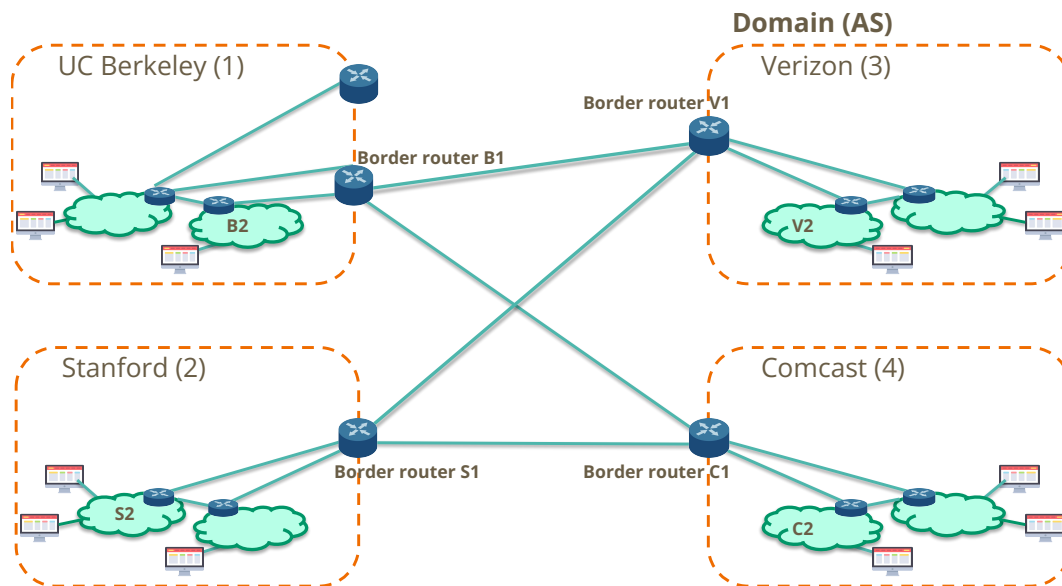


## 1 True/False

1. iBGP is used for intradomain routing.
2. Avoiding loops is one reason why BGP uses path vector.
3. BGP always advertises a shortest path.
4. BGP route advertisements use classless addressing.

## 2 Interdomain vs Intradomain



Consider the four ASes in the diagram above. ASes Berkeley, Verizon, Stanford and Comcast have border routers B1, V1, S1 and C1 respectively, and internal routers B2, V2, S2 and C2 respectively.

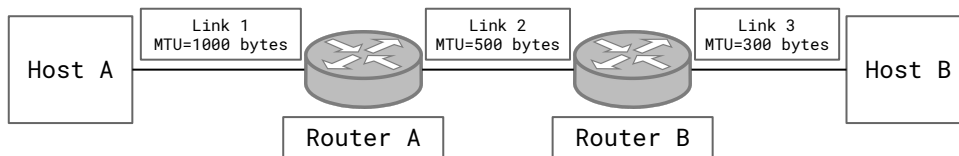
Berkeley and Stanford both use Comcast's and Verizon's services. The (fake) cost metrics are 10/MB for using Comcast's bandwidth and 20/MB for using Verizon's bandwidth. Please answer following questions with the assumption made in lecture: a border router establishes iBGP sessions to all other routers within its AS.

1. Which one of eBGP, iBGP and IGP distributes externally learned routes internally, and which routers, if any, speak it?

2. Which one of eBGP, iBGP and IGP learn routes to external destinations, and which routers, if any, speak it?
3. Which one of eBGP, iBGP and IGP provides internal reachability, and which routers, if any, speak it?
4. Which AS would Berkeley use to reach Stanford, in terms of cost effectiveness?
5. Given now Comcast knows Berkeley and Stanford don't get along with each other, it doesn't advertise its route of Berkeley to Stanford, or the other way around. However, Verizon still remains neutral. Which AS would Berkeley use to reach Stanford now?

### 3 IP Fragmentation

Maximum Transmission Unit (MTU) is the size of the largest packet that a link can carry. Host A sends an **600 byte** IP packet (including header) to Host B, which is fragmented along the way. Assume the typical IP header length of 20 bytes.



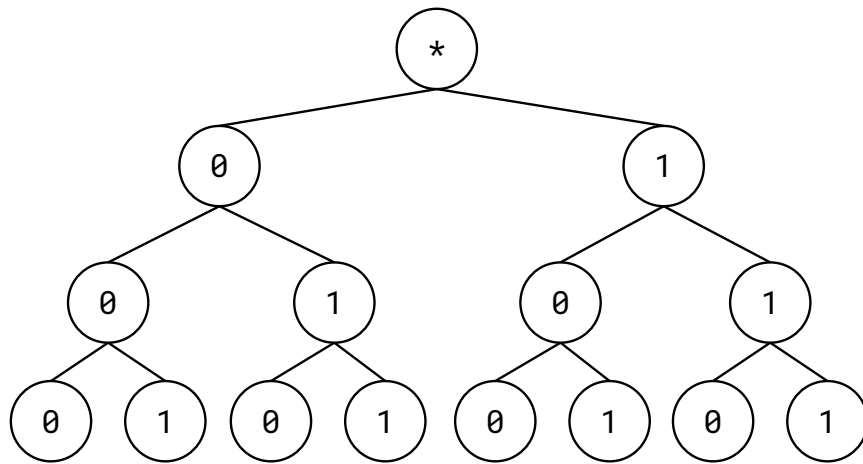
1. The packet fits within the MTU of Link 1 and arrives at Router A. What are the resulting fragments that traverse Link 2? For each fragment, identify the total length (including header), flags, and offset.
2. The fragments arrive at Router B. What are the resulting fragments that traverse Link 3?
3. Why is the MF flag needed?
4. Why can't we just number our fragments instead of keeping track of fragmentation offsets?

## 4 Longest Prefix Matching

Your routing table contains the following entries:

Address	Port
01*	Port 1
000	Port 2
001	Port 1
1**	Port 2
101	Port 1

Mark the entries on the following tree. Then, find a more concise representation of the table.



**Concise Table:\***

Address	Port

\*You may not need to fill in all rows.