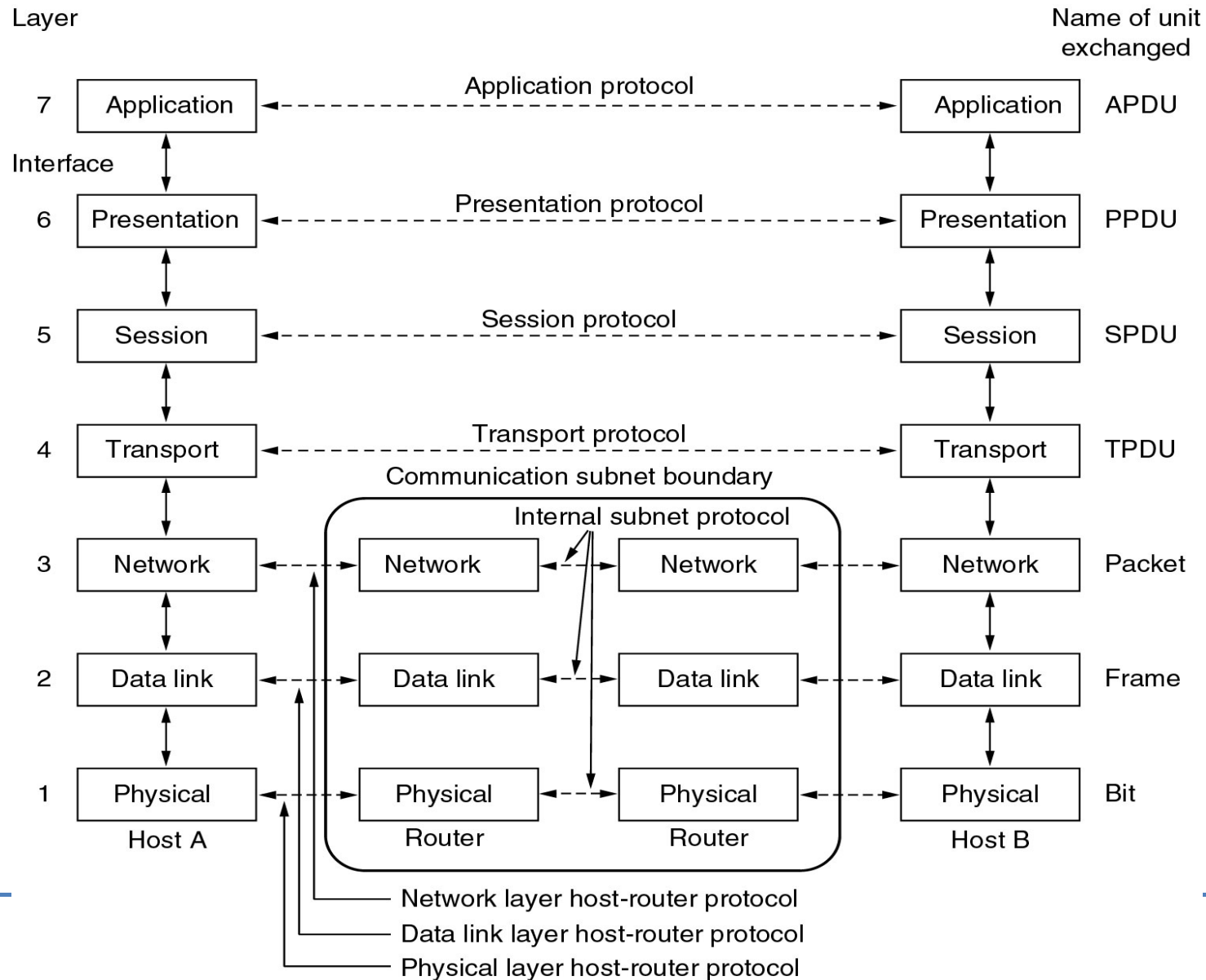

Other Layers

COMP90007
Internet Technologies

Remember the OSI Model



Two More Layers from the OSI Model

- Presentation Layer
- Session Layer
- They did not see a distinct use and labelling through out the years
- Do they not exist on todays Internet?

