

# **AVB for low latency networks:**

## **part 2 – requirements for media redundancy**



**Oliver Kleineberg, Hirschmann Automation & Control**  
**IEEE 802.1 Interim Meeting, May 2010, Geneva**

# AVB for Low Latency Networks

- **Aims of this Presentation:**

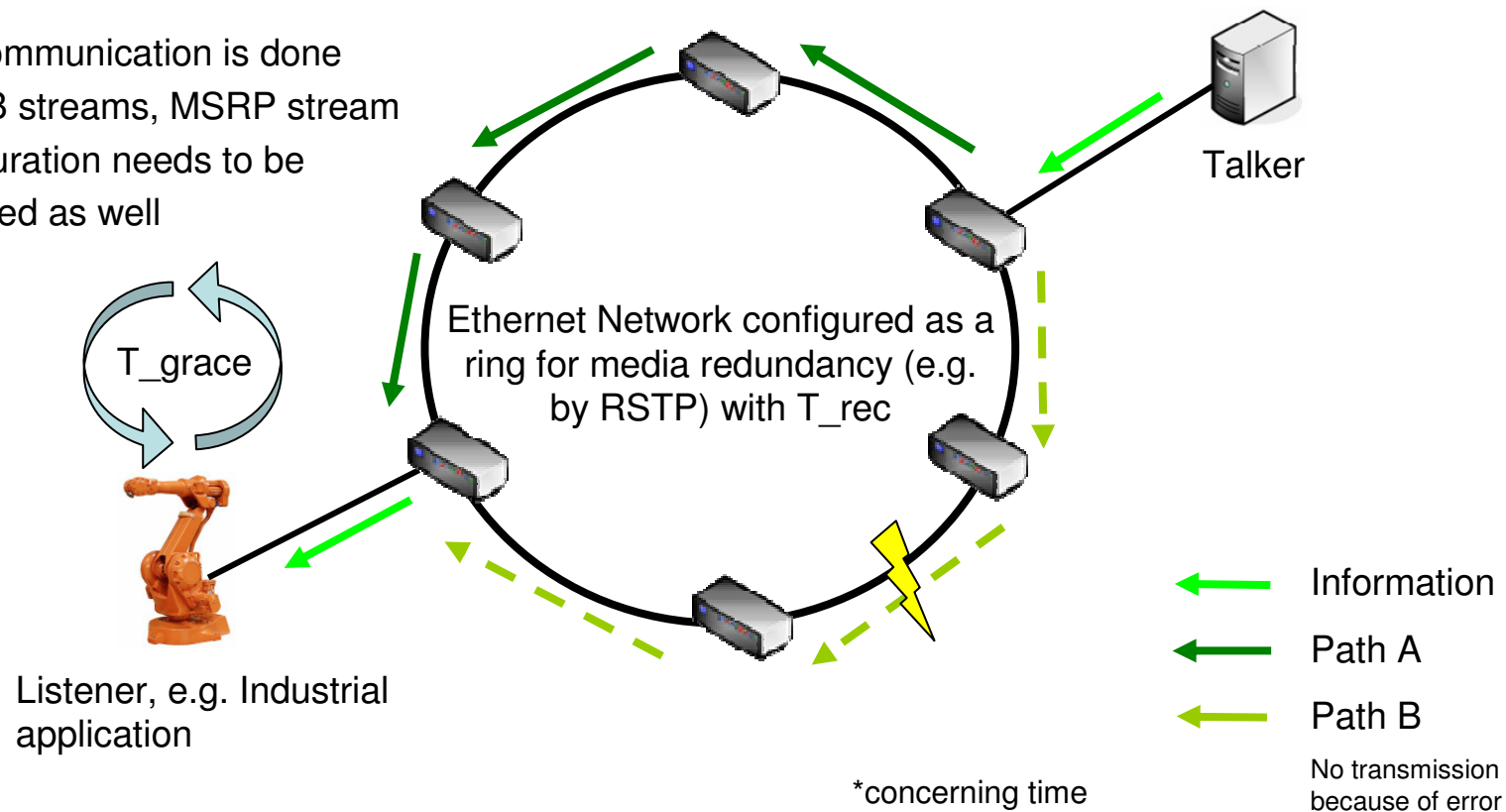
- Define requirements for low latency networks
- Show possible solutions
- Trigger discussions

