



Ethernet OAM study in ITU-T SG13, Q.3/13
Current status

July 12, 2004

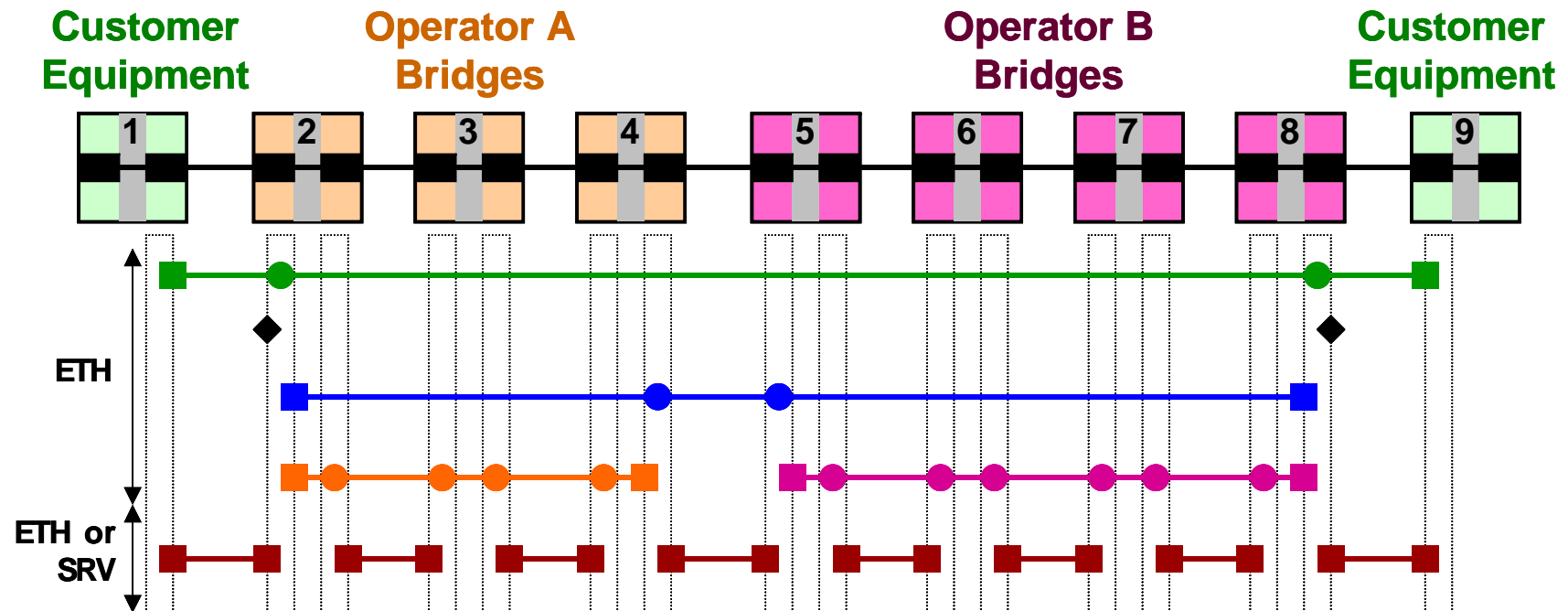
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Current status

- Last ITU-T SG13 meeting: June 7-17, 2004
- Ethernet OAM mechanisms: Y.17ethoam – summary of update
 - Identified the need for MPID (maintenance point ID) and service ID: MAC address was considered inappropriate since it changes by hardware replacement
 - Identified the need for clarification of C-VLAN and S-VLAN.
 - Same OAM mechanisms should be applicable to both C-VLAN and S-VLAN
 - Identified the need for NDD (Network Demarcation Device) for demarcation point in some access scenarios
 - Improved descriptions for CC, trace and loopback
 - Improved description for AIS function for point-point case
 - Identified issues for AIS for multipoint case
 - Questioned the value of ETH-RDI
 - Identified the need for test signal generation and detection functions
- Ethernet protection switching: Y.17ethps – updated

Maintenance levels (1)



- In order to distinguish the above OAM flows, notion of “maintenance level” was discussed.
- Two proposals: absolute level indication vs. relative level indication

