

Bridging Packet Walk Throughs

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Agenda

- **Bridging for 802.17**
 - **Issues**
 - **Methods based on Deployed Networks**

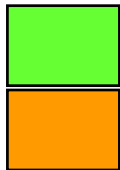
Options

- 1. Transparent bridges**
- 2. Encapsulated bridging**

Ethernet services

- 3. Double encapsulated bridging**
- 4. Encapsulated bridge**

Packet Legend



Customer data Packet

RPR Header

Higher Layer
(bridge protocol, bridge mgmnt)

MAC relay
(port state, FDB,
forwarding process)

MAC

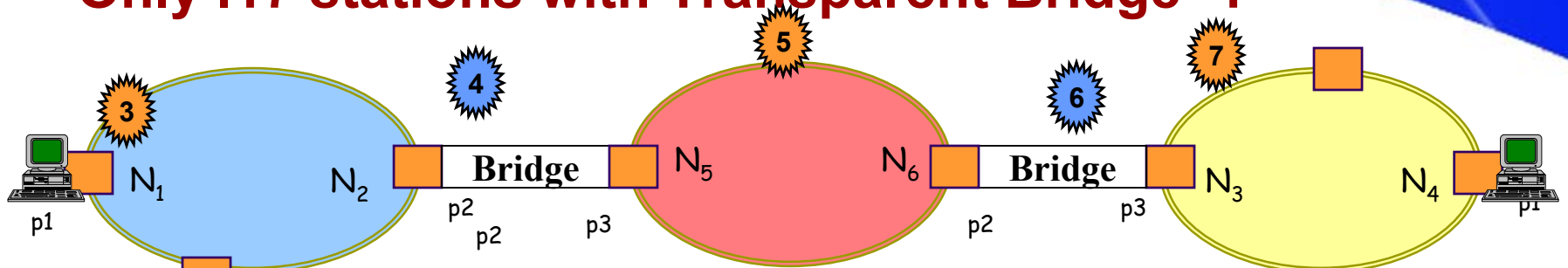
MAC

Notes

- **PRINT THIS DOCUMENT IN COLOR.**
- Aging of FDB, ARP are not included in these walkthroughs.

- **1.0 Transparent Bridge**
- 2.0 Encapsulated Bridge
- 3.0 Ethernet Service with 802.17 Bridge
- 4.0 Ethernet Service with 802.3 Bridge

