



CMDB Data Loading & IRE Best Practices

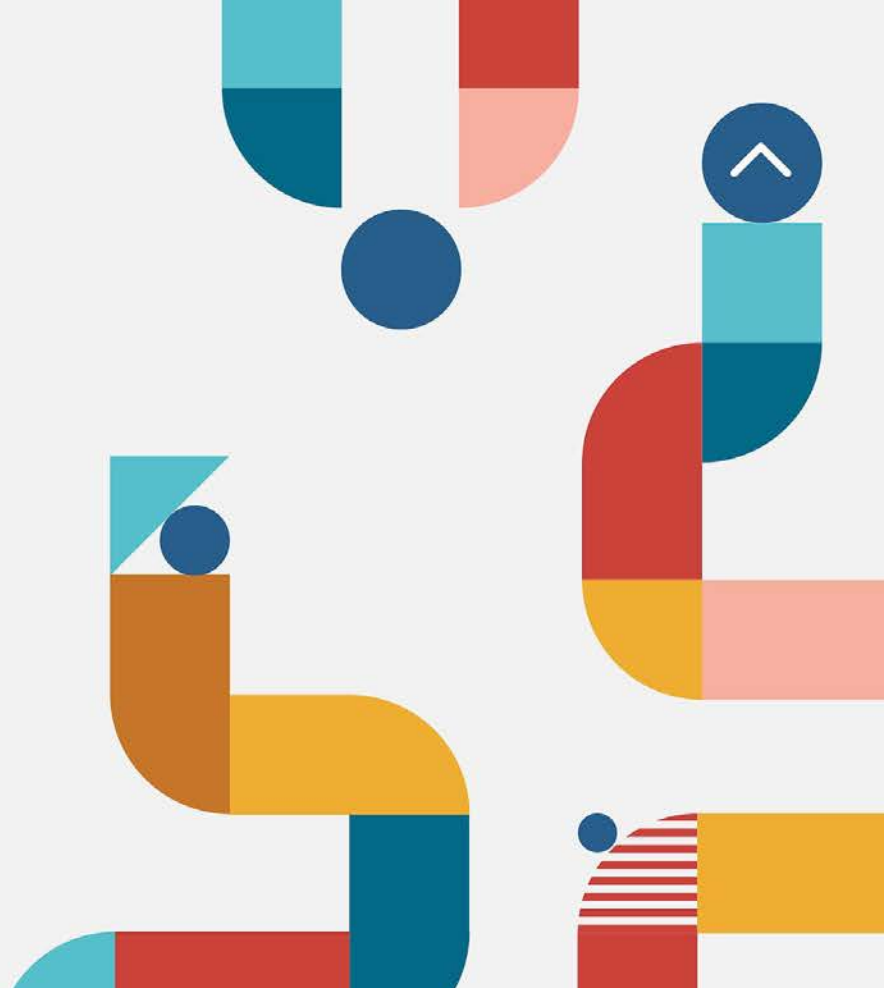
August 15, 2024



Agenda

CMDB and Discovery workshop consists of an overview of the CMDB Structure, Common Terms, How IRE Functions and Different Data Load Options

- CMDB Structure 101
- IRE Overview
- Discovery
- Service Graph
- IntegerationHUB ETL
- Transform Maps





Crafting exceptional experiences to make the difficult easy for clients

13+

Years ServiceNow Partner

11

Product Line Achievements

900+

Certifications & Accreditations

4.62
CSAT

Leading ServiceNow Partner

150+

Apps Built on ServiceNow

6

Offerings Built with ServiceNow



Inc.
5000
Best Workplaces



Cask is the only pure play
ServiceNow partner with
dedicated, fully certified
practices across the
platform.



IT SERVICE
MANAGEMENT



IT OPERATIONS
MANAGEMENT



IT ASSET
MANAGEMENT



STRATEGIC
PORTFOLIO
MANAGEMENT



EMPLOYEE
WORKFLOW



CUSTOMER
WORKFLOW



SECURITY
& RISK



APP ENGINE

STRATEGY

Strategic Roadmapping
Advisory Consulting
Platform Strategy & Governance
Demand Management

TRANSFORMATION

App Modernization
UX & UI Design
Product Management
Org Change Management
Testing & Quality Engineering
Program & Project Management
Agile Transformation w/SAFe

IMPLEMENTATION & APP DEVELOPMENT

Product Implementation
Platform Engineering
Data Management & Integrations
App Development

OPERATIONS & ENHANCEMENT

Continuous Cloud Innovation
Platform Architecture & Engineering
Functional Process Execution
Cask Reserve

Introductions



Madan Raja

Director, Delivery
Cask



Christine Morris

Director, Platform &
Service Management,
Cask



Chris Padmore

Solutions Architect,
ITOM Practice Lead,
Cask

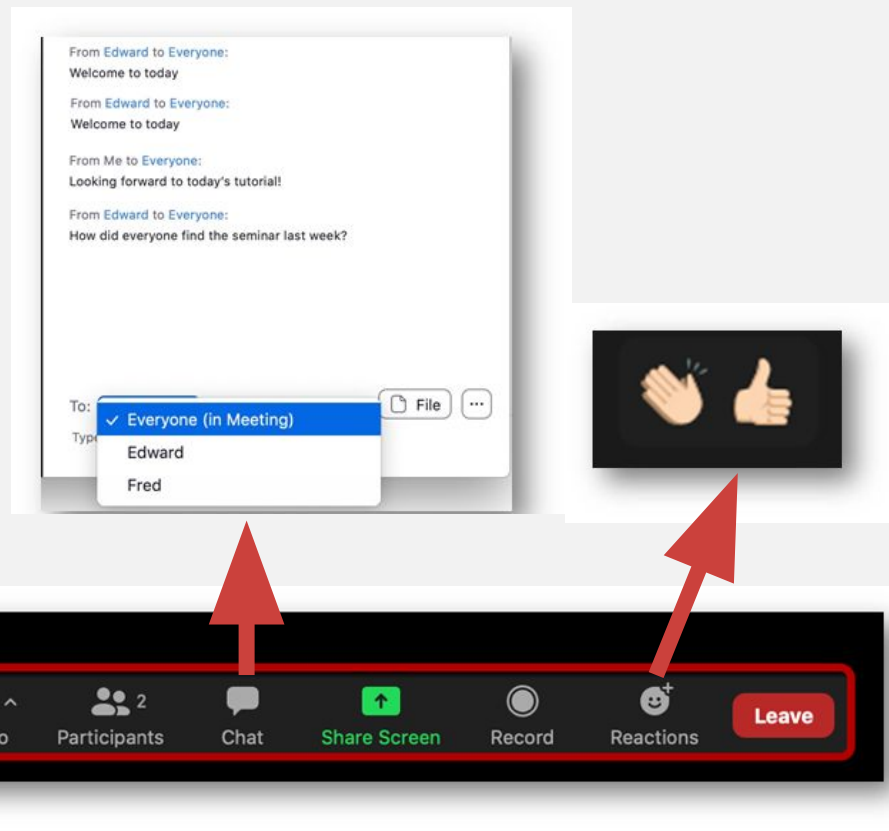
Join the Conversation: Using Zoom

Turn on Video – Let's get interactive and enjoy ourselves

Unmute – Click the microphone icon to unmute and participate

Chat – Message everyone or just one person

Get Help – Use Chat





Why Are We Here?



Why CMDB Data Loading & IRE Best Practices?