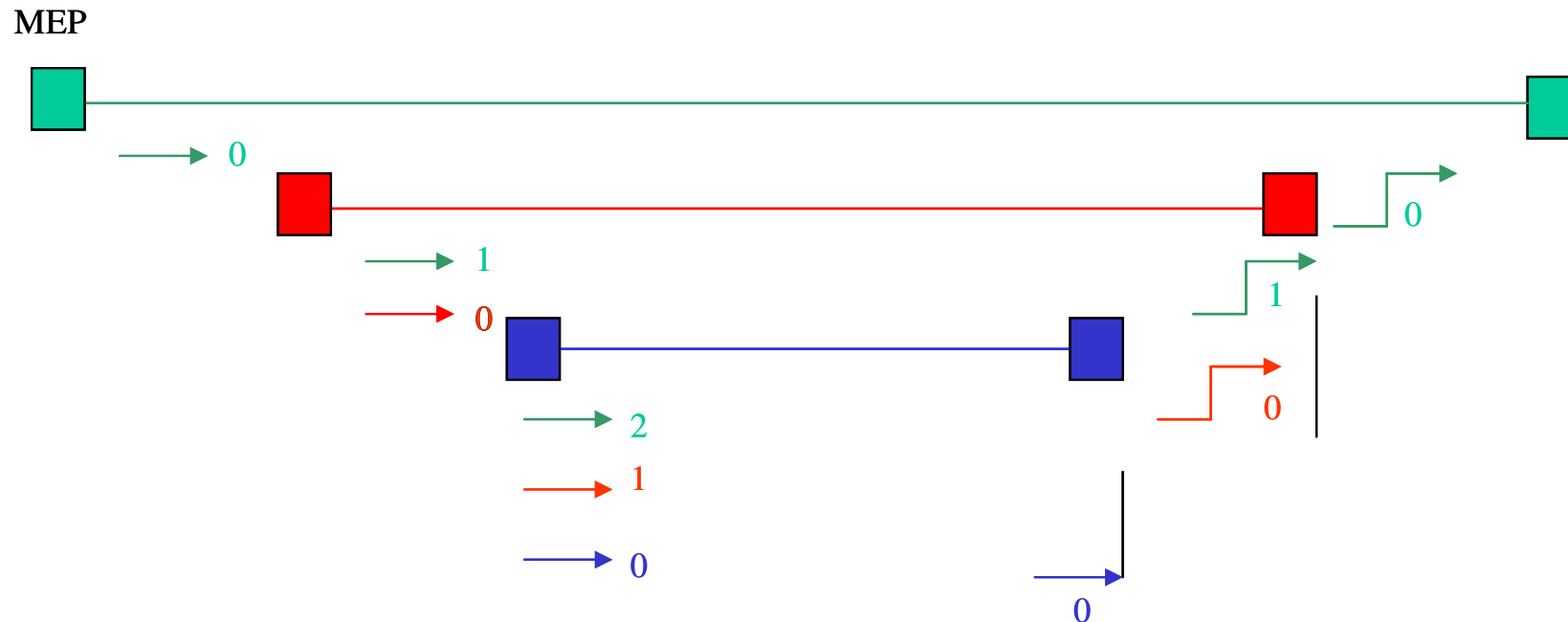
Maintenance levels (2) – absolute level indication

Example of ME levels

ME	ME Level	ME Level Indicator
UNI_C to UNI_C	6	255
UNI_N to UNI_N	5	253
Inter Domain ME	4	251
NNI ME	3	249
Access Link ME	2	247
Intra Domain ME	1	245

It was identified that it is difficult to determine the number of levels but existing technologies (ATM, SDH, OTN...) could give a hint

Maintenance levels (3) – relative level indication



- When a MEP at ingress of a ME receives an OAM packets from outside the ME, it increments the level and passes the OAM packet along.
- When the MEP at egress of a ME receives an OAM packet from within the ME, it terminates the one with level 0 and passes other OAM packets by decrementing the level.
- A limitation with this approach is that it can lead to OAM leaking when one MEP associated with a ME is faulty

