



Enhanced Bridging Spatial Reuse of 802.17 Bridge Traffic

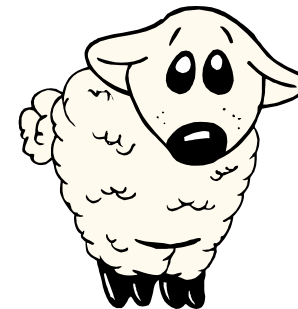
Bridging Adhoc Spatial Reuse Subteam

Li Mo

William Dai

John Coulter

Robert Castellano





Enhanced Bridging Overview



- Define a set of MAC procedures for spatial reuse of bridge traffic while satisfying the compatibility requirements with 802.1D/Q
 - Preserve the 802.1 bridging relay ISS/EISS
 - Preserves integrity of 802.1D / 802.1Q learning/aging/forwarding rules and bridge control protocols.
 - Defines the set of transmit/receive rules enhanced stations must adhere to for achieving spatial reuse of bridged traffic on the ring.
 - Defines how stations implementing enhanced bridging procedures interoperate with stations implementing basic procedures



Enhanced Bridging Strategy



- Enhanced stations support Spatial Reuse Control Sublayer which provides spatial reuse of bridged/non-bridged traffic.
- An explicit destination station identifier in the frame is used for destination stripping of unicast/multicast traffic.
- Transit stations (both basic/enhanced) copy traffic to bridge relay based on a flooding indicator in the frame.
- Bridged frames transmitted to basic stations are always flooded.



