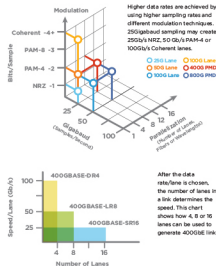


EMERGING INTERFACES AND NOMENCLATURE

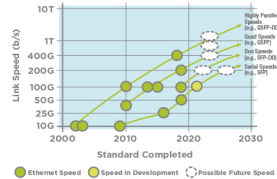
| | Emerging Interface | Interface | Transceiver Cable Code | Transceiver Pin (T/P) | Transceiver Pin (R/P) | PHY | SD-LAN | 2x SFP | Small SFP | Other SFP | SD-SFP |
|-----------|---|-----------|------------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-----------|--------|
| 10GBASE- | | TSR | | TSR7L | | | | | | | |
| 10GBASE- | | | | TT | T | | | | | | |
| 100GBASE- | | | | TT | T | | | | | | |
| 25GBASE- | | KR | | TR7 | T | | | | | | |
| 10GBASE- | | KR | | TR7 | T | | | | | | |
| 10GBASE- | | | | TR7 | T | | | | | | |
| 25GBASE- | 25GAUI | KR | CR/CR-S | | T | SR | | LR | ER | | |
| 40GBASE- | 40GAUI | KR4 | CR4 | | T | SR4/SR4 | FR4 | LR4 | ER4 | | |
| 50GBASE- | 50GAUI-0 50GAUI-1 | KR | CR | | T | SR | | FR | LR | ER | |
| 100GBASE- | CAUI-70 CAUI-700GAUI-4 100GAUI-2 100GAUI-1 | KR4 | CR4 | | T | SR4 SR4 SR4 | FR4 FR4 FR4 | LR4 LR4 LR4 | ER4 ER4 ER4 | ? | ? |
| 200GBASE- | 200GAUI-4 200GAUI-2 | KR4 | CR4 | | T | SR4 | FR4 | LR4 | ER4 | ? | ? |
| 400GBASE- | 400GAUI-8 400GAUI-4 | KR4 | CR4 | | T | SR4 | FR4 | LR4 | ER4 | ? | ? |

Gray Text = IEEE Standard Red Text = In Standardization Green Text = In Study Group
Blue Text = Non-IEEE standard but complies to IEEE electrical interfaces

HOW TO GO FASTER

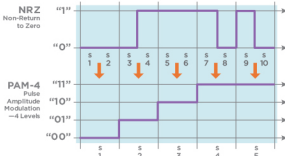


TO TERABIT SPEEDS



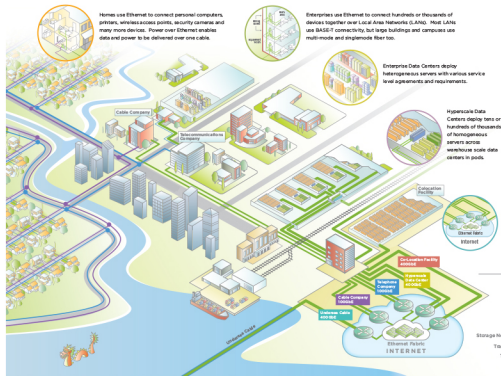
SIGNALING METHODS

Most high-speed Ethernet signaling has been Non-Return to Zero (NRZ), but Pulse Amplitude Modulation 4-Level (PAM-4) signaling delivers twice as many bits per pulse.



ETHERNET ECOSYSTEM

As streams turn into rivers and flow into the ocean, small Ethernet links flow into large Ethernet links and flow into the internet. The internet is formed at Internet Exchange Points (IXPs) that are spread around the world. The IXPs connect Telecommunications Companies, Cable companies, Providers and Content Delivery Networks over Ethernet in their data centers.



FORM FACTORS

This diagram shows the most common form factors used in Ethernet ports. Hundreds of millions of RJ45 ports are sold a year while tens of millions of SFP and millions of GPFF modules ship a year.

This diagram shows new form factors initially designed for 100GbE and 400GbE Ethernet ports. All have 4 or 8 lanes and the OBO has up to 16 lanes. The power consumption of the modules is proportional to the surface area of the module.

1-4 Lane Interfaces



8-16 Lane Interfaces