Only .17 stations with Transparent Bridge -1



N₁ UNI FDB

MAC	
N1_P1	L

Bridge FDB

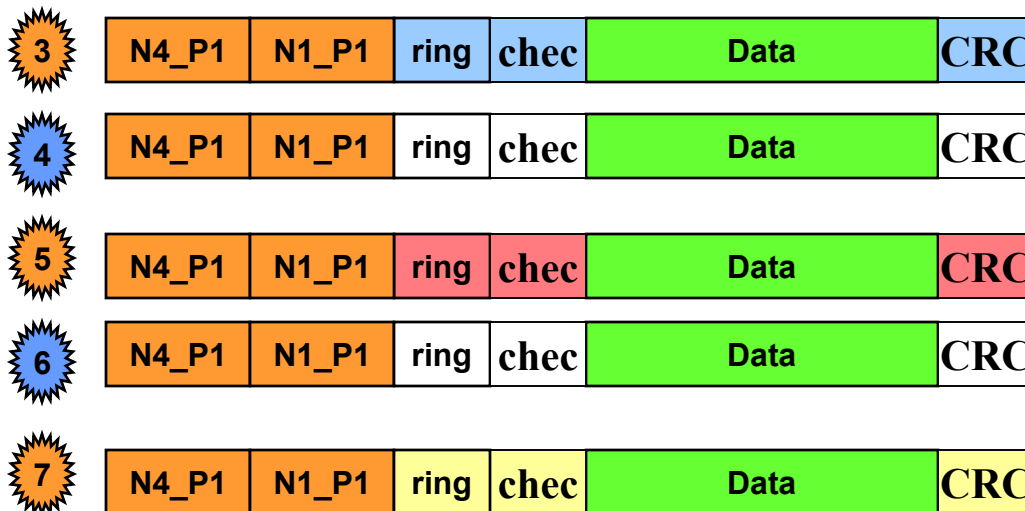
MAC	port
N1_P1	p2

Bridge FDB

MAC	port
N1_P1	p2

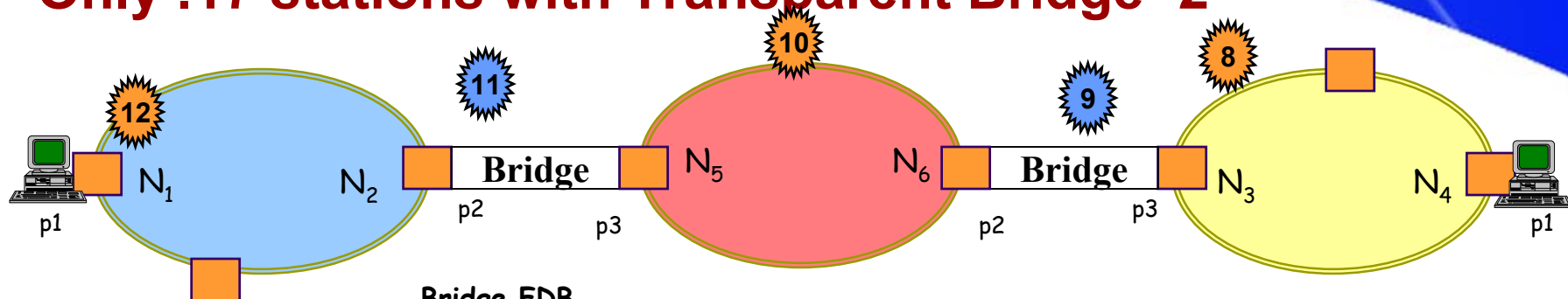
N₄ UNI FDB

MAC	r/l
N1_P1	R



ring = TTL, COS, Type...

Only .17 stations with Transparent Bridge -2



N₁ UNI FDB

MAC	r/l
N1_P1	L
N4_P1	R

Bridge FDB

MAC	port
N1_P1	p2
N4_P1	p3

Bridge FDB

MAC	port
N1_P1	p2
N4_P1	p3

N₄ UNI FDB

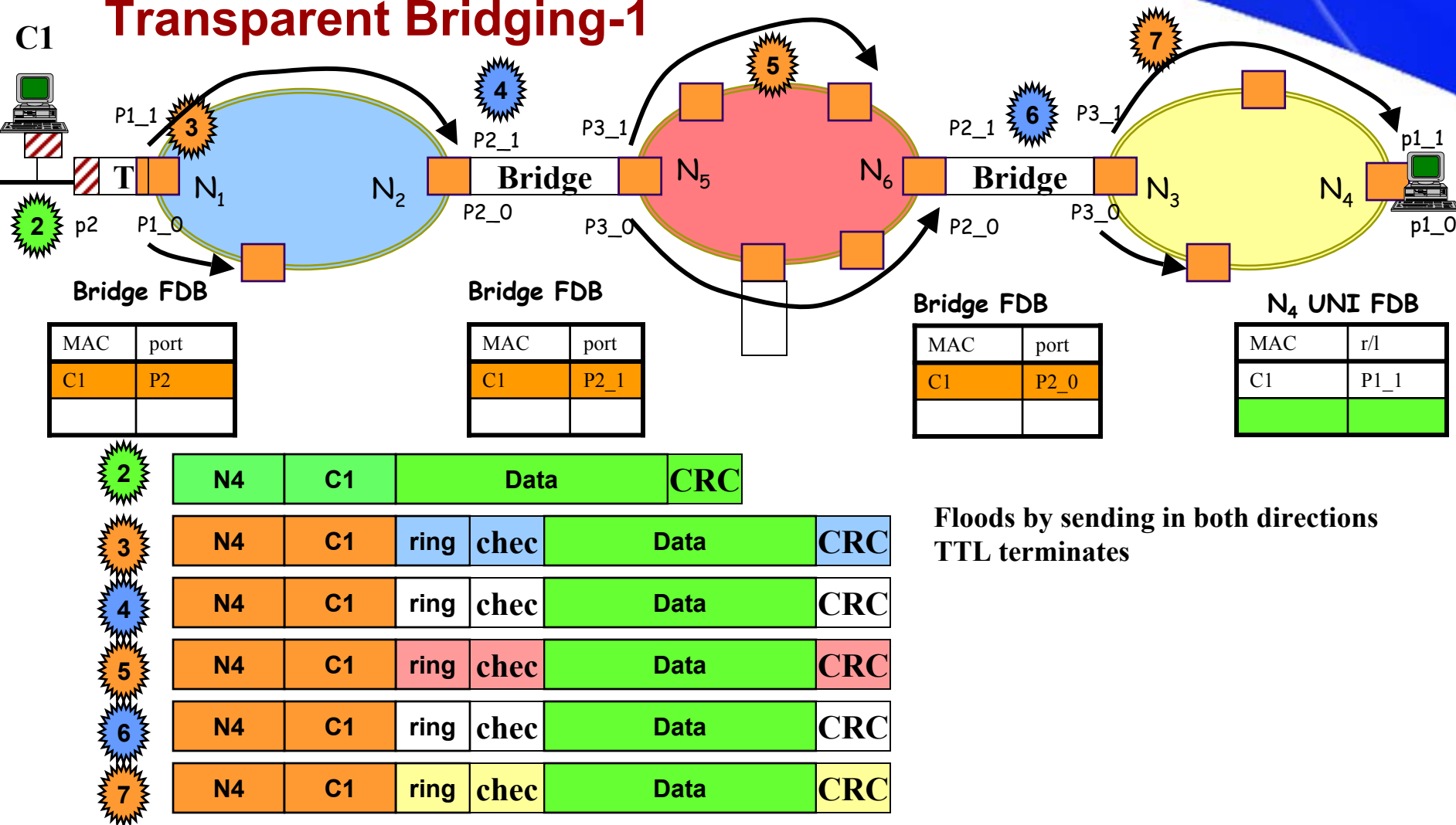
MAC	r/l
N1_P1	R
N4_P1	L

8	N1_P1	N4_P1	ring	chec	Data	CRC
9	N1_P1	N4_P1	ring	chec	Data	CRC
10	N1_P1	N4_P1	ring	chec	Data	CRC
11	N1_P1	N4_P1	ring	chec	Data	CRC
12	N1_P1	N4_P1	ring	chec	Data	CRC

