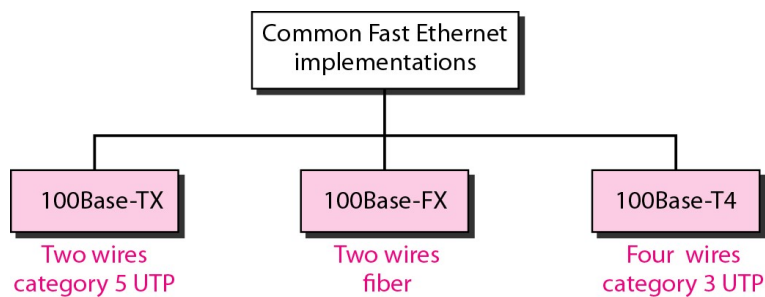


## **Fast Ethernet:**

Fast Ethernet was designed to compete with LAN protocols such as FDDI or Fiber Channel. IEEE created Fast Ethernet under the name 802.3u. Fast Ethernet is backward-compatible with Standard Ethernet, but it can transmit data 10 times faster at a rate of **100 Mbps**. The common implementations of Fast Ethernet are:

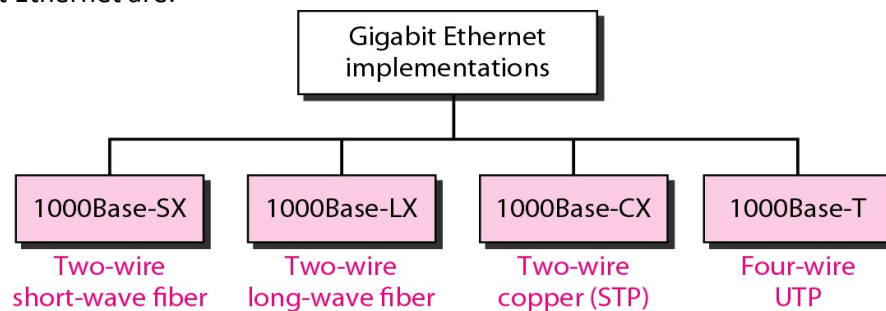


## **Summary of Fast Ethernet implementations:**

<i>Characteristics</i>	<i>100Base-TX</i>	<i>100Base-FX</i>	<i>100Base-T4</i>
Media	Cat 5 UTP or STP	Fiber	Cat 4 UTP
Number of wires	2	2	4
Maximum length	100 m	100 m	100 m
Block encoding	4B/5B	4B/5B	
Line encoding	MLT-3	NRZ-I	8B/6T

## **Gigabit Ethernet:**

The need for an even higher data rate resulted in the design of the Gigabit Ethernet protocol (**1000 Mbps**). The IEEE committee calls the standard 802.3z. The common implementations of Gigabit Ethernet are:



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## **Summary of Gigabit Ethernet implementations:**

<i>Characteristics</i>	<i>1000Base-SX</i>	<i>1000Base-LX</i>	<i>1000Base-CX</i>	<i>1000Base-T</i>
Media	Fiber short-wave	Fiber long-wave	STP	Cat 5 UTP
Number of wires	2	2	2	4
Maximum length	550 m	5000 m	25 m	100 m
Block encoding	8B/10B	8B/10B	8B/10B	
Line encoding	NRZ	NRZ	NRZ	4D-PAM5

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## **Ten-Gigabit Ethernet:**

The IEEE committee created Ten-Gigabit Ethernet and called it Standard 802.3ae. It upgrades the data rate to **10 Gbps** and makes it compatible with Standard, Fast, and Gigabit Ethernet. The goals of the Ten-Gigabit Ethernet design can be summarized as follows:

## **Summary of Ten-Gigabit Ethernet implementations:**

<i>Characteristics</i>	<i>10GBase-S</i>	<i>10GBase-L</i>	<i>10GBase-E</i>
Media	Short-wave 850-nm multimode	Long-wave 1310-nm single mode	Extended 1550-nm single mode
Maximum length	300 m	10 km	40 km

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## **Exercises:**

- A. What are the common Fast Ethernet implementations?
- B. Compare and contrast Fast Ethernet and Gigabit Ethernet?