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Switch Abstraction Interface

Change Proposal

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| --- | --- |
| **Title** | **Mirroring API’s** |
| **Authors** | **DELL** |
| **Status** | **In Review** |
| **Type** | **Standards Track** |
| **Created** | **02/05/2015** |
| **SAI-Version** | **V0.9.2** |

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# List of Changes

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Changes | Name | Date |
| 0.9.2 | Proposal for Mirror – Version 1 |  | 2/5/15 |
| 0.9.2 | Version 2. Updated with the following changes   * Made the Mirror enable/Disable a port based attribute * Replaced all instances of SPAN with Mirroring * Added a new field for GRE Protocol Type |  | 2/16/15 |
| 0.9.2 | Version 3. Updated the following changes   * Removed the argument mirror\_type from create and added as an attribute. Appendix has more details. * Changed according to the unified objet id proposal |  | 3/17/15 |
| 0.9.2 | Version 4. Updated the following changes   * Changed few attributes to CREATE+SET. Appendix section has more details. * Changed the specification to be more specific. Appendix section has more details. * Removed SAI\_MIRROR\_L2\_TUNNEL from sai\_erspan\_encapsulation\_type\_t. Details are in Appendix section. |  | 3/20/15 |

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# Overview

Proposal for saimirror.h interface

# Specification

**Mandatory**

* Implements port mirroring management functions like
* Creating a mirror session
* Specifying the type of mirroring
* Destroying the session
* Specifying various parameters to create a session
* Assigning/Enabling mirror sessions on a port
* Removing mirror sessions on a port.

## Changes to sai.h

typedef enum \_sai\_api\_t {

SAI\_API\_MIRROR= 14, /\* sai\_mirror\_api\_t \*/

} sai\_api\_t;

## Changes to saiport.h

typedef enum \_sai\_port\_attr\_t

{

/\* READ-WRITE \*/

/\* Mirror session [sai\_object\_list\_t] \*/

SAI\_PORT\_ATTR\_INGRESS\_MIRROR\_SESSION

/\* READ-WRITE \*/

/\* Mirror session [sai\_object\_list\_t] \*/

SAI\_PORT\_ATTR\_EGRESS\_MIRROR\_SESSION

} sai\_port\_attr\_t

## New definitions in saimirror.h

/\* Specify the type of mirroring \*/

typedef enum \_sai\_mirror\_type\_t {

/\* Local span \*/

SAI\_MIRROR\_TYPE\_LOCAL = 1,

/\* Remote span \*/

SAI\_MIRROR\_TYPE\_REMOTE,

/\* Enhanced Remote span \*/

SAI\_MIRROR\_TYPE\_ENHANCED\_REMOTE,

} **sai\_mirror\_type\_t**;

typedef enum \_sai\_erspan\_encapsulation\_type\_t

{

/\* L3 Tunnel Encapsulation \*/

SAI\_MIRROR\_L3\_GRE\_TUNNEL,

} **sai\_erspan\_encapsulation\_type\_t**;

typedef enum \_sai\_mirror\_session\_attr\_t {

/\* READ-ONLY \*/

/\* READ-WRITE \*/

/\* MANDATORY\_ON\_CREATE | CREATE \_ONLY \*/

/\* Mirror type SPAN/RSPAN/ERSPAN [sai\_mirror\_type\_t]\*/

SAI\_MIRROR\_SESSION\_ATTR\_TYPE,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET\*/

/\* Destination/Analyser/Monitor Port [sai\_object\_id\_t]\*/

SAI\_MIRROR\_SESSION\_ATTR\_MONITOR\_PORT,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET\*/

/\* Class-of-Service (Traffic Class) [uint8\_t] \*/

SAI\_MIRROR\_SESSION\_ATTR\_COS,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET\*/

/\* Valid for RSPAN and ERSPAN

\* L2 header TPID if vlanId is not zero [uint16\_t]\*/

SAI\_MIRROR\_SESSION\_ATTR\_VLAN\_TPID,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET\*/

/\* Valid for RSPAN and ERSPAN L2 header VlanId [sai\_vlan\_id\_t]\*/

SAI\_MIRROR\_SESSION\_ATTR\_VLAN\_ID,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET\*/

/\* Valid for RSPAN and ERSPAN packet priority [uint8\_t] \*/

SAI\_MIRROR\_SESSION\_ATTR\_VLAN\_PRI,

/\* All attributes below are Valid only for ERSPAN \*/

/\* MANDATORY\_ON\_CREATE | CREATE\_ONLY \*/

/\* Encapsulation type - sai\_erspan\_encapsulation\_type\_t \*/

SAI\_MIRROR\_SESSION\_ATTR\_ENCAP\_TYPE,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET\*/

/\* tunnel IP header version [uint8\_t]\*/

SAI\_MIRROR\_SESSION\_ATTR\_IPHDR\_VERSION,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET\*/

