Service Mapping

CMDB MasterClass Part 7

Chris Padmore & Christine Morris | March 27, 2025

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Agenda

Welcome & Introduction

1. Service Mapping Overview

2. Personas & Roles

3. Architecture

4. Mapping Approaches and Related Processes

5. Service Mapping Practical Applications

6. Q&A

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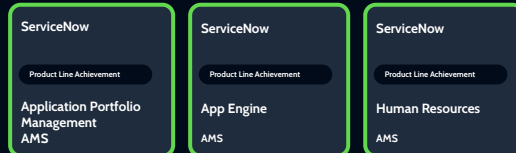## Cask NX is with clients for what comes next – on the platform and in their business.

4.6 Customer Satisfaction Rating

5.4K+ Certifications & Accreditations

servicenow
ELITE Partner
Consulting & Implementation

servicenow
ADVANCED PLATFORM Partner
Build

servicenow
ELITE Partner
Reseller

servicenow
Validated Practice ✓
IT Service Management
AMS

servicenow
Validated Practice ✓
Customer Service Mgmt
AMS

servicenow
Validated Practice ✓
Hardware Asset Mgmt
AMS

servicenow
Validated Practice ✓
Software Asset Mgmt
AMS

servicenow
Validated Practice ✓
ITOM Visibility
AMS

servicenow
Validated Practice ✓
Vulnerability Response
AMS

servicenow
Validated Practice ✓
Integrated Risk Management
AMS

servicenow
Validated Practice ✓
Hybrid Project Mgmt
AMS

ServiceNow
Product Line Achievement
Application Portfolio Management
AMS

ServiceNow
Product Line Achievement
App Engine
AMS

ServiceNow
Product Line Achievement
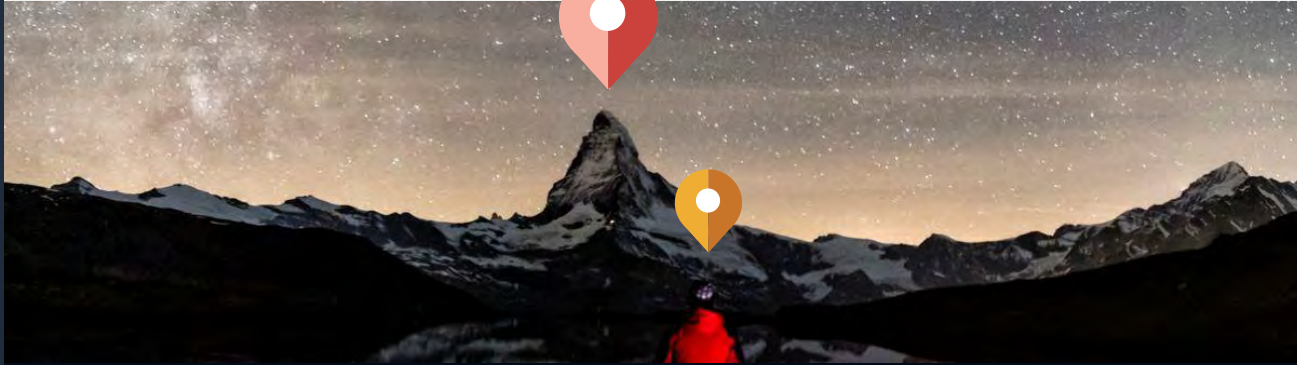**Human Resources**
AMS

8 VALIDATED PRACTICES (Most of any Pure-Play Partner in AMS)

+3 PRODUCT LINE ACHIEVEMENTS

Cask NX 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

Christine Morris
Director, Platform & Service Management
Cask NX

Chris Padmore
Solutions Architect, ITOM Practice Lead
Cask NX

Madan Raja
Director, Delivery
Cask Canada

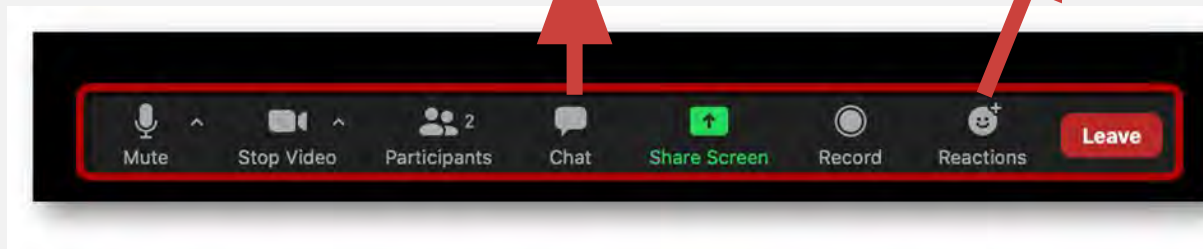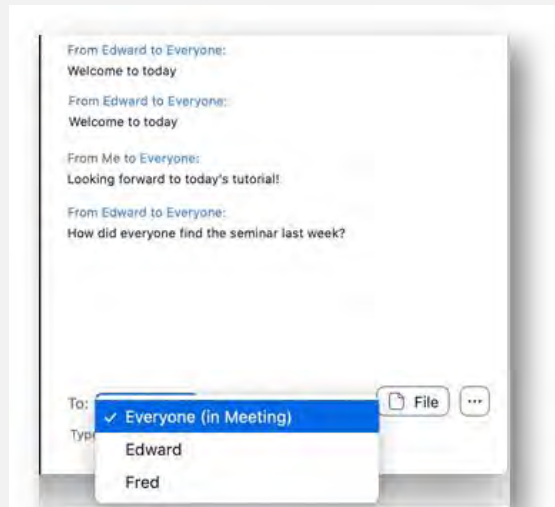# Join the Conversation: Using Zoom

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

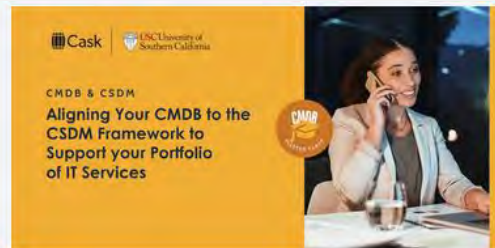**Unmute** – Click the microphone icon to unmute and participate

Chat – Message everyone or just one person

Get Help – Use Chat

Show Captions - Click on MORE, Show Captions

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Catch Up with Parts 1-6 of our CMDB MasterClass Series!

Cask — CMDB FOUNDATIONS
Unlock the Power of Your Platform with a Strong CMDB Foundation

Cask — CMDB & SECURITY
Maximize Your Platform's Potential with Effective CMDB Data Loading and IRE Strategies

Cask — USC University of Southern California — CMDB & CSDM
Aligning Your CMDB to the CSDM Framework to Support your Portfolio of IT Services

Cask — CMDB & DISCOVERY
Maximize Your IT Potential: Discovery Meets CMDB

Cask — CMDB & ITAM
A Strategic Approach to Visibility and Value

Cask — CMDB CARE AND FEEDING
Ongoing CMDB Maintenance: Feed It, Fix It, Love It

Find recordings, resources & more here! https://casknx.com/cmdb-masterclass-intro/

AUDIENCE POLL

Will you be at Knowledge 2025?

Would you be interested in a Cask MasterClass meetup?

(A) Yes, I'll be at Knowledge and would love to join a meetup!

(B) Yes, I'll be there—but my schedule is too packed for a meetup.

(C) No, I won't be attending this year.

(D) I'm not sure yet if I'm going.

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Service Mapping Overview

AUDIENCE POLL

How well is your organization managing services today?

A High confidence – we're confident and in control.

B Medium confidence – we're doing okay, but there's room to grow.

C Low confidence – we're struggling to manage effectively.

D Wait... what are services?

What is Service Mapping in ServiceNow?

Maps all application services in your organization and builds a comprehensive map of all devices, applications, and configuration profiles used in these application services.

Service Mapping – Use Cases

01

Reduced MTTR

Outage reduction

Improve change/incident routing

Reduce risk and impact analysis of change

Prioritize high impact and critical business provided services

02

Automation

Enable automation

Reduce manual processes

03

Visibility

End to End visibility

Empower Agents

Personas & Roles

Configuration Management Organization

Service Mapping Admin

- Sets up the Service Mapping application.
- Maps, fixes, and maintains application services.
- All Access to Service Mapping

Discovery Admin

- Expected to configure and execute Discovery in your network.
- All Access to Discovery
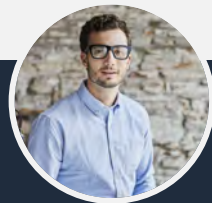
IT Application Owner

- Ensures accurate mapping of application services
- Reviews mapped services, approving or suggesting changes
- Assigned to users who own application services and understand the infrastructure
- View/approve individual services
- May be multiple IT application owners
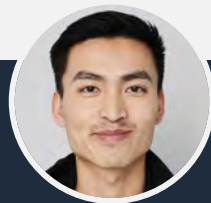
Service Map User

- Views maps for operational application services to plan change or migration, as well as analyze the continuity and availability of services.
- Assign this role to application users.
- Limited role – View only
- May be multiple IT application owners, agents or process owners

