Purpose of the Exam Preparation Guide

The intent of this guide is to set expectations about the content and the context of the exam and to help you prepare for the exam. In this guide, you will find references to resources that will assist you in preparing for the exam. Studies conducted by HP and Prometric show that a combination of course attendance and self-study maximizes the likelihood of passing the exam on the first attempt.

Certification Requirements

Passing this exam meets one of the requirements for the following certification program(s):
- Tru64 UNIX V5 Systems Engineer
- Accredited Systems Engineer – AlphaServer/ Tru64 UNIX V5

Audience

The Tru64 UNIX V5 Network Administration exam is intended for Service Engineers, Pre-Sales Technical Support Engineers, and HP customers who have advanced level knowledge of networked and clustered AlphaServer systems running HP Tru64 UNIX.

HP strongly recommends that candidates acquire at least 12 months of hands-on experience with this technology before taking the exam. The specific competencies to be acquired are outlined in this document.

Exam Details

- Number of questions: 56
- Time allotted to take the exam: 75 minutes (plus 15 minutes for survey)
- Passing score: 66%
- No on-line or hard copy sources may be referenced during the exam.
Exam Registration

This exam is available at [Prometric](#).
This exam is available at [Promissor](#).

Scope of the Exam

The Tru64 UNIX V5 Network Administration exam measures advanced level knowledge and skills related to the major competencies and technologies listed below. You need hands-on experience to pass this exam. HP strongly recommends that candidates acquire at least 12 months experience with networked AlphaServer systems running Tru64 UNIX before taking this exam, to develop the desired competencies sufficiently.

Major Competencies

Exam candidates should be able to apply knowledge of TCP/IP, SNMP, remote access, network security, networked Tru64 UNIX systems, and network devices to propose, plan, configure, administer, and support customer solutions.

Specifically, candidates should be able to:

- Convert customer connectivity and security requirements to network configuration requirements and settings
- Use SysMan to install and verify IP applications on a Tru64 UNIX end system
- Configure IP addresses
- Configure SLIP/PPP services
- Install and configure UNIX native server networking applications, including: BIND, NFS, NIS, Web (Internet/intranet), DHCP, TELNET, FTP, and SNMP
- Apply advanced IP concepts to configure routing and supernetting/CIDR
- Analyze and resolve common end system and server system configuration and connectivity problems
- Analyze and resolve common end system configuration problems in IP applications (FTP, NFS, BIND, HTTP, SMTP/Mail, TELNET)
- Eliminate an end node as a problem source when troubleshooting networking problems
- Use native UNIX tools and network commands to complete networking configuration and problem resolution tasks
- Discriminate between common and advanced server system issues

Major Technologies and Concepts

Exam candidates should have advanced level knowledge of the following network, or network-related technologies and concepts:

- TCP/IP
- OSI Model
- IP addressing and address classes
- IP subnetworking
- CIDR
- Direct, indirect, and default routing
- Autonomous systems
- RIP
- OSPF
- Internet Protocol suite
- MIB
- Remote access and mobility
- SLIP/PPP
- Portmapper
- Inetd
- Wrappers
- Basic IP configuration and connectivity
- Network security
- TTYs
- Sysman
- BIND, NIS, NFS, NTP, Sendmail/SMTP, SNMP, DHCP, HTTP, TELNET
- gated
- routed
- Static routes
- Tools and utilities (PING, netstat, ifconfig, arp, traceroute, rpcinfo, nfsstat, tcpdump, nslookup, ypstat, ypserve, ntpq, showmount)
- Fault isolation
- Common server system issues

Exam Objectives

Use the exam objectives listed in this section to guide your study and to check your readiness for the exam. The exam measures your understanding of these objectives. The approximate percentage of exam questions dedicated to each major category of objectives is included in parenthesis.

