



**FORTINET**<sup>®</sup>



# NSE 8 Certification

Public Handbook  
for FortiGate 5.2 and higher

NSE 8 Certification Public Handbook

for FortiGate 5.2 and higher

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# Network Security Expert (NSE) 8

The Fortinet NSE 8 certification recognizes a candidate's comprehensive and in-depth ability to design, configure, and troubleshoot network security using Fortinet products in complex networks.

NSE 8 is the top level in the Fortinet certification program and is designed to reflect best practices using Fortinet solutions and in the networking and security industry.

## NSE 8 Validity and Recertification

The NSE 8 certification is valid for two years.

To recertify, the candidate should take the latest version of the NSE 8 written exam.

# About This Document

This document includes everything you need to be prepared for the NSE 8 certification.

## Audience

The intended audience for this document is as follows:

- NSE 8 written candidate:
  - Those who want to take the NSE 8 written exam.
- NSE 8 practical candidate:
  - Those who want to take the NSE 8 practical exam.
- Partners, distributors, ATCs, and the general public:
  - Those who are looking for more information related to the NSE 8 program.

## Document Version

This document contains all of the current information relating to the NSE 8 program and its components.

This document can change at any time without notice. Review the latest version of this document, the FAQ document, and the NSE 8 exam description, which can be found on the Fortinet public website:

<https://www.fortinet.com/support-and-training/training/network-security-expert-program/nse-8.html>

# Exam Components

Assessment for Fortinet NSE 8 certification has two parts: a written exam, and a practical exam.

## Written Exam

The Fortinet NSE 8 written exam is a 90-minute multiple-choice exam that is offered at Pearson VUE test centers worldwide. Questions include design scenarios, exhibits, configuration extracts, and troubleshooting captures that assess the networking, security, and Fortinet solution knowledge and experience of the test taker. A practice exam is available at the Fortinet NSE Institute, to give you an idea of the questions on the NSE 8 exam at Pearson VUE.

NSE 8 written exam highlights:

- Name: NSE 8 - Fortinet Network Security Expert
- Language: English only
- Available at: Pearson VUE test centers worldwide
- Cost: USD 400.00
- Number of questions: 65
- Time allowed to complete: 90 minutes total test time
- Scoring method: Each question must be 100% correct for credit. No partial credit is given. No deductions are made for incorrect answers.
- Types of questions: Multiple choice and multiple select with exhibits
- Time required between attempts: 15 days
- Time for acknowledgment and score to be reflected in NSE Institute transcripts: 21 days
- Scoring: Pass or fail
- The test taker will receive a document showing their overall result: pass or fail. The document will also show which sections the test taker passed or failed. No further details or assistance is provided.
- Expiration: 2 years

## Practical Exam

After a candidate has passed the prerequisite NSE 8 written exam, the candidate can register to take the practical exam either remotely or in person at one of Fortinet's NSE 8 test centers.

The Fortinet NSE 8 practical exam is a two-day hands-on evaluation. During the practical exam, the candidate must configure and validate a complete network topology involving multiple Fortinet products.

Highlights of the NSE 8 practical exam:

- Language: English only
- Available at: On-site or remotely; scheduling required
- Cost: USD 1600.00
- Number of tasks: 48
- Time allowed to complete: 2 days; proctored
- Scoring method: Each task must be 100% correct for credit. No partial credit is given. No deductions are made for incorrect answers.
- Type of tasks: Hands-on configuration and troubleshooting
- Time required between attempts: 15 days
- Time for acknowledgment and score to be reflected in the NSE Institute transcripts: 21 days
- Scoring: Pass or fail
- The test taker will receive a document showing their overall result: pass or fail. The document will also show which sections the test taker passed or failed. No further details or assistance is provided.



## Components

The NSE 8 practical exam has been deployed for almost all Fortinet products. It is a hybrid infrastructure with a mix of hardware and virtual components.