CMDB Data Loading and Identification and Reconciliation Engine (IRE) best practices are crucial for maintaining the accuracy, reliability, and efficiency of your ServiceNow CMDB. Here's why:

Data Integrity and Consistency

Efficient Management of Complex Environment

Reduced Operational Risks

Enhanced Automation and Efficiency





CMDB Structure 101



Key Concepts

Class

Describes a CMDB table that **contains and represents a specific type or group of CIs** that share common attributes such as a Operating System, Function or purpose (e.g., Windows Server, Router, Application, Service Offering)

Attribute

A unit of **information stored for each CI** either consistent across all assets (core) or specific to the type of asset (class). Describes a CI such as a name, serial number, manufacturer, operating system

Product Model

A product model is a **specific version or configuration** of a product

Model Categories

Model categories **associate CI classes with asset classes**. The CMDB uses this as referential data. The model category determines if an asset is created from a CI and if so, what class of Asset

Models

Models are specific versions or various configurations of an asset (e.g., Hardware, Software, Consumable)

Hardware Model

A hardware model can be discovered and populated in the CMDB. The Model will have a manufacturer, model number to identify that version of the hardware

Logical CI

Do not take up space. They perform specific functions requiring physical components in order to operate. Service Offering, Service, Business Application. Manually entered into CMDB

Physical CI

They have a specific location, take up space, and can be seen (e.g., servers, desktops, network devices, etc.). **Can often be detected through discovery**

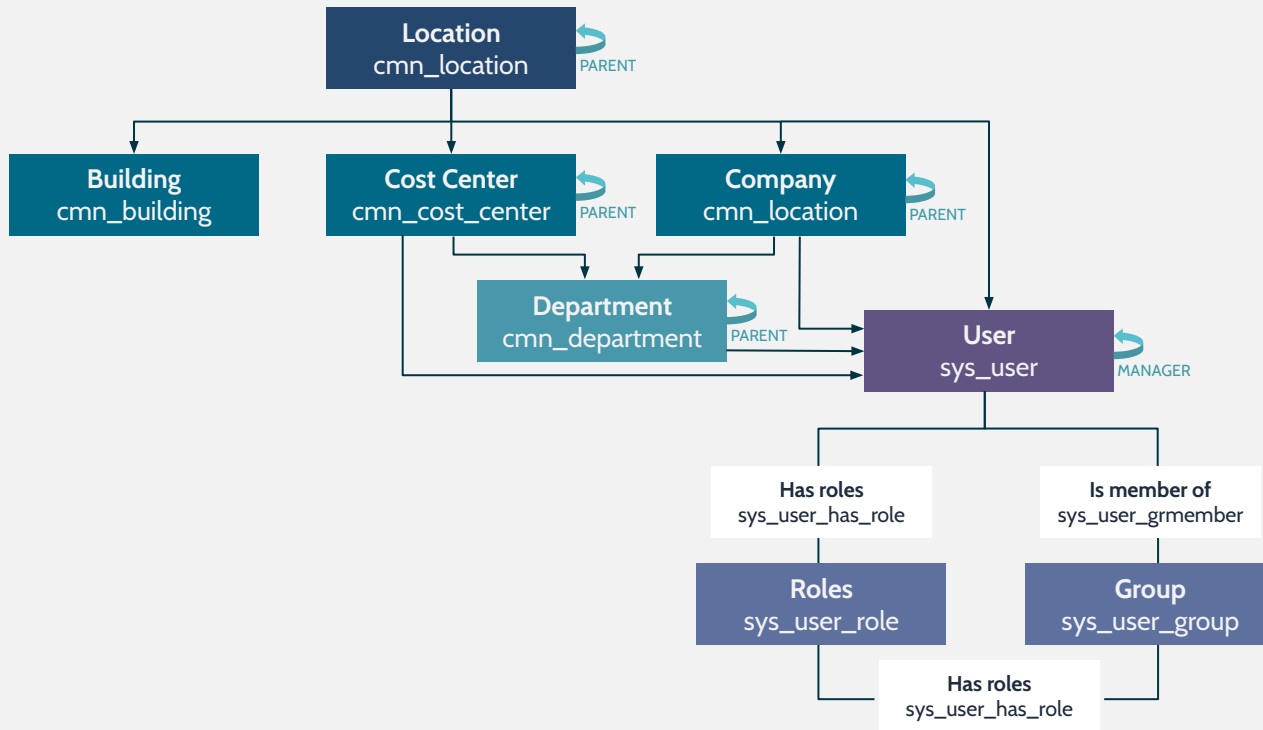
Conceptual Component

Representations of **physical and logical components that have been combined** to create a Service or System like an Application Service

Foundational Data

Common data tables which are shared across ServiceNow applications, processes or use cases

- Refers to Users, Groups, Locations, Business Units
- Not stored in CMDB
- Foundation data is often used for approvals - if this data is missing the workflow fails
- Location, Company, Cost Center, Role, Group, User, Building Department, Company

