ITRS Insights

ITRS Insights v1.6

Domain and Contributors User Guide v0.1

ITRS Group Ltd

6th Floor, The Bonhill Building, 15 Bonhill Street,

London, EC2A 4DN, UK

t: +44 (0)20 7638 6700

f: +44 (0)20 7256 5760

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CHAPTER 1

ITRS INSIGHTS CONTRIBUTOR & DOMAIN USER GUIDE

INTRODUCTION

Contributors and **Domains** form the lifeblood of Insights - Contributors contain **Streams** that feed it data, while Domains provide a granular level of organization by allowing you to clump together two or more Contributors.

Contributors are used to assign metadata to each data stream. Domains are dynamic entities that can be used to filter the results of a **query** (see ITRS Insights Query, Search and Transform Data User Guide). You can use Domains to contextualize and re-use a particular query across different sources without having to modify it.

CONTRIBUTOR

Contributor: anything that generates and publishes data to Valo or Insights. A probe or an app are example contributors. Contributors of the same type have common characteristics but can also have different metadata to one another. For example, a probe contributor on a Windows server might be able to provide more metadata than probe contributor on a Linux server. Contributors can be grouped together by common attributes to create **Domains** .

We use Contributors to assign metadata to each data source. Assigning a data Stream as a Contributor allows us to record its static metadata (say, the make of a sensor, or the location of a probe) and then run queries against it.

For example, is the source is a sensor in a heating system, we might categorize it based on what type of heater its in, who owns it, who it was manufactured by, or who installed it. You get the idea.

Like a data Stream, each Contributor has a unique URI.

```
/contributors/<tenant>/<type>
```

Where:

`tenant` = the organizational unit the stream belongs to

`type` = the type of contributor (for example probe or app)

DOMAIN

Domain: two or more **Contributors** grouped together dynamically by a common attribute. Domains help to organize and group different data sources in intuitive ways.

Domains are dynamic groups of Contributors.

Because Domains are dynamic, they take the attribute (metadata) of a Contributor (as opposed to a flag), and will automatically detect any new Contributors have that attribute (while ignoring those that don't).

In a smart city, we can create a Domain for all Contributors (sensors and other smart devices) in the West, and one for Contributors in the East. Any queries made to various Streams within the West domain will only operate on data coming from contributors in the West.

In an ITOA example, you might have a Domain for Windows servers within a particular IP range, and query for only those that have the tags `critical` and `error`. In this way you can run simple queries on this Domain, knowing that the appropriate data (i.e. `critical` and `error`) is always dynamically included in real-time, and that as new Windows servers are added, they'll be automatically added to the Domain.

Domains are a useful tool for organizing streaming data, especially if you consider that Contributors can publish data to multiple Streams.

For more about querying in Insights, see ITRS Insights Query, Search and Transform Data User Guide.

Example Domain

> In our street of smart metered houses, **we could define house Number 6 as a domain, thus every smart device that is identified as being in house number 6 is considered part of that Domain for the purposes of our analysis**.
>
> But a Domain doesn't have to be a locational entity. We could define a Domain of TVs on Arcadia Avenue, thus every contributing device that is

identified as a TV that is within our street is considered part of our domain for analysis.

A powerful attribute of Insights' domains is that because the Domain is defined by an attribute of the Contributor rather than a flag that has to be set manually at installation, Domains can be dynamic, automatically picking up new contributors coming into it.

So for instance if Mr Smith in No2 Arcadia Avenue goes out and buys a new TV for his teenage son to have in his bedroom then once the TV is plugged into the system it is automatically included in the Arcadia Ave TV domain.

Having domains also means you can have higher level metrics or data that relate to that domain which can be published, the value of this is you can publish this higher level information to people and systems who are interested in the domain but for instance do not have permission to see all the details of the data within the domain. Again looking at our example Mr Smith could see the energy consumption of all the TVs in his house, but without having access to the energy consumption (and thus potentially the hours of watching!) that came from the new TV in his son's bedroom. Or perhaps HCE could have access to the energy consumption of each house within the street without being allowed access to the consumption of the individual devices in each house, which might be considered somewhat invasive.

A domain is used at query time to filter a stream to only include data entries for contributors and tags defined by the domain. The filter is dynamic, so a contributor which no longer matches the query will be automatically removed from the domain.

A domain definition is identified by a unique URI in the following format

```
/domain/tenant/collection/name
```

What are the benefits of domains?

