

# Answers to the Review Questions

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**NOTE**

This document is an addendum to Appendix G, “Answers to the Review Questions,” in the *Building Scalable Cisco Networks* book from Cisco Press. The following are the answers to the review questions in the supplemental online chapter, “Configuring IS-IS Protocol,” which has been made available to you on the Cisco Press website in accordance with the latest Building Scalable Cisco Internetworks (BSCI) objectives.

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- 1 What is common to OSPF and Integrated IS-IS?

**Integrated IS-IS is an implementation of the IS-IS protocol for routing CLNS/CLNP and IP. OSPF and Integrated IS-IS share the same concept of establishing adjacency and building the link-state database. They use the same algorithm (Dijkstra’s Shortest Path First) to calculate their routes, and they both use hierarchical structure, based on a backbone and many areas.**

- 2 How is the router identified in an IS-IS environment?

**The router is identified by the Network Entity Title (NET) address using the following representation: 1 octet NSAP-selector (NSEL), 6 octets for system ID, and from 1 to 13 octets for the area address or area ID field.**

- 3 What is the difference between NSAP and NET?

**When the NSEL field of the NSAP is set to 00, this NSAP identifies the device itself—its network level address. This NSAP is then known as a network entity title (NET).**

- 4 What does a unique system ID define?

**The system ID uniquely identifies a device in an OSI area. It is used in Level 1 routing. The system ID must be unique inside an area. It is generally recommended that the system IDs remain unique across the domain; that way, there can never be a conflict at Level 1 or Level 2 if a device is moved into a different area, for example. All the system IDs in a domain must be of equal length, which Cisco IOS Software mandates as 6 bytes.**

Two common methods of creating a system ID are to use MAC and IP addresses. A MAC address is 6 bytes and is guaranteed to be globally unique; thus, it is a perfect fit for using as the system ID. When using an IP address, each of the four decimal fields of the IP address is padded with zeros, if necessary, so that it is three decimal digits. There are then a total of  $4 \times 3 = 12$  decimal digits. These decimal digits then are recombined as three groups of four digits. For example, IP address 192.168.57.1 becomes 192.168.057.001, which then can be used as the system ID 1921.6805.7001. (Note when used as the system ID, these digits are now treated as hexadecimal digits.)

- 5 Which network representations are supported by IS-IS?

**In the OSI model, two main types represent physical links: broadcast (LAN) and point-to-point (WAN).**

- 6 What is a pseudonode?

**The Dijkstra algorithm is built on a directed graph. A directed graph shows all devices directly connected by a unique link; think of this as point-to-point links. Multiaccess media can't be represented in this way, so one router acts as a pseudonode and all other routers form an adjacency to it, simulating a hub-and-spoke topology. A pseudonode is, therefore, a virtual router for broadcast media to build a directed graph. A pseudonode LSP generated by the Designated Intermediate System (DIS) represents the router.**

- 7 How do two Level 1 areas communicate?

**Level 1–2 routers participate in the Level 1 intra-area routing and the Level 2 interarea routing.**

- 8 How do systems find each other in IS-IS?

**IS-IS uses hello PDUs to establish adjacencies with other intermediate systems and end systems. IS-IS has three types of hello PDUs, as follows:**

- End system hello (ESH), sent by an ES to an IS
- Intermediate system Hello (ISH), sent by an IS to an ES
- IS-IS hello (IIH), used between two ISs

- 9 List the types of adjacencies between IS-IS systems.

**Level 1 routers in the same area establish a Level 1 adjacency.**

**Level 2 routers in the same area or between areas establish a Level 2 adjacency.**

**Level 1–2 routers in the same area establish both Level 1 and Level 2 adjacencies.**

**Level 1–2 routers in different areas establish only a Level 2 adjacency.**

**10** How is IS-IS routing enabled on Cisco routers?

**Enable IS-IS as an IP routing protocol (using the router isis command). Identify the router for IS-IS by assigning a NET to the router (using the net command). Enable IS-IS on the interfaces (using the ip router isis command).**