Microsoft Collaboration

- Multiple Points of Presence
- Apps hosted in Azure
- Secure data in Private Data Centers
- Serve multitude of traffic types

Virtual Appliance Requirements
- High bandwidth IPSec Connectivity
- Multi-protocol L4/L7 Application Load Balancing
- SSL termination, AAM, Certificate Management
- Consolidate functionality to high performance Azure servers
A10 & Microsoft Collaboration

Microsoft Azure
- Accelerated Networking (SRIOV)
- Data Plane Data Kit (DPDK)

A10 Networks
- Application Delivery
- Secure Connectivity
- Management & Analytics

Results
- 10X Performance improvement in packets per second (pps)
- Significantly reduced latency & jitter
Demo Topology: vThunder in Azure

<table>
<thead>
<tr>
<th>Hosted On</th>
<th>Microsoft Azure</th>
<th>Microsoft Azure</th>
<th>Microsoft Azure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public IPs</td>
<td>52.225.189.135</td>
<td>52.138.70.210</td>
<td>52.138.66.22</td>
</tr>
<tr>
<td>OS</td>
<td>ubuntu1~16.04.4</td>
<td>A10 ACOS 4.pvt</td>
<td>ubuntu1~16.04.4</td>
</tr>
<tr>
<td>Azure VM</td>
<td>ubclient4</td>
<td>acos3riov</td>
<td>ubserver4</td>
</tr>
</tbody>
</table>
30G Throughput
A10 vThunder Appliance
in
Azure Accelerated Networking
30G Throughput
A10 vThunder Appliance
in
Azure Accel Net
IPSec Service Using A10 vThunder Appliance in Azure Accelerated Networking
Demo Topology With Vthunder Ipsec In Azure

IPSec Gateways: Private Data Center vThunder (4G) --- Azure vThunder (25G)
AES 256, SHA1
Single tunnel, 90 Connections, Measured 3.59G
Next Steps

- Checkout [Azure Marketplace](https://www.a10networks.com) to find A10 vThunder Appliances

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- Leah McLean  
  Senior Manager, Strategic Alliances  
  lmclean@a10networks.com
THANK YOU
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