

Enabling Rapid Innovation in the Network Using SONiC and P4

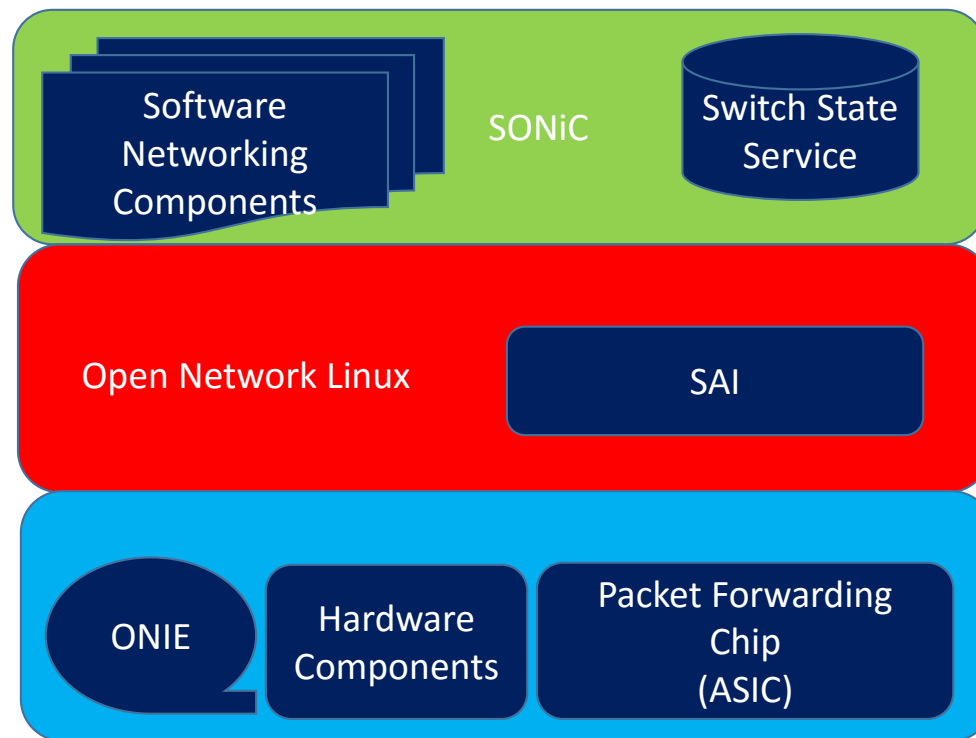
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Agenda

