Homework I

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Question 1. IP Addressing and Subnetting

a) To configure B and C as a subnet, it takes at least two available IP address, plus the reserve address for broadcast and the subnet itself. So it would be a subnet with subnet mask of `30`, or in dot-decimal notation of `255.255.255.252`. In conclusion, the number of addresses available for the Ethernet would be reduced by four.

b) As ARP proxy, B would pretend to be C in front of A.

i. Packets send sequence would be like table 1.

Table 1: All Packets Sent

Message Type	Sender	Sender's MAC Addr	Sender's IP Addr	Target MAC Addr	Target IP Addr
ARP Req	A	A's MAC addr	A's IP	00-00-00-00-00-00	C's IP
ARP reply	B	B's MAC addr	C's IP	A's MAC addr	A's IP
IP msg	A	A's MAC addr	A's IP	B's MAC addr	C's IP

ii. To implement the proxy ARP, B's routing table need to add rules that for for all received or generated packets destination at C's IP address, the packets would go through the WIFI interface. And for packets received from C with destination address not B, B would forward the message to the Ethernet interface.

Question 2. CIDR

If the router actually containing that subset failed, the connected router would detect that the link become unavailable and delete the "correct" routing policy. In the meantime, all the packets with the destination of that subset addresses would be forwarded to the router advertising the "big" address blocks, since it's the only matching one, which lead to the wrong domain.

Question 3. Internet Basics

a) The core router need to know the actual network number since the router still based on the routing table to forward a packet. Because the packet only contains a destination IP address, it does not contain the AS number it wants to go to. In other word, BGP only helps the router to build the routing table, it do not generate its own forwarding table.