

CSDM 3.0

White Paper

Common Service Data Model

This White Paper provides ServiceNow best practice guidance on service-related definitions and service modeling within the CMDB.

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The **Common Service Data Model (CSDM)** represents a standard and shared set of service-related definitions across our products and platform that will enable and support true service level reporting while providing prescriptive guidance on service modeling within the CMDB. These service-related definitions span the ServiceNow® product portfolio and the Now Platform®.

The data model is a CMDB framework across our products and platform that will enable and support multiple configuration strategies. Included are best practices related to the proper modeling of data using out-of-box (OOB) tables and relationships. Many ServiceNow products have a dependency on data within this data model.

Common Service

A standard and shared set of service-related definitions across our products and platform that will enable and support true service level reporting.

Data Model

A CMDB Framework across our products and platform that will enable and support multiple configuration strategies.

The scope of CSDM will continually be extended to include more prescriptive guidance in the use of the data model.

Note: CSDM is NOT a product/SKU from ServiceNow. The guidance within CSDM is for the standardization and modeling of the CMDB that is used by multiple ServiceNow products. The CSDM is **NOT**...

- A process or implementation guide for ServiceNow products
- A set of reports
- Code to install
- An automatic fix for past implementations

Do I need to purchase a module/product to use the CSDM? ServiceNow intends to provide all CSDM-related objects and CMDB core tables as part of the shipping out-of-box (OOB) CMDB regardless of licensing. The following (figure 1) references CSDM activity within each of their referenced releases:

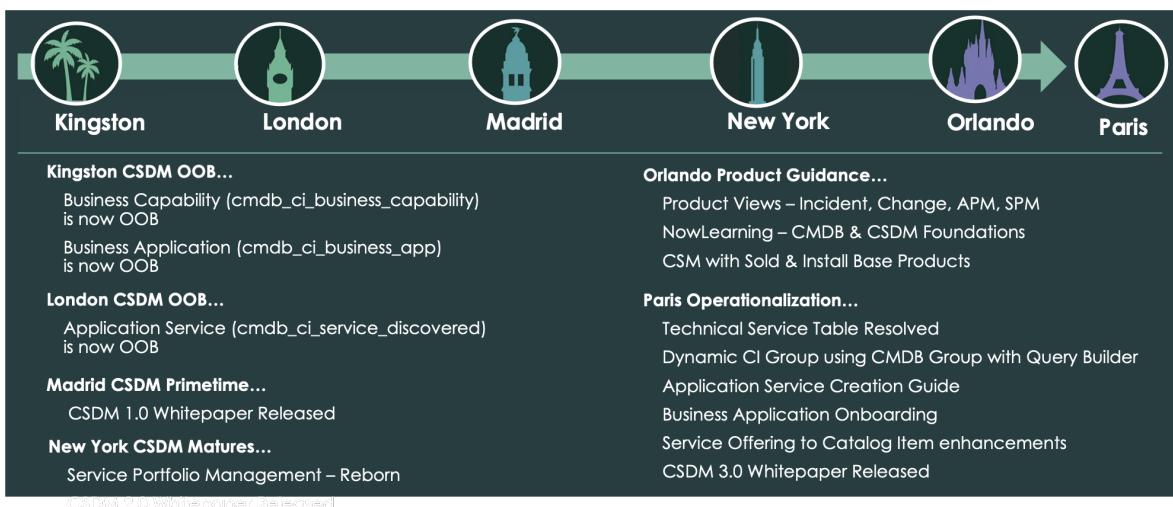


Figure 1 CSDM 3.0 Activity Through Each ServiceNow Release

To reiterate, as of the Paris release there is no need to license a module to take full advantage of CSDM referenced tables within the CMDB unless otherwise noted. Several tables, as depicted in Figure 1, have been available OOB since the Kingston release of ServiceNow. Thus, users may begin following the CSDM beginning with the Kingston release of ServiceNow.

How did we get here? In early 2017 a group of representatives from various business units within ServiceNow were tasked with identifying how service reporting could be improved. Representatives from ITSM, ITOM, ITBM, and others were present. After identifying the need for common definitions and a prescriptive CMDB data model, the CSDM as a collaboration between ServiceNow product teams was born.

What's new in CSDM 3.0? CSDM 3.0 is an evolution of the data model standard that supports the CMDB framework within the Now Platform. The intent of this CSDM 3.0 white paper is to advance the data model in support of scalability, automation, and time to value of the Now Platform while building upon the efforts outlined in the CSDM 2.0 white paper released in 2019. This includes an updated model that reflects new additions from the Paris release as well as mapping and architectural guidance for service-related objects:

- Conceptual Model – updated for 3.0
- New base table(s) in the Paris release:
 - Technical Service
(cmdb_ci_service_technical)
- Relabeling of old tables:
 - Dynamic CI Group (formerly Technical Service)
- Existing table(s) now out-of-box in the Paris release:
 - Dynamic CI Group
- CSDM Domain(s):
 - Foundation – New Domain
 - Manage Technical Services – New Table(s) & Persona(s)
 - Sell / Consume – New Persona(s)
- Definitions for new CSDM tables
- Critical table attributes
- Where to start with CSDM:
 - Add Foundation to Crawl, Walk, Run, Fly

Why should I follow the CSDM?

Why should I follow the CSDM? ServiceNow products are standardizing their use of data from the CMDB. That standard is the CSDM which identifies where to place service and application related data within the CMDB. Current and future products from ServiceNow that utilize the CMDB may require data to be found in the CMDB framework identified within this white paper. Without CI data in these prescribed CMDB tables, you may not receive the full value of the ServiceNow platform.

Founded on Key Principles

CSDM has been created based on key principals that have evolved over time. These principles were established in order to guide the decisions we make with regards to guidance, entity names and definitions, how the model is implemented, and how CSDM is managed as a whole.

1. **Simplified Concepts:** Concepts are represented in a simple, distinct manner to eliminate duplicates and confusion over data sources
2. **Designed for Reporting & Analytics:** A prime objective of CSDM is to support consistent analysis
3. **Prescriptive Relationships:** The prescribed relationships and references should be leveraged as the main approach to link CSDM tables
4. **Shared Data Model Collaboration:** CSDM identifies a data model that is to be shared across products in support of simplified concepts and collaboration. Collaborating with other product teams will achieve the best shared design
5. **Definitions:** Agreed upon CSDM definitions should be used wherever the table, reference, or attribute is utilized
6. **CSDM OOB Tables:** Shared CSDM tables will be provided out of box on Z-boot by default
7. **Consistent Data Integrations:** Leverage prescribed technologies when integrating external data source to ensure data integrity
8. **CSDM Adoption:** Customer impacts per release will be limited by providing automation and guidance to accelerate CSDM adoption
9. **Data Governance & Process:** The presence of data within the model provides little value without governance and effective process to manage the veracity of said data
10. **Product Use Documentation:** Documented guidance on use and/or value of CSDM will be provided by each product team that references CSDM objects

CSDM Conceptual Model

The **Common Service Data Model 3.0 Conceptual Model** below (Figure 2) includes short descriptions for quick reference purposes.

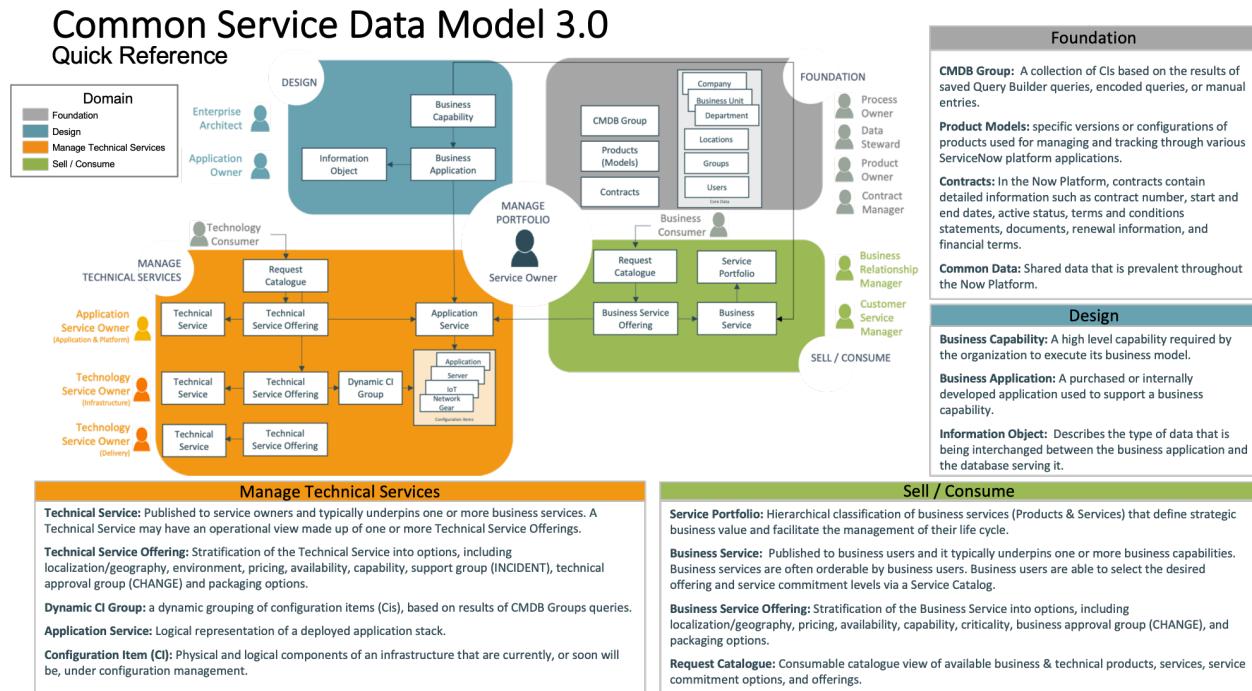


Figure 2 CSDM 3.0 Conceptual Model

Later in this document will be more detailed descriptions, conceptual to physical mapping and mock-up examples of data model implementation guidance.