Architecture
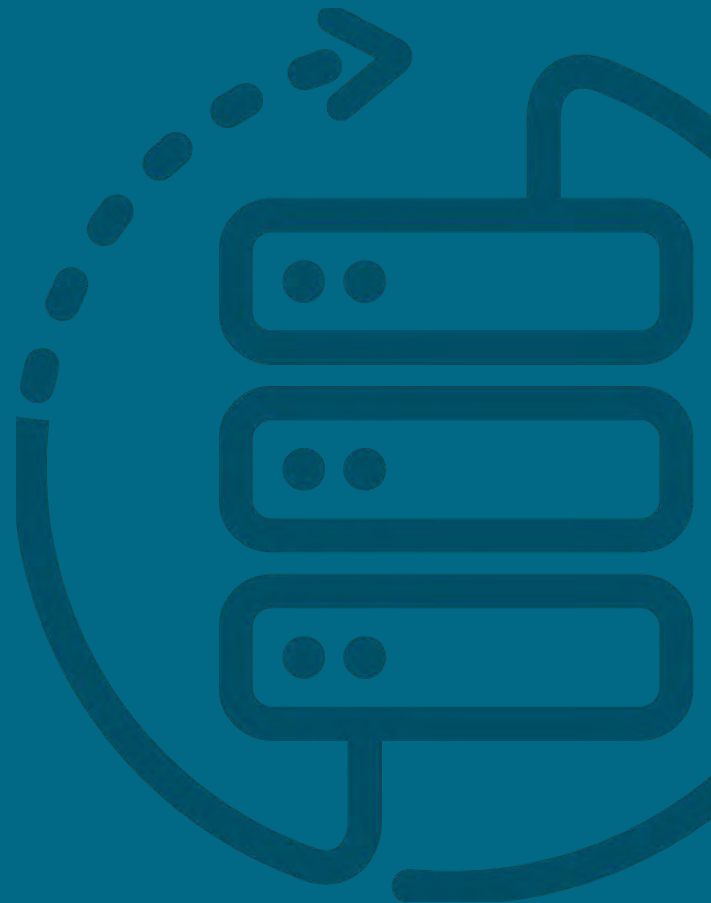
CSDM Tables Managed by ITOM Visibility

1. **Configuration Item table** *[cmdb_ci_*] =*
   CMDB tables where the configuration items are stored
   - Application table [cmdb_ci_appl]
   - Server table [cmdb_ci_server]
   - Virtual machines table [cmdb_ci_vm_instance]
   - Load balancer table [cmdb_ci_lb]
   - Network gear table [cmdb_ci_netgear]
   - Computer [cmdb_ci_computer]

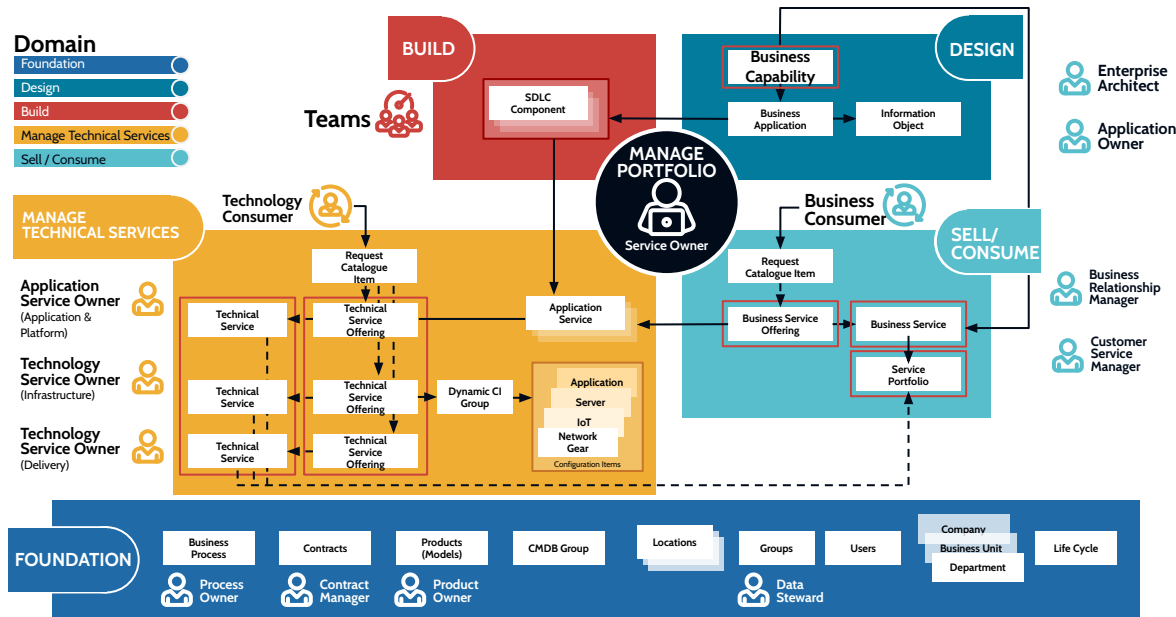2. **Application Service table** *[cmdb_ci_service_discovered]=*
   Service Mapping provides details about the application instance service in the [cmdb_ci_service_discovered] table, relating infrastructure and application [cmdb_ci_appl] CIs by grouping supporting CIs into a Dynamic CI group

3. **Used by ITOM Visibility**
   Dynamic CI Group table
   [cmdb_ci_query_based_service]=
   Dynamic CI Group service is used in Event Management as a logical grouping of CIs. It is also used in manually grouping CIs to Services for manual Service Mapping. Dynamic CI Group service provides the health status of the group to the technology or service owner
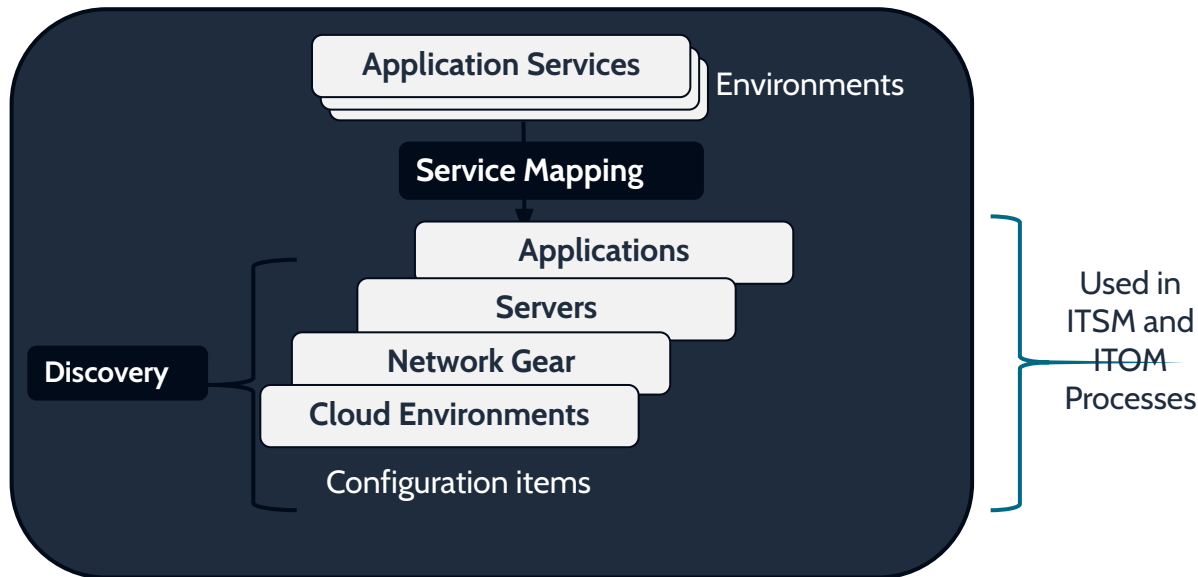
Data Architecture – Common Service Data Model

Application Service data is stored in the [cmdb_ci_service_auto] table till population method is selected.

Once mapping approach is done, the data may be viewed on one of these tables:

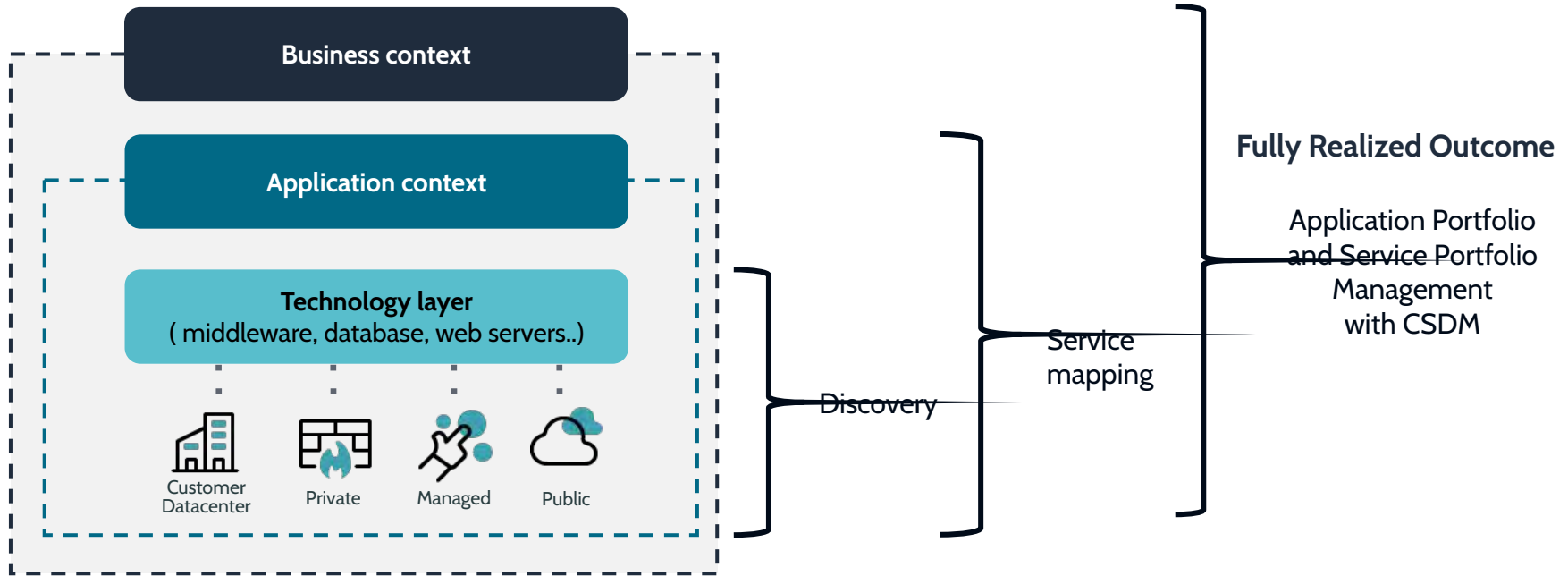- For Manual & Service Mapping: cmdb_ci_service_discovered
- Query Based: cmdb_ci_query_based_service
- Tag Based: cmdb_ci_service_by_tags
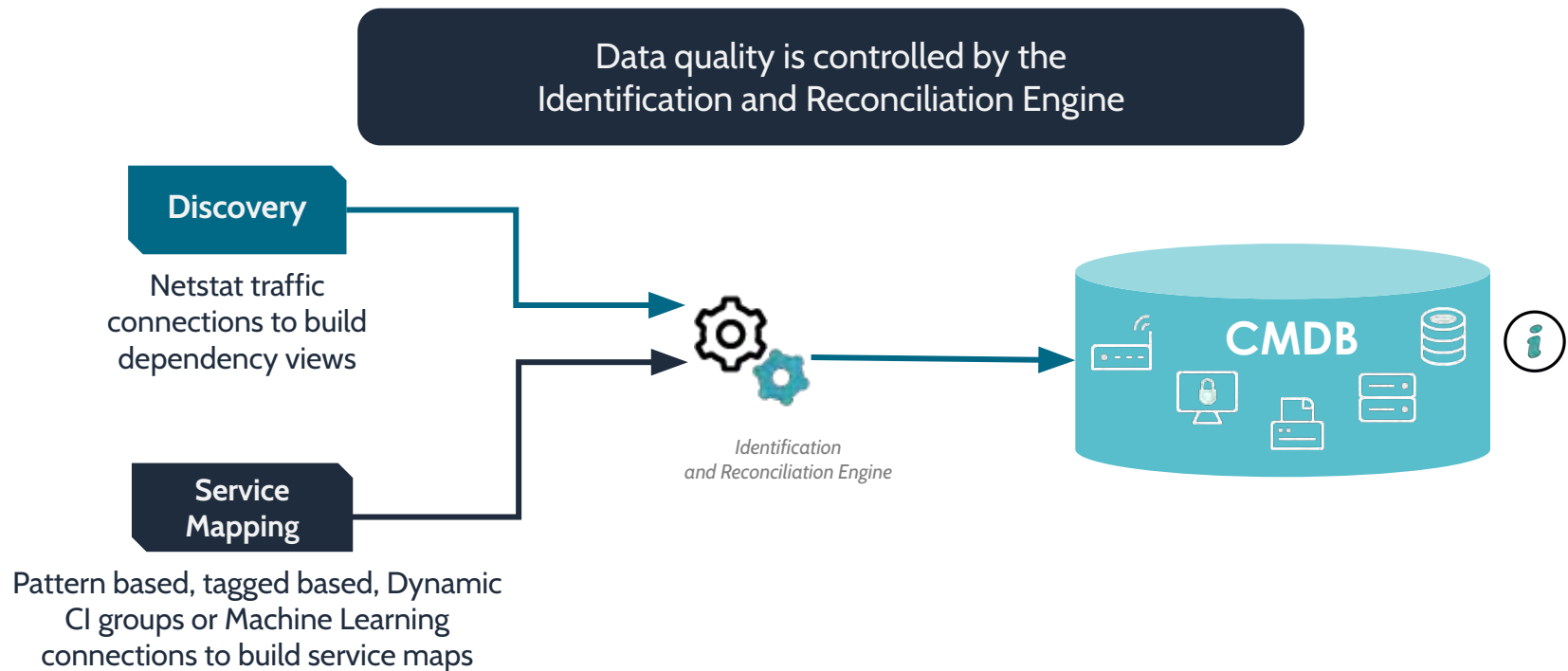
"Service Classification" = Application Service

Application Services — Environments

Service Mapping

Applications

Servers

Network Gear

Cloud Environments

Discovery

Configuration items

Used in ITSM and ITOM Processes

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Service Context Awareness to Infrastructure

CSDM – Industry recommended data model

Business context

Application context

Technology layer
(middleware, database, web servers..)

Customer Datacenter

Private

Managed

Public

Discovery

Service mapping

Fully Realized Outcome

Application Portfolio and Service Portfolio Management with CSDM

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Architecture: Population of CMDB

Data quality is controlled by the
Identification and Reconciliation Engine

Discovery

Netstat traffic
connections to build
dependency views

**Service
Mapping**

Pattern based, tagged based, Dynamic
CI groups or Machine Learning
connections to build service maps

*Identification
and Reconciliation Engine*

CMDB

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Discovery | Agentless Data Collection

Horizontal Discovery

Creates direct relationships between CIs, does not map Services to CI's

ServiceNow Discovery

CMDB Classes

Routers

Switches

Windows Servers

Linux Servers

Databases

Installed Applications
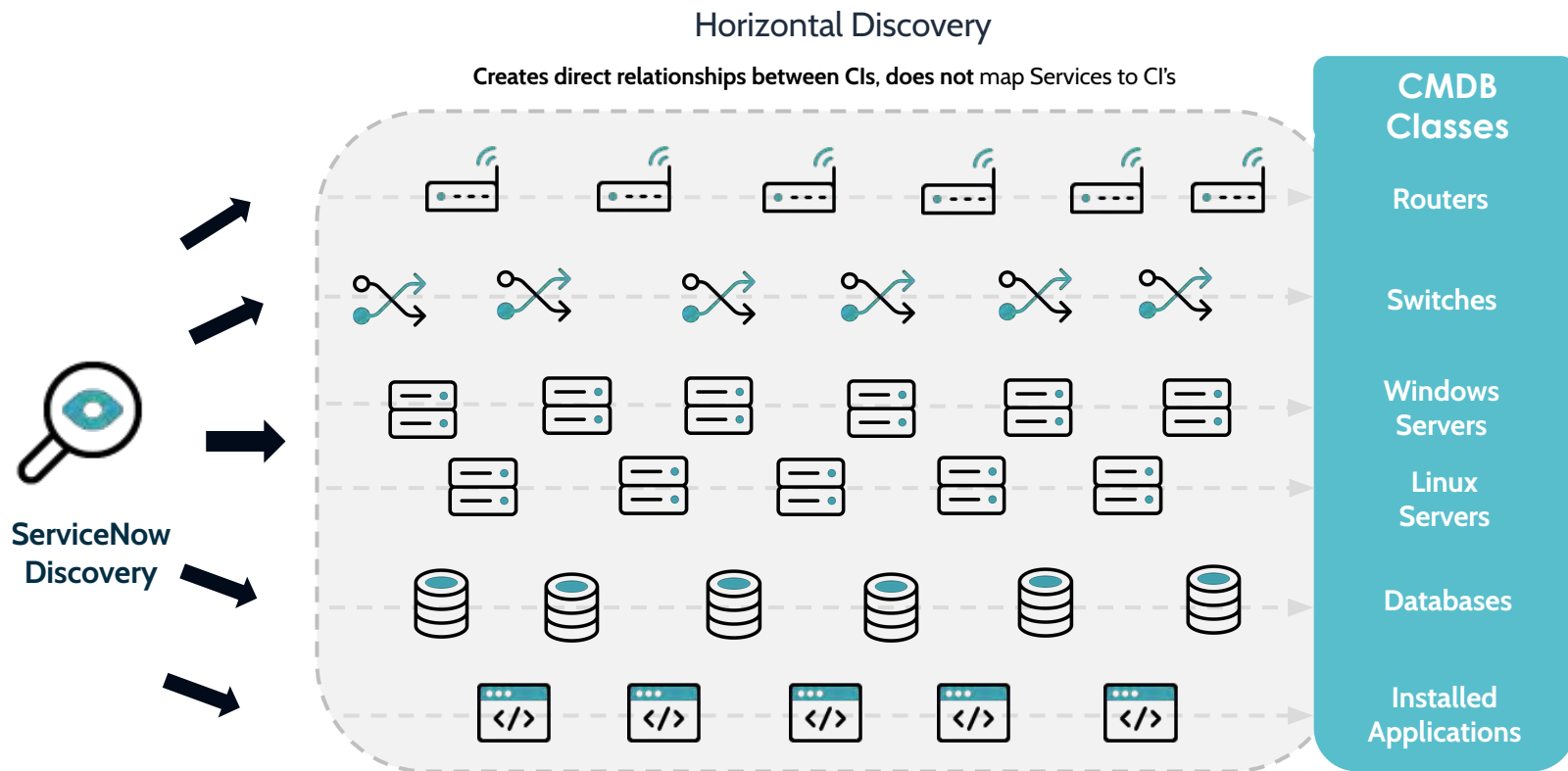
Top-Down Mapping

Mapping of Application Services to the underpinning devices.

