**SESSION I**

|  |  |
| --- | --- |
| **Activity** | **Board Activity** |
| **Topic** | UDP (simple Demultiplexer) |
|  | Definition, format for UDP header and UDP message queue |
| **Weblink** | <http://compnetworking.about.com/od/networkprotocolsip/g/udp-user-datagram-protocol.htm>  <http://www.erg.abdn.ac.uk/~gorry/course/inet-pages/udp.html> |
| **Activity** | Questions and Answers |
| **Topic** | Conclusion |
|  | 1. Define mailbox. 2. Define user datagram protocol. 3. Define pseudo header. 4. What is meant by well known port? 5. What is meant by pid? |

**SESSION II**

|  |  |
| --- | --- |
| **Activity** | Writing Board |
| **Topic** | Reliable Byte Stream (TCP), End-to-End Issues, Segment Format |
|  | How tcp manages a byte stream, TCP header format |
| **WebLink** | <http://en.wikipedia.org/wiki/Transmission_Control_Protocol> |
| **Activity** | Writing Board |
| **Topic** | Connection Establishment and Termination |
|  | Timeline for three-way handshake algorithm, TCP state transition diagram. |
| **WebLink** | http://www.eecs.yorku.ca/course\_archive/2011-12/F/3213/Notes/chap\_20\_tcp\_estab.pdf |
| **Activity** | Quiz |
| **Topic** | Conclusion |
|  | 1. Define TCP. 2. What is meant by maximum segment lifetime? 3. Define end to end argument. 4. Define segment. 5. Define advertised window. 6. Define connection establishment. 7. Define connection termination. 8. Define handshake. 9. What is meant by two way handshake? 10. What is meant by three way handshake? |

**SESSION III**

|  |  |
| --- | --- |
| **Activity** | Presentation |
| **Topic** | Triggering Transmission |
|  | Definition, silly window syndrome |
| **WebLink** | <http://my.safaribooksonline.com/book/-/9780123705488/5dot1->  simple-demultiplexer-udp/401#X2ludGVybmFsX0J2ZGVwRmxhc2hSZWFkZXI  /eG1saWQ9OTc4MDEyMzcwNTQ4OC80MDI= |
| **Activity** | Presentation |
| **Topic** | Record Boundaries |
|  | Definition |
| **WebLink** | http://www.cs.montana.edu/~halla/csci466/lectures/lec25/lec25-tcp.html |
| **Activity** | Recall the keywords |
| **Topic** | Conclusion |
|  | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |  |  |  1. Silly window syndrome 2. Maximum segment size 3. Push operation 4. Data segments 5. Self-clocking |

**SESSION IV**

|  |  |
| --- | --- |
| **Activity** | Board activity |
| **Topic** | Recap : TCP |
|  | Definition, concepts |
| **Activity** | Presentation |
| **Topic** | Adaptive Flow Control |
|  | Definition, concepts |
| **WebLink** | http://www.cs.montana.edu/~halla/csci466/lectures/lec25/lec25-tcp.html |
| **Activity** | Presentation |
| **Topic** | **SOAP (content beyond the syllabus)** |
|  | **concepts** |
| **WebLink** | **http://en.wikipedia.org/wiki/SOAP** |

**SESSION V**

|  |  |
| --- | --- |
| **Activity** | Board activity |
| **Topic** | **Recap:** Adaptive Flow Control |
|  | Definition and concepts |
| **Activity** | Analogy |
| **Topic** | Adaptive Retransmission |
|  | Karn/Partridge algorithm, Jacobson/Karels algorithm |
| **WebLink** | http://www.cs.purdue.edu/homes/cs422/LectureNotes/Fall2004/week15-2/notesNov23.pdf |
| **Activity** | Word Scramble |
| **Topic** | Conclusion |
|  | rsnoiinstrsmea  TTR  lertspmta  tsmdairettte  otshom |
|  | Rsnoiinstrsmea retransmission  TTR RTT  Lertspmta samplertt  Tsmdairettte estimatedrtt  Otshom smooth |

**SESSION VI**

|  |  |
| --- | --- |
| **Activity** | Board activity |
| **Topic** | Congestion Control |
|  | TCP Sawtooth pattern |
| **WebLink** | http://tools.ietf.org/html/rfc5681 |
| **Activity** | Board activity |
| **Topic** | Additive Increase/ Multiplicative Decrease |
|  | AIMD, example |
| **WebLink** | http://en.wikipedia.org/wiki/Additive\_increase/multiplicative\_decrease |
| **Activity** | Crossword Puzzle |
| **Topic** | Conclusion |

**SESSION VII**

|  |  |
| --- | --- |
| **Activity** | Presentation, Board activity |
| **Topic** | Recap : Congestion Control |
| **Activity** | Presentation, Board activity |
| **Topic** | Slow Start |
|  | Example |
| **WebLink** | http://en.wikipedia.org/wiki/Slow-start |
| **Activity** | Recall by keywords |
| **Topic** | Retransmit and Fast recovery |
| **WebLink** | **http://latussolutions.com/fast-retransmission-fast-recovery/** |
|  | Lost segment  Duplicate acknowledgement  Retransmission  Denial of service  Delays |

**SESSION VIII**

|  |  |
| --- | --- |
| **Activity** | Presentation |
| **Topic** | Congestion Avoidance – DEC bit |
|  | Concepts, computing average queue length at a router |
| **WebLink** | *merlot.usc.edu/cs551-m05/lectures/tentative/12a\_****decbit****-6up.pdf*‎ |
| **Activity** | Presentation |
| **Topic** | RED |
|  | RED thresholds on a FIFO queue |
| **WebLink** | http://www.icir.org/floyd/papers/early.twocolumn.pdf |
| **Activity** | Presentation |
| **Topic** | Source Based Congestion Avoidance |
|  | Congestion window Vs observed throughput rates |
| **WebLink** | www.cs.uiuc.edu/class/sp06/cs438/slides/cc3.pdf‎ |
| **Activity** | Quiz |
| **Topic** | Conclusion |
|  | 1. Define congestion avoidance 2. Define threshold. 3. What is meant by drop level? 4. What is meant by early packet discard? 5. Define RED. 6. Define early random drop. 7. Define congestion window. |

**SESSION IX**

|  |  |
| --- | --- |
| **Activity** | Presentation |
| **Topic** | QoS |
|  | concepts |
| **WebLink** | http://en.wikipedia.org/wiki/Quality\_of\_service |
| **Activity** | Presentation |
| **Topic** | Application requirements |
|  | Real time audio example - An audio application, a playback buffer |
| **WebLink** | http://en.wikipedia.org/wiki/Quality\_of\_service |
| **Activity** | Presentation |
| **Topic** | Integrated services (RSVP), Differentiated Services |
|  | Service classes, flowspecs |
| **WebLink** | http://web.cs.wpi.edu/~rek/Adv\_Nets/Spring2002/IntServ\_DiffServ.pdf |
| **Activity** | Recall by keywords |
| **Topic** | Conclusion |
|  | 1. Fine grained 2. Coarse grained 3. Network delay 4. Playback 5. Buffer |