



10G 40G 100G PACKET CAPTURE

Diagnosing network weirdness

He said, She said, Layer 1 capture said!

Ciaran Kennedy, FMADIO

# It's Broken



Network issues:

- “Weird” errors
- Link bounces
- Port flapping
- Link is down
- Unexpected errors

“It’s Broken”



# FMADIO 4th Gen Packet Capture

Full line rate 200G Packet capture, 297.6Mpps in a compact 1U form factor with PCIe Gen x12 NVMe high speed SSDs and x2 QSFP28 interfaces.

- 200Gbps Sustained Packet Capture
- Capture ports: **10G, 25G, 40G, 100G**
- 2x QSFP28 Ports
- SR4 / LR4 / CX4 + FEC support
- 200Gbps Line Rate Packet Generator
- 45TB ~ 360 TB RAID5 Storage
- Up to **384 CPU**
- Up to **1.5TB RAM**
- SED Disk Encryption by default



# There is an “Error”

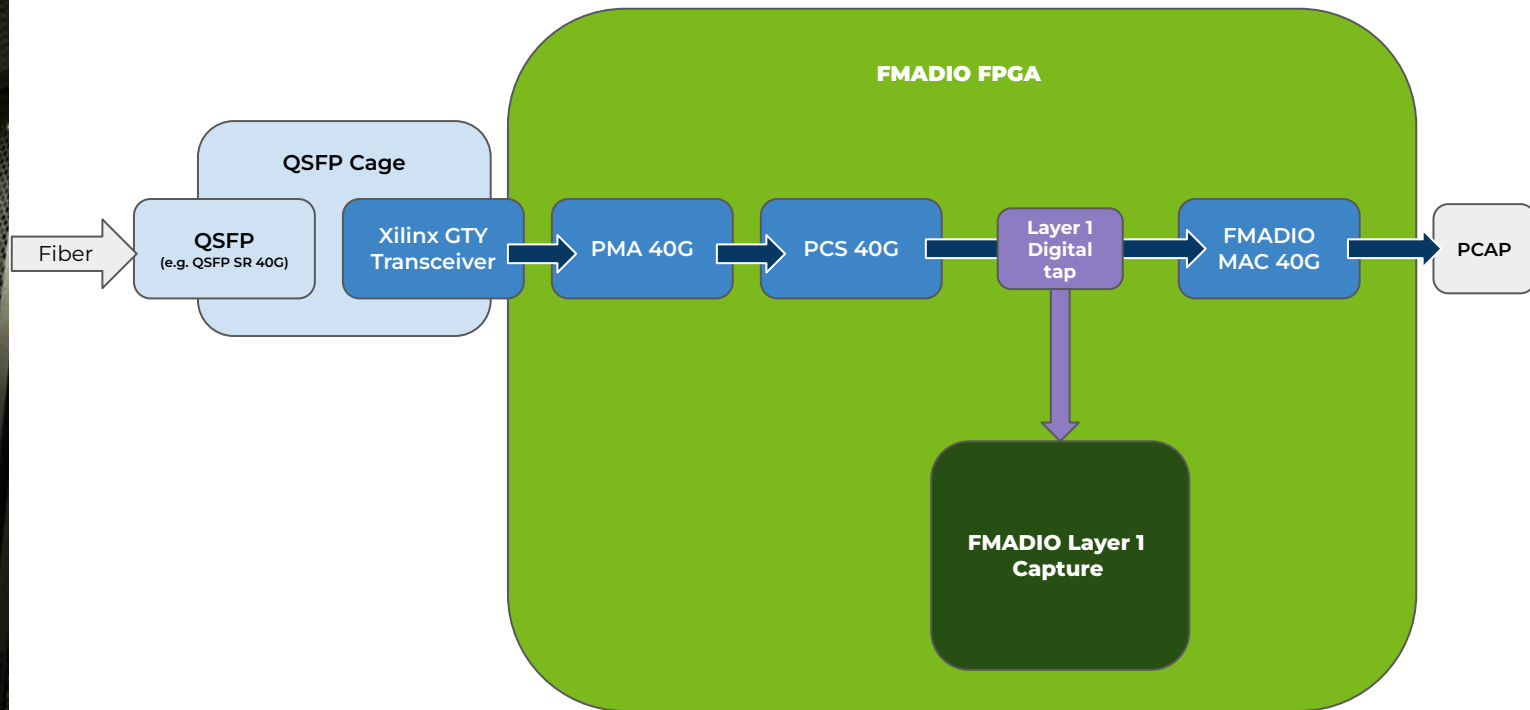
Ok... so there's a problem. You checked the error counters. Found a 1 when it should be a 0, but... what's next?

```
(fmadiosg0-tor720) #show interface 0/26

Packets Received Without Error..... 11648276
Packets Received With Error..... 1
Broadcast Packets Received..... 26661
Receive Packets Discarded..... 2
Packets Transmitted Without Errors..... 201509907
Transmit Packets Discarded..... 0
Transmit Packet Errors..... 0
Collision Frames..... 0
Number of link down events..... 184
Load Interval..... 300
Bits Per Second Received..... 0
Bits Per Second Transmitted..... 80
Packets Per Second Received..... 0
Packets Per Second Transmitted..... 0
Percent Utilization Received..... 0%
Percent Utilization Transmitted..... 0%
Link Flaps..... 0
Time Since Counters Last Cleared..... 89 day 23 hr 15 min 26 sec

(fmadiosg0-tor720) #
```