Service Mapping

Tags

Pattern/ Connection Suggestions

Top Down

My Application Service

CMDB Classes

Load Balancer

Web Servers

App Servers

Database

Virtual Machine

Hosts in Cloud DataCenter

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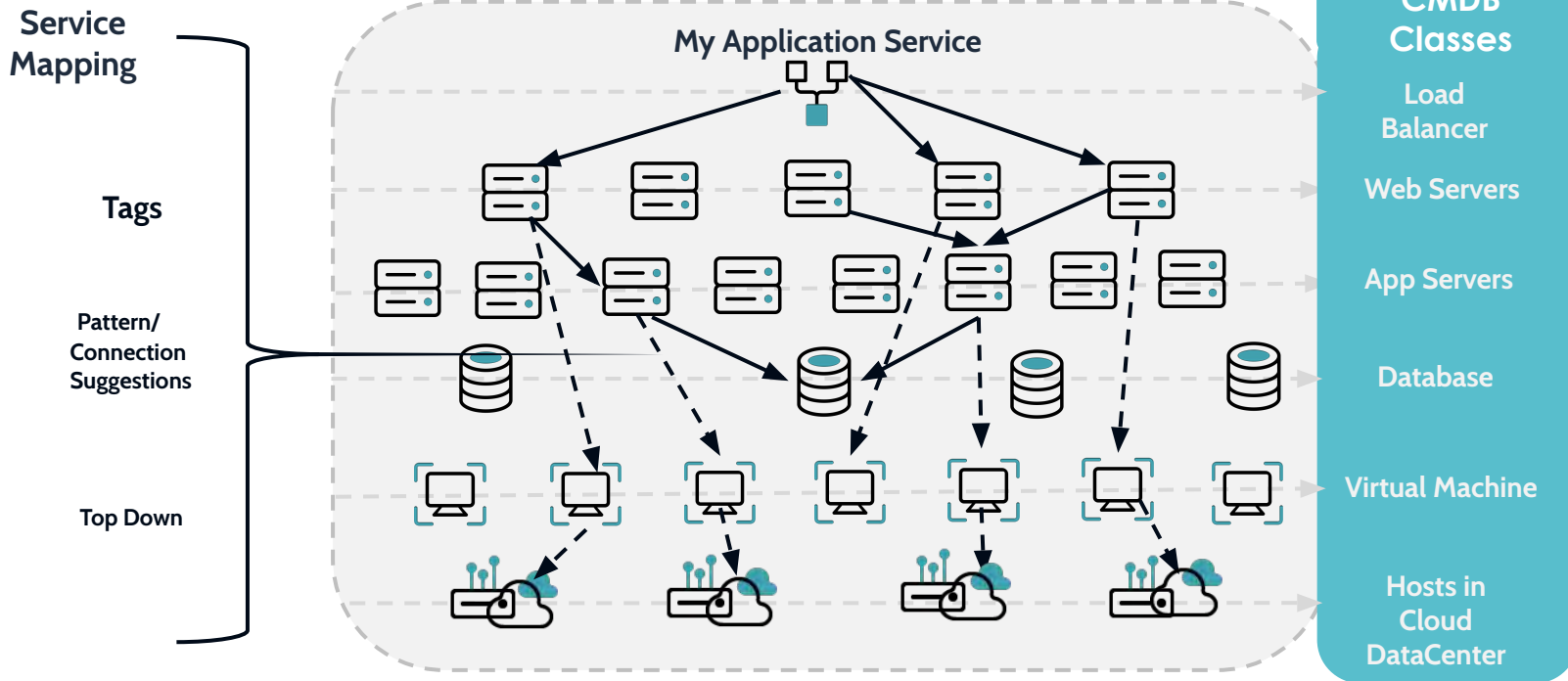
Dynamic CI Mapping

Mapping of Application Services to the underpinning devices.

My Application Service

Service Mapping

Dynamic CI Groups

CMDB Classes

Load Balancer

Web Servers

App Servers

Database

Virtual Machine

Hosts in Cloud DataCenter

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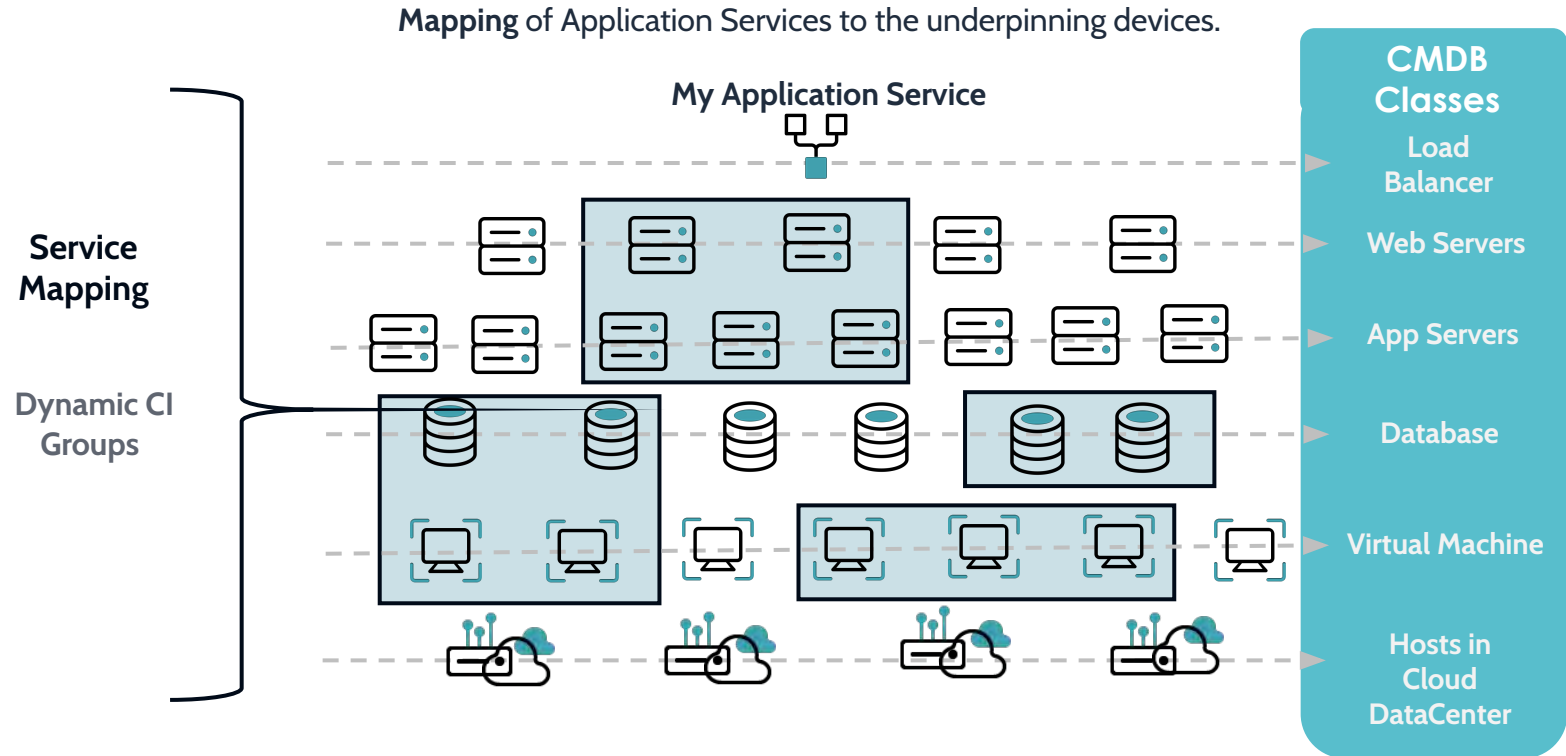
Mapping Approaches and Related Processes

AUDIENCE POLL

What are your main IT focus areas today?

(A) Business applications

(B) Infrastructure

(C) IT Services

(D) Whatever management says...

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Service Mapping Approaches

Top-Down

Dynamic CI Group	Manual	Tag Based	Automated Service Suggestions	Pattern Based & Traffic Based
Best fit for small application services that are easily grouped using created list filters or CMDB queries	Best fit for small application services or mainframes that do not change much and have high availability.	Best fit for cloud native/ Containers laden and virtual machine environments	Application Fingerprinting + Process to Process Best fit for Homegrown apps	Recommended for mission critical application services for on-premise and legacy applications
• Quick Visualization • High Touch • No License Required	• Quick Visualization • High touch – Manual updates • No License Required	• Uses tag categories • Cloud and containers in maps • Map multiple app services	• Machine Learning • Time to Value • Needs training	• Precise Mapping • Able to use traffic-based discovery • More Granular • Traffic based may create redundant CIs

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Approach Considerations

Service Mapping Approaches

Type of Mapping Approach	Quick Visualization	Less Detailed Maps	Human Updates	Higher Effort for Visualization	More Detailed Maps	Automated Updates	Time to Value
Dynamic CI	★	★	★				★
Manual	★	★	★				
Tag Based	★	★	★			★	★
Automated Service Suggestions	★				★	★	★
Top Down – Pattern and Traffic Based				★	★	★	

Dynamic CI Group Mapping Considerations

Best fit for small application services that are easily grouped using created list filters or CMDB queries

_____

- Quick Visualization
- High Touch
- No License Required

Well-suited for

- Mapping CIs to services that requires no component/topological relationship
- Mapping CIs to services belonging to technology stack or share specific attributes

Built using CMDB Groups and CMDB Query Builder

- Manually Selected CIs
- CI Encoded Query using attributes
- CMDB Query using relationships and attributes

Considerations

- Only list of matching CIs, i.e., no visual map nor impact tree
- Leverage Operational Status when using queries

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Create a Dynamic CI Group Process – Saved Query