Maintenance levels (4) – IDs, C-tag/S-tag issues

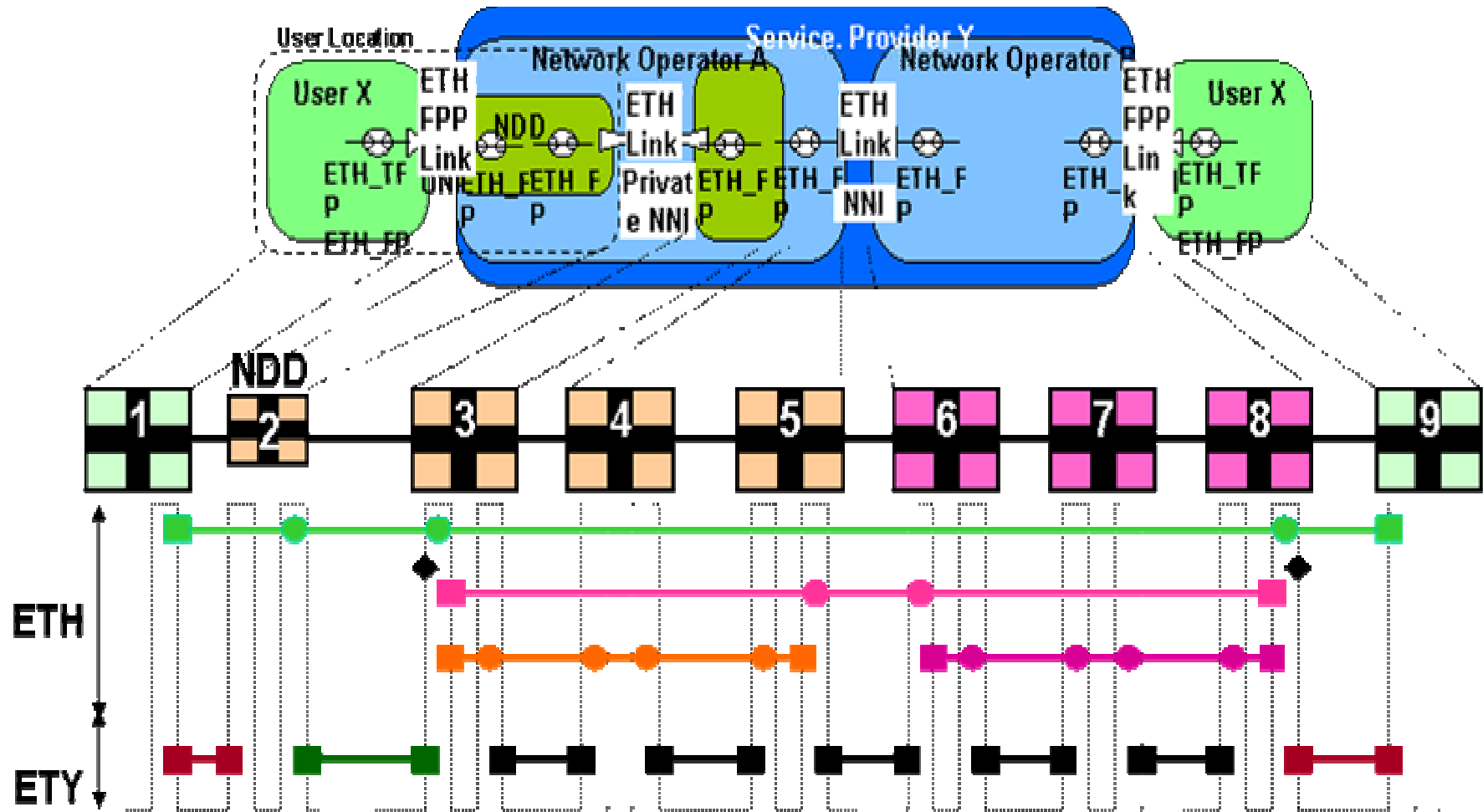
- It was agreed:
 - that MPID and service ID are necessary since MAC addresses is changed when hardware is replaced
 - to develop the draft based on the standard (e.g., it is assumed that every port has a MAC address)
 - to clarify about C-tag and S-tag

C-VLAN and S-VLAN – current description

- Customer VLANs (C-VLAN) and Service VLANs (S-VLAN) segregate the Maintenance Entities in their respective space. Same OAM mechanisms can be applied to each VLAN space. Thus, the same OAM Ethertype can be used for both C-VLAN and S-VLAN
- C-VLAN and S-VLAN are one way to show Ethernet flow domain fragments. There are other ways. There is one OAM Ethertype for any Ethernet flow domain fragment.

Access scenarios (1)

Access scenario with NDDs was introduced.