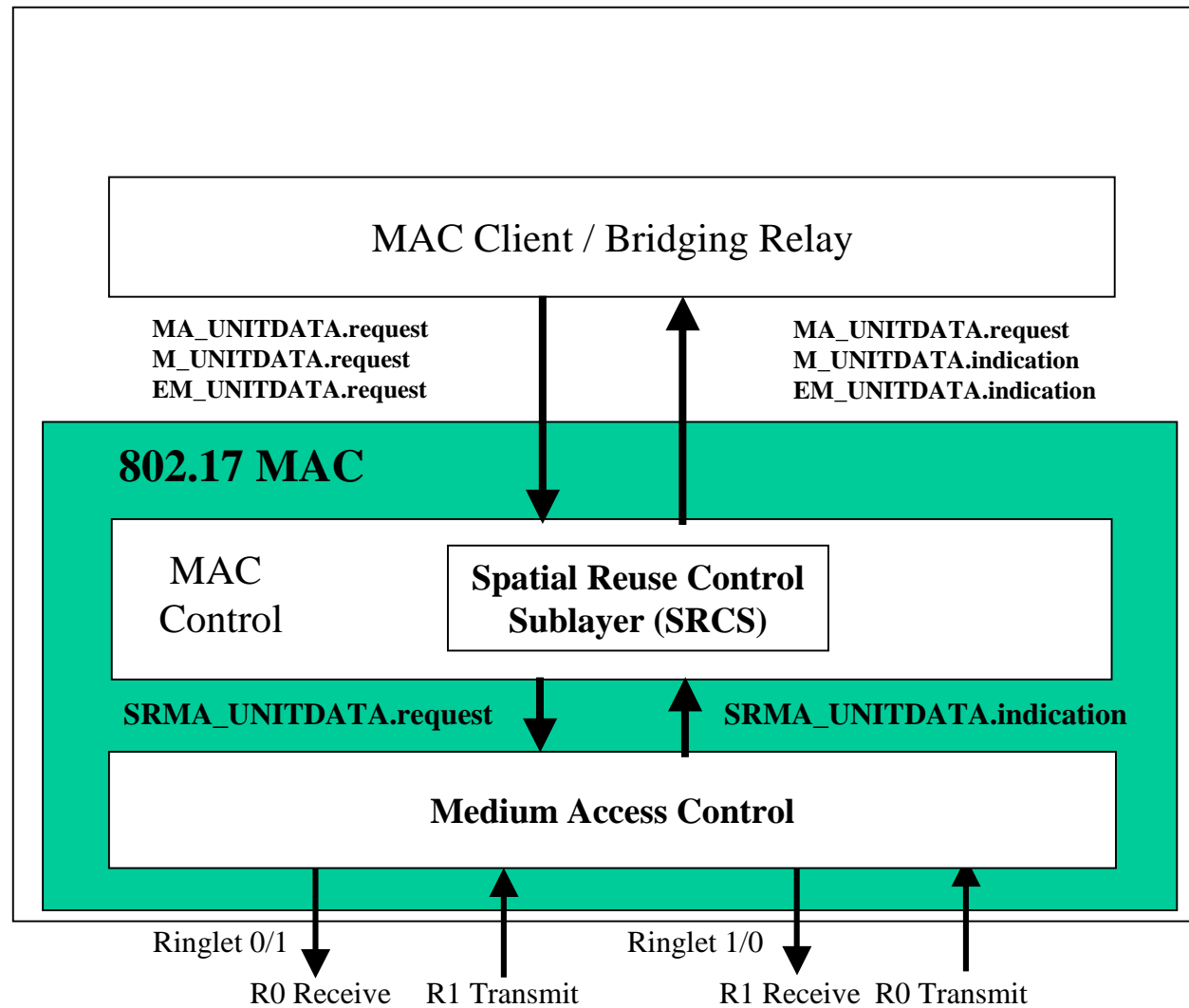
Spatial Reuse Control Sublayer

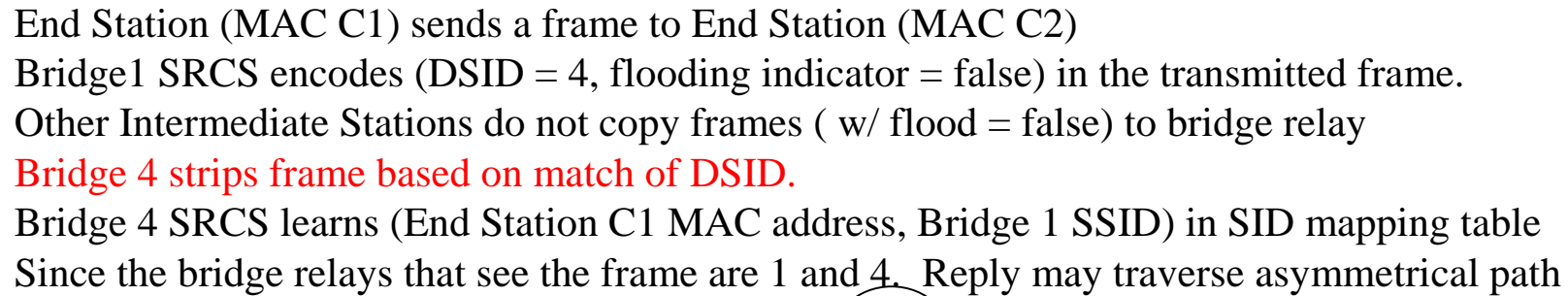


- Sublayer that implements the station and ringlet selection and adheres to the ringlet selection rules.
 - Supports ISS/EISS to bridge relay.
 - SRCS defines the set of rules ensuring 802.1D/802.1Q compatibility while providing spatial reuse of bridged and non-bridged traffic
 - SRCS supports station mapping table / algorithm which resides in the enhanced station. SRCS maps destination end station MAC addresses/FID to ringlet and station ID addresses. Mapping table entries are dynamically learned/aged.
 - SRCS manages mapping aging during STP topology changes. Generates *RPR forward delay control message (FDCM)* for other stations on ring to age mapping table entries. FDCM generated in response to receipt of STP BPDU TCN message.
 - Spatial Reuse Control Sublayer may either reside in the MAC control sublayer or between the MAC and bridge relay.