Multiple Ways to create Dynamic CI Groups
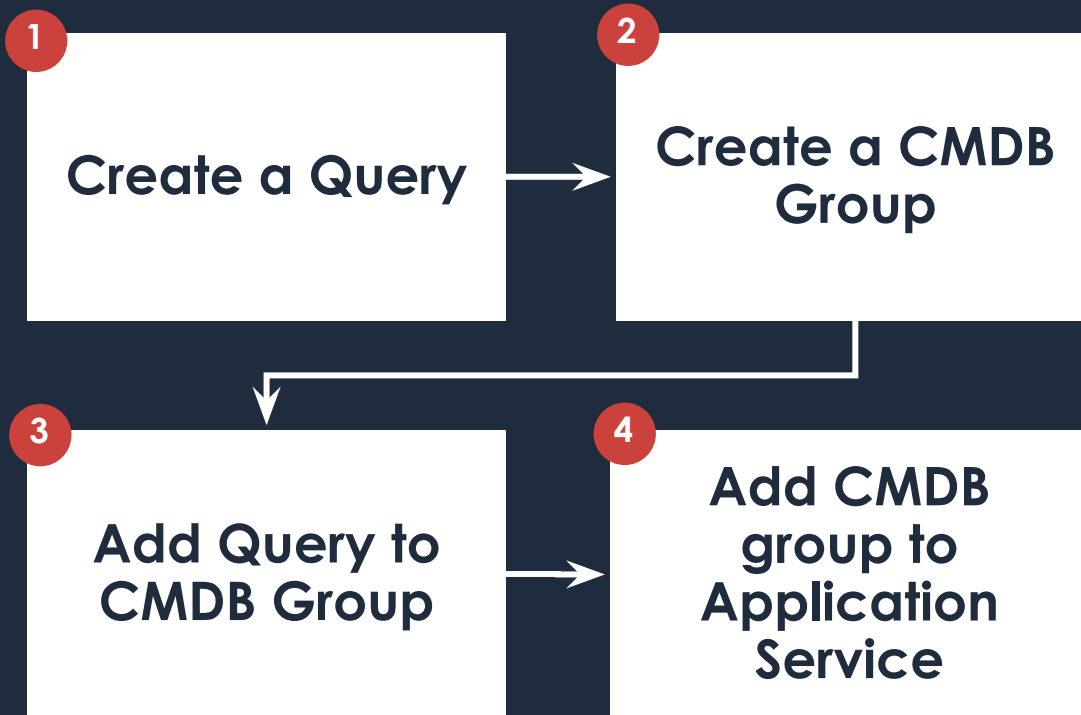
1 Create a Query

2 Create a CMDB Group

3 Add Query to CMDB Group

4 Add CMDB group to Application Service

This procedure complements the generic procedure to Create an application service using the CSDM Application Wizard.

Create a Dynamic CI Group Process – Encoded Query

Multiple Ways to create Dynamic CI Groups
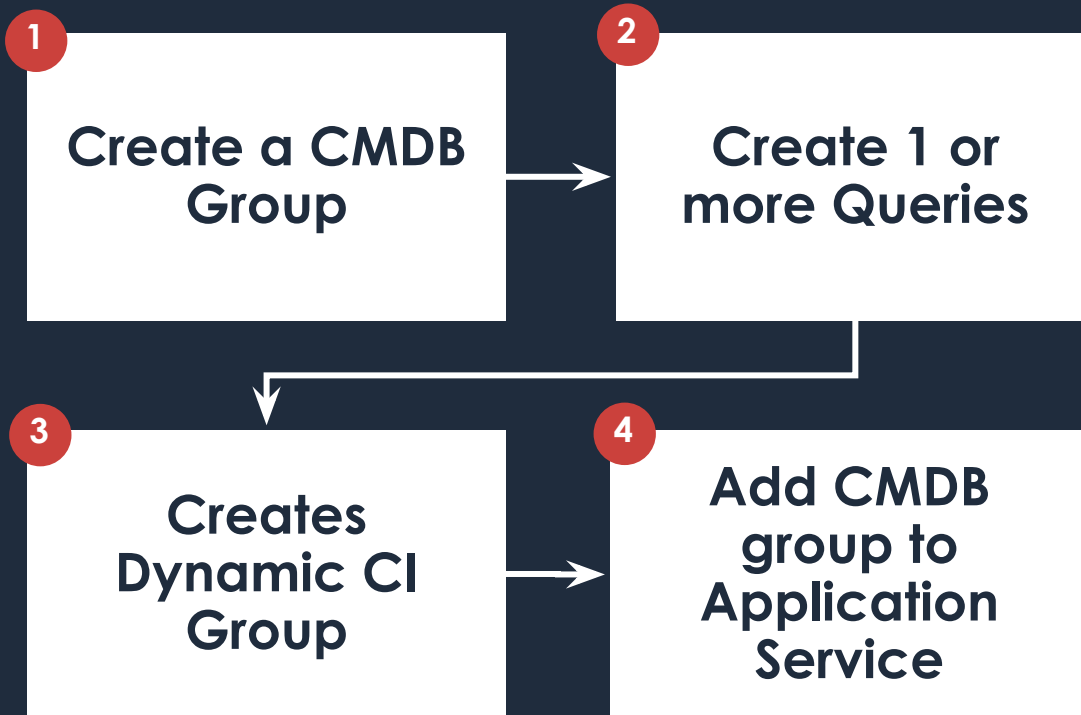
1 Create a CMDB Group

2 Create 1 or more Queries

3 Creates Dynamic CI Group

4 Add CMDB group to Application Service

This procedure complements the generic procedure to Create an application service using the CSDM Application Wizard.

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Tag-Based Mapping Considerations

Best fit for cloud native/containers laden and virtual machine environments

---

- Uses tag categories
- Cloud and containers in maps
- Map multiple app services

Well-suited for

- Mapping CIs to services utilize discovered tags on cloud native environment

Use discovered Tags

- Tag Normalization - Create tag categories that contains tag values that represent same thing
- Create tag-based service families
- Select service candidates to map
- Create services
- Operationalize services - Populate and Monitor

Considerations

- Leverage when components are cloud native and virtualized
- Newly created Tag-Based services contain only the application service CIs as their entry point
- Requires Service Mapping plugin
- Consider using Tag Governance
- Tag-based mapping does not require configuring credentials or providing users with elevated rights.

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Tag-Based Mapping Process

Multi Cloud

AWS / Azure

GCP / IBM Cloud

1 Discover Tags

Key::Value

HCI:: Nutanix

Key Value Table

CMDB

servicenow

kubernetes OPENSHIFT

vmware

2 Define tag categories and tag-based services

Key::Application or App_Code

Policy Engine

3 Auto-discovered and generates service map based on tags

Tag Based Service Maps

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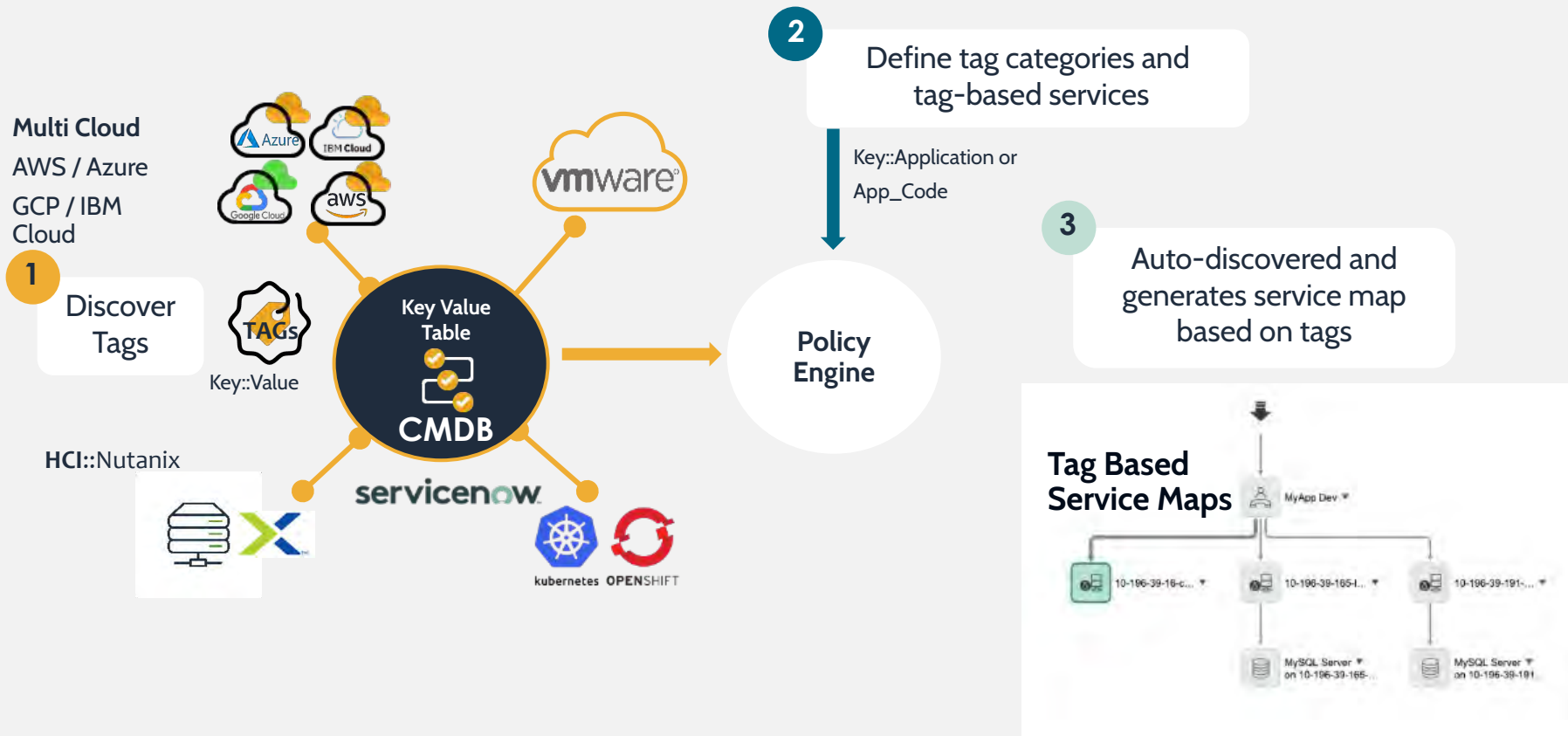
Automated Application Service Candidates

