Use of unidirectional media in PBB-TE

(supporting 802.1Qay D1.1 comment that PBB-TE service instance may consist of a single ESP with CFM reply information carried via distinct VLAN or ESP connectivity)
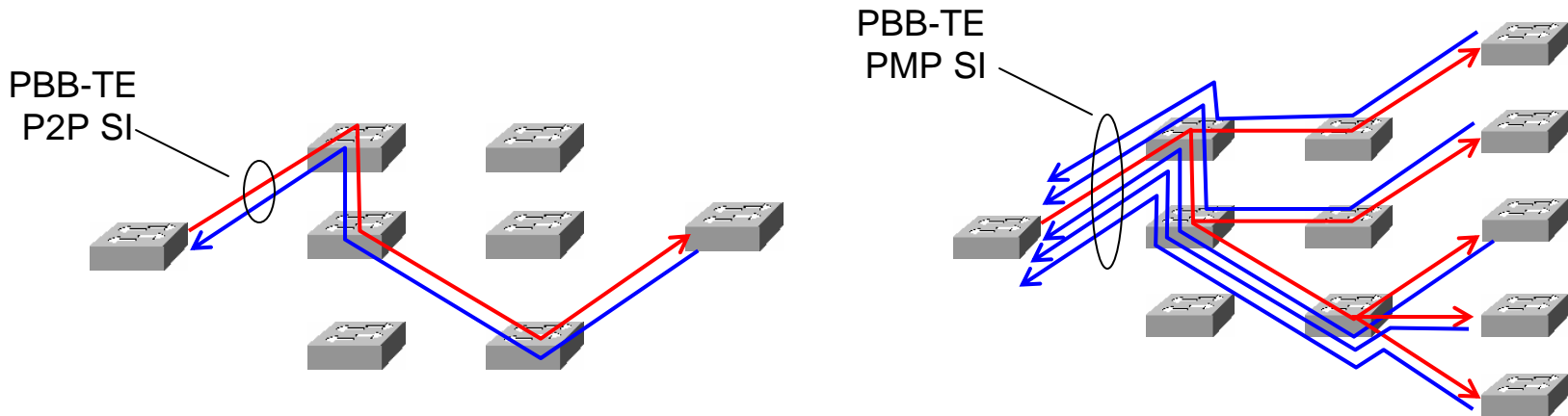
January 2008

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Purpose of presentation

We previously presented a requirement to support a
PBB-TE Unidirectional Service Instance
consisting of a single ESP (with CFM replies
carried by a means not related to the Service
Instance).

We were asked to describe an application that
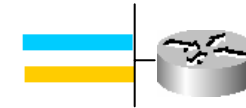makes use of such a Unidirectional Service
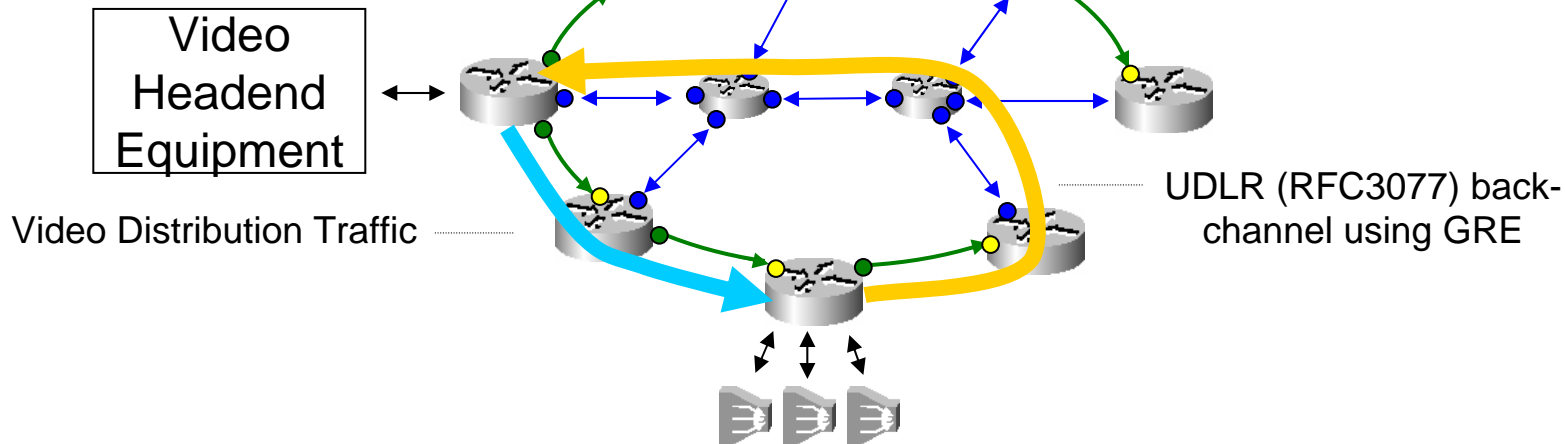Instance.

