Higher Layer Protocols

- Session Layer
- Presentation Layer
- Application Layer
- The importance of standards

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Higher Layer Protocols

- The OSI reference model defines three layers above the transport:
  - Session layer
  - Presentation layer
  - Application layer
- Internet architecture makes no clear distinction between these layers

- Goal – support application needs:
  - Manage transport layer connections
  - Name and locate application-level resources
  - Negotiate data formats, and perform format conversion if needed
  - Present data in appropriate manner
  - Implement application-level semantics

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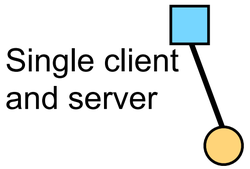
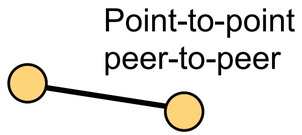
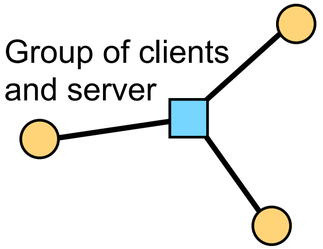
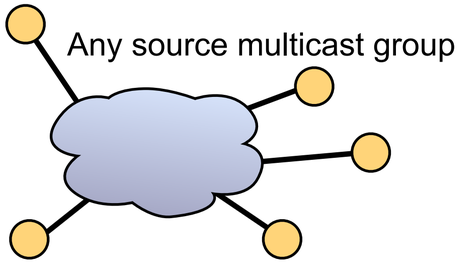
Session Layer: Managing Connections

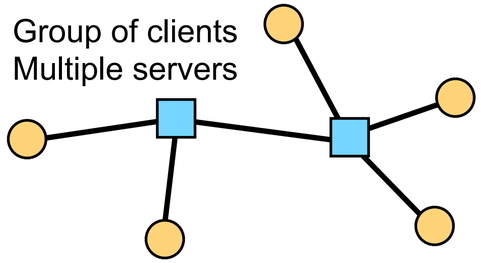
- What connections does the application need?
- How to find participants?
- How to setup connections?
- How does session membership change?
  - Does the group size vary greatly?
  - How rapidly do participants join and leave?
  - Are participants aware of other members?

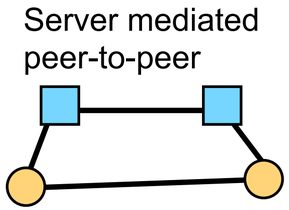


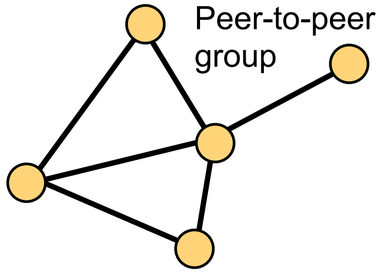


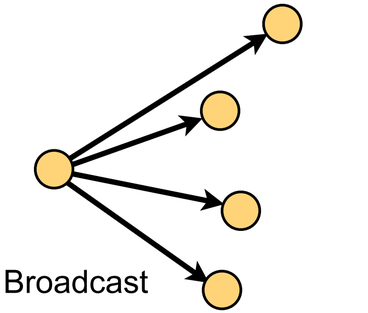












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The Presentation Layer

- Managing the presentation, representation, and conversion of data:
  - Media types and content negotiation
  - Channel encodings
  - Internationalisation, languages, and character sets
- Common services used by many applications

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The Application Layer

- Protocol functions specific to the application logic
  - Deliver email
  - Retrieve a web page
  - Stream video
  - …

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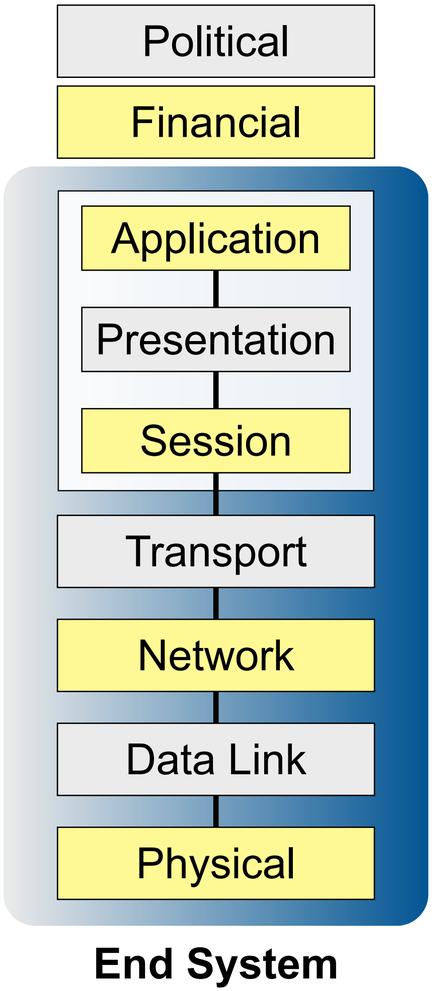
Protocol Standards (1/2)



- The OSI model is a reasonable way of thinking about network protocols
- But – it misses two key layers:
  - Financial
  - Political
- Successful network protocols support interoperability between different vendors – this interoperability exists because those vendors work to standardise the protocols

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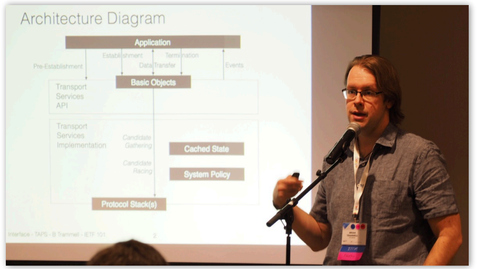
Protocol Standards (2/2)









Rough consensus and running code → standards are the result of much discussion and negotiation

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