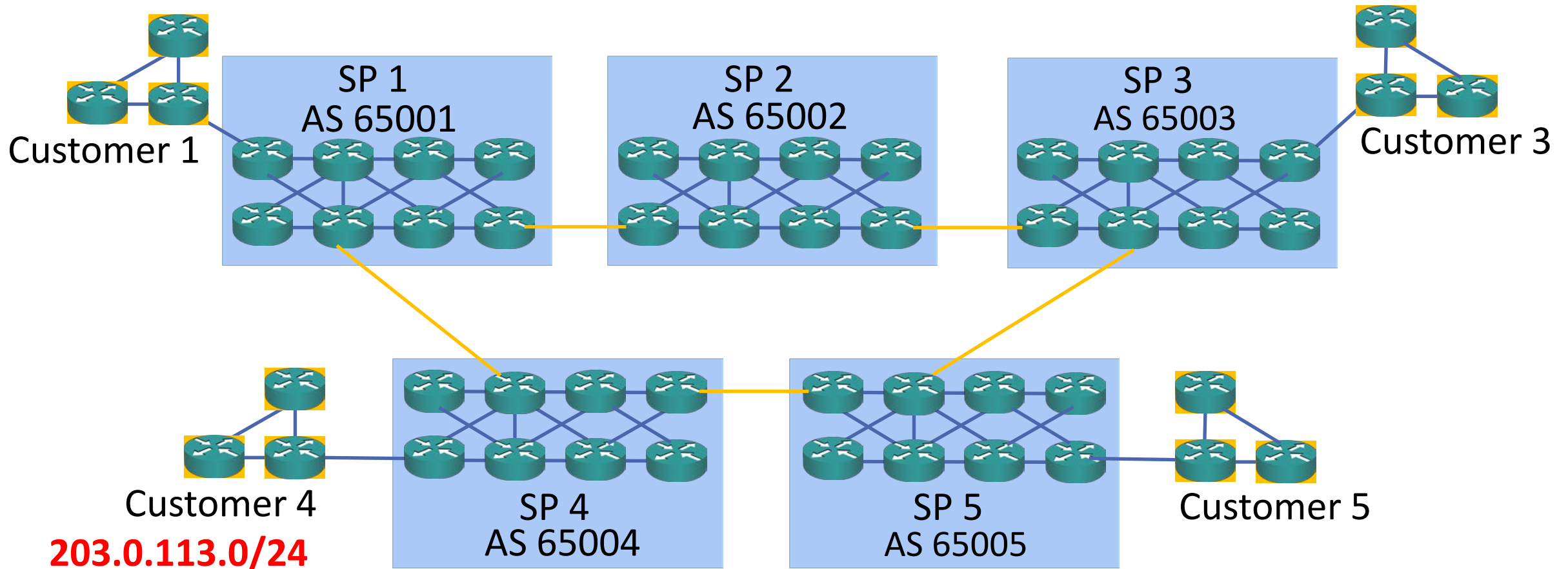


BGP Example



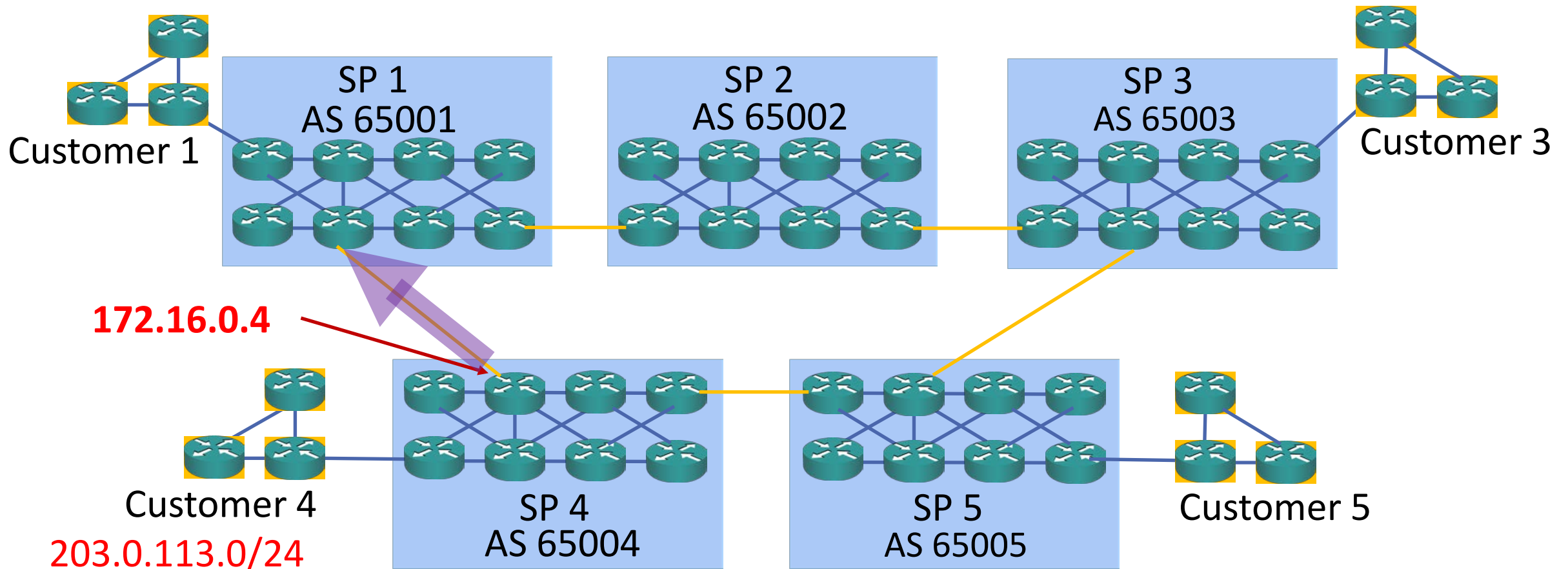
- Traffic from Customer 3 to Customer 4