- SONiC
- SONiC-P4-SWITCH
- SONiC-P4-SWITCH for Azure

SONiC and the Open Switch Stack

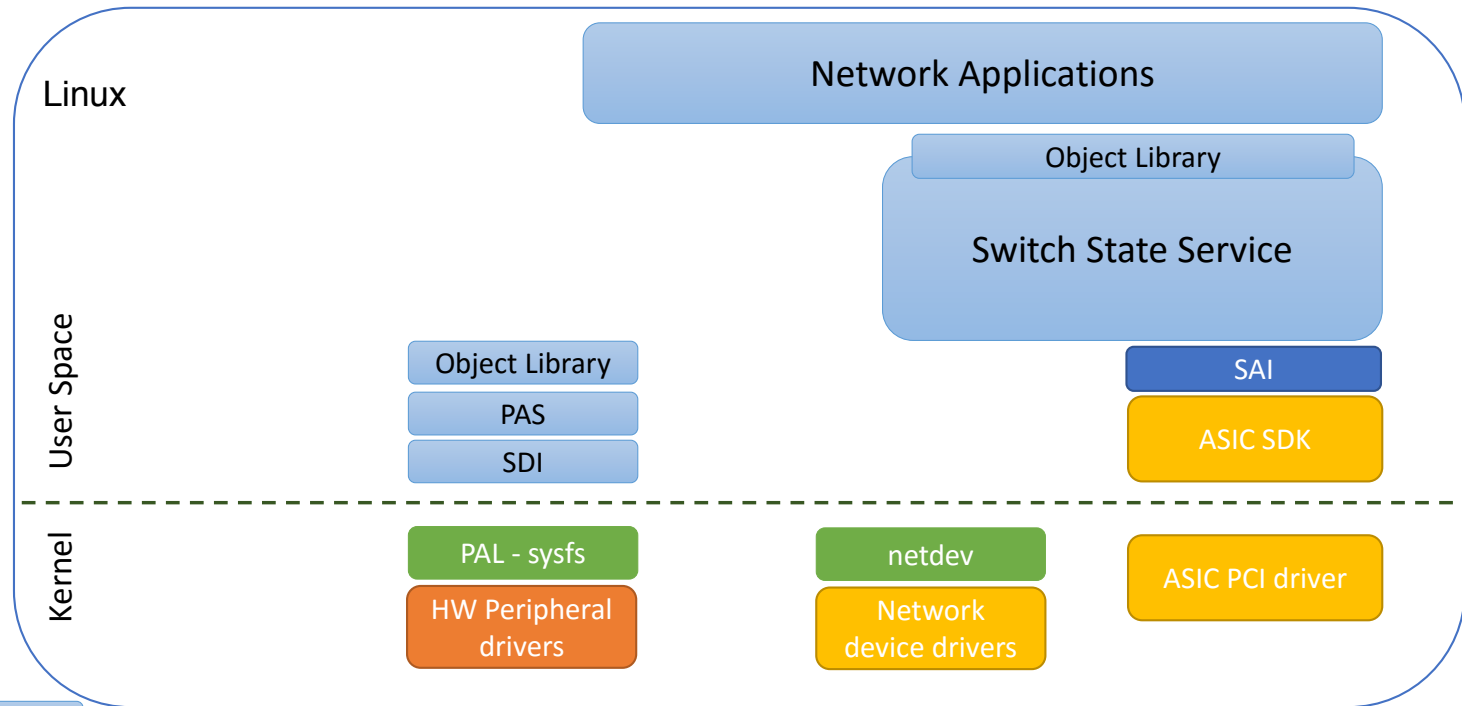


What is SONiC

- Software for Open Networking in the Cloud
- A collection of software components/tools
 - Builds on the foundations of SAI
 - Provides L2/L3 functionalities targeted for the cloud
 - Linux-based switch operating system, looks and feels like Linux
- Community driven, open source effort
 - Shared on GitHub, Apache License
 - Believe in working code + quick iteration



