Sun ZFS Appliance Implementation Specialist
Exam Study Guide

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Objective & Audience

Objective
Help you prepare to take the Sun ZFS Appliance Implementation Specialist (1Z0-547) exam by providing pointers to resources that you can use in your preparation.

Targeted Audience

- Technical Consultants
- Strong foundation and expertise in implementing Oracle NAS storage on Oracle servers
- Participated in Oracle storage implementations
- Up-to-date training and field experience are recommended
Exam Topics & Objectives

Exam Topics
The Sun ZFS Appliance Implementation Specialist exam consists of eleven topics:

1. Overview
2. Installation
3. User Interface and Systems Status
4. Configuration
5. Clustering
6. Shares and Pools
7. Active Directory / LDAP Integration
8. Data Services
9. Analytics
10. Performance Sizing
11. Application Sizing

Exam Objectives
The exam objectives are defined by learner or practitioner level of knowledge:

- **Learner-level**: questions require the candidate to recall information to determine the correct answer.
  Example: Define the term network.

- **Practitioner-level**: questions require the candidate to derive the correct answer from the application of their knowledge, which can only be attained by extensive experience with the product.
  Example: The client requests xyz functionality, would you recommend a, b or c?
Training Options

For each exam topic there have been identified alternative training options that are available at Oracle. The training options are divided into three categories:

- **Boot Camps**
  The Boot Camps are designed as a "jump start" training to enhance your skills by providing role-based training on industry-leading Oracle solutions and services. The boot camps are built as concise, intensive, and real-time training to give partners a competitive advantage as they prepare to build powerful solutions for their own customer base. Partners can choose to attend these boot camps in class or in a live virtual class format to maximize the effectiveness and the time allocated to training.

- **Instructor-Led Training (delivered by Oracle University)**
  Partners can take any publicly-scheduled Oracle University courses at steep discounts. Benefit from hands on experience to gain real working skill and work toward Oracle certifications.

- **Online Training**
  Oracle Partners are entitled free access to the Oracle Knowledge Center (OUKC), a vast library of recorded product courses. New courses are regularly added to the library, providing partners with the latest information and training to master new products or to increase proficiency on the new releases.
Topic 1: ZFS Appliance Systems Overview

Objectives

- Explain core systems features (e.g., Fishworks, Hybrid Storage Pools)  Learner
- Explain advanced features (e.g., price/*, Analytics, Compression)  Learner
- Describe the systems architecture (e.g., Clustering, Hybrid Storage Pools)  Learner
- Describe supported data services and client protocols  Learner
- Understand differences between storage profiles  Learner
- Understand clustering concepts and architecture  Learner

Training Options

- Boot Camp
  - ZFS Appliance Implementation Specialist Bootcamp

- Online Training
  - OPN Competency Sun ZFS Appliance Pre-Sales Guided Learning Path
  - Product Essentials for Sales Consultants – ZFS Storage Appliance
  - Bringing Storage Efficiency to a New Level with Oracles Unified Storage

Sample Question:

Which three data services are available?

a. RAID-4
b. Unlimited Snapshots
c. Data deduplication
d. Remote replication
Topic 2: Installation

Objectives

- Perform system installation
- List default usernames and passwords
- Define user access and roles
- Perform software and firmware updates

Level

Practitioner
Practitioner
Practitioner
Practitioner

Training Options

- Boot Camp
  - ZFS Appliance Implementation Specialist Bootcamp

- Online Training
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation

- Instructor Led Training
  - D71578GC10 - Sun Storage 7000 Unified Storage System Install/Maint/Admin

Sample Question:

Identify the following information required to complete the initial setup of a 7000-series system.

