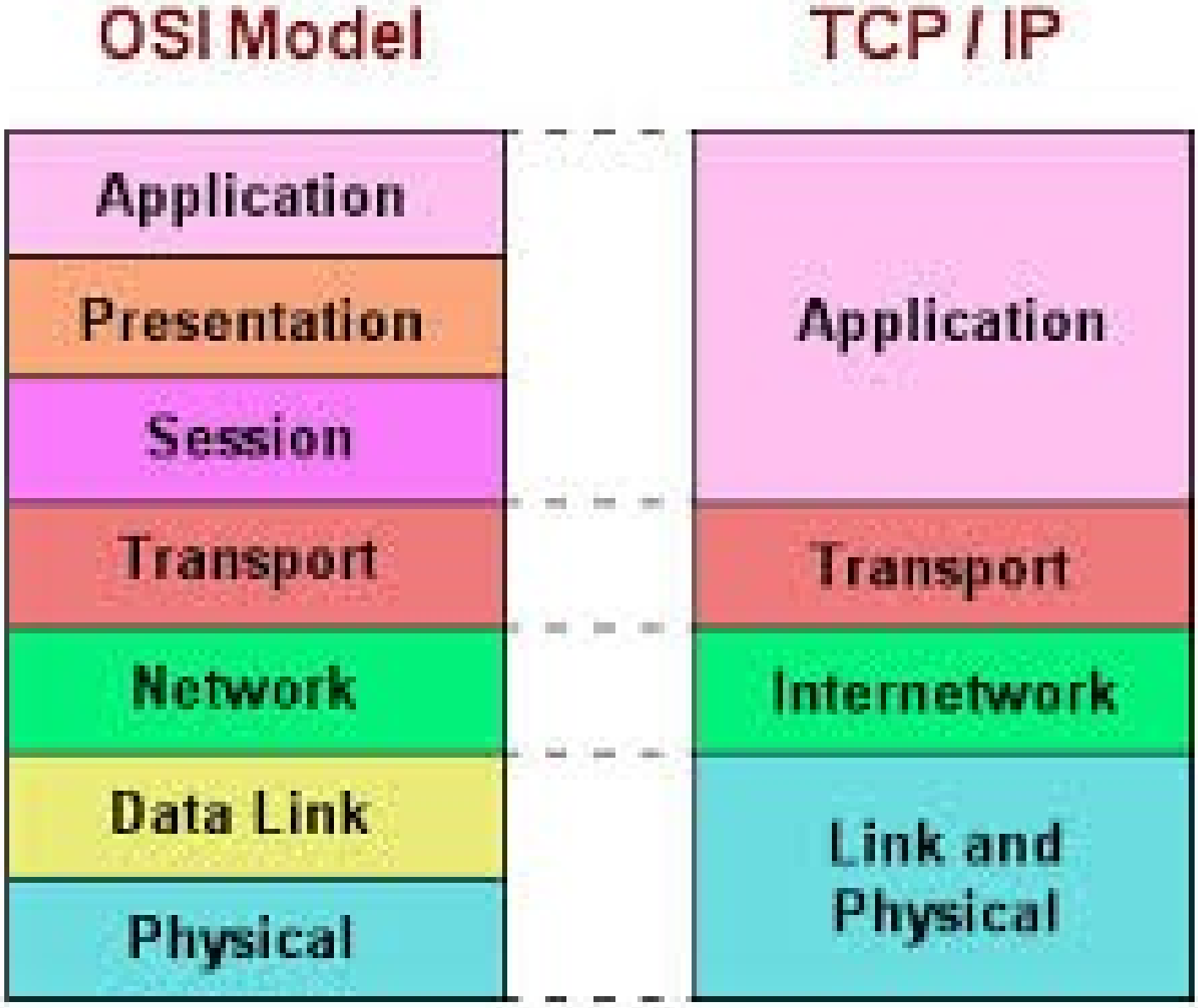
