What to expect with the Nokia Network Routing Specialist II (NRS II) Lab Exam

The Nokia NRS II Lab Exam is a three-and-a-half-hour practical exam that tests a candidate’s ability to configure basic services and the supporting technologies on the Nokia 7750 Service Router (SR).

To register for the Nokia NRS II Lab Exam, candidates must have successfully completed the following three prerequisite written exams:

- Nokia Interior Routing Protocols (4A0-101)
- Nokia Multiprotocol Label Switching (4A0-103)
- Nokia Services Architecture (4A0-104)

The exam content covers topics presented in all of the above referenced Service Routing Certification courses.

Exam topics

Exam topics are summarized in the sections below. Candidates should be able to configure and verify all topics and features; however, it is possible that not all topics will be covered in the exam.

1. Networking fundamentals

1.1 Networking concepts

- TCP/IP and OSI layers
  - Protocol layering and encapsulation
  - Understand the Nokia Service Router (SR) product architecture and the command line interface (CLI)
- Layer 2 technologies
  - Ethernet encapsulation options
  - MAC forwarding table
  - LAG
  - Function and operation of VLANs
- IP and Layer 3
  - IPv4 address structure
  - IPv6 address structure
  - Subnetting and address summarization
  - Basic principles of IP address planning
  - IP filtering

2. Routing protocols

2.1 IP routing basics

- IPv4 and IPv6 routing protocol functions and operation
- Static and default routes

2.2 Interior Routing Protocols (IRP)

- Link state protocol (OSPFv2, OSPFv3 and IS-IS)
  - Protocol operation for IPv4 and IPv6 routing
  - Traffic engineering and constraint-based routing
- Route and filter policies
- OSPFv2 and OSPFv3
  - Link state advertisements
  - Areas and topologies
- IS-IS (for IPv4 and IPv6)
  - Areas and topologies
- Route advertisement behavior in different area types
- Bidirectional forwarding detection (BFD)
- ECMP
3. Multiprotocol Label Switching (MPLS)
   • Forwarding equivalence classes
   • Labels and label stacks
   • Label distribution and label bindings
   • Label switched paths (LSPs)
   • MPLS packet forwarding
   • RSVP-TE
     - Protocol operation
     - Traffic-engineered and constraint-based LSPs
     - LSP resiliency
       - Secondary paths
       - Fast reroute
       - Shared Risk Link Groups
   • LDP
     - Protocol operation
     - Signaling
     - Targeted LDP
   • 6PE for tunneling IPv6 over IPv4/MPLS

4. Services architecture
   • Concept of Service Distribution Point (SDP)
   • SDP using GRE as transport tunnel
   • SDP using MPLS as transport tunnel
     - LDP as transport tunnel
     - RSVP-TE LSP as transport tunnel
   • SDP signaling
   • Ping and trace in SDP

5. L2/L3 services
   5.1 Virtual Private LAN Services (VPLS)
     • VPLS control/data plane
       - VPLS label signaling
       - VLPS encapsulation
       - VPLS data forwarding
     • Implementing VPLS
       - Using mesh SDPs
       - SAP encapsulation
       - VC Type
       - EtherType
     • Handling of VLAN tags
   5.2 Epipe (Ethernet VLL)
     • Epipe control/data plane
     • Epipe pseudowire signaling
     • Implementing and troubleshooting VPWS Epipe
     • MTU Issues

5.3 Internet Enhanced Services (IES)
   • Creation of IES
   • IES interface (IP addressing, port encapsulation)
   • Routing protocol on IES interface

5.4 Virtual Private Routed Networks
   • VPRN control/data plane
     - MP-BGP
     - VPRN encapsulation
     - VPRN data forwarding
     • Implementing VPRN
       - Full Mesh VPRN topology
       - SAP encapsulation
       - 6VPE for IPv6 VPRN

5.5 Service inter-operation
   • VPLS Layer 3 spoke-termination to IES services
   • VPLS inter-op with Epipe services
   • Mirroring services
     - Local mirroring
     - Remote mirroring

Exam registration
Registration and scheduling for the NRS II lab exam can be completed at the following URL: networks.nokia.com/src/examreg

Lab exams are delivered at select Nokia locations globally. Candidates should plan to register six to eight weeks in advance of their targeted exam date.

Exam notes and tips
During the exam, you will be allowed to access soft copies of the product manuals only as reference material, if necessary. The product manuals will be accessible from the PC used to access the exam equipment. No other notes or text books or reference materials are allowed during the exam. Electronic devices, including cell phones, are not allowed into the examination room. You will be provided with pen and paper during the exam.

The exam pass mark is 80 percent. Candidates must complete some parts of the exam correctly, in order to obtain full marks in later parts of the exam. The candidate must have an adequate level of hands-on experience to maintain a reasonable pace during the exam so that all required tasks can be completed within the allotted time.
Listed below are some tips to help candidates successfully prepare for and pass the Nokia NRS II Lab Exam:

1. Consider enrolling in the NRS II Lab Workshop (course # TTP42001E). This is a one-day workshop designed to help students practice and improve their service routing configuration skills. The workshop also serves as an excellent preparation tool for candidates planning to take the NRS II practical lab exam (NRSII4A0). Each workshop is led by a member of the SRC subject matter expert team who will mentor students as they work independently through a series of practical, hands-on lab exercises. Students will receive a copy of the workshop lab guide containing all of the lab exercises along with their optimal solutions. View the Workshop outline including recommended pre-requisites and a list of student lab exercises. Candidates can register for a classroom or virtual classroom (live on-line) workshop at: networks.nokia.com/src/courses.

2. Consider using My SR Lab to help you prepare for the exam. My SRL ab provides remote, dedicated access to a Service Router lab environment. Lab scheduling is available 24 hours a day, 7 days a week. In addition to lab access time, My SR Lab includes (optionally) a suite of over 50 lab practice scenarios — including NRS II practice exercises — that can serve as an excellent exam practice and preparation tool. To find out more about My SR Lab and/or to register, please visit networks.nokia.com/src/mysrlab. A summary of each of the lab practice scenarios is available from this URL as well.

3. Ensure that you completely understand and are familiar with the student manuals of the prerequisite courses in the NRS II certification. This will help you to become more comfortable with the lab exam material.

4. Ensure you are familiar with the configuration exercises from the practical labs of the prerequisite courses.

5. For each exam scenario, a recommended time and mark allocation are provided to help you manage your time.

6. If you are unclear about anything in the exam, ask the proctor for clarification. The exam proctor will attempt to clarify anything that may be ambiguous. Do not expect the proctor to provide other information during or after the exam.

7. Be sure to allow yourself some time to verify the correct operation of your solution.

8. Save your configuration often. Your exam mark will be based on your final configuration.

9. Relax and read each question very carefully. Be thorough in your solution, but remember to pace yourself appropriately.

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