Process fingerprinting

+ Application fingerprinting

Best fit for Homegrown apps

_____

- Based on Connection rules
- Longer time to value
- Needs training
- Requires license

Well-suited for

- Any application that have a known running process
- Homegrown applications
- Any COTS application that deviates from standard ports
- Any server not showing an expected outbound connection

Built using Machine Learning and Patterns

- Traffic Based (machine learning) – IP/Port network connections
  - Via netstat, grabs all open connections
  - Connections are ML identified using ADM Probe, Running Processes, TCP Connections
  - Connection suggestion rules

Considerations

- Use instead of building a new connection section in a pattern
- Turn on the Service Mapping plus plugin

Application Service Candidates

Map services in minutes

No Entry Points Needed
ML Cluster Analysis automate the service map clusters

Running Process | TCP traffic → ML Clustering → Suggested Services → Service Map

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Process for Automated Machine Learning Suggestions

Discover

Mandatory

- Credentials
- MID Server installation
- Discover Principal CIs inc. Load balancers
- Hosts
- Scheduled Discovery and Error Resolution
- Good CMDB Health

Optional

- Cloud discovery

Learn/Suggest

- Evaluates only active connection rules and suggestions that have the Undecided decision attribute
- Preview Map, Create Application Service, Continue to discover
- Rinse and Repeat – Discover and Preview and Accept

Approve

- Approve the connection suggestions
- Base your rules directly on the connection suggestions

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Pattern-Based (Top Down) Mapping Considerations

Recommended for mission critical application services for on-premise and legacy applications

---

- Precise Mapping
- Able to use traffic-based discovery
- Time and Effort required
- Traffic based may create redundant CIs

Well-suited for

- Complete service membership that requires component relationship

Built "automatically"

- Entry Points – URL, TCP, DB Connection string
- Pattern-based – Application discovery patterns in Service Mapping mode
  - Identification
  - Extension
  - Connections

Traffic-Based Discovery with Pattern-Based Mapping

- Service Mapping can discover and map configuration items (CIs) following their traffic-based connections. This method is referred to as traffic-based mapping and it complements the pattern-based mapping

- Casts a finer net, allowing Service Mapping to find even those CIs that it failed to discover using patterns

- Best Practice: Use traffic-based discovery at the initial stages of discovering an application service and disable it once you have completed discovery and fine-tuned the application service

You can enable traffic-based discovery at different levels, from the most global to the most specific

Specific CI

CI Types

Application Service

Traffic Based Service Mapping

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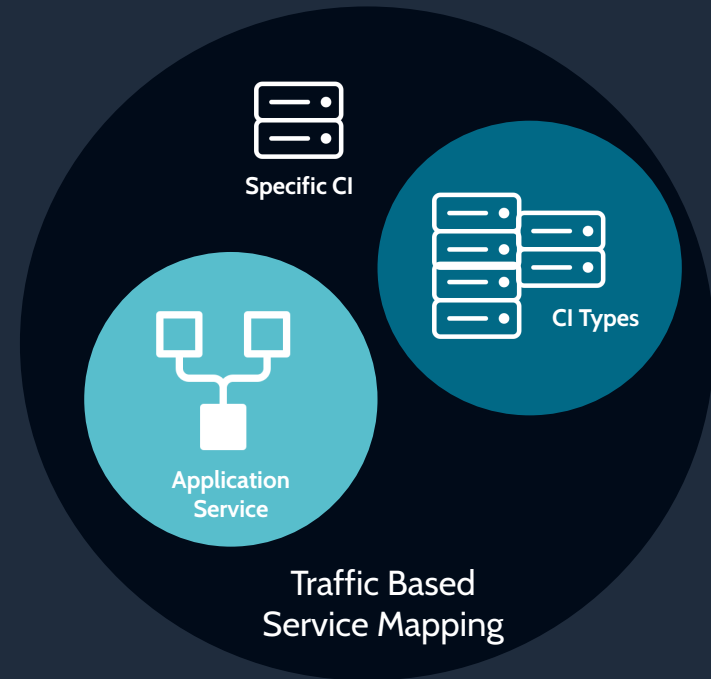
Top-Down Service Mapping

Many considerations

- Perhaps use one of other methods first for quick win and POV (ITSM and ITOM Health)

- Requires credentials and sudo privileges for accessing configuration data/files

- Requires operational Horizontal Discovery

- Requires IP Ranges

- Pattern library for COTS and conventional industry components (Store updates)

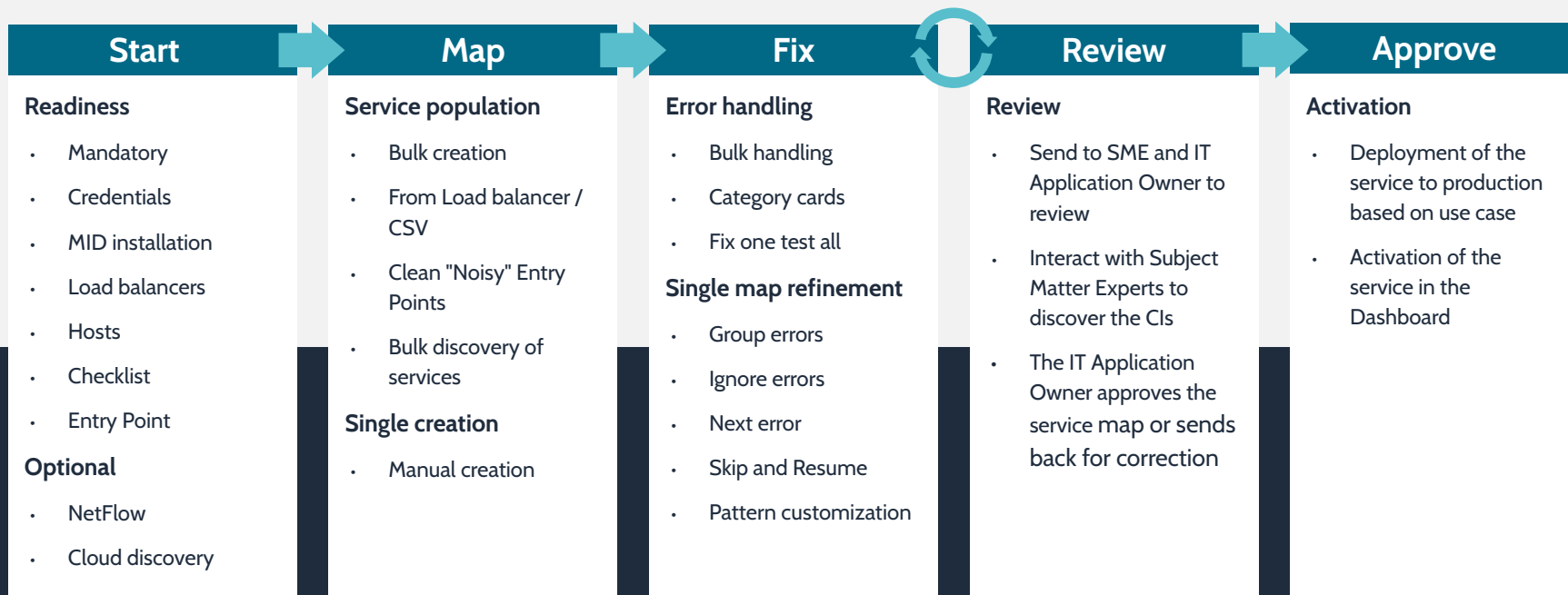- Bulk map with candidates identified from Load Balancer services ports 80 and 443
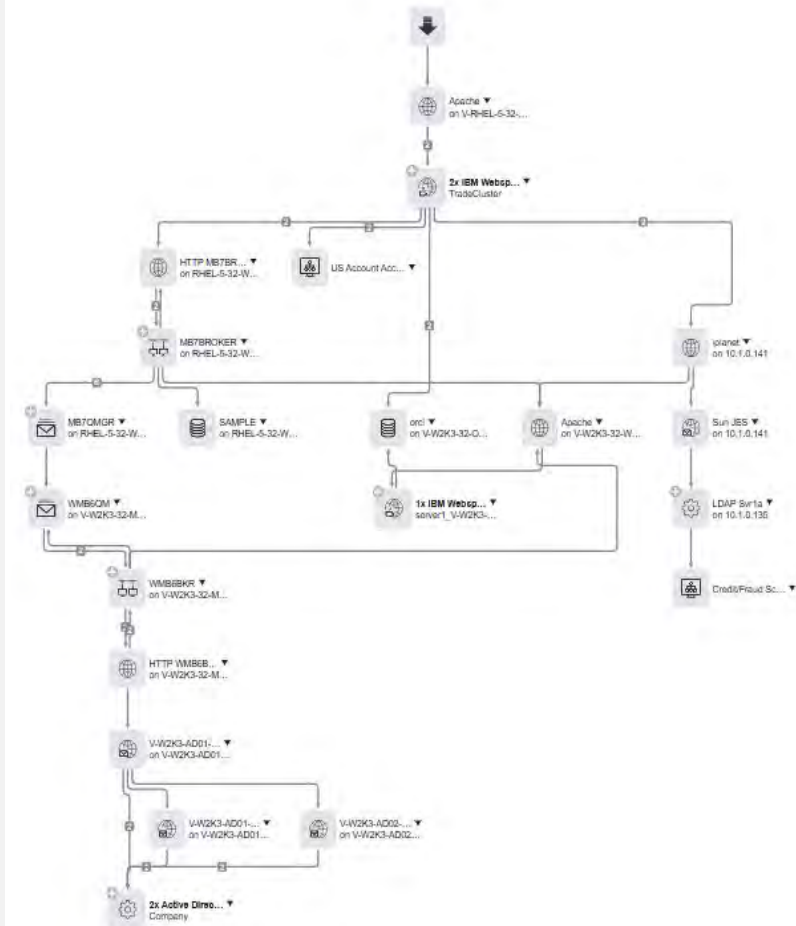
Top-Down Service Mapping