- IP address, netmask, share name, production username, and password
- IP address, netmask, DNS address, Share name, snapshot schedule
- DHCP server name, Active Domain name, Share name, CIFS server name, username, and password
- DNS server, gateway or router IP, IP address, netmask, root password
- AD name, DNS name, Timeserver (NTP) name/address, Share name, root password
Topic 3: User Interface and Systems Status

Objectives

- Access and navigate the Browser User Interface (BUI)
- Write Command Line Interface (CLI) scripts
- Monitor overall appliance status
- Customize status summary
- Configure alerts

Level

<table>
<thead>
<tr>
<th>Objective</th>
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Training Options

- **Boot Camp**
  - ZFS Appliance Implementation Specialist Bootcamp

- **Online Training**
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation

Sample Question:

In which section of the Browser User Interface (BUI) can you create snapshots?

a. Shares
b. Configuration
c. Maintenance
d. Services
Topic 4: Configuration

Objectives

- Configure network connectivity
- Configure and manage RAIDZ
- Configure block storage via FC, iSCSI, or SRP (configuring a SAN)
- Configure directory services

Level

Learner
Practitioner

Training Options

- Boot Camp
  - ZFS Appliance Implementation Specialist Bootcamp

- Online Training
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation
  - Protecting Oracle Exadata with the Sun ZFS Storage Appliance: Configuration Best Practices

Sample Question:

Which two statements are true?

a. The initial configuration of a cluster is available only in the BUI.

b. The 7110 Unified Storage System must be initially configured as a stand-alone system before it can be reconfigured for cluster operation.

c. The initial setup of the system cannot be performed using the CLI.

d. The root user default password during the initial setup is "changeme".
**Topic 5: Clustering**

**Objectives**
- Setup a cluster  
- Perform a rolling software upgrade  
- Size a system for clustering (Failover/Failback)  

**Level**  
- Learner

**Training Options**
- **Boot Camp**
  - ZFS Appliance Implementation Specialist Bootcamp
- **Online Training**
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation

**Sample Question:**

What is the maximum number of storage controllers that can form a single cluster?

- a. 1
- b. 2
- c. 4
- d. 255
- e. unlimited
Topic 6: Shares and Pools

Objectives

- Configure storage pool
- Create and manage pools/shares
- Configure share properties
- Understand advantages/disadvantages of SSDs

Training Options

- Boot Camp
  - ZFS Appliance Implementation Specialist Bootcamp

- Online Training
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation
  - Implementing Fibre Channel SAN Boot with Oracle’s Sun ZFS Storage Appliance
  - Using Sun ZFS Storage Appliance iSCSI LUNs in an Oracle Solaris environment

Sample Question:

What is the best data profile to configure a pool that needs high performance and high availability?

a. Striped
b. Mirrored
c. Double Parity RAID
d. Triple Parity RAID
e. Single Parity RAID
Topic 7: Active Directory / LDAP Integration

Objectives

- Understand prerequisites for Active Directory/LDAP implementation
- Connect a 7000 system to an AD domain/LDAP/NIS
- Set permissions with local and AD/LDAP users
- Setup DFS targets
- Publish shares in AD

Level

Learner
Practitioner
Practitioner
Practitioner
Practitioner

Training Options

- Boot Camp
  - ZFS Appliance Implementation Specialist Bootcamp
- Online Training
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation
  - ZFS Storage Rule-Based Identity Mapping Implementation Guide

Sample Question:

Which of the following is required in order to bind a 7000-series system to an LDAP server?

a. A self-signed Certificate
b. A Base Search DN (Distinguished Name)
c. LDAP Proxy Server
d. A password for the LDAP Proxy Server
**Topic 8: Data Services**

**Objectives**

- Administer snapshots/cloning  
  - Practitioner
- Configure and manage data replication  
  - Practitioner
- Evaluate compression ratios and performance for data optimization  
  - Practitioner
- Configure Flash Modules and HBAs for maximum performance or capacity  
  - Practitioner
- Evaluate performance impact of deduplication for data optimization  
  - Practitioner
- Configure and manage thin-provisioning  
  - Practitioner

**Training Options**

- **Boot Camp**
  - ZFS Appliance Implementation Specialist Bootcamp

- **Online Training**
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation
  - Sun ZFS Storage 7000 System Administration Guide
  - Automate ZFS Snapshots and Track Software Updates
  - Deduplication Design and Implementation Guide

**Sample Question:**

Which three statements are true regarding deduplication on the 7000-series systems?

