IEEE 802.17 WG

Spatial Reuse for Multicast

Peter Jones

Luminous Networks

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Why?

- Multicast is a major traffic source in the emerging access or "triple play" network
- Multicast used to efficiently deliver "broadcast" (as opposed to VOD) streams to sets of consumers via cable head ends or similar devices
- Currently supported with proprietary technology or Ethernet bridges with IGMP snooping.
- Efficient multicast is one of the advantages of the RPR ring topology

Why (cont.)

- 802.17-2004 delivered spatial reuse for ring local unicast traffic, i.e.router to router traffic.

- The two other "interesting" classes of traffic were left out.
  - Remote unicast
    - main example is traffic bridged onto or off the ring
  - Multicast
    - could access the ring via L2 or L3 device
    - The interesting application is video where external (to the MAC) knowledge tells you that not everyone on the ring wants to see this stream.

Multicast That Wants Spatial Reuse

- Video/audio point to multipoint
- Currently controlled using protocols like L3 IGMP and PIM
- Many bridges use non-standard techniques (e.g. IGMP snooping) to optimize bandwidth usage in bridged networks.
- Most interesting when only a small subset of nodes on a ring want to get a stream.
  - The extreme case is when a single node on the ring wants to drop the multicast stream

How it is done today

- IGMP Snooping bridges look at the IGMP protocol in packets as they go past.

- When a given multicast stream membership is changed (either join or leave) the bridges use "static entries" in the 802.1D/Q filtering tables to control the spread of the multicast.

What should 802.17 do

- Provide the equivalent level of spatial reuse support for multicast as currently proposed for remote unicast.

How?

- Define an additional type of static ADB entry for the SAS
- The logical contents of the entry are
  - Multicast address
  - East transmission limit (either address or hop count)
  - West transmission limit (either address or hop count)
- These entries are not aged or updated by the SAS

How (cont.)

- These entries are populated via "station management", e.g. CLI, SNMP, Local Snooping protocol.

- The SAS does (at least) a DA lookup on all MA_DATA.request calls

How (cont.)

- If a multicast ADB entry is returned, the SAS operations are:
    - Get east/west transmission limits
    - Set Flooding form based on transmission limits
    - Apply the "standard' rules for setting basic and expanded addresses.

Issues

- Ring Topology change
- Bridge Topology change
- Protection Events/Context Containment
- Rapid changes of Static Entries

Issues Cont.

- Need to avoid the 802.1 bogymen of:
  - Misorder
  - Duplication
  - Persistent "under delivery"

Ring Topology change

- Addition or removal of stations
- Mostly looks like protection events except for "passthrough"
- May change transmission bounds
- Maybe defeat the lookup process when until topology is stable, and require that system may sure that the entries are correct by then.

Bridge Topology Change

- Use whatever we do with unicast

Protection Events/Context Containment

- Will change east/west transmission limits
- How fast can the "system" respond?
- Do we disable the entries until updated by system to be safe?

Spare