.17 Network with Transparent Bridge

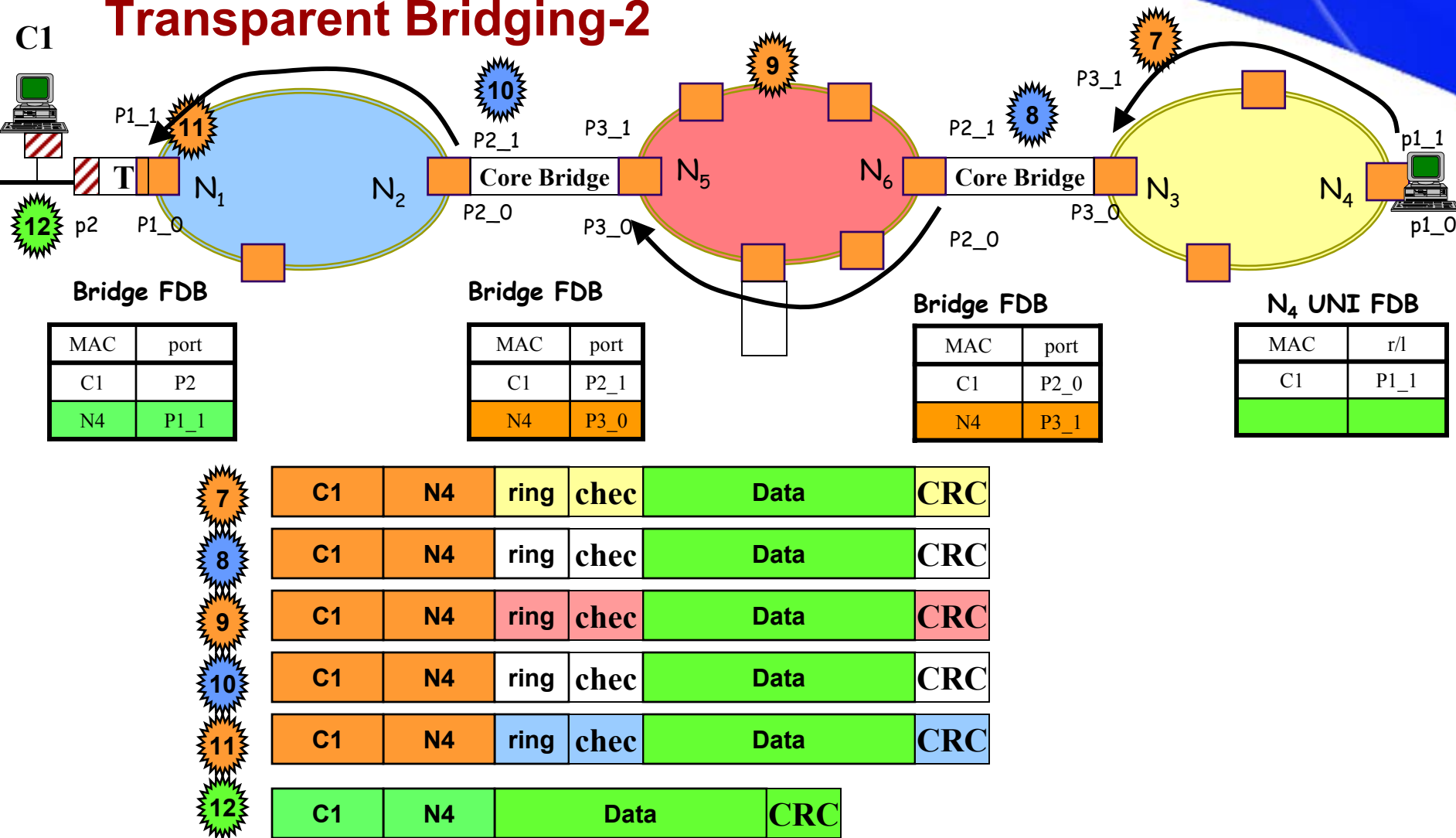
- **Bridge ports can run STP**
- **All Hosts MAC address will be in bridge FDB and needs ring speed processing**
- **NOT SCALABLE when connecting to other LAN segments. All LAN addresses in bridge FDB.**
- **CRC**
 - Cannot cut-through and distinguish un-routable packet
 - Use cHEC
- **No flooding on other ringlet ports**