# XLGMII Debugging





# Investigating a corrupt FCS

```

066:081:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:a8309a3ea9309a3e_aa309a3eab309a3e
065:082:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:ac309a3ead309a3e_ae309a3eaf309a3e
064:083:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:b0309a3eb1309a3e_b2309a3eb3309a3e
063:084:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:b4309a3eb5309a3e_b6309a3eb7309a3e
062:085:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:b8309a3eb9309a3e_ba309a3ebb309a3e
061:086:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:bc309a3ebd309a3e_be309a3ebf309a3e
060:087:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:c0309a3ec1309a3e_c2309a3ec3309a3e
059:088:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:c4309a3ec5309a3e_c6309a3ec7309a3e
058:089:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:c8309a3ec9309a3e_ca309a3ecb309a3e
057:08a:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:cc309a3ecd309a3e_ce309a3ecf309a3e
056:08b:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:d0309a3ed1309a3e_d2309a3ed3309a3e
055:08c:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:d4309a3ed5309a3e_d6309a3ed7309a3e
054:08d:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:d8309a3ed9309a3e_da309a3edb309a3e
053:08e:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:dc309a3edd309a3e_de309a3edf309a3e
052:08f:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:e0309a3ee1309a3e_e2309a3ee3309a3e
051:090:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:e4309a3ee5309a3e_e6309a3ee7309a3e
050:091:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:e8309a3ee9309a3e_ea309a3eeb309a3e
049:092:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:ec309a3eed309a3e_ee309a3eedf309a3e
048:093:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:f0309a3ef1309a3e_f2309a3ef3309a3e
047:094:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:f4309a3ef5309a3e_f6309a3ef7309a3e
046:095:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:f8309a3ef9309a3e_fa309a3eff309a3e
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043:098:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:04319a3e05319a3e_06319a3e07319a3e
042:099:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:08319a3e09319a3e_0a319a3e0b319a3e
041:09a:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:0c319a3e0d319a3e_0e319a3e0f319a3e
040:09b:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:10319a3e11319a3e_12319a3e13319a3e
039:09c:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:14319a3e15319a3e_16319a3e17319a3e
038:09d:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:18319a3e19319a3e_1a319a3e1b319a3e
037:09e:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:1c319a3e1d319a3e_1e319a3e1f319a3e
036:09f:009 Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:20319a3e21319a3e_22319a3e23319a3e
035:0a0:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:24319a3e25319a3e_26319a3e27319a3e
034:0a1:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:28319a3e29319a3e_2a319a3e2b319a3e
033:0a2:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:2c319a3e2d319a3e_2e319a3e2f319a3e
032:0a3:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:30319a3e31319a3e_32319a3e33319a3e
031:0a4:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:389ec9a26620ef6d_1dcfd03c21d6931e
030:0a5:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000111111000000 Dat:c7d5c0f2fd070707_fb555555555555d5 ----T1115----
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028:0a7:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:c22f9a3ec32f9a3e_c42f9a3ec52f9a3e
027:0a8:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:c62f9a3ec72f9a3e_c82f9a3ec92f9a3e
026:0a9:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:ca2f9a3ecb2f9a3e_cc2f9a3ecd2f9a3e
025:0aa:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:ce2f9a3ecf2f9a3e_d02f9a3ed12f9a3e
024:0ab:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:d22f9a3ed32f9a3e_d42f9a3ed52f9a3e
023:0ac:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:d62f9a3ed72f9a3e_d82f9a3ed92f9a3e
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018:0b0:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:e62f9a3ee72f9a3e_e82f9a3ee92f9a3e
018:0b1:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:ea2f9a3eeb2f9a3e_ec2f9a3eed2f9a3e
017:0b2:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:ee2f9a3ee72f9a3e_f02f9a3ef12f9a3e
016:0b3:00b Rep:000001 PCSerr: FCS:X InFrame:F XLGMI: Ctl:0000000000000000 Dat:f22f9a3ef32f9a3e_f42f9a3ef52f9a3e
015:0b4:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:f62f9a3ef72f9a3e_f82f9a3ef92f9a3e
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013:0b6:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:fe2f9a3eff2f9a3e_00309a3e01309a3e
012:0b7:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:02309a3e03309a3e_04309a3e05309a3e
011:0b8:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:06309a3e07309a3e_08309a3e09309a3e
010:0b9:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:0a309a3e0b309a3e_0c309a3e0d309a3e
009:0ba:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:0e309a3e0f309a3e_10309a3e11309a3e
008:0bb:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:12309a3e13309a3e_14309a3e15309a3e
007:0bc:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:16309a3e17309a3e_18309a3e19309a3e
006:0bd:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:1a309a3e1b309a3e_1c309a3e1d309a3e
005:0be:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:1e309a3e1f309a3e_20309a3e21309a3e
004:0bf:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:22309a3e23309a3e_24309a3e25309a3e
003:0c0:00c Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:26309a3e27309a3e_28309a3e29309a3e
002:0c1:00c Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:2a309a3e2b309a3e_2c309a3e2d309a3e
001:0c2:00c Rep:000001 PCSerr: FCS: InFrame:F XLGMI: Ctl:0000000000000000 Dat:2e309a3e2f309a3e_30309a3e31309a3e

