CS 168 Introduction to the Internet: Architecture and Protocols
Fall 2022 Sylvia Ratnasamy Discussion 10: Advanced CC, DNS

1 AIMD Throughput

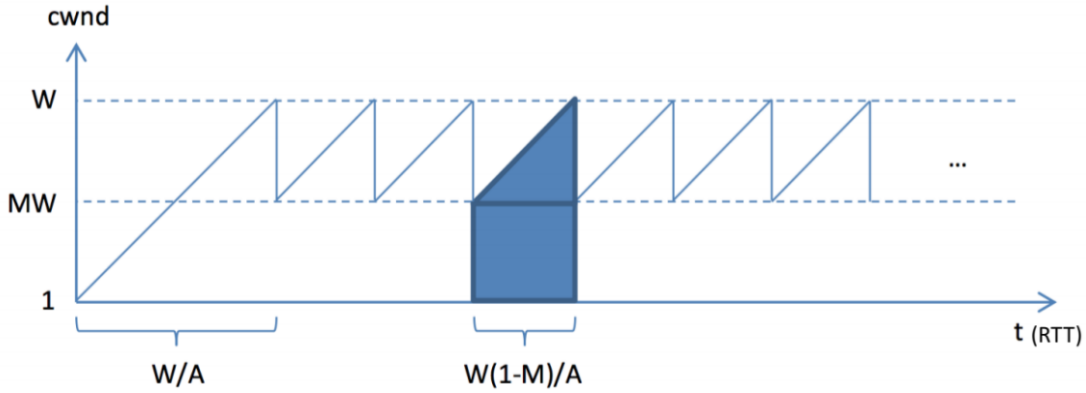

Figure 1: Graph of *Window size vs. time* referenced in AIMD Generalization and Derivation

Consider a generalized version of AIMD, where:

- For every window of data *ACK*ed, the window size increases by a constant A
- When the window size reaches W, a loss occurs, and the window size is multiplied by a constant $M < 1$

For simplicity, *assume that* $W(1-M)$ *is divisible by* A. Thus, the window sizes will cycle through the following: WM, $WM+A$, $WM+2A$, ... W. Let the RTT to denote the packet round trip time. A graph of window size versus time is referenced in Figure 1.

1. What is the average throughput? As we did in the lecture slides, express in your answers in the number of packets, so we do not need to consider MSS.

2. Calculate the loss probability p, using W and M.

3. Derive the formula for throughput in part 1 when $M = 0.5$ and $A = 1$ and try using only p and RTT.

2 DNS True or False

1. Hosts usually perform the iterative DNS resolution process themselves.

   _____

2. Every zone always has at least 2 name servers.

   _____

3. When looking up a root server, BGP will use unicast to find the correct root server.

   _____

4. A client can establish a TCP connection with a root server.

   _____

5. Most queries to DNS root servers are for nonexistent TLDs.

   _____

3 DNS Record Types

Write the corresponding DNS record type on the right column.

Information	Record Type
Name to IPV4 Address Mapping	
Name to IPV6 Address Mapping	
Name Server	
Human Readable Information (Often Used for Site Verification)	
General Name-to-Service Mapping	
Mail Exchanger	
Canonical Name	