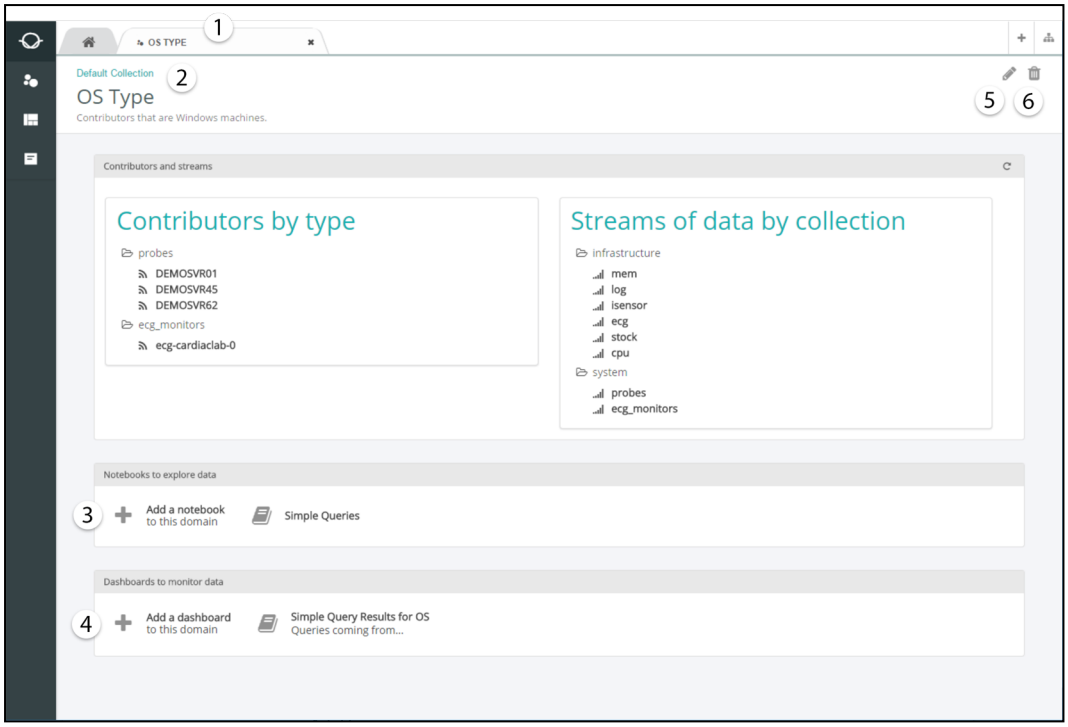
Dynamic sets of Contributors - If a new sensor is added or meta data of any existing sensor is changed, the Domains and any running queries within the Domains would adjust automatically to operate on the updated set of Contributors

Querying convenience - Let's say in this smart city there are two local authorities for the West and the East. Creating a different domain for each area would be helpful as the local authorities are only concerned with the data from air sensors in their respective area and do not want to specify the location each time in their queries

Control access to data in an organization - If we scale this example to a smart city with lots of different types of sensors and streams of data, domains would be a good way to control access to data so that employees would only have access to the data from the contributors that concern them.

Shareable - Imagine a smart city with lots of different local authorities with the same querying needs. The key queries only need to be created in one authority and then shared across all of the different areas.

The Domain Interface



1. **Active tab** - identifies the Domain, Dashboard, Notebook or Collection that is being displayed
2. **Breadcrumbs** - provides a visual indication of which Collection you are working in
3. **Notebook Panel** - allows you to rapidly create a new Notebook and provides rapid access to existing Notebooks
4. **Dashboards Panel** - allows you to rapidly create a new Dashboard and provides rapid access to existing Dashboards
5. **Edit** - allows you to edit the title and description
6. **Delete** - deletes the active component (Domain, Collection, Dashboard or Notepad)

Create a Domain

Once you've created the Domain, the active interface tab will become the new Domain's home page. From here, you can Create A Notebook and Create a Dashboard.

