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MSRP++ for Stream Registration and Reservation

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Why MSRP++?

Recap

- **MSRP++ for Stream Registration and Reservation**
  http://www.ieee802.org/1/files/public/docs2016/new-goetz-MSRPv2-update-0116-v02.pdf

Motivation

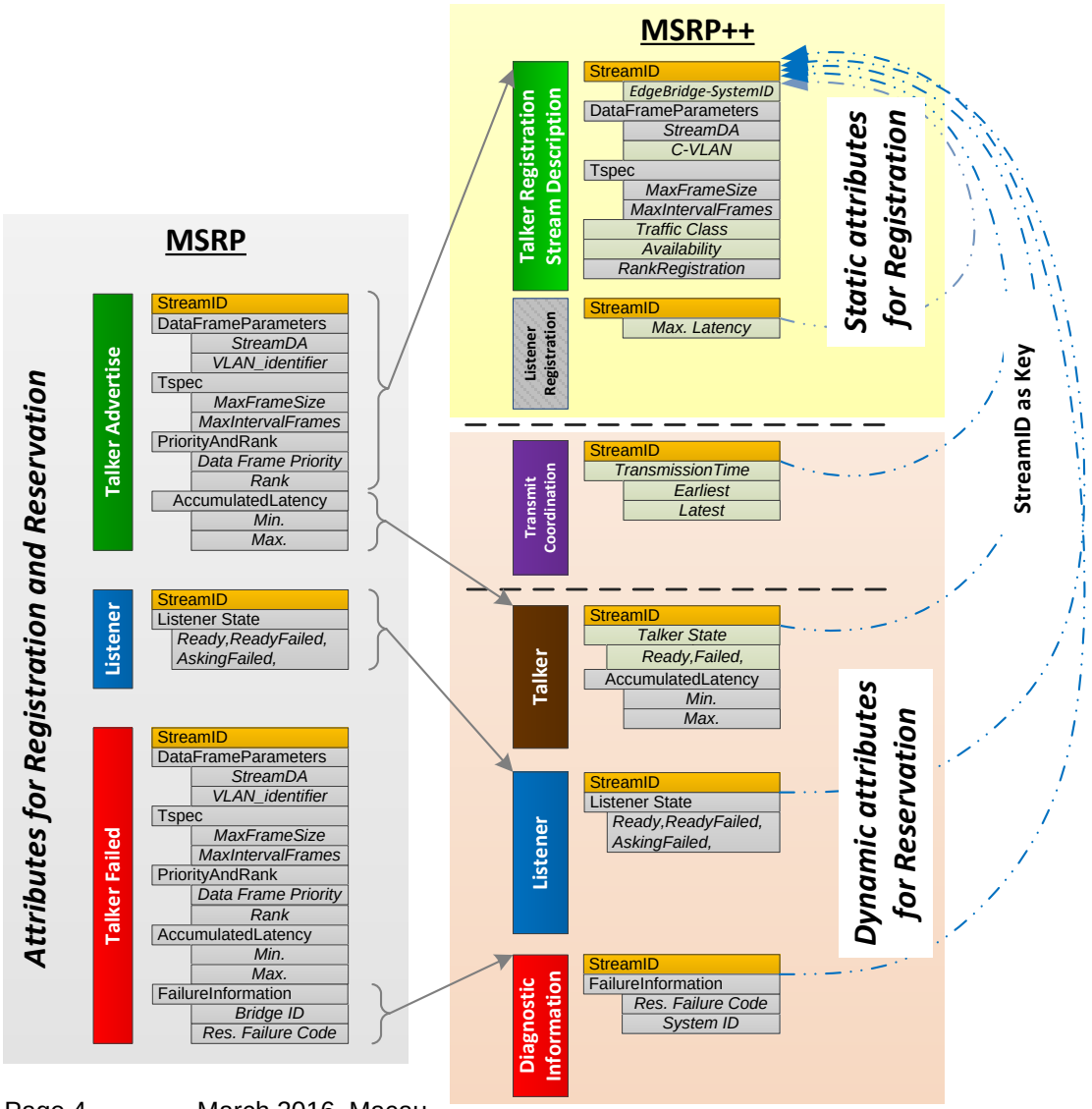
- **Performance improvement and more streams**
  - Splitting information for registration (static) and reservation (dynamic)
  - Additional parameters to support new TSN features
  - New transport mechanism for distribute static and dynamic information
- **Improved vectoring to support structuring**
- **Modular to support different registration and reservation models**
- **Part of (Industrial) User-Network-Interface (UNI)**
  http://www.ieee802.org/1/files/public/docs2016/new-goetz-UNI-MSRPv2-0316-v04.pdf