```



# Investigating a corrupt FCS

066:081:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:a8309a3ea9309a3e_aa309a3eab309a3e	
065:082:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:ac309a3ead309a3e_ae309a3eaf309a3e	
064:083:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:b0309a3eb1309a3e_b2309a3eb3309a3e	
063:084:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:b4309a3eb5309a3e_b6309a3eb7309a3e	
062:085:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:b8309a3eb9309a3e_ba309a3ebb309a3e	
061:086:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:bc309a3ebd309a3e_be309a3ebf309a3e	
060:087:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:c0309a3ec1309a3e_c2309a3ec3309a3e	
059:088:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:c4309a3ec5309a3e_c6309a3ec7309a3e	
058:089:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:c8309a3ec9309a3e_ca309a3ecb309a3e	
057:08a:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:cc309a3ecd309a3e_ce309a3ecf309a3e	
056:08b:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:d0309a3ed1309a3e_d2309a3ed3309a3e	
055:08c:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:d4309a3ed5309a3e_d6309a3ed7309a3e	
054:08d:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:d8309a3ed9309a3e_da309a3edb309a3e	
053:08e:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:dc309a3edd309a3e_de309a3edf309a3e	
052:08f:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:e0309a3ee1309a3e_e2309a3ee3309a3e	
051:090:008	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:e4309a3ee5309a3e_e6309a3ee7309a3e	
050:091:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:e8309a3ee9309a3e_ea309a3eeb309a3e	
049:092:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:ec309a3eed309a3e_ee309a3eedf309a3e	
048:093:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:f0309a3ef1309a3e_f2309a3ef3309a3e	
047:094:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:f4309a3ef5309a3e_f6309a3ef7309a3e	
046:095:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:f8309a3ef9309a3e_fa309a3efb309a3e	
045:096:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:fc309a3efd309a3e_fe309a3efd7309a3e	
044:097:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:00319a3e01319a3e_02319a3e03319a3e	
043:098:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:04319a3e05319a3e_06319a3e07319a3e	
042:099:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:08319a3e09319a3e_0a319a3e0b319a3e	
041:09a:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:0c319a3e0d319a3e_0e319a3e0f319a3e	
040:09b:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:10319a3e11319a3e_12319a3e13319a3e	
039:09c:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:14319a3e15319a3e_16319a3e17319a3e	
038:09d:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:18319a3e19319a3e_1a319a3e1b319a3e	
037:09e:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:1c319a3e1d319a3e_1e319a3e1f319a3e	
036:09f:009	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:20319a3e21319a3e_22319a3e23319a3e	
035:0a0:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:24319a3e25319a3e_26319a3e27319a3e	
034:0a1:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:28319a3e29319a3e_2a319a3e2b319a3e	
033:0a2:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:2c319a3e2d319a3e_2e319a3e2f319a3e	
032:0a3:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:30319a3e31319a3e_32319a3e33319a3e	
031:0a4:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:389ec9a26620ef6d_1dcfd03c21d6931e	
030:0a5:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000111110000000	Dat:c7d5cof2fd070707_fb555555555555d5	-----T1115-----
029:0a6:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:00af2002010000af_2002020000000000	
028:0a7:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:c22f9a3ec32f9a3e_c42f9a3ec52f9a3e	
027:0a8:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:c62f9a3ec72f9a3e_c82f9a3ec92f9a3e	
026:0a9:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:ca2f9a3ecb2f9a3e_cc2f9a3ecd2f9a3e	
025:0aa:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:ce2f9a3ecf2f9a3e_d02f9a3ed12f9a3e	
024:0ab:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:d22f9a3ed32f9a3e_d42f9a3ed52f9a3e	
023:0ac:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:d62f9a3ed72f9a3e_d82f9a3ed92f9a3e	
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021:0ae:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:de2f9a3edf2f9a3e_e02f9a3ee12f9a3e	
020:0af:00a	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:e22f9a3ee32f9a3e_e42f9a3ee52f9a3e	
019:0b0:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:e62f9a3ee72f9a3e_e82f9a3ee92f9a3e	
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016:0b3:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:f22f9a3ef32f9a3e_f42f9a3ef52f9a3e	
015:0b4:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:f62f9a3ef72f9a3e_f82f9a3ef92f9a3e	
014:0b5:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:fa2f9a3efb2f9a3e_fc2f9a3efd2f9a3e	
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012:0b7:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:02309a3e03309a3e_04309a3e05309a3e	
011:0b8:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:06309a3e07309a3e_08309a3e09309a3e	
010:0b9:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:0a309a3e0b309a3e_0c309a3e0d309a3e	
009:0ba:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:0e309a3e0f309a3e_10309a3e11309a3e	
008:0bb:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:12309a3e13309a3e_14309a3e15309a3e	
007:0bc:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:16309a3e17309a3e_18309a3e19309a3e	
006:0bd:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:1a309a3e1b309a3e_1c309a3e1d309a3e	
005:0be:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:1e309a3e1f309a3e_20309a3e21309a3e	
004:0bf:00b	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:22309a3e23309a3e_24309a3e25309a3e	
003:0c0:00c	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:26309a3e27309a3e_28309a3e29309a3e	
002:0c1:00c	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:2a309a3e2b309a3e_2c309a3e2d309a3e	
001:0c2:00c	Rep:000001	PCSerr:	FCS:	InFrame:F	XLGMII:	Ctl:0000000000000000	Dat:2e309a3e2f309a3e_30309a3e31309a3e	

FCS:  
FCS:  
FCS:



# Investigating a corrupt FCS

```

066:081:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:a8309a3ea9309a3e_aa309a3eab309a3e
065:082:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:ac309a3ead309a3e_ae309a3ear309a3e
064:083:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:b0309a3eb1309a3e_b2309a3eb309a3e
063:084:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:b4309a3eb5309a3e_b6309a3eb7309a3e
062:085:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:b8309a3eb9309a3e_ba309a3ebb309a3e
061:086:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:bc309a3ebd309a3e_be309a3ebf309a3e
060:087:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:c0309a3ec1309a3e_c2309a3ec3309a3e
059:088:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:c4309a3ec5309a3e_c6309a3ec7309a3e
058:089:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:c8309a3ec9309a3e_ca309a3ecb309a3e
057:08a:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:cc309a3ecd309a3e_ce309a3ecf309a3e
056:08b:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:d0309a3ed1309a3e_d2309a3ed3309a3e
055:08c:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:d4309a3ed5309a3e_d6309a3ed7309a3e
054:08d:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:d8309a3ed9309a3e_da309a3edb309a3e
053:08e:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:dc309a3edd309a3e_de309a3edf309a3e
052:08f:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:e0309a3ee1309a3e_e2309a3ee3309a3e
051:090:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:e4309a3ee5309a3e_e6309a3ee7309a3e
050:091:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:e8309a3ee9309a3e_ea309a3eeb309a3e
049:092:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:ec309a3eed309a3e_ee309a3eeef309a3e
048:093:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:f0309a3ef1309a3e_f2309a3ef3309a3e
047:094:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:f4309a3ef5309a3e_f6309a3ef7309a3e
046:095:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:f8309a3ef9309a3e_fa309a3efb309a3e
045:096:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:fc309a3ef309a3e_fe309a3ef7309a3e
044:097:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:00319a3e01319a3e_02319a3e03319a3e
043:098:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:04319a3e05319a3e_06319a3e07319a3e
042:099:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:08319a3e09319a3e_0a319a3e0b319a3e
041:09a:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:0c319a3e0d319a3e_0e319a3e0f319a3e
040:09b:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:10319a3e11319a3e_12319a3e13319a3e
039:09c:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:14319a3e15319a3e_16319a3e17319a3e
038:09d:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:18319a3e19319a3e_1a319a3e1b319a3e
037:09e:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:1c319a3e1d319a3e_1e319a3e1f319a3e
036:09f:008 Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:20319a3e21319a3e_22319a3e23319a3e
035:0a0:00a Rep:00
034:0a1:00a Rep:00
033:0a2:00a Rep:00
032:0a3:00a Rep:00
031:0a4:00a Rep:00
030:0a5:00a Rep:00
029:0a6:00a Rep:00
028:0a7:00a Rep:00
027:0a8:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:30319a3e31319a3e_32319a3e33319a3e
026:0a9:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:34319a3e35319a3e_36319a3e37319a3e
025:0aa:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:c2f9a3ec2f9a3e_c42f9a3ec42f9a3e
024:0ab:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:d2f9a3ed3f9a3e_d42f9a3ed52f9a3e
023:0ac:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:d6f9a3ed72f9a3e_d82f9a3ed92f9a3e
022:0ad:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:da2f9a3edb2f9a3e_dc2f9a3edd2f9a3e
021:0ae:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:de2f9a3edf2f9a3e_e02f9a3ee12f9a3e
020:0af:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:e22f9a3ef2f9a3e_e42f9a3ef32f9a3e
019:0b0:00a Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:e62f9a3ef72f9a3e_e82f9a3ef92f9a3e
018:0b1:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:ea2f9a3eeb2f9a3e_ec2f9a3eed2f9a3e
017:0b2:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:ee2f9a3ee72f9a3e_f02f9a3ef12f9a3e
016:0b3:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:f22f9a3ef32f9a3e_f42f9a3ef52f9a3e
015:0b4:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:f62f9a3ef72f9a3e_f82f9a3ef92f9a3e
014:0b5:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:fa2f9a3efb2f9a3e_fc2f9a3efd2f9a3e
013:0b6:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:fe2f9a3eff2f9a3e_1c309a3e01309a3e
012:0b7:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:02309a3e03309a3e_04309a3e05309a3e
011:0b8:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:06309a3e07309a3e_08309a3e09309a3e
010:0b9:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:0a309a3e0b309a3e_0c309a3e0d309a3e
009:0ba:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:0e309a3e0f309a3e_10309a3e11309a3e
008:0bb:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:12309a3e13309a3e_14309a3e15309a3e
007:0bc:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:16309a3e17309a3e_18309a3e19309a3e
006:0bd:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:1a309a3e1b309a3e_1c309a3e1d309a3e
005:0be:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:1e309a3e1f309a3e_20309a3e21309a3e
004:0bf:00b Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:22309a3e23309a3e_24309a3e25309a3e
003:0c0:00c Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:26309a3e27309a3e_28309a3e29309a3e
002:0c1:00c Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:2a309a3e2b309a3e_2c309a3e2d309a3e
001:0c2:00c Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:2e309a3e2f309a3e_30309a3e31309a3e

