ServiceNow CIS-DF Certification Study Notes

Code: CIS-DF

Exam Overview

📋 CIS-DF Exam Overview

Key information about the ServiceNow Data Foundations certification

- **Exam Code:** CIS-DF (CMDB and CSDM)
- **Duration:** 90 minutes
- **Questions:** 60 multiple choice
- **Passing Score:** 70%
- **Level:** Professional
- **Cost:** $300

CMDB

🗄️ Configuration Management Database (CMDB)

Core concepts and implementation

What is CMDB?

The Configuration Management Database (CMDB) is a centrali repository that stores information about Configuration Items (

their relationships throughout their lifecycle. It serves as the single source of truth for IT infrastructure.

- Impact analysis for changes and incidents
- Service dependency mapping
- Asset and license management
- Root cause analysis
- Compliance and audit reporting
- Capacity planning and optimization

Configuration Items (CIs)

A CI is any component that needs to be managed to deliver an IT service. ServiceNow organizes CIs into a hierarchical class structure.

> **CI Class Hierarchy**
>
> **cmdb_ci** (Base class for all CIs)
>
> → **cmdb_ci_hardware** (Servers, network devices, storage)
> → cmdb_ci_server, cmdb_ci_netgear, cmdb_ci_storage_device
>
> → **cmdb_ci_computer** (Workstations, laptops)
> → cmdb_ci_win_server, cmdb_ci_linux_server, cmdb_ci_vm_instance
>
> → **cmdb_ci_appl** (Applications)
> → cmdb_ci_app_server_java, cmdb_ci_db_instance, cmdb_ci_web_server
>
> → **cmdb_ci_service** (Business/Technical services)
>
> → **cmdb_ci_cloud_service_account** (Cloud resources)

Key CI Attributes

Attribute	Description	Example
sys_id	Unique identifier (32-character GUID)	a1b2c3d4e5f6g7h8i9j0k1l2m3n4o5

Attribute	Description	Example
name	CI display name	PROD-WEB-SERVER-01
operational_status	Current operational state	Operational, Non-Operational, Repa In Progress
install_status	Lifecycle stage	Installed, In Stock, Retired
asset	Link to asset record	Reference to alm_asset
owned_by	CI owner/responsible party	John Doe
managed_by	Support group	Infrastructure Team
location	Physical/logical location	Data Center 1, Rack A5
environment	Environment type	Production, Development, Test
discovery_source	How CI was discovered	Manual, Discovery, Import
last_discovered	Last discovery timestamp	2024-01-15 10:30:00
company	Owning organization	Acme Corporation

CI Lifecycle States

Install Status

- **On Order:** Purchased but not received
- **In Stock:** Received, not deployed

- **Installed:** Active in environment
- **In Maintenance:** Undergoing service
- **Retired:** Decommissioned but tracked
- **Disposed:** Physically removed

Operational Status

- **Operational:** Fully functional
- **Non-Operational:** Not working
- **Repair In Progress:** Being fixed
- **DR Standby:** Disaster recovery backup
- **Ready:** Available for use

🔗 CI Relationships

How CIs connect and depend on each other

Relationships define how CIs interact and depend on one another. Understanding these connections is critical for impact analysis and service mapping.

Relationship Type	Parent → Child	Use Case	Example
Depends On / Used By	Service → Infrastructure	Service dependencies	Email Ser depends Exchange Server
Runs On / Runs	Application → Server	Application hosting	SAP runs Linux Ser

Relationship Type	Parent → Child	Use Case	Example
Contains / Contained By	Cluster → Servers	Physical containment	VMware Cluster contains Hosts
Connects To / Connected By	Server → Switch	Network connectivity	Web Serv connects Core Swi
Hosted On / Hosts	VM → Hypervisor	Virtualization	VM hoste ESXi Hos
Member Of / Members	Server → Cluster	Cluster membership	SQL Serv member AlwaysO Group
Backed Up By / Backs Up	Database → Backup Server	Data protection	Productio backed u Veeam
Uses / Used By	App → Service	Service consumption	CRM use Authentic Service

Relationship Best Practices

- Always use directional relationships (parent/child clarity)
- Avoid circular dependencies
- Document relationship types in data dictionary
- Use Service Mapping to auto-discover application relationships
- Review relationships during change management
- Clean up orphaned relationships periodically

📊 CMDB Health Dashboard

Measuring and improving CMDB data quality

CMDB Health measures data quality across three key dimensions: Completeness, Compliance, and Correctness.

Completeness

Formula:

```
Populated Required Fields / Total Required Fields × 100
```

Measures if all mandatory fields are filled.

Compliance

Formula:

```
Compliant CIs / Total CIs × 100
```

Measures adherence to data standards.

Correctness

Formula:

```
Correct CIs / Total CIs × 100
```

Measures data accuracy.

Improving CMDB Health

- **Define Standards:** Establish data quality rules and naming conventions
- **Automate Discovery:** Use ServiceNow Discovery to populate data automatically
- **Implement IRE:** Configure Identification and Reconciliation Engine properly
- **Regular Audits:** Schedule weekly/monthly health assessments
- **Assign Stewards:** Designate CI class owners for data governance
- **Training:** Educate teams on CMDB importance and data entry
- **Metrics & Dashboards:** Track health scores and trends
- **Remediation Plans:** Address issues systematically

CSDM

🏗️ Common Service Data Model (CSDM)

ServiceNow's framework for organizing IT services and infrastructure

What is CSDM?