802.17 Unaware Client SRCS below the MSAP







Enhanced Bridging Example Known Multicast



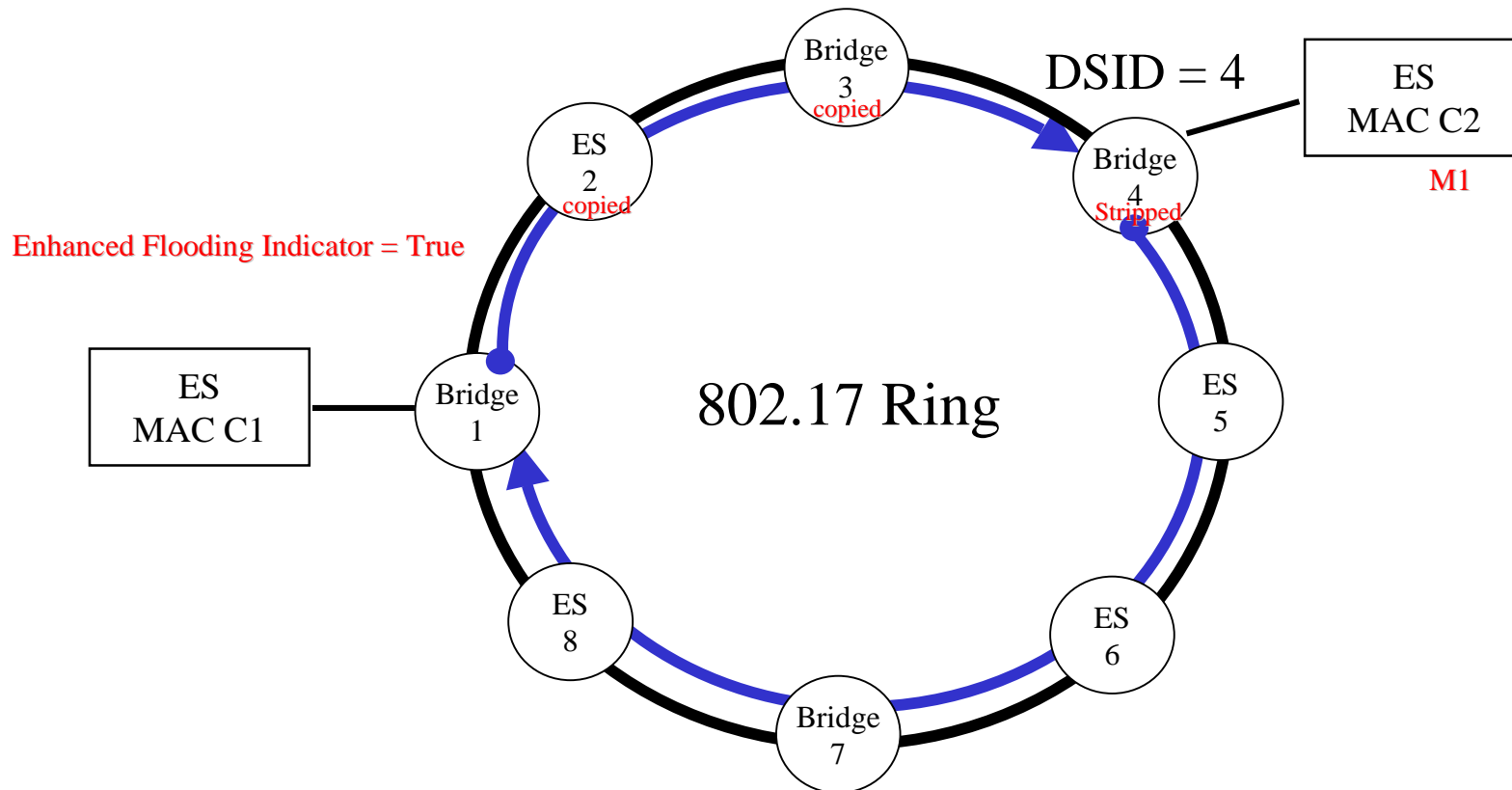
End Station (MAC C1) sends a frame to End Station (multicast M1)

Bridge 1 SRCS encodes (DSID = 4, flooding indicator = true) in the transmitted frame.