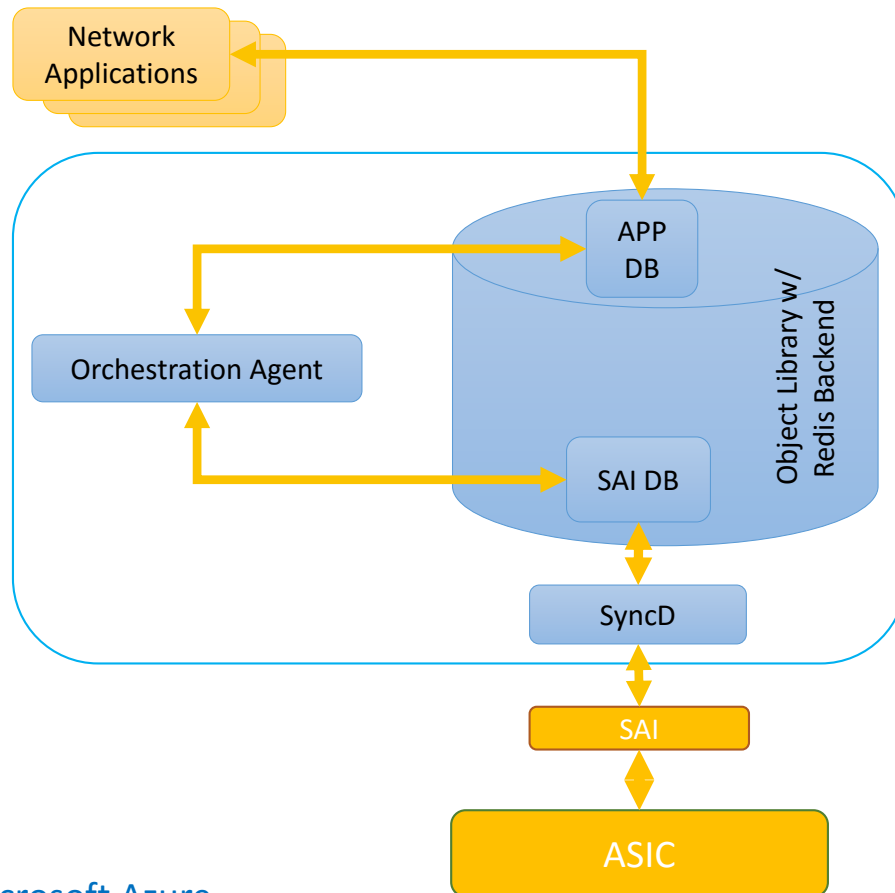
SONiC High Level Architecture



- Various
- OCP
- Chassis Supplier
- ASIC Supplier
- Linux



Switch State Service (SSS)