BGP Route Propagation



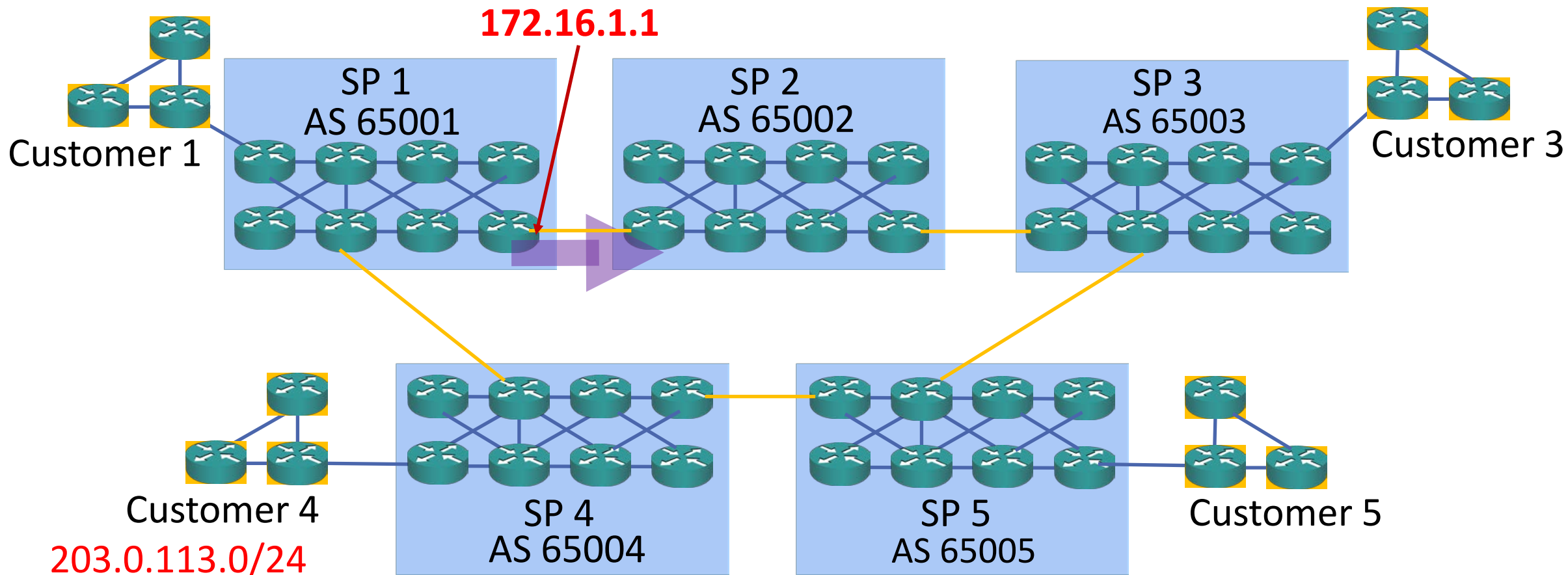
- SP4 advertises to SP1, Next Hop 172.16.0.4, AS Path 65004



BGP Route Propagation (Cont.)