Many considerations

- May require pattern updates or new ones and end points for custom applications

- Leverage Pattern Creation with Application Finger Printing (AFP) for generic apps

  - Immediate stub for horizontal discovery

  - Add connections sections for service mapping

- Enable ML Based to Add/Remove connection suggestions instead of connecting every traffic-based seen by netstat
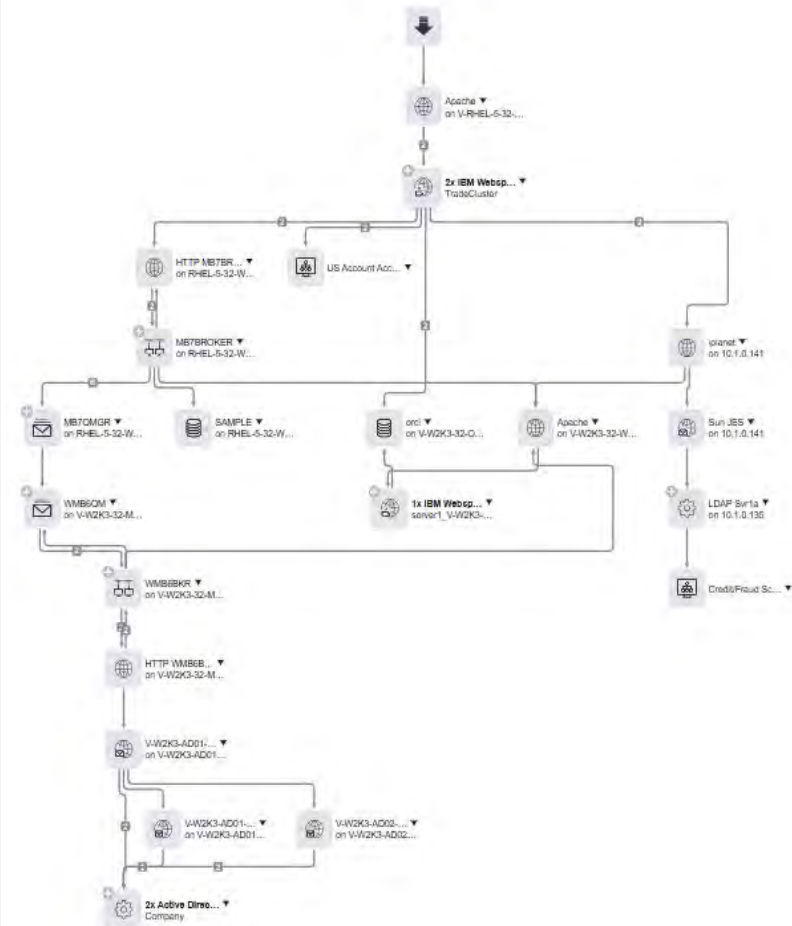
Process Steps for Top-Down Pattern-Based Mapping

Start

Readiness

- Mandatory
- Credentials
- MID installation
- Load balancers
- Hosts
- Checklist
- Entry Point

Optional

- NetFlow
- Cloud discovery

Map

Service population

- Bulk creation
- From Load balancer / CSV
- Clean "Noisy" Entry Points
- Bulk discovery of services

Single creation

- Manual creation

Fix

Error handling

- Bulk handling
- Category cards
- Fix one test all

Single map refinement

- Group errors
- Ignore errors
- Next error
- Skip and Resume
- Pattern customization

Review

Review

- Send to SME and IT Application Owner to review
- Interact with Subject Matter Experts to discover the CIs
- The IT Application Owner approves the service map or sends back for correction

Approve

Activation

- Deployment of the service to production based on use case
- Activation of the service in the Dashboard

- Select Application Service
- Bulk mapping
- Bulk error handling

Recommendation:
Use OCM to communicate to the IT Application and Product Owners to work with and provide the level of effort needed for review and approvals

Service Mapping Practical Applications

Where are you at in your CSDM journey?

(A) Crawling

(B) Walking

(C) Running

(D) Flying

(E) Stumbling

CSDM use cases across the value chain
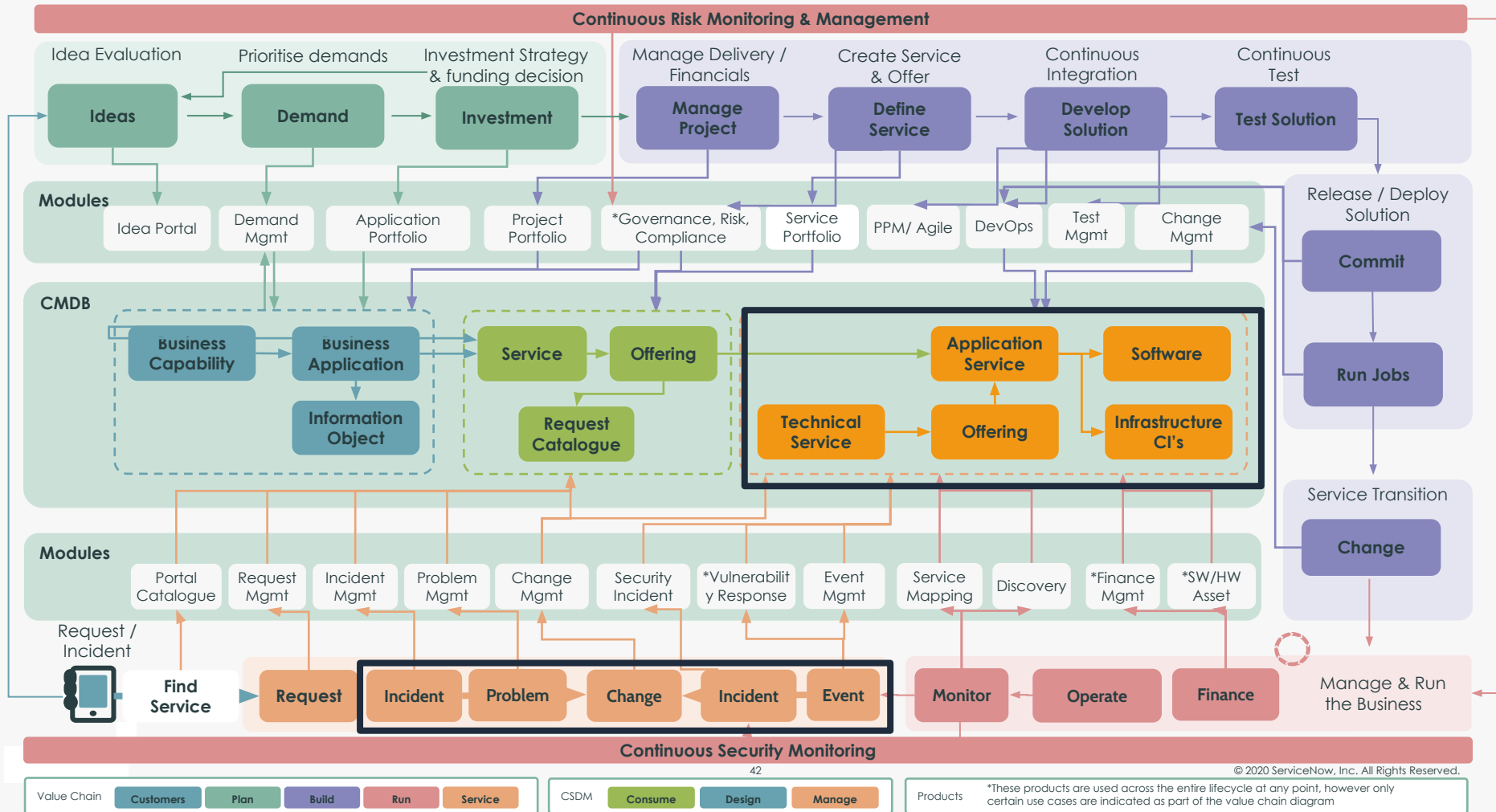
Incident Record Population

The Parent Service of the Service Offering

The Offering to "administrate" the Application Service

Often the Application Service is the CI

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Change Record Population

Technology Lifecycle Management

Event Management

Service Dashboard   +

Default | 8 services

Severity breakdown   🔥 2 critical 25.0%   ❗ 0 major 0%   ⚡ 0 minor 0%   🚩 0 warning 0%   ✅ 6 ok 75.0%

Group by **Business criticality** ▾   Group order **Ascending** ▾ | Segment each group by **Severity** ▾

Home

1 - most critical (8)

🔥 | Libor Controls Processing | Mortgage Calculator |

✓ | EU - Customer Purchase History | Payments Platform | Asset Reconciliation | Financial Audit | +2 |

