

FORTINET

Network
Security
Expert

8

NSE 8 Certification

Public Handbook

NSE 8 Certification Public Handbook
for FortiGate 6.0. 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 in the networking and security industry.

NSE 8 Validity and Recertification

The NSE 8 certification is valid for two (2) years.

First takers:

- For the written exam, we have unlimited attempts.
- For the practical exam: (passing the written exam is mandatory to schedule and attempt the practical exam) – there are also unlimited attempts.

To recertify,

- The candidate should take and pass the written exam only (three attempts maximum).
- If the candidate fails the written exam within the first three (3) attempts, they must attempt the written exam until they pass it and then schedule and pass the most updated version of the practical exam.

The candidate must attempt the written exam to obtain the re-certification before it expires. If the certification is expired, the candidate must attempt and pass both exams written and practical.

Users receive expiration notification as follows:

- Six (6) months before the expiration date
- 90, 60 and 5 days before the expiration date

Certification date is fixed to the date the test taker attempted and passed the practical exam.

When you pass the written exam for recertifying, it also recertifies you on all NSE levels valid or expired that you had achieved previously.

About This Document

This document includes all the information required by the test taker to get 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 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/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 120-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 with generic questions is available at the Fortinet NSE Institute, to give you an idea of the content you will find 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: 60
- Time allowed to complete: 120 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 report will also show which sections the test taker passed or failed. No further details or assistance is provided.
 - This document is not a certification. It is a summary of your written exam results only.
- 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 (from a Fortinet approved location) 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 and solutions.

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: 38
- Time allowed to complete: 15 hours (9 hours on day 1 and 6 hours on day 2); 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 an Exam Summary report document showing their overall result: pass or fail. The report 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.

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
- (3) NSE 8 branded pages for notes 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. A bastion host with similar characteristics and tools will also be provided.

Main software:

- Operating System: Windows 10
- Windows Remote Desktop Client
- FortiClient

Additional software:

- Kali Linux
- Ubuntu desktop
- Ubuntu server
- Adobe Acrobat
- Mozilla Firefox¹
- Wireshark
- FileZilla FTP

¹ Default browser.

- 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. This presentation is delivered 30 minutes before the exam starts.
- The test taker should bring a photo ID to the exam.
- An attendee list must be signed on each day 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 POD.
- 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
- Additional locations include, but are not limited to:
 - Fortinet Reston, Virginia USA
 - Fortinet Kuala Lumpur, Malaysia
 - Fortinet Germany
 - Fortinet Paris, France
 - Fortinet Reading, UK
 - Fortinet Ottawa, Canada
 - Fortinet Vancouver, Canada
 - Fortinet Dubai, United Arab Emirates

All locations offer the NSE 8 practical exam for a maximum of ten (10) test takers simultaneously, using isolated environments 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.

Written Exam Certification Topics (Blueprint)

1. Security Architectures
 - a) Fortinet cloud security solutions
 - i) FortiGate VM models and licensing
 - ii) FortiGate VM deployments
 - iii) Fortinet on private clouds
 - iv) Fortinet on public clouds
 - b) Designing resilient solutions
 - i) Fortinet solutions advanced high availability features
 - ii) Fortinet solutions operation and deployment modes
 - iii) FortiGate Cluster protocol
 - iv) FortiGate Session Life Support protocol
 - v) Session-aware load balancing clustering
 - vi) Load balancing
 - vii) Fault tolerance
 - c) Designing enhanced Fortinet solutions
 - i) Fortinet solutions for specific scenarios
 - (1) Secure access networks
 - (2) Web application security
 - (3) Advanced threat protection
 - (4) Cloud security
 - (5) Enterprise firewall
 - d) Fortinet high-end solutions
 - i) FortiGate 3000 Series

- ii) FortiGate 5000 Series
 - iii) FortiGate 7000 Series
- 2. Hardware acceleration
 - a) Hardware acceleration overview
 - i) Content processors
 - ii) Security processors
 - iii) Network processors
 - iv) FortiGate blades
 - v) FortiGate chassis
 - b) Traffic in Fortinet products
 - i) Traffic offloading
 - ii) Life of a packet
 - iii) Fortinet communication ports and protocols
- 3. Networking
 - a) Advanced routing
 - i) Static routing
 - ii) Dynamic routing
 - iii) Routing and high availability
 - iv) Asymmetric routing
 - v) Secure SD-WAN
 - b) Advanced NAT
 - i) Central NAT
 - ii) NAT64
 - iii) NAT46
 - iv) DNS64
 - c) VPN technologies
 - i) Advanced IPsec
 - ii) Advanced SSL
 - d) Network troubleshooting
 - i) Debugging tools
 - ii) Diagnostic tools
 - iii) Routing and VPN troubleshooting
 - iv) CLI in Fortinet solutions
- 4. Authentication
 - a) Authentication with Fortinet products
 - i) Advanced single sign-on

- ii) RADIUS
 - iii) Two-factor authentication
 - iv) 802.1x
 - v) Certificate-based authentication
 - vi) Troubleshooting
- 5. Content inspection
 - a) Inspection modes
 - i) SSL/SSH
 - ii) Certificate
 - iii) Sandbox inspection
 - b) FortiOS security profiles
 - i) Antivirus
 - ii) Intrusion prevention systems (IPS)
 - iii) Application control
 - iv) Web filtering
 - v) DNS filtering
 - vi) VoIP inspection
 - vii) Session helpers
 - c) FortiGuard services
- 6. Security operations
 - a) Fortinet solutions APIs
 - i) Rest API
 - b) Handling security events with Fortinet solutions
 - i) FortiSIEM
 - ii) FortiAnalyzer
 - iii) Log analysis
 - iv) Event management
 - c) Fortinet central management solutions
 - i) FortiManager
 - ii) FortiCloud
- 7. Integrated Solutions
 - a) Integrate Fortinet solutions for advanced threat protection
 - b) FortiLink
 - c) Fortinet wireless solutions
 - d) Fortinet authentication solutions
 - e) Fortinet hybrid solutions (traditional network and cloud)