Transparent Bridging-1



Floods by sending in both directions
TTL terminates

Transparent Bridging-2



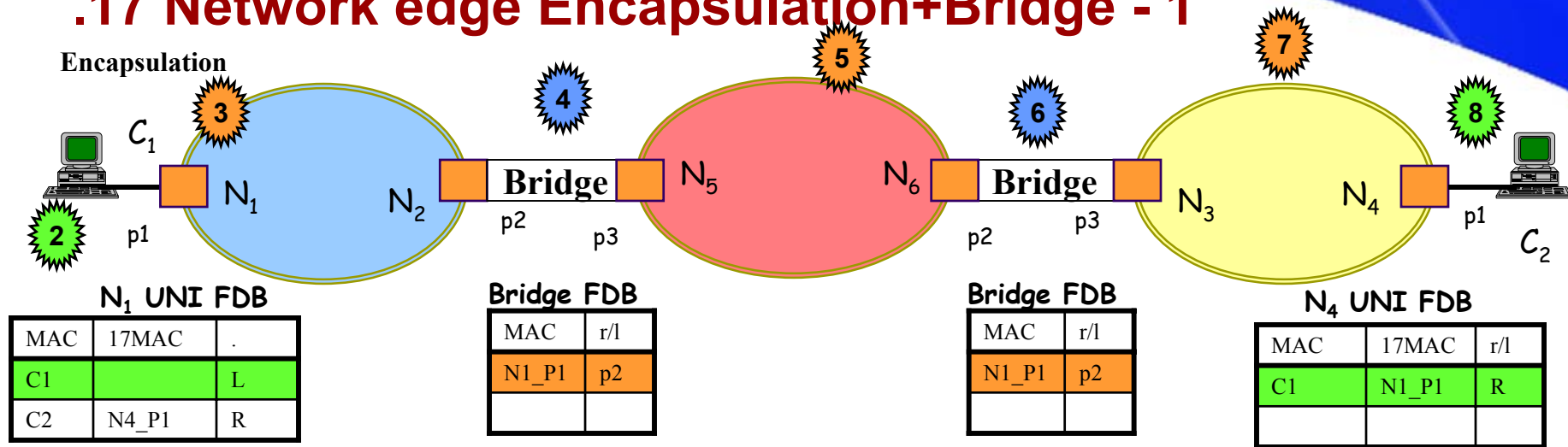
Transparent Bridging

- **To address unicast to broadcast problem***
 - Unknown address floods by sending in both directions using TTL to strip
 - Requires MAC port assignment to identify ring ports
- **Still have scalability of MAC address at “core” bridges but 802.1D compliant**

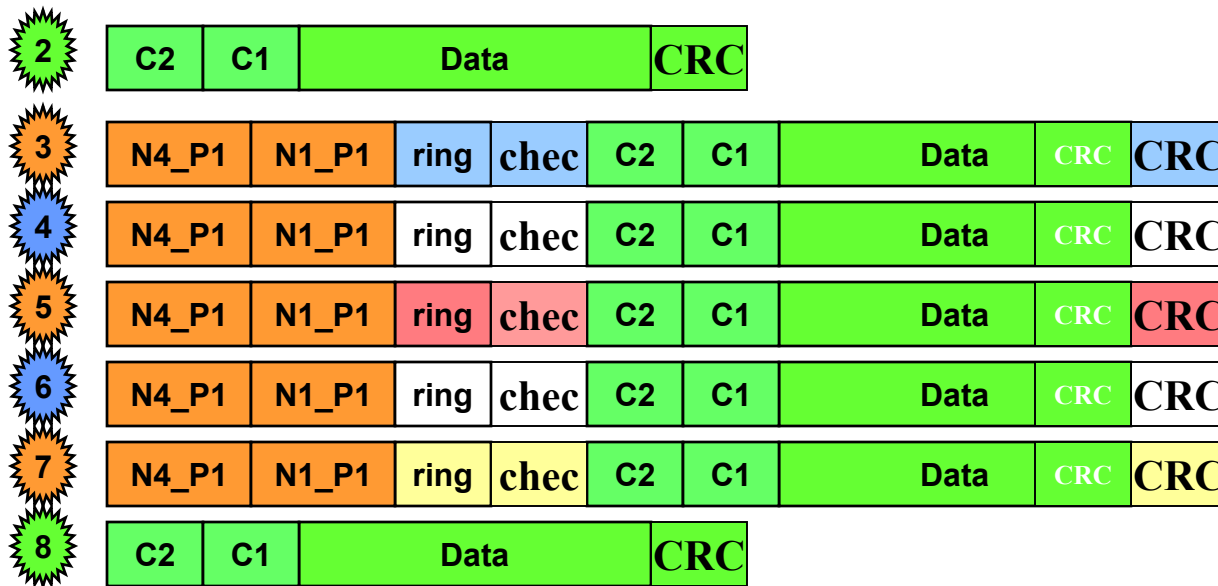
*RPR and 802.1D bridging Issues. Yong Kim. May 2001

- 1.0 Transparent Bridge
- 2.0 Encapsulated Bridge**
- 3.0 Ethernet Service with 802.17 Bridge
- 4.0 Ethernet Service with 802.3 Bridge