**=> Define new work items for AVB TG which includes requirements for industrial/low latency communication**

# Deterministic\* stream reconfiguration (with media redundancy)

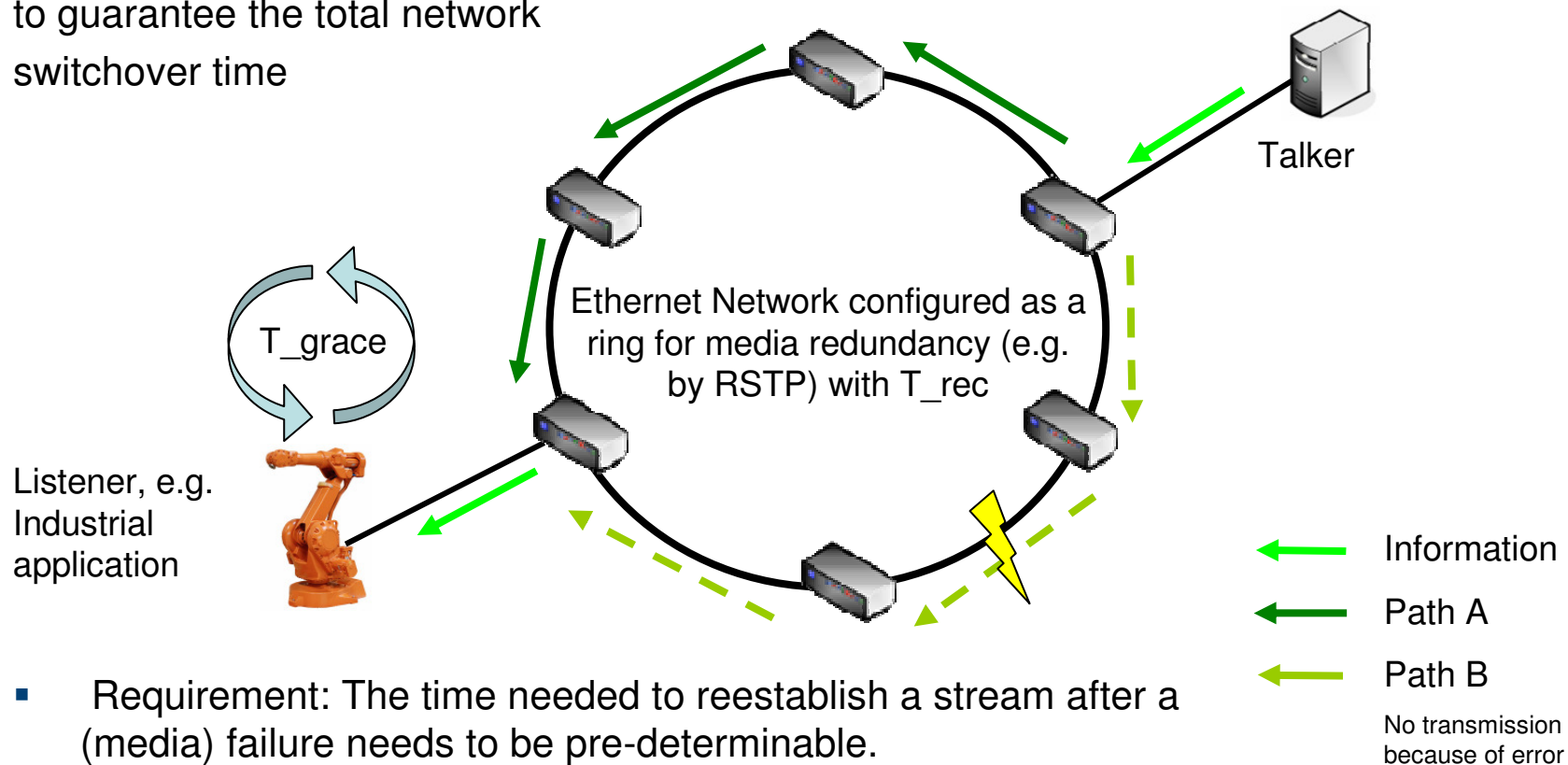
- $T_{\text{grace}}$ : Max. time an application can sustain a loss in network connectivity
  - $T_{\text{rec}}$ : Time a redundancy control protocol (e.g. RSTP) needs to reconfigure network paths
- => Usually  $T_{\text{rec}} \ll T_{\text{grace}}$  for the application not to notice network failure

