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*DecisionSpace®*

*Integration Server System Configuration*

**5000.10.4.0**

*Training Manual*

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# **Chapter 1**

# **Introduction**

Welcome to the DecisionSpace Integration Server (DSIS) 5000.10.4 Configuration class. This course covers DSIS concepts and end-user functionality, along with integration topics relevant to the usage of DSIS.

Configuration of features such as Data Server, Web Framework, Search and Business Process Management (BPM), Data Transfer, and feature integration through Web Framework are explored both in lecture and through hands-on workshops. Workshops emphasize using DSIS to connect to OpenWorks® and EDM®, using the Data Server, configuring the Portal to leverage the Web Framework, searching data sources, and designing and executing business processes using BPM.

This training course is intended for users who are involved in:

- Configuring DSIS
- Executing workflows
- Troubleshooting integration issues

---

## **Course Objectives**

---

This manual is to be used to configure DSIS in order to perform:

- Data management activities
- Business process management
- Integration with the portal to present information to the user

It is expected that students will refer to the exercises during class and use the manual for reference upon returning to the workplace.

The objectives of the course are to make students proficient in the use of DSIS data management workflows to:

- Aggregate and federate heterogeneous data sources
- Search Landmark and 3rd party data sources
- Enable business process management workflows
- Facilitate collaboration through the use of a web portal

This manual covers configuration options for the following topics:

- Data Server
- Web Framework
- Search
- BPM
- Data Transfer
- DecisionSpace Analytics
- Dropsite component

---

## **DecisionSpace Platform**

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The DecisionSpace Platform (Platform) promotes and supports hyper-collaboration™ from several perspectives:

- **Accessibility**

In addition to providing a rich, thick desktop client leveraged by Geologists and Geophysicists, portal and mobile accessibility provides the benefit of “on-demand anywhere”, convenient insight to not only Engineers, but Managers as well. Collaboration is taken to a new height by the ease of accessibility to critical knowledge and information wherever and whenever the decision maker needs it.

- **Flexibility**

With multiple deployment options and virtually unlimited scalability, E&P companies can quickly and easily avail the full power of the Platform.

The Platform is a solid investment with significant long-term cost benefits due to:

- **Compliance**

E&P companies can rest assured that, with the standards-based technologies leveraged through the DecisionSpace Platform, they are in safe hands.

- **Unprecedented Growth**

The DecisionSpace Platform takes full advantage of open source technologies to provide recognized benefits<sup>1</sup> in its product space:

- Security
- Quality
- Customizability
- Freedom

---

1. “10 Reasons Open Source Is Good for Business”, Katherine Noyes, PCWorld, Nov 5, 2010.

- Flexibility
- Interoperability
- Auditability
- Support Options
- Cost Benefits

These benefits enable the Platform's development efforts to grow from many sources, not only internal development, but also partner contributions and the open source community as a whole.

- **Agility**

Through the use of standards-based, open source technologies, new partners are bringing in new ideas more easily and safely. The result is increased business agility at a fast pace, thereby enabling rapid response to market dynamics.

As illustrated below, the Platform provides an enterprise-grade foundation capable of enabling the business agility and flexibility that E&P companies demand to respond to market dynamics.

### DecisionSpace Platform - Enabling the Enterprise



Figure 1-1: DecisionSpace Platform - Enabling the Enterprise

## DecisionSpace Platform - E&P Foundation

The Platform is logically comprised of four foundations that, collectively, are termed the E&P Foundation. This E&P Foundation provides:

- Flexible data management and tools (such as Search and Data Quality) supporting a diverse Information Foundation
- Intelligent, integrated business process management and analytics within the Integration Foundation
- Comprehensive domain applications utilizing current programming frameworks within the Application Foundation
- Highly accessible knowledge dissemination and integration with a multitude of partners within the Ecosystem Foundation

The Platform's four foundations are portrayed in Figure 1-2: E&P Foundation, and described in further detail below:

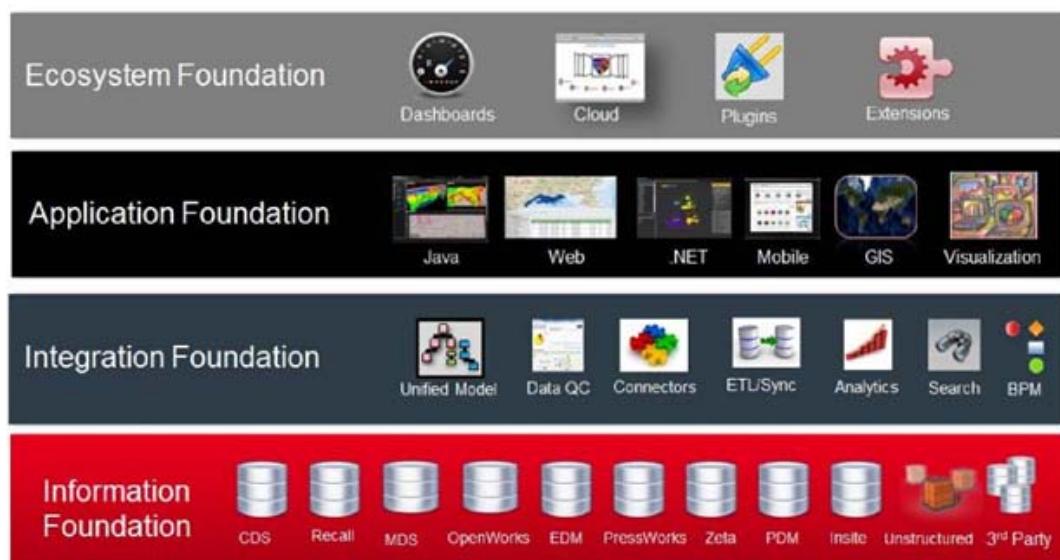


Figure 1-2: E&P Foundation

- **The Information Management Foundation** includes the underlying data and information repositories for managing all E&P data, including tiered solutions for project and enterprise or master data management, operational and production data, and big data associated with analytics.

- **The Integration Foundation** includes the data management interfaces for all data repositories, published through industry standard SOA web services, powering the data management tooling for data connectors, search, quality, data movement, and synchronization; all integrated with business process management-workflow orchestration and analytics engines.
- **The Application Foundation** is the launch pad for all technologies delivered on the platform, comprising DecisionSpace Base and GIS modules for the 3D collaborative canvas, alongside the engineering and web-based application frameworks including data management tools.
- **The Ecosystem Foundation** represents a set of capabilities that enable end-users to perform their roles in the most effective manner by optimizing the mix of applications and workflows with the underlying data. This foundation supports the creation of role-specific dashboards, easier deployment, access to Landmark and non-Landmark applications. These capabilities will be consumed by a broad community comprising customers using Landmark and partner-developed technologies, delivered and deployed on a common platform.

---

## **What is DecisionSpace Integration Server?**

---

The Integration Server software provides a comprehensive solution that maintains a company's diverse application portfolio and the need to create, develop, leverage, and protect intellectual property.

The Integration Server brings to the platform, enterprise class middleware, built for E&P applications on top of a federated information management solution. It includes the data management interfaces for all data repositories, published through industry standard SOA web services. The Integration Server powers the data management tools for data connectors, search, quality, data movement (ETL), and synchronization.

### ***DecisionSpace Integration Server Features***

Integration Server 5000.10.4.0 has the following features:

#### **Data Server**

Data Server provides applications with common data access to Landmark and non-Landmark data sources. It enables access to data via services instead of individual development kits for different databases. Virtual Databases (VDBs) that are modeled by Data Managers are accessed through data adapters, passing data to the application via standard protocol web services. Data from multiple VDBs can be combined via a logical data model and served to the application as a single source.

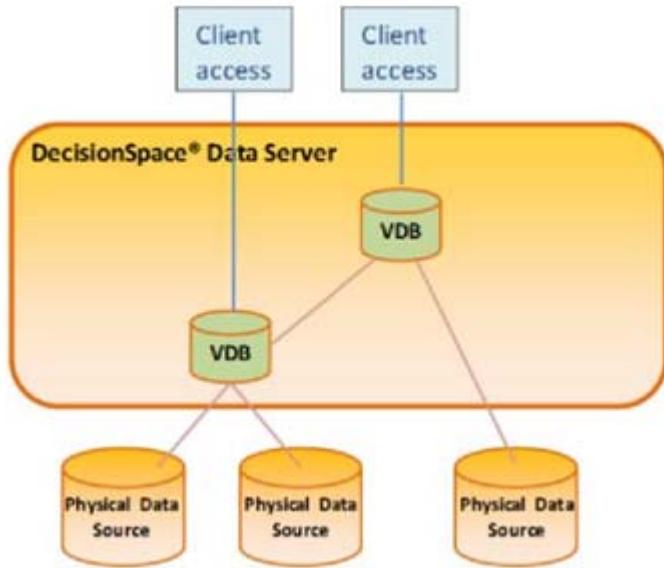


Figure 1-3: DecisionSpace Data Server

Data Server also provides tools for developers and consultants to create connections to additional data sources and expose the data as services. The advantages of Data Server are:

- Enterprise services for E&P data
- Data integration/virtualization of data from heterogeneous models and sources
- Data interoperability
- Open standards based web accessible data
- Integration with enterprise security for identity, authentication, and authorization

## Web Framework

Web Framework is a comprehensive web environment for developing web-based petro technical and business applications. It supports Microsoft SharePoint infrastructure and provides a framework and hosting environment for running new web-based business applications. It includes GIS and other web parts integrated with data and security. Applications leverage the functionality and framework provided by the Web Framework and can be independently installed, uninstalled, or upgraded.

The Web Framework provides a rich set of features encompassing the following:

- Built on SharePoint framework
- Connects to Landmark and 3rd party data sources
- ESRI ArcGIS for full GIS map capabilities
- Active Directory and role-based security
- Integrates with Business Process Management tools
- Integrates with Real Time Alarm monitoring tool

## Search

Search consists of a suite of technologies that help deliver enterprise search for the Platform. The major features include powerful full-text search, hit highlighting, faceted search, near real-time indexing, dynamic clustering, database integration, rich document (for example, Microsoft Word and Adobe PDF) handling and geospatial search. Search is powered by Apache Solr™ which is an open source enterprise search platform from the Apache Lucene™ project. The underlying technology allows searchable data to be populated from multiple sources including, but not restricted to, the following:

- Data sources in the Data Server
- Rich documents stored on the local file system
- Standalone data sources

Search provides a crawler tool that extracts data from configured data sources within the Data Server and feeds it to the search engine for

indexing and storage. For all other data sources, Apache Solr™ provides out-of-the-box tools.

The following diagram represents the functional architecture of Search modules and the technologies used from a developer perspective.

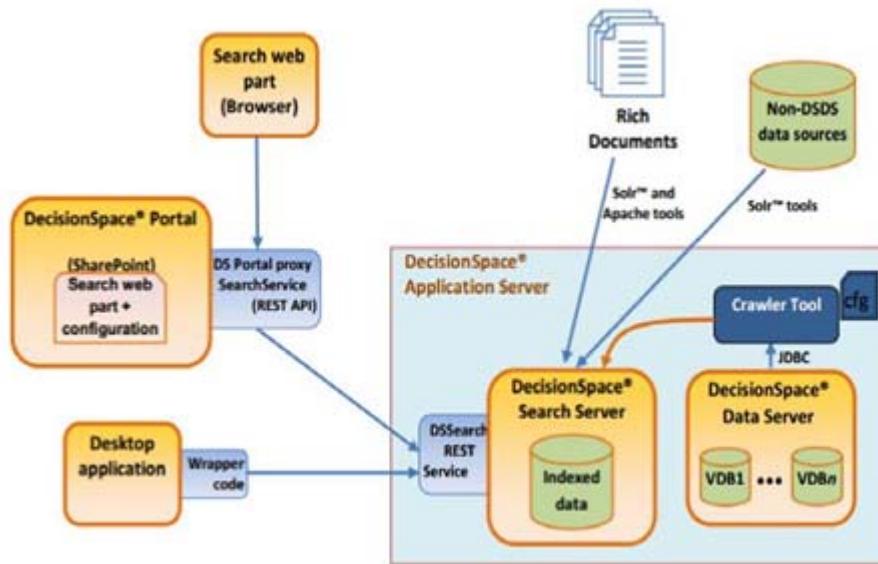


Figure 1-4: Functional architecture of Search modules and the technologies

## Business Process Management (BPM)

BPM allows orchestration of business processes. This process involves two steps:

- Designing business processes - a design time activity
- Executing business processes - a runtime activity

Use the web-based designer to model business processes in a web-based environment. A web-based console is used for administration of the business process engine. Business process definitions can be imported and business processes can be instantiated and managed. The user interface also helps to set up users and groups.

The Processes which are executed under the BPM engine can be audited. The BPM engine has a REST API exposed to import business process definitions, to instantiate business processes and to interact with users/groups present in the process.

The User Inbox is web-based and lists human tasks available for users and allows users to take different actions like claim tasks, view task forms, and submit task forms.

## Data Transfer

DecisionSpace Data Transfer is a web service that provides an interface to initiate, track, and transfer data between various supported DSIS data sources. It invokes Kettle transformations to complete the data transfer.

Data Types	Source	Target				
		CDS	EDM	Recall	Petrel	OpenWorks
Well	CDS			x	x	x
	EDM					
	Recall					x
	Petrel					x
	OpenWorks					x
Wellbore	CDS			x	x	x
	EDM					
	Recall					x
	Petrel					x
	OpenWorks					x
Directional Survey	CDS				x	x
	EDM	x <sup>1</sup>				
	Recall					x
	Petrel	x				x
	OpenWorks					x
Markers & Picks	CDS					x
	EDM					
	Recall					
	Petrel	x				x

Data Types	Source	Target				
	OpenWorks					x
Log Curve	CDS					
	EDM					
	Recall				x	x
	Petrel			x		x
	OpenWorks					x
Check Shots	CDS				x	x
	EDM					
	Recall					x
	Petrel	x				x
	OpenWorks					x

1. Implies having the same well and wellbore.

DecisionSpace Data Transfer is integrated with DecisionSpace Integrated Server through the Data Transfer plugin. This plugin enables users to search, view, browse, and transfer data from various data stores. Data can be viewed using the GIS tool or by performing a keyword/text search. Data from various data types can be transferred between data sources that are currently supported by DSDS through the Common Model. It provides the capability to create, view, and track the transfer orders through the transfer workflow.

## Other DecisionSpace Products

The other products that integrate with the Integration Server are DecisionSpace Analytics and Dropsite Component.

### **DecisionSpace Analytics**

DecisionSpace Analytics is a web-based, business-intelligence tool for historical drilling data analysis and visualization.

The software gives engineers and managers instant insight into their data by providing a series of analytic models based on common drilling business decisions. These models (or analyses) allow users to quickly and easily compare and contrast any and every variable related to their investigation in graphical form, including multiple interactive filtering, without ever having to write a database query.

Analytics can appear in the Web Framework as a web part to view interactive reports, analysis reports, and dashboards that are created from Analytics.

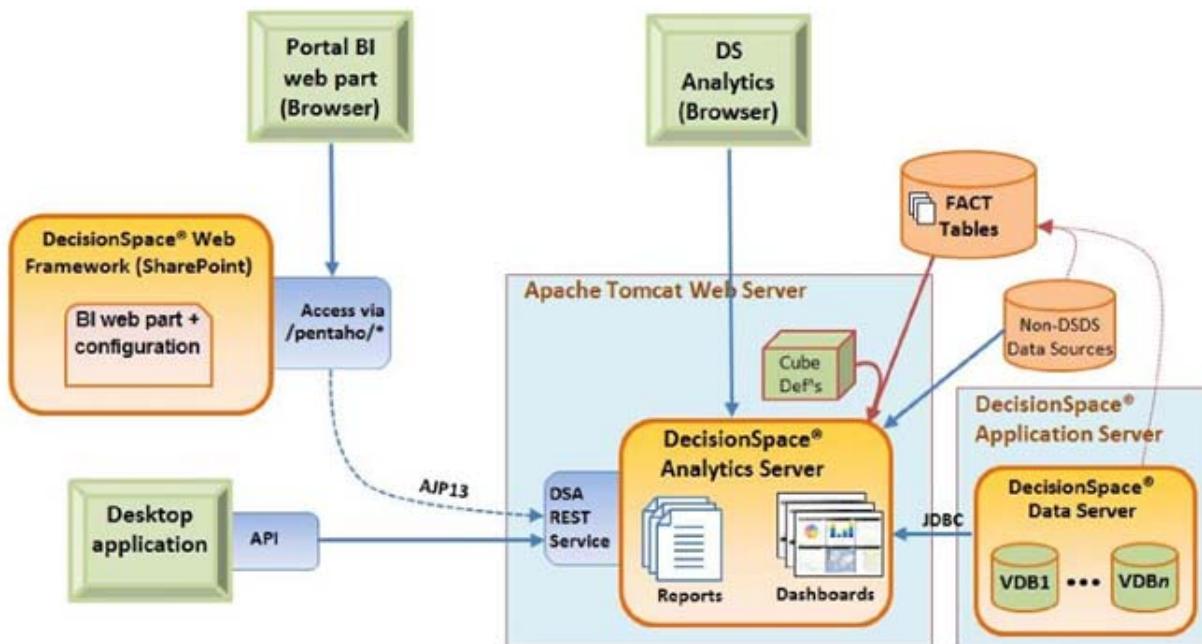


Figure 1-5: DecisionSpace Analytics architecture

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## For Assistance

---

The Integration Server software contains a zip file that provides an overview of how to use the software. Call or e-mail the Landmark help desk to get further assistance from Landmark's support specialists.

### **Contacting Landmark Customer Support**

Landmark Customer Support operates Technical Assistance Centers (TACs) in Australia, the United Kingdom, and the United States. Additional support is also provided through regional support offices around the world.

- **[Support via Web Portal](#)**
- **[Technical Assistance Centers](#)**
- **[Regional Offices](#)**

#### **Support via Web Portal**

Support information is always available on the Landmark Customer Support website. Use the Landmark Customer Support Portal to submit a support request directly to Landmark Customer Support:

<http://www.landmarksoftware.com/Pages/ContactSupport.aspx>

To request support in the Landmark Customer Support Portal:

1. In the **PIN** and **Password** text boxes in the Please Sign In area, enter the registered personal identification number and password.
2. Click **Sign In**.
3. In the Case & Defect Information area, click the **Create a New Case** link.
4. In the Create Case area, enter the necessary information. Provide details about the technical concern, including any error messages, the workflow steps where the problem occurred, and attachments of screen shots that display the problem. To help understand the concern, attach other files too, such as example data files.

5. Click **Submit**. A support analyst in the nearest Technical Assistance Center will respond to the request.

## **Technical Assistance Centers**

<b>Asia, Pacific</b>	<b>61-8-9481-4488 (Perth, Australia)</b>
8:00 am - 5:00 pm Local Time	Toll Free 1-800-448-488
Monday-Friday, excluding holidays	Fax: 61-8-9481-1580 Email: <a href="mailto:apsupport@lgc.com">apsupport@lgc.com</a>
<b>Europe, Africa, Middle East</b>	<b>44-1372-868686 (Leatherhead, UK)</b>
9:00 am - 5:30 pm Local Time	Fax: 44-1224-723260 (Aberdeen, UK)
Monday - Friday, excluding holidays	Fax: 44-1372-868601 (Leatherhead, UK) Email: <a href="mailto:support@lgc.com">support@lgc.com</a>
<b>Latin America</b>	<b>713-839-3405 (Houston, TX, USA)</b>
(Spanish, Portuguese, English)	Fax: 713-839-3646
7:00 am - 5:00 pm Local Time	Email: <a href="mailto:soporte@lgc.com">soporte@lgc.com</a>
<b>North America</b>	<b>713-839-2200 (Houston, TX, USA)</b>
7:30 am - 5:30 pm Central Standard Time	<b>Toll Free 1-877-435-7542</b> <b>(1-877-HELP-LGC)</b>
Monday - Friday, excluding holidays	Fax: 713-839-2168 Email: <a href="mailto:support@lgc.com">support@lgc.com</a>

## **Regional Offices**

For contact information for regional offices, see the Contact Support page located at:

<http://css.lgc.com/InfoCenter/index?page=contact&section=contact>

If problems cannot be resolved at the regional level, an escalation team is called to resolve the incidents quickly.

# **Chapter 2**

# ***Configuration Options for DataServer***

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## **Overview<sup>1</sup>**

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This chapter discusses the concepts, design and implementation of DecisionSpace® Integration Server's DataServer™ feature<sup>2</sup>.

DataServer is used by applications for synthesizing multi-sourced (Landmark and non-Landmark) data sources' information into definitive, common quality-assured<sup>3</sup> data sets. Data from multiple, disparate databases can be aggregated, or federated, in a virtual database and accessed via a logical data model. Applications consume that data through web services as if the data was from a single source and visualize it to business users and data managers in the context of the workflow they are using. All the data is completely secure and only users who have permissions can view the data. Furthermore, DataServer is scalable and provides fault-tolerance and administrative features.

The DataServer feature allows applications to retain core data with the associated decisions and provides reporting that documents auditable outcomes. Disparate data management systems that typically are not integrated throughout the full life cycle of a data set cannot provide this auditable reporting. Further advantages of DataServer are discussed within this chapter. It also provides tools for developers and consultants to create connections to additional data sources.

This chapter discusses the architecture of the feature and explores data integration (virtualization and federation), data consumption (OData and JDBC/ODBC), multi-server management (load balancing and managed domain servers), and authentication and authorization (file based, Active Directory (AD) integration, and data source authentication) concepts. Furthermore, tools for design and implementation and out-of-the-box functionality along with platform customizations will be covered. Finally, troubleshooting techniques will be discussed.

- 
1. Cross-references have been enabled to allow the reader to navigate quickly to a figure or text within this document using Ctrl-Click. To “go back” to where the leap took place, use Alt-Left Arrow (standard Web “go back” instruction).
  2. Refer to “DecisionSpace Integration Server’s Data Server: Key Concepts” on page A-1 for details on all concepts introduced in this discussion.
  3. Data sets are quality assured when used in conjunction with the DecisionSpace Data Quality product. Data Quality is discussed further under *Appendix: Related DecisionSpace Products - DecisionSpace Data Quality* within this course offering.

## Introduction

---

While exploring concepts of data integration and consumption, the DataServer tool set is used to accomplish meaningful workflows in both standalone and multi-server environments. Additionally, as the internals of DataServer are revealed, the mechanics of platform extensibility are also discussed.

The advantages of the DataServer technology are:

- Platform for data visualization and federation which allows for:
  - Data abstraction
  - Data federation from multiple, heterogeneous data sources
  - Uniform data access for diverse clients: desktop, web, and mobile devices
  - Customization and extension
- Enterprise services for Exploration and Production (E&P) business needs:

<ul style="list-style-type: none"><li>• Common Data Model</li><li>• CRS conversions</li><li>• Unit conversions</li></ul>	<ul style="list-style-type: none"><li>• Spatial Data Types</li><li>• Seismic data</li><li>• Wellbore path calculations (MD, TVD, TVDSS)</li></ul>
--	---

  - Out-of-the-box support for multiple data sources
  - Open source based technology
  - Integration with enterprise security for authentication and authorization
  - Open standards and use of horizontal technologies lower total cost of ownership
  - Easier extension of the platform due to standard and uniform APIs vs. classic SDKs

All advantages are discussed through lectures and/or utilized in the exercises that comprise this course.

## Architecture

The DecisionSpace Enterprise Platform provides a comprehensive solution for solving upstream E&P data challenges. The DataServer sits within the Integration Foundation layer (Common Model and Connectors components are highlighted in DecisionSpace Enterprise Platform) of that platform and, as such, facilitates enterprise-level information integration to the higher levels.

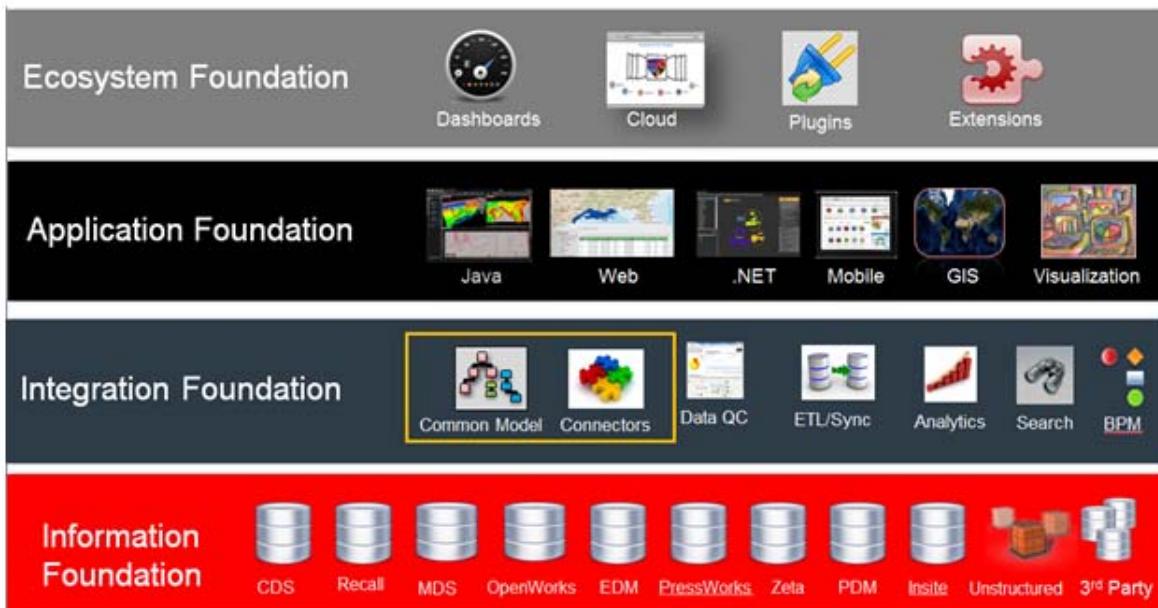


Figure 1: DecisionSpace Enterprise Platform

The DataServer is hosted by a JBoss web application server (AS). The DataServer leverages Teiid to virtualize and, if required, federates data from multiple data sources (both Landmark and non-Landmark) exposing them as a single entity accessible through a uniform API.

Furthermore, Teiid by default provides data consumption to consumers via:

- Data Service (OData): Refer to “OData Access Using a Browser” on page A-34 for details on how to view the raw XML behind data feeds
- Data Access (JDBC/ODBC)

This is depicted in DataServer Architecture as shown below:

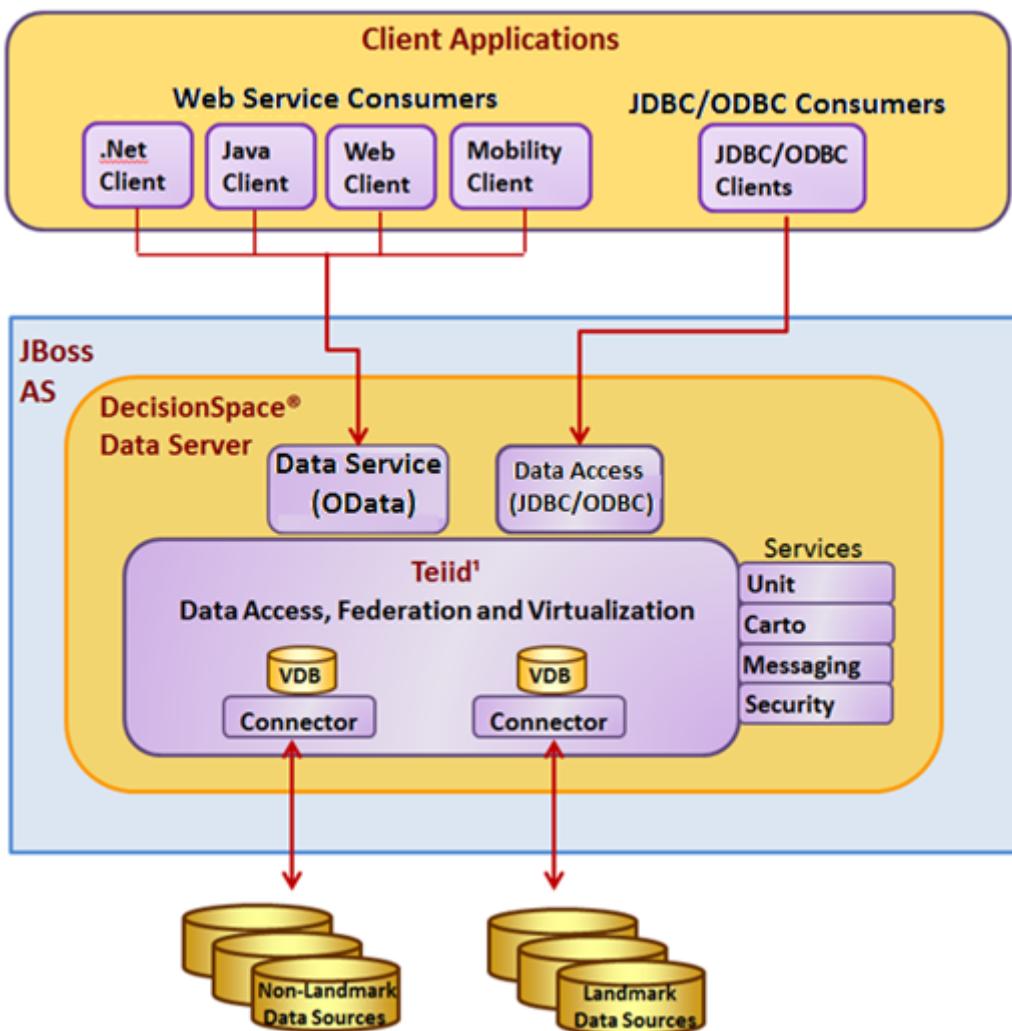


Figure 2: Data Server Architecture

<sup>1</sup> Refer to [DecisionSpace Integration Server's Data Server: Key Concepts](#) for the entry for Teiid. In this rendering, we are depicting the Teiid parts known as:

#### Server

An enterprise ready, scalable, manageable, runtime for the Query Engine that runs inside [JBoss Application Server](#) that provides additional security, fault-tolerance, and administrative features.

#### Connectors

A rich set of Translators and Resource Adapters that enable access to a variety of sources.

Later, we will discuss in detail the use of Teiid Designer, a Teiid part within the Tools set that is used to define virtual databases containing views, procedures or even dynamic XML documents.

Services (as depicted in DataServer Architecture) are the value-add proposition provided by the DataServer. Specifically, Carto & Unit provide conversions essential to data interoperability. The Messaging service publishes transaction messages to any JMS-based messaging broker, while the Security service is file-based, DB-based, and LDAP-based or combinations of those. The Security service also supports SSO.

Data Sources Abstraction shows how a VDB represents a logical view of one or more data sources.

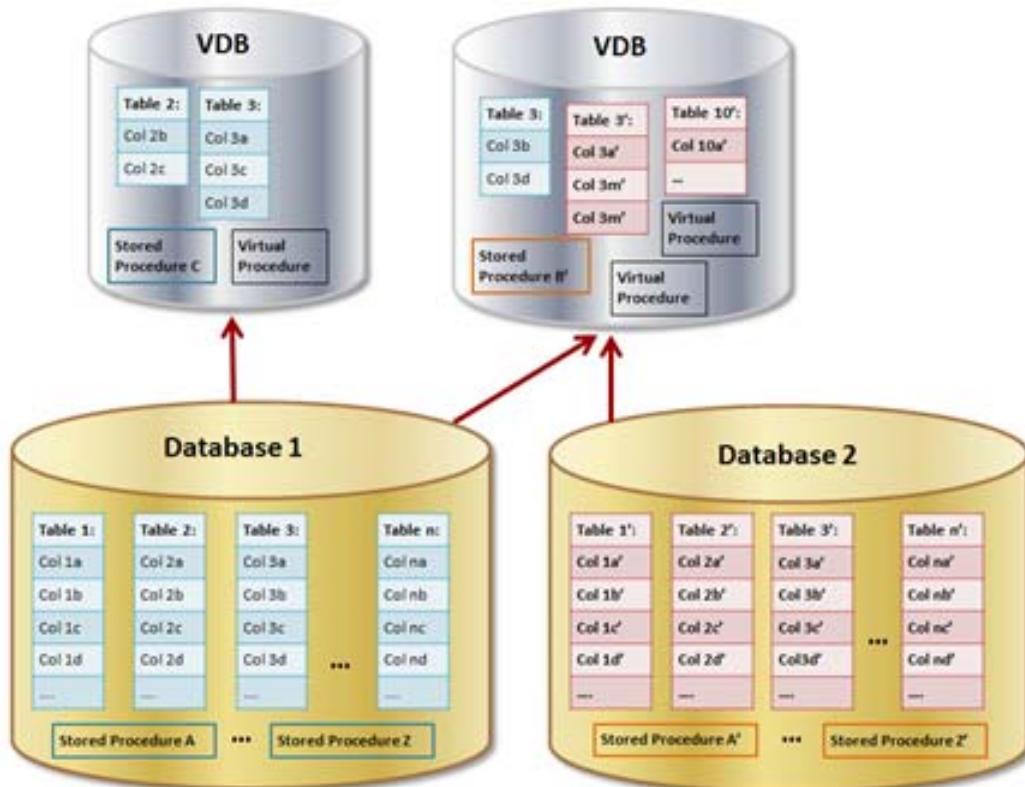


Figure 3: Data Sources Abstraction

---

## Review of DataServer Components

---

Out-of-the-box, the installation of DataServer contains the following components:

- JBoss Application Server (AS; including Teiid engine) used to serve the web application DataServer.
- DataServer Console used for administration.
- Depending upon the installation selections made at the time of installation:
  - DataServer Design Studio (Teiid Designer tool) used to create standard VDBs.
  - DataServer Messaging (Apache Active MQ) used to publish DataServer messages to subscribers.
  - Data Connectors used to provide uniform access to the following data sources: OpenWorks, EDM, InSite, and OPC-DA.
- A file-based JBoss security component to provide credentials to access the DataServer Console and data services. Default File-based Authentication and Authorization Credentials are presented in UserName/Password format.

UserName / Password	Type
dssadmin/dssadmin	admin user
user/user	user to access data svc
dsd/dsd	user to access data svc
edm/Landmark1	admin user
edadmin/Landmark1	admin user

[Figure 4: Default File-based Authentication and Authorization Credentials](#)

## DataServer Starting/Stopping

### Starting DecisionSpace DataServer

To start the DataServer, the DSIntegrationServer 5000.10.4.0 service must be started. The consoles (DataServer Console or JBoss Management Console) or the data service cannot be accessed without starting this service.

### **Windows**

#### From Windows Start Menu

Start > All Programs > Landmark > DecisionSpace Integration Server 5000.10.4.0 > Start DecisionSpace Integration Server, and click **Run as administrator**.

#### From Windows Services

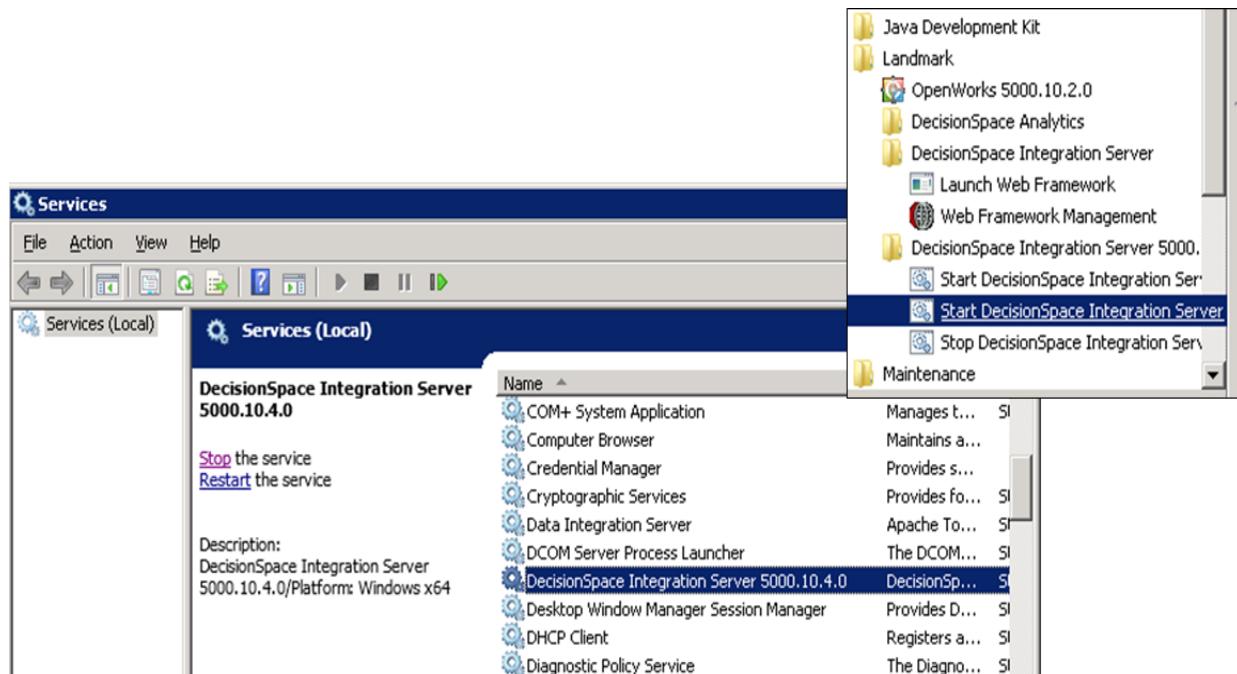


Figure 5: Start Data Server from Windows Services

## From Command Line

When starting the DataServer from the command line, messages will be written to the command window instead of the log file. This may be easier to debug.

*C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer\bin\runDSDS.bat*

### *Linux*

Execute <DSDS\_INSTALL\_HOME>/bin/runDSDS.sh. DO NOT close the command prompt if using this method. To run the program in the background, use the '&' sign at the end of the command. (This allows the same window to be used for other functions.)

## Stopping DecisionSpace DataServer

### *Windows*

#### From Windows Start Menu

Start > All Programs > Landmark > DecisionSpace Integration Server 5000.10.4.0 > Stop DecisionSpace Integration Server, and click Run as administrator.

## From Windows Services

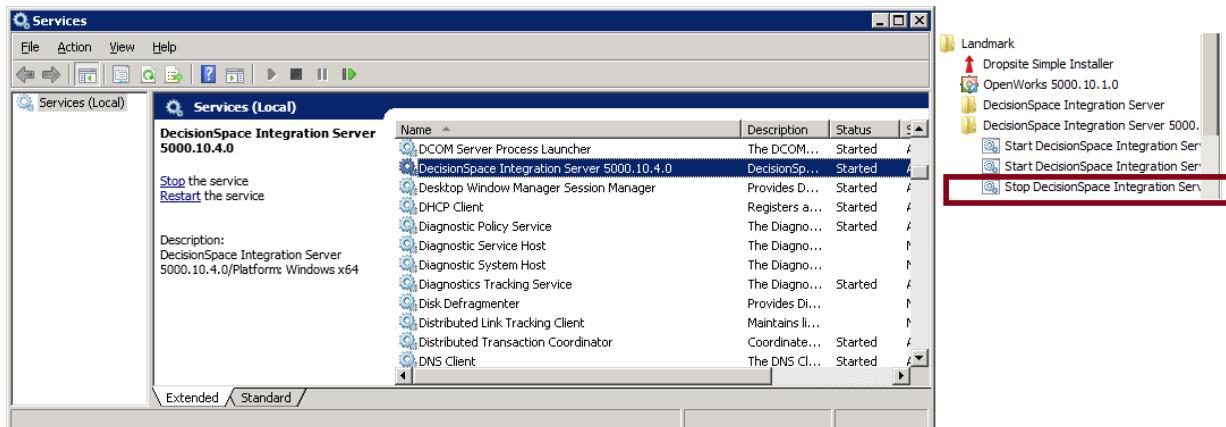


Figure 6: Stop Data Server from Windows Services

## From Command Line

Terminate the process by pressing Ctrl-C in the command window running the server.

### *Linux*

Terminate the process by pressing Ctrl-C in the command window running the server.

---

## DataServer Management Tasks

---

Management tasks to configure the DataServer include:

- Creating data sources
- Deploying VDBs and applications
- Configuring measurement systems
- Configuring ports
- Viewing summarized status and the server log
- STATUS
- Measurement systems
- Units
- Unit types
- Port
- Security

The DataServer console is the user interface (GUI) to the DataServer management tasks; therefore, a discussion of the console UI layout will be done first and then an exploration of how to achieve the tasks using the console.

## Launching the Console

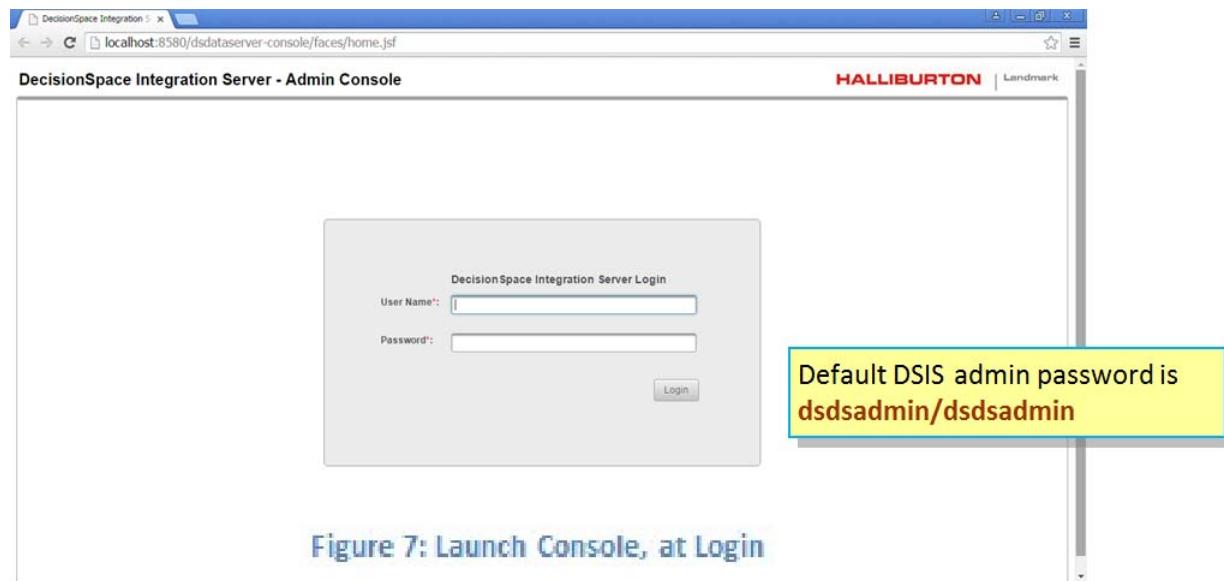


Figure 7: Launch Console, at Login

### Windows

**Start > All Programs > Landmark > DecisionSpace Integration Server 5000.10.4.0 > Start DecisionSpace Integration Console**

### Browser

[http://DSDSServer:http\\_port/dsdataserver-console](http://DSDSServer:http_port/dsdataserver-console)

### Linux

[http://DSDSServer:http\\_port/dsdataserver-console<sup>4</sup>](http://DSDSServer:http_port/dsdataserver-console)

---

4. The built-in Firefox browser for the RHEL AS 6 (Primary) or RHEL AS 5.x (Secondary) will launch the DataServer console.

## Layout of the console

The DataServer Console has six tabs that are available and displayed in the top-right of the browser, each providing a different functionality.

### Tab: Home

**Functionality:** This default tab displays summary information about the contents of the other tabs.

The screenshot shows the 'DecisionSpace Integration Server - Admin Console' interface. The 'Home' tab is selected. The main content area is divided into several sections:

- Virtual Databases:** A table showing entries like DSDDataTransfer, DSDO\_JOBS, DSDO\_RESULTS, EDM\_SQLServer, EDMOWFederatedWell, OpenWorks, OpenWorksCommonModel, and WELL\_PRODUCTION, all marked as ACTIVE.
- Data Sources:** A table showing entries under Landmark, OIW, and EDM, all marked as ACTIVE.
- Ports:** A table listing socket binding names (http, https, management-http, management-native) and their corresponding ports (8080, 8443, 9990, 9999).
- Installed Plugins:** A table listing installed plugins with their versions and access links (Business Process Management, Data Quality, Data Service, Data Transfer, EDM Connector, OpenWorks Connector, Search).
- Measurement Systems:** A table showing measurement systems like SPE Preferred Metric and US Oil Field.
- Search Crawler:** A table showing a single entry for 'default' with status 'not started' and last crawl completed at 2016-04-14 07:53:49.984.

**Tab: Data Sources****Functionality:**

- To create and manage groups in order to create and manage data sources, and then generate VDBs (virtual database connections).
- A tree of default data sources and any new additions will be listed on the left.
- Organizing the data sources by group is recommended. Groups are discussed in a later section of the training.

**Tab: Virtual Databases****Functionality:**

- Displays a list of deployed VDBs and their related details and status.
- This tab also allows the deletion of previously created VDBs or the addition or removal of data sources to an existing VDB.

**DecisionSpace Integration Server - Admin Console**

**HALLIBURTON** | Landmark

VDB Name	Version	Teiid JDBC Url	Dynamic	Status	Actions
DSDataTransfer	1	jdbc:teiid:DSDataTransfer@mm://af02-hou02.dsis.com:31000;version=1	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a> <a href="#">Undeploy</a>
DSD0_JOBS	1	jdbc:teiid:DSD0_JOBS@mm://af02-hou02.dsis.com:31000;version=1	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a> <a href="#">Undeploy</a>
DSDQ_RESULTS	1	jdbc:teiid:DSDQ_RESULTS@mm://af02-hou02.dsis.com:31000;version=1	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a> <a href="#">Undeploy</a>
EDM_SQLServer	5000.1.13	jdbc:teiid:EDM_SQLServer@mm://af02-hou02.dsis.com:31000;version=3	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a> <a href="#">Undeploy</a>
EDMONFederatedWELL	5000.10.3	jdbc:teiid:EDMONFederatedWELL@mm://af02-hou02.dsis.com:31000;version=1	false	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a> <a href="#">Undeploy</a>
OpenWorks	5000.10.3	jdbc:teiid:OpenWorks@mm://af02-hou02.dsis.com:31000;version=3	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a> <a href="#">Undeploy</a>
OpenWorksCommonModel	5000.10.3	jdbc:teiid:OpenWorksCommonModel@mm://af02-hou02.dsis.com:31000;version=3	false	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a> <a href="#">Undeploy</a>
WELL_PRODUCTION	1	jdbc:teiid:WELL_PRODUCTION@mm://af02-hou02.dsis.com:31000;version=1	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a> <a href="#">Undeploy</a>

### Tab: Status

**Functionality:** Use the Status tab to check the server.log file; helpful for trouble-shooting issues.

Attribute	Value
DSIS Version	5000.10.4.0 (1511052042,142547)
DSIS Uptime	19 days 23 hours 2 minutes 20 seconds (Since Thu May 12 07:53:40 CDT 2016)
DSIS Processes	Checking... <button>Show Processes</button>
Operating System	Windows Server 2008 R2 (amd64)
Java Runtime	1.7.0_80 (amd64)
System Memory	32 GB (physical) and 57 GB (swap) - Main DSIS Heap: 847 MB used of 3.6 GB reserved.

```

at org.primefaces.component.datatable.DataTableRenderer.encodeTbody(DataTableRenderer.java:762)
at org.primefaces.component.datatable.DataTableRenderer.encodeTbody(DataTableRenderer.java:744)
at org.primefaces.component.datatable.DataTableRenderer.encodeRegularTable(DataTableRenderer.java:258)
at org.primefaces.component.datatable.DataTableRenderer.encodeMarkup(DataTableRenderer.java:220)
at org.primefaces.component.datatable.DataTableRenderer.encodeEnd(DataTableRenderer.java:34)
at javax.faces.component.UIComponentBase.encodeEnd(UIComponentBase.java:881)[jboss-jsf-api_2.1_spec-2.1.18.Final.jar:2.1.18.Final]
at org.primefaces.renderkit.CoreRenderer.renderChild(CoreRenderer.java:85)
at org.primefaces.renderkit.CoreRenderer.renderChildren(CoreRenderer.java:68)
at org.primefaces.component.panel.PanelRenderer.encodeContent(PanelRenderer.java:204)
at org.primefaces.component.panel.PanelRenderer.encodeMarkup(PanelRenderer.java:121)

```

**Tab: Measurement System****Functionality:**

- Shows the list of measurement systems with the associated unit types and units.
- To create custom measurement systems based on the predefined measurement systems.

Unit Type	Unit
API	api
API Oil Gravity	Pa/m
Abrasive Volume	cubic metres
Abs atmos press	Pa (a)
Abs pressure	Pa (a)
Absolute Volume	m3_kg
Acceleration	m_sec2
Acidity	pH
Accou Attenu	Decibels
Accou Impedance	Mrayls
Accou Velocity	m/s
Acoustic Freq	Hertz
Acoustic vel	metre per sec
Activity time	s
Additive Cal	feet3 per deg
Additive mass	pound mass
Additive volume	cubic feet
Agitator setpt	ds/lpcf
Air Motor Calib	rev/m3/sec

## Tab: Cartographic References

The screenshot shows the 'Cartographic References' tab selected in the navigation bar. The table displays 966 entries across 39 pages. The columns include:

EPSG Code	CRS Name	CRS Type	South Bound	North Bound	West Bound	East Bound	Source	CRS Parameter	Alias and Mappings
23031	.ED50_(COM_OFF) / UTM_Z_31N	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	.ED50_(W_EU) / UTM_Z_31N	PROJECTED	38.56	82.4	0.0	6.0			<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	.ED50_(W_EU) / UTM_Z_32N	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	.ED79 / UTM_Z_31N	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	EUROPEAN_DATUM_1950_(COM_OFF)	GEOGRAPHIC							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	000PAN_LONGLATT	GEOGRAPHIC							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	00PANXXX	GEOGRAPHIC							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	ADINDIAN-MRE*EDM	GEOGRAPHIC					EDM		<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
4202	AGP_1986_NTLPE_Bursa_Wolf	GEOGRAPHIC	-47.19	-1.31	109.23	163.19			<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 48	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 49	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 50	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 51	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 52	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 53	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 54	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 55	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 56	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 57	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66 / AMO Zone 58	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit/Delete</a>
	AGD66*EDM	GEOGRAPHIC					EDM		<a href="#">View</a> <a href="#">Add/Edit/Delete</a>

## Tab: Units

The screenshot shows the 'Units' tab selected in the navigation bar. The table displays 2661 entries across 107 pages. The columns include:

Units	Alias and Mappings
1_ft	<a href="#">Add/Edit/Delete</a>
1_in	<a href="#">Add/Edit/Delete</a>
1_m	<a href="#">Add/Edit/Delete</a>
1_day	<a href="#">Add/Edit/Delete</a>
1_hr	<a href="#">Add/Edit/Delete</a>
1_min	<a href="#">Add/Edit/Delete</a>
1_sec	<a href="#">Add/Edit/Delete</a>
ARG_day	<a href="#">Add/Edit/Delete</a>
ARG_hr	<a href="#">Add/Edit/Delete</a>
AUD_day	<a href="#">Add/Edit/Delete</a>
AUD_hr	<a href="#">Add/Edit/Delete</a>
CAD_day	<a href="#">Add/Edit/Delete</a>
CAD_hr	<a href="#">Add/Edit/Delete</a>
CAD_min	<a href="#">Add/Edit/Delete</a>
CAD_sec	<a href="#">Add/Edit/Delete</a>
DKK_day	<a href="#">Add/Edit/Delete</a>
DKK_hr	<a href="#">Add/Edit/Delete</a>
DKK_min	<a href="#">Add/Edit/Delete</a>
DKK_sec	<a href="#">Add/Edit/Delete</a>
dollar_day	<a href="#">Add/Edit/Delete</a>
dollar_hr	<a href="#">Add/Edit/Delete</a>
dollar_min	<a href="#">Add/Edit/Delete</a>
dollar_sec	<a href="#">Add/Edit/Delete</a>

## Tab: Unit Types

Unit Type	Alias and Mappings
1_vol	Add/Edit/Delete
Gas Volume Rate	Add/Edit/Delete
Impedance	Add/Edit/Delete
Abrasive Volume	Add/Edit/Delete
Abs atmos press	Add/Edit/Delete
Abs pressure	Add/Edit/Delete
Absolute Volume	Add/Edit/Delete
absorbed dose	Add/Edit/Delete
Acceleration	Add/Edit/Delete
acceleration linear	Add/Edit/Delete
acceleration rotational	Add/Edit/Delete
Acidity	Add/Edit/Delete
Accou Attenu	Add/Edit/Delete
Accou Impedance	Add/Edit/Delete
Accou Velocity	Add/Edit/Delete
Acoustic Freq	Add/Edit/Delete
acoustic impedance	Add/Edit/Delete
Acoustic vel	Add/Edit/Delete
acoustical energy	Add/Edit/Delete
acoustical intensity	Add/Edit/Delete
acoustical power	Add/Edit/Delete
Activity time	Add/Edit/Delete
Additive Cal	Add/Edit/Delete

## Tab: Ports

### Functionality:

- Shows the port settings used during the initial Data Server install.
- This window will allow customizing the port settings, if necessary.

Socket Name	Effective Port(including offset)	Port	Actions
http	8080	8080	Edit
https	8443	8443	Edit
jacorb	3528	3528	Edit
jacorb-ssl	3529	3529	Edit
jmx-connector-registry	1090	1090	Edit
jmx-connector-server	1091	1091	Edit
management-http	9990	9990	Edit
management-native	9999	9999	Edit
messaging	5445	5445	Edit
messaging-throughput	5455	5455	Edit
osgi-http	8090	8090	Edit
remoting	4447	4447	Edit
teiid-jdbc	31000	31000	Edit
teiid-odbc	35432	35432	Edit
txn-recovery-environment	4712	4712	Edit
txn-status-manager	4713	4713	Edit

## Tab: Security

DecisionSpace Integration Server - Admin Console

**Security**

Enable Single Sign-on

Enable LDAP

Save

## Tab: Transfer Rules

DecisionSpace Integration Server - Admin Console

**Transfer Rules**

Name	Type	Implementation	Remark	Created On	Created By	Updated On	Updated By
compute-wellplanproject-boundary	xform	com.lgc.dlt.kettle.entity.rules.transform.C omputeWellPlanProjectBoundary	This rule computes the boundary of well planning project	2016/02/01 06:47:38	SYS	2016/02/01 06:47:38	SYS
create-missing-relation	xform	com.lgc.dlt.kettle.entity.rules.transform.C reateMissingRelation	This rule creates missing entity relationship. Some of the entities may not present in source but required in target. Value template: <#RelationName>=Wellbore_operator_AttrMap=(company_name=\$drilling_operator.parent_company_name+Halliburton)	2016/02/01 06:47:38	SYS	2016/02/01 06:47:38	SYS
create-relation	xform	com.lgc.dlt.kettle.entity.rules.transform.C reateRelation	This rule creates missing entity relationship. Some of the entities may not present in source but required in target. Value template: <#RelationName>=Wellbore_operator_AttrMap=(company_name=\$drilling_operator.parent_company_name+Halliburton)	2016/02/01 06:47:38	SYS	2016/02/01 06:47:38	SYS
data-comparator-rule	writer	com.lgc.dlt.kettle.entity.rules.writer.DataC omparatorRule	This rule Fetch and Compare data from target, skip if all updatable attributes are same. It is implicit rule and will be in chain unless removed by skip-rule	2016/02/01 06:47:38	SYS	2016/02/01 06:47:38	SYS
datum-shift-rule	writer	com.lgc.dlt.kettle.entity.rules.writer.Datum ShiftRule	This Rule shifts depth attribute (datum shift) values based on target wellbore depth reference.	2016/02/01 06:47:38	SYS	2016/02/01 06:47:38	SYS
db-writer	writer	com.lgc.dlt.kettle.entity.rules.writer.WriteT oDBRule	This Rule is responsible for writing data into database. It is always the last rule in Writer chain. It is implicit rule and will be in chain unless removed by skip-rule	2016/02/01 06:47:38	SYS	2016/02/01 06:47:38	SYS
discover-parents	criteriareader	com.lgc.dlt.kettle.entity.rules.criteriaxmle ader.DiscoverParentsRule	This rule is to discover top level parent for an entity. It reads and find top level entity in hierarchy by entity relationship definitions.	2016/02/01 06:47:39	SYS	2016/02/01 06:47:39	SYS

## Tab: Plugins

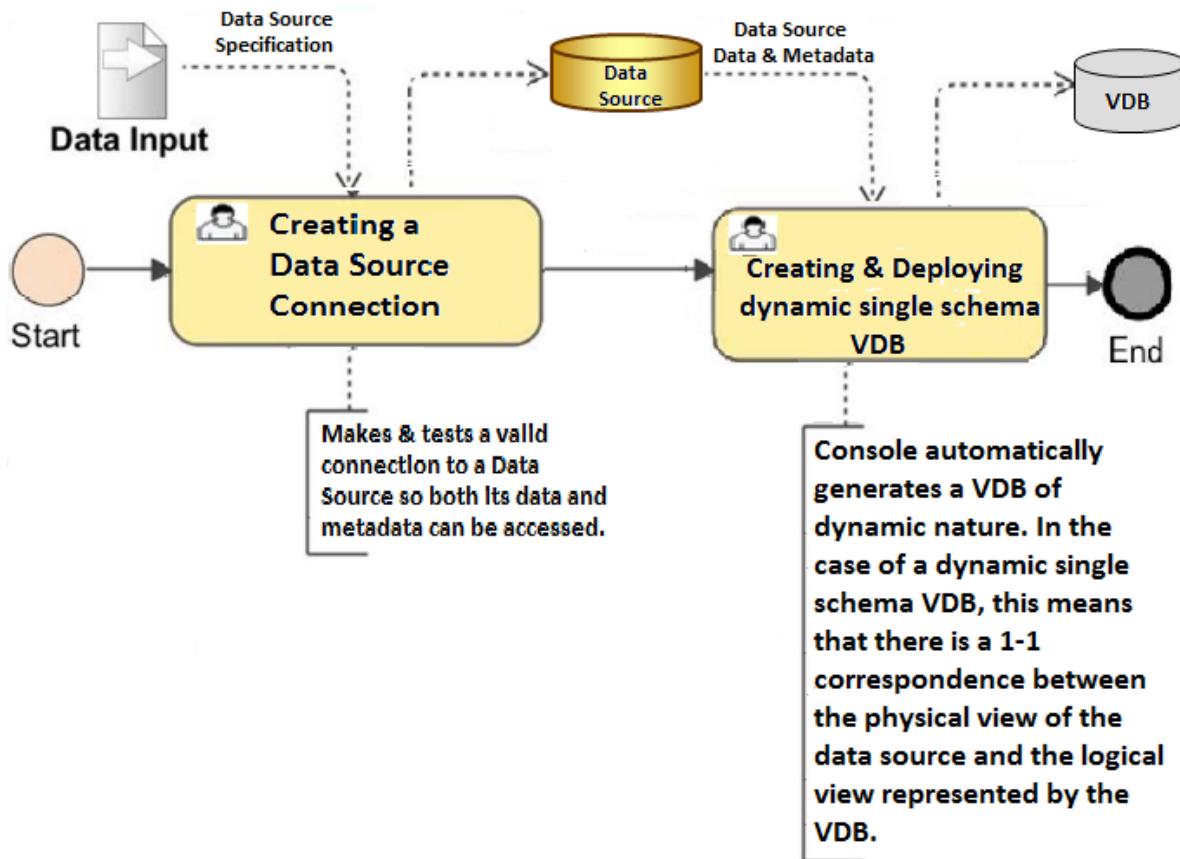
The screenshot shows the DecisionSpace Integration Server - Admin Console interface. The title bar indicates the URL is localhost:8080/dsdataserver-console/faces/plugins.jsf. The top navigation bar includes links for Home, Data Sources, Virtual Databases, Measurement System, Units, Unit Types, Cartographic References, Search, Transfer Rules, Plugins (which is selected and highlighted with a red box), Security, Ports, Status, Welcome admin!, and Log Out. The main content area is titled "DecisionSpace Integration Server - Admin Console" and displays a table of installed plugins. The table has columns for Name, Summary, Installed, and Available. The "Available" column contains icons for each plugin. The table lists the following plugins:

Name	Summary	Installed	Available
Business Process Management	A comprehensive platform for workflow management available on DecisionSpace Integration Server.	5000.10.4.0	
CDS Connector	Connects to CDS data sources via Powerhub.		
Code Examples	Browse data models and sample code for building apps on DecisionSpace Integration Server.		
Data Quality	Measure and improve the quality of data on DecisionSpace Integration Server.	5000.10.4.0	
Data Service	Access data sources on DS Integration Server via OData, JDBC, and ODBC.	5000.10.4.0	
Data Transfer	Configure and execute data transfer workflows for data from DecisionSpace Integration Server.	5000.10.4.0	
EDM Connector	Connects to Engineer's Data Model (EDM) 5000.1.10, 5000.1.12, and 5000.1.13 data sources on both Oracle and SQL Server.	5000.10.4.0	
Geolog Connector	Connects to Geolog data sources.		
InSite Connector	Connects to InSite data sources (5000.9.2, 5000.9.4, and 5000.9.6).		
Messaging	Accepts and distributes data change notifications from data sources to consumers.		
OPC DA Connector	Connects to OPC Data Access data sources.		
OPC HDA Connector	Connects to OPC Historical Data Access data sources.		
OpenWorks Connector	Connects to OpenWorks 5000.8.3, 5000.10.1, and 5000.10.3 data sources.	5000.10.4.0	
Petrel Connector	Connects to Petrel data sources.		
Recall Connector	Connects to Recall data sources.		

## Management Tasks

### Basic Workflow to Make Data Sources Accessible to the DataServer

The two manual steps (1 and 2) required in making a data source accessible from the DataServer are depicted in the Basic Workflow to Make Data Sources Accessible to the DataServer, shown in UML BPMN2 notation.



### Managing Data Sources

#### Note

To keep data sources organized, the Best Practice is to categorize them using the Group feature of the Console.

## Groups

Groups help with data source organization, and adhere to the following rules:

1. No two groups may have the same name.

Therefore, a group can be renamed at any time, as long as the new name is unique.

2. Deleting a group deletes all data sources within that group.
3. Renaming a group or moving a data source between groups has no impact on data access whatsoever. This is possible because each data source has a unique name.
4. Sub-groups may also be created to any level. The hierarchy is flexible, and can be used to create as many levels in the Data Sources tree as required.

Group information is persisted in  
**DS\_INSTALL\ApplicationServer\standalone\configuration\dsdsConsolegrouping.txt**.

## Creating a Group

Creating a Group Named RECALL illustrates the steps required to create a group named RECALL.

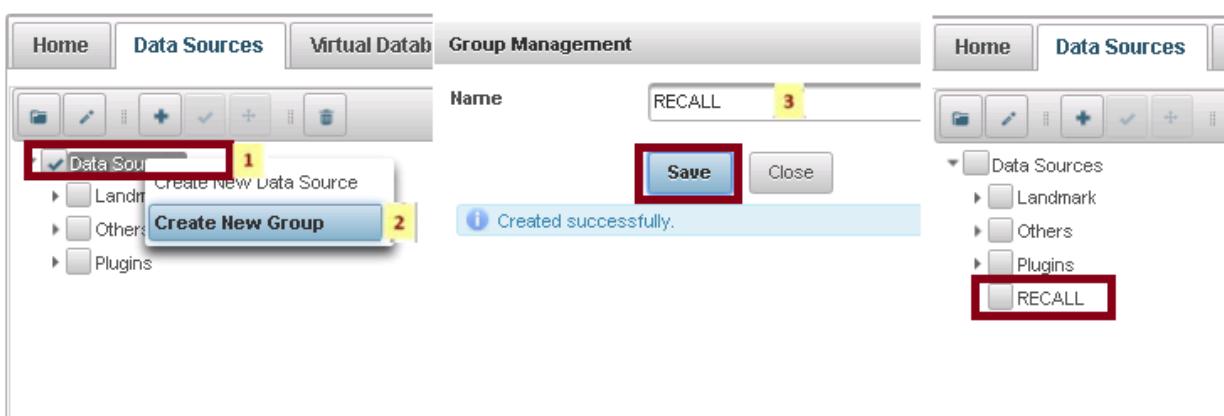


Figure 10: Creating a Group Named RECALL

## **Renaming a Group**

There is a context menu feature permitting the renaming of a group. As mentioned previously, renaming a group has no impact on data access.

## **Deleting a Group**

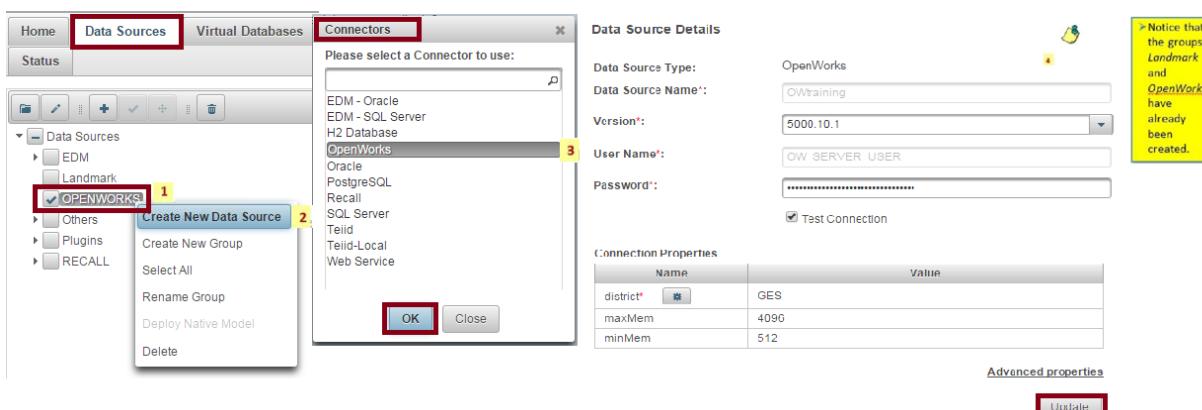
There is a context menu feature permitting the deletion of a group. As mentioned previously, deleting a group deletes **all** data sources within that group.

## **Performing the Basic Workflow to Make Data Sources Accessible to the DataServer**

This concept was illustrated in the Basic Workflow to Make Data Sources Accessible to the DataServer, and now this basic workflow will be exemplified for a VDB using two Open Works projects and for a single source VDB using one EDM data source.

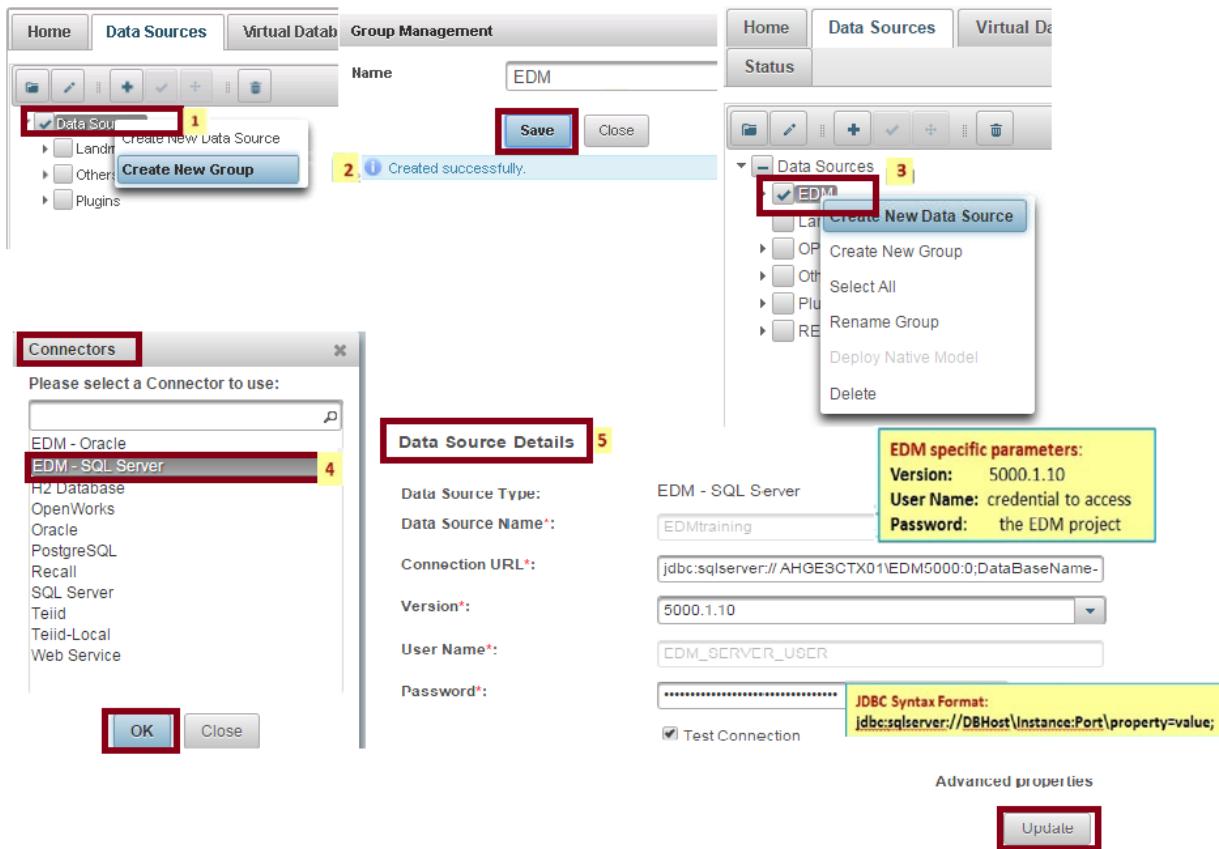
## **How to Create Data Source Connections for OpenWorks Projects:**

- 1 Create data source connections for OpenWorks projects:



## How to Create a Data Source Connection to one EDM Data Source: EDMDATA, and then Generate & Deploy a VDB<sup>5</sup>

- 1 Create a data source connection for the EDM project EDMDATA (in SQL Server). Use the recommended Best Practice by organizing Data Sources using Groups (creating the EDM Group as shown in 1 and 2 in Create Data Source Connection for the EDM project EDMDATA).



5. By default, the Console generates a VDB with multisource properties. The application of this knowledge becomes more apparent to the client consuming the VDB.

## Standard VDB

A standard VDB is created from the need to federate data from multiple data sources with different schema. A standard VDB which contains a metadata specification (within the VDB archive) is generated by an IDE such as the Eclipse Teiid Designer Tool. It can provide abstraction, and transforms the source model into a customized view model. The VDB is stored in an archive file format similar to a standard Java JAR format.

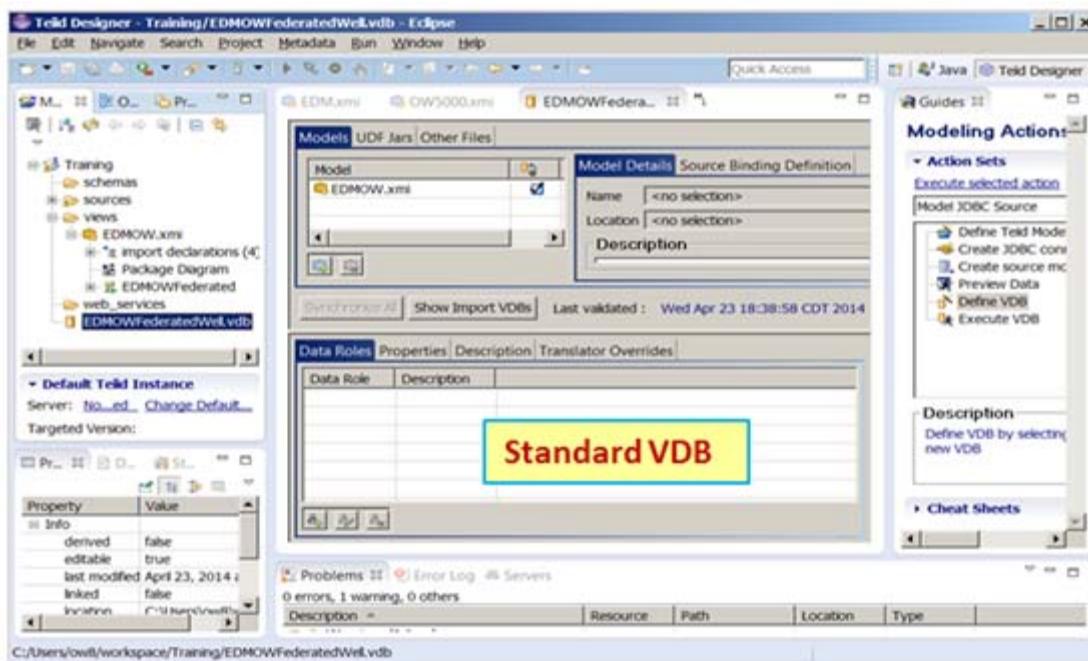
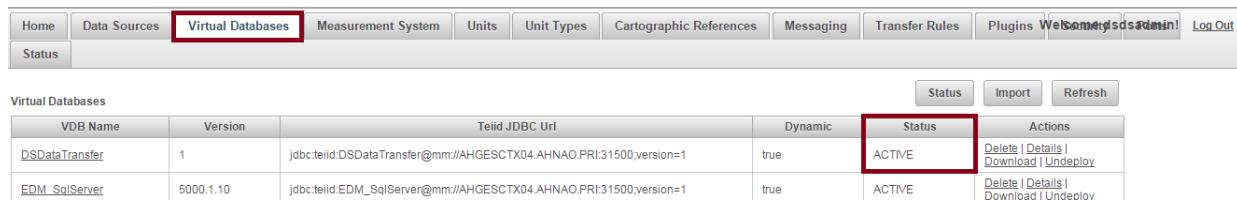


Figure 17: Standard VDB Created with DecisionSpace Design Studio (Teiid Designer)

VDBs created outside of the Console must be manually added to the DataServer runtime using the Console's button.

From the **Virtual Databases** tab in the DataServer Console, the following functionality is available:

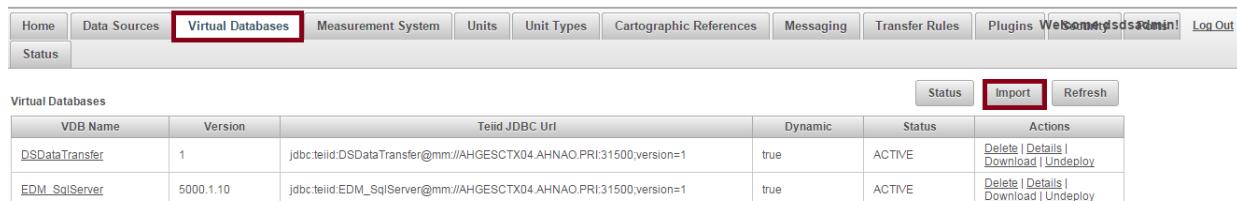
### **List Status of all Deployed VDBs**



Virtual Databases						Status	Import	Refresh
VDB Name	Version	Telid JDBC Url	Dynamic	Status	Actions			
DSDataTransfer	1	jdbc.telid:DSDataTransfer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
EDM_SQLServer	5000.1.10	jdbc.telid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>

Figure 18: Listing the Status of All Deployed VDBs: ACTIVE, ERROR, LOADING

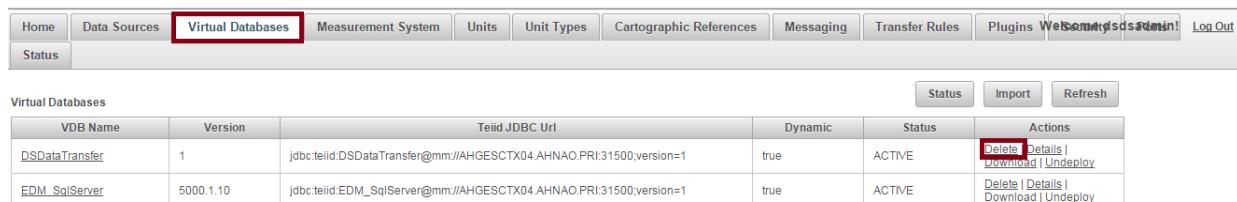
### **Add a New VDB**



Virtual Databases						Status	Import	Refresh
VDB Name	Version	Telid JDBC Url	Dynamic	Status	Actions			
DSDataTransfer	1	jdbc.telid:DSDataTransfer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
EDM_SQLServer	5000.1.10	jdbc.telid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>

Figure 19: Adding a New VDB

### **Delete a VDB**



Virtual Databases						Status	Import	Refresh
VDB Name	Version	Telid JDBC Url	Dynamic	Status	Actions			
DSDataTransfer	1	jdbc.telid:DSDataTransfer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
EDM_SQLServer	5000.1.10	jdbc.telid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>

Figure 20: Deleting a VDB

## Get More VDB Information

The screenshot shows the 'Virtual Databases' page with the 'Virtual Databases' tab selected. A red box highlights the 'VDB Details' section for the 'DSDataTransfer' entry. The 'Actions' column for this entry also has a red box around the 'Details' link.

VDB Name	Version	Telid JDBC Url	Dynamic	Status	Actions
DSDataTransfer	1	jdbc:telid:DSDataTransfer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
EDM_SQLServer	5000.1.10	jdbc:telid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>

Figure 21: Getting More VDB Information

## Download a VDB

The screenshot shows the 'Virtual Databases' page with the 'Virtual Databases' tab selected. A red box highlights the 'Actions' column for the 'DSDataTransfer' entry, specifically the 'Download' link.

VDB Name	Version	Telid JDBC Url	Dynamic	Status	Actions
DSDataTransfer	1	jdbc:telid:DSDataTransfer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
EDM_SQLServer	5000.1.10	jdbc:telid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>

Figure 22: Downloading a VDB

## Import CRS Definitions to the Data Server

### ***Introduction***

This CRS Loader utility is used to retrieve CRS information from an OpenWorks Instance. It creates a CSV file listing the CRS definitions that do not exist in the Data Server's CRS service. These definitions can then be imported into the Data Server's CRS service using the Data Server Console.

### ***How to Use the CRS Loader Utility***

The CRS Loader Utility is installed with the Data Server software in <DSIS\_HOME>/ApplicationServer/conf/cartos

This directory contains the following files:

- CartoLoader.bat
- CartoLoader.sh
- com\_lgc\_dsdataserver\_carto\_loader.jar
- com\_lgc\_DSP-middle.jar
- com\_lgc\_owsw.jar
- dsds-carto-loader.properties

Generated CSV files will be saved in this directory.

To launch the utility:

- **On Windows:** CartoLoaded.bat district\_name user\_name password
- **On Linux:** CartoLoad.sh bat district\_name user\_name password

Where district\_name is the OpenWorks district name that is used to connect. Similarly, user\_name and password are valid OpenWorks user and password with access to the OpenWorks OWSYS schema.

The output of the utility is a CSV file that contains CRS definitions that do not exist in the Data Server's CRS service.

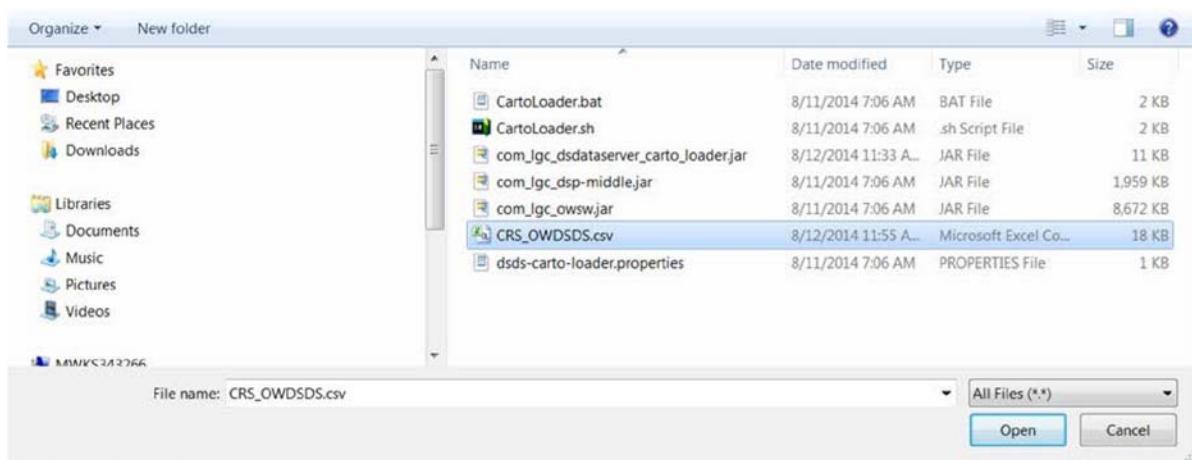
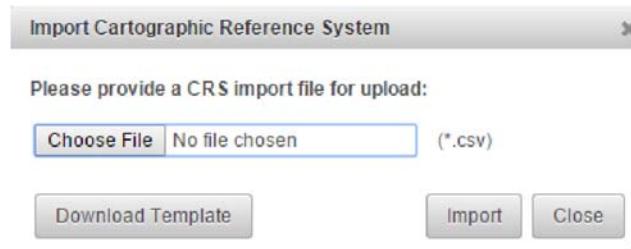
## Import CRS Definitions to the Data Server

Use the Admin Console to import CRS definitions into the Data Server's CRS service.

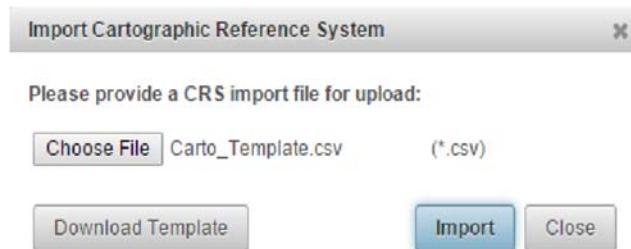
1. Select the **Cartographic References** tab and click **Import**.

EPSG Code	CRS Name	CRS Type	South Bound	North Bound	West Bound	East Bound	Source	CRS Parameter	Alias and Mappings
	.ED50_(COM_OFF)/UTM_Z_31N	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
23031	.ED50_(W_EU)/UTM_Z_31N	PROJECTED	38 56	82 4	0 0	6 0			<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	.ED50_(W_EU)/UTM_Z_32N	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	.ED79 / UTM_Z_31N	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	.EUROPEAN_DATUM_1950_(COM_OF)	GEOGRAPHIC							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	000PAN_LONGLATT	GEOGRAPHIC							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	00PANXXX	GEOGRAPHIC							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	ADINDAN-MRE**EDM	GEOGRAPHIC					EDM		<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
4202	AGD 1966 NTLP E Bursa Wolf	GEOGRAPHIC	-47.19	-1.31	109.23	163.19			<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 48	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 49	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 50	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 51	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 52	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 53	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 54	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 55	PROJECTED							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>
	AGD66 / AMG Zone 56	PROJECTION							<a href="#">View</a> <a href="#">Add/Edit Aliases and Mappings</a>

2. Click **Choose File** and select a CSV file to import.



3. Click **Import**.



4. Click **Import**. The CRSks in the CSV file are imported into the Data Server's CRS service.

**DecisionSpace Integration Server - Admin Console**

Home Data Sources Deployment Status Measurement System Cartographic References Ports Security Plugins

**Import**

( Total Coordinate Reference System(s): 958, Page: 1 of 39) 1 2 3 4 5 6 7 8 9 10 >> >>> 25

EPSG Code	CRS Name	CRS Type	South Bound	North Bound	West Bound	East Bound	Source	CRS Parameter	Alias and Mappings
23031	ED50_(COM_OFF)/UTM_Z_31N	PROJECTED						<a href="#">View</a>	<a href="#">Add/Edit Aliases and Mappings</a>
	ED50_(W_EU)/UTM_Z_31N	PROJECTED	38.56	82.4	0.0	6.0		<a href="#">View</a>	<a href="#">Add/Edit Aliases and Mappings</a>
	ED50_(W_EU)/UTM_Z_32N	PROJECTED						<a href="#">View</a>	<a href="#">Add/Edit Aliases and Mappings</a>
	ED79/UTM_Z_31N	PROJECTED						<a href="#">View</a>	<a href="#">Add/Edit Aliases and Mappings</a>
EUROPEAN_DATUM_1950_(COM_OF)	GEOGRAPHIC							<a href="#">View</a>	<a href="#">Add/Edit Aliases and Mappings</a>

**CONFIRMATION** Carto Import Successful  
2 carto record(s) have been imported successfully.

## Managing Measurement Systems

### ***Unit***

A Measurement System defines the unit used for each unit type. The DataServer provides two predefined measurement systems, both of which are stored in an H2 internal database and both of which cannot be modified:

- SPE Preferred Metric
- US Oil Field

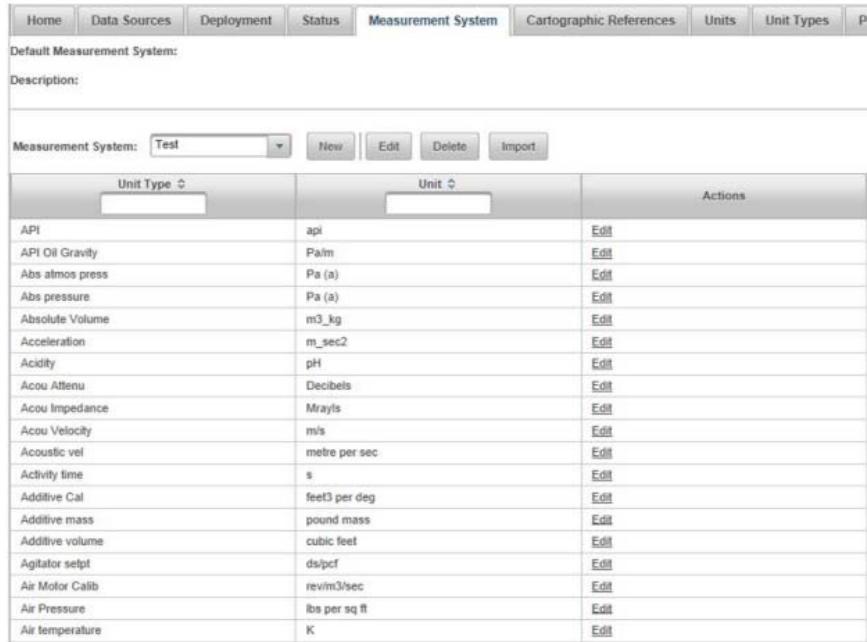
New measurement systems can be created, but must be based on the above predefined measurement systems. Measurement system is passed through the session property in the format: measurementsystem='xxx' (refer to “Verifying Change to Measurement System using an Odata Query” on page A-23)<sup>6</sup>. The data connector for OpenWorks, EDM, and InSite all handle unit conversion.

---

6. Programming considerations for Measurement Systems (such as Specifying a Measurement System in an Application) will be covered in a subsequent programming course for the Data Server.

## Viewing Measurement Systems

The **Measurement System** tab in the DataServer Console shows the list of supported measurement systems with their associated *Unit Type* and *Unit* fields.



The screenshot shows the DataServer Console interface with the 'Measurement System' tab selected. The top navigation bar includes Home, Data Sources, Deployment, Status, Measurement System (selected), Cartographic References, Units, Unit Types, and Help. Below the navigation bar, there are fields for 'Default Measurement System:' and 'Description:', both currently empty. A toolbar below these fields contains buttons for New, Edit, Delete, and Import. The main content area displays a table of measurement systems:

Unit Type	Unit	Actions
API	api	Edit
API Oil Gravity	Pa/m	Edit
Abs atmos press	Pa (a)	Edit
Abs pressure	Pa (a)	Edit
Absolute Volume	m3_kg	Edit
Acceleration	m_sec2	Edit
Acidity	pH	Edit
Acou Attenu	Decibels	Edit
Acou Impedance	Mrayls	Edit
Acou Velocity	m/s	Edit
Acoustic vel	metre per sec	Edit
Activity time	s	Edit
Additive Cal	feet3 per deg	Edit
Additive mass	pound mass	Edit
Additive volume	cubic feet	Edit
Agitator setpt	ds/pcf	Edit
Air Motor Calib	rev/m3/sec	Edit
Air Pressure	lbs per sq ft	Edit
Air temperature	K	Edit

Figure 25: List of Supported Measurements Systems from the Data Server Console

## Creating Measurement Systems

Follow the five steps below, illustrated in Creating a New Measurement System, to create a new measurement system based upon the US Oil Field:

1. **1** Using the **Measurement System** tab, select the “US Oil Field” Measurement System from the drop-down list and assert that the “Depth, Distances, Heights” Unit Type field uses the “ft” Unit.
2. **2** Click **New** to create a new measurement system, named “test”, that is based on (via the Template drop-down list) the “US Oil Field” Measurement System.
3. **3** Assert that the “test” Measurement System has been created, and that the “Depth, Distances, Heights” Unit Type field uses the “ft” Unit (as expected).
4. **4** Now customize the “test” Measurement System by modifying the “Depth, Distances, Heights” Unit Type field from the “ft” Unit to the “us\_ft” Unit using the drop-down list; also, save the change.

5. Finally, assert the change by selecting the “test” Measurement System from the drop-down list on the **Measurement System** tab and selecting the depth field from the Unit Type drop-down to validate that the new “Depth, Distances, Heights” Unit Type field is now “us\_ft” Unit.

The screenshot illustrates the process of creating a new measurement system named 'test' based on the 'US Oil Field' template. It shows five steps:

- Measurement System Creation:** A dialog box titled "Create a new measurement system test based on US Oil Field" is shown. The "Name" field contains "test 2". The "Template" dropdown is set to "US Oil Field". A yellow callout box notes: "The measurement system US Oil Field has the unit type Depth, Distances, Heights as ft".
- Measurement System List:** The main interface shows the "Measurement System" tab selected. A table lists measurement systems. The "Depth, Distances, Heights" row is highlighted with a red box and shows "ft" in the "Unit" column. A yellow callout box notes: "In the test measurement system, change the unit type Depth, Distances, Heights from ft to us\_ft".
- Change Unit Dialog:** A "Change Unit" dialog is open, showing the current unit type as "Depth, Distances, Heights". The "Units" dropdown menu is open, displaying options including "ft", "im\_ft", "in", "m", "mm", and "us\_ft". The "us\_ft" option is highlighted with a red box. A yellow callout box notes: "The unit type Depth, Distances, Heights is showing us\_ft after the change was made." Step 4 is indicated by a red box on the "Save" button.
- Measurement System List (After Change):** The measurement system list shows the updated entry. The "Depth, Distances, Heights" row now has "us\_ft" in the "Unit" column. A yellow callout box notes: "The unit type Depth, Distances, Heights is showing us\_ft after the change was made." Step 5 is indicated by a red box on the "us\_ft" entry in the list.
- Measurement System Details:** The "Measurement System" tab is selected, showing details for the "test" system. The "Name" is "test 2", "Template" is "US Oil Field", and the "Unit" for "Depth" is "us\_ft".

Figure 26: Creating a New Measurement System

Refer to “Verifying Change to Measurement System using an Odata Query” on page A-23 and “Data Server Carto REST End Points” on page A-27.

### **Modifying Measurement Systems**

In Creating Measurement Systems, the Unit Type Depth, Distances, Heights are modified from “ft” to “us\_ft” in order to create a custom measurement system, test, from the US Oil Field template. This is one type of measurement system modification.

Additionally, custom measurement systems that have been created may have their “Name” and “Description” fields modified as shown in Modifying “Name” and “Description” Fields for Custom Measurement System “test”.

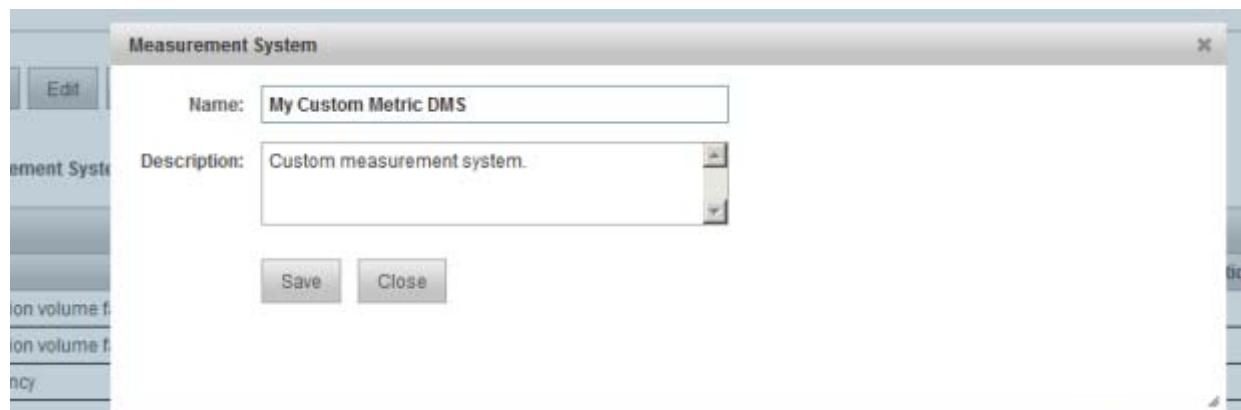


Figure 27: Modifying "Name" and "Description" Fields for Custom Measurement System "test"

## ***Deleting Measurement Systems***

### **CRS - Cartographic reference system**

The DataServer is stored in an H2 internal database. The CRS system is passed through the session property in the format: cartosystem=xxx. Refer to “Data Server Carto REST End Points” on page A-27. The CRS shipped by default are:

- EUROPEAN\_DATUM\_1950\_(COM\_OFF)
- AGD84 / AMG Zone 51
- Australian Geodetic 1984 - Bursa Wolf
- European Datum 1950 - W. Europe
- GD49 / New Zealand Map Grid
- Provisional South American 1956
- stand-alone feet
- tecrs
- texas\_4203\_ddk
- utm-55 10
- utm49S\_wgs84\_ddk
- <approx. 750 total>

## Managing Ports

The **Ports** tab in the DataServer Console shows the port settings configured during installation. These are local ports used by different services in the DataServer (JBoss).

Socket Name	Effective Port(including offset)	Port	Actions
http	8080	8080	Edit
https	8443	8443	Edit
jacorb	3528	3528	Edit
jacorb-ssl	3529	3529	Edit
jmx-connector-registry	1090	1090	Edit
jmx-connector-server	1091	1091	Edit
management-http	9990	9990	Edit
management-native	9999	9999	Edit
messaging	5445	5445	Edit
messaging-throughput	5455	5455	Edit
osgi-http	8090	8090	Edit
remoting	4447	4447	Edit
teiid-jdbc	31000	31000	Edit
teiid-odbc	35432	35432	Edit
tbn-recovery-environment	4712	4712	Edit
tbn-status-manager	4713	4713	Edit

Figure 28: Local Ports Used by Different Services in the Data Server (JBoss)

Port conflicts can be resolved by managing the ports.

Items in the **Ports Configuration** tab:

- **Socket Binding Group:** Name of the socket binding group used by the DataServer. This is for informational purposes only.
- **Port Offset:** By default, this value is 0. This value can be changed. Changing the offset value does not change the port values; it just increments the original ports in the runtime environment by the offset value. If the original http port was 8080 and the offset is changed to 10, then 8090 will be needed to connect.

The benefit of the port offset option is that the port-offset attribute of the socket-binding-group can be used to alleviate port conflicts when running multiple DecisionSpace DataServer processes on the same physical server hardware.

To change the port offset setting, do the following:

1. On the Console, select the **Ports** tab.
2. Click the Edit link followed by Port Offset.
3. When the Update Port dialog box displays, enter a value to offset the existing values and click **Save**.



Figure 29: Update Port Dialog

4. Restart the DataServer service.

## Managing Log File

The content of the server log file in its entirety is displayed in the **Status** tab of the DataServer Console. The physical log file can be found in this location:

**DS\_INSTALL\ApplicationServer\standalone\log\server.log.** The log file is archived daily with the filename reflecting the date, for example: server.log.2014.10-22. The current server log file is named **server.log**.

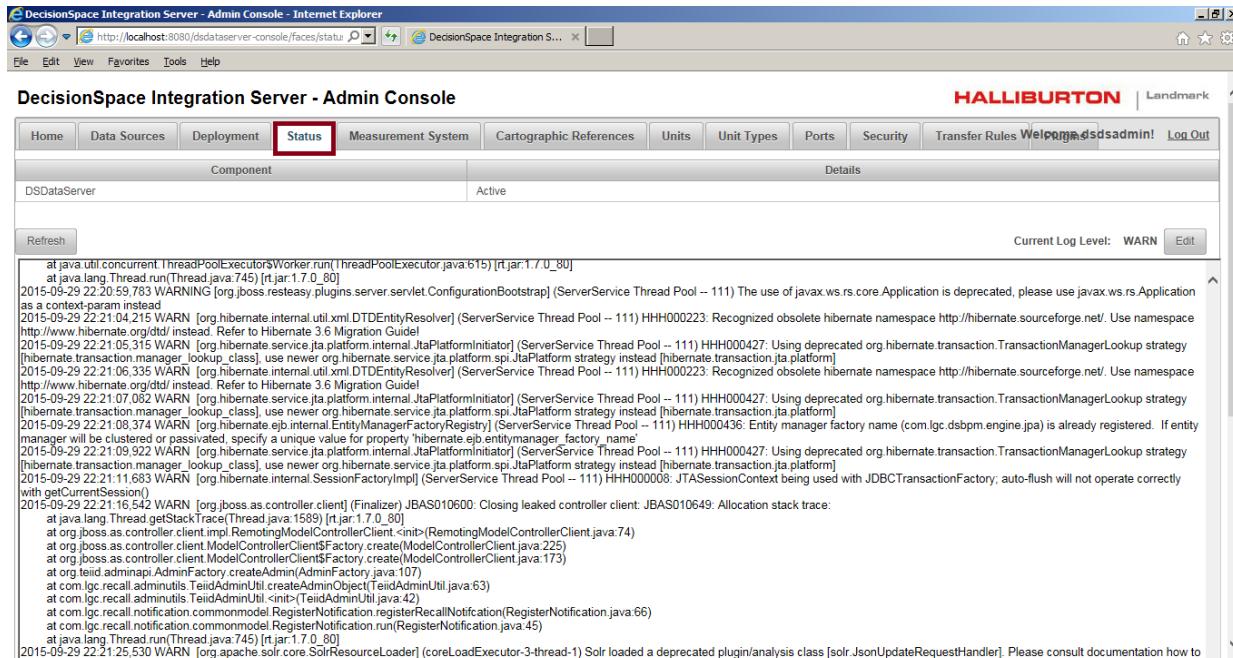


Figure 30: Content of Server Log File Displayed in Status Tab of the Data Server Console

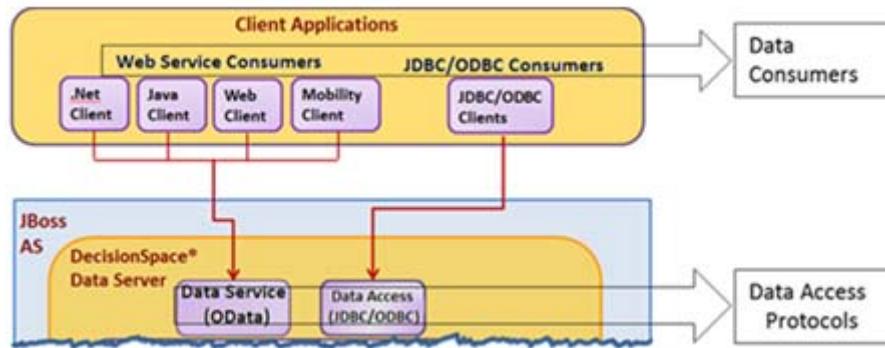
## Consuming DataServer Data Sources

In the previous section, the data source connection and its VDB deployment have been performed. Therefore, data is now ready to be accessed. Refer to “Applications Consuming Data Server Data” on page A-48 for a listing of applications consuming data, and their data access protocol.

A partial redrawing of the architecture of the DataServer is shown in Partial DataServer Architecture, Highlighting Data Consumers and Data Access Protocols in order to provide the context for data consumption.



“DecisionSpace Integration Server’s Data Server: Key Concepts” on page A-1 should be reviewed now for the following concepts: REST, OData, JDBC, and ODBC.



Within the DataServer, access to data is provided by the following means:

1. Data Service (a RESTful Web service using the OData protocol).
2. Data Access (a JDBC/ODBC protocol).

Both of these means for accessing data will now be discussed in more detail.

### Data Service (Data Access Protocol: OData)

OData is an application-level protocol for interacting with data via REST Web services. It uses the REST architecture to send particular types of messages over HTTP and provides a uniform API to describe both the data and the data model. Responses are in ATOMPub (XML) or JSON-Verbose format.

Default DataServer HTTP Port Value shows the default HTTP port value.

Socket Binding Group: dsds-sockets			
Port Offset: 0 <a href="#">Edit</a>			
Socket Bindings			
Socket Name	Effective Port(including offset)	Port	Actions
http	8080	8080	<a href="#">Edit</a>

Figure 32: Default Data Server HTTP Port Value

## How to Access

Consumer API Requirements specifies Java and .NET options for access.

These are the OData Data Service End Points of interest (where **DSDS-Server** is the <Data-Server-Host>).

- Data Models: <http://DSDS-Server:http-port/dsdataserver/dsl.svc> (also the Data Service <entryPoint>)
- Data Model Version: <entryPoint> /<modelName>
- VDBs: <entryPoint>/<modelName>/<modelVersion>
- OData Service Document (List of Entities for a VDB):  
<entryPoint>/<modelName>/<modelVersion>/<CompositeNameOfVirtualDataSource>
- Entity Details: <entryPoint> /<modelName>/<modelVersion>/<CompositeNameOfVirtualDataSource> /<EntityName>
- Metadata: <entryPoint>/<modelName>/<modelVersion>/<CompositeNameOfVirtualDataSource>/\$.metadata

Default credential to access DSDS data service is user/user

Figure 33: OData Data Service End Points

Composite Name of the Virtual Data Schema shows how to create the composite names for a single schema model VDB and a multiple schema models VDB.

## Composite Name of the Virtual Data Schema:

- Single schema model VDB: <VDBName>-<DataSourceName>  
<entryPoint>/OW5000/<modelVersion>/OpenWorks-TEAPOT\_DOME
- Multiple schema models VDB: <VDBName>  
<entryPoint> /OilWells/<modelVersion>/MyFederatedOilWellsDB

Figure 34: Composite Name of the Virtual Data Schema

## Tools

It is important to turn off all settings for feed and web slices when using Internet Explorer (v. 9+) or to install the XML Tree plugin when using Chrome to see the raw XML behind the feed.

## Browser

OData URL Conventions from:

<http://www.odata.org/documentation/odata-version-3-0/url-conventions/>  
specify what can be done to get the exact information desired.

URI	Used for	Example
\$expand	Eagerly load associations inline	http://localhost:8080/odata_example/odatajpa.svc/Supplier?\$expand=supplierParts
\$format	Specify what media type to be used for response(Atom/Xml/Json)	http://localhost:8080/odata_example/odatajpa.svc/Supplier?\$expand=supplierParts&\$format=Json
\$select	Return only subset of properties	http://localhost:8080/odata_example/odatajpa.svc/Supplier?\$select=supplierCity, supplierId
\$inlinecount	Response should include the count on entities after applying \$filter. Valid values are allpages/none	http://localhost:8080/odata_example/odatajpa.svc/Supplier?\$inlinecount=allpages<m:count>16</m:count>
URI	Used for	Example
\$links	Get all associations between entries	http://localhost:8080/odata_example/odatajpa.svc/SupplierParts(1L)/\$links/part
\$orderby	Order data based on desc or asc [default] options	http://localhost:8080/odata_example/odatajpa.svc/SupplierParts?\$orderby=quantity desc
\$top	Return first N items of the set	http://localhost:8080/odata_example/odatajpa.svc/SupplierParts?\$orderby=quantity desc&\$top=4
\$skip	Skip the first N records of the entity set and get next	http://localhost:8080/odata_example/odatajpa.svc/SupplierParts?\$skip=2&\$top=2
\$filter	Select only subset of entities that match the predicates provided – rich set of operators and functions	http://localhost:8080/odata_example/odatajpa.svc/SupplierParts?\$filter=(quantity gt 200 and quantity lt 300) or supplierId eq 10

Figure 35: OData URL Conventions

OData Access Examples using URL Conventions with the Internet Explorer browser shows practical applications.

## Programmatically

Refer to “OData Access from a Java Application” on page A-36 for programming details.

## Data Access (Data Access Protocols: JDBC/ODBC)

### JDBC Data Access Protocol

The JDBC data access protocol is needed to bypass the OData layer when applications are using JDBC for data access.

Default DataServer Port Value for JDBC shows the default DataServer port value for JDBC.

The screenshot shows a configuration page for a socket binding group named 'dsds-sockets'. It includes fields for 'Port Offset' (set to 0) and a table titled 'Socket Bindings' with one entry: 'teiid-jdbc' with an effective port of 31000. The table has columns for 'Socket Name', 'Effective Port(including offset)', 'Port', and 'Actions'.

Socket Name	Effective Port(including offset)	Port	Actions
teiid-jdbc	31000	31000	Edit

Figure 36: Default Data Server Port Value for JDBC

### How to Access

Consumers must use the Teiid JDBC database driver, as shown in How to Access Teiid JDBC Database Driver.

- Connection url: `jdbc:teiid:VdbName@mm://DSDSServer:TeiidJdbcPort;version=x;`
- Teiid JDBC Driver: `teiid-client-8.4.0.Final.jar, teiid-common-core-8.4.0.Final.jar`
- Driver class: `org.teiid.jdbc.TeiidDriver`

Figure 37: How to Access Teiid JDBC Database Driver

### Tools

#### Squirrel

The Squirrel SQL tool may be used to quickly verify JDBC access to the DataServer. Refer to “Setting Up the Squirrel SQL Tool for JDBC Access to the Data Server” on page A-32 for details on getting Squirrel ready to consume data from the DataServer.

The workflow to use Squirrel to access the data from the DataServer is represented in JDBC Access from the Squirrel SQL Tool.

1. Open a DataServer connection.
2. Enter the credentials for accessing the DataServer (DSDS) OpenWorks VDB.
3. Select the **Content** tab to view the data for a particular table selected.

JDBC Access from the Squirrel SQL Tool demonstrates all of these steps.

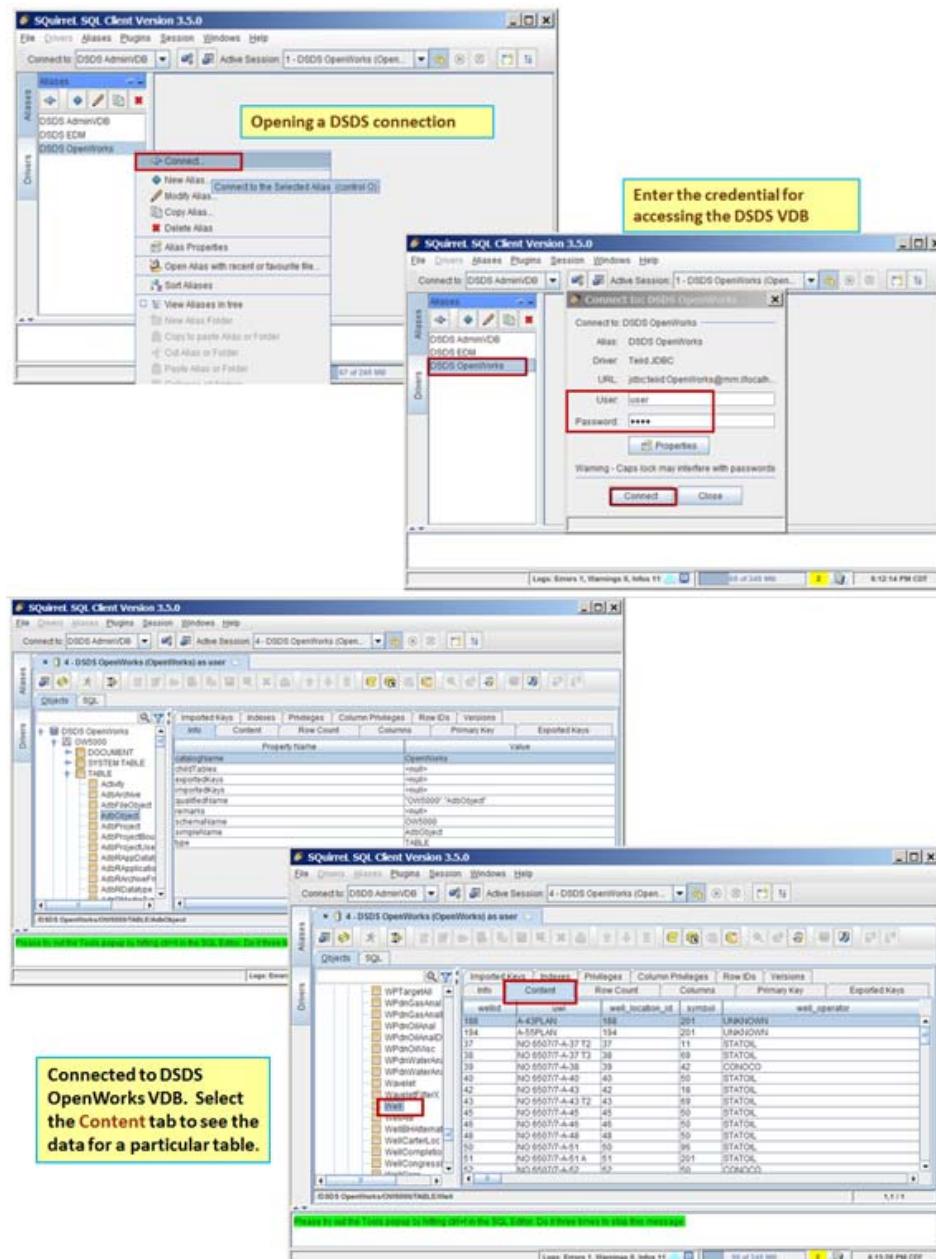


Figure 38: JDBC Access from the Squirrel SQL Tool

## Programmatically

Refer to “JDBC Access from a Java Application” on page A-31 for details on Java application JDBC access.

## ODBC Data Access Protocol

Refer to the section **ODBC Connection to Teiid** in the *DecisionSpace® DataServer Version 5000.10.1 System Administration Guide* for information and instructions for the ODBC Data Access Protocol connectivity.

## AdminVDB

Each DS DataServer has one special VDB named **AdminVDB**. AdminVDB is hidden from the DataServer Console and cannot be accessed from a browser; refer to How to Access the AdminVDB from the Squirrel tool<sup>7</sup>. It also has no data view, only stored procedures to enable JDBC applications to discover existing models and data sources in the DataServer<sup>8</sup>; refer to Stored Procedures within AdminVDB<sup>9</sup>.

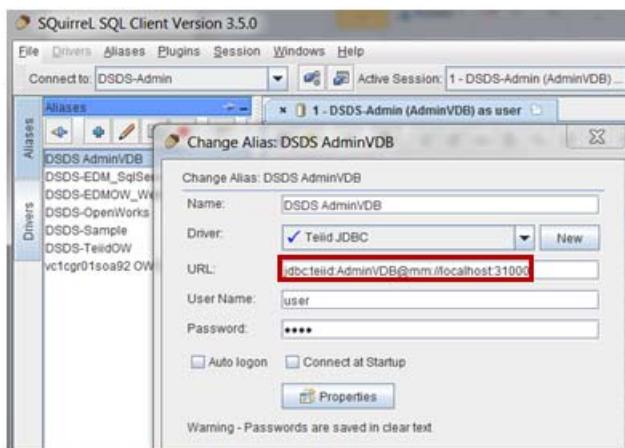


Figure 39: How to Access the AdminVDB

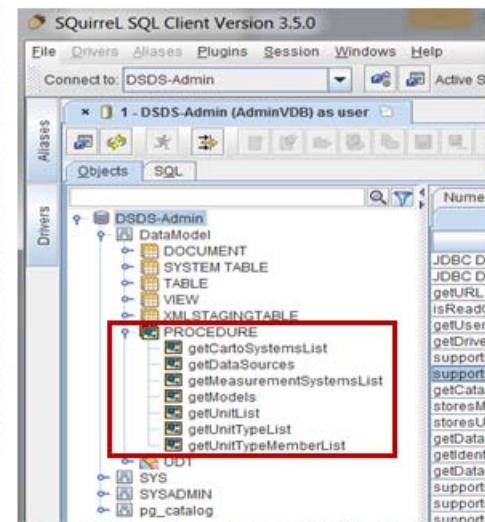


Figure 40: Stored Procedures within AdminVDB

7. Accessing AdminVDB from a Java Application provides the Java code required to access the AdminVDB from a Java application.
8. OData does not need AdminVDB because it can use \$metadata instead.
9. AdminVDB Stored Procedures provides a brief description of each stored procedure portrayed.

---

## Exercise # 1: Create Data Source Connections and Access Data

---

### ***Purpose of the Exercise***

The purpose of the exercise is to show examples of creating OpenWorks and EDM data connections, generating and deploying dynamic VDBs, and accessing data.

### ***Outcome of the Exercise***

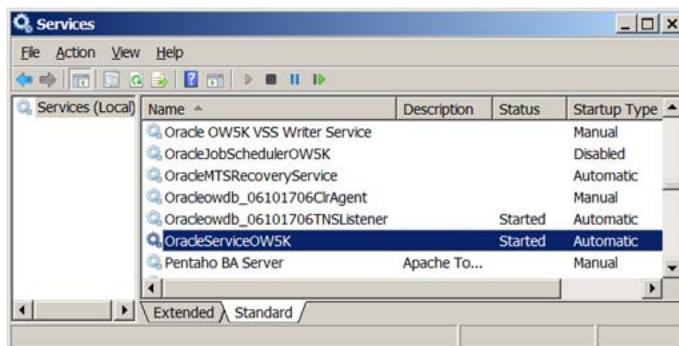
Access the data via OData and JDBC protocols after successful creation and deployment.

### ***Exercise Workflows***

- Start the Oracle services (for OpenWorks data) if not already started.
- Start the MS SQL Server services (for EDM data) if not already started.
- Start the DSDS service if not already started.
- Start DSDS Console, create data connections for EDM and OpenWorks, and generate their VDBs.
- Access the OpenWorks and EDM data using OData and JDBC protocols.

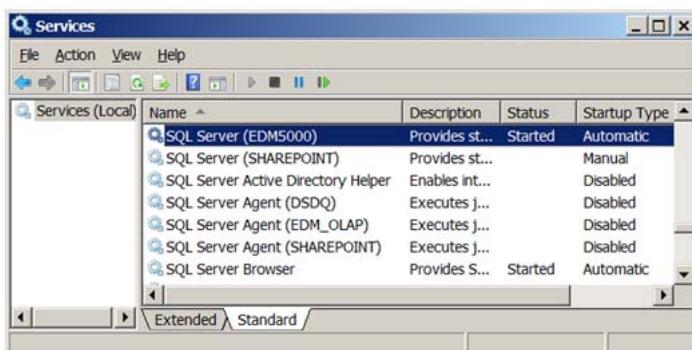
1. **Start the Oracle 11g services:** OW5K is the Oracle SID containing OpenWorks schema. Make sure these services are started:

- Oracleowdb\_06101706TNSListener, OracleServiceOW5K

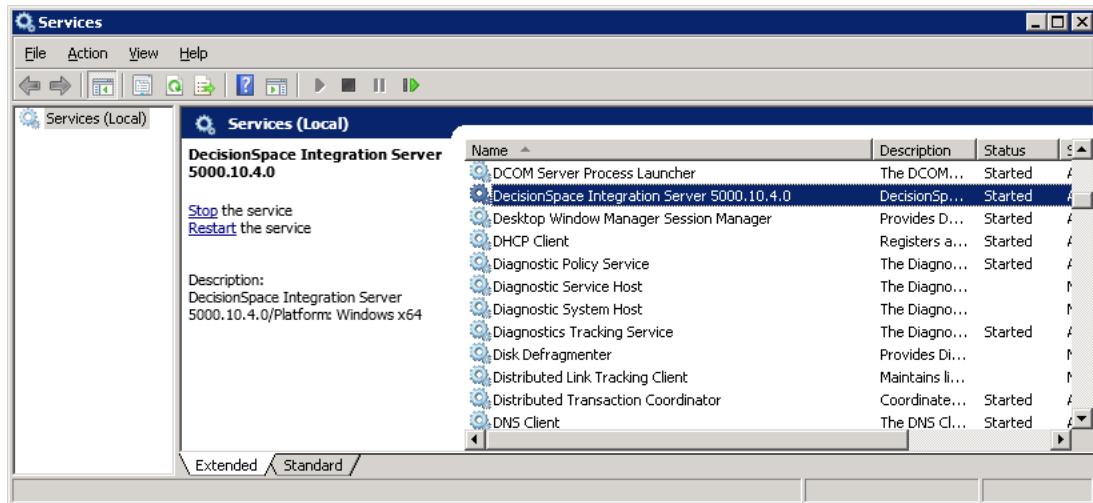


2. **Start the MS SQL 2008 services:** EDM5000 is the MS SQL instance containing the EDM. Make sure these services are started:

- SQL Server (EDM5000), SQL Server Browser



**3. Start the DecisionSpace DataServer (DSDS) service:**  
DecisionSpace Integration Server 5000.10.4.



**4. Start the DSDS Console**

- From the start menu: **Start > All Programs > Landmark > DecisionSpace Integration Server 5000.10.4.0 > Start DecisionSpace DataServer Console**, OR
- Open a browser (IE or Chrome) and enter this URL:

<http://localhost:8180/dsdataserver-console>

When prompted for credentials, enter the dsds admin login:  
**dsdsadmin/dsdsadmin**

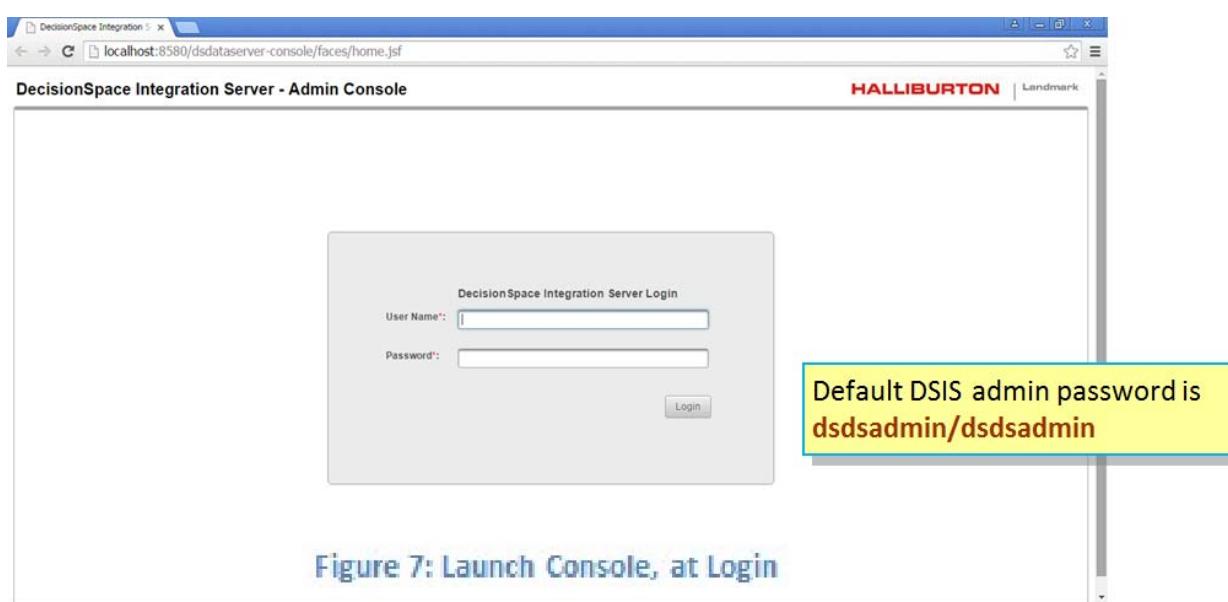
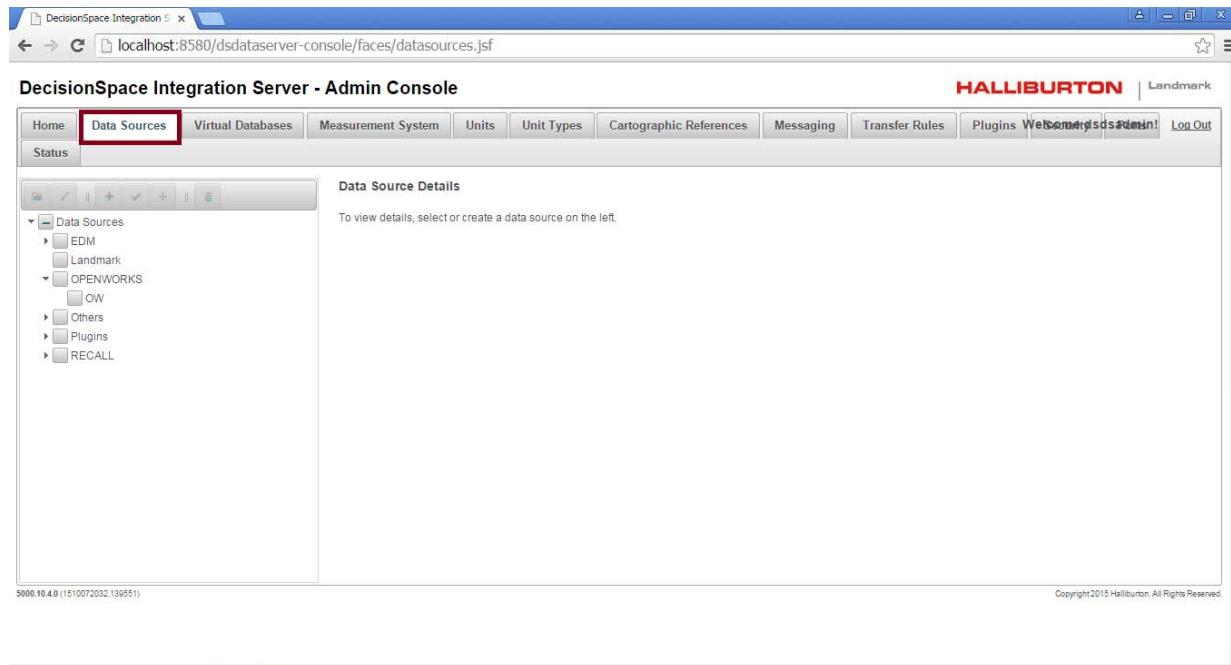


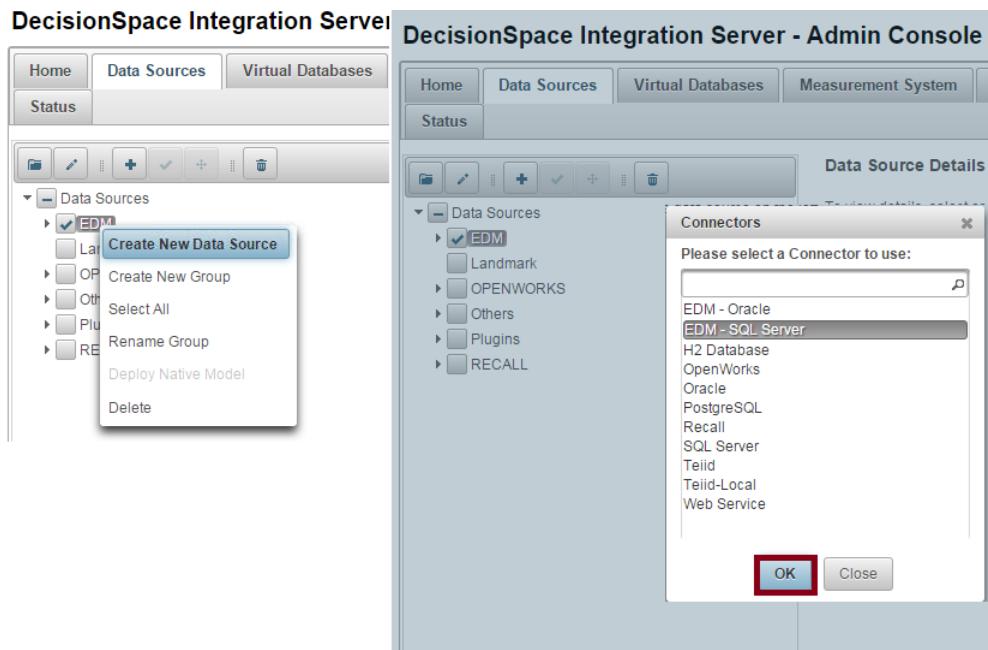
Figure 7: Launch Console, at Login

## 5. Create an EDM data connection and generate/deploy the VDB:

- a) In the DSDS Console, select the **Data Sources** tab.