SAI DB: persist SAI objects

APP DB: persist App objects

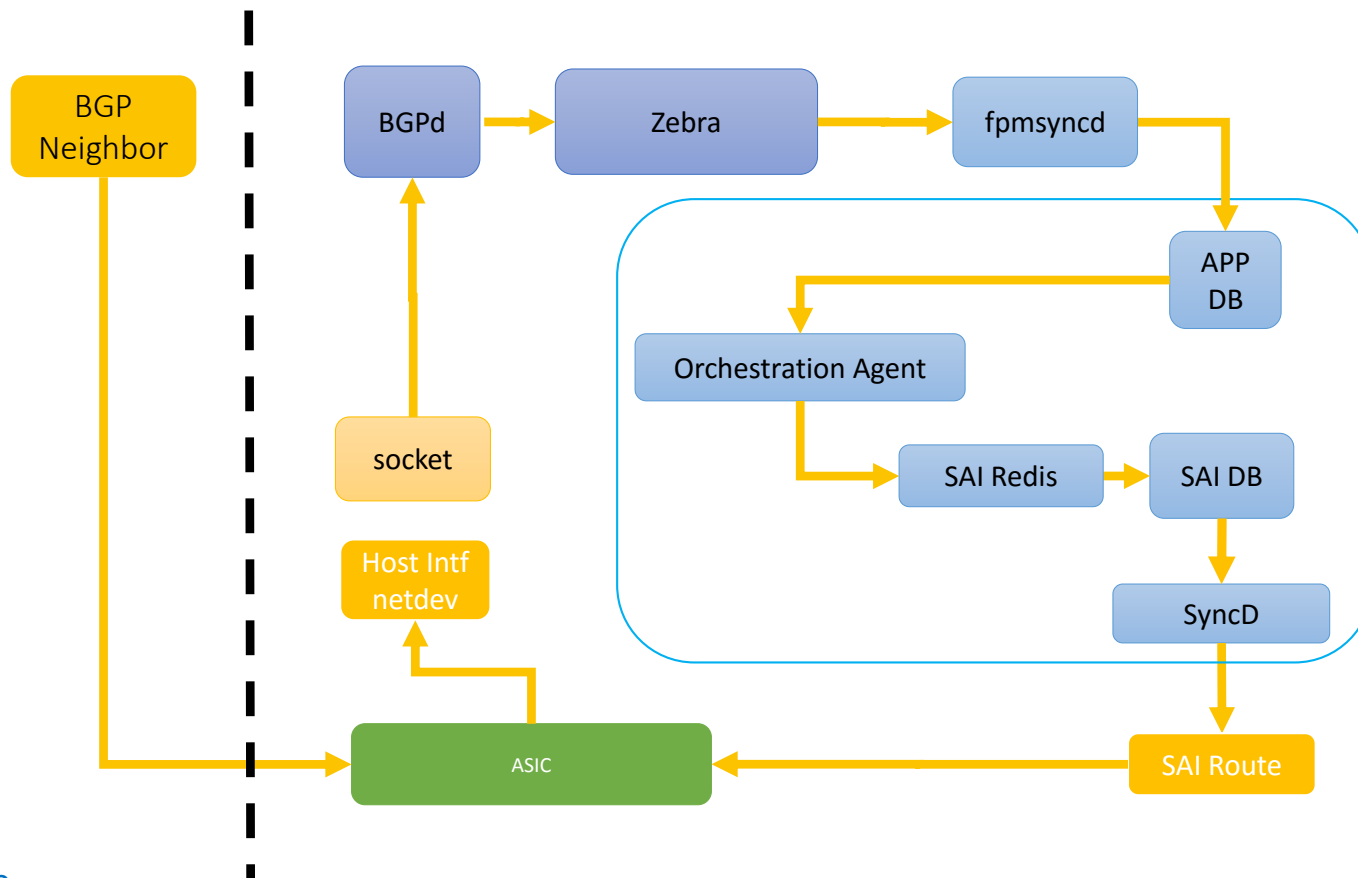
DB backend: redis with object library

SyncD: sync SAI objects between software and hardware