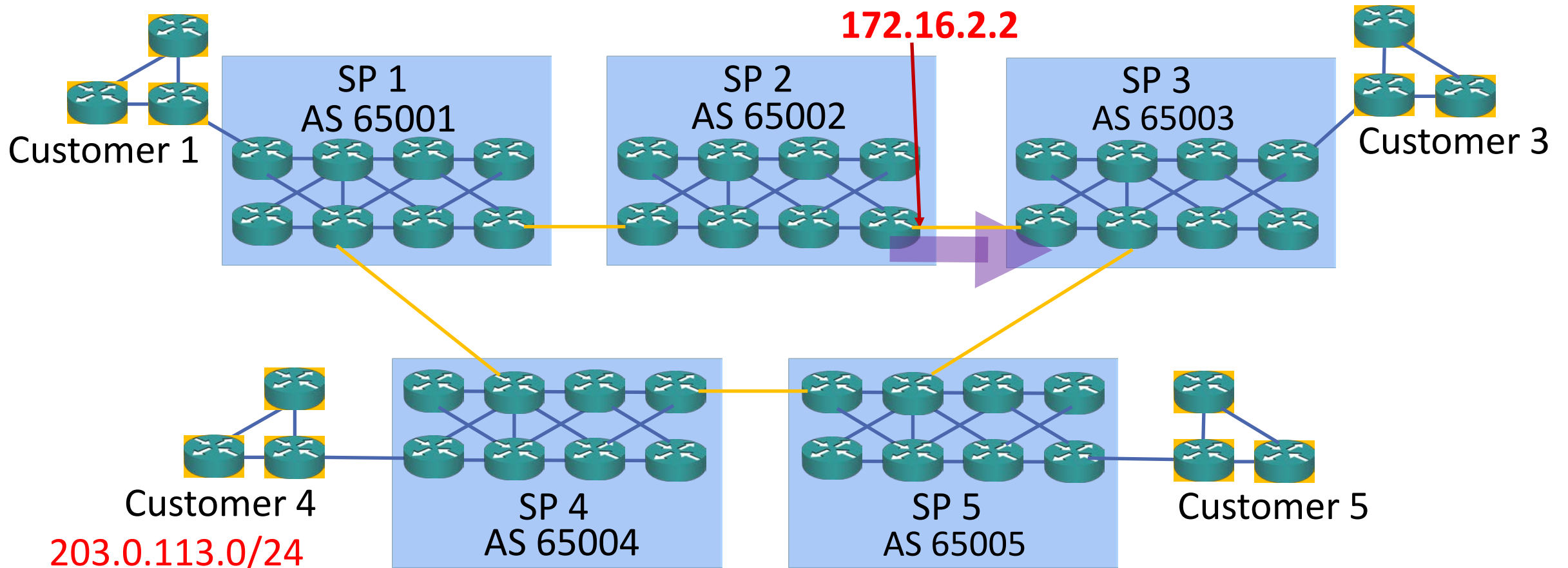


- SP1 advertises to SP2, Next Hop 172.16.1.1, AS Path 65001 65004



BGP Route Propagation (Cont.)