PBB-TE Service Instance definition

PBB-TE
PMP SI

PBB-TE
P2P SI

- Current SI definition requires co-routed forward and return ESPs
- …But 802.3 explicitly supports *unidirectional* PHY (see 22.2.4.1.12).
  – 1000BASE-PX-D PHY defaults to unidirectional; others can be provisioned
- Implies co-routed ESP *not* always possible

IPTV Configuration

Legend:
- Low-speed xmit/recv port
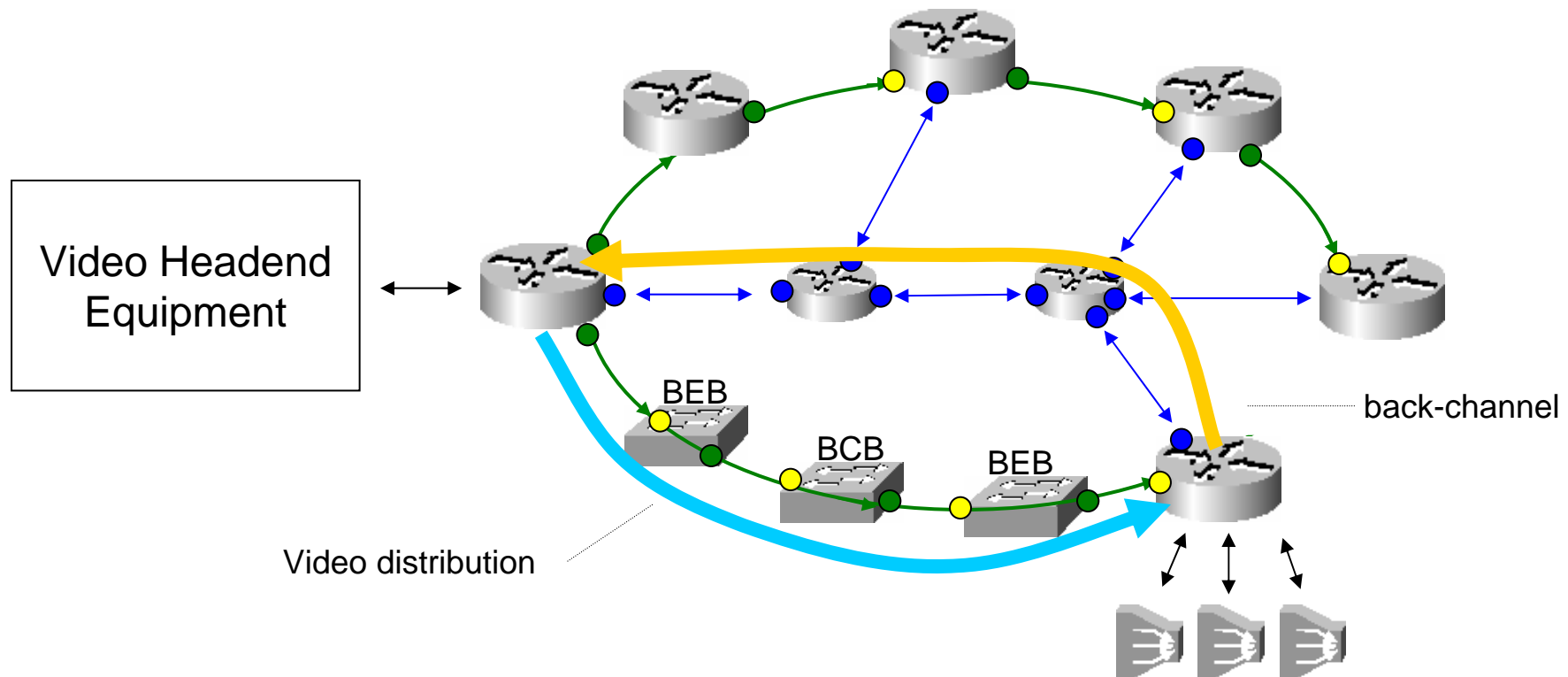- High-speed xmit port
- High-speed recv port

Video Headend Equipment

Video Distribution Traffic

Router sees backchannel traffic on unidirectional port (so router can function normally)

UDLR (RFC3077) back-channel using GRE

- Video distribution is highly asymmetric
- Vendors sell high-cap cards with only transmit <u>or</u> only receive transceiver (large cost saving)
- Return traffic uses low-cap port and can be aggregated

IPTV Configuration with PBB-TE

Video Headend Equipment

BEB

BCB

BEB

back-channel

Video distribution

- Unidirectional traffic-engineered IPTV streams
- PBB-TE is alternative to MPLS or ATM for IPTV