How to Create a Domain

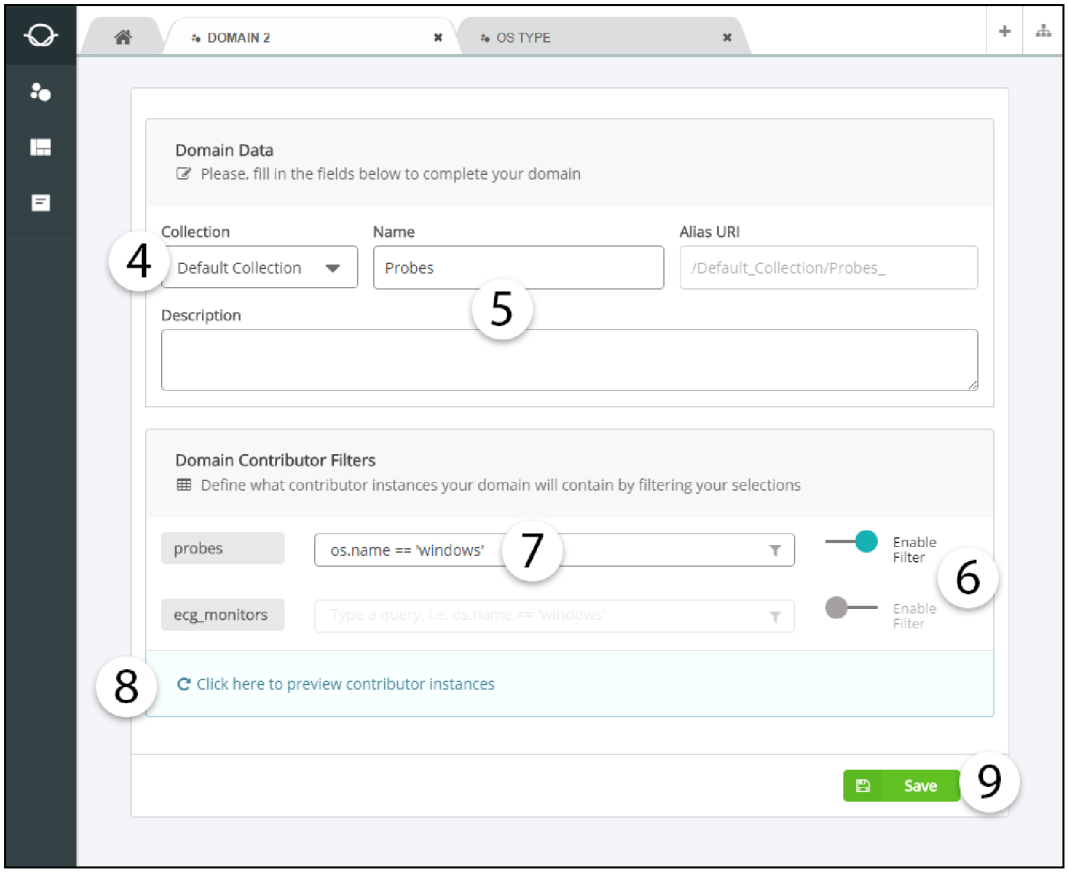
1. Run **ITRS Insights**
2. Click **Domain** on the main navigation panel
3. Click **add** - a new Domain window will open
4. Select a **Collection** from the **drop-down dialog**, or click inside the text field and type the name of the **Collection** that you want to create
5. Enter a **name** and **description** for the new Domain. The Alias URI field will automatically update
6. Use the **Domain Contributor Filters** panel to define which **Contributors** you want to include in your new Domain. Turn a filter on or off using **Enable Filter**

Filters are turned on by default. The filter list will automatically populate with the Contributor types that exist in your data Stream

7. (Optional) Enter a query to further refine the Contributors added to the Domain

a query of `os.name == 'windows'` will limit the Contributors to those whose payloads contain the 'windows' operating system value

8. (Optional) Click **Preview** to preview the **Contributors** and associated **payloads** that this Domain will contain
9. Click **Save** 



Clone a Domain

You can easily clone a domain from the Domain menu selecting **Copy to Clipboard** , this allows you to duplicate all the existing notebooks, queries etc. on that domain and move it to a different domain.

So if for example I have lots of analytics running on my European IT operations, I can clone the domain and by just updating the domain definition in the clone have all the same capabilities immediately over my North American operations.

GLOSSARY

C

Collector

New term for a lightweight monitoring agent, which is deployed on every managed Node. See Netprobe.

Contributor

An external source that provides one or more data streams to Valo. Contributors can be grouped together by common attributes to create Domains.

D

Dashboard

Dashboards provide an aggregated view of Data Visualizations

Domain

Two or more Contributors grouped together by a common attribute. Domains help to organise and group different data sources in intuitive ways.

G

Gateway

A network node that provides access to another network that uses different protocols and enables transmitted data to use its routing paths.

I

Insights

A streaming big data analytics platform that simplifies the complexity involved in analysing vast amounts of data at speed. Insights combines big data storage with a real time computation engine and in-built machine learning and algorithms.

ITRS Geneos

A real-time monitoring tool for managing increasingly complex and interconnected IT estates. Built for financial services and trading organisations, it collects a multitude of data relating to the performance of the servers, infrastructure, connectivity and applications, analyses it to detect anything untoward, and presents it in relevant, intuitive visualisations to help diagnose and fix issues quickly.

N

Netprobe

Lightweight monitoring agent, which is deployed on every managed Node

Notebook

A place in which to store a query or search, or a pipeline of queries or searches.

S

Schema

Document of understanding that defines what data a stream

contains - its structure and shape - and in what format.

SSR

The semi-structured repository (SSR) is based on Lucene which provides very powerful text search capabilities. Even though Lucene is geared towards indexing text, it also has very good index support for numerical data. However, if the data contains purely numerical fields the TSR might be a better fit as a repository for this kind of data.

Stream

A stream is made up of data (messages or events) coming from one or more external contributors. Each stream has a schema that defines what information, in what format is expected. Streams are append only.

T

Tennant

The highest level of data grouping. Within a company, it may be different departments such as Sales or Engineering. If a government is collecting data from its cities, the tenant could be the city name.

Transformational Pipeline

Each query instruction takes an input and produces an output via some form of transformation.

TSR

The Time Series Repository (TSR) is a custom built data repository designed to handle numerical time series oriented data streams. By time series we mean a series of data points each of which has an associated time stamp.

V

Valo

Real-time analytics on data streams

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