```



# Investigating a corrupt FCS

```
5: 046: 004] Rep: 000001 PCSerr: FCS: InFrame: XLGMII: Ctl: 1111111111111111 Dat: 0707070707070707_0707070707070707 1111111111111111
4: 047: 004] Rep: 000001 PCSerr: FCS: InFrame: XLGMII: Ctl: 1000000000000000 Dat: fb55555555555555_00af2002010000af S-----
3: 048: 004] Rep: 000001 PCSerr: FCS: InFrame: XLGMII: Ctl: 0000000000000000 Dat: 2002020000000000_c22f9a3ec32f9a3e
2: 049: 004] Rep: 000001 PCSerr: FCS: InFrame: XLGMII: Ctl: 0000000000000000 Dat: c42f9a3ec52f9a3e_c62f9a3ec72f9a3e
1: 04A: 004] Rep: 000001 PCSerr: FCS: InFrame: XLGMII: Ctl: 0000000000000000 Dat: c82f9a3ec92f9a3e_ca2f9a3ecb2f9a3e
0: 04B: 004] Rep: 000001 PCSerr: FCS: InFrame: XLGMII: Ctl: 0000000000000000 Dat: cc2f9a3ecd2f9a3e_ce2f9a3ecf2f9a3e
9: 04C: 004] Rep: 000001 PCSerr: FCS: InFrame: XLGMII: Ctl: 0000000000000000 Dat: d02f9a3ed12f9a3e_d22f9a3ed32f9a3e
8: 04D: 004] Rep: 000001 PCSerr: FCS: InFrame: XLGMII: Ctl: 0000000000000000 Dat: d42f9a3ed52f9a3e_d62f9a3ed72f9a3e
7: 04E: 004] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: d82f9a3ed92f9a3e_da2f9a3edb2f9a3e
6: 04F: 004] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: dc2f9a3edd2f9a3e_de2f9a3edf2f9a3e
5: 050: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: e02f9a3ee12f9a3e_e22f9a3ee32f9a3e
4: 051: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: e42f9a3ee52f9a3e_e62f9a3ee72f9a3e
3: 052: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: e82f9a3ee92f9a3e_ea2f9a3eeb2f9a3e
2: 053: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: ec2f9a3eed2f9a3e_ee2f9a3eeef2f9a3e
1: 054: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: f02f9a3ef12f9a3e_f22f9a3ef32f9a3e
0: 055: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: f42f9a3ef52f9a3e_f62f9a3ef72f9a3e
9: 056: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: f82f9a3ef92f9a3e_fa2f9a3efb2f9a3e
8: 057: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: fc2f9a3efd2f9a3e_fe2f9a3eff2f9a3e
7: 058: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 00309a3e01309a3e_02309a3e03309a3e
6: 059: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 04309a3e05309a3e_06309a3e07309a3e
5: 05A: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 08309a3e09309a3e_0A309a3e0B309a3e
4: 05B: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 0C309a3e0D309a3e_0E309a3e0F309a3e
3: 05C: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 10309a3e11309a3e_12309a3e13309a3e
2: 05D: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 14309a3e15309a3e_16309a3e17309a3e
1: 05E: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 18309a3e19309a3e_1A309a3e1B309a3e
0: 05F: 005] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 1C309a3e1D309a3e_1E309a3e1F309a3e
9: 060: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 20309a3e21309a3e_22309a3e23309a3e
8: 061: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 24309a3e25309a3e_26309a3e27309a3e
7: 062: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 28309a3e29309a3e_2A309a3e2B309a3e
6: 063: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 2C309a3e2D309a3e_2E309a3e2F309a3e
5: 064: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 30309a3e31309a3e_32309a3e33309a3e
4: 065: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 34309a3e35309a3e_36309a3e37309a3e
3: 066: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 38309a3e39309a3e_3A309a3e3B309a3e
2: 067: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 3C309a3e3D309a3e_3E309a3e3F309a3e
1: 068: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 40309a3e41309a3e_42309a3e43309a3e
0: 069: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 44309a3e45309a3e_46309a3e47309a3e
9: 06A: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 48309a3e49309a3e_4A309a3e4B309a3e
8: 06B: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 4C309a3e4D309a3e_4E309a3e4F309a3e
7: 06C: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 50309a3e51309a3e_52309a3e53309a3e
6: 06D: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 54309a3e55309a3e_56309a3e57309a3e
5: 06E: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 58309a3e59309a3e_5A309a3e5B309a3e
4: 06F: 006] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 5C309a3e5D309a3e_5E309a3e5F309a3e
3: 070: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 60309a3e61309a3e_62309a3e63309a3e
2: 071: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 64309a3e65309a3e_66309a3e67309a3e
1: 072: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 68309a3e69309a3e_6A309a3e6B309a3e
0: 073: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 6C309a3e6D309a3e_6E309a3e6F309a3e
9: 074: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 70309a3e71309a3e_72309a3e73309a3e
8: 075: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 74309a3e75309a3e_76309a3e77309a3e
7: 076: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 78309a3e79309a3e_7A309a3e7B309a3e
6: 077: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 7C309a3e7D309a3e_7E309a3e7F309a3e
5: 078: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 80309a3e81309a3e_82309a3e83309a3e
4: 079: 007] Rep: 000001 PCSerr: FCS: InFrame: F XLGMII: Ctl: 0000000000000000 Dat: 84309a3e85309a3e_86309a3e87309a3e
```



# Investigating a corrupt FCS

5:046:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:1111111111111111	Dat:0707070707070707_0707070707070707	1111111111111111
4:047:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:1000000000000000	Dat:fb55555555555555ds_00af2002010000af	S-----
3:048:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:2002020000000000_c22f9a3e32f9a3e	
2:049:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
1:04a:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
0:04b:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
9:04c:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
8:04d:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
7:04e:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
6:04f:004]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
5:050:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
4:051:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
3:052:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
2:053:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
1:054:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:f02f9a3ef12f9a3ef22f9a3ef32f9a3e	
0:055:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:f42f9a3ef52f9a3ef62f9a3ef72f9a3e	
9:056:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:f82f9a3ef92f9a3efaf2f9a3efb2f9a3e	
8:057:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:fc2f9a3efd2f9a3efe2f9a3eff2f9a3e	
7:058:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:00309a3e01309a3e02309a3e03309a3e	
6:059:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:04309a3e05309a3e06309a3e07309a3e	
5:05a:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
4:05b:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
3:05c:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
2:05d:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
1:05e:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
0:05f:005]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
9:060:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
8:061:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
7:062:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
6:063:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
5:064:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
4:065:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
3:066:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
2:067:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
1:068:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
0:069:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
9:06a:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000		
8:06b:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:50309a3e51309a3e52309a3e53309a3e	
7:06c:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:54309a3e55309a3e56309a3e57309a3e	
6:06d:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:58309a3e59309a3e5a309a3e5b309a3e	
5:06e:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:5c309a3e5d309a3e5e309a3e5f309a3e	
4:06f:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:60309a3e61309a3e62309a3e63309a3e	
3:070:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:64309a3e65309a3e66309a3e67309a3e	
2:071:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:68309a3e69309a3e6a309a3e6b309a3e	
1:072:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:6c309a3e6d309a3e6e309a3e6f309a3e	
0:073:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:70309a3e71309a3e72309a3e73309a3e	
9:074:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:74309a3e75309a3e76309a3e77309a3e	
8:075:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:78309a3e79309a3e7a309a3e7b309a3e	
7:076:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:7c309a3e7d309a3e7e309a3e7f309a3e	
6:077:006]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:80309a3e81309a3e82309a3e83309a3e	
5:078:007]	Rep:000001	PCSErr:	FCS:	InFrame:	XLGMII:	Ctl:0000000000000000	Dat:84309a3e85309a3e86309a3e87309a3e	