- b) On the **Data Sources** tree, select **Landmark** (select the check box) and then right-click to display a context menu. On the context menu, select **Create New Data Source** to display the Drivers dialog box. On the Drivers dialog box, select **EDM-SQLServer**.



- c) The **Data Source Details** panel is displayed on the right side of the DSDS console. On this panel, enter the EDM data source connection parameters. For the host name, use **localhost** or spell it out as **HOU-TRAIN01**.

- **Data Source Name:** EDMtraining

- **Connection URL:**

`jdbc:sqlserver://HOU-TRAIN01\EDM5000:0;DatabaseName=edm1`

- **Version:** 5000.1.10

- **User Name:** edm

- **Password:** Landmark 1

- d) Select the **Test Connection** check box. Then click **Save**.

If successful, the message **Created Successfully** will be displayed on the bottom.

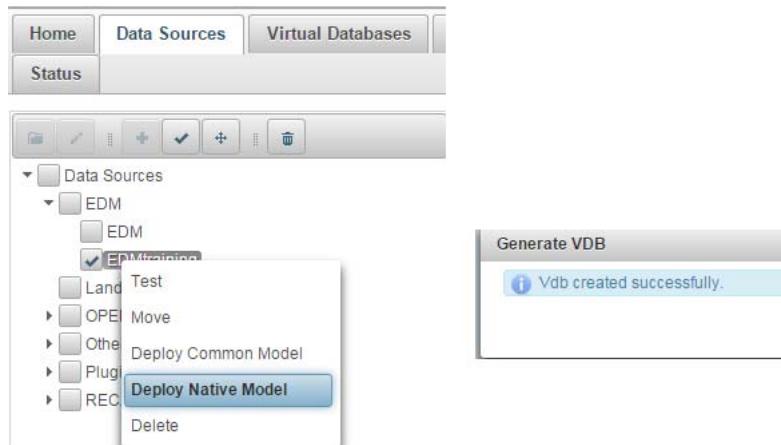
The screenshot shows the 'Data Sources' tab selected in the navigation bar. On the left, a tree view shows 'Data Sources' expanded, with 'EDM' selected. Under 'EDM', 'EDMtraining' is checked. To the right, the 'Data Source Details' panel is displayed with the following fields:

- Data Source Type: EDM - SQL Server
- Data Source Name\*: EDMtraining
- Connection URL\*: `jdbc:sqlserver://AHGESCTX01\EDM5000:0;DatabaseName=edm1`
- Version\*: 5000.1.10
- User Name\*: EDM\_SERVER\_USER
- Password\*: [REDACTED]
- Test Connection

At the bottom of the panel, there is a message: **EDMtraining has created successfully.** Below the message are 'Advanced properties' and 'Update' buttons.

After a connection has successfully been created to an EDM data source (edm1), the next step is to dynamically generate its VDB (Virtual Data Base) and deploy the VDB into DSDS (JBoss) application server.

- e) In the DSDS Console, select the newly created data connection **EDMtraining** and click the right mouse button to display the context menu. Select **Generate VDB** from the context menu. The message **Vdb created successfully** will be displayed if the VDB generation is successful.

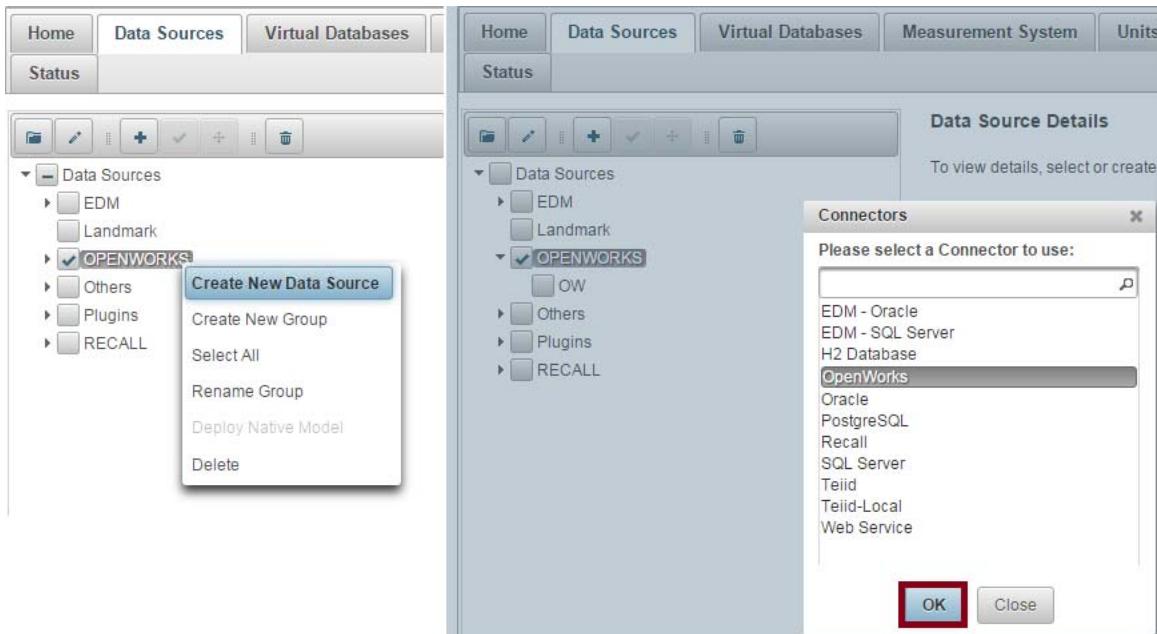


- f) To view the current deployments, select the **Virtual Databases** tab. Click **Refresh** to refresh the deployment view. The **EDM\_SqlServer** VDB should have an **ACTIVE** status. Click **Details** to see more info.

The screenshot shows the DecisionSpace Integration Server - Admin Console. The URL in the browser is 'localhost:8580/dsdataserver-console/faces/deployments.jsf'. The page title is 'DecisionSpace Integration Server - Admin Console'. The top navigation bar includes Home, Data Sources, Virtual Databases (which is highlighted with a red box), Measurement System, Units, Unit Types, Cartographic References, Messaging, Transfer Rules, Plugins, and Log Out. Below the navigation bar is a status bar with 'Status' and 'Import' buttons, and a 'Refresh' button highlighted with a red box. The main content area is titled 'Virtual Databases'. It contains a table with columns: VDB Name, Version, Teiid JDBC Url, Dynamic, Status, and Actions. The table lists several VDBs, including 'EDM\_SqlServer' which is marked as ACTIVE. At the bottom of the table, there is a section titled 'VDB Details:' with a sub-section for 'VDB Name EDM\_SqlServer'. This section includes a table with columns: Model, Data Sources, Status Messages, Multi Source, and Actions. The 'Data Sources' table shows one entry for 'EDM' with 'Name' as 'java:/EDM/5000.1.13'. The 'Status Messages' table shows an INFO message: 'VDB EDM\_SqlServer is set to ACTIVE.' The footer of the page includes the text '5000.10.4.0 (1510072032.139551)' and 'Copyright 2015 Halliburton. All Rights Reserved.'

## 6. Create 2 OpenWorks data connections and generate a VDB

- a) In the DSDS Console, select the **Data Sources** tab. On the **Data Sources** tree, select **Landmark**, right-click and select **Create New Data Source**. Select **OpenWorks** from the Drivers dialog box and click **OK**.



- b) On the **Data Source Details** panel, enter OpenWorks connection parameters for project TEAPOT\_DOME.
- Data Source Name: OWtraining\_TEAPOT
  - Version: 5000.8.3
  - User Name: lgcadmin
  - Password: lgcadmin
  - project: TEAPOT\_DOME
  - sid: OW5K

- c) Select the **Test Connection** check box and then click **Save**.

### Data Source Details

Data Source Type: OpenWorks  
 Data Source Name\*: OWtraining  
 Version\*: 5000.10.1  
 User Name\*: OW\_SERVER\_USER  
 Password\*:   
 Test Connection

### Connection Properties

Name	Value
district* 	GES
maxMem	4096
minMem	512

[Advanced properties](#)



- d) Select the **Virtual Databases** tab and check the status of the **OpenWorks** vdb deployment. (Click **Refresh**, if necessary.) Click **Details** on the **OpenWorks** deployment to get more information.

Virtual Databases							Status	Import	Refresh
VDB Name	Version	Teiid JDBC Url		Dynamic	Status	Actions			
DSDDataTransfer	1	jdbc:teiid:DSDDataTransfer@mm://@02-hou02.dsis.com:31000;version=1		true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
DSDQ_JOBS	1	jdbc:teiid:DSDQ_JOBS@mm://@02-hou02.dsis.com:31000;version=1		true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
DSDQ_RESULTS	1	jdbc:teiid:DSDQ_RESULTS@mm://@02-hou02.dsis.com:31000;version=1		true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
EDM_SqlServer	5000.1.13	jdbc:teiid:EDM_SqlServer@mm://@02-hou02.dsis.com:31000;version=3		true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
EDMONFederatedWell	5000.10.3	jdbc:teiid:EDMONFederatedWell@mm://@02-hou02.dsis.com:31000;version=1		false	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
OpenWorks	5000.10.3	jdbc:teiid:OpenWorks@mm://@02-hou02.dsis.com:31000;version=3		true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
OpenWorksCommonModel	5000.10.3	jdbc:teiid:OpenWorksCommonModel@mm://@02-hou02.dsis.com:31000;version=3		false	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>
WELL_PRODUCTION	1	jdbc:teiid:WELL_PRODUCTION@mm://@02-hou02.dsis.com:31000;version=1		true	ACTIVE	<a href="#">Delete</a>	<a href="#">Details</a>	<a href="#">Download</a>	<a href="#">Undeploy</a>

**VDB Details:**  
VDB Name OpenWorks

Model	Data Sources		Status Messages			Multi Source	Actions
OW5000	Name	JNDI Name	Severity	Message		true	Edit Data Sources
	OW	java:JOW/5000.10.3	INFO	VDB OpenWorks is set to ACTIVE.			

## Access OpenWorks and EDM Data

Up to this point, 2 OpenWorks and 1 EDM data connections have been created and their VDBs deployed.

After a VDB is deployed, its data source(s) are ready to be accessed using either the OData or JDBC method.

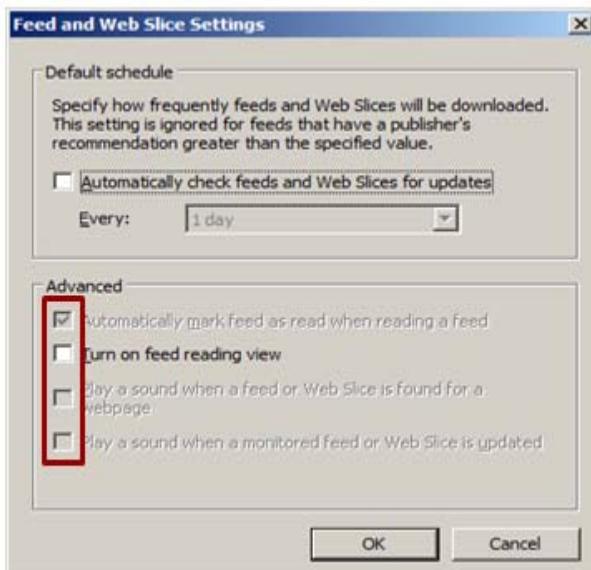
Many applications, such as internet browsers and MS Excel Power Pivot, already have built-in OData access capability which can be leveraged for quick testing purposes.

### Note

EDM data access requires Impersonation. For this training exercise, this impersonation (for credential **edm/Landmark1**) has already been configured. The instructions for impersonation are given in the *DSDS Install Guide*.

## 7. Accessing OpenWorks and EDM data using OData protocol (Internet Explorer 9 or higher)

- First, Internet Explorer needs to be configured to set the data feed options *off*. In Internet Explorer, select **Tools > Internet Options > Content > Feeds and Web Slices Settings**: set all options to off.

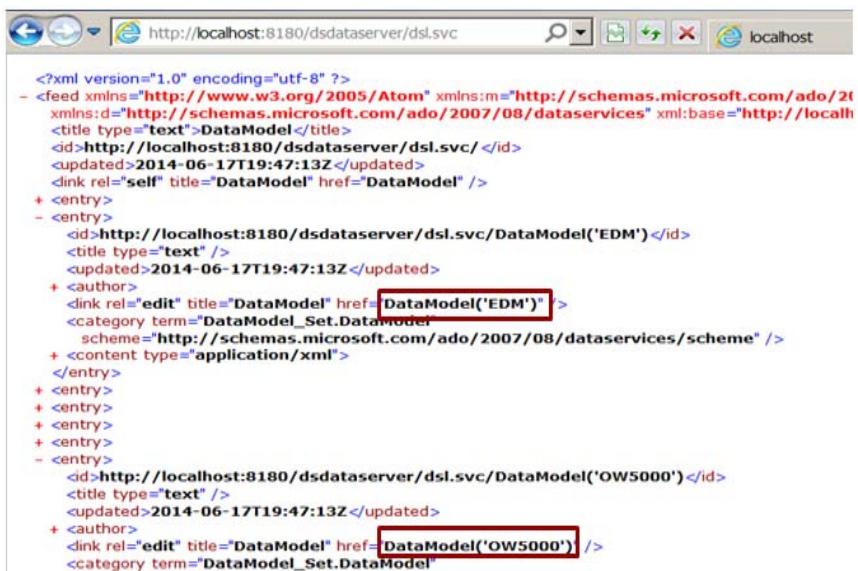


- In IE, enter the DSDS data service end point: <http://localhost:8180/dsdataserver/dsl.svc>. When prompted for credentials, enter user: **edm** and password: **Landmark1**

Two models should be returned from the data service: **EDM**, **OW5000**, and **Sample**.

### Note

If the credentials **dudsadmin/dudsadmin** are specified, the EDM data will not be visible because these credentials have not been configured to impersonate EDM.



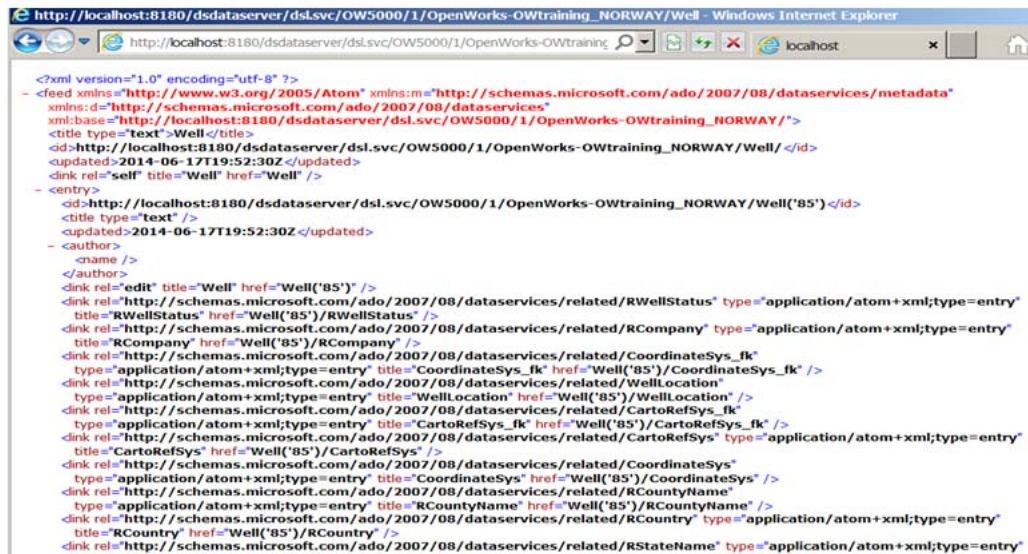
```
<?xml version="1.0" encoding="utf-8" ?>
- <feed xmlns="http://www.w3.org/2005/Atom" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices" xml:base="http://localhost:8180/dsdataserver/dsl.svc">
  <title type="text">DataModel</title>
  <id>http://localhost:8180/dsdataserver/dsl.svc/</id>
  <updated>2014-06-17T19:47:13Z</updated>
  <link rel="self" title="DataModel" href="DataModel" />
+ <entry>
- <entry>
  <id>http://localhost:8180/dsdataserver/dsl.svc/DataModel('EDM')</id>
  <title type="text" />
  <updated>2014-06-17T19:47:13Z</updated>
+ <author>
  <link rel="edit" title="DataModel" href="DataModel('EDM')"/>
  <category term="DataModel_Set.DataModel" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
+ <content type="application/xml">
</entry>
+ <entry>
+ <entry>
+ <entry>
+ <entry>
- <entry>
  <id>http://localhost:8180/dsdataserver/dsl.svc/DataModel('OW5000')</id>
  <title type="text" />
  <updated>2014-06-17T19:47:13Z</updated>
+ <author>
  <link rel="edit" title="DataModel" href="DataModel('OW5000')"/>
  <category term="DataModel_Set.DataModel" />
```

Use the data model to drill down to the data model version, then to the data source name, and then to the tables (entities) of the data model.

<http://localhost:8180/dsdataserver/dsl.svc/<DataModel>/<DataModelVersion>/<VdbDataSourceName>/Entity>

For example, to read all the wells in the project DSG\_NORWAY83, try this URL:

[http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining\\_NORWAY/Well](http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining_NORWAY/Well)



The screenshot shows a Windows Internet Explorer window with the URL [http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining\\_NORWAY/Well](http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining_NORWAY/Well). The page displays an XML document representing a well entity. The XML includes fields like id, title, type, updated, and links to related entities such as RWellStatus, RCompany, CoordinateSys\_fk, WellLocation, CartoRefSys\_fk, RCountyName, and RCountry.

```

<?xml version="1.0" encoding="utf-8" ?>
- <feed xmlns="http://www.w3.org/2005/Atom" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:base="http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining_NORWAY/Well">
  <title type="text">Well</title>
  <id href="http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining_NORWAY/Well"></id>
  <updated>2014-06-17T19:52:30Z</updated>
  <link rel="self" title="Well" href="Well('85')"/>
- <entry>
  <id href="http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining_NORWAY/Well('85')"></id>
  <title type="text"></title>
  <updated>2014-06-17T19:52:30Z</updated>
- <author>
  <name />
</author>
  <link rel="edit" title="Well" href="Well('85')"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/RWellStatus" type="application/atom+xml;type=entry"
    title="RWellStatus" href="Well('85')/RWellStatus"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/RCompany" type="application/atom+xml;type=entry"
    title="RCompany" href="Well('85')/RCompany"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CoordinateSys_fk"
    type="application/atom+xml;type=entry" title="CoordinateSys_fk" href="Well('85')/CoordinateSys_fk"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Well.location"
    type="application/atom+xml;type=entry" title="Well.location" href="Well('85')/Well.location"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CartoRefSys_fk"
    type="application/atom+xml;type=entry" title="CartoRefSys_fk" href="Well('85')/CartoRefSys_fk"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/RCountry"
    type="application/atom+xml;type=entry" title="RCountry" href="Well('85')/RCountry"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/RCountryName"
    type="application/atom+xml;type=entry" title="RCountryName" href="Well('85')/RCountryName"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/RCounty"
    type="application/atom+xml;type=entry" title="RCounty" href="Well('85')/RCounty"/>
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/RStateName"
    type="application/atom+xml;type=entry" href="Well('85')/RStateName"/>

```

To customize the OData query, refer to this doc:

<http://www.odata.org/documentation/odata-version-3-0/url-conventions/>

For example:

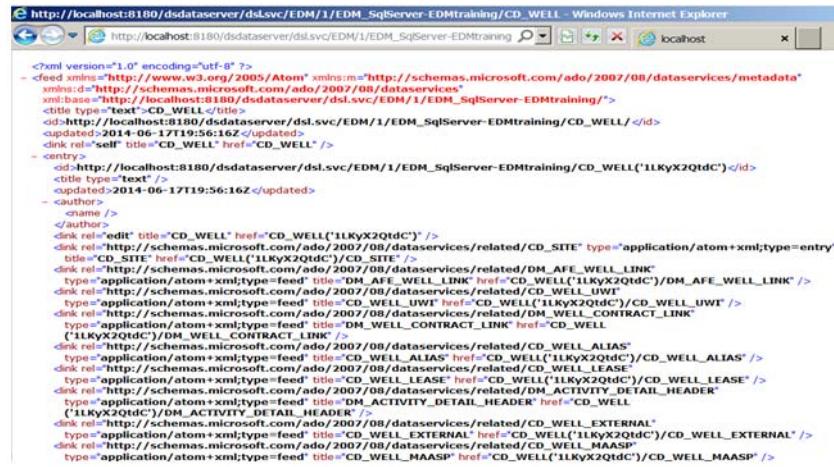
[http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining\\_NORWAY/Well?\\$filter=common\\_well\\_name eq 'A-55PLAN'](http://localhost:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining_NORWAY/Well?$filter=common_well_name eq 'A-55PLAN')

c) Now access the EDM wells

[http://localhost:8180/dsdataserver/dsl.svc/EDM/1/EDM\\_SQLServer-EDMTraining/CD\\_WELL](http://localhost:8180/dsdataserver/dsl.svc/EDM/1/EDM_SQLServer-EDMTraining/CD_WELL)

#### Note

If Accessing EDM wells fails, delete the folders in the temporary folder Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer\standalone\tmp and then restart the DSDS Server.



## 8. Accessing OpenWorks and EDM data using JDBC protocol (Squirrel SQL tool)

For this training, the **Squirrel** tool is used to test the JDBC access to the deployed VDBs in DSDS. To access the Teiid's VDBs, Squirrel needs the Teiid JDBC driver. Get the Teiid JDBC driver jar files from the DSDS installation directory and copy them to the <SQUIRREL\_INSTALL>\lib directory.

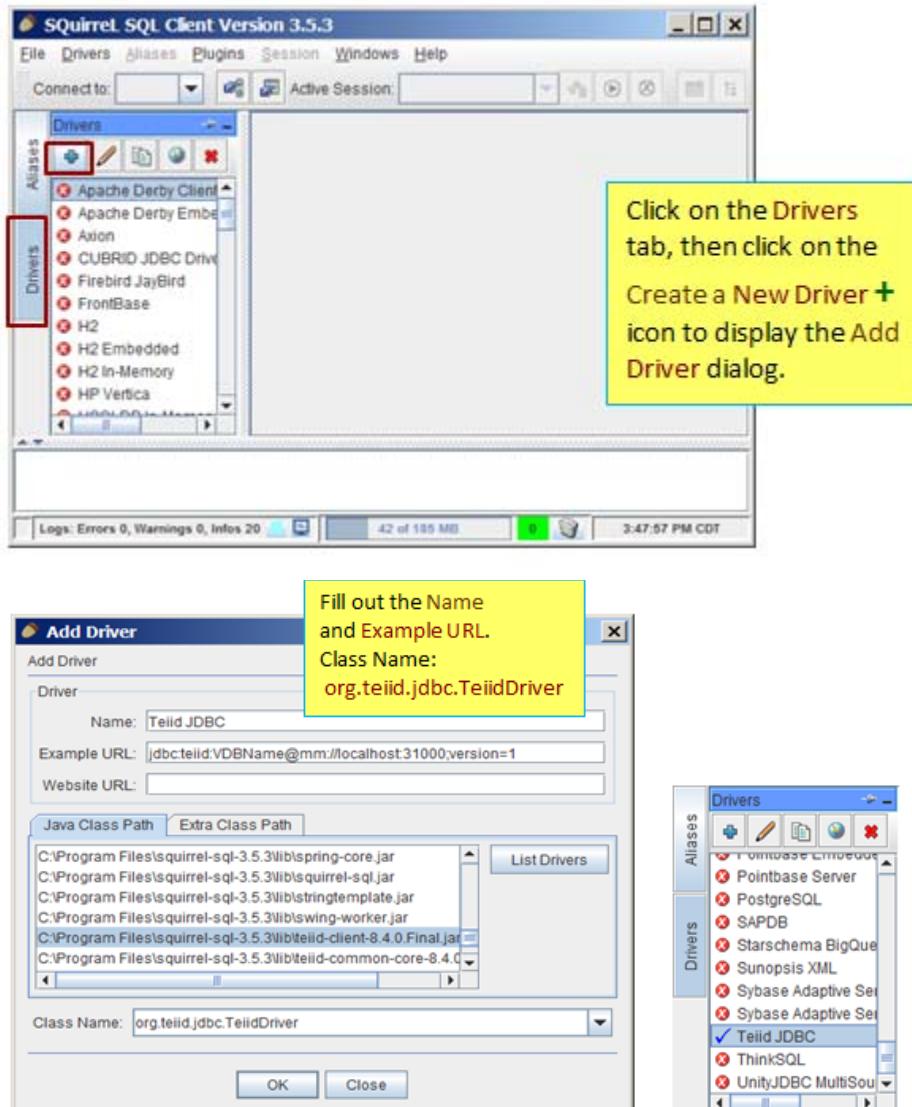
### Note

Steps a, b, and c are already completed for this VM. There is no need to redo them.

#### a) Copy Teiid JDBC Driver jar files to Squirrel installation

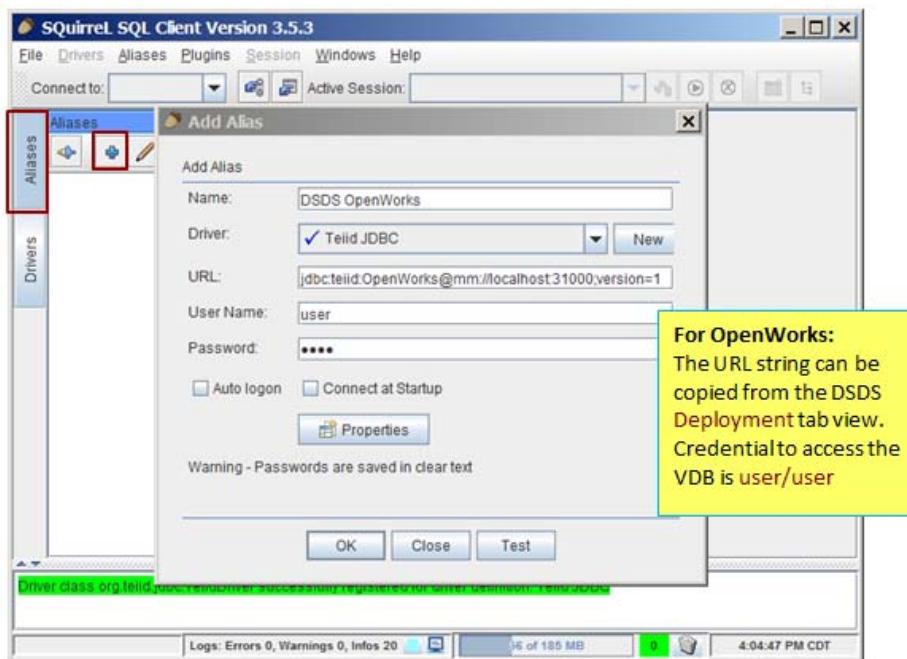
- 'cd' to **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\modules\system\layers\base\org\jboss\teiid**
- Copy **.\client\main\teiid-client-8.4.0.Final.jar** to **C:\Program Files\squirrel-sql-3.5.3\lib**
- Copy **.\common-core\main\teiid-common-core-8.4.0.Final.jar** to **C:\Program Files\squirrel-sql-3.5.3\lib**

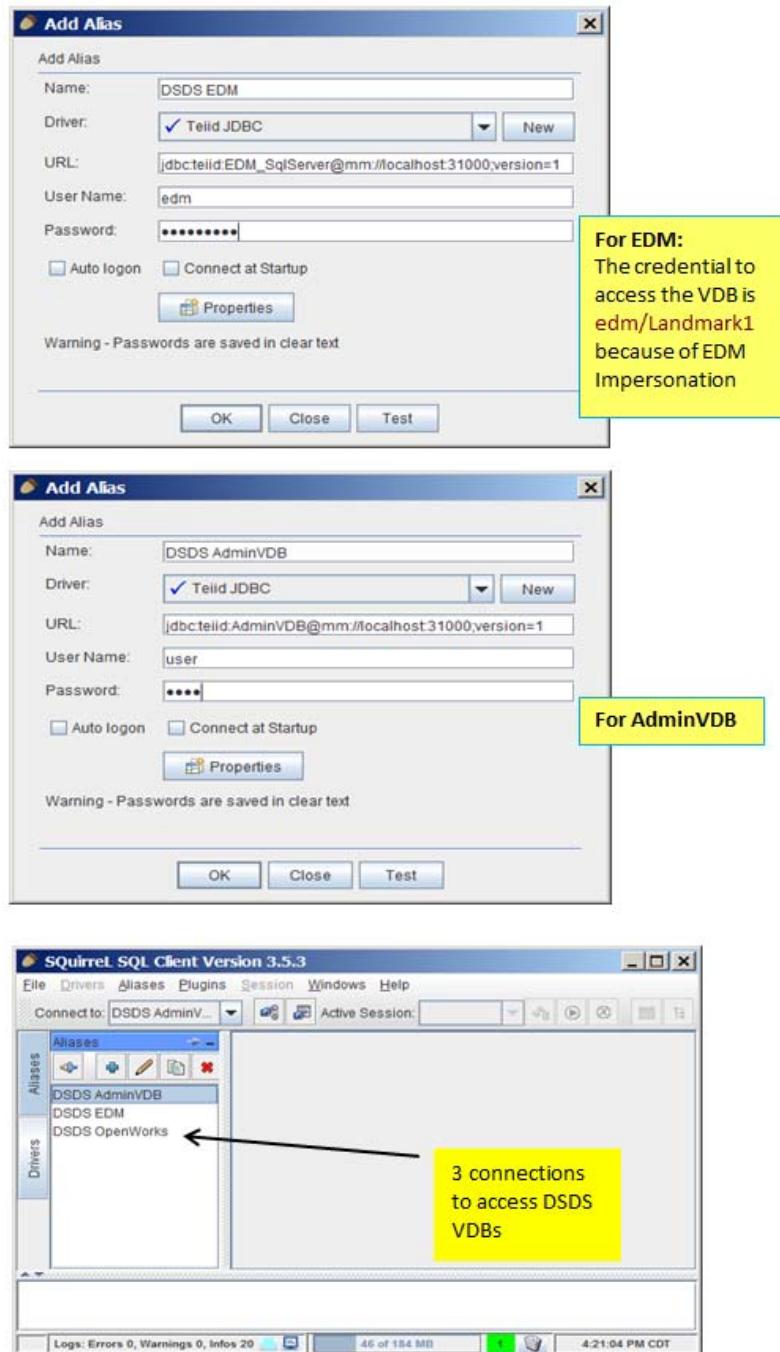
- b) Run the Squirrel tool: **Start Menu > All Programs > Squirrel SQL Client > Squirrel SQL Client.**
- c) Add a Teiid Driver in Squirrel.



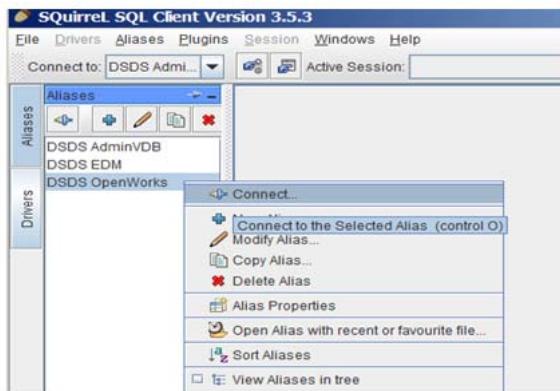
- d) Now add three **Aliases** (connections): DSDS AdminVDB, DSDS EDM, and DSDS OpenWorks to access the admin vdb, EDM vdb, and OpenWorks vdb in DSDS, respectively.

Select the **Aliases** tab, then click the  icon to display the Add Alias dialog box and enter the parameters as below:

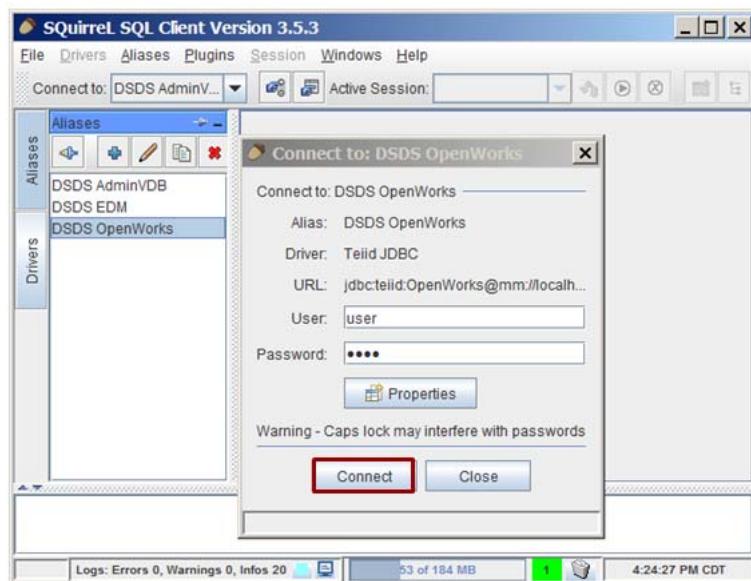




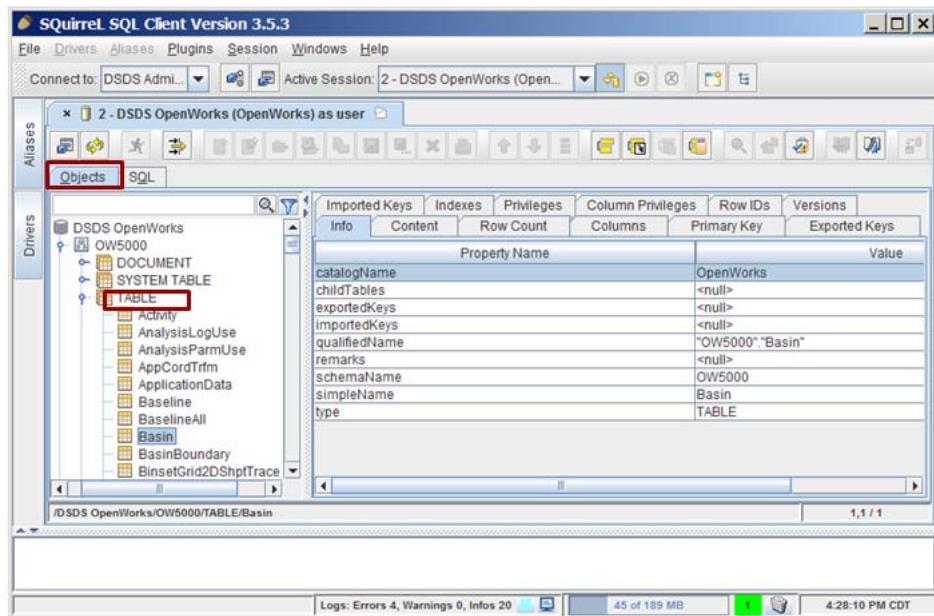
- e) **Opening a connection:** Select the **Aliases** tab on the left pane, then right-click a connection and select **Connect**.



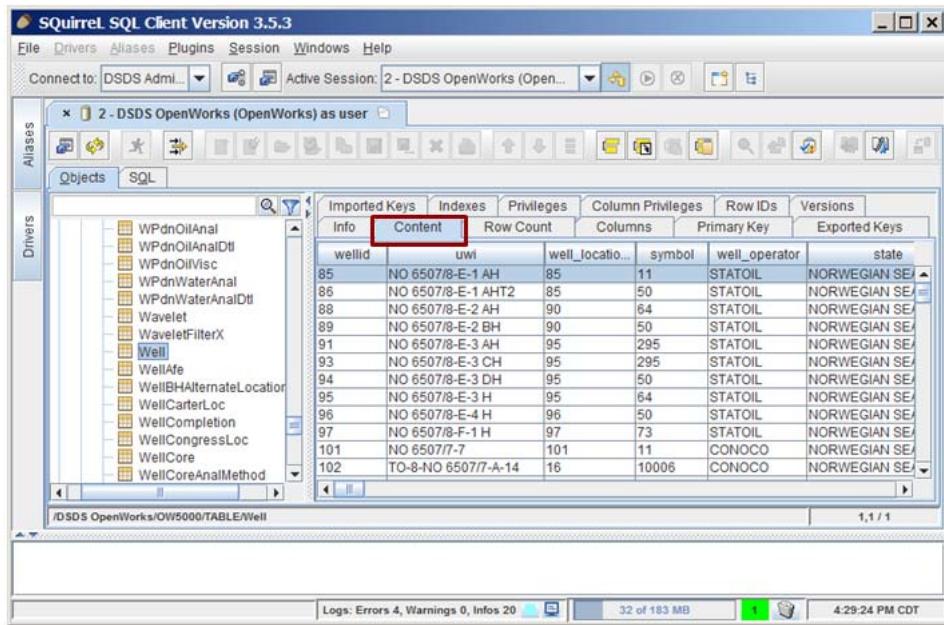
- f) On the Connect to: dialog box, click **Connect**.



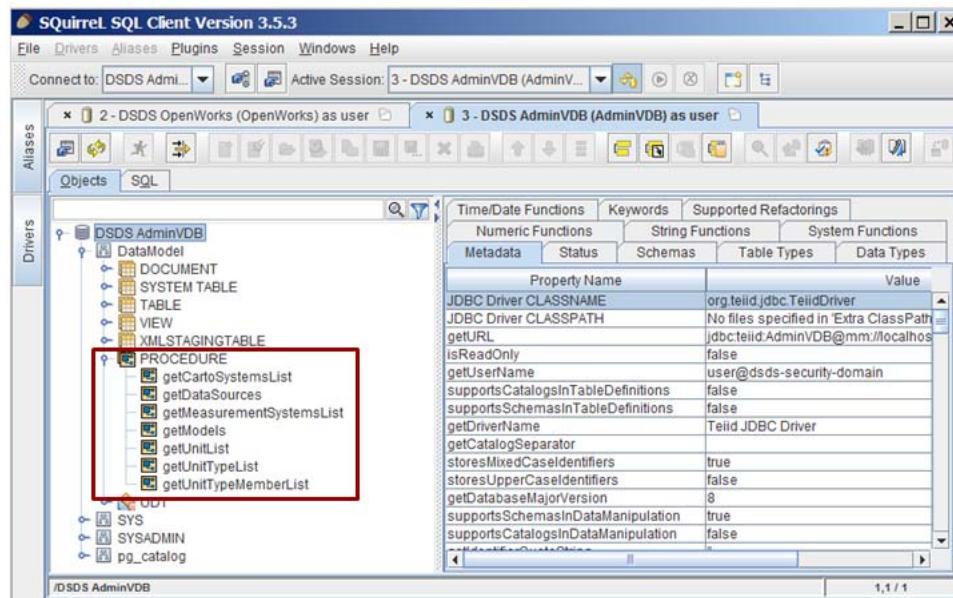
- g) Connection to OpenWorks is active, expand **OW5000 > TABLE** to list all the tables in the schema. Select a table to view.



View of all the Wells in all the projects (as exposed by the VDB).

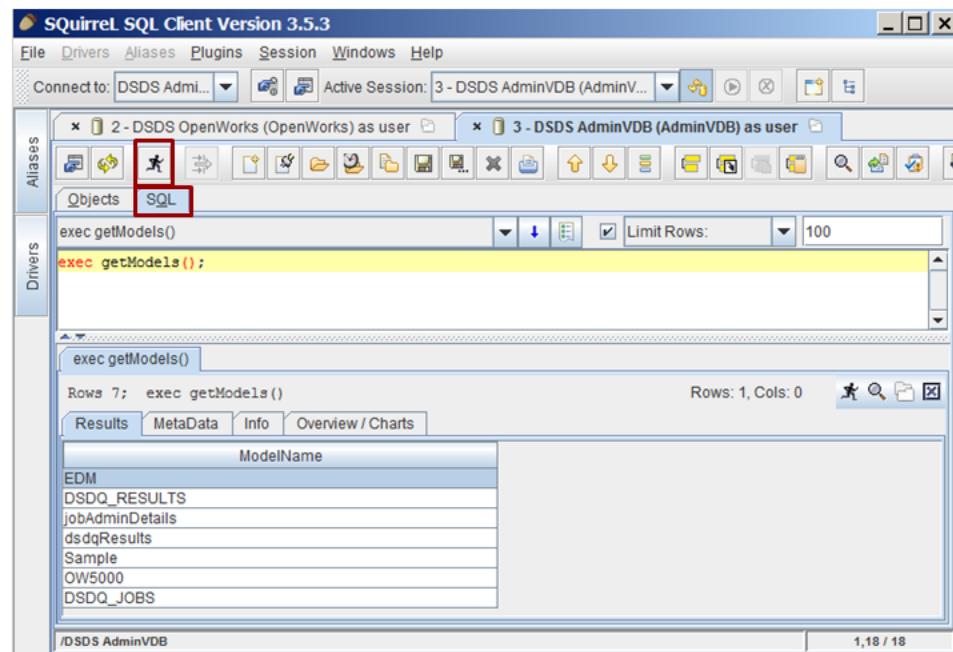


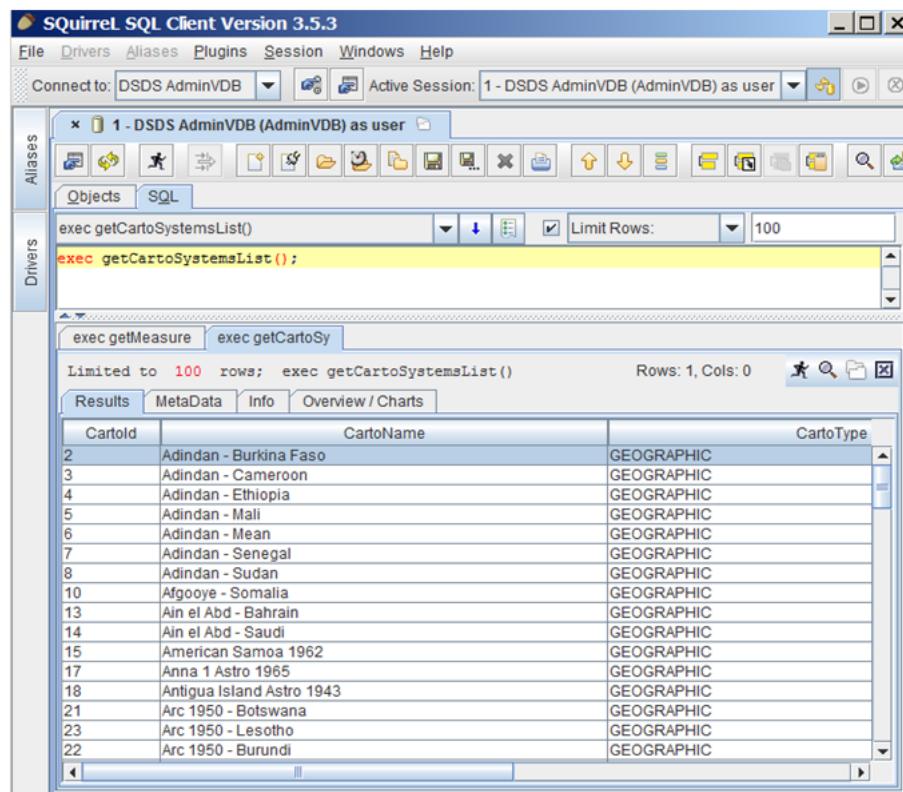
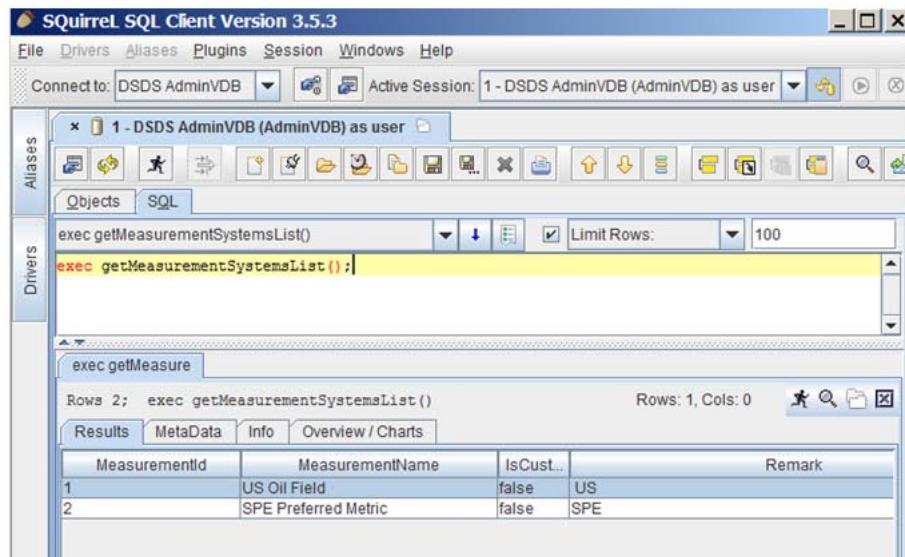
## Accessing the AdminVDB in DSDS.



Running the procedures exposed by **AdminVDB**.

Select the **SQL** tab and enter **exec getModels()**; then run the query by clicking the **Run SQL** icon.

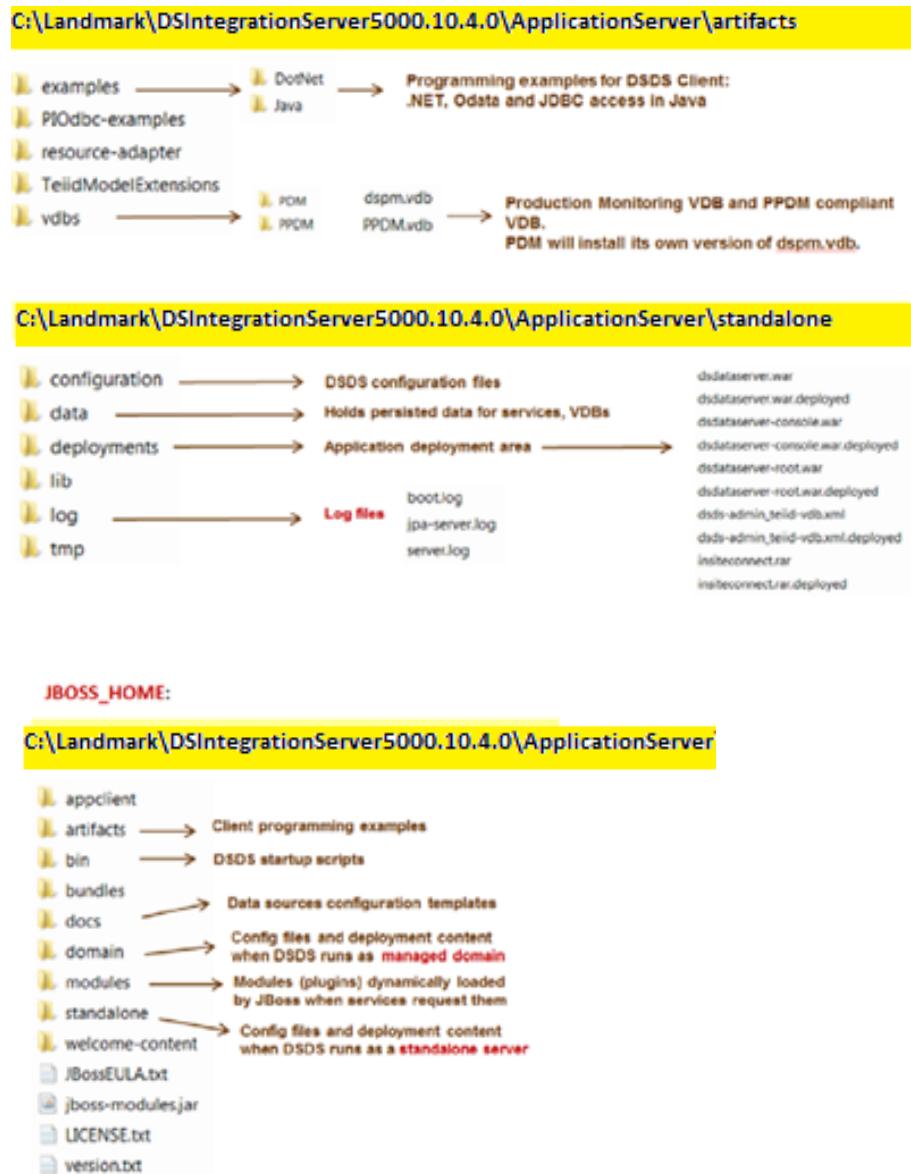




# DataServer Configuration

The DataServer configuration is read from and persisted to the `dsdsConsoleConfig.properties` file which is located in **DS\_INSTALL\ApplicationServer\standalone\configuration**.

## Directories



## Standalone Server

JBOSS\_HOME\standalone\configuration

### ➤ JBoss Server Profile Setting

Java EE 6 profile configuration: security realms, application logging and handlers, data sources, drivers, translators, resource adaptors, deployments, etc.

**standalone-dsds.xml**

### ➤ Applications Properties

**dsdsAppConfig.properties**

### ➤ DSDS Default File-Based Security

**dsds-security-roles.properties**

Mapping of user names to passwords

```
user=user
dsds=dsds
dsdsadmin=dsdsadmin
edn=Landmark1
ednadmin=Landmark1
```



**dsds-security-users.properties**

Mapping of user names to roles

```
user=example-role
dsds=dsds-user-role
dsdsadmin=dsds-user-role,dsds-admin-role
edn=dsds-user-role,dsds-admin-role
ednadmin=dsds-user-role,dsds-admin-role
```

**standalone-dsds.xml**

```
<security-domain name="dsds-security-domain" cache-type="default">
    <authentication>
        <login-module code="UsersRoles" flag="required">
            <module-option name="usersProperties" value="${jboss.server.config.dir}/dsds-security-users.properties"/>
            <module-option name="rolesProperties" value="${jboss.server.config.dir}/dsds-security-roles.properties"/>
            <module-option name="password-stacking" value="useFirstPass"/>
        </login-module>
    </authentication>
</security-domain>
```

JBOSS\_HOME\standalone\configuration

### ➤ DSDS Console Settings

**dsdsConsoleConfig.properties**

Contains attributes used as the default settings for Data Source Creation window and also for VDB generation. Default settings can be modified and new data sources can be added to this file.

**dsdsConsolegrouping.properties**

→ Landmark  
Others

Contains the names of existing groups.

Groups creation and deletion are managed by the DSDS console.

### ➤ Logging Level Settings

**standalone-dsds.xml**

```
<root-logger>
    <level name="WARN"/>
    <handlers>
        <handler name="CONSOLE"/>
        <handler name="FILE"/>
    </handlers>
</root-logger>
```

ALL  
CONFIG  
DEBUG  
ERROR  
FATAL  
FINE  
FINER  
FINEST  
INFO  
OFF  
TRACE  
WARN  
WARNING

JBOSS\_HOME\standalone\log

boot.log  
jpa-server.log  
server.log

## Data Federation and Virtualization



DecisionSpace Integration Server's DataServer: Key Concepts discusses Data Federation, Data Virtualization, Virtual Databases (VDBs), and Teiid Resource Adapter (Supported EIS) from a conceptual point of view, emphasizing both the JBoss and Teiid technologies. Refer to these topics now to understand the concepts before moving ahead with this Training Guide. The reader is also directed to Dynamic & Standard VDBs in XML Format to Show Internal Details at this time for further internal details at the XML level.

Big Picture for Data Source Connectivity reveals the technology infrastructure behind the implementation of connecting data

source(s)<sup>10</sup>. It should be easily understood after reading “DecisionSpace Integration Server’s Data Server: Key Concepts” on page A-1. Description of the Steps from Big Picture for Data Source Connectivity describes each annotation from the Big Picture figure.

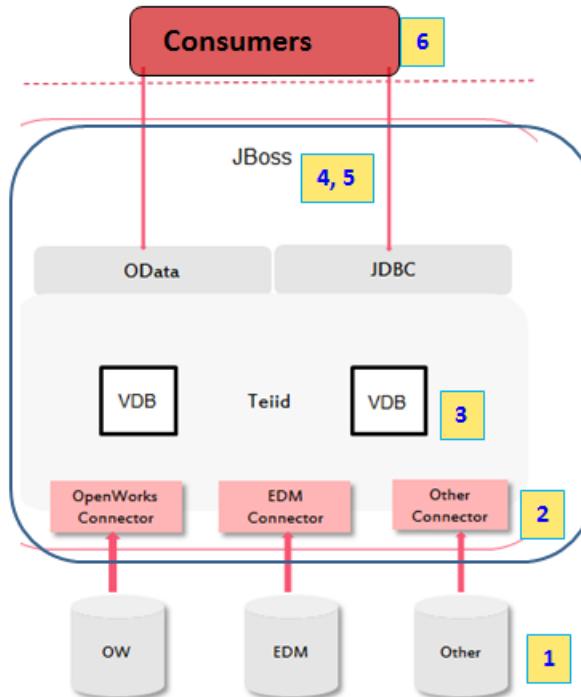


Figure 42: Big Picture for Data Source Connectivity

10. “Basic Workflow to Make Data Sources Accessible to the DataServer” on page 2-21 was concerned with the implementation, while now the discussion is concerning the technology requirements.

## Single-Schema and Multi-Schema Models VDBs



While VDBs have been discussed in “DecisionSpace Integration Server’s Data Server: Key Concepts” on page A-1, what has not been explored is single- and multi-schema models for VDBs. Single-Schema and Multi-Schema Models VDBs summarizes the salient points of these models.

➤ **How to make a data source accessible from the Data Server:**

1. Physical data source
2. Data source Connector
  - Teiid Translator and Resource Adaptor
3. Virtual Database (VDB), abstraction layer of the physical data source
4. Definition of the data source in DSDS/JBoss
5. Deployment of the VDB in DSDS/JBoss
6. Consumers access the data source through the VDB using OData or ODBC/JDBC protocols

Figure 43: Description of the Steps from Big Picture for Data Source Connectivity

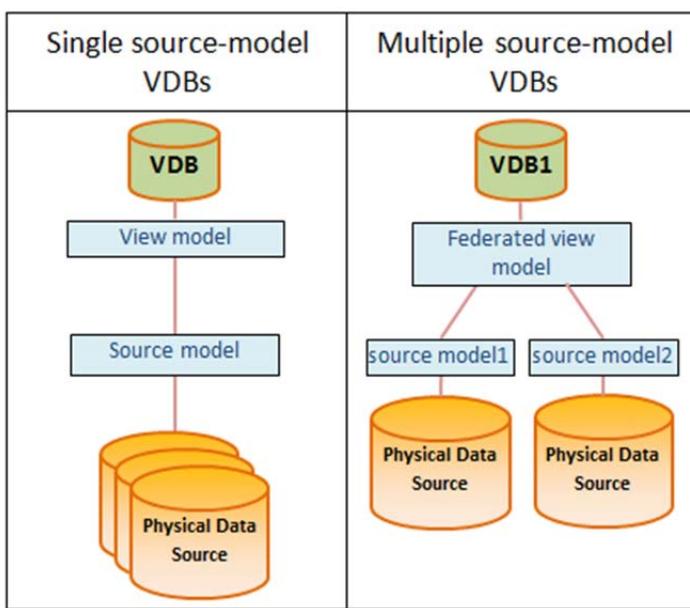


Figure 44: Single-Schema and Multi-Schema Models VDBs

### Single-Schema VDBs

#### If multiple data sources are exposed:

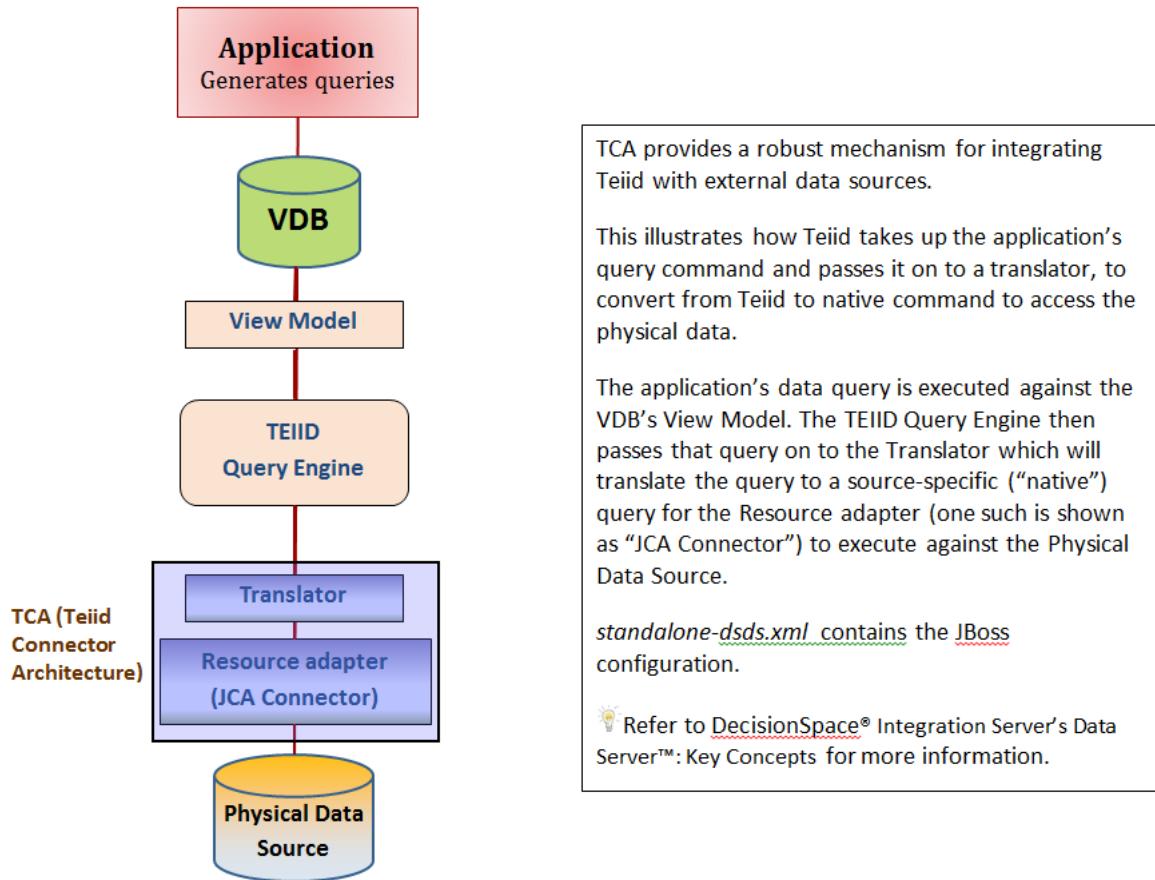
- All data sources must have the same model/schema.
- DSDS adds a virtual column named TEIID\_MULTI\_DATA\_SOURCE\_COLUMN to all entities to identify the source of data for each row in an entity.

### Multi-Schema VDBs :

- Data is federated from multiple underlying data sources with different schemas.
- No direct mapping from source model to the view model; a join is needed when creating view model from multiple schemas.

DSDS Console creates dynamic VDBs which by default are single-schema and multi-source.

## Connector Architecture



## Adding a Third Party Data Source

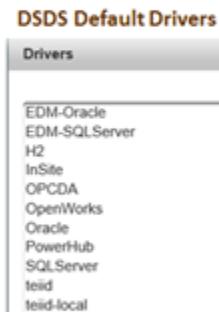
The DataServer does not have out-of-the-box support for the MySQL driver; thus the driver must be manually added to the installation. These are the steps required to add a third party data source to the DataServer:

1. Add the driver information in **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\standalone-dsds.xml**.
2. Restart the DataServer Service.
3. In the DataServer Console, create a data connection and generate the VDB for the MySQL data source.

**1. Add the MySQL driver .jar file in the Data Server (as a core module)**

- Create sub-folders under the Data Server **modules** folder to store the MySQL driver and the **module.xml**: **JBoss\_HOME\modules\system\layers\base\com\mysql\main**
- Copy **mysql-connector-java-5.1.5.jar** and **module.xml** to this folder.

```
module.xml
<?xml version="1.0" encoding="UTF-8"?>
- <module name="com.mysql" xmlns="urn:jboss:module:1.0">
  - <resources>
    <resource-root path="mysql-connector-java-5.1.5.jar"/>
  </resources>
  - <dependencies>
    <module name="javax.api"/>
  </dependencies>
</module>
```



**1. (cont'd) Add the MySQL driver info in standalone-dsds.xml**

```
<driver name="MySQL" module="com.mysql">
  <driver-class>com.mysql.jdbc.Driver</driver-class>
  <xa-datasource-class>com.mysql.jdbc.optional.MysqlXADataSource</xa-datasource-class>
</driver>
```

**2. Restart the Data Server, and**

**3. In the Data Server Console, create a new mysql data connection and generate the VDB**

Data Source Details

Data Source: MySQL  
Type:  
Data Source Name: saikila  
Connection URL: jdbc:mysql://localhost:3306/saikila  
User Name: root  
Password: \*\*\*\*\*  
 Test Connection

Generate VDB

Please enter VDB information.  
It is recommended to test that selected connection(s) are valid before generating a VDB based upon them.

VDB Name\*: MySQLtest  
Model Name\*: MySQLtest  
Group Name\*: MySQLtest  
Schema Name\*: saikila  
Translator\*: mysql

Generate Close

Figure 45: Steps for Adding a 3rd Party Data Source (MySQL)

JDBC Driver Download Locations for Common Databases is a handy reference for other JDBC drivers, and “Where Are the Generated VDBs?” on page A-41 explains where all generated VDBs are located. “Data Source Attributes” on page A-42 is provided in Appendix A.

## Enabling CDS Data Source in DataServer

The DataServer provides a built-in PowerHub Translator, but it is currently disabled. To enable the Translator (for CDS access), follow the steps below:

1. Stop the DataServer service.
2. Edit **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\dsdsConsoleConfig.properties** and uncomment below lines (remove the #):

```
#phub.attributes=jdbcUrl(jdbc:scwapi:client_id=DSDS
_only_valid_for_landmark) ,

encryptPassword(false), displayName(PowerHub), translator(powerhub), isLGC(true) ,

/vdbNames(Powerhub)

#phub.properties=server_path(// [SERVER_NAME] \ : [PORT]
]/[DICTIONARY]) {required} ,

ph_user{requiriedhidden}, ph_password{requiriedhidden}
, datamodel(CDS5000) {required} ,

database{required}, db_user{required}, db_password{re
quired secret} ,

IS_DATA_SERVER(true) {hidden}

#model.versions.phub=[{phub, CDS5000, 5000.8.3, 1,
true}]
```

3. Edit **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\standalone-dsds.xml** and add the following line in the <drivers> section:

```
<driver name="phub" module="com.lgc.phub.client"/>
```

4. Start the DataServer service.
5. From the DataServer Console, add a CDS data source connection and select **PowerHub** as its driver. Then fill out the connection information for the CDS data source.

## 6. Generate a dynamic VDB.

Steps #5 and #6 above are illustrated in Generating Dynamic VDB for the CDS Data Source, as Steps #1 - #3.

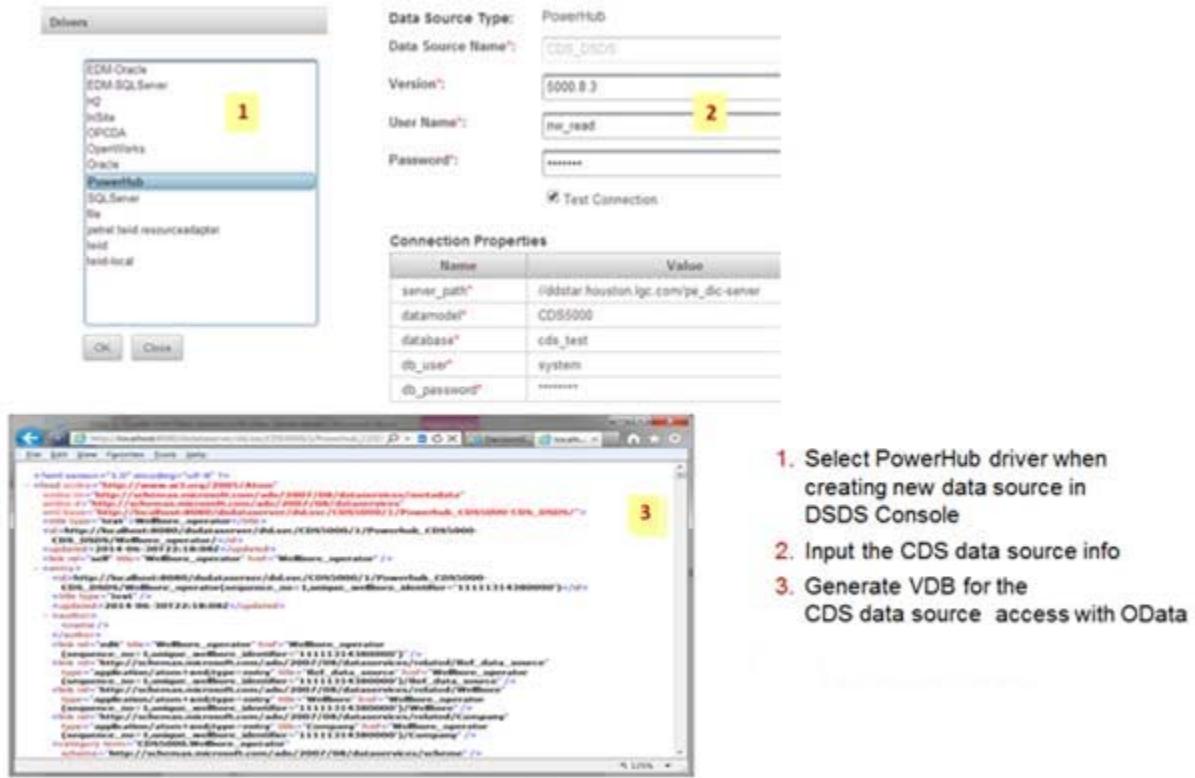


Figure 46: Generating Dynamic VDB for the CDS Data Source

## Deploying PDM and PPDM VDBs

- The DataServer provides two (2) standard VDBs in **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\artifacts\v dbs**
  - PPDM ' ppdm.vdb (3.7 and 3.8 PPDM)
  - PDM ' dspm.vdb (PPDM subset: well master, production, some drilling)

- The JNDI (**connection-jndi-name**) in the data source connections must match the ones specified in the VDBs.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<vdb name="PPDM" version="1">
  <property name="preview" value="false"/>
  <node1 name="PPDM_Oracle" type="PHYSICAL" visible="true" path="/OSDS_Sample/sources/PPDM_Oracle.xmi">
    <property name="checksum" value="3528367370"/>
    <property name="modelClass" value="Relational"/>
    <property name="builtIn" value="false"/>
    <property name="indexName" value="3528015977.INDEX"/>
    <source name="PPDM_Oracle" connection-jndi-name="java:/PPDM_ORACLE" translator-name="PPDM_Oracle_oracle"/>
  </node1>
  <translator name="PPDM_Oracle_oracle" type="oracle" description=""/>
</vdb>
```

---

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<vdb version="1" name="dspn">
  <property value="false" name="preview"/>
  <node1 visible="false" type="PHYSICAL" name="DSPNSrc" path="/Teiid-Designer/DSPNNew/sources/DSPNSrc.xmi">
    <property name="supports-multi-source-bindings" value="true"/>
    <property name="multisource.columnName" value="TEIID_MULTI_DATA_SOURCE_COLUMN"/>
    <property value="3507611204" name="checksum"/>
    <property value="Relational" name="modelClass"/>
    <property value="false" name="builtIn"/>
    <property value="1892968640.INDEX" name="indexName"/>
    <source translator-name="sqlserver" connection-jndi-name="java:/dspn" name="dspn"/>
  </node1>
  <node1 visible="true" type="VIRTUAL" name="DSPNVView" path="/Teiid-Designer/DSPNNew/views/DSPNVView.xmi">
    <property value="571613309" name="checksum"/>
    <property value="Relational" name="modelClass"/>
    <property value="false" name="builtIn"/>
    <property value="983794657.INDEX" name="indexName"/>
    <property value="/Teiid-Designer/DSPNNew/sources/DSPNSrc.xmi" name="imports"/>
    <validation-error severity="WARNING">The model extension definition &quot;relational&quot; found in model is a different version than the one in the registry.</validation-error>
    <validation-error severity="WARNING">The model extension definition &quot;rest&quot; found in model is a different version than the one in the registry.</validation-error>
  </node1>
</vdb>
```

ppdm.v  
..

pdm.vd  
..

---

## Exercise # 2: Add a 3rd Party Data Source (MySQL) to the DataServer

---

### **Purpose of the Exercise**

The purpose of the exercise is to show how to configure the DataServer to recognize and access a new type of data source.

### **Outcome of the Exercise**

After DSDS is configured, DSDS Console can be used to connect to MySQL data source and to generate a dynamic VDB for it. Prove data access is working by accessing the data service or with JDBC.

### **Exercise Workflows**

- a) The MySQL sakila database is already installed
- b) Make sure the MySQL55 service is started
- c) Stop DSDS service
- d) Modify DSDS to recognize this data source
- e) Start DSDS service
- f) Start DSDS Console to create data connection and generate the VDB
- g) Access the sakila data using OData (browser) or JDBC protocol (Squirrel).

- 1. Stop DSDS service**
- 2. Configure DSDS to connect to MySQL database**
  - a) Create folders in DSDS installation:  
C:\Landmark\DecisionSpace Integration Server

5000.10.4.0\ApplicationServer\modules\system\layers\base\com\mysql\main

- b) Add MYSQL driver and module.xml to the...\\mysql\\main folder created above:

Copy the **module.xml** file

- From: **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\docs\teiid\datasources\mysql\modules\com\mysql\main**
- To: **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\modules\system\layers\base\com\mysql\main**

Copy MySQL driver mysql-connector-java-5.1.5.jar

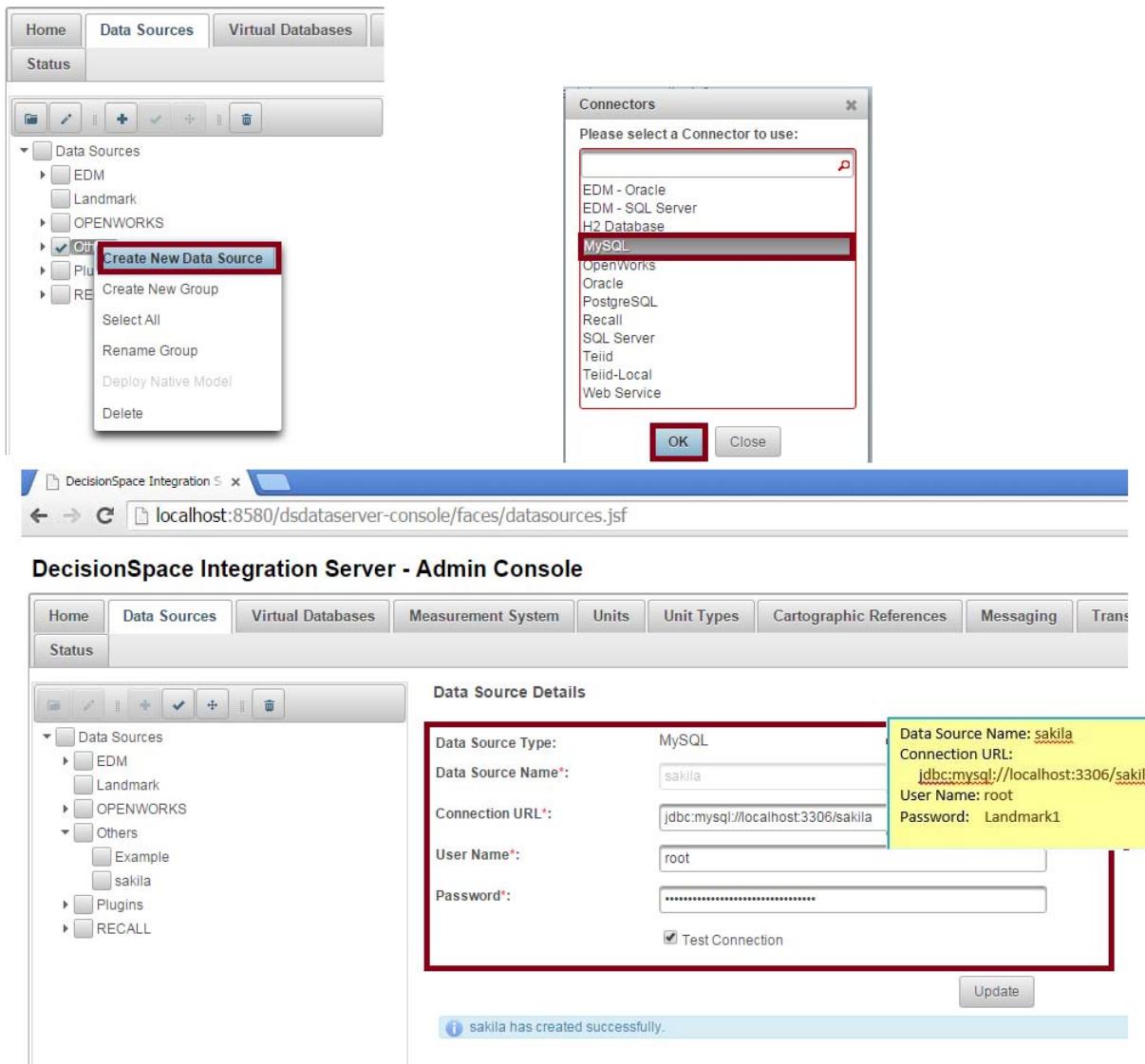
- From: **C:\Training\DS**
  - To: **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\modules\system\layers\base\com\mysql\main**
- c) Create a backup copy of the **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\standalone-dsds.xml** file
- d) Modify **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\standalone-dsds.xml** to add MYSQL driver, and save:

- Add below lines inside the **<drivers>** section of the standalone-dsds.xml file. Add manually or cut and paste from **C:\Training\DS\MySQLDriver.txt**

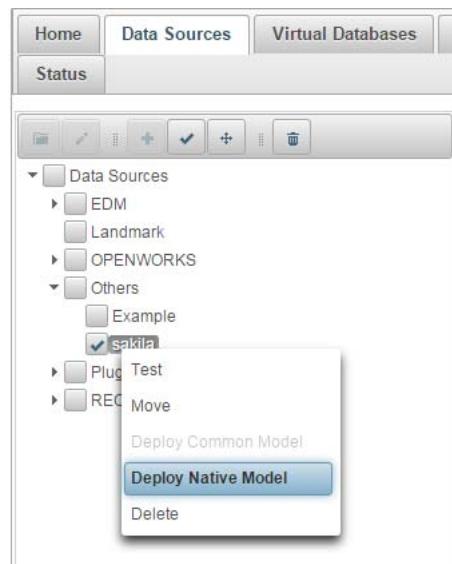
```
<driver name="MySQL" module="com.mysql">  
  <driver-class>com.mysql.jdbc.Driver</driver-class>  
  <xa-datasource-class>com.mysql.jdbc.jdbc2.optional.MysqlXADataSource</xa-datasource-class>  
</driver>
```

### 3. Restart the DS service

#### 4. Start the DSDS Console: create a new data source with MySQL driver



## Generate the VDB



**Generate VDB**

Please enter VDB information.  
It is recommended to test that selected connection(s) are valid before generating a VDB based upon them.

VDB Name*:	MySQLTest
It is name of your virtual database(VDB).	
Model Name*:	MySQLTest
It is name of your virtual model.	
Name*:	MySQLTest
It is a logical name to group same models.	
Schema Name*:	sakila
It is the name of your actual database schema	
Translator*:	mysql
Select translator corresponding to the type of your actual data source.	
<b>Generate</b> <b>Close</b>	

## Check the VDB deployment

The screenshot shows the 'Virtual Databases' section of the Admin Console. The MySQLTest VDB is highlighted with a red border. The table columns are: VDB Name, Version, Teiid JDBC Url, Dynamic, Status, and Actions.

VDB Name	Version	Teiid JDBC Url	Dynamic	Status	Actions
DSDDataTransfer	1	jdbc:teiid:DSDDataTransfer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
EDM_SQLServer	5000.1.10	jdbc:teiid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
EDM_SQLServer	5000.1.13	jdbc:teiid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=3	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
EdmCommonModel	5000.1.13	jdbc:teiid:EdmCommonModel@mm://AHGESCTX04.AHNAO.PRI:31500;version=3	false	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
MySQLTest	1	jdbc:teiid:MySQLTest@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
recall	1	jdbc:teiid:recall@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	LOADING	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
RecallCommonModel	1	jdbc:teiid:RecallCommonModel@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	false	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>

### 5. Access sakila data

<http://localhost:8180/dsdataserver/dsl.svc/MySQLtest/1/MySQLtest-sakila/film>

## DataServer Design Studio

The DataServer Design Studio is an Eclipse-based graphical modeling tool for modeling, analyzing, integrating, and testing multiple data sources to produce Relational, XML, and Web Service views that expose business data. Design Studio provides for easy federation and transformation of data sources, quick definition of data services, and easy to maintain and reuse resulting artifacts. DataServer Design Studio / Teiid Designer Environment depicts the DataServer Design Studio within its environment:

- Extracting Metadata from its data sources
- Producing VDB output that:
  - Behaves like standard JDBC DB schema: can be connected to, queried, and updated
  - Can act as sources to other view model transformations (reusable components)
  - Is a zip archive; file extension is .vdb
- When the VDB is deployed, the metadata is consumed by Teiid to create the necessary runtime metadata
- The Teiid Runtime in turn issues source specific queries

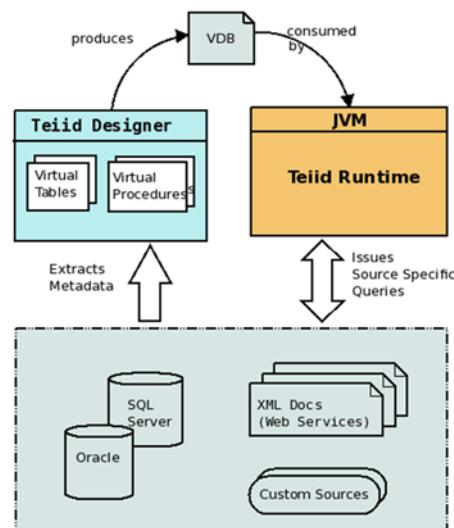


Figure 47: Data Server Design Studio / Teiid Designer Environment

## Starting DataServer Design Studio

The DataServer Design Studio can be launched from:

- Extract DSIS\_Installer\TeiidDesigner9.0.2.zip
- Run TeiidDesigner9.0.2\eclipse.exe

## GUI Components

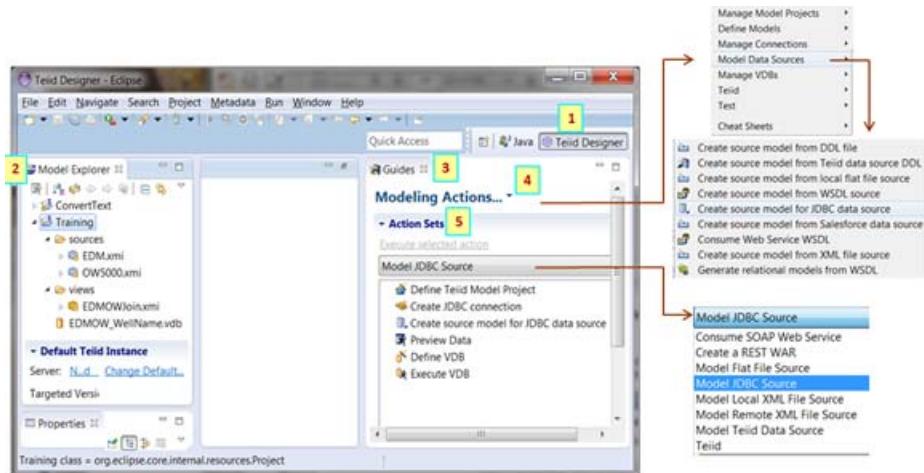


Figure 49: Data Server Design Studio's (Teiid Designer's) Eclipse Perspective

1. **①** To switch into the DataServer Design Studio's perspective within the Eclipse IDE, select “Teiid Designer”.
2. **②** The Model Explorer provides a file-structured view of models and resources within projects.
3. **③** Guides View provides wizard-like steps (and cheat sheets) for many common modeling tasks.
4. **④** Modeling Actions group together all of the actions to accomplish a task.
5. **⑤** Action Sets groups related actions.

## Workflow for Modeling a JDBC Data Source

1. Define Teiid Model Project
2. Create JDBC connection to the data source
3. Create source model for data source

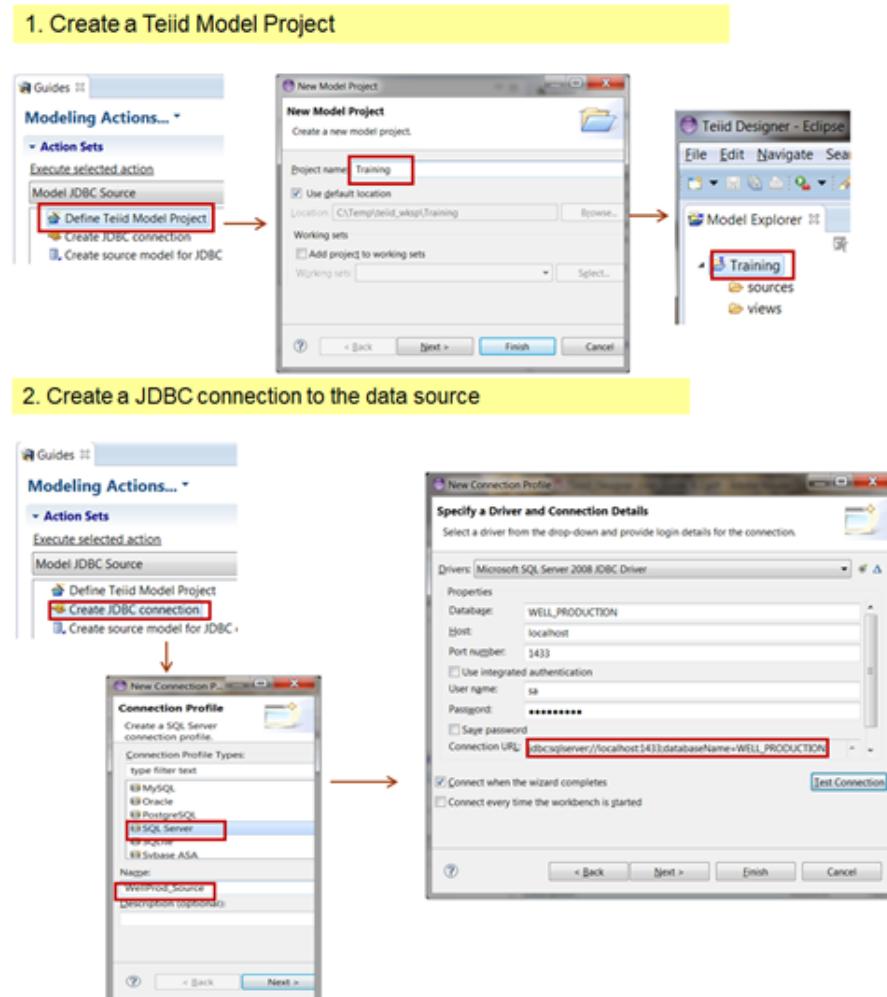
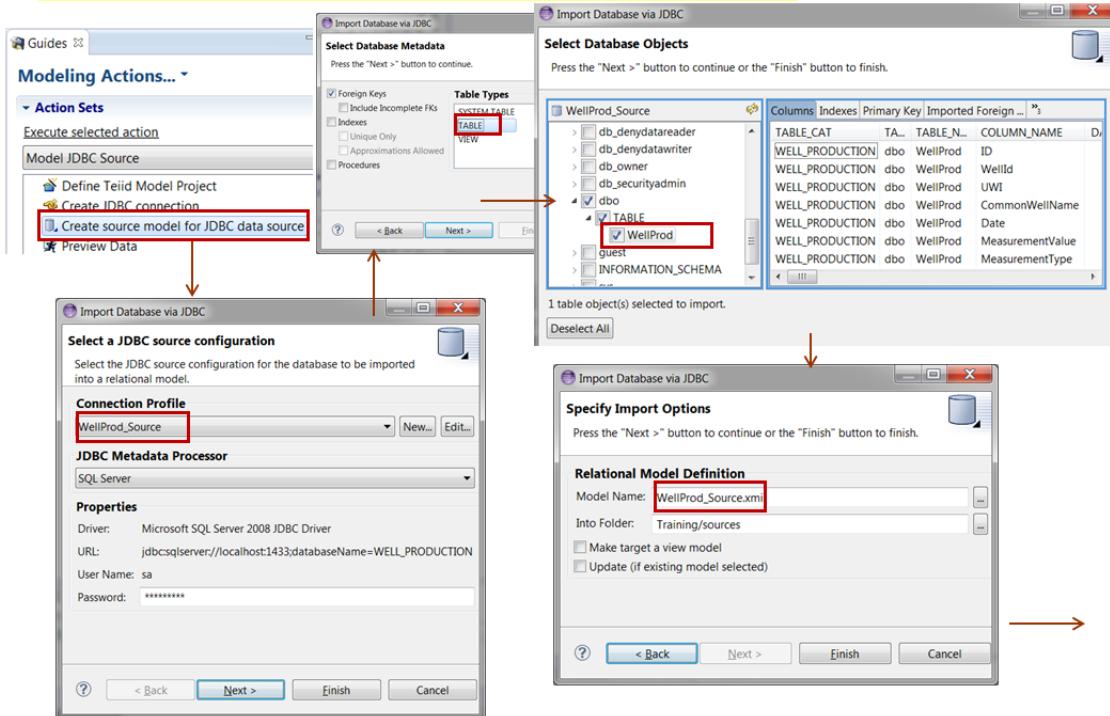


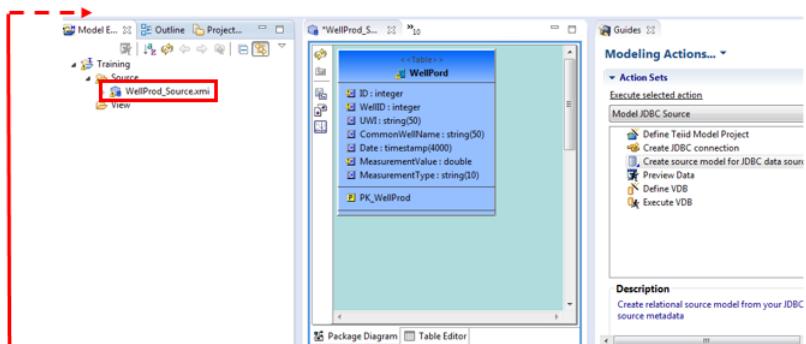
Figure 50: Workflow for Modeling a JDBC Data Source (cont'd through "5. Generate the VDB")

4. Create a view model
5. Create VDB
6. Deploy VDB

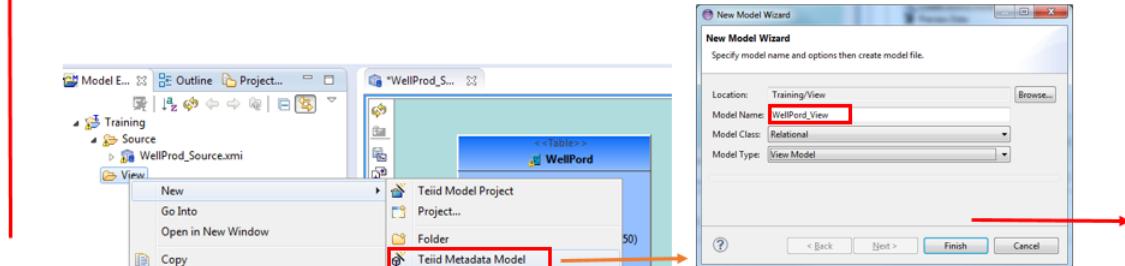
### 3. Create a source model for the data source



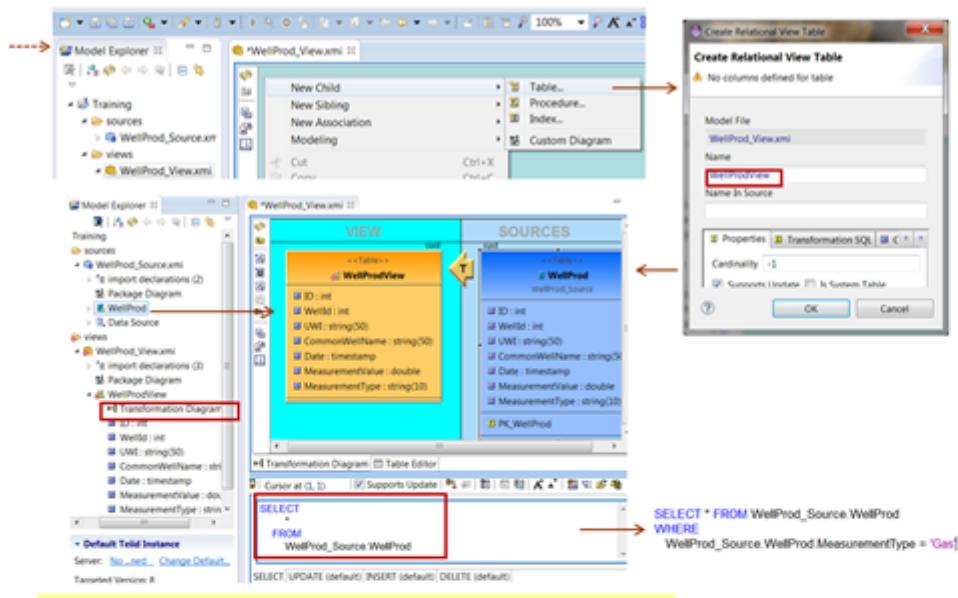
### 3. Create a source model for the data source



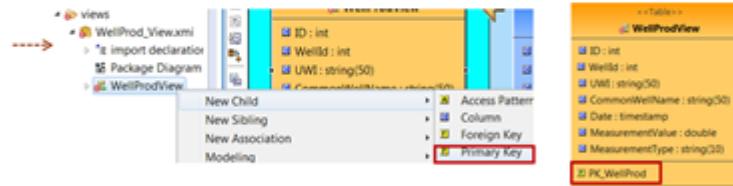
### 4. Create a view model



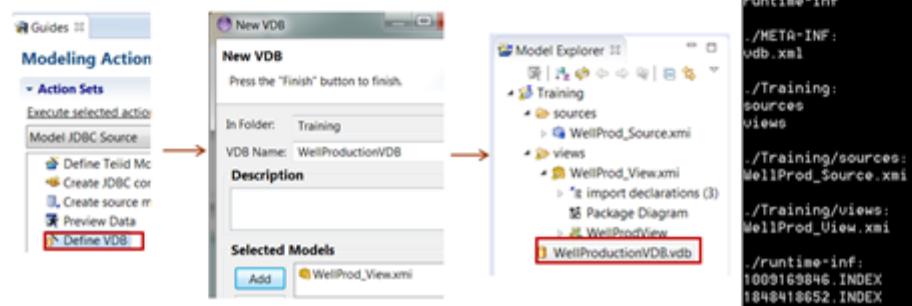
#### 4. Transform the view model



#### Create a primary key for the view table



#### 5. Generate the VDB



## Writing to a Database with an **IDENTITY** Column

The **IDENTITY** column is a field in a database table that contains a value generated by the database (e.g., “AutoNumber” in MS Access, “Sequence” in Oracle). To enable write access (OData) to a table defined with the **IDENTITY** column, the DataServer requires a procedure named **nextval**<sup>11</sup> to be defined.

The virtual procedure, **nextval**, contains logic to return the next sequence number:

- **nextval** is called by the DataServer to insert a new record; thus, the OData client does not need to know the next sequence id
- **nextval** can be implemented in a custom Translator
- **nextval** can be implemented in the view model using Teiid Designer

---

11. This procedure will be covered in more detail in a subsequent programming course for the DataServer.

---

## Exercise # 3: Create a Standard VDB for Cross-reference EDM and OW Well Tables

---

### **Purpose of the Exercise**

The purpose of the exercise is to show how to use the DataServer Design Studio to create a federated view model from multiple data sources.

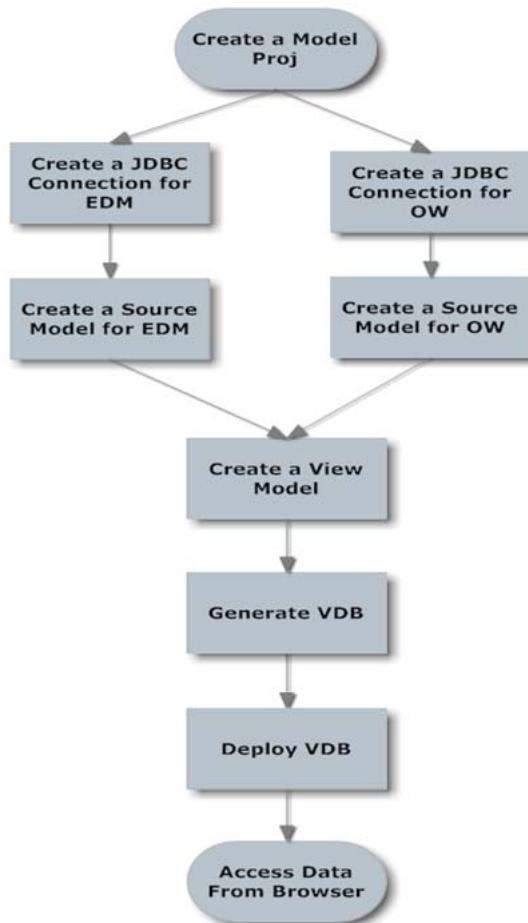
### **Outcome of the Exercise**

Access the federated data from both OW and EDM data sources as a single entity after successful creation and deployment of the federated model.

### **Exercise Workflows**

- Start the database services (Oracle and MS SQL Server) if not already started
- Start the DSIS service if not already started
- Ensure that OpenWorks and EDM deployments in DSIS are active
- Ensure the JAVA\_HOME environment variable is defined (to run Teiid Designer)
- Launch the DecisionSpace Design Studio (Teiid Designer) tool and create a federated view model VDB
- Deploy the federated VDB into DSDS
- Access the federated VDB using OData (browser) or JDBC protocol (Squirrel)

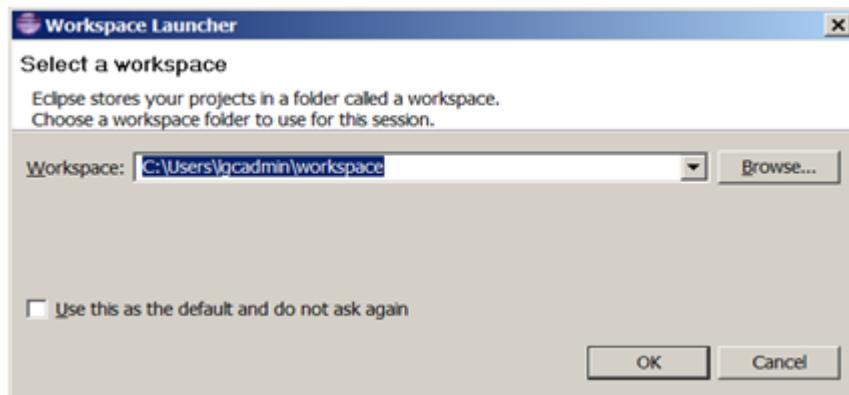
Workflow diagram for creating a federated view model from EDM and OW Data Sources.



**1. Open the DecisionSpace DataServer Design Studio (Teiid Designer)**

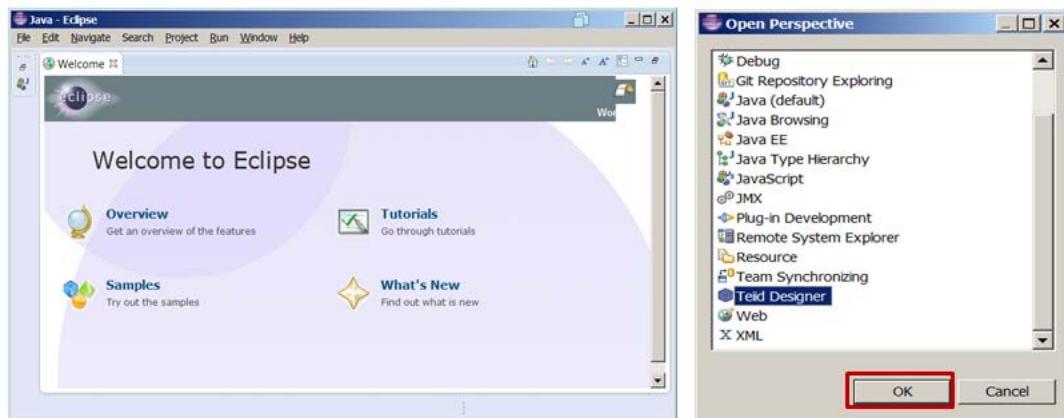
**Run DSIS\_INSTALLER\TeiidDesigner9.0.2\eclipse.exe.**

Accept the default workspace or change it to another folder.

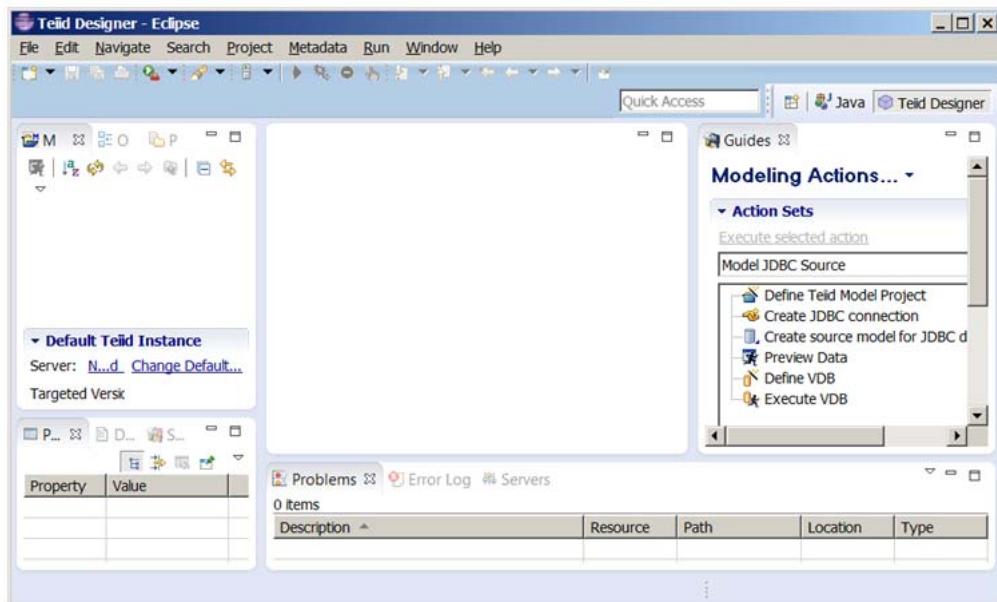


If this is the first time that the Eclipse tool is run, the Welcome to Eclipse screen is displayed.

- a) Open a **Teiid Designer** perspective by selecting **Window > Open Perspective > Other...** and then select **Teiid Designer** from the Open Perspective dialog box.

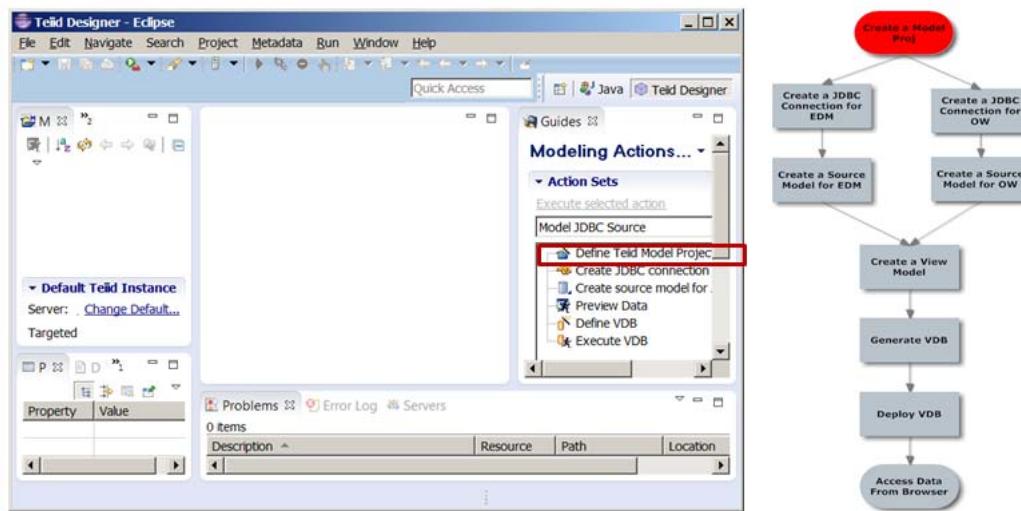


- b) Close the **Welcome** tab to expose the Teiid Designer perspective view.

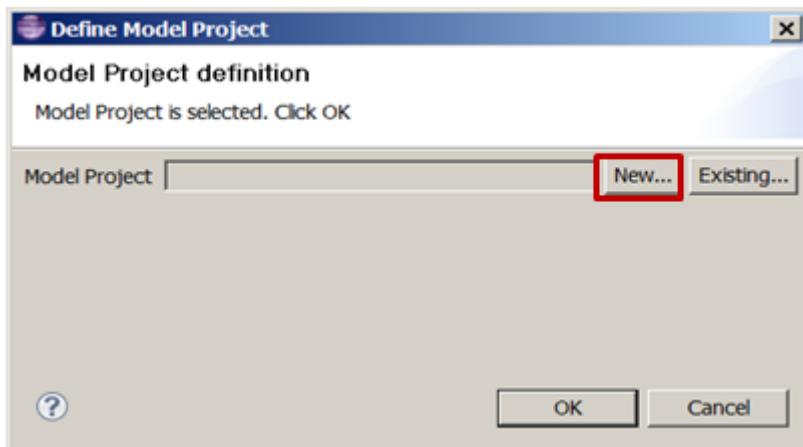


## 2. Create a model project in Teiid Designer

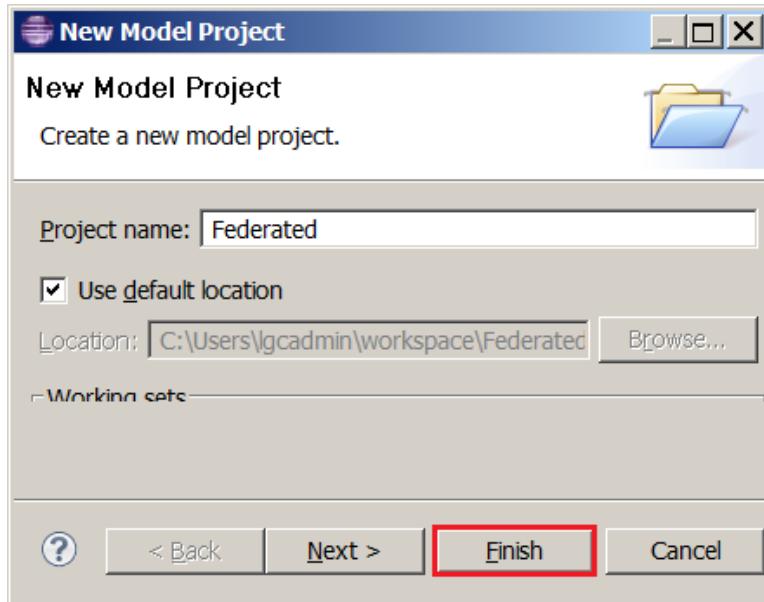
- Double-click the **Define Teiid Model Project** modeling action.



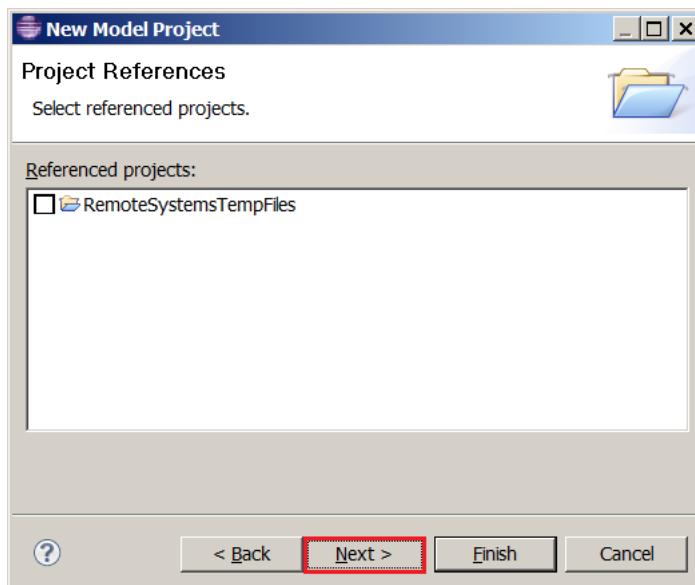
- Click **New** on the Define Model Project dialog box to display the New Model Project dialog box.



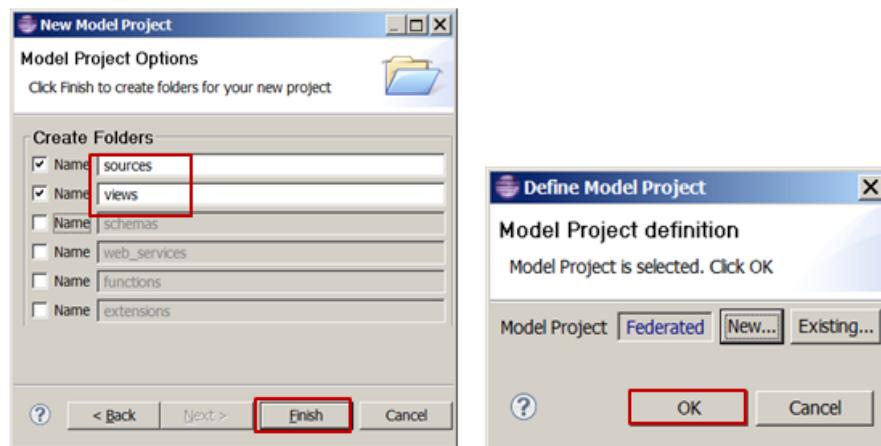
- c) On the New Model Project dialog box, enter the project name (**Federated**) and then click **Next**.



- d) Click **Next** on the Project References dialog box.



- e) In the Model Project Options dialog box, check only sources and views. Click **Finish**.



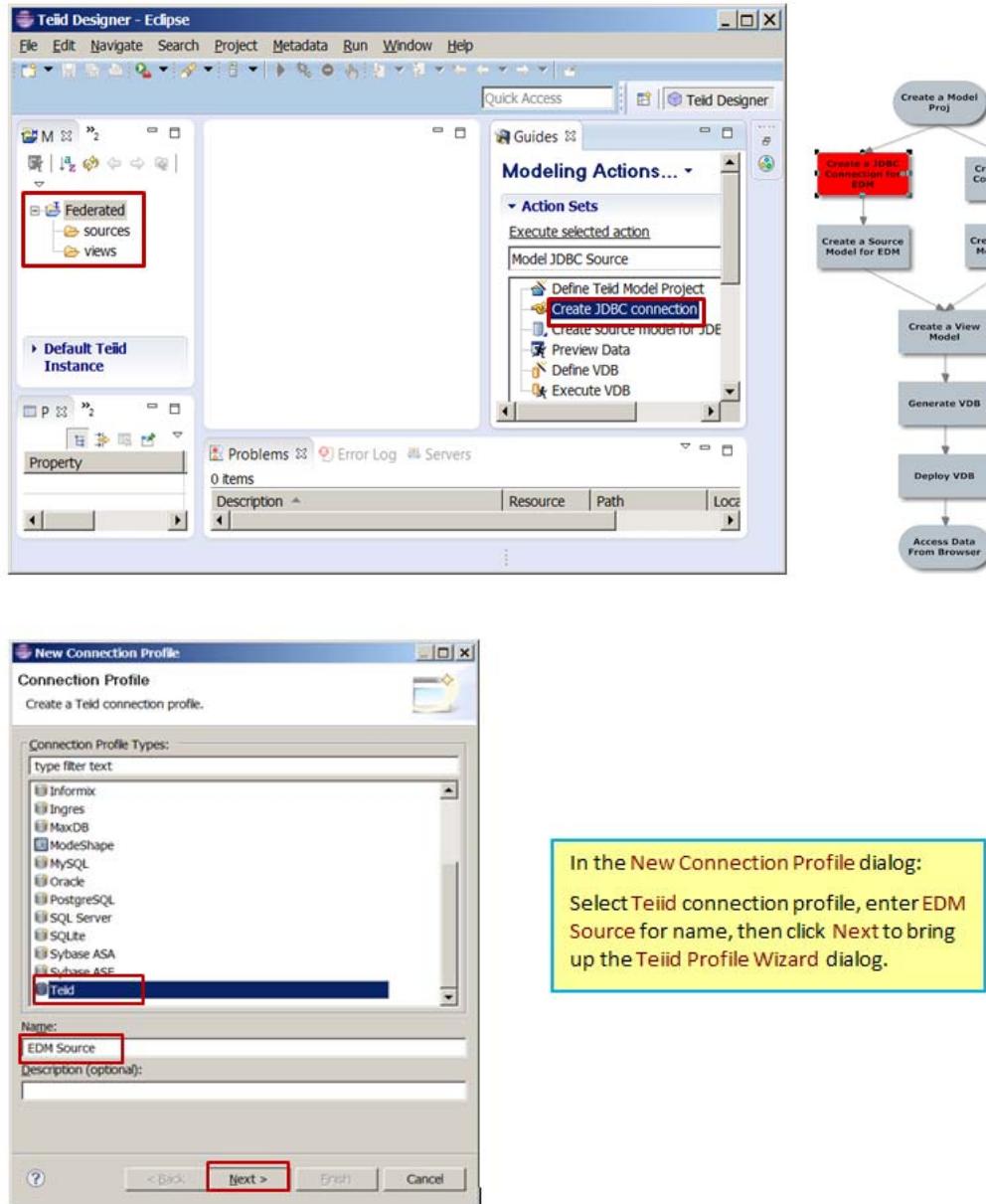
**Note**

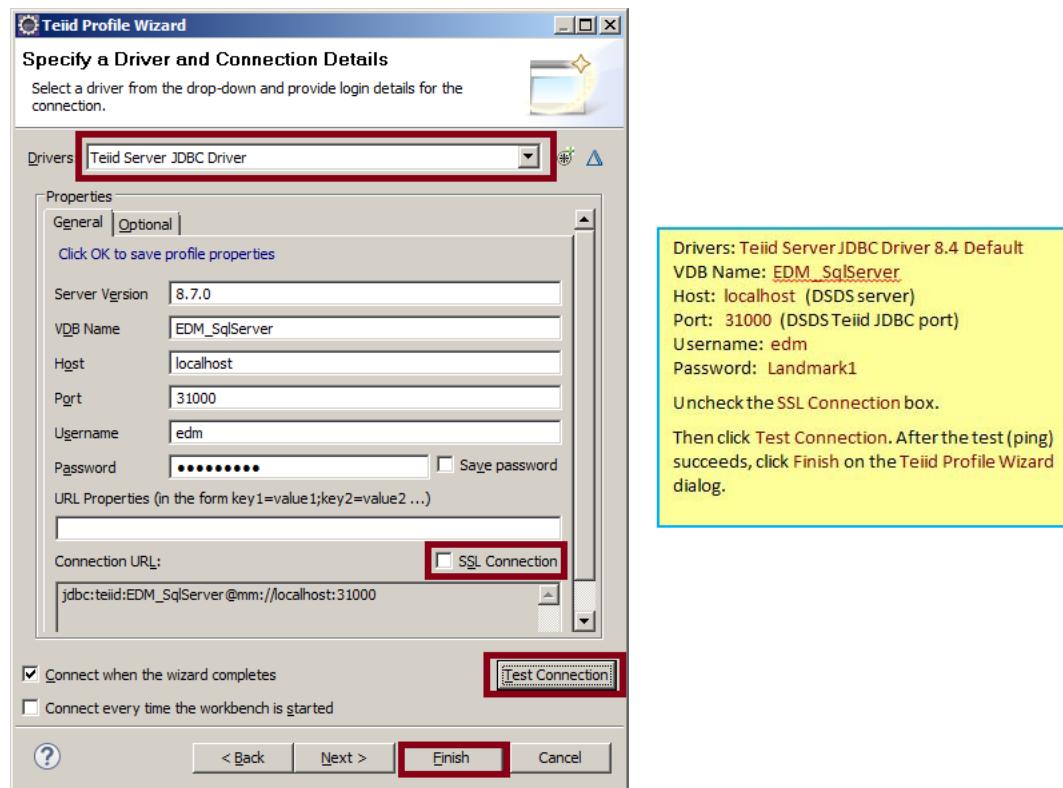
The Federated project is created with the sub-folders: sources and views.

The next step is to create a JDBC connection for a data source.

### 3. Create a JDBC Connection for EDM data source

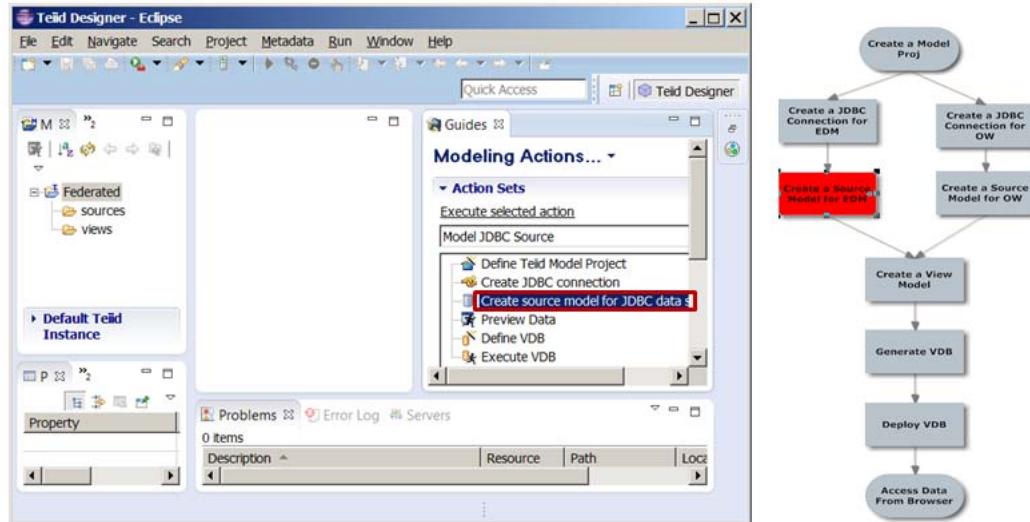
- a) Double-click the **Create JDBC connection** modeling action to display the New Connection Profile dialog box.



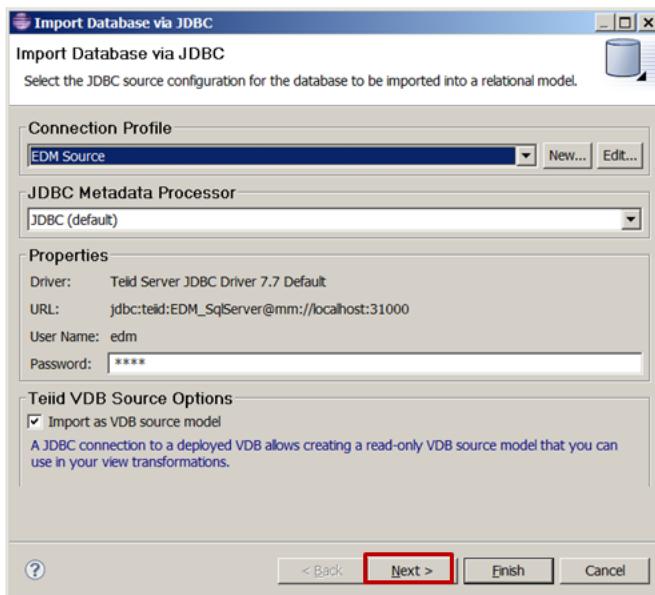


#### 4. Create a Source Model for EDM

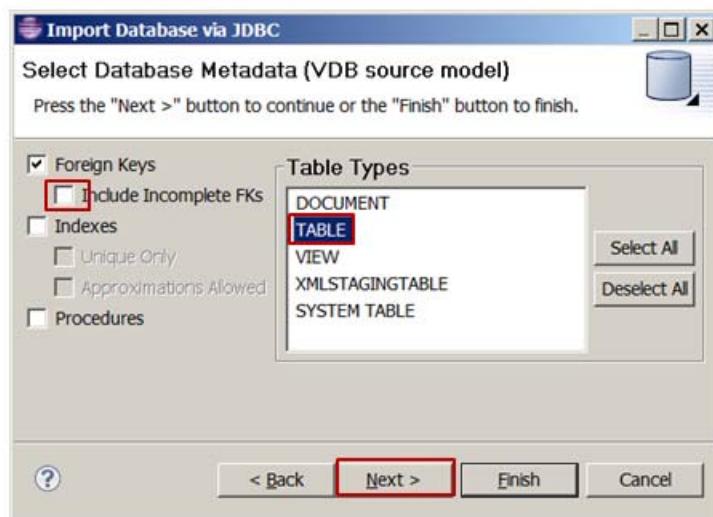
- a) Double-click the **Create Source model for JDBC data source** action to display the Import Database via JDBC dialog box.



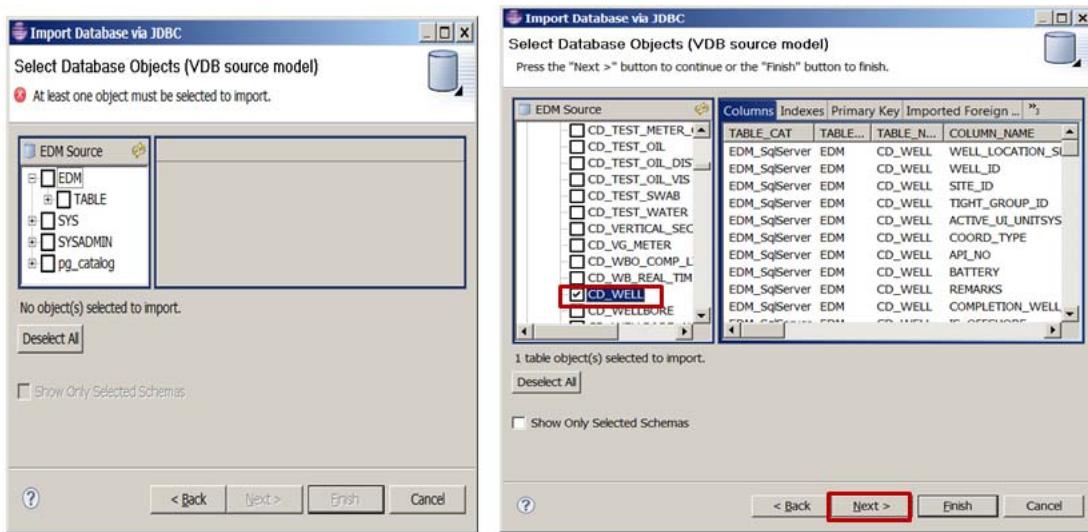
- b) In the Import Database via JDBC dialog box, enter the name of the **Connection Profile** that was created earlier (EDM Source), and then click **Next**.



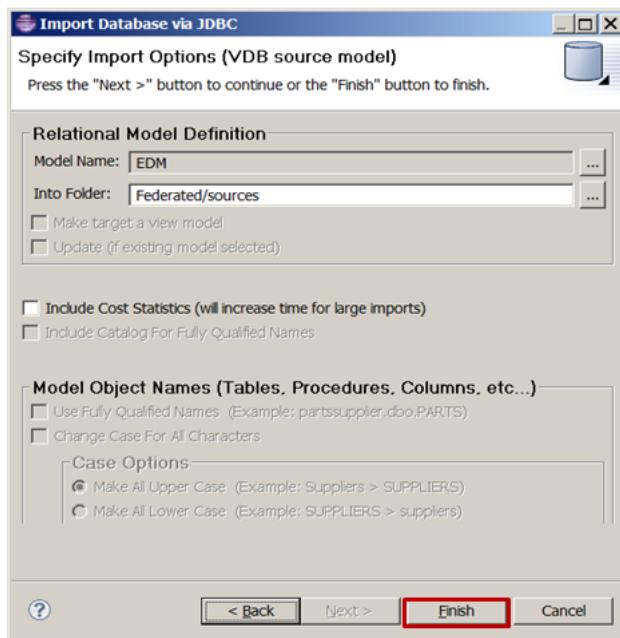
- c) Clear the **Include Incomplete FKs** check box, and then select TABLE from the Table Types and click **Next**.



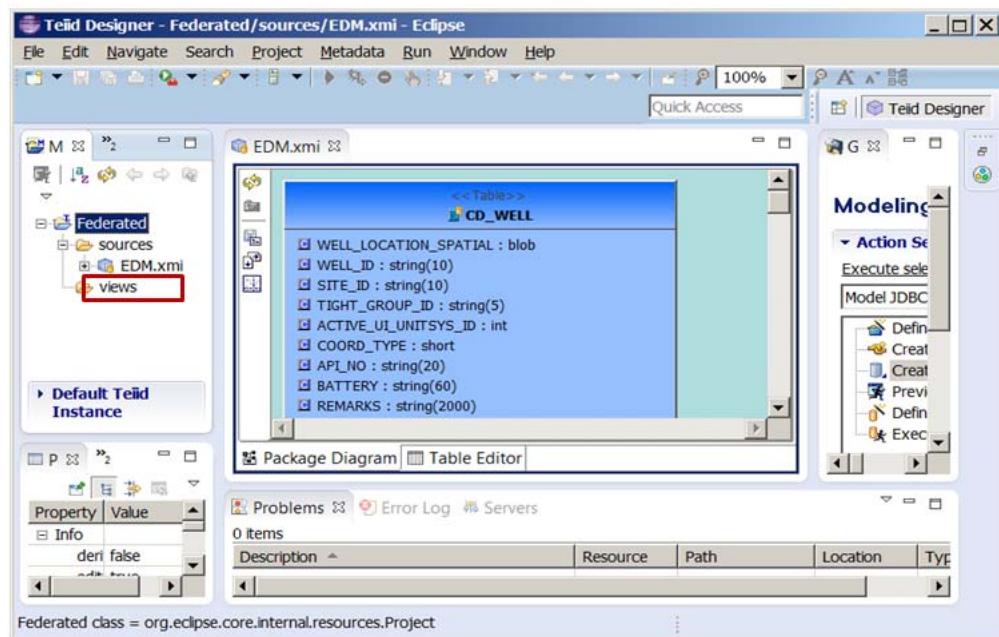
- d) Expand the **EDM > TABLE** tree, and then select the **CD\_WELL** table and click **Next**.



