

COMPUTER SCIENCE

Basic Networking Concepts

Continuation

Types of Networks There are two principle kinds of networks: Wide Area Networks (WANs) and Local Area Networks (LANs). WANs -Cover cities, countries, and continents. -Based on packet switching technology -Examples of WAN technology: Asynchronous Transfer Mode (ATM), Integrated Services Digital Network (ISDN) LANs -Cover buildings or a set of closely related buildings. -Examples of LAN technology: Ethernet, Token Ring, and Fibber Distributed Data Interconnect (FDDI). Ethernet LANs: based on a bus topology and broadcast communication Token ring LANs: based on ring topology FDDI LANs: use optical fibbers and an improved token ring mechanism based on two rings flowing in opposite directions. 7 Shared bus (a) Ethernet LAN Ring (b) Token Ring LAN Dual ring (c) FDDI LAN 8 Network connectivity type Speed Transmission time

for 10 Mbytes (Telephone) dial-up modem 14.4 Kbps 90 min ISDN
modem 56/128 Kbps 45/12min T1 connection 1.54 Mbps 50s Ethernet
10 Mbps 9s Token ring 4/16 Mbps Fast Ethernet 100 Mbps FDDI 100
Mbps Gigabit Ethernet 1 Gbps ATM 25Mbps/2.4Gbps 9 Interconnection -
Networks of low capacity may be connected together via a backbone
network which is a network of high capacity such as a FDDI network, a
WAN network etc. -LANs and WANs can be interconnected via T1 or T3
digital leased lines -According to the protocols involved, networks
interconnection is achieved using one or several of the following
devices: → Bridge: a computer or device that links two similar LANs
based on the same protocol. → Router: a communication computer
that connects different types of networks using different protocols. →
B-router or Bridge/Router: a single device that combines both the
functions of bridge and router. → Gateway: a network device that
connects two different systems, using direct and systematic translation
between protocols. 10 Toronto branch Ethernet LAN Router Vancouver
branch Token Ring LAN Gateway Frame Relay ATM T1 line NY

headquarters Bridge/Route Token Ring LAN Router Bridge Bridge/Router

Ethernet 11 Network Topology Diagram The specification of the

network topology diagram requires the definition of the characteristics

and entities underlying the network: -Geographical locations of the

different components or subnets involved in the network. -Description

of the LAN topology -Description of the WAN topology -Description of

the network connectors such as routers, bridges, repeaters, and

gateways.