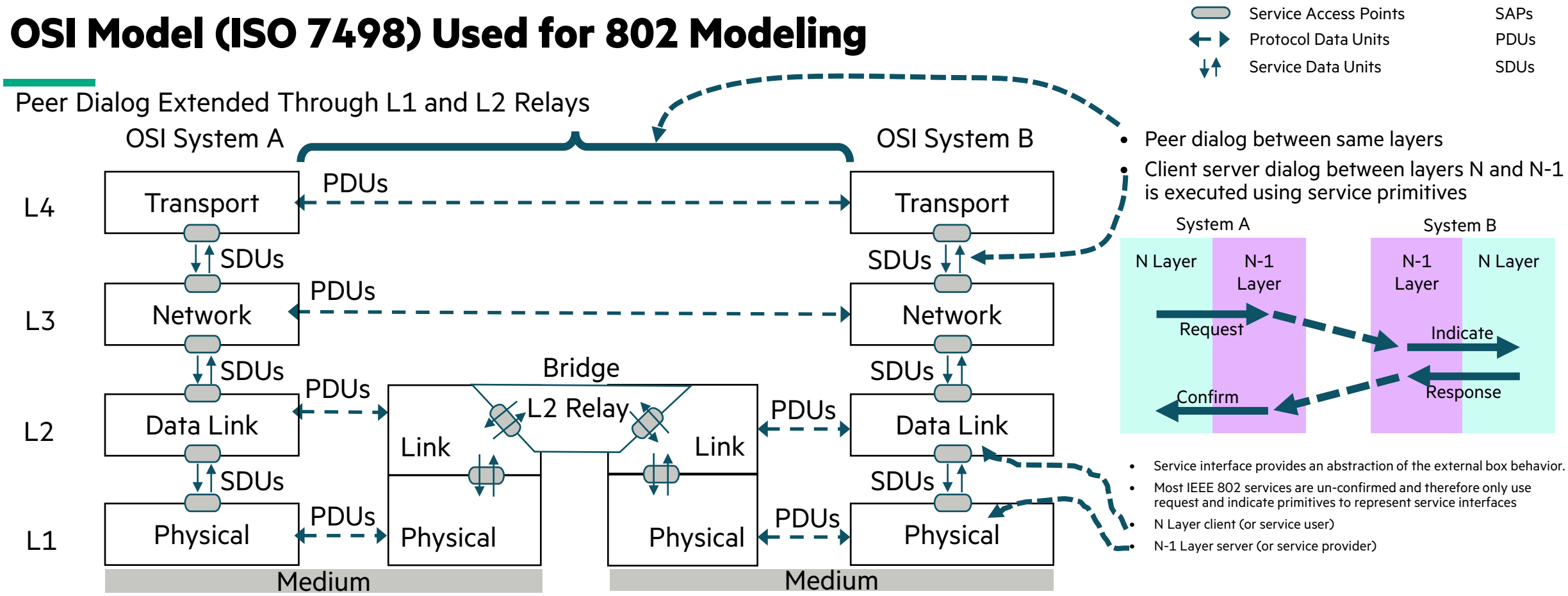
Hewlett Packard
Enterprise
HPE Aruba Networking

CTF Bridge Service Primitives

Paul Bottorff
Paul.Bottorff@hpe.com
July 16, 2024

OSI Model (ISO 7498) Used for 802 Modeling



- ISO relays are used to model network devices. A bridge is an L2 relay, and a router is an L3 relay.
- The relay is the method for interconnecting two or more OSI stacks. Relay diagrams only show two stacks, however this is understood to represent as many stack as supported by the relay.
- As shown on the left each Request generates a layer PDU which causes an Indication at the peer layer
- IEEE divides the OSI layers in smaller sublayers using OSI modelling to interconnect these sublayers

Proposed CTF Internal Sublayer Service (CISS)