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



# Deterministic stream reconfiguration (with media redundancy)

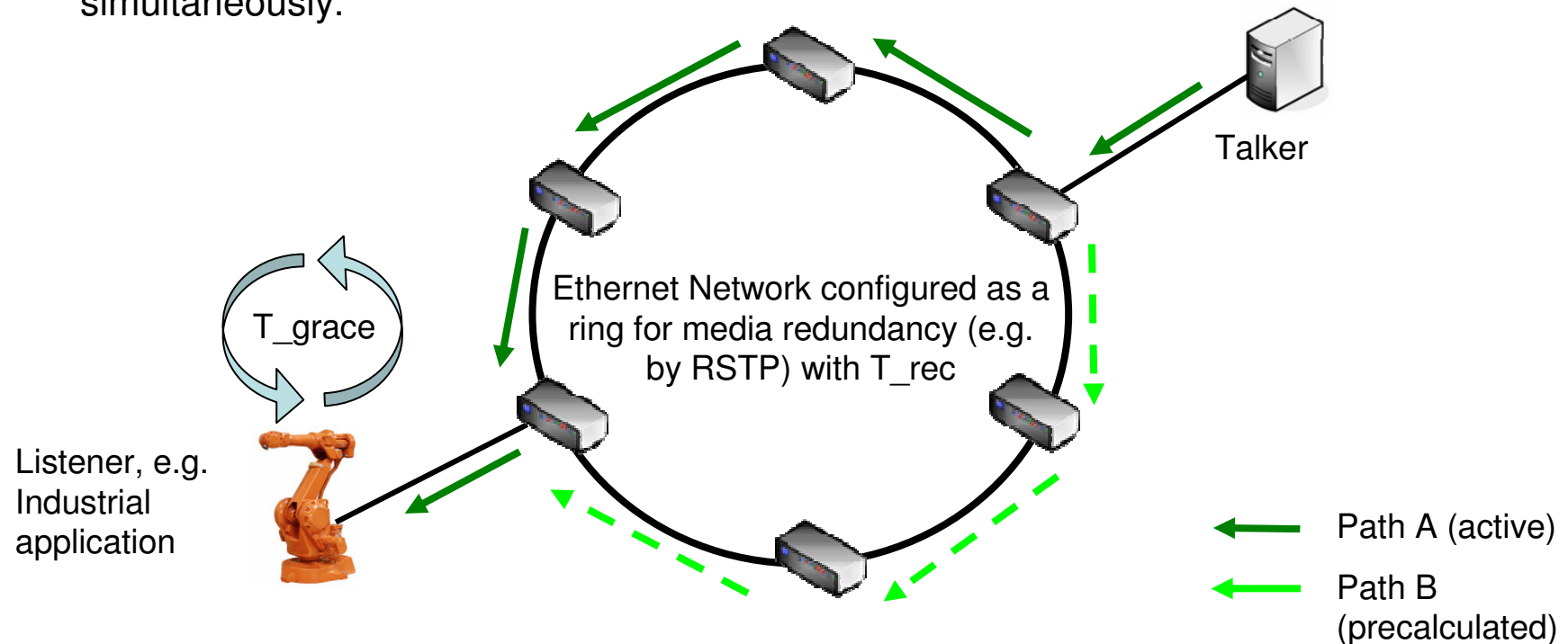
- If in case of network path switchover and a stream has to be „rerouted“, the stream switchover time  $T_{stream}$  must be factored in:
  - $T_{rec} + T_{stream} \ll T_{grace}$
  - Therefore,  **$T_{stream}$  needs to be calculable / determinable**
- to guarantee the total network switchover time



- 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.



- 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

**FIN**

**Thank you!**