Describe TCP/IP networking concepts and components (20%)
- Describe and apply TCP/IP networking concepts
  - Identify Internet historical facts, define terminology, and apply concepts
  - Compare and contrast Internet functional layers to the OSI model (Application Layer, Presentation Layer, Session Layer, Transport Layer, Internet Layer, Data Link Layer, Physical Layer)
  - Describe the Internet Protocol, including: IP addresses and address classes, special addresses, IP Subnetworking and Classfull Subnetworking, and CIDR
  - Describe IP routing, including direct and indirect routing, routing priorities, default routing, autonomous systems, interior gateway protocols, RIP, and OSPF.
  - Describe the Internet Protocol Suite including the Internet Control
Message Protocol (ICMP), Transmission Control Protocol (TCP), User Data Protocol (UDP), Address Resolution Protocol (ARP), Proxy ARP, Internet Domain Name (BIND), Domain Name System Structure, and RFCs.

- Describe and apply SNMP concepts including MIB/MIB browser concepts, and discuss general attributes of SNMP management stations.
- Describe and apply remote access and mobility concepts as they apply to UNIX networking
  - Describe and apply knowledge of SLIP/PPP services on an end system/client and on a access server
- Describe and apply portmapper, inetd, and wrappers concepts
- Describe basic network security concepts and appropriate practices including how to use secure TTYs, ftpusers, /etc/exports, and ifaccess.conf.

**Describe how to install and verify IP applications on a Tru64 UNIX end system (20%)**

- Describe how to obtain and configure IP addresses when installing an end system
- Describe how to use SysMan to install BIND, NIS, NFS, NTP, Sendmail/SMTP, SNMP, and DHCP.
- Describe how to configure SLIP/PPP services on an end system/client

**Describe how to Install and configure UNIX native server networking applications: (21%)**

- Describe how to install and configure BIND, and how to resolve related problems
  - Describe how to modify the start up script for BIND
  - Describe how system tuning parameters relate to BIND
- Describe how to install and configure SMTP
- Describe how to install and configure NFS, and how to resolve related problems
  - Describe how to modify the start up script for NFS
  - Describe how system tuning parameters relate to NFS
- Describe how to install and configure TELNET, and how to resolve related problems
  - Describe how to modify the start up script for TELNET
  - Describe how system tuning parameters relate to TELNET
- Describe how to install and configure FTP, and how to resolve related problems
  - Describe how to modify the start up script for FTP
  - Describe how system tuning parameters relate to FTP
- Describe how to install and configure DHCP, and how to resolve related problems
  - Describe how to modify the start up script for DHCP
  - Describe how system tuning parameters relate to DHCP
- Describe how to install and configure NIS, and how to resolve related problems
- Describe how to modify the start up script for NIS
- Describe how system tuning parameters relate to NIS
- Describe how to install and configure SNMP, and how to resolve related problems
  - Describe how to modify the start up script for SNMP
  - Describe how system tuning parameters relate to SNMP
- Describe how to install and configure NTP, and how to resolve related problems
  - Describe how to modify the start up script for NTP
  - Describe how system tuning parameters relate to NTP
- Describe how to install and configure Netscape / Apache Web Server, and how to resolve related problems
  - Describe how to modify the start up script for web
  - Describe how system tuning parameters relate to web

**Describe advanced configuration procedures for IP and routing (14%)**

- Describe the effect of gated.conf on enabled routing protocols
- Describe the function of routed, and when and how to use it
- Describe static routes

**Describe fault resolution procedures and practices (25%)**

- Describe how to solve common end system basic IP configuration (address/netmask) and connectivity problems
- Describe how to solve common end system configuration problems in IP applications such as FTP, NFS, BIND, HTTP, SMTP/Mail, and TELNET
- Describe how to use common network troubleshooting tools and utilities such as PING, netstat, ifconfig, arp, traceroute, rpcinfo, nfsstat, tcpdump, nslookup, ypslst, ypserver, ntpq, and showmount.
- Describe how to rule out network errors external to the end system, or to isolate problems to the application, or to isolate end node network interface problems
- Explain how to apply basic troubleshooting methodology using appropriate utilities to resolve common server system issues involving BIND, SMTP, NFS, TELNET, FTP, DHCP, NIS, SNMP, and NTP.
- Differentiate between basic and advanced server system issues
  - Describe how to eliminate an end node as a problem source
  - Describe how to determine physical topology
  - Identify and describe the purpose of Tru64 UNIX troubleshooting commands used to gather server system component information
    - Describe how to use syscheck
- Identify self help tools and resources
Training Courses and Documents