Other Intermediate Stations copy the transmitted frame (w/ flood = true) to bridge relay

Bridge 4 strips frame based on match of DSID.

All enhanced stations learn (End Station C1 MAC address, Bridge 1 SSID) in SID mapping table





Enhanced Bridging Example Broadcast / Unknown



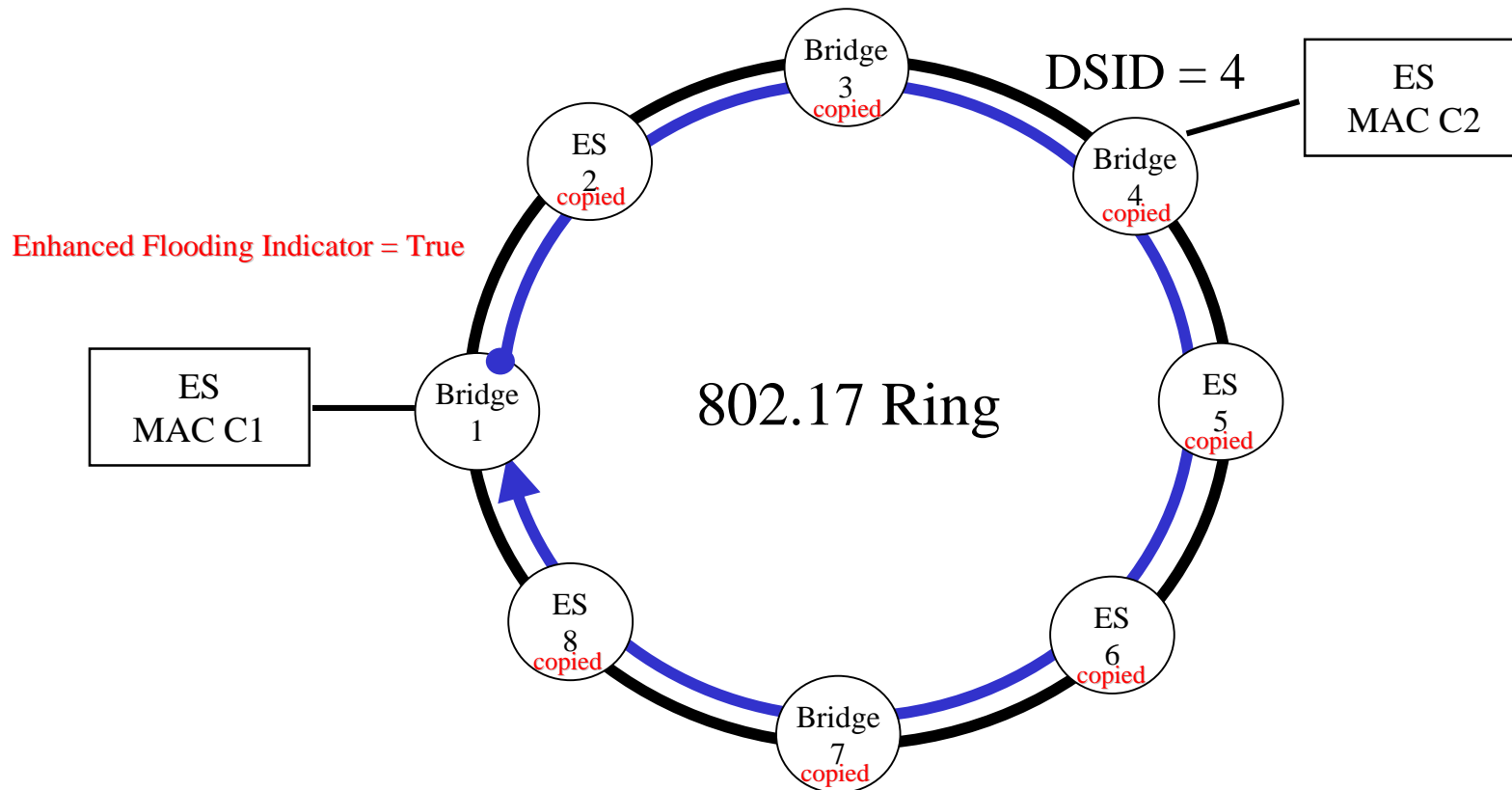
End Station (MAC C1) sends a frame to End Station (MAC C2)

