

Performance Analytics and Domain Separation

Getting started with Performance Management
for Managed Service Providers

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Introduction

What you need to know before you start

Planning for, configuring and running a domain separated instance takes preparation and dedication. When setting up an application on such an instance, there are additional considerations which require attention to ensure that the application functions as desired across domains. There are always unexpected challenges which surface due to: the domain structure, security model, process model, and application support for domain separation. This paper was written to prepare the reader for these challenges when setting up Performance Analytics on a domain separated instance.

Performance Analytics on any instance can be simple: taking out of the box content packs, or complex: custom KPIs and dashboards. With the potential for multiple process models on a domain separated instance, additional planning and setup may be required.

The ideal solution is to stay out of the box as much as possible. Performance Analytics content packs, distributed along-side applications, are designed cooperatively to work with no additional configuration. Changes made to the process model of an application, may also need to be reflected in the configuration of the Performance Analytics content pack. If process diverges across domains (due to the use of overrides) it may limit the usefulness of these content packs as a solution. They should always, however, be used as a starting point.

An organization willing to change people and process to suit software (which has been designed with best/common practice in mind e.g. ITIL) is the desired mindset to begin an implementation. Changing software is sometimes seen as a more flexible and cost-effective solution in the short term. Over the long term these customisations can have long lasting impacts on upgradability and support of an instance.

Seriously consider each divergence from an out of the box state, as additional time and resource will be required to re-asses these changes at critical points in the instance lifecycle e.g. upgrade.

A brief refresher on Data vs Process Separation

To support multi-tenancy in a single ServiceNow instance, Domain Separation employs two key concepts: Data Separation and Process Separation. Data Separation is the separation of data between domains, ensuring that domains have no access to each other's data. Process Separation enables centralized administration of the instance, or separate process per-domain and in some cases delegated administration to domain users.

This paper assumes the reader is already well educated on these concepts and has practical experience implementing them. To learn more, please refer to the available training courses and the Domain Separation Reference Architecture and Best Practice document.

Performance Analytics basics

Performance Analytics uses these concepts (data and process separation) to simplify configuration and ensure that data visibility rules are adhered to when collecting and displaying scores. The majority of Performance Analytics tables are Process Separated. Classifying Performance Analytics records as process allows domains to inherit a single set of configurations, making setup and ongoing maintenance much simpler. If they weren't then for each domain, a separate set of indicators, breakdowns, widgets, dashboards, data collector etc. would be required!

The data collector can be configured to collect scores across many domains at the same time, using the same set of indicator configurations. However it will respect data separation on source tables when calculating scores. Just like the source tables, scores are data separated. When a dashboard is loaded, although that dashboard may be available to users across multiple domains, the widgets will only display scores from the user's domain.

Preparing for Performance Analytics

In all cases:

- Get certified! The implementation team should have people trained in:
 - System administration
 - Domain Separation implementation
 - Performance Analytics implementation

For new instances:

The following should be done prior to making any configurations or customisations to the instance:

- Read and understand the Domain Separation Reference Architecture and Best Practice document.
- Decide on an MSP instance approach:
 - Standalone (Not Domain Separated)
 - Multi-Tenant (Domain Separated)
 - Multi-Tenant + Standalone (no integration)
 - SIAM (Service Integration between Standalone, Multi-Tenant or a mixture of instances)
- Finalise the Domain Map
- Identify process gap: keep track of configuration and customization changes made to out-of-the-box applications
 - Map any required changes to applications (e.g. new custom field) to the Performance Analytics content pack(s) e.g. adding a new breakdown for the custom field.

For existing instances:

The following should be done prior to deploying Performance Analytics:

- Map the domain structure (if not done already)
- Identify process gap: For each Performance Analytics content pack being deployed, go through the source application and identify any changes which also need to be applied to the content pack e.g. new breakdown on custom field

Figuring out entitlements:

The following should be considered prior to deploying Performance Analytics:

- If the instance is Multi-Tenant, will service delivery differ across customers? Will customer specific process changes be allowed? Or will all customers have the same service experience?
 - Will Performance Analytics be available on all service offerings, or only some?
- Who is the target audience for Performance Analytics?
 - Is Performance Analytics for use by the MSP only?
 - To compare and report on the service delivery for each customer internally?

- Is Performance Analytics for use by the customer?
 - Will customers be logging into the instance?
 - To be a part of fulfillment?
 - To get real-time insight into service delivery?

Deploying Performance Analytics

Get started with out-of-the-box Content Packs

The best place to start, whether this is a new instance or existing, is with a Performance Analytics Content Pack. These Content Packs have been created in collaboration with the application teams to contain industry standard KPIs and dashboards designed to measure the application's workflow efficiency and success factors. Any additional KPIs which are required, can be easily added to support any custom parts of the workflow not covered by the Content Pack.