Each student will work in their own unique and independent environment or POD. Each POD is identified by its own desktop color

- POD0: white
- POD1: orange
- POD2: green
- POD3: gray
- POD4: blue

No external documentation or material is allowed in the testing room.

All material necessary to complete the exam is provided on each POD:

- Computer and peripherals (mouse, keyboard, monitors, and so on)
- Exam tasks and diagrams
- Notepad with pen or pencil
- Configuration guides: handbooks, admin guides, CLI documents for all the products and solutions included in the exam

## Laptop Computers

Each NSE 8 test taker will be provided with a dedicated, Fortinet-owned laptop, which the test taker must use to complete all the tasks for the practical exam.

Main software:

- Operating System: Windows 7 Professional SP1 (minimum)
- Windows Remote Desktop Client

Additional software:

- Adobe Acrobat
- FortiClient
- Mozilla Firefox<sup>1</sup>
- VMware VSphere Client 6.0.0

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<sup>1</sup> Default browser.

- Wireshark
- FileZilla FTP
- Mozilla Thunderbird
- Notepad++
- Putty
- 3CDaemon (FTP/TFTP)

## Additional Information

The following are additional details regarding the NSE 8 practical exam:

- There is an introduction session (exam overview and instructions) on Day 1 of the exam.
- No switching or cabling is required during the exam.
- Some troubleshooting might be required during the exam. The complexity of this troubleshooting is directly related to the configuration of each test taker.
- No external material or devices are allowed in the testing room, including computers, cell phones, tablets, or any other electronic devices.
- Lunch is included for each day of the exam.
- Other details are shared during the introduction session.

# NSE 8 Sites

The NSE 8 practical exam is delivered at the following sites:

- Sunrise Florida, USA
  - Address:
    - 13450 W Sunrise Blvd
    - Suite 430
    - Sunrise FL 33323, USA
  - Phone:
    - + 954-368-9990
- Sophia Antipolis, France
  - Address:
    - 905 rue Albert Einstein
    - Bâtiment Fortinet Agora
    - 06560 Valbonne, France
  - Phone:
    - +33-4-8987-0500

Both locations can offer local and remote exams for a maximum of five test takers simultaneously, using a separate infrastructure for each student.

# Exam Preparation

## Certification Topics

Candidates preparing for the Fortinet NSE 8 certification exam (written and practical) should be familiar with the following topics:

**Note:** This list is a guideline only. The topics covered in the exam can change at any time without notice.

1. FortiGate device operation
  - a. Controlling management access
  - b. CLI operation and configuration
    - i. Commands
    - ii. Advanced CLI configuration
  - c. Advanced troubleshooting
    - i. Diagnostics
    - ii. Packet and flow captures
    - iii. Analysis
  - d. GUI operation and configuration
    - i. Dashboards
    - ii. Menus
  - e. Hardware operation and configuration
    - i. Hardware-related features and configuration
  - f. Firmware management
    - i. Upgrades
2. FortiGate operation modes and VDOMs
  - a. Operation mode definition and configuration
    - i. NAT/route mode
    - ii. Transparent mode
  - b. Cluster operation
    - i. Advanced cluster management
    - ii. Different cluster operation options
  - c. Advanced VDOM operation and configuration
    - i. Resource settings
    - ii. Operation modes

- iii. Inter-VDOM configurations
  - d. Virtual clustering
    - i. Operation and configuration
- 3. FortiGate network connectivity and reachability
  - a. High availability (HA) operation and configuration
    - i. Operation modes
    - ii. Configuring and connecting
  - b. Advanced clustering operation
    - i. Cluster management
    - ii. VDOMs and HA
    - iii. Virtual Cluster HA
  - c. HA and load balancing
  - d. Advanced FortiOS network connectivity
    - i. WAN load balancing
    - ii. Link load balancing
  - e. Advanced interface operation and configuration
    - i. VLANs
    - ii. Wireless
    - iii. DHCP
    - iv. LACP
  - f. OSI Layer 2 protocols
    - i. VLANs
    - ii. ARP
    - iii. Layer 2 features and configurations
  - g. IPv4 addressing and routing
    - i. Static routing
    - ii. IPv4 to IPv6
  - h. IPv6 addressing and routing
    - i. Static routing
    - ii. IPv6 to IPv4
  - i. Advanced static and dynamic routing
    - i. IPv4 and IPv6: static, BGP, OSPF
- 4. FortiGate policies and NGFW
  - a. Advanced firewall operation and configuration
    - i. Firewall policies
      - 1. IPv4