CISS Data Primative

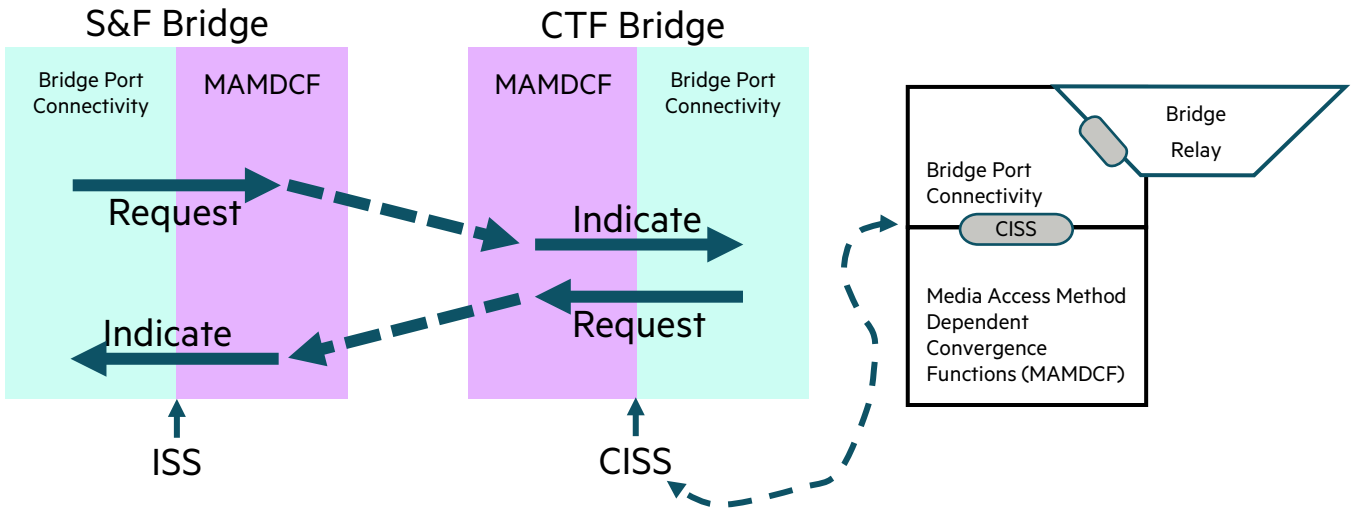
CM_UNITDATA.indication (
destination_address,
source_address,
mac_service_data_unit,
priority,
drop_eligible,
frame_check_sequence,
service_access_point_identifier,
connection_identifier,
frame_position,
marked_error
)

CM_UNITDATA.request (
destination_address,
source_address,
mac_service_data_unit,
priority,
drop_eligible,
frame_check_sequence,
service_access_point_identifier,
connection_identifier,
frame_position,
marked_error
)

CISS Control Primatives

CM_CONTROL.request (
destination_address,
opcode,
request_operand_list
)

CM_CONTROL.indication (
opcode,
indication_operand_list
)



CISS Description

- The CISS extends the standard ISS service interface to provide the features needed for Cut-through Forwarding.
- The CISS retains the existing ISS parameters as specified in IEEE Std 802.1AC, however adds the two parameters frame_position and marked_error used to support delivering service primitives in chunks.
- The CISS supports delivering the CISS service primitives in chunks over the CISS Service Access Point (CISS-SAP). Each chunk of each service primitive instance is delivered with the service parameters instantiated at the time the CM_UNITDATA.indication chunk was delivered over the CISS-SAP.
  - The frame_position indicates the frame position of each chunk (begin, middle, end) of the service primitive instance.
    - The frame_position for S&F MAC indications is always marked begin+end while for CTF MACs the frame_position will change from begin to end as chuck of the indication is delivered over the CISS_SAP.
    - For S&F MACs the MAMDCF will collect all chunks before passing them to the S&F Media Access Method Specific Functions (MAMSF) while for CTF MACs the chunks will be passed to the MAMSF.
  - The marked_error indicates if any errors were detected on this or prior chunks of the service primitive.
    - For both S&F and CTF MACs marked_error can take the value error or no error. If the S&F MAC discards errored frames then it will always set marked_error to no error. For requests to S&F MACs with marked_error set to error the MAMCTF will not pass the request to the MAMSF, but instead will discard it.

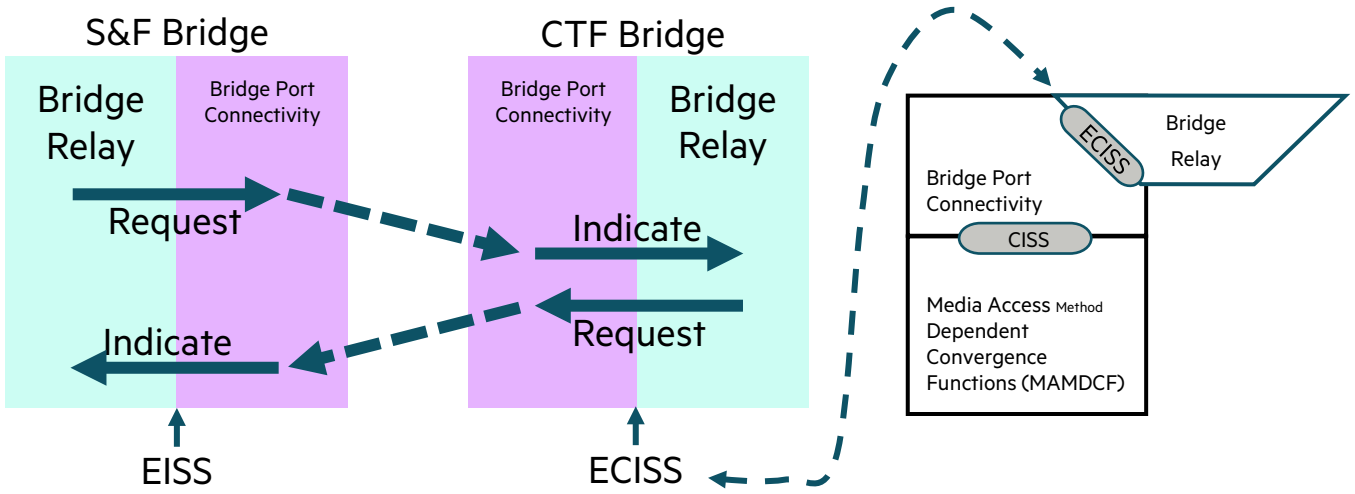
Proposed CTF Enhanced Internal Sublayer Service (ECISS)