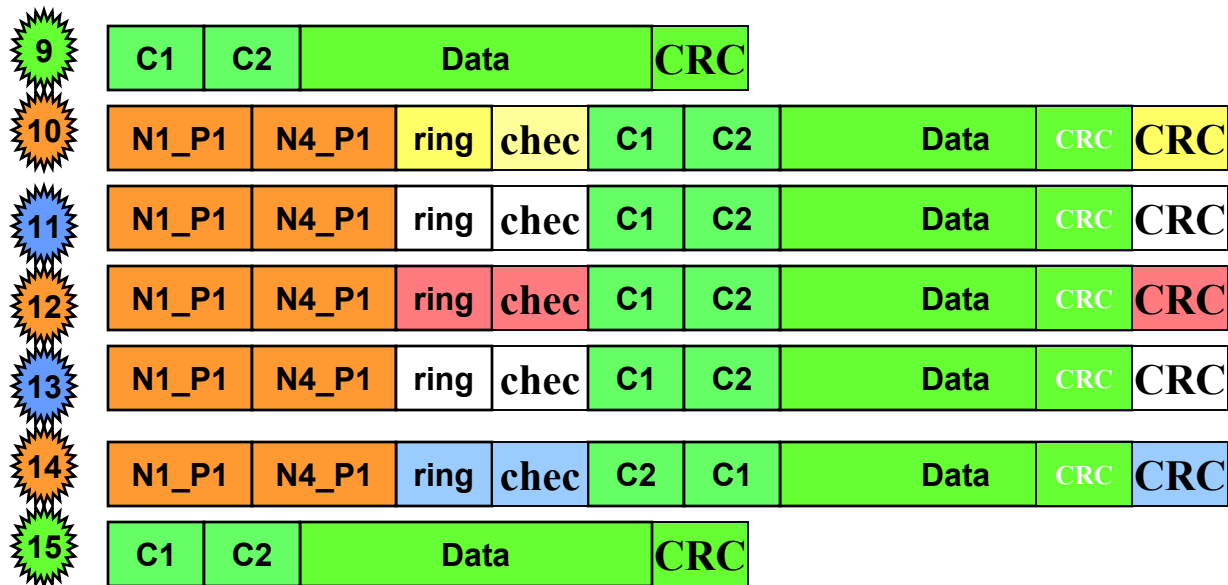
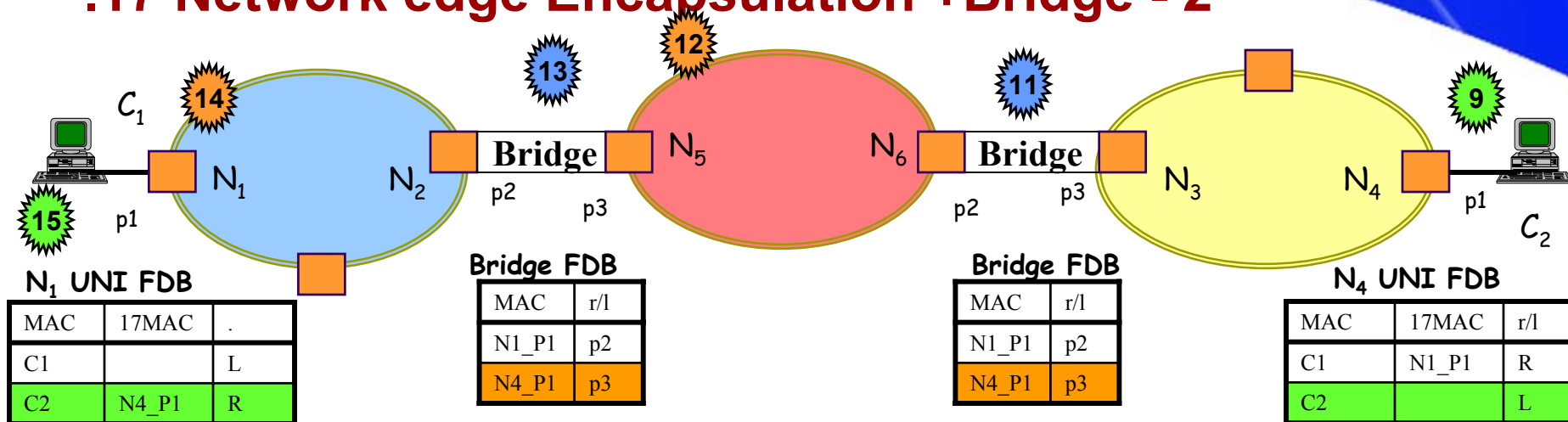
.17 Network edge Encapsulation+Bridge - 1