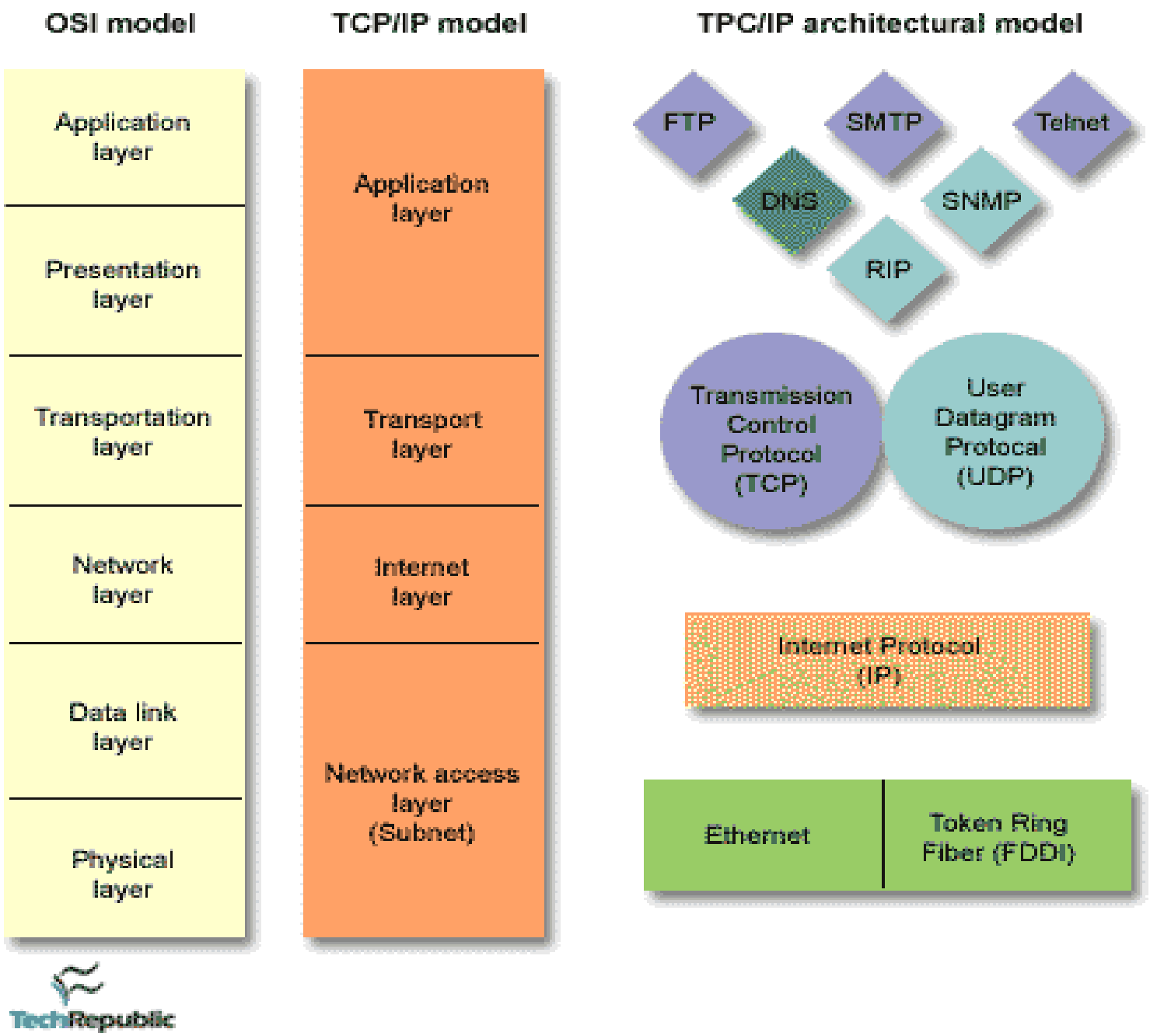