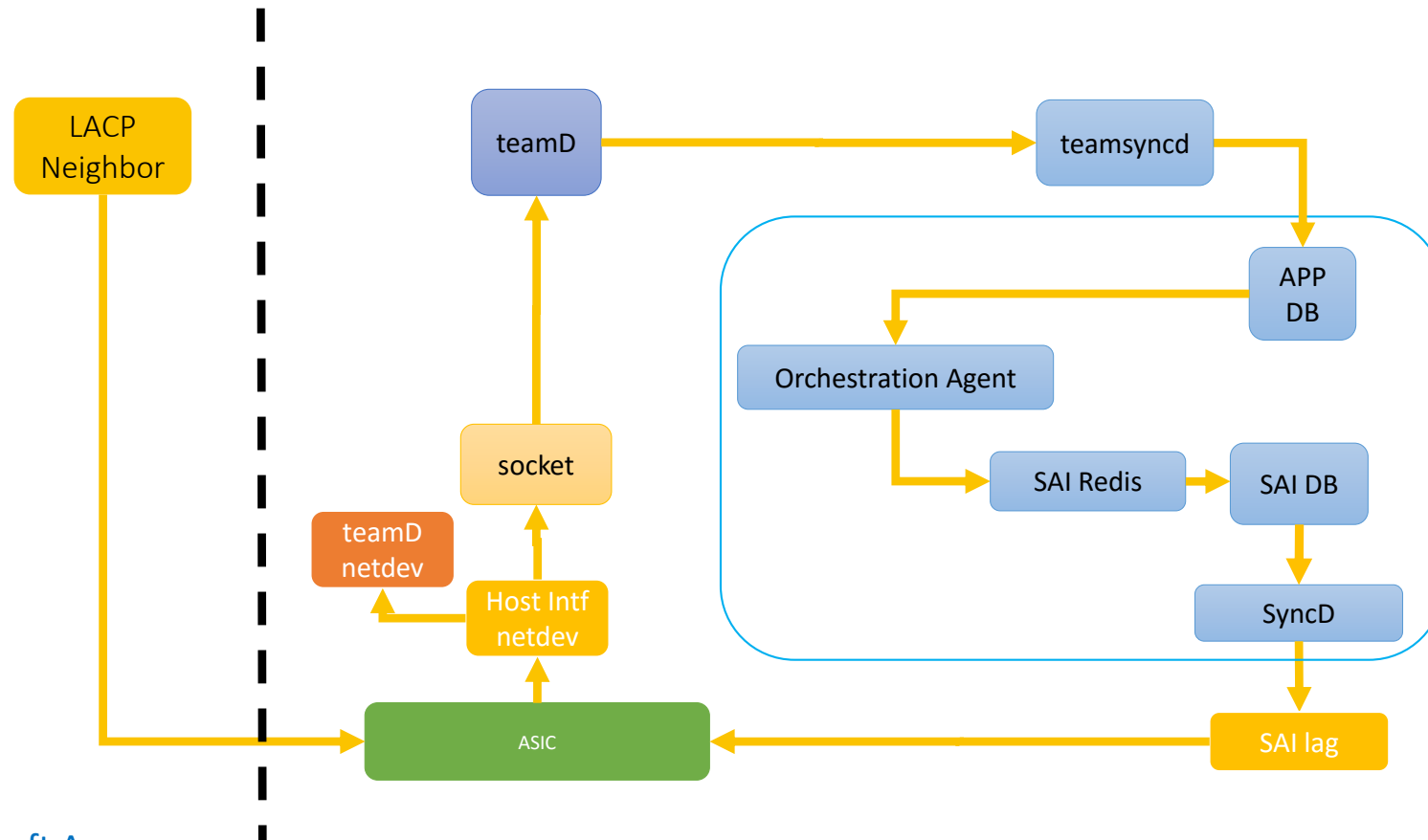
Orchestration Agent: translation between apps and SAI objects, resolution of dependency and conflict