While the intent is to provide prescriptive guidance, the model was specifically designed with extensibility in mind so that customers could extend it as needed (For example add “clinical” as a service classification type of a Service).

The various domains Foundation, Design, Manage Technical Services and Sell/Consume are how we describe and group objects in the data model based on function. These functions help support how our products work together. Additionally, we introduce the concept of Manage Portfolio that encompasses portions of all 4 domains. This representation also accounts for how different persona archetypes may consume, view, and populate the model.

What is a Service? A service is a means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks. This is consistent with the base definition of “service” in ITIL v3 and IT4IT. Services typically have three aspects: the interaction, the offering, and the service system. While ServiceNow ships with three OOB service types, you can extend these service types of classifications to align with the service types in your organization. The three OOB service types are application, business, and technical.

What is a Service?		
<p>A Application service is a <u>service type</u> that is a logical representation of a deployed application stack.</p> <p>(cmdb_ci_service_auto)</p> <p>Key Details</p> <ul style="list-style-type: none"> • An Operational CI • Focus in Incident, Problem, Change (IPC) • Unique Instance of an Application • May be created per "Environment" ex. Dev, QA, Prod • May be created per region • Creation Methods: Manual Mapping, Service Mapping with Entry Point, Tags, Dynamic Query 	<p>A Business Service is a <u>service type</u> that is published to <i>business users</i> and it typically underpins one or more business capabilities.</p> <p>(cmdb_ci_service)</p> <p>Key Details</p> <ul style="list-style-type: none"> • One level, not a hierarchy of Business Services • An Operational CI • Used for impact in Incident, Problem, Change (IPC) • Used for Approvals for Change • Should be <u>Consumer</u> or <u>Sell</u> focused 	<p>A Technical Service is a <u>service type</u> that is published to <i>service owners</i> and typically underpins a business or application service.</p> <p>(cmdb_ci_service_technical)</p> <p>Key Details</p> <ul style="list-style-type: none"> • One level, not a hierarchy of Technical Services • An Operational CI • Used for impact in Incident, Problem, Change (IPC) • Should be <u>Provider</u> focused: the technology <u>provided</u> for the business to <u>consume</u> or <u>Sell</u>

Figure 3 What is a Service?

- **Business service** is a service type that is published to business users, and it typically underpins one or more business capabilities.
- **Technical service** is a service type that is published to service owners and typically underpins one or more business or application services.
- **Application service** is a service type that is a logical representation of a deployed application stack.

What reporting comes with CSDM? Short answer – none. At this time, the CSDM is a CMDB framework focused on identifying where to place data that our products depend upon. In the future more visualization, reporting and analytics will be made available through the product teams that utilize the CMDB.

Leverage the [CMDB query builder](#) to structure complex queries across multiple elements and relationships. As of Paris we also support traversing Application Services automatically and using CMDB Query Builder queries in reporting and PA analysis.

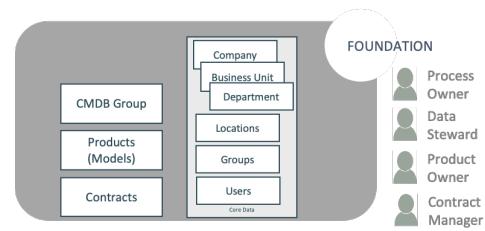
CMDB Query Builder allows you to easily build complex infrastructure and service queries that span multiple CMDB classes, non-CMDB tables, and that involve many CIs that are connected by different relationships.

CSDM Domains

CSDM Domains are groupings of the data model that support activity within the Now Platform. CSDM has 4 Domains: Foundation, Design, Manage Technical Services, and Sell/Consume. Each of these Domains include one or more products within ServiceNow. The combination of quality data across these Domains assist in the day-to-day efforts to achieve business outcomes.

Foundation Domain

What is Foundation? Foundation is a CSDM Domain that represents those tables that contain base data referenced from or to objects in the remaining CSDM domains. The tables identified in the Foundation Domain are not used in CMDB relationships. Instead, they are critical referential data. In some scenarios Foundation data is required prior to the implementation of ServiceNow products and/or buildup of the CMDB. The Business Process table is a CMDB table while the remaining tables exist outside of the CMDB. All tables identified in the Foundation Domain have been available OOB since prior to the Kingston release of ServiceNow. Common personas in this domain are Process Owner, Data Steward, Product Owner, and Contract Manager.



CMDB Group

CMDB Group is a collection of CIs based on the results of saved Query Builder queries, encoded queries, or manual entries. The CMDB Group is *NOT* a configuration item. The purpose of the CMDB Group is to provide a grouping of CIs. This grouping can then be used throughout the Now Platform. Within the CSDM, the Dynamic CI

Group references a CMDB Group to provide a list of CIs based on some common criteria.

Figure 4 CSDM 3 CMDB Group Form View

CMDB Groups are recorded in the **cmdb_group** table. A CMDB Group can contain one or more saved queries from Query Builder, encoded queries, or manually added Configuration Items. For some customers a CMDB Group can replace the spreadsheet grouping of configuration items where automated solutions are either not available or not yet implemented.

Products (Models)

Products are specific versions or configurations of products used for managing and tracking through various ServiceNow platform applications. Within ServiceNow these products are recorded as Product Models. Product Models provide the ability to identify a Product Owner, the status of a product within your organization, compatibility to other products, reference to product catalog, and reference list of deployed configuration items of said model. Additionally, you can identify the end-of-life details of your products as established by 3rd party providers and/or internal product owners. With product models you can build hierarchical products to represent the set of products that your organization sells or consumes.

Product Models are extended into 7 base types: Application Model, Consumable Model, Contract Model, Facility, Hardware, Service, Software. Products may be bundled to create a collection or grouping of products such as a FlashBlade Server (hardware model) and the 24/7 support service (service model).

Product Models are recorded in the **cmdb_model** table or its extended tables aligned to the 7 base types. The Product Model tables are *NOT* configuration items. Configuration items reference Product Models using the “Model ID” attribute available on all CMDB tables. For example, a Service Offering CI may reference a Service Model, while a Windows Server may reference a Hardware Model.

Contracts

A contract is a binding agreement between two parties. In the Now Platform, contracts contain detailed information such as contract number, start and end dates, active status, terms and conditions statements, documents, renewal information, and financial terms.

Contracts are recorded in the **ast_contract** table. A Contract is *NOT* a configuration item. Contracts utilize Contract Model types from the Product Model module. Service contracts may support hardware CIs in support of SLA and Vendor Management. Additionally, Service contracts may be utilized by Customer Service Management.

Common Data

Common Data are shared data that is prevalent throughout the Now Platform. Examples of Common Data include the organizational structure (Company, Business Unit, Department), locations, groups, and users. Multiple ServiceNow products depend on Common Data to provide business value. Planning of Common Data becomes core to the effective implementation of ServiceNow capabilities. The following questions should be discussed:

- Do I have a trusted source for this data?
- Are there multiple sources?
- How often does this data change?
- Do I have the depth of data that my CIs will require?
- Who will maintain this data?

Careful planning of Common Data including but not limited to the above questions will assist in an effective foundation of critical data.

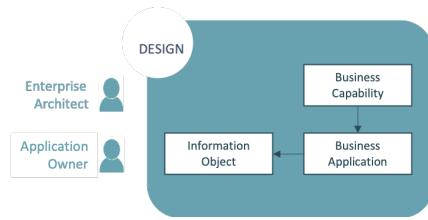
Common Data are recorded in the following tables:

- **Company: core_company**
- **Business Unit: business_unit**
- **Department: cmn_department**
- **Location: cmn_location**
- **Groups: sys_user_group**
- **Users: sys_user**

Common Data are *NOT* configuration items.

Design Domain

What is Design? Design is a CSDM Domain that represents those tables currently utilized by Application Portfolio Management (APM). These tables are used for design and planning thus records in them are NOT the direct targets of ITSM processes, namely Incident, Problem, and Change management. These tables represent the logical design of the enterprise applications to be deployed and utilized by the business. Though Application Portfolio Management is not required to utilize these CMDB tables, APM provides enhanced capability to rationalize and manage your Business Applications, Technologies, Information and Business object portfolios. The Business Capability and Business Application tables have been available OOB in the CMDB since the Kingston release. Information Object is a new CMDB table available OOB in the New York release of ServiceNow. Common personas in this domain are Enterprise Architect and Application Owner.



Business capabilities

A business capability can be described as a high-level capability that an organization requires to execute its business model or fulfill its mission. A business capability describes what the organization does, not how work is performed. It is typically described in the context of performing specific tasks to achieve one or more business outcomes. Business capabilities are often represented as verbs (For example managing financials or providing IT support services). It is recommended that you establish a CI relationship between the business capability and the business applications for visualization and reporting purposes. Subsequently, you should establish a similar relationship between business applications and the application services to ascertain the technologies which pose risks to the business capabilities. This is necessary since enterprise architects routinely assess technologies, information, and services based on their relationships to business capabilities and business applications. An accurate service model that includes the relationships to business capabilities can serve as the foundation for strategy-aligned architectural decisions.

