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802.1, Sacramento, January 2006

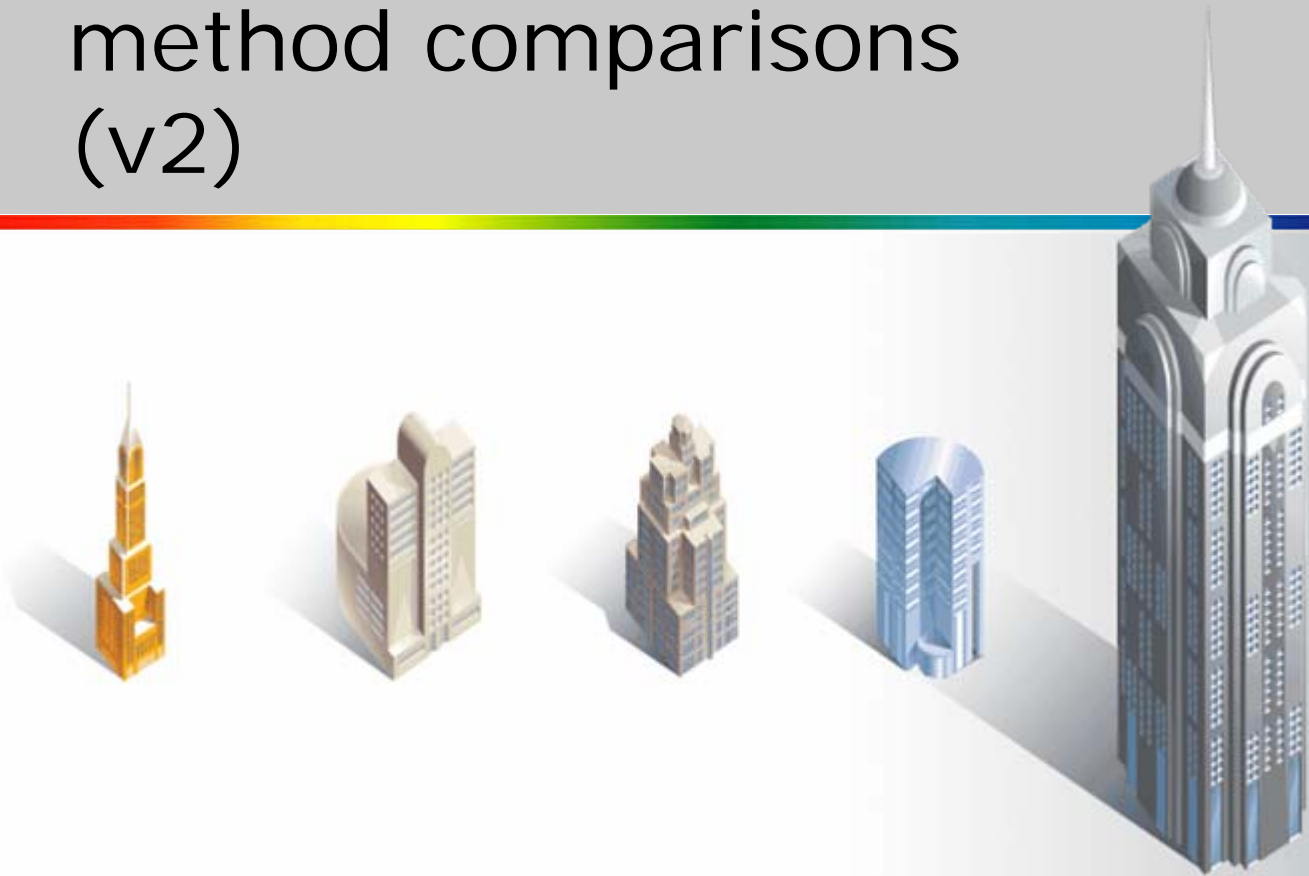# TPMR Management method comparisons (v2)

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Aims of TPMR Management

- Scope: This standard specifies the function of a MAC Relay with two MACs, and the protocols and procedures to support its operation. A MAC Relay is transparent to all frame-based media independent protocols except those explicitly addressed to this device. It is remotely manageable through at least one of its external MACs, and signals a failure of either MAC's LAN through the other MAC.

- "… providing the manageability and remote diagnostic capabilities traditionally offered by circuit switched technologies."

- It's likely that a device managing a chain of TPMRs would want to incorporate their managed objects into its own, to avoid NMS interaction with each TPMR.

Requirements of a management scheme

- Management protocol and method
  - Examples include CORBA, SNMP, EFM
- Transport protocol
  - Examples include TCP/IP, plain Ethernet
- Addressing scheme
  - IP addresses with IP routing, or
  - Ethernet addresses with a L2 discovery protocol
- Managed objects
  - A basic set of these should be required by the standard
    - For example: port rate control and status, auto-negotiation selection, fan status, unit temperature
  - Additional objects should be supportable from other standards or vendor extensions

Pros and Cons of EFM for TPMR management

- EFM OAM is part of IEEE Std 802.3ah-2004, aimed at link maintenance and link management
- Pros
  - Part of a standard which is likely to be used by many TPMRs for its link maintenance capabilities
  - Already deployed in the field for such devices
  - Provides the ability to read managed objects and signal events
  - Extensible (using OUIs), so write operations could be added
- Cons
  - Doesn't scale well to management of chains
  - Only available on Ethernet links (and arguably not all of them)
  - Single DA - doesn't address management of multiple units
  - Limited bandwidth (10 frames per second max)
  - Management semantics are insufficient and extending them is hard to do well (e.g., no "Set")

Pros and Cons of SNMP for TPMR management

- Pros
  - Widely deployed and understood
  - MIBs for devices will have to be developed anyhow, so re-using them for in-band management saves effort
  - Already deployed (but maybe differently)
  - The MIB of a remote TPMR can be combined into the MIB of another device managing it
    - Use a proxy, or
    - Wrap the remote objects into the managing device's interface and entity MIBs
- Cons
  - More complex than EFM, requiring a more capable device, so probably more costly

Pros and Cons of CORBA for TPMR management

- Pros
  - CORBA is the future of device management (so we hear)
  - More sophisticated management operations
  - Possible to combine remote and local objects in a similar way to SNMP
- Cons
  - Yet more complex than SNMP, so more costly
  - Not deployed already, so steeper learning curve
  - CORBA requires a reliable transport protocol as it is byte-stream based

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Transport protocol and addressing scheme

- Users don't want to administer an IP address per TPMR
- A layer-2 addressing scheme avoids this
- A layer-2 discovery scheme would also be needed to allow topology discovery and automatic containment relationships to be established
  - LLDP could be used for this

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Thank you

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