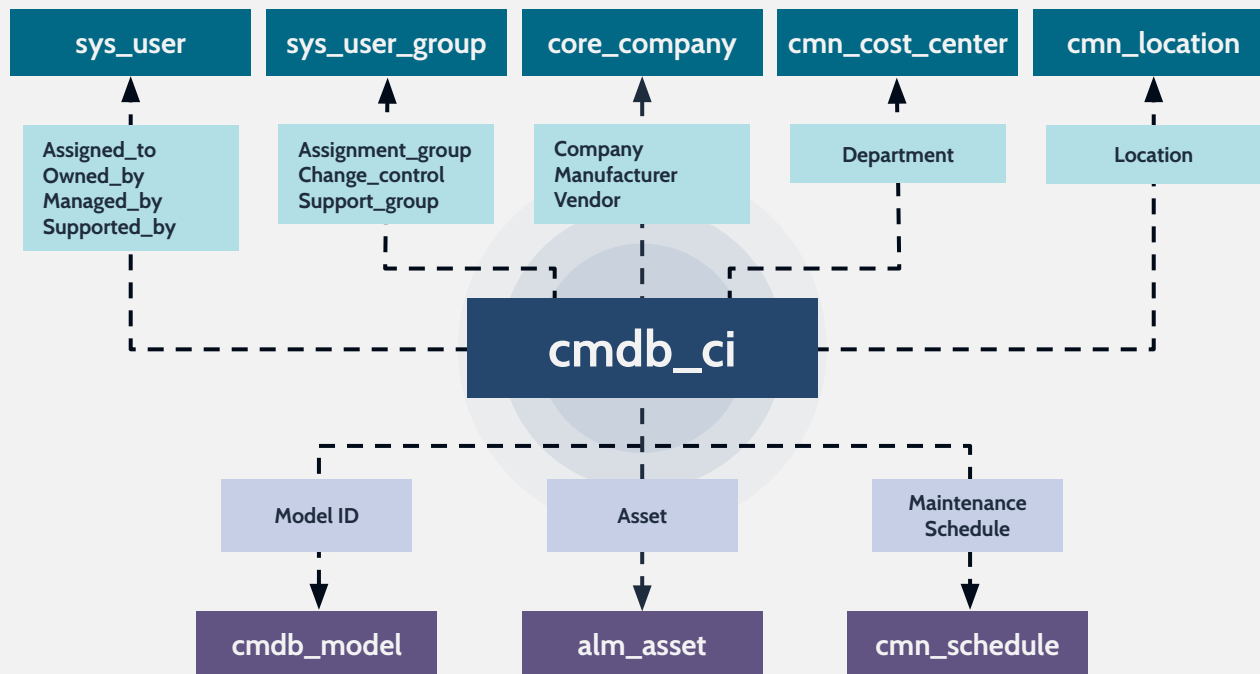


CMDB Base Table

CMDB CI schema related to common core and non-core tables

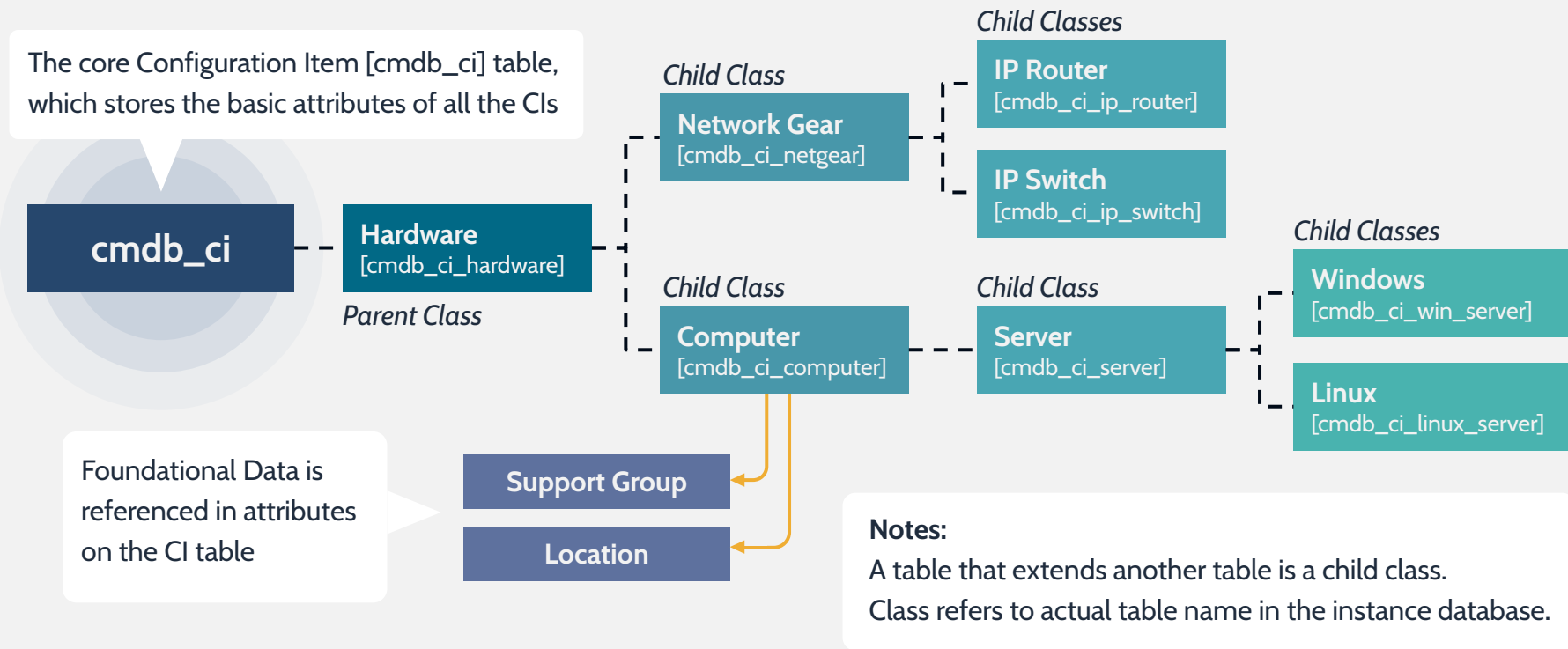
CMDB [cmdb_ci] base table and references to foundational or "core data"

Non-core tables are referenced against other ServiceNow applications



CMDB Class Structure

The core CMDB CI [cmdb_ci] table, stores the basic attributes of all the CIs

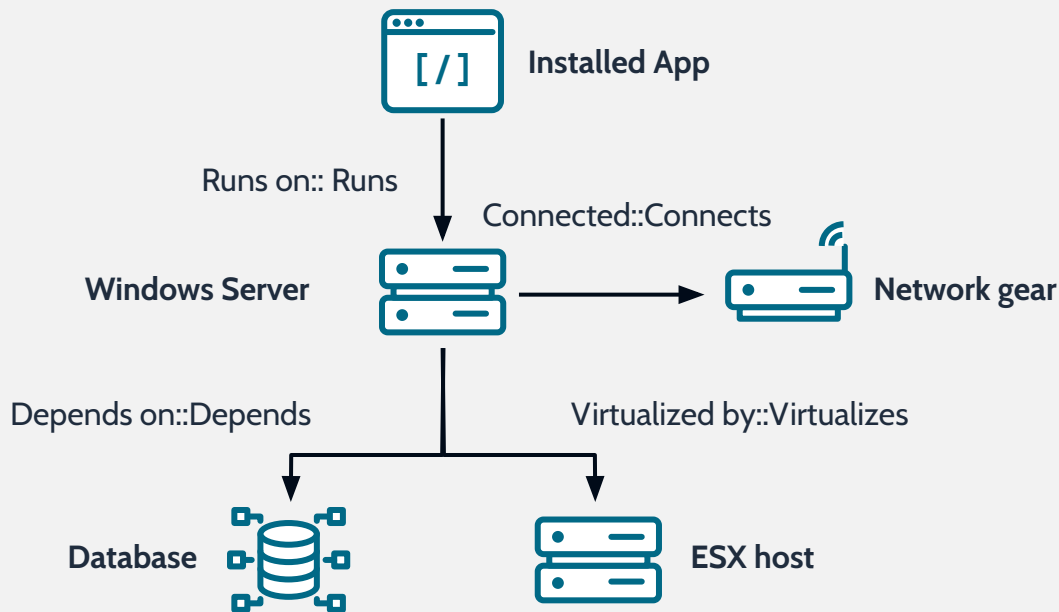
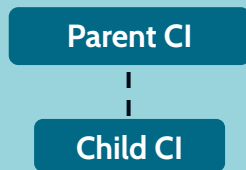


CI Relationships

CMDB helps track both the CI and their relationships to other CIs

The relationships between CIs can be automatically discovered. If you use Discovery, many relationships can be automatically loaded into the system through automated Discovery process. If you import your data from another system, you get some form of relationships.

A relationship in the CMDB consists of two CIs and a relationship type:





Identification & Reconciliation Engine (IRE)



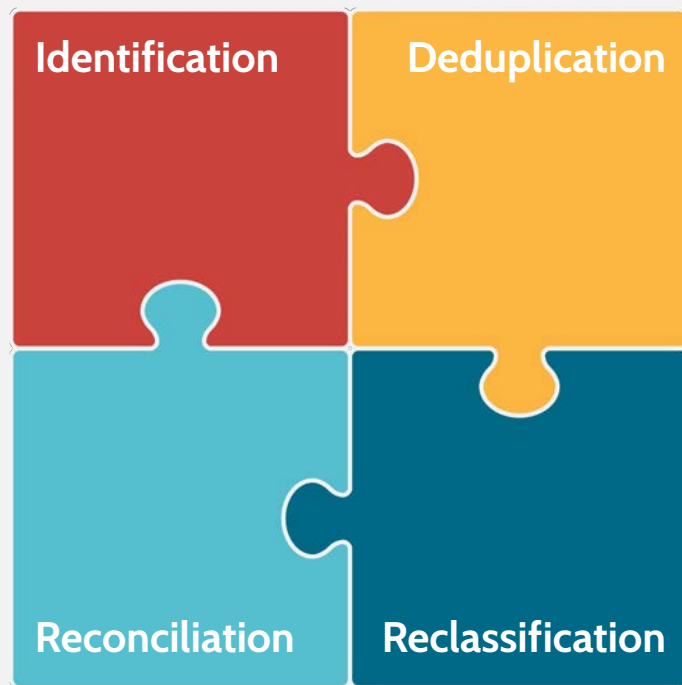
Identification & Reconciliation Engine

Identification

- Correctly identify CIs so you do not duplicate
- Does it exist or need to be created?
- Relies on identification

Reconciliation

- Only allow authoritative sources
- The CMDB is updated in real time; the process relies on reconciliation rules



Deduplication

- Duplicate CIs are grouped into de-duplication task
- Shows how it determined it was duplicate

Reclassification

A CI can be upgraded to a higher class, downgraded to a lower class, or switched to a different branch in the class hierarchy

Identification rules



- ▶ **An identification rule applies to a CI class and consists of:**
 - One or more identifier entries and related entries

- ▶ **They are hierarchical but can be overwritten at child class**
 - Parent Class = Server
 - Child Class = Windows Server

- ▶ **Most classes have an Identification IRE rules in the platform; it's an exception to have to create your own**

- ▶ **2 types of Rules –**
 - Independent (e.g., Server)
 - Dependent (e.g., Tomcat running on Server)

- ▶ **The identification process rules use the CIs attributes for identification:**
 - **Unique attributes**
Designated attribute values that can be used to uniquely identify the CI. Unique attributes can be from the same table or from derived tables
 - **Required attributes**
Designated attributes of a CI that cannot be empty

Identification rules – Independent

- Navigate to CI Class Manager
- Locate the CI Class
- Review the Out of Box Identification Rule
- Most “Discoverable” classes come with an OOB identification rule
- Identification rules support hierarchy

The screenshot shows the 'CI Class Manager' interface. On the left, a sidebar lists 'Class Info', 'Basic Info', 'Attributes', 'Identification Rule' (selected), 'Reconciliation Rules', 'Suggested Relationships', 'All Relationship Rules', 'Health', and 'CI List'. The main area displays the 'Identification Rule' for 'Windows Server'. A blue callout bubble points to the 'Independent' radio button, which is selected. Below this, there are three 'Identifier Entries' listed as 'Search on Table' with details like 'Serial Number', 'Priority', 'Attributes', and 'Active' status. A second blue callout bubble points to the 'Independent' radio button with the text 'Identification rules can be independent or dependent'. A third blue callout bubble at the bottom right states 'IRE handles reclassification – ability to control class switching of instance, payload or by integration' and 'IRE controls integrations being able to update vs create a record'.