Expected: 0x9a3e  
Captured: 0x9a2e  
One bit flipped 1->0

Expected: 0x9a3e  
Captured: 0xda3e  
One bit flipped 0->1



# Hunting the Packet of Death

0055:140:014	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:7e58ac8f8758ac8f_8058ac8f88158ac8f	
054:140:014	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:8258ac8f88358ac8f_8458ac8f8858ac8f	
053:140:014	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:8658ac8f88758ac8f_8858ac8f88958ac8f	
052:140:014	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:8a58ac8f88b58ac8f_8c58ac8f88d58ac8f	
051:147:014	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:8e58ac8f88f58ac8f_9058ac8f89158ac8f	
050:150:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:9258ac8f89358ac8f_9458ac8f8958ac8f	
049:151:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:9658ac8f89758ac8f_9858ac8f89958ac8f	
048:152:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:9a58ac8f89b58ac8f_9c58ac8f89d58ac8f	
047:153:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:9e58ac8f89f58ac8f_a058ac8f8a158ac8f	
046:154:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:a258ac8f8a358ac8f_a458ac8f8a558ac8f	
045:155:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:a658ac8f8a758ac8f_a858ac8f8a958ac8f	
044:156:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:aa58ac8f8ab58ac8f_ac58ac8f8ad58ac8f	
043:157:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:ae58ac8f8af58ac8f_b058ac8f8b158ac8f	
042:158:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:b258ac8f8b358ac8f_b458ac8f8b558ac8f	
041:159:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:b658ac8f8b758ac8f_b858ac8f8b958ac8f	
040:15a:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:ba58ac8f8bb58ac8f_bc58ac8f8bd58ac8f	
039:15b:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:be58ac8f8bf58ac8f_c058ac8f8c158ac8f	
038:15c:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:c258ac8f8c358ac8f_c458ac8f8c558ac8f	
037:15d:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:c658ac8f8c758ac8f_c858ac8f8c958ac8f	
036:15e:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:ca58ac8f8cb58ac8f_cc58ac8f8cd58ac8f	
035:15f:015	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:ce58ac8f8cf58ac8f_d058ac8f8d158ac8f	
034:160:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:d258ac8f8d358ac8f_d458ac8f8d558ac8f	
033:161:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:d658ac8f8d758ac8f_d858ac8f8d958ac8f	
032:162:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:da58ac8f8db58ac8f_dc58ac8f8dd58ac8f	
031:163:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:de58ac8f8df58ac8f_e058ac8f8e158ac8f	
030:164:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:e258ac8f8e358ac8f_e458ac8f8e558ac8f	
029:165:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:e658ac8f8e758ac8f_e858ac8f8e958ac8f	
028:166:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:ea58ac8f8eb58ac8f_ec58ac8f8ed58ac8f	
027:167:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:ee58ac8f8ef58ac8f_f058ac8f8f158ac8f	
026:168:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:f258ac8f8f358ac8f_f458ac8f8f558ac8f	
025:169:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:f658ac8f8f758ac8f_f858ac8f8f958ac8f	
024:16a:016	Rep:000001	PCSErr:	FCS:	InFrame:F	XLGWI:	Ct1:0000000000000000	Dat:fa58ac8f8fb58ac8f_fc58ac8f8fd58ac8f	



# Hunting the Packet of Death

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[027:167:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:ee58acf8ef58acf8_f058acf8f158acf8 : -----
[026:168:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:f258acf8f358acf8_f458acf8f558acf8 : -----
[025:169:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:f658acf8f758acf8_f858acf8f958acf8 : -----
[024:16a:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:fA58acf8fb58acf8_fc58acf8fd58acf8 : -----
[023:16b:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:8b6ee8016620adbd_01b9574121d6931e : -----
[022:16c:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000111110000000 Dat:f98d7374fd070707_fb555555555555d5 : ----Tiiis-----
[021:16d:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:270800ca280800ca_290800ca0039d9b7 : -----
[020:16e:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:f06620adbd01b957_4101d6930ea332f6 : -----
[019:16f:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:fefefefefefefefefefef_fd07070707070707 : EEEEEEEETiiiiiii
[018:170:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:fb555555555555d5_00af2002010000af : S-----
[017:171:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:2002020000000000_8c57acf88d57acf8 : -----
[016:172:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:9257acf89357acf8_9457acf89557acf8 : -----
[015:173:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:9657acf89757acf8_9857acf89957acf8 : -----
[014:174:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:9a57acf89b57acf8_9c57acf89d57acf8 : -----
[013:175:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:9e57acf89f57acf8_a057acf8a157acf8 : -----
[012:176:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:a257acf8a357acf8_a457acf8a557acf8 : -----
[011:177:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:a657acf8a757acf8_a857acf8a957acf8 : -----
[010:178:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:aa57acf8ab57acf8_ac57acf8ad57acf8 : -----
[009:179:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:ae57acf8af57acf8_b057acf8b157acf8 : -----
[008:17a:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:f98d7374fd070707_fb555555555555d5 : ----Tiiis-----
[007:17b:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:00af2003010000af_2003020000000000 : -----
[006:17c:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:1f0800ca200800ca_210800ca220800ca : -----
[005:17d:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:230800ca240800ca_250800ca260800ca : -----

```

FCS:  
FCS:X  
FCS:

```

[027:167:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000111110000000 Dat:f98d7374fd070707_fb555555555555d5 : ----Tiiis-----
[021:16d:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:00af2003010000af_2003020000000000 : -----
[020:16e:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:1f0800ca200800ca_210800ca220800ca : -----
[019:16f:016] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:230800ca240800ca_250800ca260800ca : -----
[018:170:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:f06620adbd01b957_4101d6930ea332f6 : -----
[017:171:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:fefefefefefefefefefef : EEEEEEEETiiiiiii
[016:172:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:1111111110000000 Dat:fb555555555555d5_00af2002010000af : S-----
[015:173:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:2002020000000000_8c57acf88d57acf8 : -----
[014:174:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:8e57acf88f57acf8_9057acf89157acf8 : -----
[013:175:017] Rep:000001 PCSerr: FCS: InFrame:F XLGMII: Ct1:0000000000000000 Dat:ae57acf8af57acf8_b057acf8b157acf8 : -----

```



# Hunting the Packet of Death

## 48.2.4 Ordered\_sets and special code-groups

10GBASE-X PCS ordered\_sets consist of combinations of special and data code-groups (defined as a column of code-groups). All ordered\_sets are four code-groups in length and begin in lane 0. In addition to ordered\_sets, the PCS defines several special code-groups for control purposes. Ordered\_sets and special code-groups provide the following capabilities:

- a) PCS Synchronization process ability to obtain bit and code-group synchronization
- b) Packet delineation
- c) Synchronization between the transmitter and receiver circuits at opposite ends of a link
- d) Deskew of received code-groups from all serial lanes to an alignment pattern
- e) Clock rate compensation protocol
- f) Link status reporting protocol
- g) Column fill
- h) Error indication

Table 48–4 lists the defined ordered\_sets and special code-groups.

**Table 48–2—XGMII character to PCS code-group mapping**

XGMII TXC	XGMII TXD	PCS code-group	Description
0	00 through FF	Dxx.y	Normal data transmission
1	07	K28.0 or K28.3 or K28.5	Idle in [I]
1	07	K28.5	Idle in [T]
1	9C	K28.4	Sequence
1	FB	K27.7	Start
1	FD	K29.7	Terminate
1	FE	K30.7	Error
1	Other value in Table 36-2	See Table 36-2	Reserved XGMII character
1	Any other value	K30.7	Invalid XGMII character

NOTE—Values in TXD column are in hexadecimal.

171:0d:00f:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:200301000000000000	f30700caf40700ca	
170:0d8:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:f50700caf40700ca	f700700caf80700ca	
169:0d9:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:f90700caf40700ca	fbb0700caf80700ca	
168:0da:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:f0d700ca0a427c8	fde620adbd01b956	
167:0db:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000111111	Date:2c01de930d400301	fa4d070707070707	T1111111
166:0dc:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:f055555555555555	00af2003020000af	S-----
165:0dd:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:200302000000000000	f30700caf40700ca	
164:0de:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:f50700caf40700ca	f700700caf80700ca	
163:0df:00d	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:f90700caf40700ca	fbb0700caf80700ca	
162:0e0:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:f0d700ca00f4305	da620adbd01b956	
159:0e2:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:200302000000000000	f30700caf40700ca	
160:0e2:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:100000000000000000	Date:f055555555555555	00af2003020000af	S-----
159:0e3:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:200302000000000000	f0700caffa0700ca	
158:0e4:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:000800ca010800ca	020800ca030800ca	
157:0e5:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:040800ca050800ca	060800ca070800ca	
156:0e6:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:080800ca0653620	08620adbd01b956	
155:0e7:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:721dd6930104111111	734d070707070707	T1111111
154:0e8:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:100000000000000000	Date:f055555555555555	00af2003020000af	S-----
153:0e9:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:200301000000000000	f0700caffa0700ca	
152:0ea:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:000800ca010800ca	020800ca030800ca	
151:0eb:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:040800ca050800ca	060800ca070800ca	
150:0ec:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:080800ca003d52ed	c26620adbd01b956	
149:0ed:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:702dd6930104111111	734d070707070707	T1111111
148:0ee:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:100000000000000000	Date:f055555555555555	00af2003020000af	S-----
147:0ef:00e	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:200301000000000000	090800ca0a0800ca	
146:0fo:00f	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:0b0800ca0c0800ca	0d0800ca0e0800ca	
145:0f1:00f	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000000000	Date:0f0800ca010800ca	110800ca120800ca	
144:0f2:00f	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:100000000000000000	Date:130800ca044ed3b2	36620adbd01b956	
143:0f3:000001	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:000000000000111111	Date:2b01de930d400301	fa4d070707070707	T1111111
142:0f4:00f	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLGMI:	Ct1:100000000000000000	Date:f055555555555555	00af2003020000af	S-----
141:0f5:00f	Rep:000001	PCSErr:	FCFS:	InFrame:F	XLG				



[illegible]



[illegible]



[illegible]

# Hunting the Packet of Death

