SONiC in Microsoft Azure: Enabling Mission Critical Applications

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Enabling Mission Critical Applications
Mission Critical Applications in Azure

Goal: unlock the market for mission critical workloads that cannot yet run on Azure natively
A Mission Critical Application: Azure HSM

- Azure service providing cryptographic key storage
  - Dedicated server: customer has full administrative and cryptographic control
  - Provisioned into a customer’s private IP address space (VNET)
- Typical customer deployment:
  2 HSMs per regions for high availability
  2 in an alternate region for disaster recovery
Mission Critical Applications

The application must be provisioned into a customer’s private IP address space (VNET)

- Challenges:
  - Workloads are not virtualized
  - Hardware form factor
Architecture

- **Demo Controller**
- **Azure Control Plane**
- **SONiC**
- **Isolated VNET Data Plane**
- **Virtualized Network and Compute**
- **Workload Server**

Control Plane

Data Plane
Ease of Operations:
- Homogeneity with respect to management and control plane
- Hardware independence

Customizable and Extensible:
- Custom features for Azure integration
- Cherry pick feature set

Agility:
- Fast turnaround time for fixes
- Leverage open-source contributions
SONiC Features: Data Plane

Customer Isolation via VNI, VRF, VLAN and TOR Port VLAN membership

SONiC TOR

SONiC L3 VxLAN Tunnel Endpoint (VTEP)

- VNI
- VNET/VRF
- VLAN

WL Server
SONiC Features: Control Plane

- **REST API**
  - Routes

- **CONFIG_DB**
  - Vxlan, VRF and Vlan

- **APP_DB**

- **Orchestrator Agent**

- **ASIC_DB**
  - sairedis
  - swsssyncd
  - SAI API
  - ASIC SDK

- **ASIC**
Demo Scenario 1/3
Demo Scenario

2/3
Demo Scenario 3/3
Demo Scenario
Lessons learned / Next steps

- Configuration error handling:
  - No syntactic or semantic validations on configuration set in the config and app DBs
  - No reporting mechanism for errors in enforcing configuration on the hardware (e.g., in the case of resource exhaustion)
  - As a result the configuration entity cannot verify if config is honored in the ASIC

- Route persistence:
  - Dynamically added static routes are not persisted
  - Switch reboot leads to loss of dynamically added static routes
Contributors

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