- 2. IPv6
  - ii. Web and explicit proxy
- b. Advanced security policies
  - i. Security profile configuration
- c. NAT operation and configuration
  - i. Basic NAT
  - ii. Advanced NAT: NAT64, NAT46
- d. Firewall policies
  - i. Advanced configuration and features
- e. Endpoint control operation and configuration
  - i. Device identification
- f. Third-party integration
  - i. Protocols
  - ii. Features
- 5. FortiGate VPNs
  - a. Advanced IPsec VPN operation and configuration
    - i. Dynamic IPsec
    - ii. VPN tunnels
    - iii. Authentication
  - b. Advanced SSL VPNs operation and configuration
    - i. Modes of operation and configuration
    - ii. SSL VPN web portals
    - iii. Secure browsing
  - c. VPNs and advanced routing
    - i. VPNs and static routing
    - ii. VPNs and dynamic routing
- 6. FortiGate authentication
  - a. Users and user groups
  - b. Authentication methods operation and configuration
  - c. Firewall policies and authentication
  - d. Fortinet single sign-on
  - e. Third-party integration and authentication
  - f. Two-factor authentication
- 7. Fortinet wireless solutions
  - a. Deploying wireless solutions
  - b. FortiGate as wireless controller

- c. Configuring secure wireless
  - d. Protecting wireless networks
- 8. Fortinet centralized reports and management
  - a. Remote log and reporting operation and configuration
  - b. FortiAnalyzer operation and configuration
    - i. Advanced FortiAnalyzer features
  - c. FortiManager operation and configuration
    - i. Advanced FortiManager features
  - d. FortiOS logging and reporting
- 9. Fortinet advanced technologies
  - a. FortiGate security features and advanced technologies integration
    - i. Architecture integration
    - ii. Design integration
    - iii. Interoperability between FortiGate and advanced technologies solutions
  - b. FortiADC (D series) operation and configuration
    - i. Basic networking
    - ii. Deployment options
    - iii. System management
    - iv. Server load balancing and its components
  - c. FortiWeb operation and configuration
    - i. Basic networking
    - ii. Deployment options
    - iii. Policy configuration
    - iv. User authentication
    - v. Load balancing configuration
    - vi. Attack blocking behavior and configuration
  - d. FortiSandbox integration and configuration
    - i. Basic networking
    - ii. Deployment options
    - iii. FortiGate and advanced technologies integration
    - iv. Types of detection
  - e. FortiAuthenticator advanced operation and configuration
    - i. Basic setup and configuration
    - ii. Authentication and user management
    - iii. Fortinet single sign-on options
  - f. FortiMail advanced operation and configuration



- i. Basic networking
- ii. Deployment options and operation modes
- iii. System settings configuration
- iv. Policy and profiles configuration
- v. Antispam settings
- g. FortiVoice enterprise
  - i. Basic settings and operation
  - ii. Phone system settings and extensions

For all of the previously mentioned topics and solutions, knowledge of troubleshooting is an asset.



## Firmware Versions

The content of the NSE 8 certification exam is based on the following firmware versions:

**Note:** Firmware versions can change at any time without notice. Please review the latest version of this document, the FAQ document, and the NSE 8 exam description.

