1588 Transparent Clock use case

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Transparent Clocks are 2 point Sensors

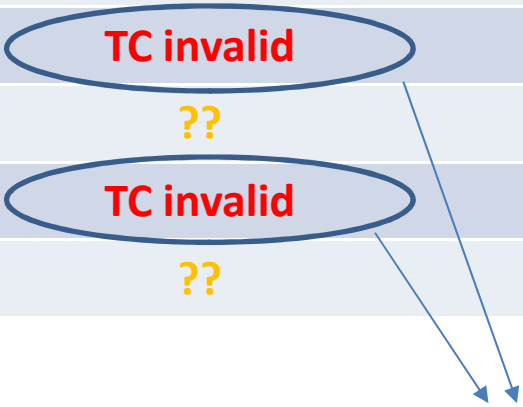
- Only function is measurement of packet residence on 1588 packets.
- Transport Path of TC without knowledge of each other.
- No TC generated packets, no TC nodal identity.
- Development of 1588 version 3 is about to begin and it is critical to be aligned to other relevant standards.

Transparent Clocks can be critical in GPS backup networks

- GPS vulnerability is a driving force behind on path support deployments.
- Market forces are pushing for TaaS capability
  - TaaS – Timing as a Service
- Deployments are occurring with current systems.
- Goal of this discussion is to elicit ideas and support from 802.1.

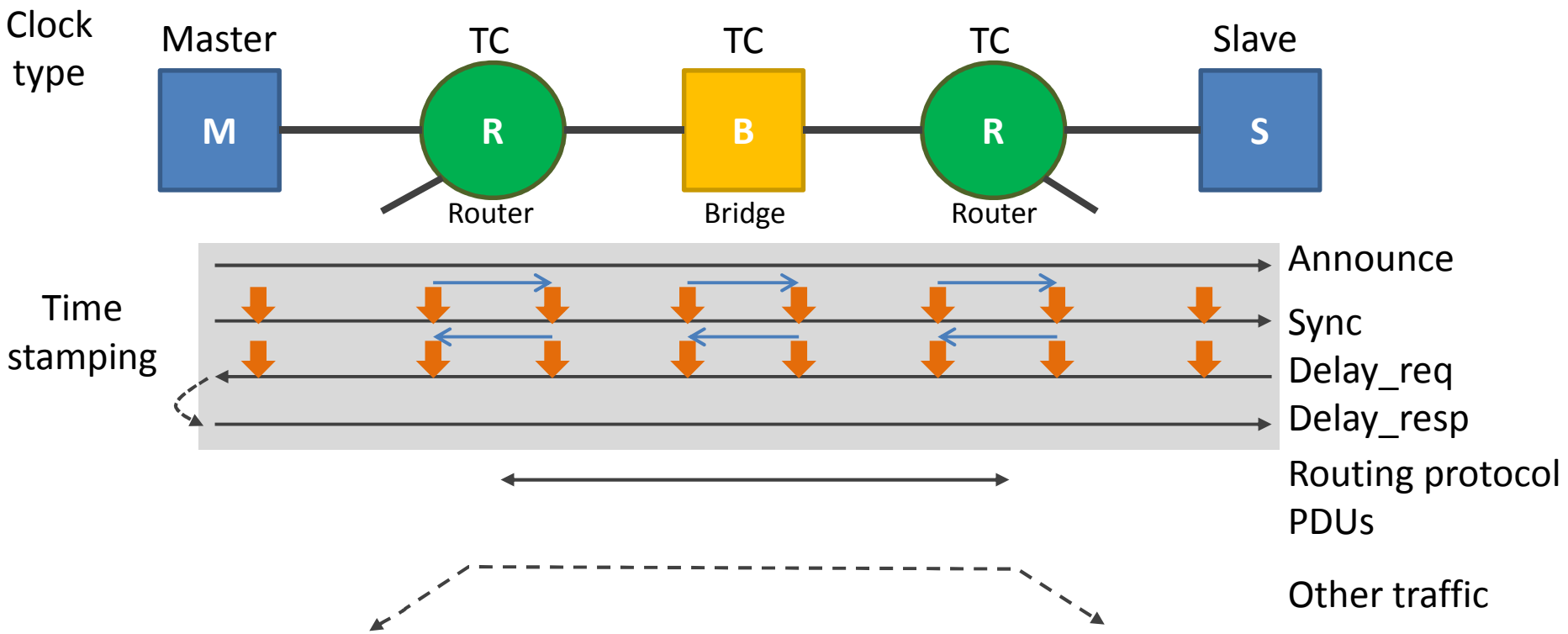
Transparent Clock - status

Protocol stack	802.1 bridging	L3 forwarding
ETH/PTP UC	TC valid w/SA replacement. Requires PTP:ClockIdentity for multiple Master, or Slave separation	N/A
ETH/PTP MC	Same as above	N/A
ETH/IPv4/UDP/PTP UC	TC invalid	TC fully supported
ETH/IPv4/UDP/PTP MC	??	TC fully supported
ETH/IPv6/UDP/PTP UC	TC invalid	TC fully supported
ETH/IPv6/UDP/PTP MC	??	TC fully supported