Supporters

Karl Weber (Beckhoff)
Stephan Kehrer (Hirschmann Automation and Control)
Oliver Kleineberg (Hirschmann Automation and Control)
Chen Feng (Siemens)
Franz-Josef Götz (Siemens)
Marcel Kiessling (Siemens)
Jürgen Schmitt (Siemens)

Performance improvement and more streams

Splitting information for registration (static) and reservation (dynamic)



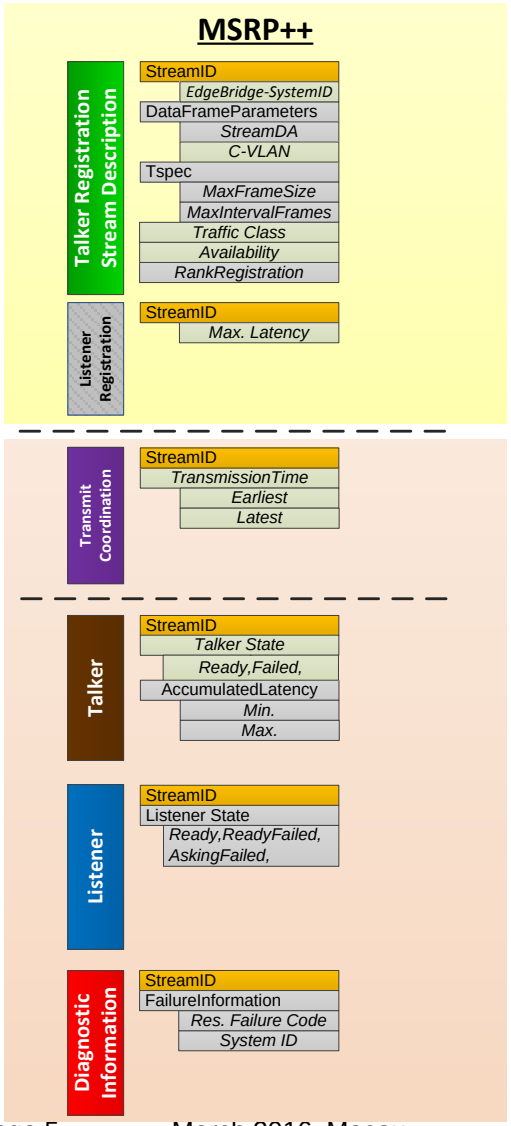
Using the Stream ID as a key for referencing the Stream description is important:

- to split dynamic and static information

- to gain smaller attributes for reservation

Performance improvement and more streams

Additional parameters to support new TSN features



Additional parameters:

- **Talker Registration**
  - EdgeBridge-SystemID
    - Stream Edge-Bridge identification
  - C-VLAN
    - Customer VLAN
  - Traffic Class
    - Configured stream traffic class
  - Availability
    - Specifies the requirement on recovery time
  - ….
- **Listener Registration**
  - Max Latency
    - Required max. latency
  - ….
- **Transmit Coordination**
  - Earliest transmission time
  - Latest transmission time
  - ….
- **Talker**
  - Talker State
    - Stream of talker is in ready or failed state
  - …
- ….