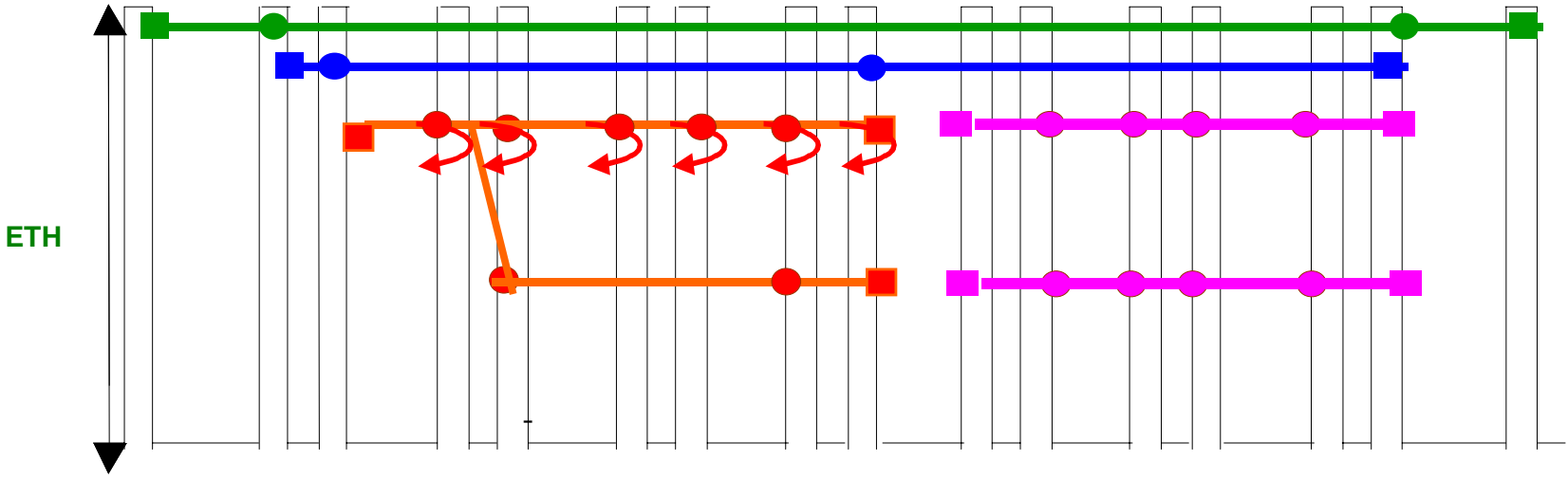
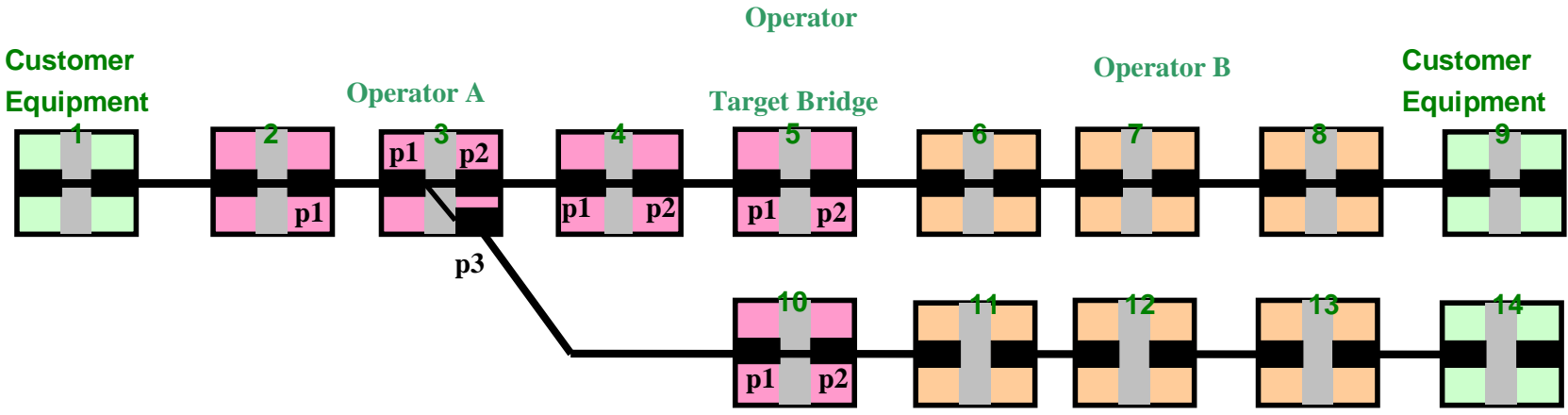
- Following issues were identified:
 - Need for maintenance scenarios regarding access network management
 - NDD can be contained in some of the possible network models
 - Workload of NDD should be considered since it is a cheap and small device resides in customer network
 - Methods to indicate AIS to users should be considered. We cannot assume the capabilities of user equipments.