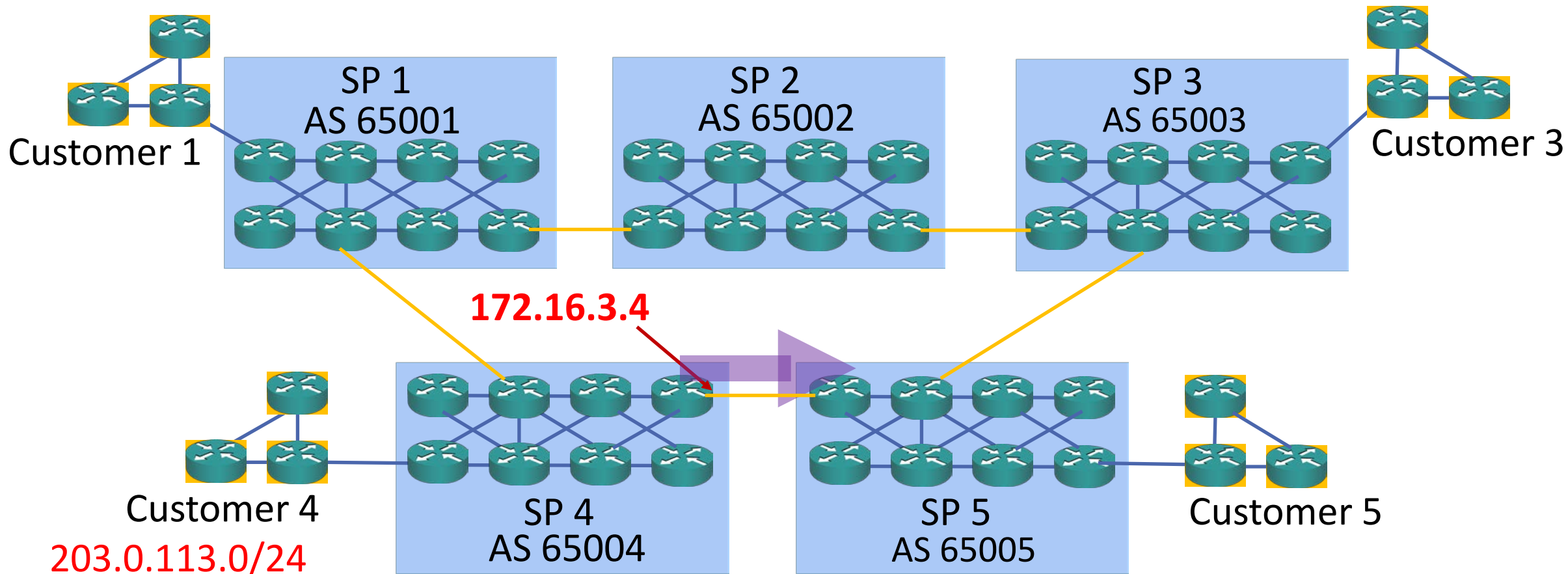
- SP2 advertises to SP3, Next Hop 172.16.2.2, AS Path 65002 65001 65004



BGP Route Propagation (Cont.)



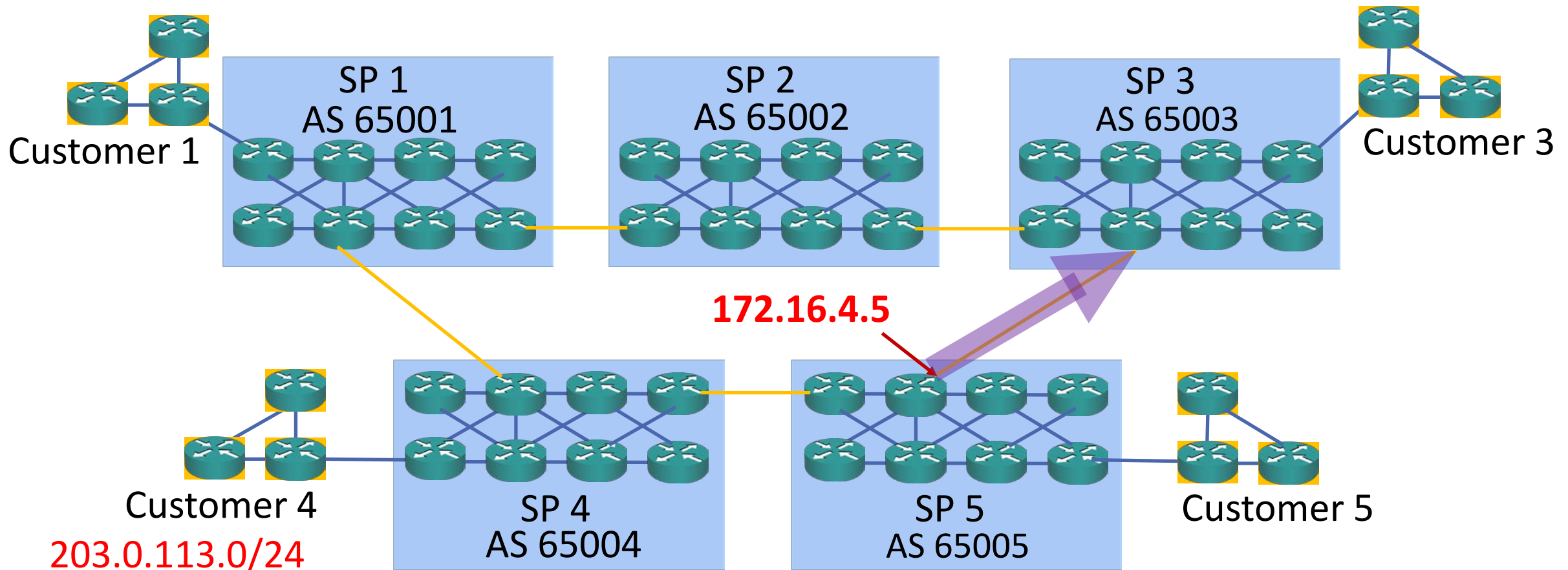
- SP4 advertises to SP5, Next Hop 172.16.3.4, AS Path 65004