Product Name	Firmware Version
FortiGate	5.2.x
FortiAP	5.2.x
FortiManager / FortiAnalyzer	5.2.x
FortiADC (VM and D series)	4.3.x
FortiWeb	5.3.x
FortiSandbox	2.1.x
FortiAuthenticator	3.3.0
FortiMail	5.2.x
FortiVoice Enterprise	4.0.x
Windows XP	Pro SP2 32 Bits
Windows 7	Pro SP1 32 bits
Windows Server	2008 R2
Kali Linux	3.18
Ubuntu Server	14.04 LTS

## Recommended Study Materials

This section lists the study materials that are recommended to help test candidates prepare for the NSE 8 certification exams.

- Administration guides and handbooks:
  - FortiGate
  - FortiManager
  - FortiAnalyzer
  - FortiADC (VM and D Series)
  - FortiWeb
  - FortiSandbox
  - FortiAuthenticator
  - FortiMail
  - FortiVoice (Enterprise)
- CLI references
- Cookbooks
- Fortinet Knowledge Base articles

## Recommended Preparatory Courses

The NSE 8 certification exams have no prerequisites, but we highly recommend that test candidates complete the following courses prior to taking the exams:

- NSE 2: Network Security Solutions
- NSE 3: Advance Network Security Solutions Design
- NSE 4: FortiGate I and II
- NSE 6:
  - FortiWeb
  - FortiMail
  - FortiOS Integrated and Cloud Wi-Fi
  - FortiADC for D Series Models and FortiADC VM
  - FortiSandbox
  - FortiAuthenticator
- NSE7: FortiGate III



## Recommended Knowledge and Experience

It is strongly recommended the test candidates have extensive knowledge of and experience in the following areas:

- Third-party systems and practices:
  - Advanced virtual Infrastructures
  - Advanced switching and routing
  - Advanced operating systems: Windows and Linux
  - Security vulnerabilities and penetration testing tools and techniques

Fortinet solutions, networking, and security practices:

- Design
- Deployment
- Management and administration
- Troubleshooting

For more information, please visit:

<https://www.fortinet.com/support-and-training/training/network-security-expert-program.html>

# Exam Process

The test taker will follow these steps to complete both the written and practical components of the NSE 8 certification exam:

1. Buy a voucher to take the written exam.
  - SKU: NSE8-EX
  - Price: USD 400.00 per voucher per candidate
  - Lifespan: One year. If the voucher is not used during the one-year lifespan, a replacement voucher will *not* be issued.
  - Usage restrictions: Each voucher can be use only once
2. Go to the Person VUE [website](#) to register for the written exam. The following is among the information that must be supplied when registering:

**Note:** When entering an email address, a corporate address is preferred.

Basic Info	Location
Customer ID	Address
First Name	Country
Middle Name	State/Province
Last Name	City
Title	Postal Code
Company	Phone
<i>Email</i>	Fax
Additional Info	Comments
Company <i>Email</i>	
Is Employee	
<i>Relationship</i>	
Updated by	
Updated Date	

**Important!** The information provided when registering on the Pearson VUE site must match the corresponding information provided to Fortinet.

3. On the Pearson VUE site, choose date and location to take the written component of the exam.
  - If the test taker passes the written component of the exam, they can move on to the practical component.
  - If a test taker passes the written exam, they do *not* receive a certificate.
  - If the test taker does not pass the exam, they will require a new voucher to rewrite the exam again.
4. Buy a voucher to take the practical exam.
  - SKU: NSE8-EX-PR
  - Price: USD 1600.00 per voucher per candidate
5. Enroll in the practical component through the regional training team administrator:
  - [training@fortinet.com](mailto:training@fortinet.com) for AMER
  - [EMEAtraining@fortinet.com](mailto:EMEAtraining@fortinet.com) for EMEA
  - [APACtraining@fortinet.com](mailto:APACtraining@fortinet.com) for APJC, ANZ, and INDIA

**Important!** The information provided when enrolling to take the practical component must match the corresponding information that they provided when registering on the Pearson VUE site.