- It was agreed:
 - to retain CC database and examine its utilities
- It was identified:
 - sub-second interval of CC transmission is necessary e.g., for fast protection switching
 - the methods to indicate lifetime of the validity of CC reception needs to be considered
 - TLVs for CC need to be considered further
- Terminology: ETH-CC

Link trace (1)

- It was agreed:
 - to use traceroute mechanism in next slide
 - to determine the objectives of traceroute being adjacent relation retrieval and defect localization
 - to use unicast address for traceroute request and reply since it is dangerous (e.g., could be DoS attacked) to use multicast address.
 - It should be noted that tracing a loop is included in "adjacent relation retrieval".
- Terminology: ETH-LT

Link trace (2)

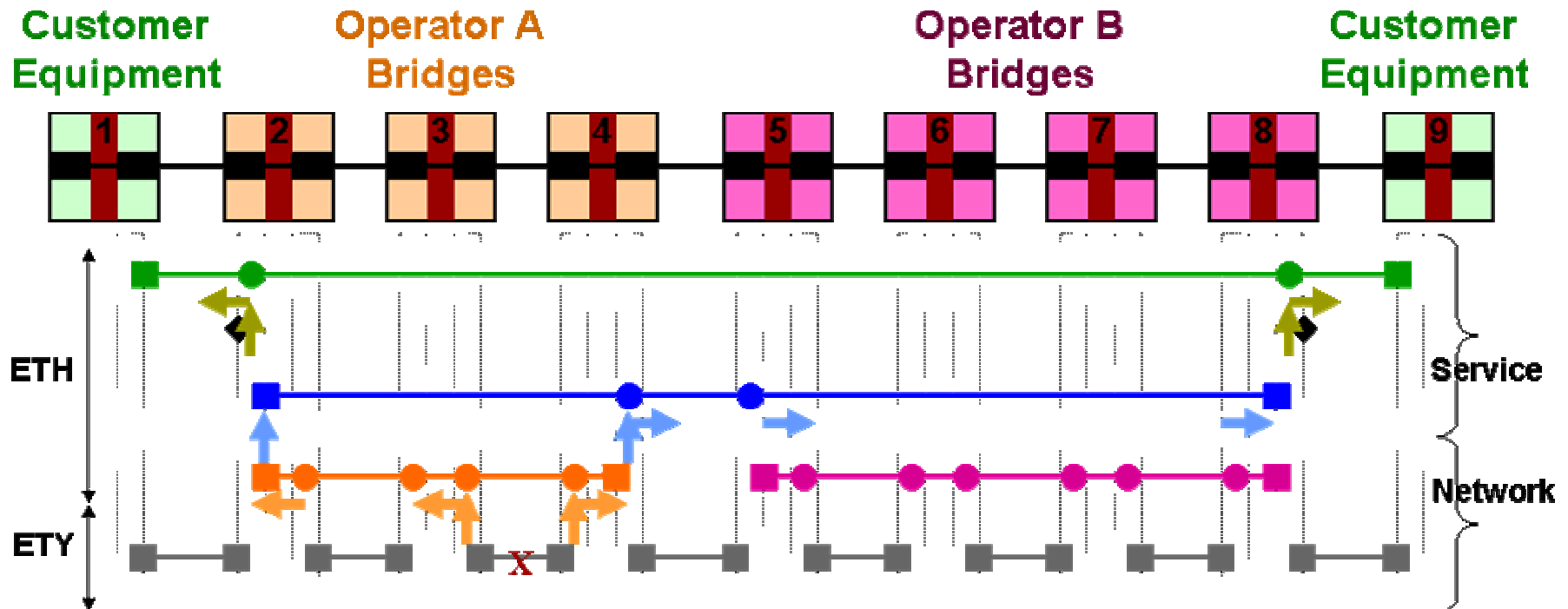


Loopback

- It was agreed:
 - to retain intrusive LB and to examine its utilities
 - to use OAM instead of CFM with maintaining consistency with IEEE 802.1ag
 - to define MPID and service ID separately
 - to change customer service ID to service ID
 - to update the description with CC database issue being under study.
- It was identified:
 - need to consider TLVs further
 - need to indicate the danger and utility of multicast non-intrusive LB and intrusive LB.
- Terminology: ETH-LB