Business capabilities are recorded in the **cmdb_ci_business_capability** table. Business capabilities are represented in a hierarchical model that includes a parent business capability that may be underpinned by one or more lower level capabilities. These lower level capabilities are referred to as “leaf nodes” in the business capability hierarchy and are typically represented by numeric values such as 1.0 for the parent and 2.0-6.0 for the leaf nodes. If a business capability hierarchy appears to require more than six levels, it is likely a candidate to be decoupled into multiple business capabilities with the lower levels representing processes and tasks, not capabilities.

It is recommended that you use the business capability form to create, modify, and extend business capabilities. If you add a new capability, update an existing capability, delete a capability at a leaf node level, the levels of all the capabilities for the leaf nodes in that hierarchy must be updated accordingly. A preferred method for updating capabilities from the business capability form is to click the **Update Capability Level and HierarchyID** related link to update the levels in the hierarchy so that the capability map reflects the change. Additionally, the APM product provides a capability map with edit mode, a more robust management of the business capability hierarchy for non-technical business users. The following conditions should be considered when working with business capabilities.

Business capability update guidance

- When adding a capability, the hierarchy level is automatically assigned based on parent capability level

- If a parent capability is updated in the hierarchy, the levels of all its child capabilities are recalculated
- The total number of levels cannot exceed more than six in the hierarchy
- Only leaf node level capabilities or capabilities that have no child can be deleted
- Do not create circular relationships. In creating a parent capability, a child capability cannot be its parent

Business applications

A business application represents all software and infrastructure (For example catalog of titles) configured to provide business functionality. Business applications are the logical representation of all instances, used to increase productivity and to provide functionality to perform business functions

accurately (For example payables, receivables, general ledger). Business applications are typically the software used by business users, but also may represent the “products” that the business uses for generating revenue or performing missions. They can span multiple environments and / or deployed per geography (For example dev, test, prod or Americas, APJ, EMEA). You can use the business application form shown above (Figure 3) to add the applications that your organization uses based on the business capabilities that they serve. You can record the details of a business application manually via the form or import the list of applications from a spreadsheet or a third-party tool. To import data, define a data source and transform map and run or schedule an import. While the use of business applications is not required, it is a recommended data object to help plan transformations such as M&A, divestitures, cloud migrations, or cost reduction.

Since business applications are a manually managed CMDB CI class, you will need to manually create relationships between the business application and other CIs such as the deployed instances of the business application: the application services class. If needed, two or more applications can be integrated or connected to each other to establish a relationship between them, representing the design level. This allows you to relate business applications to other infrastructural CIs such as database and webservers as well. Using ServiceNow APM, you can add any business application needed to assess and track for costs, usage, business value, functional fitment, and risks.

In the New York release of ServiceNow, the “architecture type” attribute on the business application contains the choices “platform app” and “platform host”. These architecture types help represent platforms as one type of business application and related business applications which depend on the platforms separately.

Information Object

Information object is part of the new information portfolio and referenced by the business application. The information object is a configuration item that displays information in an organized manner. The purpose of the information object is to logically describe the type of data (or the information) that is

Figure 5 CSDM 3.0 Business Application Form View

interchanged between the application and the database. The database being the one that services the application with data. Information objects are mapped to **cmdb_ci_information_object** table within the CMDB.

The information object table may be used to identify the types of data a business application may possess such as PII, PCI, and etc.

Manage Technical Services Domain

What is Manage Technical Services?

Manage Technical Services is a CSDM Domain that represents those tables currently utilized by IT Operations Management such as Service Mapping and ServiceNow Discovery. Additionally, they represent the technical service portfolio of services provided for the business to consume. The Manage Technical Services tables are “operational” thus ARE selected for ITSM: Incident, Problem, and Change.

Beginning with New York, service offerings may be requested through the Request Catalog. The Manage Technical Services tables represent the provider view of deployed technology that the business will sell/consume. Common personas in this domain are Application Service Owner and Technology Service Owner. Technology Service Owners may own the infrastructure tied to their services or to the delivery of services where no infrastructure exists. One example of delivery is Managed Service Providers.

Though Service Mapping and ServiceNow Discovery are not required to utilize the referenced CMDB tables, such capability greatly reduces the manual effort to manage/maintain configuration items and their relationships. The Application Service table has been available OOB in the CMDB since London. Configuration Items in the manage technical services space represent those discoverable items such as installed applications, servers, and networking. Common personas in this domain are Application Service Owner and Technology Service Owner.

Application Services

Application service is a service type that is a logical representation of a deployed application stack.

Application services can be internal, like an organization email system or customer-facing, like an organization website. For example, creating financial reports through a web-based application requires a computer, web server, application server, databases, middleware, and network infrastructure. These

applications and hosts are all configured to offer the service of financial reporting. In development environments, application services represent instances of a business application or system in different

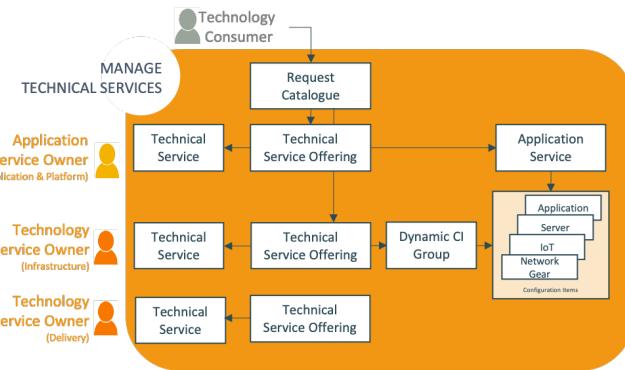


Figure 6 CSDM 3 New Application Service Form

types of development environments, like development, test, or production. Using application services lets you view maps and change history for services. If Event Management is deployed, you can monitor application service performance and identify health issues for application services.

Application services roll up to **cmdb_ci_service_auto** for common reporting and they underpin a business or technical service. Beginning with the Paris release of ServiceNow, customers have a method to register application service first and then pick the population method later. The registration process gives admins the ability to define uniqueness as well as define required field to create the initial record. Furthermore, Application Service also has a unique ID associated with it and can be leveraged for tagging external systems. Finally, there is also a new way to create application service using Dynamic Group that is introduced in Paris.

To assist with the creation of Application Services a “New Application Service” form is used to create an Application Service (along with new APIs). This form allows you to provide basic details, choosing a data population method, and Previewing the Application Service prior to committing. NOTE: previous methods for creating an Application Service remain. Application Service creation flow begins using the **cmdb_ci_service_auto** table and then switching to the child table once you have picked your method for population.

- **Top Down Discovery (Service Mapping):** `cmdb_ci_service_discovered`
- **Dynamic CI Group (Query Based):** `cmdb_ci_query_based_service`
- **Tags:** `cmdb_ci_service_tags`
- **Manual:** `cmdb_ci_service_discovered`

The offering of application services should be exposed via the related business or technical service offering. Application Service was introduced in London and will continue to serve as a key relationship entity for ITSM, ITOM, ITBM, and CSM in the upcoming releases. Its relationships include business applications, business services, technical services, applications, and infrastructure CIs.

[Application](#)

An application is any deployed program or module that is designed to provide specific functionality on specific compute infrastructure. An application defines behavior and has specific functionality associated with it. Applications are typically discoverable instances and tend to provide a specific set of functionalities for one or more services. In the context of ServiceNow, applications are limited to single host to ensure they maintain a unique identification during discovery processes. Additionally, there is not a one-to-one relationship between application and application service. In other words, a single installed application such as a database instance, may support multiple Application Services depending on the configuration and use of those applications.

The application table is not intended to be an inventory or portfolio of your applications. Those inventory/portfolio objects belong in the Business Application table discussed earlier in the Design domain. Instead, the application table and extended tables are meant to be those uniquely discoverable instances of code running on a host. Applications are considered to part of the infrastructure configuration items.

[Infrastructure configuration items \(CI\)](#)

Infrastructure configuration items (CI) are physical and logical components of an infrastructure that are currently or soon will be under configuration management. CIs may be a single module such as a server,

database, router, or more complex items such as a complete system (For example web server, database, infrastructure). The underlying infrastructure components or CIs are known and well understood in most organizations. The complexity often surfaces as the data structures are layered on top of those physical CIs, which is why ServiceNow recommends engaging a business relationship manager or enterprise architect to define the various business capabilities and business applications.

Technical Services

Technical service is a service type that is published to service owners and typically underpins one or more business or application services. Using technical services lets you view and manage the technology you provide to the business. A technical service may have an operational view made up of one or more technical service offerings.

Technical Services are mapped to the **cmdb_ci_service_technical** table starting with the Paris release of ServiceNow. Previous releases recommended mapping technical services to **cmdb_ci_service** with a service classification of “Technical Service” while Event Management enabled technical services are mapped to **cmdb_ci_query_based_service**. The **cmdb_ci_query_based_service** has been relabeled to Dynamic CI Group in the Paris release of ServiceNow.

Technical Service offering

Technical service offering is a service offering type defined as a stratification of the technical service into options including localization/geography, environment, pricing, availability, capability, support group (for incident), technical approval group (for change), and packaging options (commitments).