6. Indicate if the exam will be taken on-site or at a remote location. If a remote exam is requested, the following conditions apply:
  - A minimum of four test takers are required for a session.
  - Location and proctors should be defined within 60 days (minimum) of the request date and exam date.
  - Fortinet Training Operations team confirms if the requested date is available on the calendar. If it is, they will notify the test taker that the date, site, and proctor have been approved.
  - If the test taker needs to cancel or reschedule the exam, they must inform the Fortinet Training Operations team at least 20 days before of the scheduled exam date.
  - Approved facilities for taking the remote exam, include:
    - Fortinet offices worldwide
    - Distributor offices worldwide
    - ATCs offices worldwide

**Note:** Review the [Requirements for the NSE 8 Remote Exam](#) section for more details and in-depth rules for the NSE 8 remote exam option.
7. After the test taker completes the practical exam and the proctor graded it, the test taker will receive an *Examination Summary Report* with the results of the exam. The report will include:
  - A global pass or fail section
  - All of the exam sections with corresponding results: pass or fail

8. The Fortinet Technical Training Operations team will follow the internal process to confirm that the test taker has passed both exams: the written and the practical.
9. If the test taker passes both exams, the updated information will be available at the NSE Institute site in candidate's profile. A digital certificate will be available for download.
10. After successfully completing this process, the Fortinet Training department will proceed with the preparation of the NSE 8 Award box. The NSE 8 Award box will be delivered to the shipping address provided by the test taker.

## Remote Practical Exam Delivery

The NSE 8 practical exam can be delivered in two ways:

- On-site at NSE 8 physical sites: Sunrise, FL or Sophia, France
- Remotely through a VPN to our NSE 8 physical sites locations

To take the practical exam, the test taker must be able to establish a Windows Remote Desktop (RDP) session to a bastion host (VM host) that allows full connectivity to the entire NSE 8 infrastructure. When taking the practical exam remotely, the test taker must establish the connection from a Fortinet-approved location to one of the NSE 8 lab environments, allowing full connectivity to the NSE 8 infrastructure. A local proctor will accompany the test takers for the duration of the exam.

The requirements and components for the NSE 8 remote exam option are the same as those for the on-site exam. The practical exam will be taken from a suitable remote location approved and defined by Fortinet. The remote location cannot be the test taker's office or home.

## Requirements for the NSE 8 Remote Exam

### Proctor requirements

At least one proctor is required for each session. For the remote exam, a remote assistant (based on the NSE 8 site location) would be needed in case a physical interaction with the environment is necessary. This person does not need to be an NSE 8 Proctor or an NSE 8 Certified Engineer. Basic technical knowledge is required.

### Connectivity Requirements

For an acceptable remote session, proper Internet connectivity is required: At a minimum, a connection of 5Mb/s is required.

Each session can hold a maximum number of five exam takers at the same time: POD0 to POD4. Each student will have its independent environment.

The recommended connection should be of the wired type (Ethernet). The goal is to minimize latency. It does not need to be a dedicated connection exclusively for remote proctoring. However, it should meet the minimum bandwidth requirements.

**Note:** If an Ethernet network is not available, a Wi-Fi network (802.11ac) can be used. If a Wi-Fi connection is used, it must be stable enough to maintain the remote desktop session connected to the NSE 8 environment.

## Site Specifications

The following are the minimal requirements for the site that will host the remote session:

- A private room with a closed door is required for examination purposes. Preferably, a location that has minimal disruptions and noise.
- An independent desk for each test taker with space for a laptop, an additional monitor, a mouse, and a notepad.
- A laptop for each test taker.
  - For the wired connection between the laptops and the FortiGate, a total of six UTP Cat-6A cables (six ft. long minimum), are required: one for each laptop and one for the Internet link.
- A projector, television or something similar should be available on the first day for the pre-examination presentation (introduction and overview).
- A paper shredder is required at the end of the second day to destroy all the examination material.