AIS

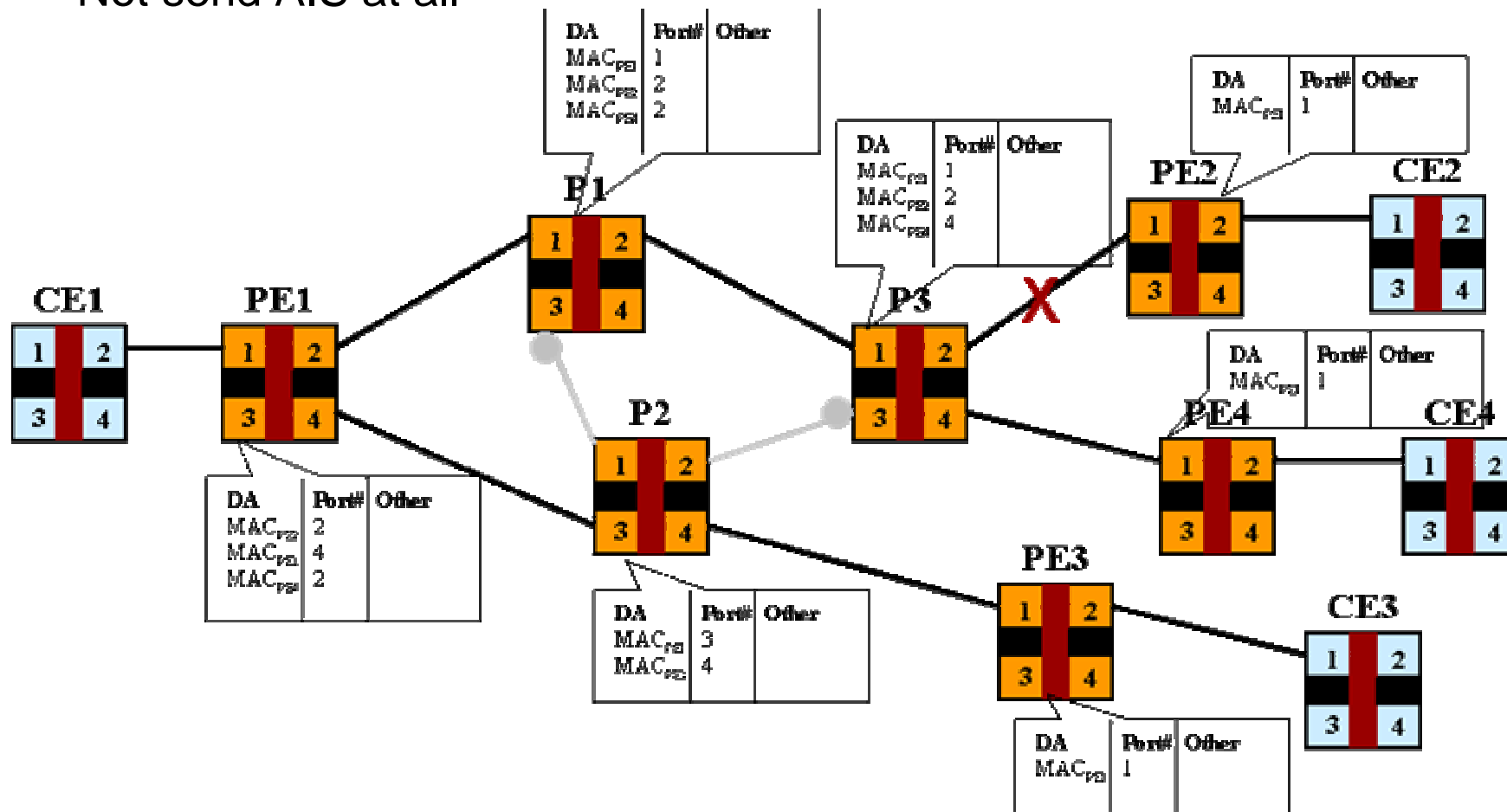
- Description for point-point case was enhanced
- Terminology: ETH-AIS



Issues of ETH-AIS for multipoint connectivity

How should we do in the case below?