Different levels of performance and features for a given technical service can be made available via the technical service offering. A service commitment defines service delivery obligations agreed to between consumer and provider. There is also a concept of a service offering subscription that records which users have access to an offering.

Service offerings (SO) consist of one or more service commitments that uniquely define the level of service in terms of availability, criticality, scope, and pricing, and other factors. For example, an organization may offer two levels of support for an application service: a “Prod” offering of high availability and criticality for the production instances with commitments of 5 minute response guarantee 24/7: a “NonProd” offering of limited availability and criticality with commitments of 60 minute response guarantee between 8-5 on weekdays.

The technical service offerings are mapped to **service_offering** with a service classification of “Technical Service.” Technical service offering is derived from service and refined depending on how the parent serves a specific technical need. ServiceNow recommends that every operational technical service have at least one offering. Beginning with New York, service offerings may be requested through the Request Catalog.

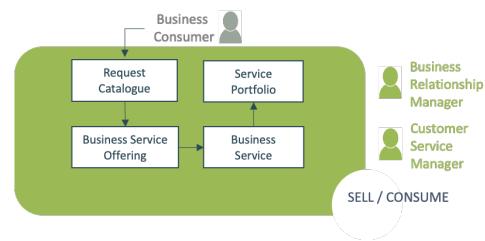
Dynamic CI Group

The Dynamic CI Group is a dynamic grouping of configuration items (CIs), based on results of CMDB Groups queries. For example, you can create a dynamic CI group based on the location of all web servers in Detroit or all Oracle databases in Boston. Dynamic CI Group uses CMDB Group (see Foundation Domain for details) to identify CIs of common criteria. Note: A Dynamic CI Group contains CIs. However, a Dynamic CI Group cannot contain other groups.

The use cases for Dynamic CI Group include but are not limited to the following:

- As a Query Based Application Service – You don't have Service Mapping yet, but you know these 12 servers and 3 database instances are part of *MyAppServiceProd*. Eliminate the old spreadsheets and use a Dynamic CI Group as an Application Service.
- As a Managed Group of Infrastructure – The web servers in Detroit are managed by the *DetroitRockCity* Technical Service Offering. No need to manually create relationships from Technical Service Offerings to Infrastructure CIs. Use a Dynamic CI Group. A single relationship from your Technical Service Offering CI (*DetroitRockCity*) to your Dynamic CI Group (web servers in Detroit) will result in the desired visibility.
- Patch Management – It's time to patch our 200 Linux servers again. In the Change we select our Dynamic CI Group for or Linux Servers and then have a business rule auto populate our 200 servers into Affected CI.

Dynamic CI Group is mapped to **cmdb_ci_query_based_service** table with a service classification of either "Application Service" or "Technical Service" depending on its use.



Sell / Consume Domain

What is Sell/Consume? Sell/Consume is a CSDM Domain that represents those tables currently utilized by Service Portfolio Management (SPM) and Customer Service Management (CSM). Additionally, they represent the business portfolio of services that may sell/consume elements of the manage technical services domain. The sell/consume tables are "operational" thus ARE selectable for ITSM: Incident, Problem, and Change. Beginning with New York, service offerings may be requested through the Request Catalog.

Though Service Portfolio Management and Customer Service Management are not required to utilize the referenced CMDB tables, such capability greatly improves the ability to manage workflows and report on service-related data. Service offering has been made OOB in New York while Business Service Portfolio is a new table OOB in the New York release of ServiceNow. Common personas in this domain are Business Relationship Manager and Customer Service Manager.

Portfolio

At the highest level, a portfolio is a collection of services, products, projects, or applications. Portfolio(s) are used to manage like items together for a business. These may be grouped by objective, capabilities, organization, or geography, etc. (For example, ERP or financial management). ServiceNow supports a wide range of portfolio types such as service, project, and applications. In this white paper, the focus will be limited to the service portfolio.

Service Portfolio

Service portfolio is a hierarchical classification of business services (products and services) that define strategic business value and facilitates the management of their life cycle.

Business Service

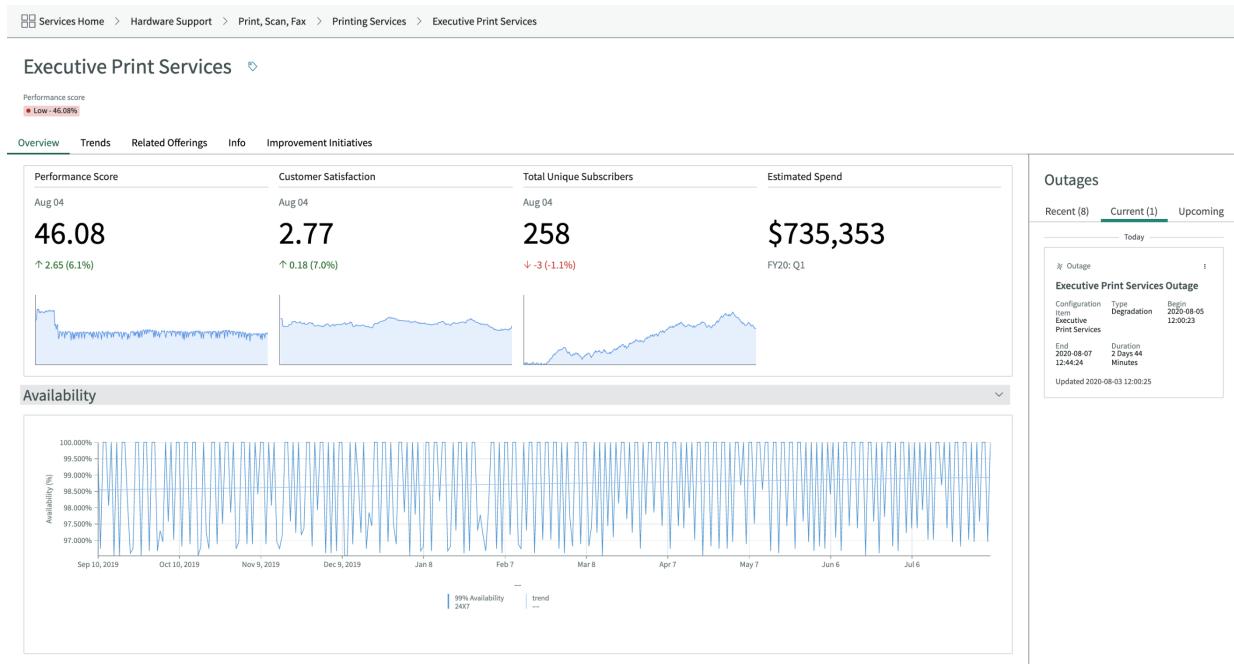
Business service is a service type that is published to business users and typically underpins one or more business capabilities. Business services are often orderable by business users. Business users are able to

select the desired offering and service commitments levels via a request catalog. A business service is made up of one or more business service offerings. The view of business services are mapped to **cmdb_ci_service** with a service classification of “Business Service”.

Business Service offering

Service offerings are the starting point for configuring Service Portfolio Management (SPM). Service offerings (SO) consist of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and other factors. For example, an organization may offer two levels of desktop support in your organization: a “standard” offering of upgrades and virus protection and an “executive” offering with the standard commitments plus some type of response guarantee such as 30 minutes between 8-5 on weekdays.

A service offering is defined as a stratification of the service into capability, availability, pricing, and packaging options. Different levels of performance and features for a given service can be made available via the service offering. A service commitment defines service delivery obligations agreed to between consumer and provider. The service offering is the specific record in ServiceNow that identifies the business area being serviced and the entity where the service is delivered. There is also a concept of a service offering subscription that records which users have access to an offering. Some business services and offerings depend on application service. Service offering is derived from service and refined depending on how the parent serves a specific business need. ServiceNow recommends that every operational business or technical service have at least one offering.



If offerings have different commitments (and they usually will), those differences should be represented by different SLA definitions. If an organization has no offerings, their SLAs will almost always be at a process level only (P1 incident, minor change, etc.) with no reference to the service offering being affected. Services and offerings that you provide can be represented in the service catalog (by catalog Items) and made active for consumers to see.

Request Catalog

A request catalog provides a consumable view of available business & technical products, services, service commitment options, and offerings. Catalogs help manage what services a user may have access to, and they are the initiation point for access to available services. For example, HR service catalog, technical catalog. Request Catalogs utilize catalog items to document consumable offerings.

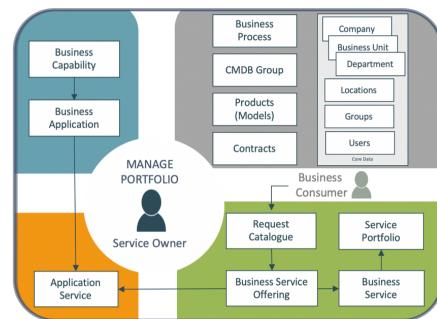
Beginning with New York, service offerings may be requested through the Request Catalog.

Catalog item

A catalog item is a requestable item within the service catalog. Catalog items are the consumable representations of service offerings. A given service is often made up of multiple catalog items. (For example: employee onboarding). Catalog items are published on the service portal and are available to users who are subscribed to services linked with them or have access because of specific catalog category/item user criteria.

Manage Portfolio

What is Manage Portfolio? The Manage Portfolio domain is a CSDM Domain that represents portions of all four previous domains: foundation, design, manage technical services, and sell/consume. For many organizations, the service owner responsibility includes more than the business services found in sell/consume. For these service owners there is a need to include oversight in the business applications and their deployed instances known as application services. It is by having this visibility and oversight that these service owners encompass the true breadth of their responsibility.