/\* tunnel header TOS [uint8\_t]\*/

SAI\_MIRROR\_SESSION\_ATTR\_TOS,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET\*/

/\* tunnel header TTL [uint8\_t]\*/

SAI\_MIRROR\_SESSION\_ATTR\_TTL,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET \*/

/\* tunnel source IP [sai\_ip\_address\_t] \*/

SAI\_MIRROR\_SESSION\_ATTR\_SRC\_IP\_ADDRESS,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET \*/

/\* tunnel destination IP [sai\_ip\_address\_t] \*/

SAI\_MIRROR\_SESSION\_ATTR\_DST\_IP\_ADDRESS,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET \*/

/\* L2 source MAC address [sai\_mac\_t] \*/

SAI\_MIRROR\_SESSION\_ATTR\_SRC\_MAC\_ADDRESS,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET \*/

/\* L2 destination MAC address [sai\_mac\_t] \*/

SAI\_MIRROR\_SESSION\_ATTR\_DST\_MAC\_ADDRESS,

/\* MANDATORY\_ON\_CREATE | CREATE\_AND\_SET \*/

/\* GRE protocol Id [uint16\_t] \*/

SAI\_MIRROR\_SESSION\_ATTR\_GRE\_PROTOCOL\_TYPE,

} **sai\_mirror\_session\_attr\_t**;

/\*

\* Routine Description:

\* Create mirror session.

\*

\* Arguments:

\* [out] session\_id - port mirror session

\* [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\_mirror\_session\_fn)(

\_out\_ sai\_object\_id\_t \*session\_id,

\_In\_ uint32\_t attr\_count,

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

/\*

\* Routine Description:

\* Destroy Mirror session.

\*

\* Arguments:

\* [in] session\_id - port mirror session

\*

\* Return Values:

\* SAI\_STATUS\_SUCCESS on success

\* Failure status code on error

\*/

typedef sai\_status\_t (\*sai\_remove\_mirror\_session\_fn)(

\_In\_ sai\_object\_id\_t session\_id);

/\*

\* Routine Description:

\* Set Mirror session attribute.

\*

\* Arguments:

\* [in] session\_id - session\_id to set the attributes

\* [in] attr – attribute value

\*

\* Return Values:

\* SAI\_STATUS\_SUCCESS on success

\* Failure status code on error

\*/

typedef sai\_status\_t (\*sai\_set\_mirror\_session\_attribute\_fn)(

\_In\_ sai\_object\_id\_t session\_id,

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

/\*

\* Routine Description:

\* Get mirroring session attribute.

\*

\* Arguments:

\* [in] session\_id - session\_id to retrieve the attribute

\* [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\_mirror\_session\_attribute\_fn)(

\_In\_ sai\_object\_id\_t session\_id,

\_In\_ uint32\_t attr\_count,

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

/\* MIRROR method table retrieved with sai\_api\_query() \*/

typedef struct \_sai\_mirror\_api\_t

{

sai\_create\_mirror\_session\_fn create\_mirror\_session;

sai\_delete\_mirror\_session\_fn delete\_mirror\_session;

sai\_set\_mirror\_session\_attribute\_fn set\_mirror\_session\_attribute;

sai\_get\_mirror\_session\_attribute\_fn get\_mirror\_session\_attribute;

} sai\_mirror\_api\_t;

# Appendix

Message: 1

Date: Thu, 19 Mar 2015 08:39:51 +0000

From: Guohan Lu <[gulv@microsoft.com](mailto:gulv@microsoft.com)>

To: "[Arunsubash\_Manickam@Dell.com](mailto:Arunsubash_Manickam@Dell.com)" <[Arunsubash\_Manickam@Dell.com](mailto:Arunsubash_Manickam@Dell.com)>,

"[tusharty@broadcom.com](mailto:tusharty@broadcom.com)" <[tusharty@broadcom.com](mailto:tusharty@broadcom.com)>,

"[opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)"

<[opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)>

Subject: Re: [Opencompute-networking] SAI - Mirroring and SFLOW API's

for review

Message-ID:

<[BN1PR03MB139F862F01A1EEB8CD3B2E1C9010@BN1PR03MB139.namprd03.prod.outlook.com](mailto:BN1PR03MB139F862F01A1EEB8CD3B2E1C9010@BN1PR03MB139.namprd03.prod.outlook.com)>

Content-Type: text/plain; charset="us-ascii"

I am fine with 2, but just want to know what kind of L2 tunnel the NPU is going to use, hence the tunnel header used for encap the packet. So that the user can know what the fields are needed to be filled as attributes.

For example, the SAI\_MIRROR\_L3\_GRE\_TUNNEL is more clear to me, we know the encapsulation header is IP header plus the GRE header.

