P4
&
Switch Abstraction Interface

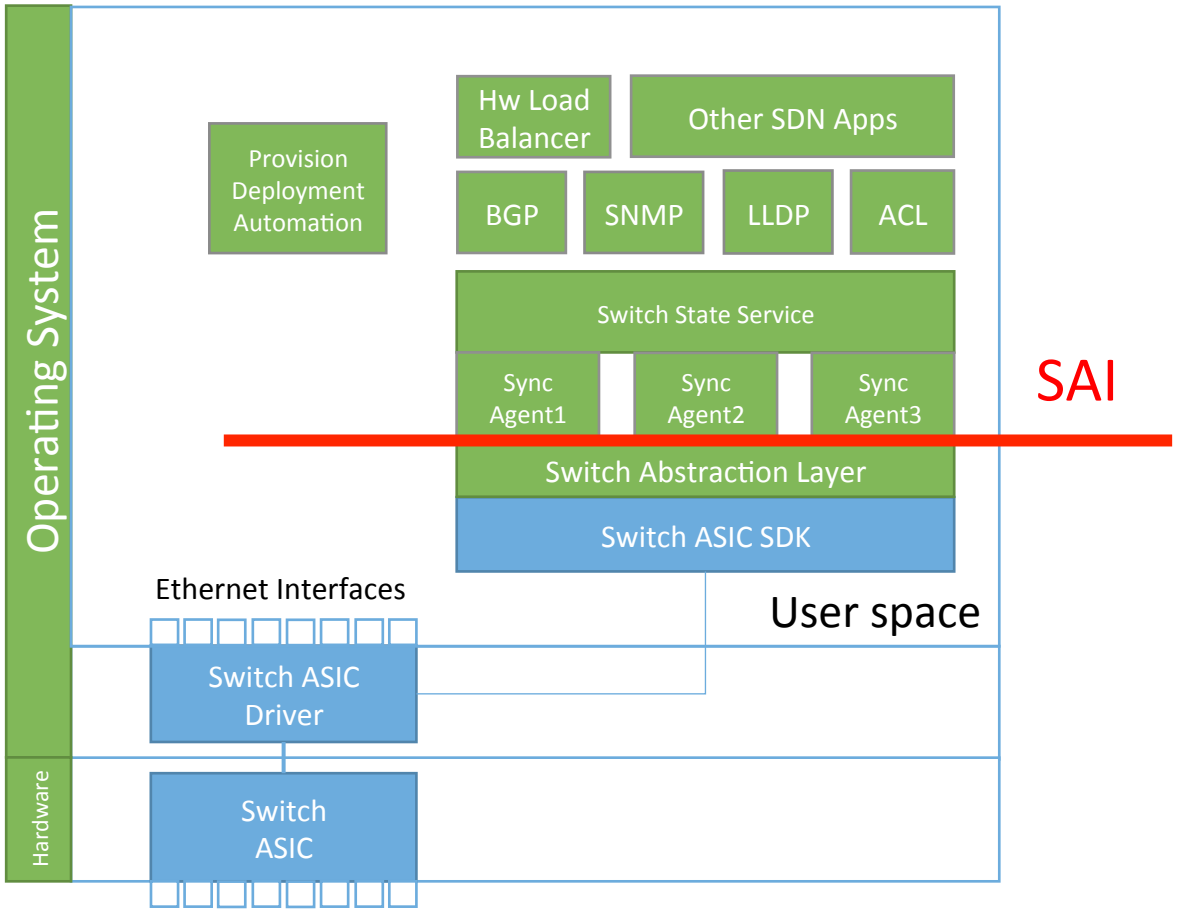
Lihua Yuan, Guohan Lu

Microsoft Azure Networking

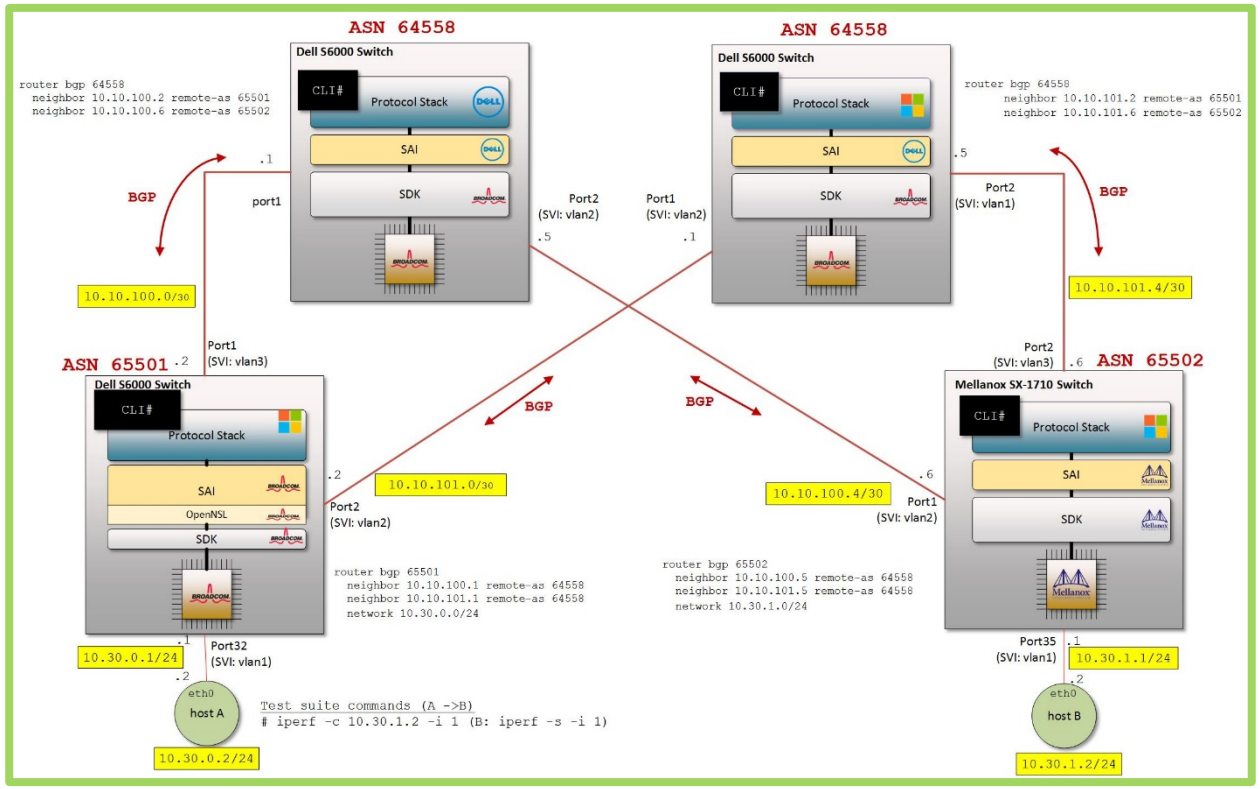
Switch Abstraction Interface (SAI)

- Unified **control-plane API** over various switch devices
  - Open-source contribution to OCP from multiple companies
    - Barefoot, Broadcom, Cavium, Dell, Facebook, Intel, Mellanox, Microsoft,
  - CRUD operation over extensible Entity/Attribute/Value data model
  - Current coverage (0.9.3 github):
    - switch, port, lag, vlan, fdb, stp, tunnel (IPinIP, VXLAN)
    - virtual router, router interface, neighbor table, next hop, next hop groups, l3 routes
    - ACL, policer, QoS, buffer
    - Port mirroring, ERSPAN, sflow
  - SAI extension allows vendor to expose new data-plane capabilities.

