



Protocol Design

Assignment 3: Protocol Analysis



How robust is your protocol design...? (1)

Analyze your design with respect to:

- ▶ Robustness to extended error conditions along the path
 - How many packets lost in a row can you deal with? Error rate?
 - What are the implications of increased loss rate?
 - How much (variation in) latency is acceptable?
- ▶ Try to come up with situations in which your protocol will be less than perfect
 - Have you considered all boundary cases (zero-length files etc.)?
 - Can you handle all error cases (losses, duplications, ...)?
 - What kinds of failures do you get:
 - Crash
 - Lack of progress
 - Incorrect result
 - Livelock, Jabbering



How robust is your protocol design...? (2)

- ▶ Robustness of the sender to a cheating receiver?
 - Concerning congestion control
 - E.g.: Can the receiver make the sender create and sustain congestion on the path?

- ▶ Robustness against DoS attacks from men at the side?
 - Can overhear and inject traffic in both directions, but cannot suppress
 - Like another node in a wireless LAN
 - Three attacks:
 - Pretend successful reception
 - Mess up received files
 - Tamper with congestion control to cause link overload
 - Sketch remedies for your protocol design (no complete spec needed)



For fun: how robust is your implementation?

- ▶ What happens...
 - In case of inopportune packet losses
 - In case of borderline parameters
 - After injection of damaging packets
 - After injection of random packets
 - When sending *many* packets (like > 100 Mbit/s)

- ▶ Google keyword: Fuzzer...