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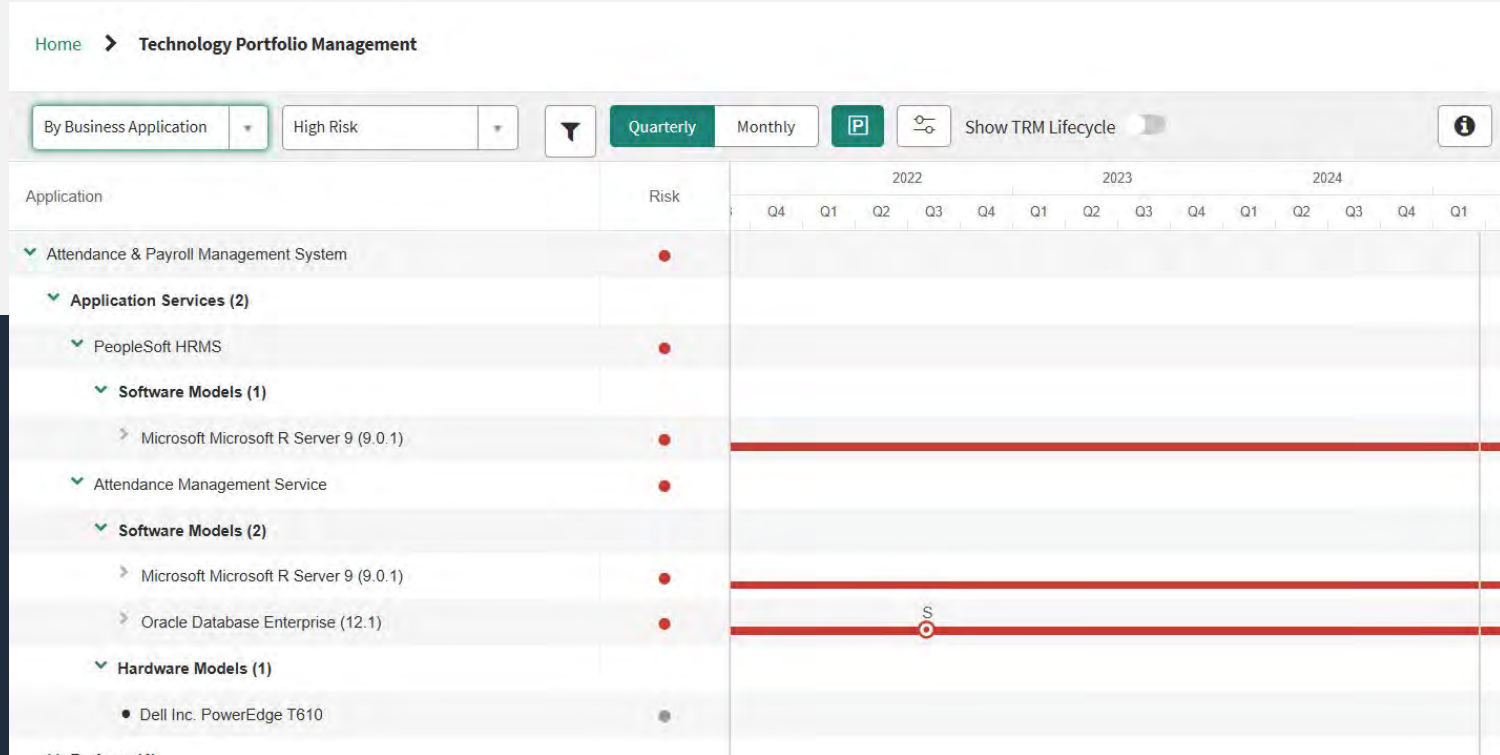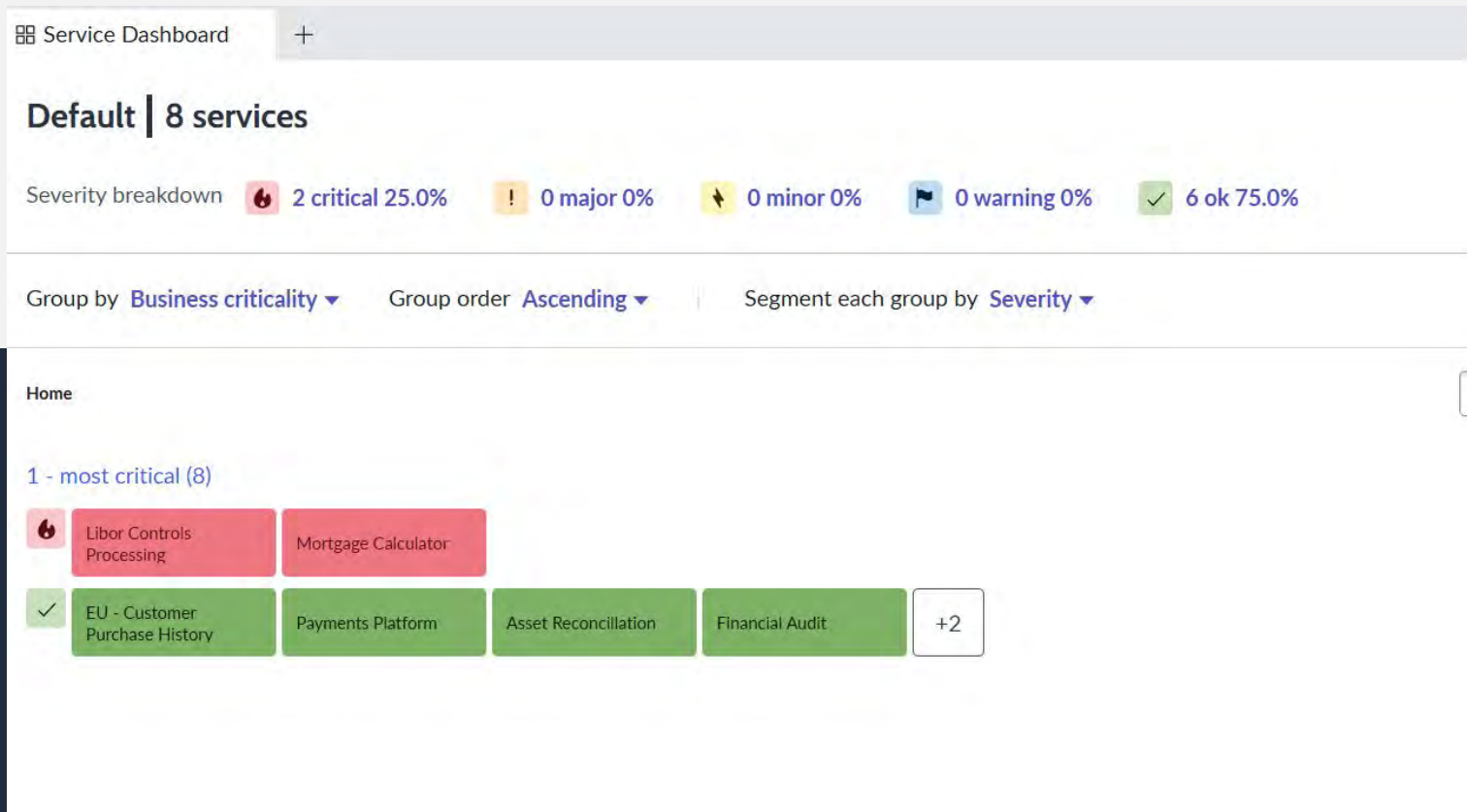
Summary
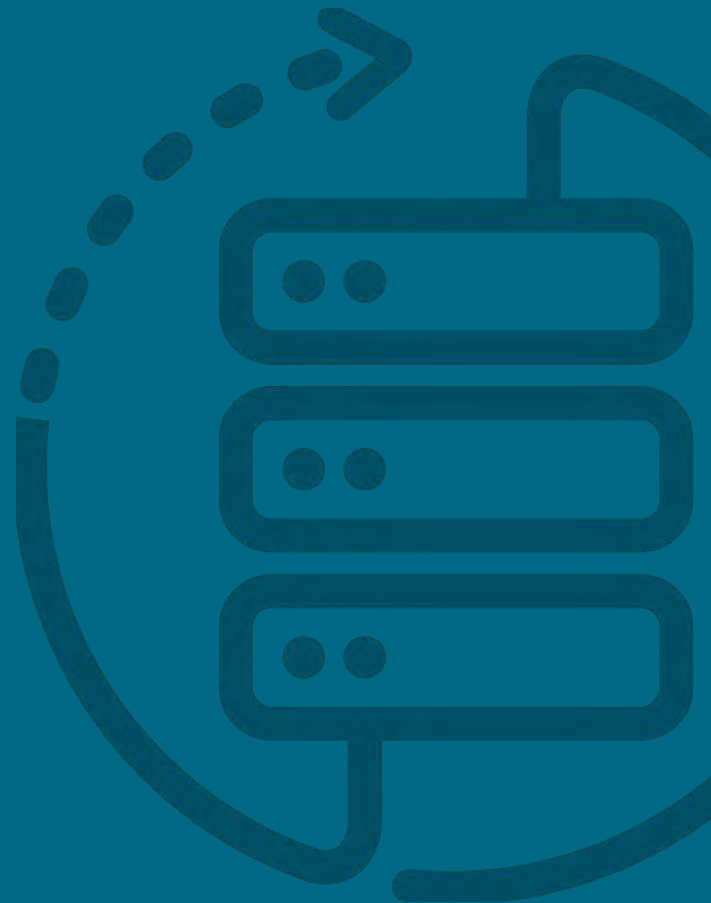
Getting Started Is Easy!

We can meet you where you're at in your Service Mapping journey.

Want a quick CMDB assessment and rapid remediation?

CMDB LAUNCHPAD

Need to implement CMDB and see value fast?

CMDB ESSENTIALS

Ready to get started with Service Mapping?

Service Mapping Implementation

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

Look for a survey following this session!

April 16: Join our next ITAM MasterClass: Part 2!

Cask
ITAM MASTERCLASS
Getting Started with IT Asset Management

June 11: Join our next CMDB MasterClass Part 8 around Event Management!

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Questions?

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Thank you!

Questions?

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