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SAI Updates and Looking Forward

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Switch Abstraction Interface (SAI)

Network Applications

Hello

Switch Abstraction Interface

частный
你好
नमस्ते
Bonjour
SAI Achievements In 2017

**Monitoring**
- TAM [Broadcom]
- Microburst [Marvell]
- Critical Resource Monitoring [MSFT]
- Data Plane Telemetry [Barefoot]

**Protocols**
- MPLS [Mellanox]
- BFD [Dell]
- Segment Routing [Cavium]
- VxLAN-Ext [MSFT]

**Reliability/QoS**
- L3 Fast Reroute [Metaswitch]
- ECN [Dell]

**Infrastructure**
- SAI P4 Model [Mellanox]
- Multi-NPU [Dell]
- Capability Query [Mellanox]
- SAI Ext API [Dell]
SAI Challenges

• SAI capabilities
  - Different ASICs has different capabilities
  - SAI now supported by 8 ASIC vendors
  - Applications need to accommodate different SAI capabilities

• SAI for specialized forwarding functions
  - Networking gears in data center and WANs are still using traditional packet forwarding functions, L2 forwarding, L3 routing
  - However, certain SDN features need customized forwarding functions
  - Allow user to customize SAI pipeline and expose programmable pipeline
Applications Adapt to ASIC Capability Through SAI

• Applications query the SAI capability
• Applications adapt its behavior based on the SAI capability
• Example: ACL port range \((\text{permit tcp any any 1024 1048})\)
  − When ASIC has port range checker, apps creates SAI port range check
  − When ASIC does not have port range checker, application can use multiple ACL rules to emulate port range checker
Generic API for SAI capability

• SAI consists of objects and attributes
  - Query(object_type, attribute)
  - Query(object_type, attribute, valid enum range)
  - ACL Range
  - sai_query_attribute_capability(SAI_OBJECT_TYPE_ACL_RANGE, SAI_ACL_RANGE_ATTR_TYPE)
  - sai_query_attribute_enum_values_capability(SAI_OBJECT_TYPE_ACL_RANGE, SAI_ACL_RANGE_ATTR_TYPE, enum_values_capability)
  - enum_values_capability: SRC_PORT_RANGE, DST_PORT_RANGE, ...
Infrastructure to Expose SAI Capability

- SAI meta data infrastructure
- Allow vendor to extend meta to include their own information

```c
/* @type sai_object_id_t */
/* @flags CREATE_AND_SET */
/* @objects SAI_OBJECT_TYPE_NEXT_HOP,
SAI_OBJECT_TYPE_NEXT_HOP_GROUP,
SAI_OBJECT_TYPE_ROUTER_INTERFACE,
SAI_OBJECT_TYPE_PORT */
/* @allownull true */
/* @default SAI_NULL_OBJECT_ID */

SAI_ROUTE_ENTRY_ATTR_NEXT_HOP_ID,
```
SAI for Common Functionalities

• Goal: provide common API for different ASICs
• SAI works very well for common packet forwarding functionalities
  − Define common APIs
  − Define SAI packet pipeline model (SAI behavior model)
  − Each ASIC maps the SAI API to their ASIC SDK based on SAI behavior model
• Example, L3 packet forwarding model
SAI for Specialized Functionalities

• Goal: Providing flexibility on top of existing SAI pipeline

• Approach
  - Provide SAI flex API generated by pipeline description language on top of existing SAI behavior model

• Benefits
  - Existing SAI APIs are still available
  - Users can customize the pipeline and use the generated SAI API
SAI Flex API
SAI Road Map 2018 and Beyond

- Telemetry
- WAN
- Programmability
- Test
Open Invitation – OCP Workshop on 3/22

OCP SONiC/SAI Engineering Workshop - hosted by LinkedIn
by Open Compute Project Foundation

Free

Sold Out

MAR
22

DATE AND TIME
Thu, March 22, 2018
8:00 AM – 5:00 PM PDT
Add to Calendar

LOCATION
2GC Capital Corporation
4500 Great America Parkway
Room 1025–1027
Santa Clara, CA 95054

DESCRIPTION
• March 22nd 8:00am - 5:00pm
• Dinner to Follow - when registering, please let us know if you can join us for dinner. Location TBD
• Breakfast/Lunch will be provided.

Dear SONIC, SAI community and Open Networking enthusiasts:
We would love to invite you to join us on 3/22 to discuss the latest SONIC and SAI developments, roadmaps, and meet face-to-face with your fellow community members.
Open Invitation II

• Inviting contributions in all areas:
  - Bring up new proposals
  - Test and contribute test cases
  - Use it and report bugs

• Github  https://github.com/opencomputeproject/SAI
• Mailing list  opencompute-sai@lists.opencompute.org
• Meeting  https://attendee.gotowebinar.com/register/6659543304101781761