AVB for low latency networks:

part 2 – requirements for media redundancy

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Aims of this Presentation:

- Define requirements for low latency networks
- Show possible solutions
- Trigger discussions

=> Define new work items for AVB TG which includes requirements for industrial/low latency communication
Deterministic* stream reconfiguration (with media redundancy)

- **T**\_grace: Max. time an application can sustain a loss in network connectivity
- **T**\_rec: Time a redundancy control protocol (e.g. RSTP) needs to reconfigure network paths
  
  => Usually **T**\_rec !< **T**\_grace for the application not to notice network failure

- But: If communication is done with AVB streams, MSRP stream reconfiguration needs to be considered as well

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![Diagram showing Ethernet Network configured as a ring for media redundancy (e.g. by RSTP) with **T**\_rec, Listener, e.g. Industrial application, and Talker. The diagram includes arrows indicating network paths and error signals.]

*concerning time
If in case of network path switchover and a stream has to be „rerouted“, the stream switchover time $T_{\text{stream}}$ must be factored in:

- $T_{\text{rec}} + T_{\text{stream}} < T_{\text{grace}}$
- Therefore, **$T_{\text{stream}}$ needs to be calculable / determinable**

To guarantee the total network switchover time

- **Requirement:** The time needed to reestablish a stream after a (media) failure needs to be pre-determinable.
Deterministic stream reconfiguration: possible solutions

- To reduce the time for stream switchover, precalculate additional paths:
- Solution one: In case of a failure in path A, the stream is switched over to path B (within a defined short timeframe)
- Solution two: Both paths are active, streams are sent over both paths simultaneously.

- Ethernet Network configured as a ring for media redundancy (e.g. by RSTP) with $T_{rec}$
- Requirement: MSRP must be able to do an additional reservation on an alternate path
Requirements for MSRP to support media redundancy

- **Stream reconfiguration time must be deterministic**
  - To engineer media redundant networks with deterministic failover times, the reconfiguration time for streams must be deterministic and pre-determinable
  - Ability to do reservations of alternate path(s) not dependant on RSTP active topology
  - In case of failure on the active path, switch over to pre-calculated alternate path or
  - Send data over redundant paths simultaneously
Thank you!