Key Goal: Evolve components independently

How Routing Works in SONiC



How LAG Works in SONiC

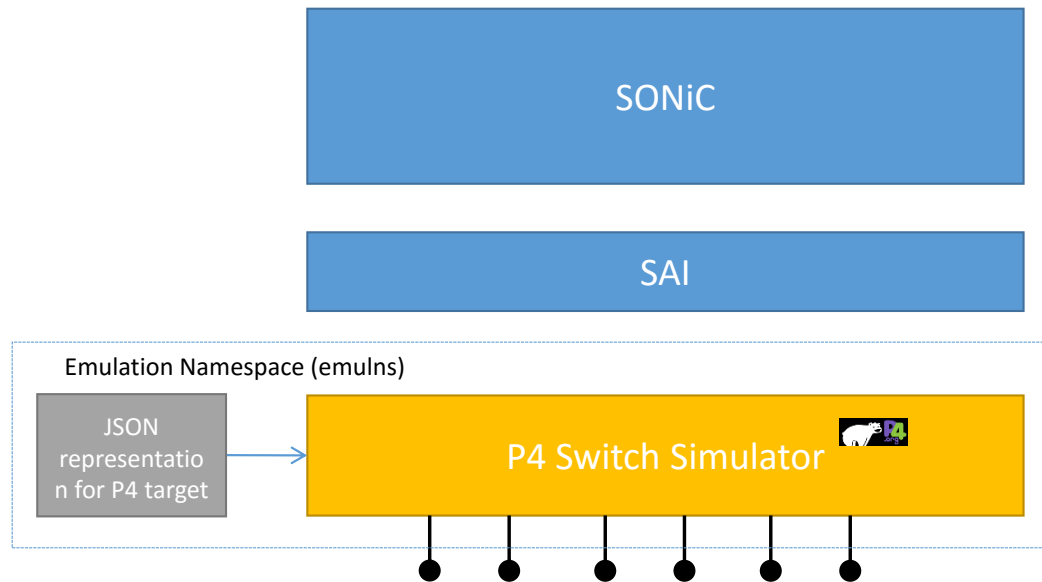


Benefits of P4 Switch

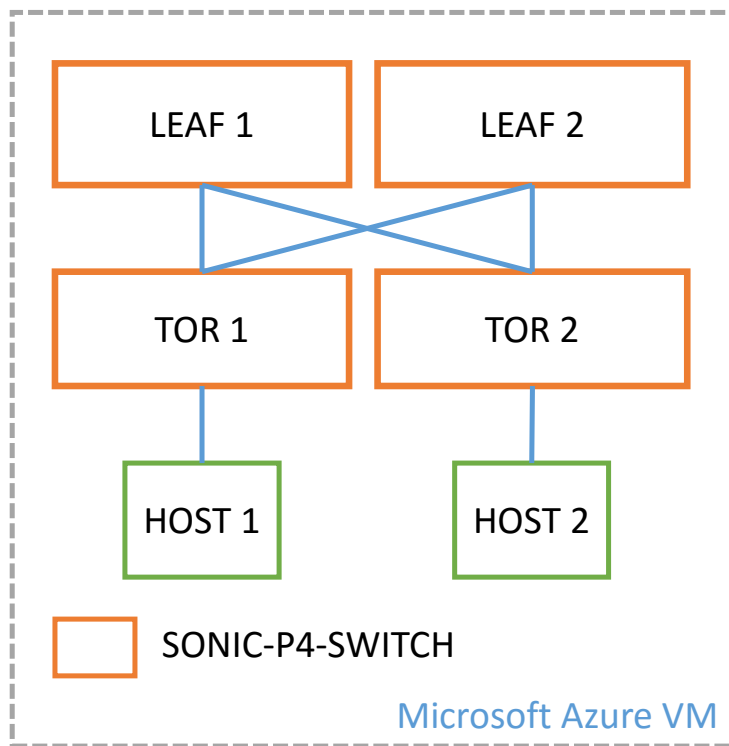
- Programmable Pipeline
 - Add new feature, tweak / improve / fix existing features
- Rapid Prototyping and Testing
 - Pipeline changes can be compiled and tested in just a few hours!!
- Feature-rich P4 defined pipeline
 - switch.p4 provides fully functional advanced L2/L3 switch pipeline
- Zero Effort Silicon Migration
 - The pipeline can run on simulator and P4 devices



SONiC and P4



SONIC P4 Switch in Azure VM



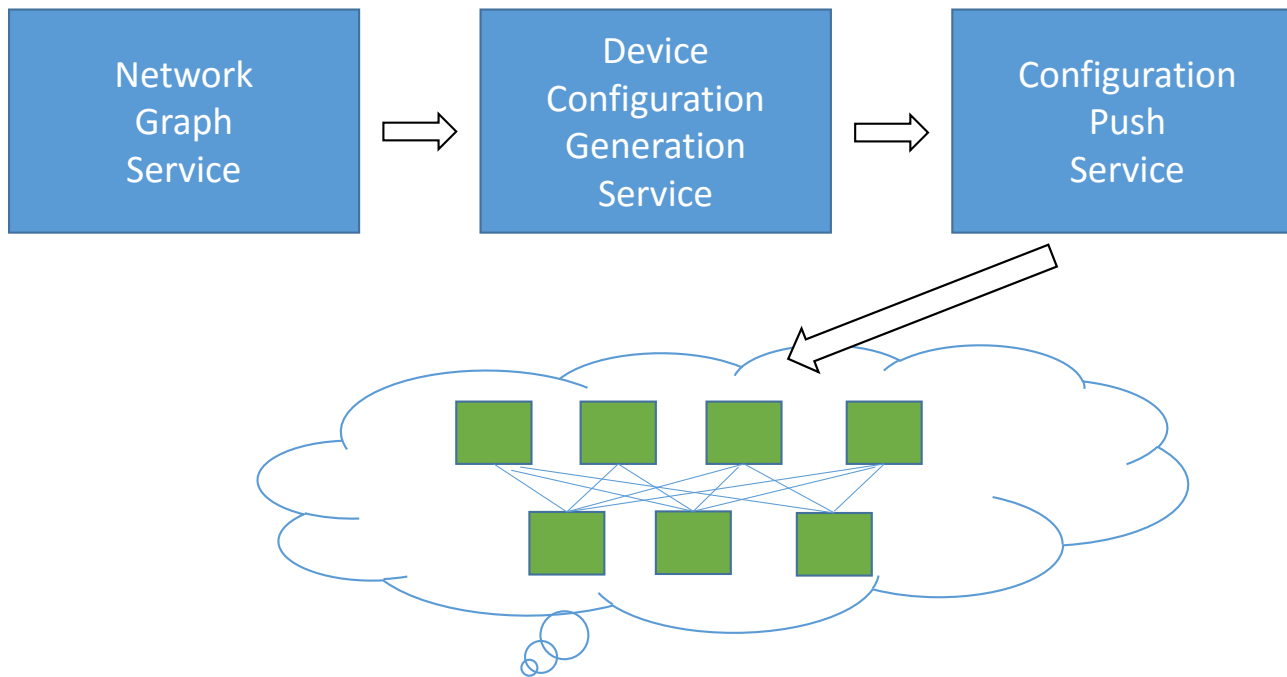
- Build SONiC + P4 into a container
- Deploy container in Azure VM
- Connect containers via Mininet
- Build, test and deploy cloud network in Azure within minutes
- Test SONiC control plane stack without real hardware

