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# COMP 204 Homework 3

Answer the following questions based on your reading of the text book, the module key points, and the instructor’s presentation this week.



Figure : Network diagram for questions 1-3.

1. **[6 points]** Using the diagram above, fill in the routing table with “next hops” for Router 1, Router 2, and Router 3 below. Note, that if there are multiple routes, then list all possible next hops in the order of preference (highest to lowest). *[Assume, for this exercise, that routers 1-3 are configured to route RFC 1918 addresses. If you don’t know what that previous sentence means, don’t worry as we’ll cover that in Chapter 6.]*

|  |  |
| --- | --- |
| **Packet Destined for…** | **Arrives at…** |
| **Router 1** | **Router 2** | **Router 3** |
| 192.168.1.X/24 |  |  |  |
| 192.168.2.X/24 |  |  |  |
| 0.0.0.0/0 (default) |  |  |  |

1. **[5 points]** If Router 1 and Router 2 are mis-configured so that packets from 192.168.1.X/24 destined for 192.168.2.Y/24 and vice-versa just bounce back-and-forth between Router 1 and Router 2, what happens to a packet sent from Host 1 to Host 2? Is an error generated? What happens to the error? What would you expect to see happening at Host 1? At Host 2?

1. **[3 points]** What is a “default gateway”? What would the default gateway be for Host 1? Host 2?
2. **[3 points]** How does fragmentation affect performance in routing? How can fragmentation be minimized?
3. **[5 points]** Compare and contrast static vs. dynamic routing. Consider several factors, such as router maintenance, bandwidth overhead, router performance, and network stability.
4. **[4 points]** IPv6 is an effort to replace 32-bit IP addresses (IPv4) with 128-bit addresses. What impact does this have on routing?
5. **[4 points]** Why do we go to the trouble of dividing a set of hosts into distinct networks? What are the advantages? What are the disadvantages?