For example, the Service Owner for HR may have financial responsibility for the business application that provides HR services. Additionally, the HR service owner may be directly responsible for overseeing the effective deployment of the HR application instances known as application services. Though the HR service owner may not be responsible for troubleshooting and repairing these application services, that's the responsibility of the related technical services & offerings, they are responsible for the impact the application has on the business.

CSDM Conceptual to CMDB Tables

How does the CSDM 3.0 conceptual model map to the CMDB? In this section, we will take a look at how these conceptual objects from the CSDM map to the physical tables and CI classes. The mappings in Figure 8 are straightforward, but please be advised that this mapping will continue to evolve as we strengthen the relationships across the foundation, design, manage technical services, and sell/consume domains to the degree possible.

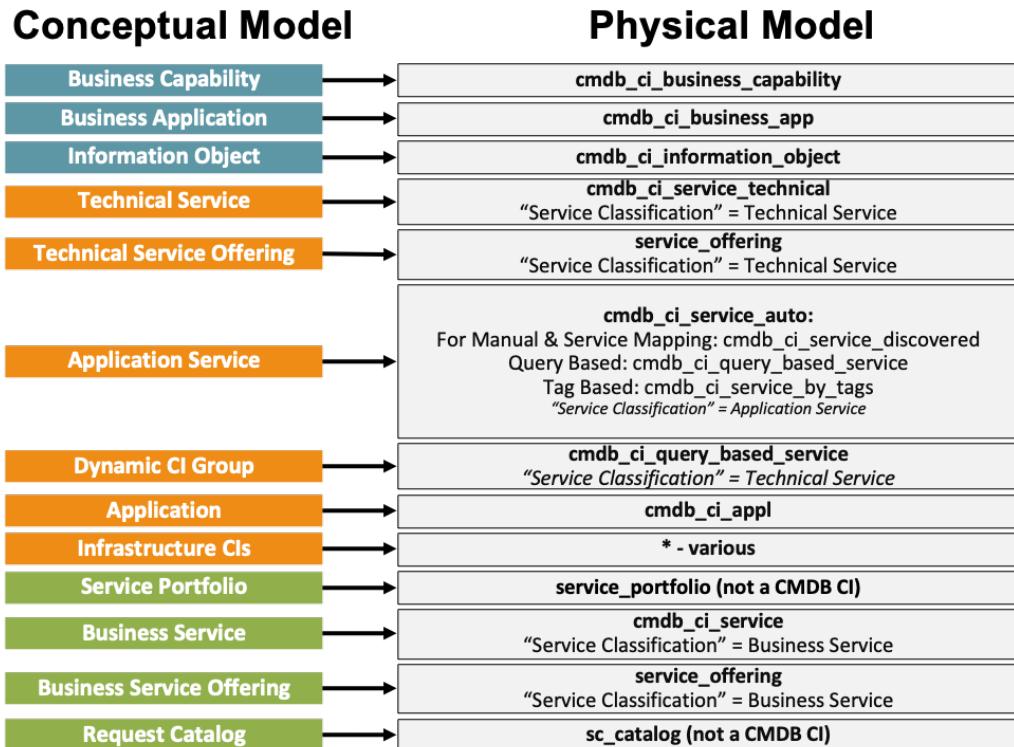


Figure 8 CSDM 3.0 Conceptual to Physical Mapping

ServiceNow also intends to update the ITSM reference architecture with an ERD for CSDM. Future versions of CSDM will include more detailed information on how governance risk & compliance (GRC), performance analytics (PA), customer service management (CSM), internet of thing (IoT), development operations, (DevOps), security operations (SecOps) and project performance management (PPM) relate.

How to follow CSDM standard

How do I get started with the CSDM? ServiceNow does not recommend trying to implement all elements of the CSDM data model at once. Based on decades of experience it is not only acceptable but highly recommended to approach the CSDM in a staged manner: foundation, crawl, walk, run, fly.

Foundation

The primary use of data is for reporting. More often than we like to admit, we consider reporting too late in our projects. It is critical that we have the right data at the right time to facilitate the reporting and business decisions we seek to make. Many of the reporting asks of data within a CMDB are dependent upon referential data as opposed to the configuration items themselves. Early planning around referential data is critical to long term success.

- **Organizational Structure** – OOB tables Company, Business Unit, and Department are provided for identification of internal business structure as well as external customers, manufacturers and vendors. Organizational structures can change often. Having an early plan to consume and manage this data will save heartache in the future.
 - **Company** – The legal entities of either internal or external companies are populated in the Company table. A hierarchy is permitted using the available parent attribute. Consider what legal entities you will require within your reporting when the CMDB is populated
 - Internal, your company, entries should focus on a hierarchy of legal entities as opposed to a hierarchy of business units within a legal entity.
 - External entries can be identified by the available true/false flags. The Customer flag identifies your customers external to your company. The Manufacturer flag identifies those companies that create products you consume. Note: your internal company may also be a Manufacturer. The Vendor flag identifies those companies that provide products that you procure. Note: your internal company may also be a Vendor.
 - **Business Unit** – The hierarchy of your business is populated in the Business Unit table with a reference to the Company they are part of. Business units are parts of your organization that are in charge of certain operations, such as Finance, HR, IT, and so on. A hierarchy within Business unit is common. For large multinational companies you may have Business Units that identify independent regional operations and then the specific operations within said region.
 - **Department** – A further stratification of your Business Units are populated in the Department table. Departments provide another way to categorize users, groups, assets and Cls.
- **Location** – OOB table provided to identify a geographical position. A hierarchy of location data can be created using the parent attribute. Such a hierarchy could include entries that match your required level of reporting. For example, you could populate the location table as follows:



If your reporting requirements identify greater location detail then you could extend the hierarchy into floors, rooms, datacenters and etc. With hierarchy capabilities, trusted source data, and your requirements in hand, you can create proper locations to support your future reporting needs.

- **Groups** – OOB table meant to identify a set of users who share a common purpose. Groups may perform tasks such as approving change requests, resolving incidents, receiving email notifications, or performing work order tasks. Groups are also used referential data in the CMDB such as to identify management of a CI (Managed by group) and support for a CI (Support group). Any business rules, assignment rules, system roles, or attributes that refer to the group apply to all group members automatically.
- **Users** – OOB table meant to identify the individuals that have access to the ServiceNow instance. These users can then be organized within groups, associated to Company, Business Unit, and Departments.
- **CMDB Group** – OOB table meant to identify a collection of CIs using queries and/or manually populated CIs. CMDB groups become a critical element of Dynamic CI Groups and the strategic management of CIs. Early consideration of how you wish to report on and monitor CIs will help in the creation of CMDB Groups in support of your requirements.
- **Product Models** – OOB tables meant to identify the unique types of products developed or consumed by your organization. Assets and CIs may be grouped by product models. Such grouping may be desired for project planning, costing, and rationalization. Discovery can populate hardware model type products once operational, but other product types require planning from Product Owners.
- **Contracts** – OOB table meant to identify a binding agreement between two parties. When populating services provided by vendors into the CMDB, it is valuable to consider the use of Contracts when measuring against contractual service level agreements (SLA).

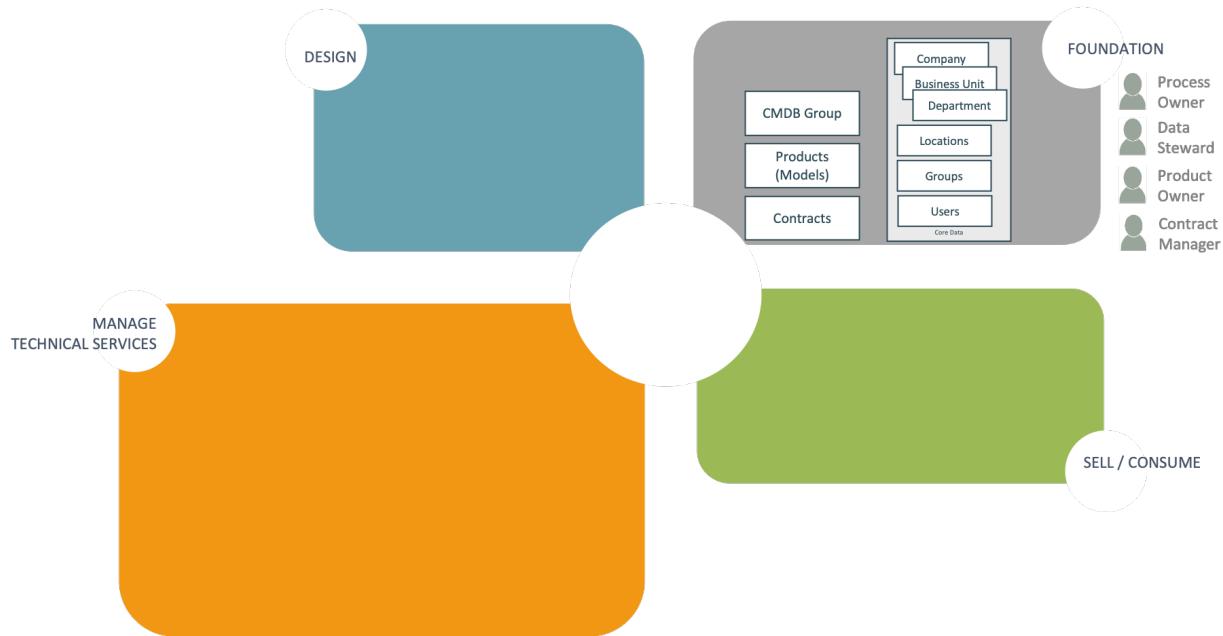


Figure 9 CSDM 3.0 Foundation

What is the value of Foundation? As seen in figure 9, the foundation stage focuses on 9 OOB referential tables: company, business unit, department, locations, groups, users, CMDB group, product models, and contracts. Starting with these objects provide the following value:

- Foundation for many ServiceNow products and the Now Platform
- Early alignment to reporting requirements will expedite data model value realization
- Reduce or eliminate costly rework to align data to reporting requirements

The basis of any good structure or data model begins with foundational data that is referenced throughout the model. Identifying, validating, and governing this data is best discussed sooner than later.