SONIC P4 Switch for Azure

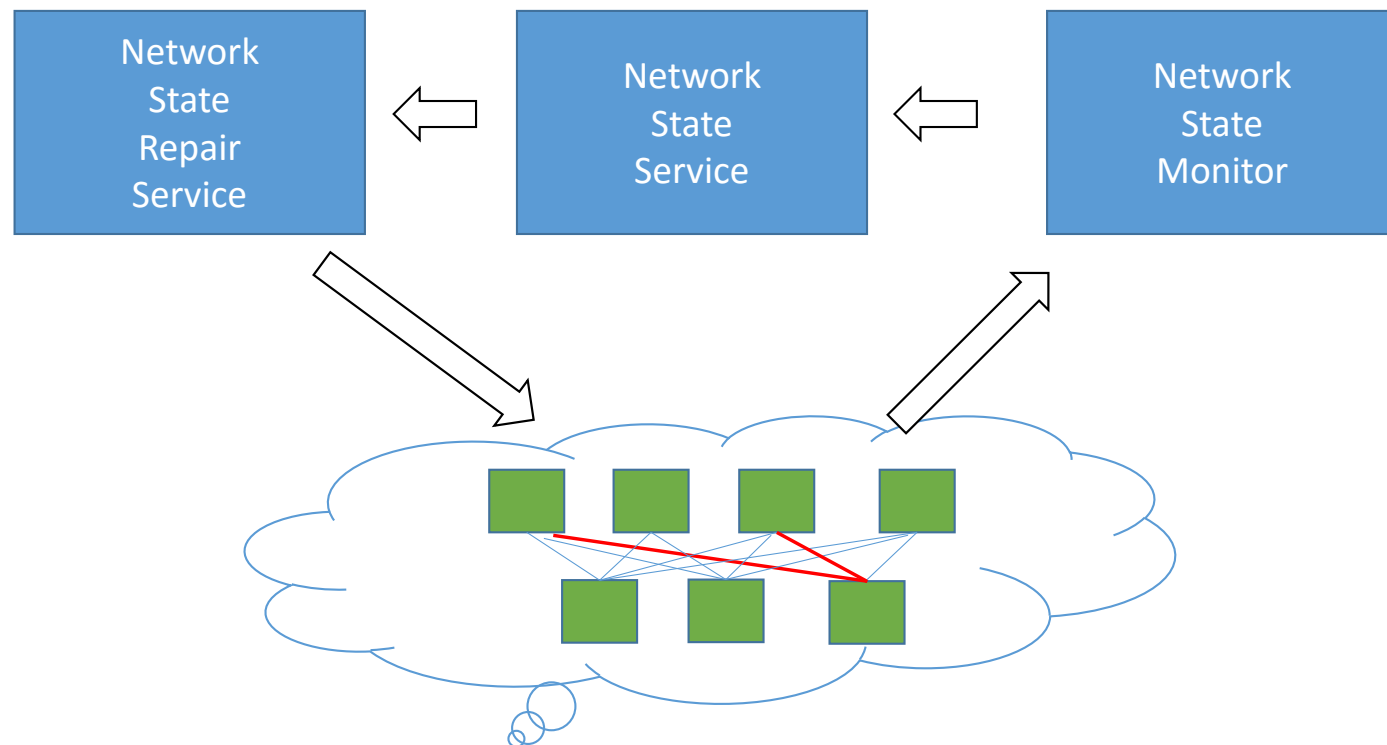
- Microsoft Azure Network
 - 24 regions around worldwide
 - Hundreds of thousands of switches to manage
- Complex suites of network management software stack
 - Continuous switch configuration/software rollout
 - Real-time network failures handling
 - Large challenge to test the network management stack
- Emulating Large scale network in the cloud
 - Test configuration rollout and software deployment
 - Test various failure scenarios (Link/Switch/Podset)



