# Cisco

## Exam 350-029

## CCIE SP Written Exam, V3.0

**Version: 16.0**

**[ Total Questions:   520 ]**

**Topic 1, I&O&T Core IP Technologies**

### Question No : 1  - (Topic 1)

Which three modes are the operating of HDLC? (Choose three)

**A.** asynchronous balanced mode (ABM)
**B.** normal response mode (NRM)
**C.** normal peer mode (NPM)
**D.** asynchronous client mode (ACM)
**E.** asynchronous response mode (ARM)

**Answer: A,B,E**

**Explanation:** Normal response mode allows operation over half-duplex communication links, as long as the primary is aware that it may not transmit when it has given permission to a secondary.

Asynchronous response mode is an HDLC addition[1] for use over full-duplex links. While retaining the primary/secondary distinction, it allows the secondary to transmit at any time. Asynchronous balanced mode added the concept of a combined terminal which can act as both a primary and a secondary. There are some subtleties about this mode of operation; while many features of the protocol do not care whether they are in a command or response frame, some do, and the address field of a received frame must be examined to determine whether it contains a command (the address received is ours) or a response (the address received is that of the other terminal).

### Question No : 2  - (Topic 1)

IP over DWDM management models (Choose two.)

**A.** Segmented Management
**B.** Integrated Management
**C.** Virtual Transponder
**D.** Traffic Management

**Answer: A,B**

**Explanation:** 1.2. IP over DWDM IPoDWDM supports 2 network management models:

1. Segmented Management:

- Retain existing operational model for certain SPs.

- Respect boundaries between IP/Transport groups.

2. Integrated Management:

- End to end provisioning.

- Better troubleshooting.

- 1 Management system, 1 database.

- Unified look & feel.

- Lower OPEX.

Lay the Foundation for Network Convergence

IP over dense wavelength-division multiplexing (IPoDWDM) is a technology pioneered by Cisco that delivers superior service flexibility, scalability, and resiliency. It allows carriers to capitalize on increasingly bandwidth intensive and complex applications for next-generation Internet innovations and collaborative business services.

Enhance Your IP Transport Through Innovation

IPoDWDM collapses network layers by tightly integrating DWDM interfaces with the routing platform. This increases efficiency, simplifies management, and accelerates service delivery. Combined with industry-leading omnidirectional and colorless reconfigurable optical add/drop multiplexer (ROADM) technology, IPoDWDM educes service truck rolls, power consumption, and space and cooling requirements. Numerous providers now use the power of IPoDWDM to distribute video content rapidly and efficiently over an all-IP network. They can provision additional network capacity instantly as demand increases for any-play consumer and managed business services. The Cisco IPoDWDM solution reduces transport elements, while supporting advanced multilayer features such as proactive protection and control plane interaction, dramatically reducing operating expenses and capital costs.

Benefit from Valuable Product Enhancements

The Cisco IPoDWDM solution features:

Ultra long haul 100 Gb IPoDWDM capability, using the Cisco CRS 1-Port 100 Gigabit Ethernet Coherent

DWDM Interface Module

100 Gb coherent regeneration using the single-slot, 100 Gb trunk card on the ONS 15454 Multiservice

Transport Platform (MSTP), fully compatible with proactive protection.

Proactive protection on the Cisco ASR 9000 Series 2-Port and 1-Port 100 Gigabit Ethernet Line Cards

Industry-leading 10 Gb IPoDWDM density on the ASR 9000 Series 36-Port and 24-Port 10 Gigabit Ethernet

Line Cards

Complete Generalized Multiprotocol Label Switching (GMPLS) interoperability between the CRS-3, ASR 9000, and ONS 15454 MSTP

**Question No : 3  - (Topic 1)**

Which three of these are optical channel data unit (ODU) overhead fields? (Choose three)

**A.** general communication channel 0 (GCC0)
**B.** section monitoring
**C.** reserved (RES)
**D.** general communication channels 1 and 2 (GCC1 GCC2)
**E.** tandem connection monitoring activation deactivation (TCM ACT)

**Answer: C,D,E**

**Explanation:** Optical Data Unit (ODU)

The ODU overhead is broken into several fields: RES, PM, TCMi, TCM ACT, FTFL, EXP, GCC1/GCC2 and APS/PCC. The reserved (RES) bytes are undefined and are set aside for future applications.

The path monitoring (PM) field is similar to the SM field described above. It contains the TTI, BIP-8, BEI, BDI and Status (STAT) sub-fields.

There are six tandem connection monitoring (TCMi) fields that define the ODU TCM sub-layer, each containing TTI, BIP-8, BEI/BIAE, BDI and STAT sub-fields associated to each TCM level (i=1 to 6). The STAT sub-field is used in the PM and TCMi fields to provide an indication of the presence or absence of maintenance signals.

The tandem connection monitoring activation/deactivation (TCM ACT) field is currently undefined in the standards. The fault type and fault location reporting communication channel (FTFL) field is used to create a message spread over a 256-byte multiframe. It provides the ability to send forward and backward path-level fault indications.

The experimental (EXP) field is a field that is not subject to standards and is available for network operator applications.

General communication channels 1 and 2 (GCC1/GCC2) fields are very similar to the GCC0 field except that each channel is available in the ODU.

The automatic protection switching and protection communication channel (APS/PCC) supports up to eight levels of nested APS/PCC signals, which are associated to a dedicated-connection monitoring level depending on the value of the multiframe.

## Question No : 4  - (Topic 1)

What is one of the primary overhead fields associated with the Optical Payload Unit (OPU)?

**A.** path monitoring
**B.** tandem connection monitoring activation deactivation (TCM ACT)
**C.** Payload Structure Identifier (PSI)
**D.** multiframe alignment signal (MFAS)
**E.** section monitoring

**Answer: C**

**Explanation:** Optical Payload Unit (OPU)

In order to begin describing the OTN as defined by the ITU G.709 standard, we must first enumerate its critical elements, their termination points, and the way they relate to one another in terms of hierarchy and function.

The primary overhead field associated with the OPU is the payload structure identifier (PSI). This is a 256-byte multiframe whose first byte is defined as the payload type (PT). The remaining 255 bytes are currently reserved. The other fields in the OPU overhead are dependent on the mapping capabilities associated to the OPU. For an asynchronous mapping (the client signal and OPU clock are different) justification control (JC) bytes are available to Application Note 153Telecom Test and Measurement compensate for clock rate differences. For a purely synchronous mapping (client source and OPU clock are the same), the JC bytes become reserved. Further details on mapping are available in ITU G.709.

## Question No : 5  - (Topic 1)

In optical channel transport unit overhead (OTU OH), what are general communication

channels 1 and 2 (GCC1/GCC2) used for?

**A.** for trail trace identification

**B.** as the backward defect indicator

**C.** to transmit information between OTU termination points

**D.** to extend command and management functions over several frames

**E.** General communication channels 1 and 2 (GCC1/GCC2) do not belong to OTU OH.

**Answer: E**

**Explanation:** OTU overhead:

The OTU overhead consists of three bytes for section monitoring (SM), a two-byte general communications channel (GCC0), and two bytes reserved for future international standardization.

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**Question No : 6  - (Topic 1)**

What is the minimum hardware configuration of the multishelf Cisco CRS-1 system?

**A.** One route processor (RP) card and one modular services card (MSC)

**B.** One distributed route processor (DRP) and one S13 fabric card (SFC)

**C.** One line card chassis (LCC) and one fabric card chassis (FCC)

**D.** One route processor (RP) and one fabric card chassis (FCC)

**E.** One line card chassis (LCC) and one S13 fabric card (SFC)

**Answer: C**

**Explanation:** 1.4. SP high end product

A minimum of one LCC and one FCC are required to configure a multishelf system.

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**Question No : 7  - (Topic 1)**

Cisco IOS XR software is partitioned into three planes: control, data, and management. Which three of these belong to the data plane? (Choose three.)

**A.** XML

**B.** RIB

**C.** FIB

**D.** QoS

**E.** PFI

**Answer: C,D,E**

**Explanation:** (FIB, QoS, PFI). RIB is part of control plane

1.4. SP high end product

Cisco IOS XR Software is partitioned into three planes:

Control: Distributes routing tasks and management of the routing information base (RIB) to participating RPs; different routing processes can be running on different physical units.

DatA. Maintains the forwarding information base (FIB) changes across the participating nodes, letting the router perform as a single forwarding entity.

Management: Controls the operation of the router as a single networking element.

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**Question No : 8  - (Topic 1)**

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Which statement about Software Maintenance Upgrade is true?

**A.** CRS-1 SMU can be applied to a different platform, and vice versa.

**B.** SMU is an executable code for running a process or libraries that are shared between the different processes.

**C.** SMUs for each release are individually downloadable from Cisco.com and come in the form of a tar ball.

**D.** SMUs provide software fixes for critical network down and qualification blocking issues. Therefore, every software defect has a corresponding SMU.

**E.** SMUs are release-specific. If an issue affects multiple platforms or releases, an SMU is built separately for each release and each platform.

**Answer: E**

**Explanation:** 1.4. SP high end product

SMUs for each release are individually downloadable from Cisco.com, whereas the bootable files and optional PIEs come in the form of a tarball.

SMUs are release specific. If an issue affects multiple platforms or releases, an SMU will be separately built for each release and each platform depending on the mission-critical need.

A CRS-1 SMU cannot be applied to a different platform, and vice versa.

SMUs provide software fixes for critical network-down and qualification-blocking issues.

Therefore, every software defect will not have a corresponding SMU.

## Question No : 9  - (Topic 1)

Cisco IOS XR has implemented a nonstop routing feature so that when RP failover occurs, the routing information can be recovered locally. Which protocol does not support the NSR feature?

**A.** OSPF
**B.** LDP
**C.** BGP
**D.** IS-IS
**E.** RSVP

**Answer: E**

## Question No : 10  - (Topic 1)

Which three components are included in the Cisco IOS XR infrastructure? (Choose three.)

**A.** modular line cards
**B.** shelf controllers
**C.** route processors
**D.** service processors
**E.** distributed service cards

**Answer: B,C,D**

**Explanation:** 1.4. SP high end product

1.4.01. IOS-XR structure

Distributed Infrastructure

The kernel is replicated across the router infrastructure. The services and client applications can be distributed across the router infrastructure. The infrastructure includes route processors (RPs), distributed route processors (DRPs), service processors (SPs), shelf controllers (SCs), modular service cards (MSCs), and line cards (LCs).

**Question No : 11 - (Topic 1)**

All secure domain routers (SDRs) have shared attribute and resources. Which three resources are shared all SDRs? (Choose three.)

**A.** privilege-level configuration
**B.** fabric cards
**C.** SNMP traps
**D.** admin-level configuration
**E.** exec-level configuration

**Answer: B,C,D**

**Explanation:** 1.4. SP high end product

There are shared attributes and resources common to all SDRs. It is important to note that the shared resources are critical to the system's overall operation. Some examples of shared resources that are common to SDR are:

- Environmental resources.
- Power supplies.
- Fan trays.
- Fan controllers.
- Fabric cards.

Software related:

* Exec-level configuration. Configuration in admin mode can affect all SDRs.

* Admin-level configuration. Admin-level command can impact owner SDR and non-owner SDRs.

* Process instances. A few processes are shared, systemwide processes such as LRd (SDR Deamon).

Management:

* SNMP traps. For example, shared power, fans, and fabric-related traps.

* SNMP polling. Shared for power, fans, and fabric-related MIBS.

* Syslogs. Some non-owner SDRs are logged to the owner SDR.

* Shared environment variables.

**Question No : 12 - (Topic 1)**

Which three statements about the secure domain router are true? (Choose three.)

**A.** The logical router can span across chassis.
**B.** The fabric and system controller module are shared by all logical routers.
**C.** Each logical router has a distinct fabric and system controller module
**D.** The logical router can share a route processor
**E.** The logical router cannot share a route processor.

### Answer: A,B,E

**Explanation:**

1.4. SP high end product

1.4.04. Secure domain router (SDR)

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### Question No : 13  - (Topic 1)

There are two cabling schemes to choose from when implementing a Cisco CRS-1 multi shelf system: single module cabling and multi module cabling. What is the maximum capacity of the LCCs that are supported in multi module cabling?

**A.** 9 LCCs
**B.** 7 LCCs
**C.** 10 LCCs
**D.** 6 LCCs
**E.** 8 LCCs

### Answer: A

**Explanation:**

1.4. SP high end product

A single card or multiple cards can be grouped as a fabric plane. Single-module cabling requires eight S2 cards in the fabric card chassis. In this mode, each S2 is dedicated to a plane number and cabled to the appropriate line card chassis plane. If your network requires more than three

LCC in the multi shelf system, this is achieved using the multi module configuration. Multi module configuration provides capacity to add up to nine LCCs.