From: [Arunsubash\_Manickam@Dell.com](mailto:Arunsubash_Manickam@Dell.com) [<mailto:Arunsubash_Manickam@Dell.com>]

Sent: Thursday, March 19, 2015 1:11 AM

To: Guohan Lu; [tusharty@broadcom.com](mailto:tusharty@broadcom.com); [opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)

Subject: RE: [Opencompute-networking] SAI - Mirroring and SFLOW API's for review

Hi Guohan,

1 - Yes they need not be READ ONLY. It can be R/W. We will modify

2 - Some NPU's support only L2 based tunnel header for ERSPAN and hence has added that

-Arun

**From:** [opencompute-networking-bounces@lists.opencompute.org](mailto:opencompute-networking-bounces@lists.opencompute.org) [<mailto:opencompute-networking-bounces@lists.opencompute.org>] **On Behalf Of** Guohan Lu  
**Sent:** Wednesday, March 18, 2015 9:26 PM  
**To:** Manickam, Arunsubash; [tusharty@broadcom.com](mailto:tusharty@broadcom.com); [opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)  
**Subject:** Re: [Opencompute-networking] SAI - Mirroring and SFLOW API's for review

All the mirror session attributes are CREATE + READ-ONLY now. Maybe except for SAI\_MIRROR\_SESSION\_ATTR\_TYPE and SAI\_MIRROR\_SESSION\_ATTR\_ENCAP\_TYPE, all others should allow to be modified after the session is created?

For SAI\_MIRROR\_L2\_TUNNEL, which L2 tunnel is going to use to encap the packet? What’s the packet format for the mirror packet?

-Guohan

**From:** [opencompute-networking-bounces@lists.opencompute.org](mailto:opencompute-networking-bounces@lists.opencompute.org) [<mailto:opencompute-networking-bounces@lists.opencompute.org>] **On Behalf Of** [Arunsubash\_Manickam@dell.com](mailto:Arunsubash_Manickam@dell.com)  
**Sent:** Tuesday, March 17, 2015 7:59 PM  
**To:** [tusharty@broadcom.com](mailto:tusharty@broadcom.com); [opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)  
**Subject:** Re: [Opencompute-networking] SAI - Mirroring and SFLOW API's for review

Updated spec

<https://github.com/opencomputeproject/OCP-Networking-Project-Community-Contributions/blob/master/sai/doc/Mirror/SAI-Proposal-2-Mirror-Ver3.docx>

We would use this to generate headers

-Arun

**From:** [opencompute-networking-bounces@lists.opencompute.org](mailto:opencompute-networking-bounces@lists.opencompute.org) [<mailto:opencompute-networking-bounces@lists.opencompute.org>] **On Behalf Of** Tushar Tyagi  
**Sent:** Wednesday, March 18, 2015 10:21 PM  
**To:** Manickam, Arunsubash; [opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)  
**Subject:** Re: [Opencompute-networking] SAI - Mirroring and SFLOW API's for review

Requesting some minor clarifications before the headers are released..

The document talks about the mandatory functions like:

“Adding source ports to the session”.

“Removing the source ports from the session”.

But then in the attribute list there is no mention of “source ports”.

If the naming convention could be matched to help clarify the usage, that will be great.

-thanks

Tushar

**From:** [Arunsubash\_Manickam@Dell.com](mailto:Arunsubash_Manickam@Dell.com) [<mailto:Arunsubash_Manickam@Dell.com>]   
**Sent:** Tuesday, March 17, 2015 10:59 PM  
**To:** Tushar Tyagi; [opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)  
**Subject:** RE: [Opencompute-networking] SAI - Mirroring and SFLOW API's for review

Updated spec

<https://github.com/opencomputeproject/OCP-Networking-Project-Community-Contributions/blob/master/sai/doc/Mirror/SAI-Proposal-2-Mirror-Ver3.docx>

We would use this to generate headers

-Arun

From: Manickam, Arunsubash   
Sent: Tuesday, March 17, 2015 8:17 AM  
To: 'Tushar Tyagi'; [opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)  
Subject: RE: [Opencompute-networking] SAI - Mirroring and SFLOW API's for review

Yes agreed will make the change

-Arun

From: Tushar Tyagi [<mailto:tusharty@broadcom.com>]   
Sent: Tuesday, March 17, 2015 2:48 AM  
To: Manickam, Arunsubash; [opencompute-networking@lists.opencompute.org](mailto:opencompute-networking@lists.opencompute.org)  
Subject: RE: [Opencompute-networking] SAI - Mirroring and SFLOW API's for review

Hello Arun,

A small input..

Looking at other sai object create functions, I think that for maintaining consistency in..

*typedef sai\_status\_t (\*sai\_create\_mirror\_session\_fn)(*

*\_Inout\_ sai\_mirror\_session\_id\_t \*session\_id,*

*\_In\_ sai\_mirror\_type\_t mirror\_type,*

*\_In\_ uint32\_t attr\_count,*

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

**sai\_mirror\_type\_t mirror\_type** should be moved into the **attr\_list**.

-thanks

Tushar