- e) Click **Finish**. The EDM source model **EDM.xmi** is created.

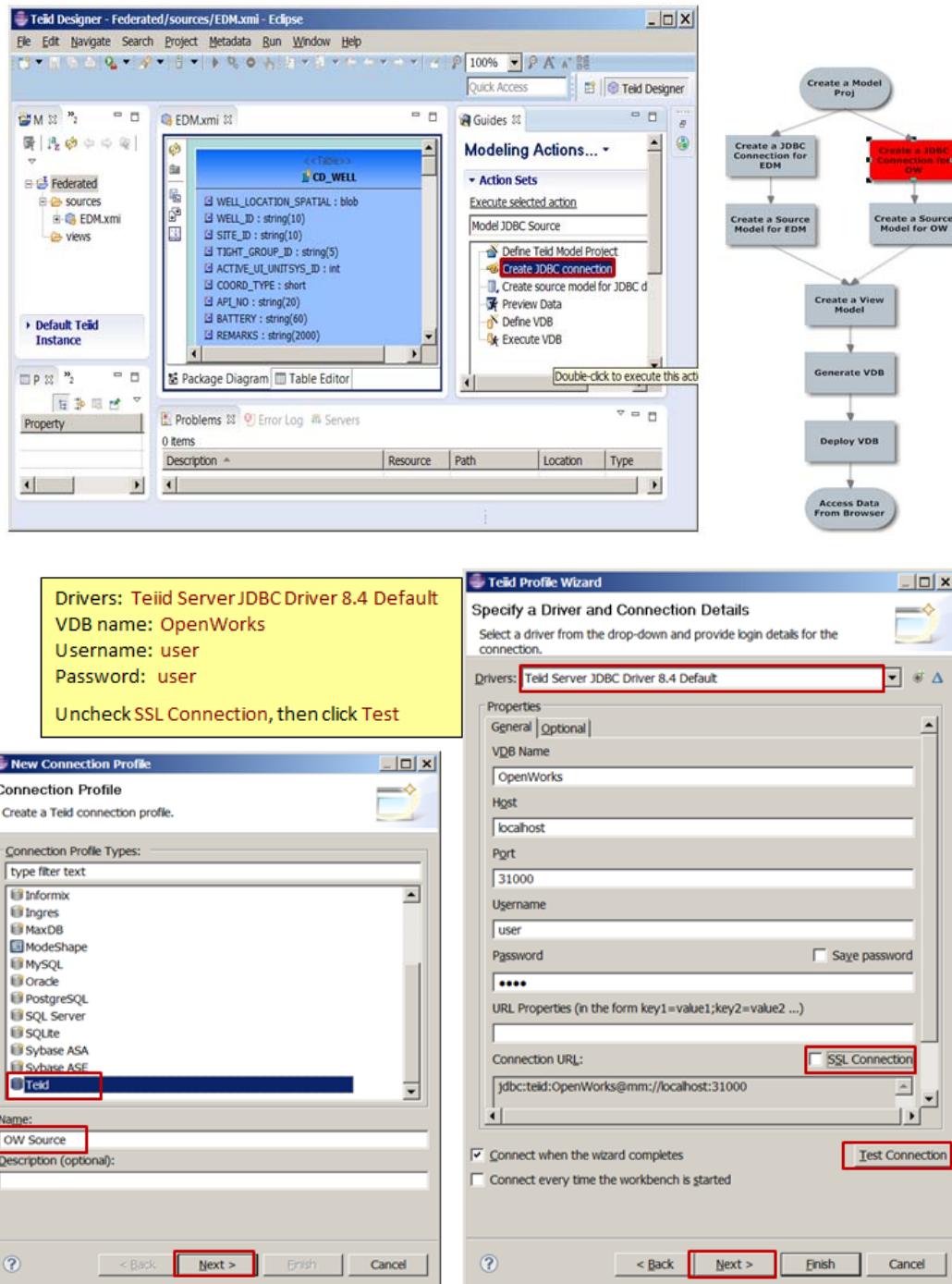


Up to this point, a JDBC connection to EDM and the EDM source model have been created. Now, the same will be done for OpenWorks (create JDBC connection and source model).

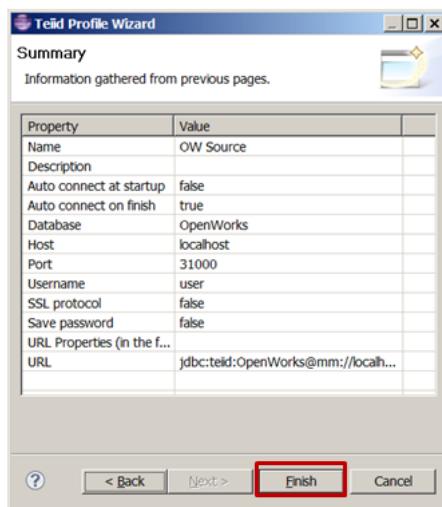


## 5. Create a JDBC Connection for OpenWorks data source

- a) Double-click the **Create JDBC connection** modeling action to display the New Connection Profile dialog box.

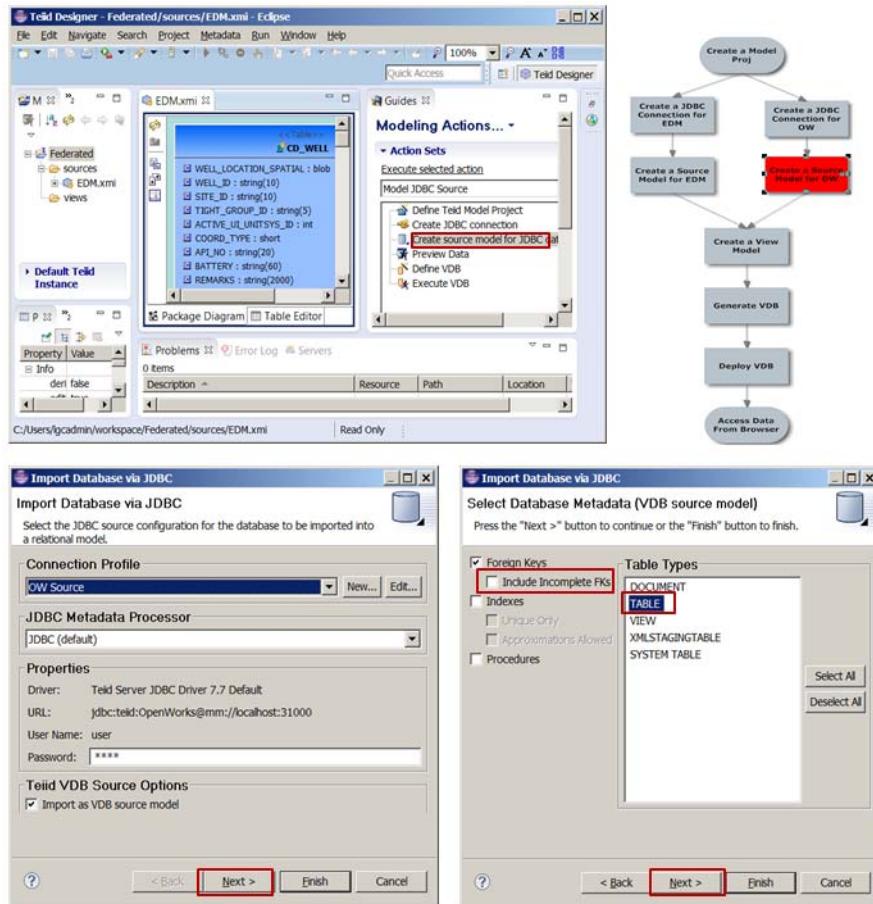


b) Click **Finish**.

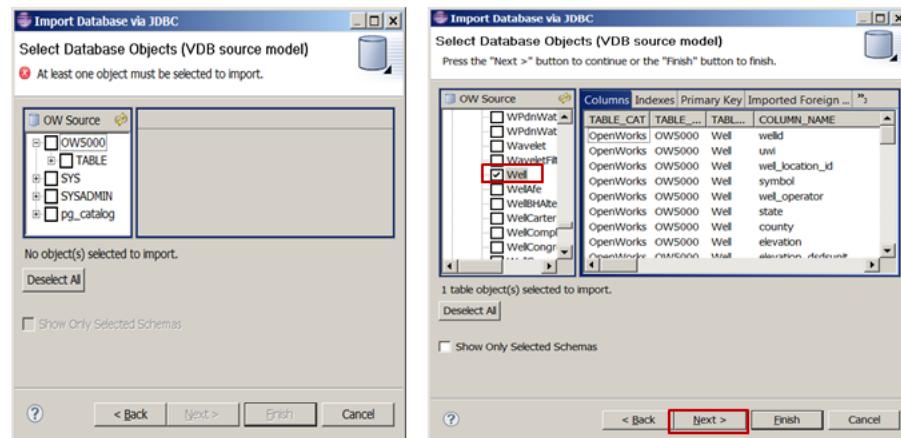


## 6. Create a Source Model for OpenWorks

- a) Double-click **Create Source model for JDBC data source** to display the Import Database via JDBC dialog box.

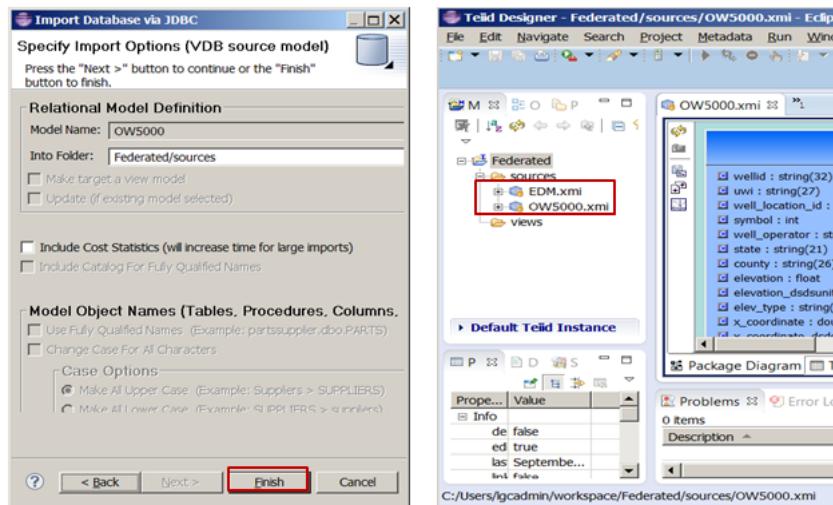


- b) Expand **OW5000 > TABLE** and select **Well** table, and then click **Next**.



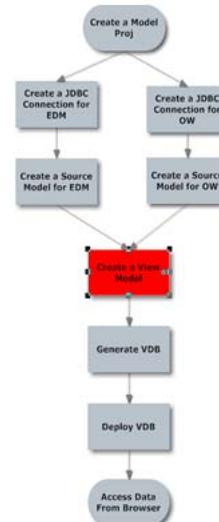
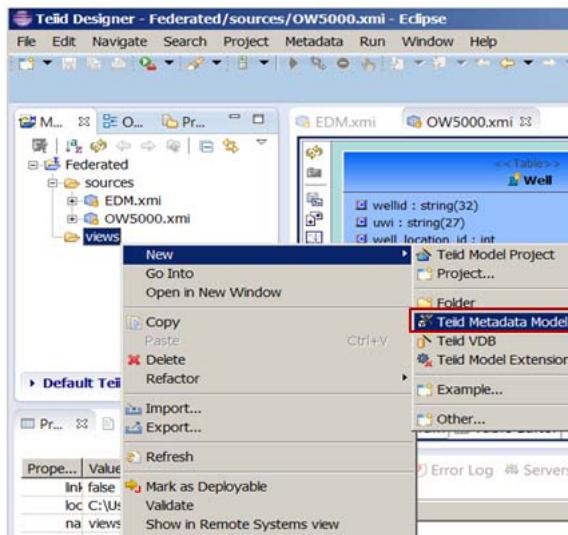
- c) Click **Finish**. The OpenWorks source model **OW5000.xmi** is created.

Source models have been created for EDM and OpenWorks. The next step is to create a federated view from OW and EDM tables.

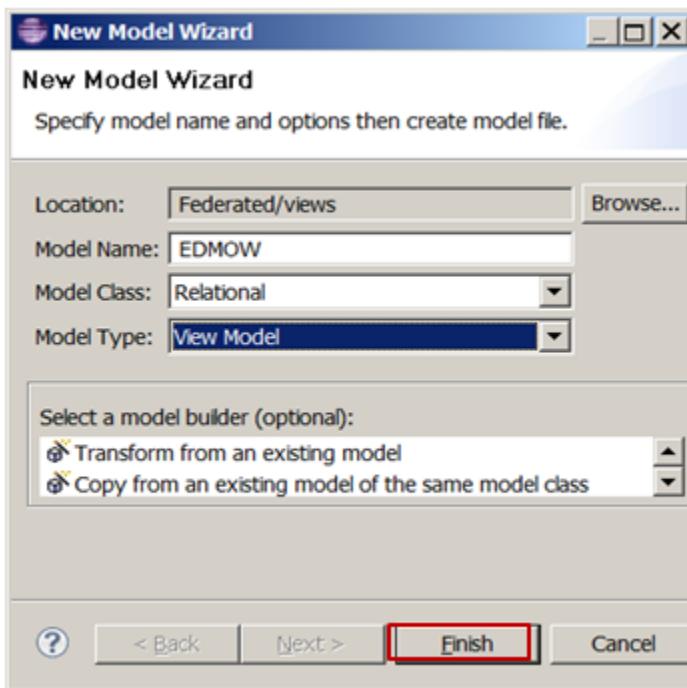


## 7. Create a federated view model

- a) Right-click the **views** and select **New > Teiid Metadata Model** from the context menu.



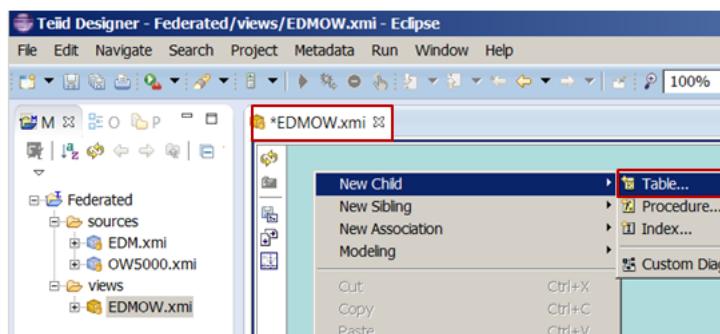
- b) On the New Model Wizard, enter the model name **EDMOW**, and model type **View Model**. Then click **Finish**.



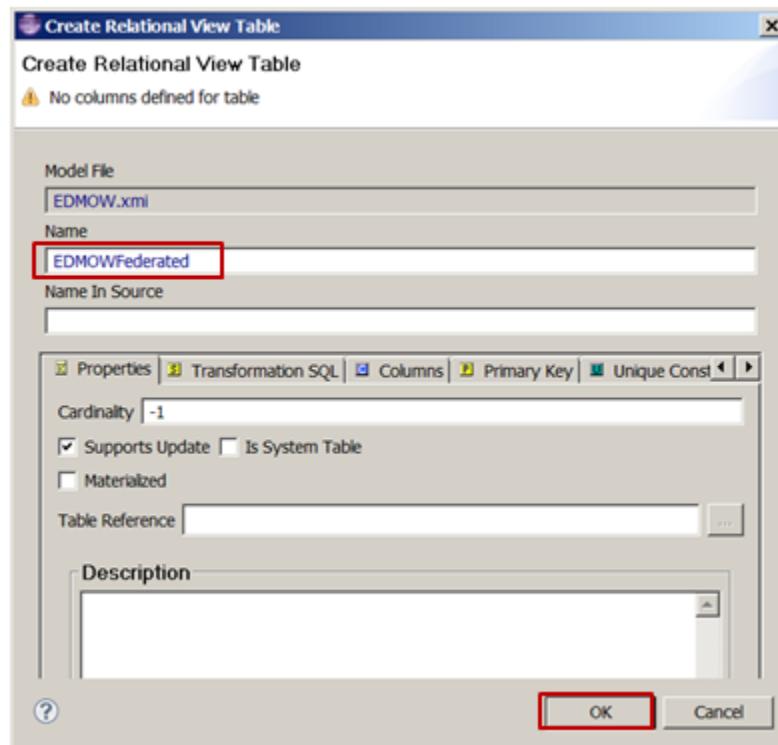
An **EDMOW** View Model has been created for federating OW and EDM well data.

This view is empty now. To populate the view, create a relational view table to see the source tables and the federated view tables.

- c) Right-click **EDMOW.xmi** empty view, select **New Child > Table** to display the Create Relational View Table dialog box.

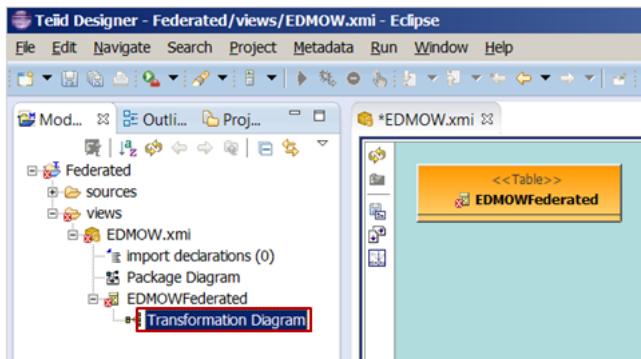


- d) Enter a name for this relational view table (**EDMOWFederated**) and then click **OK**.

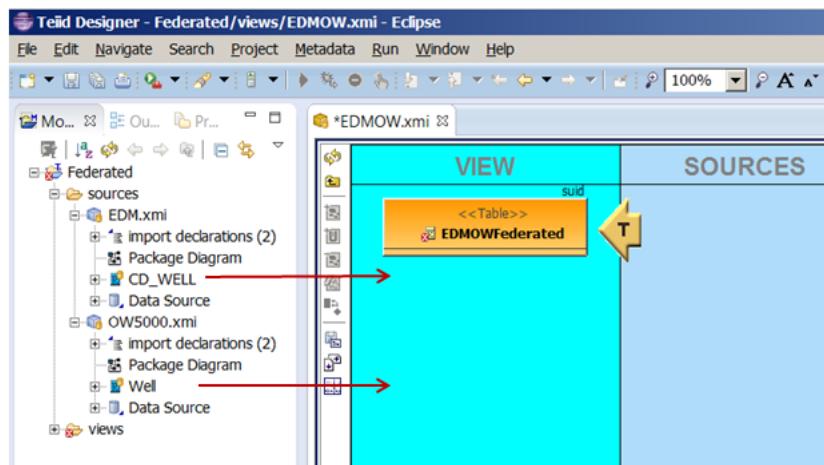


The process of transforming the sources into a federated view can now be started.

- e) Double-click the **EDMOW.xmi** view Transformation Diagram.

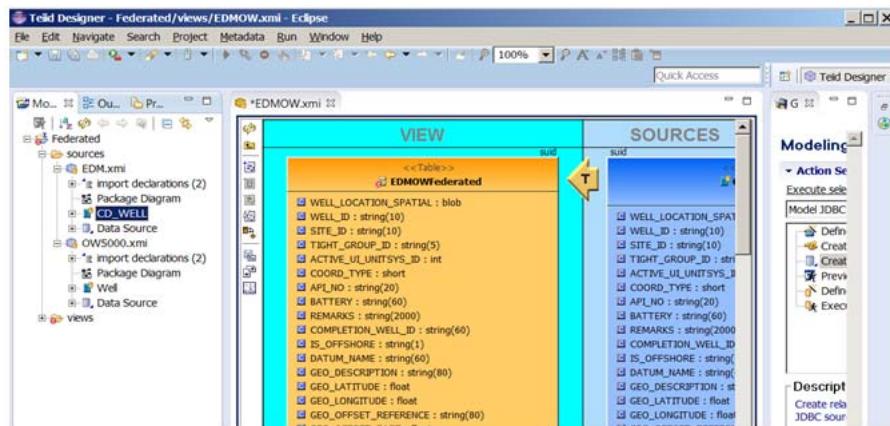


- f) Drag the source tables **CD\_WELL** and **Well** to the **VIEW** area.



The picture below shows the view state after dragging **Sources > EDM.xmi > CD\_WELL** to the **VIEW** area.

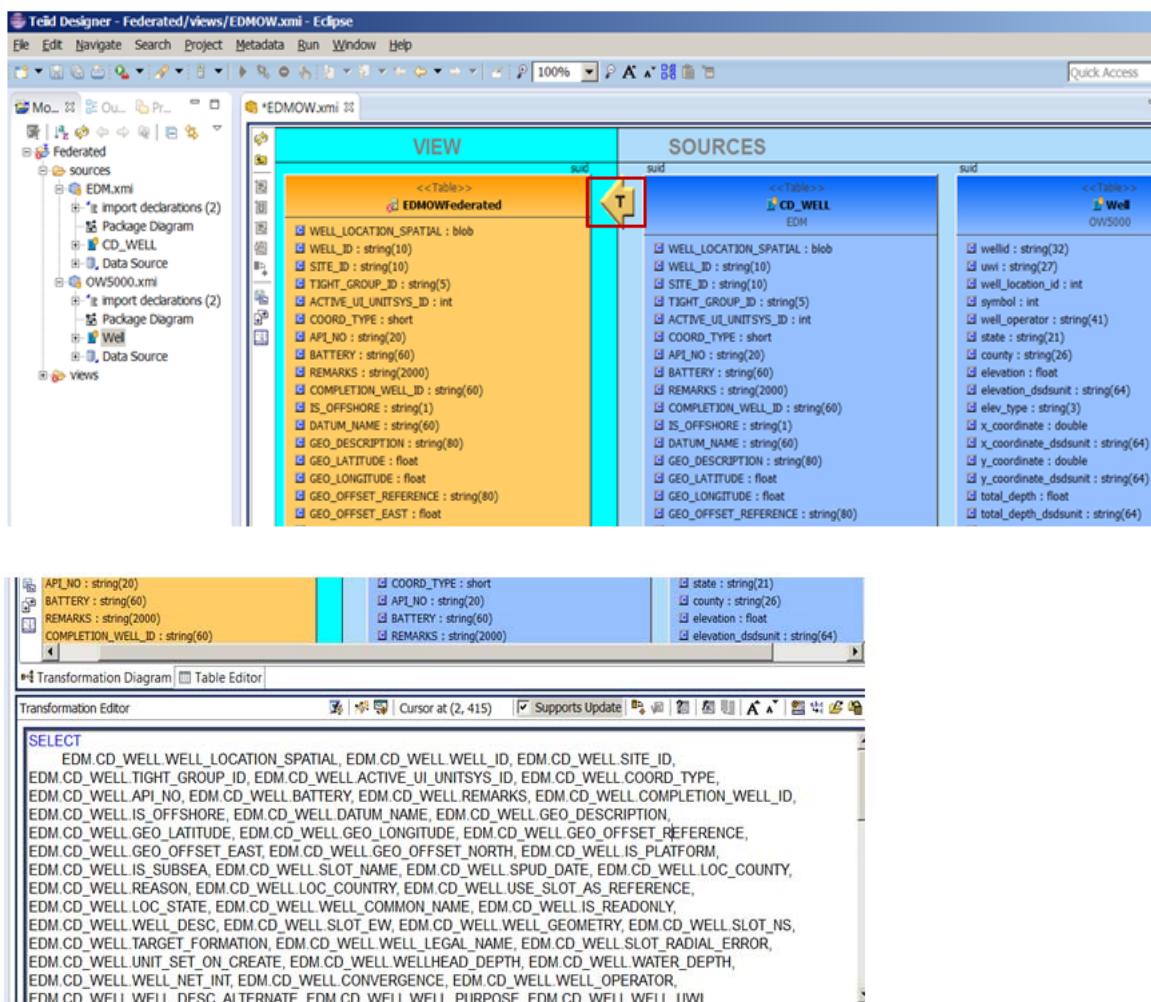
The **EDMOWFederated** table contains the same columns as the **CD\_WELL** table.



The picture below shows the view state after dragging **Sources > OW.xmi > Well** to the **VIEW** area.

The **EDMOWFederated** table now contains columns from **CD\_WELL + Well** tables.

- g) Double-click the **Transform Arrow** button to display the **Transformation Editor** pane. This can be used to edit the SQL join query of the CD\_WELL and Well tables.



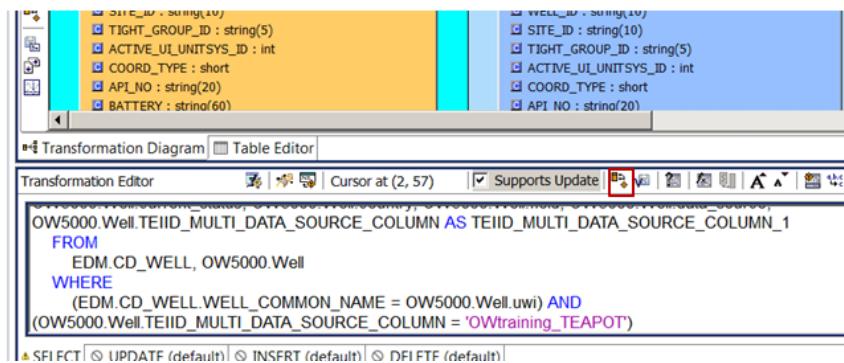
- h) Edit the SQL Query - at the end of the query, add:

```

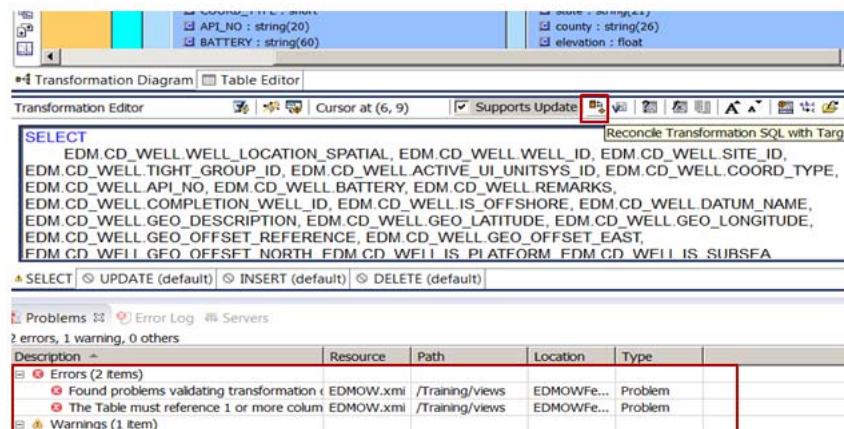
WHERE
(EDM.CD_WELL.WELL_COMMON_NAME=OW5000.Well.uwi) AND
(OW5000.Well.TEIID_MULTI_DATA_SOURCE_COLUMN = 'OWtraining_TEAPOT')

```

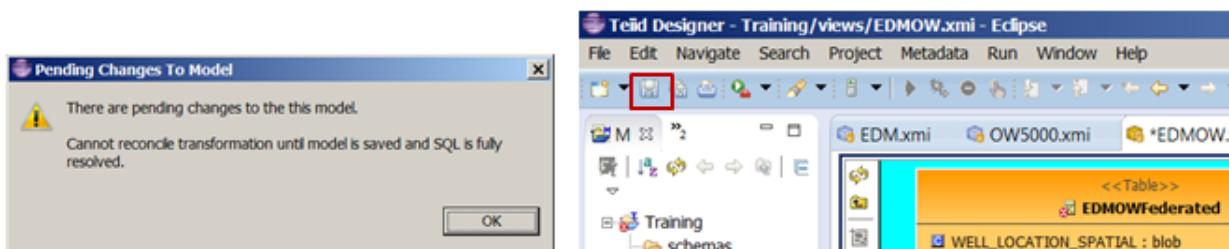
- i) Then click the **Save/Validate SQL** icon.



- j) To fix/reconcile the errors, click the **Reconcile Transformation SQL with Target Columns** icon.



- k) If the Pending Changes To Model dialog box displays, click **OK**. Save the model by clicking the second icon on the Teiid Designer toolbar, then do **Reconcile Transformation** again. The Reconcile Virtual Target Columns dialog box displays.

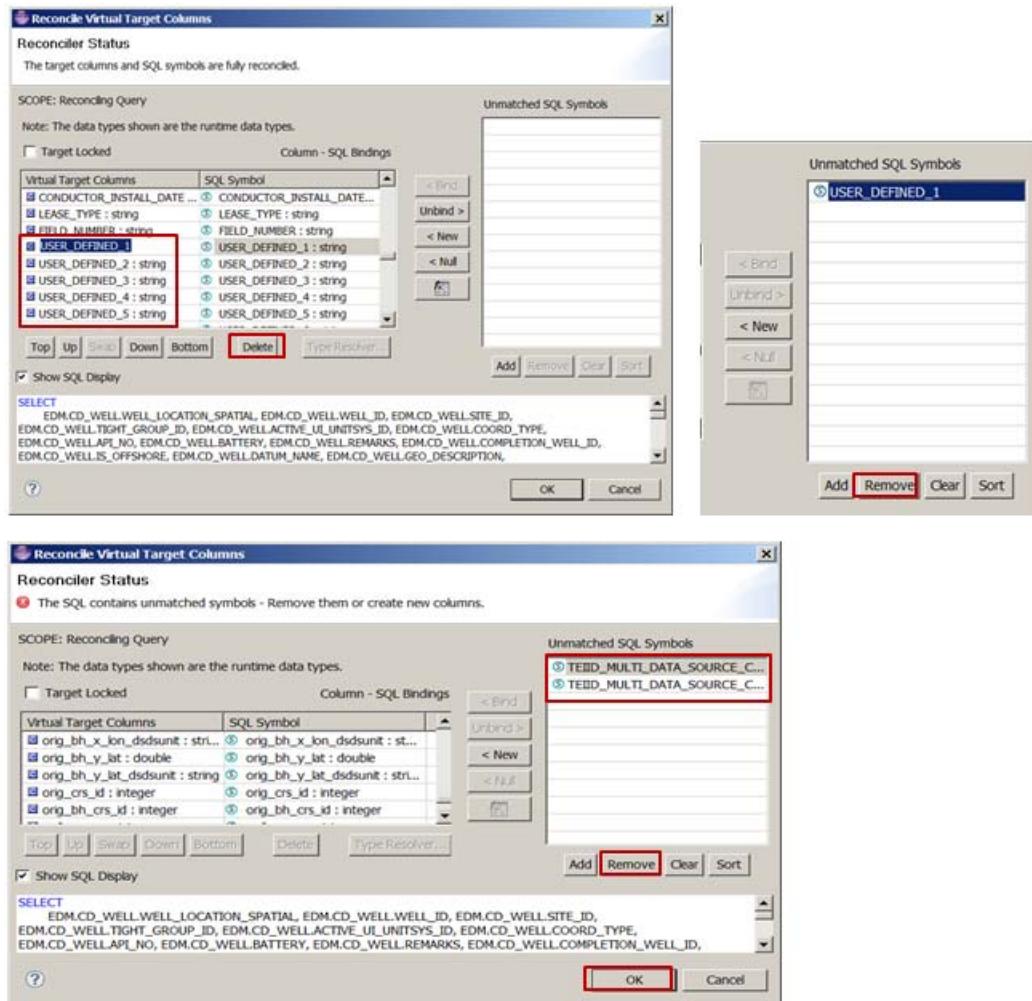


On the **Reconcile Virtual Target Columns** dialog box:

- **Optional:** To clean the federated table, remove unnecessary columns, such as `USER_DEFINED*`, `CREATE_USER_ID`, `CREATE_APP_ID`, `UPDATE*`, etc. from the **Virtual Target Columns** list by selecting the column(s) and then

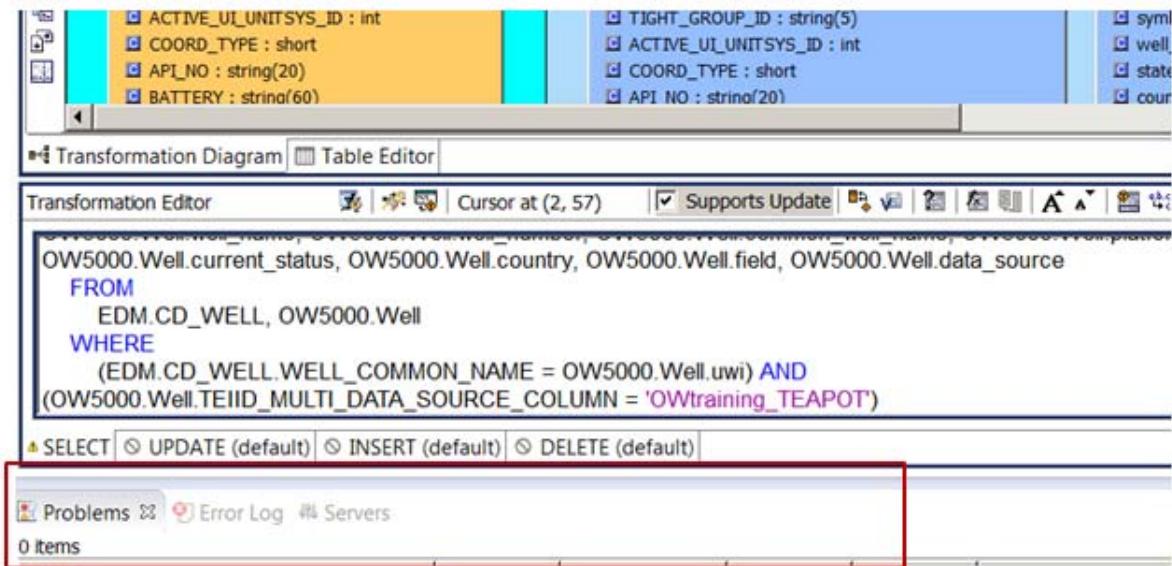
clicking **Delete**. When deleted, the corresponding SQL symbols appear in the **Unmatched SQL Symbol** list, which can be deleted by clicking **Remove**.

- Delete EDM **TEIID\_MULTI\_DATA\_SOURCE\_COLUMN** and **OW TEIID\_MULTI\_DATA\_SOURCE\_COLUMN\_1** columns from the **Virtual Target Columns** and **Unmatched Symbols** list.



- Click **OK** after all the unwanted columns are removed from both **Virtual Target Columns** and **Unmatched SQL Symbols**.

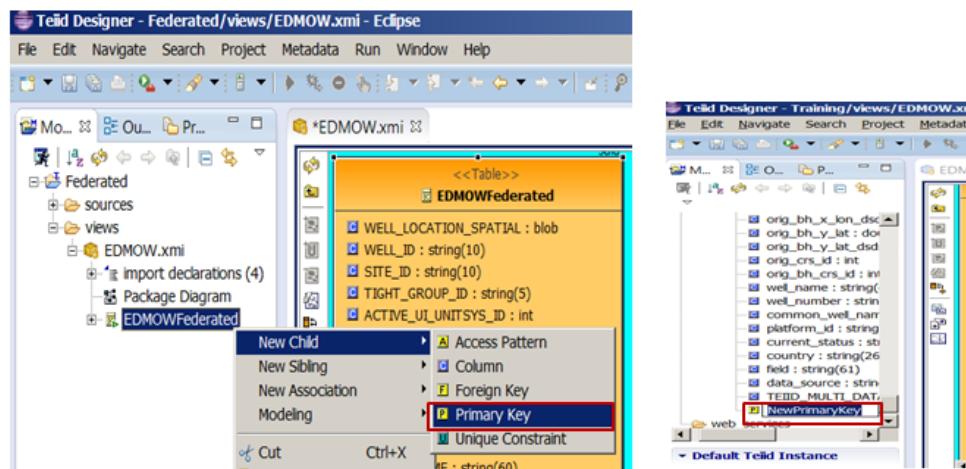
Back in the main window, make sure there are no errors.



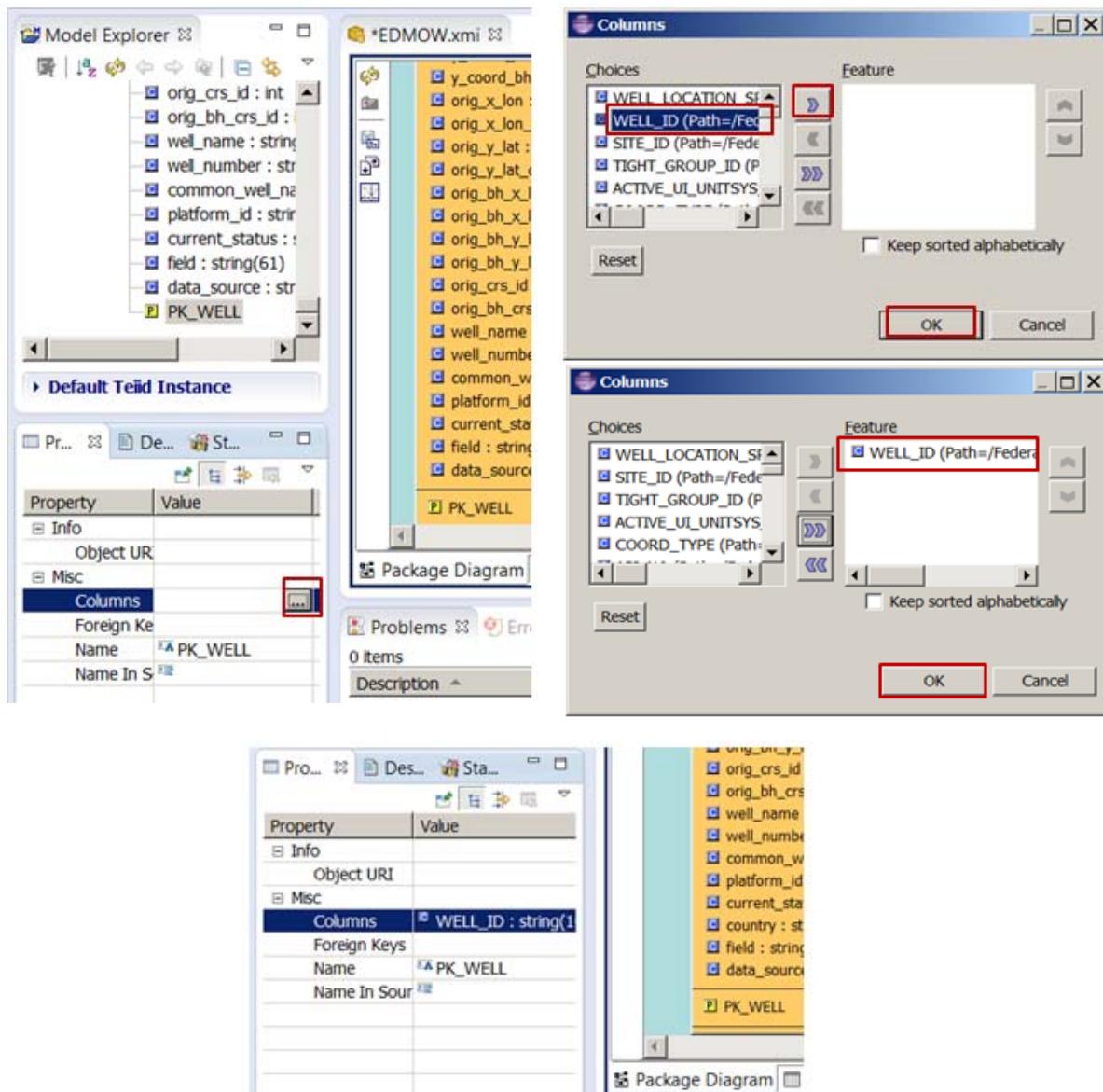
Make sure there are no more errors that need to be fixed/reconciled.

A primary key (required by OData) must be added to this federated table.

- 1) Expand **views > EDMOW.xmi > EDMOWFederated**. Right-click and select **New Child > Primary Key**.

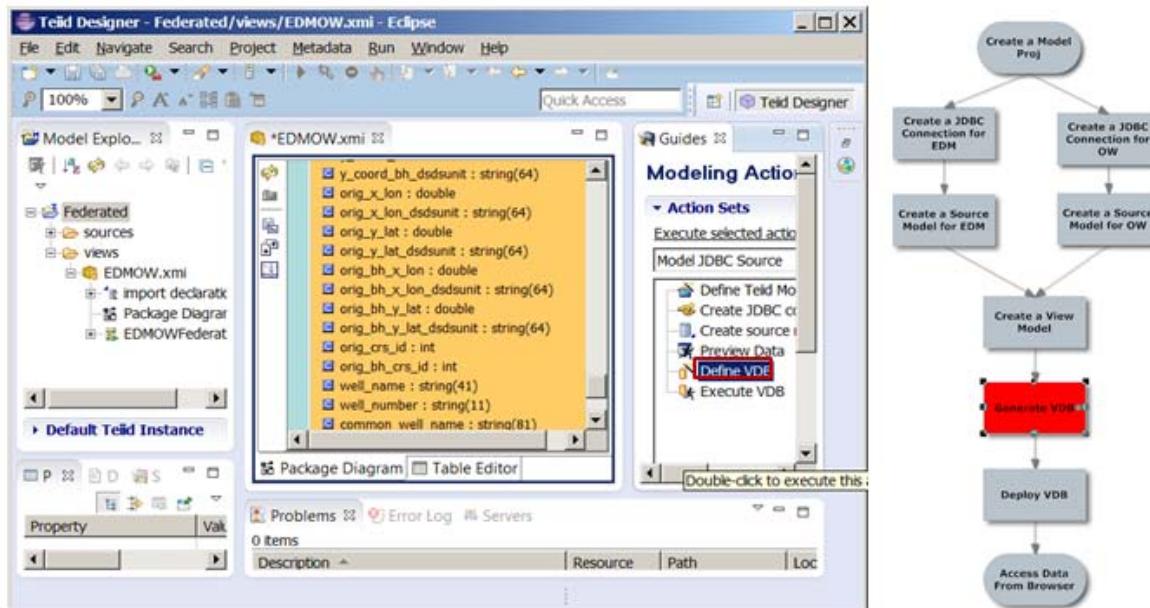


- m) Name the primary key **PK\_WELL**. In the Property pane, click **Columns...** and select **WELL\_ID** from the Columns dialog box. Move it to the Feature list with the **arrow** button. Then click **OK**. The primary key has been mapped to the **EDM WELL\_ID** column.

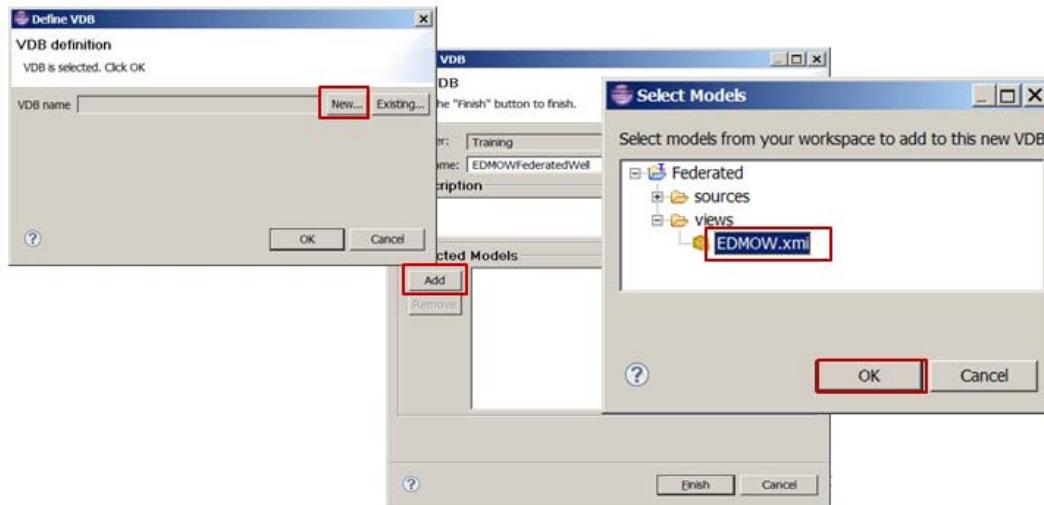


## 8. Generate a VDB for the newly created federated view model

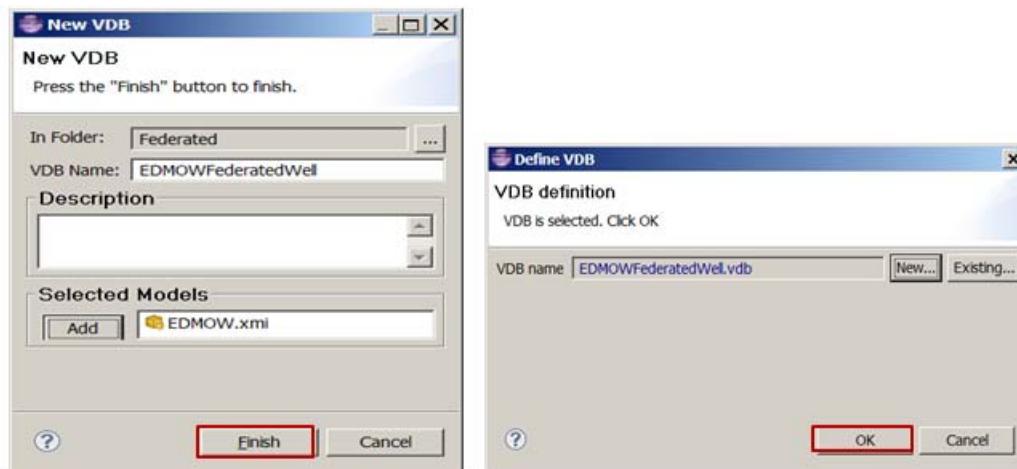
- a) Double-click the **Define VDB** action to display the Define VDB dialog box.



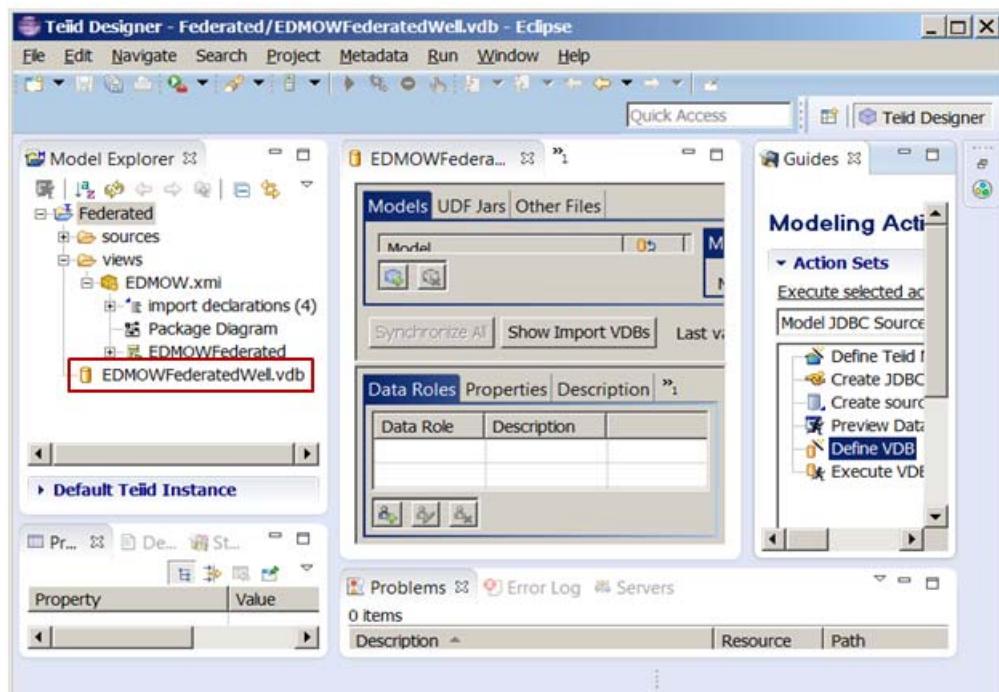
- b) On the Define VDB dialog box, click **New** to display the New VDB dialog box. On the New VDB dialog box, enter a VDB Name (**EDMOWFederatedWell**) and then click **Add** to display the Select Models dialog box to select the **EDMOW.xmi** view. Click **OK** on the Select Models dialog box.



- c) Click **Finish** on the New VDB dialog box. Then click **OK** on the Define VDB dialog box.

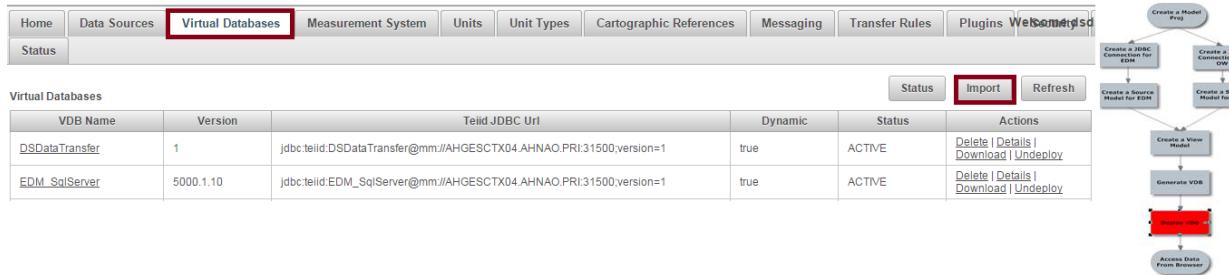


The new **VDB EDMOWFederatedWell.vdb** is created. The VDB can now be deployed into DSIS.

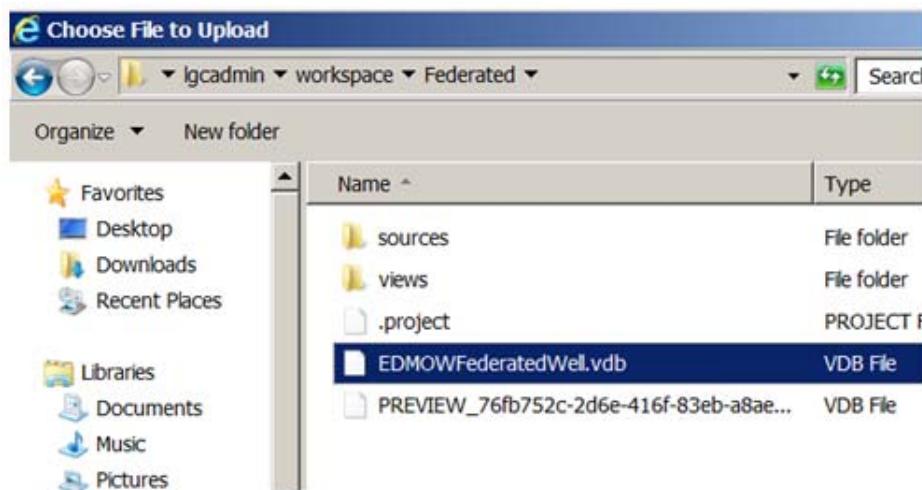


## 9. Deploy the new federated VDB into DecisionSpace DataServer

- a) Start the DSIS Console and select the **Virtual Databases** tab.  
Click + **Add** to display the file browser.



- b) In the file browser, access the location where the vdb was created (%USERPROFILE%\workspace\Federated) and select the **EDMOWFederatedWell.vdb** file.



- c) Click **Refresh** in the DSIS Console to refresh the states of the deployed VDBs.

The EDMOWFederatedWell vdb is displayed with an ACTIVE status.

EDMOWFederatedWell	5000.8.3	jdbc:teiid:EDMOWFederatedWell@mm://HOU-TRAIN01.training.pri:31000;version=1	false	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a>
MySQL test	1	jdbc:teiid:MySQLtest@mm://HOU-TRAIN01.training.pri:31000;version=1	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a>
OpenWorks	5000.8.3	jdbc:teiid:OpenWorks@mm://HOU-TRAIN01.training.pri:31000;version=1	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a>
TestVDB	1	jdbc:teiid:TestVDB@mm://HOU-TRAIN01.training.pri:31000;version=1	true	ACTIVE	<a href="#">Delete</a> <a href="#">Details</a> <a href="#">Download</a>

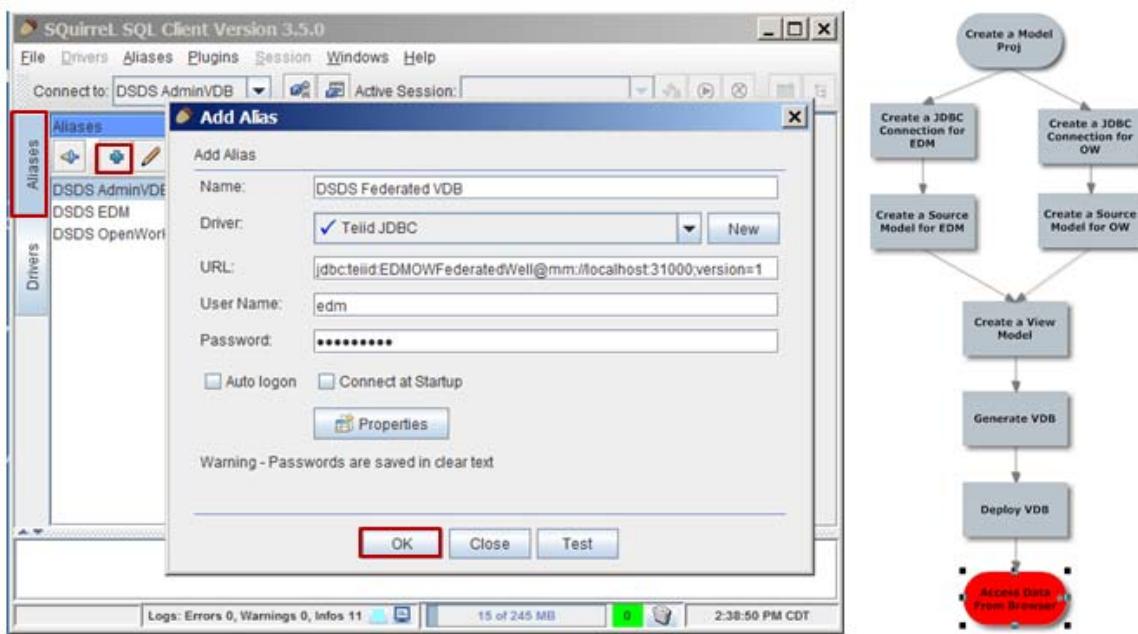
**VDB Details:**

VDB Name: EDMOWFederatedWell

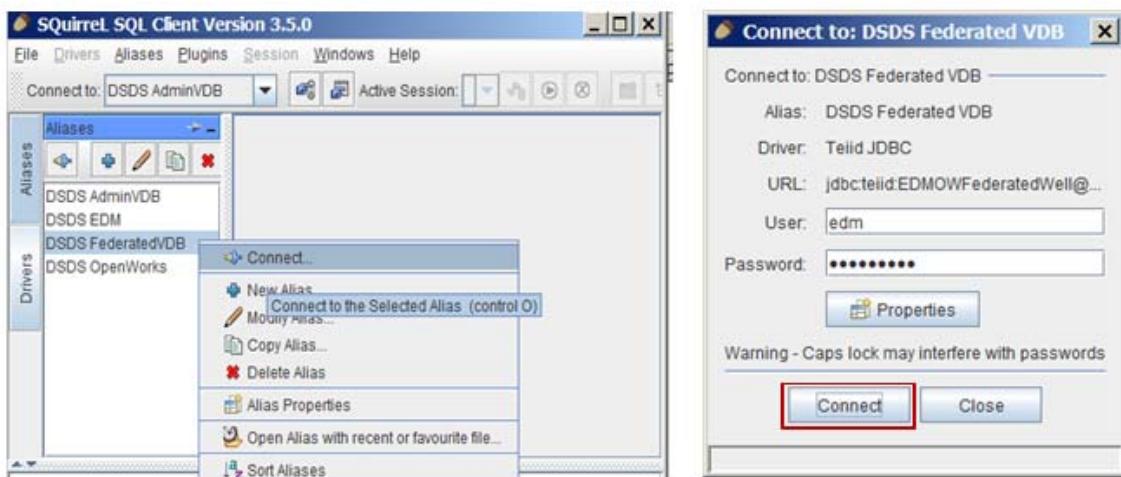
Model	Data Sources		Status Messages		Multi Source	Actions
	Name	JNDI Name	Severity	Message		
EDMOW	No records found.		INFO	VDB EDMOWFederatedWell is set to ACTIVE.	false	
EDM	Name	JNDI Name	Severity	Message	true	Edit data sources
	EDMtraining	java:/EDMtraining/5000.1.10	INFO	VDB EDMOWFederatedWell is set to ACTIVE.		
OW5000	Name	JNDI Name	Severity	Message	true	Edit data sources
	OWtraining_TEAPOT	java:/OWtraining_TEAPOT/5000.8.3	INFO	VDB EDMOWFederatedWell is set to ACTIVE.		
	OWtraining_NORWAY	java:/OWtraining_NORWAY/5000.8.3				

## 10. Access the federated data with Squirrel (JDBC) and browser (OData)

- a) In Squirrel, create a new connection/alias to connect to the federated VDB in DSIS. Use **edm/Landmark1** for credentials.



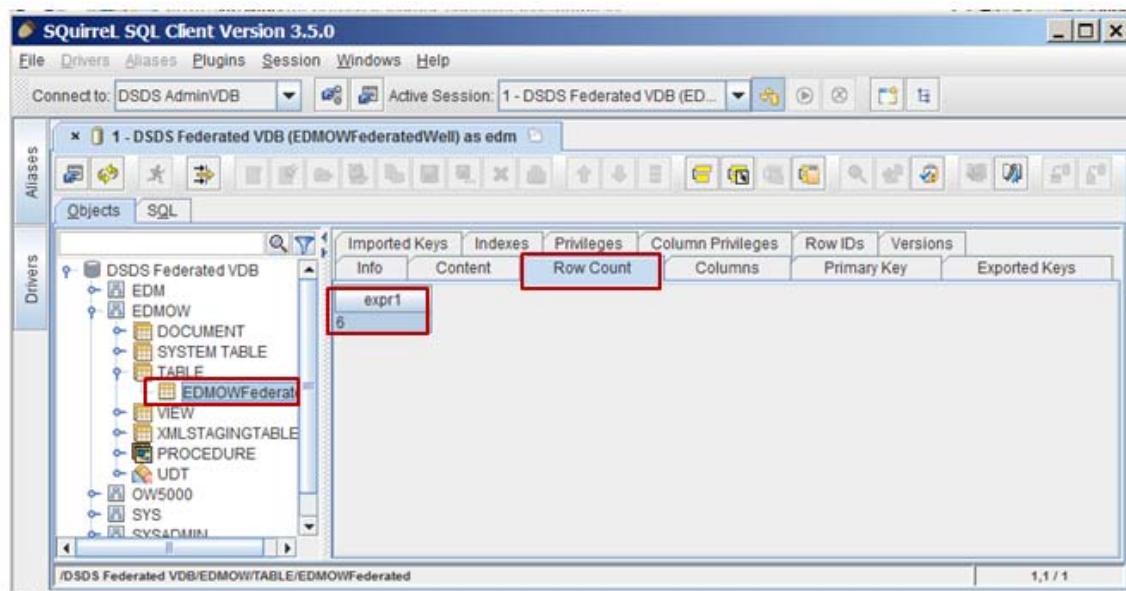
- b) Connect to the newly created alias (**DSDS FederatedVDB**).



- c) Once connected, expand the EDMOW tree and click **EDMOWFederated** table.

The various tabs are displayed in the right pane.

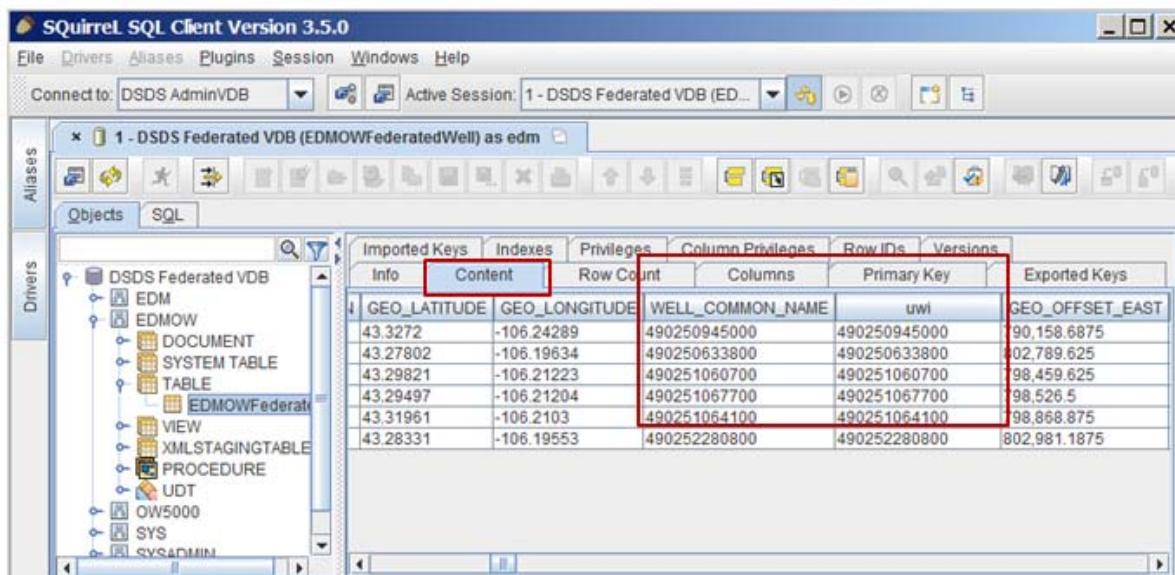
The **Row Count** tab displays the number of records found, which should be 6.

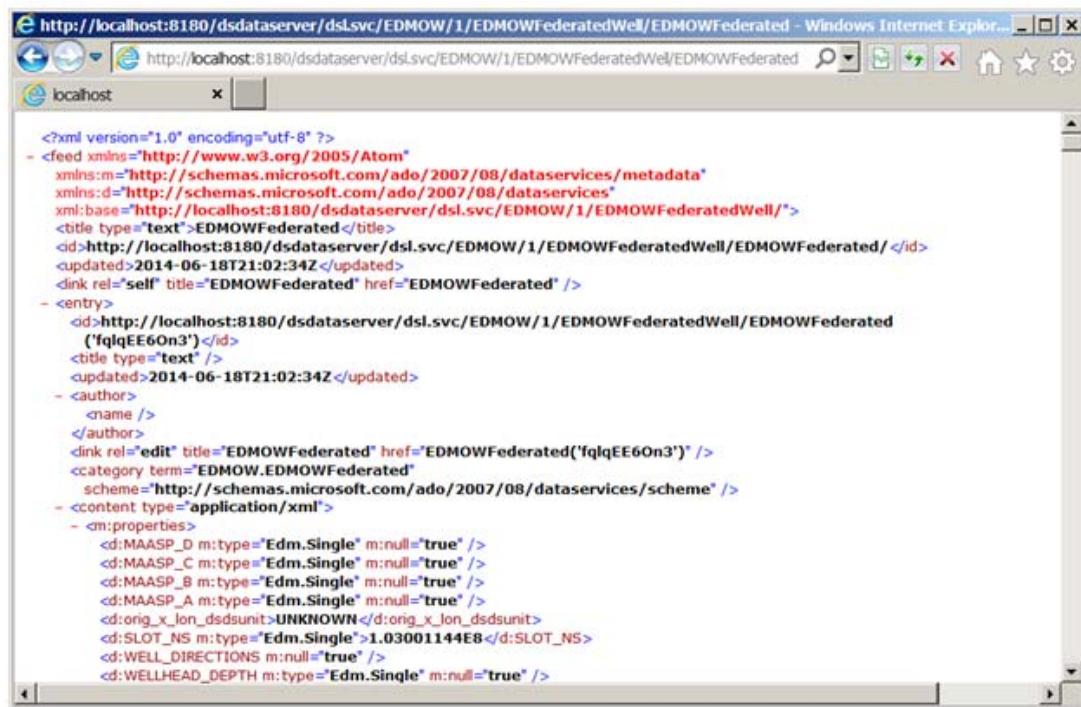


The **Content** tab displays the values of those records.

This exercise shows that there are 6 wells with the same name that exist in both EDM and OpenWorks (TEAPOT\_DOME) databases. The criteria for the name matching was:

**EDM.CD\_WELL.well\_common\_name = OW5000.Well.uwi**





The screenshot shows a Microsoft Internet Explorer window displaying an XML feed. The URL in the address bar is `http://localhost:8180/dsdataserver/dslsvc/EDMOW/1/EDMOWFederatedWell/EDMOWFederated`. The page content is an Atom feed representing a single entry for the 'EDMOWFederated' resource.

```
<?xml version="1.0" encoding="utf-8" ?>
- <feed xmlns="http://www.w3.org/2005/Atom"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xml:base="http://localhost:8180/dsdataserver/dsl.svc/EDMOW/1/EDMOWFederatedWell/"
  <title type="text">EDMOWFederated</title>
  <id>http://localhost:8180/dsdataserver/dsl.svc/EDMOW/1/EDMOWFederatedWell/EDMOWFederated</id>
  <updated>2014-06-18T21:02:34Z</updated>
  <link rel="self" title="EDMOWFederated" href="EDMOWFederated" />
- <entry>
  <id>http://localhost:8180/dsdataserver/dsl.svc/EDMOW/1/EDMOWFederatedWell/EDMOWFederated('fqlqEE6On3')</id>
  <title type="text" />
  <updated>2014-06-18T21:02:34Z</updated>
- <author>
  <name />
</author>
<link rel="edit" title="EDMOWFederated" href="EDMOWFederated('fqlqEE6On3')" />
<category term="EDMOW.EDMOWFederated"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
- <content type="application/xml">
  - <m:properties>
    <d:MAASP_D m:type="Edm.Single" m:null="true" />
    <d:MAASP_C m:type="Edm.Single" m:null="true" />
    <d:MAASP_B m:type="Edm.Single" m:null="true" />
    <d:MAASP_A m:type="Edm.Single" m:null="true" />
    <d:orig_x_lon_dsdsunit>UNKNOWN</d:orig_x_lon_dsdsunit>
    <d:SLOT_NS m:type="Edm.Single">1.03001144E8</d:SLOT_NS>
    <d:WELL_DIRECTION m:null="true" />
    <d:WELLHEAD_DEPTH m:type="Edm.Single" m:null="true" />
```

---

## **Exercise # 4a: Add an MS SQL Server Data Source to the Data Server**

---

### ***Purpose of the Exercise***

The purpose of the exercise is to show how to connect to a non-Landmark database WELL\_PRODUCTION (MS SQL) and generate a dynamic VDB. The purpose for this connection is twofold:

- The dynamic VDB is used in an exercise in the DecisionSpace Web Framework training.
- This dynamic VDB cannot handle OData write because the WELL\_PRODUCTION table has an IDENTITY field.

Therefore, “Exercise # 4b: Create a Standard VDB with nextval Virtual Procedure” on page 2-121, was created where a standard VDB will be created by implementing the nextval virtual procedure to override the default SQL INSERT statement.

### ***Outcome of the Exercise***

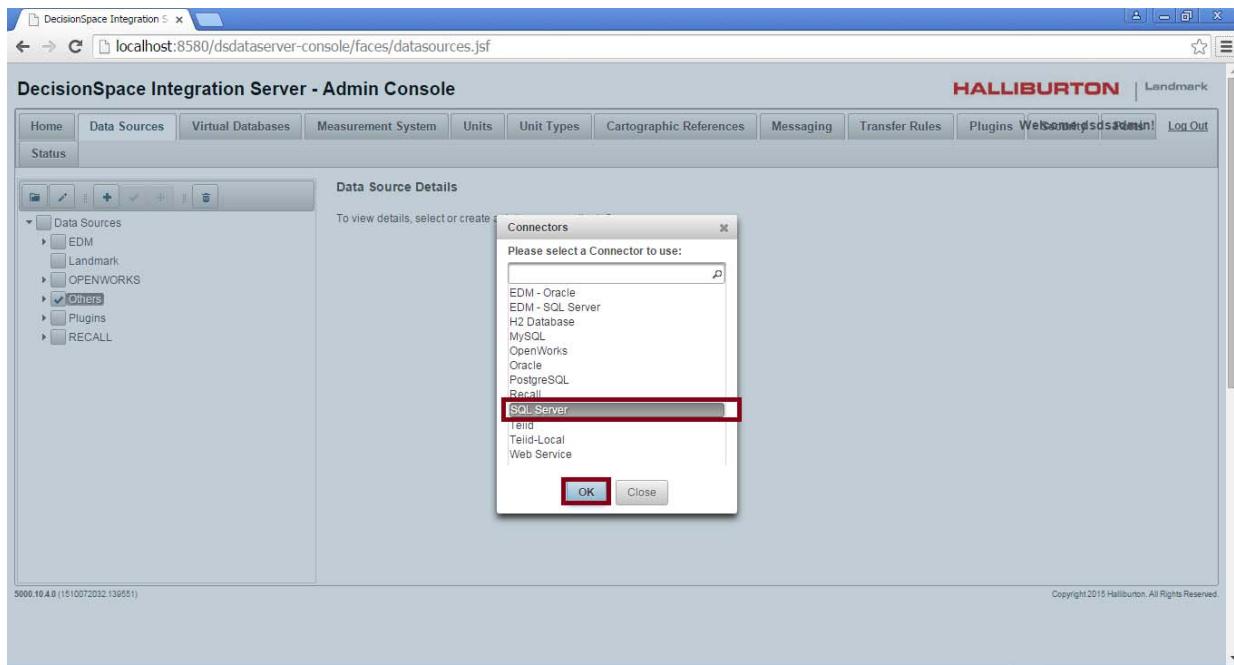
Access (read only) the data after successful creation and deployment of the VDB.

### ***Exercise Workflows***

- Start the database service for SQL Server (EDM5000), if not already started.
- Start the DSIS service, if not already started.
- Launch the DSIS Console: add the data source connection and generate dynamic VDB.
- Prove data access is working with browser and Squirrel.

## 1. Create a data source connection

- Select SQL Server for the driver.

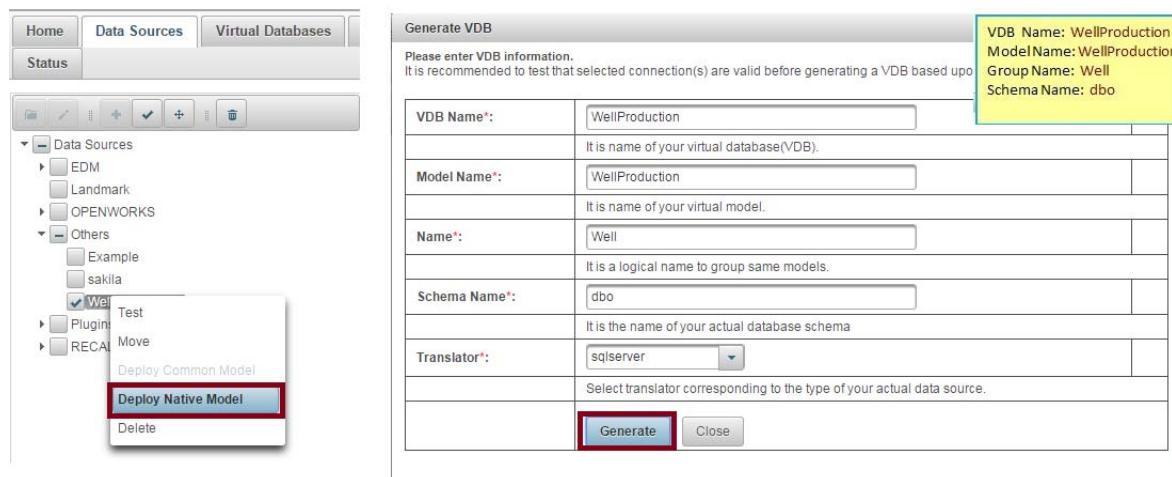


**Data Source Details**

Data Source Type:	SQL Server
Data Source Name*:	<input type="text" value="WellProdSource"/>
Connection URL*:	<input type="text" value="jdbc:sqlserver://AHGESCTX01:0;DatabaseName=EDMDB50"/>
User Name*:	<input type="text" value="edm"/>
Password*:	<input type="password" value="*****"/>
<input checked="" type="checkbox"/> Test Connection	

Data Source Name: WellProdSource  
 Connection URL:  
 jdbc:sqlserver://localhost\EDM5000:0;  
 DatabaseName=WELL\_PRODUCTION  
 User Name: sa  
 Password: Landmark1

## 2. Generate a dynamic VDB for this data source



- Make sure data is accessible

<http://localhost:8180/dsdataserver/dsl.svc/WellProduction/1/WellProduction-WellProdSource/WellProd>

---

## Exercise # 4b: Create a Standard VDB with nextval Virtual Procedure

---

### **Purpose of the Exercise**

The purpose of the exercise is to show how to use the DataServer Design Studio to create a VDB with a virtual procedure named nextval. This procedure returns the next sequence id from the SQL Server data source.

### **Outcome of the Exercise**

Write data (using OData) protocol to the SQL Server data source after successful creation and deployment of the VDB.

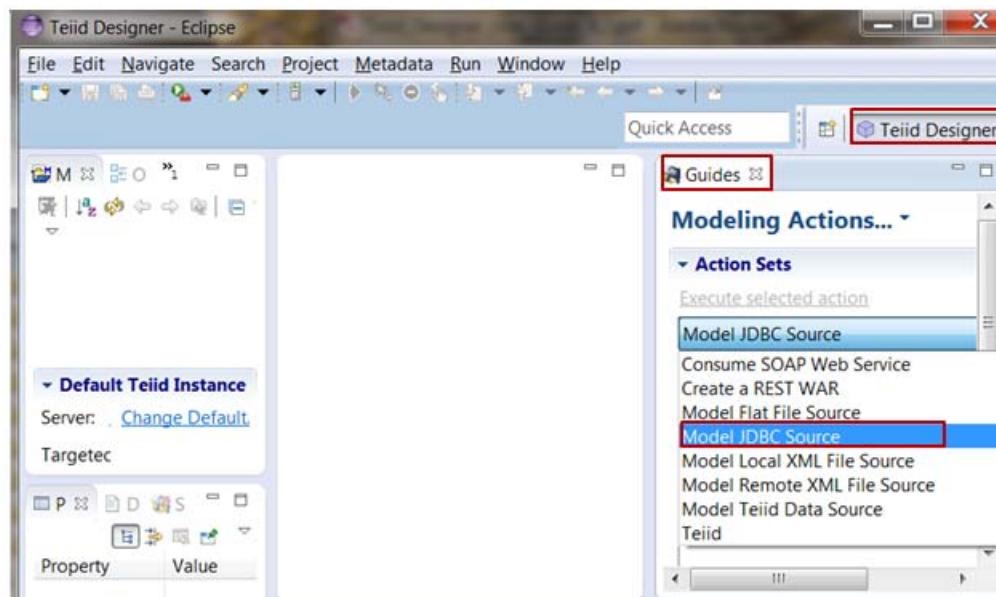
### **Exercise Workflows**

- Start the database service for SQL Server (EDM5000), if not already started.
- Start the DSIS service, if not already started.
- Ensure the JAVA\_HOME environment variable is defined (to run Teiid Designer)
- Launch the DecisionSpace Design Studio (Teiid Designer) tool and create a VDB with nextval virtual procedure for the SQL Server data source (WELL\_PRODUCTION).
- Deploy the VDB into DSIS.
- Use an OData application (i.e., fiddler) to insert records into the WELL\_PRODUCTION database.

## 1. Launch the DecisionSpace DataServer Design Studio (Teiid Designer)

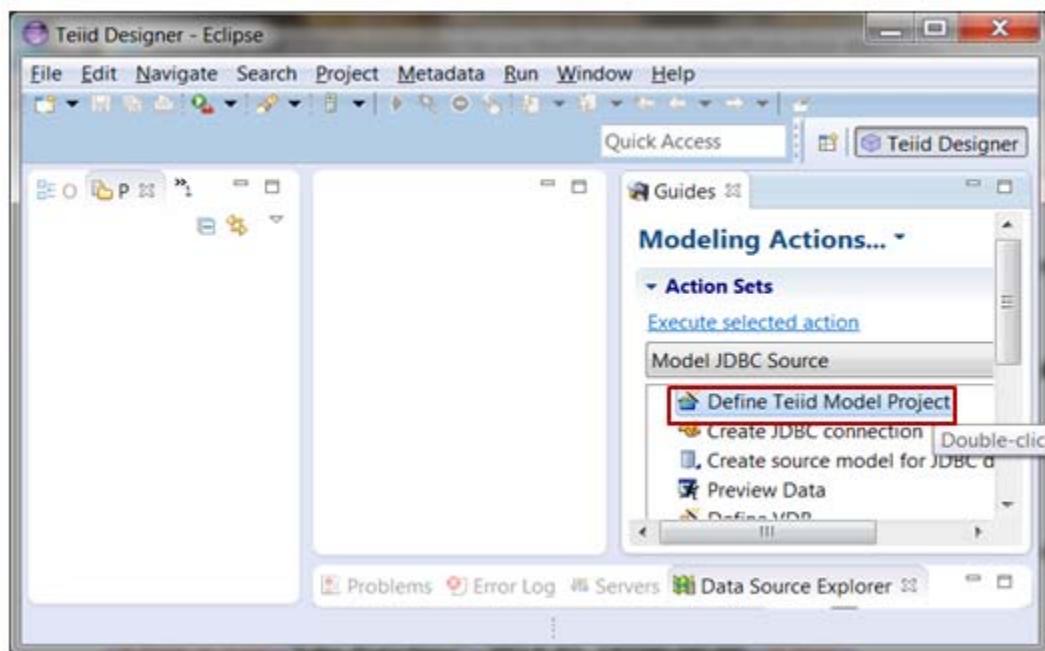
Use the same workspace as the previous exercise or create a new one.

- a) In Teiid Designer, open a **Teiid Designer** perspective by selecting **Window > Open Perspective > Other...**, and then select **Teiid Designer** from the Open Perspective dialog box.
- b) In the Teiid Designer perspective window - in the **Guides** tab, click the **Model JDBC Source** drop-down menu and select **Model JDBC Source**.

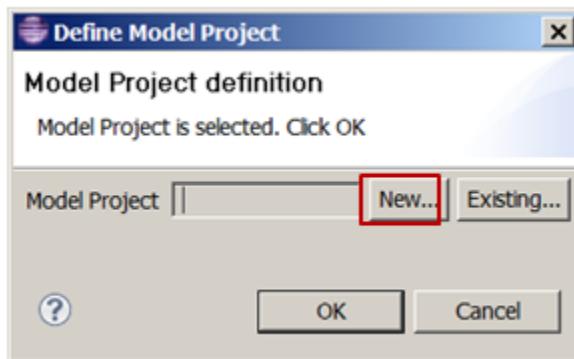


## 2. Create a model project in Teiid Designer

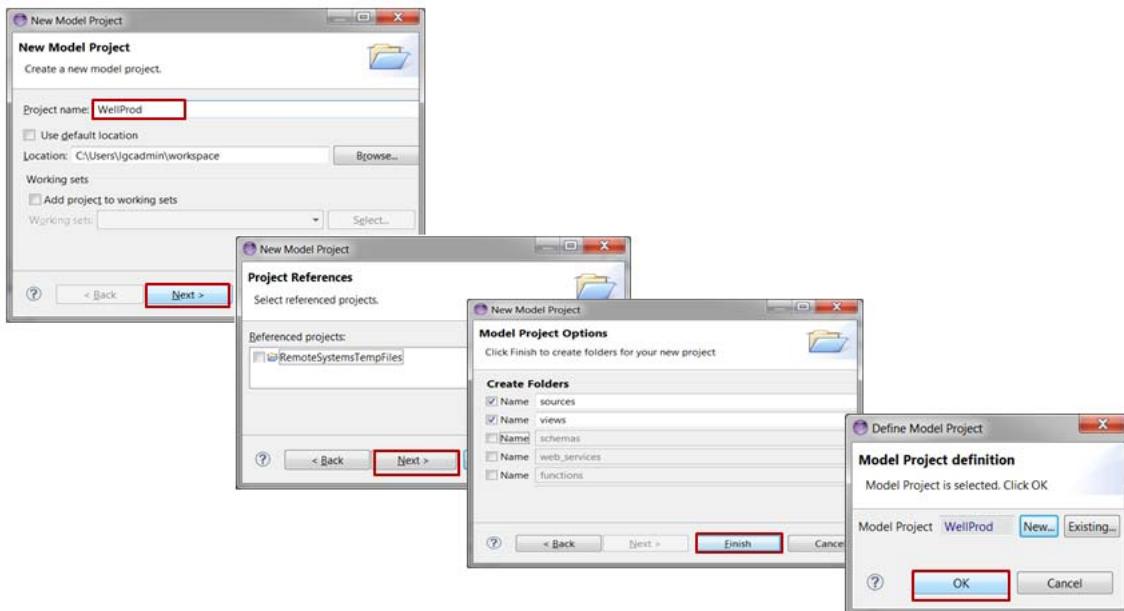
- a) Double-click the **Define Teiid Model Project** modeling actions.



- b) Click **New** on the Define Model Project dialog box to display the New Model Project dialog box.

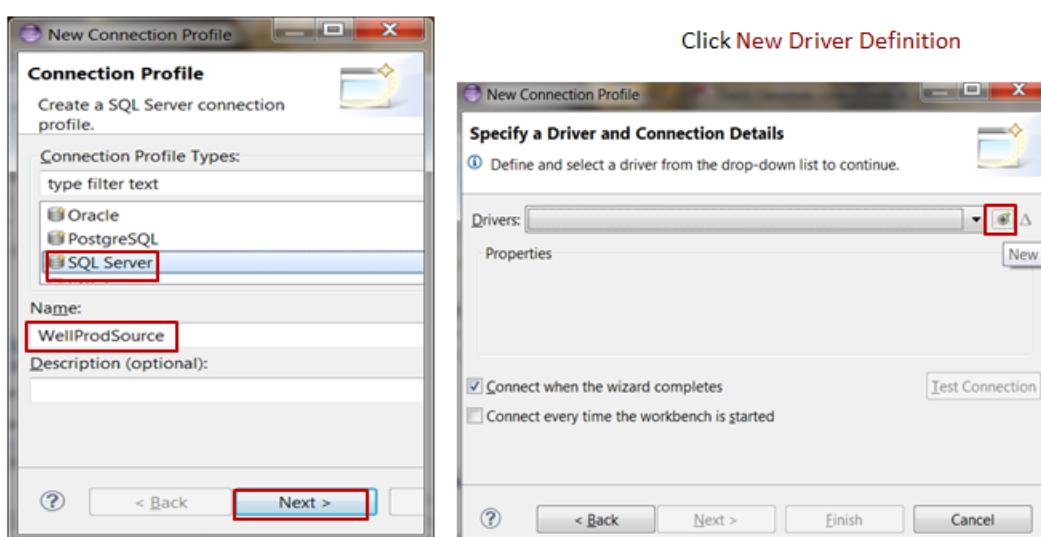
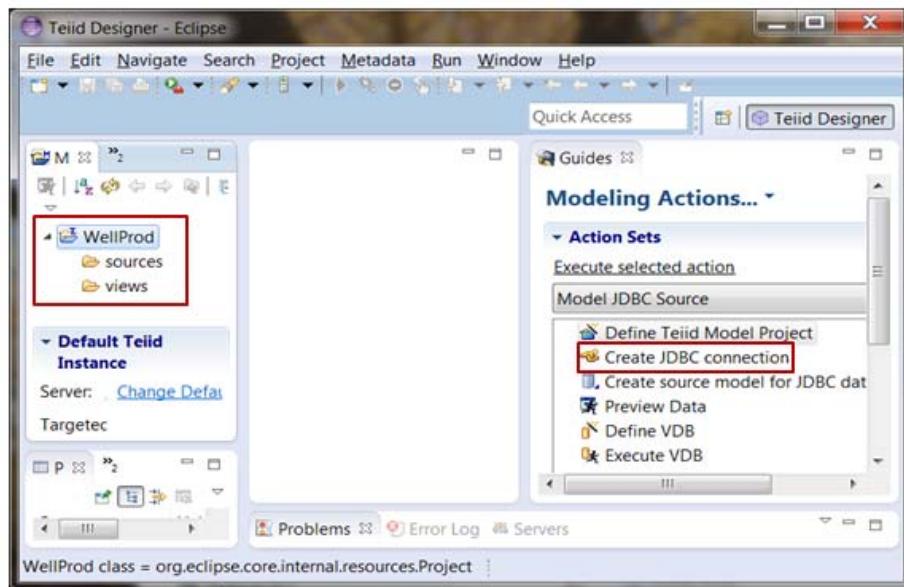


- c) In the New Model Project dialog box, enter the project name (**WellProd**), and click **Next**, **Next**, **Finish**, and **OK**.

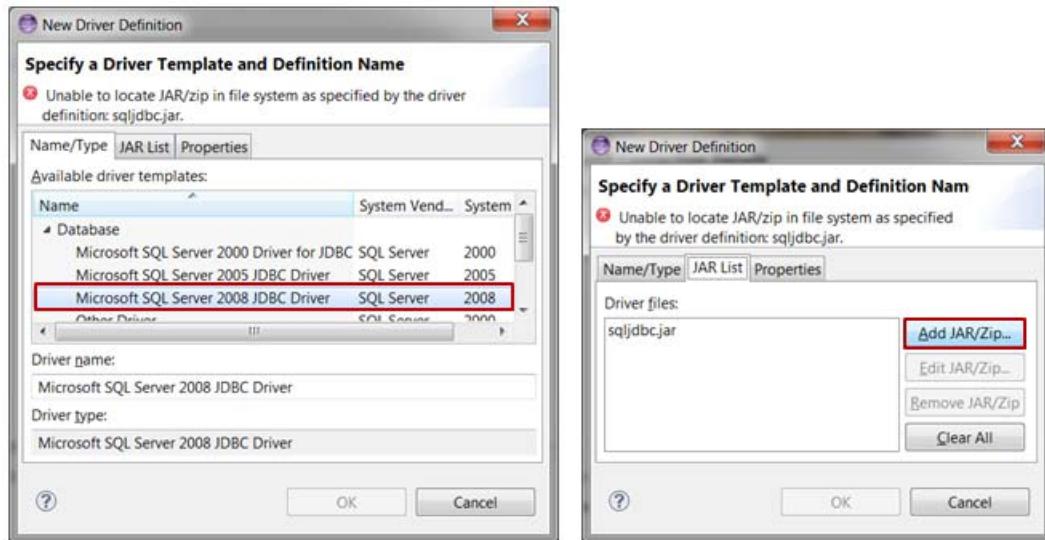


### 3. Create a JDBC Connection for WELL\_PRODUCTION SQL Server data source

- Double-click the **Create JDBC connection** modeling action to display the New Connection Profile dialog box.



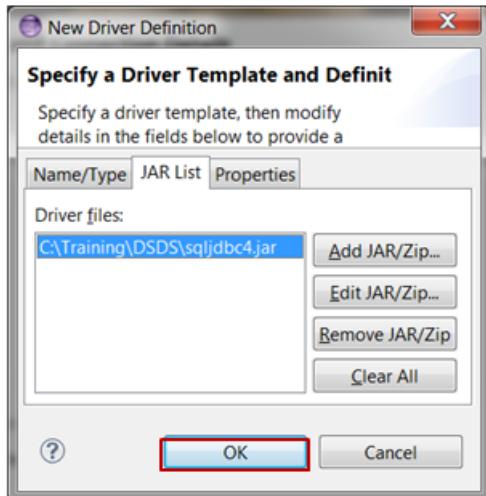
- b) In the Specify a Driver Template and Definition Name, select **Microsoft SQL Server 2008 JDBC Driver** from the Database list. Select the **JAR List** tab and then click **Add Jar/Zip...**



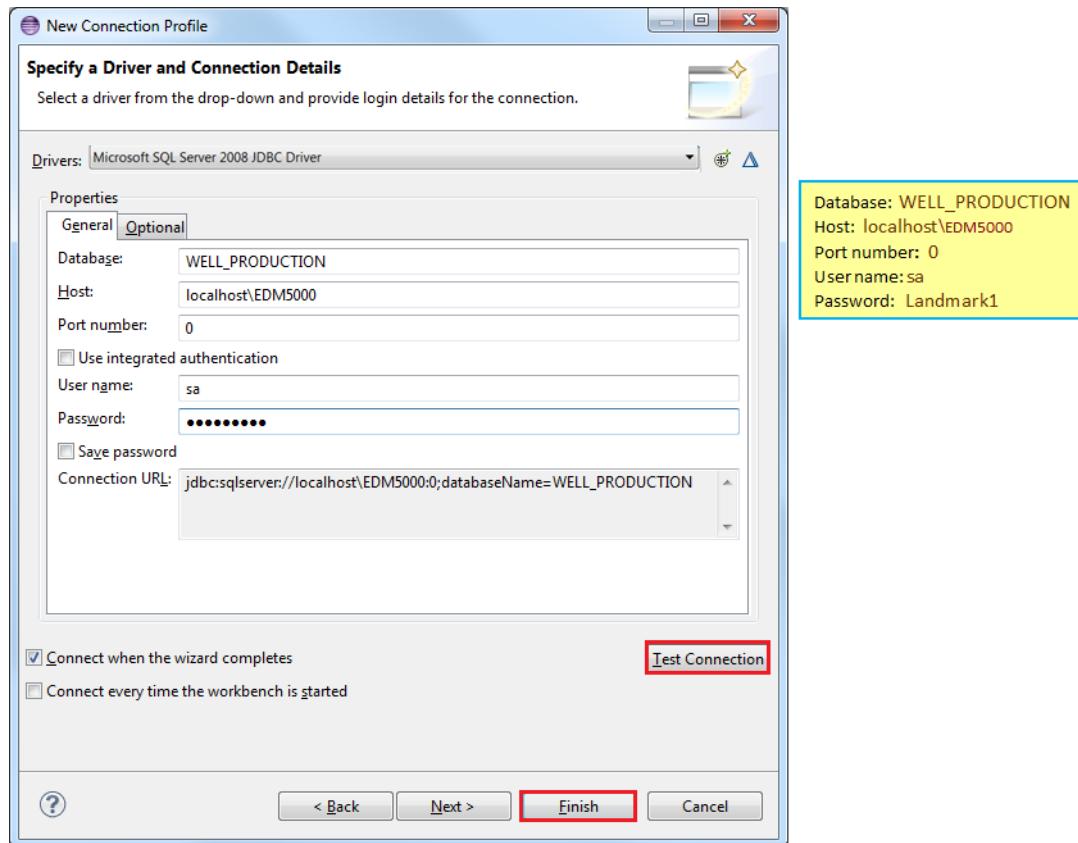
- c) Navigate to the folder **C:\Training\DSDS** and select the **sqljdbc4.jar** file.



- d) Back in the Specify a Driver Template and Definition Name dialog box, remove **sqljdbc.jar** and then click **OK**.

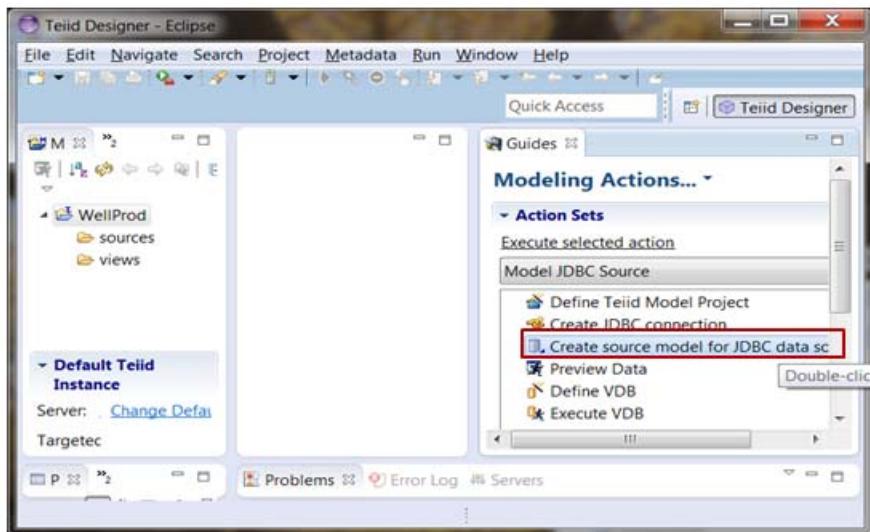


- e) In the Specify a Driver Template and Connection Details dialog box, enter the data source information. Then click **Test Connection**. If connection is successful, the message **Ping succeeded!** is displayed. Click **Finish**.

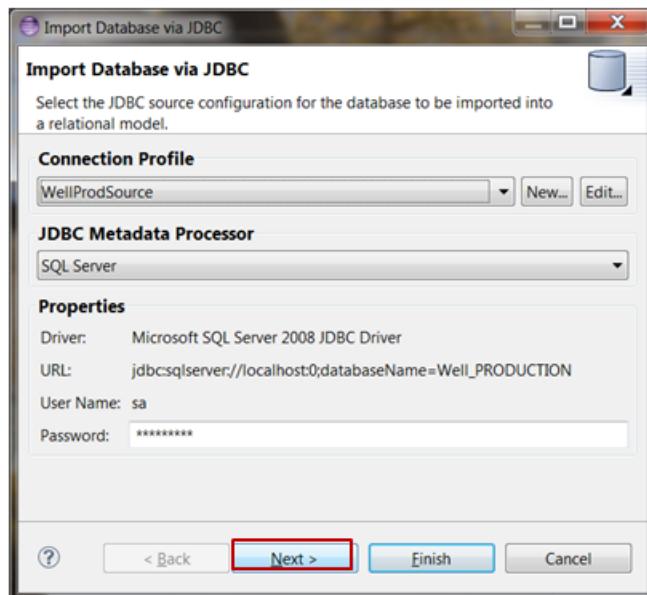


#### 4. Create a Source Model for the WELL\_PRODUCTION data source

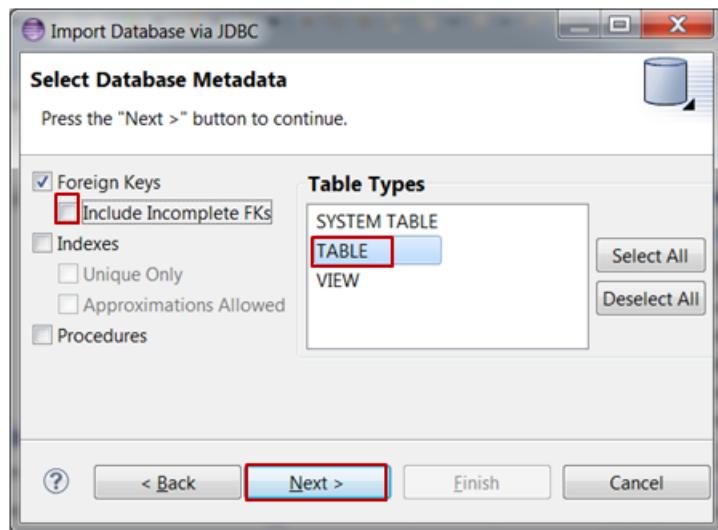
- a) Double-click the **Create Source model for JDBC data source** action to display the Import Database via JDBC dialog box.



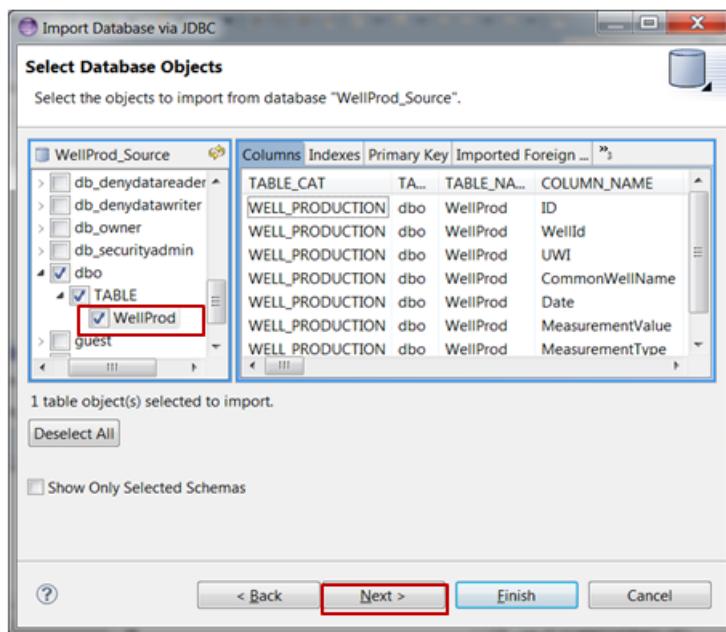
- b) In the Import Database via JDBC dialog box, enter the name of the **Connection Profile** that was created earlier (**WellProd\_Source**), and then click **Next**.



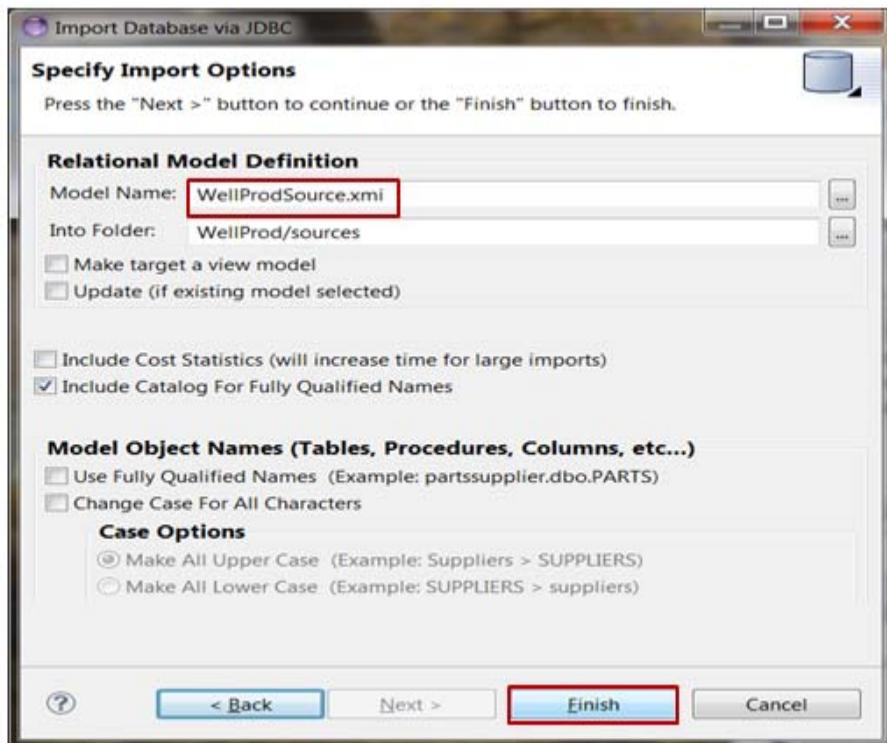
- c) Clear the selection of the **Include Incomplete FKs** option and then select **TABLE** from the **Table Types**. Click **Next**.



- d) In the Select Database Objects dialog box, navigate to **WELL\_PRODUCTION > dbo > TABLE** and select the **WellProd** table. Then click **Next**.



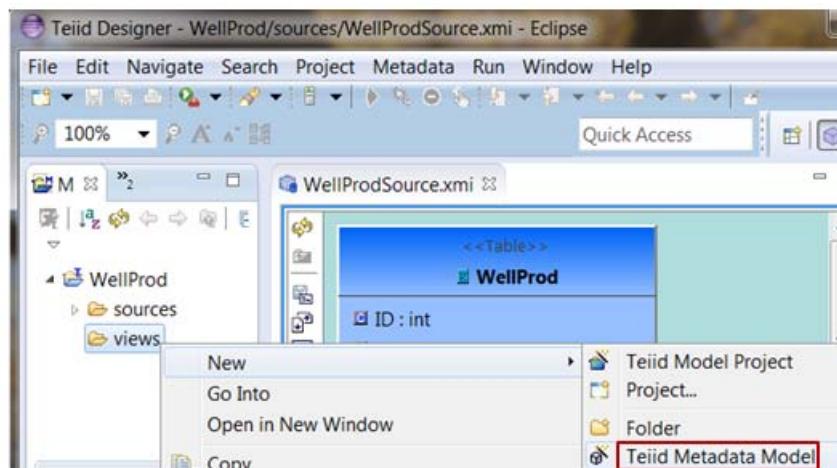
- e) In the Specify Import Options dialog box, enter the Model Name (**WellProdSource.xmi**) and into folder (WellProd/sources). Click **Finish**.



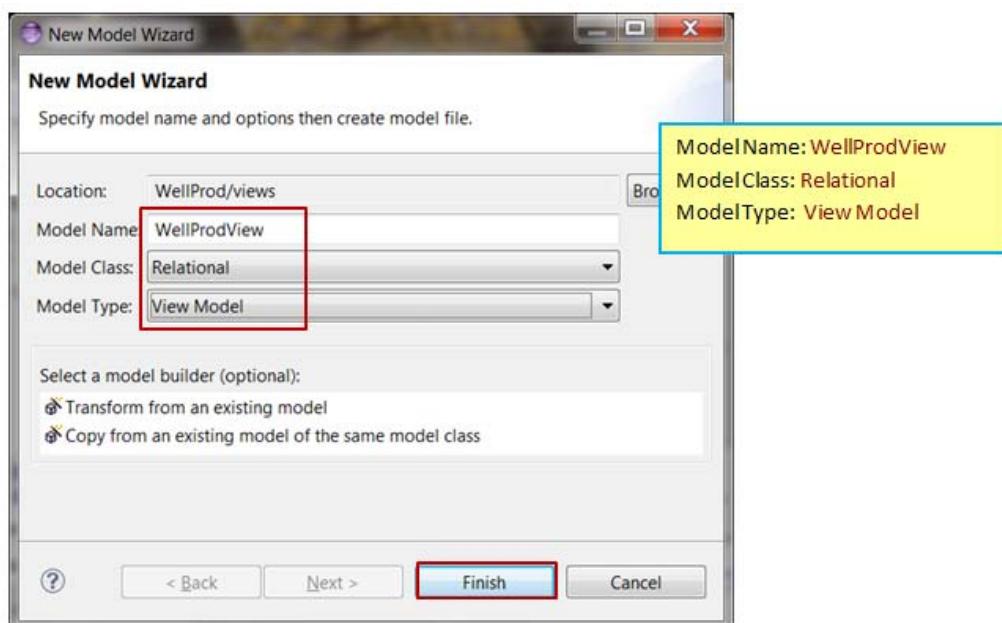
## 5. Create a View model for the data source

Notice that the source model **WellProdSource.xmi** has been created. Now a view model can be created.

- In the Model Explorer pane, right-click **views** and select **New > Teiid Metadata Model** to display the New Model Wizard dialog box.

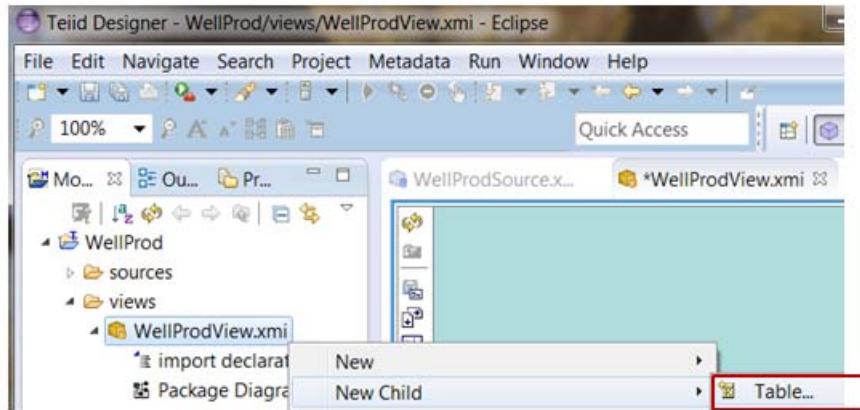


- In the New Model Wizard dialog box, enter parameters as shown. Click **Finish**.



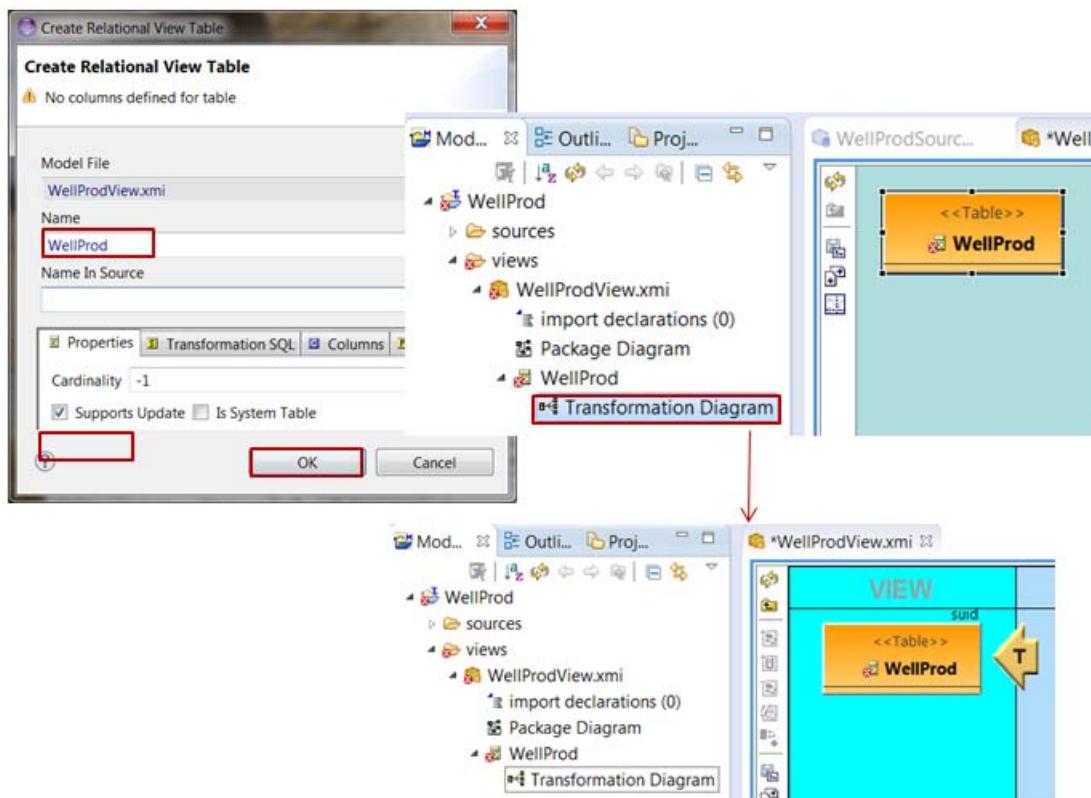
## 6. Create a new table for the view model

- Right-click **WellProdView.xmi** and select **New Child > Table** to display the Create Relational View Table dialog box.

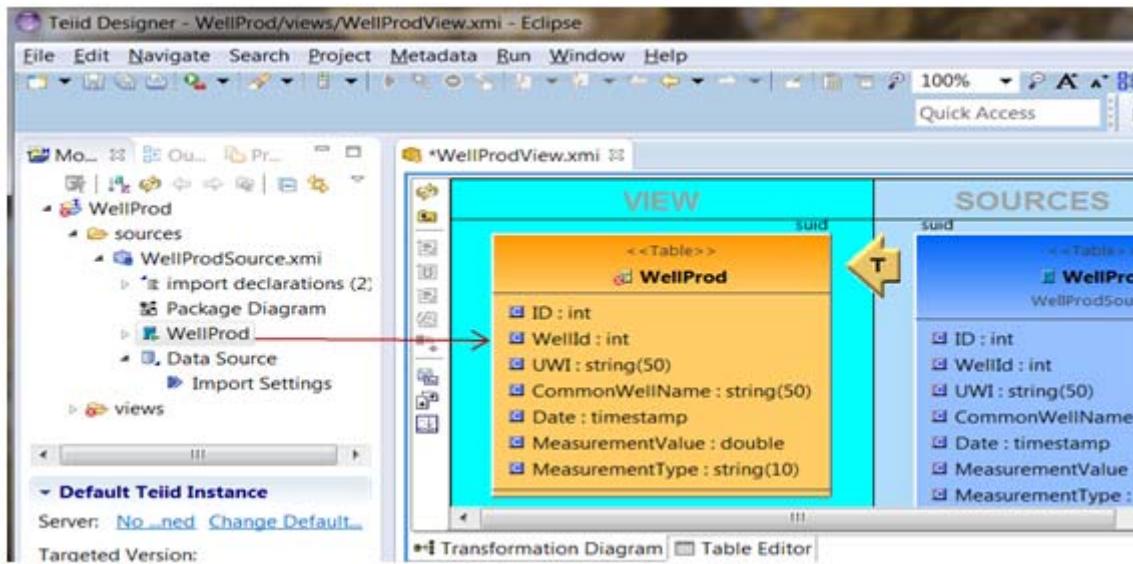


- Enter a name for this relational view table (**WellProd**) and then click **OK**.

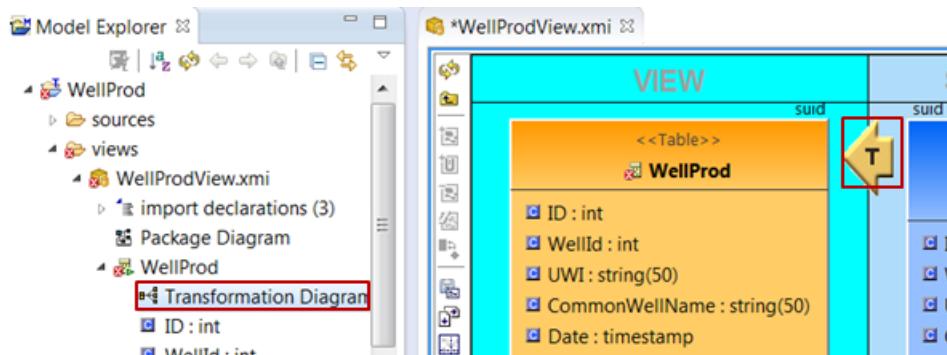
Double-click the **Transformation Diagram** of the view's **WellProd** table.



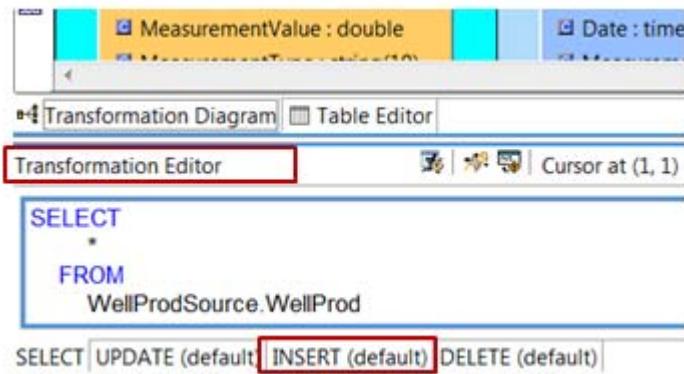
- c) Drag the **WellProd** table from the **SOURCES** folder to the **VIEW** area.



- d) In the **Model Explorer** tree, double-click the **Transformation Diagram** under the **views > WellProdView.xmi > WellProd**. Then double-click the **Transform arrow** button to display the Transformation Editor window.



- e) On the **Transformation Editor**, select the **INSERT** (default) tab.



- f) In the **INSERT** tab, clear the selection of the **Use Default** check box and then enter the SQL statement as shown below (or copy and paste from C:\Training\DSDS\Insert\_Override.txt).

Save the changes (**Save/Validate SQL** icon), and make sure no problems are found.

The screenshot shows the Transformation Editor with the 'INSERT' tab selected. The 'Use Default' checkbox is unchecked, indicated by a red border around the checkbox. The SQL code entered is:

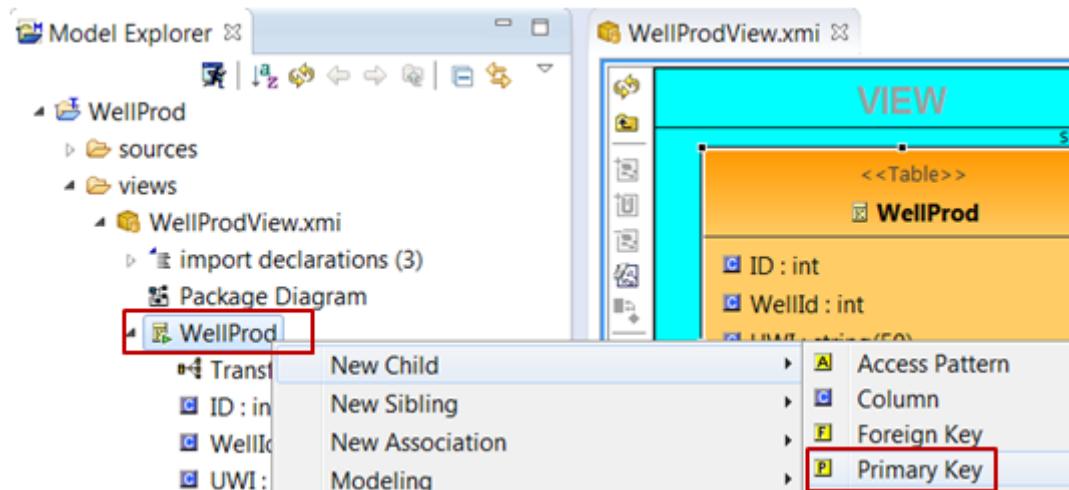
```

FOR EACH ROW
BEGIN ATOMIC
  INSERT INTO WellProdSource.WellProd (WellProdSource.WellProd.WellId,
  WellProdSource.WellProd.UWI, WellProdSource.WellProd.CommonWellName,
  WellProdSource.WellProd."Date", WellProdSource.WellProd.MeasurementValue,
  WellProdSource.WellProd.MeasurementType) VALUES ("NEW".WellId, "NEW".UWI, "NEW".CommonWellName,
  "NEW"."Date", "NEW".MeasurementValue, "NEW".MeasurementType);
END
  
```

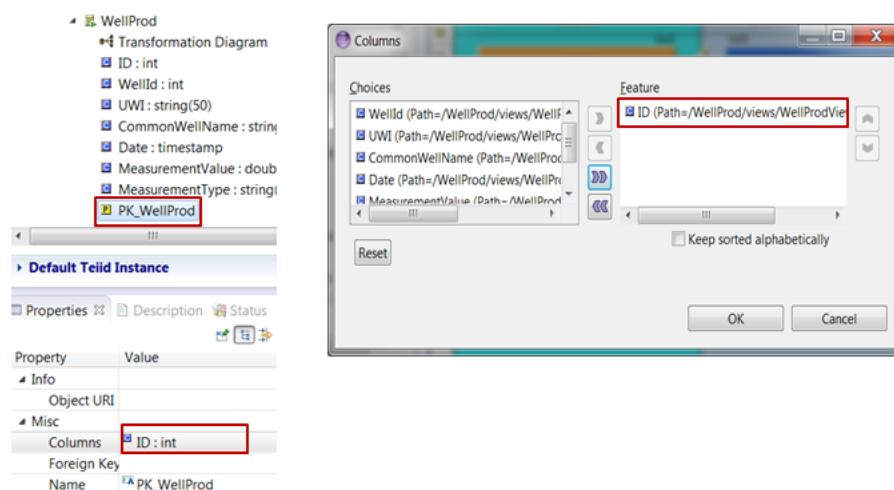
A message at the bottom states 'The SQL has pending changes.' Below the SQL editor, the tabs are: 'SELECT', 'UPDATE (default)', 'INSERT (default)', and 'DELETE (default)'. The 'INSERT (default)' tab is highlighted with a red border.

At the bottom of the screen, there is a 'Problems' view window. It shows a single item: '0 items'. This window has tabs: 'Problems', 'Error Log', and 'Servers'. The 'Problems' tab is selected.

- g) Create a primary key for the view's **WellProd** table. Right-click the **WellProd** table and select **New Child > Primary Key**.



- h) Name the primary key **PK\_WellProd**, then click **Columns ...** in the **Properties** tab. Map this primary key to the **ID** field.



## Summary

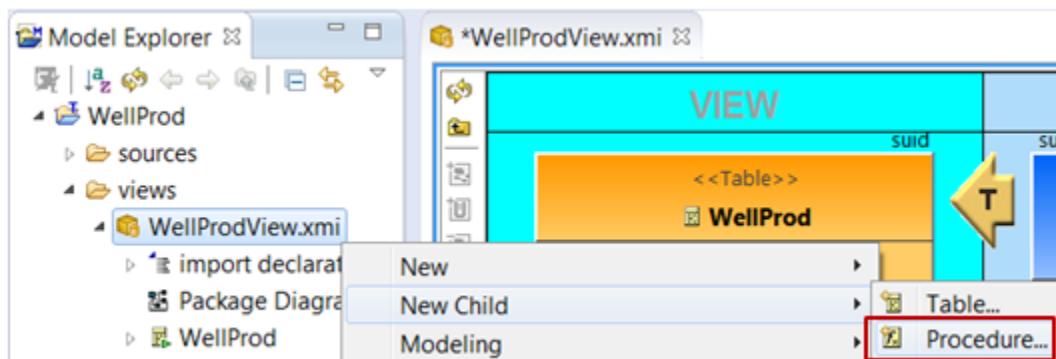
To summarize what has been done with the WellProd view table:

- Add a primary key that maps to the ID field.
- Override the default SQL INSERT statement.

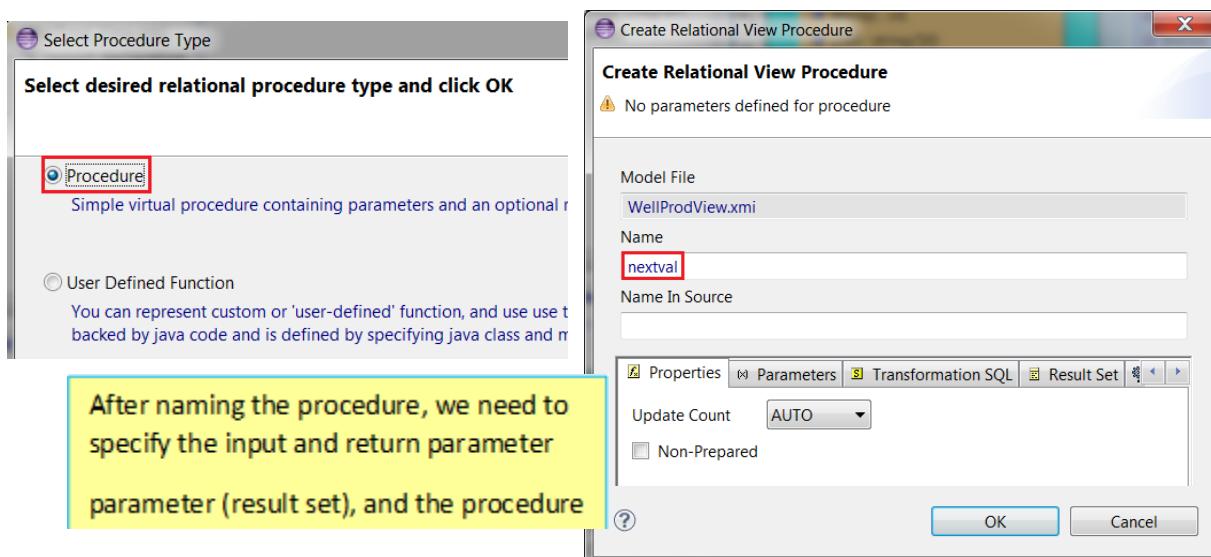
Now write a virtual procedure named nextval. This procedure is called by DSDS and is used in place of the default db INSERT statement to insert a record into the data source (OData).

## 7. Create a virtual procedure for the view model

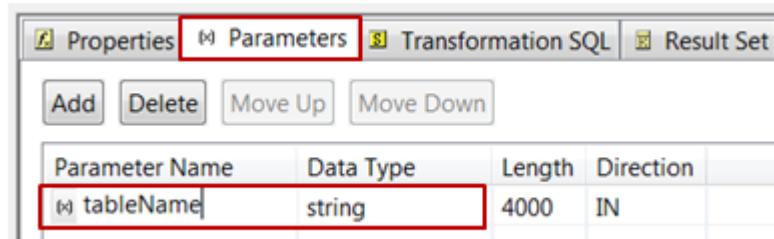
- Right-click the **WellProdView.xmi** and select **New Child > Procedure** which will display the Select Procedure Type dialog box.



- Select **Procedure** and click **OK** to display the Create Relational View Procedure dialog box.  
Name the procedure **nextval**.

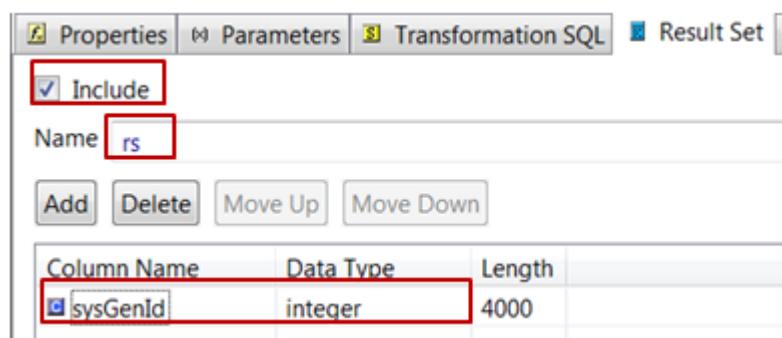


- c) Select the **Parameters** tab. Then click **Add** to add a row. In the new row, enter **tableName** in the **Parameter Name** column, **string** for the **Data Type** column.

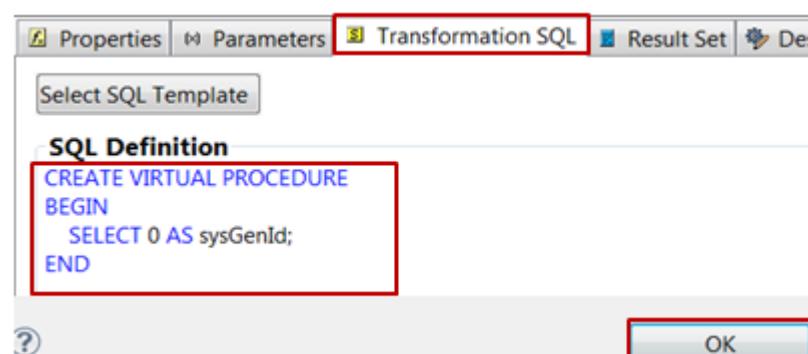


- d) Select the **Result Set** tab. Select the **Include** option, and enter **rs** in the **Name** text box.

Then click **Add** to add a new row. Enter **sysGenId** for **Column Name**, and **integer** for **Data Type**.



- e) Select the **Transformation SQL** tab. Enter the function body as shown. Click **OK**.



- f) Double-click **nextval** > **Transformation Diagram** in the **Model Explorer** tree. Then select the **Table Editor** tab and click **nextval** > **rs** > **sysGenID** in the **Model Explorer** tree to display the following window:

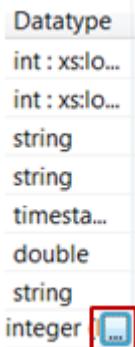
The screenshot shows the Model Explorer on the left and the Table Editor on the right. In the Model Explorer, under the 'WellProd' project, 'views' is expanded, showing 'WellProdView.xmi'. Under 'WellProdView.xmi', 'nextval' is selected, and 'rs' is expanded, showing 'sysGenId : integer'. The Table Editor window has tabs for 'Base Tables', 'Columns', 'Primary Keys', 'Procedures', 'Procedure Parameters', and 'Procedure Results'. The 'Columns' tab is active, displaying a table with columns: Location, Name, Name In Sour..., Native Type, Length, Lengt..., Num..., Nu..., Nullable, Auto..., Defau... . A red box highlights the 'Native Type' column for the 'sysGenId' row, which is currently set to 'integer'.