- **a.** Checksum hashes are stored within the DDT (Deduplication Table).
- **b.** The DDT is only stored within memory (ARC).
- **c.** Shares defined with smaller block sizes or database record sizes have a better chance of being deduplicated, but conversely may result in the DDT filling up faster.
- **d.** There is no impact on performance for shares if the DDT fills up as deduplication is disabled in that event.
- **e.** If the DDT fills up and spills into L2ARC or disk, performance can be severely degraded.
Topic 9: Analytics

Objectives
- Generate systems statistics        Level        Practitioner
- Create custom worksheets          Practitioner
- Perform drill-down analysis       Practitioner
- Archive statistics                Practitioner

Training Options
- Boot Camp
  - ZFS Appliance Implementation Specialist Bootcamp
- Online Training
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation
  - Sun ZFS Storage 7000 Analytics Guide

Sample Question:
Which two actions allow a statistic to become an archived data set?

a. using "Add statistic..." in Analytics > Open Worksheet
b. clicking the archive (tape) icon in Analytics > Open Worksheet
c. saving the statistic in a worksheet
d. monitoring the statistic in Analytics > Open Worksheet for more than one hour
e. zooming out to more than one hour, and then pausing the statistic
Topic 10: Performance Sizing

Objectives

- Understand the impact of workloads on performance and throughput
- Size the system to meet performance and throughput goals
- Capacity planning
- Identify and diagnose performance issues

Level

- Learner
- Practitioner

Training Options

- Boot Camp
  - ZFS Appliance Implementation Specialist Bootcamp

- Online Training
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation
  - Detecting and Resolving Oracle Solaris LUN Alignment Problems
  - ZFS Evil Tuning Guide – wiki
  - ZFS Best Practices Guide - wiki

Sample Question:

You have issues with the performance characteristics of a specific version of NFS and would like to disable this version. What is a good resolution?

a. disabling the NFSv4 delegation
b. setting the NFS minimum and maximum versions to the same value as another NFS version number
   c. reducing the maximum number of concurrent NFS requests allowed
d. enabling iSNS discovery
Topic 11: Application Sizing

Objectives

- Define systems parameters for disk backup
- Define systems parameters for Oracle databases
- Define systems parameters for file sharing
- Define systems parameters for virtualization
- Define systems parameters for Microsoft infrastructures
- Define systems parameters for consolidation/bulk storage

Level

Practitioner

Training Options

- Boot Camp
  - ZFS Appliance Implementation Specialist Bootcamp

- Online Training
  - Sun ZFS Storage Appliance Simulator
  - Sun ZFS Storage Appliance Documentation
  - Detecting and Resolving Oracle Solaris LUN Alignment Problems
  - ZFS Evil Tuning Guide – wiki
  - ZFS Best Practices Guide – wiki
  - Oracle Technology Network - Whitepapers

Sample Question:

Secondary cache should be turned on when using which two of the following?

a. online redo log files
b. **data files with < 5 ms response time requirements**
c. random read workloads
d. flashback recovery log
Exam Registration

• **How to register for the exam?**
  You can register for all Oracle certification exams with Pearson VUE. Before a registration can be submitted, a Pearson VUE profile must be created using your Company ID. Your Company ID can be obtained by contacting your local Oracle Partner Business Center or by signing in to your OPN account. Your Company ID is located in the section on the right under "Company information".

  Please follow these instructions in order to properly set-up your Pearson VUE account for the first time.

• **Have you completed an Oracle Certification Exam in the past?**
  Due to systems enhancements, each partner who has completed an Oracle Certification Exam will need to update their Pearson VUE profile in order to receive credit and for those records to appear in the OPN Competency Center.

• **How to get full recognition as Certified Implementation Specialist?**
  To get full recognition as a Certified Implementation Specialist you need to:
  A. Update your Pearson VUE profile with your Company ID
  B. Activate your Certview Account

  Please follow these instructions and your records will be properly recorded.
SOFTWARE. HARDWARE. COMPLETE.