CSDM is ServiceNow's predefined framework for organizing and relating services, applications, and infrastructure. It provides a standardized approach to data modeling aligned with ITIL 4 and industry best practices.

- Establish a common language across IT and business
- Accelerate ServiceNow implementations
- Ensure consistent data structure across instances
- Enable out-of-box integrations and workflows
- Support multi-vendor, hybrid IT environments
- Facilitate reporting and analytics

CSDM Framework - 7 Domains

1. Service Domain

- **Business Service:** Customer-facing services (Email, CRM, Payroll)
- **Technical Service:** IT services supporting business services (Active Directory, DNS)
- **Service Offering:** Catalog of available services
- **Product:** Commercial products used to deliver services

2. Application Domain

- **Application:** Software delivering functionality (SAP, Salesforce)
- **Application Service:** APIs, microservices
- **Application Module:** Components of applications

- **Application Resource:** Files, configs, scripts

3. Infrastructure Domain

- Servers (physical and virtual)
- Network gear (routers, switches, firewalls)
- Storage (SAN, NAS, arrays)
- Databases
- Clusters
- Cloud resources (AWS, Azure, GCP)

CSDM Implementation Phases

Phase 1: Foundation (Weeks 1-4)

- Define 10-20 critical business services
- Identify supporting technical services
- Document service owners and support groups
- Establish naming conventions

Phase 2: Applications (Weeks 5-8)

- Inventory critical applications (top 20-50)
- Map applications to services
- Identify application dependencies
- Configure Service Mapping

Phase 3: Infrastructure (Weeks 9-12)

- Deploy Discovery for automated population
- Configure patterns for servers, networks, storage
- Run Service Mapping for application topology

- Validate CI relationships

CSDM vs Traditional CMDB

Aspect	Traditional CMDB	CSDM Approach
Focus	Infrastructure-centric (bottom-up)	Service-centric (top-down)
Starting Point	Discover all infrastructure first	Define business services first
Coverage	Attempt 100% CI discovery	Focus on critical services (80/20 rule)
Business Alignment	Weak linkage to business outcomes	Strong service-to-capability mapping
Time to Value	6-12 months	4-8 weeks for critical services
Maintenance	High manual effort	Automated discovery + service focus

Discovery & Integration

🔗 🔍 Discovery & Integration

Automated infrastructure discovery and data integration

Discovery Types

1. Horizontal Discovery

Infrastructure-focused discovery using:

- Network Discovery (IP range scans)
- Server Discovery (Linux, Windows, Unix, AIX)
- Database Discovery (Oracle, SQL Server, MySQL, PostgreSQL)
- Storage Discovery (NetApp, EMC, Pure Storage)
- Virtualization (VMware, Hyper-V, KVM)

Protocols: SSH, WMI, SNMP, JDBC, PowerShell

2. Service Mapping

Application-centric discovery:

- Traffic-based analysis of network connections
- Pattern-based discovery for common apps (SAP, Oracle, Salesforce)
- Visual topology maps showing dependencies
- Automatic relationship creation

3. Cloud Discovery

API-based discovery for cloud resources:

- AWS: EC2, RDS, S3, Lambda, ECS, EKS
- Azure: VMs, Storage, SQL, App Services
- GCP: Compute Engine, Cloud Storage, Cloud SQL
- Kubernetes, Docker, OpenShift

MID Server Architecture

The Management, Instrumentation, and Discovery (MID) Server bridges ServiceNow and your infrastructure:

- **Java Application:** Runs as Windows service or Linux daemon (Java 11+)
- **Communication:** Outbound HTTPS (443) to ServiceNow instance
- **ECC Queue:** External Communication Channel for job management
- **Credentials:** Stores encrypted credentials locally
- **Probes:** Executable scripts performing discovery tasks

MID Server Best Practices

- Deploy at least 2 MID Servers per network segment for redundancy
- Place MID Servers close to target infrastructure
- Dedicated server: 4 CPU, 8GB RAM minimum
- Use MID Server Clusters for high availability
- Regular updates (ServiceNow releases patches quarterly)

Identification and Reconciliation Engine (IRE)

IRE prevents duplicate CIs and merges data from multiple sources:

Identifier	Priority	Confidence	Use Case
Serial Number	Highest	95%	Hardware identification
MAC Address	High	90%	Network devices, servers
Hostname	Medium	70%	Secondary identifier
IP Address	Lowest	50%	Fallback (can change)

Integration Patterns

Import Sets

- Staging tables for external data (CSV, Excel, XML, JSON)
- Transform maps for field mapping
- IRE integration for reconciliation
- Coalesce fields for update vs insert logic

IntegrationHub

- Pre-built Spoke packages (AWS, Azure, Jira, Slack)
- Flow Designer for visual workflows
- REST/SOAP actions for API calls

- Event-driven integrations

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