Identification rules can be independent or dependent

IRE handles reclassification – ability to control class switching of instance, payload or by integration

IRE controls integrations being able to update vs create a record

Identification rules – Dependent rule

CI Class Manager is the place to manage Identification Rules

The screenshot shows the 'CI Class Manager' interface. On the left is a sidebar with a 'Hierarchy' tab and a tree view containing 'Tomcat', 'Class Info', 'Basic Info', 'Attributes', 'Identification Rule' (selected), 'Dependent Relationships', 'Reconciliation Rules', 'Suggested Relationships', 'All Relationship Rules', 'Health', and 'CI List'. The main area is titled 'Identification Rule' and shows a table with one rule. The rule's 'Name' is 'tomcat' and it is marked as 'Dependent' with a blue icon. A callout bubble points to this icon with the text 'Identification rules can be independent or dependent'. Below the table are sections for 'Identifier Entries (1)', 'Related Entries (1)', and an 'Add' button. The 'Identifier Entries' section shows a search on the 'Tomcat' table with attributes like 'Priority 100' and 'Active'. The 'Related Entries' section shows a search on the 'Related Table' with attributes like 'Key Value' and 'Reference Field'.

CI Class Manager

Configuration Item > Application > Application Server > Tomcat

Tomcat

Identification Rule

Indicates if a CI can be identified

Name	Applies to	Description	
tomcat	Tomcat	SW:Tomcat	Edit Delete

Dependent

Identifier Entries (1)

Includes criterion attributes that uniquely identify the CI that the identification rule is associated with. An identification rule must have at least one active identifier entry.

+ Add

Search on Table
Tomcat
Priority
100
Attributes (3)
Class, Installation directory, Running proces...
Active

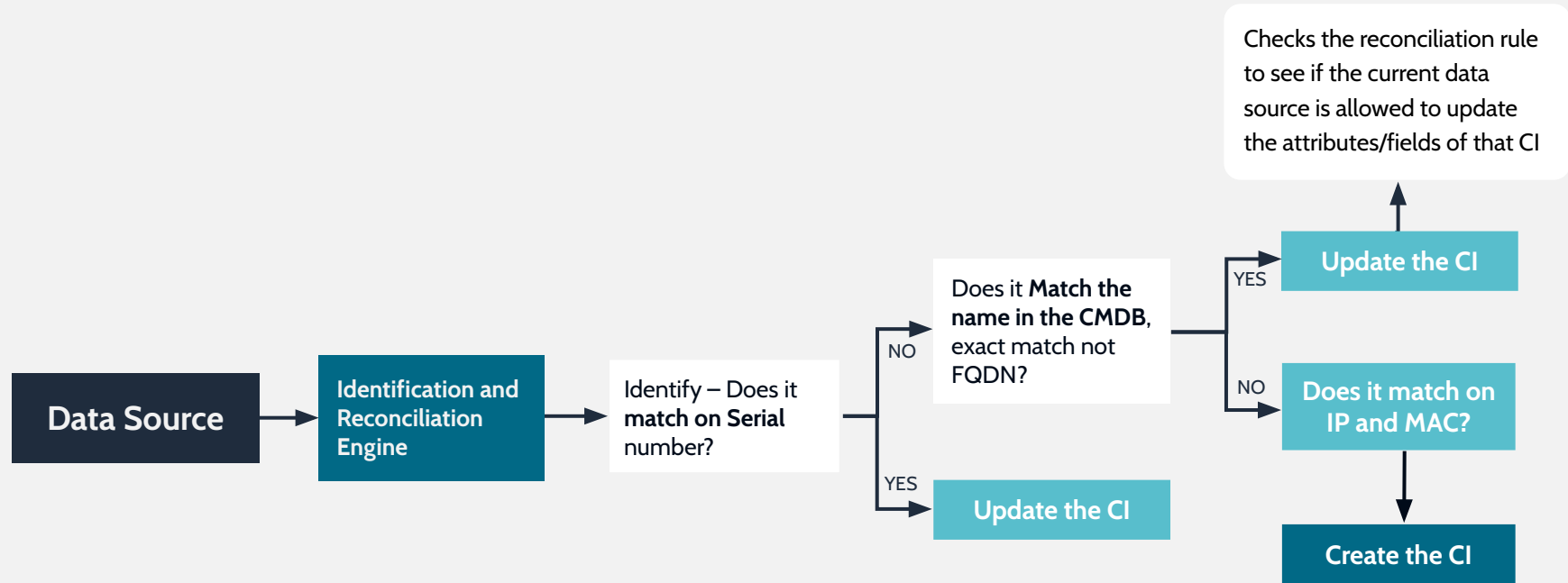
Related Entries (1)

Includes criterion attributes based on related CIs. Related entries are not used to directly identify CIs.