Performance improvement and more streams

New transport mechanism for distribute static and dynamic information

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Proposal:

Introducing different transport mechanisms which respect the different natures of static and dynamic stream attributes

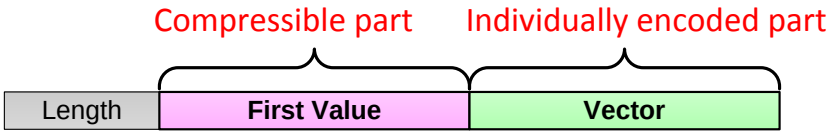
IS-IS-like:

A **IS-IS-like** data-plane flooding mechanism on a spanning tree with IS-IS CSNP, PSNP synchronization mechanism for additional synchronization on link

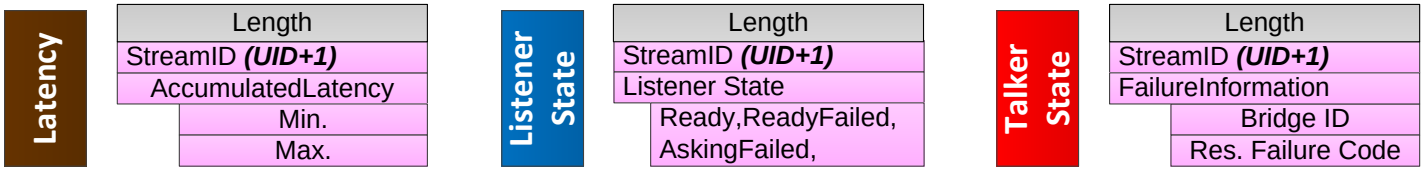
Link-Local IS-IS:

An improved **link-local** (peer-to-peer) attribute propagation mechanism utilizing some IS-IS mechanisms on a link for synchronization (e.g. hold time, checksum,…)

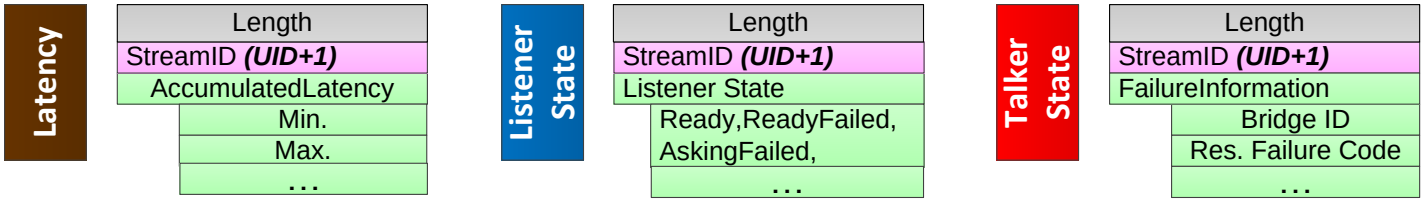
Improved vectoring to support structuring



FULL vectoring: All in First Value



PARTIAL vectoring: only StreamID is in FirstValue, others are individually encoded in vector



Using the Stream ID as a Key for referencing the Stream Description is important:

- Vectoring based on Stream ID in each Attribute
- separate Vectoring mechanism for each Attribute

FULL or PARTIAL vectoring

- Reduced size vs. increased probability
- Use-case dependent probability of Vectoring

Modular to support different registration and reservation models

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typical usage within networks