ECISS Data Primatives

```
ECM_UNITDATA.indication (
                          destination_address,
                          source_address,
                          mac_service_data_unit,
                          priority,
                          drop_eligible,
                          vlan_identifier,
                          frame_check_sequence,
                          service_access_point_identifier,
                          connection_identifier,
                          flow_hash,
                          time_to_live,
                          frame_position,
                          marked_error
                        )
ECM_UNITDATA.request    (
                          destination_address,
                          source_address,
                          mac_service_data_unit,
                          priority,
                          drop_eligible,
                          vlan_identifier,
                          frame_check_sequence,
                          service_access_point_identifier,
                          connection_identifier,
                          flow_hash,
                          time_to_live,
                          frame_position,
                          marked_error
                        )
```

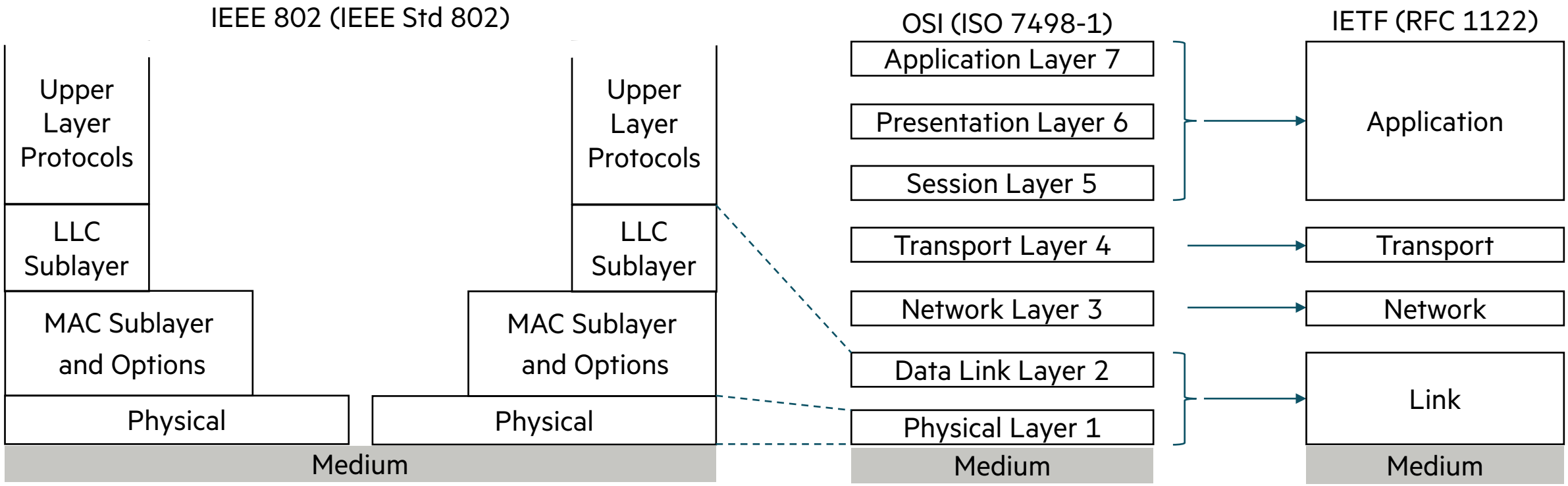
ECISS Control Primatives

```
ECM_CONTROL.request     (
                          destination_address,
                          opcode,
                          request_operand_list
                        )
ECM_CONTROL.indication  (
                          opcode,
                          indication_operand_list
                        )
```



Thank you

IEEE 802 Layer Model, OSI 7 Layer Model and IETF Layer (End Stations)



- The IEEE 802 modeling is based on the OSI 7 layer model (ISO/IEC 7498-1)
- All IEEE 802 networking protocols are mapped to the OSI physical and data link layers 1 and 2
- Each IEEE 802 standard further subdivides the OSI layers 1 and 2 into sublayers
- IEEE 802 applies OSI modeling techniques to each of the sublayers within the standard