8. Enhanced Technologies

- a) Fortinet enhanced solutions including:
 - i) FortiWeb
 - ii) FortiADC
 - iii) FortiDDoS
 - iv) FortiAuthenticator
 - v) FortiMail

Practical Exam Certification Topics (Blueprint)

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

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

1. FortiOS Administration
 - a) VDOMs
 - b) Proxies
 - c) Resilient networking
2. FortiOS Networking
 - a) VPN deployments
 - b) IPv6 networking
 - c) Advanced routing
3. Authentication
 - a) Single sign-on
 - b) Authentication methods
4. Content Inspection
 - a) Traffic inspection
 - b) Traffic control
5. Security Fabric
 - a) Fortinet Security Fabric
6. Secure Access
 - a) Fortinet Secure Access solutions
7. Security Operations and Management
 - a) FortiManager operation
 - b) FortiSiem operation
 - c) FortiAnalyzer operation
8. Enhanced Technologies
 - a) FortiWeb to secure web applications
 - b) Protection against DDoS attacks
 - c) FortiMail to secure mail applications
 - d) FortiADC to load balance traffic

Note: for all the previously mentioned topics and solutions, knowledge of troubleshooting is an asset.

Firmware Versions

This section details all the firmware and versions used for the NSE 8 exam:

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.

The new version of the NSE 8 exams will be based on the most current firmware available on our support site. The NSE 8 candidate should have the knowledge required to configure a network environment with the latest

firmware versions available, and up to two major releases following the date on which the exam becomes available to the public.

Product	Base Firmware	Written Exam	Practical Exam
FortiGate	6.0.x +	X	X
FortiAnalyzer	6.0.x +	X	X
FortiAuthenticator	5.4.x +	X	X
FortiManager	6.0.x +	X	X
FortiSandbox	3.0.x	X	X
FortiWAN	4.5.x +	X	-
FortiVoice Enterprise	5.3.x +	X	-
FortiADC	5.1.x +	X	X
FortiWeb	6.0.x +	X	X
FortiMail	6.0.x +	X	X
FortiDDoS	4.6.x +	X	X
FortiAP	6.0.x +	X	X
FortiSwitch	6.0.x +	X	X
FortiSIEM	5.1.x +	X	X
FortiClient	6.0.x +	X	X

- Base versions:
 - The NSE 8 certification program will have base firmware versions for all the solutions. The program will be adaptable to support up to two additional major releases during the life of the exam.
 - The expert candidate's knowledge of Fortinet features, technologies, and solutions should extend beyond a single OS version.

Additional components include:

- Windows 10
- Ubuntu desktop
- Ubuntu server
- Windows Server

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
 - FortiWeb
 - FortiSandbox
 - FortiAuthenticator
 - FortiMail
 - FortiSIEM
 - FortiDDoS
 - FortiSwitch
 - FortiAP
 - FortiClient
- 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 before taking the exams:

- NSE 4:
 - FortiGate Security
 - FortiGate Infrastructure
- NSE 5:
 - FortiAnalyzer
 - FortiManager
 - FortiSIEM

- NSE 6:
 - FortiWeb
 - FortiMail
 - Secure Wireless
 - FortiADC
 - FortiSandbox
 - FortiAuthenticator
 - FortiDDoS
- NSE7:
 - Secure Access
 - Enterprise Firewall
 - Advanced Threat Protection
 - Cloud Security

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/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-CERT
 - 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 used 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-PRL8
 - Price: USD 1600.00 per voucher per candidate
5. Enroll in the practical component through the regional training team administrator:
 - training@fortinet.com for AMER
 - EMEAtraining@fortinet.com for EMEA
 - 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 location exam is requested, the following conditions apply:
 - A minimum of six test takers are required for a session (maximum is 10).
 - Location and proctors should be defined within 60 days (minimum) of the requested 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 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 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 21 business days after the practical exam was approved in the 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 where we have the NSE 8 environments
- Remotely through a CAPWAP tunnel 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, using Fortinet's provided laptops. 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 Fortinet proctor is mandatory and 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 20Mb/s dedicated bandwidth is required.

Each session can hold a maximum number of ten (10) exam takers at the same time: POD01 to POD10. Each student will have an isolated environment.

The connection from the laptop will be done to a wireless connection which is tunneled directly to NSE8 physical sites. All the traffic is isolated. For the on-site FortiAP(s) there must be a ethernet cabled connection with DHCP enabled, DNS resolution and CAPWAP traffic allowed to the Internet. The

FortiAP will be powered by PoE or a power supply. It does not need to be a dedicated connection exclusively for remote proctoring. However, it should meet the minimum bandwidth requirements.

Note: An approved pre-configured FortiAP will be provided by Fortinet.

Remote Site Location 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.
- A projector, television or 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. The laptops will be connected to the pre-defined NSE 8 site for the duration of the exam using Windows RDP.

Minimum hardware specifications:

- Wi-Fi card (802.11ac)
- 8 GB of RAM
- 100GB of HDD storage
- Microsoft Windows (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 in 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 of each task:
 - Correct configuration parameters²
 - 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 exam³ (day 1 of the practical exam)
- Grade

² Each task may have different configurations but all of them may be correct.

³ 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, POD01 will have a lower NSE 8 ID than POD10, from the same group of the same day and will also be lower than POD01 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 business days after the practical exam was taken.

Successful Candidates

Sequential Identification Numbers

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

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 (the content of the box may differ in some cases):

- 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