Content Packs are unloaded into the global domain. All domains will have access to the content and will users with pa_* roles will have access to this common set of configurations: indicators, breakdowns, widgets, dashboards etc.

The false economy of overrides

On face value, the appeal of modifying content to suit individual domain needs can seem too good to be true, and it is. While overrides work perfectly well for a stand-alone business rule, Performance Analytics is an application with many interdependent records. Problems occur when records which reference the overridden record are not dynamically referred to the new record. A simple "record not found" message is displayed by the UI. Programmatically the story is no different. With APIs like GlideRecord also failing to properly realise that a referenced record has been overridden in a domain.

This behavior leads to unexpected behavior and broken configuration. A such, an all or nothing approach to Performance Analytics in a Domain Separated instance is recommended. Domain specific changes are for this reason, prevented by ACLs.

The only exception being new domain specific content. It is encouraged, if needed, to create new indicators, breakdowns, widgets, dashboards etc. on a domain-specific basis. These new configurations can form part of a service offering available to a select number of domains. It is possible to even mix new content with content from a parent domain (or global) for example: a new indicator created in a domain can use a global indicator source.

Creating new content in this way requires planning and care to ensure relationship integrity is maintained across domains. A new data collector job will also need to be created for this content, as a data collector in any other domain will not be able to collect for this new indicator. Ultimately, the more configurations are created in this way, the more it undermines the scalability of a process-based approach.

The advantage here is re-use. Domain specific content need not be a duplicate of existing configuration. The trade-off is maintainability. The more configurations are created in this way, the more complex managing Performance Analytics becomes.

A note on custom applications:

The data collector will respect Domain Separation on source tables when collecting scores. When creating a custom application, ensure that the tables are correctly domain separated. ACLs are not enough. For performance reasons, the data collector will ignore ACLs and business rules when querying source tables. If source tables in the application have no domain field, the data collector will aggregate all records returned by the source queries, and scores will not be domain separated.

Performance Analytics – Domain Support Plugin

One collection configuration, multiple domains

The Performance Analytics – Domain Support (com.snc.pa.domain_support) plugin provides three essential features for managing Performance Analytics on a Domain Separated instance.

- Configuration options for the data collector
 - Allowing the collection of scores from multiple domains using a single set of Performance Analytics configurations
- Collection of aggregate scores
 - Scores from multiple domains can be combined to create an aggregate score
 - Visibility of this aggregate score is limited to users who have visibility (via domain tree, domain contains, or group visibility) into ALL domains included the aggregate.
- Dashboard filtering by domain
 - In addition to breakdown element filtering, dashboards can also be filtered to show scores by domain or domain aggregate

Aggregation options

The Domain Configuration record provides flexibility in the way domain records contribute to scores. Prior to the availability of the Domain Support plugin, records in child domains would “roll up” and contribute to the score of a parent domain. The Domain Support plugin provides additional options for how records in child domains should be handled. See appendix: Domain Configuration Rollup and Aggregation table, for a summary of how these options manipulate the final score calculated.

Collecting scores

Domain Separation changes the behavior of the Data Collector

The behavior of the Data Collector changes slightly when an instance is Domain Separated. The Data Collector will have a domain context, taken from either: the domain of the Run As user, or the domain(s) specified in a Domain Configuration record(s). The following procedures in the data collector take into account this domain context.

- Querying source tables
 - The domain context of the data collector ensures data separation rules still apply when querying records from source tables.
- Retrieving breakdown elements
 - If breakdown elements differ from domain to domain e.g. specific choice values per domain, the data collector will take this into account and use the elements closest to the records context.
- Storing scores
 - The data collector will store scores in the appropriate domain, determined by the domain configuration record or the Run As user.

Domain Context of the Data Collector

Where the Data Collector get its domain context from is determined by the use of a Domain Configuration:

- Without a Domain Configuration
 - The Data Collector will use the domain of the Run As user as the domain context
- With a Domain Configuration
 - The Data Collector will use the domain(s) of the Domain Configuration record(s)

Appendix

Domain Configuration Rollup and Aggregate Table

	Query: Domain - Is - MSP					Aggregate
	Customers			MSP contains customers		
	A	B	C	MSP	Customers	
New incident records	30	100	50	20	0	-
No aggregate options	-	-	-	20	-	-
No aggregate options + Aggregate	-	-	-	20	-	20
Collect Children	30	100	50	20	0	-
Collect Children + Aggregate	30	100	50	20	0	200
Collect Children + Rollup Selected	30	100	50	20	0	-
Collect Children + Rollup Selected + Aggregate	30	100	50	20	0	200
Collect Children + Rollup Children	30	100	50	200	180	-
Collect Children + Rollup Children + Aggregate	30	100	50	200	180	200
Rollup Selected	-	-	-	20	-	-
Rollup Selected + Aggregate	-	-	-	20	-	20
Rollup Children	-	-	-	200	-	-
Rollup Children + Aggregate	-	-	-	200	-	200