- g) Fill out the **Name In Source** and **Native Type** columns and change the **sysGenId** **Data Type** to **int** instead of **integer**.

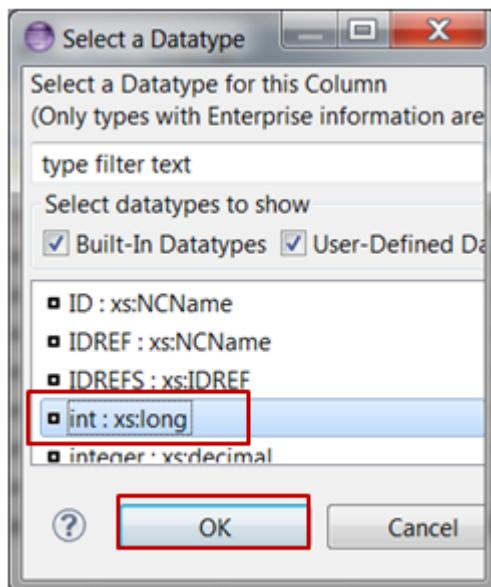
The screenshot shows the Table Editor window with the 'Columns' tab selected. The table includes columns: Location, Name, Name In Source, Native Type, and Length. The 'Native Type' column for the 'sysGenId' row is highlighted with a red box and contains the value 'int'. The 'Length' column for this row also contains the value '4000'.

Location	Name	Name In Source	Native Type	Length
WellProd	ID	"ID"	integer	0
WellProd	WellId	"WellId"	integer	0
WellProd	UWI	"UWI"	string	50
WellProd	Common...	"CommonWellName"	string	50
WellProd	Date	"Date"	timestamp	0
WellProd	Measure...	"MeasurementValue"	float	0
WellProd	Measure...	"MeasurementType"	string	10
rs	sysGenId		int	4000

- h) Scroll all the way to the right and change the integer DataType of **sysGenId** to **int**.

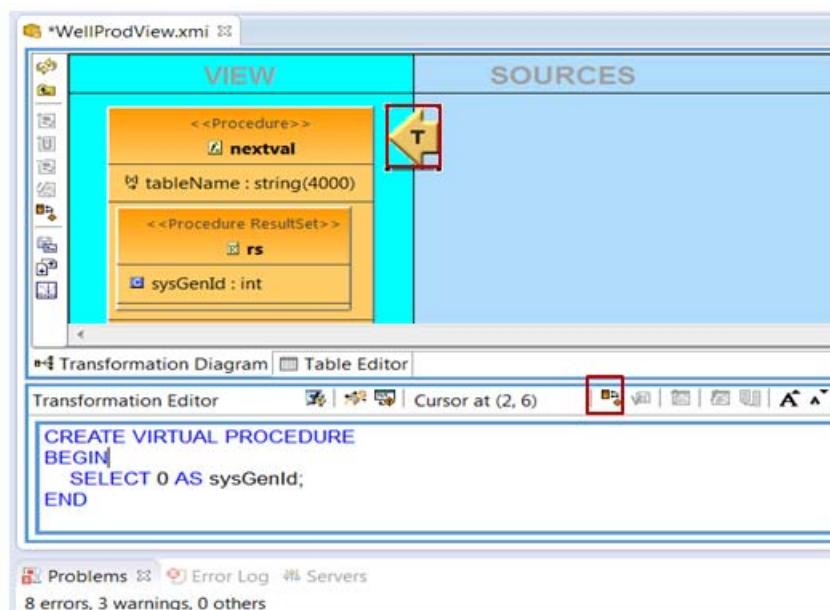


- i) Click the **integer:...** datatype of **sysGenId**, then select **int: xs:long** from the Select a Datatype dialog box. Click **OK**.

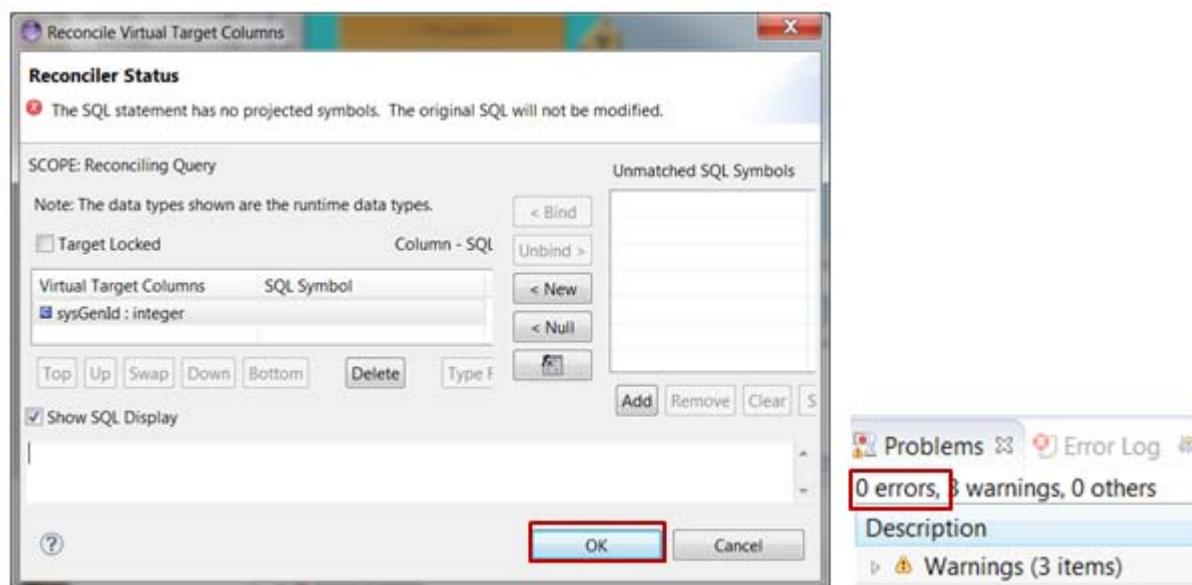


- j) Double-click the **nextval > Transformation Diagram** in the **Model Explorer** tree, then click the **T** arrow button.

Then save the model and click the **Reconcile Transformation SQL with Target Columns** icon.

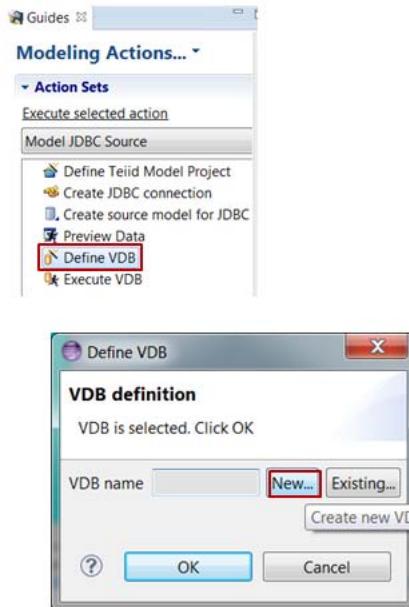


- k) Click **OK**. Make sure there are no errors.

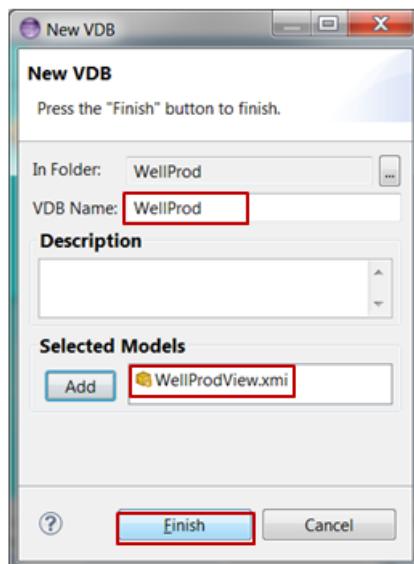


## 8. Create a VDB for the view model

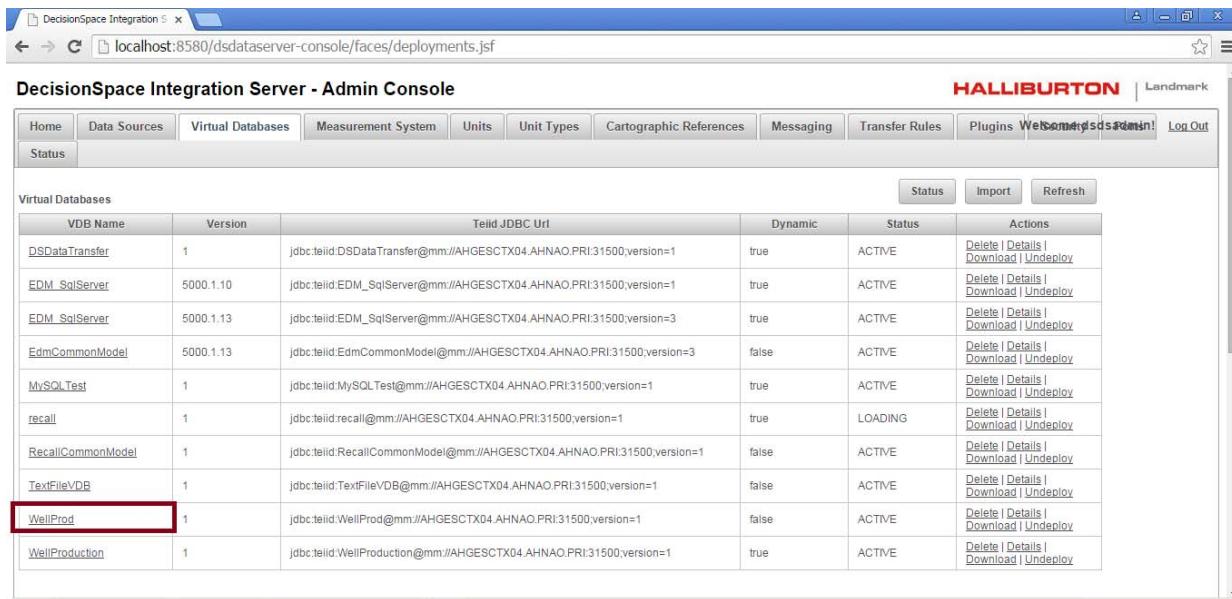
- a) Double-click the **Define VDB** action in the **Guides** tab. Click **New** to display the New VDB dialog box.



- b) Select **WellProd** as the In folder, enter WellProd for the VDB Name, and WellProdView.xmi for the model. Click **Finish**.



## 9. Deploy the WellProd.vdb into DSIS using DSIS Console



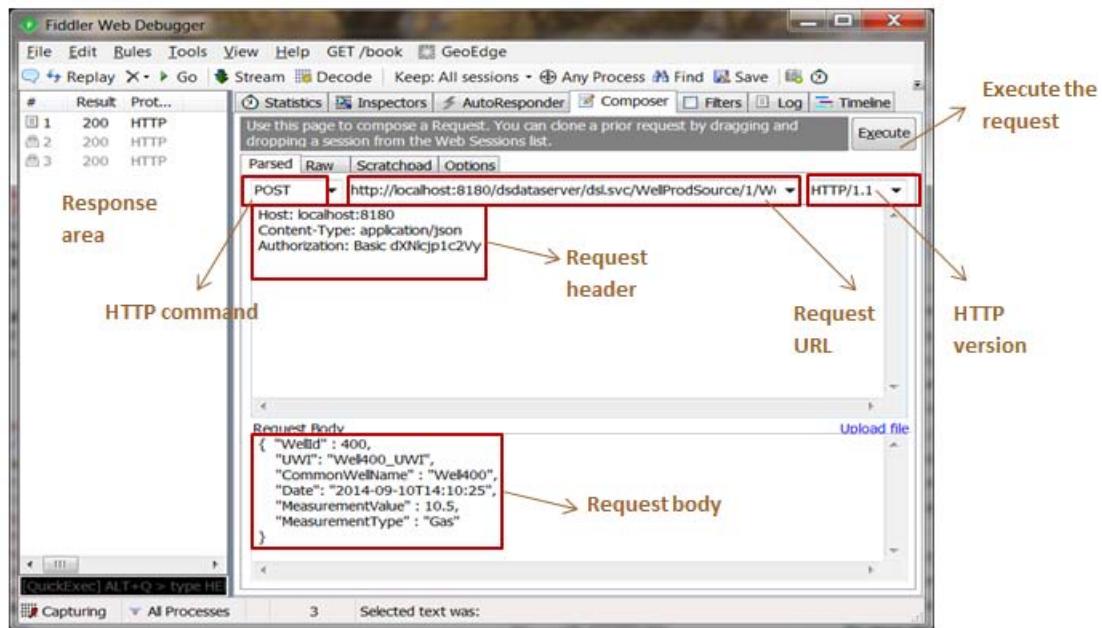
The screenshot shows the 'Virtual Databases' section of the DSIS Admin Console. The table lists various VDBs with their details. The 'WellProd' row is selected and highlighted with a red box.

VDB Name	Version	Teiid JDBC Uri	Dynamic	Status	Actions
DSDataTransfer	1	jdbc.teiid:DSDataTransfer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
EDM_SQLServer	5000.1.10	jdbc.teiid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
EDM_SQLServer	5000.1.13	jdbc.teiid:EDM_SQLServer@mm://AHGESCTX04.AHNAO.PRI:31500;version=3	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
EdmCommonModel	5000.1.13	jdbc.teiid:EdmCommonModel@mm://AHGESCTX04.AHNAO.PRI:31500;version=3	false	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
MySQLTest	1	jdbc.teiid:MySQLTest@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
recall	1	jdbc.teiid:recall@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	LOADING	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
RecallCommonModel	1	jdbc.teiid:RecallCommonModel@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	false	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
TextFileVDB	1	jdbc.teiid:TextFileVDB@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	false	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
WellProd	1	jdbc.teiid:WellProd@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	false	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>
WellProduction	1	jdbc.teiid:WellProduction@mm://AHGESCTX04.AHNAO.PRI:31500;version=1	true	ACTIVE	<a href="#">Delete</a>   <a href="#">Details</a>   <a href="#">Download</a>   <a href="#">Undeploy</a>

## 10. Access the data

- Use **fiddler** tool to read and write data to the **WELL\_PRODUCTION** data source.
  - Prove that using the dynamic vdb, write access fails.
  - Prove that using the standard vdb, write access succeeds.

See C:\Training\DSDS\fiddler\_commands.txt



---

## **Exercise # 5: Create a Standard VDB from a Text File (CSV)**

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### ***Purpose of the Exercise***

The purpose of the exercise is to show how to use the DataServer Design Studio to create a relational view model from a CSV format text file.

### ***Outcome of the Exercise***

Access the flat file data as a relational data source after successful creation and deployment of the VDB.

### ***Exercise Workflows***

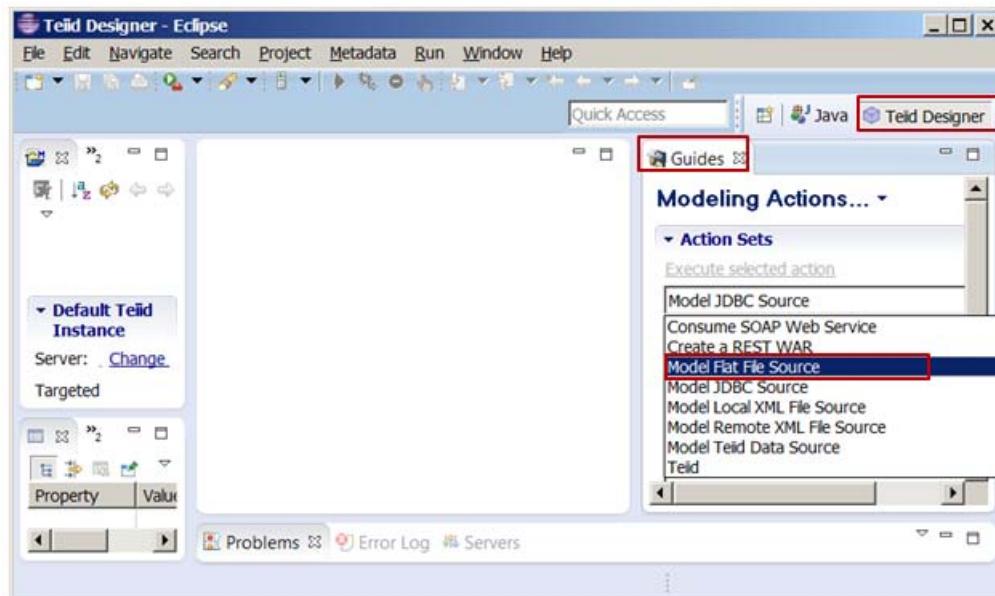
- Ensure that the JAVA\_HOME environment variable is defined (to run Teiid Designer)
- Launch the DecisionSpace Design Studio (Teiid Designer) tool and create the source, view models, and VDB
- Deploy the VDB into DSIS
- Access the VDB using OData (browser) or JDBC protocol (Squirrel)

## 1. Launch the DecisionSpace DataServer Design Studio (Teiid Designer)

Use the same workspace as the previous exercise or create a new one.

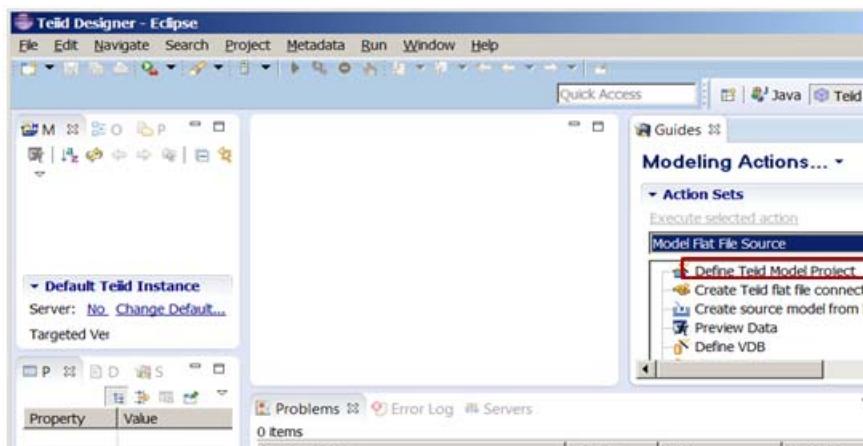
- a) In Teiid Designer, open a Teiid Designer perspective by selecting **Window > Open Perspective > Other...**, and then select **Teiid Designer** from the Open Perspective dialog box.

In the Teiid Designer perspective window - in the **Guides** tab, click the **Model JDBC Source** drop-down menu and select **Model Flat File Source**.



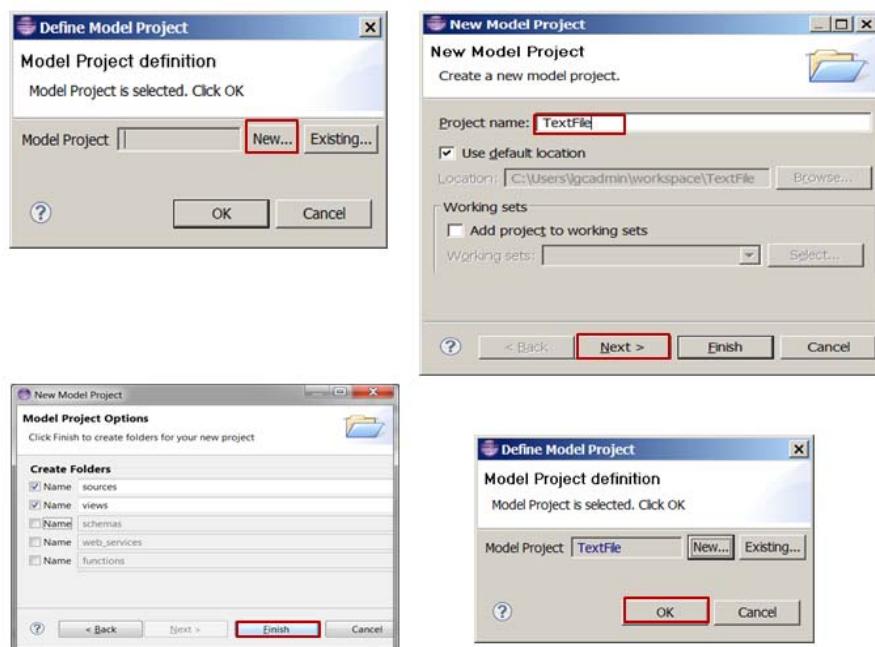
## 2. Create a model project in Teiid Designer

- a) Double-click the **Define Teiid Model Project** modeling actions.



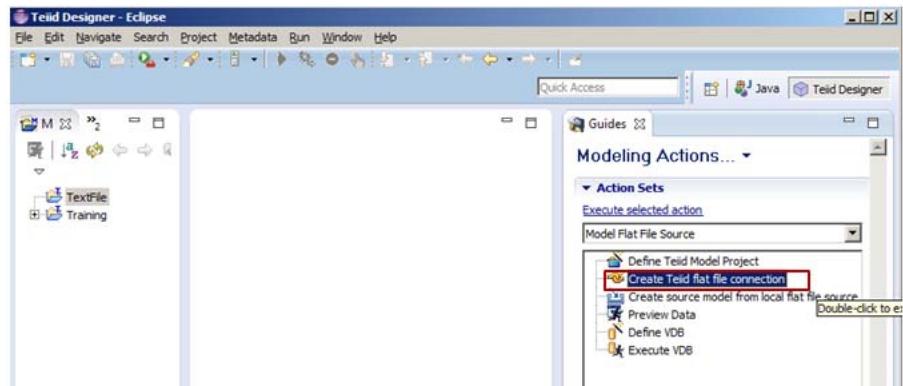
- b) Click **New** on the Define Model Project dialog box to display the New Model Project dialog box.

In the New Model Project dialog box, enter the project name (**TextFile**) and click **Next** to select the folders, and then click **Finish**.

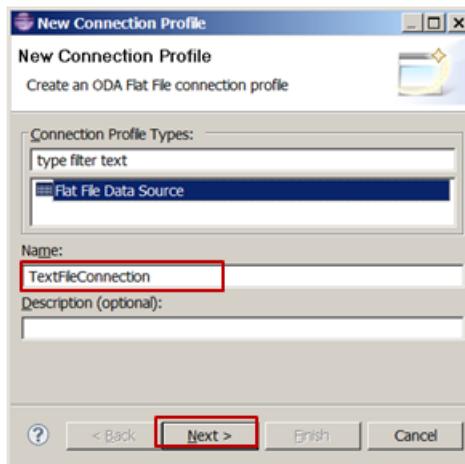


### 3. Create a Flat File connection

- a) Double-click the **Create Teiid flat file connection** action to display the New Connection Profile dialog box.

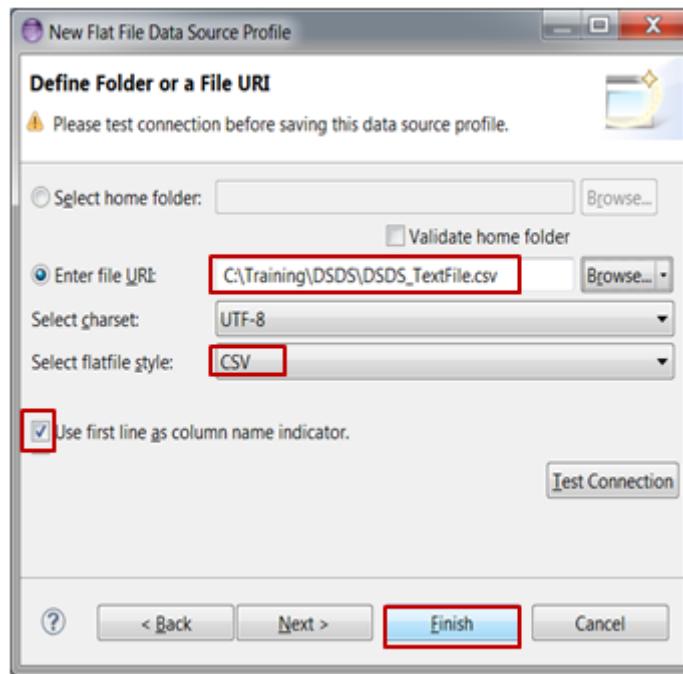


- b) In the New Connection Profile dialog box, enter **TextFileConnection** for the connection name, and then click **Next**.



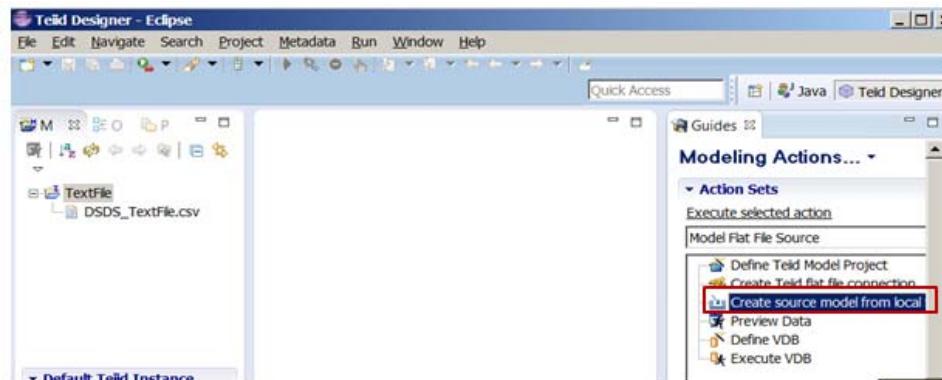
- c) In the New Flat File Data Source Profile dialog box:
- Select the **Enter file URI** option, and then Browse to **C:\Training\DSDS\DSDS\_TextFile.csv**
  - The **Select flatfile** style is **CSV**.
  - Check **Use first line as column name indicator**.

- Click **Test Connection**. If the Ping is successful, click **Finish**.

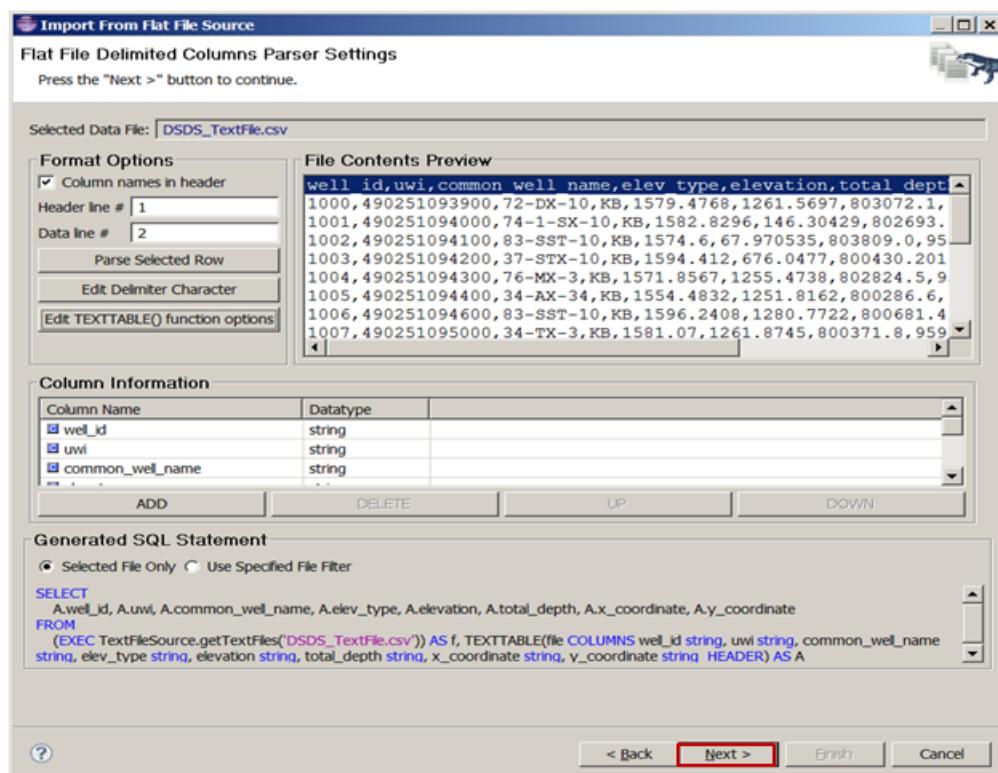
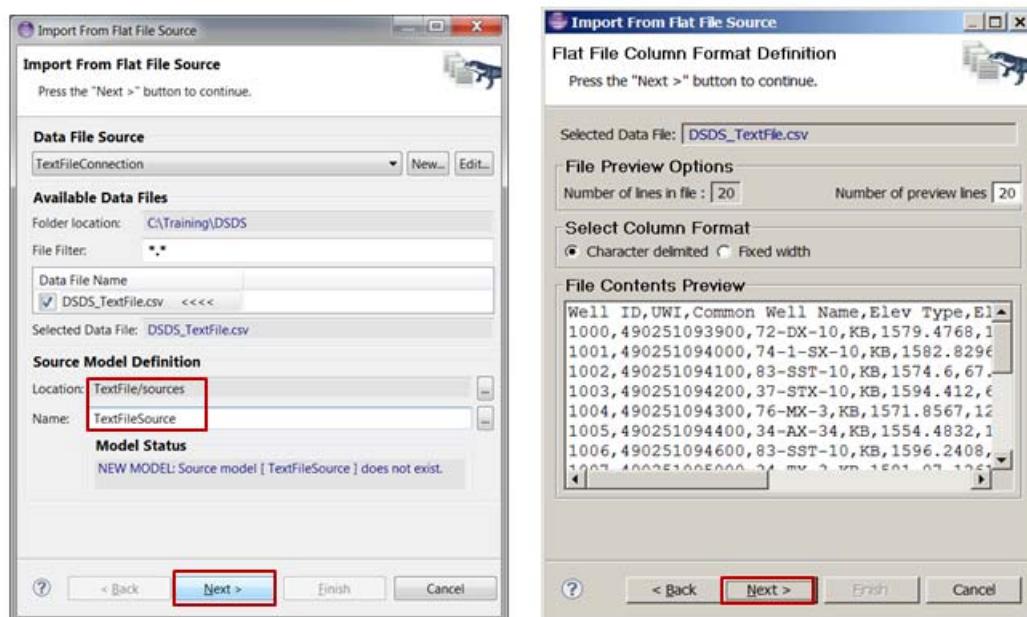


#### 4. Create a source model and view definition for the flat file (CSV)

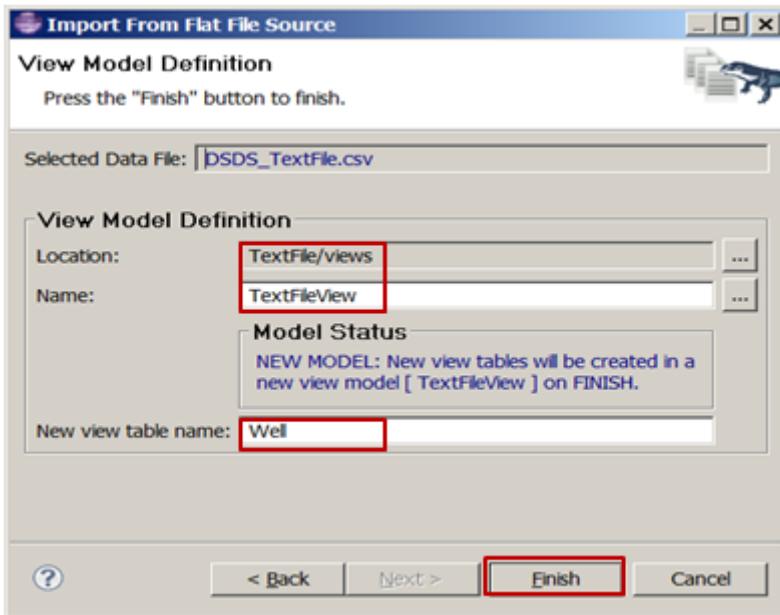
- a) Double-click the **Create source model from local flat file** source modeling action to display the Import From Flat File Source dialog box.



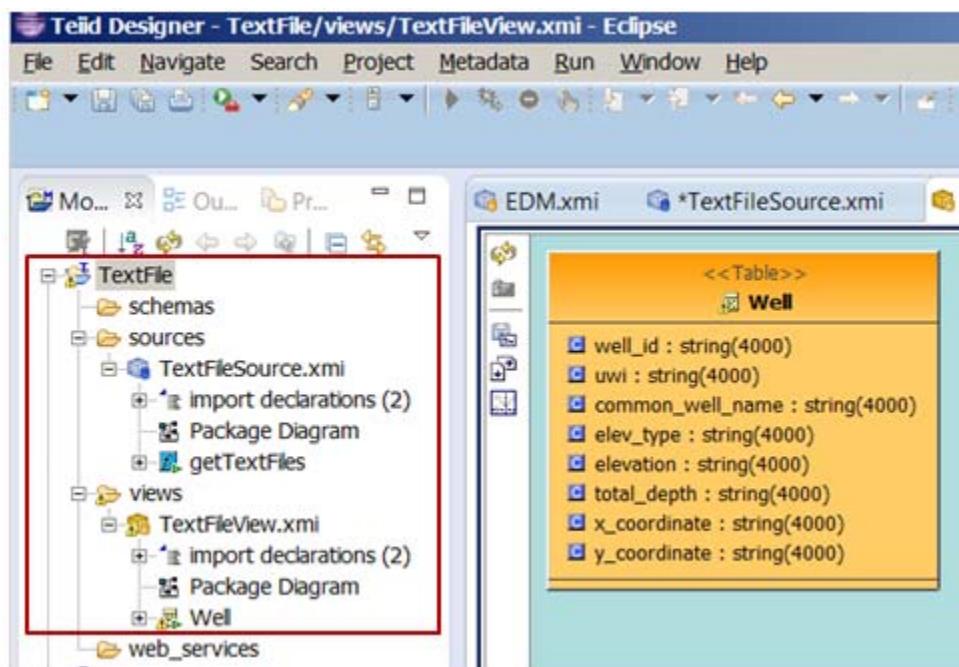
- b) In the Import From Flat File Source dialog box, browse to **TextFile/sources** for Location and enter **TextFileSource** for the Name. Click Next.



- c) In the View Model Definition dialog box, browse to **TextFile/views** for **Location** and enter view name **TextFileDialog** and table name **Well**. Click **Finish**.

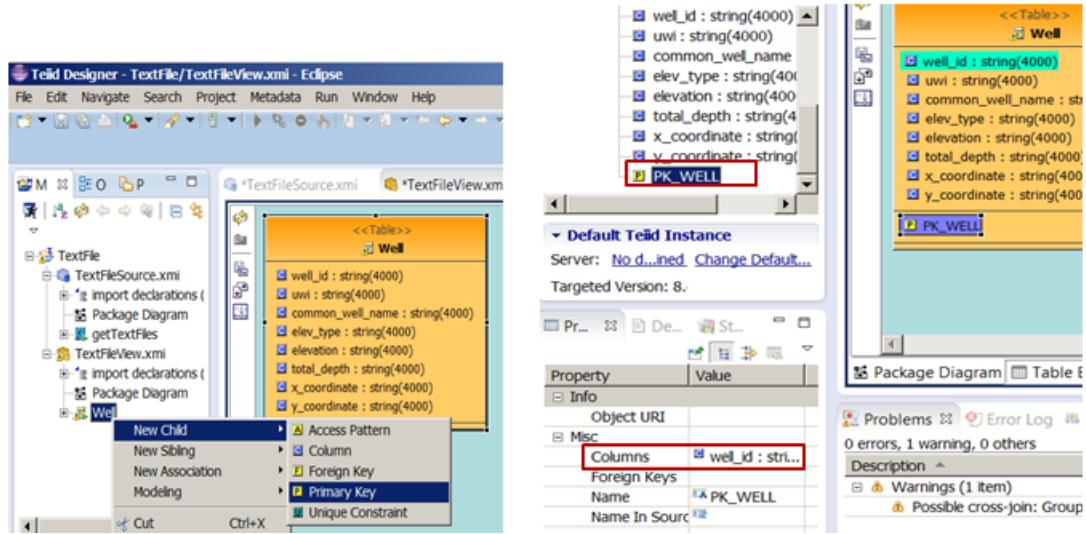


- d) Source model (**TextFileSource.xmi**), view model (**TextFileDialog.xmi**) and virtual table (**Well**) have been created.



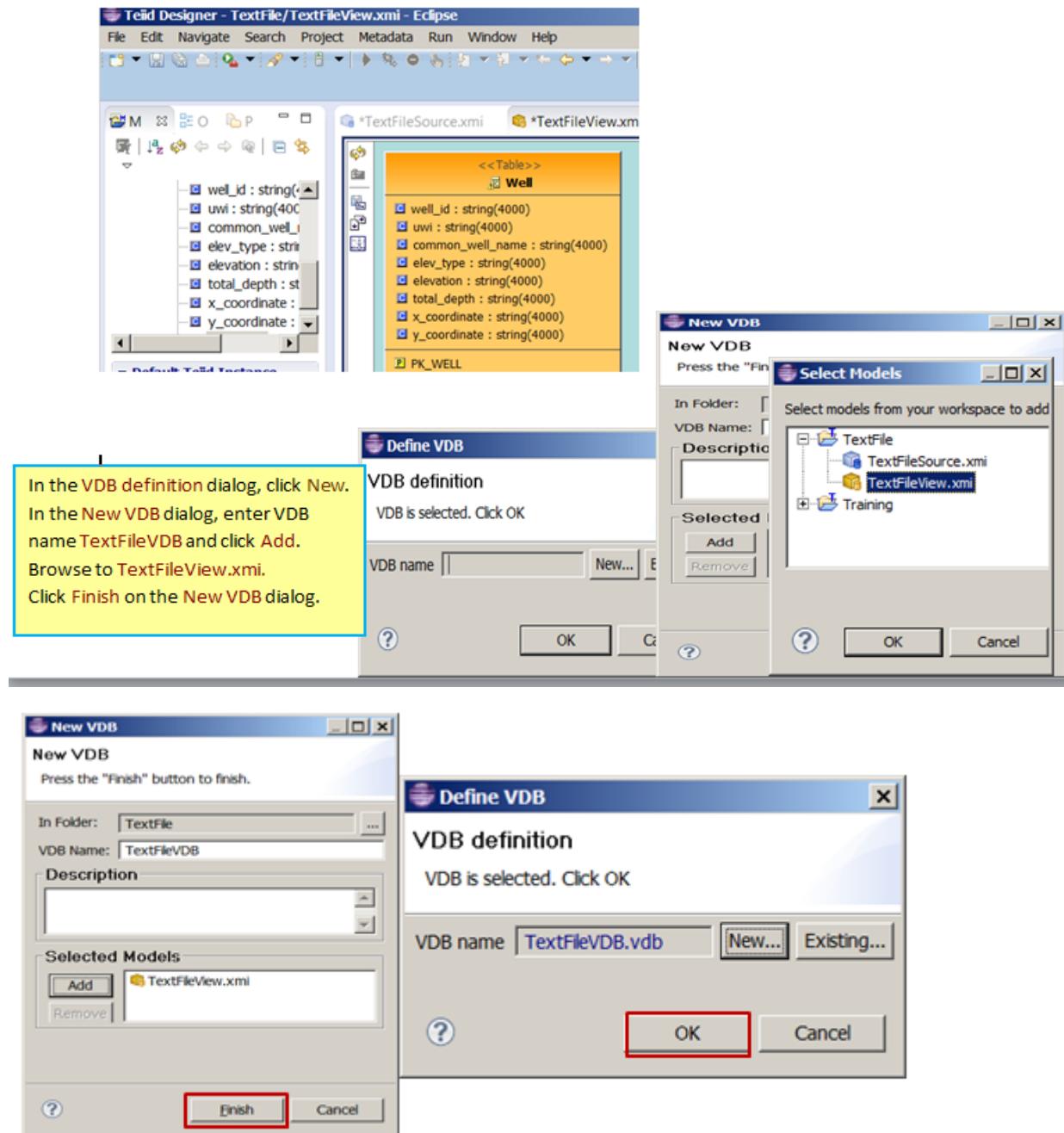
## 5. Define a primary key for the virtual Well table

Right-click the Well table and select **New Child > Primary Key**. Name it **PK\_WELL** and map it to the **well\_id** column of the table.



## 6. Create a VDB

Double-click the **Define VDB** modeling action to display **New Connection Profile** to display the Define VDB dialog box.



## 7. Stop the DSIS Service

### 8. Modify DSDS standalone-dsds.xml to add the resource adapter for “file” data connection

For File data sources, Teiid provides a JCA connector (resource adapter) which is deployed at installed time. The template for a File resource adapter is located in **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\docs\teiid\datasources\file\file-ds.xml**

- a) Edit the **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\standalone-dsds.xml** file and add the following lines (or cut and paste from **C:\Training\DSDS\FileResourceAdapter.txt**) in the <resource-adapters> section.

Ensure that the **jndi-name** name matches the one in the **vdb.xml**. (In this example, the names match.)

```
<resource-adapter id="file">

<module slot="main" id="org.jboss.teiid.resource-adapter.file"/>

<transaction-support>NoTransaction</transaction-support>

<connection-definitions>

<connection-definition
  class-name="org.teiid.resource.adapter.file.FileManagedConnectionFact
  ory"

  jndi-name="java:/TextFileSource"
  enabled="true"

  pool-name="file">

    <config-property name="AllowParentPaths">true</config-property>

    <config-property
      name="ParentDirectory">C:\Training\DSDS</config-property>

    <pool>

      <min-pool-size>2</min-pool-size>
```

```

<max-pool-size>20</max-pool-size>

<prefill>false</prefill>

</pool>

</connection-definition>

</connection-definitions>

</resource-adapter>

```

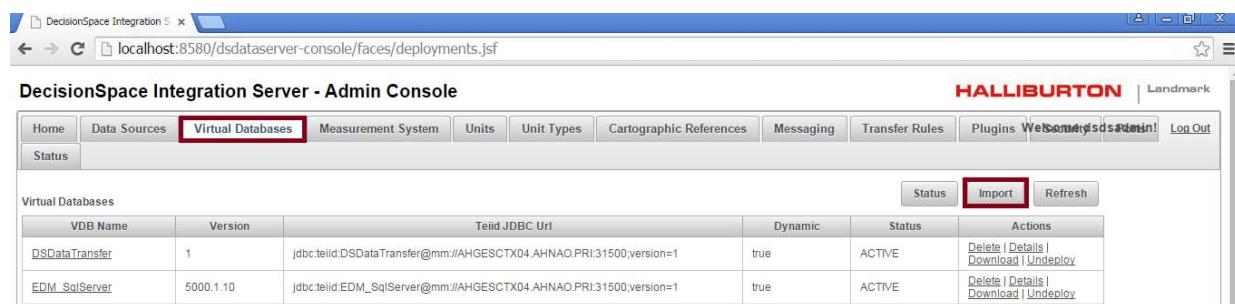
## 9. Steps to change the jndi-name in the vdb.xml file (if needed)

- Go to the Teiid Designer workspace folder  
**%USERPROFILE%\workspace\TextFile.**
- Using WinRAR, unzip the **TextFileVDB.vdb**.
- Modify the **vdb.xml** file in the **META-INF** folder:
  - Replace the value for property **connection-jndi-name** to be “**TextFileSource**”
  - Zip/pack all the folders (**META-INF, runtime-inf, TextFile**) using WinRAR (ZIP format option) and name it **TextFileVDB.vdb** (replacing the old one)

## 10. Start the DSIS Service

## 11. Deploy the TextFileVDB into DSIS

Select the **Virtual Databases** tab in the DSIS Console and then click **Add** to deploy the modified **TextFileVDB.vdb**.



## 12. Access the text file in a browser or Squirrel

The screenshot shows the Squirrel SQL Client interface. The left sidebar displays the 'Objects' tree, which includes a 'DSDS TextfileVDB' node containing various database objects like 'SYS', 'SYADMIN', 'TextfileSource', 'TextfileView', 'DOCUMENT', 'SYSTEM TABLE', 'TABLE' (with 'Well' highlighted), 'VIEW', 'XMLSTAGINGTAB', 'PROCEDURE', 'UDT', and 'pg\_catalog'. The main pane shows a table with columns: well\_id, uwi, common\_well\_name, elev\_type, elevation, total\_depth, x\_coordinate, and y\_coordinate. The table contains 108 rows of data.

The screenshot shows the Squirrel SQL Client interface with the 'SQL' tab selected. The SQL editor contains the following query:

```
SELECT * FROM Well WHERE well_id > '1010'
```

The results pane below shows the output of the query, listing 10 rows of data from the 'Well' table where well\_id is greater than 1010.

The screenshot shows a web browser window displaying the XML representation of the 'Well' resource. The URL is <http://localhost:8180/dsdataserver/dslsvc/TextFileView/1/TextFileVDB-TextFileSource/Well>. The XML content includes metadata headers and two entries for wells with IDs 1000 and 1001, each with their respective properties like total\_depth, elev\_type, and coordinates.

```
<?xml version="1.0" encoding="utf-8"?>
<feed xmlns="http://www.w3.org/2005/Atom" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
      xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
      xml:base="http://localhost:8180/dsdataserver/dslsvc/TextFileView/1/TextFileVDB-TextFileSource/"/>
<category type="text" />
<updated>2014-06-23T15:25:36Z</updated>
<link rel="self" title="Well" href="Well" />
<entry>
  <id>http://localhost:8180/dsdataserver/dslsvc/TextFileView/1/TextFileVDB-TextFileSource/Well('1000')</id>
  <title type="text" />
  <updated>2014-06-23T15:25:36Z</updated>
  <author>
    <link rel="edit" title="Well" href="Well('1000')"/>
    <category term="TextFileView.Well" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  </author>
  <content type="application/xml">
    <m:properties>
      <d:total_depth>1261.5697</d:total_depth>
      <d:elev_type>KB</d:elev_type>
      <d:uwi>490251093900</d:uwi>
      <d:elevation>1579.4768</d:elevation>
      <d:y_coordinate>955296.201</d:y_coordinate>
      <d:x_coordinate>146.30429</d:x_coordinate>
      <d:common_well_name>22-OX-10</d:common_well_name>
      <d:well_id>1000</d:well_id>
    </m:properties>
  </content>
</entry>
<entry>
  <id>http://localhost:8180/dsdataserver/dslsvc/TextFileView/1/TextFileVDB-TextFileSource/Well('1001')</id>
  <title type="text" />
  <updated>2014-06-23T15:25:36Z</updated>
  <author>
    <link rel="edit" title="Well" href="Well('1001')"/>
    <category term="TextFileView.Well" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  </author>
  <content type="application/xml">
    <m:properties>
      <d:total_depth>146.30429</d:total_depth>
      <d:elev_type>KB</d:elev_type>
      <d:uwi>490251093900</d:uwi>
    </m:properties>
  </content>
</entry>
```

---

---

## **DataServer Security**

---

### ***DataServer Authentication***

The DataServer authentication (dsds-security-domain) can be combinations of these JBoss Authentication (SecurityIdentityLoginModule) options:

- File based (UsersRolesLoginModule)<sup>12</sup>
- Database-driven (DatabaseServerLoginModule)
- LDAP (LdapExtLoginModule)

The option(s) chosen can be integrated with Microsoft's Active Directory (AD) and supports Single Sign On (SSO).

### ***Data Source Authorization***

All the authorization mechanisms for the underlying data sources are honored.

---

12. This is the out-of-the-box default (dsds-security-users.properties and dsds-security-roles.properties). Refer to “Default File-based Authentication” on page A-28 for the contents of these two \*.properties files and *standalone-dsds.xml*.

## Data Source Password Encryption

Data Stores' passwords can be stored in clear text or encrypted based on the attribute encryptPassword (either true for encrypt or false to leave in clear text) specification defined in dsdsConsoleConfig.properties. The passwords are stored in standalone-dsds.xml. Refer to Data Source Password Encryption Example -- dsdsConsoleConfig.properties and standalone-dsds.xml for one example of how these files might appear.

```
# DSDS Console Configuration Properties.
h2.attributes=encryptPassword(false),displayName(H2)
phub.attributes=jdbcUrl(jdbc:scuapi:client_id=DSDS_only_valid_for_landmark),encryptPassword(false),displayName(PowerHub),translator(powerhub),isLGC(true),vdbName(Powerhub)
outconnect.attributes=isLGC(true),translator(openworks),schemaName(%),modelName(OW5000),vdbName(OpenWorks),displayName(OpenWorks),transactionSupport(XATransaction)
EDM-SQLServer.attributes=jdbcUrl(jdbc:sqlserver://[:serverName[:instanceName]][:portNumber]][;property=value[;property=value]],isLGC(true),translator(EdmTranslator),schemaName(dbo),modelName(EDM),vdbName(EDM_SQLServer)
EDM-SQLServer.attributes.connectionValidation=valid-connection-checker-class-name(org.jboss.jca.adapters.jdbc.extensions.mssql.MSSQLValidConnectionChecker),check-valid-connection-sql(select 1),validate-on-match(true),use-fast-fail(false),exception-sorter-class-name(org.jboss.jca.adapters.jdbc.extensions.novendor.NullExceptionSorter)
EDM-Oracle.attributes=jdbcUrl(jdbc:oracle:thin:@[HOST][:PORT][:SERVICE]),isLGC(true),translator(EdmOracleTranslator),schemaName(EDMADMIN),modelName(EDM),vdbName(EDM_Oracle)

<security-domain name="NORWAYSecurityDomain" cache-type="default">
    <authentication>
        <login-module name="NORWAYSecurityDomainlogin-module" code="SecureIdentity" flag="required">
            <module-option name="username" value="hb15968"/>
            <module-option name="password" value="36e38294ce72625c"/>
        </login-module>
    </authentication>
</security-domain>
<security-domain name="EDMDATASecurityDomain" cache-type="default">
    <authentication>
        <login-module name="EDMDATASecurityDomainlogin-module" code="SecureIdentity" flag="required">
            <module-option name="username" value="edm"/>
            <module-option name="password" value="-68464afbc18e19e864265fa892564719"/>
        </login-module>
    </authentication>
</security-domain>
```

Figure 51: Data Source Password Encryption Example -- dsdsConsoleConfig.properties and standalone-dsds.xml

The default is to encrypt the password. The DataServer encryption tool is provided in **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\bin\encryptDSDSPassword.bat**, and an example of its use is shown below:

```
c:\Landmark\DSDataServer5000.10.1.0\ApplicationServer\bin>encryptDSDSPassword.bat mypassword
Encoded password: 1d31b70b3650168f79edee9e04977e34
```

Figure 52: Data Server Encryption Tool Example Usage

## DataServer Integration with Active Directory (AD)

- Configure the dsds-security-domain in standalone-dsds.xml with **LdapExtLoginModule** and **UsersRolesLoginModule** authentication stack; this is a manual edit.
- With LDAP, the authentication comprises only two steps.

- An initial bind to the LDAP server is done using the **bindDN** and **bindCredential** options. The **bindDN** is a user (e.g., **dsds**) with the ability to search both the **baseCtxDN** and **rolesCtxDN** trees for the user and roles. The user DN to authenticate against is queried using the filter specified by the **baseFilter**.
- The resulting user DN is then authenticated by binding to the LDAP server using the user DN as the **InitialLdapContext** environment Context.**SECURITY\_PRINCIPAL**. The Context.**SECURITY\_CREDENTIALS** property is set to the String password obtained by the callback handler.
- If this is successful, the associated user roles are queried using the **rolesCtxDN**, **roleAttributeID**, **roleAttributeIsDN**, **roleNameAttributeID**, and **roleFilter** options.
- In **dsds-security-roles.properties**, add the AD users/groups and their DSDS roles; this is a manual edit.

```

<security-domain name="dsds-security-domains" cache-type="default">
  <authentication>
    <login-module code="org.jboss.security.auth.spi.LdapExtLoginModule" flag="optional" >
      <module-option name="java.naming.factory.initial" value="com.sun.jndi.ldap.LdapCtxFactory"/>
      <module-option name="java.naming.provider.url" value="ldap://host:389"/>
      <module-option name="java.naming.security.authentication" value="simple"/>
      <module-option name="bindDN" value="CN=dsds,CN=Users,DC=training,DC=pr1"/>
      <module-option name="bindCredential" value="T3st&dm123"/>
      <module-option name="baseCtxDN" value="OU=Users,DC=training,DC=pr1"/>
      <module-option name="baseFilter" value="(sAMAccountName=(#))"/>
      <module-option name="allowEmptyPasswords" value="true"/>
      <module-option name="bindAllAttributes" value="true"/>
      <module-option name="bindAllAttributesFromReferrals" value="false"/>
      <module-option name="java.naming.referral" value="follow"/>
      <module-option name="selectTable" value="CN=Users,DC=training,DC=pr1"/>
      <module-option name="roleFilter" value="(sAMAccountName=(#))"/>
      <module-option name="roleAttributeID" value="memberID"/>
      <module-option name="roleAttributeValueID" value="cn"/>
      <module-option name="roleAttributeValueIsDN" value="true"/>
      <module-option name="roleRecursion" value="1"/>
      <module-option name="searchScope" value="SUBTREE_SCOPE"/>
      <module-option name="password-stacking" value="useFirstPass"/>
    </login-module>
    <login-module code="UsersRoles" flag="required" >
      <module-option name="usersProperties" value="${jboss.server.config.dir}/dsds-security-users.properties"/>
      <module-option name="rolesProperties" value="${jboss.server.config.dir}/dsds-security-roles.properties"/>
      <module-option name="password-stacking" value="useFirstPass"/>
    </login-module>
  </authentication>
</security-domain>

```

standalone-dsds.xml

```

# A roles.properties file for use with the UsersRolesLoginModule
# username=role,role
user@example-role
dsds=dsds-user-role
dsdsadmin=dsds-user-role,dsds-admin-role
ede=dsds-user-role,dsds-admin-role
edeadmin=dsds-user-role,dsds-admin-role
dsds-client=dsds-user-role,dsds-admin-role
pmbkUser=dsds-user-role,dsds-admin-role
pmbkUserAdmin=dsds-user-role,dsds-admin-role
dsds-user=dsds-user-role,dsds-admin-role
dsds-userDBX,LCC.COM=dsds-user-role,dsds-admin-role
dsXL1261=dsds-user-role,dsds-admin-role
dsXL1261HDX,LCC.COM=dsds-user-role,dsds-admin-role

```

dsds-security-roles.properties

Figure 53: Data Server Integration with Active Directory -- standalone-dsds.xml and dsds-security-roles.properties files

## DataServer Management Modes and Clustering

### Management Modes

The choice between a Standalone vs. Managed Domain is all about **how the servers are managed**, not about what capabilities they have to service the end users. Hence, it is not about load balancing or some other capability, but just about how server(s) are administered.

#### Standalone Management Mode

Standalone management mode is a single, independent DataServer process. There is no need for centralized management capabilities, as the process resides on a single server. It is primarily used for Development/Testing, Proof of Concept (PoC), Remote Location, or a Production Environment for up to 20 users (based on data sources and kind of data).

### Startup and Profile

- DSDS Service is launched by DSDS\_INSTALL\start.bat --> JBOSS\_HOME\bin\service.bat

```
"C:\Landmark\DSDataServer5000.10.1.0\ApplicationServer\bin\jbossvc.exe" -p 1 "Starting %SUCDISP%" > run.log
call run.bat < .r.lock >> run.log 2>&1
```

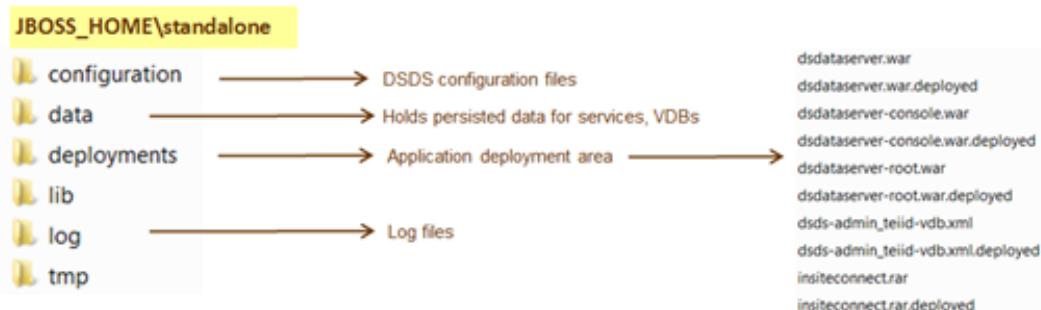
service.bat

---

```
if "%1"=="start" {
    :: All configuration except that dependent on windows variables is set through properties file
    standalone.bat -P%JBOSS_HOME%\standalone\configuration\dsdsAppConfig.properties
                    -DSLG_CARTO_FILE_DIR=%PE_HOME%\conf\ou
                    --server-config=standalone-dsds.xml
```

run.bat

- Reads its profile configuration from  
JBOSS\_HOME\standalone\configuration\standalone-dsds.xml



## Managed Domain Management Mode

- A **Managed Domain** is a collection of Data Server servers that are **centrally** managed from a single point of control.
  - The domain consists of one **Domain Controller (DC)**, and one or more **Host Controllers (HC)**
  - A DC is a HC that has been configured to be the *domain controller*
  - The DC acts as a central management point for the domain. Together with the HCs, they ensure that all the Data Server instances in the domain share a common management policy
  - The DC/HC start and stop the Data Server server instance(s) on their host
  - If a DC fails, you can configure and promote any of the HCs to act as the DC

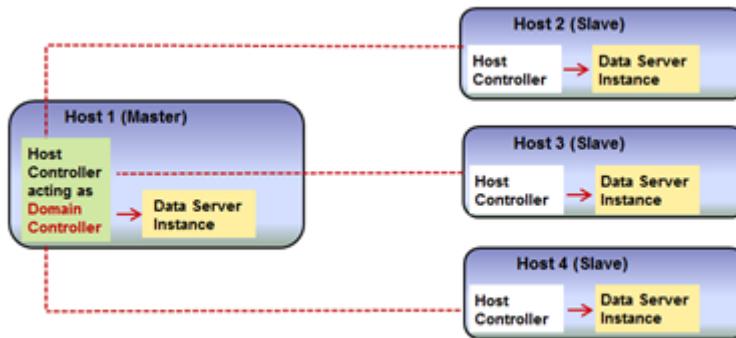


Figure 54: Managed Domain Topology

In multi-server environments, the choice comes down to the need for centralized management capabilities that a managed domain would provide. However, for enterprises which have their own multi-server management capabilities, a multi-server architecture comprised of individual standalone servers is a good option.

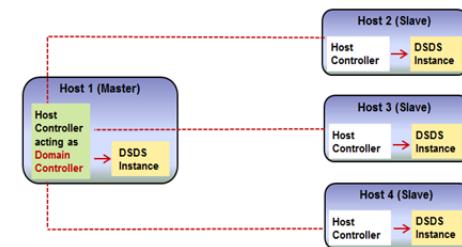
## Setup

- Install DSDS on each host that will be in the domain
- On the designated Domain Controller, configure the Host Controller as the Domain Controller:
  - In `JBOSS_HOME\domain\configuration\host-master-dsds.xml`:
    1. Add the `<domain-controller>` section to make itself a DC
    2. Expose the native and HTTP management interfaces
  - Create slaves' credentials (`add-user.bat`) for slaves to register with DC
- On each slave Host Controller do:
  - In `JBOSS_HOME\domain\configuration\host-slave-dsds.xml`:
    3. Add a distinct (within the domain), logical host name for this host
    4. Add a security realm to hold the identity of this slave
    5. Add the Domain Controller IP and port so it can register itself with the DC

```

<management-interfaces>
  <native-interface security-realm="ManagementRealm">
    <socket interface="management" port="${jboss.management.native.port:9999}" />
  </native-interface>
  <http-interface security-realm="ManagementRealm">
    <socket interface="management" port="${jboss.management.http.port:9990}" />
  </http-interface>
</management-interfaces>
<interfaces>
  <interface name="management">
    <inet-address value="192.168.0.101"/>           // DC host ip
  </interface>
</interfaces>

```



1  
`<domain-controller>`  
`<local/>`  
`</domain-controller>`

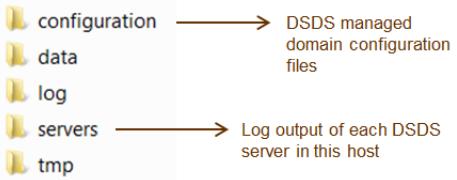
2  
`<host xmlns="urn:jboss:domain:1.0"`  
`name="slave1">`  
`</host>`

3  
`<security-realm name="Slave1Realm">`  
`<server-identities>`  
`<secret value="cE3EBEkE=" />` // add-user.bat output  
`</server-identities>`  
`</security-realm>`

4  
`<domain-controller>`  
`<remote host="192.168.0.101" port="9999"`  
`username="slave1" security-realm="Slave1Realm"/>`  
`</domain-controller>`

## Startup and Profiles

- On the Domain Controller host, run *runDSDS\_Domain\_Master.bat* to start the Domain Controller. Profile is **domain-dsds.xml** + **host-master-dsds.xml**
- On each of the Host Controller host, run *runDSDS\_Domain\_Slave.bat* to start the Host Controller. Profile is **domain-dsds.xml** + **host-slave-dsds.xml**
- The DC and HC will start the Data Server server(s) on their hosts

<p>&lt;DSDS_Install&gt;\ApplicationServer\bin</p> <pre>runDSDS_Domain_Master.bat runDSDS_Domain_Slave.bat</pre> <p>&lt;DSDS_Install&gt;\ApplicationServer\domain</p>  <ul style="list-style-type: none"> <li>↳ configuration → DSDS managed domain configuration files</li> <li>↳ servers → Log output of each DSDS server in this host</li> </ul>	<p><b>runDSDS_Domain_Master.bat</b></p> <pre>domain.bat -DSLG_CARTO_FILE_DIR=%PE_HOME%/conf/ow ^ -Djboss.home=%JBoss_HOME% ^ -P=%JBoss_HOME%/standalone/configuration/dsdsAppConfig.properties -P=%JBoss_HOME%/domain/configuration/dsdsClusterConfig.properties --domain-config=domain-dsds.xml ^ --host-config=host-master-dsds.xml</pre> <p><b>runDSDS_Domain_Slave.bat</b></p> <pre>domain.bat -DSLG_CARTO_FILE_DIR=%PE_HOME%/conf/ow ^ -Djboss.home=%JBoss_HOME% ^ -P=%JBoss_HOME%/standalone/configuration/dsdsAppConfig.properties -P=%JBoss_HOME%/domain/configuration/dsdsClusterConfig.properties --host-config=host-slave-dsds.xml</pre>
--	--

## Server Groups

- A **Server Group** is a collection of server (DSDS) instances that are managed and configured as one
  - Every server instance belongs to a Server Group, even if it's the only member
  - Server instances in a group share the **same** profile configuration and deployed content
  - Domain Controller and the Host Controller ensure that all server instances in a Server Group have consistent configuration
- A domain can consist of multiple server groups
  - Different server groups can be configured with different profiles and deployments

domain-dsds.xml

```

<server-groups>
  <server-group name="main-server-group" profile="default">
    <jvm name="default">
      <heap size="64m" max-size="512m"/>
      <permgen size="128m" max-size="128m"/>
    </jvm>
    <deployments>
      <deployment name="foo.war" runtime-name="foo.war"/>
      <deployment name="bar.ear" runtime-name="bar.ear"/>
    </deployments>
    <socket-binding-group ref="standard-sockets"/>
  </server-group>
  <server-group name="other-server-group" profile="bigger">
    <jvm name="default">
      <heap size="64m" max-size="512m"/>
    </jvm>
    <deployments>
      <deployment name="foo.war" runtime-name="foo.war"/>
    </deployments>
    <socket-binding-group ref="bigger-sockets"/>
  </server-group>
</server-groups>

```

## Clustering

Clustering refers to using multiple resources, such as servers, as though they were a single entity.

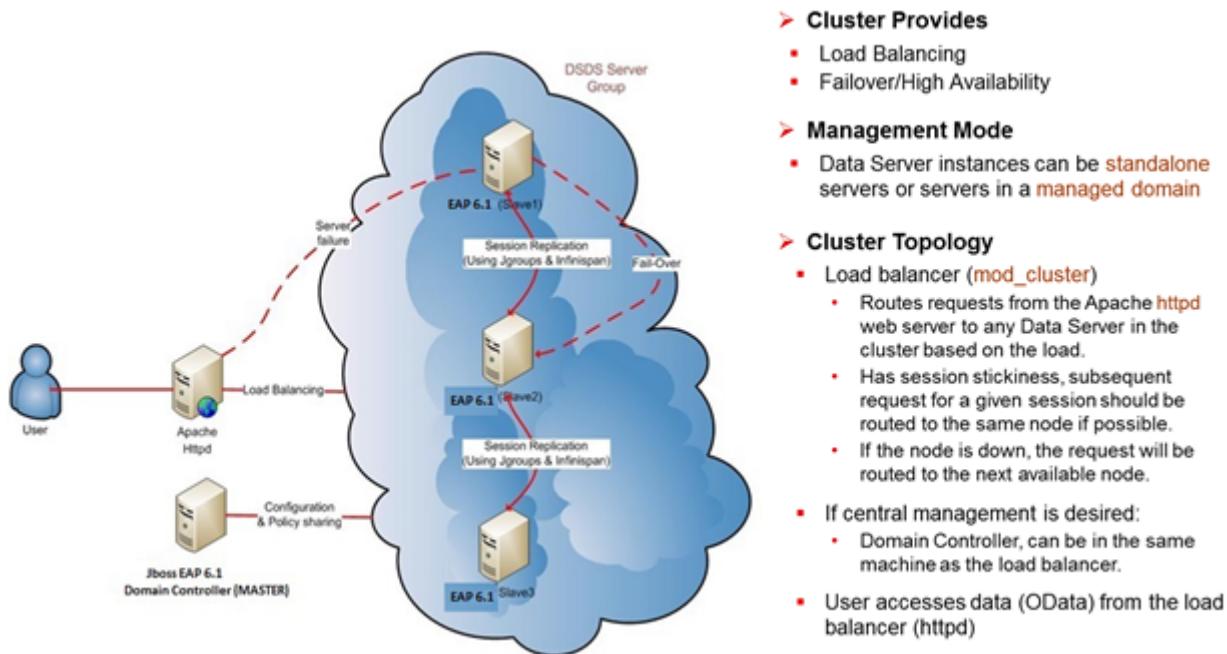


Figure 55: Clustering Architecture and Characteristics

## Configuration<sup>13</sup>

- Install Apache httpd (HTTP server) and mod\_cluster module for the load balancer
- Install the DataServer on each host that will participate in the cluster
- On each host, configure the **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\domain\configuration\dsdsClusterConfig.properties** file:
  - Binds, multicast & master addresses, admin password, etc.
- Verify slaves are attached to mod\_cluster

13. Refer to the *DecisionSpace® DataServer Version 5000.10.1 System Administration Guide* for details; what is presented here is a summary.

- http://ApacheServerHost:80/mod\_cluster-manager
- A *slave* host can be easily added or removed to scale up or down

**mod\_cluster/1.2.0.Final**

[Auto Refresh](#) [show DUMP output](#) [show INFO output](#)

**Node slave1:server-two-slave1 (ajp://DSDSW2K8-C2.rdx.lgc.com:8159):**

[Enable Contexts](#) [Disable Contexts](#)  
Balancer: dsds-server-group,LBGroup: ,Flushpackets: Off,Flushwait: 10000,Ping: 10000000,Smax: 65,Ttl: 60000000,Status: OK,Elected: 0,Read: 0,Transferred: 0,Connected: 0,Load: 100

**Virtual Host 1:**

**Contexts:**  
`/dsdataserver, Status: ENABLED Request: 0 Disable`

**Aliases:**  
`default-host  
localhost  
example.com`

**Node slave1:server-one-slave1 (ajp://DSDSW2K8-C2.rdx.lgc.com:8009):**

[Enable Contexts](#) [Disable Contexts](#)  
Balancer: dsds-server-group,LBGroup: ,Flushpackets: Off,Flushwait: 10000,Ping: 10000000,Smax: 65,Ttl: 60000000,Status: OK,Elected: 0,Read: 0,Transferred: 0,Connected: 0,Load: 100

**Virtual Host 1:**

**Contexts:**

**Figure 56: mod\_cluster-manager**

## Accessing Data

- OData access is from the mod\_cluster server - the URL points to the server where httpd is running
  - http://ApacheServerHost:80/dsdataserver/dsl.svc
- JDBC access does not support clustering by default<sup>14</sup>
  - jdbc:teiid:VDBName@mm://host1:31000;host2:31000;host3:31000
  - The client will randomly pick one of the Teiid Servers from the list and establish a session with that server. If that server cannot be contacted, another connection will be attempted to

14. JDBC data access is discussed exclusively in this Training Guide.

each of the remaining servers in random order. This allows for connection time fail-over.



Refer to “Clustering: Additional Information” on page A-45 for further details.

## Server Management Tools

- Server management tasks include:
  - Configuring profiles and its subsystems
  - Deploying applications and VDBs
  - Managing data sources, etc.
- The Data Server and JBoss provide various tools to execute management tasks on the Data Server servers:
  - Data Server Console (standalone server only)
  - JBoss HTTP Management Console (graphical web interface)
  - JBoss Management CLI (command line interface)
  - File system deployment scanner (standalone server only)
  - A set of XML configuration files

- The HTTP Management Console and CLI require a *management realm User* to be created first.  
Use **JBOSS\_HOME\bin\add-user.bat** to create the user.
  - Regardless of the tool used, the configuration is always persisted to the XML files.

## DataServer Console (Standalone Server Only)

Data Server Console is a graphical web application  
<http://DSDSHost:http-port/dsdataserver-console>

The screenshot shows the 'DecisionSpace Integration Server - Admin Console' interface. It includes several tabs: Home, Data Sources, Virtual Databases, Measurement System, Units, Unit Types, Cartographic References, Search, Transfer Rules, Plugins, and Welcome/Logout/Help/Standby.

- Virtual Databases:** Shows a table with columns Name, Version, and Status. Examples include DSDataTransfer (Version 1, ACTIVE), DSDD\_JOB6 (Version 1, ACTIVE), and DSDD\_BBULLTS (Version 1, ACTIVE).
- Data Sources:** Shows a table with columns Name and Status. Examples include QW (ACTIVE) and EOM (ACTIVE).
- Ports:** Shows a table with columns Socket Binding Name and Port. Examples include http (Port 8080), https (Port 8443), management-http (Port 8990), and management-native (Port 9999).
- Measurement Systems:** Shows a table with columns Name. Examples include SPC Preferred Metric and US Oil Field.

### What can you do with it?

- Manage data source
- Generate dynamic VDBs
- Manage VDB deployments
- View server log
- Create new measurement sys
- View and edit ports

**Data Server Console can only be used for standalone servers.**

**It cannot be used in a Managed Domain setting.**

## How to Create the JBoss User for JBoss Management Tool Access

```
C:\Landmark\DSDataServer5000.10.1.0\ApplicationServer\bin>add-user.bat

What type of user do you wish to add?
 a) Management User (mgmt-users.properties)
 b) Application User (application-users.properties)
(a): a

Enter the details of the new user to add.
Realm (ManagementRealm) : ManagementRealm
Username : noniadmin
Password :
Re-enter Password :
About to add user 'noniadmin' for realm 'ManagementRealm'
Is this correct yes/no? yes
Added user 'noniadmin' to file 'C:\Landmark\DSDataServer5000.10.1.0\ApplicationServer\standalone\configuration\mgmt-users.properties'
Added user 'noniadmin' to file 'C:\Landmark\DSDataServer5000.10.1.0\ApplicationServer\domain\configuration\mgmt-users.properties'
Is this new user going to be used for one AS process to connect to another AS process?
e.g. for a slave host controller connecting to the master or for a Remoting connection for server to
server EJB calls.
yes/no? no
Press any key to continue . . .
```

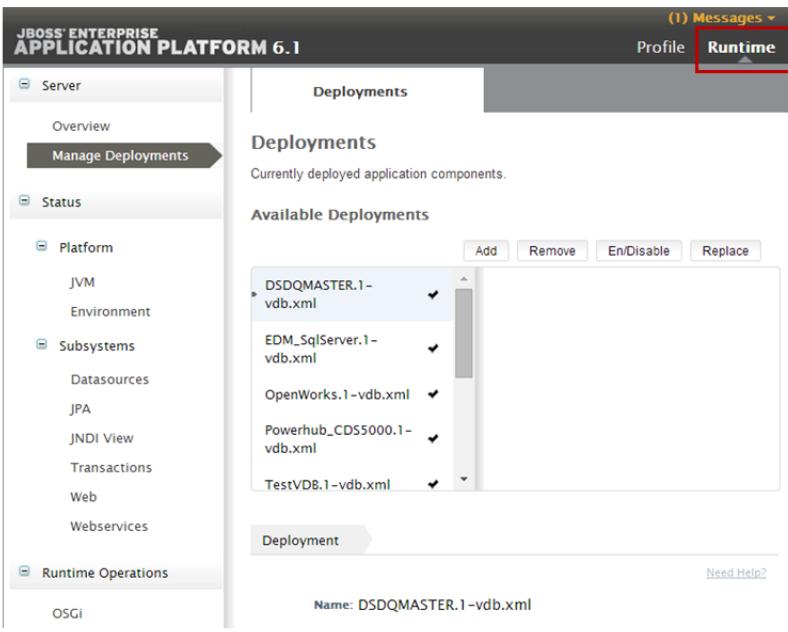
## Managed Domain

- **Can not use DSDS Console**
- Available tools to manage servers in a Managed Domain setting:
  - JBoss HTTP Management Console web interface <http://DCHost:9990/management>
  - JBoss CLI Management Console `jboss-cli.bat`
    - Connects to a server's native management endpoint (port 9999)
    - Can run in batch mode and takes a file for input commands

- Deploying applications and VDBs in a Managed Domain:
    - Add the deployments to the **Server Group** to push them to host controllers
    - Order of deployments: all rars, VDBs, dsdataserver.war
    - Dynamic VDBs must be manually generated:
      - Copy from a template or
      - Boot one of the DSDS slave temporarily as a standalone, and use the DSDS console to generate dynamic VDBs.

## JBoss HTTP Management Console

JBoss HTTP Management Console is a graphical web application  
<http://DSDSHost:mgmt-http-port/console> (port defaults to 9990)

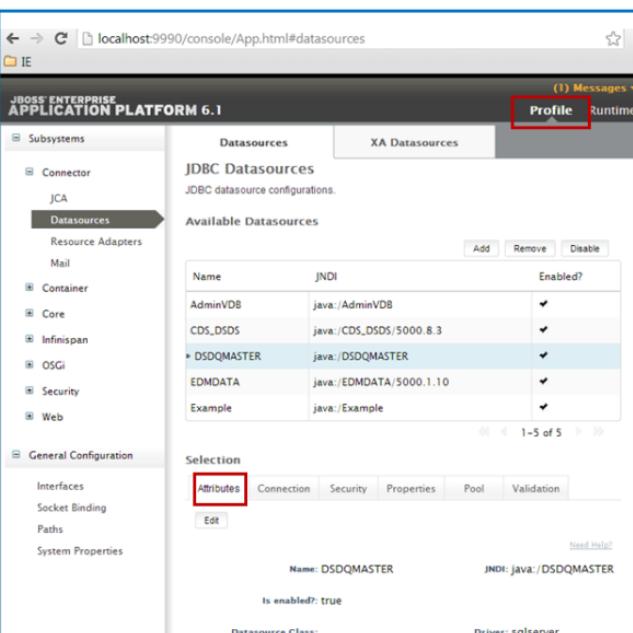


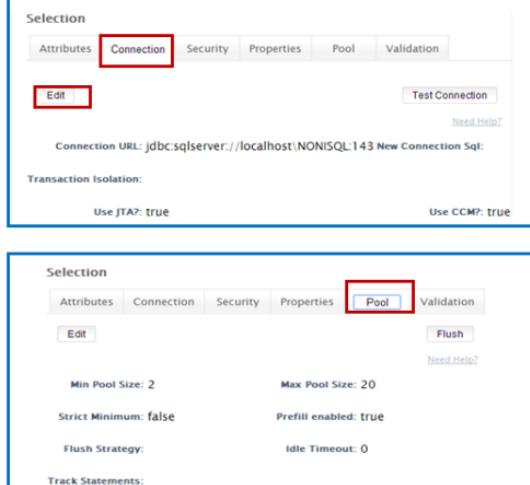
**➤ What can you do with it?**

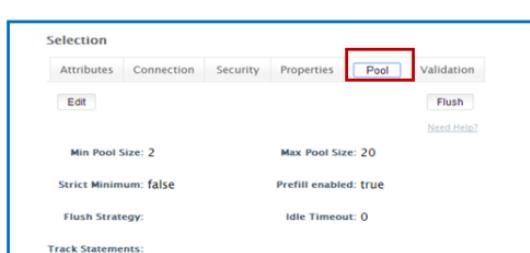
- Configure and manage the subsystems running in JBoss AS such as: data sources, resource adapters, security, transactions, web, logging, Infinispan, JVM, etc.
- Manage deployments of applications and VDBs

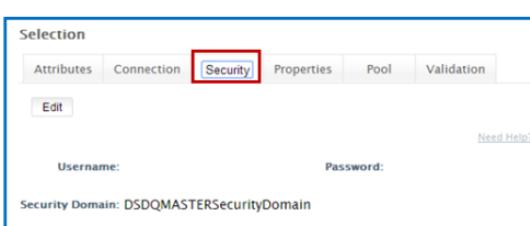
In centrally managed domain, use this graphical tool or the CLI tool (on the Domain Controller host) to create data sources and manage deployments.









**Socket Bindings: Group `dsds-sockets`**

A list of socket configurations. These configurations are referenced throughout the overall server/domain configuration.

**Available Socket Bindings**

Name	Port	MCast Port
http	8080	
https	8443	
jacorb	3528	
jacorb-ssl	3529	
jmx-connector-registry	1090	
jmx-connector-server	1091	
management-http	<code> \${jboss.management.http.port:9990}</code>	
management-native	<code> \${jboss.management.native.port:9999}</code>	

**Selection**

**Edit**

Name: `jacorb-ssl`   Interface:

Port: `3529`   Fixed Port?: `false`

**Multicast**

Multicast Port:    Multicast Address:

**Multicast ports are used to broadcast in cluster mode**

The screenshot displays two main configuration panels from the JBoss Enterprise Application Platform 6.1 management console.

**Environment Properties:** This panel shows a table of system properties. A red box highlights the "Environment" tab in the left sidebar. The table includes the following entries:

Key	Value
OW_NO_PASSWORD_DIALOG	true
SLG_CARTO_FILE_DIR	C:\Landmark\DSDataServer5000.10.1.0\Appli... phs_dsd...
SLG_PHSERVER_DIC	PHUBENT
SLG_PHSERVER_TYPE	AdminVDB
admin.dsds.hide.datasources	AdminVDB
admin.dsds.hide.vdbs	AdminVDB
awt.toolkit	sun.awt.windows.WToolkit
catalina.home	C:\Landmark\DSDataServer5000.10.1.0\Appli...

**JCA Resource Adapters:** This panel shows resource adapter configurations. A red box highlights the "Resource Adapters" tab in the left sidebar. The table lists one available resource adapter:

Archive	Connection Def.	Option
insiteconnect.rar	0	<a href="#">View &gt;</a>

## JBoss Management CLI

- JBoss Management CLI is a command-line tool which has the ability to create and run deployment scripts. It can run jobs **unattended**.
- The CLI tool has the same functionality as the JBoss HTTP Management Console.

To start the CLI tool: `JBOSS_HOME\bin\jboss-cli.bat`

```
c:\Landmark\DSDataServer5000.10.1.0\ApplicationServer\bin>jboss-cli.bat
You are disconnected at the moment. Type 'connect' to connect to the server or
  f supported commands.
[disconnected /] connect localhost:9999
[standalone@localhost:9999 /] ■
```

```
[standalone@host@9999] deploy /path-to/someapp.war

[domain@host@9999] deploy /path-to/someapp.war --server-groups=group1,group2

[standalone@localhost:9999 /] data-source add \
>      --name=ApplicationDS \
>      --driver-name=postgresql \
>      --connection-url=jdbc:postgresql://localhost:5432/DemoDB \
>      --jndi-name=java:jboss/jdbc/ApplicationDS \
>      --user-name=demouser \
>      --password=password \
>      --use-ccm=false \
>      --max-pool-size=25 \
>      --blocking-timeout-wait-millis=5000 \
>      --new-connection-sql="set datestyle = ISO, European;" \
[standalone@localhost:9999 /] data-source enable --name=ApplicationDS
```

## File System Deployment Scanner (Standalone Server Only)

- Manually deploying your deployment files:
  - Only applicable to a **standalone** servers
  - Suited for development and testing scenarios, not production
  - Configure your deployment scanner mode to be **automatic deployment** or **manual deployment**

```
<!-- standalone-dsds.xml -->
</subsystem>
<subsystem xmlns="urn:jboss:domain:deployment-scanner:1.1">
  <deployment-scanner path="deployments" relative-to="jboss.server.base.dir" scan-enabled="true"
    scan-interval="5000" deployment-timeout="600"/>
</subsystem>
```

- Copy the deployment files to the `JBOSS_HOME\standalone\deployments`

**Auto-deploy mode:**

- Scanner scans the directory and automatically deploys new deployments or deployments with changed time stamp. The scanner then lays down marker files to indicate the status of the deployments.

**Manual-deploy mode:**

- The end user must create the marker files to trigger the scanner to act, then delete the marker files after deployment is complete.

Deployment Scanner Attributes

Name	Description	Type	Default Value
<code>auto-deploy-exploded</code>	Allows the automatic deployment of exploded content without requiring a <code>.dodeploy</code> marker file. Recommended for only basic development scenarios to prevent exploded application deployment from occurring during changes by the developer or operating system.	Boolean	False
<code>auto-deploy-xml</code>	Allows the automatic deployment of XML content without requiring a <code>.dodeploy</code> marker file.	Boolean	True
<code>auto-deploy-zipped</code>	Allows the automatic deployment of zipped content without requiring a <code>.dodeploy</code> marker file.	Boolean	True
<code>deployment-timeout</code>	The time value in seconds for the deployment scanner to allow a deployment attempt before being cancelled.	Long	600
<code>path</code>	Defines the actual filesystem path to be scanned. If the <code>relative-to</code> attribute is specified, the <code>path</code> value acts as a relative addition to that directory or path.	String	<code>deployment</code> <code>s</code>
<code>relative-to</code>	Reference to a filesystem path defined in the <code>paths</code> section of the server configuration XML file.	String	<code>jboss.server</code> <code>.base.dir</code>
<code>scan-enabled</code>	Allows the automatic scanning for applications by <code>scan-interval</code> and at startup.	Boolean	True
<code>scan-interval</code>	The time interval in milliseconds between scans of the repository. A value of less than 1 restricts the scanner to operate only at startup.	Int	5000

Marker files have the same name as the deployment content, but with an additional file suffix appended. Different file suffixes have different meanings:

- **.dodeploy** placed by the user to indicate that the given contents should be deployed
- **.skipdeploy** disables auto-deploy of the content for as long as this file is present
- **.isdeploying** placed by the scanner to indicate that it has noticed a .dodeploy file and is in the process of deploying the content. File is deleted when deployment process completes.
- **.deployed** placed by the scanner to indicate that the given content has been deployed. If a user delete this file, the content will be undeployed.
- **.failed** placed by the scanner to indicate that the content failed to deploy. Removing this file will make the deployment eligible for deployment again.
- **.isundeploying** placed by the scanner to indicate that it has noticed a .deployed file has been deleted and the content is being undeployed. This file will be deleted when the undeployment process completes.
- **.undeployed** placed by the scanner to indicate that the content has been undeployed. If a user deletes this file it has no impact.
- **.pending** placed by the scanner to indicate that it has noticed the need to deploy content but has not yet instructed the server to deploy it.

---

## Exercise # 6a: Integrate the DataServer Security Domain with Windows Active Directory (AD)

---

### **Purpose of the Exercise**

Show how to configure DSDS to integrate with an Enterprise Security, such as Active Directory.

### **Outcome of the Exercise**

After successful DSDS configuration with AD, the DSDS data service and DSDS Console can be accessed by AD users.

### **Exercise Workflows**

- Make a copy of the C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\standalone-dsds.xml file.
- Configure the DSDS Security Domain to integrate with LDAP
- Add the names of the Active Directory users and their roles (admin and user) in the DSDS configuration
- Create the user accounts in Active Directory
- Verify access to DSDS console with the AD admin account
- Verify access to DSDS data service with the AD user account

## 1. Login to the DSIS Host (HOU-TRAIN01 Virtual Machine)

Use the TRAINING\lgcadmin user to login. This is an Active Directory user belonging to the TRAINING domain. TRAINING\lgcadmin is also an admin on the HOU-TRAIN01 system.

## 2. Integrate the DSIS security domain with LDAP

Out of the box, DSIS is installed with a default security domain named **dsis-security-domain**. This security domain is configured to authenticate and authorize users, whose names and roles are stored in a file-based fashion. Change the configuration of the dsis-security-domain from file-based to integrate with AD/LDAP users.

- a) Edit **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\standalone-dsis.xml** and locate the section **<security-domain name="dsis-security-domain"** in the file.

Modify the yellow highlighted entries with the values specified below:

- java.naming.provider.url:ldap://localhost:389
- bindDN: “CN=lgcadmin, CN=Users, DC=training, DC=pri”
- bindCredential: “LGC\_admin!23”
- baseCtxDN: “CN=Users,DC=training,DC=pri”
- rolesCtxDN:“CN=Users,DC=training,DC=pri”

Below is a snapshot of the modified **standalone-dsds.xml** file.

```
<security-domain name="dsds-security-domain" cache-type="default">
    <authentication>
        <login-module code="org.jboss.security.auth.spi.LdapExtLoginModule" flag="optional">
            <module-option name="java.naming.factory.initial" value="com.sun.jndi.ldap.LdapCtxFactory"/>
            <module-option name="java.naming.provider.url" value="ldap://localhost:389"/>
            <module-option name="java.naming.security.authentication" value="simple"/>
            <module-option name="bindDN" value="CN=lgcadmin,CN=Users,DC=training,DC=pri"/>
            <module-option name="bindCredential" value="LGCC admin!23"/>
            <module-option name="baseCtxDN" value="CN=Users,DC=training,DC=pri"/>
            <module-option name="baseFilter" value="(sAMAccountName={0})"/>
            <module-option name="allowEmptyPasswords" value="true"/>
            <module-option name="throwValidateError" value="true"/>
            <module-option name="java.naming.referral" value="follow"/>
            <module-option name="rolesCtxDN" value="CN=Users,DC=training,DC=pri"/>
            <module-option name="roleFilter" value="(sAMAccountName={0})"/>
            <module-option name="roleAttributeID" value="memberOf"/>
            <module-option name="roleNameAttributeID" value="cn"/>
            <module-option name="roleAttributeIsDN" value="true"/>
            <module-option name="roleRecursion" value="-1"/>
            <module-option name="searchScope" value="SUBTREE_SCOPE"/>
            <module-option name="password-stacking" value="useFirstPass"/>
        </login-module>
        <login-module code="UsersRoles" flag="required">
            <module-option name="usersProperties" value="${jboss.server.config.dir}/dsds-security-users.properties"/>
            <module-option name="rolesProperties" value="${jboss.server.config.dir}/dsds-security-roles.properties"/>
            <module-option name="password-stacking" value="useFirstPass"/>
        </login-module>
    </authentication>
</security-domain>
```

### 3. Add Active Directory users and their roles to the DSDS configuration

Edit C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\dsds-security-roles.properties file and add the following entries:

- lgcadmin=dsds-user-role,dsds-admin-role
- student1=dsds-user-role

```
# A roles.properties file for use with the UsersRolesLoginModule
# username=role1,role2
user=example-role
dsds=dsds-user-role
dsdsadmin=dsds-user-role,dsds-admin-role
edm=dsds-user-role,dsds-admin-role
edmadmin=dsds-user-role,dsds-admin-role
lgcadmin=dsds-user-role,dsds-admin-role
student1=dsds-user-role
```

Two Active Directory users (lgcadmin and student1) have been enabled to access DSDS.

lgcadmin has the dsds admin role (access to everything), while the student1 only has a user access role.

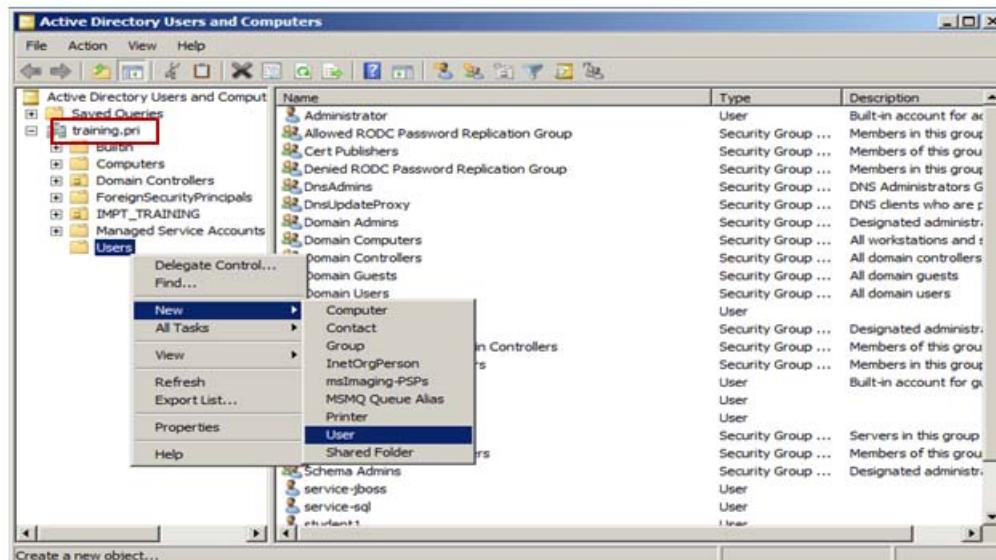
**Note**

Since the user **student1** is not in the Active Directory yet, this user will be created in the next step. The purpose is to see that the authentication against Active Directory is working for a regular user account.

If the user **student1** already exists, ignore step 4.

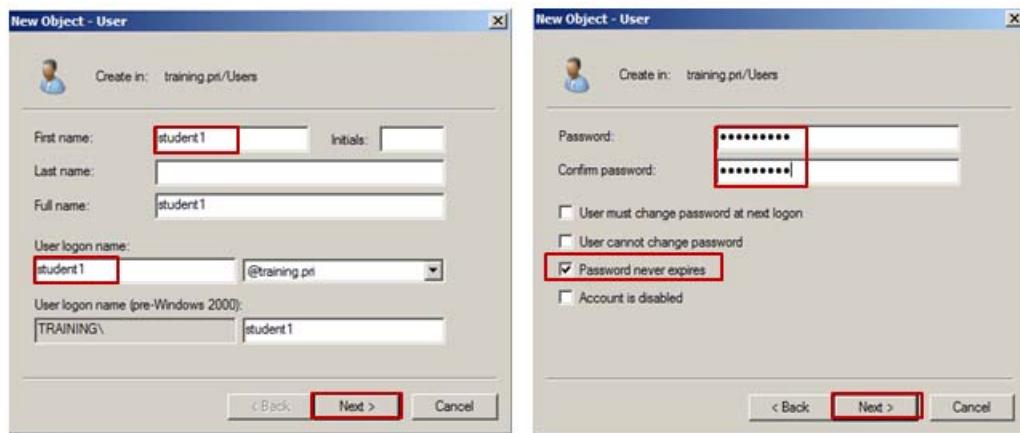
#### 4. Create a user **student1** in the Active Directory

- Log on again with the **TRAINING\lgcadmin** user if this was not already done.
- Select **Start > Administrative Tools > Active Directory Users and Computers**.
- Under the **training.pri** domain, right-click **Users** > **New > User** to display the New Object - User dialog box.



- In the New Object - User dialog box, enter **student1** as First name and User logon name, and then click **Next**.

Enter **Landmark1** for password and select the **Password never expires** option. Click **Next** and **Finish**.



## 5. Security domains and security roles

JBoss files: **web.xml** and **jboss-web.xml** define the security roles and the name of the security manager which are used by JBoss to perform authentication and authorization of web clients.

Both files are packaged/zipped in the **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\deployments\dsdataserver.war** file.

To add/modify/delete DSDS security domains and roles, unpack the dsdataserver.war file, make changes to the web.xml and jboss-web.xml, and then pack them back into dsdataserver.war and redeploy the dsdataserver.war into the DSDS deployments.

In this exercise, **there is no need to modify** those files since the default **dsds-security-domain** and the security roles (**dsds-user-role**, **dsds-admin-role**) are used.

*Fragment of web.xml*

```
<security-constraint>
    <web-resource-collection>
        <web-resource-name>All resources</web-resource-name>
        <url-pattern>*</url-pattern>
    </web-resource-collection>
    <auth-constraint>
        <role-name>example-role</role-name>
        <role-name>dsds-user-role</role-name>
        <role-name>dsds-admin-role</role-name>
    </auth-constraint>
    <user-data-constraint>
        <transport-guarantee>NONE</transport-guarantee>
    </user-data-constraint>
</security-constraint>

<login-config>
    <auth-method>BASIC</auth-method>
    <realm-name>Custom DSDS Security Realm</realm-name>
</login-config>

<security-role>
    <description>The role required to access content </description>
    <role-name>example-role</role-name>
</security-role>
<security-role>
    <description>The role required to access content.</description>
    <role-name>dsds-user-role</role-name>
</security-role>
<security-role>
    <description>The role required to access content.</description>
    <role-name>dsds-admin-role</role-name>
</security-role>
```

*jboss-web.xml*

```
<?xml version="1.0" encoding="UTF-8"?>
<jboss-web>
    <security-domain>dsds-security-domain</security-domain>
</jboss-web>
```

**6. Restart the DSDS data service**

**7. Verify that DSDS Data Service and DSDS Console can be accessed with the AD users**

On the browser, go to the DSDS data service URL:  
<http://localhost:8180/dsdataserver/dsl.svc>

- a) When prompted for a login, enter user name **student1** and password **Landmark1**



If the AD integration has been set up correctly, DSDS will successfully authenticate and authorize the AD credentials and the data service should return all the deployed models in DSDS.

```

<feed xmlns="http://www.w3.org/2005/Atom" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
      xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices" xml:base="http://localhost:8180/dsdataserver/dsl.svc/">
  <title type="text">DataModel</title>
  <id>http://localhost:8180/dsdataserver/dsl.svc/</id>
  <updated>2014-06-24T21:23:16Z</updated>
  <link rel="self" href="DataModel" />
  <entry>
    <id>http://localhost:8180/dsdataserver/dsl.svc/DataModel('EDM')</id>
    <title type="text">/</title>
    <updated>2014-06-24T21:23:16Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="DataModel" href="DataModel('EDM')"/>
    <category term="DataModel_Set.DataModel" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <d:LgcModelName>EDM</d:LgcModelName>
      <d:ModelDescription />
      <m:properties>
        <d:LgcModelName>Sample</d:LgcModelName>
        <d:ModelDescription />
      </m:properties>
    </content>
  </entry>
  <entry>
    <id>http://localhost:8180/dsdataserver/dsl.svc/DataModel('Sample')</id>
    <title type="text">/</title>
    <updated>2014-06-24T21:23:16Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="DataModel" href="DataModel('Sample')"/>
    <category term="DataModel_Set.DataModel" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <d:LgcModelName>Sample</d:LgcModelName>
      <d:ModelDescription />
      <m:properties>
        <d:LgcModelName>Sample</d:LgcModelName>
        <d:ModelDescription />
      </m:properties>
    </content>
  </entry>
</feed>

```

- b) Launch the DSDS Console from the browser with <http://localhost:8180>

- c) When prompted for a login, enter user name **Igcadmin** and password **LGC\_admin!23**

The screenshot shows the DecisionSpace Data Server Admin Console interface. The top navigation bar includes links for Home, Data Sources, Deployment, Status, Measurement System, and Ports. The main content area is divided into three sections: Deployment, Data Sources, and Ports. The Deployment section lists VDB Names: EDM\_SqlServer and TestVDB. The Data Sources section lists Data Sources: Landmark, edm, and Example. The Ports section lists Socket Binding Names and their corresponding ports: http (8180), https (8443), management-http (9990), and management-native (9999). The top right corner displays the Halliburton logo and a welcome message for the user 'Igcadmin'. The bottom right corner shows the system date and time: 4:48 PM, 6/24/2014.

The AD Users and DSDS Role mapping are configured correctly and working as expected.

---

## **Exercise # 6b: Map Active Directory (AD) groups to DataServer Roles**

---

### ***Purpose of the Exercise***

In “Exercise # 6a: Integrate the DataServer Security Domain with Windows Active Directory (AD)” on page 2-176, the AD users are enabled to access DSDS, a process which involved recording each AD user's name and role in a DSDS property file (dsds-security-roles.properties). This scenario will quickly become inefficient in an enterprise deployment where there are a large number of user accounts.

In this exercise, DSDS role(s) are mapped to Active Directory Groups (of users). Therefore, instead of listing each user name and role in the properties file, AD group(s) can be listed and each group can be mapped to its associated DSDS role(s).

### ***Outcome of the Exercise***

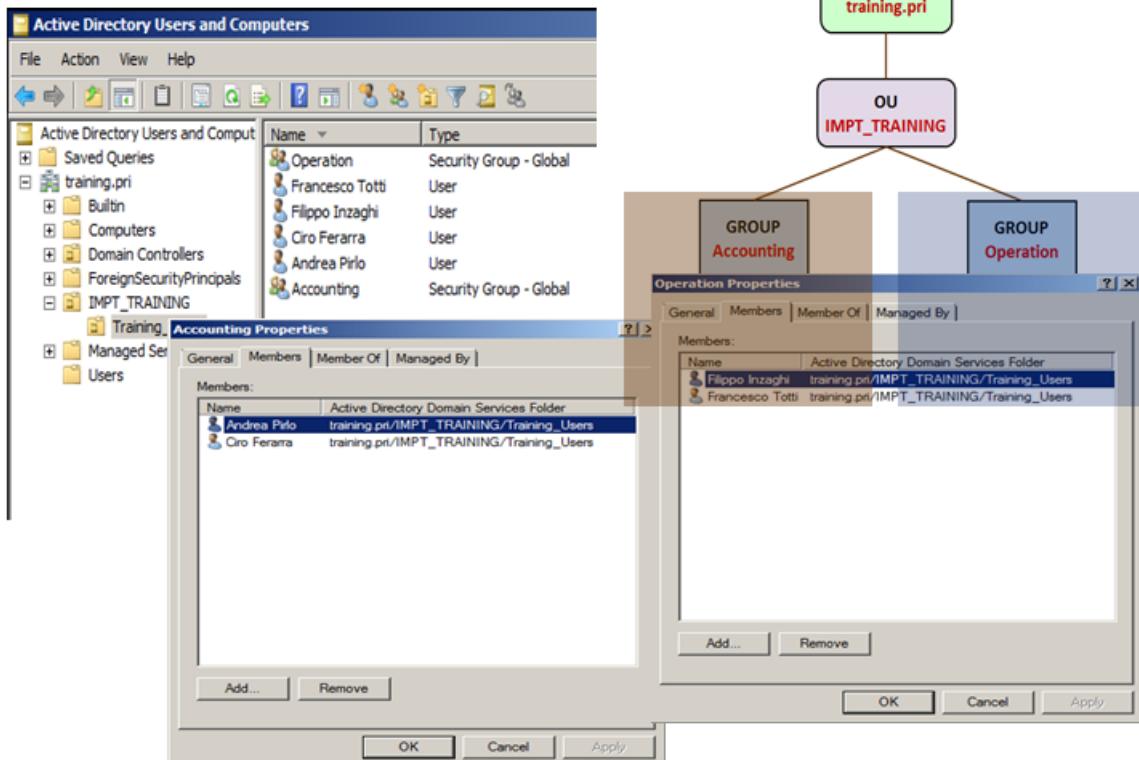
More efficient way of integrating a large number of Active Directory users with DSDS.

### ***Scenario***

There is an Active Directory Organizational Unit (OU) named **IMPT\_TRAINING**.

This OU has 2 groups: **Accounting** and **Operation**. Each group has 2 users.

Name	Login	Group	Password
Andrea Pirlo	apirlo	Accounting	Landmark1
Ciro Ferarra	cferarra	Accounting	Landmark1
Filippo Inzaghi	finzaghi	Operation	Landmark1
Francesco Totti	ftotti	Operation	Landmark1



## Exercise Workflows

- Configure DSDS to recognize the AD Organization Unit tree and assign DSDS roles for the OU Groups
- Create the file for the role mapping between AD OU groups and DSDS roles
- Restart the DSDS Service
- Verify that access to the DSDS Console and DSDS data service follow the authorization roles assigned to the AD Organization Unit Groups

**1. Configure DSDS to recognize the AD Organization Unit and assign DSDS roles to the OU groups**

Edit **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration\standalone-dsds.xml**

- a) In the **dsds-security-domain** section, make sure the **baseCtxDn** and **roleCtxDn** have the following values:

- **baseCtxDN :**  
“OU=Training\_Users,OU=IMPT\_TRAINING,DC=training,DC=pri”
- **rolesCtxDN :**  
“OU=Training\_Users,OU=IMPT\_TRAINING,DC=training,DC=pri”

- b) In the same dsds-section, add the following login module:

```
login-module code="RoleMapping" flag="optional">>

<module-option name="rolesProperties"
  value="${jboss.server.config.dir}/dsds-ad-roles-mapping.properties"/>

<module-option name="replaceRole" value="false"/>

</login-module>
```

```

<security-domain name="dsds-security-domain" cache-type="default">
  <authentication>
    <login-module code="org.jboss.security.auth.spi.LdapExtLoginModule" flag="optional">
      <module-option name="java.naming.factory.initial" value="com.sun.jndi.ldap.LdapCtxFactory"/>
      <module-option name="java.naming.provider.url" value="ldap://localhost:389"/>
      <module-option name="java.naming.security.authentication" value="simple"/>
      <module-option name="bindDN" value="CN=lgcadm,CH=Users,DC=training,DC=pri"/>
      <module-option name="bindCredential" value="LGC_admin123"/>
      <module-option name="baseCtxDN" value="OU=Training_Users,OU=IMPT_TRAINING,DC=training,DC=pri"/>
      <module-option name="baseFilter" value="(SAMAccountName={0})"/>
      <module-option name="allowEmptyPasswords" value="true"/>
      <module-option name="throwValidateError" value="true"/>
      <module-option name="java.naming.referral" value="follow"/>
      <module-option name="rolesCtxDN" value="OU=Training_Users,OU=IMPT_TRAINING,DC=training,DC=pri"/>
      <module-option name="roleFilter" value="(SAMAccountName={0})"/>
      <module-option name="roleAttributeID" value="memberOf"/>
      <module-option name="roleNameAttributeID" value="cn"/>
      <module-option name="roleAttributeIsDN" value="true"/>
      <module-option name="roleRecursion" value="-1"/>
      <module-option name="searchScope" value="SUBTREE_SCOPE"/>
      <module-option name="password-stacking" value="useFirstPass"/>
    </login-module>
    <login-module code="RoleMapping" flag="optional">
      <module-option name="rolesProperties" value="${jboss.server.config.dir}/dsds-ad-roles-mapping.properties"/>
      <module-option name="replaceRole" value="False"/>
    </login-module>
    <login-module code="UsersRoles" flag="required">
      <module-option name="usersProperties" value="${jboss.server.config.dir}/dsds-security-users.properties"/>
      <module-option name="rolesProperties" value="${jboss.server.config.dir}/dsds-security-roles.properties"/>
      <module-option name="password-stacking" value="useFirstPass"/>
    </login-module>
  </authentication>
</security-domain>

```

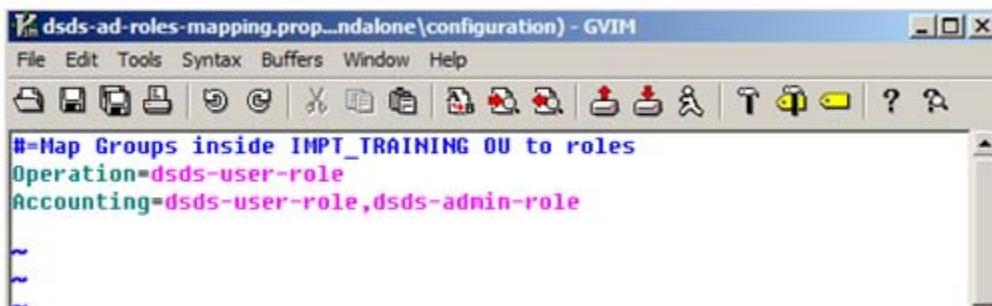
## 2. Create dsds-ad-roles-mapping.properties file to map AD OU Groups to DSDS roles

Use a text editor to create the file and put entries as shown below.

This property file has the format *key*=*value* for entries, one entry per line.

The *key* is the AD group name, *value* is the dsds role name.

Save the file to **C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer\standalone\configuration** directory.



**3. Restart the DSDS Service**

**4. Verify that a user from the Operation group has access to DSDS data service but not DSDS Console**

- a) Access DSDS data service  
`http://localhost:8180/dsdataserver/dsl.svc` with the AD credential **ftotti/Landmark1**. All the deployed data models will be returned from the request.

- b) Launch DSDS Console  
`http://localhost:8180/dsdataserver-console` with the AD credential **ftotti/Landmark1**. This does not access the DSDS Console.

**5. Verify that a user from the Accounting group has access to the DSDS data service and DSDS Console**

- a) Access the DSDS data service  
`http://localhost:8180/dsdataserver/dsl.svc` with the AD credential **apiro/Landmark1**. All the deployed data models will be returned from the request.
- b) Launch DSDS Console  
`http://localhost:8180/dsdataserver-console` with the AD credential **apiro/Landmark1**. DSDS Console is displayed and is accessible for doing management tasks.

## Troubleshooting

- The DataServer does not start and models cannot be displayed:
  - Go through the DataServer log file  
**C:\Landmark\DecisionSpace Integration Server 5000.10.4.0\ApplicationServer/standalone/log/server.log** and see whether there are any configuration changes that are missing.
  - Then restart the DataServer and check whether the problem still persists.
- The DataServer is running, but the models cannot be accessed and the following exception is displayed in the data model log file:

*“java.sql.SQLRecoverableException: IO Error: The Network Adapter could not establish the connection”*

- Ensure that username and password are correctly specified for this data source in the file  
**C:\Landmark\DSIntegrationServer5000.10.4.0\Application Server/standalone/configuration/standalone-dsds.xml**
- Make sure the correct JNDI name is set in <file  
**C:\Landmark\DSIntegrationServer5000.10.4.0\Application Server/standalone/configuration/standalone-dsds.xml** for the data source.

This JNDI name must match the one provided for the data source defined in the VDB file.

Note that the “java:/” prefix can be ignored while setting the connection JNDI name in the VDB.

- The user can login to the administration console, but gets error 403 in the browser.
  - Check the DataServer log file  
**(C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer/standalone/log/server.log)** and see whether there is any license checkout error.

- If yes, then make sure the LM\_LICENSE\_FILE is correctly set in the system environment variables and should point to either the LAM server - <**LAM port number**>@<**LAM server name**>, or path if the LAM server is local - c:\Landmark\LM\<license file>.
- Also, make sure the **lgcx** daemon is running on the LAM server. Lgcx daemon is available in later versions of the LAM license server
- If there are items that have already been deployed and are no longer displayed in the administration console but are still in standalone-dsds.xml and content area, then:
  - Stop the DataServer Service
  - Remove log and tmp directories from file  
**C:\Landmark\DSIntegrationServer5000.10.4.0\Application Server/standalone/**
  - Remove teiid-data; timer-service-data, and tx-object-store (everything but content) from file  
**C:\Landmark\DSIntegrationServer5000.10.4.0\Application Server/standalone/data**
  - Restart service. If the deployments do not become available then repeat the steps and start the service
  - Lastly, if nothing else works make a backup of the directory before deleting but remove the file  
**C:\Landmark\DSIntegrationServer5000.10.4.0\Application Server/modules/org/jboss/teiid/main/deployment**
- To get more detailed logging to resolve an issue:
  - The debugging level needs to be increased in the file C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer/standalone/configuration/standalone-dsds.xml file from WARN to FINEST.

- If the DataServer service does not start, then use the runDSDS script to start.

#### — Linux

- Execute  
**C:\Landmark\DSIntegrationServer5000.10.4.0\Application Server\bin\runDSDS.sh**
- DO NOT close the window if using this method. To run the program in the background, use the '&' sign at the end of the command. This allows the same window to be used for other functions.

#### — Windows

- Execute  
**C:\Landmark\DSIntegrationServer5000.10.4.0\Application Server\bin\runDSDS.bat**
- DO NOT close the window or the DSDS process will be stopped.
- Allocated memory for JVM is not sufficient to hold deployed contents

#### — Standalone

- Open standalone.conf.bat and search for an entry similar to below:

```
Set "JAVA_OPTS=Xms64M -Xmx1024M  
XX:MaxPermSize=512M"
```

- Change value for -Xms (maximum setting) to the value representing the new memory limit.
- Also update the MaxPermSize as per server requirement.
- Restart the DataServer service.

## — Domain Configuration

Open host-slave-dsds.xml on each slave host. Search for **the <jvms>** tag and update the max-size property to the new limit.

```
<jvms>

    <jvm name="default">

        <heap size="1024m" max-size="4096m"/>

        <permgen size="256m" max-size="512m"/>

        <jvm-options>

            <option value="-server"/>

        </jvm-options>

    </jvm>

</jvms>
```

# **Chapter 3**

# ***Configuration Options for Web Framework***

---

## **Overview**

---

The DecisionSpace Integration Server Web Framework (Web Framework) software is the host platform for Landmark's integrated operations solutions. The software uses a scalable, web-based, multi-tiered and service-oriented architecture (SOA) to facilitate collaboration and integration between data services and a platform for visualization and presentation as represented in Exploration and Production Foundation.

The structure for the Web Framework is the powerful Microsoft SharePoint (SharePoint) application. The Web Framework leverages the functionality of SharePoint, which includes an intuitive user interface. By using SharePoint across the integration server, collaboration tools and automated workflows can be shared across teams to support information flow more easily. Depending on the environment, the Web Framework may use SharePoint 2010 or SharePoint 2013. Generally, the functionality of the Web Framework is the same, although in a few areas it is different. These differences are discussed where applicable.

The Web Framework provides data enrichment (represented by Interpreted Data Management), a web-based interface, content management, alarm management, automated workflows, integration with all DecisionSpace Integration Server features and with DecisionSpace Analytics (Analytics) (represented by Equipment Monitoring Dashboards) and much more.

## ***Implementation Samples***

The DecisionSpace Integration Server Platform provides a comprehensive solution for solving upstream E&P data challenges. The Web Framework sits within the Application Foundation layer of that

platform, and as such acts as the host platform for Landmark's integrated operations solutions.

### DecisionSpace® Enterprise Platform- E&P Foundation

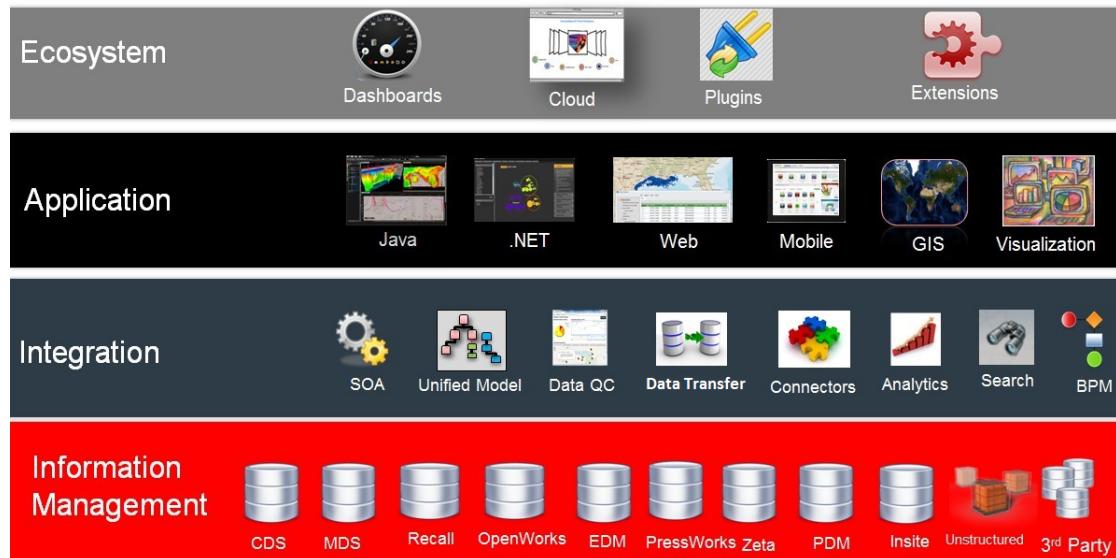


Figure 3-1: Enterprise Platform- E&P Foundation

The Web Framework is the web interface for composite applications.

### Interpreted Data Management

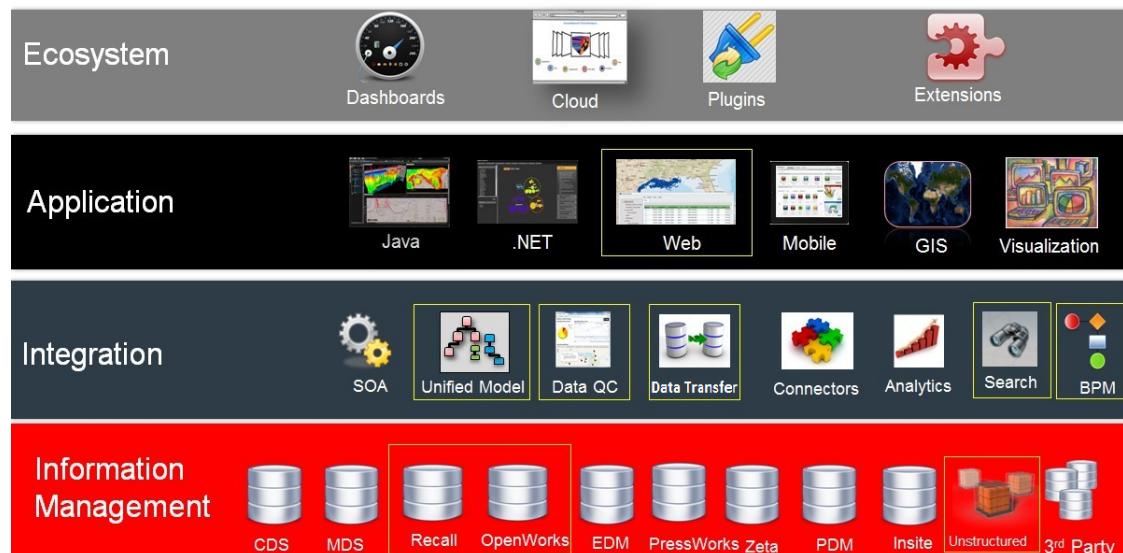


Figure 3-2: Interpreted Data Management

Finally, Web Framework provides the framework for packaging solutions which can be independently installed, uninstalled or configured.

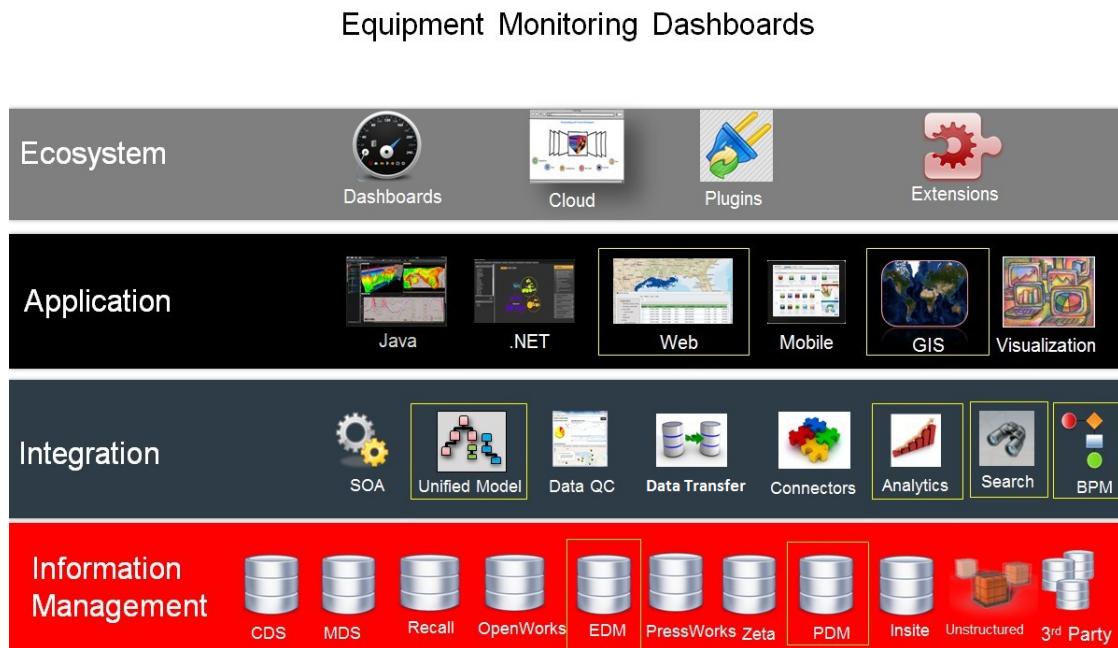


Figure 3-3: Equipment Monitoring Dashboards

This chapter describes how to use the functionality in the Web Framework for administrators, end users and developers<sup>1</sup>.

## What Does Web Framework Do?

The following points summarize what Web Frameworks does:

- Web Interface for composite Applications.
- Provides a framework and hosting environment for developing and running web-based applications.
- Provides framework for packaging solutions which can be independently installed, uninstalled or configured.
- Access to wide variety of tools from a single interface.
- Seamless collaboration between teams.

1. Programming will be covered in a separate class.

## Architecture and Integration Tracks

---

### Architecture

Web Framework Architecture reveals that the user environment is Microsoft Windows-based and is supported on Internet Explorer 9 and above, Chrome or Firefox. It operates within either an inter- or intra-net, and that the Web Framework (including the portal base, SDK, REST APIs, plugins and applications) is deployed on Microsoft SharePoint 2010 or 2013 in standalone mode or on a farm. The SharePoint server is hosted on Microsoft Windows Server 2008 R2 and authenticated using NTLM, Kerberos or FBA mode.

### Web Framework Architecture

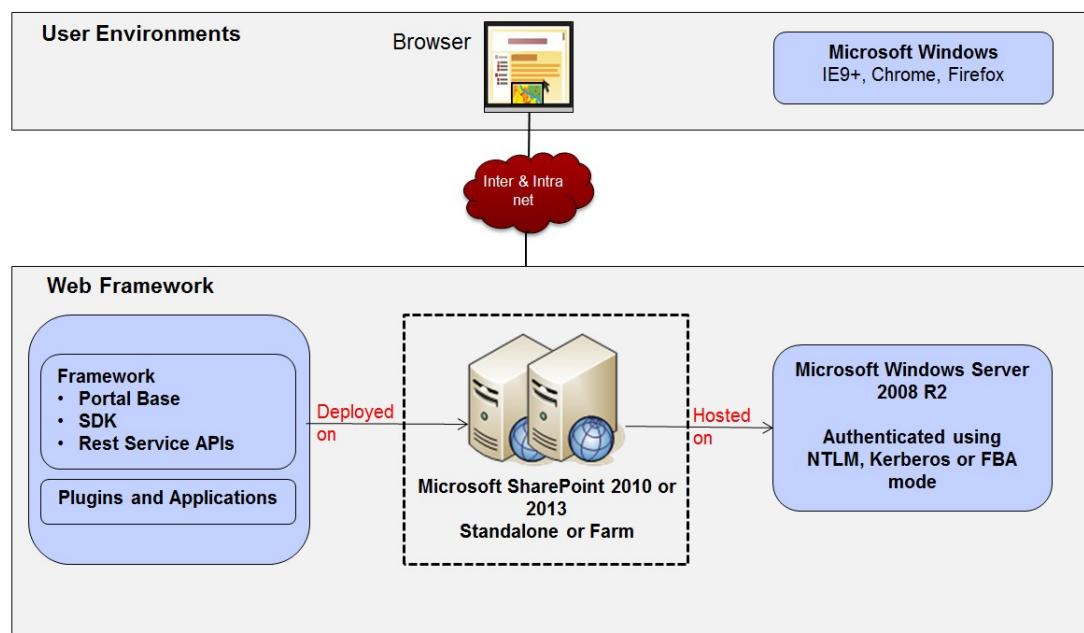


Figure 3-4: Web Framework Architecture

## **Characteristics**

The following points summarize the characteristics of Web Framework:

- Built on SharePoint framework for ease of Installation/Maintenance/Update.
- Integration with DecisionSpace platform services including Data Server, Business Process Management Server, Search Server, Analytics Server, etc.
- Portal with Application navigation.
- Themes support to control Look & Feel.
- Page Template and Page Layout for consistent behavior and Look & Feel across all Applications.
- Plugins including Data Query, Integration Server Search, Shopping Cart, GIS, BPM Notifications, DecisionSpace Analytics.
- Application packaging, installer and hosting framework.
- Supports User Authentication using NTLM, Kerberos & FBA.
- Authorization and Access Control framework for all sensitive and securable resources.
- Client-side inter-web part communication.
- Configuration and Persistence Framework.
- SDK & Reference application (used by other apps developers as a benchmark).
- Logging framework.

## **Integration Tracks (*DecisionSpace Integration Server Overview*)**

### **Data Server**

Web Framework connects to the Data Server directly using the OData Protocol<sup>2</sup>. The Data Server section of this chapter details how this is done.

### **Business Process Management**

Web Framework allows the user to collaborate and track business processes. The Business Process Management section of this chapter will provide the details of this integration.

### **Data Quality**

The integration allows the end user to access a dashboard for checking on data rules, data load success percentages and data processing approvals.

### **Search**

The integration outlined in the *Search* section of this chapter allows the end user to search for resources from Web Framework application pages, view their metadata and perform custom actions.

### **DecisionSpace Analytics**

The integration with DecisionSpace Analytics allows the reports to be shown inside the Web Framework applications pages.

---

2. Refer to Chapter 2: *Configuration Options for Data Server* for details.

## **What's Included?**

- **Portal with Application Navigation**
- **REST APIs & SDK with samples**
- **Default Application Template**
  - This template can be used to dynamically create and compose an application using the plugins that are available.
- **Plugins**

Alarms	Data Query	Reference
Analysis Components	GIS	Search
Application Launching	Data Quality components	Shopping Cart
Calendar	Generic IFrame	Symbology
Custom Pages	Left Center Right Layout	

## Portal Walkthrough (User Interface Components and their Summaries)

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### Portal Layout of User Interface (UI) Components

Navigation with the Web Framework begins with its Home Page as depicted in Web Framework Home Page.