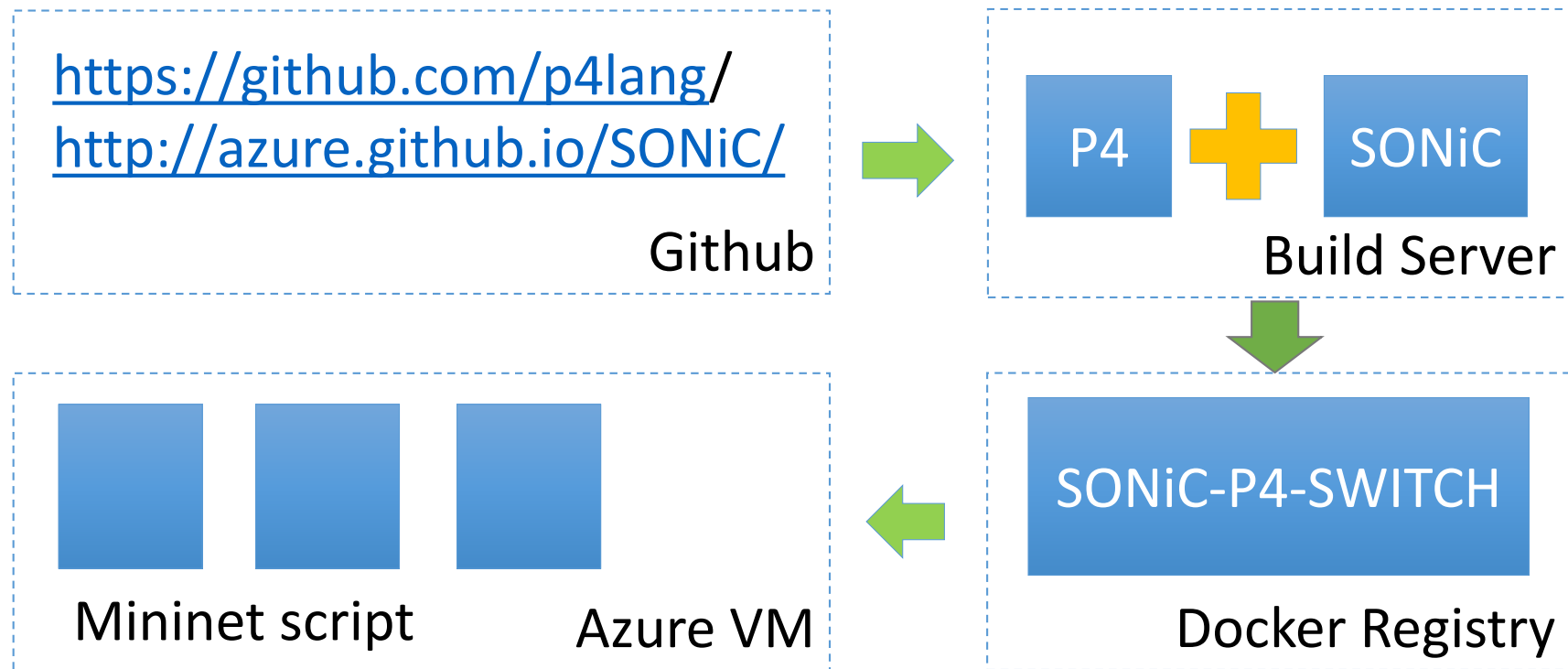
Use scenario 1: Switch Configuration Validation



Use scenario 2: Network Failure Emulation



Build and Deploy in Azure



Takeaway

- SONiC is full open source L2/L3 switch stack from Microsoft
- SONiC + P4 switch simulator turns into a high fidelity switch emulation platform
- Build, deploy and test SONIC-P4 Switch in Azure VM in minutes

Q & A