BGP Route Propagation (Cont.)



- SP5 advertises to SP3, Next Hop 172.16.4.5, AS Path 65005 65004

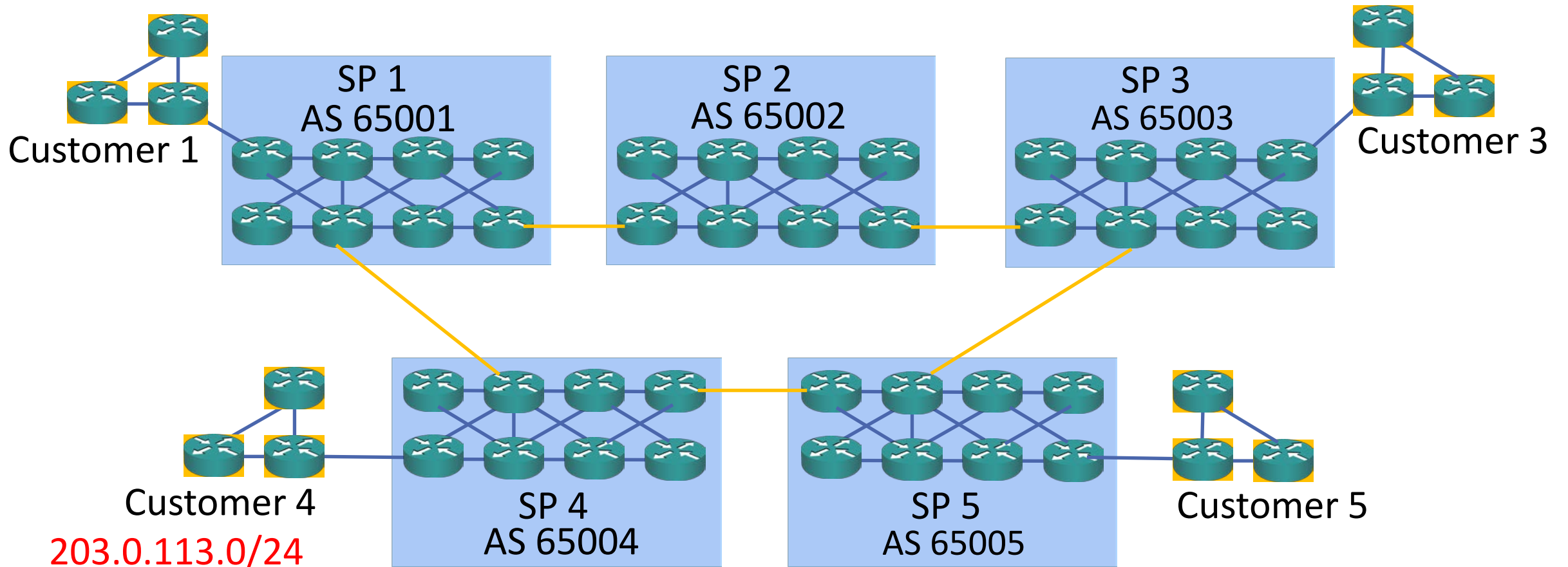


BGP Route Propagation (Cont.)



- SP3 learns two different paths that it can take to reach 203.0.113.0/24
 - Via SP2 with an AS Path of 65002 65001 65004 and a next hop address of 172.16.2.2
 - Via SP5 with an AS Path of 65005 65004 and a next hop address of 172.16.4.5
- Both these paths will be visible in the BGP table on SP3

BGP Route Propagation (Cont.)



BGP Route Propagation (Cont.)

