

- 1) What must an application layer protocol specify?
Types of message exchanged
Message Syntax (fields, structure)
Message Semantics (meaning)
Rules for message send & response (how, when)
- 2) Protocol interoperability allows multiple protocols to work together.
- 3) What are some applications which would have stringent *data integrity* requirements
File transfer, email, web services...
- 4) What are some applications which would have stringent *bandwidth* requirements
Video games, large databases, etc...
- 5) What are some applications which would have stringent *timing* requirements
Video games, VoIP, streaming video (any streaming service), etc...
- 6) What are some applications which would have stringent *security* requirements
Email, payment services, identity services, etc...
- 7) Application layer protocols must specify transport requirement by selecting a transport protocol from the transport layer.
 - a. Give an example of an application that uses TCP, and explain why it uses TCP.
(Many possible answers) Example:
File downloading. TCP provides reliable transfer, so we can be confident that every bit of the file will be transferred and received in the correct order.
 - b. Give an example of an application that uses UDP, and explain why it uses UDP.
(Many possible answers) Example:
Streaming video. This requires fast data transfer, because video requires large amounts of data. UDP is much faster than TCP, because it does not perform all of the validation that TCP performs. While it is possible that some data may be lost or corrupted, it usually does not produce enough “jitter” to affect the performance.
- 8) What are some services the TCP protocol does *not* provide
Timing, Bandwidth, (additional answers possible)