Presentation Layer

- Formatting related issues
- For example:
 - ❑ Given complex data, such as a data structure
 - ❑ You may want to serialize the data to send across
 - ❑ Create an XML representation for example
 - ❑ This should not be the duty of the application
 - ❑ But it is commonly done in applications today...

Presentation Layer Contd.

- Encryption/Decryption:
 - ❑ Should be done in Presentation Layer as well
 - ❑ Although it is commonly done at Application layer

- Compression:
 - ❑ We have discussed for example in Multimedia data that decompression can be done
 - ❑ It should be done at this layer rather than in applications

Why not have an Explicit Presentation Layer?

- Today's Internet does not have this clear distinction
 - A key reason is many Presentation layer list of things to do that we discussed is considered to be application specific
 - Thus, Application Layer and Presentation is mixed for today's Internet
-

How about the Session Layer?

- Common services of this layer
 - ❑ Authentication
 - ❑ Session management
 - Monitoring connections
 - Disconnect if not used
 - Reconnect if needed
 - ❑ These are also seen as a part of the Application layer duties depending on different requirements of applications of today's Internet
 - ❑ A few are done at Transport Layer (e.g., SCTP)
 - ❑ Especially session management in a simple client server architecture is trivial
-

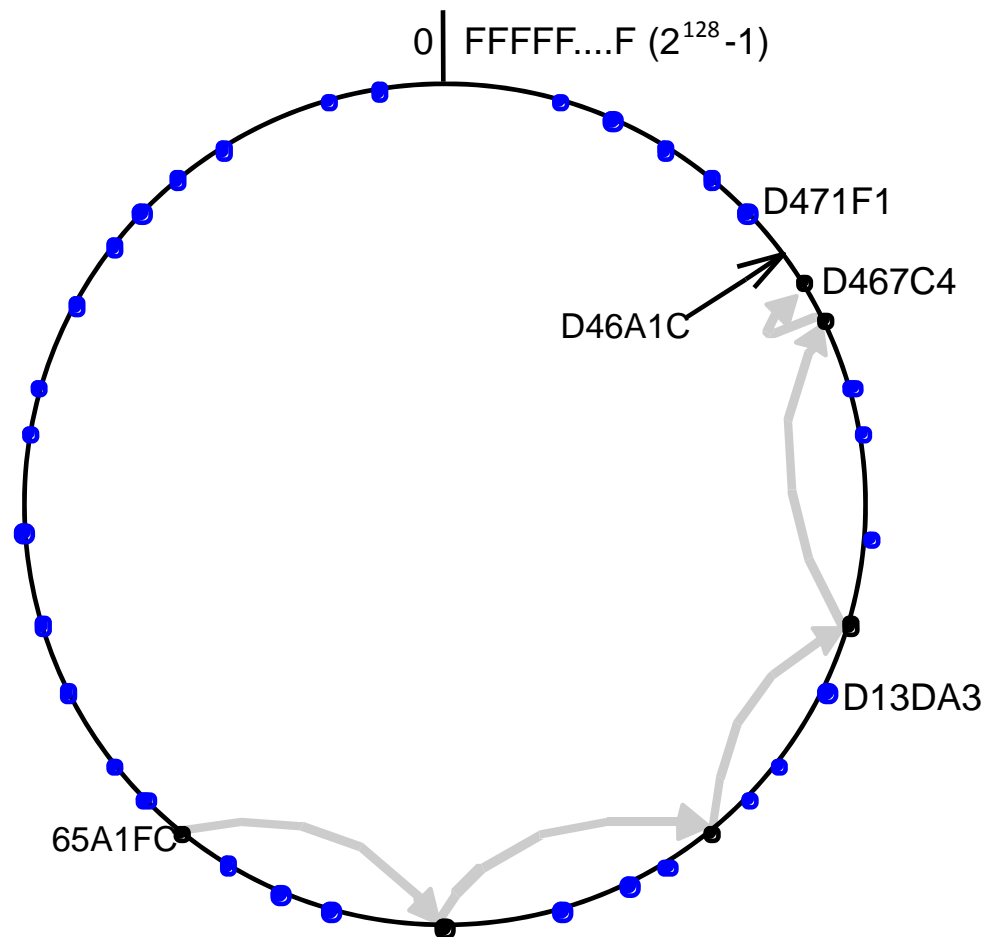
Advise for Practitioners

- If you have a need to do compression, session management, etc then think before implementing
- You should probably create a “better” software design by creating your own little Session Layer as a separate layer in your software architecture

Case Study

- Client server systems dominated the Internet
 - They are simple to implement
 - However other are more complex: **Peer-to-Peer (P2P) systems**
 - A P2P system:
 - Does not have clients and server but just peers
 - Does not have a central point of control
 - Advantages:
 - No central point of control or failure
 - Potential to scale without a bottleneck
 - Disadvantages:
 - **Harder to develop applications on a dynamic platform where PCs come and go**
 - ...
-

A “Simple” Way to Connect Peers

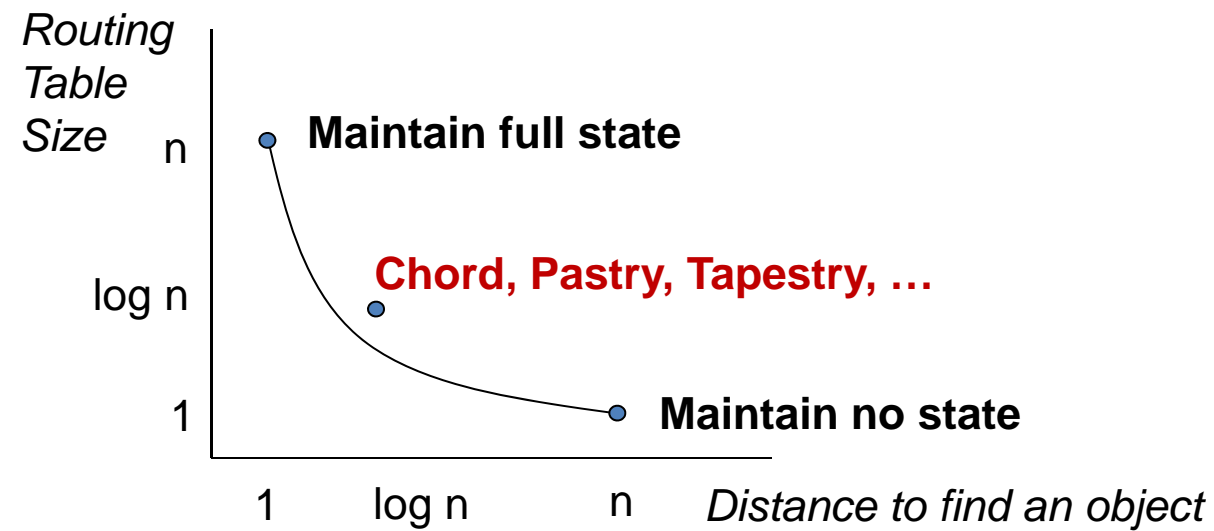


Not all peers can know about all others in a large system.

Thus: New methods are needed.

E.g.: The black dots depict live nodes. The blue ones are files. The address space is considered as circular: node 0 is adjacent to node ($2^{128}-1$). The diagram illustrates the routing from node 65A1FC to D46A1C. This happens at application layer where there is no other layer on top of TCP/IP

Scalability comparison



Advise: Build it as a separate layer