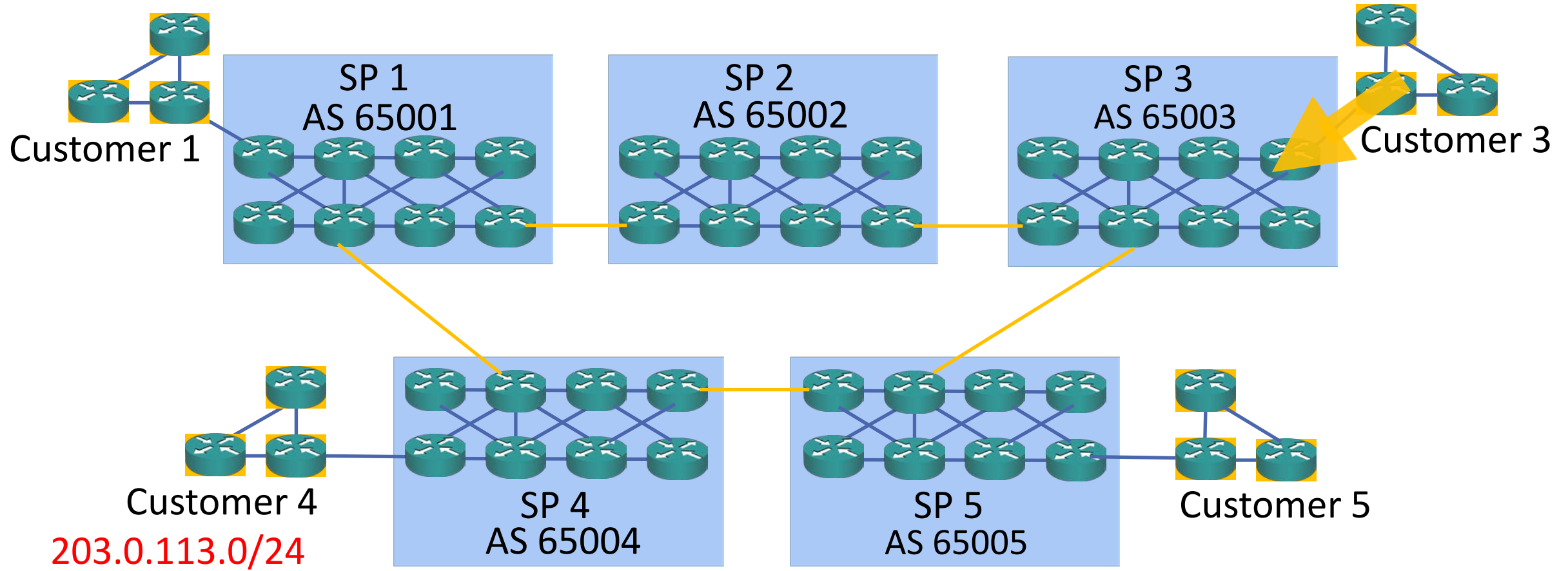


- Just like with an IGP, only the best path will make it into the routing table and be used
- (Only the best path will be advertised to BGP neighbors)
- SP3 will insert the path via SP5 into its routing table because it has a shorter AS Path (2 AS's vs 3 AS's)

