**Wireshark Lab – TCP**

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**1. Client IP and Port**

* **Client IP Address:** 192.168.210.77
* **Client TCP Port:** 61043

**2. Server IP and Port**

* **Server IP Address (gaia.cs.umass.edu):** 128.119.245.12
* **Server TCP Port:** 80

**3. Sequence Number (SYN segment)**

* **Initial Sequence Number:** 3007661508
* **SYN Flag Set?** Yes
* **SACK Permitted Option Present?** Yes

**4. SYNACK Segment**

* **Sequence Number of SYNACK:** 4006248772
* **Flags Set:** SYN, ACK
* **Acknowledgment Number:** 3007661509

**5. Sequence Number of HTTP POST**

* **TCP Sequence Number with POST:** 3007814406
* **Payload Bytes in This Segment:** 1460
* **Does entire file fit in one segment?** No (spans ~106 segments)

**6. RTT Calculations**

* **Time First Segment Sent:** Apr 25, 2025 22:41:31.888947000 Pakistan Standard Time
* **Time ACK Received:** Apr 25, 2025 22:41:30.500015000 Pakistan Standard Time
* **RTT (1st segment):**
* **RTT (2nd segment):**
* **Estimated RTT (α = 0.125):**

**7. Segment Lengths**

| **Segment #** | **Total Length (Header + Payload)** |
| --- | --- |
| 1 | 20+621=641 |
| 2 | 20+1400=1420 |
| 3 | 20+1400=1420 |
| 4 | 20+1400=1420 |

**8. Buffer Advertisement (Flow Control)**

* **Minimum Window Size Value (in first 4 segments):** 30464
* **Window Scaling Factor:** 128
* **Actual Available Buffer:** 30,464
* **Was sender throttled?** Yes

**9. Retransmissions**

* **Were there retransmitted segments?** Yes
* **How did you identify them?**
  + Look for "[TCP Retransmission]" in the "Info" column
  + Compare Sequence Numbers

**10. ACK Behavior**

* **Typical ACK’d Bytes (first 10 data segments):** 113 Bytes
* **Any delayed ACKs (ack every other segment)?** Yes