```
[026:168:016] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:f258acf8f558acf8_f458acf8f558acf8 :
[025:169:016] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:f658acf8f758acf8_f858acf8f958acf8 :
[024:16a:016] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:fa58acf8fb58acf8_fc58acf8fd58acf8 :
[023:16b:016] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:8b6ee8016620adbd_01b9574121d6931e :
[022:16c:016] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:000011111100000000 Dat:f98d7374fd070707_fb555555555555d5 : -Tiiii-
[021:16d:016] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:00af2003010000af_2003020000000000 :
[020:16e:016] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:1f0800ca200800ca_210800ca220800ca :
[019:16f:016] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:230800ca240800ca_250800ca260800ca :
[018:170:017] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:270800ca280800ca_290800ca0039d9b7 :
[017:171:017] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:f06620adbd01b957_4101d6930ea332f6 :
[016:172:017] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:1111111111111111 Dat:fefefefefefefefe_fd07070707070707 : EEEEEETiiiiiii
[015:173:017] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:1000000000000000 Dat:fb555555555555d5_00af2002010000af : S-----
[014:174:017] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:2002020000000000_8c57acf88d57acf8 :
[013:175:017] Rep:000001 PCSErr: FCS: InFrame:F XLGMII: Ctl:0000000000000000 Dat:8e57acf88f57acf8_9057acf89157acf8 :
```



# No ~~PCAP~~-L1 Trace, No Comment

Our company motto applies at the Layer 1 Level also!



**Stickers Available!**

```
State
  bram_index      : 0
  enable          : 0
  trigger         : 1
  zerodata        : 0
  trigger_disable : 0

  trigger_run     : 0
  trigger_over    : 0
  trigger_fcseerr : 0
  trigger_sanitze : 0
  trigger_framerr : 0
  trigger_pcseerr : 0
  trigger_pcsother : 0
  trigger_pcscsop : 0
  trigger_pcscsop_err : 0
  trigger_pcseop  : 1
  trigger_back2back : 0
  trigger_debug   : 0

  trigger_enb_run : 0
  trigger_enb_over : 0
  trigger_enb_fcseerr : 0
  trigger_enb_sanitze : 0
  trigger_enb_framerr : 0
  trigger_enb_pcseerr : 0
  trigger_enb_pcsother : 0
  trigger_enb_pcscsop : 0
  trigger_enb_pcscsop_err : 0
  trigger_enb_pcseop  : 1
  trigger_enb_back2back : 0
  trigger_enb_debug   : 0
```

```

XLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
XLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
XLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
XLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
XLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
XLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
XLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
XLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
VLGMII: Ctl:11111111_11111111 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 1 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 1 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 0 Dat:0022222222220066_6666666600000000 : 11111111EEEEEEEE
          : 0 Dat:000000ca010000ca_020000ca030000ca : -----
          : 0 Dat:040000ca050000ca_060000ca070000ca : -----
          : 0 Dat:080000ca090000ca_0a0000caf4ab0879 : -----
e         : 0 Dat:fd07070707070707_0707070707070707 : Tiiiiiiiiiiiiiii
          : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
r         : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
err        : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
          : 1 Dat:fefefefefefefefefe_0022222222220066 : EEEEEEEE-----
ck         : 0 Dat:6666666600000000_0b0000ca0c0000ca : -----
          : 0 Dat:0d0000ca0e0000ca_0f0000ca100000ca : -----
          : 0 Dat:110000ca120000ca_130000ca140000ca : -----
t         : 0 Dat:150000ca187ac87_fd07070707070707 : -----Tiiiiiii
r         : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
err        : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
itize     : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111
merr      : 0 Dat:0707070707070707_0707070707070707 : 1111111111111111

```



# Forget the SOP?

Table 48-2—XGMII character to PCS code-group mapping

XGMII TXC	XGMII TXD	PCS code-group	Description
0	00 through FF	Dxx.y	Normal data transmission
1	07	K28.0 or K28.3 or K28.5	Idle in   I
1	07	K28.5	Idle in   T
1	9C	K28.4	Sequence
1	FB	K27.7	Start
1	FD	K29.7	Terminate
1	FE	K30.7	Error
1	Other value in Table 36-2	See Table 36-2	Reserved XGMII character
1	Any other value	K30.7	Invalid XGMII character

NOTE—Values in TXD column are in hexadecimal.

# Triggers

**trigger\_runt** - Trigger when a runt / under 64B packet is received.

**trigger\_over** - Trigger when an oversized / greater than 9KB JUMBO frame is received. This also doubles as missing EOP/EOF trigger.

**trigger\_sanitiz** - Trigger when the sanitizer finds some unknown condition. e.g. misaligned SOF/EOP/Control bits.

**trigger\_frame** - Trigger when a frame is unable to be detected. missing SOP or EOP.

**trigger\_pcserr** - Trigger when PCS Control Word 0xFE is seen anywhere in the layer 1 stream.

**trigger\_pcsot** - Trigger when a PCS Control Word other than 0xFE(Err), 0xFB(Start), 0xFD(Terminate) is seen.

**trigger\_pcssop** - Trigger when a SOP/SOF is received.

**trigger\_pcssop err** - Trigger when a SOP is received in an invalid byte lane.

**trigger\_pcseop** - Trigger when an EOP is received.



# No more finger pointing!





10G 40G 100G PACKET CAPTURE

More examples:

**[www.fmad.io](http://www.fmad.io)**

<https://www.fmad.io/blog/layer1-packet-capture-debug>

**Check FMADIO on your card to find out more!**