#### Web Framework Home Page

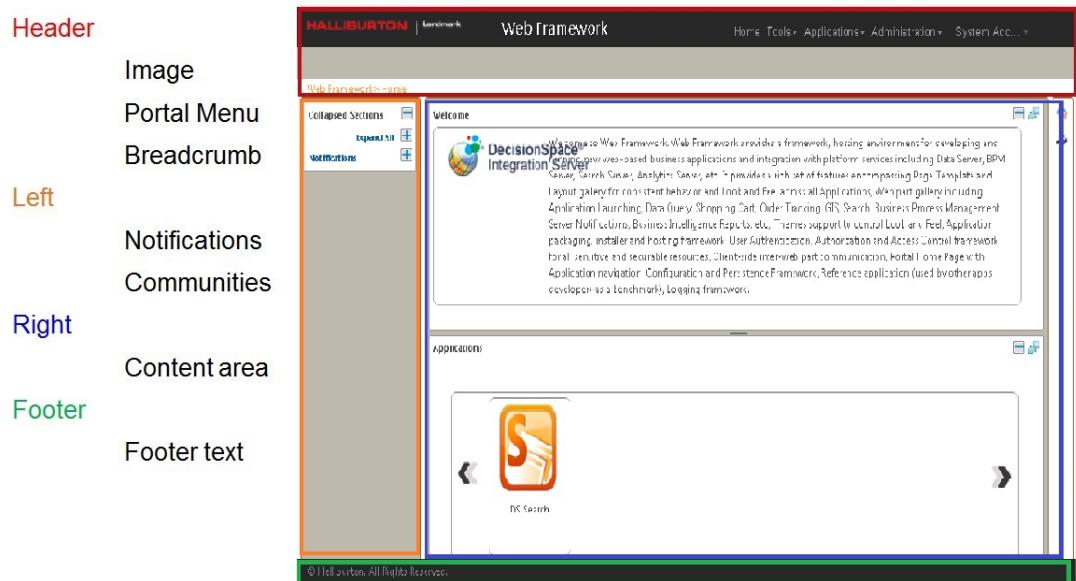


Figure 3-5: Web Framework Home Page

### Portal Menu

Portal Menu (upper-right hand side of the Web Framework Home Page) depicts the navigation items available from the Web Framework Home Page. The first row of this depiction shows the menu without any drop-down menu items expanded. The second row shows the Tools menu item expanded. The third row expands the Applications menu item. The fourth and final row shows the choices from the Administration menu item. To the right of the rows is an explanation of the expanded drop-down menu items.

Notifications & Communities (left side of the Web Framework Home Page) depicts the pending tasks for the user (notifications) and

communities show the communities<sup>3</sup> that are created inside the Web Framework. In this depiction, the minimized state is left-most while the maximized state is on the right.

With Notifications, the following bullet point items apply:

- The minimized state shows the total number of pending tasks.
- The maximized state shows the latest 2 task notifications.
- Links to refresh are available to allow the user to always have access to the most recent status.
- Links to go to Workflow Inbox also exist to facilitate navigation to this area for workflow information.

With communities, the communities that are created inside the Web Framework are shown<sup>4</sup>.

## Portal Menu

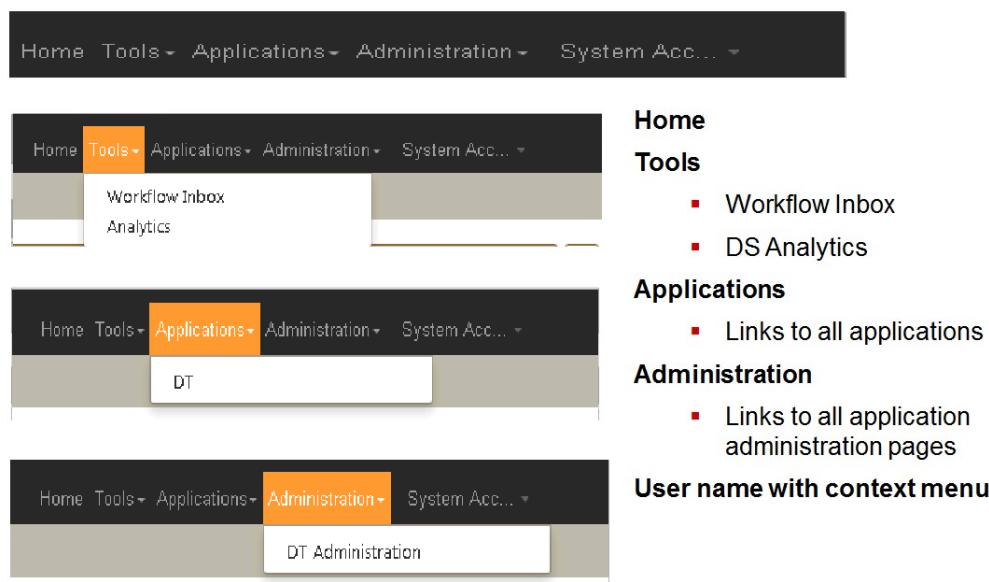


Figure 3-6: Portal Menu (Upper Right-Hand Side of the Web Framework Home Page)

3. Communities are not discussed in detail in this Chapter because it is considered to be a SharePoint feature. However, it is discussed in detail in the *DecisionSpace® Integration Server Web Framework version 5000.10.2.2 End User Guide* under the title of the same name.

4. This feature is only available in SharePoint 2013.

## Left Section

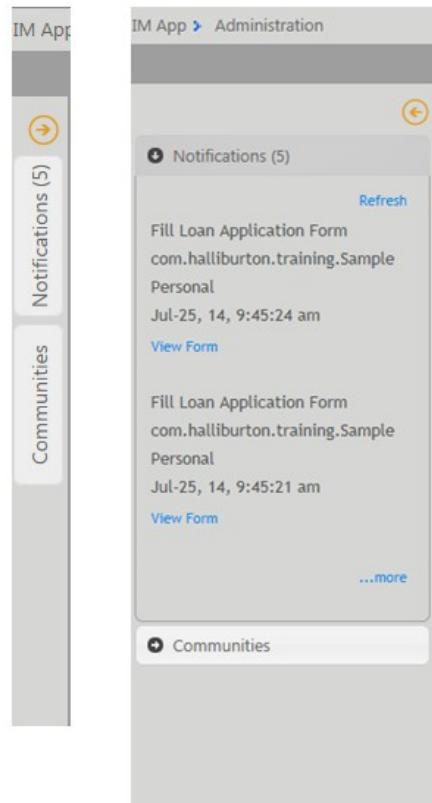


Figure 3-7: Notifications & Communities (Left Side of the Web Framework Home Page)

## Administration

The Administration menu item links to all application administration pages as shown in Portal Administration.

### Portal Administration

**Security** - Manage user groups and users

**Settings** - Manage portal settings

**Galleries** - View components

**Workflow Settings** - Workflow specific settings

**App Management** - Manage applications

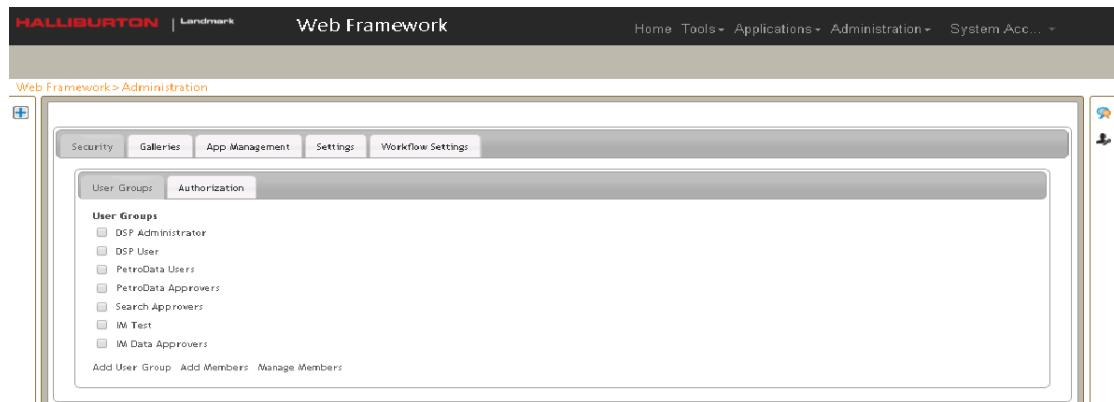


Figure 3-8: Portal Administration

## Security & Authorization

Administration of User Groups with Examples of Some Existing User Groups shows some existing User Groups (*Community Owners*, *Community Visitors*, etc.) with the links beneath these existing User Groups where one can create (or add) a User Group, add members to a User Group and manage members of a User Group. Permissions are based on Activity and on Resource, as show in User Group Permissions.

The screenshot shows a web-based administration interface for user groups. At the top, there is a horizontal menu bar with tabs: Security, Galleries, App Management, Settings, and Workflow Settings. Below the menu, another tab bar has two tabs: User Groups (which is selected and highlighted in blue) and Authorization. Under the User Groups tab, there is a section titled "User Groups" containing a list of existing groups, each preceded by a small square checkbox. The listed groups are: DSP Administrator, DSP User, PetroData Users, PetroData Approvers, Search Approvers, IM Test, and IM Data Approvers. At the bottom of this list, there are three links: "Add User Group", "Add Members", and "Manage Members".

Figure 3-9: Administration of User Groups with Examples of Some Existing User Groups

The screenshot shows a detailed view of the User Group Permissions administration page. At the top, it displays the Halliburton Landmark logo and the title "Web Framework". The top navigation bar includes links for Home, Tools, Applications, Administration, and System Acc... . Below the navigation, the breadcrumb trail shows "Web Framework > Administration". The main content area features a header with tabs: Security, Galleries, App Management, Settings, and Workflow Settings. Under the User Groups tab, there is a sub-header "Activities" and "Administration Page". A table-like structure lists a single row for "Administrative Activities" with columns for "Group Name" (containing "Administrative Activities") and "Description" (containing "Administrative Activities Configurations"). At the bottom of this section are several buttons: Assign Permission, View Permissions, View Activities, Add Activities Group, Edit Activities Group, and Manage Association. On the far left, there is a vertical toolbar with a plus sign icon. On the far right, there are icons for messaging and user profile.

Figure 3-10: User Group Permissions

## Galleries (Page Layout, Page Template & Webpart)

The **Galleries** tab holds all of the **Page Layout**, **Page Template** and **Webpart** options.

This screenshot shows the 'Galleries' tab selected in the top navigation bar. Below it, the 'Page Layout Gallery' tab is also selected. The main area displays a list of page layout templates with their names, descriptions, and preview icons.

Layout Name	Description	Layout Preview
Top , Bottom	This layout contains Top and Bottom zones with collapsible b...	
Left(20%), Right	This layout contains Left (20%) and Right (80%) zones with c...	
Top , Bottom-Left , Bottom-Right	This layout contains Top , Bottom left (50%) and bottom righ...	
Single Column Layout	This layout contains only one column.	
Four Zone Layout	This layout contains Left (70%) and Right (30%) inside each t...	

12

Figure 3-11: Galleries tab highlighting Page Layout Gallery

This screenshot shows the 'Galleries' tab selected in the top navigation bar. Below it, the 'Page Template Gallery' tab is selected. The main area displays a list of page template entries with their names, descriptions, and preview icons.

Template Name	Description	Template Preview
Data Query (Deprecated)	Helps to view Data Query	
Sample Master Detail Properties (Deprecated)	Page Templates for Master Details	
Sample Master Detail Properties	Page Templates for Master Details	
Data Query	Helps to view Data Query	
Alarm Configuration Manager (Deprecated)	Allows users to add, edit and delete alarm configurations	

123...

Figure 3-12: Galleries tab highlighting Page Template Gallery

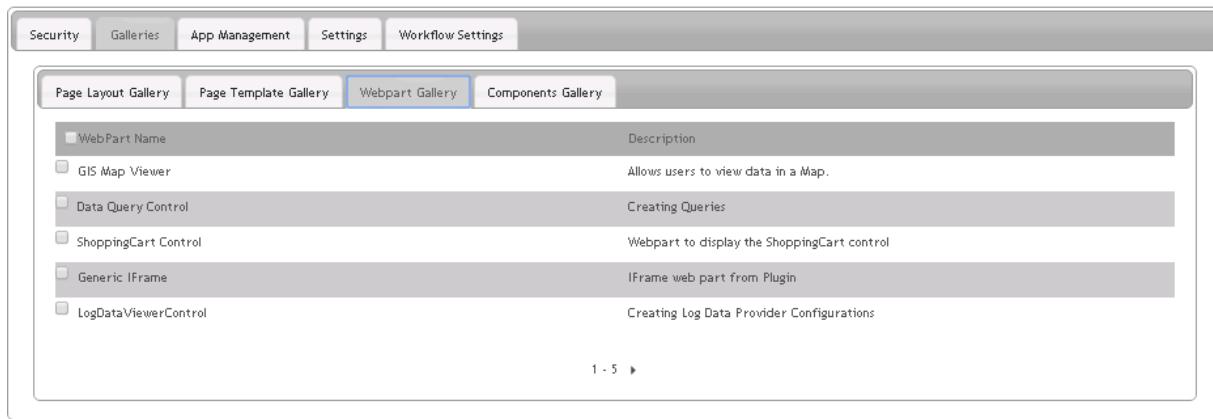


Figure 3-13: Galleries tab highlighting Webpart Gallery

## Application Management (Create & Delete Applications)

### Create Application

There are two methods to create an application:

1. Dynamically from Portal Base (Default Application Template)  
Leverages existing Features and Functions.
2. Using a pre-existing Application Template. Pre-packaged set of pages.

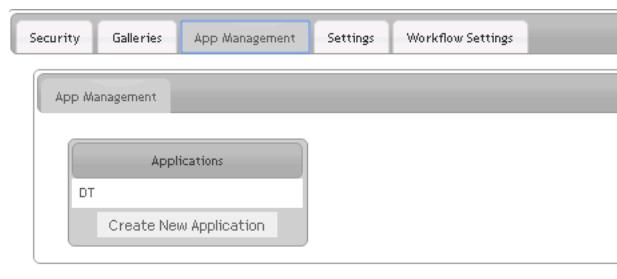


Figure 3-14: Create New Application in the App Management tab

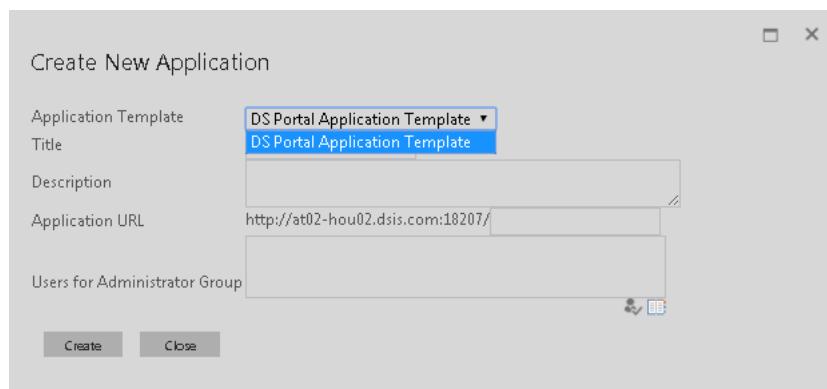


Figure 3-15: Create New Application Using Application Template

## Delete Application

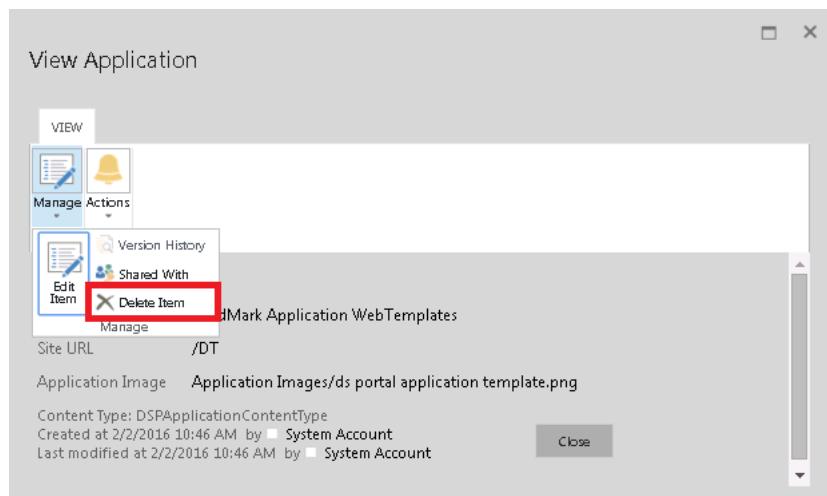


Figure 3-16: Delete Application

## **Settings (Service, Other Settings, Home Page, Theme, Workflow & Community)**

Service Settings allows configuration of service end points for the platform and other REST based services, such as Data Server, Search, Business Process Management (BPM), etc. using the *Add Service Configuration* and *Edit Service Configuration* links.

The screenshot shows the 'Service Settings' tab selected in the top navigation bar. Below it is a table listing six services:

Service Name	Connection URL	Authentication type	Status	Service Type	Username
Default Search Service	http://dssearch-host:8080...	Explicit - group	Active	DS Search	user
Default Citrix Service	http://web-interface-host:...	Explicit - Individual	Active	Citrix Service	
Order Service	http://order-service-host:...	Anonymous	Active	Order Service	
Default BPM Service	http://localhost:8080/dsbp...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-host:8080...	Explicit - group	Active	DS Search	user

At the bottom left are 'Add Service Configuration' and 'Edit Service Configuration' links. A page navigation indicator '1 - 5' is at the bottom center.

Figure 3-17: Service Settings

Other Settings allows configuration of any other settings that are needed by plugins. These settings can be managed using the Settings Manager API. Home Page Settings allows configuration of the Home Page image and Introduction text. Theme Settings allows the change of the theme (default/light). Workflow Settings illustrates the links for adding, editing or deleting workflow page configurations. Configure application pages to be viewed for a task instead of the BPM form.

The screenshot shows the 'Workflow Settings' tab selected in the top navigation bar. Below it is a table with one row and four columns:

Workflow Name	Task Name	Application	Page Name

A message below the table states: 'There are no items to show in this view of the "DSPWorkflowPageConfiguration" list. To add a new item, click "New".' At the bottom left are 'Add Workflow Page Configuration', 'Edit Workflow Page Configuration', and 'Delete Workflow Page Configuration' links.

Figure 3-18: Workflow Settings

## Application (Authorization, Galleries, Page Management, Settings, Other Settings & Webpart Configuration)

- **Authorization** - Manage Activity/Resource level groups and manage members of group.

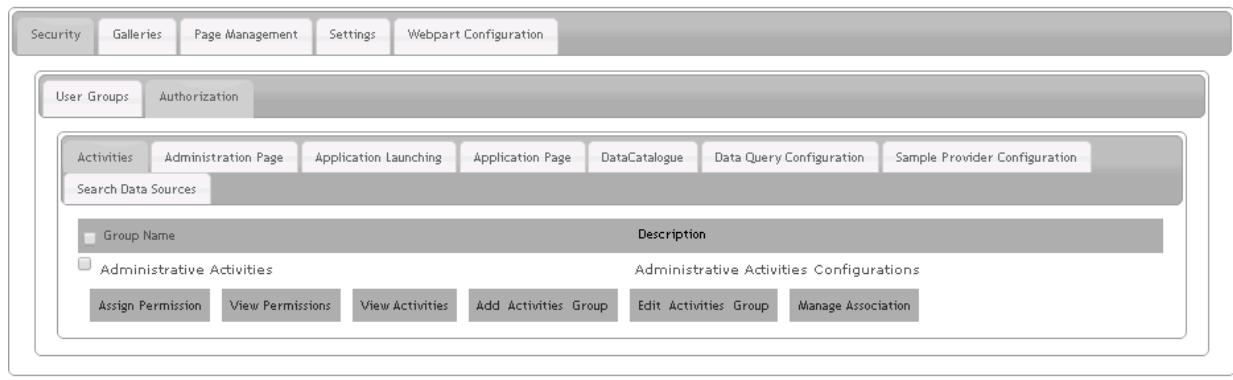


Figure 3-19: Authorization - Manage Activity/Resource level groups

- **Galleries** - View components (same as Portal).

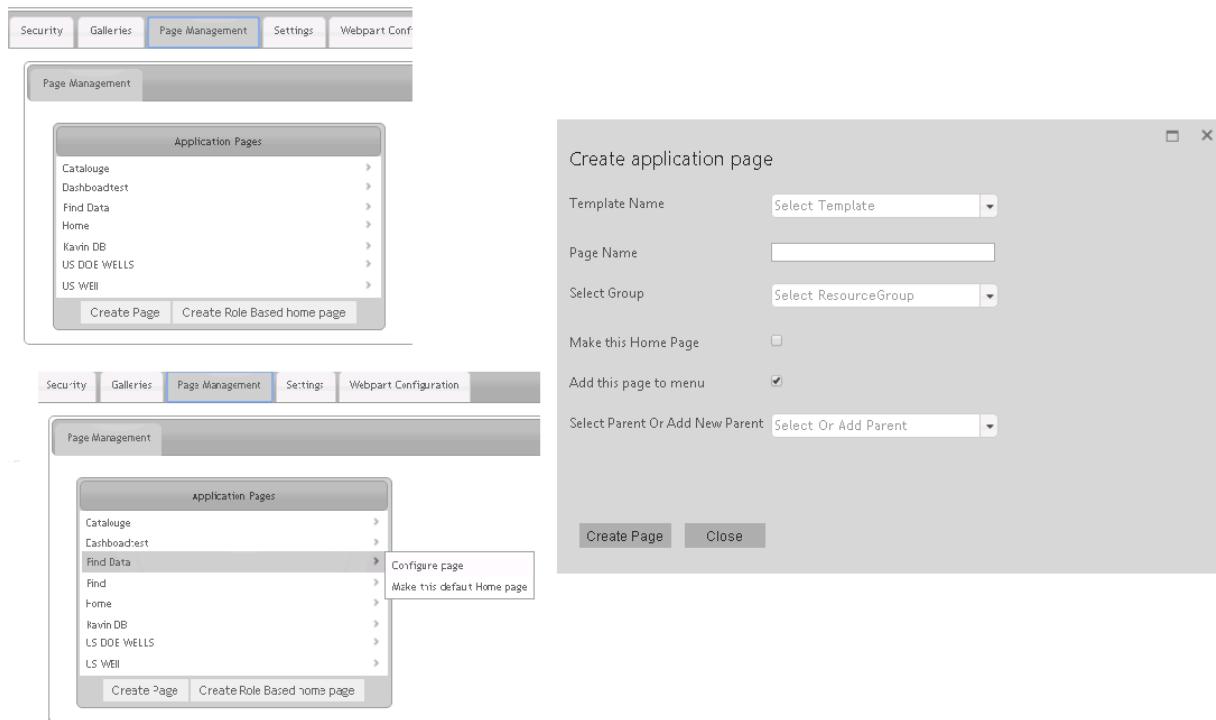


Figure 3-20: Page Management

- **Page Management** - Manages pages; creates/configures pages and set Application Home page.

- **Service Settings** - Manages application level Service Settings and Other Settings; all applications will have access to settings that are created at Portal level; settings can be overridden if needed.

The screenshot shows the 'Service Settings' tab selected in a navigation bar. Below it are two tables:

- Web Framework Services (Highlighted Services are overridden by the application)**: This table lists services with their connection URLs, authentication types, statuses, service types, and usernames. Several services are highlighted in red, indicating they are overridden by the application. The table includes columns for Service Name, Connection URL, Authentication Type, Status, Service Type, and Username.
- Application Services**: This table lists similar service configurations with columns for Service Name, Connection URL, Authentication type, Status, Service Type, and Username. It also includes a checkbox column for selecting services.

At the bottom, there are links for 'Add Service Configuration', 'Edit Service Configuration', and a page number indicator '1 - 5'.

Figure 3-21: Service Settings

- **Webpart Configuration**- Manages configurations of Webparts that are used in the application pages. Each Webpart has a tab which offers reusability and maintainability.

The screenshot shows the 'Webpart Configuration' tab selected in a navigation bar. Below it is a table:

Config Name	Source	Entity	Property	Query Filter	Other Query	Data Limit	Data Filter	ToolMode	Key Columns	Support	Edit	Edit Url	Run on load	Show Data
Alarm ...	DS RTA...	confSolu...	AlarmN...	rtSoluti...	\$order...	All		No	[{"Dat...	Yes	/_LAYOUT...	Yes	No	
Alarms...	DS RTA...	rtSoluti...	Severit...	rtSoluti...	\$order...	All		No	[{"Dat...	No		Yes	No	
US DO...	OpenW...	WellEnt...	well_na...	well_op...	\$order...	Page	Default	No	[{"Dat...	Yes	/custo...	Yes	No	
Teapot...	OpenW...	Well	elevati...		\$order...	All	Excel	No	[{"Dat...	Yes	/custo...	Yes	Yes	

At the bottom, there are links for 'Add Data Query Control Configuration', 'Edit Data Query Control Configuration', and 'Delete Data Query Control Configuration'.

Figure 3-22: Webpart Configuration

Refer to detailed Administration Guide: DecisionSpace® Integration Server Web Framework Version 5000.10.2.2 System Administration Guide.

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# Exercise 1: Create Application, Set Up Custom Security and Change Settings

---

## Purpose of the Exercise

Show how to create Application, setup custom security & change Portal and Application level settings.

## Outcome of the Exercise

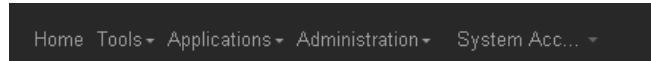
After successful creation, an Application with custom user group and settings will be available inside the Web Framework.

## Exercise Workflows

- Configure Home Page Settings
- Configure Theme Settings
- Create Application
- Create New User Group
- Manager Users for User Group
- Configure Portal Service Settings
- Create Portal Other Settings
- Create Application Service Settings
- Create Application Other Settings

## Configure Home Page Settings

1. Launch the Portal as *Administrator*.
2. Click the **ADMINISTRATION** link on the top right-hand side.



3. Select the **Settings** tab and the **Home Page Settings** tab to display current available settings.

A screenshot of a web application's configuration interface. The 'Settings' tab is selected and highlighted with a red box. Within the 'Settings' tab, the 'Home Page Settings' tab is also selected and highlighted with a red box. The main content area displays a list of home page configurations. One configuration is selected, showing details like 'Welcome Description' and 'Is Default'. At the bottom of the list, there is a red box around the 'Add Home Page Configuration' link.

4. Click the **Add Home Page Configuration** link to create a new setting.

A screenshot of a modal dialog box titled 'Add Home Page Configuration'. It contains fields for 'Welcome Text' (with placeholder 'Welcome to new DSIS Web Framework Portal') and 'Application Image' (with a file input field labeled 'Choose File' containing 'Stars.jpg'). A 'Create' button is at the bottom.

Application Image file is located at  
**C:\Windows\winsxs\x86\_microsoft-windows-mail-app\_31bf3856ad364e35\_6.1.7601.17514\_none\_f35f9773adf74c06\Stars.jpg**

5. Enter Welcome text and select an image to be displayed on the home page.

6. Click **Create**.

7. Select the newly created configuration and click **Make Default** to make it default for Home Page.

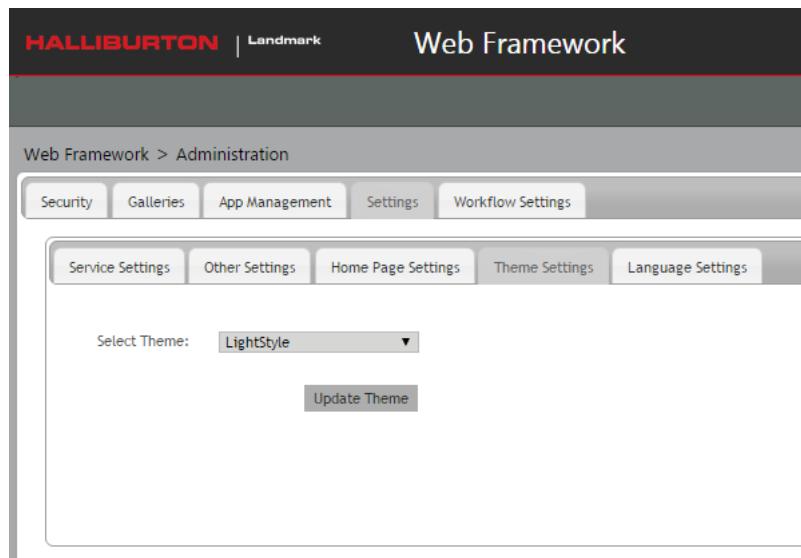
Application Image	Welcome Description	Is Default
<input type="checkbox"/> Portal Images/Halliburton_logo.png	Founded in 1919, Halliburton is one of the world's largest p...	No
<input checked="" type="checkbox"/> Portal Images/Stars.jpg	Welcome to new DSIS Web Framework Portal	No

Add Home Page Configuration | Edit Home Page Configuration | Make Default

8. Click the **Home** link at the top to see the home page with new content.

## **Configure Theme Settings**

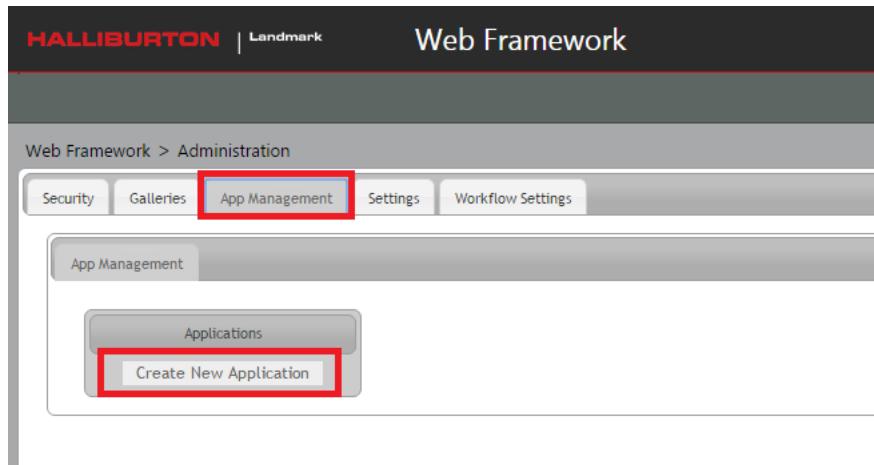
1. Launch the Portal as Administrator.
2. Click the Administration link at top-right-hand side.
3. Select the **Settings** tab.
4. Select **Theme Settings**.



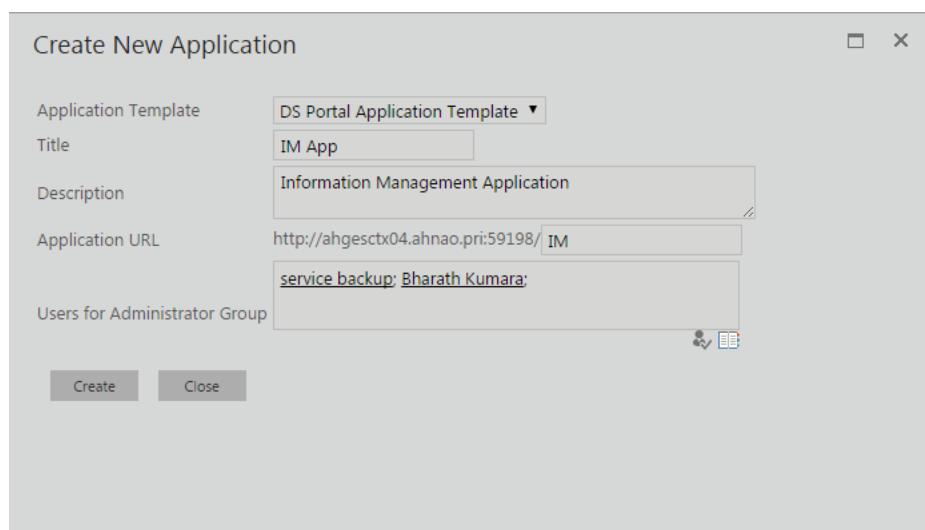
5. Apply a theme (Light Style and Default Style) and click **Update**.

## Create Application

1. Launch the Portal as Administrator.
2. Click the **Administration** link at the top-right hand side.
3. Select the **App Management** tab and click **Create New Application**.

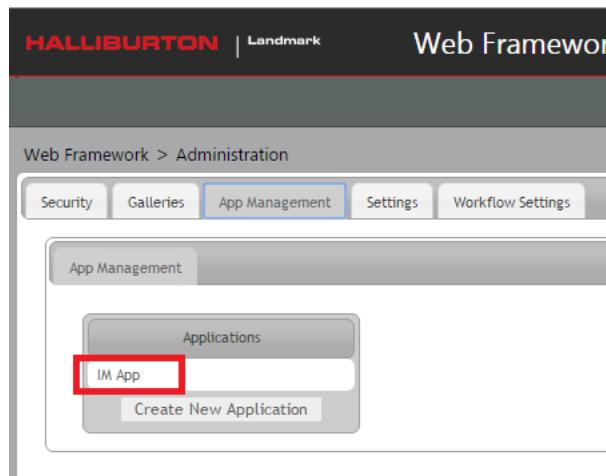


4. In Create New Application pop-up, enter the required information and click **Create**.



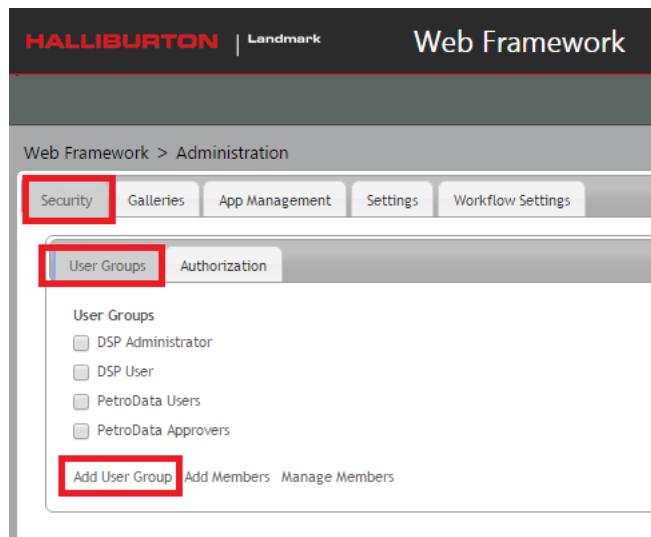
- Select a template from Application Template list (select Default Application Template).
- Add a name (Title) for the application (IM App).
- Add any optional description about the application.

- Enter an Application URL.
  - Add all the users who will be part of the administrator group (lgcadmin, Andrea Pirlo).
  - Click **CREATE**.
5. After the Application is created successfully, the newly created application is displayed on the **App Management** as below:



## Create New User Group

1. Launch the Portal as **Administrator**.
2. Click the **Administration** link at top right-hand side.
3. Select the **Security** tab.
4. Select **User Groups** which displays all available user groups.
5. Click the **Add User Group**.



6. In the Add User Group pop-up, enter the required information and click **Create**.
  - Enter a name for the group (IM Data Approvers).
  - Add any optional description about the group.
  - By default, the current user will be added as the owner. There can be multiple owners as well.
  - Default group settings is recommended.
  - If needed, enable membership request via Email. (Do not enable it as the system is not configured with Email server.)
  - Select Contribute permission.

- Click **CREATE**.

**Add User Group**

Name and About Me Description  
Type a name and description for the group.

**Name:** IM Data Approvers

**About Me:**

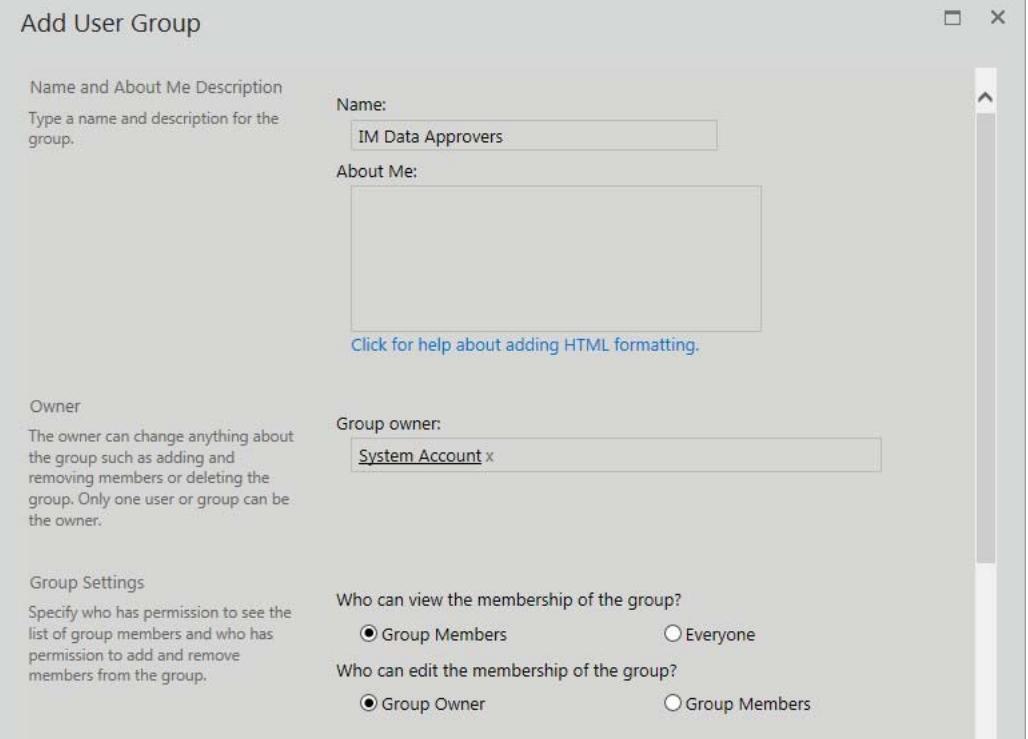
Click for help about adding HTML formatting.

**Owner**  
The owner can change anything about the group such as adding and removing members or deleting the group. Only one user or group can be the owner.

**Group Settings**  
Specify who has permission to see the list of group members and who has permission to add and remove members from the group.

**Who can view the membership of the group?**  
 Group Members       Everyone

**Who can edit the membership of the group?**  
 Group Owner       Group Members



**Membership Requests**  
Specify whether to allow users to request membership in this group and allow users to request to leave the group. All requests will be sent to the e-mail address specified. If auto-accept is enabled, users will automatically be added or removed when they make a request.

**Caution:** If you select yes for the Auto-accept requests option, any user requesting access to this group will automatically be added as a member of the group and receive the permission levels associated with the group.

**Allow requests to join/leave this group?**  
 Yes       No

**Auto-accept requests?**  
 Yes       No

**Send membership requests to the following e-mail address:** [REDACTED]

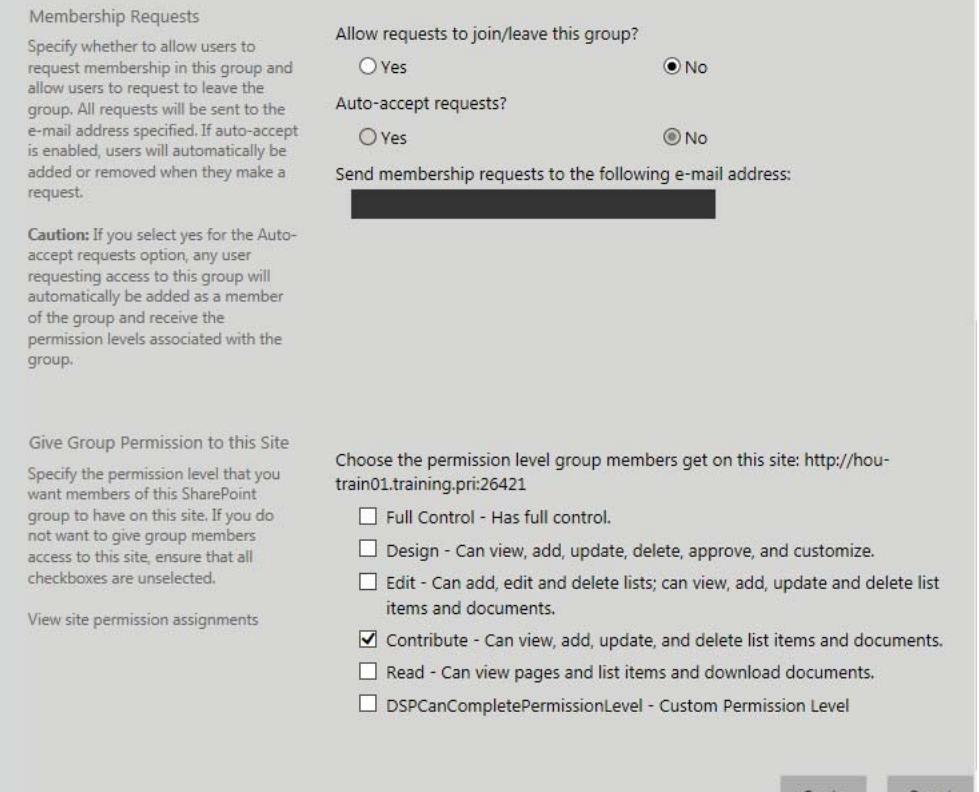
**Give Group Permission to this Site**  
Specify the permission level that you want members of this SharePoint group to have on this site. If you do not want to give group members access to this site, ensure that all checkboxes are unselected.

**View site permission assignments**

Choose the permission level group members get on this site: http://hou-train01.training.pri:26421

Full Control - Has full control.  
 Design - Can view, add, update, delete, approve, and customize.  
 Edit - Can add, edit and delete lists; can view, add, update and delete list items and documents.  
 Contribute - Can view, add, update, and delete list items and documents.  
 Read - Can view pages and list items and download documents.  
 DSPCanCompletePermissionLevel - Custom Permission Level

**Create** **Cancel**

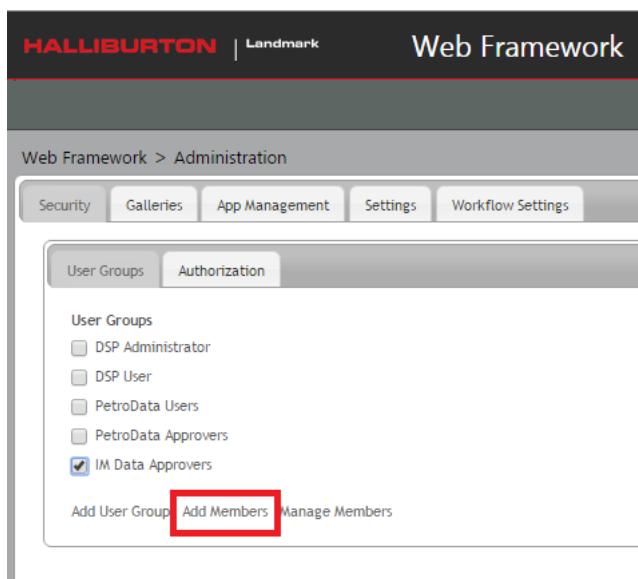


7. On successful group creation, the **Security** tab displays the group that was created as below:

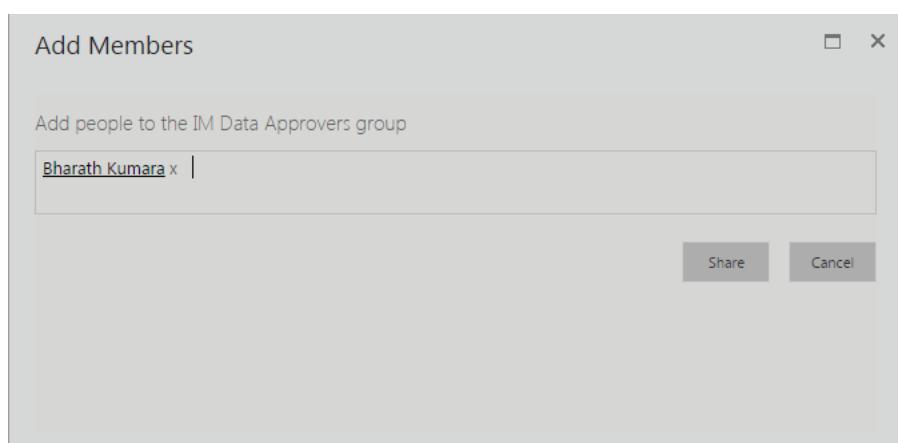
The screenshot shows the Halliburton Landmark Web Framework Administration interface. The top navigation bar includes the Halliburton logo, a Landmark icon, and the text "Web Framework". Below the header, the breadcrumb navigation shows "Web Framework > Administration". The main content area has a tab bar with "Security" selected, followed by "Galleries", "App Management", "Settings", and "Workflow Settings". Under the "Security" tab, there are two tabs: "User Groups" (selected) and "Authorization". The "User Groups" section lists several groups: "DSP Administrator", "DSP User", "PetroData Users", "PetroData Approvers", and "IM Data Approvers". The "IM Data Approvers" group is highlighted with a red rectangular border around its row. At the bottom of the "User Groups" section are three links: "Add User Group", "Add Members", and "Manage Members".

## Manage Users for User Group

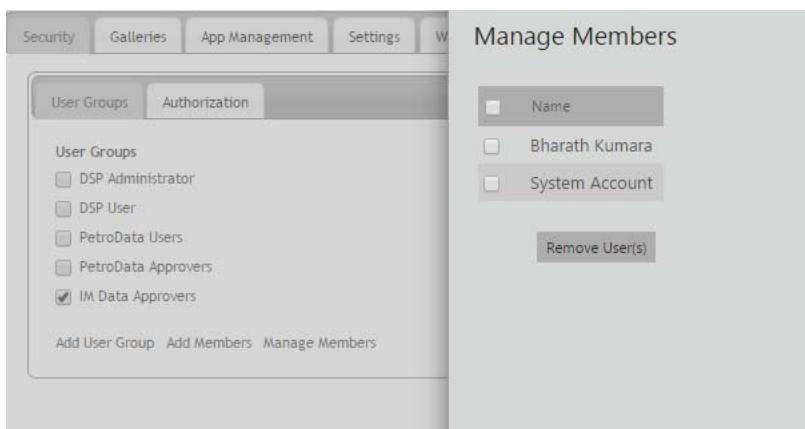
1. Launch the Portal as **Administrator**.
2. Click the **Administration** link at top right-hand side and select the **Security** tab.
3. Select **User Groups** which displays all available user groups.
4. Select the **IM Data Approvers** User Group that was created above and click **Add Members**.



5. Enter name of user, select the user from suggestions and then click **Share**.  
Add users: Andrea Pirlo, Ciro Ferarra.



6. Use the **Manage Members** option to remove users from the group.



## Configure Portal Service Settings

1. Launch the Portal as **Administrator**.
2. Click the **Administration** link on the top right-hand side.
3. Click **Settings** and then select the **Service Settings** tab.

Service Name	Connection URL	Authentication type	Status	Service Type	Username
Default Search Service	http://dssearch-host:8080/solr/ds/	Explicit - group	Active	DS Search	user
Default Citrix Service	http://web-interface-host/Citrix/w...	Explicit - individual	Active	Citrix Service	
Order Service	http://order-service-host:8080/ord...	Anonymous	Active	Order Service	
Default BPM Service	http://dsbpm-host:8080/dsbpm-en...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-host:8080/solr/ds/	Explicit - group	Active	DS Search	user

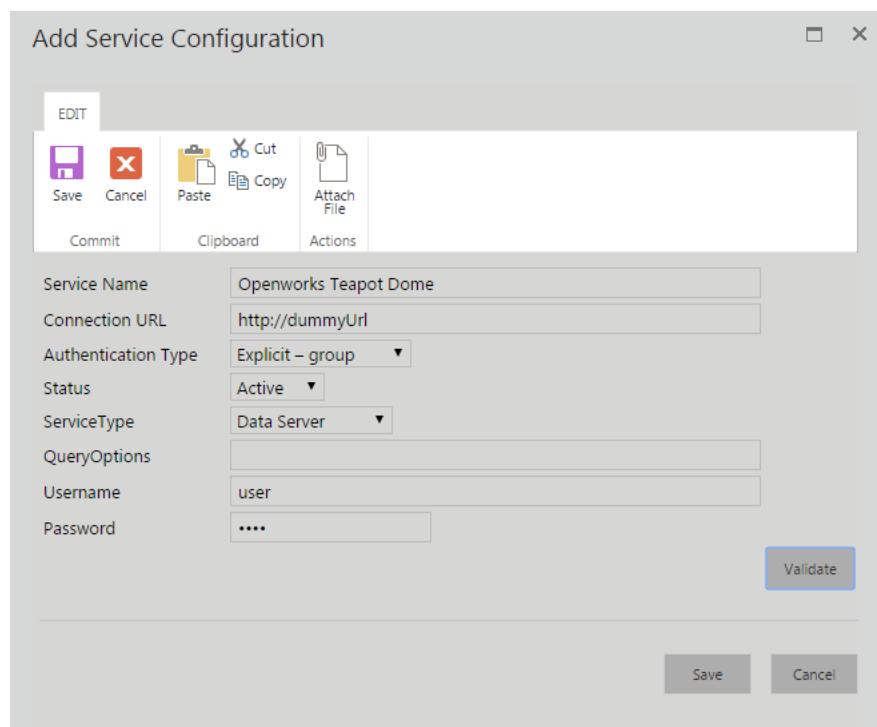
4. Use this screen to Add/Edit Service configurations.
5. Click **Add Service Configuration**.
6. In the Add Service Configuration pop-up, fill the required fields and click **Save**.
  - **Service Name** (Required): The unique identifier of the service within the context. The Portal cannot have two services with the same name but the Portal and applications can have same service name.  
Example: OpenWorks Teapot Dome.

- **Connection URL** (Required): The URL of the service.  
Example: <http://DummyUrl/>
- **Authentication Type** (Required): The authentication type with which the service will be called. Supported values are:
  - Anonymous: No credentials.
  - Explicit - group: Basic authentication with credentials being provided for all users.
  - Explicit - individual: Basic authentication with separate credentials for each user (This is only supported in the SharePoint Server/Integration Server version of the Portal).
  - Identity delegation: The identity of the logged in user of the Portal will be propagated to the external service in the form of a Kerberos token (This is only supported in Kerberos installations of the Portal).  
Example: Explicit Group.
- **Status** (Required): The status of the service. If the service is set to Inactive, it will not be available for the end user to work with.  
Example: Active.
- **Service Type** (Required): The type of service. The following services are supported:
  - BI Service
  - Citrix Service
  - Data Server
  - Data Transfer
  - DataServer JDBC
  - DS BPM Service
  - DS Search
  - Order Service

This is a selectable field which pulls data from the **DSPServiceType** list. Use this list to add new service types.

Example: Data Server.

- **User Name** (Optional): The service will be called using this username. This is an optional field in the following scenarios:
  - If Authentication Type is Anonymous.
  - If Authentication Type is Identity delegation.  
Example: user
- **Password** (Optional): The service will be called using this password. This is an optional field in the following scenarios:
  - If Authentication Type is Anonymous.  
Example: user.



7. The newly created Service is displayed in the **Service Settings** tab as below:



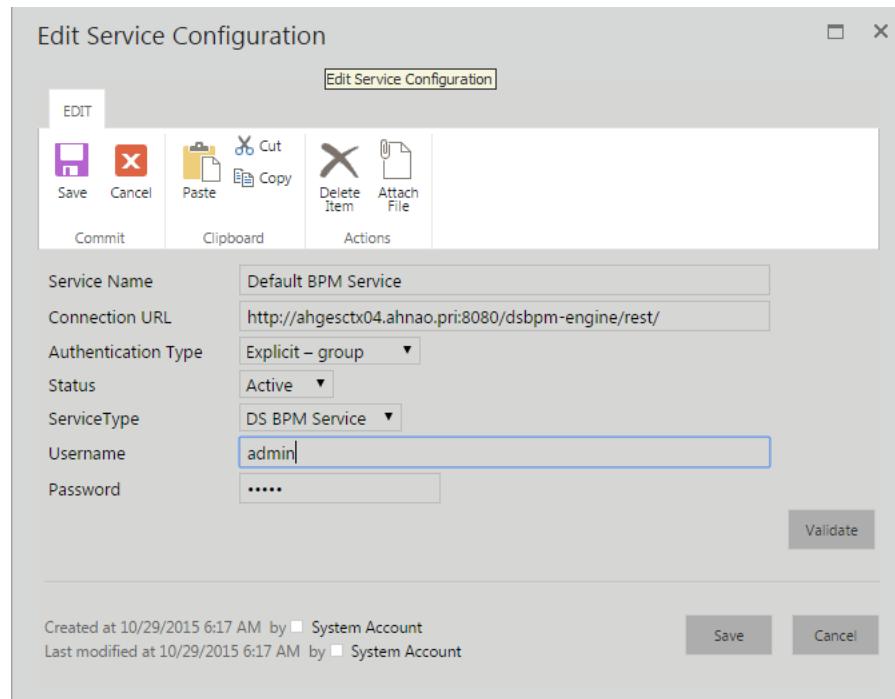
The screenshot shows a software interface with a top navigation bar containing tabs: Security, Galleries, App Management, Settings, and Workflow Settings. Below this is a sub-navigation bar with tabs: Service Settings, Other Settings, Home Page Settings, Theme Settings, and Language Settings. The Service Settings tab is selected and highlighted in red. A table displays a single row of service configurations. The columns are: Service Name, Connection URL, Authentication type, Status, Service Type, and Username. The data for the single row is: Openworks Teapot Dome, http://dummyUrl, Explicit - group, Active, Data Server, user. At the bottom of the table, there are links for 'Add Service Configuration' and 'Edit Service Configuration'.

8. Now Select **Default BPM Service** and click **Edit Service Configuration**.

9. In the Edit Service Configuration pop-up:

- Change the URL to <http://hou-train01.training.pri:8080/dsbpm-engine/rest/>
- Change user name and password to **admin** and **admin**, respectively.

10. Click **Save**.



The screenshot shows the 'Edit Service Configuration' dialog box. At the top, there is a toolbar with buttons for Save, Cancel, Cut, Copy, Paste, Delete Item, Attach File, Commit, Clipboard, and Actions. The main area contains fields for Service Name (Default BPM Service), Connection URL (http://ahgesctx04.ahnao.pri:8080/dsbpm-engine/rest/), Authentication Type (Explicit – group), Status (Active), ServiceType (DS BPM Service), Username (admin), and Password (.....). There is also a 'Validate' button and a status message at the bottom indicating the creation and modification times.

Service Name	Default BPM Service
Connection URL	http://ahgesctx04.ahnao.pri:8080/dsbpm-engine/rest/
Authentication Type	Explicit – group
Status	Active
ServiceType	DS BPM Service
Username	admin
Password	.....

Created at 10/29/2015 6:17 AM by System Account  
Last modified at 10/29/2015 6:17 AM by System Account

Save Cancel Validate

## Configure Portal Other Settings

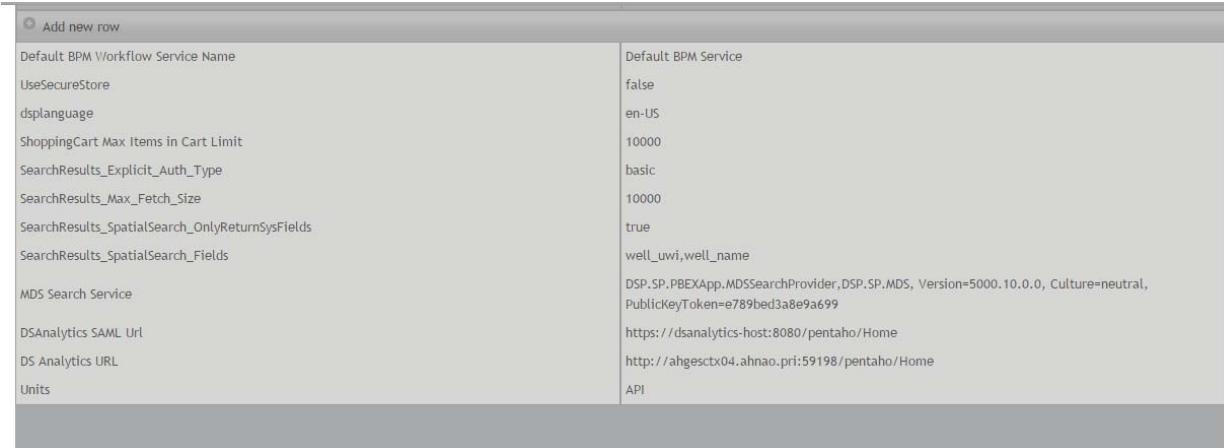
1. Launch the Portal as **Administrator**.
2. Click the **Administration** link on the top right-hand side.
3. Click **Settings** and select the **Other Settings** tab.

Setting name	Value
Default BPM Workflow Service Name	Default BPM Service
UseSecureStore	false
dsplanguage	en-US
ShoppingCart Max Items in Cart Limit	10000
SearchResults_Explicit_Auth_Type	basic
SearchResults_Max_Fetch_Size	10000
SearchResults_SpatialSearch_OnlyReturnSysFields	true
SearchResults_SpatialSearch_Fields	well_uwi,well_name
MDS Search Service	DSP.SP.PBEXApp.MDSSearchProvider,DSP.SP.MDS, Version=5000.10.0.0, Culture=neutral, PublicKeyToken=e789bed3a8e9a699
DSAnalytics SAML Url	<a href="https://dsanalytics-host:8080/pentaho/Home">https://dsanalytics-host:8080/pentaho/Home</a>

4. Click **Add new row**, enter values in **Setting name**, **Value** and click **Done**.
- Example: Setting name - Units; Value: API.

Setting name	Value
Units	API
Default BPM Workflow Service Name	Default BPM Service
UseSecureStore	false
dsplanguage	en-US
ShoppingCart Max Items in Cart Limit	10000
SearchResults_Explicit_Auth_Type	basic
SearchResults_Max_Fetch_Size	10000
SearchResults_SpatialSearch_OnlyReturnSysFields	true
SearchResults_SpatialSearch_Fields	well_uwi,well_name
MDS Search Service	DSP.SP.PBEXApp.MDSSearchProvider,DSP.SP.MDS, Version=5000.10.0.0, Culture=neutral, PublicKeyToken=e789bed3a8e9a699
DSAnalytics SAML Url	<a href="https://dsanalytics-host:8080/pentaho/Home">https://dsanalytics-host:8080/pentaho/Home</a>

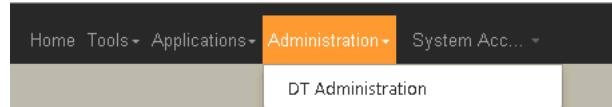
5. After successful creation, the settings are displayed in the page as below:



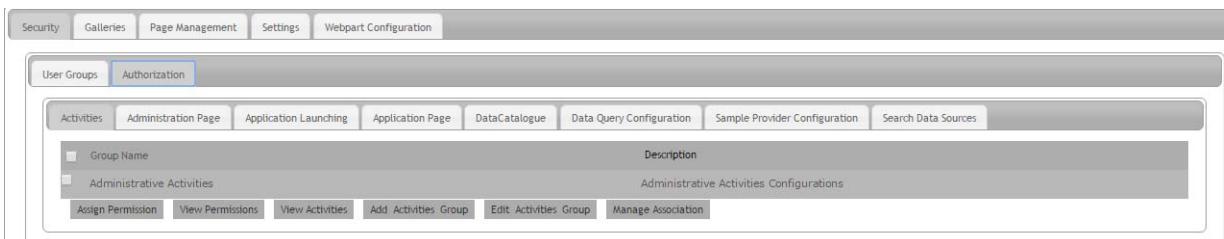
<input type="radio"/> Add new row	
Default BPM Workflow Service Name	Default BPM Service
UseSecureStore	false
displaylanguage	en-US
ShoppingCart Max Items in Cart Limit	10000
SearchResults_Explicit_Auth_Type	basic
SearchResults_Max_Fetch_Size	10000
SearchResults_SpatialSearch_OnlyReturnSysFields	true
SearchResults_SpatialSearch_Fields	well_uwi,well_name
MDS Search Service	DSP.SP.PBEXApp.MDSSearchProvider,DSP.SP.MDS, Version=5000.10.0.0, Culture=neutral, PublicKeyToken=e789bed3a8e9a699
DSAnalytics SAML Url	https://dsanalytics-host:8080/pentaho/Home
DS Analytics URL	http://ahgesctx04.ahnao.pr:59198/pentaho/Home
Units	API

## Configure Application Service Settings

1. Launch the Portal as **Administrator**.
2. Mouse over **Administration** link on the top right-hand side which will show all the Application Administration page links as below:



3. Click the **IM App Administration** link which will display the Application Administration page as below:



The screenshot shows the IM App Administration interface. At the top, there's a navigation bar with tabs: Security, Galleries, Page Management, Settings, and Webpart Configuration. Below that is a sub-navigation bar with tabs: User Groups (selected), Authorization, Activities, Administration Page, Application Launching, Application Page, DataCatalogue, Data Query Configuration, Sample Provider Configuration, and Search Data Sources. The main content area is titled "Authorization". It has two sections: "Group Name" and "Administrative Activities". Under "Group Name", there's a checkbox labeled "Group Name". Under "Administrative Activities", there's a checkbox labeled "Administrative Activities". At the bottom of the content area are several buttons: Assign Permission, View Permissions, View Activities, Add Activities Group, Edit Activities Group, and Manage Association.

4. Click **Settings** and select the **Service Settings** tab.

5. The screen will show all Portal services as well as Application services. The Services that are overridden by the applications will be highlighted in red.

The screenshot shows the 'Service Settings' tab selected in a navigation bar. Below it, there are two tables: 'Web Framework Services' and 'Application Services'. In the 'Web Framework Services' table, the 'Default Search Service' is highlighted in red. In the 'Application Services' table, both 'Default Search Service' and 'Order Service' are highlighted in red. A red box highlights the 'Default Search Service' row in the 'Application Services' table.

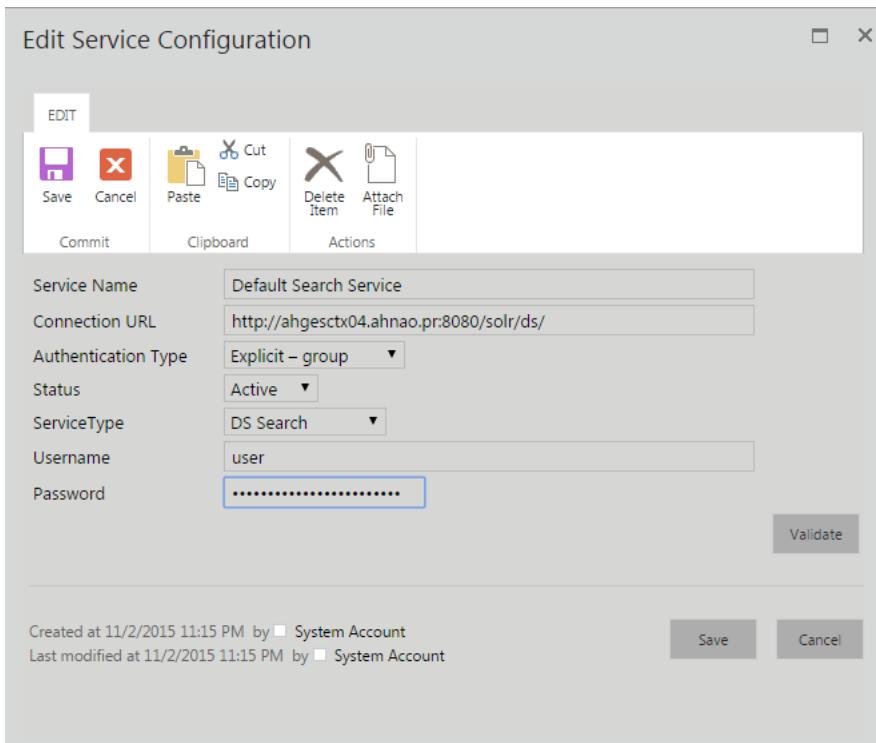
Service Name	Connection URL	Authentication Type	Status	ServiceType	Username
Default Search Service	http://dssearch-host:8080/solr...	Explicit - group	Active	DS Search	user
Default Citrix Service	http://web-interface-host/Citrix...	Explicit - Individual	Active	Citrix Service	
Order Service	http://order-service-host:8080/...	Anonymous	Active	Order Service	
Default BPM Service	http://dsbpm-host:8080/dsbp...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-host:8080/solr...	Explicit - group	Active	DS Search	user

Service Name	Connection URL	Authentication type	Status	Service Type	Username
DS RTA Configuration Service	http://dsds-host:8080/dsdatas...	Explicit - group	Active	Data Server	user
Default Search Service	http://dssearch-host:8080/solr...	Explicit - group	Active	DS Search	user
Order Service	http://localhost:8080/order_tr...	Anonymous	Active	Order Service	

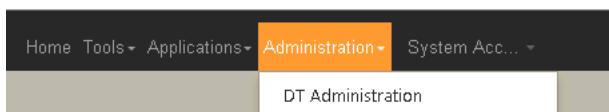
6. Use this screen to Add/Edit Service configurations at the application level.
7. Select **Default Search Service** and click **Edit Service Configuration** (Search uses settings at Application level).
8. In the Edit Configuration pop-up:
- Change the URL to <http://hou-train01.training.pri:8280/solr/ds/>
  - Change user name and password to **user** and **user**, respectively.

- Click **Save**.

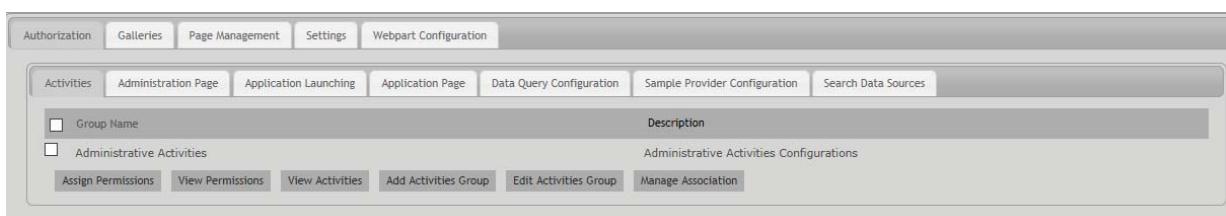


## Configure Application Other Settings

1. Launch the Portal as **Administrator**.
2. Mouse over **Administration** link on the top right-hand side which will show all the Application Administration page links as below:



3. Click the **IM App Administration** link which will show the Application Administration page as below:



4. Click **Settings** and select the **Other Settings** tab. This screen will show the other settings that are created in Portal and Application level. The overridden settings will be highlighted in red.

Setting name	Value
Default BPM Workflow Service Name	Default BPM Service
UseSecureStore	false
<b>dsplanguage</b>	en-US
ShoppingCart Max Items in Cart Limit	10000
SearchResults_Explicit_Auth_Type	basic
SearchResults_Max_Fetch_Size	10000
SearchResults_SpatialSearch_OnlyReturnSysFields	true
SearchResults_SpatialSearch_Fields	well_uwi,well_name
<b>MDS Search Service</b>	DSP.SP.PBEXApp.MDSSearchProvider,DSP.SP.MDS, Version=5000.10.0.0, Culture=neutral, PublicKeyToken=e789bed3a8e9a699
DSAnalytics SAML Url	https://dsanalytics-host:8080/pentaho/Home
DS Analytics URL	http://ahgesctx04.ahnao.pri:59198/pentaho/Home

5. Click **Add new row** in the Application Settings grid, enter values in **Setting name**, **Value** and click **Done**.  
Example: Setting name - Units; Value: Metric.

Setting name	Value
DSAnalytics SAML Url	https://dsanalytics-host:8080/pentaho/Home
DS Analytics URL	http://ahgesctx04.ahnao.pri:59198/pentaho/Home
Units	API
<b>Application Settings</b>	
Setting name	Value
<input checked="" type="radio"/> Add new row	
SearchResults_Explicit_Auth_Type	basic
SearchResults_Max_Fetch_Size	10000
SearchResults_SpatialSearch_OnlyReturnSysFields	true
SearchResults_SpatialSearch_Fields	well_uwi,well_name
dsplanguage	en-US
DS RTA Configuration Service Name	DS RTA Configuration Service
DS RTA Solution Id	
ShoppingCart Max Items in Cart Limit	10000
TimeZoneOffset	0
<b>MDS Search Service</b>	DSP.SP.PBEXApp.MDSSearchProvider,DSP.SP.MDS, Version=5000.10.0.0, Culture=neutral, PublicKeyToken=e789bed3a8e9a699

6. After successful creation, the settings are displayed in the page as below:

Application Settings	
Setting name	Value
SearchResults_Explicit_Auth_Type	basic
SearchResults_Max_Fetch_Size	10000
SearchResults_SpatialSearch_OnlyReturnSysFields	true
SearchResults_SpatialSearch_Fields	well_uwi,well_name
dsplanguage	en-US
DS RTA Configuration Service Name	DS RTA Configuration Service <span style="float: right;">(x)</span>
DS RTA Solution Id	
ShoppingCart Max Items in Cart Limit	10000
TimeZoneOffset	0
MDS Search Service	DSP.SP.PBEXApp.MDSSearchProvider;DSP.SP.MDS, Version=5000.10.0.0, Culture=neutral, PublicKeyToken=e789bed3a8e9a699
<i>Units</i>	<i>Metric</i>

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# Plugins and Integration with Other DecisionSpace® Integration Server Features, GIS, and DecisionSpace® Analytics

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## Data Server

### Overview

#### ***Current Status***

- Allows to connect to Data Server using all supported authentication.
  - Basic Authentication
  - Identity delegation
- Allows to Create/Read/Update/Delete data from Web Framework.

#### ***What's Coming***

- FBA authentication in 10.3 vs Basic authentication in 10.2.

#### ***Web Framework Plugins that use Data Server***

- Data Query
- Data Catalogue
- GIS

## **Data Query Plugin**

### **Overview**

#### **Current Status**

- Allows to connect to any OData Services including Data Server.
- Allows to read data from any entity inside a model.
- Displays the data in a grid which supports Sorting, Paging, Filtering, Conditional formatting & communication with other webparts.
- Provides extension points to support Create/Update/Delete.
- Allows to view single server page vs all data.
- Uses Infragistics IgniteUI Grid (<http://www.igniteui.com/grid/overview>).

#### **What's Coming...**

- Rich capabilities in Data Grid like Excel like filtering, Column ordering, Column grouping, Column header changing, Custom columns for linking to other page with context, Ability to choose features like Column hiding, Column Summary, etc. (10.3).

### **Walkthrough**

#### **Administrators can**

- Manage Data Server Service configurations.
- Create Page in Tool mode for end users to view data by browsing the registered services.
- Create Configurations for end users.
- Create and configure Application Pages for end users to view data.

***End Users can***

- View Pages which shows the data in a grid.
- Use Pre-configured queries to view data.
- Browse the model data if Administrator has enabled Tool mode.

***Developers can***

- Populate Pre-Configured Queries.
- Use the Data Query Manager to get data through the Data Server.
- Extend Data Query Grid to support data entry using custom UI (asp.net or HTML 5).

## **Exercise 2: Create Data Query, Create Page and Configure Webparts**

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### **Purpose of the Exercise**

- Create Data Query Control Web part Configuration.
- Create Page and configure the page to show one of the existing web part configuration.

### **Outcome of the Exercise**

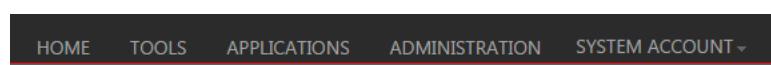
There is a page which uses Data Query Grid web part which connects to OW data source using DSDS and displays the data with some filter and conditional formatting.

### **Exercise Workflows**

- Edit Service Setting
- Create a new Data Query Control Configuration which connects to OW and displays required data
- Create a page level Authorization group
- Create a page using Data Query Page Template
- Configure the page to use the configuration created in this exercise
- View the created page which shows the Data Grid

### **Edit Service Settings**

1. Login to the Portal as **Administrator**.
2. Click **Administration**.



**3. Click **Settings** and select the **Service Settings** tab.**

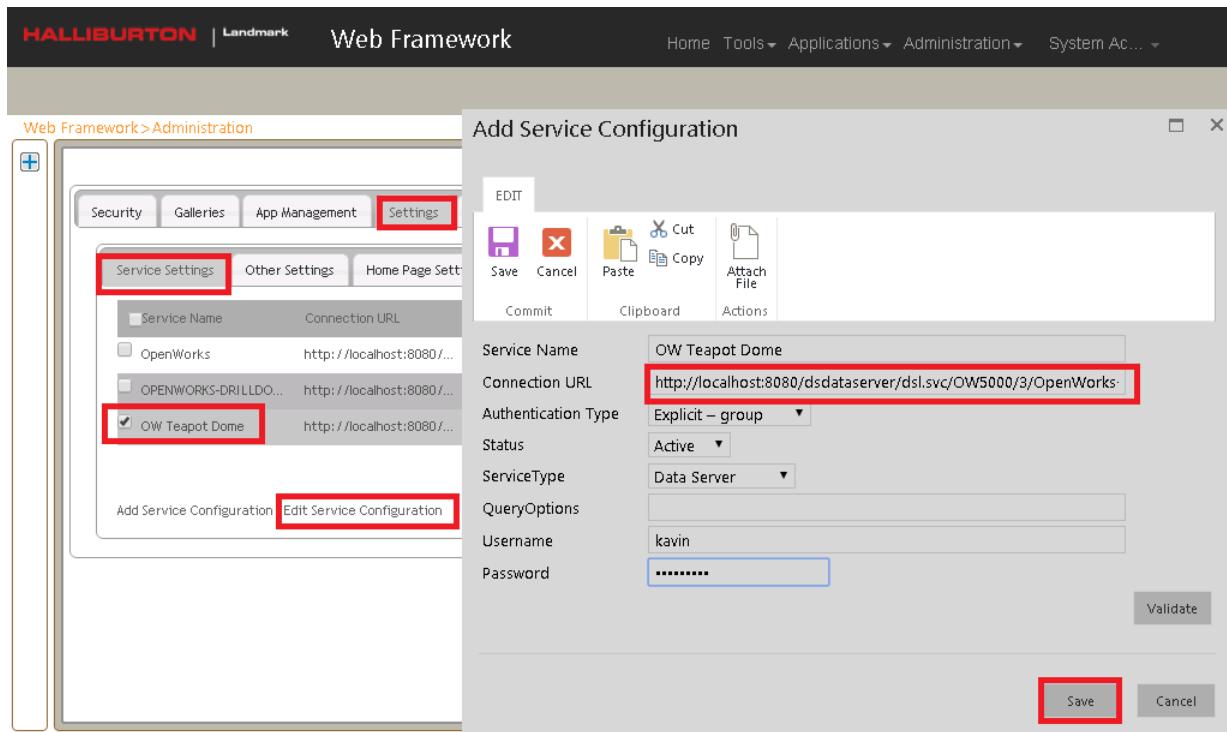
Service Name	Connection URL	Authentication type	Status	Service Type	Username
Default Search Service	http://dssearch-host:...	Explicit - group	Active	DS Search	user
Default Citrix Service	http://web-interface-...	Explicit - Individual	Active	Citrix Service	
Order Service	http://order-service-...	Anonymous	Active	Order Service	
Default BPM Service	http://dsbpm-host:80...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-host:...	Explicit - group	Active	DS Search	user

**4. Select **OpenWorks Teapot Dome** service that was created in Exercise 1 and click **Edit Service configurations**.**

Service Name	OW Teapot Dome
Connection URL	http://localhost:8080/dsdataserver/dsl.svc/OW5000/3/OpenWorks:
Authentication Type	Explicit – group
Status	Active
ServiceType	Data Server
QueryOptions	
Username	kavin
Password	*****

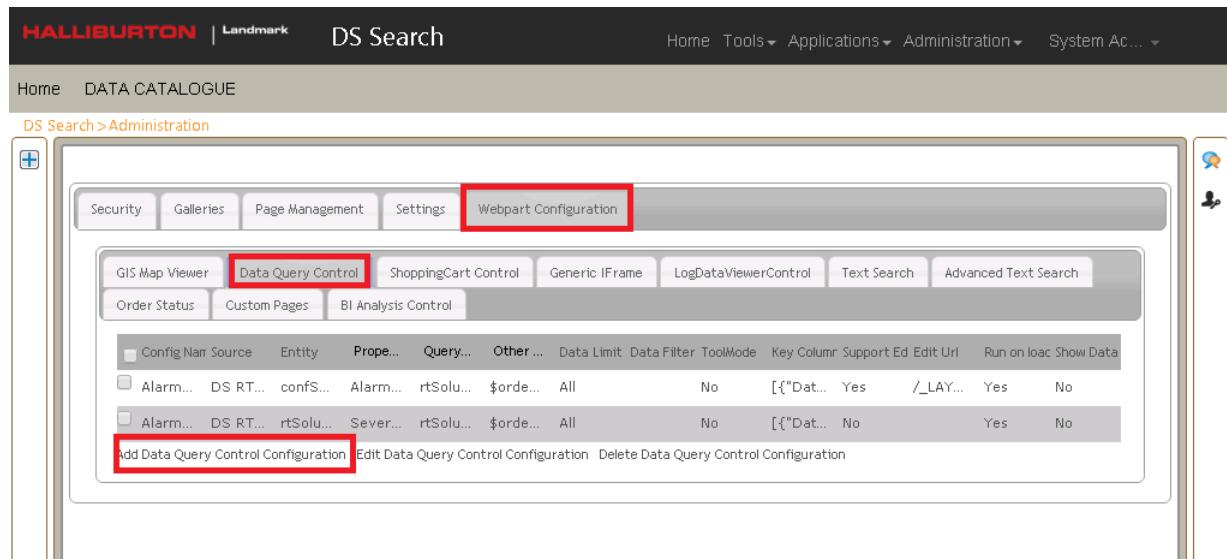
**5. Change the URL to point to right URL [http://hou-train01.training.pri:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining\\_TEAPOT/](http://hou-train01.training.pri:8180/dsdataserver/dsl.svc/OW5000/1/OpenWorks-OWtraining_TEAPOT/)**

6. Click **Save** after the URL is changed.

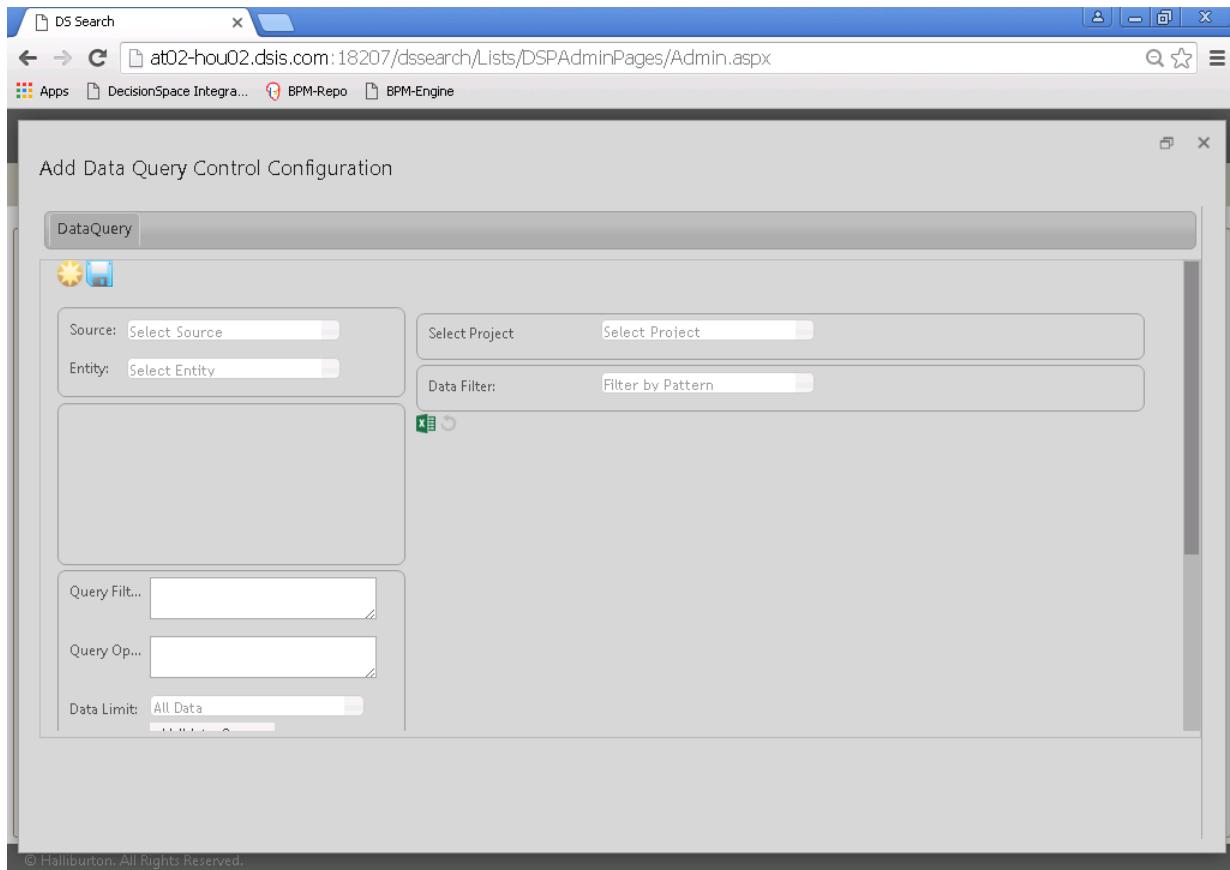


## Create a New Data Query Control Configuration

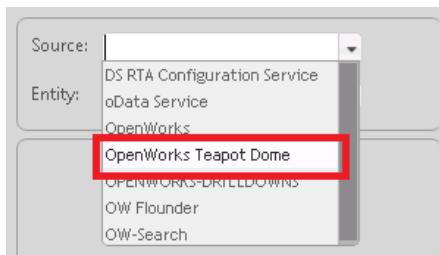
1. In IM App administration page, select **Webpart Configuration > Data Query Control > Add Data Query Configuration**.



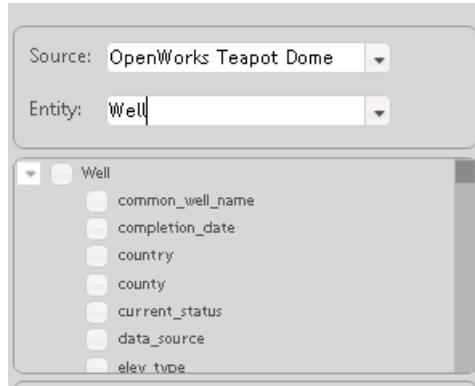
2. The **Data Query Tool** is displayed in a pop-up window as shown below:



3. Select a data source to load its corresponding entities. In this exercise, the Service that was added in the above step OpenWorks Teapot Dome will be selected.

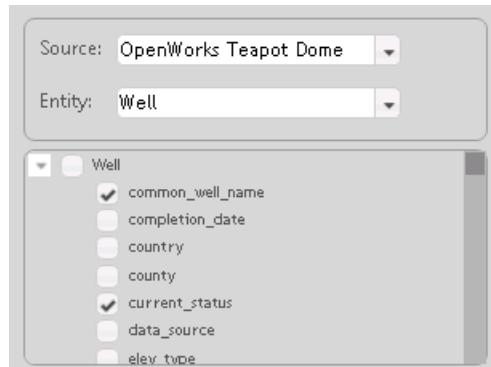


4. Select an entity to load its corresponding properties. In this exercise, the **Well** entity will be selected and will display all the properties in that entity as below:



5. Select the Properties that need to be shown in the grid. In this exercise, the following properties will be selected:

- common\_well\_name
- current\_status
- elevation
- latitude
- longitude
- total\_depth
- well\_id
- well\_operator



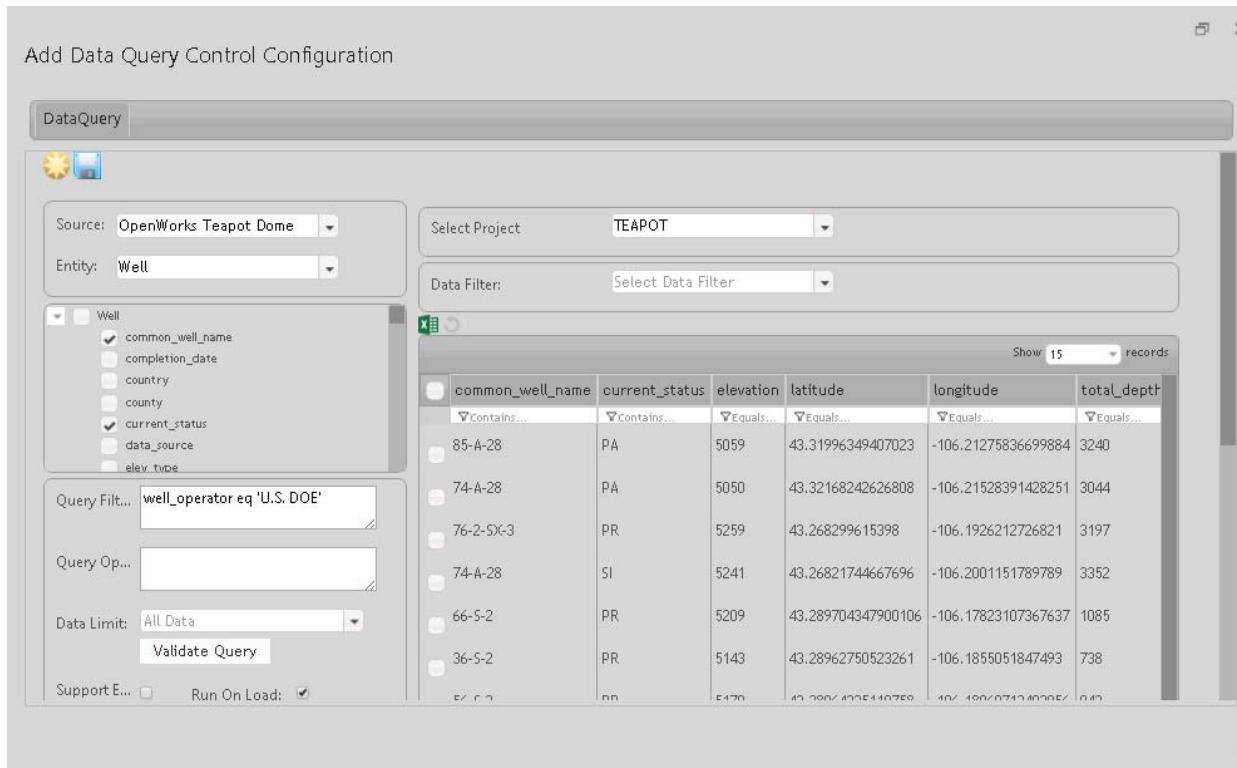
6. Click **Validate Query** to see the data in a grid on the right-hand side of the page as shown below:

The screenshot shows the 'Add Data Query Control Configuration' window with the 'DataQuery' tab selected. On the left, there's a sidebar with a tree view under 'Well' showing fields like common\_well\_name, completion\_date, country, current\_status, data\_source, and elev\_type. Below the tree are 'Query Filter...' and 'Query Op...' dropdowns, and a 'Data Limit' dropdown set to 'All Data'. A 'Validate Query' button is also present. On the right, a data grid displays 15 records of well data with columns: common\_well\_name, current\_status, elevation, latitude, longitude, and total\_depth. The data includes entries such as 101-5-3, PA, 5171, 43.29568252509156, -106.1966581974165, 3062; 85-A-28, PA, 5059, 43.31996349407023, -106.21275836699884, 3240; etc.

7. If the data needs to be filtered, a valid OData filter condition can be specified in the text area. In this exercise, a filter will be used to get data where well\_operator is U.S. DOE. Here is the corresponding oData filter format:

```
well_operator eq 'U.S. DOE'
```

After entering the filter, click **Validate Query** to view the latest data.



#### Note

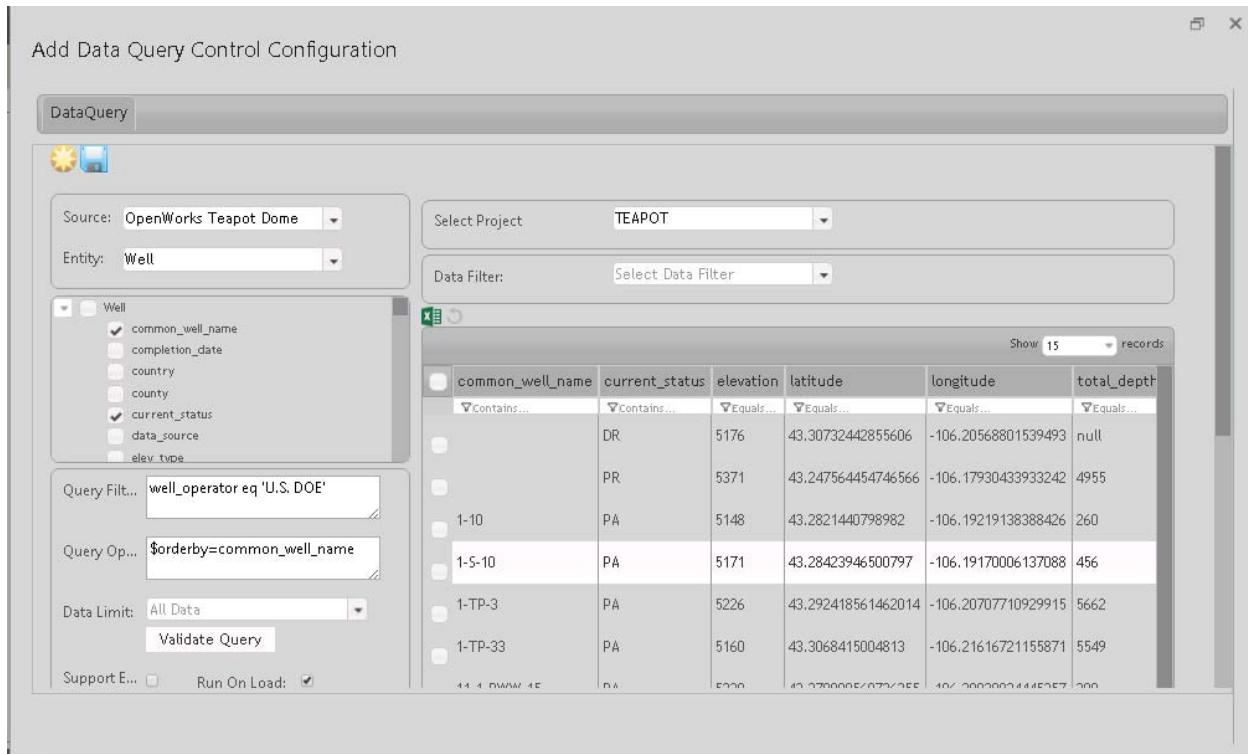
Here are list of filtering options in OData (<http://www.odata.org/documentation/odata-version-2-0/uri-conventions/>).

see section 4.5 Filter System Query Option.

8. Query Options are used to do additional conditions like Order by, top number of records etc. In this exercise, the date will be ordered by common\_well\_name filed. Here is the query option syntax to achieve that:

`$orderby=common_well_name`

After entering the query options, click **Validate Query** to view the latest data.



## Note

Here are list of filtering options in OData (<http://www.odata.org/documentation/odata-version-2-0/uri-conventions/>).

see section 4 System Query Option.

## 9. Data Limit

Normally OData services are set up to serve data with server driven paging. Use the Server Driven Paging feature to get data page-by-page or in its entirety.

- To get data page by page, select the Data Limit property **Single Page Data**.
  - To get data in its entirety, select the Data Limit property **All Data**.

In this exercise, the Data Limit will be kept as **All Data**.

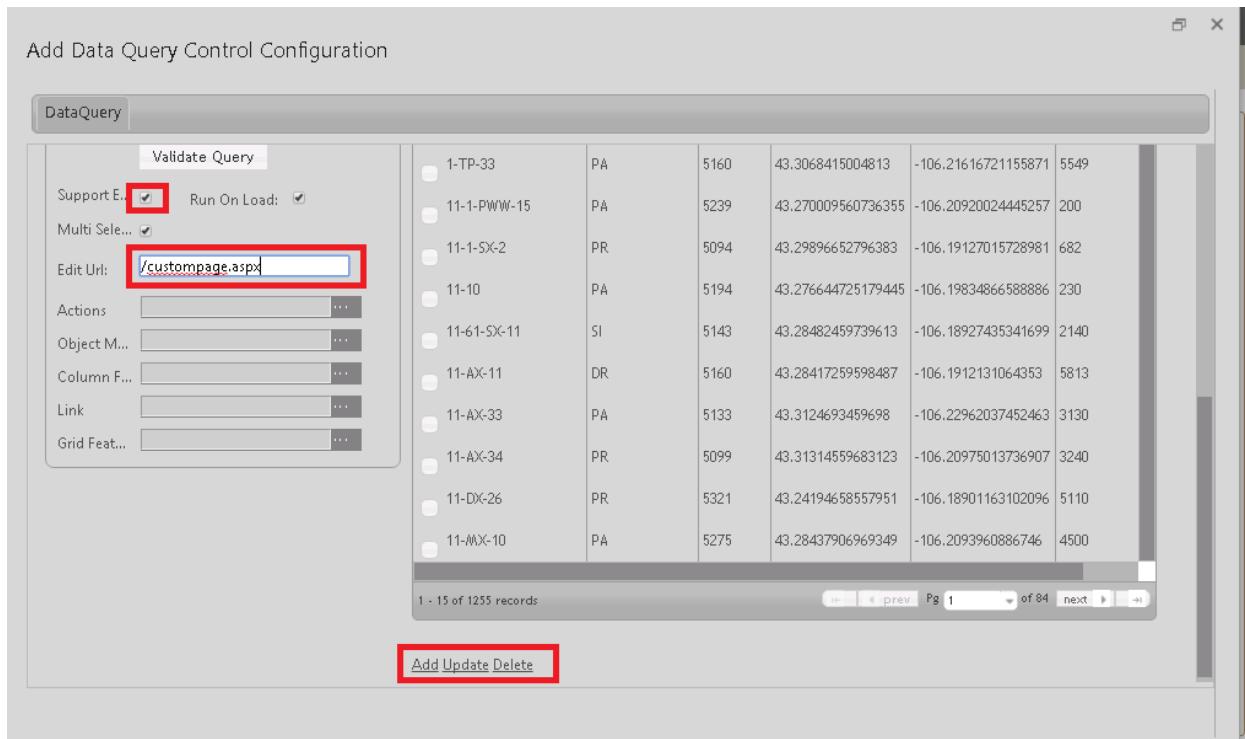
## 10. Support Edit

oData generally provides an interface for interacting with data over the web and performing CRUD (Create, Read, Update, and Delete) operations. To perform a CUD operation in the oData service, select the **Support Edit** option below the data limit drop-down and provide the corresponding edit url in the **Edit Url** text box. This provides the user interface for CUD operations.

If the **Support Edit** option is selected, the **Add**, **Update** and **Delete** buttons are visible.

### Note

Add/Update/Delete functionality is not available in create or update mode.



## 11. Run on load

Use the **Run On Load** option to load the page with or without the grid by default.

- To load the page with the grid, select the **Run On Load** check box beside Support Edit.

- To load the page without the grid, clear the **Run On Load** check box beside Support Edit.

In this exercise, the **Run on load** option will be checked.

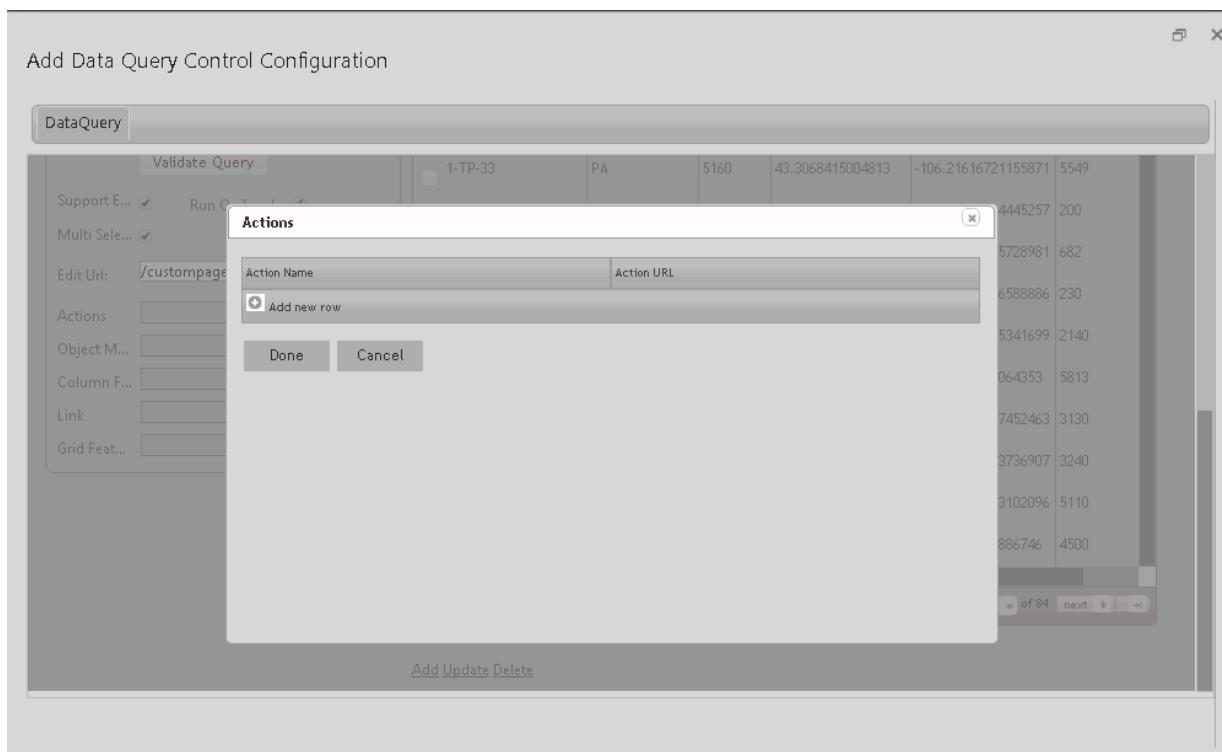
## 12. Actions

This option will allow the end user to select some of the rows and call a service and post the selected rows data. The service should have the logic to complete the action.

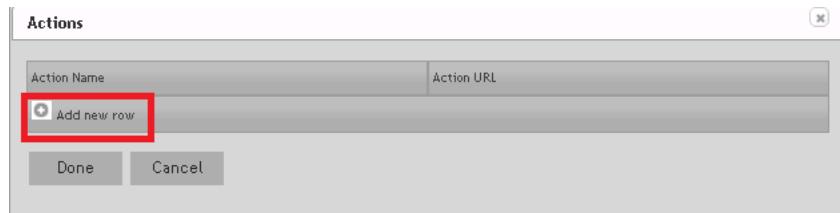
In this exercise, a custom action will be configured for following scenario.

To change the status of the well from PA to PR, use a custom action called **Change to PR** to call a service method **WellManager.svc/ChangeToPR** and pass the selected well data, and the service method will have the logic to change the status for the wells that are passed to the service. In order to do the above, follow the steps below:

- Click **Actions browse** to display the Actions pop-up as below:



- In the Actions pop-up, click **Add new row**.



- Enter **Change to PR** in Action name column and enter **WellManager.svc/ChangeToPR**, and then click **Done** in the grid. Click the **Done** on the pop-up.



**Note**

- Actions will not be shown.
- Since custom services are not developed, this action will not work but this is just to show how this functionality can be used.

### 13. Object Mapping

Object Mapping is helpful to communicate the selected row as a DSP Object during web part communication. The DSP object consists of ID, Name and type parameters. This mapping allows communicating the selected object as generic DSP Object which will be understood by all other web parts.

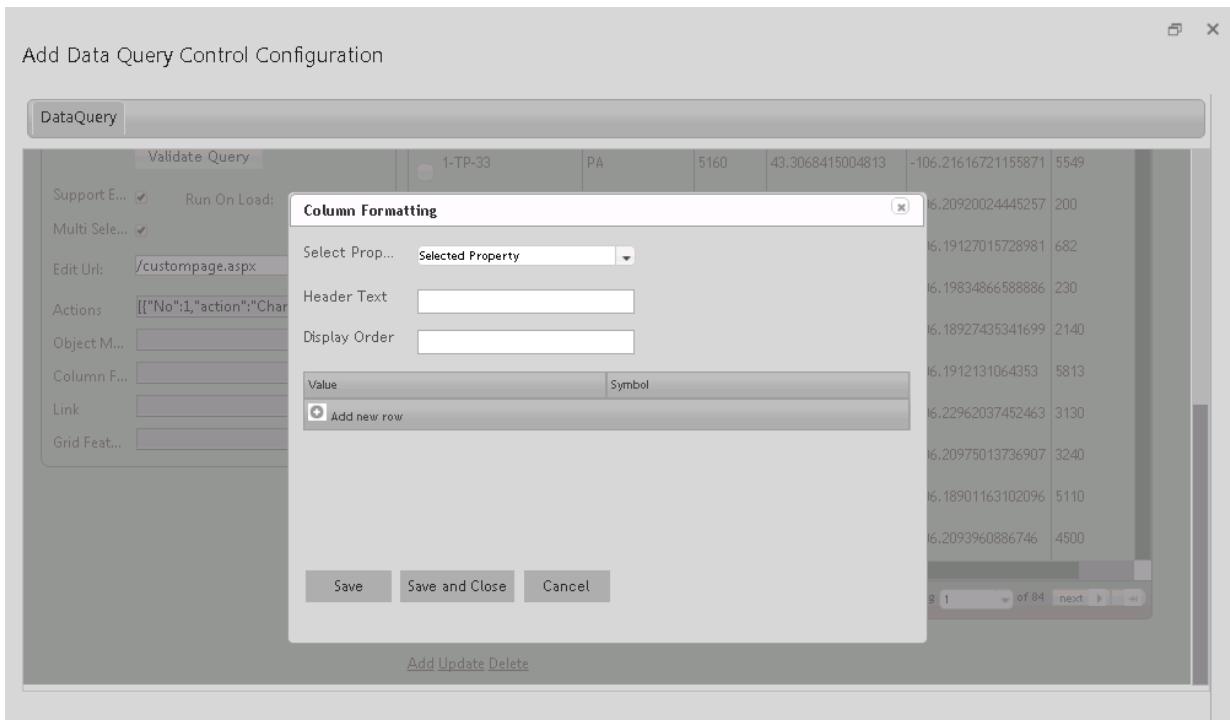
Use any entity to create a data query and use this mapping to communicate a generic object which holds the data that needs to be sent. For example, there can be another Webpart which listens to this Data Query Grid Webpart and receives the DSP Object, and uses the id to render a Report or perform a search, etc.

Objects will not be mapped in this exercise.

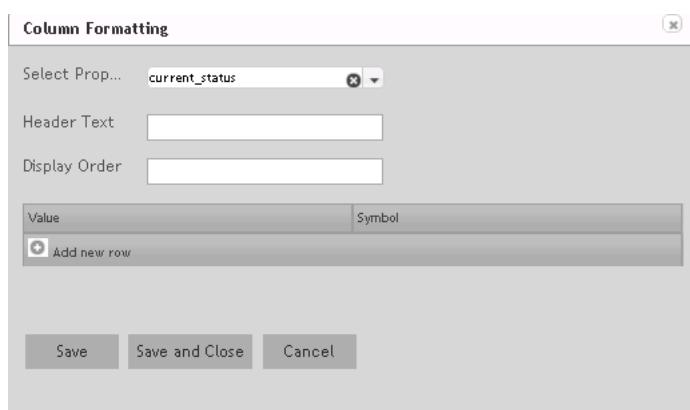
## 14. Column Formatting

Format the columns with a colored symbol to categorize certain property values.

- Click the **Column Formatting** browse button just below Object Mapping to display the Column Formatting pop-up.



- In the Column Formatting pop-up, select the Property to format. Select **current\_status**.



- Add the rows with the value and the symbol to be associated. For this exercise, click **Add new row** then enter **PA** in value column and select a symbol from the drop-down and then click **Done**. Similarly, add another row and enter **PR** in value column and

select a different symbol from the drop-down and then click **Done**.

The screenshot shows the 'Column Formatting' dialog box for the 'current\_status' property. The 'Select Prop...' dropdown is set to 'current\_status'. The 'Header Text' and 'Display Order' fields are empty. Below is a table with two rows:

Value	Symbol
PA	Orange
PR	Red

At the bottom are three buttons: 'Save', 'Save and Close', and 'Cancel'.

- Add a value as **Other** and a symbol so all the values other than what is specified will have this symbol. For this exercise, click **Add new row**, enter **Other** in value column and select a symbol from the drop-down, and then click **Done**. Finally, click **Done** on the pop-up.

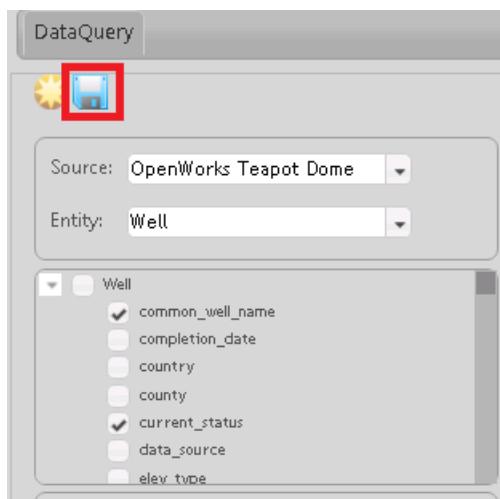
The screenshot shows the 'Column Formatting' dialog box for the 'current\_status' property. The 'Select Prop...' dropdown is set to 'current\_status'. The 'Header Text' and 'Display Order' fields are empty. Below is a table with three rows:

Value	Symbol
PA	Orange
PR	Red
Other	Yellow

At the bottom are three buttons: 'Save', 'Save and Close', and 'Cancel'.

15. Click **Validate Query** to validate if the query is formed correctly. Results of the entered query will be displayed.

16. Click **Save Query**.

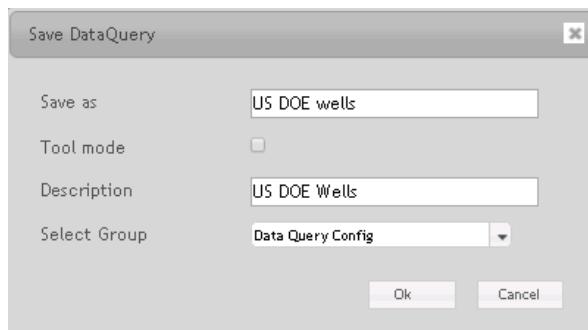


17. In the Save Data Query pop-up, enter data for all the fields and click **OK**.

- **Save as** - Query Name.
- **Tool Mode** - The Data Query configuration behaves differently based on the state of the **Tool Mode** property. If the Tool Mode is selected, page will open in Create or Update mode.

If the Tool Mode is cleared, the page will open with just the Data Grid functionalities.

- **Description** - Description for a query.
- **Select Group** - Authorization group associated with the Query.



18. The query will be saved in the Data Query Control web part configuration.

Config Name	Source	Entity	Property...	Query Fi...	Other Q...	Data Limit	Data Filter	ToolMode	Key Columns	Support	Edit	Edit Url	Run on load	Show Data
Alarm ...	DS RTA...	confSol...	AlarmN...	rtSoluti...	\$order...	All		No	[{"Dat...	Yes	/_LAYO...	Yes	No	
Alarms...	DS RTA...	rtSoluti...	Severit...	rtSoluti...	\$order...	All		No	[{"Dat...	No		Yes	No	
<b>US DO...</b>	<b>OpenW...</b>	<b>Well</b>	<b>commo...</b>	<b>well_op...</b>	<b>\$order...</b>	<b>All</b>	<b>Default</b>	<b>No</b>	<b>[{"Dat...</b>	<b>Yes</b>	<b>/custo...</b>	<b>Yes</b>	<b>No</b>	

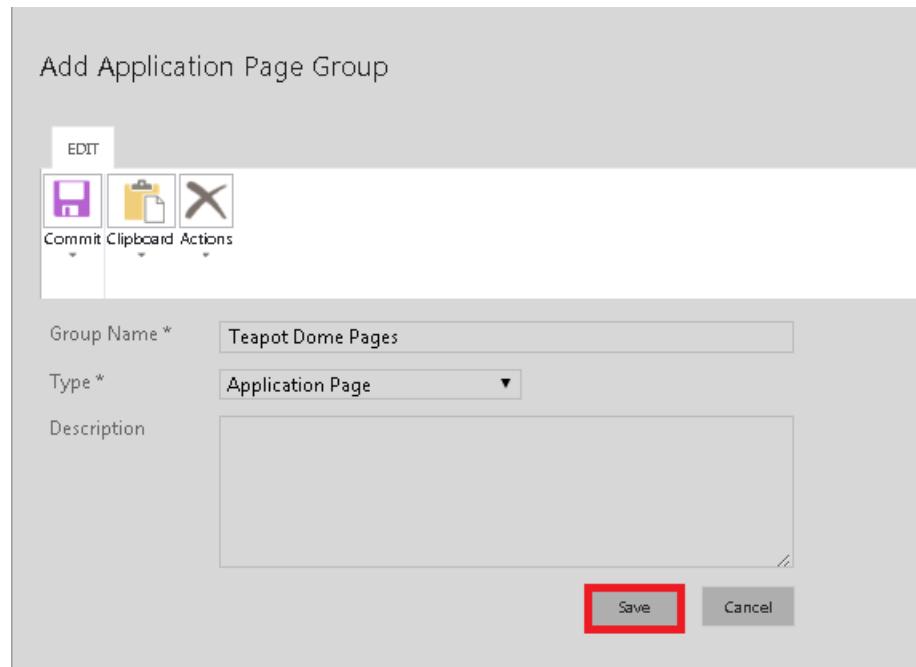
## Create a Page Level Authorization Group

1. In IM App Administration page, now click **Authorization** and then click **Application Page** which shows the existing groups that are available within the application.

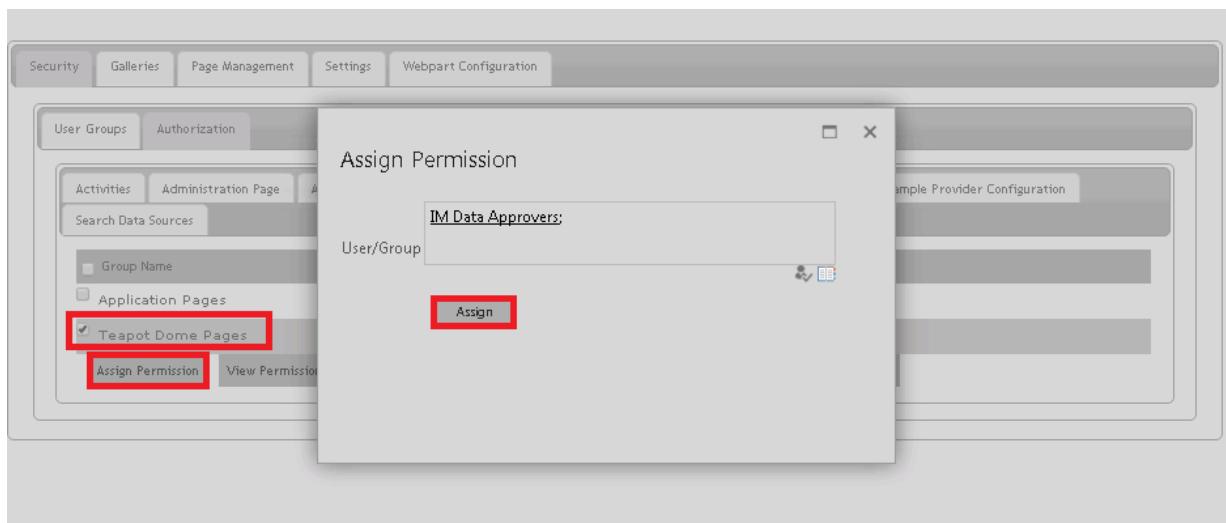
Group Name	Description
Application Pages	Application Pages

2. Click **Add Application Page Group** to create a new group.

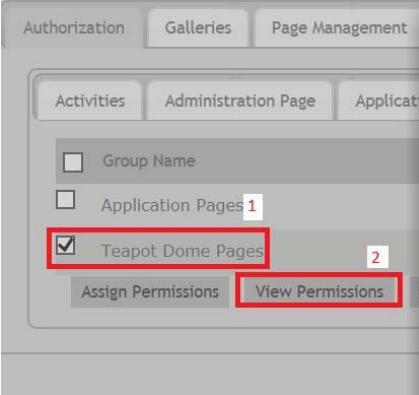
3. In the Add Application Page Group pop-up, enter a name for the group and click **Save**.

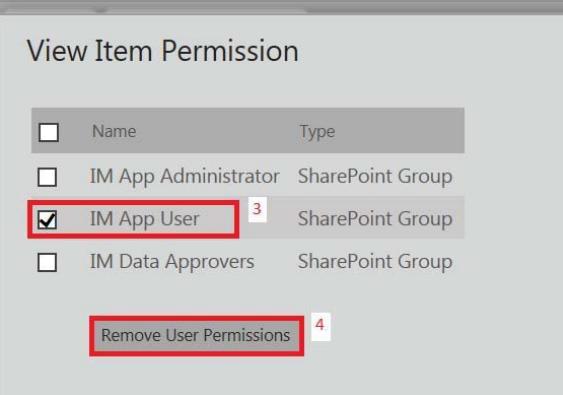


4. Now select the newly created group and click **Assign Permissions**. Then enter the IM Data Approvers group that was created before and click **Assign** as shown below:



5. Now select the newly created group again and click **View Permissions**. Then remove the permission for all Application users by selecting **IM App User** and clicking **Remove User Permissions** as shown below:

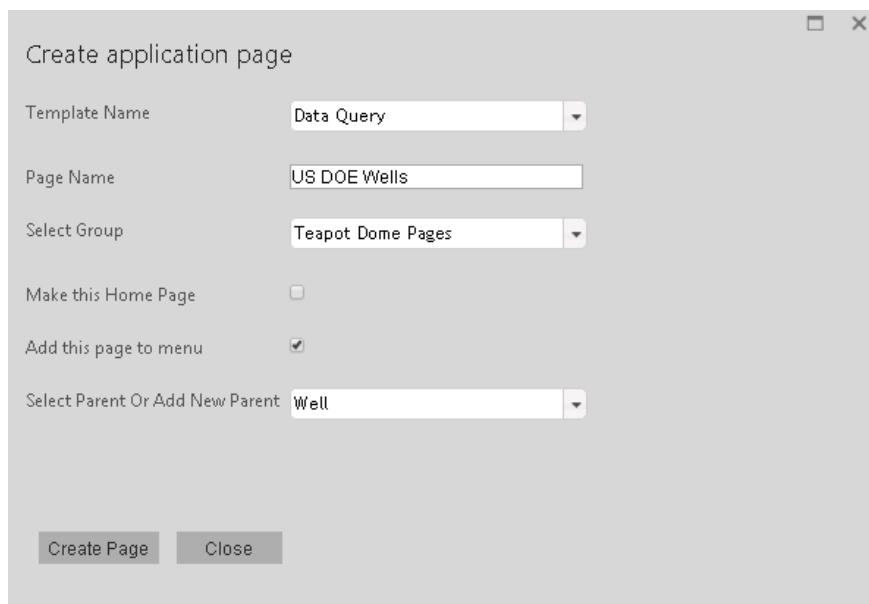




## Create a Page using Data Query Page Template

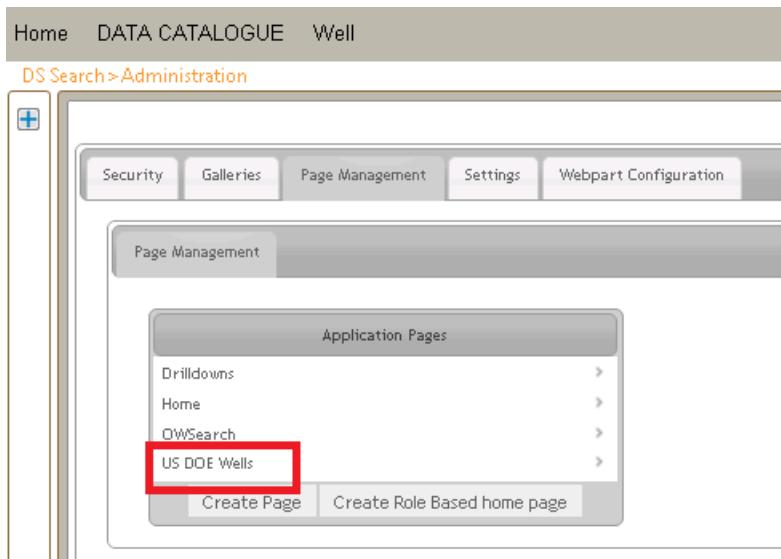
1. In IM App Administration page, click **Page Management** and then click **Create Page** which will launch the Create Page pop-up as shown below:

2. Select the **Data Query** template and enter required details:
  - **Page Name:** Enter a name of the page.
  - **Select Group:** Select a Security Group which will have access to this page. For this select the group that was created in previous step (Teapot Dome Pages).
  - **Make this Home Page:** Then if needed, select the check box to make this page as the home page for the application.
  - **Add this page to menu:** This option will allow the admin to create a menu for end users to access this page.
  - **Select Parent or Add new Parent:** Admin can select an existing menu group or add a new group. In this exercise, add a new menu group called **Wells** as below:

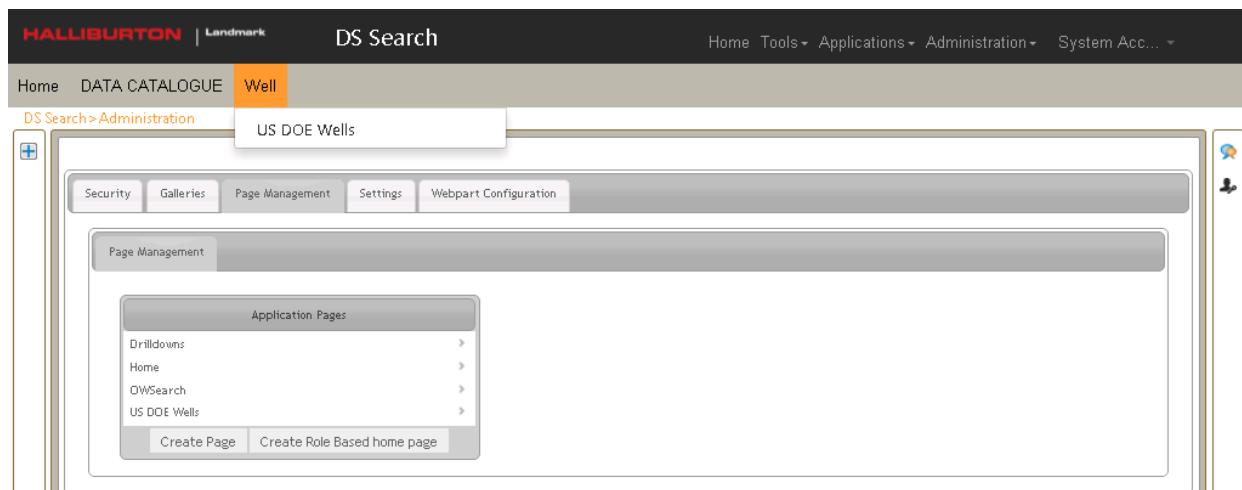


3. Click **Create Page**. After the page is created, click **Close**.

4. A new page inside the application pages is displayed as below:

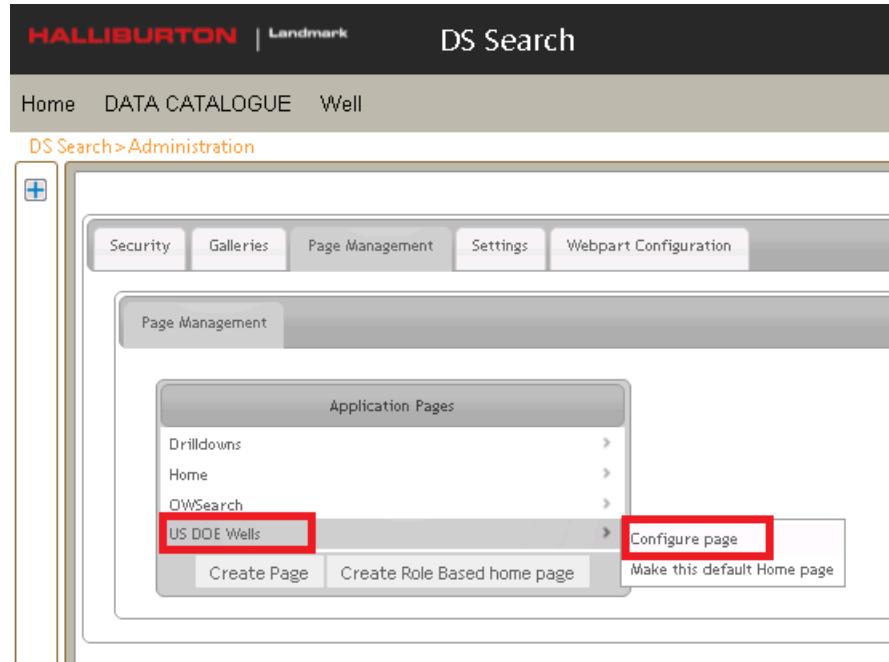


5. Also, a new menu group called **Wells** is displayed. On mouse-over, the newly created page is displayed as below:

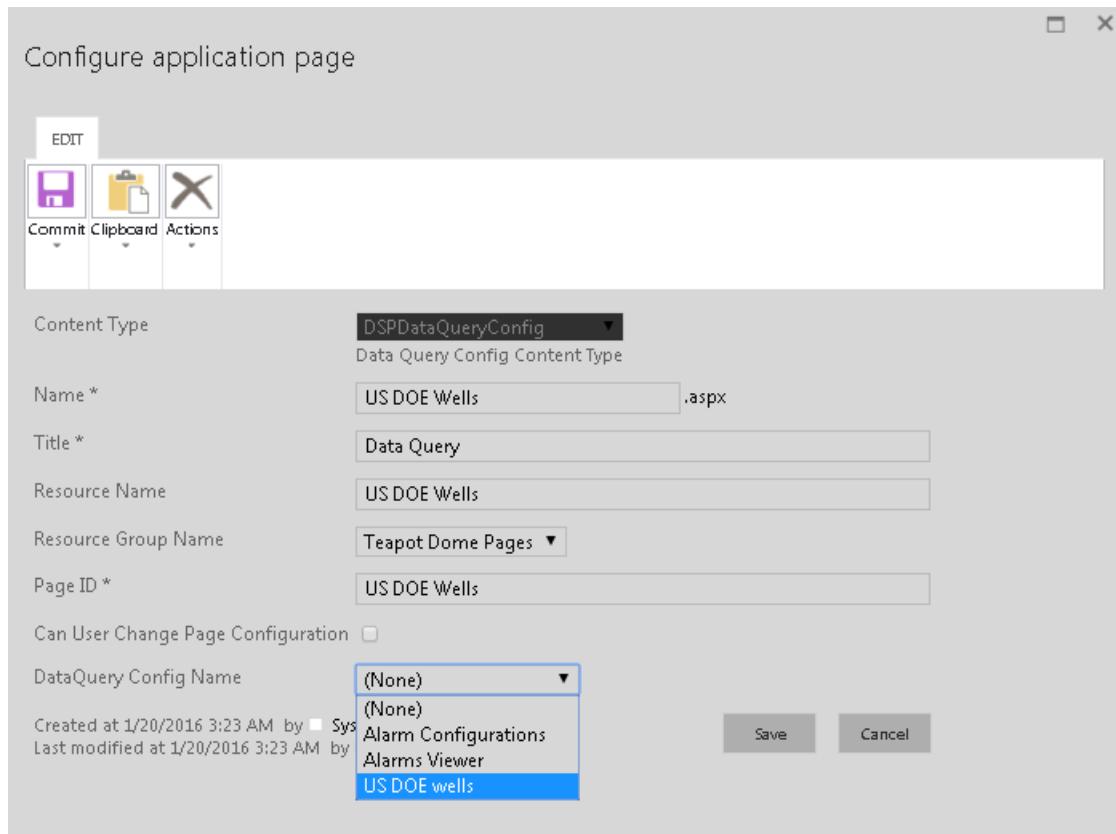


## Configure the Page

1. In IM App Administration page, under **Page Management > Application Pages**, click the newly created page which will open a context menu. In that menu, click **Configure Page** as shown below:



2. Use this pop-up to select the configuration that needs to be loaded for each Web part on the page. Since the Data Query template has just one web part (Data Query web part), select a configuration by selecting one of the query from existing Data Queries. In this exercise, select the **US DOE Wells** query that was created above.