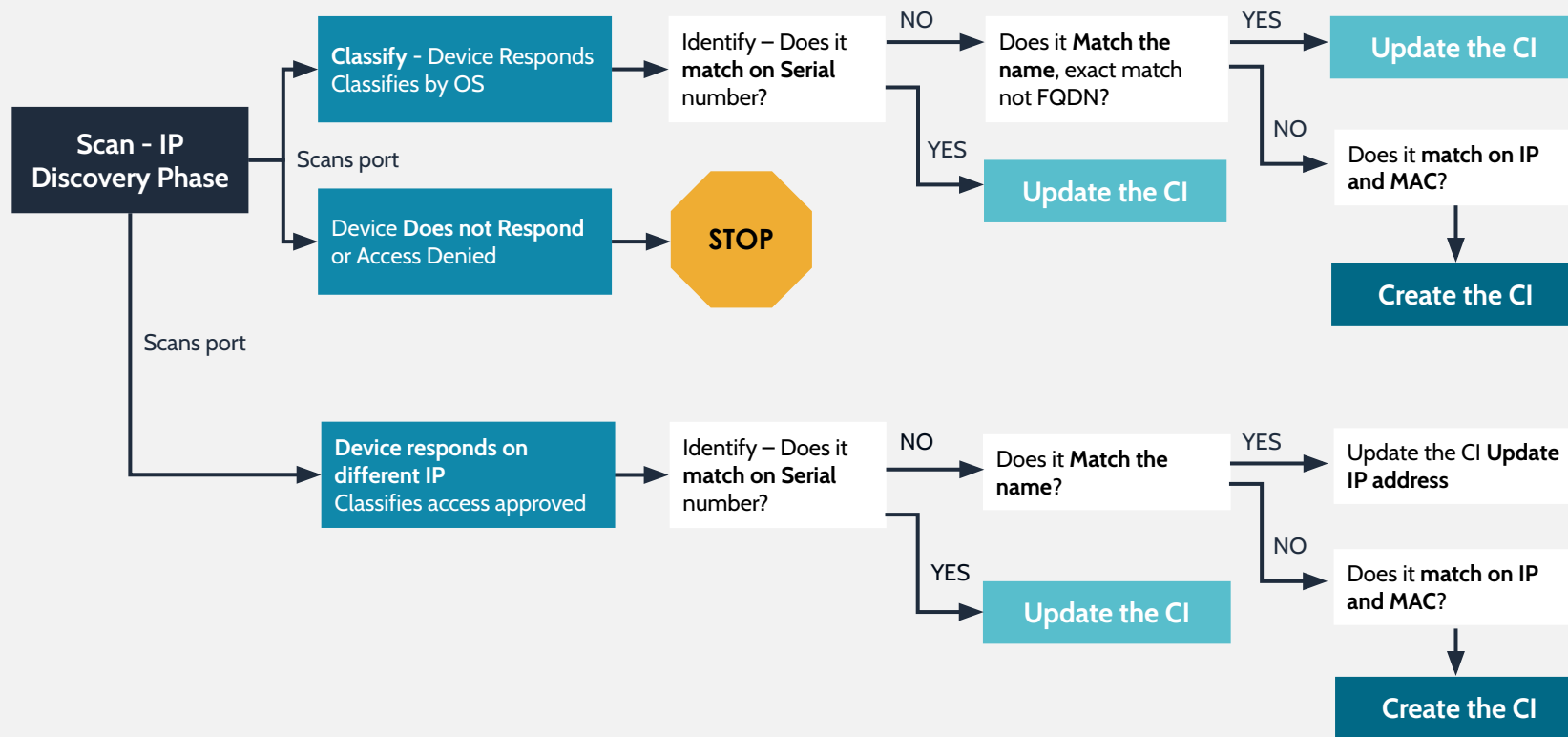
+ Add

Related Table
Key Value
Reference Field

Data Source and IRE Engine Process Flow

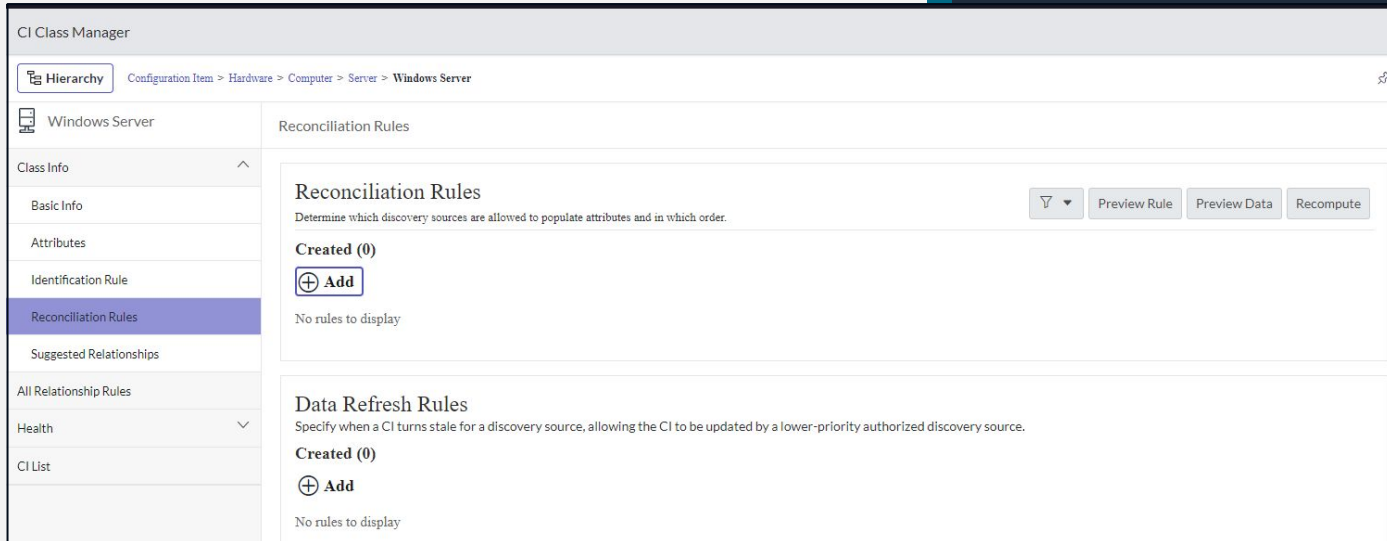


Discovery and IRE Engine Process Flow



Reconciliation rules

- Determine which data sources can update CI attributes
- Data sources with highest priority determine what an attribute value will be
- Create a static or dynamic CI reconciliation rule
- No OOB reconciliation rules



The screenshot shows the 'CI Class Manager' interface. The breadcrumb trail is 'Configuration Item > Hardware > Computer > Server > Windows Server'. The left sidebar shows a hierarchy of configuration items, with 'Reconciliation Rules' selected under 'Windows Server'. The main panel is titled 'Reconciliation Rules' and contains two sections: 'Reconciliation Rules' and 'Data Refresh Rules'. Both sections show 'Created (0)' and an 'Add' button. The 'Reconciliation Rules' section also has a 'No rules to display' message. The 'Data Refresh Rules' section also has a 'No rules to display' message. At the top right of the main panel, there are buttons for 'Preview Rule', 'Preview Data', and 'Recompute'.



- Reconciliation can be per class, per attribute
- Child class rules have higher precedence over parent rules
- Dynamic rules requires multi-source engine



Discovery



What is Discovery?

ServiceNow Discovery is a method of populating your CMDB with relevant hardware and software assets within your enterprise environment

- ▶ Utilizing a specific step, or phased, process Discovery remotely discovers your Windows and Unix computers/servers, network devices, powering and printing equipment
- ▶ The platform then maps specific Application to Host and Application to Application dependencies including Layer 2 Physical Hardware relationships



Key Concepts

Horizontal Discovery

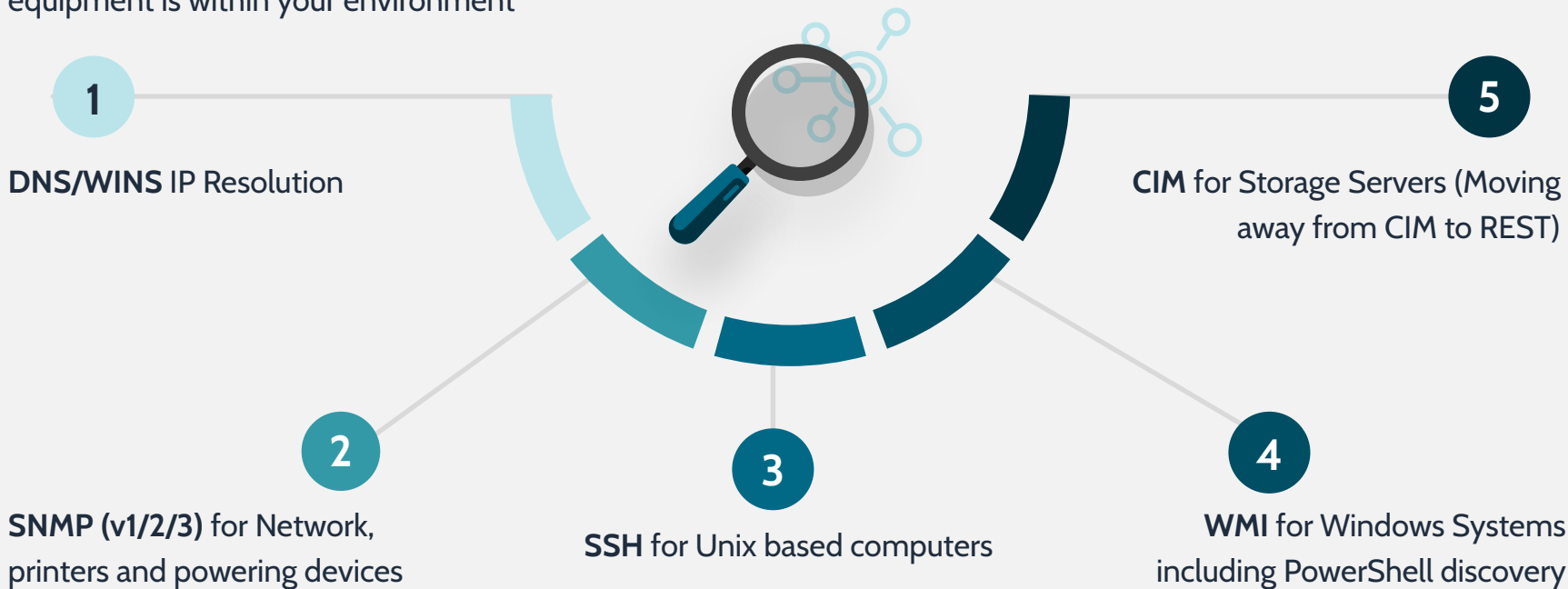
The discovery of like **devices in the same CI class** creates direct relationships between CIs. Discovery is not 'service' aware and **does not create relationships based on the Business/Technical or Application service they support.**

Top Down Discovery

Used by Service Mapping, finds CIs and maps to other CIs based on the Business/Technical or Application service. **Works with Discovery together, to run horizontal discovery first to find CIs, and then Service Mapping runs top-down to establish the relationships between the services.**

Discovery Technology

ServiceNow Discovery technology uses industry established ports and protocols to identify and assess what equipment is within your environment