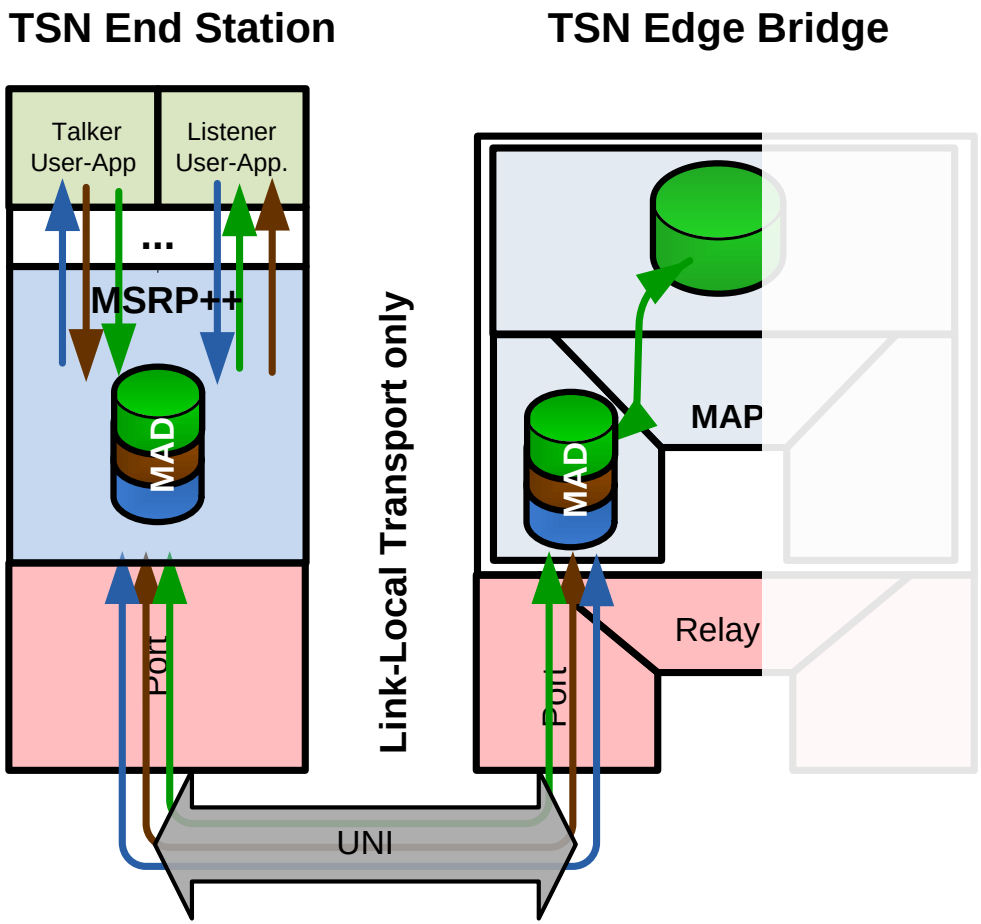
typical usage in end-stations and small networks

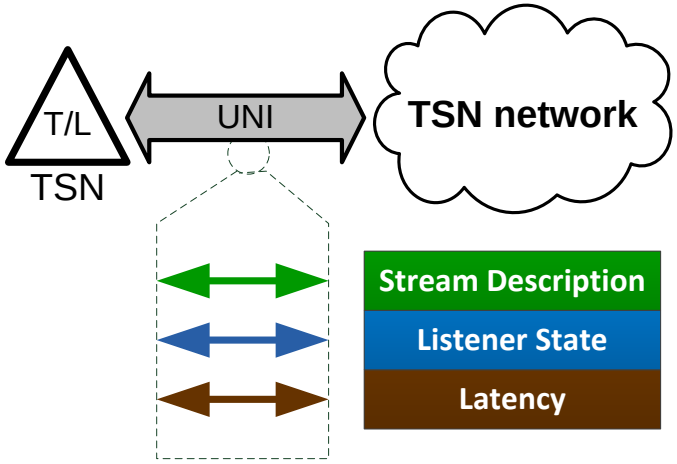
Mechanism	Options	1	2	3	4	…	5	6	…
Registration	Talker Registration Stream Description	I	I	I	I		L	L	
	Listener Registration	I	I	I	-		-		
Reservation	Transmit Coordination	-	-	-	-		L	-	
	Talker	-	-	-	L		L	L	
	Listener	-	-	L	L		L	L	
	Diagnostic Information	-	L	L	L		L	L	

Transport mechanism:
I: IS-IS like
L: Link-local IS-IS

Examples
Option 1: IS-IS-like for registration and **implicit** reservation (e.g. ISIS SPB PCR)
Option 4: IS-IS-like for registration and **Link-Local IS-IS** for reservation
Option 5: Link-Local IS-IS for registration and reservation
…

Part of (industrial) User-Network-Interface (UNI)





MSRP++ (Link-Local IS-IS mechanism) as one protocol at UNI for stream registration and reservation between TSN end-stations and TSN network

Next Steps!

Who wants to be named as supporter for this PAR/CSD proposal?

Vote for a new PAR/CSD for SRPv2 in next IEEE 802.1 Interim!

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