3. Click **Save**.

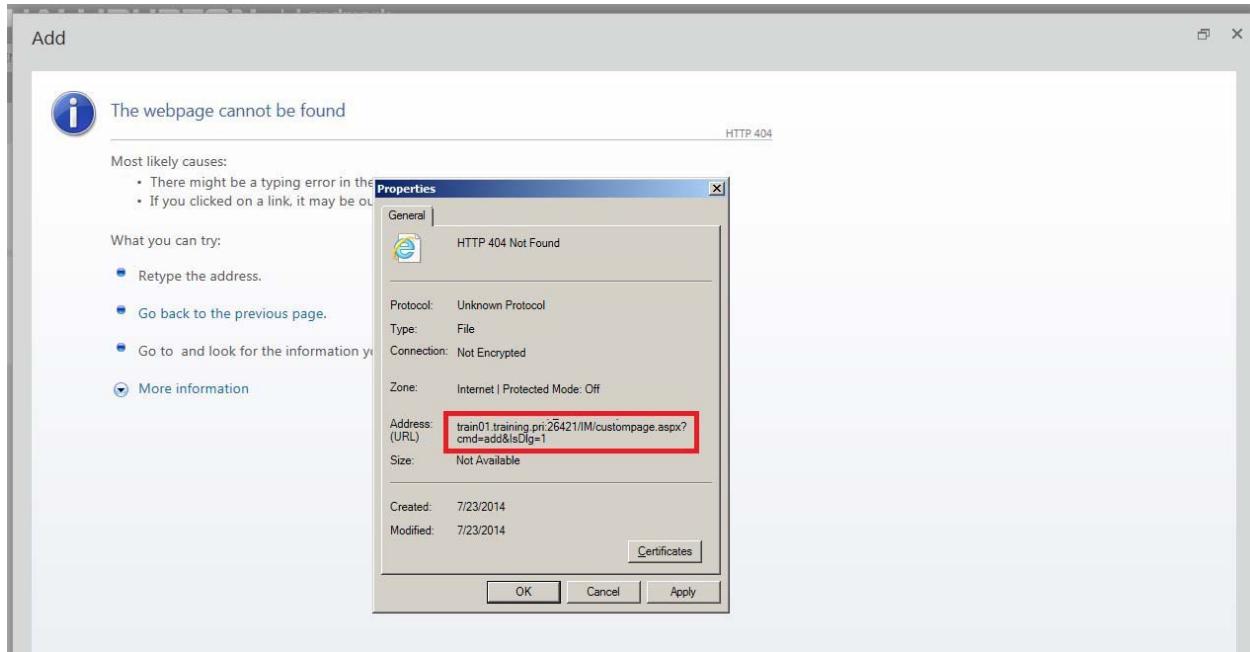
## View the Created Page

1. Click **Wells** menu group and click the **US DOE Wells** link which will show the page as below:

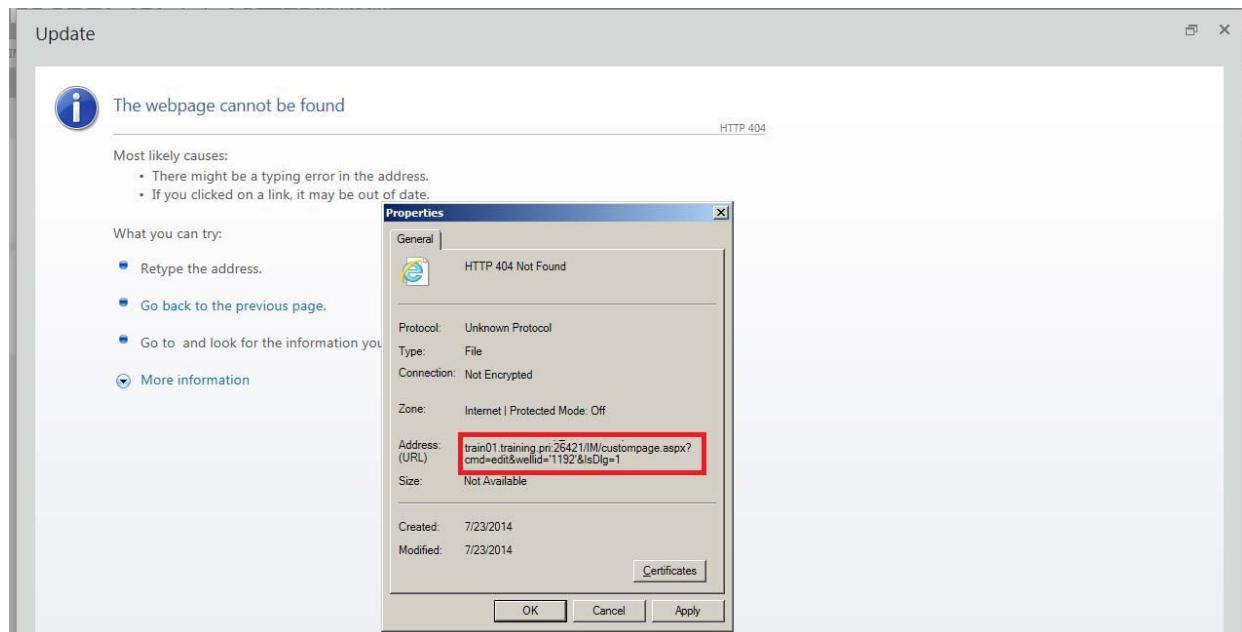
	common_well_name	current_status	elevation	latitude	longitude	total_depth	wellid
	DR	5176	43.30732442855606	-106.20568801539493	null	1655	
	PR	5371	43.247564454746566	-106.17930433933242	4955	465	
	1-10	PA	5148	43.2821440798982	-106.19219138388426	260	1428
	1-S-10	PA	5171	43.28423946500797	-106.19170006137088	456	1159
	1-TP-3	PA	5226	43.292418561462014	-106.20707710929915	5662	350
	1-TP-33	PA	5160	43.3068415004813	-106.21616721155871	5549	384
	11-1-PWW-15	PA	5239	43.270009560736355	-106.20920024445257	200	960
	11-1-SX-2	PR	5094	43.29896652796383	-106.19127015728981	682	1543
	11-10	PA	5194	43.276644725179445	-106.19834866588886	230	1424
	11-61-SX-11	SI	5143	43.28482459739613	-106.18927435341699	2140	1192
	11-AX-11	DR	5160	43.28417259598487	-106.1912131064353	5813	985
	11-AX-33	PA	5133	43.3124693459698	-106.22962037452463	3130	526
	11-AX-34	PR	5099	43.31314559683123	-106.20975013736907	3240	1092
	11-DX-26	PR	5321	43.24194658557951	-106.18901163102096	5110	1062

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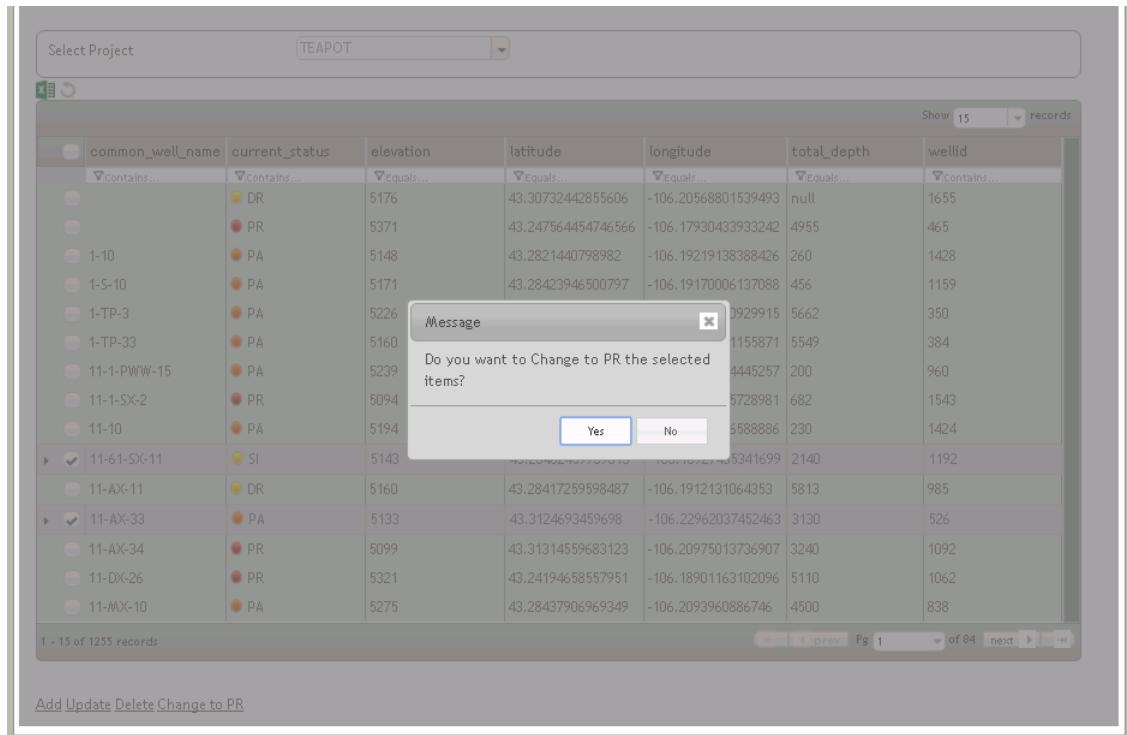
2. Clicking **Add** will open the page as a pop-up with command as **Add**, but since the custom page was not developed, it will throw a Page not found error.



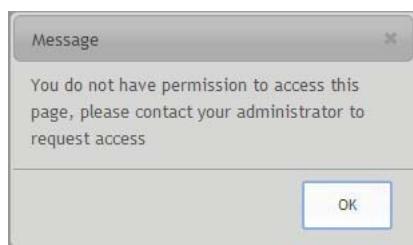
3. Select a row and clicking **Update** or **Delete** will open up the same configured page as a pop-up with command as edit/delete and will also pass the unique identifier of that row for the page to process that command.



4. Selecting one or more rows and click the action **Change to PR** will get a confirmation and then call the configured service and pass the selected rows entire data for the service to process.



5. Now try to access the same page logged in as a user who does not have permission on the **Teapot Dome Pages** group. For example, use **training\ftotti - Landmark1** to login to the Portal and try to access the same page which will show an error as shown below:



## Data Catalogue Plugin

### Overview

- A **Data Catalogue** is an abstract representation of a data entity defined in a model within the Data Server. For example, there can be a **Well Data Catalogue** representing a **well\_header** entity in the Data Server.
- Administrators can:
  - configure what entities to publish from the Data Server
  - specify access permissions on a Data Catalogue to an individual user or group
  - set the display settings for each Data Catalogue in the web part, by specifying the columns to show and their order
- Data Catalogue web part is the user interface to display Data Catalogues that have been configured for the end user to access.
- Users can search for data using **Basic** and **Advanced** query criteria and see results in a tabular format.
- The web part also allows:
  - data to be sorted
  - an option to add to Shopping Cart
  - an option to launch applications in the context of data
- It has a page template called **Data Catalogue** for the Admin/End users to access Data Catalogues.

## Walkthrough

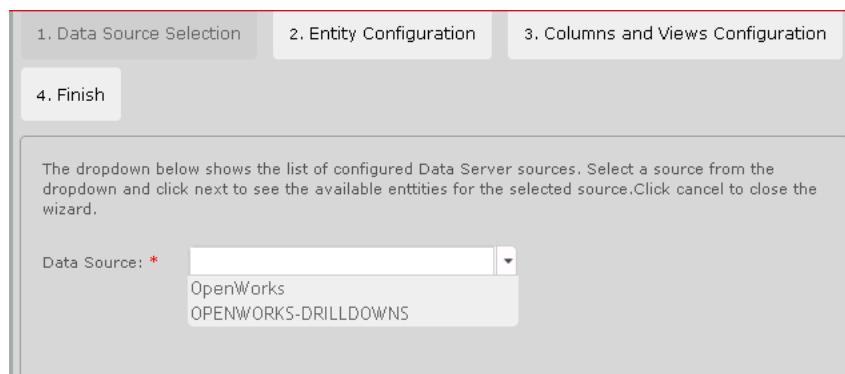
### **Creating Data Catalogue**

Create Data Catalogues using a tool that is launched from the Web Part. This tool is only visible to users with **Administration Activities** privileges.

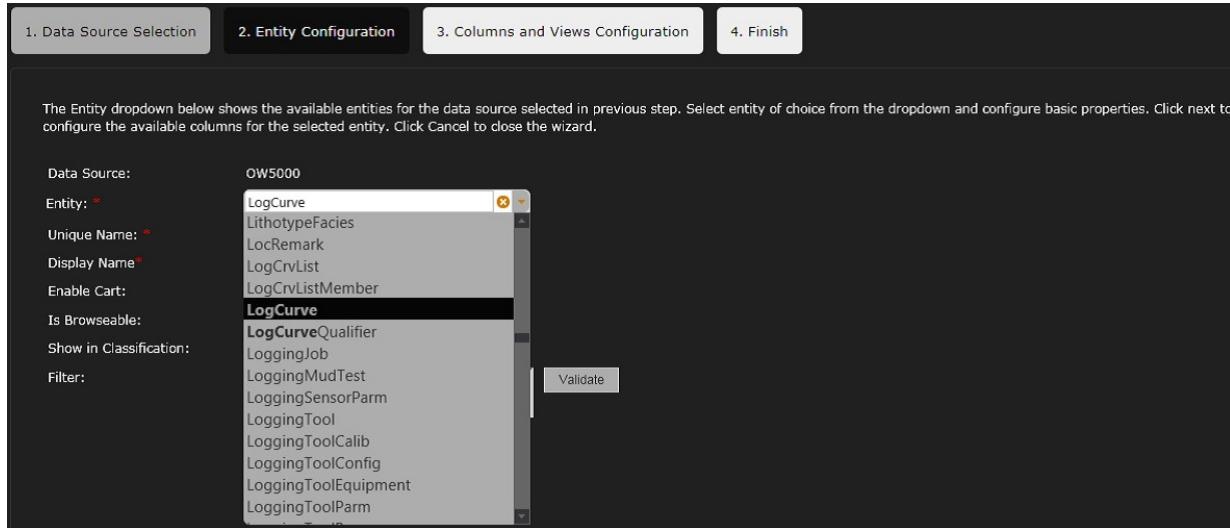
1. Log in as the application administrator and navigate to the page that has the Data Catalogue web part.
2. Click the **Create Data Catalogue** tool icon to launch the **Create Data Catalogue** tool.



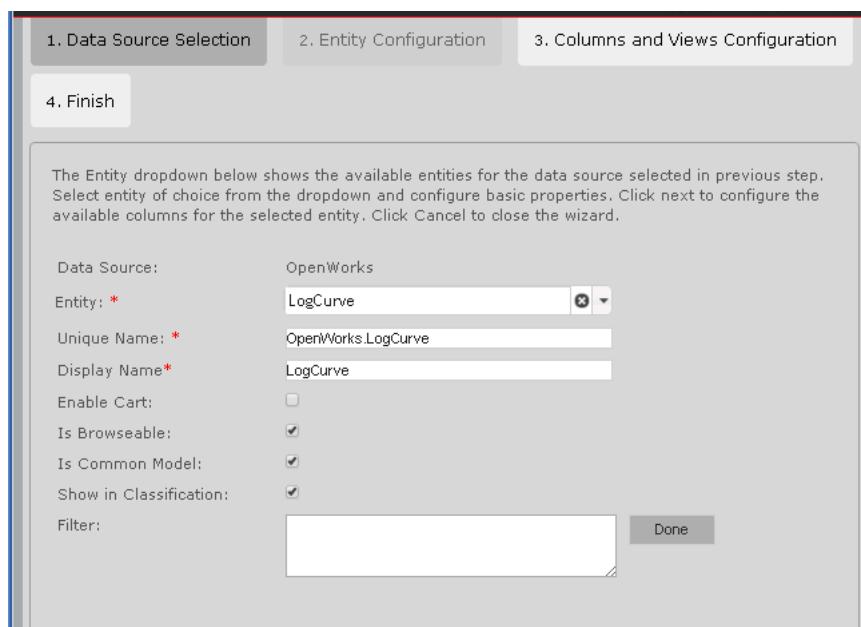
3. Select a source from the drop-down list. For example, OW5000. Click **Next**.



4. Select the entity from the available entities for the selected data source.



5. For the selected entity, specify a Unique Name and Display Name. By default, the Display Name is same as the selected entity and the Unique Name is <SourceName>.<EntityName>.



- Select/Clear the **Enable Cart** option to show or hide the **Add to cart** and **Remove from cart** menu buttons. By default, this option is clear.
- Select/Clear the **Is Browseable** option to make Data Catalogue browseable by default when a Data Catalogue is clicked from the tree view. By default, this option is selected.

- Select/Clear the **Show in Classification** check box to show or hide Data Catalogue from the classification tree view. By default, this option is selected.
- Specify Filter criteria in OData format and click **Validate** to verify there are no errors. The screenshot below shows an example of a filter that specifies the constraint **wellid equals 1008**.



The screenshot below shows a filter with a dynamic keyword.



See the Filter Criteria and Dynamic Keywords section of the DecisionSpace® Integration Server Web Framework System Administration Guide Version 5000.10.2.2 for more details.

## 6. Click **Next** to configure the **View** and **Column** settings.

1. Data Source Selection	2. Entity Configuration	3. Columns and Views Configuration	4. Finish																																																																											
<p>The table below shows the available columns for the selected entity. Configure display name and views for the columns. Click Finish to create the Data Catalogue or click Cancel to close the wizard.</p> <table border="1"> <thead> <tr> <th rowspan="2">Column Name</th> <th rowspan="2">Display Name</th> <th colspan="5">Views</th> </tr> <tr> <th>grid</th> <th>search</th> <th>basicsearch</th> <th>full</th> <th>cart</th> </tr> </thead> <tbody> <tr><td>access_mode</td><td>access_mode</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>api_code</td><td>api_code</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>base_depth</td><td>base_depth</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>base_depth_dsdunit</td><td>base_depth_dsdunit</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>base_depth_storage</td><td>base_depth_storage</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>block</td><td>block</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>bulk_data_id</td><td>bulk_data_id</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>char_data_ind</td><td>char_data_ind</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>create_date</td><td>create_date</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr> </tbody> </table> <p style="text-align: right;"><b>Previous</b> <b>Create</b> <b>Cancel</b></p>				Column Name	Display Name	Views					grid	search	basicsearch	full	cart	access_mode	access_mode	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	api_code	api_code	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	base_depth	base_depth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	base_depth_dsdunit	base_depth_dsdunit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	base_depth_storage	base_depth_storage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	block	block	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	bulk_data_id	bulk_data_id	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	char_data_ind	char_data_ind	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	create_date	create_date	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Column Name	Display Name	Views																																																																												
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char_data_ind	char_data_ind	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																																																								
create_date	create_date	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																																																								

**Note**

The Data Catalogue expects five predefined views with the following names:

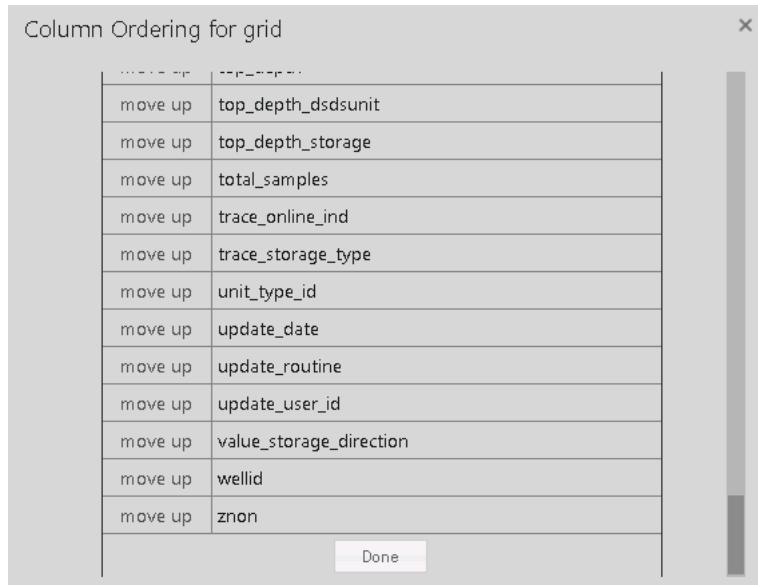
- grid: columns that appear in a grid view
- search: columns that appear in **Advanced search**
- basicsearch: columns that appear in **Basic search**
- full: columns that appear in detail view
- cart: columns that appear in Shopping Cart View

**Note**

To perform search on data catalogues, either **search** or **basicsearch** view should be configured. If these views are not defined, the user will be shown a *No search settings specified* on selection of Data Catalogue message.

- Select/Clear all view columns: By default, all the grid and full view columns are selected. Select/Clear all on any of view by selecting/clearing check box appearing in header of each view column.

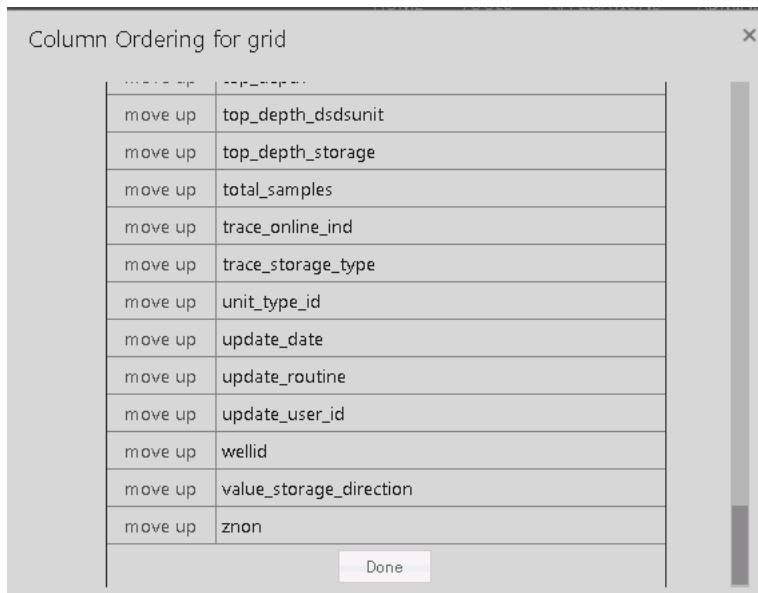
- Ordering view columns: By default, the selected columns are numbered from 0... so on. The ordering of columns for a view can be set on a screen that launches when a header is clicked in a view column. For example, click **grid** to customize the order of grid view columns as shown below:



The screenshot shows a modal dialog titled "Column Ordering for grid". It contains a table with two columns: "move up" and "column name". The "move up" column has a "Done" button at the bottom. The "column name" column lists various configuration options: top\_depth\_dsdunit, top\_depth\_storage, total\_samples, trace\_online\_ind, trace\_storage\_type, unit\_type\_id, update\_date, update\_routine, update\_user\_id, value\_storage\_direction, wellid, and znon.

move up	column name
move up	top_depth_dsdunit
move up	top_depth_storage
move up	total_samples
move up	trace_online_ind
move up	trace_storage_type
move up	unit_type_id
move up	update_date
move up	update_routine
move up	update_user_id
move up	value_storage_direction
move up	wellid
move up	znon

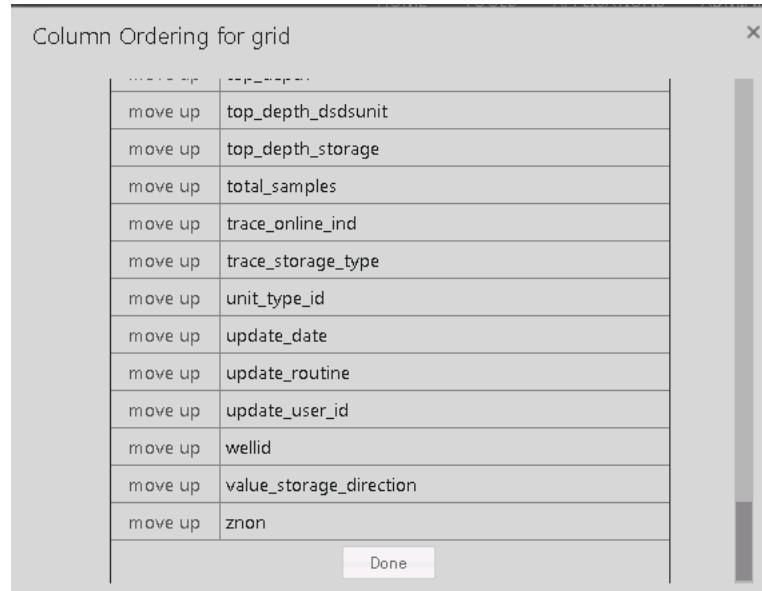
- Click **move up** to change order of columns. For example, clicking **move up** against **base\_depth** moves it before **api\_code** as shown below:



The screenshot shows the same "Column Ordering for grid" dialog as the previous one, but with a visible change: the "base\_depth" entry has been moved up to the second position in the list, positioned above "api\_code". The rest of the columns remain in their original order: top\_depth\_dsdunit, top\_depth\_storage, total\_samples, trace\_online\_ind, trace\_storage\_type, unit\_type\_id, update\_date, update\_routine, update\_user\_id, value\_storage\_direction, wellid, and znon.

move up	column name
move up	top_depth_dsdunit
move up	base_depth
move up	total_samples
move up	trace_online_ind
move up	trace_storage_type
move up	unit_type_id
move up	update_date
move up	update_routine
move up	update_user_id
move up	value_storage_direction
move up	wellid
move up	znon

- Click **Done** to close the ordering screen and set the new order of view columns.

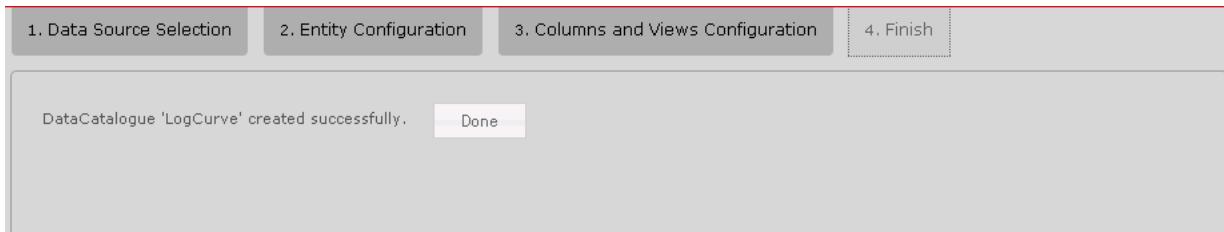


The screen below shows the columns with their new order number.

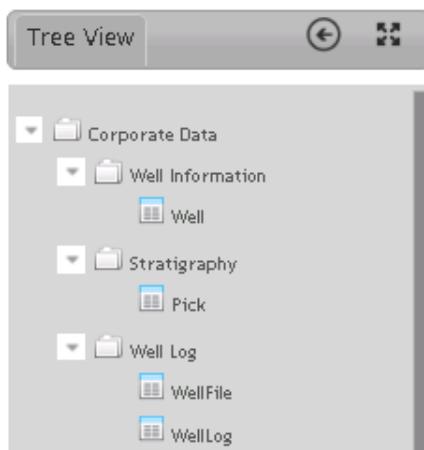
Column Name	Display Name	Views				
		grid	search	basicsearch	full	cart
access_mode	access_mode	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
api_code	api_code	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
base_depth	base_depth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
base_depth_dsdunit	base_depth_dsdunit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
base_depth_storage	base_depth_storage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
block	block	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- Specify the display names for each column. Select the views that these columns should appear in.

8. Click **Create** to create the Data Catalogue and wizard will show the Finish step. Click **Cancel** to close the wizard without creating the Data Catalogue. If there are no errors, a confirmation message will display at the top.



9. Click **Done** to close the wizard and refresh the web part and show the newly created DataCatalogue in the tree view.



### ***Changing View Settings***

This section explains how to modify the **View** settings of a Data Catalogue.

1. Log in to the Web Framework using the Web Framework owner account (system account).
2. Navigate to the **DSPDataCatalogue\_VIEWS** list at the site collection level. For example:  
[http://myhost:9000/Lists/DSPDataCatalogue\\_VIEWS/AllItems.aspx](http://myhost:9000/Lists/DSPDataCatalogue_VIEWS/AllItems.aspx)
3. Select the row with the view to be modified and click **Edit Item** to display an edit item form.

4. Specify a new **View** setting by modifying the **Columns** field. For example, col1, col2, etc.

**Note**

The Column name must match the Entity Column name in the Data Server.

5. Save the changes.

Catalogue Name	View	Columns
CM.TapeFile	grid2	native_uid,project_name,field_name,well_name,current_operator,tape_name,file_id,top_depth,bottom_depth
CM.TapeFile	grid	native_uid,tape_name,file_id,top_depth,bottom_depth,depth_units,name,creator,well_api
CM.TapeFile	full2	native_uid,project_name,field_name,well_name,current_operator,tape_name,file_id,top_depth,bottom_depth
CM.TapeFile	full	native_uid,tape_name,file_id,top_depth,bottom_depth,depth_units,name,creator,well_api,operator
CM.TapeFile	search2	well_name,tape_name,top_depth
CM.TapeFile	search	tape_name,top_depth,well_api
CM.TapeFile	basicsearch	tape_name
CM.DirectionalSurvey	grid	native_uid,wellbore_uwi,survey_name,survey_calc_method,survey_date,survey_tool,md_unit,npts,measured_depth
CM.DirectionalSurvey	search	wellbore_uwi,company,data_source,npts,survey_calc_method,survey_method,survey_name,survey_tool
CM.DirectionalSurvey	basicsearch	wellbore_uwi
CM.DirectionalSurvey	full	native_uid,wellbore_uwi,azimuth_unit,company,compute_xyz_ind,convergence_angle,convergence_angle_units
CM.DirectionalSurvey	cart	wellbore_uwi,survey_name,survey_calc_method,survey_date,survey_tool,md_unit,npts,measured_depth_unit
CM.Project	grid	project_name,min_x,max_y,max_x,min_y,project_leader,accounting_code,project_type
CM.Project	search	project_name,min_x,max_y,max_x,min_y,project_leader,accounting_code,project_type

**Note**

A maximum of 50 columns can be configured for full view and 20 columns for grid view.

### Set Permissions on Data Catalogue

Permissions can be set on a Data Catalogue so that only authorized users can access them. To do this, create one or more Resource Groups for the Data Catalogue resource.

Resource Groups for Data Catalogue can be created from the application administration screen. For more details on Resource Groups and authorization refer the Resource Permissions and Authorization section of the documentation. By default, the **Data Catalogues Everyone**

**Access** group is created. The image below shows the Resource Groups for Data Catalogues.

The screenshot shows a web-based application interface for managing resource groups. At the top, there is a navigation bar with tabs: Security, Galleries, Page Management, Settings, and Webpart Configuration. Below this is another set of tabs: User Groups, Authorization, Activities, Administration Page, Application Launching, Application Page, DataCatalogue (which is selected and highlighted in blue), Data Query Configuration, and Sample Provider Configuration. A search bar labeled 'Search Data Sources' is present. The main content area displays a table with two rows. The first row has columns for 'Group Name' and 'Description'. The second row contains a checkbox labeled 'Data Catalogues Everyone Access' and a detailed description: 'Allows access on Data Catalogues to all user with in DSPortal Appl...'. At the bottom of this section are buttons for 'Assign Permission', 'View Permissions', 'View DataCatalogues', 'Add DataCatalogue Group', and 'Edit DataCatalogue Group'.

### Add Data Catalogue(s) To a Resource Group

To add Data Catalogues to a resource group, do the following:

1. Login as the application administrator and navigate to the page that has the DataCatalogue web part.
2. Click the **Manage Resource Group Assignments** icon. The Data Catalogue Sharing screen displays.

The screenshot shows a 'Manage Resource Group Assignments' screen. At the top, there is a toolbar with icons for back, forward, and search. Below the toolbar is a header with the title 'Manage Resource Group Assignments'. The main content area shows a message '0 - 0 of 0 records'. At the bottom, there is a navigation bar with buttons for 'prev', 'next', and a dropdown menu for 'Show 10 records'.

3. Select a resource group from the **Select Resource Group** drop-down.

4. Select the Data Catalogue(s) that should be given access to the selected resource group.

Manage Resource Group Assignments

Select Resource Group : Data Catalogues Everyone Access

Add To Group Remove From Group Done

Not Added DataCatalogues Added DataCatalogues

UniqueName	DisplayName	Name
CM.TapeFile	TapeFile	TapeFile
CM.DirectionalSurvey	DirectionalSurvey	DirectionalSurvey
CM.Project	Project	Project
CM.LogCurve	LogCurve	LogCurve
CM.Wellbore	Wellbore	Wellbore
CM.WellList	WellList	WellList
CM.Film	Film	Film
CM.PlatformInfo	PlatformInfo	PlatformInfo
CM.PositionLog	Position Log	PositionLog
CM.IrregularGeometry	IrregularGeometry	IrregularGeometry

Show 10 records

1 - 10 of 33 records

5. Click **Add To Group** to add the DataCatalogue to this Resource Group.

### Remove Data Catalogue(s) From a Resource Group

To remove Data Catalogues from a resource group, do the following:

1. On the Manage Resource Group Assignments screen, select the resource group.

2. Select the **Added Data Catalogues** option.

The grid will display all the Data Catalogues which have been added to the selected resource group.

The screenshot shows a dialog box titled "Manage Resource Group Assignments". At the top, there is a dropdown menu labeled "Select Resource Group : Data Catalogues Everyone Access" and three buttons: "Add To Group", "Remove From Group", and "Done". Below the buttons, there are two radio button options: "Not Added DataCatalogues" (unchecked) and "Added DataCatalogues" (checked). A grid table displays the following data:

UniqueName	DisplayName	Name
CM.WellPlanProject	WellPlanProject	WellPlanProject
CM.Pick	Pick	Pick
CM.WellLog	WellLog	WellLog
CM.WellFile	WellFile	WellFile
CM.Well	Well	Well
OpenWorks.Wells	Well_OW	Well
OPENWORKS-DRILLDOWNS.Well	Wells	Well
OpenWorks.Welldd	Wellww	Well
OpenWorks.LogCurve	LogCurve	LogCurve

At the bottom of the grid, it says "1 - 9 of 9 records" and has navigation buttons for "prev", "next", and "Done".

3. Select the Data Catalogues that should be removed from the resource group and click **Remove From Group**.

4. Click **Done**.

### **Create/Manage Relationships**

Relations can be defined between two Data Catalogues to support the following workflows:

- Related items
- Master-Detail relationships

The section below explains the steps to create relations for the above workflows.

### **Create a Relationship for Related Items Workflow**

1. Log in as the application administrator and navigate to the page that has the Data Catalogue web part.

2. Click the **Manage Data Catalogues** icon.



3. Select a **Data Catalogue** from the drop-down to manage it.

**Manage DataCatalogues**

Data Catalogue: **Pick**

**Relations**

[+ Add New Relation](#)

Action	Relation Name	Relation Type	Source	Target	Source Columns	Target Columns
No records to display.						

If relationships exist for the selected Data Catalogue these will appear in the grid under the **Relations** tab.

4. Click **Add New Relation** to add a new relation for the selected Data Catalogue to display the Add New Relation screen.

**Add New Relation for Pick**

Relation Name *	Show Wells
Relation Type *	1-Many
Source *	Pick
Target *	Well

**Relation Joins**

[Add New Join](#)

Actions	Source Column	Target Column
remove	wellbore_uwi	well_uwi

**Create**    **Cancel**

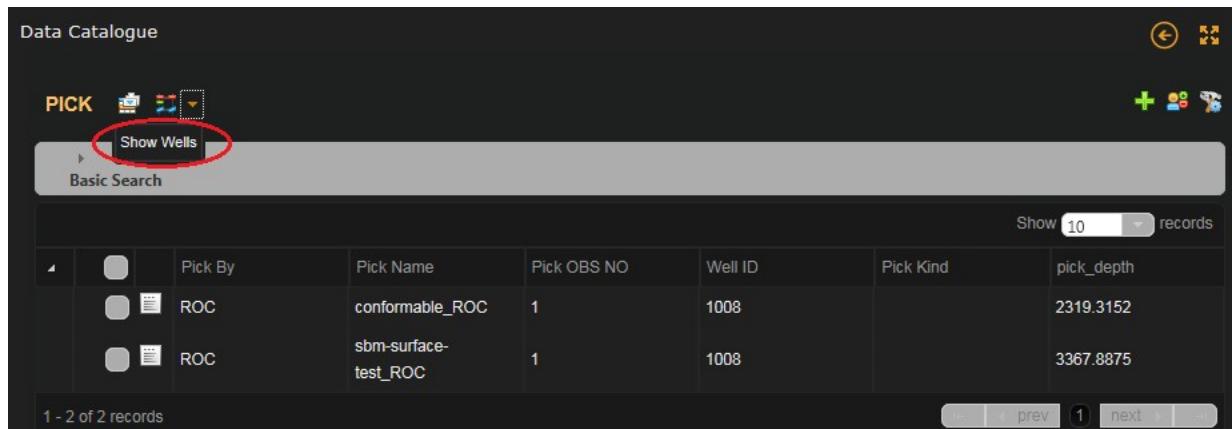
5. Specify **Relation Name** and select **Relation Type 1-Many** from the drop-down.
6. Select the target Data Catalogues from the drop-down.
7. Click **Add New Join** in the Relation Joins grid.
8. Specify a **Source Column** and a **Target Column**.

9. Click **Add** in the grid row to add a join.

10. Repeat steps 7-9 to add more joins.

11. Click **Create** to add the new relation.

After a 1-Many relationship is created, the web part will display the relationship under the **Related Items** menu for the **Source Data Catalogue**.



The screenshot shows a 'Data Catalogue' interface. At the top, there's a toolbar with various icons. One icon, labeled 'Show Wells', is circled in red. Below the toolbar is a search bar labeled 'Basic Search'. The main area is a grid table with the following columns: Pick By, Pick Name, Pick OBS NO, Well ID, Pick Kind, and pick\_depth. There are two records listed:

Pick By	Pick Name	Pick OBS NO	Well ID	Pick Kind	pick_depth
ROC	conformable_ROC	1	1008		2319.3152
ROC	sbm-surface-test_ROC	1	1008		3367.8875

At the bottom of the grid, it says '1 - 2 of 2 records'. To the right of the grid, there are navigation buttons for 'prev', 'next', and a page number '1'.

### Create a Relationship for Master-Detail Workflow

1. Login as the application administrator and navigate to the page that has the Data Catalogue web part.
2. Click **Manage Data Catalogues** (on screen shown in step 2 of Creating a relation for Related Items workflow section).
3. Select a Data Catalogue from the drop-down to manage it.

4. Click **Add New Relation** (on the screen shown in step 3 of the Creating a Relation for Related Items Workflow section) to add a new relationship.

The screenshot shows the 'Add New Relation for Well' dialog box. It has two main sections: 'Relation Details' and 'Relation Joins'. In the 'Relation Details' section, the 'Relation Name' is set to 'Related Picks', 'Relation Type' is '1-Many', 'Source' is 'Well', and 'Target' is 'Pick'. In the 'Relation Joins' section, there is a grid with columns 'Actions', 'Source Column', and 'Target Column'. A link 'Add New Join' is visible above the grid, which contains the message 'No records to display.' At the bottom are 'Create' and 'Cancel' buttons.

5. Specify **Relation Name** and select the Relation Type **1-Many (child)** from the drop-down.
6. Select the target Data Catalogues from the drop-down.
7. Click **Add New Join** in the **Relation Joins** grid.
8. Specify a **Source Column** and a **Target Column**.
9. Click **Add** in the grid row to add a join.
10. Repeat steps 7-9 to add more joins.
11. Click **Create** to add a new relation.

After a 1-Many (child) relation is created on a Data Catalogue, the web part will display the child Data Catalogues rows in a hierarchical fashion. Each Child in the relation will be displayed in a separate tab. Clicking the tab will display data for that Data Catalogue. The screenshot below displays the child Data Catalogues **Pick** and **LogCurve** for the parent **Well**.

The screenshot shows a Data Catalogue interface with a 'WELL' selected in the top navigation bar. Below it, there are two tabs: 'Pick' and 'LogCurve'. The 'Pick' tab is currently active, displaying a grid of data for a single well. The columns include Well ID (459), Well Name (NPR-3), Common Well Name (46-S-14), UWI (490251...), Well Operator (U.S. DOE), Well Location ID (459), Country (USA), State (Wyoming), Elevation Type (KB), Well Number (46-S-14), Latitude (43.260...), and Longitude (106.18...). The 'LogCurve' tab shows a smaller grid with three entries: CILD, DPHI, and GR, each with log\_cr\_name, log\_cr\_version, log\_curve\_id, log\_name, log\_run\_no, and wellid.

	Well ID	Well Name	Common Well Name	UWI	Well Operator	Well Location ID	Country	State	Elevation Type	Well Number	Latitude	longitude
-	459	NPR-3	46-S-14	490251...	U.S. DOE	459	USA	Wyoming	KB	46-S-14	43.260...	-106.18...

	log_cr_name	log_cr_version	log_curve_id	log_name	log_run_no	wellid
CILD	1	2787	UNKNOWN	1	459	
DPHI	1	2792	UNKNOWN	1	459	
GR	1	2789	UNKNOWN	1	459	

#### Note

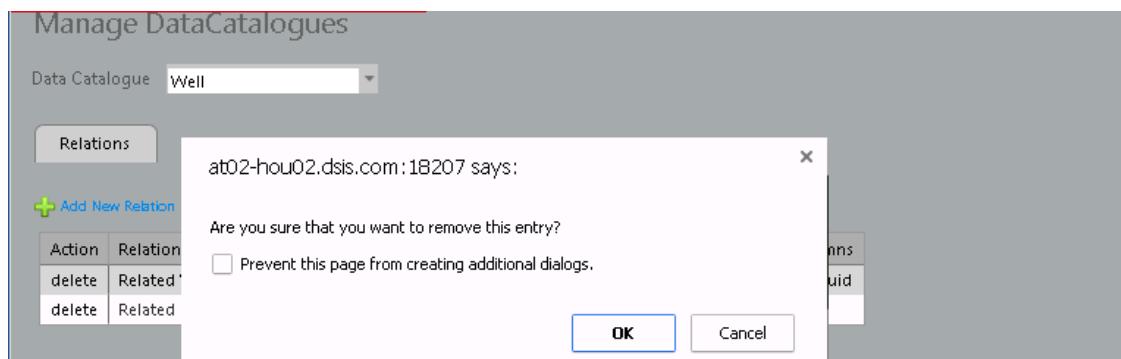
The join column of the parent Data Catalogue must either be part of the primary key columns or be defined in the grid view otherwise the relation will fail with an error.

### Remove Relationship

To remove a relationship of a Data Catalogue, do the following:

1. On the Manage Data Catalogues screen, select a Data Catalogue from the drop-down. Existing relations appear in the grid.

2. Click **Delete** in the grid for a relation to be deleted.



3. Click **OK** to delete the relationship.

## **Classifying Data Catalogs**

A classification hierarchy can be defined specific to an organization, which can then be used to classify each Data Catalogue. The Data Catalogue web part then displays the Data Catalogues in a hierarchical view based on the classifications applied for a given classification hierarchy.

### **Create a Classification Hierarchy**

1. Log in to the Web Framework using the Web Framework owner account (system account).
2. Navigate to the **DataCatalogues\_Classification** settings library at the site collection level. For example:  
[http://myhost:9000/Lists/DSPDataCatalogues\\_classification/AllItems.aspx](http://myhost:9000/Lists/DSPDataCatalogues_classification/AllItems.aspx)
3. Edit the **classificationtype.xml** file to create a classification hierarchy that is best suited.
4. Save the changes.

### **Apply Classifications to Data Catalogues**

1. Log in to the Web Framework using the Web Framework owner account (system account).

2. Navigate to the **DataCatalogues\_Classification** settings library at the site collection level. For example:

[http://myhost:9000/Lists/DSPDataCatalogues\\_classification/AllItems.aspx](http://myhost:9000/Lists/DSPDataCatalogues_classification/AllItems.aspx)

3. Edit the **classificationmapping.xml** and specify the mapping to associate a Data Catalogue with the name **WellHeader** to a classification entry OpenWorks/Drilling type in the following:

```
<items>
...
<item type="datacatalogue" id="WellHeader"
      path="/OpenWorks/Drilling"/>
...
</items>
```

4. Add entries for other Data Catalogues.

**Note**

Any Data Catalogues that do not have a mapping will display under **UnClassified** in the web part.

5. Save the changes.

## Data Catalogue Vs. Data Query

Feature	Data Catalogue	Data Query
Integrated with DSIS Data Server		
Show entity data in a grid	No pre-configuration option 	
Show Related entities data		
Custom security over DSIS Data Server	Based on Data Catalogue 	Based on Query 
Integration with other components	App Launching Shopping Cart Search 	GIS 
Option to write back to Data Server		Extensions to Support Edits 
Page level data rendering		

## GIS

### Overview

#### Pre-requisites

- ArcGIS Server 10.1 (optional).
- Internet Connection to consume base maps.
- Browser: Internet Explorer 9+, Google Chrome (29.0+), Mozilla Firefox (23.0+).

#### Current Status

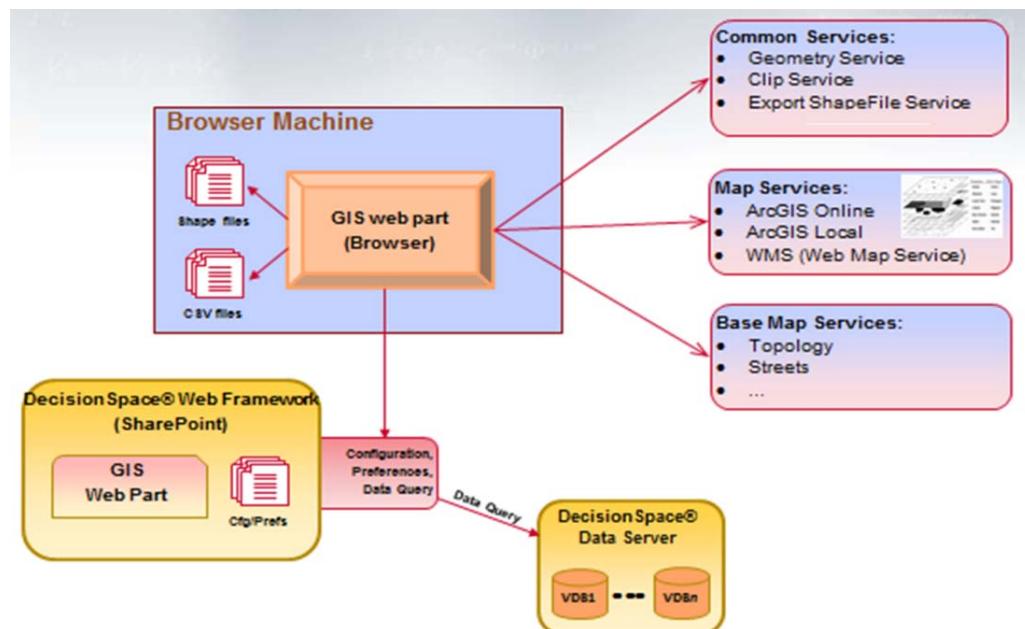
- Provides a geospatial view of data.
- Provides feature-rich map support, using ESRI APIs.
- Many E&P workflows require data analysis using geographical locations and spatial relationships:
  - Geoscientists, Drilling and Production Engineers, Operators

- GIS views provide surface maps that show topology, contours, surface features, locations of wells, equipment and other assets.
- Supports user-level and page-level saved configurations, data query integration and web part communication.

### What's Coming...

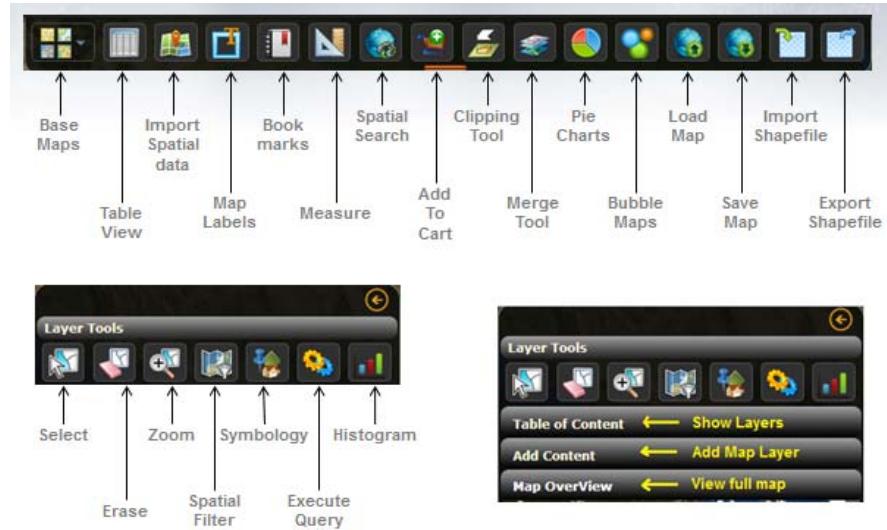
- Offline mode, Heat maps, Clusters, Drawing tools, support for Large Shape files.
- Support for Seismic data from Data Server.
- Full integration Search.

### GIS Webpart Functional Architecture:



## Tools and Functionalities

### GIS Webpart Tools



### User Functionality - Key Takeaways/Capabilities

- GIS reads seismic data from a Map Service (not from Data Server (yet));
  - Next version will support seismic from Data Server
- GIS can read wells and other spatial data from Data Server via Data Query (but not seismic);
  - Use GIS primarily to view and analyze your data;
  - Anything selected on the GIS map will be published;
    - You will need other web parts on that page that subscribe for those messages.
- Currently, there is no way to link any image or data to a seismic line (because it comes from a Map service).
- Save User-specific configuration for each page

## Application User Configuration

- **Available Sources of Features:**

- Data Server Query (Import Spatial Data)
- Map Service
- CSV Files (not preserved in user configuration)
- Shapefiles (not preserved in user configuration)

➤ **What is stored in GIS Web Part User Configuration?**

- A **map** with one or more layers
- User can configure each layer:
  - The source of the features
  - Symbology of the features
- Each map has a Name and a Description

➤ **How to Configure?**

- Via Webpart Configuration
- From the GIS Webpart directly

➤ **Available Sources of Features:**

- Data Server Query (Import Spatial Data)
- Map Service
- CSV Files (not preserved in user configuration)
- Shapefiles (not preserved in user configuration)

---

## **Exercise 3: View Spatial data from DSOS in a map and visualize using Pie chart**

---

### **Purpose of the Exercise**

Show how GIS plugin can be used to view spatial data from DSOS. Also it shows how Pie chart layer can be created in GIS map.

### **Outcome of the Exercise**

There will be a page which shows the Wells from OW in a map with Pie layer showing Elevation & Depth.

### **Exercise Workflows**

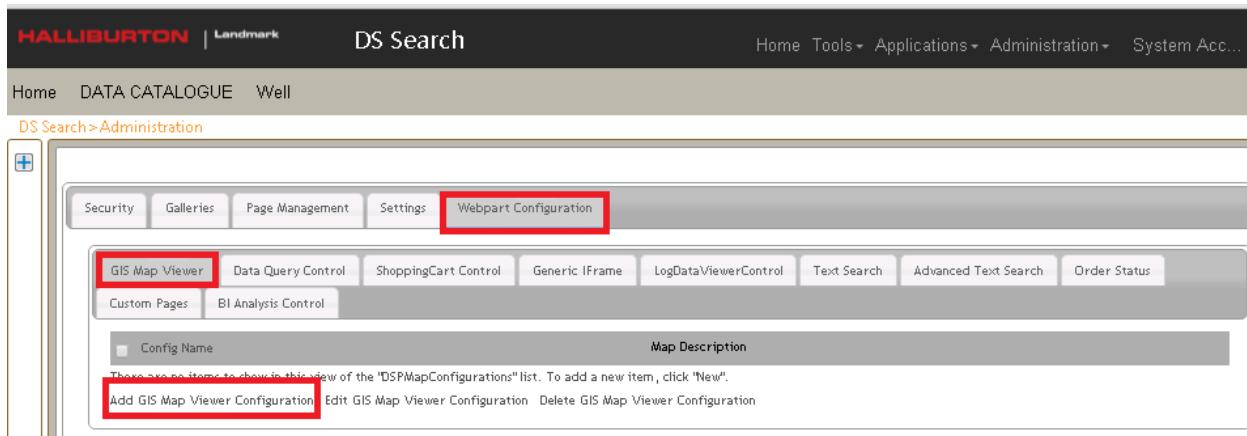
- Pre-req: Data Query to get the Well data is working.
- Create GIS configuration to view Wells.
- Create a Find Data page.
- Configure Find Data page to show GIS configuration that was created.
- Use Pie chart feature to show data.

### **Pre-req - Data Query to get the well data is working**

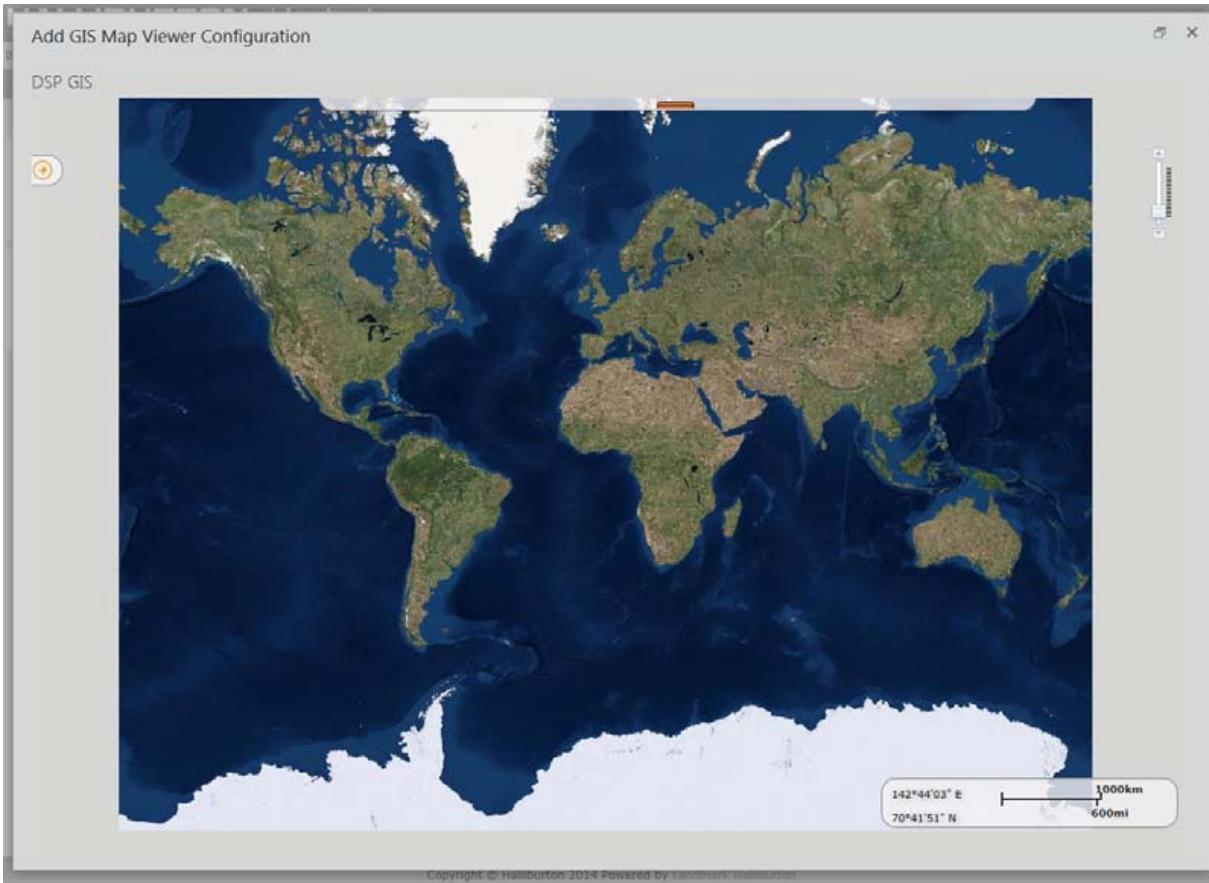
1. Make sure the query that was created in Exercise 3 is working and it should include Latitude and Longitude fields.

## Create GIS configuration to View Wells

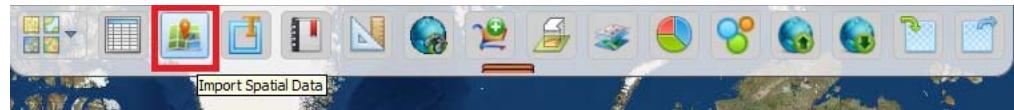
1. In Application administration page, select **Webpart Configuration > GIS Map Viewer > Add GIS Map Viewer Configuration.**



2. A pop-up window displays the GIS webpart as shown below:



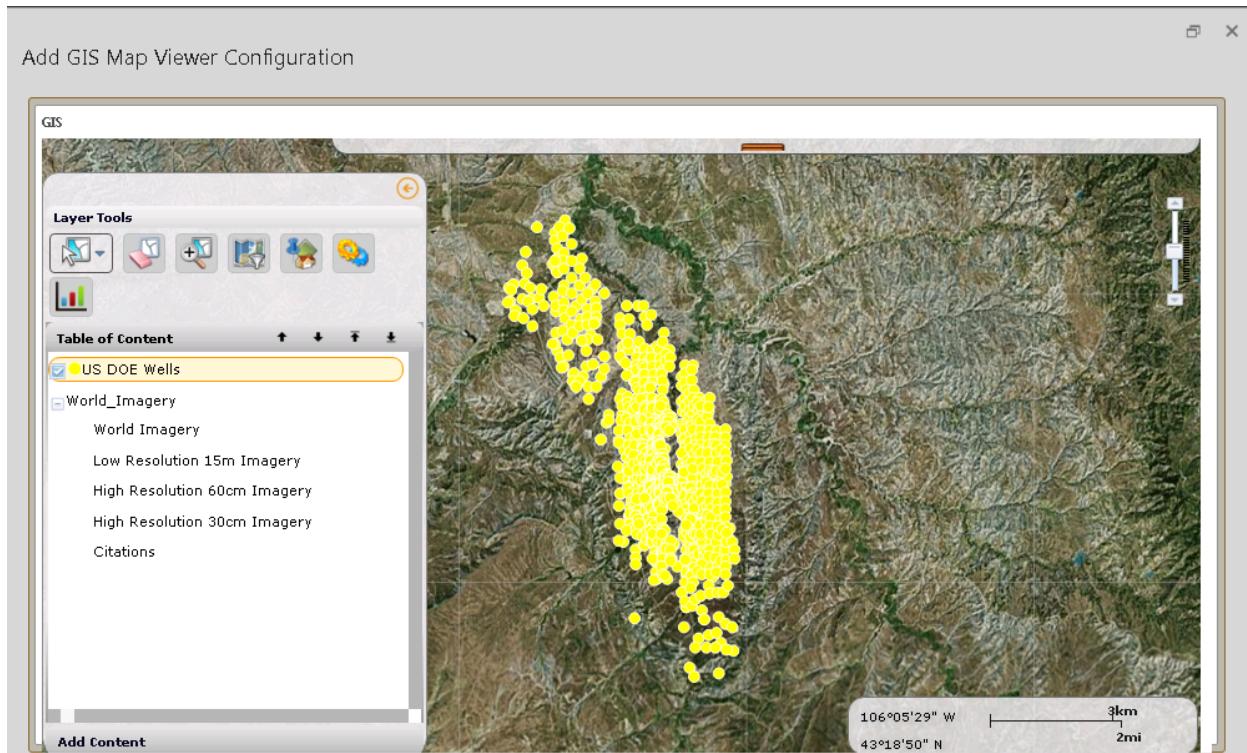
3. Mouse over the GIS Tool bar at the top of the map and click the **Import Spatial Data**.



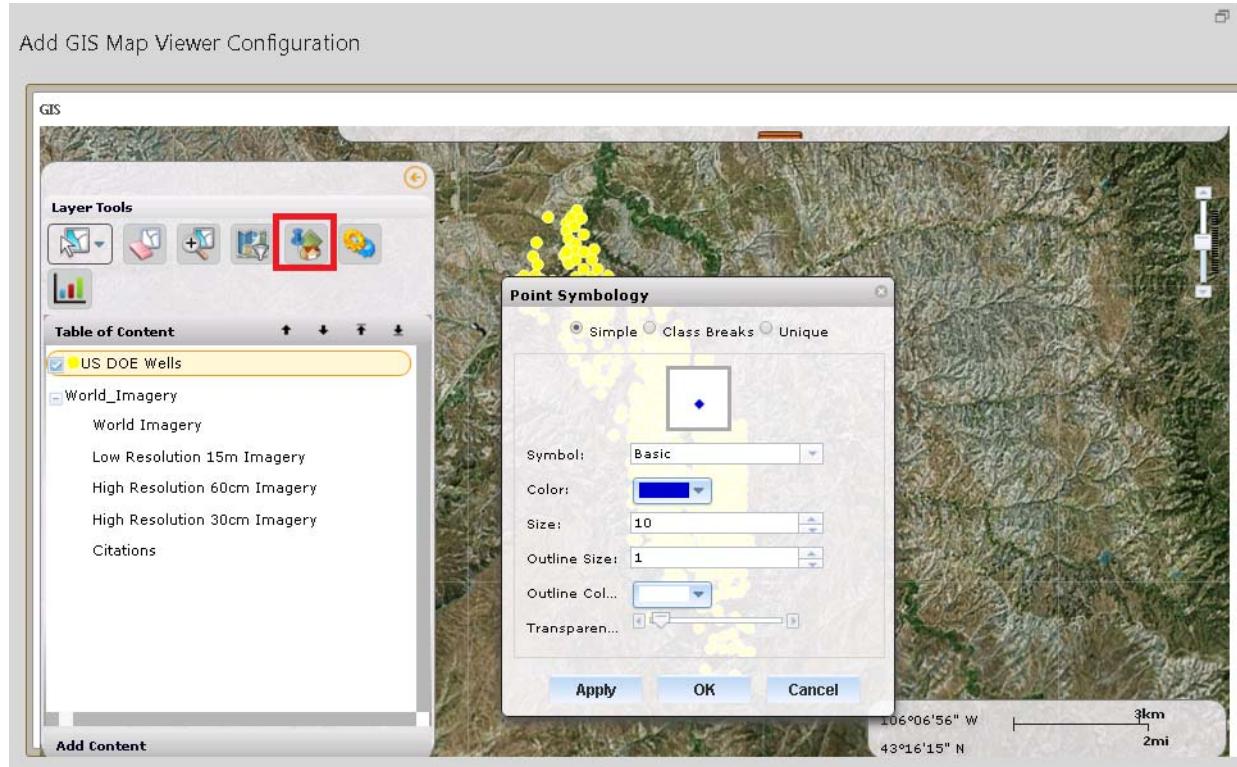
4. Upon selecting the query that was created in exercise 5, it will automatically map the latitude and longitude if the properties exist in the query.
  - Enter a name for the layer
  - Select a color
  - Click **Import**



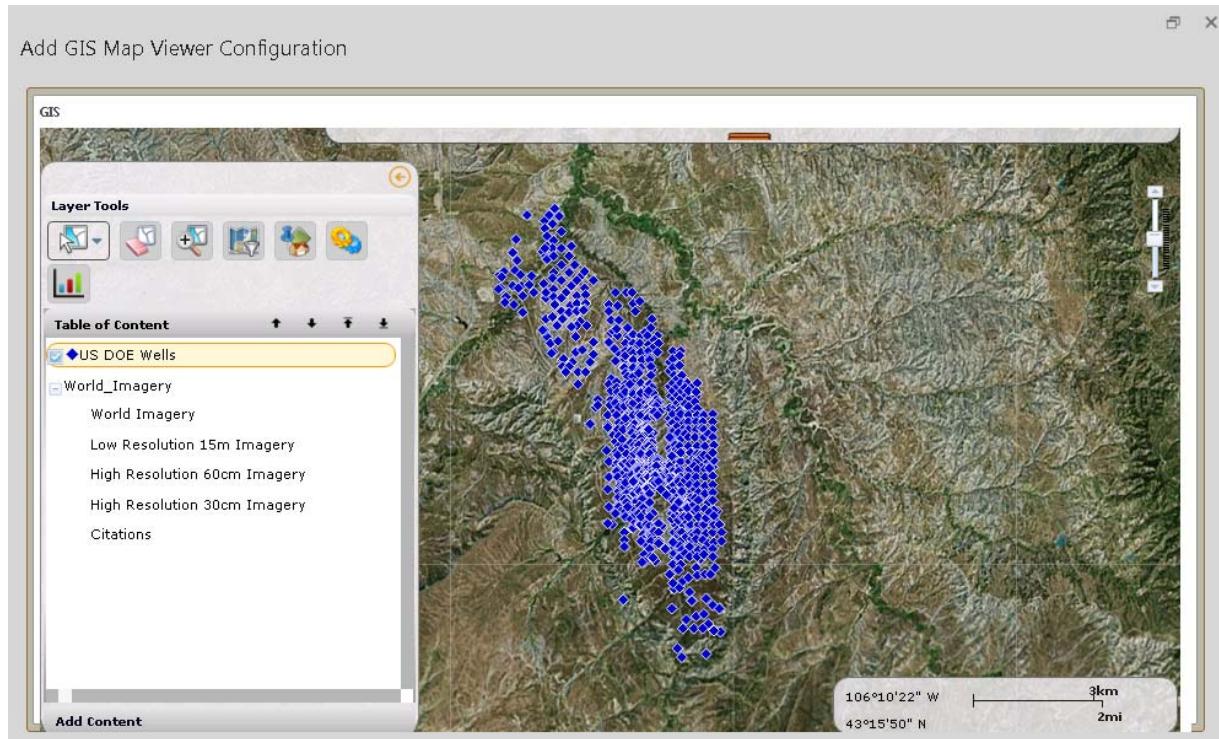
5. After it is imported, the map is automatically zoomed to the location of the data. In the layer tools, a layer is added to the map.



6. In order to change the symbol, select the layer and click **Symbology** to display a pop-up window as shown below:



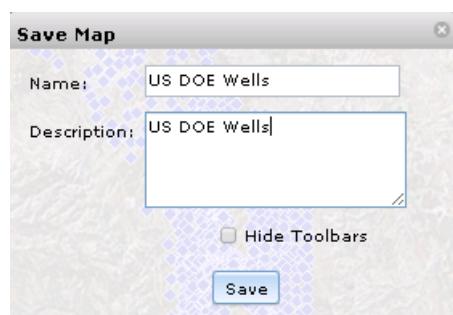
7. Use this pop-up to control the symbol appearance.



8. In order to save this map, click **Save Map** from the GIS tool bar.



9. In the Save Map pop-up, enter name and description for the map and click **Save**.

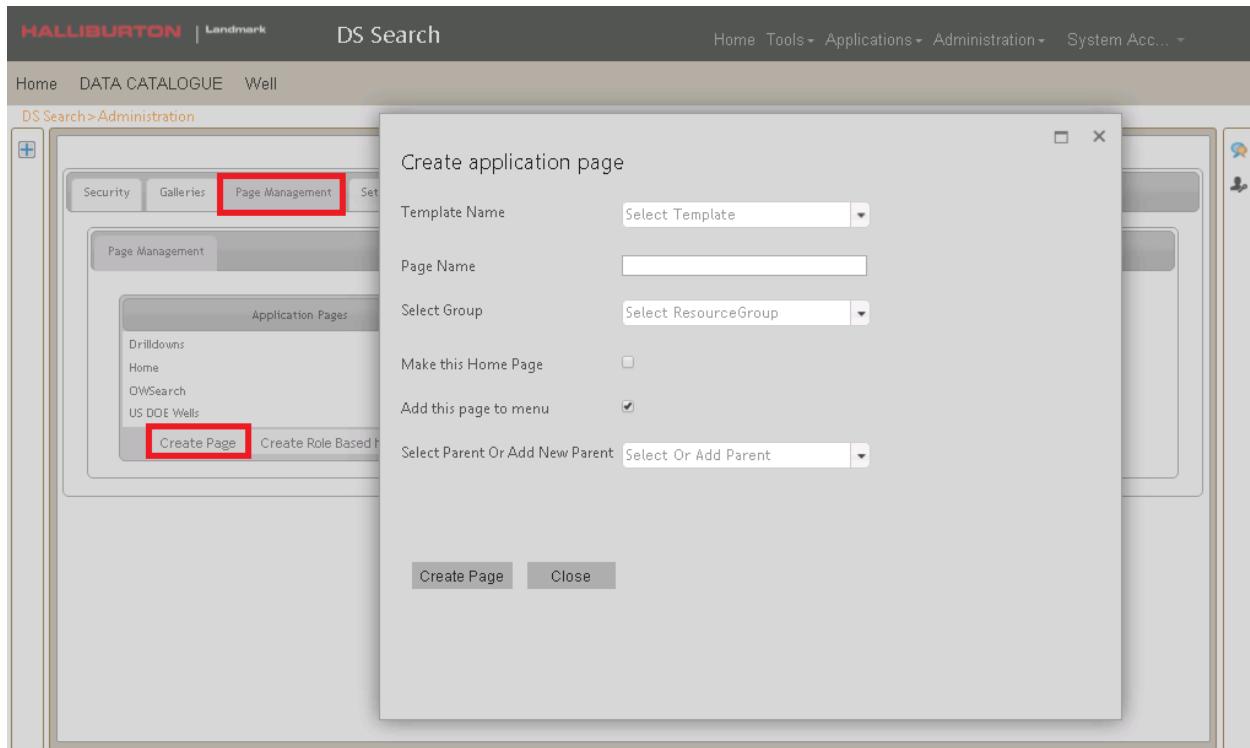


10. After the map is saved, close the pop-up windows to view the newly created configuration.

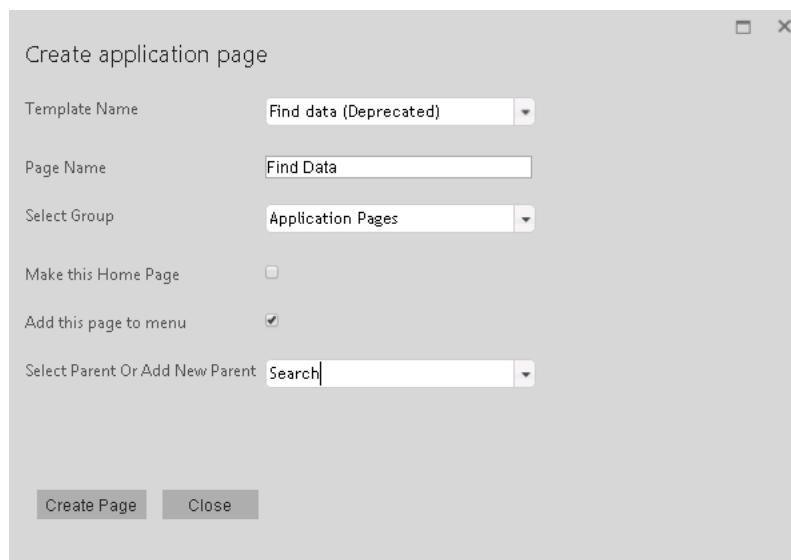
Config Name	Map Description
DefaultMap	Default map
<b>US DOE Wells</b>	US DOE Wells

## Create Find Data Page

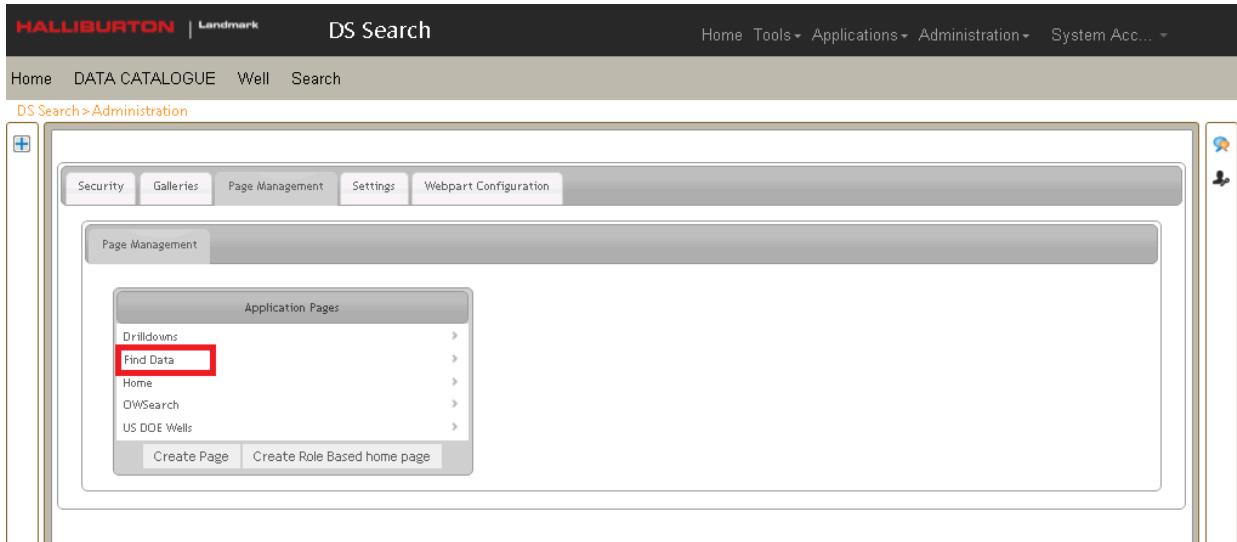
1. In Application administration page, select **Page Management > Create Page**.



2. Select Find Data page template and enter details in other fields and click **Create page**.

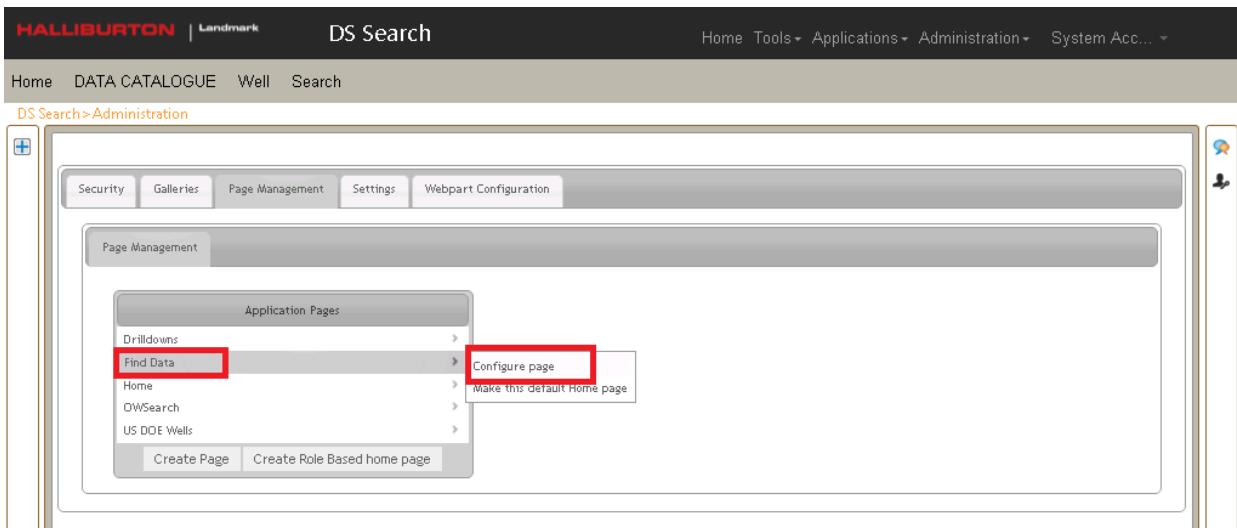


3. After the page is created, close the pop-up and make sure the page is displayed in the **Page Management** tab.

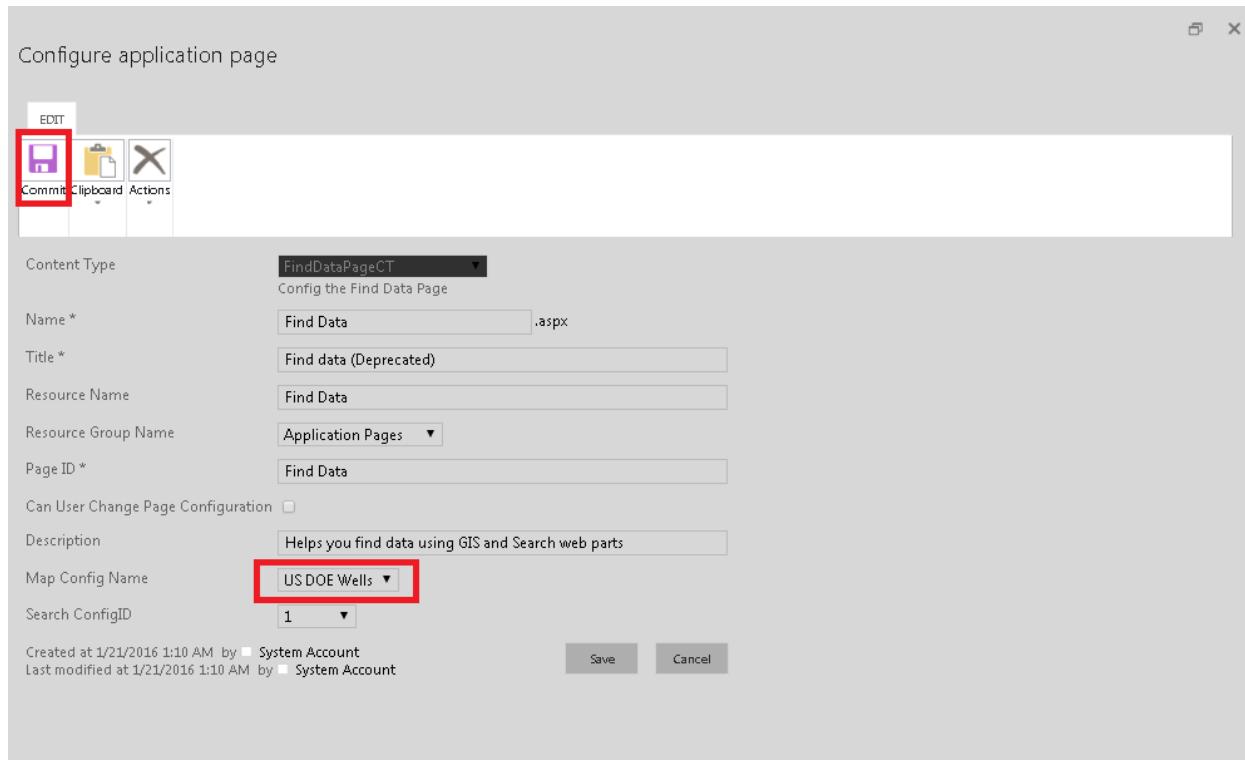


### **Configure Find Data Page to show the GIS Configuration that was Created**

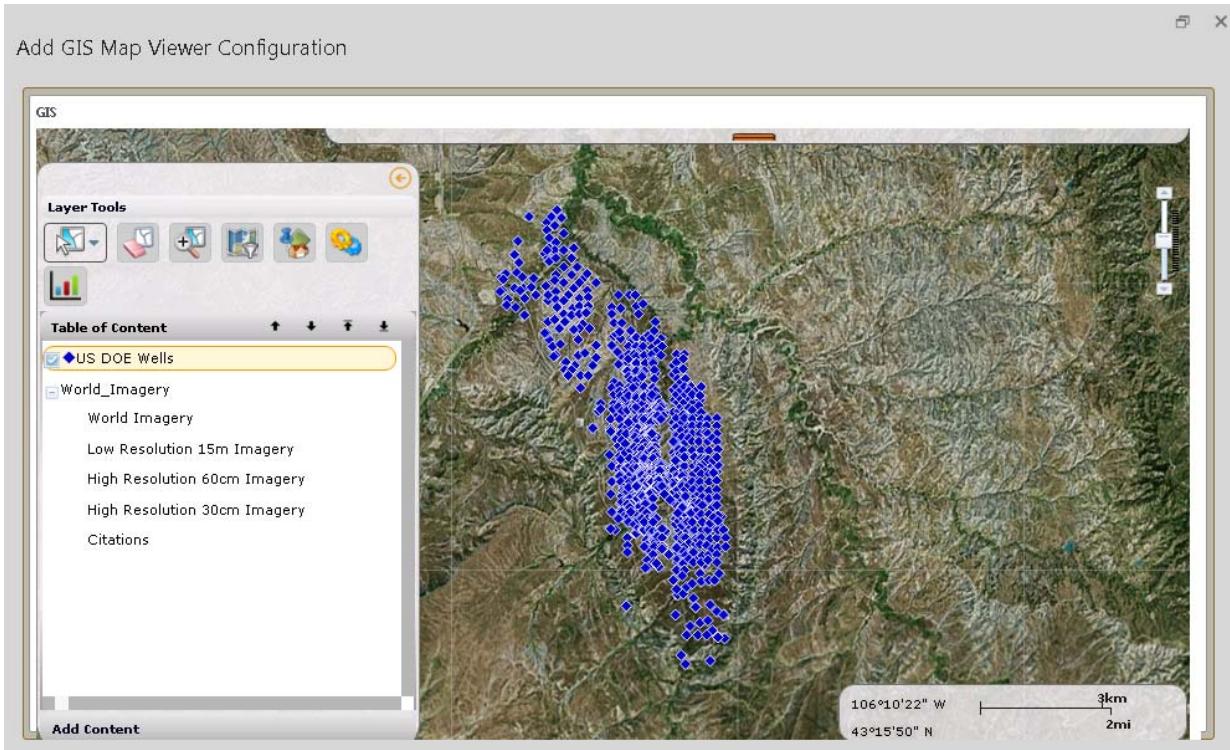
1. In Application administration page, in **Page Management** tab, mouse over the Find Data page and select **Configure Page**.



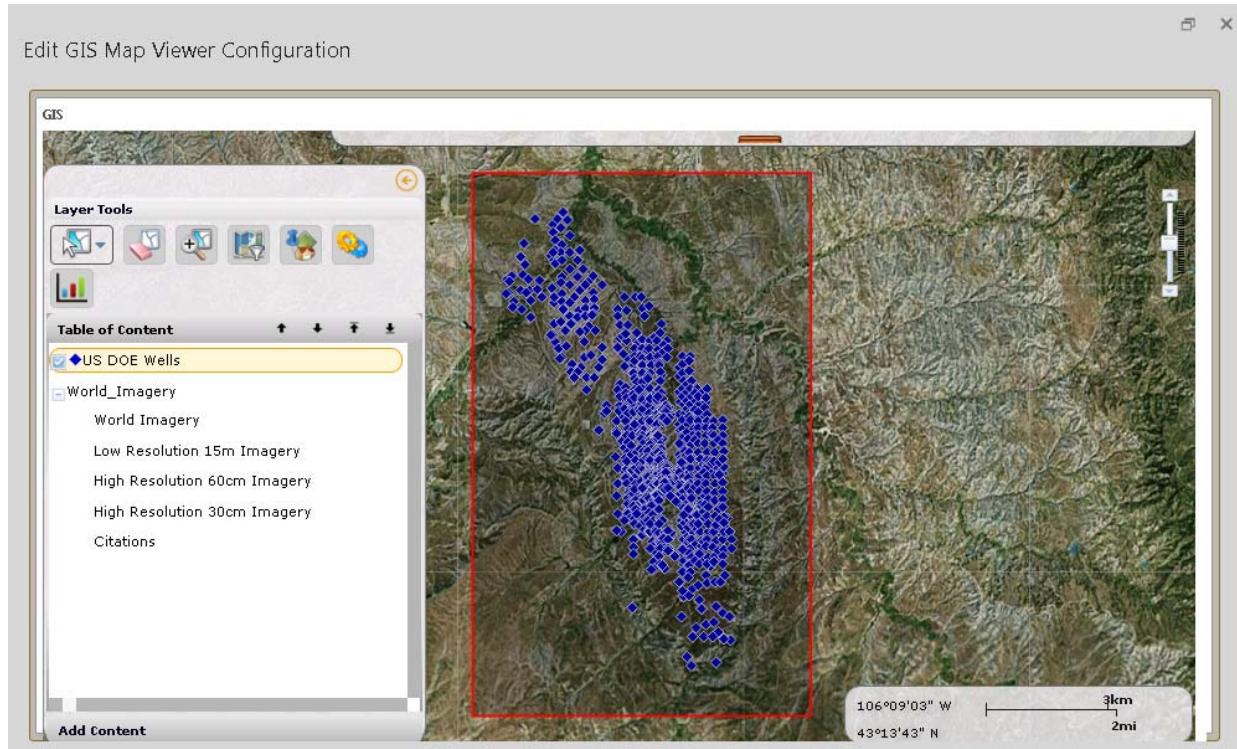
2. In the Configure application page pop-up, for the **Map Config Name** field, select the configuration that was created in this exercise and click **Commit**.



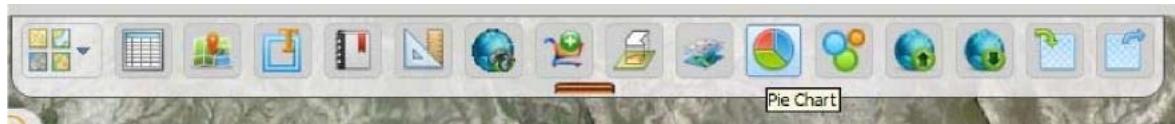
3. Navigate to the page using the application menu to see the OW wells by default on the page as below:

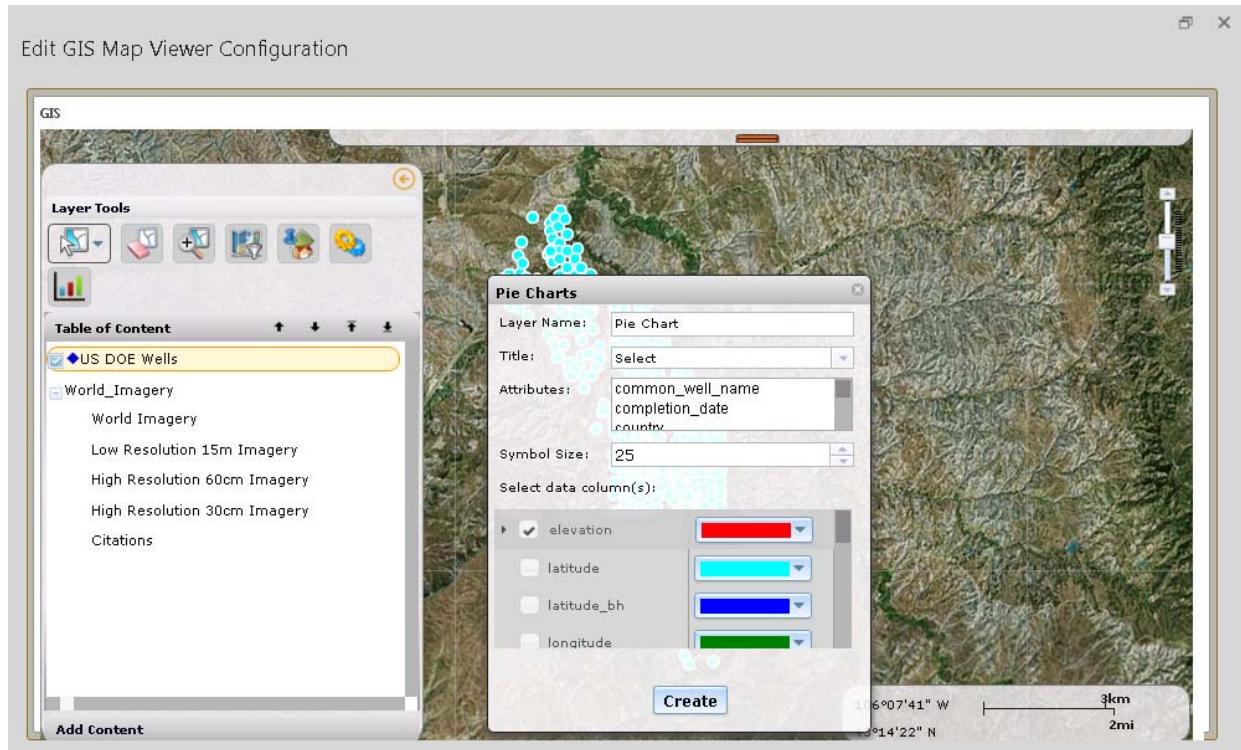


4. Using the Selection tool, select all the wells in the newly created layer as below:

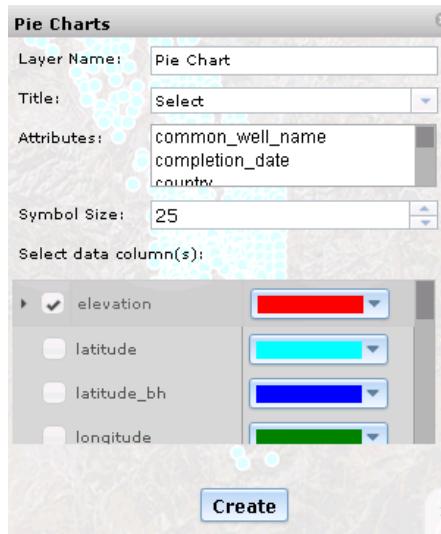


5. Once selected, click the Pie Chart tool from GIS tool bar to display a dialog box as shown below:

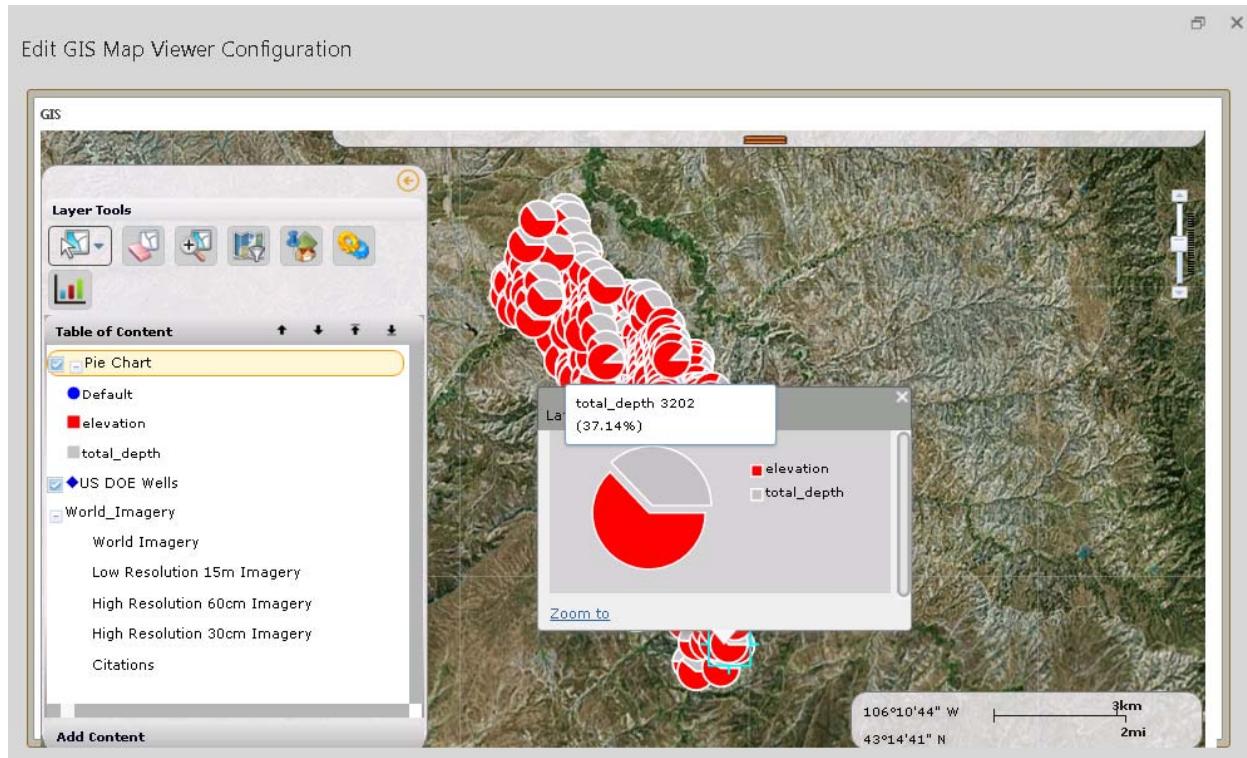




6. Enter a name for the layer and select columns (elevation, total\_depth) from available columns and move it to selected columns. Then click **Create**.



7. The pie chart rendering for each well is displayed on mouse over.



## Exercise 4: Import Shape file and execute query to merge data from DSDS

### Purpose of the Exercise

Show how GIS plugin can be used to import Share files and associate additional data from DSDS.

### Outcome of the Exercise

There will be a page which shows the OW Wells from Shape file with DSDS OW data.

### Exercise Workflows

- Update Data Query.
- Create and configure new Map page.
- Import Shape File.
- Use Execute query feature with the newly created query.

### Update Data Query

1. In Application administration page, select **Webpart Configuration > Data Query Control**.

Config Name	Source	Entity	Properties	Filter	Other Query...	Data Limit	ToolMode
Alarm Config...	DS RTA Confi...	confSolution...	AlarmName,...	rtSolutionId...	\$orderby=Mo...	No	
Alarms Viewer	DS RTA Confi...	rtSolutionEve...	SeverityNam...	rtSolutionId...	\$orderby=Cr...	No	
US DOE Wells	OW Teapot D...	Well	common_wel...		\$orderby=co...	All	

2. Now select the Query that was created before US DOE Wells and click **Edit Data Query Control configuration**.

The screenshot shows the DataQuery configuration window. The left panel displays the query settings:

- Source:** OW Teapot Dome
- Entity:** Well
- Filter:** well\_operator eq 'U.S. DOE'
- Query Option:** Orderby=common\_well\_name
- Data Limit:** All Data
- Support Edit:** checked
- Edit Uri:** /Custompage.aspx
- Actions:** [{"No": 2, "action": "Change to I"}]
- Object Mapp...**
- Column For...** [fieldName:"current\_status"]

The right panel shows the results of the query, listing 15 records of US DOE wells. The columns are:

common_well_name	current_status	latitude	longitude	elevation	well_operator	total_depth
null	DR	43.3073244285829	-106.205688015383	5176	U.S. DOE	null
null	PR	43.24756445	-106.17930434	5371	U.S. DOE	4955
1-10	PA	43.2821440799247	-106.19219138587201	5148	U.S. DOE	280
1-5-10	PA	43.2842394650345	-106.19170006135901	5171	U.S. DOE	456
1-TP-3	PA	43.292418561488695	-106.20707710928701	5226	U.S. DOE	5662
1-TP-33	PA	43.3068415005081	-106.21616721154702	5160	U.S. DOE	5549
11-1-PWW-15	PA	43.270009560762794	-106.209200244441	5239	U.S. DOE	200
11-1-SX-2	PR	43.2989665279905	-106.19127015727801	5094	U.S. DOE	682
11-10	PA	43.2766447252059	-106.198348665877	5194	U.S. DOE	230
11-61-SX-11	SI	43.2848245974227	-106.189274353405	5143	U.S. DOE	2140
11-AX-11	DR	43.28417259801139	-106.191213106423	5180	U.S. DOE	5813
11-AX-33	PA	43.214693459967	-106.229620374513	5133	U.S. DOE	3130
11-AX-34	PR	43.311145598581	-106.20975013735699	5099	U.S. DOE	3240
11-DW-26	PR	43.241946585605696	-106.18901163100901	5321	U.S. DOE	5110
11-MX-10	PA	43.284379097201	-106.209396088663	5275	U.S. DOE	4900

3. Make the following changes in the Query:

- Select an additional property *uwi*.
- Remove the filter.
- Click **Validate Query** to make sure the query shows data.

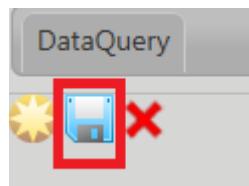
The screenshot shows the DataQuery configuration window with the following changes made:

- Filter:** The filter field is empty, indicated by a red box.
- Query Option:** Orderby=common\_well\_name
- Data Limit:** All Data
- Support Edit:** checked
- Edit Uri:** /Custompage.aspx
- Actions:** [{"No": 2, "action": "Change to I"}]
- Object Mapp...**
- Column For...** [fieldName:"current\_status"]

The right panel shows the results of the query, listing 15 records. A column labeled *uwi* has been added to the table header, highlighted with a red box. The columns are:

common_well_name	current_status	latitude	longitude	elevation	well_operator	total_depth	uwi
null	PA	43.34061065	-106.19815461	4980	Anschutz Corp.	4650	490252206
null	PR	43.24756445	-106.17930434	5371	U.S. DOE	4955	490251025
null	UNKNOWN	null	null	null	UNKNOWN	null	490251022
null	PA	43.34298259	-106.23071606	0	Howell petroleum Corp.	2765	490251023
null	UNKNOWN	null	null	null	UNKNOWN	null	490251095
null	PA	43.34634208	-106.21317319	0	pacific Enterprises Oil Com.	2798	490251023
null	UNKNOWN	null	null	null	UNKNOWN	null	490251073
null	UNKNOWN	null	null	null	UNKNOWN	null	490251095
null	UNKNOWN	null	null	null	UNKNOWN	null	490251106
null	UNKNOWN	null	null	null	UNKNOWN	null	490252282
null	UNKNOWN	null	null	null	UNKNOWN	null	490251090
null	UNKNOWN	null	null	null	UNKNOWN	null	490251094

4. Click **Save** to launch the Save dialog box. Change the name of the query and then click **OK**.



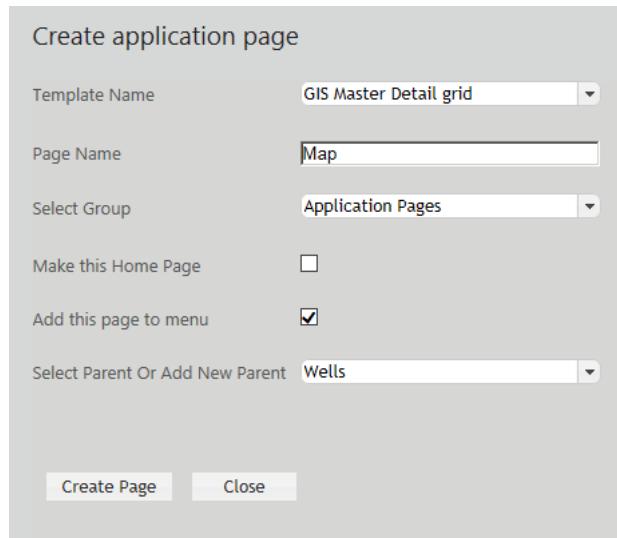
5. This will save the query with new name as shown below:

Data Query Control							
Config Name	Source	Entity	Properties	Filter	Other Query...	Data Limit	ToolMode
<input type="checkbox"/>	Alarm Config...	DS RTA Config...	confSolution...	AlarmName,...	rtSolutionId...	\$orderby=Mo...	No
<input type="checkbox"/>	Alarms Viewer	DS RTA Config...	rtSolutionEve...	SeverityNam...	rtSolutionId...	\$orderby=Cr...	No
<input checked="" type="checkbox"/>	OW Wells	OW Teapot D...	Well	common_wel...	\$orderby=co...	All	No

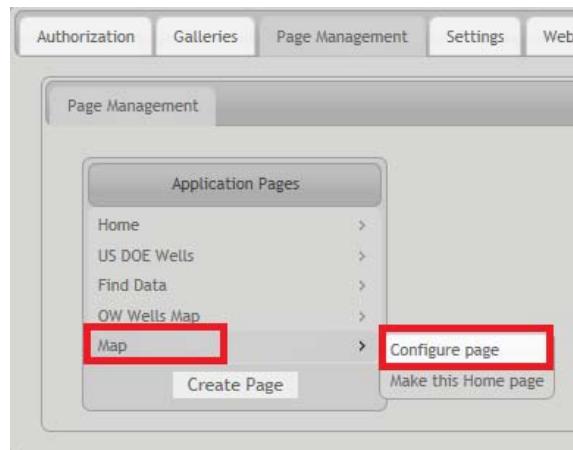
Add Data Query Control Configuration | Edit Data Query Control Configuration | Delete Data Query Control Configuration

## Create and configure new Map page

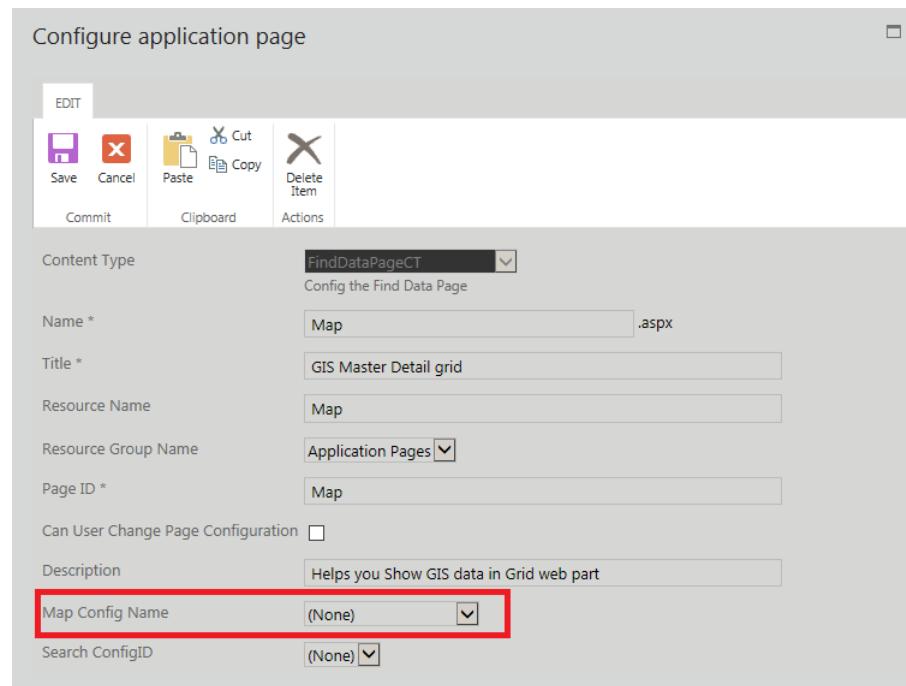
1. In Application administration page, select **Page Management > Create Page**.
2. In the Create application page pop-up, using **GIS Master Detail Grid**, create a page as below:



3. Mouse over the newly created page and select **Configure Page**.

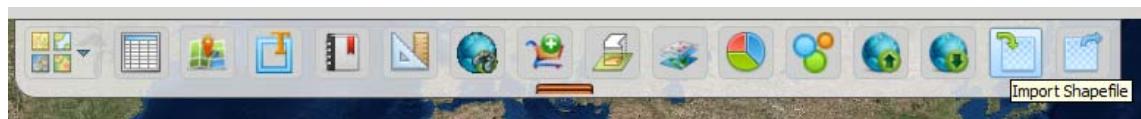


4. Make sure the **Map Config Name** is set to **None** and click **Save**.

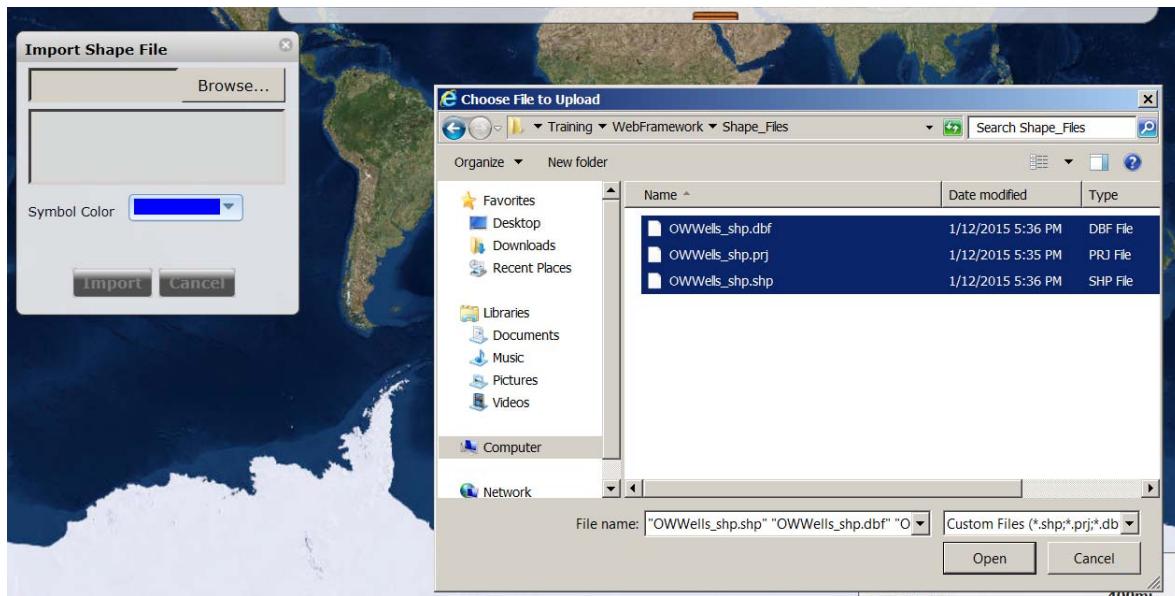


## Import Shape File

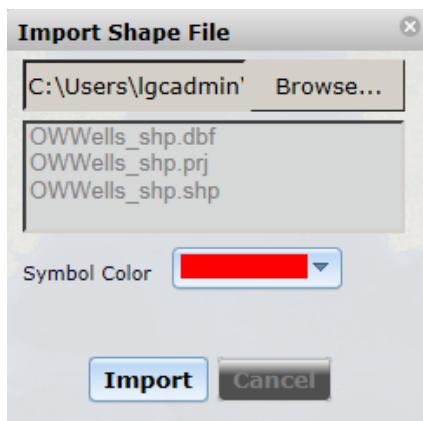
1. Using the App menu, click the newly created page.
2. In the GIS webpart, click **Import Shape File**.



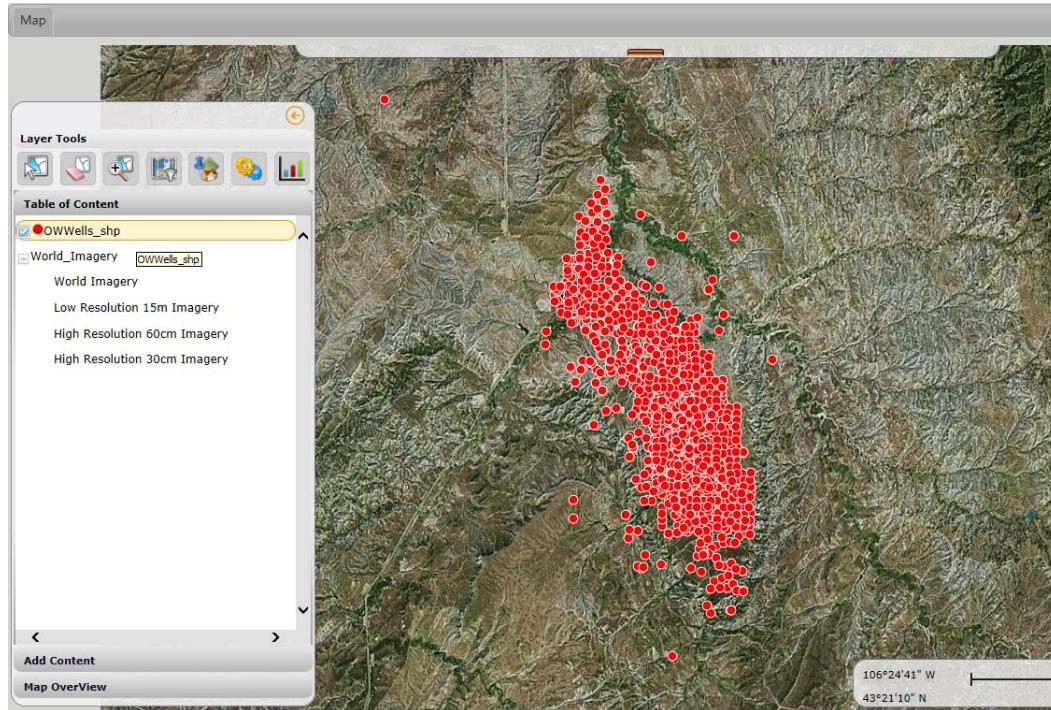
3. In the Import Shape file pop-up, click **Browse** and select three files with the name **OWWells\_shp** as shown below, and click **Open**.



4. Select a Symbol color and click **Import**.

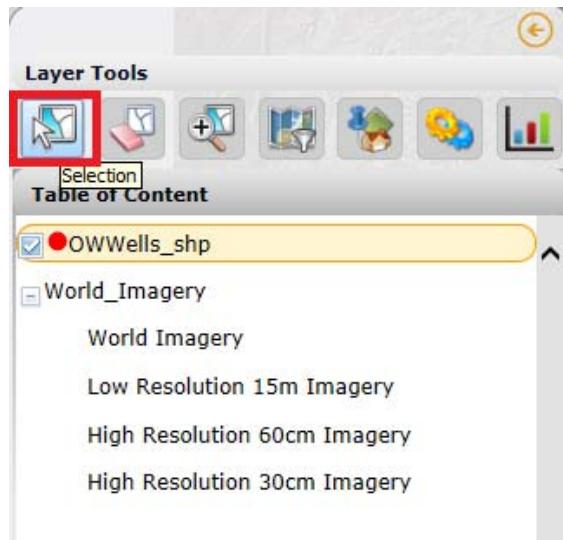


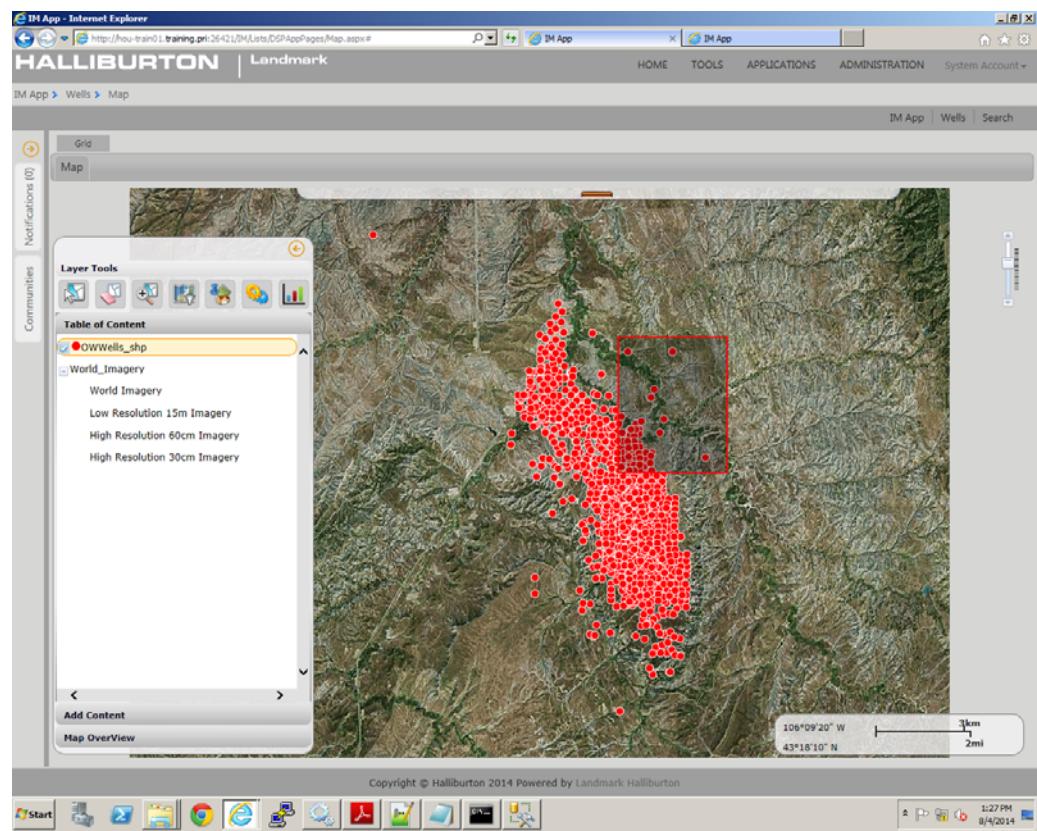
- Upon successful import, a layer called **OWWells\_shp** is displayed in the layer tools section as below:



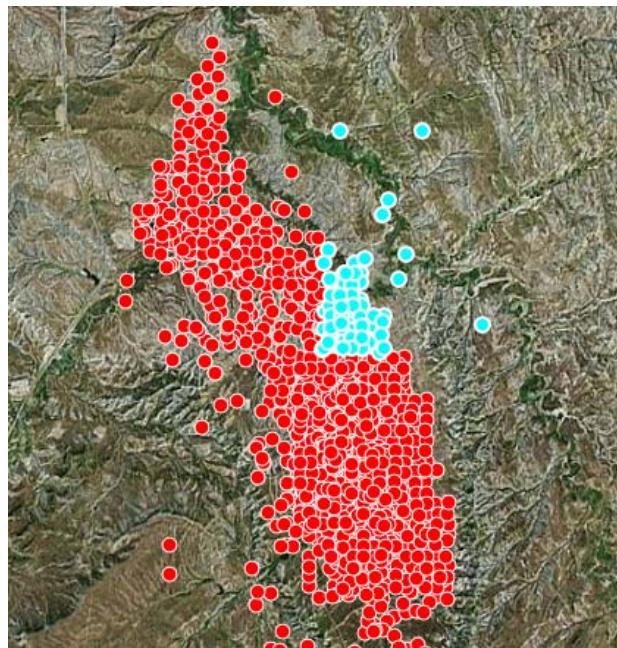
### **Use Execute query feature with the newly created query**

- In Layer Tools, select **OWWells\_shp** layer as active layer.
- Using the **selection** tool, select some wells from the layer.

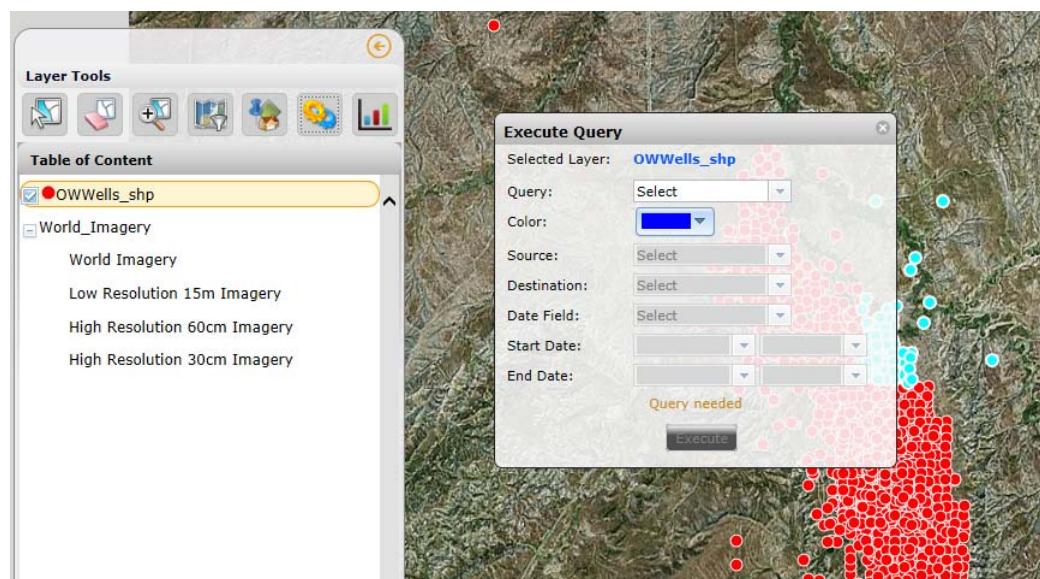
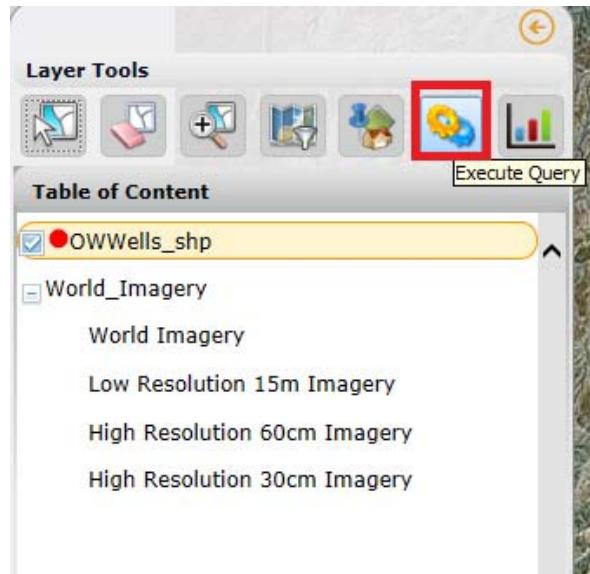




3. The selected wells are displayed in different colors as shown below:



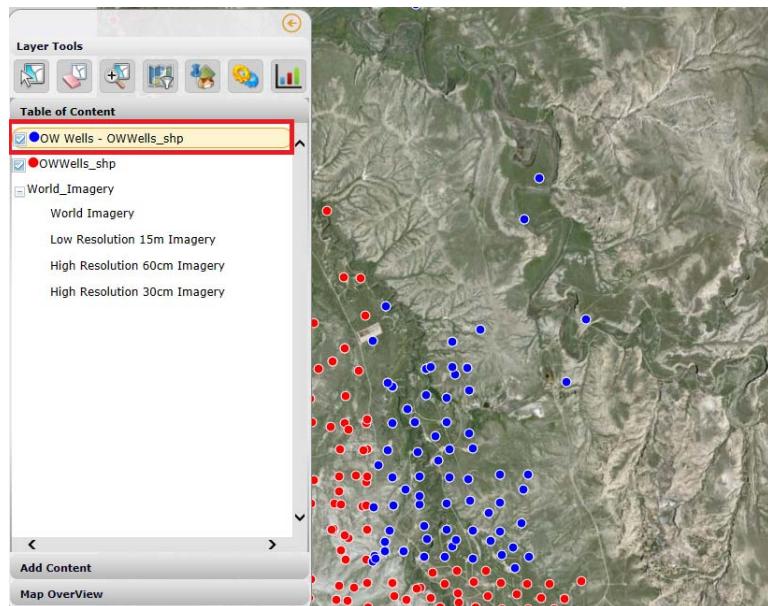
4. In the Layer Tools, click **Execute Query** to display the Execute Query pop-up as shown below:



5. From the **Query Select** drop-down, select the Query that was updated in this exercise. Also select a color, set the Source and destination columns as shown below and click **Execute**.



6. On successful query execution, another layer is added to the map as shown below:



## Business Process Management

### Overview

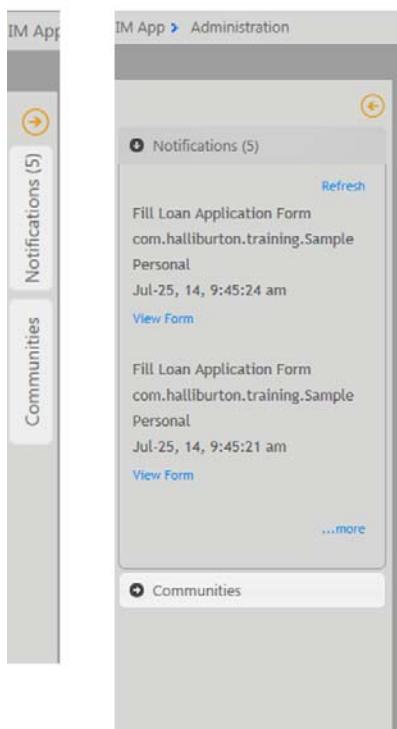
#### Current Status

- Allows to View Tasks that are assigned to the user inside Web Framework Portal
- Ability to Claim Task from Web Framework Portal
- Ability to View Task form and complete the task from Web Framework Portal
- Ability to view an Application page for a task instead of DS BPM form pop-up (Needs Page Template development)

#### What's Coming...

- Ability to Start Workflow Process from Portal (10.3 – Needs migration of form from DS BPM to DS Web Framework)
- Ability to complete tasks from Portal

### Integration Walkthrough



#### Notification Section

- Minimized or Maximized State
- Minimized state shows the total number of Pending Tasks
- Maximized state shows latest 2 task notifications with options to View Form / Claim Task
- Links to refresh
- Links to go to Workflow Inbox

#### Main Menu

- Links to go to Workflow Inbox



## Workflow Inbox

- Similar to DS BPM User Inbox, It Shows all Tasks for current user
- Shows actions that can be done on the task (View Form / Claim Task)
- Shows the Workflow Status diagram

The screenshot shows the 'Workflow Inbox' interface. At the top, there is a table with columns: Task Name, Workflow Name, Task Input Parameters, Type, Created On, and Action. The table lists five records, all of which are 'Fill Loan Application Form' tasks from the 'com.halliburton.training.Sample' workflow. The 'Action' column for each row contains a 'View Form' link. Below the table is a 'Show 5' dropdown and a 'records' link. The main area below the table displays a workflow status diagram. The diagram is divided into two parallel horizontal sections: 'Loan Candidate' and 'Loan Approver'. The 'Loan Candidate' section starts with a green circle 'Start' node, followed by a yellow rounded rectangle 'Fill Loan Application Form' node, which then leads to a yellow rounded rectangle 'Create Welcome Kit' node. From 'Create Welcome Kit', the flow goes to a yellow rounded rectangle 'Sending Welcome Email' node, which ends at a red circle 'Positive End' node. The 'Loan Approver' section starts with a yellow rounded rectangle 'Fetch Credit History' node, followed by a yellow rounded rectangle 'Approve Loan' node. A decision diamond 'Is Loan Approved?' follows, with a 'Yes' path leading back to the 'Create Welcome Kit' node in the 'Candidate' section. A 'No' path leads to a yellow rounded rectangle 'Sending Rejection Email' node, which ends at a red circle 'Negative End' node.

## Claim a Task

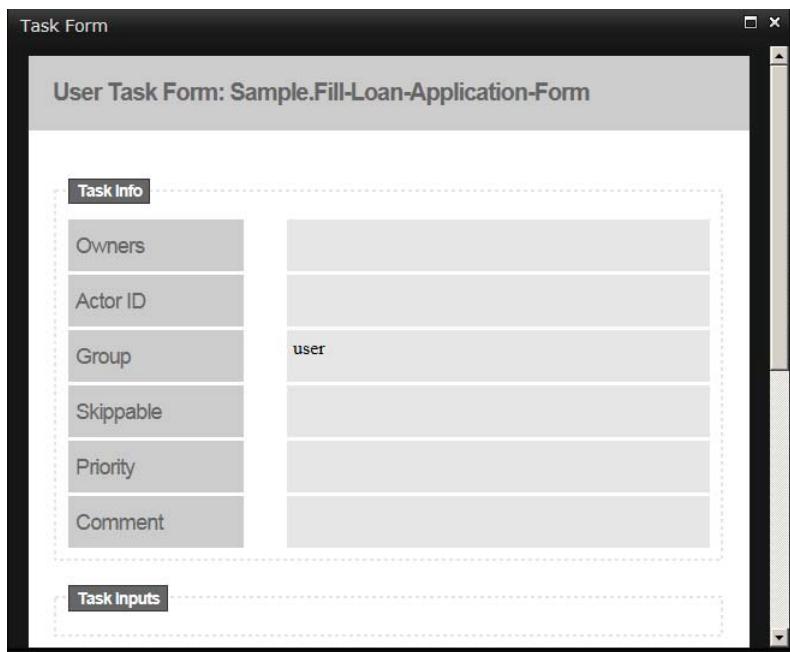
If the Task Type is Group then the Action is Claim Task. Users that are part of the Group can claim the task. After a user claims a task, Task Type becomes Personal and it cannot be claimed or viewed by other users.