BGP Packet Forwarding

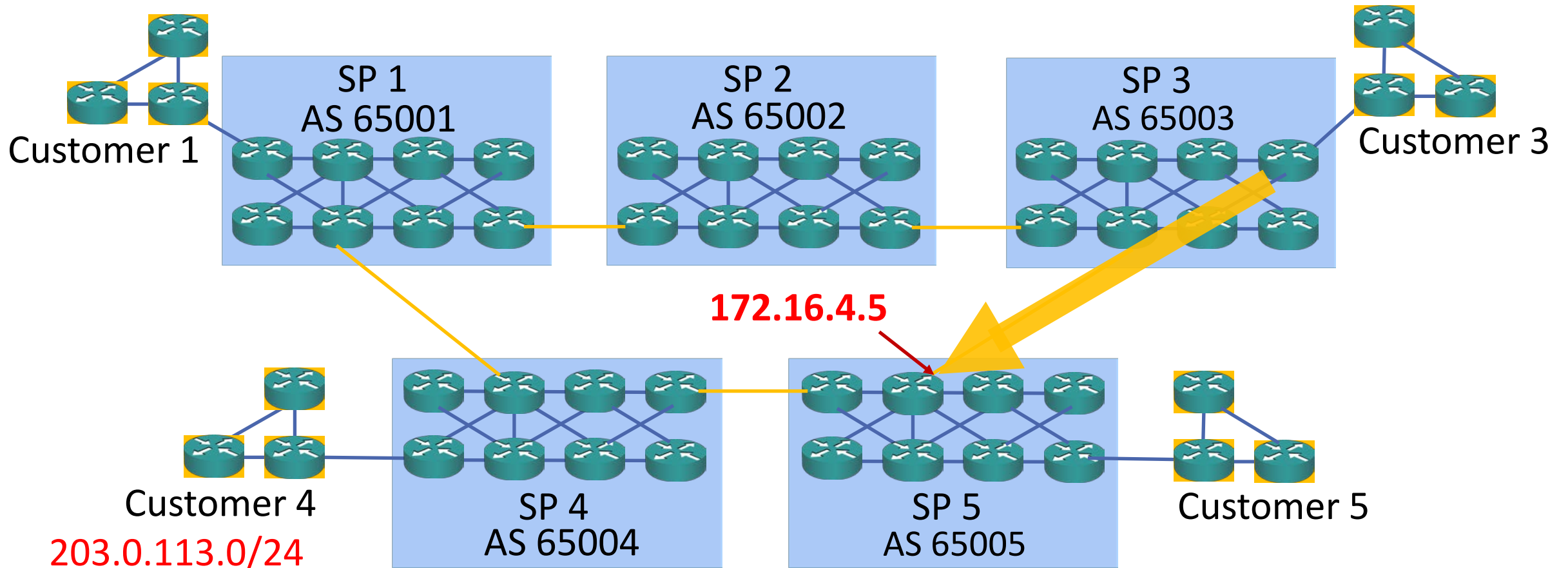


- Customer 3 sends traffic to Customer 4 via SP3 according to its default static route



BGP Packet Forwarding (Cont.)

- SP3 sends the packet to the next hop 172.16.4.5 according to its BGP route

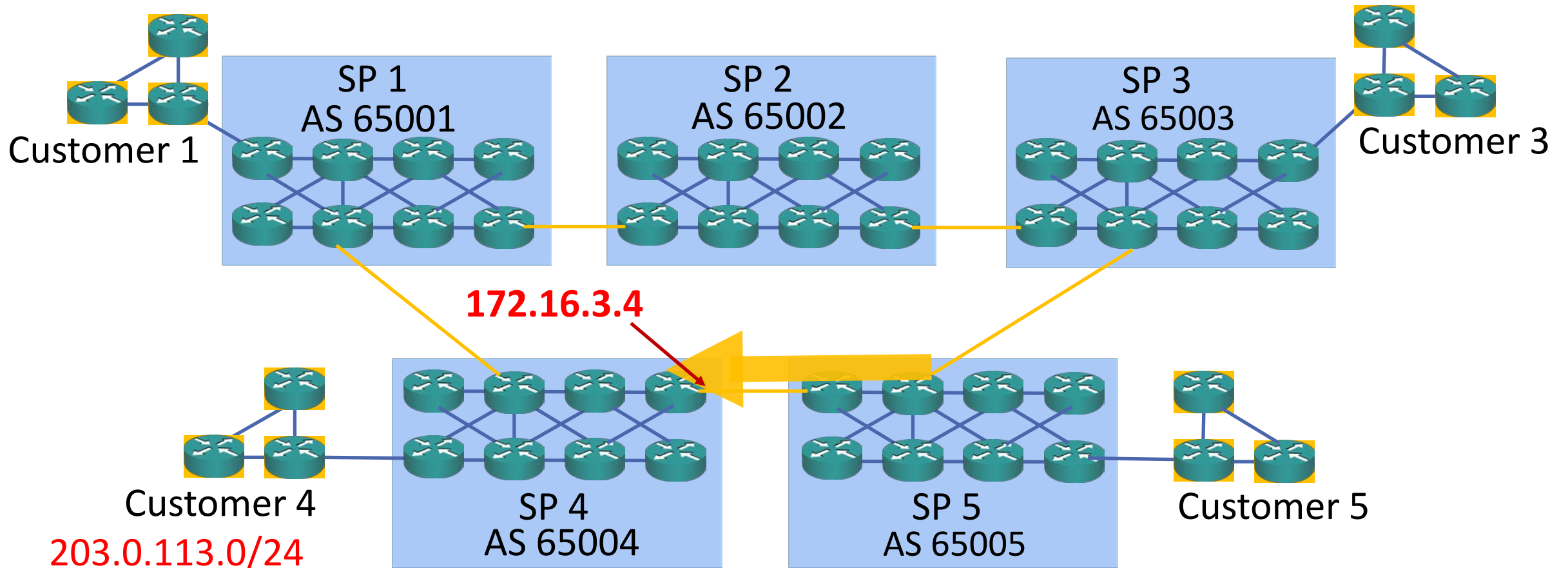


203.0.113.0/24

BGP Packet Forwarding (Cont.)