Crawl

With a goal of quick wins within IT service management (ITSM) we recommend a focus on Applications. As you learned above, ServiceNow has 3 locations for application related data:

Which Application?		
<p>An Application is any deployed program, module or group of programs, that is designed to provide specific functionality on a compute infrastructure. The installed bits & bytes.</p> <p>(cmdb_ci_appl)</p> <p>Key Details</p> <ul style="list-style-type: none"> • An Operational CI • Used in Incident, Problem, Change (IPC) • Discoverable installation of code communicating over a particular port • Unique deployment of an Application on a particular host • Ex: Database Instances, Java, Websphere, Tomcat 	<p>A Business application represents all software and infrastructure environments (Dev, Test, Prod) configured to provide business functionality</p> <p>(cmdb_ci_business_app)</p> <p>Key Details</p> <ul style="list-style-type: none"> • Inventory of Application (Portfolio) • NOT an Operational CI • NOT used in Incident, Problem, Change (IPC) • NOT Version specific • Contains Meta data about the Business Application 	<p>An Application service is a <u>service type</u> that is a logical representation of a deployed application stack.</p> <p>(cmdb_ci_service_auto)</p> <p>Key Details</p> <ul style="list-style-type: none"> • An Operational CI • Focus in Incident, Problem, Change (IPC) • Unique Instance of an Application • May be created per “Environment” ex. Dev, QA, Prod • May be created per region • Creation Methods: Manual Mapping, Service Mapping with Entry Point, Tags, Dynamic Query

Figure 10 CSDM 3.0 Which Application?

- **Business Application** – OOB table in the CMDB meant to house your inventory/portfolio of applications and their meta data. This is *NOT* an operational CI and should not be used in incident, problem and change
- **Application Service** – OOB tables in the CMDB meant to identify the deployments of the related business application. You may have several application services representing each unique deployment including environment (dev/qa/prod) and location/geography (emea/na/apac). This CI will often be the object chosen when an incident caller identifies an issue with enterprise

application (fill in your app here). The application service is the glue that ties all the elements of the CSDM together where applications are present.

- **Application** – OOB table since the start of ServiceNow CMDB. This table is NOT your inventory of applications. It is meant to represent the discoverable instance of an application: code related to a process running on a host. It is a technical CI created and maintained by discovery. Though the application may be the final cause of an incident, without event management, it may not be the initial offender. With discovery in place, applications will be automatically related to their host, providing an impact hierarchy from server to hosted applications. Manual population of the Application table is not recommended.

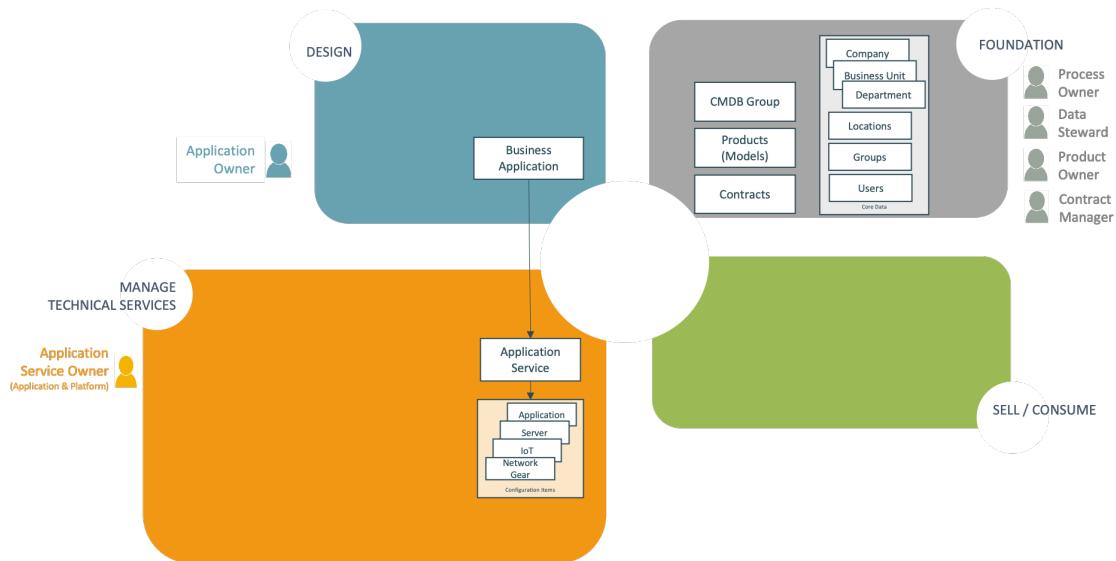


Figure 11 CSDM 3.0 Crawl

What is the value of Crawl? As seen in figure 11, the crawl stage focuses on 4 OOB CMDB tables: business application, application service, application (discoverable), and server/host (discoverable). Working with these objects provide the following value:

- Minimum CMDB requirements to provide ITSM: incident, problem, change
- Foundation for future APM use. When you license/utilize APM, your business application data will already be in the right place which will improve your implementation velocity of APM.
- Foundation for future ServiceMapping use. When you license/utilize ServiceMapping, you will have your application service data populated and ready to fill in your entry points for mapping.
- Foundation for Technology Portfolio Management risk details use, a capability of APM. Technologies that underlie the business applications deployed in your business enterprise have a shelf life that must be actively managed and diligently monitored to track their versions and lifecycle. When utilizing ServiceNow APM, ServiceMapping, and SAM Pro, customers can identify these pending risks to using outdated software.
- Future products and enhancements to existing products will depend on data being populated in these specified tables.

Walk

Deployed applications and infrastructure need someone to manage/support them. Many of the “services” populated in customer instances today are technical in nature. The next natural buildout of

the CSDM focuses on the management of technology services. As you learned above, ServiceNow has 3 tables that identify the provider of technology:

- **Technical Service** – OOB table in the CMDB meant to identify the provider of the technology that your business consumes.
- **Technology Service Offering** - Technical service offerings may be broken into options including localization/geography, environment (prod/non-prod), pricing, availability, support group (for incident), technical approval group (for change), and packaging options (commitments). The technical service is derived from service and refined depending on how the parent serves a specific technical need. ServiceNow recommends that every operational technical service have at least one offering. Beginning with New York, service offerings may be requested through the Request Catalog. NOTE: not all Technical Service Offerings have to be related to applications or infrastructure CIs. Some Offerings may be provided by Managed Service Providers.
- **Dynamic CI Group** – OOB table meant to identify a dynamic grouping of configuration items (CIs), based on some common criteria. One of the many use cases of the Dynamic CI Group is a collection of Configuration Items managed by a particular Technical Service Offering.

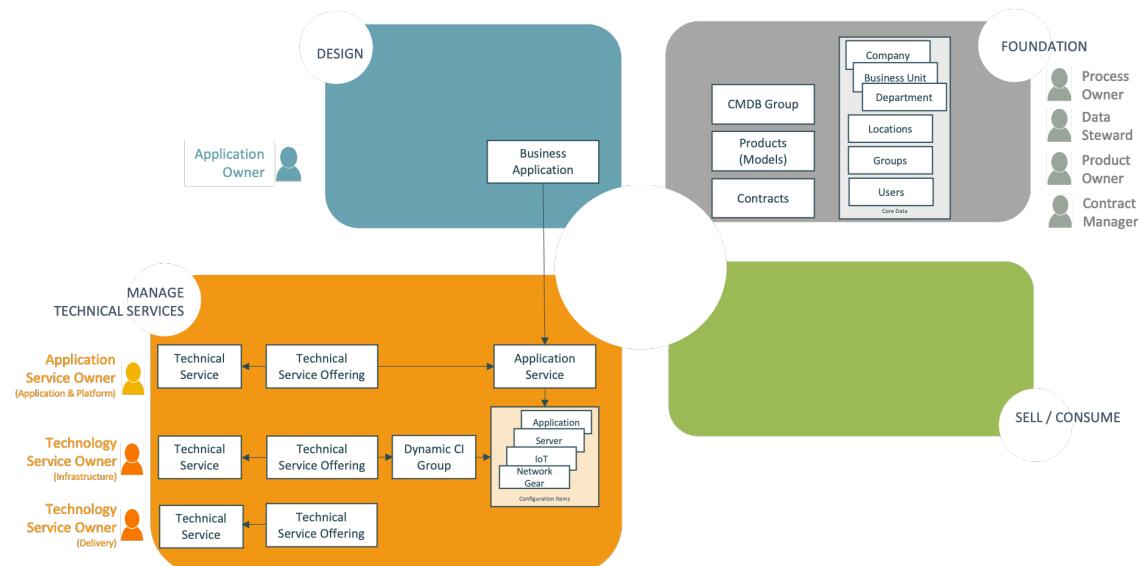


Figure 12 CSDM 3.0 Walk

What is the value of Walk? As seen in figure 12, the walk stage focuses on 3 additional OOB CMDB tables: Technical Service, Technical Service Offering (Service Offering with a service classification of Technical Service) and Dynamic CI Group. Focusing on these objects in the walk stage provide the following value:

- Management of configuration items. Many infrastructure CIs are discoverable. Managing the manual meta data on these objects such as support group and technical approval group can be taxing. By identifying the technical service offering that manage these CIs, you can configure ServiceNow to populate/synchronize this data onto these related child objects thus eliminating the manual effort of maintaining said data on thousands of CIs.
- Establish a view of those CIs that the technical teams support within your organization. Allows for additional stratification of their support structure along the lines of OLAs and commitments.