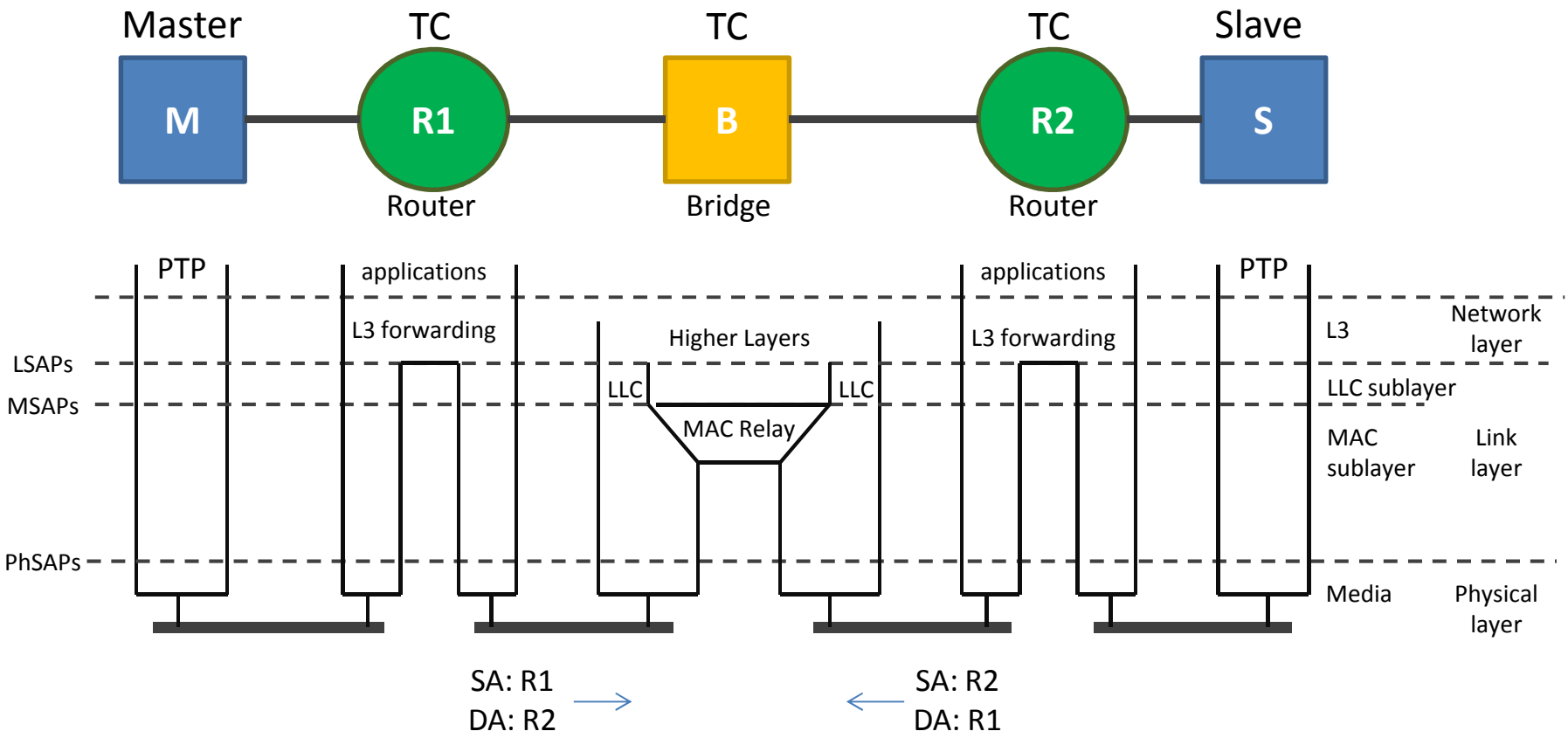


Network scenario in next slides

Network Scenario (E2E TC)



Layer model


Master
TC
TC
TC
Slave
M
R1
B
R2
S
Router
Bridge
Router
PTP
applications
applications
PTP
L3 forwarding
Higher Layers
L3 forwarding
L3
Network layer
LSAPs
LLC
LLC
LLC sublayer
MSAPs
MAC Relay
MAC sublayer
Link layer
PhSAPs
Media
Physical layer
SA: R1
DA: R2
SA: R2
DA: R1

A deployment scenario

- Bridge installed
- Routers 1 and 2 are physically connected via bridge
- ARP establish MAC/IP-address binding
- TC is enabled on bridge ports, then what should be the next step?
  - Swap SA on R1-R2 connection? (security issues: SA/SIP binding?)
  - All frames w/DA=R1 or R2 to higher layer?
  - Filter ingress; associate arrival time with frame through MAC relay function; update on egress?