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Switch Abstraction Interface

Change Proposal

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| **Authors** | **CENTEC** |
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# List of Changes

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| Version | Changes | Name | Date |
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# Overview

L2 Multicast, a basic layer 2 feature, which provides a security solution by isolating flooding domain from VLAN to l2multicast group. Meanwhile, it decreases the traffic load on a Layer 2 switch. This document covers details of l2multicast object –l2multicast group creating and removing, l2multicast group attributes setting and getting, port adding to l2multicast group, and port removing from l2multicast group.

# Specification

This section describes the details of the proposed interface/API

## Changes to sai.h

typedef enum \_sai\_api\_t {

SAI\_API\_L2MC= 44, /\* sai\_l2mc\_api\_t \*/

} sai\_api\_t;

## Changes to saivlan.h

/\*\*

\* @brief Attribute Id in sai\_set\_vlan\_attribute() and

\* sai\_get\_vlan\_attribute() calls

\*/

typedef enum \_sai\_vlan\_attr\_t

{

/\*\* READ-WRITE \*/

/\*\* VLAN IGMP Snooping enable [bool]

\*(default is enabled)\*/

SAI\_VLAN\_ATTR\_IGMP\_SNOOPING\_EN,

/\*\* VLAN IGMP Snooping discard\_unknown [bool]

\* (default is enabled)\*/

SAI\_VLAN\_ATTR\_IGMP\_SNOOPING\_DISCARD\_UNKNOWN,

/\*\* Custom range base value \*/

SAI\_VLAN\_ATTR\_CUSTOM\_RANGE\_BASE = 0x10000000

} sai\_vlan\_attr\_t;

## New definitions in sail2mc.h

/\*

\* L2 multicast entry key

\*/

typedef struct \_sai\_l2mc\_entry\_t

{

sai\_mac\_t mac\_address;

sai\_vlan\_id\_t vlan\_id;

} sai\_l2mc\_entry\_t;

/\*

\* Attribute Id for L2 mutlicast entry

\*/

typedef enum \_sai\_l2mc\_entry\_attr\_t

{

/\* READ-ONLY \*/

/\*\* SAI member list [sai\_object\_list\_t].

\* member should be port oid or tunnel\_id oid \*/

SAI\_L2MC\_ATTR\_MEMBER\_LIST,

/\* -- \*/

/\* Custom range base value \*/

SAI\_L2MC\_ENTRY\_ATTR\_CUSTOM\_RANGE\_BASE = 0x10000000

} sai\_l2mc\_entry\_attr\_t;

/\*

\* Routine Description:

\* Create L2 multicast entry

\*

\* Arguments:

\* [in] l2mc\_entry - L2 multicast entry

\* [in] attr\_count - number of attributes

\* [in] attr\_list - array of attributes

\*

\* Return Values:

\* SAI\_STATUS\_SUCCESS on success

\* Failure status code on error

\*/

typedef sai\_status\_t (\*sai\_create\_l2mc\_entry\_fn)(

\_In\_ const sai\_l2mc\_entry\_t\* l2mc\_entry,

\_In\_ uint32\_t attr\_count,

\_In\_ const sai\_attribute\_t \*attr\_list

);

/\*

\* Routine Description:

\* Remove L2 multicast entry

\*

\* Arguments:

\* [in] l2mc\_entry – L2 multicast entry

\*

\* Return Values:

\* SAI\_STATUS\_SUCCESS on success

\* Failure status code on error

\*/

typedef sai\_status\_t (\*sai\_remove\_l2mc\_entry\_fn)(

\_In\_ const sai\_l2mc\_entry\_t\* l2mc\_entry

);

/\*

\* Routine Description:

\* add member list to L2 multicast, the member should be bridge port or tunnel port.

\*

\* Arguments:

\* [in] l2mc\_entry - L2 multicast entry

\* [in] member\_list - port and tunnel\_id list

\*

\* Return Values:

\* SAI\_STATUS\_SUCCESS on success

\* Failure status code on error

\*/

typedef sai\_status\_t (\*sai\_add\_members\_to\_l2mc\_fn)(

\_In\_ const sai\_l2mc\_entry\_t\* l2mc\_entry,

\_In\_ const sai\_object\_list\_t \*member\_list

);

/\*

\* Routine Description:

\* remove member list from L2 multicast, the member should be bridge port or tunnel\_id.