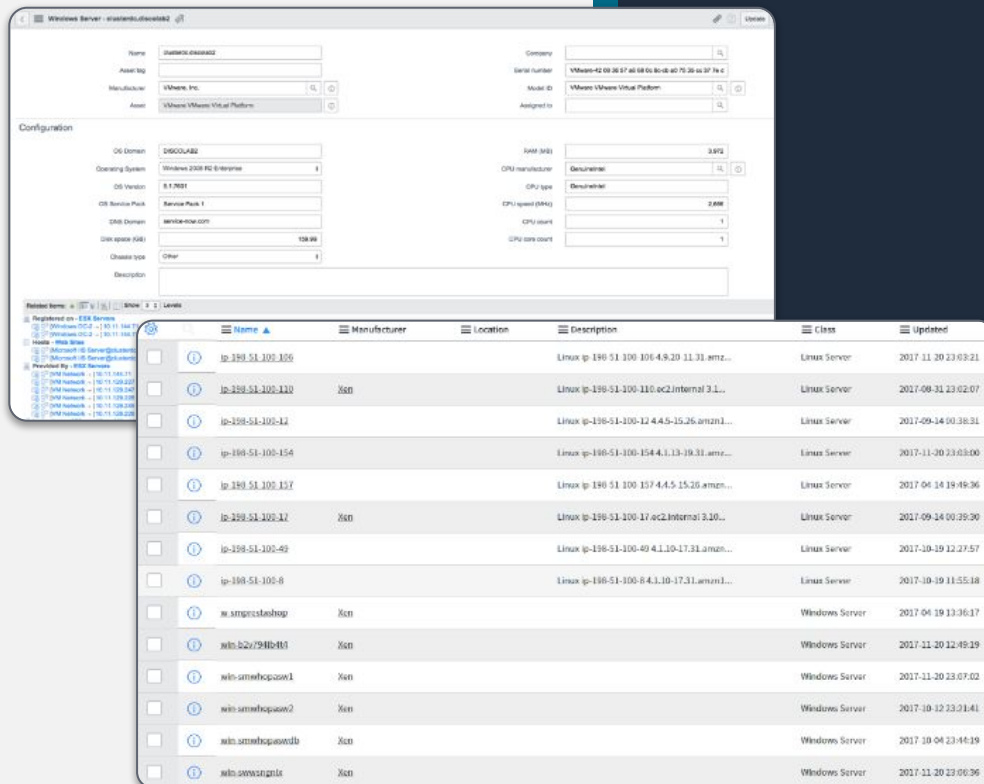
No secret protocols or agents to deploy.

Discovery Results

Discovery will populate the CMDB with all discovered devices such as

- Linux Servers
- Windows Servers
- Desktops
- Network Devices
- Printers

Each device will be represented as a record in the CMDB processed through the IRE





Service Graph Connectors



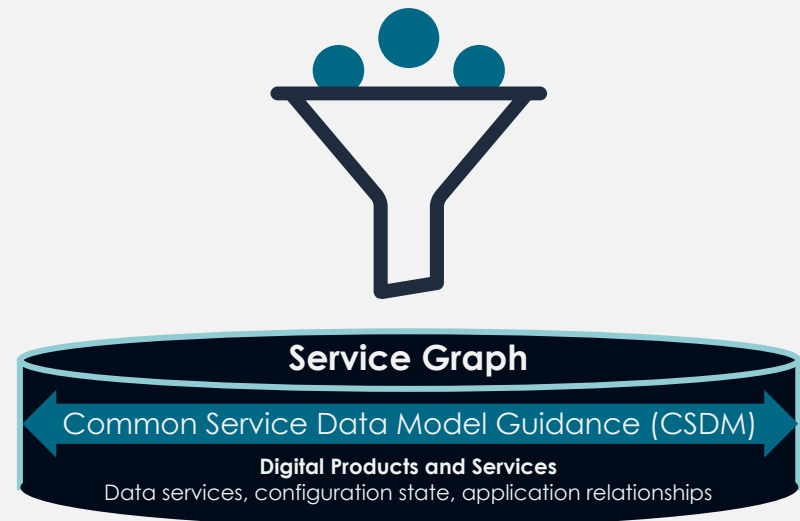
Use cases

Standard Service Graph Connector Features

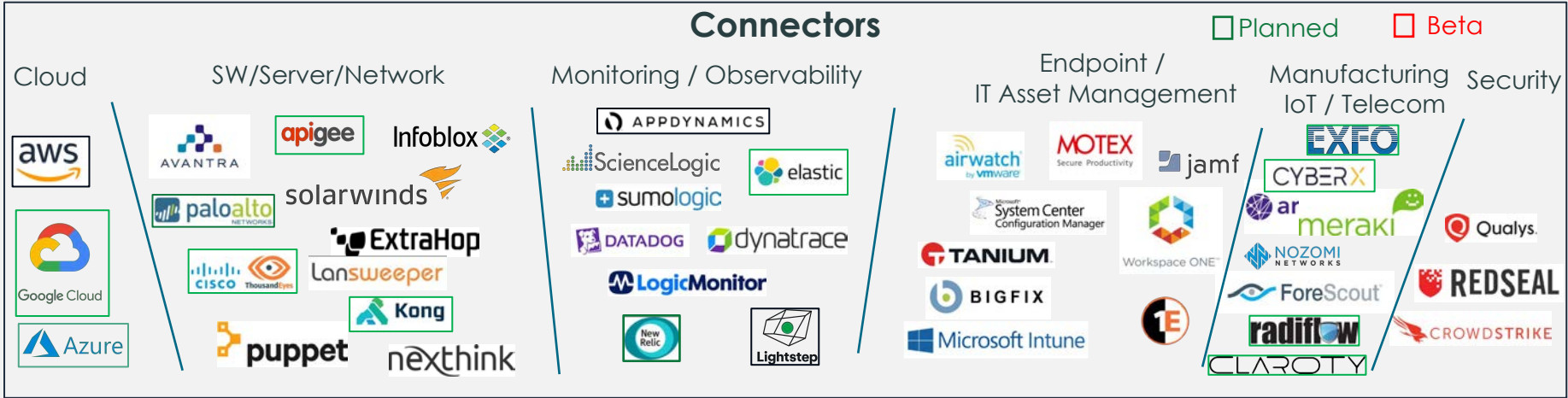
- Data sources & Registered Discovery Source
- Predefined IH-ETL Mapping out-of-box
- RTE and IRE support
- Transforms and table cleaners
- Guided Setup
- Event Management Support (NOW-developed connectors)

Use Cases supported by connector

- ITAM
- ITOM
- Security
- IT/OT
- Industry



Service Graph Connectors



Why Service Graph Connectors?

- ✓ ServiceNow tested & supported
- ✓ ServiceNow or ISV Partner built
- ✓ Multisource & reconciliation enabled

servicenow

IH-ETL

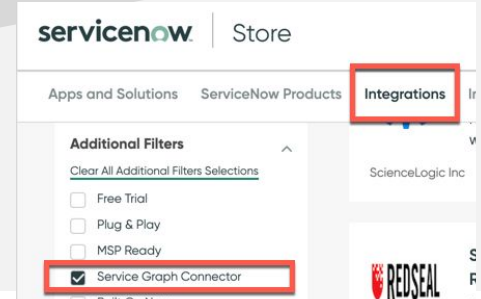
Multisource
IRE

Discovery
Service Mapping

Service Graph

CSDM & CMDB

<https://store.servicenow.com>



Service Graph Connector for Microsoft SCCM



ITOM Visibility

Detailed hardware and software inventory

ITSM

Create Incident/Problem/Changes on discovered CIs

Automatic device ownership assignment

SAM / HAM

Inventory software and track installations

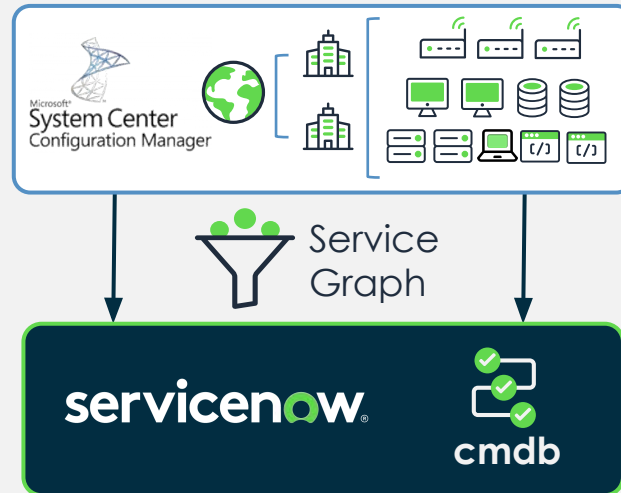
License reclamation

Supports software editions, publisher, product information, and SCCM asset intelligence

Summary:

Connector via MID Server to SCCM.