To claim a task, click the **Claim Task** link.

## Complete a Task

When a Task Type is Personal, the Action is View Form.

Click the **View Form** link. When the Task Form dialog box displays, scroll to the Task Inputs section and perform the steps needed to complete the task.



After the task is complete, it moves to the next level in the Workflow and the Notification count in the **Notification** tab header is updated based on the new Notification count.

## **Exercise 5: Show Business Notifications in Portal**

---

### **Note**

Please complete all the exercises in *Chapter 5 (Configuration Options for BPM)* before doing Exercise 5.

### **Purpose of the Exercise**

Show how Portal is integrated with BPM.

### **Outcome of the Exercise**

A full cycle of a Workflow from Web Framework Portal will be completed without accessing BPM User Inbox.

### **Exercise Workflows**

- Pre-req: Check BPM Integration
- Workflow walkthrough using Portal

### Pre-req: Check BPM Integration

1. In the Home Page of the Web Framework, the notification bar on the left hand side displays some numbers within parentheses. If there are no tasks, it will show as (0).



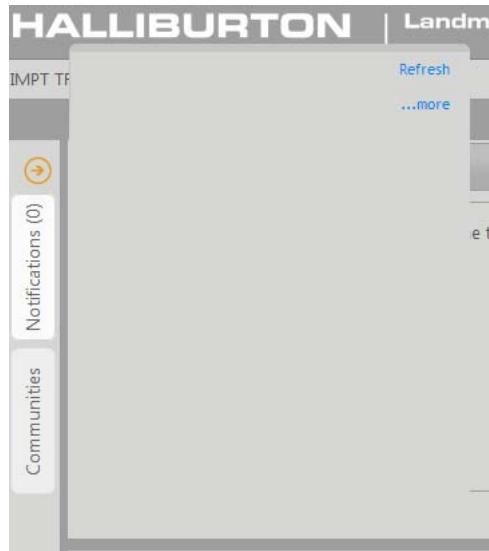
2. If not make sure the BPM is running and the Service setting is already changed to right URL.

### Workflow Walkthrough using Portal

Use Chrome browser for this exercise as it will be easier to login as different users.

1. Go to **DS BPM Admin Console** and Abort all running instances of **Sample Workflow**.
2. Login to the Portal as Load Applier (username: training\apirlo, password: Landmark1). Since all the workflows are aborted, the

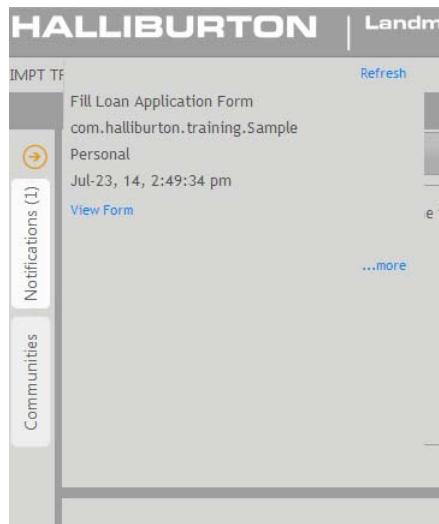
user will have no BPM tasks and so the notification section will show 0 tasks as below.



### 3. Now from BPM admin console, Start a new Process Instance.

A screenshot of the DecisionSpace Business Process Management Admin Console. The top header shows 'DecisionSpace® Business Process Management - Admin Console' and 'HALLIBURTON'. The main area has tabs for 'Audit', 'Manage Processes', and 'Import Processes'. Below is a table titled 'Select a Process Definition to view its details and manage instances'. It lists a single row for 'com.halliburton.training' with a package name 'Hallibut' and a process name 'Sample'. Under 'Process Details', there's a table of process instances with columns: Instance ID, Start On, End On, Status, and Action. Several rows are listed, all with status 'ABORTED'. A modal dialog box titled 'Start Process Instance' is open, prompting for 'candidateFirstName', 'candidateLastName', 'candidateEmailAddress', 'candidateLoanAmount', 'candidateApprovalMessage', and 'candidateSSN'. To the right of the table, a process flow diagram is shown. It starts with a 'Create Welcome Kit' step, followed by 'Sending Welcome Email'. This leads to a decision diamond 'Is Loan Approved?'. If 'Yes', it goes to 'Approve Loan' and then 'Fetching Credit History'. If 'No', it goes to 'Sending Rejection Email'. Both paths lead back to the initial 'Create Welcome Kit' step.

4. Go back to the Portal and click **Refresh**. Since, the first task is assigned to APIRLO in BPM, the user will see task notification as below:



5. Click **View Form** which will launch the *Load Application Form* in BPM as a pop-up.

A screenshot of a 'Task Form' window titled 'User Task Form: Sample Fill-Loan-Application-Form'. The window has a dark theme. It contains two sections: 'Task inputs' (which is currently empty) and 'Task Outputs'. The 'Task Outputs' section includes five input fields labeled 'FirstName', 'LastName', 'EmailAddress', 'RequestedLoanAmount', and 'SSN', each with a corresponding text input field to its right. At the bottom right of this section is a 'SUBMIT' button.

6. Provide valid inputs and click **Submit**.

The screenshot shows a web application window titled "IMPT TRAINING - Internet Explorer". The URL is "http://hou-train01.training.prt:26421/Lists/DSPLAdminPages/Admin.aspx#". The main content is a "User Task Form" titled "User Task Form: Sample.Fill-Loan-Application-Form". The form is divided into two sections: "Task Inputs" and "Task Outputs". Under "Task Outputs", there are five input fields with the following values:

Field	Value
FirstName	Guru
LastName	Kandasamy
EmailAddress	guru.kandasamy@halliburton.com
RequestedLoanAmount	100000.00
SSN	\$100

A "SUBMIT" button is located at the bottom right of the form.

7. After the Successfully processed input message displays, close the pop-up.

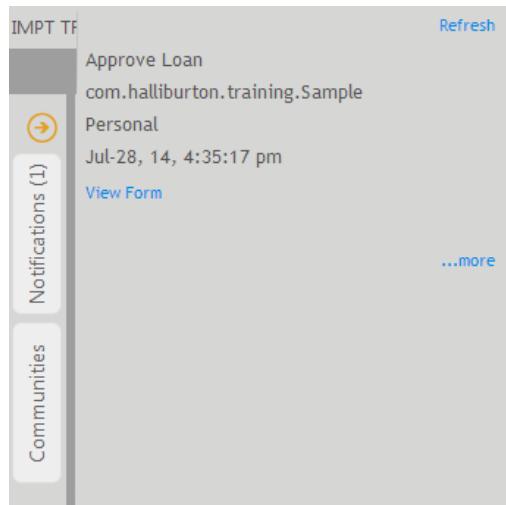
**Note**

The notifications will go back to 0 as the task is completed now.

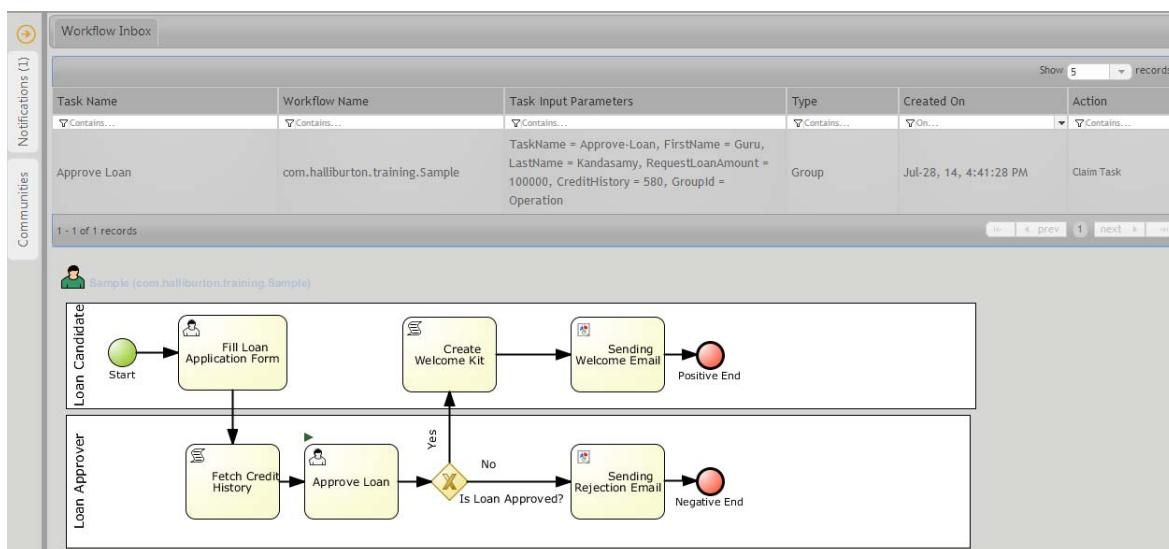
8. Now close the browser window and Login as Loan Approver user (training\ftotti, password: Landmark1). Since this user is part of the Approver group, a notification is displayed as below:



9. Click the **Claim Task**, which will change Task type to Personal and action to View Form.



10. Click **..more** to navigate to workflow inbox page.
11. A task notification is displayed on the Workflow inbox page. Click that row to display a status image with the current workflow status.



12. Click **View Form** from Actions column to open the form, Approve the loan and click **Submit**.

13. After the “Successfully processed input” message displays, close the pop-up.

**Note**

The grid will automatically refresh and displays 0 as the approval task is completed now.

## **DecisionSpace Analytics**

### **Overview**

#### **Current Status**

- Allows to view DS Analytics Reports/Dashboards inside an application page
- Has link to open DS Analytics user console via portal
- Consumes messages from other web parts and passes them as parameter for the Report/Dashboard

#### **What's Coming**

- Easy GUI based configurations for LDAP & SSO
- Web part based configuration for Web Framework Integration

#### **Web Framework Plugins that uses DS Analytics**

- Analytics Components

## Plugin Overview

### Current Status

- Allows to view any DS Analytics report/dashboard using Analytics Webpart
- 3 Page Templates
  - BI Page
  - Spatial Analysis
  - Textual Analysis
- Allows to set Static or Dynamic filters to reports/Dashboards

### What's Coming...

- Web part for DS Analytics and Web Framework Integration

## Integration Walkthrough<sup>5</sup>

### Administrators can

- Create and configure Application Pages for end users to view report/Dashboards from DS Analytics
- Manage Configurations for pages that uses DS analytics

### End Users can

- View Pages which shows the report/dashboard from DS Analytics

### Developers can

- Populate Pre-Configured reports/Dashboard

---

5. For detailed instructions, refer to the *Analytics* section within the *DecisionSpace® Integration Server Web Framework System Administration Guide* version 5000.10.2.1.

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## Exercise 6: Create BI Configuration and BI Page to show Reports/Dashboards from DS Analytics in Application Page

---

### Note

Please complete the *DS Analytics Installation (Appendix B)* and all the exercises in Chapter 6 (DS Analytics) before doing Exercise 6.

### Purpose of the Exercise

To understand how to:

- Create BI Web part Configurations.
- Create BI Page and configure the page to show one of the existing BI web part configuration.

### Outcome of the Exercise

There will be one page using BI page template in which a selected report will be displayed from Analytics. There will be another page using Spatial Search Analysis in which a report will be displayed which has parameters and the parameter will be passed from GIS map which will be available on that page.

### Exercise Workflows

- Pre-req: Analytics integration.
- Create 2 BI Control Configuration based on created reports/dashboards.
- Create a page using BI Page Template.
- Create a page using Spatial Search Analysis Page Template.
- Configure the pages to use the configuration created in this exercise.

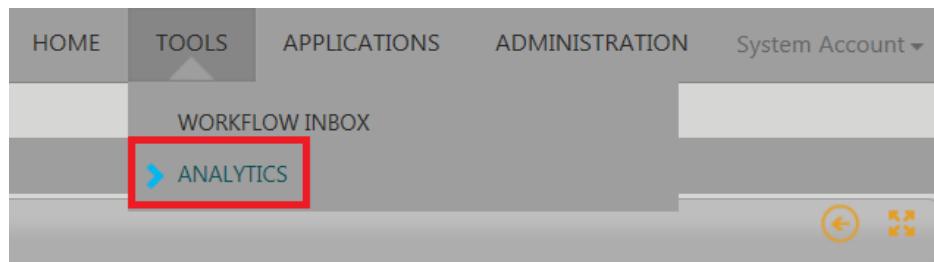
- View the created pages which shows the Analytics report & Dashboard.

**Note**

Use Chrome browser for this exercise.

### Pre-req: DS Analytics Integration

1. Make sure the Analytics integration is working properly by clicking the **Tools > DS Analytics** link in the Web Framework Portal.

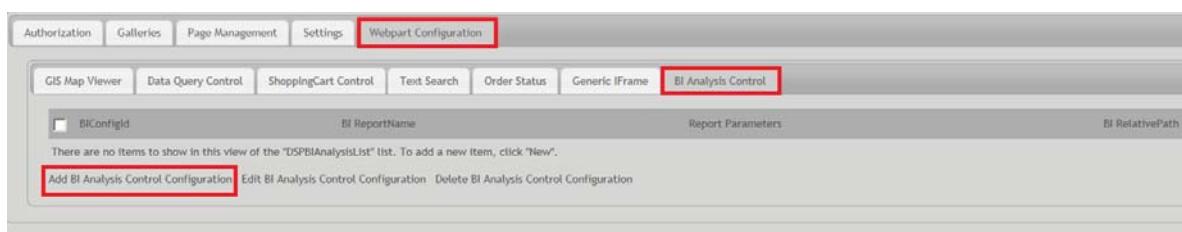


2. This opens the Analytics User Console logged in as the same user as the Web Framework.



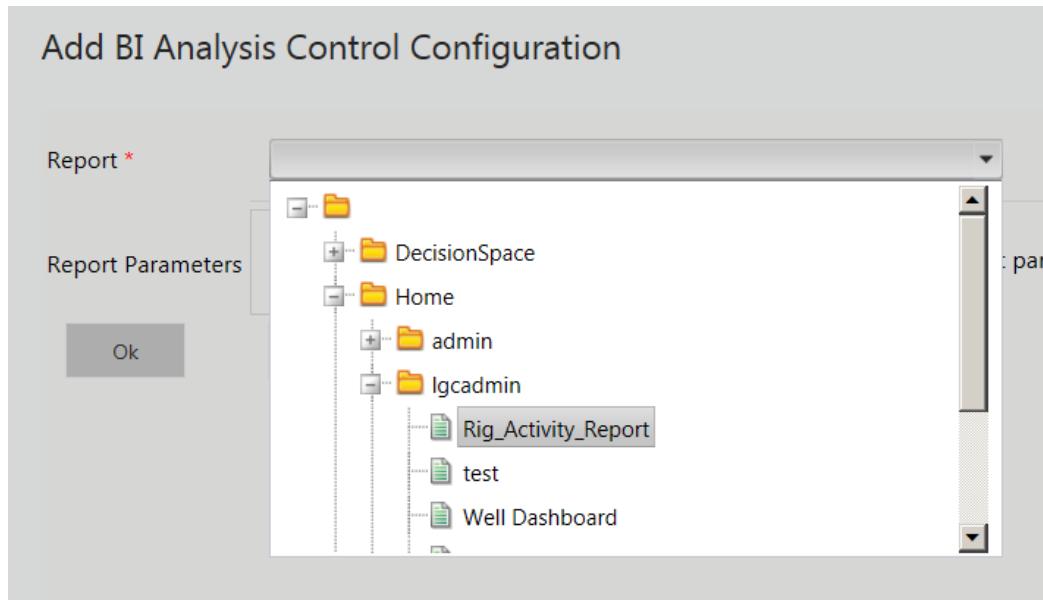
### Create 2 BI Control Configuration based on created Reports/ Dashboards

1. In IM App administration page, select **Webpart Configuration > BI Analysis Control - Add BI Analysis Control Configuration**.



2. In the Add BI Analysis Control Configuration pop-up, select the report to view in the page using the drop-down list and click **OK**.

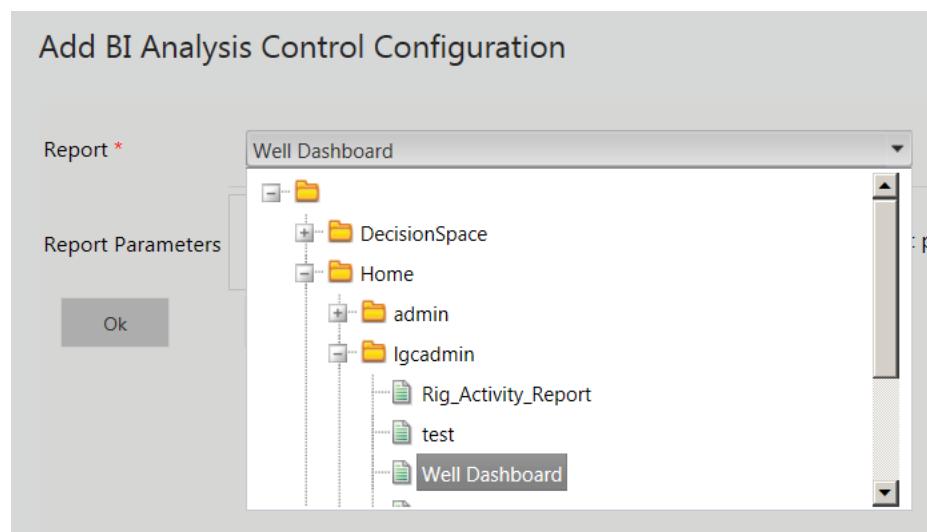
First, select a report (Rig\_Activity\_Report) that was created as a part of Analytics exercise.



3. After clicking **OK**, a configuration is displayed that can be used as shown below:



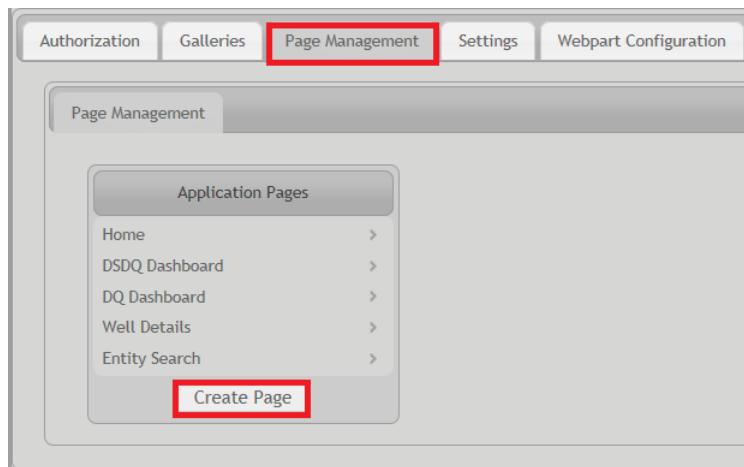
4. Similarly create another configuration for Well Dashboard that was created before.





## Create a Page using BI Page Template

1. In IM App administration page, select **Page Management > Create Page**.



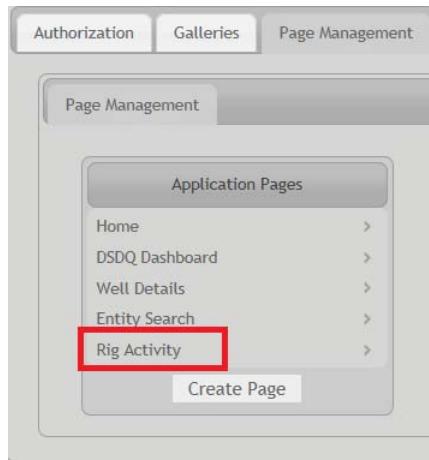
2. In the Create Page pop-up, select BI Page Template and enter other details as shown below and create page.

The screenshot shows the 'Create application page' dialog box. The fields are as follows:

- Template Name: BI
- Page Name: Rig Activity
- Select Group: Application Pages
- Make this Home Page:
- Add this page to menu:
- Select Parent Or Add New Parent: Dashboards

At the bottom are 'Create Page' and 'Close' buttons.

3. Close the pop-up and make sure the Page is created as shown below:



### **Create a Page using Spatial Search Analysis Page Template**

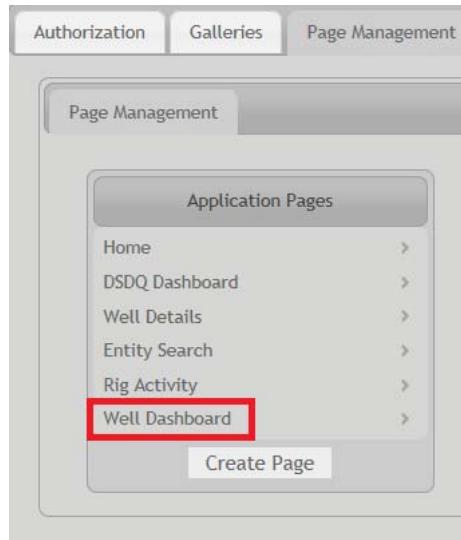
1. In IM App administration page, select **Page Management > Create Page**.
2. In the Create Page pop-up, select **Spatial Search Analysis Page Template** and enter other details as shown below and create page.

The screenshot shows a 'Create application page' dialog box. It has the following fields and settings:

- Template Name:** Spatial Search Analysis
- Page Name:** Well Dashboard
- Select Group:** Application Pages
- Make this Home Page:**
- Add this page to menu:**
- Select Parent Or Add New Parent:** Dashboards

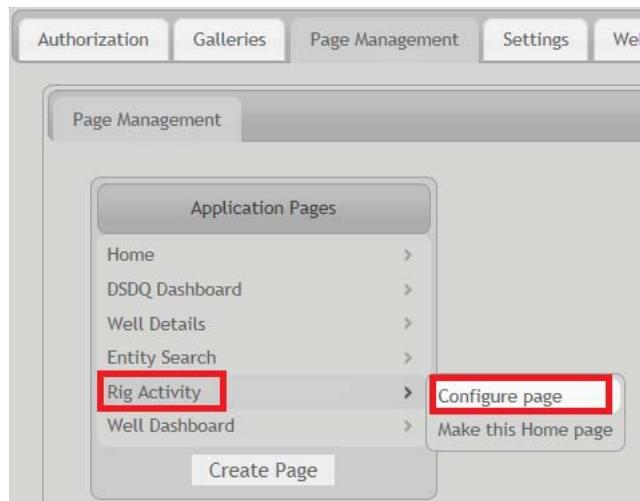
At the bottom of the dialog are two buttons: 'Create Page' and 'Close'.

3. Click **Close** and make sure the page is created as shown below:

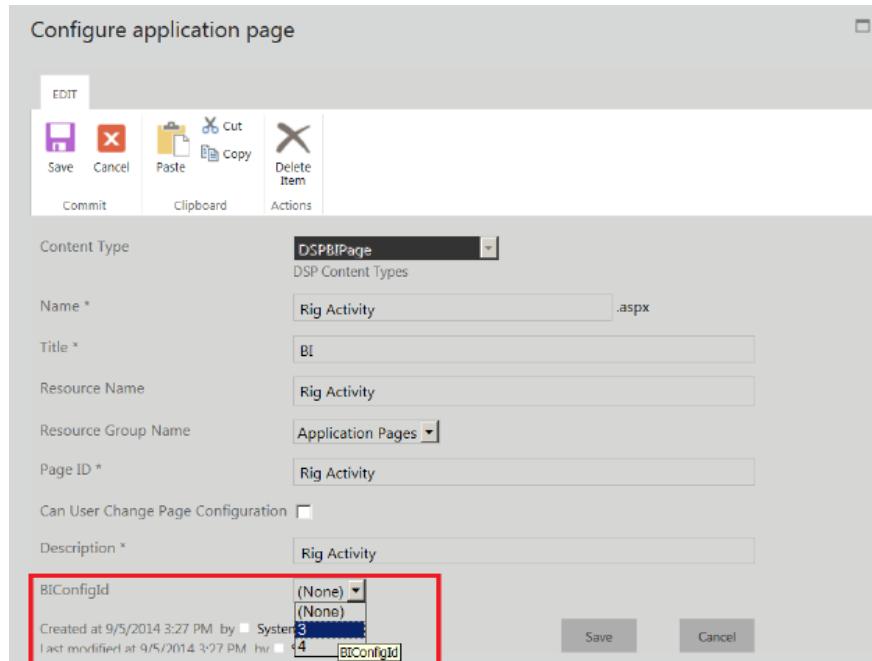


### **Configure the Pages to use the Configuration created in this Exercise**

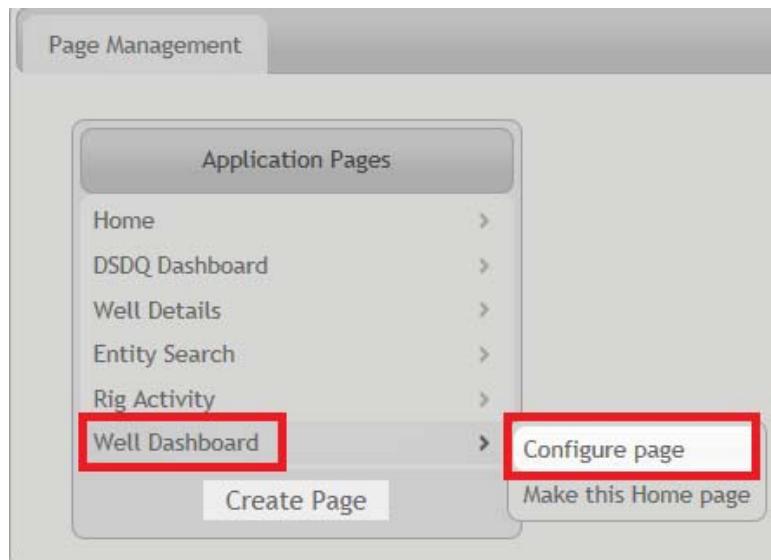
1. In IM App administration page, select **Page Management** > Mouse over **Rig Activity** page and click **Configure Page** as shown below:



2. In the Configuration pop-up, select the **BI Configuration ID** to show the Rig Activity configuration.



3. Similarly, click **Configure page** on Well Dashboard Page and set the BI Config ID to the configuration that has the Well Dashboard and Set the configuration for Map to Show the US DOE Wells configuration that was created in GIS exercise.



Configure application page

EDIT

Save Cancel Cut Copy Delete Item Commit Clipboard Actions

Content Type: SpatialSearchAnalysisPage

Name \*: Well Dashboard .aspx

Title \*: Spatial Search Analysis

Resource Name: Well Dashboard

Resource Group Name: Application Pages

Page ID \*: Well Dashboard

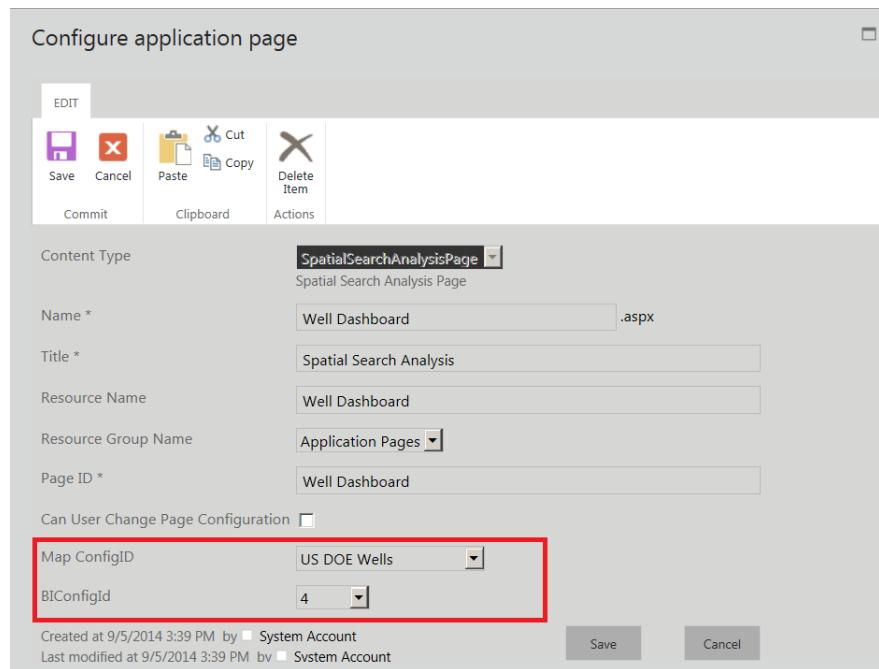
Can User Change Page Configuration:

Map ConfigID: US DOE Wells

BIConfigId: 4

Created at 9/5/2014 3:39 PM by System Account  
Last modified at 9/5/2014 3:39 PM by System Account

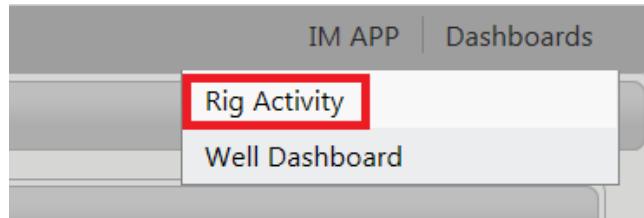
Save Cancel



4. Click **Save** after both the configurations are set.

### ***View the Created Pages which shows the DS Analytics Report and Dashboard***

1. From the Application menu, click the **Rig Activity** link as shown below:



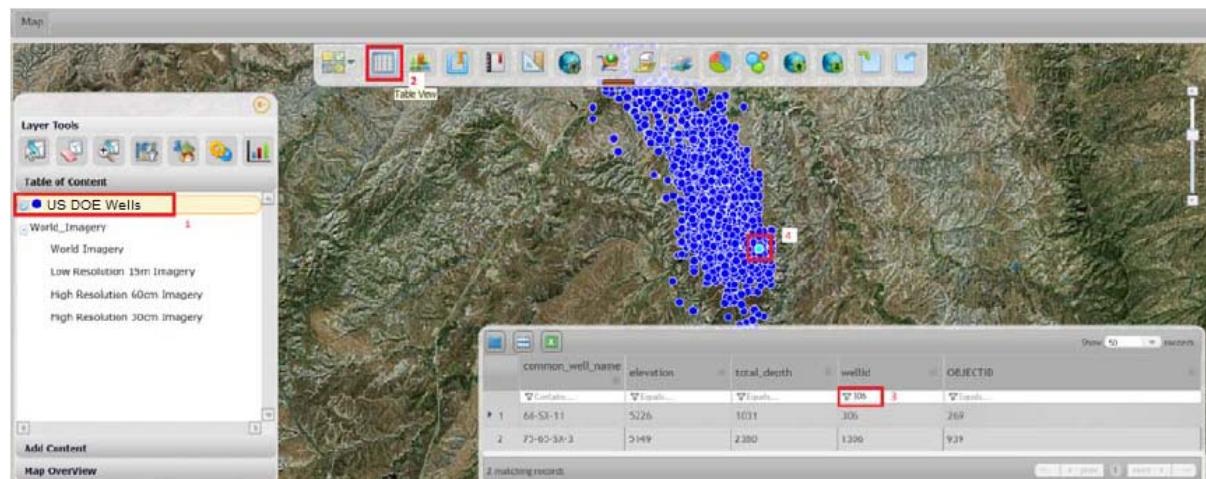
2. The report that was created inside this page is displayed as shown below:



3. From the Application menu, click the **Well Dashboard** link.
4. Now the Well Dashboard will show for the default wellid as shown below:



5. Minimize the Analytics webpart for now and In the GIS map, select the layer that was created, click the table tool, and then filter for the wellid 306 as shown below:



6. Bring back the Analysis webpart now and select the well using the selection tool as shown below:



7. Now this will send the wellid-306 to the Analysis webpart and the report is displayed based on that wellid as shown below:

Log type name	Total samples	Base depth	Top depth
ASN	1881	1030.5	90.5
B/W	1929	1020	65
C/LD	1888	1023.5	31
GR	1780	960.5	66
GRIN	420	992.5	763
GRMax	323	1031	66
ILD	1882	1030	83.5
P/H/A	1929	1030	66

# Advanced Web Framework

---

## ***Technologies and Terminologies***

### ➤ Runs on top of:

- SharePoint 2010/2013 Foundation/Standard/Enterprise ([Feature Comparison link](#))
- SQL Server 2008 R2 Express/Standard
- Windows 7 (Foundation) or Windows Server 2008 R2

### ➤ Development Environment

- Visual Studio 2012 Update 3 or higher
- Office Developer Tools for VS 2012
- SharePoint 2010/2013
- Windows Server 2008 R2 or Windows 7(Foundation)

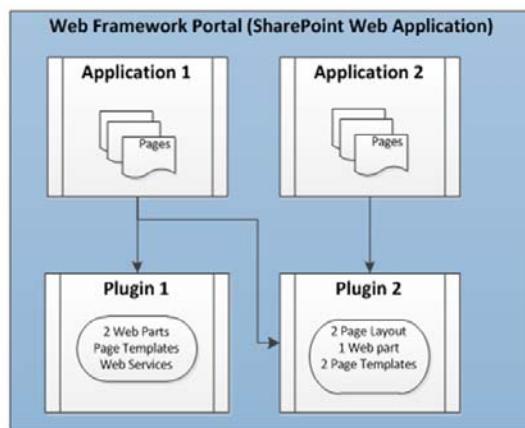
### ➤ Languages/Frameworks used in Web Framework Development

- HTML5/JavaScript, CSS 3.0, jQuery, jQuery UI
- .Net Framework
- SharePoint Master Pages and jQuery UI Layouts
- SharePoint Page Layouts and Web Parts
- SharePoint Web Templates and Solutions
- SharePoint Web Services

Term	Meaning
DS Portal / DS Web Framework	Framework container for composite applications
Portal Base	Root application where common settings/configurations exists
Application	Composite application which are created in the container which has a definite purpose and functionality
Plugin /Component	Package that consists of components that is used for a
Webpart	SharePoint UI component
Page Layout	Framework component which has the UI layout with zones for each section of UI
Page Template	Framework component which has the UI layout with Webparts in each zones

## How do the pieces relate to each other?

- Each Web Framework will have a Portal Base
- Each Web Framework can have multiple Applications
- Applications consists of Pages & Configurations to accomplish a certain functionality.
- Applications are created using existing or new Plugins
- Plugins can contain any combination of Page Layout or Page Template or Webpart or Services



## Web Framework Security

### Supports:

- NTLM (Classic)
- Kerberos
- FBA

### When to use what?

#### NTLM

- Default option, authorizes against the Active directory in which the server is installed

#### Kerberos

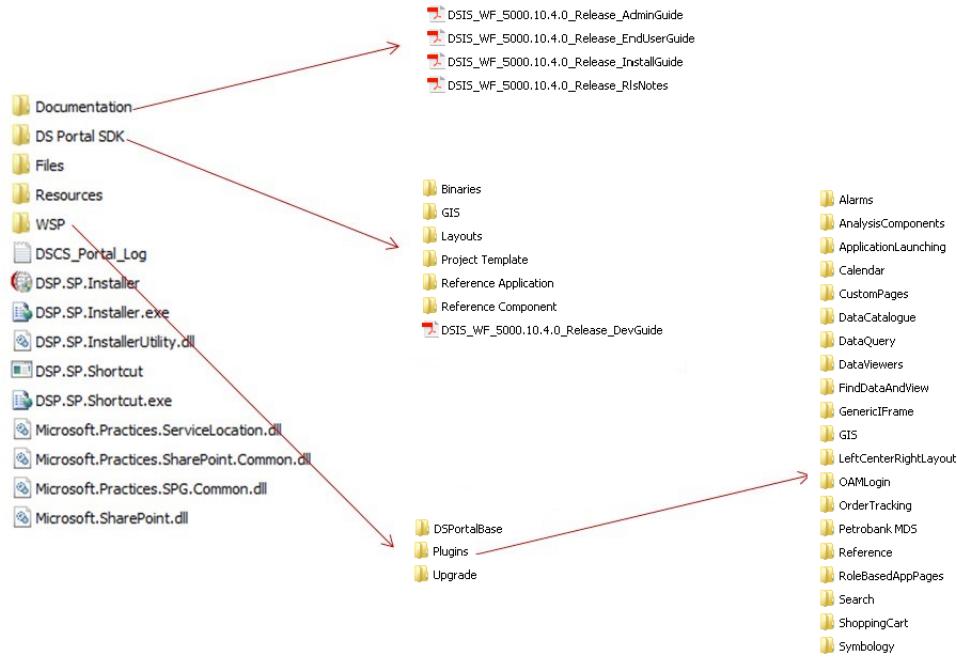
- If the user context has to be passed to underlying services (Data Server)

#### FBA

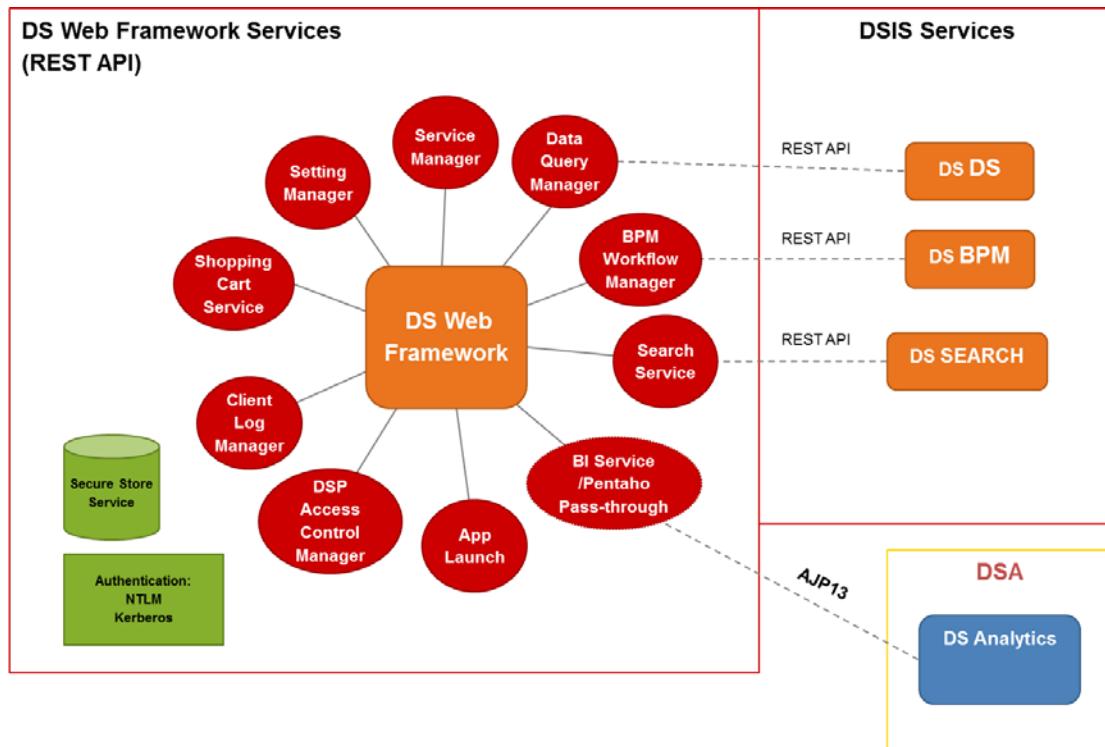
- If you need to access the Web Framework using external AD which may be exposed to public registration.
- If you have 3<sup>rd</sup> party Access Management Systems

## Install Folder Walkthrough

C:\Program Files (x86)\Landmark\DSPortal



## REST APIs



Service API - C:\Program Files (x86)\Landmark\DSPortal\DS Portal SDK\ DSPortal\_5000.10.2\_Release\_DevGuide.pdf

Service	Main Functionality
Data Query Manager	<ul style="list-style-type: none"> <li>➢ Read data from DSDS</li> <li>➢ Execute saved queries</li> <li>➢ Run dynamic queries</li> </ul>
BPM Workflow Manager	<ul style="list-style-type: none"> <li>➢ Get tasks for a user from DS BPM</li> <li>➢ Get all Workflows, Tasks from DS BPM engine</li> </ul>
Search Service	Execute a search based on the criteria and additional parameters
App Launch	<ul style="list-style-type: none"> <li>➢ Application Management</li> <li>➢ Application launching</li> </ul>
DSP Access Control Manager	Manage permissions on Resources & User actions
Client Log Manager	Log messages
Shopping Cart Service	Manages Shopping Cart
Settings Manager	Manages Portal and Application level Settings
Service Manager	Manages Portal and Application level Settings

---

## Exercise 7: Use Data Query Manager Service to get data from any DSDS model

---

### Purpose of the Exercise

Understand Data Query Manager Service API.

### Outcome of the Exercise

Use the Data Query Manager API to view the data to understand the data format and API.

### Exercise Workflows

- Call service method to execute query by ID.
- Call service method to execute query by Query Name.
- Call service method to execute dynamic query.

### Call Service Method to Execute Query by ID

1. Construct the service URL using the following template:

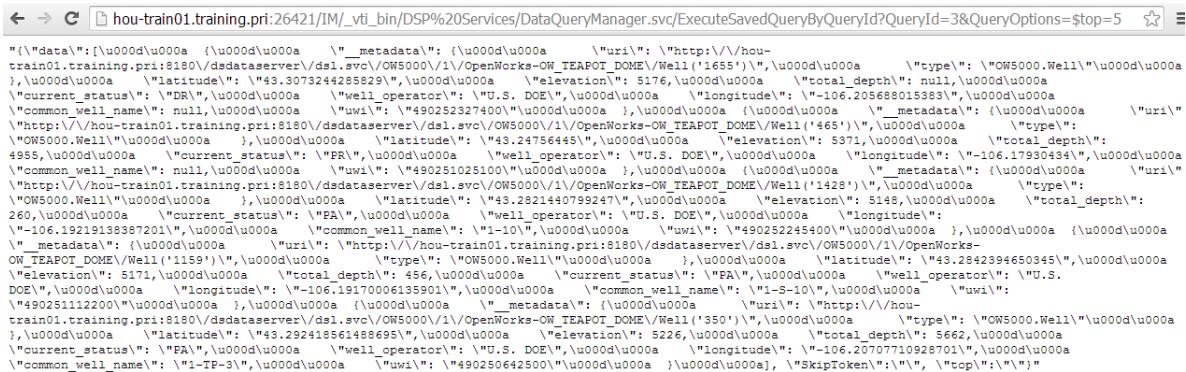
[http://<<Server>>:<<Port>>/<<AppUrl>>/ vti\\_bin/ DSP%20Services/DataQueryManager.svc/ ExecuteSavedQueryByQueryName?QueryId=<<QueryId>>&QueryOptions=<<QueryOptions>>](http://<<Server>>:<<Port>>/<<AppUrl>>/ vti_bin/ DSP%20Services/DataQueryManager.svc/ ExecuteSavedQueryByQueryName?QueryId=<<QueryId>>&QueryOptions=<<QueryOptions>>)

- Server - the web framework server name
- Port - the Web framework port number
- AppUrl - Application URL
- QueryId - Id of the configuration that was created
- QueryOptions (Optional) - Additional Query options if needed

Example:

[http://hou-train01.training.pri:26421/IM/\\_vti\\_bin/DSP%20Services/DataQueryManager.svc/ExecuteSavedQueryByQueryId?QueryId=3&QueryOptions=\\$top=5](http://hou-train01.training.pri:26421/IM/_vti_bin/DSP%20Services/DataQueryManager.svc/ExecuteSavedQueryByQueryId?QueryId=3&QueryOptions=$top=5)

2. Open a browser and enter the constructed URL and press **Enter** to view the data from DSDS as below:



## **Call Service Method to Execute Query by Query Name**

1. Construct the service URL using the following template.

[http://<<Server>>:<<Port>>/<<AppUrl>>/vti\\_bin/  
DSP%20Services/DataQueryManager.svc/  
ExecuteSavedQueryByQueryName?QueryName=<<Query  
Name>>&QueryOptions=<<Query Options>>](http://<<Server>>:<<Port>>/<<AppUrl>>/vti_bin/DSP%20Services/DataQueryManager.svc/ExecuteSavedQueryByQueryName?QueryName=<<Query Name>>&QueryOptions=<<Query Options>>)

- Server - the web framework server name
  - Port - the Web framework port number
  - AppUrl - Application URL
  - Query Name - Config Name of the configuration that was created
  - Query Options (Optional) - Additional Query options if needed

## Example:

[http://hou-train01.training.pri:26421/IM/vti\\_bin/DSP%20Services/DataQueryManager.svc/ExecuteSavedQueryByQueryName?QueryName=US%20DOE%20Wells](http://hou-train01.training.pri:26421/IM/vti_bin/DSP%20Services/DataQueryManager.svc/ExecuteSavedQueryByQueryName?QueryName=US%20DOE%20Wells)

2. Open a browser and enter the constructed URL and press **Enter** to view the data from DSDS as below:

## ***Call Service Method to Execute a Dynamic Query***

1. Construct the service URL using the following template.

[http://<<Server>>:<<Port>>/<<AppUrl>>/vti\\_bin/  
DSP%20Services/DataQueryManager.svc/ExecuteQuery/  
<<Source>>/<<Entity>>/  
?Properties=<<Properties>>&Filter=<<Filters>>&QueryOptions=  
<<QueryOptions>>&DataLimit=<<Data Limit>>](http://<<Server>>:<<Port>>/<<AppUrl>>/vti_bin/DSP%20Services/DataQueryManager.svc/ExecuteQuery/<<Source>>/<<Entity>>/?Properties=<<Properties>>&Filter=<<Filters>>&QueryOptions=<<QueryOptions>>&DataLimit=<<Data Limit>>)

- Server - the web framework server name
  - Port - the Web framework port number
  - AppUrl - Application URL
  - Source - DSDS Service name which has the model

- Entity - Entity name which has the data
  - Properties - Comma separated list of columns that is needed
  - Filter (optional) - Filters
  - QueryOptions (Optional) - Additional Query options if needed
  - DataLimit - It is used to get the required number of data. It accepts **Page** or **All**.

## Example:

[http://hou-train01.training.pri:26421/IM/vti\\_bin/  
DSP%20Services/DataQueryManager.svc/ExecuteQuery/OW](http://hou-train01.training.pri:26421/IM/vti_bin/DSP%20Services/DataQueryManager.svc/ExecuteQuery/OW)  
[Teapot Dome/](#)  
[Well?Properties=common\\_well\\_name,current\\_status,latitude,longitude,total\\_depth&Filter=well\\_operator eq 'U.S.'](#)  
[DOE&QueryOptions=\\$orderby=common\\_well\\_name&DataLimit=Page](#)

2. Open a browser and enter the constructed URL and press **Enter** to view the data from DSDS as below:

---

## Exercise 8: Use BPM Workflow Manager Service to get data from any DS BPM Engine

---

### **Purpose of the Exercise**

- Understand BPM Workflow Manager Service API

### **Outcome of the Exercise**

Use the BPM Workflow Manager API to view the task data and other data from DS BPM engine to understand the data format and API.

### **Exercise Workflows**

- Call service method to Get Default BPM service name
- Call service method to Get all workflows in BPM engine
- Call service method to Get all Tasks for a user
- Call service method to Get Task details by Task Id

### **Call Service Method to get Default BPM Service Name**

1. Construct the service URL using the following template:

[http://<<Server>>:<<Port>>/<<AppUrl>>/\\_vti\\_bin/\\_DSP%20Services/BPMWorkflowManager.svc/GetDefaultWorkflowService](http://<<Server>>:<<Port>>/<<AppUrl>>/_vti_bin/_DSP%20Services/BPMWorkflowManager.svc/GetDefaultWorkflowService)

- Server - the web framework server name
- Port - the Web framework port number
- AppUrl - Application URL

Example:

[http://hou-train01.training.pri:26421/IM/\\_vti\\_bin/DSP%20Services/BPMWorkflowManager.svc/GetDefaultWorkflowService](http://hou-train01.training.pri:26421/IM/_vti_bin/DSP%20Services/BPMWorkflowManager.svc/GetDefaultWorkflowService)

2. Open a browser and enter the constructed URL and press **Enter** to view the data from BPM as below:



### **Call Service Method to get all Workflows in BPM Engine**

1. Construct the service URL using the following template:

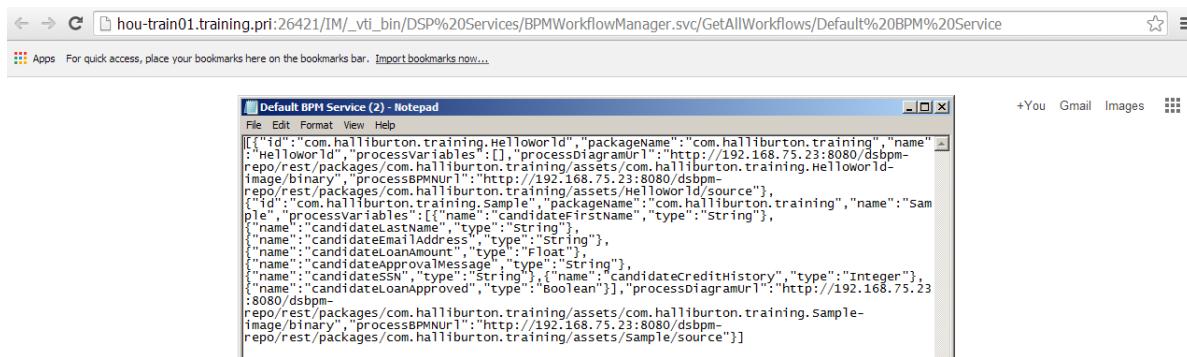
[http://<<Server>>:<<Port>>/<<AppUrl>>/vti\\_bin/DSP%20Services/BPMWorkflowManager.svc/GetAllWorkflows/<<Service Name>>](http://<<Server>>:<<Port>>/<<AppUrl>>/vti_bin/DSP%20Services/BPMWorkflowManager.svc/GetAllWorkflows/<<Service Name>>)

- Server - the web framework server name
- Port - the Web framework port number
- AppUrl - Application URL
- Service Name - Service name that is configured. Use the response from the previous response

Example:

[http://hou-train01.training.pri:26421/IM/\\_vti\\_bin/DSP%20Services/BPMWorkflowManager.svc/GetAllWorkflows/Default BPM Service](http://hou-train01.training.pri:26421/IM/_vti_bin/DSP%20Services/BPMWorkflowManager.svc/GetAllWorkflows/Default BPM Service)

2. Open a browser and enter the constructed URL and press Enter which will get the response as download. Click to view the response in notepad to view the data from BPM as below:



The screenshot shows a Microsoft Notepad window titled "Default BPM Service (2) - Notepad". The content of the window is a JSON object representing a BPM process definition. The JSON structure includes fields like "id", "name", "packageName", "version", and "processVariables", along with nested objects for "processDiagramUrl", "image/binary", and "processBPMNurl". The data is highly detailed, listing various components and their properties.

```

{
    "id": "com.halliburton.training.Helloworld",
    "packageName": "com.halliburton.training",
    "name": "HelloWorld",
    "version": "1.0.0",
    "processVariables": [],
    "processDiagramUrl": "http://192.168.75.23:8080/dsbpm-repo/rest/packages/com.halliburton.training/assets/com.halliburton.training.Helloworld-image/binary",
    "processBPMNurl": "http://192.168.75.23:8080/dsbpm-repo/rest/packages/com.halliburton.training/assets/Helloworld/source",
    "processDiagram": {
        "id": "com.halliburton.training.sample"
    },
    "packageName": "com.halliburton.training",
    "name": "sample",
    "processVariables": [
        {
            "name": "candidateFirstName",
            "type": "String"
        },
        {
            "name": "candidateLastName",
            "type": "String"
        },
        {
            "name": "candidateEmailAddress",
            "type": "String"
        },
        {
            "name": "candidateLoanAmount",
            "type": "Float"
        },
        {
            "name": "candidateApprovalMessage",
            "type": "String"
        },
        {
            "name": "candidateSM",
            "type": "String"
        }
    ],
    "candidateCreditHistory": {
        "name": "candidateCreditHistory",
        "type": "Integer"
    },
    "candidateApproved": {
        "name": "candidateApproved",
        "type": "Boolean"
    },
    "processDiagramUrl": "http://192.168.75.23:8080/dsbpm-repo/rest/packages/com.halliburton.training/assets/com.halliburton.training.sample-image/binary",
    "processBPMNurl": "http://192.168.75.23:8080/dsbpm-repo/rest/packages/com.halliburton.training/assets/Sample/source"
}
  
```

## Call Service Method to get all Tasks for a User

1. Construct the service URL using the following template.

[http://<<Server>>:<<Port>>/<<AppUrl>>/vti\\_bin/DSP%20Services/BPMWorkflowManager.svc/GetTasks/<<Service Name>>](http://<<Server>>:<<Port>>/<<AppUrl>>/vti_bin/DSP%20Services/BPMWorkflowManager.svc/GetTasks/<<Service Name>>)

- Server - the web framework server name
- Port - the Web framework port number
- AppUrl - Application URL
- Service Name - Service name that is configured. Use the response from the previous response

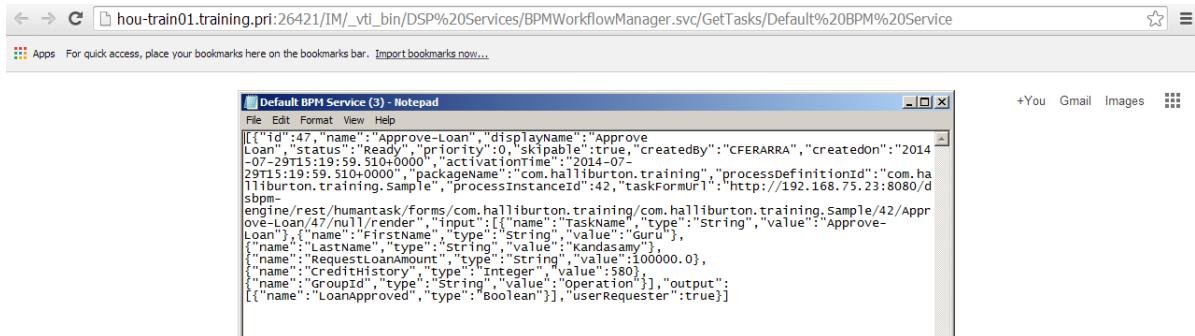
Example:

[http://hou-train01.training.pri:26421/IM/vti\\_bin/DSP%20Services/BPMWorkflowManager.svc/GetTasks/Default\\_BPM\\_Service](http://hou-train01.training.pri:26421/IM/vti_bin/DSP%20Services/BPMWorkflowManager.svc/GetTasks/Default_BPM_Service)

### Note

This will use the current logged in user context to get pending tasks from BPM.

2. Open a browser and enter the constructed URL and press **Enter** to view the data from DSDS as below:



## **Call Service Method to get Task Details by Task Id**

1. Construct the service URL using the following template:

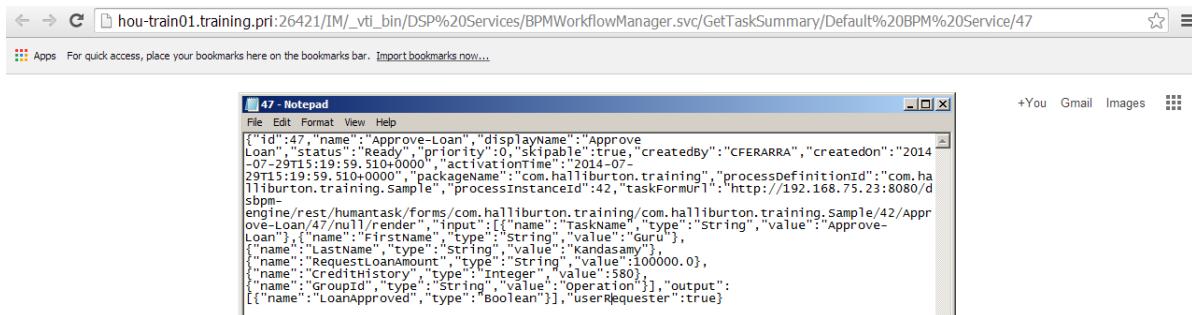
[http://<<Server>>:<<Port>>/<<AppUrl>>/vti\\_bin/  
DSP%20Services/BPMWorkflowManager.svc/GetTaskSummary/  
<<Service Name>>/<<Task ID>>](http://<<Server>>:<<Port>>/<<AppUrl>>/vti_bin/DSP%20Services/BPMWorkflowManager.svc/GetTaskSummary/<<Service Name>>/<<Task ID>>)

- Server - the web framework server name
  - Port - the Web framework port number
  - AppUrl - Application URL
  - Service Name - Service name that is configured. Use the response from the previous response
  - Task ID - ID of a task in BPM

Example:

[http://hou-train01.training.pri:26421/IM/\\_vti\\_bin/\\_DSP%20Services/BPMWorkflowManager.svc/GetTaskSummary/\\_Default BPM Service/47](http://hou-train01.training.pri:26421/IM/_vti_bin/_DSP%20Services/BPMWorkflowManager.svc/GetTaskSummary/_Default BPM Service/47)

2. Open a browser and enter the constructed URL and press **Enter** to view the data from DSDS as below:



The screenshot shows a Microsoft Edge browser window with the URL `hou-train01.training.pri:26421/IM/_vti_bin/DSP%20Services/BPMWorkflowManager.svc/GetTaskSummary/Default%20BPM%20Service/47`. Below the address bar, there's a message: "For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...". The main content area displays a JSON object representing a task summary. The JSON structure includes fields like `id`, `name`, `status`, `priority`, `createdBy`, `createdOn`, `activationTime`, `processDefinitionId`, `processInstanceId`, `taskFormUrl`, and `skipable`. It also contains input parameters such as `FirstName`, `LastName`, `RequestLoanAmount`, `CreditHistory`, and `Groupid`, along with their respective values.

```
{
  "id": 47,
  "name": "Approve-Loan",
  "displayName": "Approve Loan",
  "status": "Ready",
  "priority": 0,
  "skipable": true,
  "createdBy": "CFERARRA",
  "createdOn": "2014-07-29T15:19:59.510+0000",
  "activationTime": "2014-07-29T15:19:59.510+0000",
  "processDefinitionId": "com.halliburton.training.sample",
  "processInstanceId": 42,
  "taskFormUrl": "http://192.168.75.23:8080/dspservice/rest/humantask/forms/com.halliburton.training/com.halliburton.training.sample/42/Approve-Loan/47/null/render",
  "input": [
    {
      "name": "TaskName",
      "type": "string",
      "value": "Approve-Loan"
    },
    {
      "name": "FirstName",
      "type": "string",
      "value": "Guru"
    },
    {
      "name": "LastName",
      "type": "string",
      "value": "Kandasamy"
    },
    {
      "name": "RequestLoanAmount",
      "type": "string",
      "value": "100000.0"
    },
    {
      "name": "CreditHistory",
      "type": "integer",
      "value": 580
    },
    {
      "name": "Groupid",
      "type": "string",
      "value": "operation"
    }
  ],
  "output": [
    {
      "name": "LoanApproved",
      "type": "Boolean"
    }
  ],
  "userRequester": true
}
```

## Web Framework vs. SharePoint

*How SharePoint is leveraged*

DS Web Framework Platform Component	SharePoint Component Used
Web Framework Portal	SharePoint Web Application
Portal Base	Root Site collection in SharePoint Web App
Application	Sub-site using a web template
Plugins	SharePoint Solutions
Web Framework Integration Services	Custom web services hosted in SharePoint (ISAPI)
Page Layouts	SharePoint Page Template & Master Page
Page Templates	SharePoint Page Template, Master Page & Web Parts
Pages	Instance of Page Templates in SharePoint Document Library
Web Parts	SharePoint Web Parts
Settings & Configurations	SharePoint Lists

---

## **Exercise 9: Setup Forms-Based Authentication**

---

### **Purpose of the Exercise**

Create Web Framework Portal which uses FBA authentication.

### **Outcome of the Exercise**

Use a Web Framework Portal which uses the FBA login screen to authenticate users.

### **Exercise Workflows**

- Create FBA Web Framework Portal
- Validation of Internal and External sites
- External site setup for user access
- External site validation by logging in as the user

### **Create FBA Web Framework Portal**

1. Open the Web Framework Management tool by selecting **Start > All Programs > Landmark > DecisionSpace Integration Services > Web Framework Management**.

2. In the Web Framework Management tool, click the **Create Web Framework** link.

Some fields are pre-populated.

<b>Create</b>	Web Framework Name: <input type="text" value="Web Framework"/> Port Number: <input type="text" value="40146"/> Auth Mode: <input type="text" value="NTLM"/> Web Framework Owner: <input type="text" value="Select"/> App Pool Owner: <input type="text" value="Select"/> Theme: <input type="text" value="DefaultStyle"/> Host Header: <input type="text"/>
<b>Delete</b>	<a href="#">Web Framework</a> <a href="#">Application</a>

- **Web Framework name:** When the Web Framework site is created and displays to users of the Web Framework, the title of the Web Framework will be based on what is entered here. The default value is Web Framework.  
Example: FBA Web Framework.
- **Port Number:** By default, this is a randomly generated port number. Use any number between 1 and 65535. Accept the default or enter another port number. If Host Header is specified then tool will not validate port number. If Host Header is not specified then the tool will validate the port number; if the port number is already in use, a message prompt displays. Pick another number.

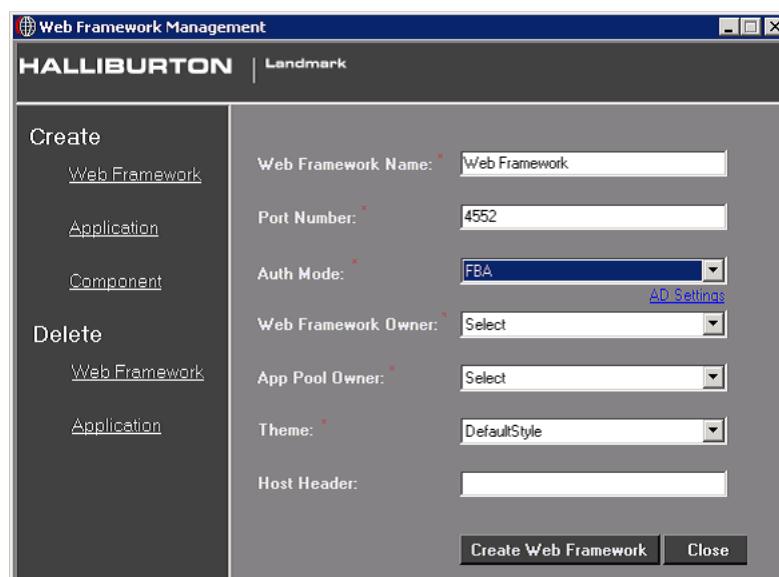
#### Note

Make a note of this Port number which will be used for Internal site.

- **Auth Mode:** Choose FBA as the authentication mode.  
**FBA:** Creates the Web Framework with claims mode FBA authentication.
  - Creates a (HTTP) Web Framework with claims mode NTLM authentication for internal administrators, extends

the site, and creates a Secure (HTTPS) Claims Based FBA Authentication site for external and internal users.

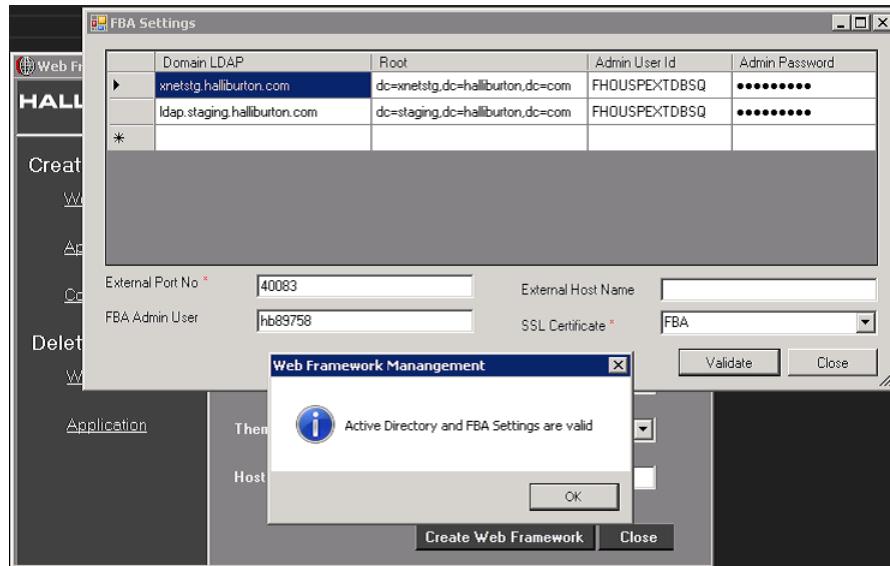
- Both Web Frameworks share the same content database.
- External AD can be used for authentication.
- Users must be added using the FBA site.
- Click **Settings** to specify the AD details.
- **Active Directory details:** FBA only. Specify the active directories that the Web Framework needs to use:
  - Domain LDAP: Active Directory LDAP detail (Example: Training.pri)
  - Root: Active Directory Root detail (Example: dc=training,dc=pri)
  - Admin User Id/Password: Credentials with permissions to retrieve members and roles from AD
  - (Ex. Admin UserId - lgcadmin; Admin Password - LGC\_admin!23)



- **External Site Port No:** FBA only. Enter the extended port number for the Claims-based FBA site, and then click **Verify** to validate whether the port number is available.

**Note**

Make a note of this Port number which will be used for External site.

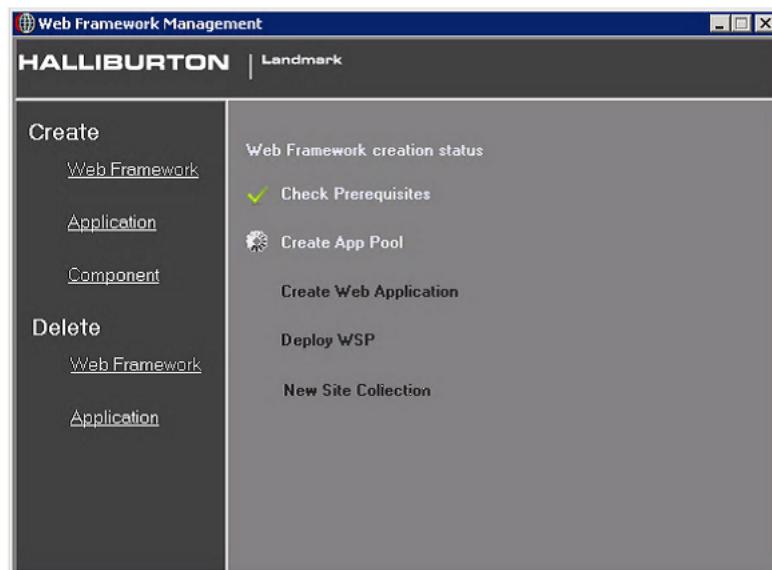


- **SSL Certificates:** FBA only. Select one of the available certificates from the SSL certificate drop-down. Selection of a certificate is mandatory; it is used to create the secure (HTTPS) Web Framework.  
If no certificates are listed, create one or more now using the steps in FBA Changes for HTTPS. Then close the settings screen and open again. The newly created certificate(s) will be listed in the **SSL Certificate** drop-down.
- **FBA User Name:** FBA Only. Enter a user name that belongs to any one of the specified Active Directories. FBA User Name is mandatory.  
This will be the only user having permissions to log into the External FBA site and can add further users.
- **Extended Host Header:** FBA Only. Specify an Extended Host Header value for the FBA Web Framework; for example: [LandmarkSoftware.com](http://LandmarkSoftware.com).  
If the Host Header was not configured before installing the Web

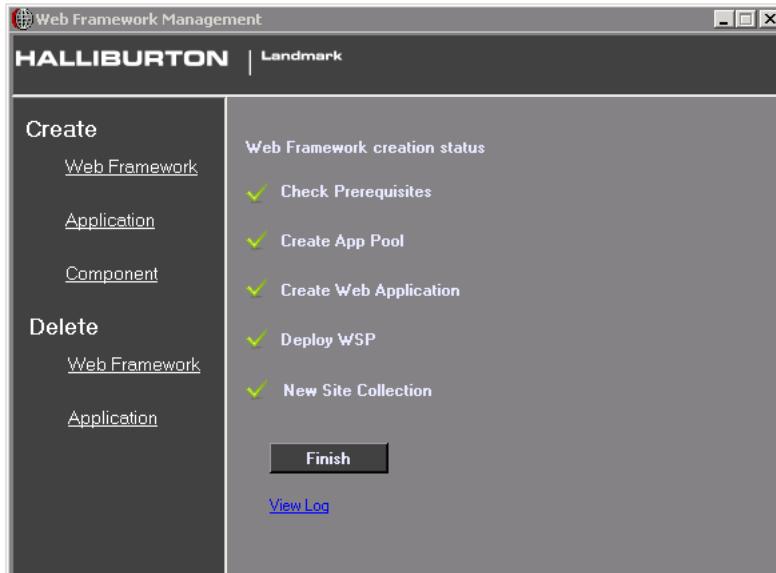
Framework, do so now. See Configure the Host Header. Click **Create Web Framework**.

- **Web Framework Owner:** Select a user to be the Site Collection Administrator for the Web Framework site.
- **App Pool Owner:** Select a user to be the App Pool Owner for the Web Framework site.
- **Theme:** Select the theme for the Web Framework. DefaultStyle is the dark theme.
- **Host Header:** Specify a Host Header value for the Web Framework; for example: [LandmarkSoftware.com](http://LandmarkSoftware.com).

After the required values are provided and the **Create Web Framework** button is created, the status of the Web Framework creation process displays.



The Web Framework creation process is complete when the **Finish** button becomes enabled.



3. Click **Finish**.
4. If there are errors creating the Web Framework, click the **View log** link.  
Launch the Portal as Administrator.

### **Validation of Internal and External Sites**

1. Using the port numbers that are used before, access both Internal site and External site.  
Example:

<http://hou-train01.training.pri:<Internal Port No>/>

<https://hou-train01.training.pri:<External Port No>/>

2. When the internal site is used, it should automatically log in as the current Windows user.
3. When the external site is used, the user is redirected to a Forms Based Login Screen.

**Note**

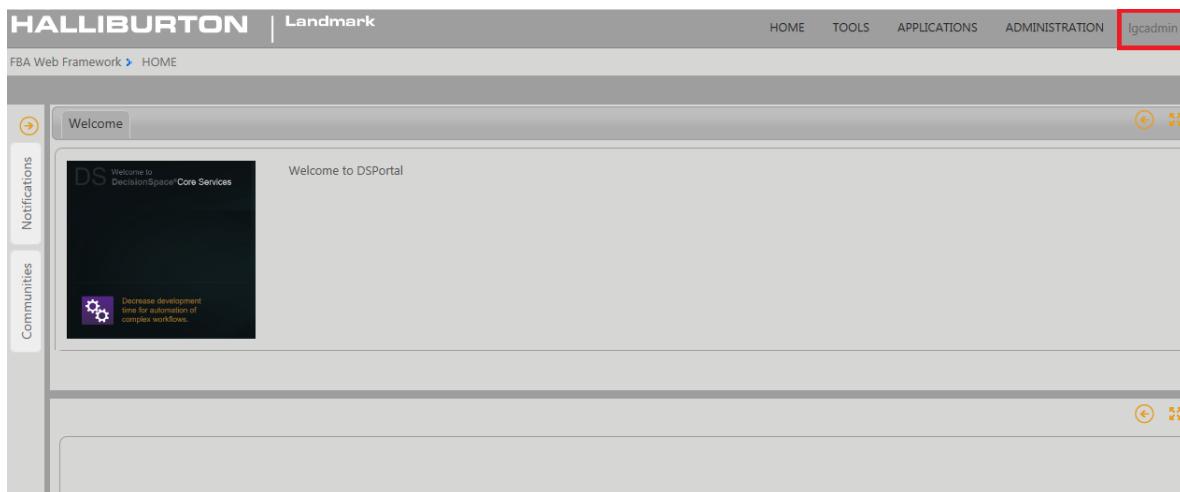
When External site is created, only Portal Owner has access to the site.

User name:

Password:

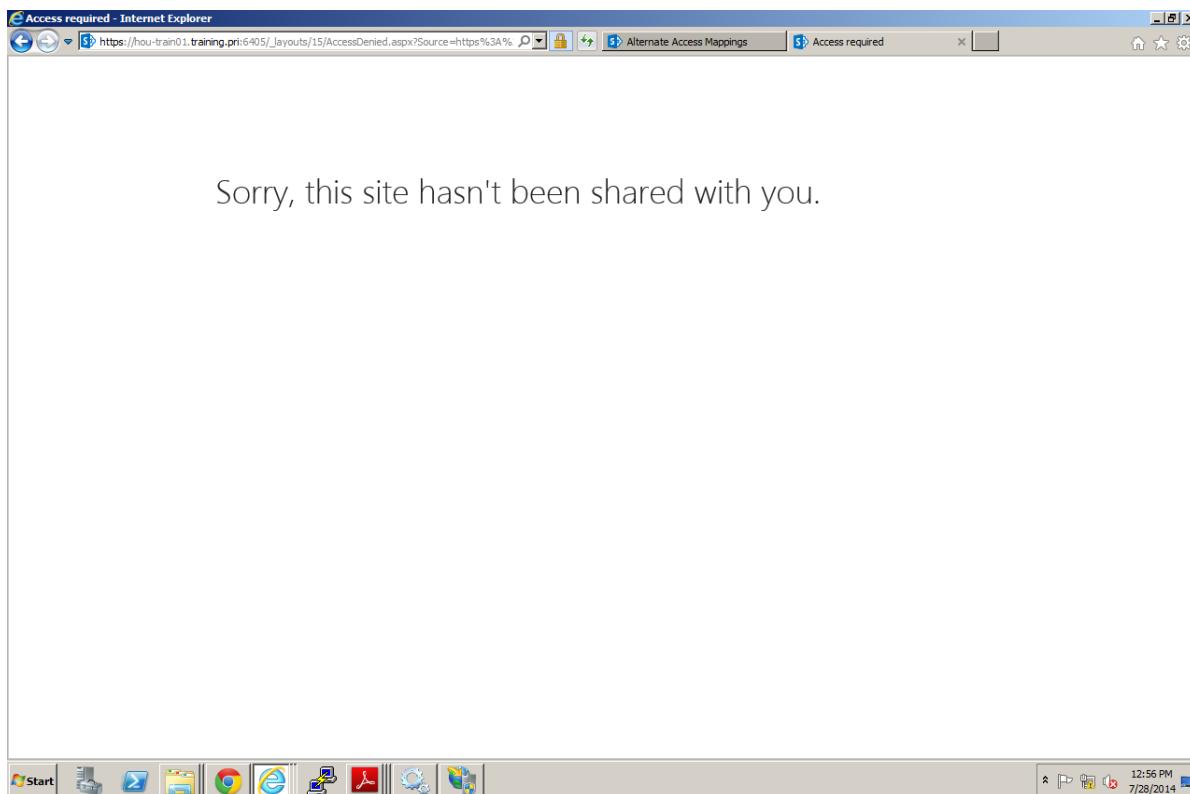
Sign me in automatically

4. Enter the username as lgcadmin and Password as **LGC\_admin!23**.
5. After successful authentication, the portal is accessed as the FBA user.



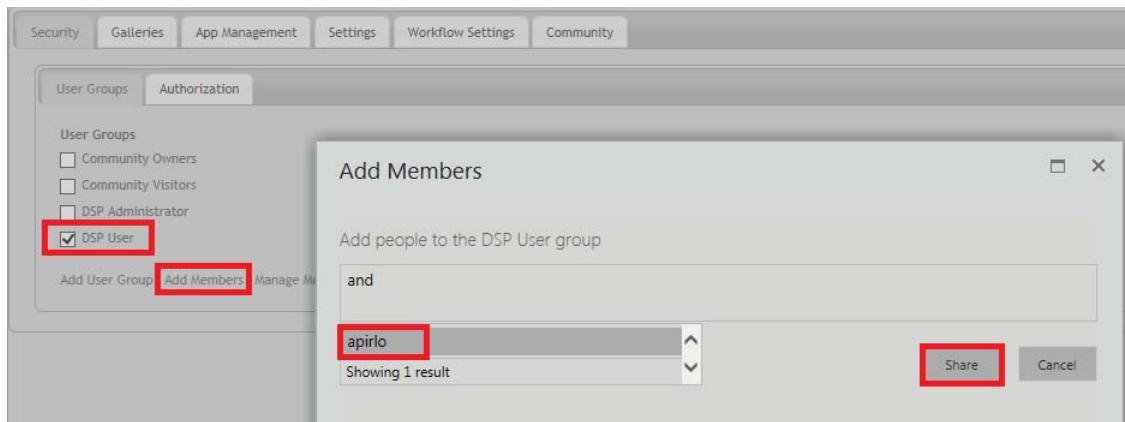
## External Site Setup and Validation for User Access

1. Login to external site using an end user account (username: apirlo & Password: Landmark1).
2. An error message displays, stating that the content is not shared with the user.

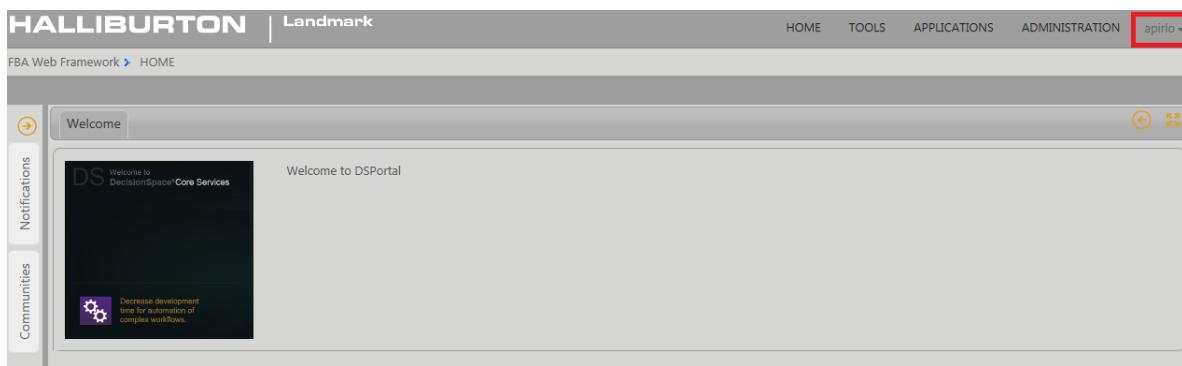


3. Now close the browser session and login as the admin user (lgcadmin).
4. After successful authentication, the portal is accessed as the FBA admin user.
5. Click **Administration**.
6. In **Security > User Groups** tab, select **DSP User**.
7. Click **Add Member**.

8. Add user apirlo and then click **Share**.



9. Now Sign Out and try to login as apirlo.



## Web Framework Customization

---

### You Need to Write Code If...

- You need a new page layout;
- You need a new page template;
- You need a new web part;
- You need a new Theme;
- If you want to use specific permissions for your page or web part;

Refer to detailed Development Guide:

C:\Program Files (x86)\Landmark\DSPortal\DS Portal SDK\ DSPortal\_5000.10.1\_Release\_DevGuide.pdf

*Reference Application & Reference Component shows sample of how to create Application and Plugin, respectively.*

### Skillset Needed:

- SharePoint Development experience around:
  - SharePoint Master Pages
  - SharePoint Page Templates and Web Parts
  - SharePoint Web Templates and Solutions
  - .NET WCF Services
- .Net Framework
- HTML5/JavaScript, CSS 3.0, jQuery, jQuery UI
- Infragistics(Optional)

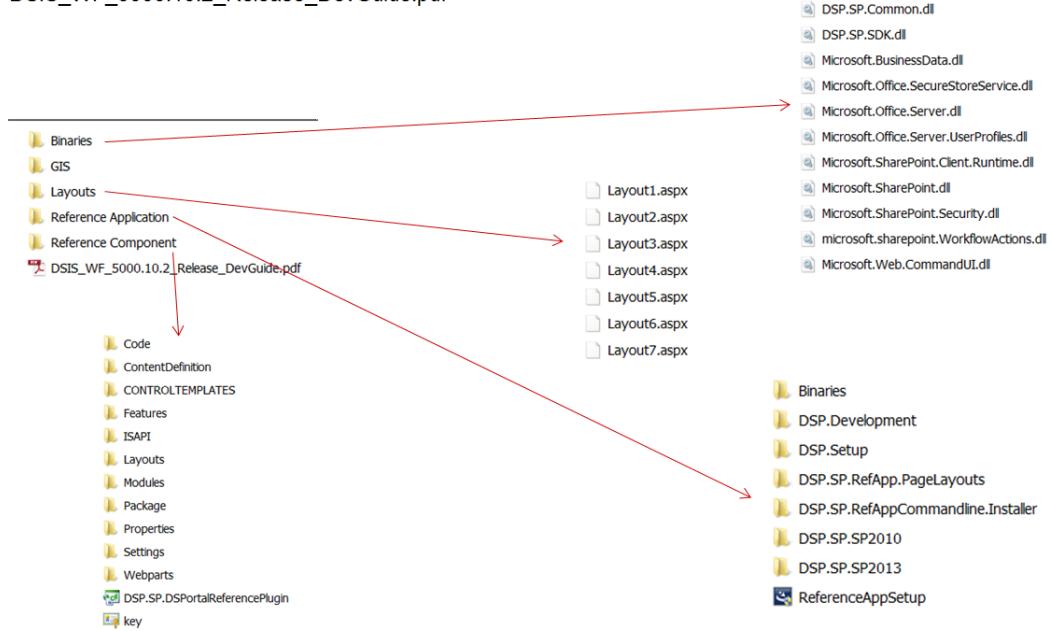
## Developing Applications and Plugins with Page Layouts, Page Templates and Web Parts

Once you have designed the application, following are the steps to plan for the development

- Create Application template
- Find out if there are existing plugins to support your requirement. If you want to use those plugins, add the dependency. If not create your own plugin and share it with the framework.
- Reuse Page Layouts or create new layouts as plugins
- Reuse page templates or create new templates as a part of plugin.
- Reuse webparts or create new webpart as a part of plugin.
- Reuse REST Service APIs that are available to communicate with other products and web framework. Create your own REST Services if you are exposing new functionality.
- Group your new components as one Plugin if it makes sense.
- Use SDK to communicate with the Web Framework or SharePoint
- Create your own setup for Application (which should include all your newly created plugins)

## Leveraging the SDK

Development Guide - C:\Program Files (x86)\Landmark\DSPortal\DS Portal SDK\DSIS\_WF\_5000.10.2\_Release\_DevGuide.pdf



## GIS Advanced

### Application Developer Configurations and Extensions

#### Application Developer Configuration

➤ Application Developer can Control GIS Options:

- Control available Symbols (Symbology)
- Control available Base Maps
- Control available services:
  - Geometry Service
  - Clip Service
  - Export Shapefile Service
- Control presentation of DecisionSpace® Search results
- Control GIS operation parameters (like timeout values when connecting to remote services)

**Note:** This configuration is separate from the code, but is not exposed to administrators or end-users of the Application.

#### Symbol Configurations

<http://<server>:<port>/<App-URL>/Lists/GISCustomSymbols/Forms/AllItems.aspx>



Type	Name	Modified	Modified By	Category
Basic	7/22/2014 4:22 PM	System Account		
Business	7/22/2014 4:22 PM	System Account		
Cartography	7/22/2014 4:22 PM	System Account		
OutdoorRecreation	7/22/2014 4:22 PM	System Account		
PeoplePlaces	7/22/2014 4:22 PM	System Account		
SafetyHealth	7/22/2014 4:23 PM	System Account		
Transportation	7/22/2014 4:23 PM	System Account		

Add new item

## Base Maps Configurations

<http://<Server>:<Port>/<App-Url>M/Lists/GIS%20Mapping%20Base%20Maps/AllItems.aspx>

The screenshot shows a SharePoint list titled 'GIS Mapping Base Maps'. The columns are 'Title', 'BaseMapType', 'MapServiceURL', 'ThumbnailImage', and 'DisplayName'. The data includes various base map types like Streets, Topographic, Imagery, USA Topo Maps, Ocean, Light Gray Canvas, Terrain, Shaded Relief, and OpenStreetMap, each with its corresponding URL and display name.

<input type="checkbox"/>		Title	BaseMapType	MapServiceURL	ThumbnailImage	DisplayName
		Streets	ArcGIS Server	<a href="http://services.arcgisonline.com/ArcGIS/rest/services/World_Street_Map/MapServer">http://services.arcgisonline.com/ArcGIS/rest/services/World_Street_Map/MapServer</a>		Streets
		Topo	ArcGIS Server	<a href="http://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer">http://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer</a>		Topographic
		Imagery	ArcGIS Server	<a href="http://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer">http://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer</a>		Imagery
		USA Topo Maps	ArcGIS Server	<a href="http://services.arcgisonline.com/ArcGIS/rest/services/USA_Topo_Maps/MapServer">http://services.arcgisonline.com/ArcGIS/rest/services/USA_Topo_Maps/MapServer</a>		USA Topo Maps
		Ocean	ArcGIS Server	<a href="http://services.arcgisonline.com/ArcGIS/rest/services/Ocean_Basemap/MapServer">http://services.arcgisonline.com/ArcGIS/rest/services/Ocean_Basemap/MapServer</a>		Ocean
		Light Gray Canvas	ArcGIS Server	<a href="http://services.arcgisonline.com/ArcGIS/rest/services/Canvas/World_Light_Gray_Base/MapServer">http://services.arcgisonline.com/ArcGIS/rest/services/Canvas/World_Light_Gray_Base/MapServer</a>		Light Gray Canvas
		Terrain	ArcGIS Server	<a href="http://services.arcgisonline.com/ArcGIS/rest/services/World_Terrain_Base/MapServer">http://services.arcgisonline.com/ArcGIS/rest/services/World_Terrain_Base/MapServer</a>		Terrain
		Shaded Relief	ArcGIS Server	<a href="http://services.arcgisonline.com/ArcGIS/rest/services/World_Shaded_Relief/MapServer">http://services.arcgisonline.com/ArcGIS/rest/services/World_Shaded_Relief/MapServer</a>		Shaded Relief
		OpenStreetMap	ArcGIS Server	<a href="http://OpenStreetMap.org">http://OpenStreetMap.org</a>		OpenStreetMap

Add new item

## GIS Services Configurations

[http://<Server>:<Port>/<App-Url>/Lists/GIS%20Mapping%20Common%20Services/AllItems.aspx](http://<Server>:<port>/<App-Url>/Lists/GIS%20Mapping%20Common%20Services/AllItems.aspx)

The screenshot shows a SharePoint list titled 'GIS Mapping Common Services'. The columns are 'Title' and 'URL'. The data includes services like Geometry Service, Clip Service, Export ShapeFile Service, Proxy, and Print Service, each with its corresponding URL.

<input type="checkbox"/>		Title	URL
		Geometry Service	<a href="http://sampleserver6.arcgisonline.com/arcgis/rest/services/Utilities/Geometry/GeometryServer">http://sampleserver6.arcgisonline.com/arcgis/rest/services/Utilities/Geometry/GeometryServer</a>
		Clip Service	<a href="http://enau00050681.corp.halliburton.com:6080/arcgis/rest/services/ClipFeatures/GPServer/ClipFeatures">http://enau00050681.corp.halliburton.com:6080/arcgis/rest/services/ClipFeatures/GPServer/ClipFeatures</a>
		Export ShapeFile Service	<a href="http://enau00050681.corp.halliburton.com:6080/arcgis/rest/services/ExportShapeFile/GPServer/ExportShapeFile">http://enau00050681.corp.halliburton.com:6080/arcgis/rest/services/ExportShapeFile/GPServer/ExportShapeFile</a>
		Proxy	<a href="http://np1prxy801.corp.halliburton.com:80">http://np1prxy801.corp.halliburton.com:80</a>
		Print Service	<a href="http://enau00050681.corp.halliburton.com:6080/arcgis/rest/services/Utilities/PrintingTools/GPServer/Export%20Web%20Map%20Task">http://enau00050681.corp.halliburton.com:6080/arcgis/rest/services/Utilities/PrintingTools/GPServer/Export%20Web%20Map%20Task</a>

Add new item

## GIS operation parameter Configurations

<http://<Server>:<port>/<App-url>/Lists/GIS%20Parameters/AllItems.aspx>

Title	GIS Parameter	GIS Value
Service Timeout (seconds)	ServiceTimeout	120
Application Timeout (seconds)	ApplicationTimeout	120
Spatial Tolerance (meters)	SpatialTolerance	50
Server Proxy URL	ServerProxyURL	<a href="http://np1pny801.corp.halliburton.com:80">http://np1pny801.corp.halliburton.com:80</a>
Offline Mode	Offline	No

[Add new item](#)

## Key Takeaways for Developers

- The GIS Webpart is a reusable component that is very configurable and customizable
- Provides many out-of-the-box tools and behaviors:
  - Enhanced user experience, analytical and visual information (Pie Charts, Bubbles, Histogram, etc).
  - Supports advanced operations like clipping and merging to narrow down your data for further processing
- Domain-specific application pages should be created with appropriate map configuration(s)
- Leverage web part communication to add value to the maps being displayed in GIS.

### Examples:

- Display selected objects on a GIS map;
- Display dashboards and analytical reports based on data on a map (e.g., well status dashboards);
- Display search results on a GIS map;
- Associate unstructured data (documents) with objects on a map;
- Enhance object properties by merging new attributes by executing a Data Query;
- Map data can be loaded from multiple sources.
- Fully integrated with platform components like Data Query, Shopping Cart, Search etc.

***Business Process Management Advanced***

## Custom Workflow Form

## Custom Workflow Form (Development Required)

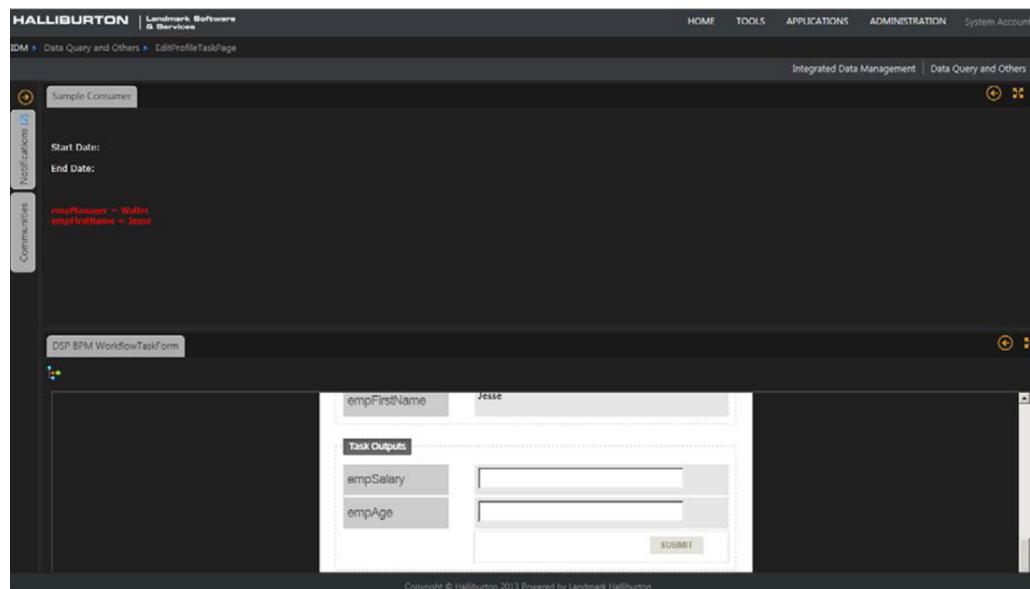
- Administration -> Workflow Settings will allow the admin to configure an Application page to be viewed instead of DS BPM Page
  - The Page should understand the Workflow context or it can use Workflow Form Webpart which displays the Form and status image. It also communicates the Input data to other webparts in the page.
  - Refer to page 92 in Admin Guide (C:\Program Files (x86)\Landmark\DSPortal\Documentation\DSIS\_WF\_5000.10.2\_Release\_AdminGuide.pdf)

Add Workflow Page Configuration

Workflow Name	com.halliburton.training.Sample
Task Name	Approve-Loan
Application	IM App
Page Name	US DOE Wells

## Custom Workflow Form (Development Required)

- Clicking on View Form will take the user to the configured page instead of pop-up



---

## Advanced Plugins and Integration

---

### ***PLUGIN: Application Launch***

#### **Overview**

**Application Launching Feature of DS Web Framework provides:**

- Access to Citrix XenApp Applications
- Access to Applications published as web links

System administrator can set application entitlements based on user's access

**Through DS Web Framework, Users can:**

- Launch remote and streamed Citrix XenApp applications
- Search and locate applications using specific criteria
- Add applications to favorites list

## **PLUGIN: Generic iFrame**

### **Overview**

#### **Current Status**

- Allows to show any web page inside your application page.
- You can configure any public site or custom application page that is deployed in some other server to be shown inside an iFrame.
- It can pass the message that was received to underlying page as query string parameters.

#### **Administrators can**

- Manage the Generic iFrame configurations for pages.
- Create pages using templates that uses Generic iFrame webpart and configure those webparts to use the created configuration.

#### **End Users can**

- View any external page inside Application page.

#### **Developers can**

- Design their external application in such a way that it can communicate with other webparts in the Web Framework
- Can create configurations automatically that are needed by the application using SDK.

## **PLUGIN: Shopping Cart**

### **Overview**

#### **Current Status**

- Allows users to add items to the cart from the Search or GIS or Data Catalogue web part
- Manage items and submit selected items for processing

#### **What's Coming...**

- Integration with more Web parts

#### **Administrators can**

- Manage the Shopping Cart service that will be used
- Create and configure Types that can be added to the cart
- Manage Shopping Cart Configurations for pages

#### **End Users can**

- Use Search or GIS webpart to add items to cart
- Use the Shopping Cart webpart to Manage items

#### **Developers can**

- Leverage Shopping Cart Services to manage items in Cart from any custom webpart

## **PLUGIN: Custom Pages**

### **Overview**

#### **Current Status**

- Allows to show any SharePoint webpart inside your application page.
- You can create configuration with any OOB SharePoint webpart to be shown inside an application page.
- There is no communication between this webpart and other webparts.

#### **Administrators can**

- Manage the Custom Pages configurations.
- Create pages using templates that uses Custom Pages webpart and configure those webparts to use the created configuration.

#### **End Users can**

- View any SharePoint webpart inside Application page.

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## **Exercise 10: Create and Configure Custom Pages using OOB Page Template**

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### **Purpose of the Exercise**

Show how to use Custom Pages features.

### **Outcome of the Exercise**

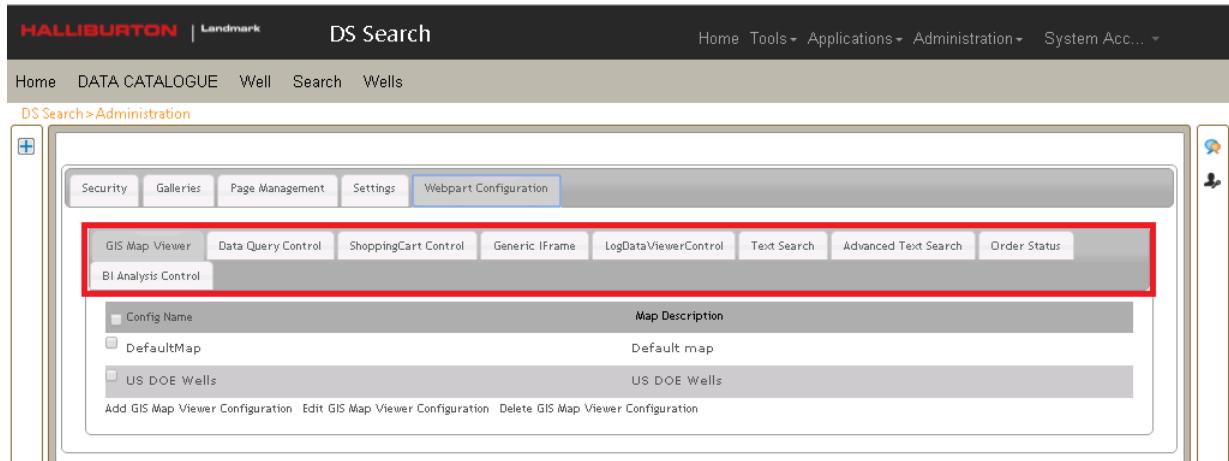
Use the SharePoint UI to create a configuration which has OOB SharePoint Webparts and then use it to show it in an application page.

### **Exercise Workflows**

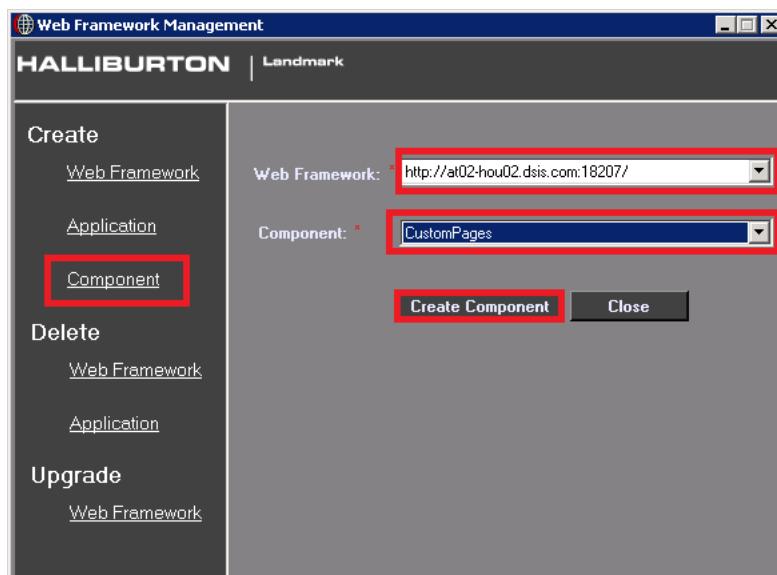
- Install Custom Pages Component into the Portal
- Create Custom Pages Configuration
- Create and Configure Page using OOB Page template
- View the page

## Install Custom Pages Component into the Portal

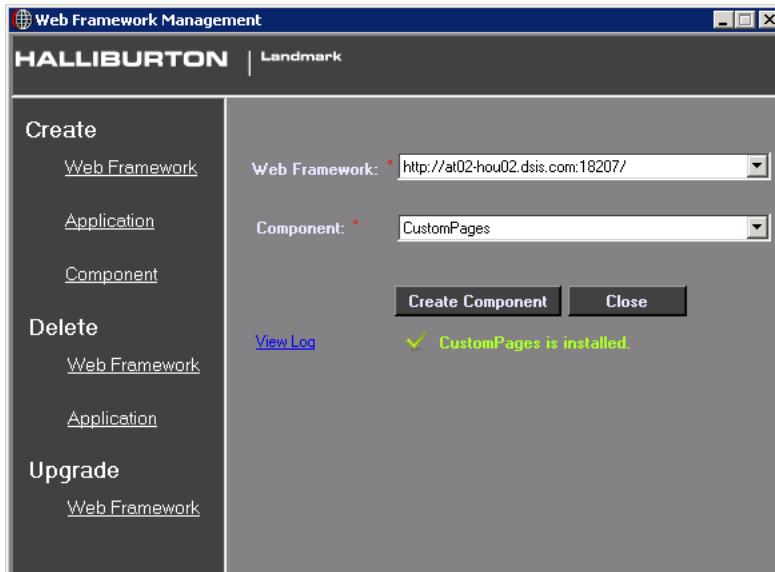
1. In IM App administration page, click **Webpart Configuration**.
2. By default, the Custom Pages component is not installed. Therefore, a tab is not displayed in the application administration page.



3. Launch the Web Framework Management Tool by selecting **Start > All Programs > Landmark > DecisionSpace Integration Services > Web Framework Management**.
4. Select the Components menu, select the Web Framework to be installed, select the Custom Pages component, and then click **Create Component** as shown below:

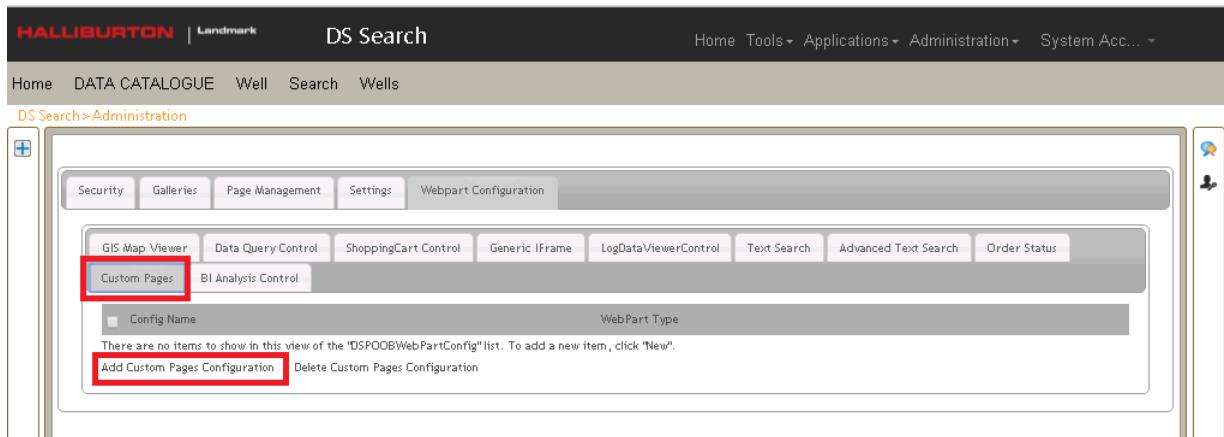


5. After the component is created, click **Close** to close the management tool.



## Create Custom Pages Configuration

1. Go back to the **Application Administration > Webpart Configuration** tab and make sure the **Custom Pages** tab is now available.
2. Click **Add Custom Pages Configuration** as shown below:



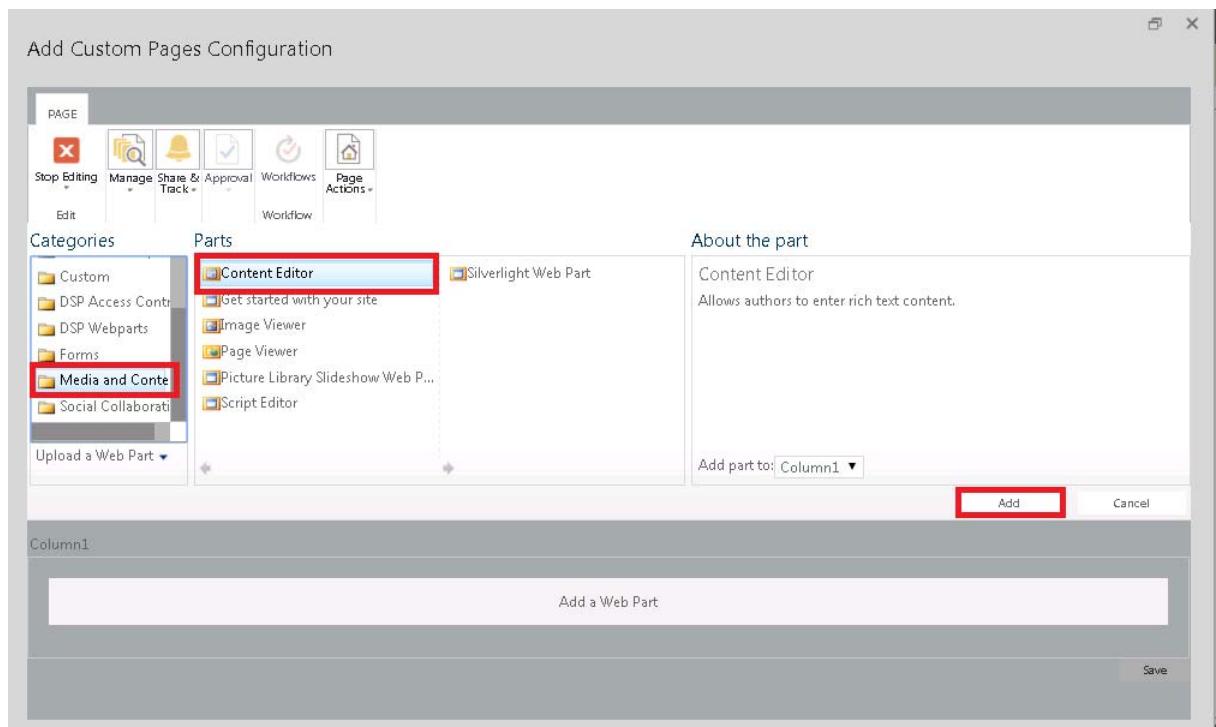
3. Select the **PAGE** menu and then click **Edit Page**.



4. After the page opens in edit mode, click **Add a Web Part**.



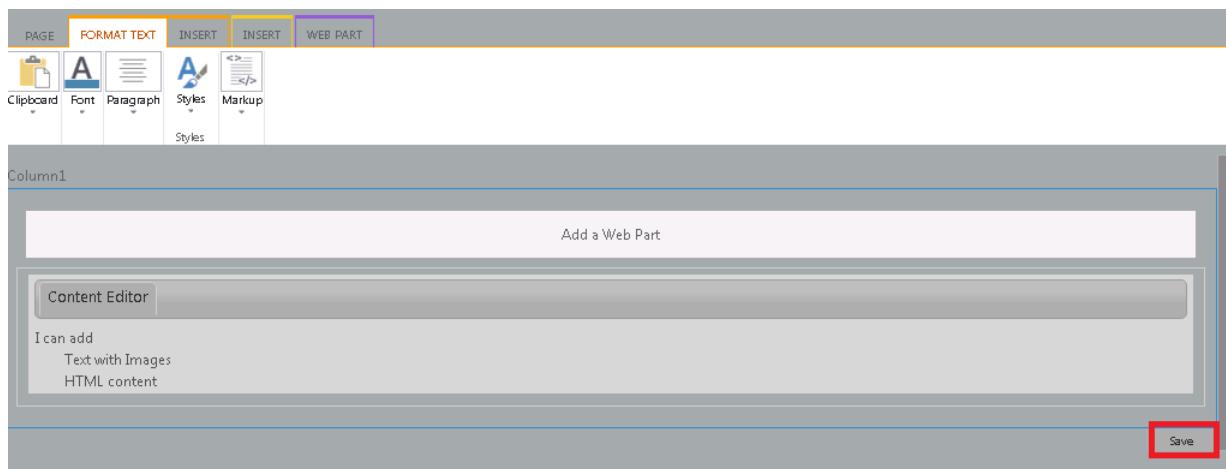
5. After the Web Part list loads, select the category as **Media and Content** and then add the Content Editor Web Part to the page by clicking **Add** as shown below:



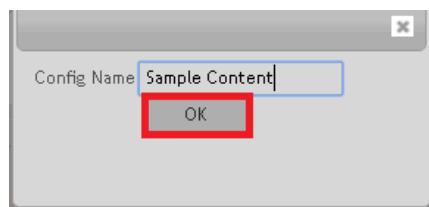
6. After the content editor webpart is added to the page, click **Click here to add new content**.



7. Enter some text and click **Save** as shown below:



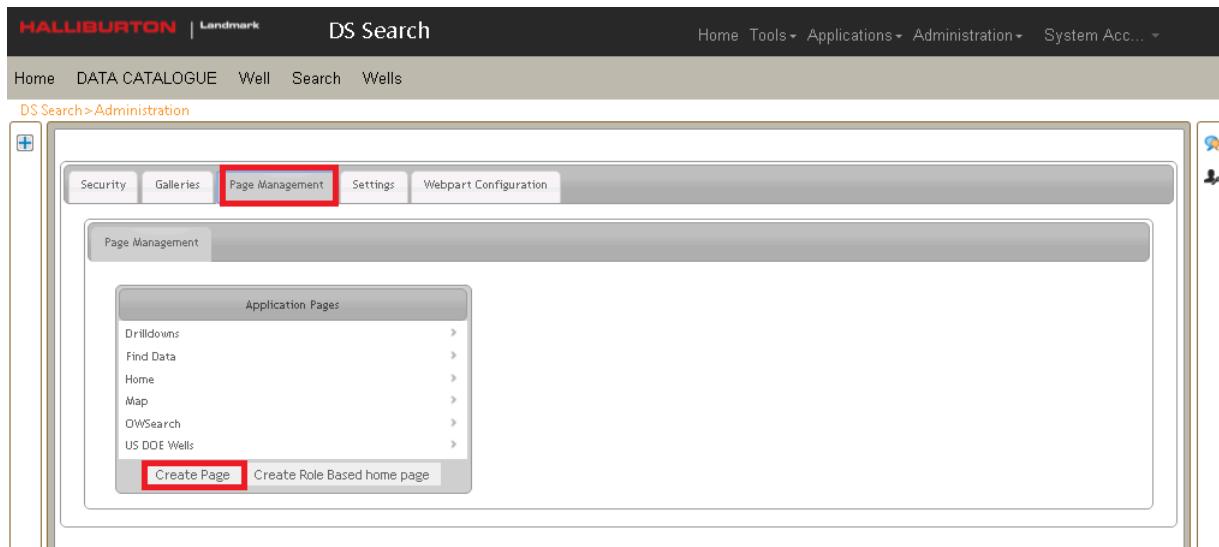
8. In the pop-up, enter a name for the configuration and click **OK**.



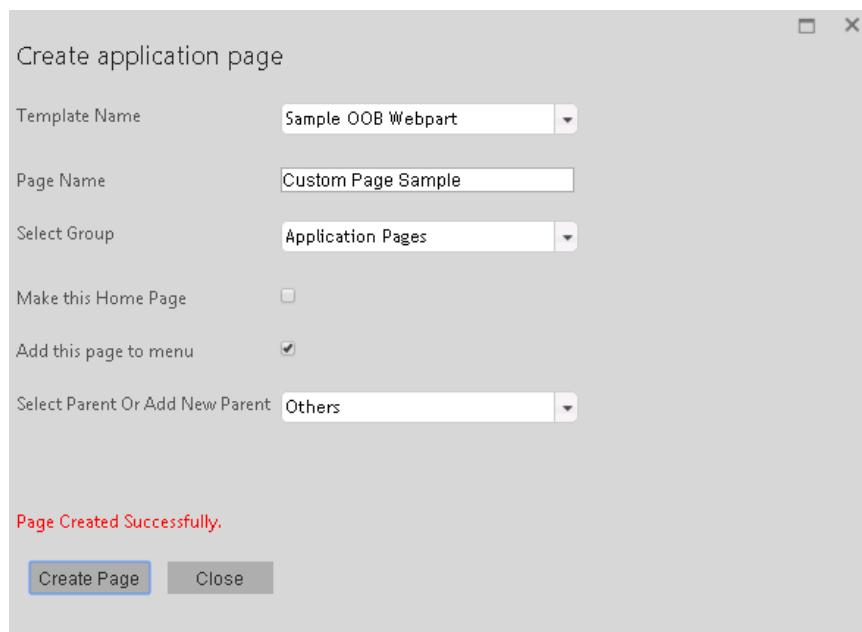
9. A Custom Pages configuration should be created as shown below:

## Create and Configure Page using OOB Page Template

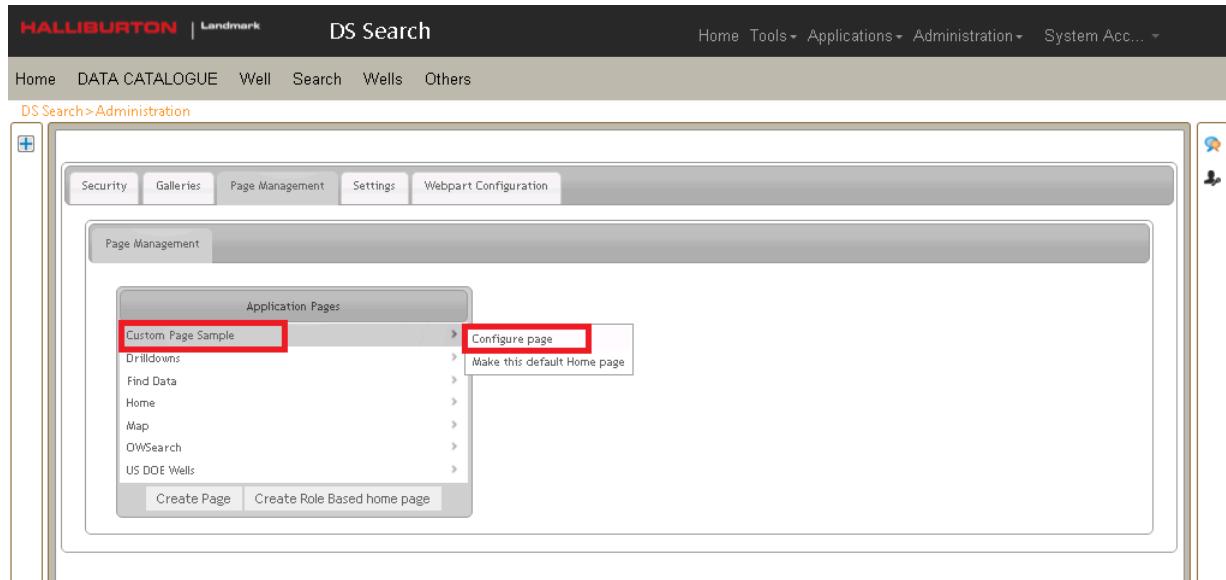
1. In IM App administration page, select **Page Management > Create Page**.



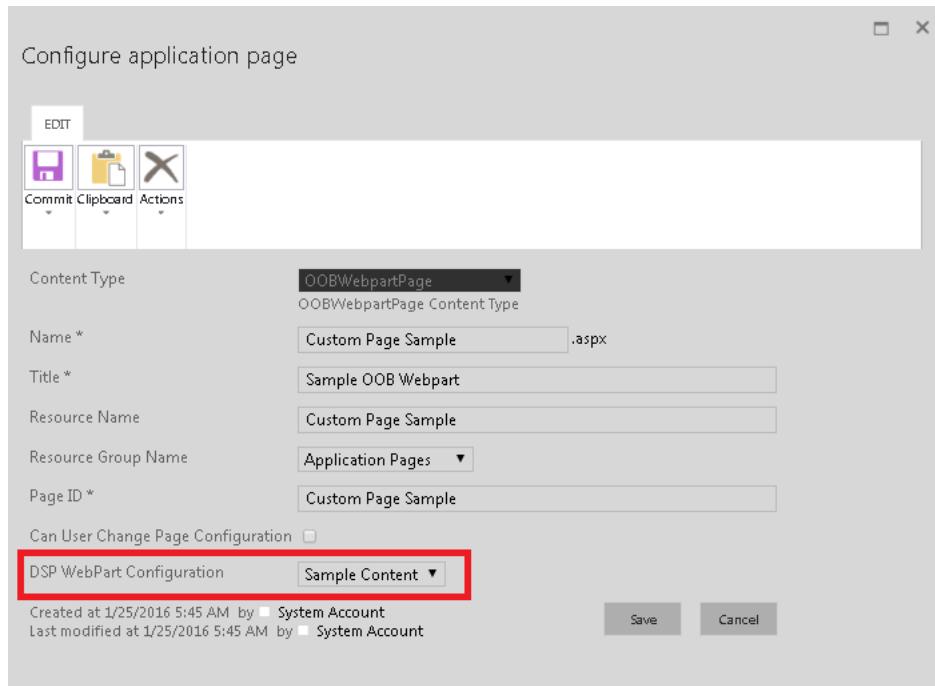
2. In the Create application page pop-up, select **Sample OOB Webpart** Page Template and enter other details as shown below and create page.



3. After clicking **Close**, the created page displays. Mouse-over the new page and click **Configure Page** as shown below:



4. In the Configuration screen, select the previously created **Custom Page Configuration**.

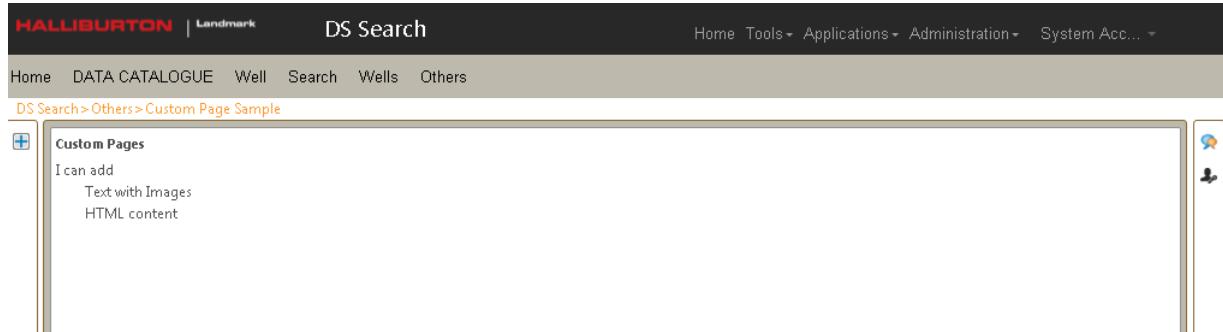


## View the Page

1. From the Application menu, click the newly created page.



2. The custom content that was added in the configuration is displayed as shown below:





# **Chapter 4**

# ***Configuration Options for Search***

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## **Overview**

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### ***Why Search is Important?***

- Quickly locate relevant information and data
- Everything starts with a search: find something and act on that information
- Knowledge can be easily shared across the enterprise

### ***Why Not Search the Databases Directly?***

- Data is everywhere, not just in databases
- Databases are not organized to provide quick and efficient search results
- Lots of common behavior can be centralized in the Search Server:
  - No need to navigate multiple data sources (structured + unstructured) on each search
  - Collaborative activities: rank results, provide comments, share
  - Faceting/Categorizing results
  - Pattern matching
  - Spatial searches
  - Consolidating and correlating the results

## **Introduction**

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DecisionSpace Search consists of a suite of technologies that help deliver enterprise search for the DecisionSpace platform. Its major features include powerful full-text search, hit highlighting, faceted search, near real-time indexing, dynamic clustering, database integration, rich document (for example, Microsoft Word, Adobe PDF) handling, and geospatial search.

DecisionSpace Search is powered by Apache Solr™ which is an open source enterprise search platform from the Apache Lucene™ project. See <http://lucene.apache.org/solr/> for more details.

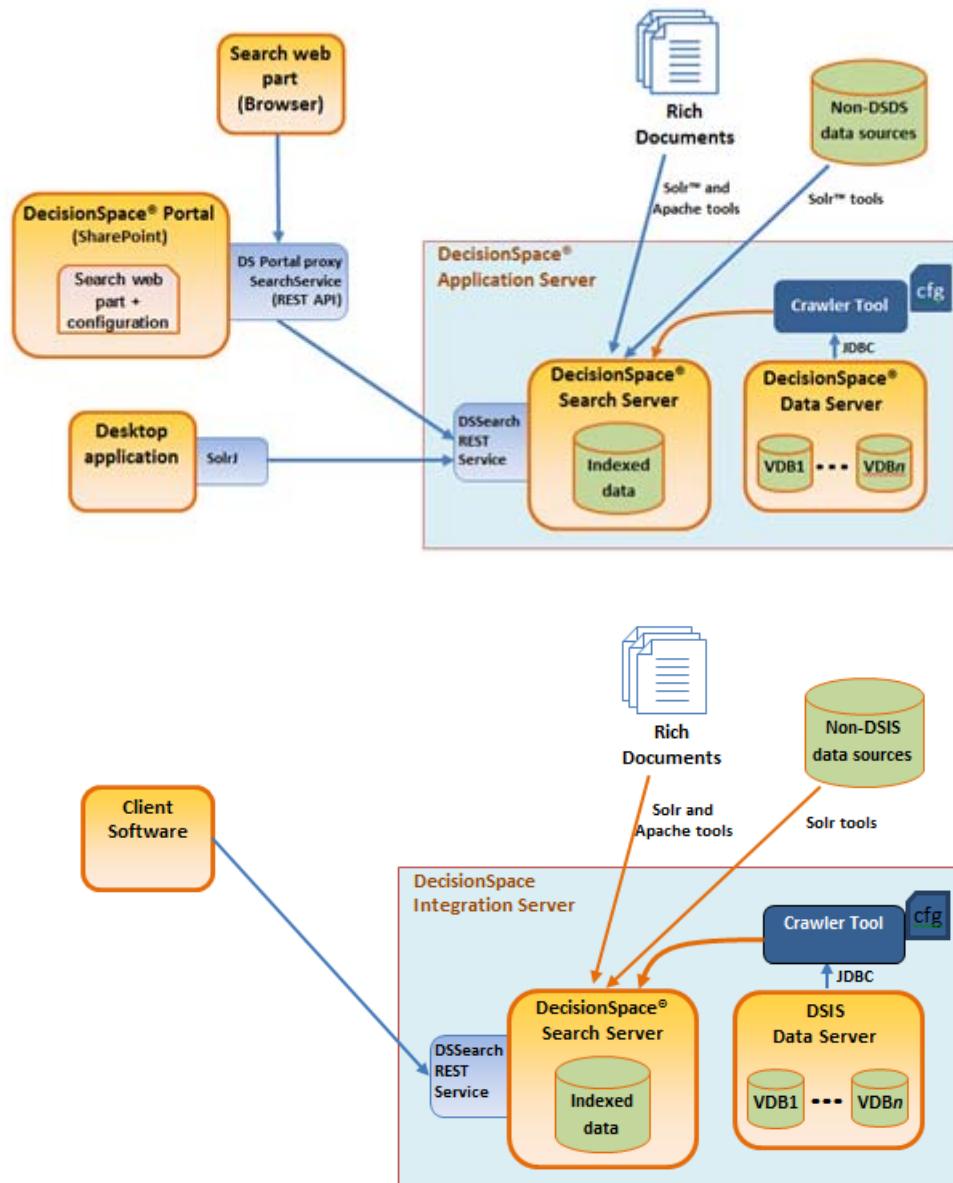
This guide is intended for Data Managers whose responsibility is to create searchable content for the enterprise using DecisionSpace Search. The content is then searched via a DecisionSpace Integration Server (DSIS) Web Framework webpart, or via a native application. For more information on how to search for data in the DecisionSpace Search Server, please refer to the DecisionSpace® Search Developer Guide.

The underlying technology allows searchable data to be populated from multiple sources including, but not restricted to, the following:

- Data sources in the DSIS Data Server
- Rich documents stored on the local file system
- Stand-alone data sources

DecisionSpace Search provides a Crawler tool that extracts data from configured data sources within the DSIS Data Server and feeds it to the search engine for indexing and storage. For all other data sources, Apache Solr provides out-of-the-box tools.

# Architecture



- **DecisionSpace Integration Server:** The JBoss open source application server to host DecisionSpace Platform services (Data Server, Search Server, etc.)
- **Crawler Tool:** An executable that extracts data from data sources for indexing and storage in the search engine.

- **DSIS Data Server:** Exposes virtual databases (VDBs) created by Data Managers to represent business views of the underlying data in relational form.
- **Solr and Apache tools:** Solr provides out-of-the-box capability to load data from any RDBMS data sources into Solr for indexing. In addition, it provides tools to import data from non-RDBMS sources, such as XML files, plain text files, and rich text documents.
- **Rich Documents:** Any text documents supported by Apache Tika™ framework (for example, Microsoft Word documents, Adobe PDF documents) and may contain metadata.