Formalize the structure that already exists today through your use of varying support groups for application and technology owners.

- Foundation for future service portfolio management (SPM) use. When you license/utilize SPM, your service data will already be in the right place which will improve your implementation velocity of technical SPM.
- Technology Service Offerings may be ordered through the request catalogue. Automation may be configured as need to enhance the request workflow and update/create related CIs.
- Foundation for ITOM products such as ServiceMapping and Discovery.
- More automated methods of grouping CIs for identification and management by Technical Service Offerings.

Run

A critical element of ITSM is understanding the impact technology can have on the business. The business may consume the technology provided. Additionally, CSM has a similar dependency where the business sells the technology provided. Such dependencies require a relationship from the technology provided to the business that sells/consumes it. The next buildout of the CSDM focuses on sell/consume. As you learned above, ServiceNow has 3 tables that identify the sellers/consumers of technology:

- **Business Service Portfolio (not a CMDB table)** - Business service portfolio is a hierarchical categorization of business services (products and services) that define strategic business value.
- **Business Service** – OOB table in the CMDB meant to identify strategic business value that may utilize technology infrastructure. Such a dependency results in the business service selling/consuming said technology infrastructure.
- **Business Service Offering** – Business service offerings are the starting point for configuring Service Portfolio Management (SPM). Business service offerings consist of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and other factors. The business service offering is derived from service and refined depending on how the parent serves a specific business need. ServiceNow recommends that every business service have at least one offering.

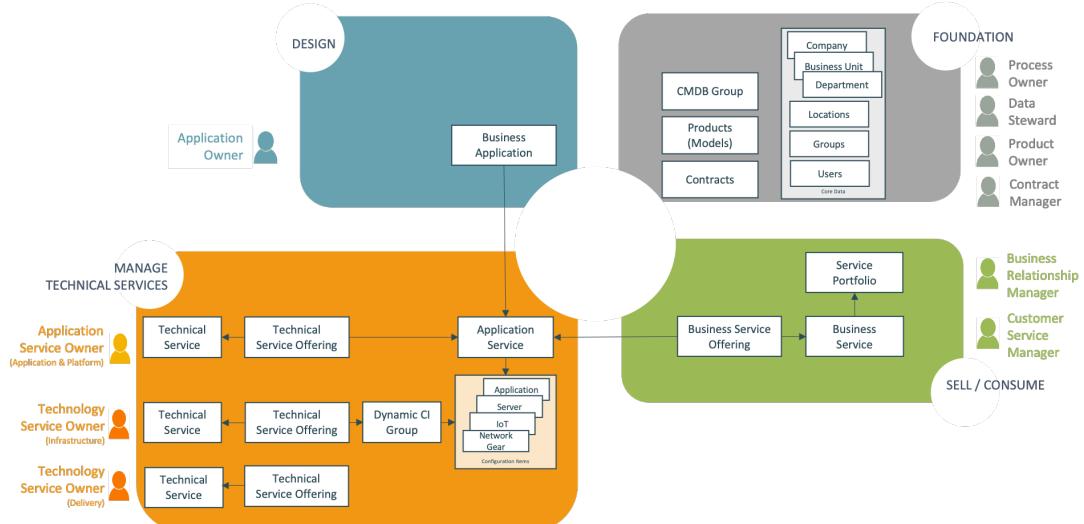


Figure 13 CSDM 3.0 Run

What is the value of Run? As seen in figure 13, the run stage focuses on 3 additional OOB tables: Business Service Portfolio (not a CMDB table), Business Service (Service with a service classification of Business Service) and Business Service Offering (Service Offering with a service classification of Business Service). Focusing on these objects in the run stage provide the following value:

- Impact assessment for ITSM: incident, problem and change. Within an incident or change you can identify the impacted business services and offerings assuming relationships exist between the selected CI and the impacted services.
- Lays the foundation for Service Portfolio Management capabilities with service owner workspace. The service owner workspace delivers a workspace where service owners can monitor service portfolios and effectively gain an overall understanding of service-related information. Such information includes service trends, improvement initiatives, service performance, outage monitoring, and more.
- Lays the foundation for ITSM+ capabilities. Populate the related subscribe by table on a service offering to identify more than what business is impacted. Identify “who” is impacted. Business Service Offerings can identify subscribers by user, company, location, department, and group.

Fly

The complete CSDM 3.0 is made available in the fly stage. Mother always said, “don’t bite off more than you can chew.” The CSDM is no different. Reaching the fly stage means you have accomplished all or most of the foundation, crawl, walk, run recommended approach to the CMDB framework. The last stage of the CSDM build-out finishes the remaining elements of CSDM 3.0. As you learned above, ServiceNow has 3 tables that identify the remainder of the CSDM 3.0 effort:

- **Request Catalog (not a CMDB table)** - Beginning with New York, service offerings may be requested through the Request Catalog.
- **Business Capability** – Business capability is a high-level capability that an organization requires to execute its business model or fulfill its mission. These capabilities can be used to rationalize and prioritize spend on business applications and business services.
- **Information Object** - Information object is part of the new information portfolio and referenced by the business application. The information object table may be used to identify the types of data a business application may possess such as PII, PCI, HIPAA, and etc.

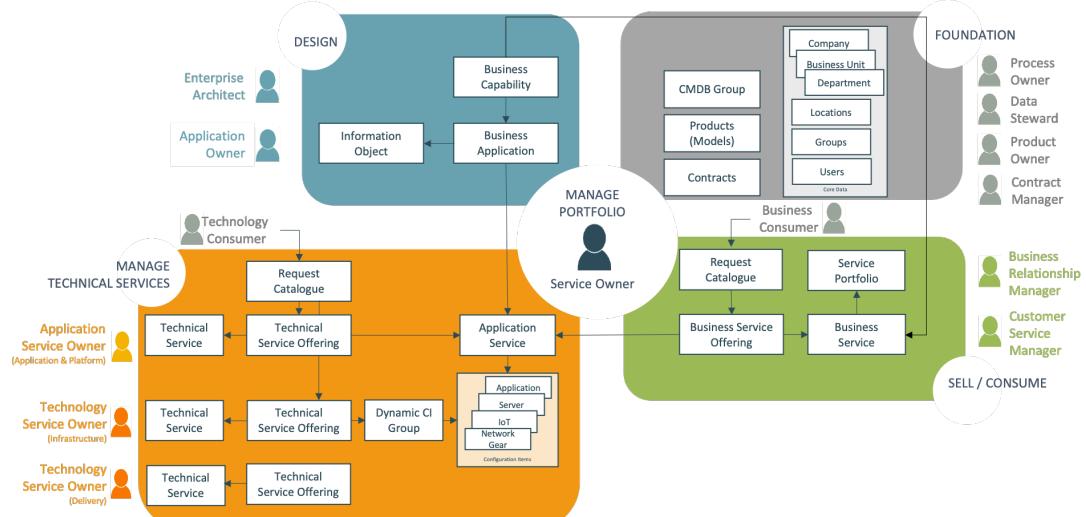


Figure 14 CSDM 3.0 Fly

What is the value of Fly? As seen in figure 14, the fly stage focuses on 2 additional OOB tables: Business Capability and Information Object. Additionally, request catalog capabilities with Service Offerings are valuable. Focusing on these objects in the fly stage provide the following value:

- Lays the foundation for APM capabilities. Perform rationalization of your business applications with APM. Are you spending too much or too little on your business capabilities? Should you be increasing spend on emerging business capabilities?
- Lays the foundation for APM with SPM capabilities. Perform rationalization of your business services and related offerings. Like business applications, are you spending too much or too little on services? Are they the right services compared to emerging capabilities?
- Lays the foundation for ITSM+ capabilities. From the request catalog you can now relate a service offering to a catalog item in New York. Enhance the request workflow to auto populate the subscribe by user table.
- Manage business services in your environment as a service owner with a combination of CIs from each of the CSDM domains.
- Identify the types of data that may be contained/used within your business applications. A common requirement for compliance, the new information object table will assist in identifying the details of your information portfolio.

NOTE: The information object table may be required sooner in your data model implementation. Your business requirements should determine the right stage for implementation of the information object table

Relationships in CSDM

What relationships do I use between the CSDM Cls? Configuration management is not effective without the use of relationships between Cls. Not all objects in the CSDM 3.0 conceptual model are CMDB tables. Additionally, not all the objects have relationships. The following (figure 15) identifies the relationships utilized.