SAI Implementations



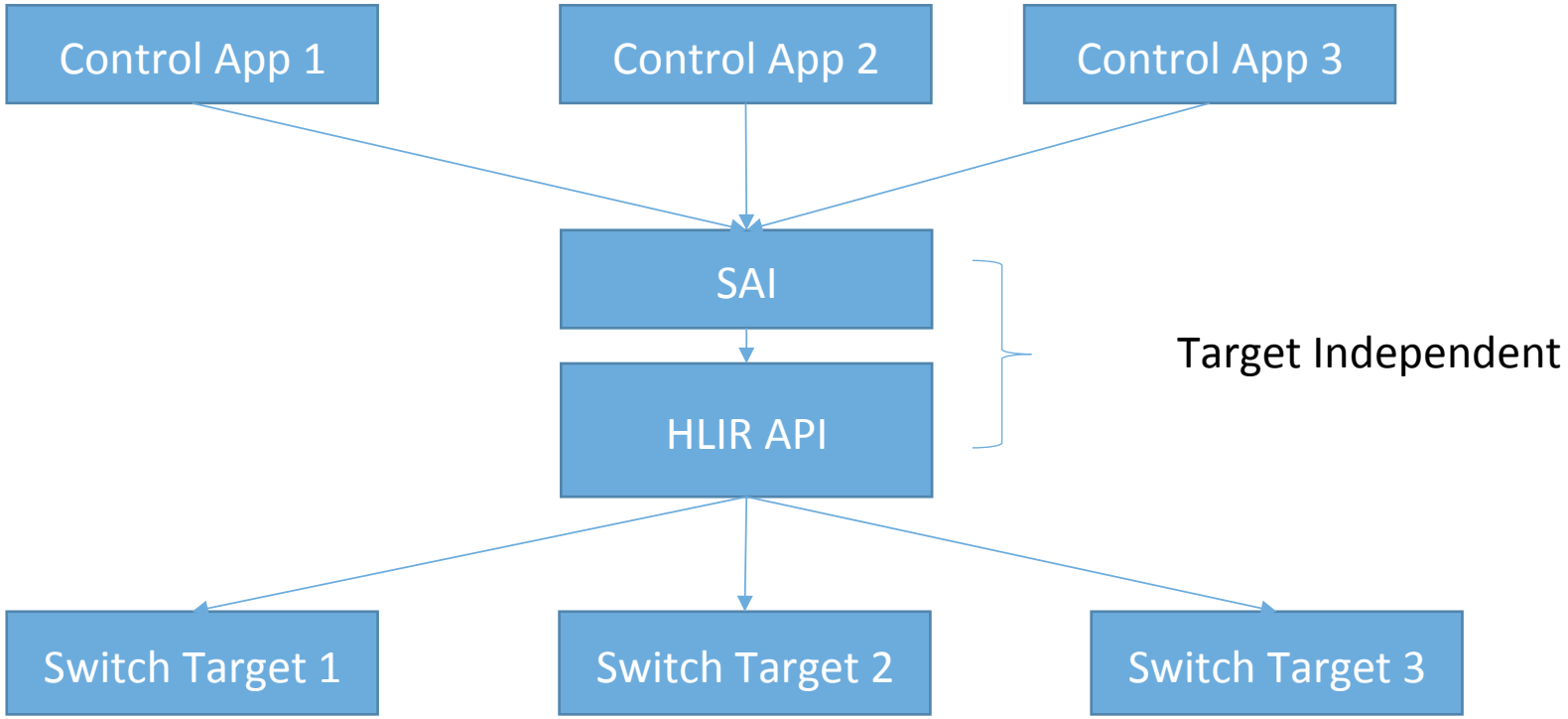
SAI in Azure Cloud Switch



SAI Interop Demo at OCP @Mar, 2015

SAI + P4

- P4 provides the language to describe the data plane.
- SAI configures the data plane.



SAI + P4

- SAI.P4:
  - Defines a SAI-compliant pipeline that can be mapped to a software switch.

- Potential applications of the SAI+P4
  - Testing of SAI-based control applications.
  - Simulation of a network with real switch software.
  - Help software development on new data-plane capabilities.