Not a corner-case

- The use of unidirectional media in PBB-TE is _not_ a corner-case.
  - E.g., is a recognized element of IPTV architecture.
- Unidirectional media are supported by 802.3
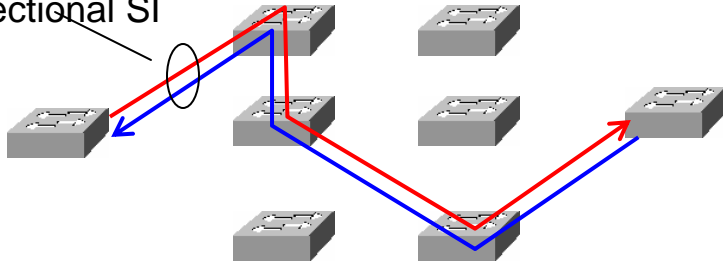- UDLR (RFC3077) hides unidirectionality of medium from router.

PBB-TE Unidirectional Service Instance

Service Instance comprising a single ESP with CFM reply traffic carried by means independent of the Service Instance (VLAN or ESP).
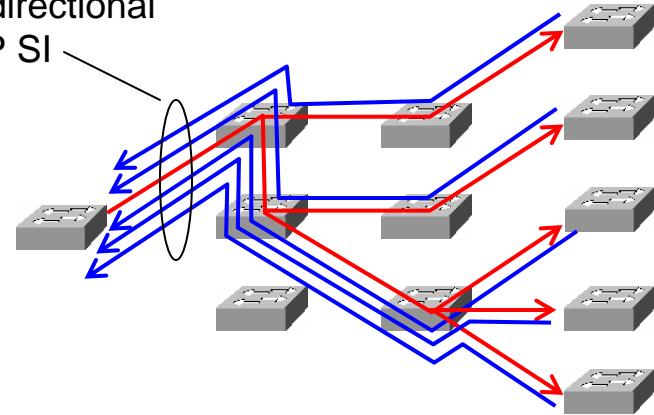
No objection to treating Unidirectional and Bidirectional Service Instances as separate entities.
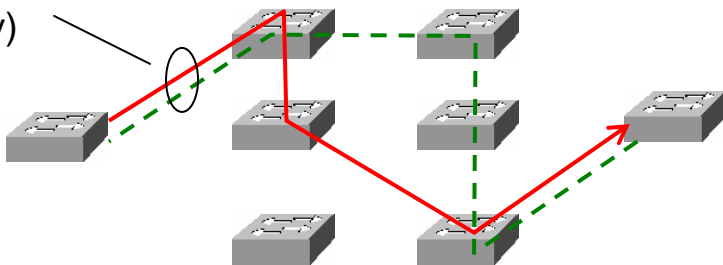
Examples of PBB-TE Service Instances

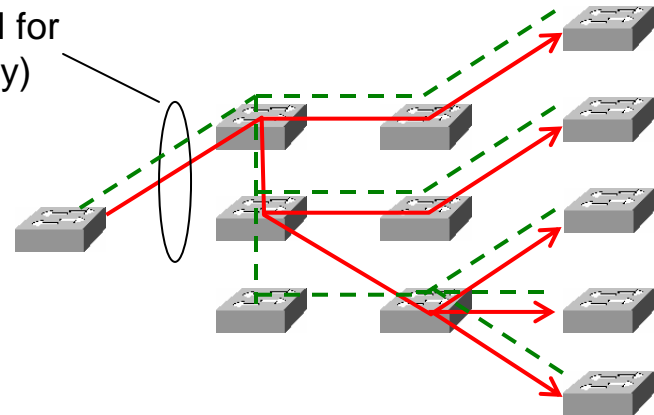PBB-TE
P2P Bidirectional SI

PBB-TE bidirectional
PMP SI

PBB-TE
P2P Unidirectional
SI (with
independent VLAN
or ESP for CFM
reply)

PBB-TE PMP
Unidirectional SI
(with VLAN for
CFM reply)

change

3.5 Point-to-Point PBB-TE service instance: An instance of the MAC service provided by two unidirectional co-routed ESPs forming a bidirectional service.

3.6 Point-to-Multipoint PBB-TE service instance: An instance of the MAC service provided by a set of ESPs which comprises one multipoint ESP plus n unidirectional point-to-point ESPs, routed along the leaves of the multicast ESP."

to

3.5 Point-to-Point PBB-TE Unidirectional service instance: An instance of the MAC service provided by two unidirectional co-routed ESPs forming a bidirectional service.

3.6 Point-to-Multipoint PBB-TE Unidirectional service instance: An instance of the MAC service provided by a set of ESPs which comprises one multipoint ESP plus n unidirectional point-to-point ESPs, routed along the leaves of the multicast ESP."

3.7 Point-to-Point PBB-TE Unidirectional service instance: An instance of the MAC service provided by a single ESP.

3.8 Point-to-Multipoint PBB-TE Unidirectional service instance: An instance of the MAC service comprised of a single multipoint ESP.