C2 unknown, Bridge 1 SRCS encodes (flooding indicator = true) and floods the transmitted frame.

Other Intermediate Stations copy the transmitted frame (w/ flood = true) to bridge relay

Frame stripped when flooding is complete

All enhanced stations learn (End Station C1 MAC address, Bridge 1 SSID) in SID mapping table





Basic Bridging Example

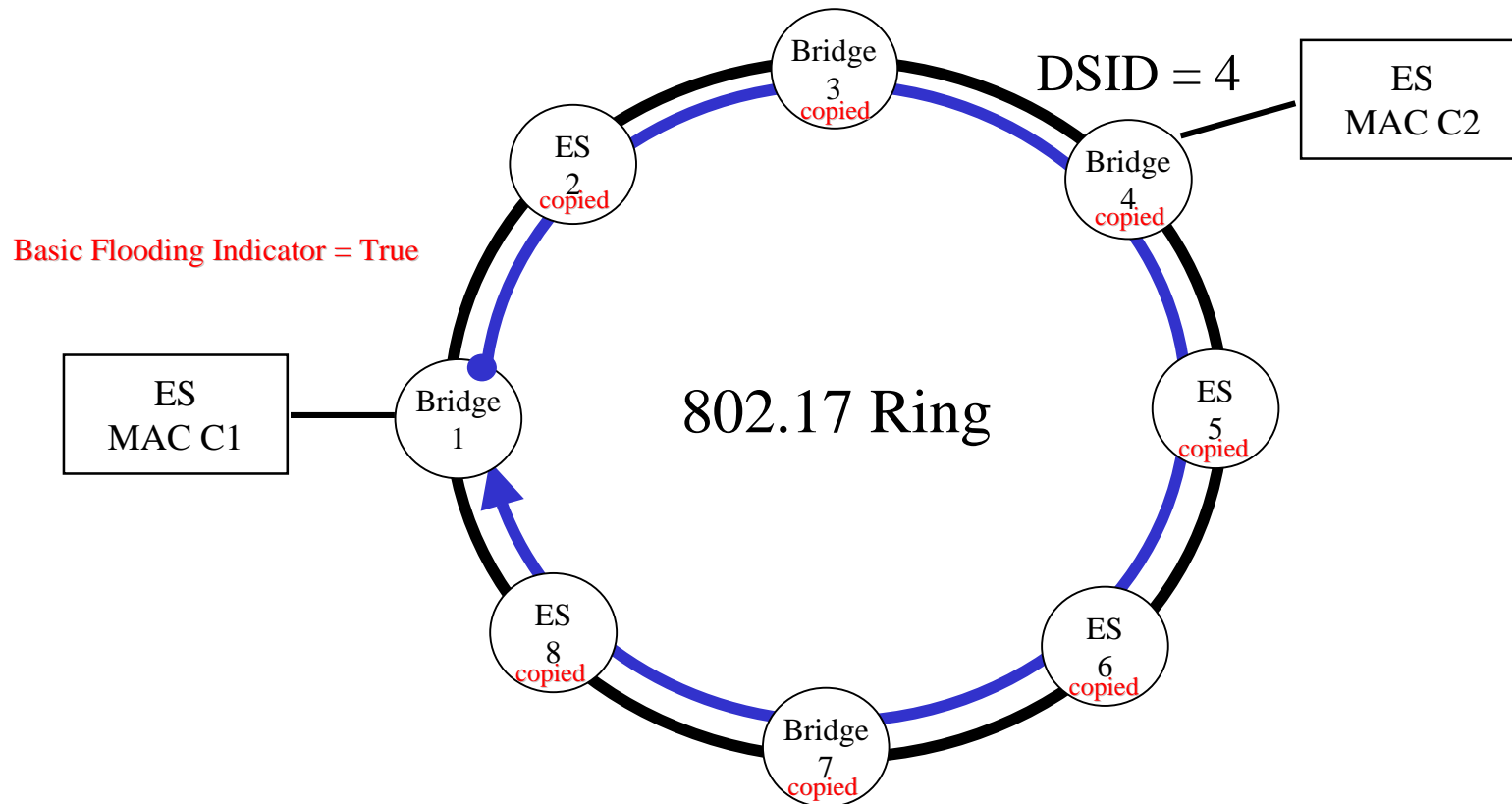
End Station (MAC C1) sends a frame to End Station (MAC C2)