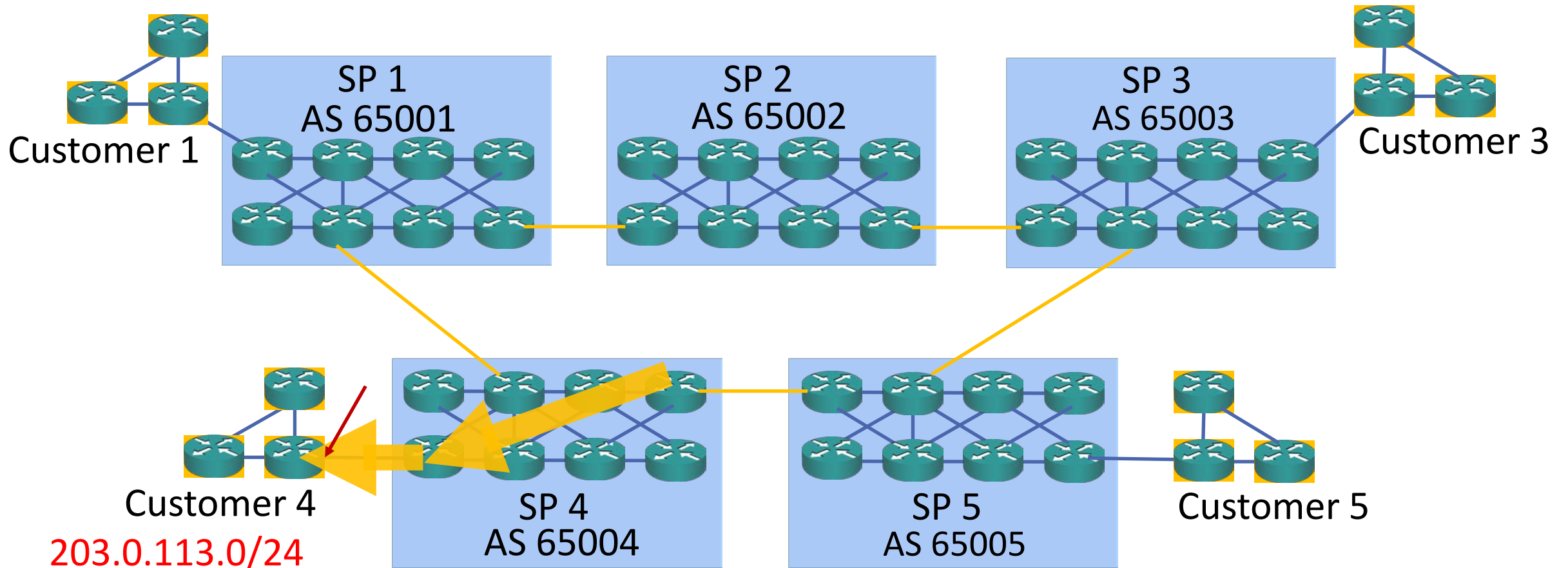
- SP5 sends the packet to the next hop 172.16.3.4 according to its BGP route



BGP Packet Forwarding (Cont.)



- SP4 sends the packet to the destination according to its IGP route



Loop Prevention



- BGP routers discard a received route if it contains their own AS in the path

BGP Load Balancing



- By default, BGP selects only a single best path and does not perform load balancing.
- If multiple paths to a destination network are available with identical AS Path lengths, only one will make it into the routing table

BGP Policy



- The shortest AS path is the preferred route by default
- Administrators can override this by configuring BGP policy
- An example reason for doing this would be if an AS has links to other AS's with different bandwidths on those links
- BGP can be configured to prefer the higher bandwidth links even if they have a longer AS Path
- Paths can be manipulated for both outbound and inbound traffic