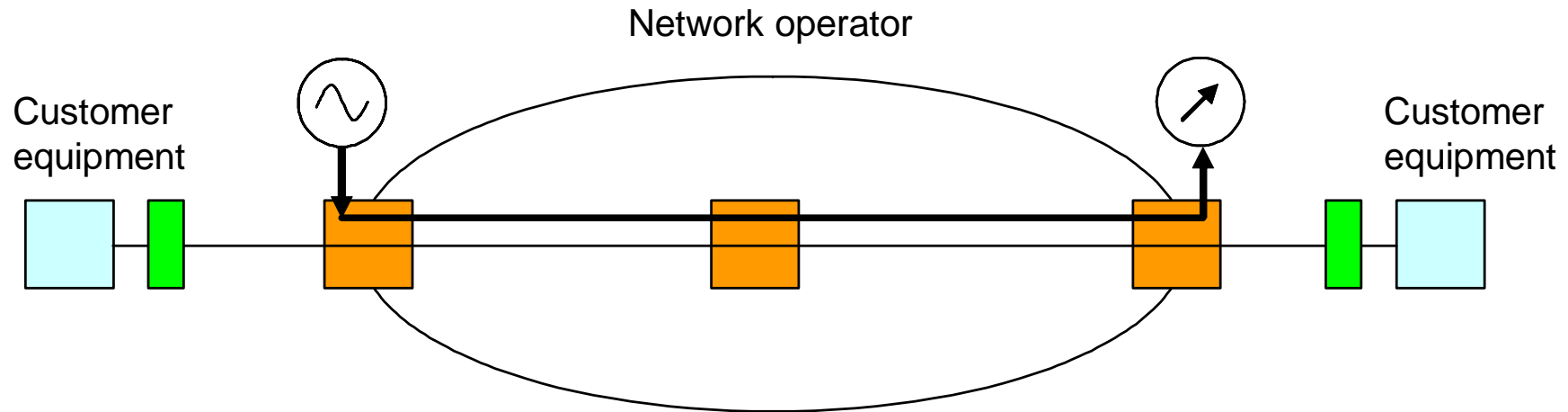
- Send AIS across all other ports
- Send AIS selectively across selective ports
- Not send AIS at all




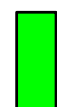


RDI

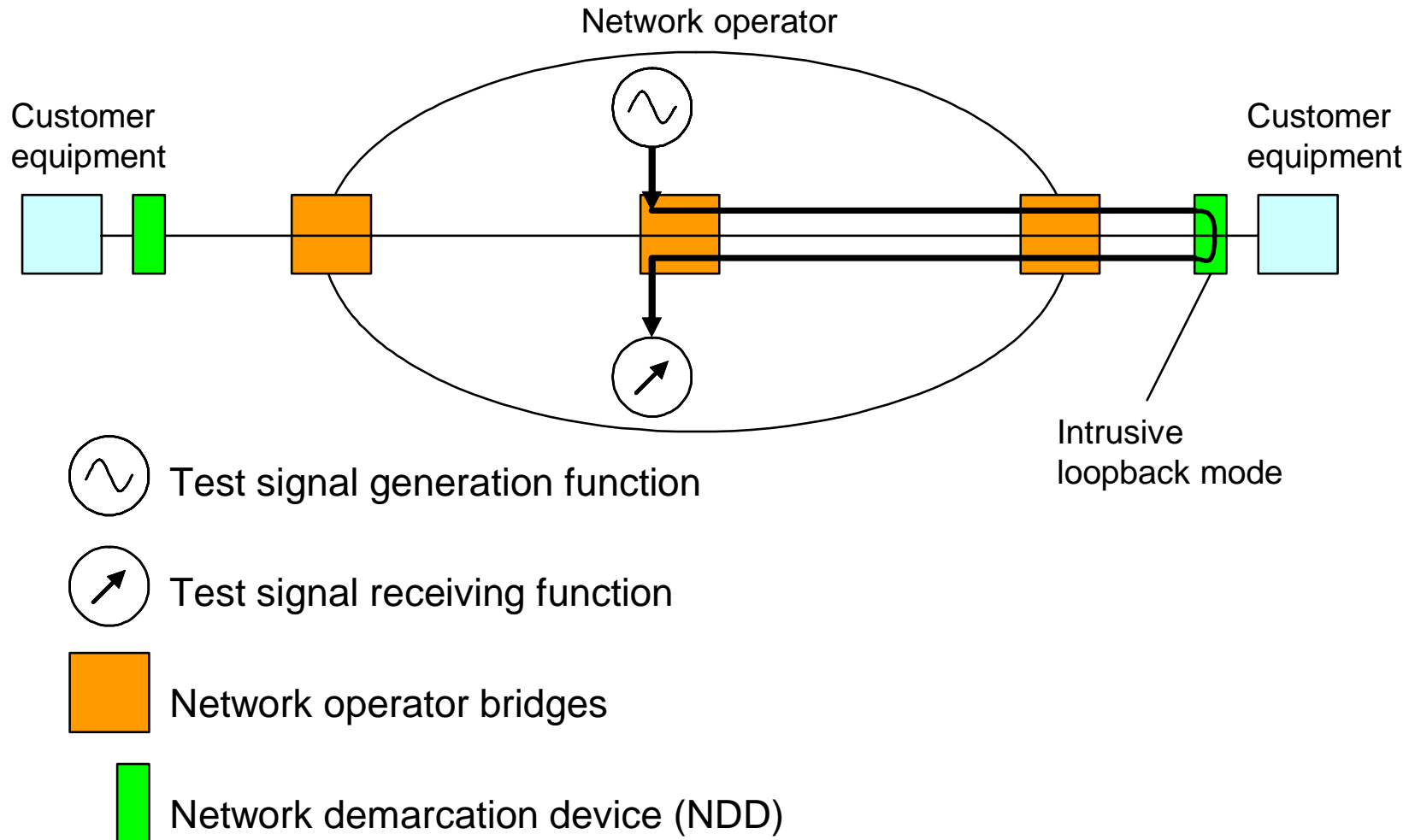
- Value of ETH-RDI was questioned
- Left for further study
- Terminology: ETH-RDI