Bridge 1 encodes (basic flooding indicator = true) and floods the transmitted frame.

Other Intermediate Stations copy the transmitted frame (w/ flood = true) to bridge relay

Frame stripped when flooding is complete

Enhanced stations do not learn frames (basic flooding indicator = true) in their SRCS mapping table





Revised Annex F w/ Enhanced Bridging



- Overview
 - Draft Text Proposal for Enhanced Bridging incorporated into a proposed revised version of Annex F.
 - Preliminary draft submitted to BAH on 6/11. Final BAH review on 7/2/02.
- Proposal supports both Basic and Enhanced Bridging
 - All stations must support Basic Bridging
 - Stations may optionally support Enhanced Bridging
 - Devices supporting enhanced bridging shall be able to coexist with and transmit/receive data with basic bridging devices.
 - Local end stations adhering to basic bridging rules can support spatial reuse when transmitting packets to end stations which are local to the ring
 - Enhanced bridging devices shall also support spatial reuse of multicast traffic



Revised Annex-F Outline



- F.1 Bridging Overview
- F.2 Architectural Model of a Bridge
 - Bridge Relay Entity, Ports, Higher Layer Entities
- F.3 Basic Bridging Model Overview
 - Frame Transmission, Frame Reception
- F.4 Enhanced Bridging Model Overview
 - Spatial Reuse Control Sublayer – Model of operation, Mapping of UNITDAT request/indication primitives, Frame Transmission, Frame Reception, Aging of Station Ids
- F.5 802.17 End Stations
 - Basic End Stations, Enhanced End Stations
- F.6 Bridge Protocol Entity Interactions
- F.7 Flooding (*Place holder for flooding text*)
- F.8 Frame Format Encoding (*Editorial Text to help illustrate how logical parameters are mapped onto various proposed frame formats*)



Enhanced Bridging Frame Format Requirements



- Requires source and destination station Ids in the frame format for source/destination stripping, respectively
 - DSID needed for destination stripping of known unicast/multicast traffic
 - SSID needed to support Station ID learning for enhanced stations.
- Requires the following indications in the frame
 - Basic Flooding Indicator – Indicates when traffic is flooded by a basic station
 - Enhanced Flooding Indicator – Indicates when traffic is flooded by an enhanced station. Allows enhanced stations to coexist with basic stations.



Conclusions



- Enhanced Bridging defines a general method for bridges and end stations to achieve spatial reuse of traffic while maintaining 802.1D/Q compliance.
 - Preserves ISS/EISS and provides compatibility with 802.1D / 802.1Q bridging procedures and control protocols.
 - Provides spatial reuse for bridged and non-bridged unicast traffic.
 - Basic bridging proposal does not provide spatial reuse for bridge traffic. Basic bridging alone may not fully satisfy the 802.17 PAR.
 - Provides interoperability between basic and enhanced stations.
 - Needs support for SIDs in the RPR frame format
 - Basic/enhanced flooding indications in frame needed for basic/enhanced station interoperability.



Thank You!!