Enable software editions so that you can gather edition information for products such as Adobe Acrobat, Microsoft SQL Server, and Windows Exchange Server



Technology Workflow Use Cases Supported:

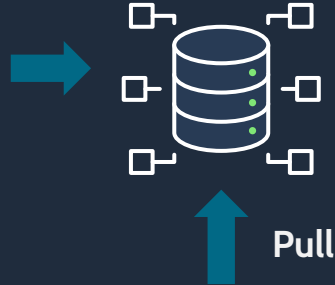
- Software Asset Management
- Hardware Asset Management
- Service Operations
- Endpoint Device monitoring

Service Graph Connector (SCCM)

On Premise

SCCM Tables:	
Computer identity	...
Operating System	...
Processor	...
Disk	...
Network	...
Software	...
	...
	...

SCCM
(SQL Database)



JDBC (Port 1433)

Password Vault
(CyberArk)



MID Server

HTTPS TLS (Request Port 443)



Redact Sensitive Data



Transform



Reconsolidation

ECC Bus

ServiceNow Cloud

SG-SCCM-Patterns:

SG-SCCM Computer Identity: You can see the following data if it is available in SCCM:

Asset Tag. If the Asset Tag data is available, the mapping can be optionally enabled via

Assigned DNS Domain

Organizational Unit. This information will be in a related table. SG-SCCM Disk

SG-SCCM Last Discovered Update. This data source will run at the end of the import schedules to

update the last_discovered date on the Computer SG-SCCM Network

SG-SCCM Operating System

SG-SCCM Network

SG-SCCM Disk

SG-SCCM Processor

SG-SCCM Removed Software. Ensure the last_run datetime option is cleared for every run.

SG-SCCM Removed Software AI. Ensure the last_run datetime option is cleared for every run.

SG-SCCM Software



Password Vault



Discovery
Schedule

Service Graph Connector for AWS



ITOM Visibility

Detailed hardware and software inventory

Governance/Compliance outcome

SAM / ITAM

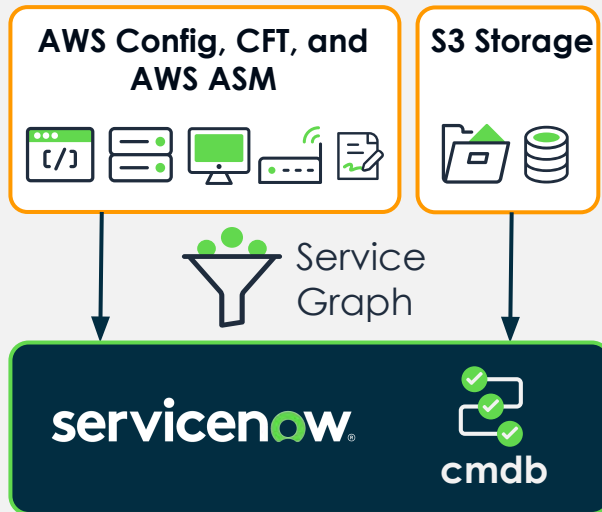
Inventory software and track installations

Deep Discovery of Applications

Correlate multiple cloud accounts for ITAM/SAM outcomes

Summary:

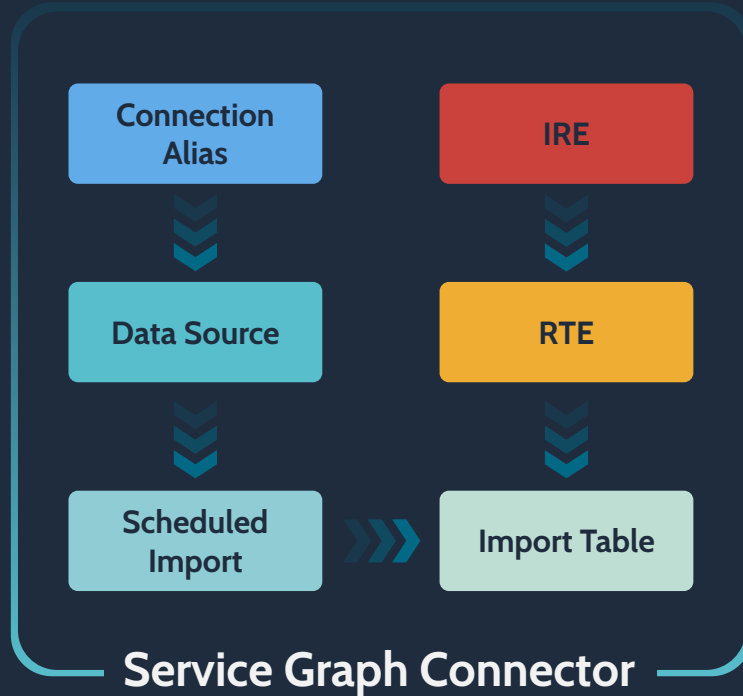
Connect to AWS EC2 and S3 to import the component EC2 ci and S3 storage ci from multiple accounts.



Technology Workflow Use Cases Supported:

- Cloud Governance
- Cloud Optimization
- Predictive AI Ops
- Health Log Analytics
- Service Operations

Service Graph Connector for AWS



servicenow®

Service Graph Connector for Jamf



ITOM Visibility

Detailed hardware and software inventory tracking for MacOS and iPhone/iPad

Compliance tracking for devices

ITSM

Create Incident/Problem/Changes on discovered CIs

Automatic device ownership assignment based on top user

SAM / ITAM

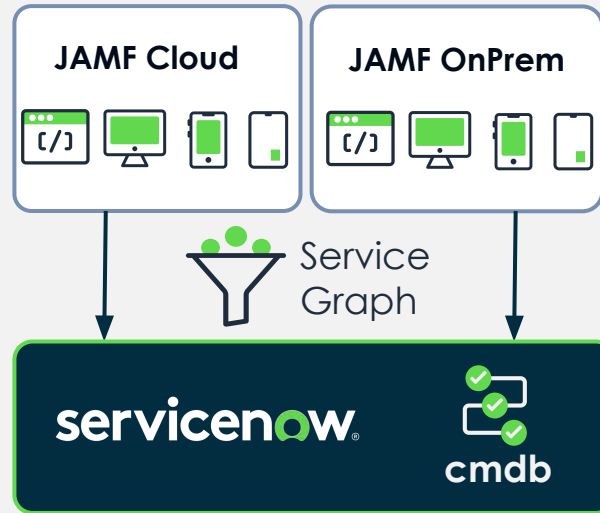
Inventory software and track installations

License reclamation

Software usage tracking

Summary:

Connect to any JAMF environment to import devices and related information into CMDB such as network, storage and software CI.



Technology Workflow Use Cases Supported:

- Software Asset Management
- Hardware Asset Management
- Service Operations
- Mobile Device monitoring

Service Graph Connector for Meraki



ITOM Visibility

Detailed hardware and software inventory

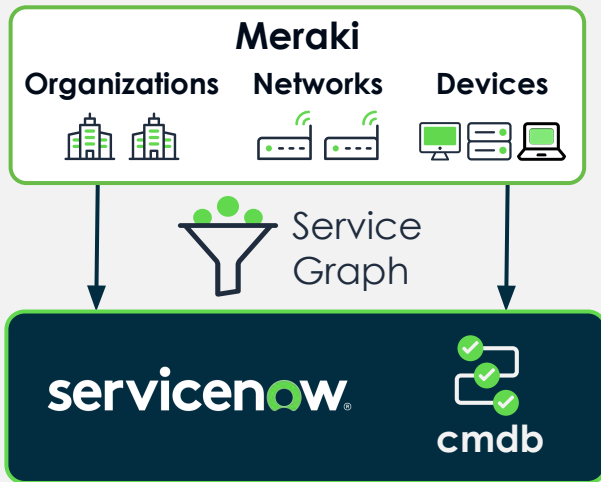
Event Management stream for alerting use cases

ITSM

Create Incidents on discovered CIs

Summary:

Connect to import Meraki Organizations which contain Networks and Devices under management, create Incidents from Meraki alerts with correlated ci and event data.