This section lists training courses and documents that can help you gain the knowledge and skills needed to pass the exam. You are not required to take the courses before taking the exam, however HP strongly recommends that you attend classes, participate in class labs, and thoroughly review all course materials and reference documents before taking the exam. In addition, you should have about 12 months practical experience with networked and clustered AlphaServer systems running HP Tru64 UNIX, which should include each major competency cited in the previous section.

Instructor-Led Training

The HP course that supports this exam is:

• Course Code: 980 Tru64 UNIX V5.0 Network Administration (5 days)

HP has selected independent training providers to deliver this course. To identify the independent training provider(s) in your area, refer to your country’s HP Training Catalog [http://www.HP.com/training/cd-os.html].

Self-Paced Training

This section lists the relevant self-paced courseware available from HP. If you are not able to attend an instructor-led course, then consider this self-paced alternative.

<table>
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<tr>
<th>Title</th>
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<tr>
<td>TRU64 UNIX V5 Network Administration</td>
<td>EY-X385E-SG.0001</td>
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</table>

To order self-paced courseware, refer to your country’s HP Training Catalog [http://HP.directedje.com/training/index.asp].

Documentation and References

This section lists references that describe the major competencies, technologies, and concepts covered in the exam. Use the exam objectives listed in this publication to guide your study, since some sections may describe topics in more depth than is required for the exam.

<table>
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<tr>
<td>gated.conf</td>
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Section 2: Sample Exam Questions

Sample Exam Questions

This set of sample exam questions will help you become familiar with the types of questions on the exam. This set of questions is not intended to test your readiness for the exam, since the questions do not cover every test objective. None of these questions is contained on the actual exam. The actual exam questions may be more or less difficult than this set of questions.

After answering these questions, check your responses using the answer key provided at the end of this section.

Section One: Describe TCP/IP Networking Concepts and Components

1. Which protocol provides a datagram delivery service described as "connectionless and best effort"?
   A. ICMP  
   B. TCP  
   C. IP  
   D. ARP

2. Which is a Class 'B' address?
   A. 98.45.6.3  
   B. 127.0.0.1  
   C. 128.4.5.6  
   D. 198.4.5.6

3. The telnet foo command returns the error foo:unknown host. Which IP layer is reporting this error?
   A. Internet  
   B. Transport  
   C. Application  
   D. Network Interface
4. A MAC address can be seen in a packet trace of which IP layer? (See the Exhibit below.)

<table>
<thead>
<tr>
<th>OSI Layer</th>
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<td>APPLICATION</td>
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<tr>
<td>PHYSICAL LINK</td>
<td>INTERFACE</td>
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</table>

A. Application  
B. Transport  
C. Internet  
D. Network Interface

Section Two: Describe how to Install and Verify IP Applications on a Tru64 UNIX End System

5. When you are adding an NFS mount, SysMan displays:

```
Cannot get Net ID for host
```

Which action should you choose?

A. add your host to the .rhosts on the server  
B. add the NFS server hostname to your /etc/hosts file  
C. ping the NFS server to make sure it is running  
D. issue the rpcinfo -p localhost to make sure the mountd is registered with portmapper

6. When configuring NIS using SysMan, what must be configured to make your system an NIS client?

A. DNS server  
B. NIS server
C. whitepages server
D. automount

7. Which types of NIS configurations can be set up using SysMan? Select TWO.
   A. slave
   B. cache
   C. master
   D. replic
   E. secondary

8. Which command dismounts an NFS mounted filesystem?
   A. unmount /mnt
   B. mount -r /mnt
   C. umount server:/mnt
   D. mntab -x /mnt

Section Three: Describe how to Install and Configure UNIX Native Server Networking Applications

9. Which type of client software configuration reduces the administration of the /etc/hosts file?
   A. BIND
   B. NFS
   C. DHCP
   D. WINS