Assume:
C2 in FDB.
If not then
Use bcst



.17 Network edge Encapsulation + Bridge - 2



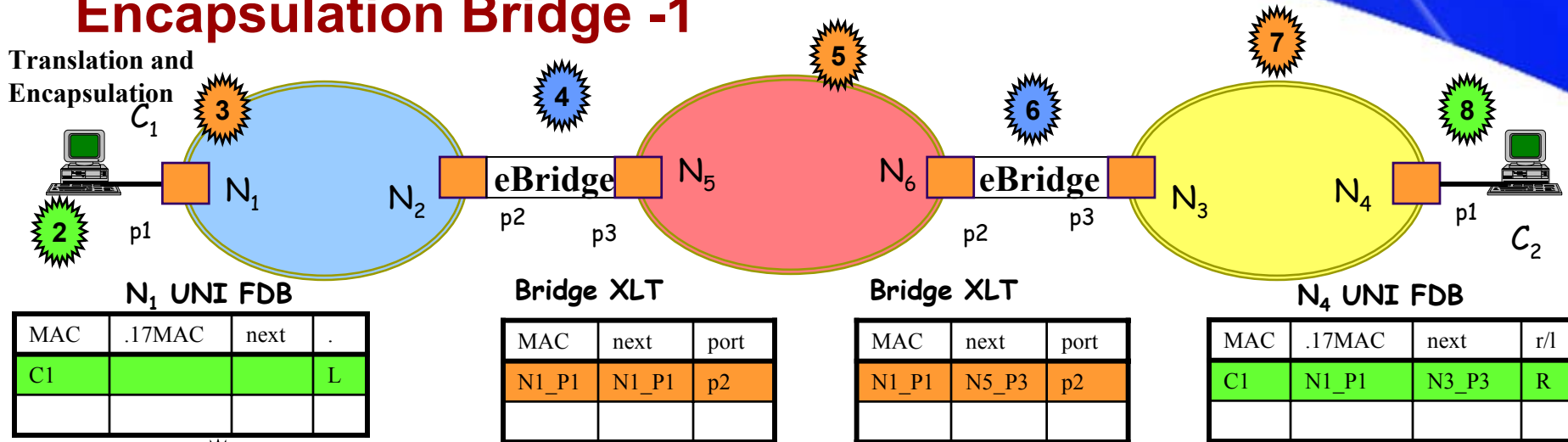
.17 Network edge Encapsulation+Bridge

- **Core Bridge ports can run STP**
 - Within encapsulation domain
- **All Station MAC address will be in bridge FDB and needs ring speed processing**
 - more SCALABLE
 - All LAN MAC address is now represented by .17 MAC
- **CRC**
 - No longer transparent with ring specific fields: changing TTL
 - Use cHEC
- **No flooding on other ringlet ports**

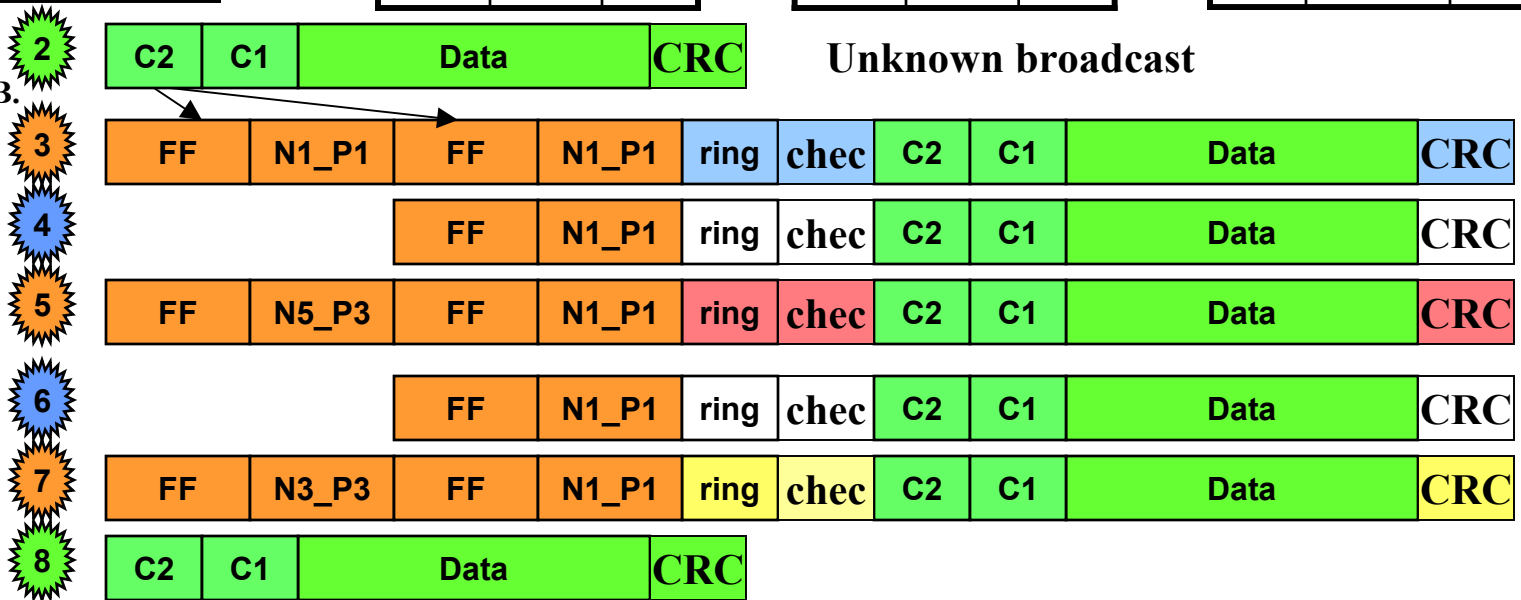
- 1.0 Transparent Bridge
- 2.0 Encapsulated Bridge
- 3.0 Ethernet Service with 802.17 Bridge**
- 4.0 Ethernet Service with 802.3 Bridge