\*

\* Arguments:

\* [in] l2mc\_entry - L2 multicast entry

\* [in] member\_list - port and tunnel\_id list

\*

\* Return Values:

\* SAI\_STATUS\_SUCCESS on success

\* Failure status code on error

\*/

typedef sai\_status\_t (\*sai\_remove\_members\_from\_l2mc\_fn)(

\_In\_ const sai\_l2mc\_entry\_t\* l2mc\_entry,

\_In\_ const sai\_object\_list\_t \*member\_list

);

/\*

\* Routine Description:

\* Set L2 multicast entry attribute value

\*

\* Arguments:

\* [in] L2 multicast - L2 multicast entry

\* [in] attr - attribute

\*

\* Return Values:

\* SAI\_STATUS\_SUCCESS on success

\* Failure status code on error

\*/

typedef sai\_status\_t (\*sai\_set\_l2mc\_entry\_attribute\_fn)(

\_In\_ const sai\_l2mc\_entry\_t\* l2mc\_entry,

\_In\_ const sai\_attribute\_t \*attr

);

/\*

\* Routine Description:

\* Get L2 multicast entry attribute value

\*

\* Arguments:

\* [in] l2mc\_entry - L2 multicast

\* [in] attr\_count - number of attributes

\* [inout] attr\_list - array of attributes

\*

\* Return Values:

\* SAI\_STATUS\_SUCCESS on success

\* Failure status code on error

\*/

typedef sai\_status\_t (\*sai\_get\_l2mc\_entry\_attribute\_fn)(

\_In\_ const sai\_l2mc\_entry\_t\* l2mc\_entry,

\_In\_ uint32\_t attr\_count,

\_Inout\_ sai\_attribute\_t \*attr\_list

);

/\*

\* L2 multicast method table retrieved with sai\_api\_query()

\*/

typedef struct \_sai\_l2mc\_api\_t

{

sai\_create\_l2mc\_entry\_fn create\_l2mc\_entry;

sai\_remove\_l2mc\_entry\_fn remove\_l2mc\_entry;

sai\_add\_members\_to\_l2mc\_fn add\_members\_to\_l2mc;

sai\_remove\_members\_from\_l2mc\_entry\_fn remove\_members\_from\_l2mc\_fn;

sai\_set\_l2mc\_entry\_attribute\_fn set\_l2mc\_entry\_attribute;

sai\_get\_l2mc\_entry\_attribute\_fn get\_l2mc\_entry\_attribute;

} sai\_l2mc\_api\_t;

# Examples

sai\_api\_query(SAI\_API\_L2MC, &sai\_l2mc\_api);

sai\_l2mc\_entry\_t l2mc\_entry;

sai\_object\_id\_t port\_list\_obj[2] = {0};

sai\_attribute\_t attr[1] = {0};

l2mc\_entry.vlan\_id = 10;

l2mc\_entry.mac\_address = {0x01, 0x00, 0x5e, 0x00, 0x02, 0x00};

attr[0].id = SAI\_L2MC\_ATTR\_PORT\_LIST;

port\_list\_obj [0] = port1\_obj;

port\_list\_obj [1] = port2\_obj;

attr[0].value.objlist.count = 2;

attr[0].value.objlist.list = port\_list\_obj;

sai\_l2mc\_api->create\_l2mc\_entry(&l2mc\_entry, 1, attr);

# Appendix (review meeting questions)

1. Suggest the multicast group entry to be pointers to a group structure instead of port itself. That group structure could be shared by L2 and L3 multicast, containing the port bitmap for L2 and maybe VLAN info for L3.

Answer: for L3 multicast, please refer to <<SAI-Proposal-15-IP-Multicast.docx>>.

1. The port in the multicast group should consider tunnel port and bridge port both.

Answer: Yes, I will add it.

1. Regarding IGMP\_Disable flag (bool), how we defined the behavior when enabling it?

Answer: when IGMP\_SNOOPING\_EN is true and IGMP\_SNOOPING\_DISCARD\_UNKNOWN is true, the unknown traffic should be discard. When IGMP\_SNOOPING\_EN is true and IGMP\_SNOOPING\_DISCARD\_UNKNOWN is false, the unknown traffic should be flooding in VLAN.

4. Is IGMP v3 considered in the proposal?

Answer: This proposal only consider L2 entry based on MAC and there are no consideration about L2 entry based on IP. For IGMP v3 snooping, according to the current usage, we suggest the software process v3 packets as v2. If there are request for L2 entry based on IP, we will add them in this proposal.