# 2016.ComNet.1stHomework

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R11. TCP is a reliable protocol rather than UDP, and make sure the data package be received in the correct order without lose. These protocols (HTTP, FTP, SMTP, POP3) has these requirements, so they run on top of TCP rather than UDP.

R19. It is possible for an organization’s Web server and mail server to have the same alias for a hostname. The MX record is used to map the mail server’s host name to its IP address.

P7. The total time is . Since is 0, so the total time is

P22.

For client-server, the minimum time can be calculated by this formula , where

|  |  |  |  |
| --- | --- | --- | --- |
|  | 10 | 100 | 1000 |
| 300Kbps | 7680 | 51200 | 512000 |
| 700Kbps | 7680 | 51200 | 512000 |
| 2Mbps | 7680 | 51200 | 512000 |

For P2P distribution, the minimum time is

|  |  |  |  |
| --- | --- | --- | --- |
|  | 10 | 100 | 1000 |
| 300Kbps | 7680 | 25904 | 47559 |
| 700Kbps | 7680 | 15616 | 21525 |
| 2Mbps | 7680 | 7680 | 7680 |

P23.

1. Consider this condition. For the server, the rate of sending file to each client is , so the time of each client to receive this file is . Since , the entire time is .
2. Consider this condition. For the server, the rate of sending file to each client is , so the time of each client to receive this file is . Since , the entire time is .
3. Form a. and b. we know that when , the entire time is . In this situation, . When , the entire time is , and . So we can draw the conclusion that the minimum distribution time is in general given by .

P24.

1. Consider this condition, define . Divide the file into N parts, the size of the part is . The server transmits the part to peer at the rate . Note that . So peer needs to transmit to peers at . Since . So holds. Thus the forwarding rate is less than its link rate .

In this distribution system, peer receives bits at rate of . Thus each peer receives the file in .