

Recitation 8 — Encapsulation/Layering

Layering on the Internet

- The layers
 - applications (DNS, etc.)
 - transport (TCP, etc.)
 - networking (IP)
 - link layer (Ethernet and friends)
- Note the single protocol at the networking layer (IP). Means any device with an IP address can talk to another one with an IP address; we can connect all machines.
 - IP is often known as the “narrow-waist” of the “hourglass model of the Internet”

Encapsulation

- Encapsulation is how the layers are borne out in packets. Each supporting layer simply considers the whole packet of the layer above it to be its payload, completely encapsulating the higher layer packet inside a lower layer one.
 - Can separate “address” spaces
 - In many cases, error detection and possibly recovery are unique to each encapsulation, so there may be checksums for each layer, for example.

Value of layers

- Abstraction
- Diversity of options (e.g., different transport protocols)
- Separation of functionality
- Multiplexing: utilization of single flow/stream/etc. at a lower layer to support multiple “connections” or flows in an upper layer.