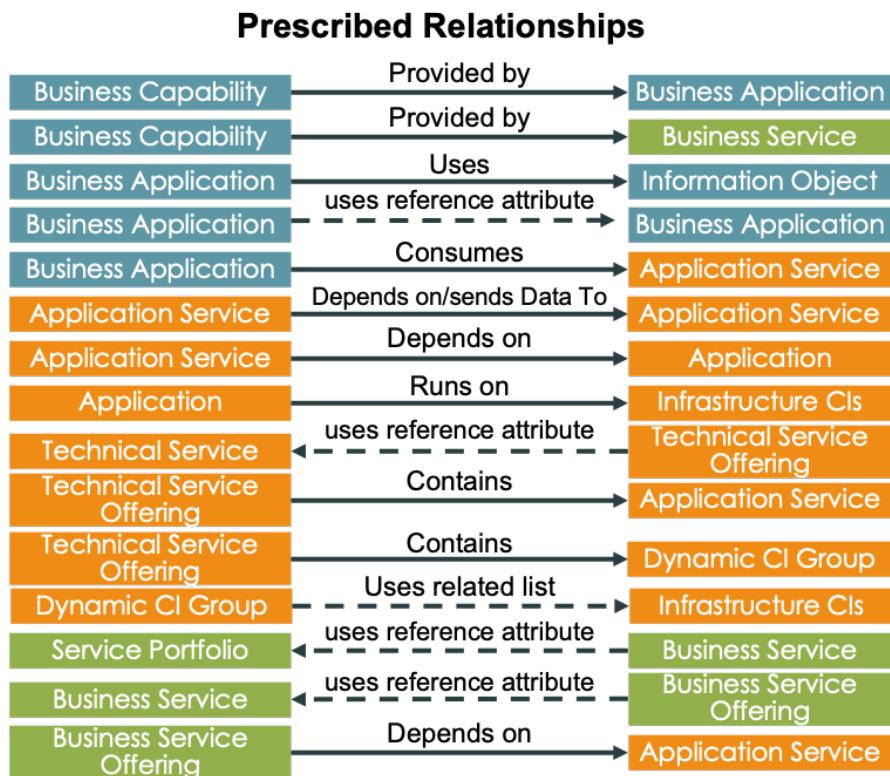


Figure 15 CSDM 3.0 Relationships

Several ServiceNow products, such as APM, have a critical dependency on the relationships listed above. If these relationships are not utilized (ex. Business Application “consumes” Application Service) then functionality such as the Technology Portfolio Management risk assessment will not function. Additionally, the relationships commonly created as part of ITOM Service Mapping & ServiceNow Discovery are considered the standard for infrastructure Cls. When mapping these elements manually, without ServiceNow Discovery, it is best to consider WWDD (what would discovery do?).

Migrating into CSDM

How do I migrate into the CSDM? Much of the CSDM tables have only been available OOB for 2 years or less. Many ServiceNow customers may be utilizing necessary customizations or nonconforming tables within the CMDB. But continued use of these customizations and nonconforming uses will result in reduced value from the ServiceNow products that increasingly depend on data found in the CMDB framework outlined by the CSDM. So, how do we migrate into the CSDM – very very carefully...

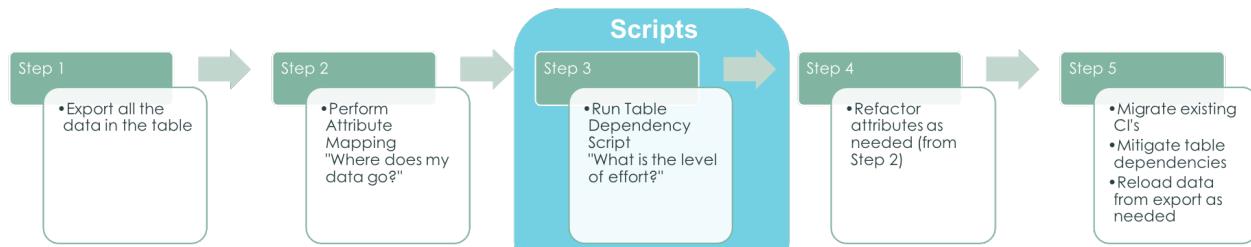


Figure 16 Migrating into the CSDM 3.0

Since the Business Application table was made OOB in Kingston, we have spent a lot of time helping customers migrate their data from one table/class to another. That time and experience is what we are using to provide you guidance in migrating into the CSDM. There are 5 steps to such a migration from table to table as seen in figure 14 above. These steps are:

- **Step 1: Back up your data** – ServiceNow takes data loss very seriously. Though you won't need this data immediately, it is always a best practice to back up your data prior to embarking on a data migration effort. Export your table data with all attributes to excel and place in a safe spot.
- **Step 2: Attribute mapping** – Identify what tables your data will migrate to and if the destination table has your required attributes available OOB. This is an opportunity to rationalize your custom attributes. Do you really need those customizations that were only used once 5 years ago or have only been populated on less than 10% of your CIs?

In most cases, less is more. Use this opportunity to eliminate low use / no use attributes or those attributes with more effective methods of fulfilling their use case. Categorize your custom attributes as follows

- Best Practice – no related OOB attribute but is recommended by ServiceNow or a Partner.
- Keep – no related OOB attribute but a unique use case requires the attribute be retained.
- Refactor – there is an OOB attribute or capability that can be migrated to
- Do Not Need (DNN) – this customization is no longer needed
- **Step 3: The most important step!!!** – In all honesty, it is relatively simple to move a CI from one class to another. But such effort may neglect an extremely important element of your environment – dependency on your non-conforming table. You may not be aware of potentially hundreds of reports, business rules, scripts, table references and more that look for data specifically in your non-conforming table. Moving the CIs to a new table does not automatically move the reports, business rules, and etc. Thus, we need to identify table dependencies.

We accomplish this effort using a fix script developed by Austin Buono of ServiceNow Customer Outcomes. The script has a place to enter the name of the table you desire dependency details on. The result is a list of specific dependencies.

ServiceNow makes this fix script freely available through our ServiceNow Community [here](#). Please take the time to subscribe to our community forum for updates to the CSDM.

After running the dependency script and evaluating the data, you will have a level of effort understanding for your dependency migration efforts. Use this time to validate the referenced reports – are they still needed? Validate the rules & scripts – are they still needed? Identify what should stay and make a plan for migrating these to the new table(s) as needed.

Note: this script does not move your data or dependencies. This script identifies where you have dependencies that you will need to refactor in step 5.

- **Step 4: Refactor attributes** – Now is the time to get the data model solidified and ready for data migration.

Using the attribute mapping effort of Step 2, create the necessary best practice and keep attributes on the necessary CMDB tables as you or a partner have documented. This is also the time to perform the documented refactor efforts as needed.

- **Step 5: Data Migration** – With the attributes refactored and dependencies ready to migrate we can begin our data migration:
 - Validate the data backup in step 1 is still useful. Perform another data backup if necessary.
 - Migrate your CIs –modify the class to the new class name. This will move the CI and all its related objects, incidents, changes, and so on to the new table. Perform a handful at first and increase as needed/comfortable.
 - Custom attributes or OOB attributes not in the same table hierarchy will result in data loss. This is why we made a backup.
 - Remediate your table dependencies:
 - Modify reports to use new table
 - Migrate business rules & scripts if needed
 - Update table references as needed
 - Reload data into new attributes using your data backup.
 - Validate all data and dependencies.

ServiceNow does not expect you to perform such table migrations alone. ServiceNow's Customer Outcomes organization and partners are available to assist in this effort.

Note: there is always risk when migrating data. Make sure you backup your data and provide contingency plans in case issues arise.

What tools are available to help with CSDM migration? The following tools are made available to assist in your CSDM journey:

- **Data Migration Script** – as identified above in step 3 of How do I migrate to CSDM, we have made a fixscript available on our community forum to identify table dependencies.

- **CMDB and CSDM Data Foundations Dashboard** - as of August 2020, the CMDB and CSDM Data Foundations Dashboard is available at no cost in the App Store. This app installs two modules: one for CMDB and one for CSDM. Each dashboard provides key indicators that evaluate configurations and customizations within the CMDB. The indicators provide visible results of evaluation, **Green / Red**, with weighted Priority to help with planning. Each indicator has a URL link to a remediation playbook to provide background and offer plays for remediation. The CSDM dashboard focuses on key data elements to support of the stages in CSDM adoption.

Frequently Asked Questions

What are some use cases (examples) of the CSDM? The updated CSDM 3.0 conceptual model helps identify a more prescriptive view of what the CSDM is which reduces the need for explicit examples within this white paper.

That said, ServiceNow intends to provide use cases as unique examples for implementing the CSDM 3.0 in separate documentation and eLearning. Such a separation will make management of this document easier while providing increased velocity for sharing real-world use cases as examples.

Conclusion

Your foundation for digital transformation

The Common Services Data Model 3.0 (CSDM) should be used as a reference for mapping your IT services into ServiceNow. Additionally, we will be using CSDM to drive standardization and further strengthen the value proposition of using ServiceNow products and services.

ServiceNow brings enormous value for enterprise customers that want to run IT as a business. CSDM, combined with the Now Platform, creates a standard blueprint for automated and integrated IT services. With streamlined supporting activities and value streams fully integrated on the Now Platform, you can realize full-value chain alignment, improved quality, transparency, better insights, automation, and lower costs. Ultimately, the combination of CSDM and ServiceNow serves as the foundation for digital transformation.



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