Lecture 8. Inter-Domain Routing Quiz

1. What is an Autonomous System (AS)?

A) A single router that operates independently
B) One or more local networks under a single administrative control
C) A collection of all networks in a country
D) A computer network without any external connections

ANS:

---

2. What is the primary difference between inter-domain and intra-domain routing?

A) Inter-domain uses BGP while intra-domain uses IP
B) Intra-domain computes routes within a single network; inter-domain finds paths between networks
C) Inter-domain is faster than intra-domain routing
D) Intra-domain requires more routers than inter-domain

ANS:

---

3. What are the two main types of business relationships in the AS graph?

A) Customer-to-customer and peer-to-peer
B) Provider-to-provider and host-to-host
C) Customer-provider and peering relationships
D) Backup and primary relationships

ANS:

---

4. What does a Stub AS do?

A) Forwards packets on behalf of other ASes
B) Only sends and receives packets on behalf of its own hosts; does not forward between other ASes
C) Provides redundant connections to the backbone
D) Acts as a backup for failed routers

ANS:

---

5. What are Transit ASes?

A) ASes that connect to only one other AS
B) Temporary ASes used during network upgrades
C) ASes that forward packets on behalf of other ASes; similar to routers in the intra-domain model
D) ASes used only for experimental routing

ANS:

---

6. Why can't the AS graph have cycles?

A) Cycles cause packets to be lost
B) A cycle would mean an AS is paying itself, which doesn't make business sense
C) Cycles prevent packets from reaching their destination
D) The Internet cannot handle cyclic graphs

ANS:

---

7. What are Tier 1 ASes?

A) ASes that are one hop away from the destination
B) ASes at the top of the hierarchy with no providers; they peer with each other to ensure global connectivity
C) The first ASes to be connected to the Internet
D) ASes that provide service only to customer ASes

ANS:.

---

8. What are the three main goals of inter-domain routing design?

A) Speed, reliability, and low cost
B) Scalability, privacy, and autonomy
C) Redundancy, encryption, and traffic balancing
D) Bandwidth optimization, latency reduction, and packet prioritization

ANS:

---

9. What is the Gao-Rexford principle?

A) All ASes must use the same routing algorithm
B) ASes should prefer the shortest path to minimize latency
C) ASes prefer the most profitable path: customer > peer > provider
D) All paths must go through Tier 1 ASes

ANS:

---

10. According to Gao-Rexford rules, when will an AS participate in forwarding a packet?

A) Always, as long as the packet reaches its destination
B) Only if at least one of its neighbors along the path is a customer
C) Only if the path is the shortest
D) Only if the packet originates from a Tier 1 AS

ANS:

---

11. What is a "valley-free" route?

A) A route that avoids mountainous terrain
B) A route that has no peering links
C) A route where you don't go downhill (to customers) and then back uphill go uphill (to a provider)
D) A route with the minimum number of hops

ANS:

---

12. What is BGP (Border Gateway Protocol)?

A) A protocol used only within a single network
B) The one and only inter-domain routing protocol used on the Internet
C) A replacement for IP addresses
D) A protocol for encrypting routing information

ANS:

---

13. Why did BGP extend distance-vector instead of link-state routing?

A) Distance-vector is faster than link-state
B) Link-state requires revealing policies to all networks (no privacy) and all ASes must agree on the same metric (no autonomy)
C) Distance-vector uses less bandwidth
D) Link-state cannot handle failures

ANS:

---

14. What is the key difference between BGP import and export policy?

A) Import policy determines which paths to accept; export policy determines which paths to advertise to neighbors
B) Both determine the same thing but are applied at different times
C) Import policy applies to customers; export policy applies to providers
D) They are only used in Tier 1 ASes

ANS:

---

15. What is path-vector routing and why is it better than distance-vector for BGP?

A) Path-vector is just distance-vector with longer names
B) Path-vector includes the full AS path to the destination, enabling loop detection and arbitrary policy checking
C) Path-vector routes packets faster through fewer hops
D) Path-vector is only used for Tier 1 ASes

ANS:

---

16. True or False. iBGP is used for intradomain routing.

ANS:

---

17. True or False. Avoiding loops is one reason why BGP uses path vector.

ANS:

---

18. True or False. BGP always advertises the shortest path.

ANS:

---

19. True or False. BGP route advertisements use Classless Inter Domain Routing (CIDR).

ANS: