

# CISCO CCNA 3 OSPF CONCEPTS AND CONFIGURATION CHECKPOINT PRACTICE EXAM (SAMPLE) STUDY GUIDE



## SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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<https://ciscoccna3ospfconceptscheckpt.examzify.com>



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# Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

# How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

## 1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

## 2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

## 3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

## 4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

## 5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

## 6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

## Questions

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- 1. How does OSPF determine the best path to a destination?**
  - A. By using hop count as the metric
  - B. By evaluating the cost of the links
  - C. By selecting the shortest path in terms of bandwidth
  - D. By prioritizing paths from the routing table
- 2. What type of database is used in OSPF to maintain routing information?**
  - A. Routing table
  - B. Link-state database
  - C. Distance vector database
  - D. Topology database
- 3. When are DR and BDR elections required in an OSPF network?**
  - A. When OSPF is first configured
  - B. When there is a link failure
  - C. When the routers are interconnected over a common Ethernet network
  - D. When a router is added to the OSPF area
- 4. During which process does a router compare its topology with that of another router?**
  - A. Link-state update
  - B. Database description
  - C. Hello packet exchange
  - D. Best path selection
- 5. What does OSPF use to ensure reliable transport of routing information?**
  - A. UDP packets
  - B. IP packets
  - C. ICMP messages
  - D. TCP packets
- 6. What does adjacency mean in OSPF?**
  - A. A full routing relationship between two routers
  - B. A partial routing relationship
  - C. A non-existent relationship
  - D. A backup understanding between routers

7. What is the default OSPF cost for any link with a bandwidth of 100 Mb/s or greater?
- A. 20
  - B. 5
  - C. 1
  - D. 10
8. What is the default OSPF hello interval for most network types?
- A. 10 seconds
  - B. 20 seconds
  - C. 30 seconds
  - D. 5 seconds
9. What happens during the Loading state in OSPF?
- A. The router is establishing neighbor adjacencies
  - B. The router is sending LSAs
  - C. The router is completing the exchange of LSAs
  - D. The router is acknowledging packets from neighbors
10. Which command is used to verify the hello and dead timer intervals on an OSPF interface?
- A. show ip ospf interface
  - B. show ip ospf neighbor
  - C. show ip ospf interface serial 0/0/0
  - D. show running-config

## **Answers**

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1. B
2. B
3. C
4. B
5. B
6. A
7. C
8. A
9. C
10. C

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## **Explanations**

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## 1. How does OSPF determine the best path to a destination?

- A. By using hop count as the metric
- B. By evaluating the cost of the links**
- C. By selecting the shortest path in terms of bandwidth
- D. By prioritizing paths from the routing table

OSPF, or Open Shortest Path First, utilizes a cost metric based on the bandwidth of the links to determine the best path to a destination. Each interface on a router is assigned a cost, which is typically calculated using the formula:  $100,000,000/\text{bandwidth in bits per second}$ . This means that higher bandwidth links have lower costs, leading OSPF to prefer paths that traverse faster interfaces. When OSPF routers exchange link-state information, they construct a complete topological map of the network. They then employ the Dijkstra algorithm, also known as the Shortest Path First (SPF) algorithm, to compute the shortest path to each destination based on the accumulated costs of the links. As a result, OSPF is efficient in finding the optimal path, favoring routes that minimize the overall cost rather than simply counting the number of hops or prioritizing paths from routing tables. This method ensures that OSPF not only considers the number of routers (or hops) but places a more significant emphasis on the performance characteristics of the connections in the network. Thus, the correct determination of the best path hinges primarily on the evaluation of the link costs assigned to each route according to their respective bandwidths.

## 2. What type of database is used in OSPF to maintain routing information?

- A. Routing table
- B. Link-state database**
- C. Distance vector database
- D. Topology database

The correct choice for the type of database used in OSPF (Open Shortest Path First) to maintain routing information is the link-state database. This database contains information about the state of each link and the routers connected to that link. OSPF is a link-state routing protocol, which means that each router maintains a link-state database that provides a detailed view of the topology of the network. In a link-state database, routers share information about their directly connected neighbors and the cost of the links to those neighbors. This information allows each router to construct a complete picture of the network's topology. The link-state database is crucial for the OSPF algorithm, which uses the Shortest Path First (SPF) algorithm, known as Dijkstra's algorithm, to compute the shortest paths to various destinations. The routing table is different; it is derived from the link-state database and contains the best paths to reach various networks, but it does not store the raw state information of the links. Similarly, a distance vector database is associated with distance vector protocols like RIP and does not apply to OSPF, and the term topology database is not a standard term used or recognized in OSPF terminology. Thus, the link-state database is uniquely suited

### 3. When are DR and BDR elections required in an OSPF network?

- A. When OSPF is first configured
- B. When there is a link failure
- C. When the routers are interconnected over a common Ethernet network**
- D. When a router is added to the OSPF area

DR (Designated Router) and BDR (Backup Designated Router) elections are required in an OSPF network specifically in scenarios where multiple OSPF routers are interconnected over a common broadcast medium, such as Ethernet. The purpose of electing a DR and BDR is to optimize the way OSPF routers exchange routing information. In a broadcast environment, if every router were to send updates to every other router, it could lead to excessive traffic and inefficient use of network resources. By designating a DR, the selected router takes on the responsibility of coordinating communications and aggregate routing updates, thereby reducing the amount of traffic on the network. The BDR serves as a backup in case the DR becomes unavailable. This election process is crucial for maintaining efficiency and minimizing routing loops in such environments. While OSPF configuration, link failures, and adding routers to an OSPF area may trigger other processes, the specific requirement for DR and BDR elections is directly tied to how routers communicate over a broadcast medium.

### 4. During which process does a router compare its topology with that of another router?

- A. Link-state update
- B. Database description**
- C. Hello packet exchange
- D. Best path selection

The correct answer is the database description process. During this phase, routers build and maintain a synchronized link-state database (LSDB) by exchanging summaries of their link-state information. When a router sends a database description packet, it includes information about the types of link-state advertisements (LSAs) it holds, allowing the receiving router to determine whether it has the most up-to-date information. This comparison is crucial as it helps routers identify which LSAs they need to request from each other, leading to the overall updating of the link-state database. The database description packets ensure that both routers have a consistent view of the network topology, which is vital for accurate and efficient routing. In contrast, the other processes listed have different purposes: link-state updates are concerned with sending the actual LSAs after the initial comparison, hello packet exchanges are used primarily to establish and maintain OSPF neighbor relationships, and best path selection occurs after the LSDB is synchronized and involves determining the optimal route to each destination based on various metrics.

## 5. What does OSPF use to ensure reliable transport of routing information?

- A. UDP packets
- B. IP packets**
- C. ICMP messages
- D. TCP packets

OSPF, or Open Shortest Path First, utilizes IP packets to transport routing information. This is fundamental because OSPF is a link-state routing protocol that operates directly on top of the IP layer. It encapsulates its routing information within IP packets and uses the Internet Protocol for transmitting the data across the network. This choice reflects the underlying architecture of OSPF, which relies on the capabilities of IP to deliver routing updates reliably. By employing IP packets, OSPF can operate over a variety of network types, ensuring its flexibility and efficiency in different networking scenarios. In contrast, UDP (User Datagram Protocol), which is often used for applications needing fast, connectionless communication, and TCP (Transmission Control Protocol), which ensures reliable, ordered, and error-checked delivery of a stream of data, do not align with OSPF's operational requirements. ICMP (Internet Control Message Protocol), while essential for network diagnostics and error reporting, is not utilized for the transport of OSPF routing information. These protocols serve different purposes and are not designed for the specific needs of OSPF's routing information exchange.

## 6. What does adjacency mean in OSPF?

- A. A full routing relationship between two routers**
- B. A partial routing relationship
- C. A non-existent relationship
- D. A backup understanding between routers

Adjacency in OSPF (Open Shortest Path First) refers to the state of a full routing relationship established between two OSPF routers. This relationship is crucial for OSPF to function correctly, as it allows routers to exchange routing information efficiently. When two routers form an adjacency, they have successfully completed the OSPF neighbor discovery process, communicated their respective OSPF parameters, and agreed upon the Link State Database (LSDB) contents. Once an adjacency is formed, the routers will share their routing updates, allowing them to synchronize their routing tables. This synchronization aids in creating a cohesive and updated network view, which is essential for effective routing decisions. Therefore, adjacency signifies a robust and fully-functional connection between two OSPF routers, in contrast to other states that might indicate partial or non-existent communications.

**7. What is the default OSPF cost for any link with a bandwidth of 100 Mb/s or greater?**

- A. 20
- B. 5
- C. 1**
- D. 10

*In OSPF (Open Shortest Path First), the cost of a link is inversely related to its bandwidth. The formula used to calculate the OSPF cost is:  $\text{Cost} = \text{Reference Bandwidth} / \text{Interface Bandwidth}$ . The default reference bandwidth in OSPF is typically set to 100 Mbps, although it can be modified if needed. For any link with a bandwidth of 100 Mb/s or greater, the cost would be calculated as follows:  $\text{Cost} = 100,000 \text{ kbps} / 100,000 \text{ kbps} = 1$ . This means that any link running at 100 Mbps or faster will have a default OSPF cost of 1. This value is essential for OSPF to determine the most efficient path through the network based on link costs. A lower cost indicates a more preferred route. Higher bandwidth links contribute to lower costs, making them more favorable during the OSPF route selection process. Understanding this cost calculation is crucial for network engineers and administrators when designing and troubleshooting OSPF-configured networks, ensuring optimal routing decisions are made for data flow.*

**8. What is the default OSPF hello interval for most network types?**

- A. 10 seconds**
- B. 20 seconds
- C. 30 seconds
- D. 5 seconds

*The default OSPF hello interval for most network types, including broadcast and point-to-point networks, is indeed 10 seconds. The hello interval is a crucial parameter in OSPF (Open Shortest Path First) because it dictates how often OSPF routers send hello packets to discover and maintain neighbor relationships. These hello packets are necessary for establishing and maintaining the adjacencies between OSPF routers. By default, if routers do not receive a hello packet from a neighbor within a specific time frame (which depends on the dead interval), they will consider that neighbor to be down and will initiate the process of re-calculating the routing table. Setting the hello interval to 10 seconds strikes a balance between responsiveness and bandwidth consumption. If the interval were set too low, it could lead to unnecessary overhead on the network due to the frequent transmission of these packets, while a higher interval could delay neighbor discovery and result in slower convergence times. Understanding the default hello interval is essential when configuring or troubleshooting OSPF in diverse network environments.*

## 9. What happens during the Loading state in OSPF?

- A. The router is establishing neighbor adjacencies
- B. The router is sending LSAs
- C. The router is completing the exchange of LSAs**
- D. The router is acknowledging packets from neighbors

*During the Loading state in OSPF (Open Shortest Path First), the router is completing the exchange of Link State Advertisements (LSAs) with its neighbors. This state occurs after the Initial state and the Exchange state, where routers have already sent and received their LSAs. In the Loading state, the routers specifically confirm that they have received all the necessary LSAs from their neighbors to build a complete view of the network topology. They may send additional LSAs to ensure all routers in the area have the most up-to-date information. This is crucial for OSPF's operation, as it relies on having an accurate and complete link-state database (LSDB) to perform correct route calculations. Once the LSAs have been completely exchanged and acknowledged, the routers then transition to the Full state, where they have established fully adjacent relationships with their neighbors and have converged on the same topology information.*

## 10. Which command is used to verify the hello and dead timer intervals on an OSPF interface?

- A. show ip ospf interface
- B. show ip ospf neighbor
- C. show ip ospf interface serial 0/0/0**
- D. show running-config

*The command that accurately verifies the hello and dead timer intervals on an OSPF interface is the one that specifies the interface directly, allowing for targeted examination of that particular interface's OSPF settings. In this case, using the command referring to a specific interface, such as "show ip ospf interface serial 0/0/0," provides detailed information about the OSPF parameters configured for that specific interface, including the hello and dead intervals. By executing this command, it enables the network administrator to quickly check OSPF settings that are crucial for ensuring that OSPF neighbors can effectively communicate. The hello timer determines how often OSPF routers send hello packets to maintain neighbor relationships, while the dead timer specifies how long a router should wait without receiving a hello packet before declaring a neighbor down. The broader command to display OSPF interface information does provide overall insights into OSPF configurations and will include these timers. However, by providing an interface name, the command focuses specifically on the parameters for that given interface, enhancing clarity and precision in troubleshooting or verification tasks. Utilizing "show ip ospf interface" alone does not narrow down the context, potentially showing output for all OSPF interfaces and making it less convenient*

## Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at [hello@examzify.com](mailto:hello@examzify.com).

Or visit your dedicated course page for more study tools and resources:

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We wish you the very best on your exam journey. You've got this!

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