17 Network with edge double encapsulate + Encapsulation Bridge -1

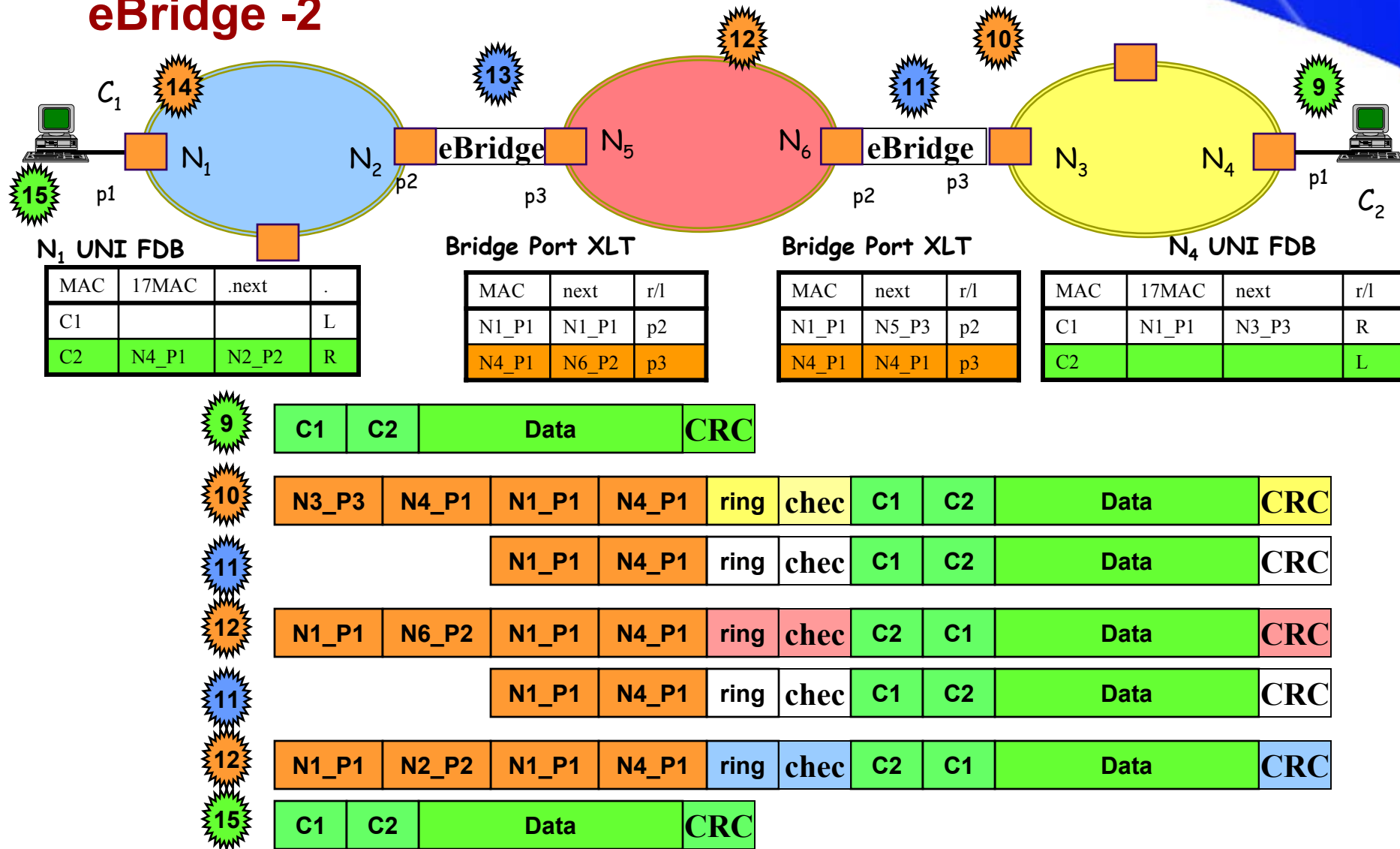
Translation and Encapsulation



Assume:
C2 NOT in FDB.
then Use bcst



.17 Network with edge double encapsulation + eBridge -2



.17 Network with edge double encapsulation

- **Bridge ports can run STP**
- **One Station MAC address at ring rate**
 - SCALABLE
 - Only bridge traffic is forwarded to MAC relay entity
 - Not promiscuous mode
- **Translation bridge, FDB and needed at user interface**
 - SCALABLE .17 MAC
- **CRC**
- **No broadcast on opposite ring port**

- 1.0 Transparent Bridge
- 2.0 Encapsulated Bridge
- 3.0 Ethernet Service with 802.17 Bridge
- 4.0 Ethernet Service with 802.3 Bridge**