## Laptop Requirements

Test takers will be using either Fortinet-provided or locally-provided laptops. The laptops will be connected to the pre-defined NSE 8 site for the duration of the exam using Windows RDP.

Minimum hardware specifications:

- 1 RJ45 Port
  - Wi-Fi card (802.11ac)
- 4 GB of RAM
- 1GB of HDD storage
- Microsoft Windows 7, 8, 10 (version not relevant)
- RDP Client (usually built in with Windows)
- Adobe Acrobat Reader

# Grading Procedure

This section contains detailed information about the steps used to grade the NSE 8 certification exams. All the information not mentioned in this section is Fortinet Confidential, and for internal use only.

## NSE 8 Written Exam Grade

The written exam is graded with the Pearson VUE system using the scoring method defined by Fortinet:

- Each item (question) must be 100% correct for credit, no partial credit
- No deduction for incorrect answers
- Grade: Pass or Fail

At the end of the exam, a summary report will show the global and per section results of the test.

## NSE 8 Practical Exam Grade

Test takers should consider the following approach when taking the exam:

- Review all tasks described on the Exam Task Form.
  - Scoring method: Each task must be 100% correct for credit. No partial credit is given and no deductions are made for incorrect answers.
  - Score: Pass or Fail
- Consider these two aspects for each task:
  - Correct configuration parameters<sup>2</sup>
  - Correct output or operation of the configuration

When the exam is complete, the proctor will share the following information with the Fortinet Training Operations Department:

- Test taker name
- Test taker email
- Test taker country
- Date of the exam<sup>3</sup> (day 1 of the practical exam)
- Grade

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<sup>2</sup> Each task may have different configurations but all of them may be correct.

<sup>3</sup> Day 1 of the practical exam.



If the test taker passes the exam, a unique NSE 8 ID is assigned to them. The unique ID numbering order will depend on the number of the POD used during the practical exam by the test taker and the date (day 1) on which the test taker took the practical exam. For example, POD0 will have a lower NSE 8 ID than POD1, from the same group of the same day and will also be lower than POD0 of the next session.

## Examination Summary Report

NSE 8 certification includes two different reports:

- A report delivered immediately after the test taker completes the written exam. This is a Pearson VUE system report that includes:
  - Candidate name
  - Date of the test
  - Result (pass or fail)
  - Grade details:
    - All the sections that the test taker has passed or failed. (It is directly related to the exam list of topics.)
- An examination summary report applicable to the practical exam, that includes:
  - Candidate name
  - Date of the test
  - General result (pass or fail)
  - Grade details:
    - All the sections that the test taker has passed or failed. (It is directly related to the exam list of topics.)
  - This report is delivered through a direct email communication between the proctor and the test taker between 12 to 15 days after the practical exam was taken.

# Successful Candidates

## Sequential Identification Numbers

All the leading certification programs have a numbering scheme. For the NSE 8, the numbering scheme starts at 3072.

This numbering scheme is based on cryptography. In cryptography, key size or key length is the number of bits in a key used by a cryptographic algorithm (such as a cipher). Key length defines the upper-bound on an algorithm's security. RSA Key **3072** is the next step for keys intended to extend beyond 2030. This is the same approach that we have for our NSE 8 certified engineers.

Reference: [https://en.wikipedia.org/wiki/Key\\_size](https://en.wikipedia.org/wiki/Key_size)

This unique ID is perpetual and tied to the test taker name and information.

## Awards

If the test taker passes both exams (written and practical) he/she will receive, at their registered home/office address, the following awards in a customized award box:

- Electronic NSE 8 certificate:
  - Available for download from test taker's profile at the Fortinet NSE Institute
- Physical NSE 8 certificate:
  - Signed by Ken Xie and Michael Xie
- NSE 8 plaque:
  - With test taker's name and NSE 8 ID printed
- NSE 8 Pin:
  - With the logo of the program