Test signal generation/detection - unidirectional measurement

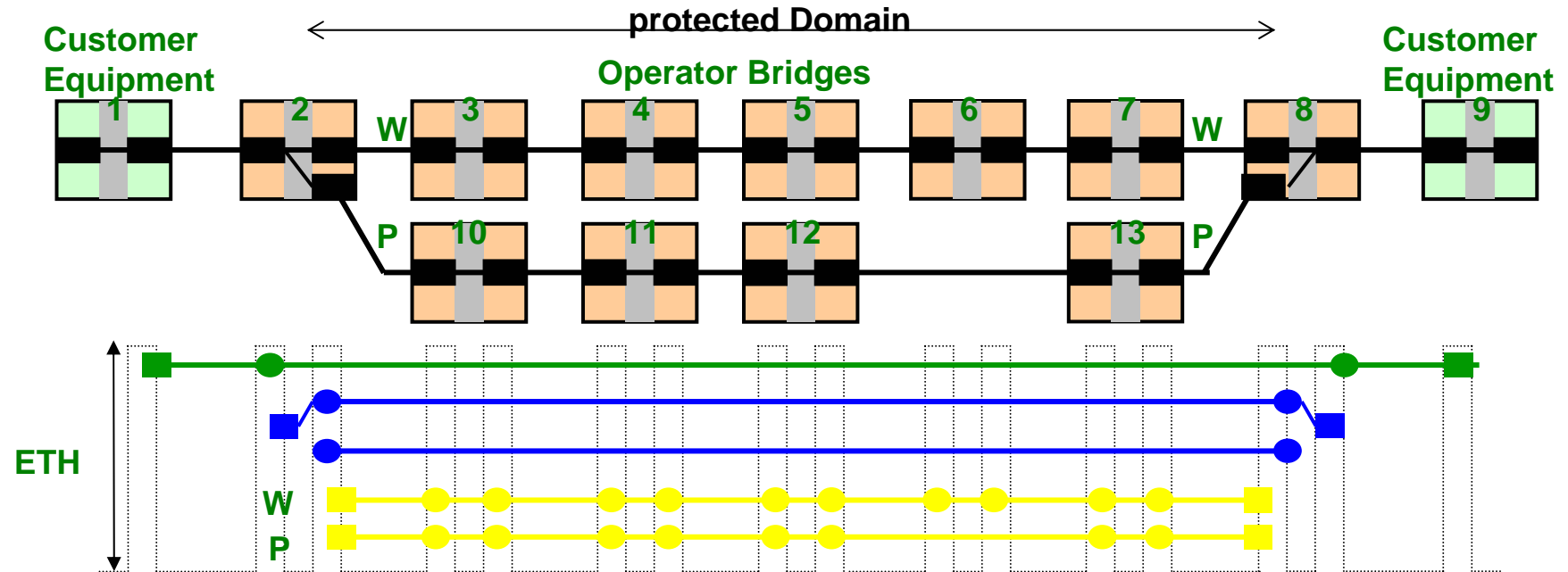


-  Test signal generation function
-  Test signal receiving function
-  Network operator bridges
-  Network demarcation device (NDD)

Test signal generation/detection – bidirectional measurement



Ethernet protection switching – draft updated



Future ITU-T meetings

- Interim: Sept. 20-24 in Sophia-Antipolis (France)
- SG13 plenary: Nov. 30 – Dec. 10 in Geneva