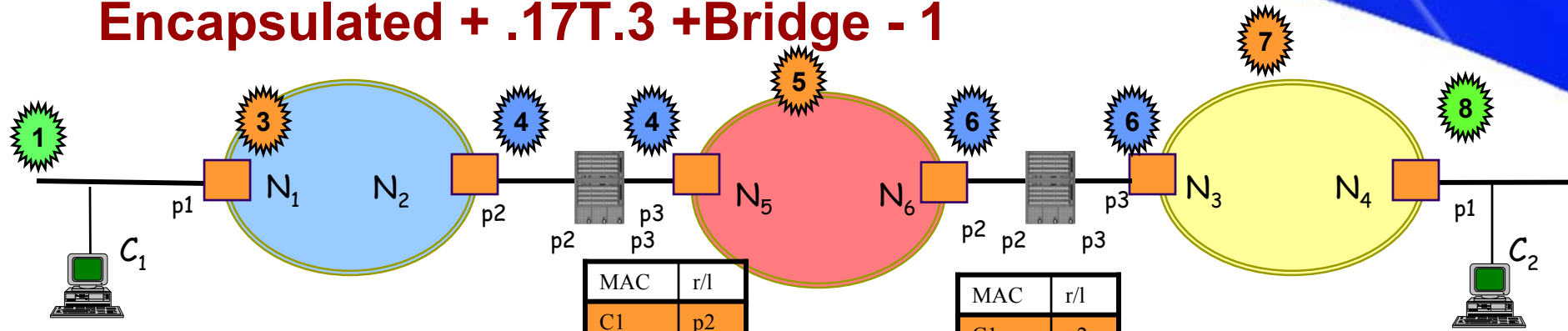
N5 UNI FDB

MAC	MAC	r/l
C1		L

MAC	MAC	r/l
C1	N5_P3	R

N6 UNI FDB

Encapsulated + .17T.3 + Bridge - 1



N₁ UNI FDB

MAC	17MAC	.
C1		L

N₂ UNI FDB

MAC	MAC	r/l
C1	N1_P1	R

MAC	r/l
C1	p2

MAC	r/l
C1	p2

N₃ UNI FDB

MAC	MAC	r/l
C1		L

N₄ UNI FDB

MAC	17MAC	r/l
C1	N3_P3	R



C2	C1	Data	CRC
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ring	FF	N1_P1	chec	C2	C1	Data	CRC
------	----	-------	------	----	----	------	-----

C2	C1	Data	CRC
----	----	------	-----

ring	FF	N5_P3	chec	C2	C1	Data	CRC
------	----	-------	------	----	----	------	-----

C2	C1	Data	CRC
----	----	------	-----

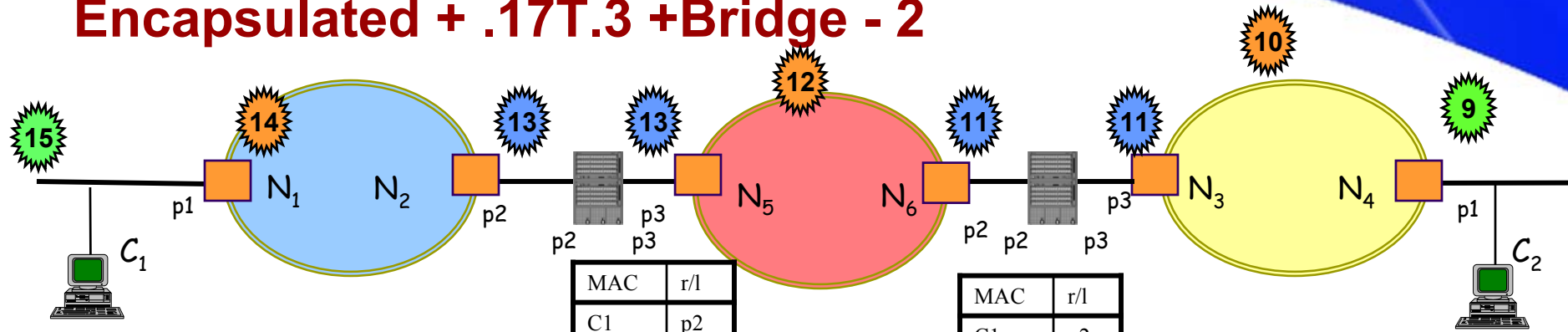
ring	FF	N3_P3	chec	C2	C1	Data	CRC
------	----	-------	------	----	----	------	-----

C2	C1	Data	CRC
----	----	------	-----

MAC	MAC	r/l
C1		L
C2	N6_P2	R

MAC	MAC	r/l
C1	N5_P3	R
C2		L

Encapsulated + .17T.3 + Bridge - 2



MAC	r/l
C1	p2
C2	P3

MAC	r/l
C1	p2
C2	P3

N₁ UNI FDB

N₂ Bridge Port FDB

N₃ Bridge Port FDB

N₄ UNI FDB

MAC	MAC	.
C1		L
C2	N2_P2	R

MAC	MAC	r/l
C1	N1_P1	R
C2		L

MAC	MAC	r/l
C1		L
C2	N4_P1	R

MAC	MAC	r/l
C1	N3_P3	R
C2		L



C1	C2	Data	CRC
----	----	------	-----

ring	N3_P3	N4_P1	chec	C1	C2	Data	CRC
------	-------	-------	------	----	----	------	-----

C1	C2	Data	CRC
----	----	------	-----

ring	N5_P3	N6_P2	chec	C1	C2	Data	CRC
------	-------	-------	------	----	----	------	-----

C1	C2	Data	CRC
----	----	------	-----

ring	N1_P1	N2_P2	chec	C1	C2	Data	CRC
------	-------	-------	------	----	----	------	-----

C1	C2	Data	CRC
----	----	------	-----

Remote Bridging

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Conclusion

- **802.17 can work with 802.1D T bridges**
 - MAC address scaling issue.
- **Some other options to build a L2 network**
 - Single Encapsulated Bridges
 - Double Encapsulated Bridges
 - Single MAC Address at 802.17 MAC station
 - Ethernet Service Use 802.1D bridge
 - Use 802.3 to 802.17 encapsulation