Technology Workflow Use Cases Supported:

- Visibility into Meraki Networks and Devices
- Service Operations



IntegrationHUB ETL



IntegrationHub ETL



Simplified user interface that guides the integration process end-to-end

2/2

Tasks

4. Preview Sample Integration Results and Schedule Import

Run your ETL Transform Map, make any necessary adjustments and perform rollback if needed.

- ✓ Test and Rollback Integration Results
- ✓ Set Import Schedule



Test and adjust configuration settings before scheduling recurring integrations

New ETL Transform Map

ETL Transform Map Assistant

Use this guided walkthrough to create and manage ETL Transform Map for integrating third-party data into CMDB.

0/1

1. Specify Basic Details

Provide basic information for the ETL Transform Map.

Tasks

- Import Source Data and Provide Basic Details

2. Process Source Data for Mapping

are it for mapping to CMDB classes and attributes.

unlock this step.

Relationships

source data to, and add any relationships amongst these classes.

data

g' in order to unlock this step.

Complete 'Select CMDB classes to map source data' in order to unlock this step.

4. Preview Sample Integration Results and Schedule Import

Run your ETL Transform Map, make any necessary adjustments and perform rollback if needed.

Locked

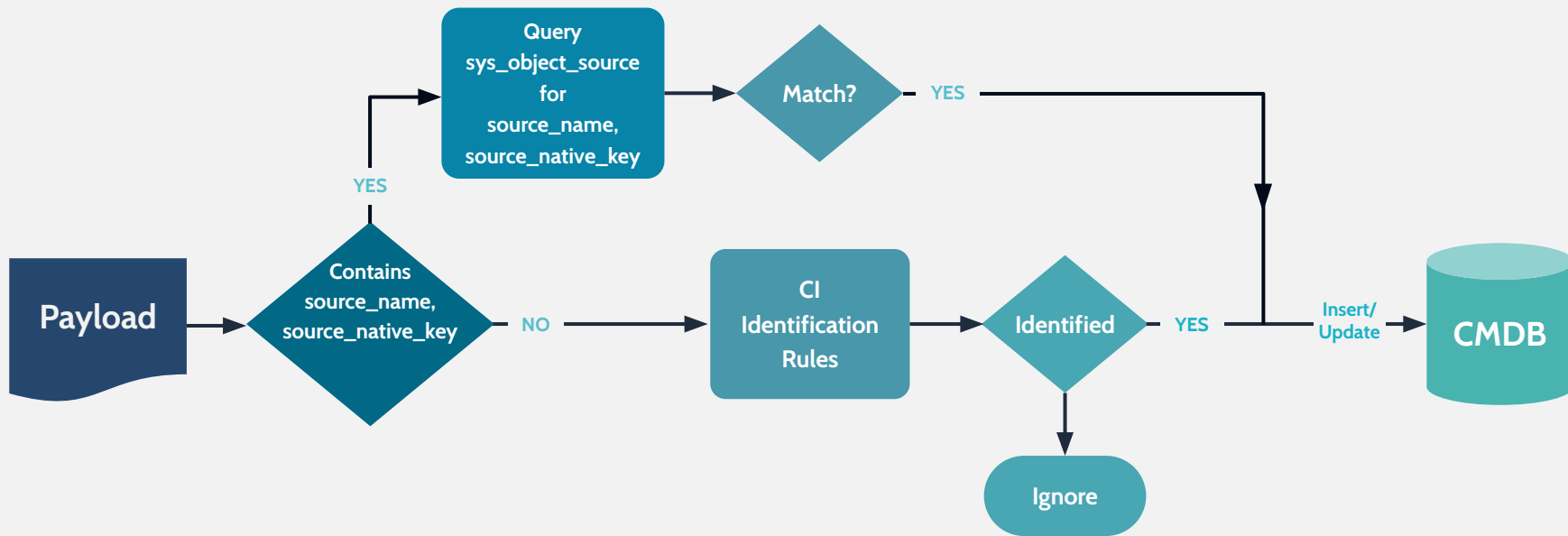
- Test and Rollback Integration Results
- Complete 'Map to CMDB and Add relationships' in order to unlock this step.
- Set Import Schedule
- Complete 'Test and Rollback Integration Results' in order to unlock this step.

IntegrationHub ETL Identification

- 1 The CMDB identification process relies on identification rules to uniquely identify CIs
- 2 Identification Rules can be slow to process due to the number of tables and data to query
- 3 To improve performance CIs can be uniquely identified using source_name and source_native_key values provided in the payload, against the Source [sys_object_source] table
- 4 If identification is not successful using that method, then identification rules will be used

```
{
  "items": [
    {
      "className": "cmdb_ci_win_server",
      "values": {
        "name": "SAMLABVM52"
      },
      "sys_object_source_info": {
        "source_native_key": "16777219",
        "source_name": "SCCM",
        "source_feed": "SCCM Computer Identity",
        "source_recency_timestamp": "2019-08-26 13:00:00"
      }
    }
  ]
}
```

IntegrationHub ETL Identification





Transform Maps



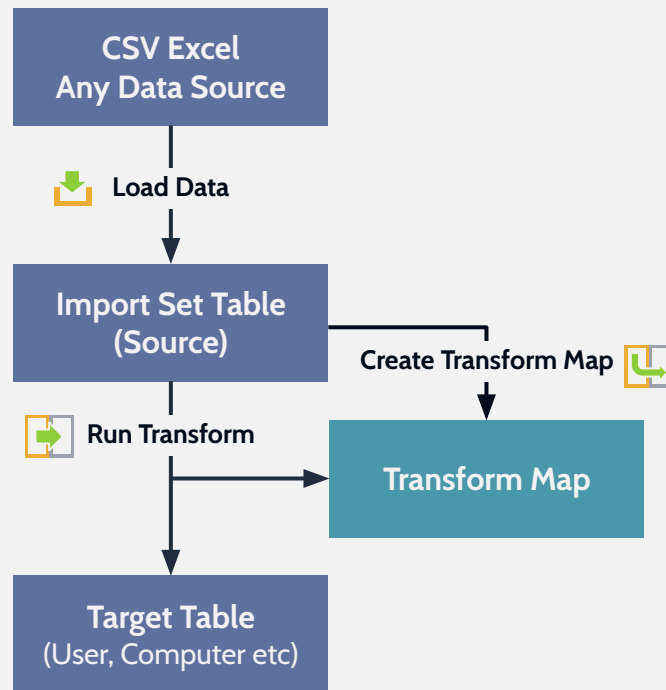
Manual Import

Import data from an import file such as CSV or Excel

Import best practices:

- Use the provided data load templates from target table
- Ensure the data is cleansed before import. Review for:
 - ✓ Completeness
 - ✓ Correctness
 - ✓ Compliance
- Need to add the following code to leverage IRE

```
(function runTransformScript(source, map, log, target) {  
  // Call CMDB API to do Identification and Reconciliation of current row  
  var cmdbUtil = new CMDBTransformUtil();  
  cmdbUtil.identifyAndReconcile(source, map, log);  
  ignore = true;  
})(source, map, log, target);
```





Summary



Getting Started Is Easy!

Cask meets you where your CMDB is today

Need a quick CMDB assessment
and rapid remediation?



CMDB
LAUNCHPAD

Need help managing your
CMDB on an ongoing basis?



CMDB
EXPERT ASSIST

Need to implement or overhaul
ITOM including your CMDB?



IT OPERATIONS
MANAGEMENT
ESSENTIALS

CMDB & CSDM CLASS

WEBINAR

Aligning Your CMDB to the CSDM Framework to Support your Portfolio of IT Services

5 SEPT 11 am PT

REGISTRATION COMING SOON! >

Cask USC University of Southern California

**LOOK FOR INSTALLMENT THREE
COMING NEXT MONTH**



Tell us what CMDB topics you
want to learn more about!

.....

Look for a survey
following this session!



Thank you!

Questions?

Email: Madan Raja, madan.raja@caskinc.com