10. Which command verifies that the user name Sam is listed in the NIS distributed password file?
    A. ypcat -k passwd | grep Sam
    B. ypcat Sam
    C. yppasswd | grep Sam
    D. ypwhich passwd | grep Sam
11. To which file does the SNMP daemon log errors?
   A. snmpd.log
   B. daemon.log
   C. syslog
   D. binary error log

12. In SNMP, what does a number like 1.3.6.1.2.1.1.3.0 represent?
   A. a MIB II object identifier
   B. an extended IP address
   C. an IPv6 address
   D. an NMS address

Section Four: Describe advanced configuration of IP and routing

13. Which protocol does gated use to advertise routes?
   A. ARP
   B. BRIP
   C. OSPF
   D. RARP

14. SysMan lets you choose between routed and one other routing program. Which one?
   A. bind
   B. gated
   C. iprd
   D. ripd

15. Which file does SysMan create when gated is chosen?
   A. routes
   B. gateways
C. gated.conf
D. rc.conf

16. The command route add 1.2.3.4  5.6.7.8 returns the following message:

    writing to routing socket: Network is unreachable
    add host 1.2.3.4: gateway 5.6.7.8: ioctl returns 51
    Network is unreachable

What does the message indicate?
A. 1.2.3.4 is too far away to be reached.
B. The route was added, but the gateway is 51 hops away.
C. The gateway is not reachable through a route listed in the table.
D. A route for this network already exists.

Section Five: Describe troubleshooting procedures and practices

17. Your system uses NFS across low-speed or error-prone WAN links. Which command has options such as read and write size, retries, and timeouts?
A. BIND
B. mount
C. rpcsetup
D. nfssetup

18. Which command is used to display counters for NFS, such as timeouts and retransmissions?
A. rpcstat
B. nfsstat
C. nfsinfo
D. rpcinfo

19. The ACME Corporation just replaced their 10MB Ethernet cards with 100MB cards to increase the speed of FTP transfers. But, rather than realizing higher throughput, the throughput rate decreased. Why?
A. The high-speed Ethernet adapters will not show a visible increase in data transfer rate because the bandwidth is taken up by ICMP packets.
B. FTP cannot take advantage of the increased network speed because it is a "connection oriented protocol" and uses "sliding windows" to determine how quickly to send packets.

C. ACME neglected to install the correct licenses, so even though the correct hardware is in place, the software will not use it.

D. 100MB Ethernet requires Cat 5 cabling. ACME installed the new cards, but neglected to upgrade their Ethernet cabling to support Fast Ethernet.

20. User 1 and User 2 both telnet into System A from System B. Which is TRUE of the two connections?

A. Both share the same Ethernet packets to optimize traffic.

B. Both rely on each other for window size updates.

C. Both are independent of each another.

D. Both share a link ID and the same virtual circuit.

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**Answer Key**

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<th>#</th>
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| 11. | b | Tru64 UNIX V5 Network Administration  
     |    | EY-X385E-SG-0001 |
| 12. | a | Tru64 UNIX V5 Network Administration  
     |    | EY-X385E-SG-0001 |
| 13. | c | IV.A, ref: UNIX System mgmt doc |
| 14. | b | Tru64 UNIX V5 Network Administration (EY-X385E-SG.001) |
| 15. | c | Tru64 UNIX V5 Network Administration (EY-X385E-SG.001) |
| 16. | c | IV.C ref: training Ch 1, pp 1-28 |
| 17. | b | Tru64 UNIX V5 Network Administration  
     |    | EY-X385E-SG-0001 |
| 18. | b | Tru64 UNIX V5 Network Administration  
     |    | EY-X385E-SG-0001 |
| 19. | d | Tru64 UNIX V5 Network Administration  
     |    | EY-X385E-SG-0001 |
| 20. | c | TRU64 UNIX V5 Network Administration  
     |    | EY-X385E-SG.0001 |

**Conclusion**

HP wishes you success in the HP Certified Professional Program and in passing the exam for which you are preparing.