TCP/IP

Introduction TCP/IP

- The **Internet Protocol Suite** (commonly known as **TCP/IP**) is the set of communications protocols used for the Internet and other similar networks.
- It is named from two of the most important protocols in it:
  - the Transmission Control Protocol (TCP) and
  - the Internet Protocol (IP), which were the first two networking protocols defined in this standard.


OSI Model
TCP / IP
Application
Presentation
Session
Transport
Network
Data Link
Physical
Application
Transport
Internetwork
Link and Physical

Layer	Function
Application Services	Email (SMTP), network management (SNMP), WWW (HTTP), and other services
Transport	End-to-end message integrity (UDP, TCP) and error recovery (TCP)
Internet	Connectionless, best-effort packet delivery (IP)
Network Interface	Almost any network technology

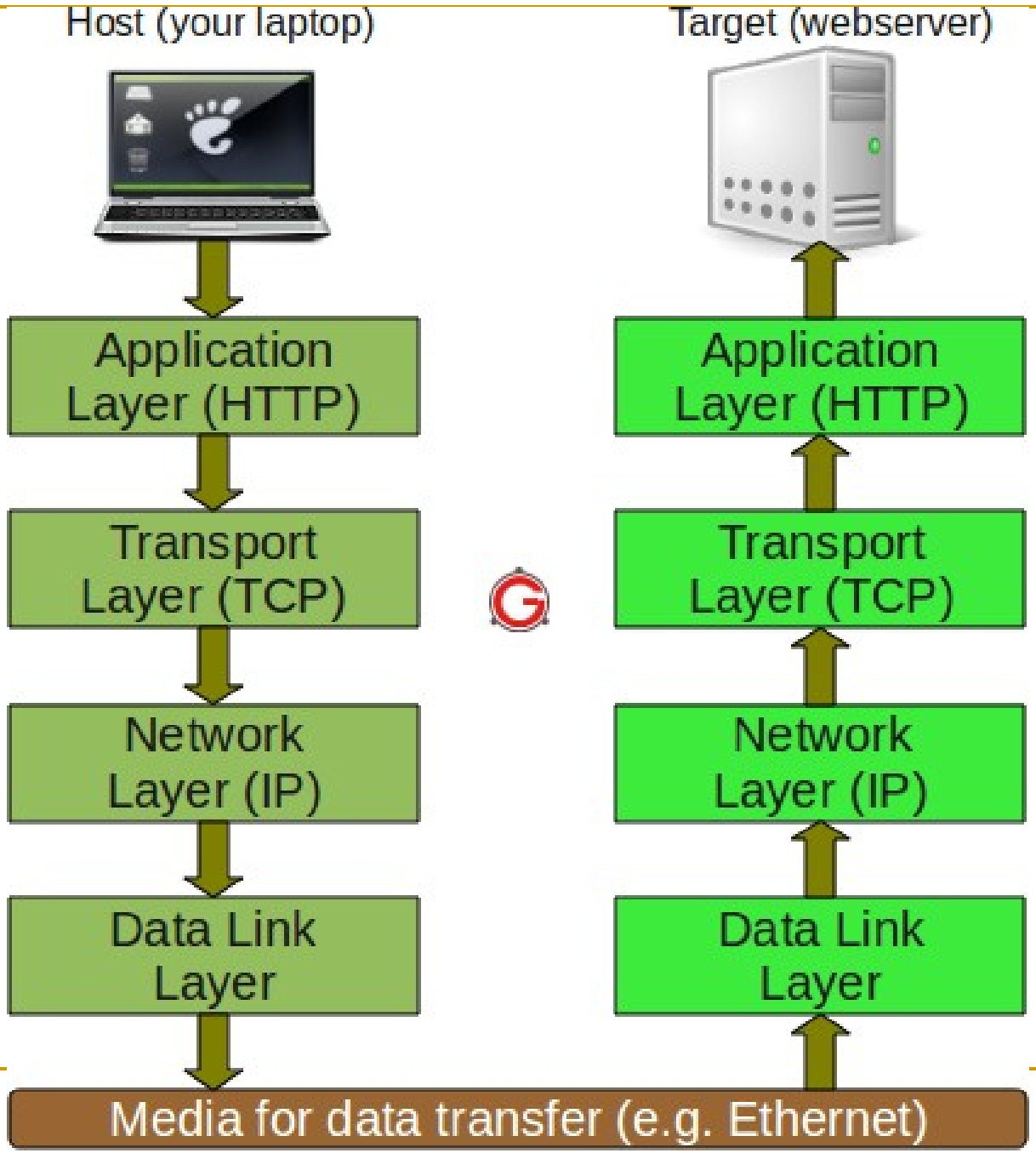

OSI model
TCP/IP model
TPC/IP architectural model
Application layer
Presentation layer
Transportation layer
Network layer
Data link layer
Physical layer
Application layer
Transport layer
Internet layer
Network access layer (Subnet)
FTP
SMTP
Telnet
DNS
SNMP
RIP
Transmission Control Protocol (TCP)
User Datagram Protocal (UDP)
Internet Protocol (IP)
Ethernet
Token Ring Fiber (FDDI)
TechRepublic

APPLICATION

- This layer is comparable to the application, presentation, and session layers of the OSI model all combined into one.
- It provides a way for applications to have access to networked services.
- This layer also contains the high level protocols. The main issue with this layer is the ability to use both TCP and UDP protocols.

- **For example** TFTP uses UDP because usually on a LAN the physical links are short enough to ensure quick and reliable packet delivery without many errors. SMTP instead uses TCP because of the error checking capabilities.
- Since we consider our email important information we would like to ensure a safe delivery.

- **UDP (User Datagram Protocol) -** offering a direct way to send and receive datagrams over an IP network with very few error recovery services.
- **TFTP (Trivial File Transfer Protocol) -** Simplified version of the FTP protocol which has no security features.


Host (your laptop)
Target (webserver)
Application Layer (HTTP)
Transport Layer (TCP)
Network Layer (IP)
Data Link Layer
Application Layer (HTTP)
Transport Layer (TCP)
Network Layer (IP)
Data Link Layer
Media for data transfer (e.g. Ethernet)

TRANSPORT

- This layer acts as the delivery service used by the application layer.
- Again the two protocols used are TCP and UDP.
- The choice is made based on the application's transmission reliability requirements.
- The transport layer also handles all error detection and recovery.

- It uses checksums, acknowledgements, and timeouts to control transmissions and end to end verification.
- Unlike the OSI model, TCP/IP treats reliability as an end-to-end problem

INTERNET

- This layer is also known as Internet layer. The main purpose of this layer is to organize or handle the movement of data on network.
- By movement of data, we generally mean routing of data over the network. The main protocol used at this layer is IP. While ICMP(used by popular ‘ping’ command) and IGMP are also used at this layer.

NETWORK

- This layer is also known as network interface layer
- This layer normally consists of device drivers in the OS and the network interface card attached to the system.
- Both the device drivers and the network interface card take care of the communication details with the media being used to transfer the data over the network.
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- In most of the cases, this media is in the form of cables.
- Some of the famous protocols that are used at this layer include ARP(Address resolution protocol), PPP(Point to point protocol) etc.


Thank You!