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HW 4 – Networks

1. Control vs. Data Plane:
   1. Control
   2. Data
   3. Data
   4. Control
   5. Control
   6. Data
2. Forwarding is a lot more complex and optimizations can be made when more packet information is available to analyze. By having the routing and forwarding behavior separated we can observe and understand the network traffic and make adjustments based on its behavior, all-the-while the forwarding is being done in response to these adjustments.
3. Hub, Switch, or Router?
   1. Switch
   2. Router
   3. Switch
   4. Router
4. Forwarding Table for Switch 2:

|  |  |
| --- | --- |
| Host | Port |
| A | 5 |
| B | 2 |
| C | 1 |
| H | 1 |
| J | 1 |
| K | 2 |
| M | 1 |
| N | 2 |
| P | 2 |
| Y | 4 |
| Z | 3 |

1. Forwarding Table for Switch 1:

|  |  |
| --- | --- |
| Host | Port |
| J | 3 |
| K | 1 |
| M | 2 |

I based my forwarding decisions based on the lowest number of the port since there were the same number of switches between switch 1 and host J.

1. Packet Order: 1, 7, 8, 5, 2, 6, 3, 4
2. 48
3. 65,535 bytes
4. For both encapsulations it is 4. For an ICPM it is 1
5. Fragmentation:
   1. Assumptions:
      1. IP Header 20 bytes
      2. TCP Header 20 bytes
   2. Packet 1:
      1. Fragment 1:
         1. Size: 724 bytes of payload
         2. Offset: 0
         3. M-Bit: 1
      2. Fragment 2:
         1. Size: 556 bytes
         2. Offset: 93
         3. M-Bit: 0
   3. Packet 2:
      1. Fragment 1:
         1. Size: 724 bytes of payload
         2. Offset: 0
         3. M-Bit: 1
      2. Fragment 2:
         1. Size: 556 bytes
         2. Offset: 93
         3. M-Bit: 0
   4. Packet 3:
      1. Fragment 1:
         1. Size: 394 bytes
         2. Offset: 0
         3. M-Bit: 0
6. 210.81.112 to 210.81.128
7. CIDR Mappings:
   1. 6
   2. 5
   3. 1
   4. 4
   5. 3
   6. 4
8. Valid IPv6
   1. Yes
   2. No
   3. No
   4. Yes
   5. Yes
9. 60,0,6
10. A bogon is a legitimate IP address that has no reason to be out on the open internet.
11. Flow Table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Ingress** | **IPSRC** | **IPDST** | **Forward** |
| 1 | 10.3.0.5/16 | 10.1.0.1/16 | 2 |
| 2 | 10.1.0.1/16 | 10.3.0.5/16 | 1 |
| 1 | 10.0.0.0/8 | 10.2.0.3 | 3 |
| 1 | 10.0.0.0/8 | 10.2.0.4 | 4 |
| 2 | 10.0.0.0/8 | 10.2.0.3 | 3 |
| 2 | 10.0.0.0/8 | 10.2.0.4 | 4 |
| 3 | 10.2.0.3 | 10.2.0.4 | 4 |
| 4 | 10.2.0.4 | 10.2.0.3 | 3 |