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## Features

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- Index (Google Type) and Query Based Search
- Spatial Search
- Hit Highlighting
- Faceted Search
- Near Real-Time Indexing
- Search Based on Entitlements
- View Related Items and Previous Search Criteria
- Search Common Model
- Search Rich Documents (PDF, Word, Excel, etc.)

## Search Information Flow

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- Identify all the data that should be available for enterprise search.
- If the searchable data is extracted from the DecisionSpace® Data Server VDBs, use the Crawler tool to index and store the data in the DecisionSpace® Search server.

**Note**

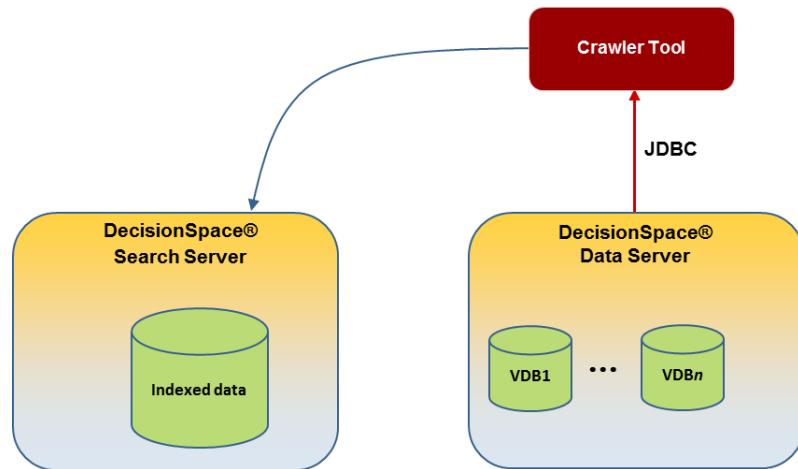
BLOB and CLOB data is not extracted by the Crawler tool.

- If the searchable data is extracted from a non-DSDS VDB, use the Apache Solr™ tools to index and store the data in the DecisionSpace® Search server.
- Once the data is indexed and stored in the DecisionSpace® Search server, clients can use the REST based web service to conduct search based on specified criteria and retrieve the results.
- Update the indexed and stored data on a regular basis as the source data changes.

## Crawler Tool with Dynamic VDB

### Uses Configuration Files

- VDBs
  - Include/exclude
- Tables
  - Include/exclude
- Related Items
  - Based on FK declarations in VDB
- Spatial Data
  - Based on specified tables (“spatial” data type column)

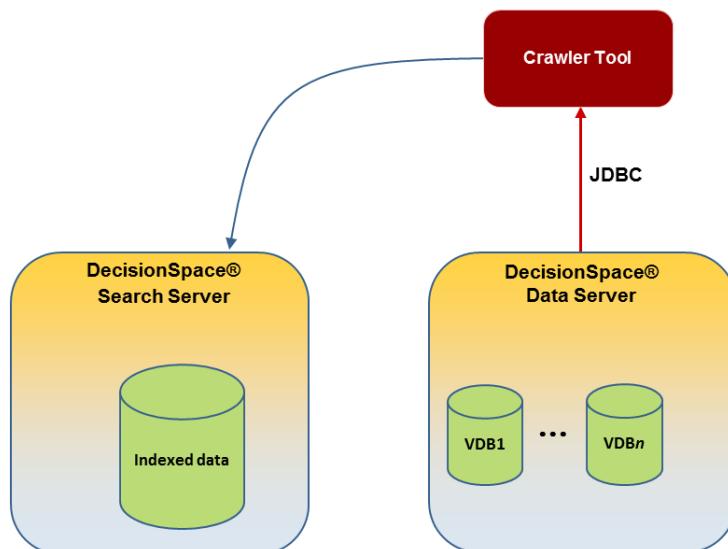


## Crawler Tool with Standard VDB

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### **Relies on Meta-Data in VDB**

- It is independent of any view model (OW5000, EDM, CommonModel, etc.)
- **Table** meta-data
  - Include/exclude
  - Table display name
- **Column** meta-data
  - Column indexed?
  - Column stored?
- **Related Items**
  - Based on FK declarations
- **Spatial Data**
  - Include/exclude



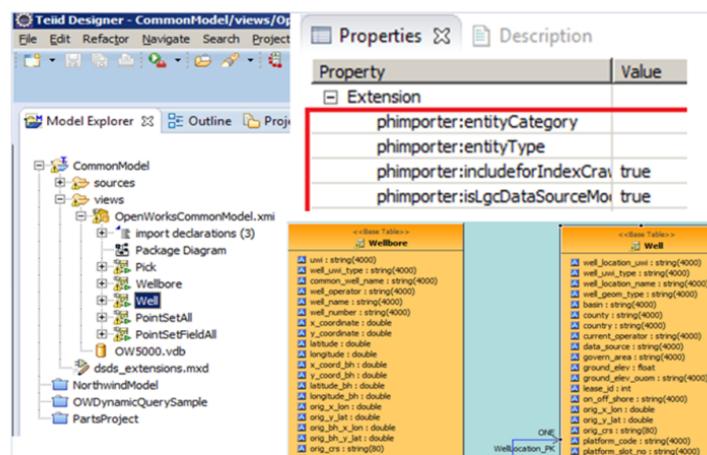
## Metadata in Standard VDBs

Object	Property	Default	Description
Table	includeforIndexCrawl	true	Set it to false to tell Crawler to ignore this table/view
	entityType	empty	Defaults to table name. User friendly name for entity instead of raw table name. This is useful to categorize or group related items; for example, group "Well_Location" and "WellBore" as same entity "Well" although they are different tables
Column	isIndexed	true	If "true", index this field
	isStored	true	If "true", store this field
FK	primaryKeyTableCols	empty	Comma separated list of columns for selecting from PK table; for example, "commonWellName" from "Wells" table in a Wells-Pick FK relation .

Works on **any** VDB including CommonModel VDB

**Example:** Table Metadata

Object	Property	Default	Description
Table	includeforIndexCrawl	true	Set it to false to tell Crawler to ignore this table/view
	entityType	empty	Defaults to table name. User friendly name for entity instead of raw table name. This is useful to categorize or group related items; for example, group "Well_Location" and "WellBore" as same entity "Well" although they are different tables



## Crawling Non-Data Server Data Sources Querying for Data

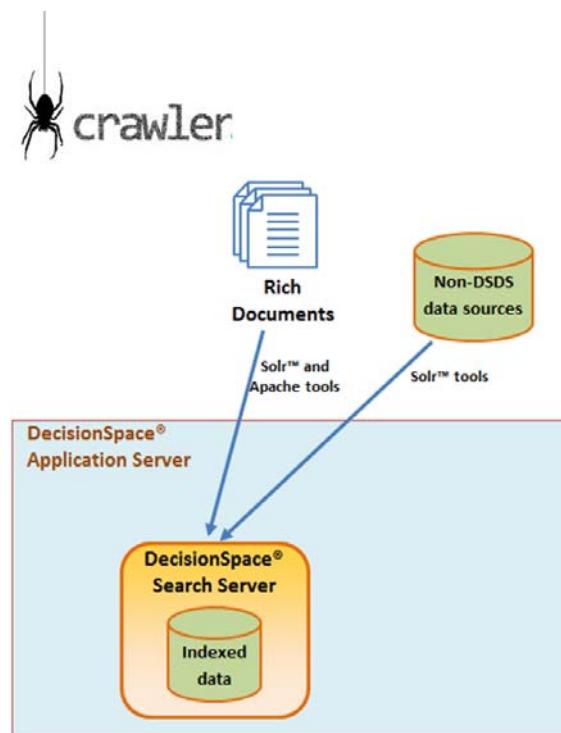
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### ***DataImportHandler Framework***

- Imports data via JDBC connectivity
- Imports data from a URL
- Imports data from files
- Extracts text and meta-data from rich document formats (via Apache Tika™)

### ***What Can be Crawled?***

- XML files
- Text files
- PDF files
- MSWord files
- Web sites
- Any JDBC compliant DS



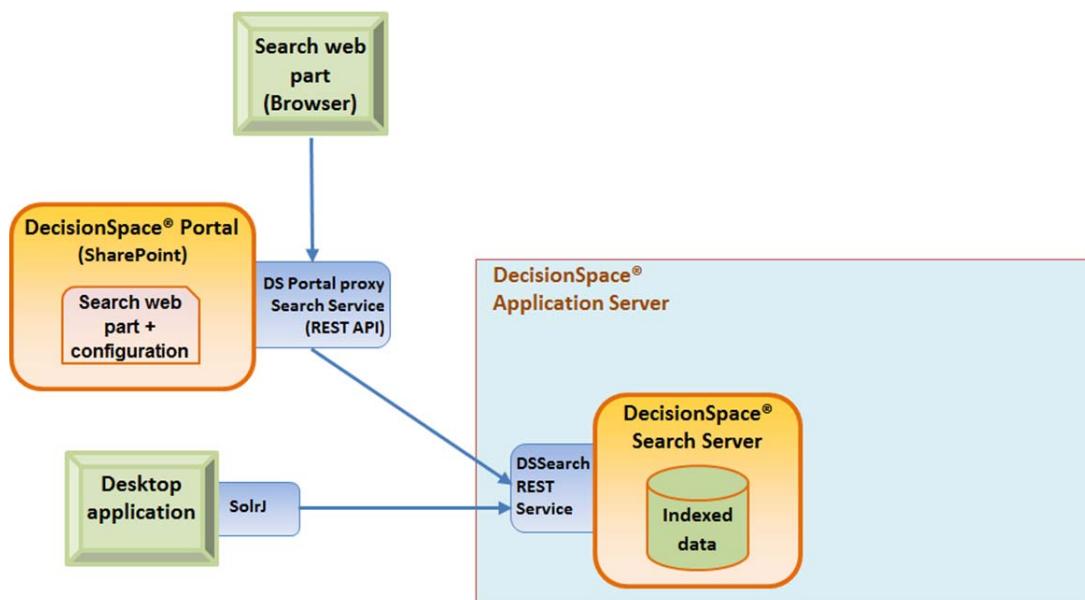
## Querying for Data

### Access via Search REST API

- No business logic support - pure REST API

### Access via DS Portal Proxy Search Service

- Acts as a proxy to the “Search” to avoid cross-domain communication issues from the browser
- Adds APIs to introduce search options to a UI
- Adds API to restrict search results based on the logged-on user ID



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## **Search Integration**

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### **Overview**

#### ***Key Features***

- Provides API to connect to DS Search Service
- Provides UI to search for Data
- Consumes message from GIS webpart to perform spatial search
- Integrates with Shopping Cart webpart

#### ***Includes***

- Search Webpart
- Find Data, Find Data & Order page templates
- Search Service

## Result View Sample

REFINE BY :	
category	<input type="checkbox"/> id: OpenWorks-OW5000-OW_TEAPOT_DOME-AppCordTrfrm-1. sys_primarykey: AppCordTrfrm.app_cord_trfm_id=1. AppCordTrfrm.app_cord_trfm_id: 1. AppCordTrfrm.coordinate_trfm_nm: Australian Map Grid Zone 48. AppCordTrfrm.r_geod_source_nm: EPSG. AppCordTrfrm.source_cord_sys: 41. AppCordTrfrm.target_cord_sys: 375. sys_idbcurr: jdbc:teiid:OpenWorks@mm://HOU-TRAIN01.training.prj:31000;version=1;ApplicationName=OW_TEAPOT_DOME. sys_entitytype: AppCordTrfrm. category: AppCordTrfrm.
	<input type="checkbox"/> id: OpenWorks-OW5000-OW_TEAPOT_DOME-AppCordTrfrm-2. sys_primarykey: AppCordTrfrm.app_cord_trfm_id=2. AppCordTrfrm.app_cord_trfm_id: 2. AppCordTrfrm.coordinate_trfm_nm: Australian Map Grid Zone 49. AppCordTrfrm.r_geod_source_nm: EPSG. AppCordTrfrm.source_cord_sys: 41. AppCordTrfrm.target_cord_sys: 378. sys_idbcurr: jdbc:teiid:OpenWorks@mm://HOU-TRAIN01.training.prj:31000;version=1;ApplicationName=OW_TEAPOT_DOME. sys_entitytype: AppCordTrfrm. category: AppCordTrfrm.
	<input type="checkbox"/> id: OpenWorks-OW5000-OW_TEAPOT_DOME-AppCordTrfrm-3. sys_primarykey: AppCordTrfrm.app_cord_trfm_id=3. AppCordTrfrm.app_cord_trfm_id: 3. AppCordTrfrm.coordinate_trfm_nm: Australian Map Grid Zone 50. AppCordTrfrm.r_geod_source_nm: EPSG. AppCordTrfrm.source_cord_sys: 41. AppCordTrfrm.target_cord_sys: 377. sys_idbcurr: jdbc:teiid:OpenWorks@mm://HOU-TRAIN01.training.prj:31000;version=1;ApplicationName=OW_TEAPOT_DOME. sys_entitytype: AppCordTrfrm. category: AppCordTrfrm.
	<input type="checkbox"/>

## List View Sample

---

The screenshot shows a search interface for a database of wells. The search bar at the top contains the text "SEARCH :". Below it are buttons for "Advanced Search" and a red-bordered "Calendar" icon. The search results are displayed in a table with columns: Actions, Well.wellid, Well.uwi, Well.well\_operator, Well.state, Well.county, and Well.elev\_type.Well.well\_name. The results show five entries, each with a checkbox and a "Quick View" link. The first entry is selected. The right side of the interface shows a summary table with the following data:

Well.wellid	1000
Well.uwi	490251093900
Well.well_operator	U.S. DOE
Well.state	WYOMING
Well.county	NATRONA

---

## **Exercise 1: Show Search based on System Document Files**

---

### ***Purpose of the Exercise***

The purpose of this exercise is to demonstrate how to crawl and search system files using Search.

### ***Outcome of the Exercise***

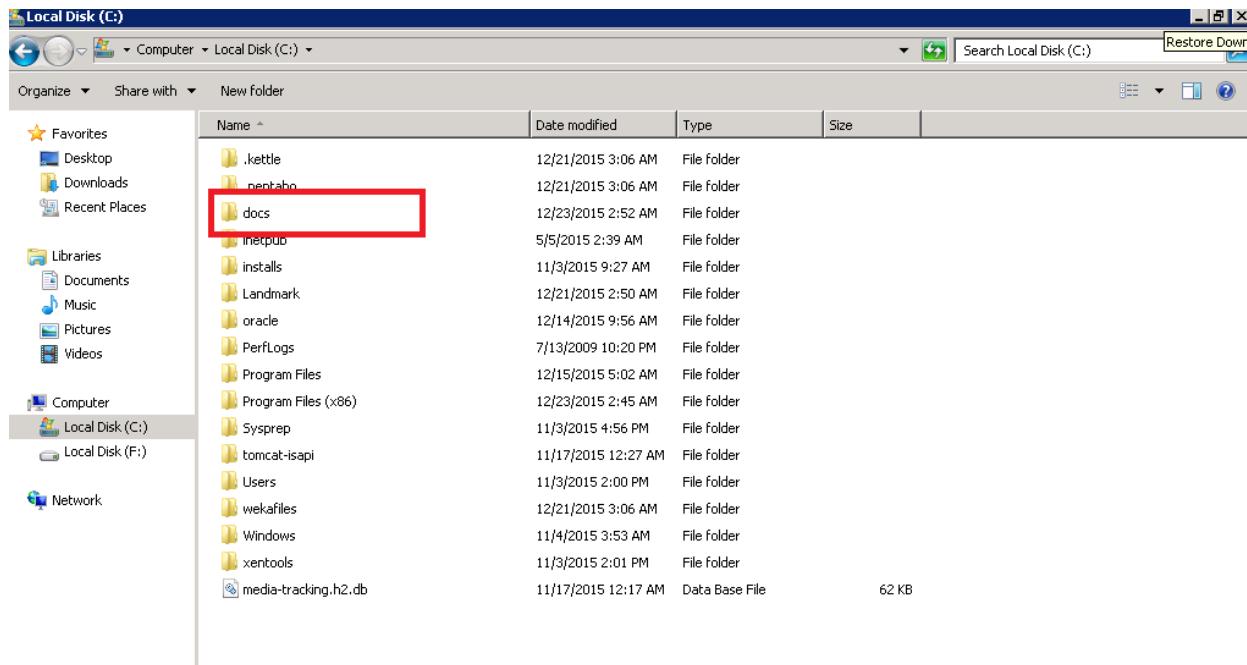
Search will be based on the content of system files. Results will display in the Portal.

### ***Exercise Workflows***

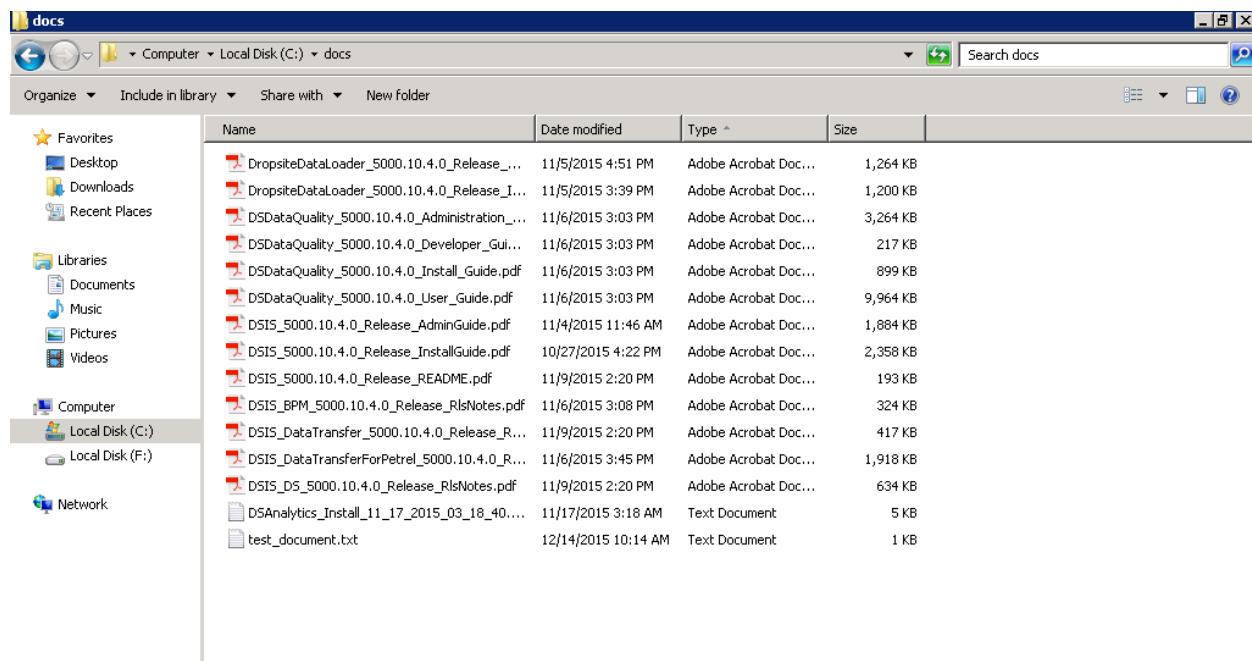
- Create files to index
- Crawl the folder that was created
- Configure Portal search settings
- View search results in Search webpart

## Create Files to Index

1. On the server where the Search is installed, create a folder called **Docs** in the **C:\** drive.



2. Inside the **Docs** folder, create/upload rich text files (PDF, Word, etc.) for the Search to index.



## Crawl the Folder that was Created

- Before crawling, access the Solr dashboard using the following link: <http://localhost:8080/solr>. Select **ds** as core selector, and ensure that none of the documents are indexed.

The screenshot shows the Apache Solr Admin interface. On the left, there's a sidebar with various navigation links like Dashboard, Logging, Core Admin, Java Properties, Thread Dump, and Replication. A dropdown menu is open under 'Core Admin' with 'ds' selected. The main area has two main sections: 'Statistics' and 'Instance'. The 'Statistics' section shows details for the last 30 minutes: Num Docs: 1, Max Doc: 1, Heap: 19049, Memory Usage: 0, Deleted: 0, Docs: 177, Segment: 1, Count: 1, Optimized: checked, and Current: checked. The 'Instance' section displays system paths and configurations: CWD: C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer\data\ds-search\crawler\db\default, Instance: C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer\data\ds-search\solr\dscore\ds, Data: C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer\data\ds-search\solr\dscore\ds\data, Index: C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer\data\ds-search\solr\dscore\ds\data\index, and Impl: org.apache.solr.core.NRTCachingDirectoryFactory.

- Open the **Document.xml** file from the following location: **C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer\data\ds-search\crawler\db\default\conf** folder.
- Please ensure that the following properties are set as shown below:
  - baseDir**: Enter the location (e.g., on disk or accessible network mapped location) of the files to be indexed
  - filename**: Enter the list of extensions of the files to be indexed

- **recursive:** Set it to **true** if the directory structure under the location defined for baseDir needs to be traversed, and all valid files found are already indexed. Otherwise, set it to **false**.

```

<document>
  <entity name="f"
    dataSource="null"
    rootEntity="false"
    processor="FILELISTENTITYPROCESSOR"
    baseDir="C:\docs"
    filename="*.(DOC)|(doc)|(TXT)|(txt)|(PDF)|(pdf)|(PPT)|(ppt)|(PPTX)|(pptx)"
    onError="continue"
    recursive="true" >
    <field column="fileAbsolutePath" name="id"/>
    <field column="fileSize" name="fileSize_i"/>
    <field column="fileLastModified" name="last_modified"/>
  <entity name="tika-test"
    dataSource="bin"
    processor="TikaEntityProcessor"
    url="${f.fileAbsolutePath}"
    format="text"
    onError="continue"
    transformer="TemplateTransformer,script:DTransformer">
    <!--
    <field column="sys_ismetadata" name="sys_ismetadata" template="false"/>
    <field column="sys_entitytype" name="sys_entitytype" template="Document"/>
    <field column="sys_model" name="sys_model" template="Document"/>
    <field column="sys_isfile" name="sys_isfile" template="true"/>
  
```

4. To index the documents, open a browser window and enter the URL for the Solr service followed by the DIH request:

`http://<server>:<port>/solr/ds/document?command=full-import&commit=true&clean=false&optimize=true`

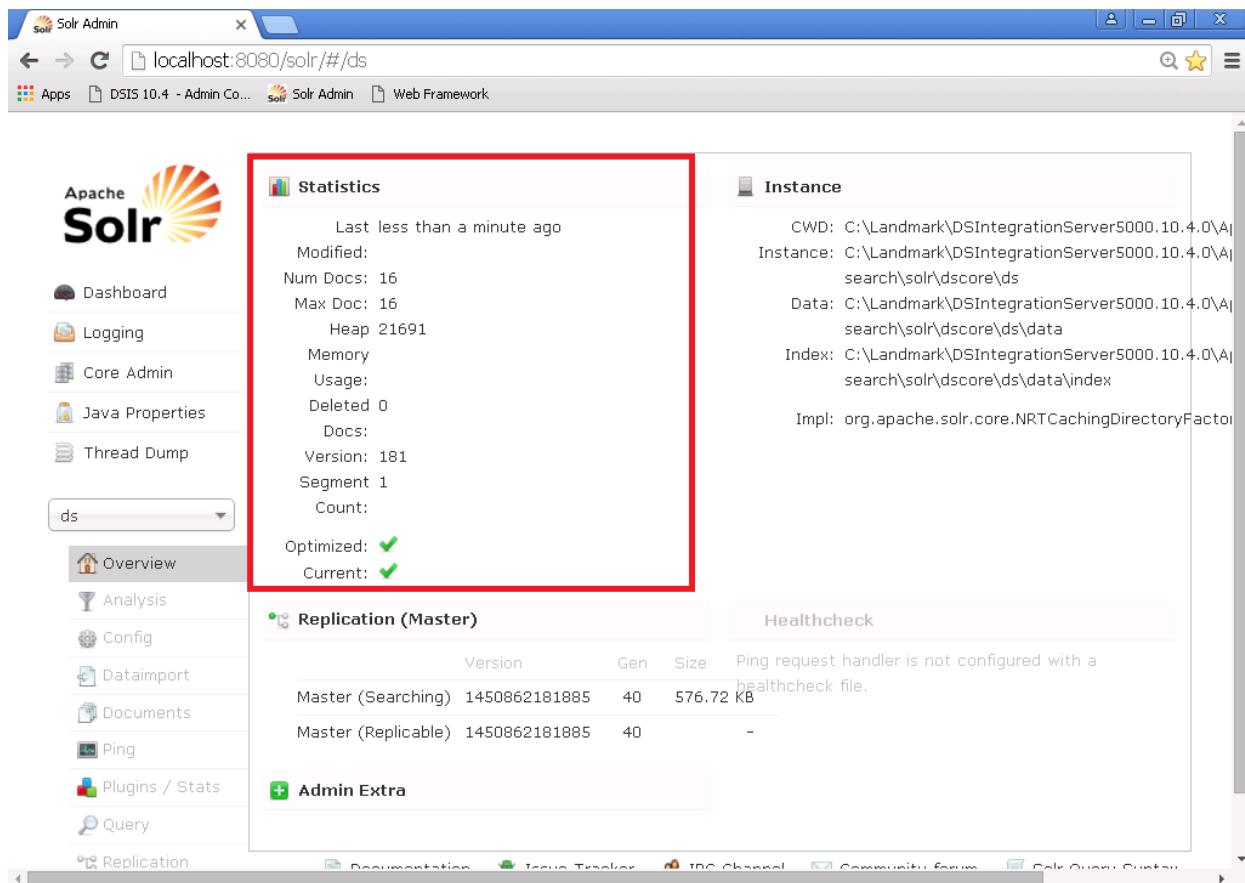
#### Example:

`http://hou-train01.training.pri:8080/solr/ds/document?command=full-import&commit=true&clean=false&optimize=true`

#### Note

This request will give out a response, but do not worry about the content of the response.

5. Access the Solr dashboard using the following link:  
<http://localhost:8080/solr>. Select **ds** as core selector and ensure that documents are indexed correctly.

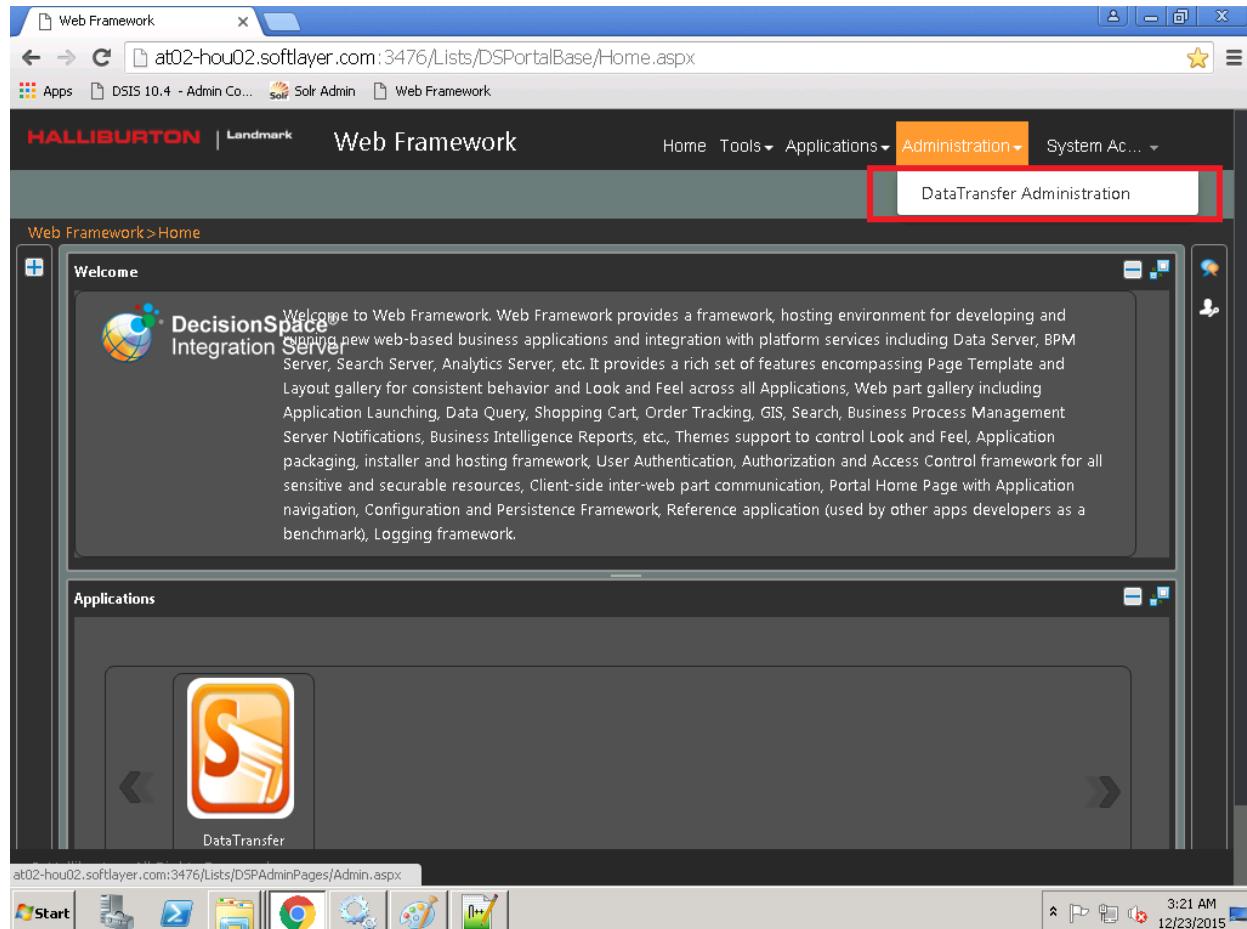


The screenshot shows the Apache Solr Admin interface. On the left, there's a sidebar with various navigation links: Dashboard, Logging, Core Admin, Java Properties, Thread Dump, Overview (which is selected), Analysis, Config, Dataimport, Documents, Ping, Plugins / Stats, Query, and Replication. A dropdown menu is open under 'Core Admin' with 'ds' selected. The main content area has two main sections:

- Statistics**: This section is highlighted with a red box. It shows the following data:
  - Last less than a minute ago
  - Modified: [checkbox checked]
  - Num Docs: 16
  - Max Doc: 16
  - Heap: 21691
  - Memory
  - Usage: [checkbox checked]
  - Deleted: 0
  - Docs: [checkbox checked]
  - Version: 181
  - Segment: 1
  - Count: [checkbox checked]
  - Optimized: [checkbox checked]
  - Current: [checkbox checked]
- Instance**: This section displays the configuration of the current Solr instance.
  - CWD: C:\Landmark\DSIntegrationServer5000.10.4.0\ApacheSolr\server\solr\dscore\ds
  - Instance: C:\Landmark\DSIntegrationServer5000.10.4.0\ApacheSolr\server\solr\dscore\ds
  - Data: C:\Landmark\DSIntegrationServer5000.10.4.0\ApacheSolr\server\solr\dscore\ds\data
  - Index: C:\Landmark\DSIntegrationServer5000.10.4.0\ApacheSolr\server\solr\dscore\ds\data\index
  - Impl: org.apache.solr.core.NRTCachingDirectoryFactory

## Configure Portal Search Settings

1. Hover over **Administration** and click the application administration where you want to configure Search.



2. In the Application Administration page, select **Settings > Service Settings**.

The screenshot shows the 'DataTransfer' application administration interface. The browser address bar displays 'at02-hou02.softlayer.com:3476/DataTransfer/Lists/DSPAdminPages/Admin.aspx'. The main navigation bar includes 'Apps', 'DSIS 10.4 - Admin Co...', 'Solr Admin', and 'Web Framework'. Below this, a secondary navigation bar has tabs for 'Security', 'Galleries', 'Page Management', 'Settings' (which is highlighted with a red box), and 'Webpart Configuration'. Under the 'Settings' tab, there are two sub-tabs: 'Service Settings' (highlighted with a red box) and 'Other Settings'. The main content area is titled 'Web Framework Services [highlighted Services are overridden by the application]' and lists several services with their details:

Service Name	Connection URL	Authentication Type	Status	Service Type	Username
Default Search Ser...	http://localhost:80...	Explicit - group	Active	DS Search	admin
Default Citrix Service	http://web-interface...	Explicit - Individual	Active	Citrix Service	
Order Service	http://order-service...	Anonymous	Active	Order Service	
Default BPM Service	http://dsbpm-host:...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-ho...	Explicit - group	Active	DS Search	user

Below this, another section titled 'Application Services' lists the same set of services:

Service Name	Connection URL	Authentication type	Status	Service Type	Username
DS RTA Configuration	http://dsds-host:80...	Explicit - group	Active	Data Server	user
Default Search Ser...	http://localhost:80...	Explicit - group	Active	DS Search	admin
Order Service	http://localhost:80...	Anonymous	Active	Order Service	
Default BPM Service	http://dsbpm-host:...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-ho...	Explicit - group	Active	DS Search	user

At the bottom left of the page, a copyright notice reads '© Halliburton. All Rights Reserved.'

3. In Application Services, select **Default Search Service** and click **Edit Service Configuration**.

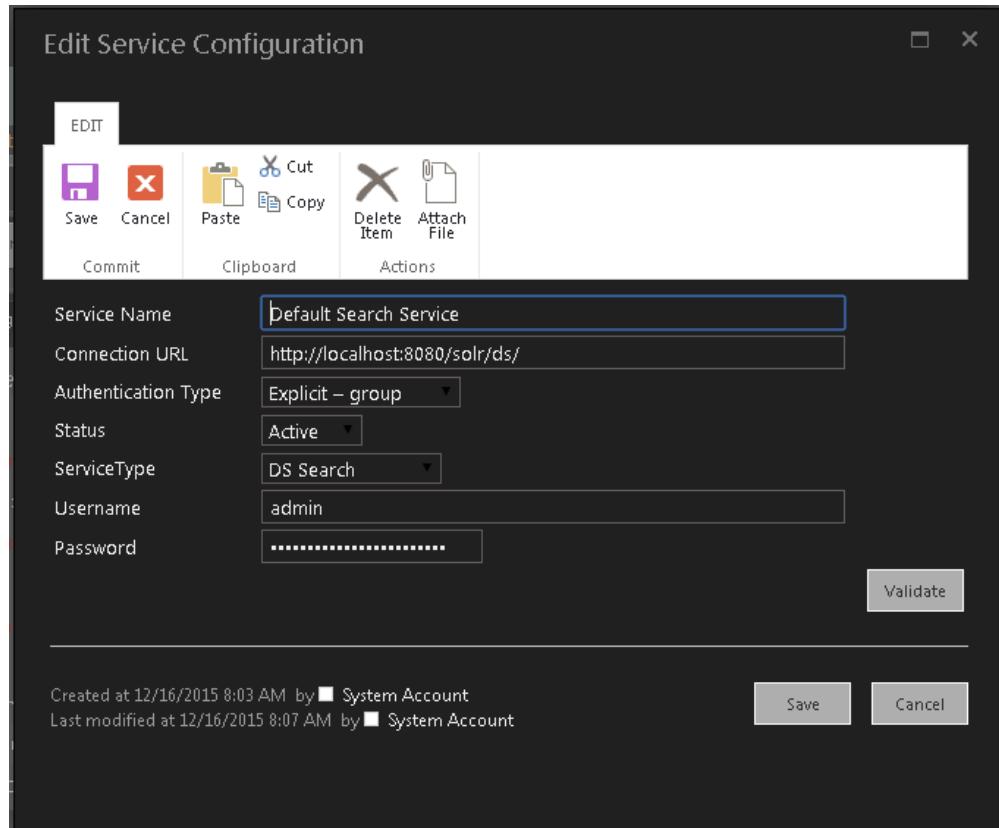
The screenshot shows the 'Service Settings' tab of the DataTransfer application. It displays two sections: 'Web Framework Services' and 'Application Services'. In the 'Application Services' section, the 'Default Search Service' is listed with its service name checked. This row is highlighted with a red box. Below the table, there are buttons for 'Add Service Configuration' and 'Edit Service Configuration', with the latter also highlighted by a red box.

Service Name	Connection URL	Authentication Type	Status	Service Type	Username
Default Search Ser...	http://localhost:80...	Explicit - group	Active	DS Search	admin
Default Citrix Service	http://web-interface...	Explicit - Individual	Active	Citrix Service	
Order Service	http://order-service...	Anonymous	Active	Order Service	
Default BPM Service	http://dsbpm-host:...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-ho...	Explicit - group	Active	DS Search	user

Service Name	Connection URL	Authentication type	Status	Service Type	Username
DS RTA Configuration	http://dsds-host:80...	Explicit - group	Active	Data Server	user
<input checked="" type="checkbox"/> Default Search Ser...	http://localhost:80...	Explicit - group	Active	DS Search	admin
Order Service	http://localhost:80...	Anonymous	Active	Order Service	
Default BPM Service	http://dsbpm-host:...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-ho...	Explicit - group	Active	DS Search	user

4. Make sure the **Connection URL** and other credentials are set correctly as shown below:

- a) **Connection URL:** http://localhost:8080/solr/ds/
- b) **User:** admin
- c) **Password:** admin



## View Search Result in Search Webpart

1. Click the **Find Data** page that was created before. If not, create a new page based on the Find Data template, and associate the page with Search configuration.
2. Minimize the GIS webpart for now. Search for a known indexed text string contained in the document. Search results matching the text string are displayed.

The screenshot shows a web browser window for the Halliburton DataTransfer application. The URL is `at02-hou02.softlayer.com:3476/DataTransfer/Lists/DSPAppPages/Search.aspx`. The page title is "DataTransfer". The search results are displayed under the heading "Search Summary" with a count of "15 Document". The results list includes:

- 1 - 10 of 15 results for Show All Documents containing Phrase/words \*\*
- **DecisionSpace® Integration Server Web Framework End User Guide Version 5000.10.4.0**  
last\_modified: 2015-11-05T22:51:08Z file: DropsiteDataLoader\_5000.10.4.0\_Release\_EndUserGuide.pdf author: Halliburton | Landmark c...  
▼ More
- **DropSite Data Loader Install Guide Version 5000.10.4.0**  
last\_modified: 2015-11-05T21:39:58Z file: DropsiteDataLoader\_5000.10.4.0\_Release\_InstallGuide.pdf author: Halliburton | Landmark cont...  
▼ More
- **DSAnalytics\_Install\_11\_17\_2015\_03\_18\_40.log**  
last\_modified: 2015-11-17T09:18:41.000Z file: DSAnalytics\_Install\_11\_17\_2015\_03\_18\_40.log content\_type: text/plain; charset=windows-1...  
▼ More
- **DecisionSpace® Data Quality Software Administration Guide**  
last\_modified: 2015-11-06T21:03:16Z file: DSDataQuality\_5000.10.4.0\_Administration\_Guide.pdf author: Halliburton | Landmark Softwar...

On the left, there is a sidebar with a "Save as:" field and a "Save" button. Below it, under "Available Refinements", there are filters for "Data Type" (Document 15) and "Attributes".

---

## **Exercise 2: Show Spatial Search based on Data Server VDB Data Using Map**

---

### ***Purpose of the Exercise***

Show how to crawl and search DSDS model data using Search.

### ***Outcome of the Exercise***

Perform a spatial search based on a selected area, and see the search results based on that area.

### ***Exercise Workflows***

- Configure Crawl options
- Configure VDB options
- Run the crawler tool
- View search results in Search webpart

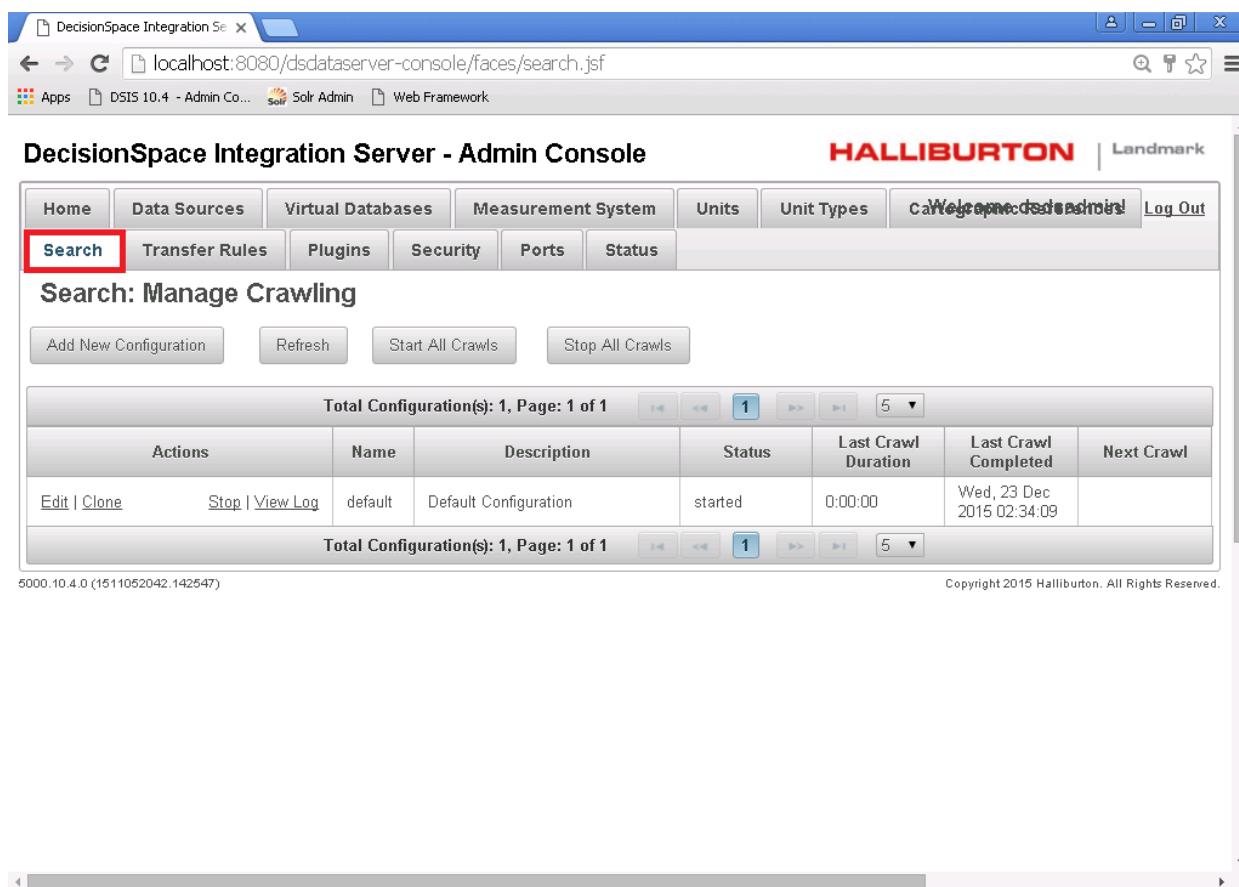
## Configure Crawl Options

1. On the server where the search is installed, open the following URL in the browser:

<http://localhost:8080/dsdataserver-console>

When prompted for a credential, enter the dsds admin login:  
**dsdsadmin/dsdsadmin**

2. Select the **Search** tab in the DS Server.



The screenshot shows the DecisionSpace Integration Server - Admin Console interface. The title bar reads "DecisionSpace Integration Server - Admin Console". The top navigation bar includes links for Home, Data Sources, Virtual Databases, Measurement System, Units, Unit Types, and a "Connected as" dropdown. The "Connected as" dropdown shows "dsdsadmin". The main menu bar has tabs for Home, Data Sources, Virtual Databases, Measurement System, Units, Unit Types, and a red-highlighted "Search" tab. Below the menu is a toolbar with buttons for Add New Configuration, Refresh, Start All Crawls, and Stop All Crawls. A message "Total Configuration(s): 1, Page: 1 of 1" is displayed above a table. The table has columns for Actions, Name, Description, Status, Last Crawl Duration, Last Crawl Completed, and Next Crawl. One row is shown with actions "Edit | Clone" and "Stop | View Log", name "default", description "Default Configuration", status "started", last crawl duration "0:00:00", last crawl completed "Wed, 23 Dec 2015 02:34:09", and no next crawl listed. Navigation buttons for pages 1 through 5 are at the bottom of the table.

3. Select **Edit** to configure the crawler option.

The screenshot shows the 'Search: Manage Crawling' interface. At the top, there are buttons for 'Add New Configuration', 'Refresh', 'Start All Crawls', and 'Stop All Crawls'. Below this is a table with the following data:

Actions	Name	Description	Status	Last Crawl Duration	Last Crawl Completed	Next Crawl
<a href="#">Edit   Clone</a>	default	Default Configuration	started	0:00:00	Wed, 23 Dec 2015 02:34:09	

Below the table, there is a modal dialog titled 'Edit 'default''. It contains tabs for 'Details', 'Data Source', 'VDB', and 'Other'. The 'Details' tab is selected, showing the following configuration:

- Name:** default
- Description:** Default Configuration
- Enable Incremental Crawl:**
- Schedule Crawl:**

At the bottom of the dialog are 'Save' and 'Close' buttons.

At the bottom of the page, the footer includes the version '5000.10.4.0 (f511052042.142547)' and 'Copyright 2015 Halliburton. All Rights Reserved.'

4. Select **Data Source** to configure the Data Source settings and save the settings.

The screenshot shows a web-based administration console for the DecisionSpace Integration Server. The URL in the browser is `localhost:8080/dsdataserver-console/faces/search.jsf`. The main title bar says "DecisionSpace Integration Se". The top navigation bar includes links for "Apps", "DSIS 10.4 - Admin Co...", "Solr Admin", and "Web Framework". The main content area displays a table titled "Total Configuration(s): 1, Page: 1 of 1". The table has columns for Actions, Name, Description, Status, Last Crawl Duration, Last Crawl Completed, and Next Crawl. One row is shown with the name "default", description "Default Configuration", status "started", last crawl duration "0:00:00", last crawl completed "Wed, 23 Dec 2015 02:34:09", and no next crawl scheduled. Below the table is another header "Total Configuration(s): 1, Page: 1 of 1". A sub-section titled "Edit 'default'" is displayed, featuring tabs for "Details" (selected), "Data Source" (highlighted with a red box), "VDB", and "Other". The "Data Source" tab contains two sections: "Data Server" and "Search Server". Both sections have their respective fields highlighted with a red box. In the "Data Server" section, the "Server URL\*" field contains "jdbc:teiid:AdminVDB@mm://at02-hou02.softlayer.com:31000;v1", "User Name\*" field contains "dsdsadmin", and "Password\*" field contains ".....". In the "Search Server" section, the "Server URL\*" field contains "http://localhost:8080/solr/", "Search Core\*" field contains "ds", "User Name\*" field contains "admin", and "Password\*" field contains ".....". At the bottom of the "Data Source" tab are "Save" and "Close" buttons.

## Configure VDB Options

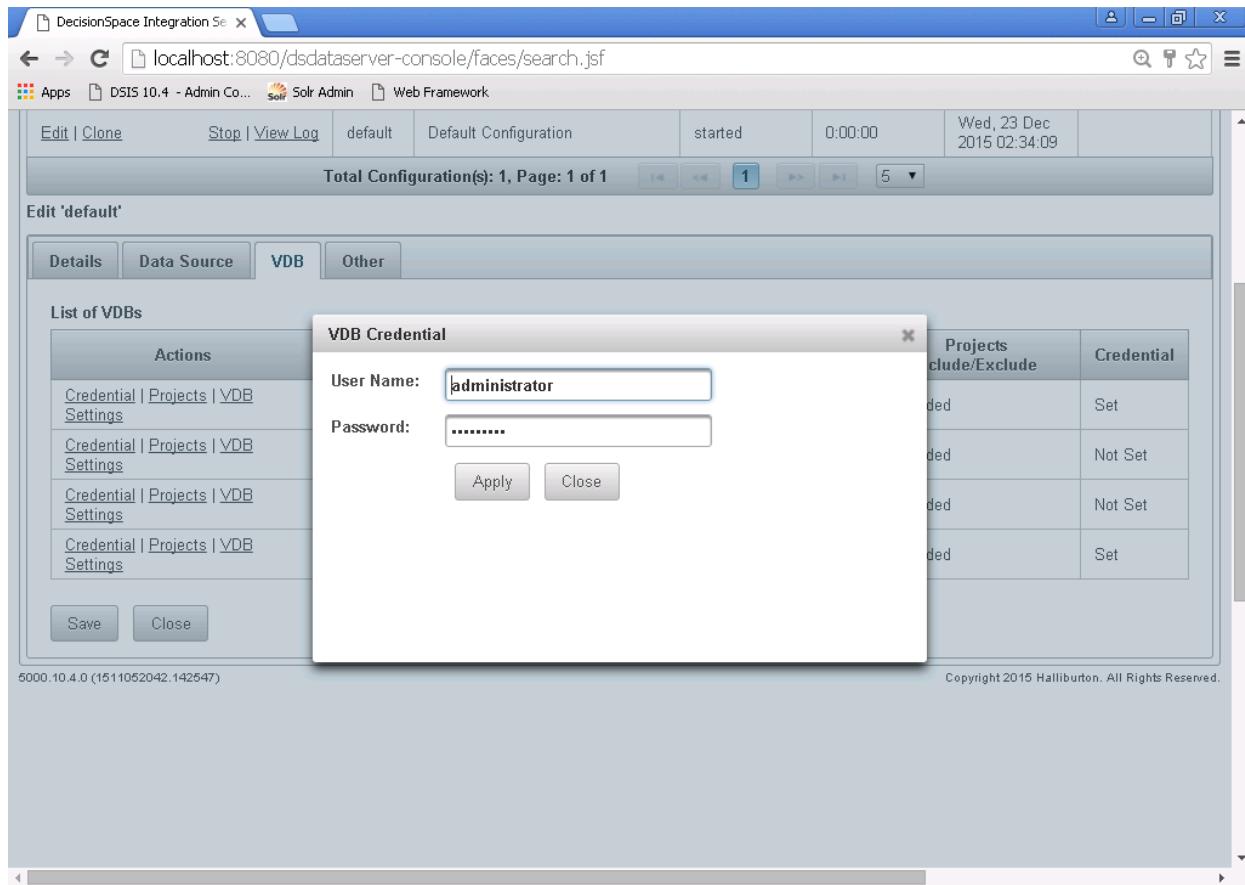
1. Select the **Search** tab in DS Server.
2. Select **VDB** to list the available VDB.

The screenshot shows the 'Search' tab selected in the DS Server Admin Console. The 'VDB' tab is highlighted with a red box. The table below lists four VDB configurations:

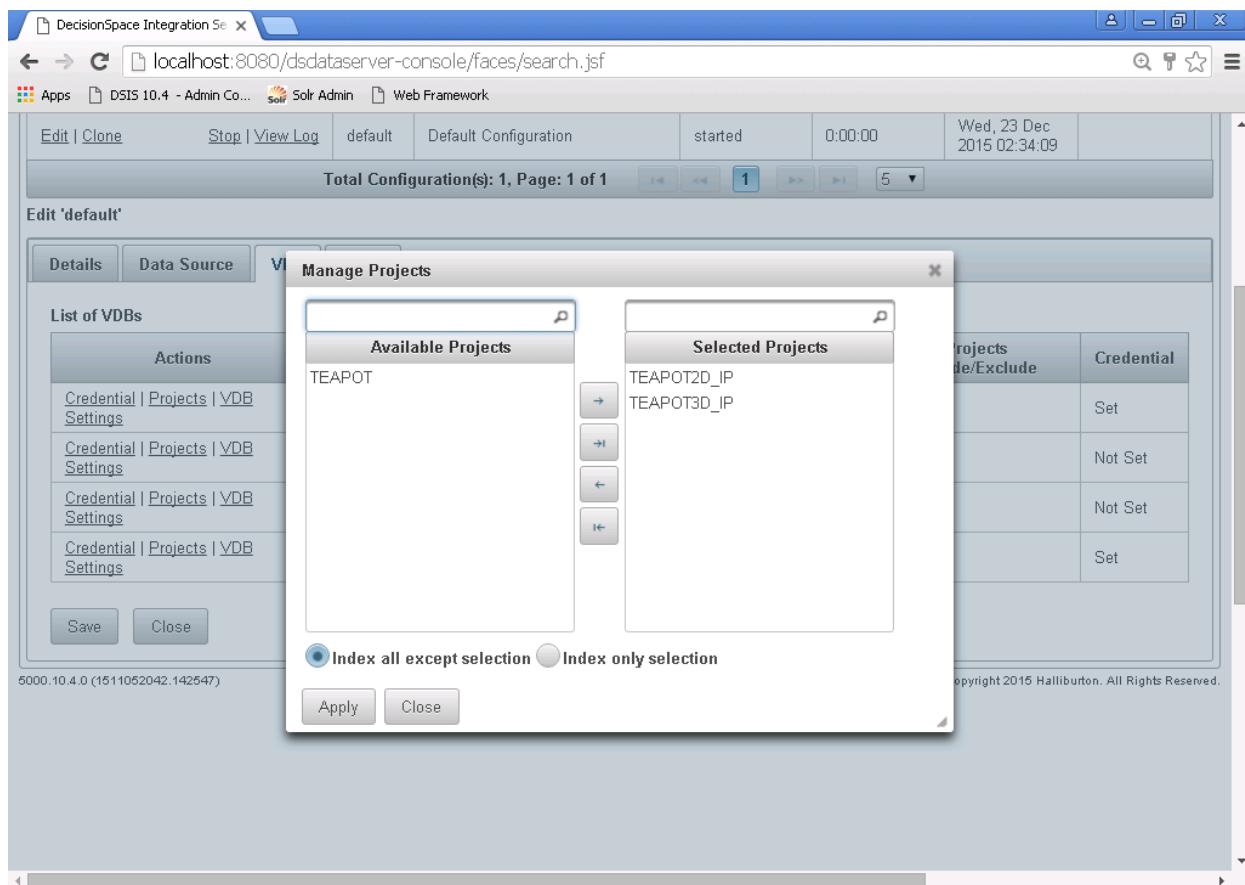
Actions	Included	VDB Name	Selected Projects	Projects Include/Exclude	Credential
<a href="#">Credential</a>   <a href="#">Projects</a>   <a href="#">VDB Settings</a>	<input type="checkbox"/>	OpenWorks	TEAPOT2D_IP, TEAPOT3D_IP	Excluded	Set
<a href="#">Credential</a>   <a href="#">Projects</a>   <a href="#">VDB Settings</a>	<input type="checkbox"/>	EDM_SqlServer	NONE	Excluded	Not Set
<a href="#">Credential</a>   <a href="#">Projects</a>   <a href="#">VDB Settings</a>	<input type="checkbox"/>	DSDataTransfer	NONE	Excluded	Not Set
<a href="#">Credential</a>   <a href="#">Projects</a>   <a href="#">VDB Settings</a>	<input checked="" type="checkbox"/>	OpenWorksCommonModel	TEAPOT2D_IP, TEAPOT3D_IP	Excluded	Set

Buttons at the bottom left are 'Save' and 'Close'. The bottom right corner displays 'Copyright 2015 Halliburton. All Rights Reserved.'

3. Select **Credential** to set the credentials to connect to the VDB.



4. Select **Project** to select the projects for crawling.



5. Save the details.

## Run the Crawler Tool

1. Select the **Search** tab in DS Server.
2. To start the crawler, click **Start**.

The screenshot shows the 'Search: Manage Crawling' page of the DecisionSpace Integration Server - Admin Console. The URL in the browser is `localhost:8080/dsdataserver-console/faces/search.jsf`. The page title is 'DecisionSpace Integration Server - Admin Console'. The top navigation bar includes links for Home, Data Sources, Virtual Databases, Measurement System, Units, Unit Types, and a welcome message for 'admin'. Below the navigation bar is a sub-navigation bar with links for Search, Transfer Rules, Plugins, Security, Ports, and Status. The main content area is titled 'Search: Manage Crawling' and displays a table of crawling configurations. The table has columns for Actions, Name, Description, Status, Last Crawl Duration, Last Crawl Completed, and Next Crawl. There is one row for a configuration named 'default' with the description 'Default Configuration'. The 'Actions' column for this row contains links: 'Edit', 'Close', 'Start', 'Restart', 'Clear', and 'View Log'. The 'Start' link is highlighted with a red box. The status is 'not started', and the last crawl completed on 'Thu, 24 Dec 2015 00:16:49'. The table has two header rows and one data row. At the bottom of the page, there is a footer with the text '5000.10.4.0 (1511052042.142547)' and 'Copyright 2015 Halliburton. All Rights Reserved.'

Actions	Name	Description	Status	Last Crawl Duration	Last Crawl Completed	Next Crawl
Edit   Close Start   Restart   Clear   View Log	default	Default Configuration	not started	0:00:00	Thu, 24 Dec 2015 00:16:49	

3. Verify that data has been loaded into Solr by navigating to the Solr Dashboard and checking the core overview section. You should see more documents in the **Num Docs** field which displays the count of documents in the core.

The screenshot shows the Apache Solr Admin interface for a core named 'ds'. The left sidebar lists various administrative tasks: Dashboard, Logging, Core Admin, Java Properties, Thread Dump, Overview (which is selected), Analysis, Config, Dataimport, Documents, Ping, Plugins / Stats, Query, and Replication. The main content area is divided into two main sections: 'Statistics' and 'Instance'.

**Statistics:**

- Last: about 20 hours ago
- Modified:
- Num Docs: 1469
- Max Doc: 1469
- Heap: 79898
- Memory:
- Usage:
- Deleted: 0
- Docs:
- Version: 189
- Segment: 1
- Count:

Optimized: Current:

**Instance:**

- CWD: C:\Landmark\DSIntegrationServer5000.10.4.0\ApacheSolr\bin
- Instance: C:\Landmark\DSIntegrationServer5000.10.4.0\ApacheSolr\bin\solr\dscore\ds
- Data: C:\Landmark\DSIntegrationServer5000.10.4.0\ApacheSolr\bin\solr\dscore\ds\data
- Index: C:\Landmark\DSIntegrationServer5000.10.4.0\ApacheSolr\bin\solr\dscore\ds\data\index
- Impl: org.apache.solr.core.NRTCachingDirectoryFactory

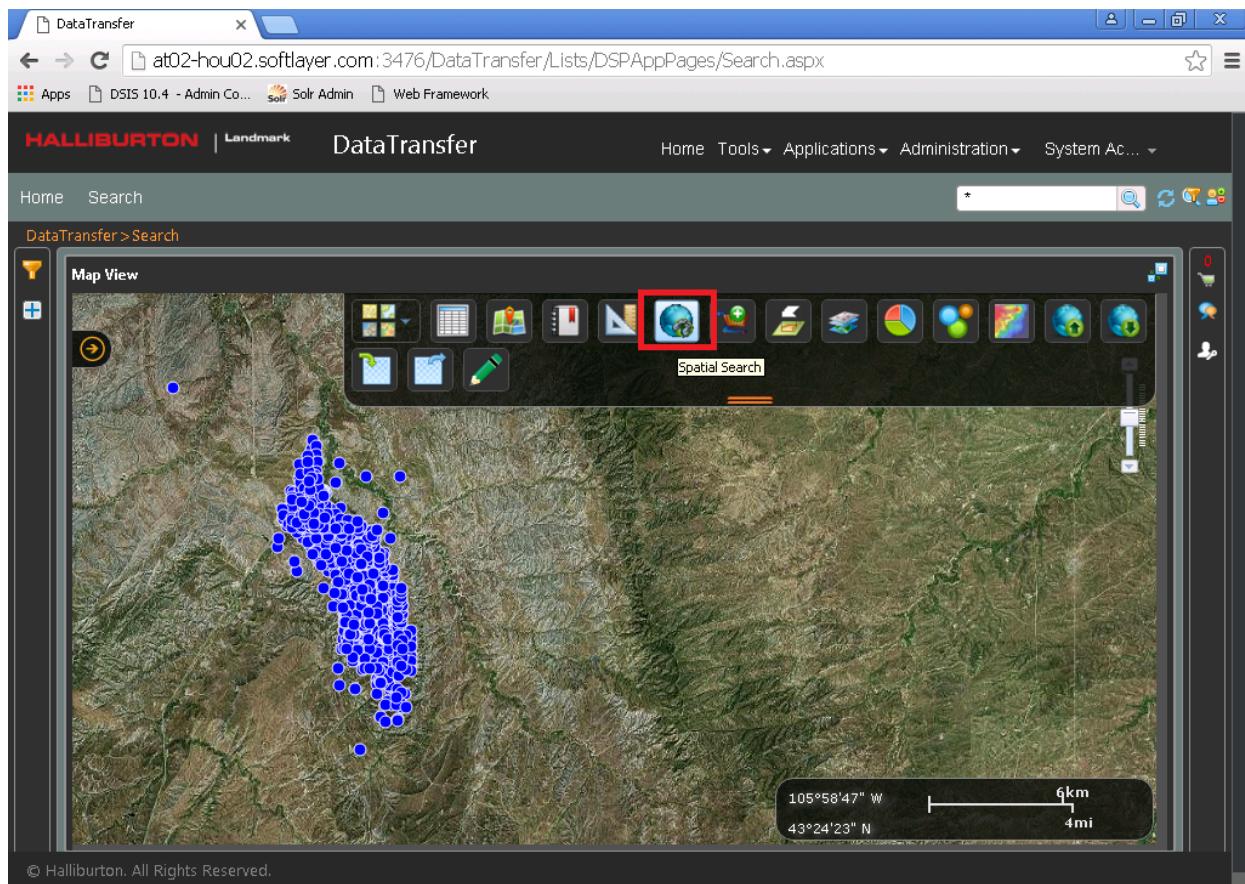
Below these sections are 'Replication (Master)' and 'Healthcheck' tables, and an 'Admin Extra' section.

## View Search Result in Search Webpart

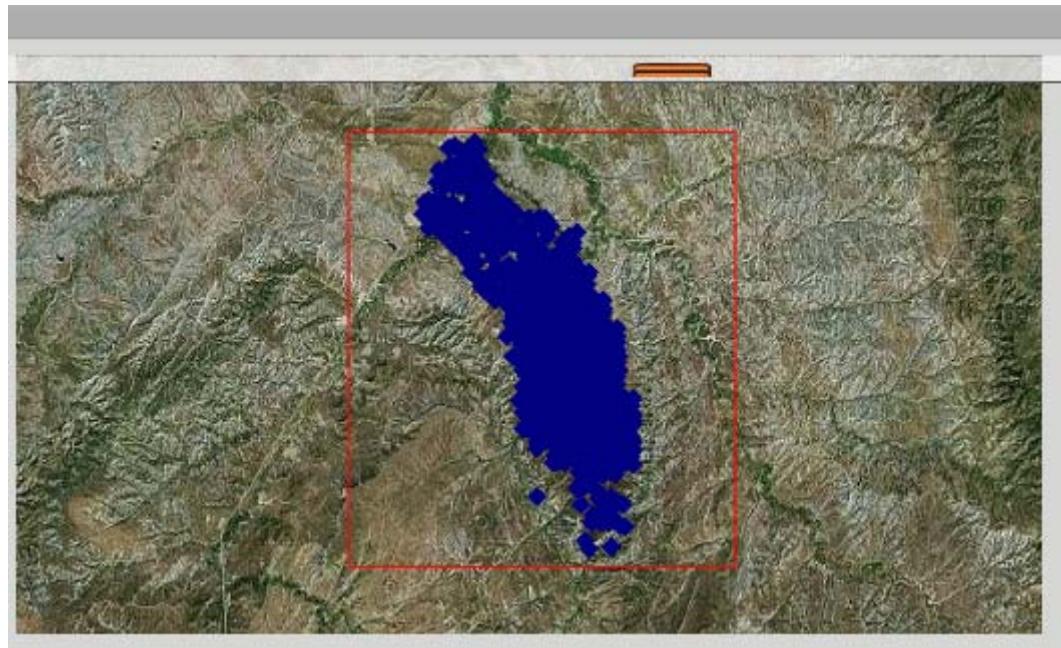
1. Click the **Find Data** page that was created before.
2. Minimize the GIS webpart for now and search for \*. View the results with categories **Well** and **WellEntire**, as shown below.

The screenshot shows a web browser window for the Halliburton DataTransfer application. The URL is [at02-hou02.softlayer.com:3476/DataTransfer/Lists/DSPAppPages/Search.aspx](http://at02-hou02.softlayer.com:3476/DataTransfer/Lists/DSPAppPages/Search.aspx). The page title is "DataTransfer". The search bar contains the placeholder "\*". The search summary shows "1395 Wellbore" results. The results list includes three items: "TEAPOT Wellbore 1000", "TEAPOT Wellbore 1001", and "TEAPOT Wellbore 1002". Each result item shows its native\_uid, UWI, Field, and Completion Date. On the left, there is a sidebar with a "Save as:" button and a "Refinements" section containing "Database Type" (OpenWorks), "Projects" (TEAPOT), "Data Type" (Wellbore), and "Attributes". The bottom of the page has a copyright notice: "© Halliburton. All Rights Reserved."

3. Maximize the GIS webpart, and click the **Spatial Search** icon in the GIS tool bar.



4. Draw a polygon around all the wells. This triggers a spatial search.



5. Search results are filtered according to the selected area.

A screenshot of a GIS search interface. At the top, there is a search bar with the query "SEARCH {spatialquery=sys\_spatial[43.2356855]}". Below the search bar, there are buttons for "Advanced Search", "Sort: Relevance", and "Show 5 results per page". On the left, there is a sidebar titled "REFINE BY:" with a "category" dropdown set to "WellEntire (74)". Under "PREVIOUS SEARCH", there are several entries, each with a checkbox and some descriptive text. The first entry is checked and shows the following details:

id: OpenWorks-OW5000-OW\_TEAPOT\_DOME-WellEntire-1658. sys\_primarykey: WellEntire.wellid=1658. WellEntire.wellid: 1658. WellEntire.well\_operator: RMOTC. WellEntire.orig\_crs\_id: 702. WellEntire.orig\_bh\_crs\_id: 702. WellEntire.field: TEAPOT DOME. WellEntire.basin: POWDER RIVER. WellEntire.county: NATRONA. WellEntire.state: WYOMING.

The other two entries are not checked and show similar but slightly different details for well IDs 1659 and 1660.

## Search Advanced

### Querying SOLR and Search API

#### ➤ Direct calls to **Search REST API**

- Search a survey using full name or part of a name:
  - <host>/solr/ds/select?q=SG85\*&fq=sys\_entitytype:survey
- From survey, navigate to related items and select desired data type for related search
  - <host>/solr/ds/select?q=SG8571\_3D\_OR&fq=sys\_entitytype:navigation
- From navigation, use related search to get the associated document:
  - <host>/solr/ds/select?q=NH8403\_2D\_OR&fq=sys\_entitytype:document
- Search for “LMK”, facet=Country, highlight all matching fields, limit count to <= 2:
  - <host>/solr/ds/select?q=LMK&enableFacet=true&facetfield=Country&hl=true&hl.fl=\*&hl.requireFieldMatch=true&start=0&rows=2

#### ➤ Calling **DS Portal SearchService**

- Search Service End Point **[PortalSearchService]**:
  - <DSIS Web Framework>/\_vti\_bin/DSP%20Services/SearchService.svc/
- Get authorized data sources  
**[PortalSearchService]/DataSources?endPoint=Default Search Service**
- Get entity names for data source = EdmVDB, OpenWorksVDB
  - **[PortalSearchService]/EntityTypes?endPoint=Default Search Service&ds= EDMVDB-A/ViewModel-EdmSource,OpenWorksVDB-OpenWorksModel-Flounder**
- Get columns for entity=Faults
  - **[PortalSearchService]/EntityTypeColumns?endPoint=Default Search Service&entity=Faults&maxRows=200**

## Query Sample

### Example:

#### ➤ QUERY

```
var url = baseUrl + "SearchService.svc/GetSearchResult"  
+ "?endPoint=Default Search Service"  
+ "&q=LMK"  
+ "&enableFacet=true" + "&facetfield=Country"  
+ "&enableHighlight=true" + "&highlightField=*"  
+ "&hlrequireFieldMatch=true"  
+ "&start=0" + "&rows=2";  
  
dpservice.callService(url, "GET", "", function(data) {  
    callback(data);  
});
```



#### ➤ RESULT

```
"response": { "numFound": 18,  
              "start": 0,  
              "docs": [{ "id": "data2", "PB_SURVEY": "10534855", ... },  
                      { "id": "data4", "PB_SURVEY": "10799073", ... }]  
            },  
            "facet_counts": { "facet_queries": {},  
                             "facet_fields": { "Country": [  
                                              "UNITED KINGDOM": "15",  
                                              "CANADA": "2",  
                                              "USA": "1" ]},  
                             "facet_dates": {},  
                             "facet_ranges": {}  
                           },  
            "highlighting": { "data2": {}, "data4": {}  
                           }
```

## Developer Configuration

#### ➤ Admin user Configurations

- Reference to DS Search server
- The “SearchSettings” library to use
- Facet fields to use
- Sort fields

#### ➤ Developer Configurations:

Stored in “SearchSettings” document library and involves the following files

- items.xml: Controls what fields appear in each row. Also controls “summary” view and “Quick View.”
- action.xml: Controls what actions links are allowed for each row in the search results.
- SearchTemplate.txt: Controls how search results are rendered, where actions show up, how they show up, etc. Also controls what code to execute when action is clicked.

<http://<portal-base-url>/<applicationName>/SearchSettings>

## Developer Control (action.xml)

- **action.xml** - Controls what actions links are allowed for each row in the search results

```

<actions>
    <action name="ORDER" displayName="ADD TO CART"
        javascript="$root.action.doAddToCart(item)"></action>
    <action name="REMOVEORDER" displayName="REMOVE FROM CART"
        javascript="$root.action.doRemoveFromCart(item)"></action>
    <action name="VIEW_DOCUMENT" displayName="OPEN"
        javascript="$root.action.doOpenDoc($parent, docUrl)"></action>
    <action name="SEARCH_WELL" displayName="WELL"
        javascript="$root.action.doRelatedSearch($parent,
            $root.searchResult.configuration, 'category','WELL')"></action>
    <action name="SEARCH_WELLCORE" displayName="Wellcore"
        javascript="$root.action.doRelatedSearch($parent,
            $root.searchResult.configuration, 'category', 'WELL CORE')"></action>
    <action name="SEARCH_WELLLOG" displayName="WellLog"
        javascript="$root.action.doRelatedSearch($parent,
            $root.searchResult.configuration, 'category', 'WELL LOG')"></action>
    <action name="SEARCH_NAV" displayName="Navigation"
        javascript="$root.action.doRelatedSearch($parent,
            $root.searchResult.configuration, 'category', 'NAVIGATION')"></action>
    <action name="VIEW_LOG_CURVES" displayName="View Log Curves"
        javascript=""></action>
</actions>

```

Actions that you can use in items.xml

JavaScript code to call for each action. These are all the available JavaScript calls built into the search web part (these are not customizable). For example, doAddToCart(), doOpenDoc() etc are hard-coded JS functions built into the web part.

However, you can add custom actions and provide your own JavaScript to run those actions – that JavaScript code must be referenced or defined in searchtemplate.txt

## Developer Control (SearchTemplate.txt)

- **SearchTemplate.txt** - Controls how search results are rendered, where actions show up, how they show up, etc.

```





```

---

## **Exercise 3: Change Search Settings to Customize the Search Results**

---

### ***Purpose of the Exercise***

Show how to change default search settings based on the indexed data type.

### ***Outcome of the Exercise***

We will change the default search result display parameters for Well Entire.

### ***Exercise Workflows***

- Create and Configure Portal Service Settings
- Create and Configure Portal Page
- Create DataCatalogues and view data in DataCatalogue

## Create and Configure Portal Service Settings

1. Launch the Portal as **Administrator**.
2. Click the **Administration** link in the top-right corner.
3. Click **Settings** and then select the **Service Settings** tab.

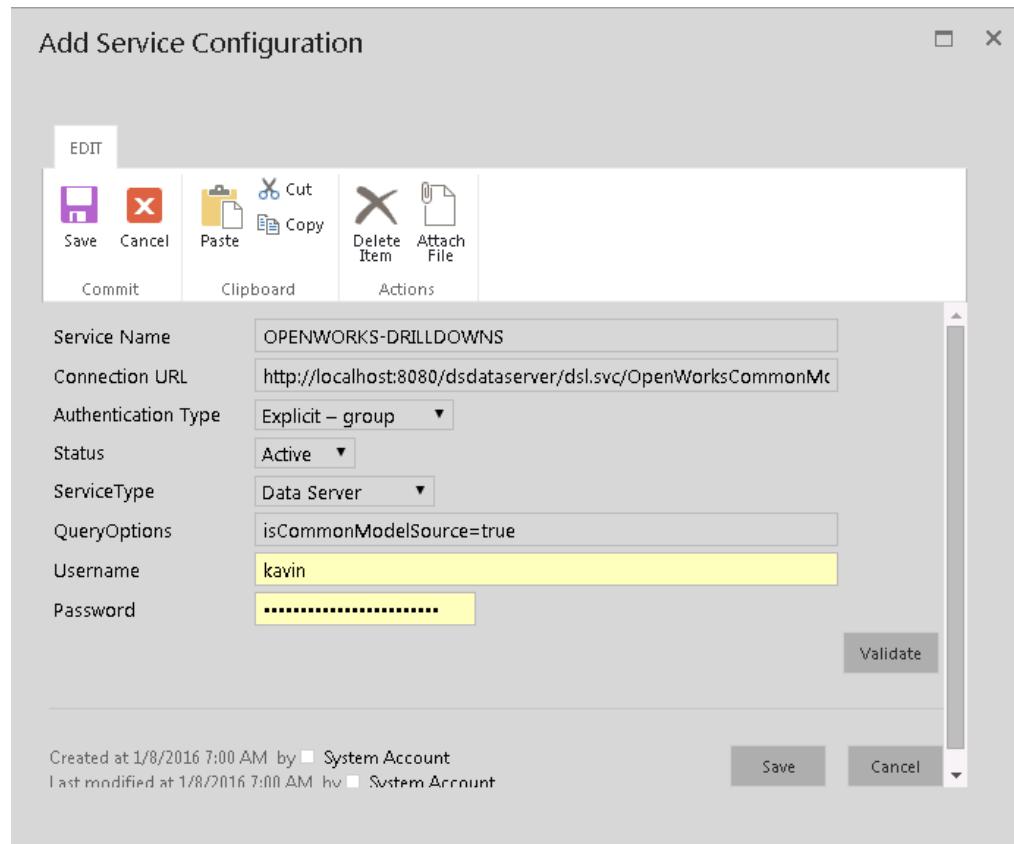
The screenshot shows a web-based administration interface for managing service settings. At the top, there is a navigation bar with tabs: Security, Galleries, App Management, Settings (which is selected), and Workflow Settings. Below the navigation bar is another tab bar with tabs: Service Settings (selected), Other Settings, Home Page Settings, Theme Settings, and Language Settings. The main content area displays a table of service configurations:

Service Name	Connection URL	Authentication type	Status	Service Type	Username
Default Search Service	http://dssearch-host:...	Explicit - group	Active	DS Search	user
Default Citrix Service	http://web-interface-...	Explicit - Individual	Active	Citrix Service	
Order Service	http://order-service-...	Anonymous	Active	Order Service	
Default BPM Service	http://dsbpm-host:80...	Explicit - group	Active	DS BPM Service	admin
MDS Search Service	http://dssearch-host:...	Explicit - group	Active	DS Search	user

Below the table, there is a small navigation indicator "1 - 5 >". At the bottom of the page, there are two links: "Add Service Configuration" and "Edit Service Configuration".

4. Use this screen to add/edit Service Configurations.
5. Click **Add Service Configuration**.

6. In the *Add Service Configuration* window, fill the required fields and click **Save**.



7. The newly created Service displays in the **Service Settings** tab as shown below.

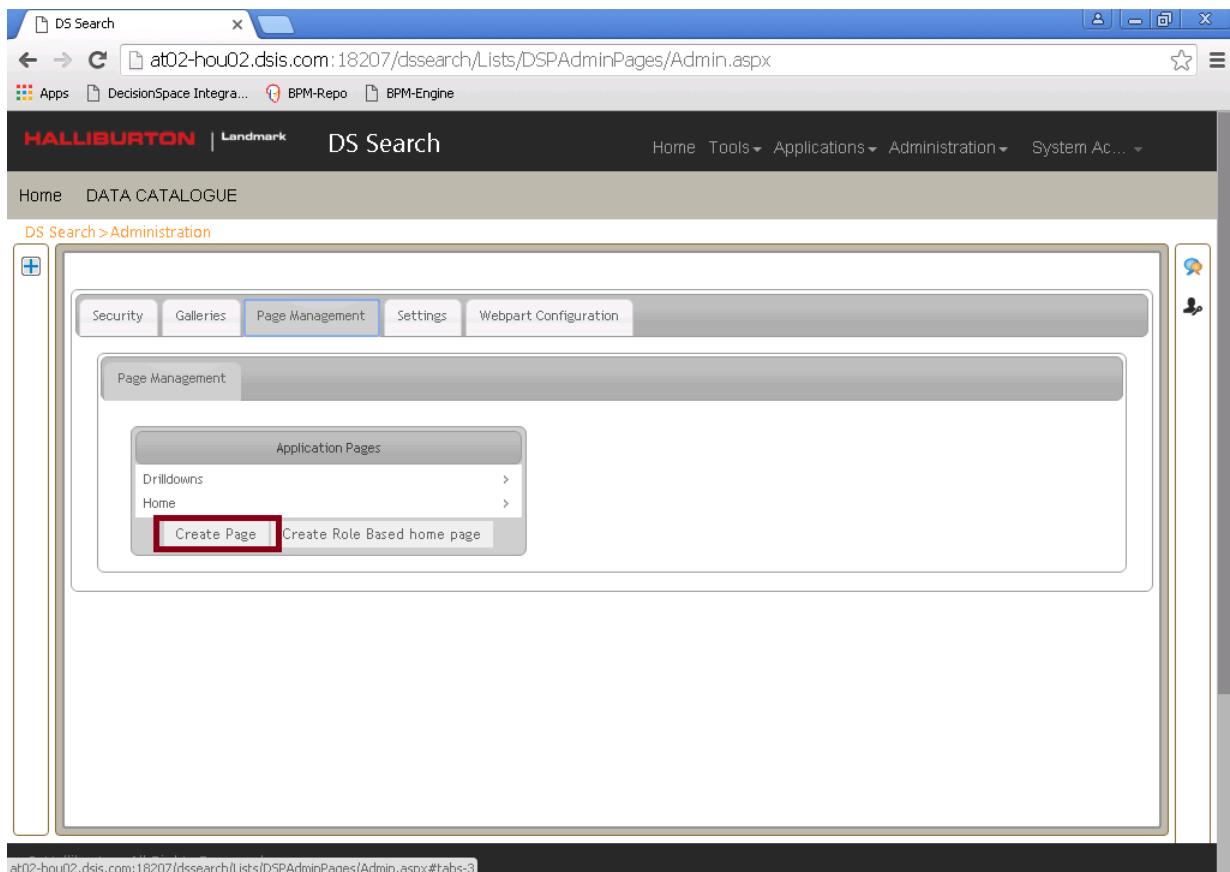
The screenshot shows the 'Service Settings' tab selected in the application settings interface. The tab bar includes Security, Galleries, App Management, Settings, and Workflow Settings. The 'Service Settings' tab contains a table with service configurations:

Service Name	Connection URL	Authentication type	Status	Service Type	Username
OpenWorks	http://localhost:8080/...	Explicit - group	Active	Data Server	administrator
OPENWORKS-DRILLDO...	http://localhost:8080/...	Explicit - group	Active	Data Server	kavin

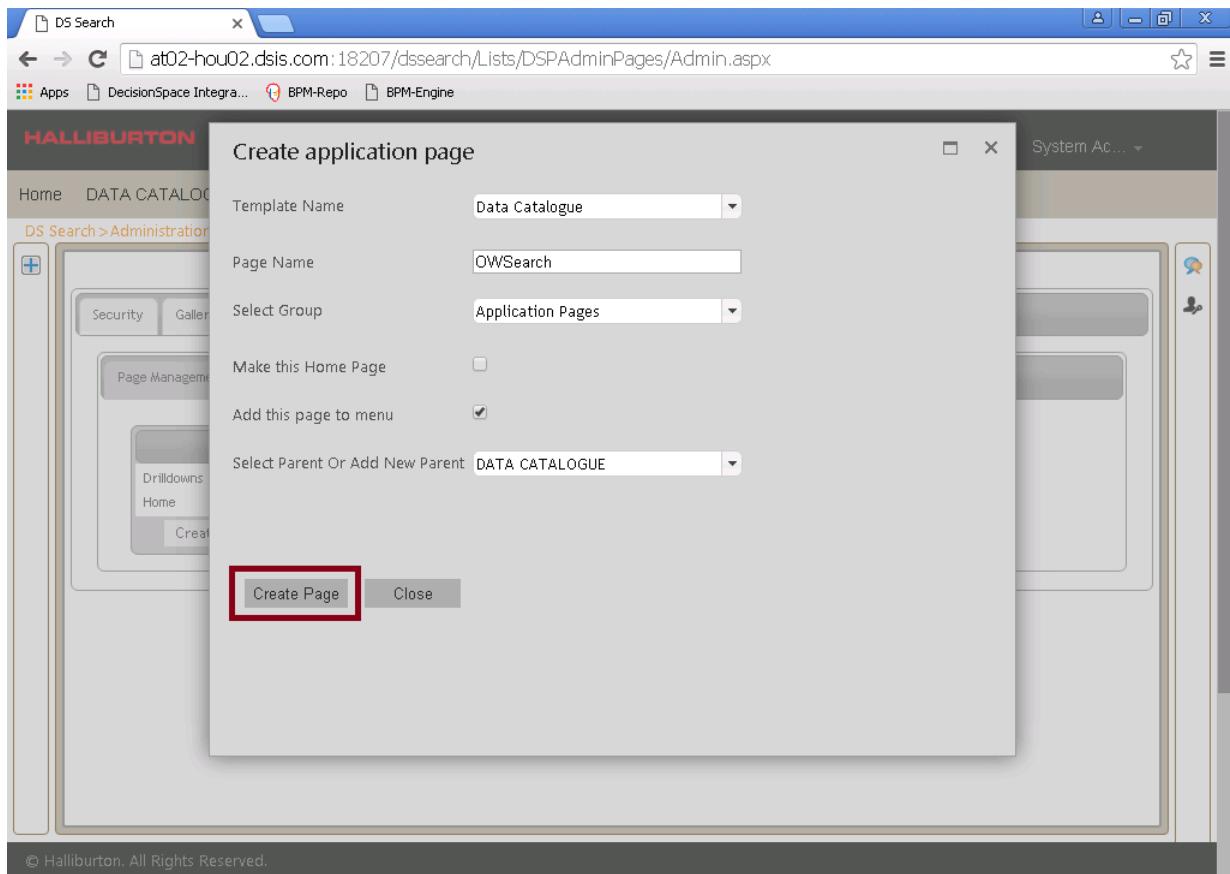
At the bottom, there are links for 'Add Service Configuration' and 'Edit Service Configuration'.

## Create and Configure Portal Page

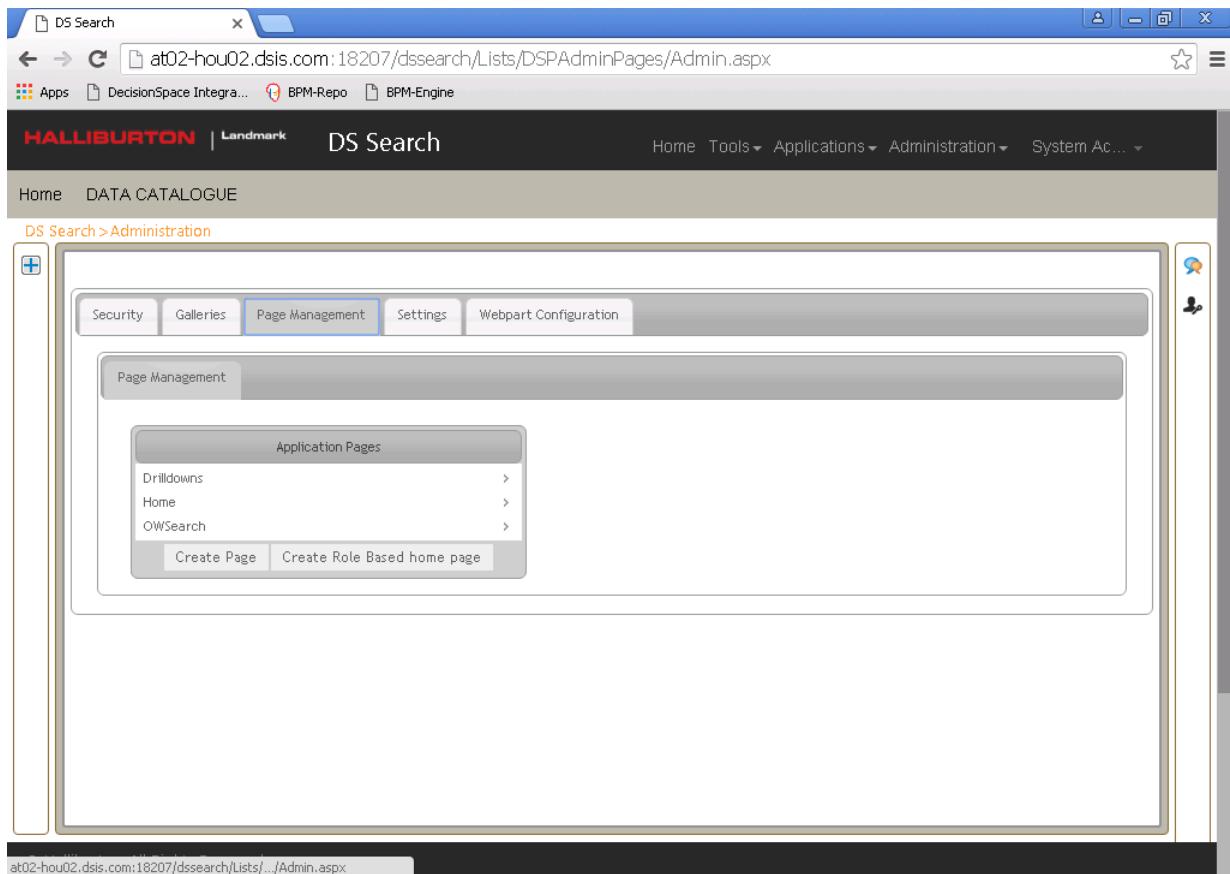
1. Launch the Portal as **Administrator**.
2. Select **Administration > Ds Search Administration > Page Management** and click **Create Page**.



3. Choose the template for Data Catalogue as shown below and click **Create Page**.

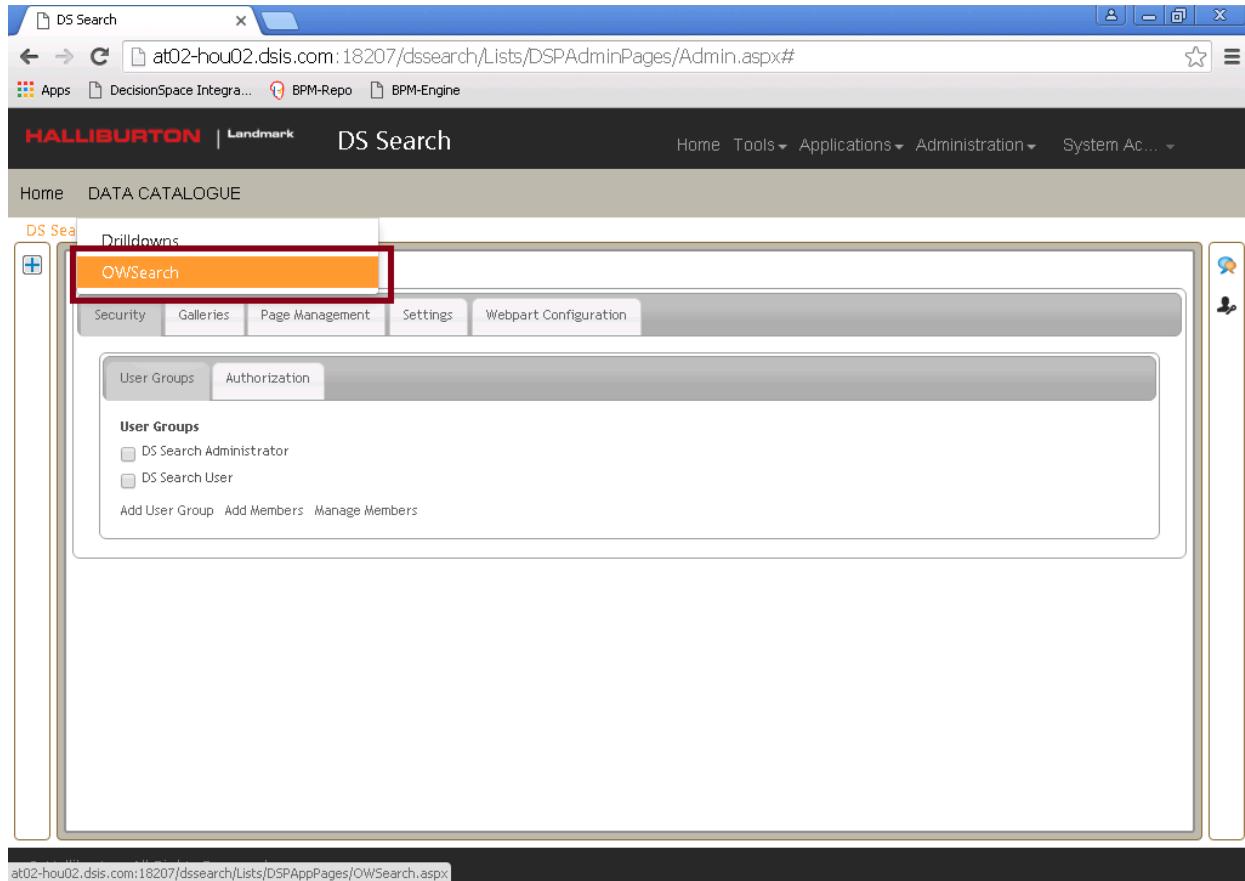


4. The newly created page displays in the **Page Management** tab as shown below.



## Create DataCatalogues and View Data in DataCatalogue

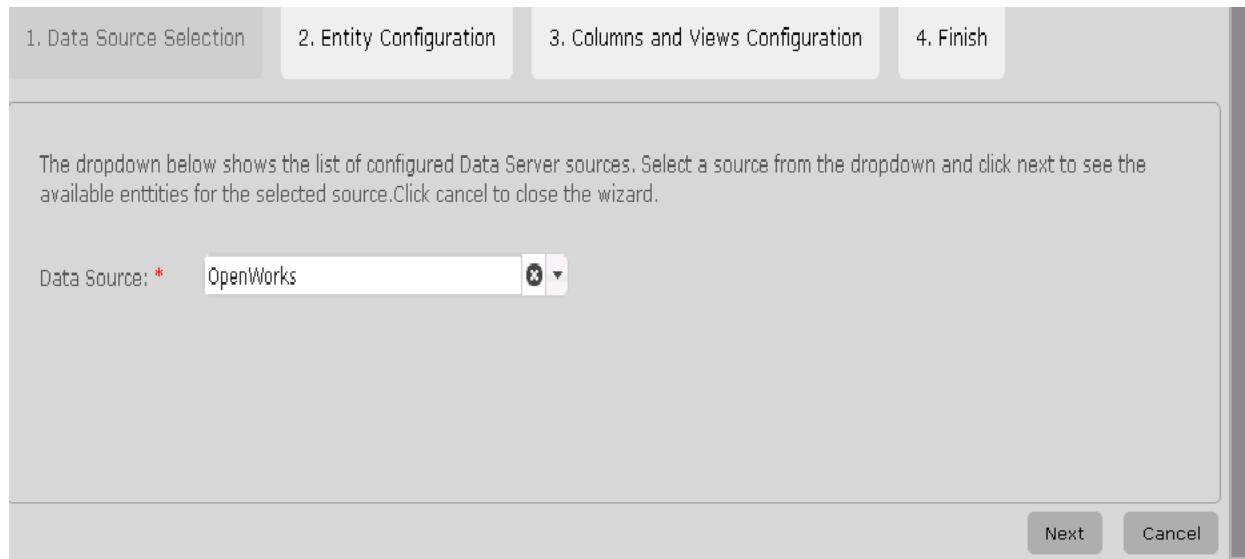
1. Log in as the application administrator and navigate to the page that has the DataCatalogue webpart.



2. Click the “Create Data Catalogue” tool icon to launch the “Create Data Catalogue” tool.



3. Select a source from the drop-down list, e.g., OpenWorks, and click **Next**.



4. Select the entity from the available entities for the selected data source. For the selected entity, specify a **Unique Name** and **Display Name**. By default the Display Name is the same as the selected entity and the Unique Name is “<SourceName>.<EntityName >”.

The Entity dropdown below shows the available entities for the data source selected in previous step. Select entity of choice from the dropdown and configure basic properties. Click next to configure the available columns for the selected entity. Click Cancel to close the wizard.

Data Source:	OpenWorks
Entity: *	<input type="text" value="Well"/> <input type="button" value="x"/>
Unique Name: *	<input type="text" value="OpenWorks.Well"/>
Display Name*	<input type="text" value="Well"/>
Enable Cart:	<input type="checkbox"/>
Is Browseable:	<input checked="" type="checkbox"/>
Is Common Model:	<input checked="" type="checkbox"/>
Show in Classification:	<input checked="" type="checkbox"/>
Filter:	<input type="text"/>
<input type="button" value="Done"/>	

- a) Check/Uncheck the “Enable Cart” check box to show or hide “Add to cart” and “Remove from cart” menu buttons. By default, this option is unchecked.
- b) Check/Uncheck the “Is Browseable” check box to make Data Catalogue browseable by default when a Data Catalogue is clicked from the tree view. By default, this option is checked.
- c) Check/Uncheck the “Is Common Model” check box to specify that this Data Catalogue definition is for a common model entity. If you are creating a Data Catalogue using a native data source, then uncheck this check box. By default, this option is checked.

- d) Check/Uncheck the “Show in Classification” check box to show or hide Data Catalogue from the classification tree view. By default, this option is checked.
  - e) Specify Filter criteria in OData format and use the “Validate” button to verify there are no errors.
5. Click **Next** to configure the “View” and “Column” settings.
6. Specify the display names for each column. Select the views that these columns should appear in.

The table below shows the available columns for the selected entity. Configure display name and views for the columns. Click Finish to create the Data Catalogue or click Cancel to close the wizard.

Column Name	Display Name	Views			
		grid	search	basicsearch	full
common_well_name	common_well_name	<input checked="" type="checkbox"/> 0			
completion_date	completion_date	<input checked="" type="checkbox"/> 1			
country	country	<input checked="" type="checkbox"/> 2			
county	county	<input checked="" type="checkbox"/> 3			
current_status	current_status	<input checked="" type="checkbox"/> 4			
data_source	data_source	<input checked="" type="checkbox"/> 5			
elev_type	elev_type	<input checked="" type="checkbox"/> 6			
elevation	elevation	<input checked="" type="checkbox"/> 7			
elevation_dsdunit	elevation_dsdunit	<input checked="" type="checkbox"/> 8			

Previous    Create    Cancel

7. Click **Create** to create the Data Catalogue; the wizard will display the Finish step. Click **Cancel** to close the wizard without creating the Data Catalogue. If there are no errors, a confirmation message will display at the top.

DataCatalogue 'Well' created successfully.

Done

8. Click **Done** to close the wizard and refresh the webpart and display the newly created DataCatalogue in tree view.

The screenshot shows the Halliburton Landmark DS Search application. The browser address bar displays the URL: at02-hou02.dsis.com:18207/dssear.../Lists/DSPAppPages/OWSearch.aspx?prevPage=wizard. The page title is "DS Search". The navigation menu includes HOME, TOOLS, APPLICATIONS, ADMINISTRATION, and SYSTEM ACCOUNT. On the left, there is a "Tree View" sidebar listing categories like Corporate Data, Well Information, Well Log, Reference Data, Data Management, and Well Planning. The main content area is titled "Drill Downs" and shows a search results grid with 0 - 0 of 0 records. Below it is a "Select List(0)" section with a table header for Name, Type, and Data Source, each with a "Contains..." filter dropdown. The bottom of the screen has a footer with the text "© Halliburton. All Rights Reserved."

9. Now select any Data Type to view.

The screenshot shows the DS Search application interface. On the left, there is a tree view of data categories: Corporate Data, Well Information (with Position Log selected), Well Log, Reference Data, Data Management, and Well Planning. In the center, under the POSITION LOG section, there are dropdown menus for 'Data Source' (set to OPENWORKS-DRILL) and 'Project' (set to TEAPOT). Below these are several columns: native\_uid, Wellbore UWI, Survey Name, Survey Calcul..., BH Y\_Offset, and BH X\_Offset. The data table contains five rows of data. At the bottom of the interface, there is a footer bar with the text '© Halliburton. All Rights Reserved.'

native_uid	Wellbore UWI	Survey Name	Survey Calcul...	BH Y_Offset	BH X_Offset
350	490250642500	UNKNOWN	Minimum Curvature	0	98.280655
507	490251030200	UNKNOWN	Minimum Curvature	-13.138554	-75.28928
461	490251023300	UNKNOWN	Minimum Curvature	-49.025597	-105.30696
437	490251001700	UNKNOWN	Minimum Curvature	287.12985	107.7936
410	490250945000	UNKNOWN	Minimum Curvature	102.730576	2.8557818



# *Chapter 5*

## ***Configuration Options for BPM***

This chapter provides step by step instructions for the DecisionSpace Business Process Management (DSBPM) configuration, integration, and deployment. There are exercises with examples that describe how to perform DSBPM specific tasks.

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## **Chapter Overview**

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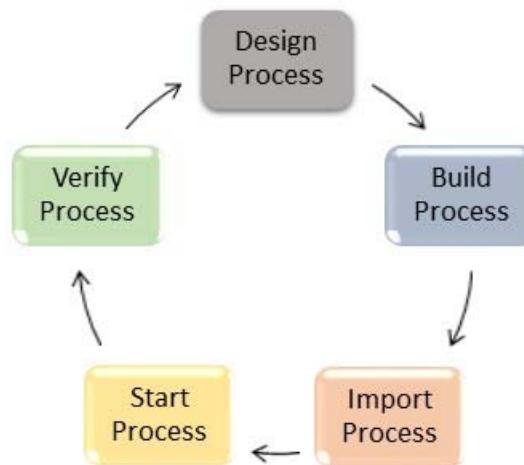
This chapter will discuss:

- DSBPM architecture
- DSBPM components
- Creating packages, designing and building processes
- Importing a package from within the repository
- Deploying the imported package in DSBPM engine
- Integrating with DecisionSpace Web Framework (Web Framework)

## Introduction

The DecisionSpace Business Process Management (DSBPM) provides business analysts, process owners, and developers a comprehensive suite of tools to design, orchestrate, and execute business processes across disparate system landscapes throughout the enterprise. DSBPM helps in establishing optimal business processes.

The following depicts the design and execute BPM workflow:



*Exercise 1: Design and Execute a BPM Process*, presented later in this chapter, discusses each and every step of the design and executes the BPM workflow as applied to a Loan Application example.

To launch the DSBPM engine, enter the following URL in a web browser.

<http://localhost:8080/dsbpm-engine>

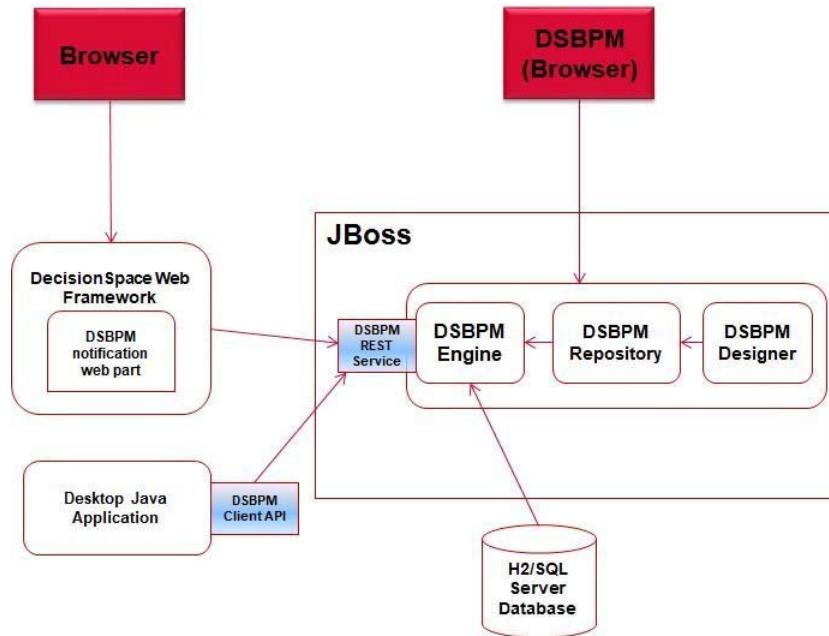
The major advantages of BPM are to:

- Document business processes
- Enable successful collaboration between stakeholders/owners of the business processes, business analysts and developers
- Optimize business processes across time through the use of a cyclic workflow that easily enables process verification and re-design

## DecisionSpace Business Process Management Architecture

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The architecture of DSBPM is shown in the diagram below:



### Components of DecisionSpace BPM

From review of the DecisionSpace Business Process Management Architecture shown above, the components of BPM are:

- **JBoss Application Server (AS)** hosts the BPM suite.
- **DSBPM Engine** also known as jBPM, the DSBPM Engine is an open source workflow engine written in Java. It executes business processes as described in BPMN 2.0, which is explained within the DSBPM Process Designer found later in this chapter.
- **DSBPM Repository (DSBPM Repo)** also known as Guvnor, the DSBPM Repository is an open source project that is home to the Governance Repository utilities and tools.

It governs and manages artifacts, such as rule and process definitions, service descriptions, database schemas, etc. As such, it provides services for querying, uploading, exploring, curating and managing artifacts.

- **DSBPM Designer** within DSBPM Repo, a web-based Process Designer tool (DSBPM Designer) is available to design processes in BPMN 2.0 notation. The area where this design activity occurs is in the **Designer Palette**.

All of these components will be used in the Exercises presented later within this chapter.

## Components of DecisionSpace Business Process Repository

As mentioned in the Components of DecisionSpace BPM section before this, the DSBPM REPOSITORY can be used as a process repository to store business processes. It also offers a web-based interface to manage the process called DSBPM Designer. DSBPM Designer includes a web-based BPMN 2.0 editor for creating, editing and viewing the processes.

DSBPM REPOSITORY performs the following actions:

- Importing an existing process
- Creating a new process in the DSBPM Designer
- Editing/updating an existing process in DSBPM Designer
- Validating and building packages
- Archiving packages/processes

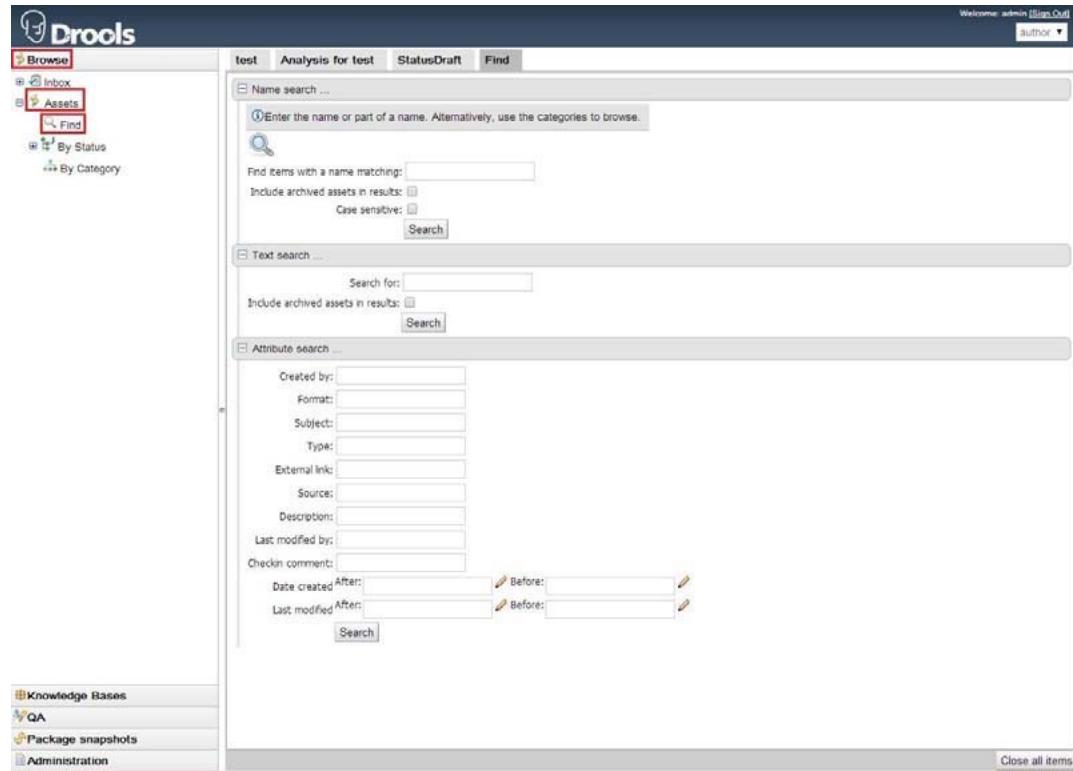
### **Browse**

The **Browse** tab displays by default. Use this tab to find the current activity, performed tasks, and running processes. **Incoming Changes**, **Recently Edited**, and **Recently Opened** items are present under the **Inbox** option. The following image shows the **Recently Edited** list of items.



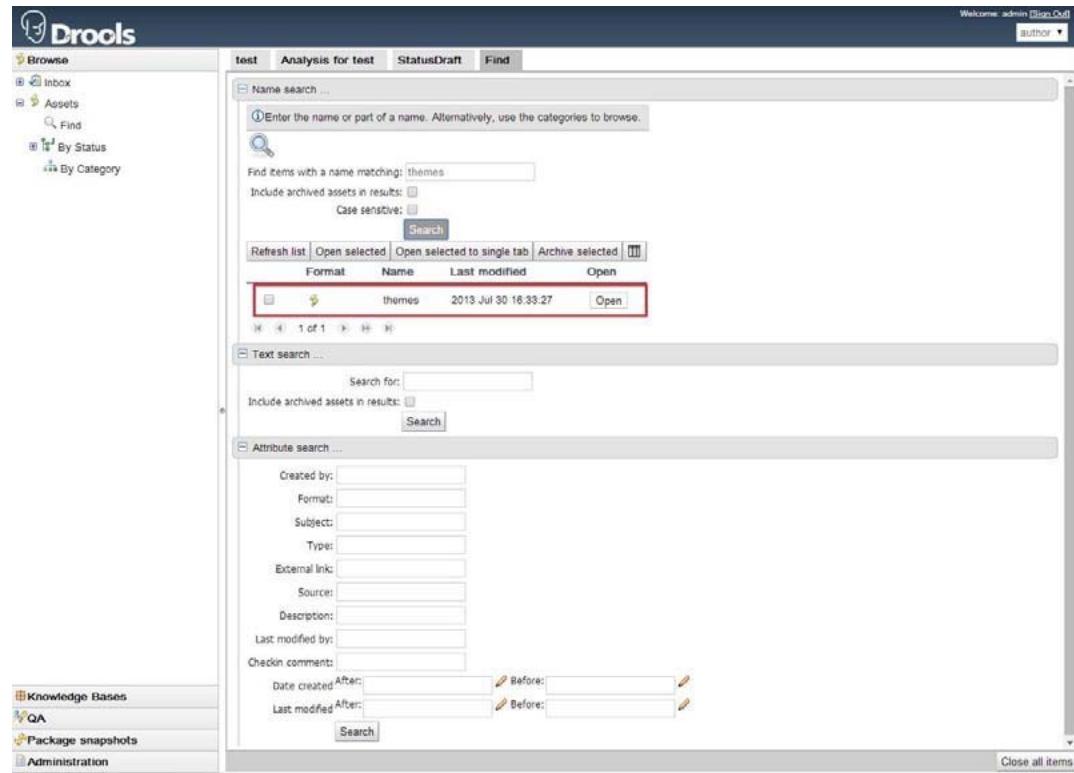
To find an asset in a repository:

1. Select the **Browse** tab.
2. Click  to expand the **Assets** option.
3. Select the **Find** option. The Find window appears.



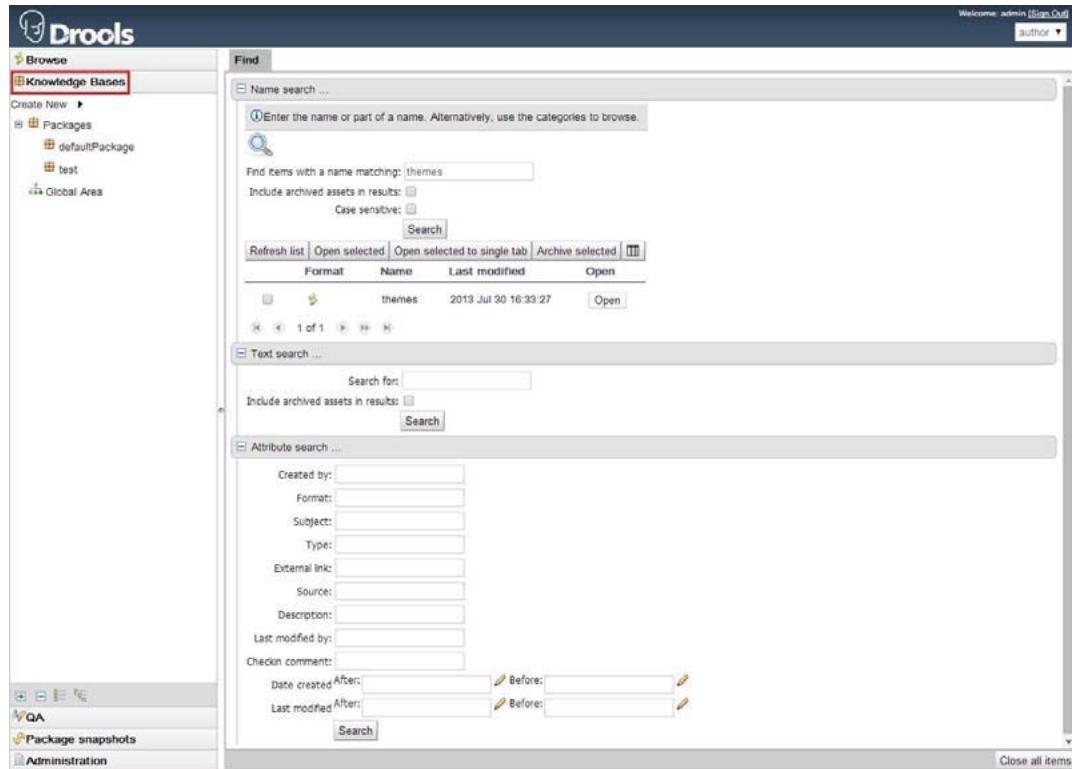
4. In the Name search section, enter **themes** in the **Find items with a name matching** field.

5. Click **Search**. The themes details display in the **Name search** section.



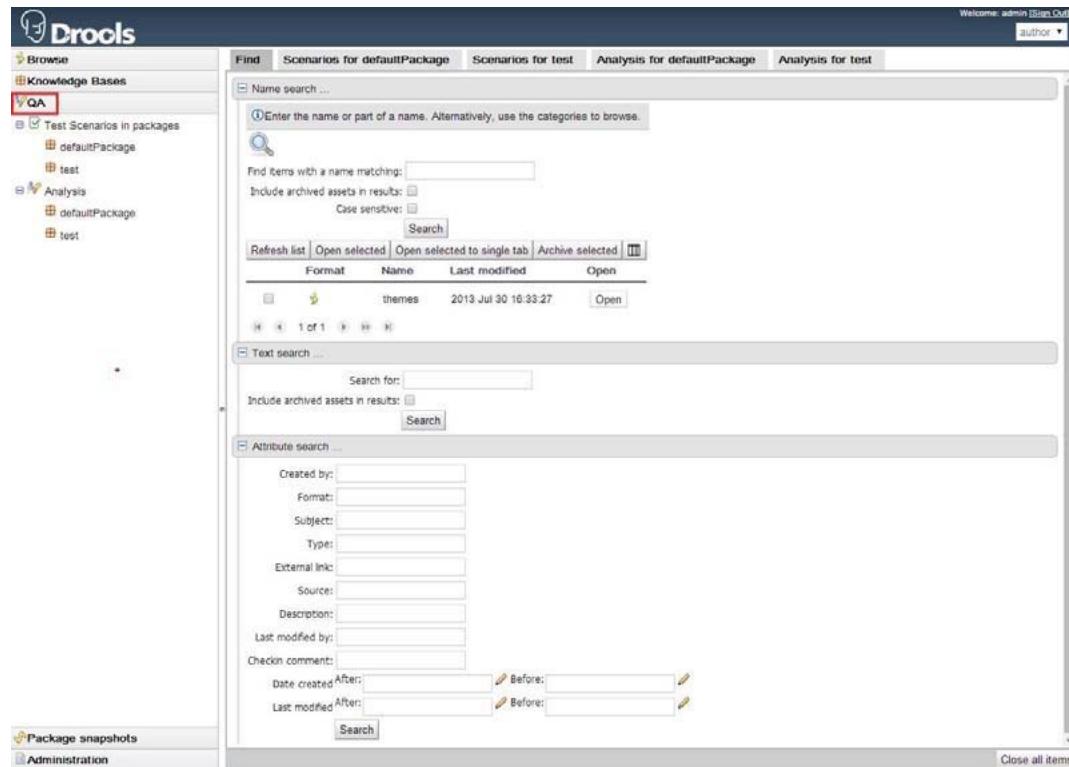
## Knowledge Bases

The **Knowledge Bases** tab is a very important part of the DSBPM REPOSITORY. It contains all binary packages. These packages contain compiled knowledge assets such as business processes, business rules, and DSL mappings. The **Knowledge Bases** tab is a static container for compiled knowledge.



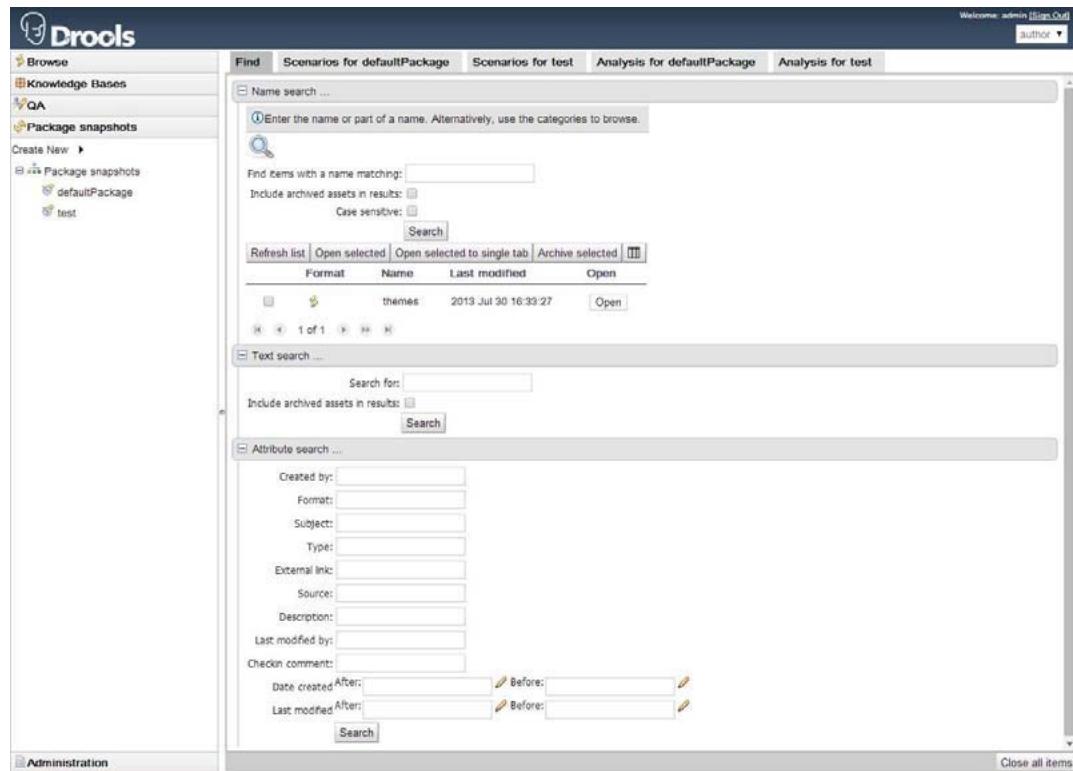
## QA

The **QA** tab provides an analysis of created packages and also checks the associated scenarios. Analysis and test scenarios are package based.



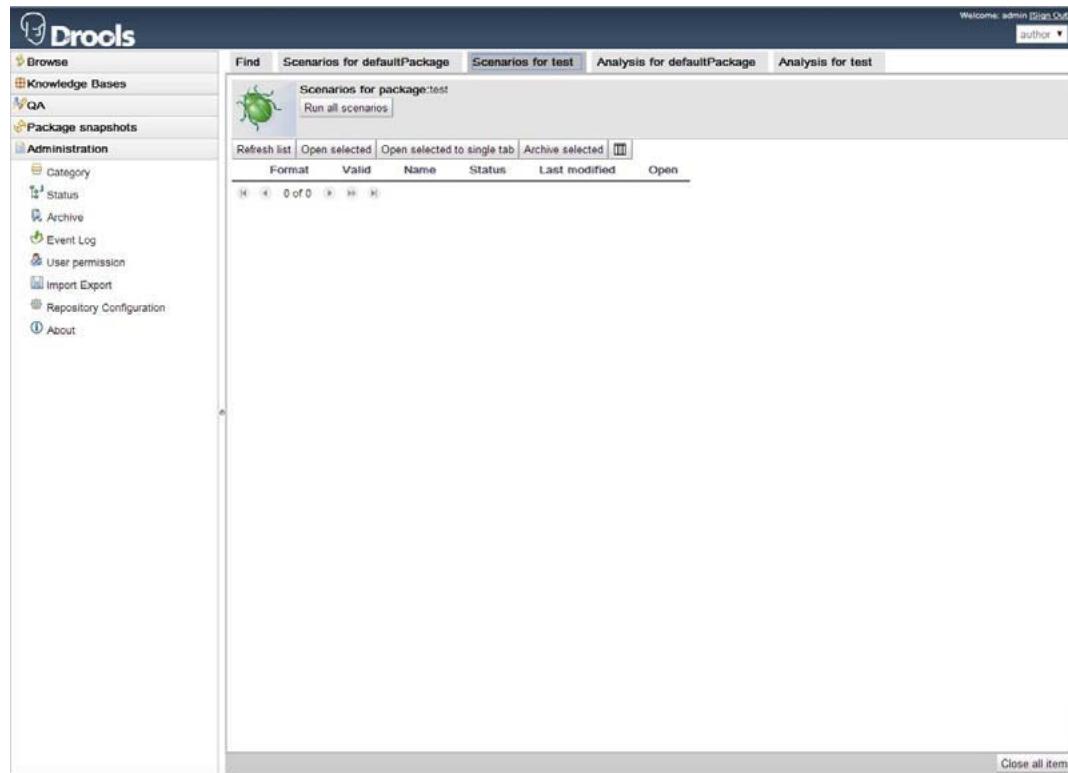
## Package Snapshots

The **Package Snapshots** tab enables rebuilding and taking snapshots of created packages.



## Administration

The **Administration** tab of the DSBPM REPOSITORY enables importing and exporting of existing packages. The **Archive** option enables permanent deletion of packages and its contents.



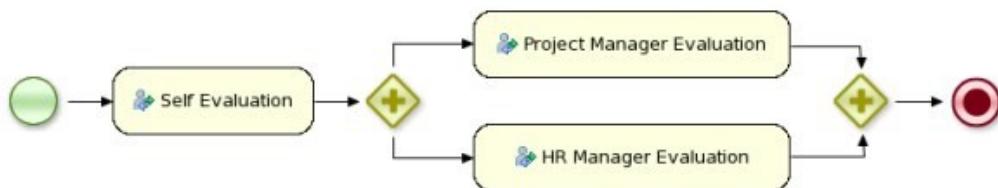
## DSBPM Designer

Use DSBPM to model and implement business processes using BPMN 2.0 notation. It does this by using the **Design Pallet** of DSBPM Repository, termed *DSBPM Designer*.

This section of the chapter provides the basics of BPMN 2.0 notation. There are many BPMN 2.0 training materials available on the internet, and one worthy of mention here is *Training course for Introduction to BPMN 2* by Dr. Jim Arlow. Additionally, the BPMN 2.0 standard is available through the internet.

### Process Definition

A process definition is a workflow diagram that can be designed by business analysts and run by BPM products to achieve process orchestration. A process definition adheres to the Business Process Model Notation 2 (BPMN2) specification. BPMN2 is a standard in the business process management world.



### Events

An event occurs during the course of the process, affecting the process flow and has a trigger or result. Events are represented by circles with an empty center, which enables the inclusion of different markers to differentiate them from each other.

## Start Event

The start event represents the starting point of a process. A process definition has one start event which initiates the business process.



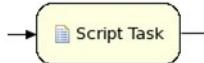
## End Event

The end event represents termination of the business process. A process definition can have one or more end events.



## Task

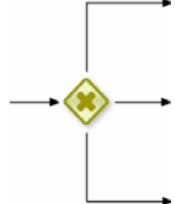
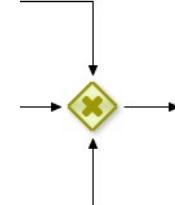
In process definition, task or activity is represented as one or more rounded rectangular boxes. A task is a single logical and atomic step in the process definition. Task has input and output parameters. These can be mapped to process variables. Tasks can be of various types and some of these are mentioned below:

<b>Script Task</b>	This task executes a Java Code Snippet given to it. 
<b>Human Task / User Task</b>	This is a manual step and must be performed by a user to complete it. To perform this step, fill the form and submit; e.g Approve Expense. 
<b>Service Task/Domain Specific Task</b>	This is a domain specific task and it runs a domain specific atomic operation. These can be as generic as send email to as specific as load data in MDS. 

<b>Email Task</b>	It represents a unit of work that should be executed in this process. All work that is executed outside the process engine should be represented (in a declarative way) using a Service Task. Different type of services are predefined, e.g., sending an email, logging a message, etc.
<b>Log Task</b>	It represents output logs.

## Gateway

A gateway is used to model decisions, merges, and joins in the process definition. Gateways are categorized in two main categories:

<b>Diverging Gateway</b>	As a divergence shape, the exclusive gateway is used when two or more alternative paths appear at one point in the process, and just one of them is valid at a given time.	
<b>Converging Gateway</b>	As a point of convergence, this shape is used to synchronize the paths exiting the exclusive gateway (divergence element).	

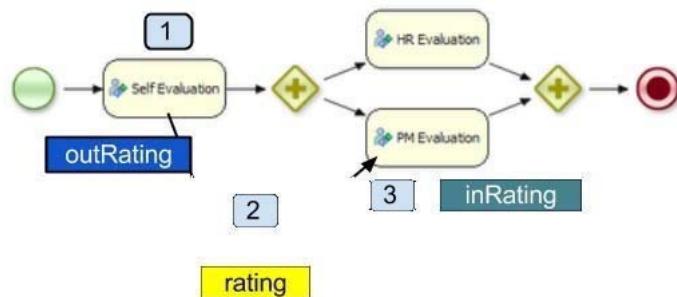
Each gateway is further categorized into:

- XOR Gateway - represents a merging decision
- OR Gateway - allows more than one path

- AND Gateway - performs activities concurrently

## Process Variables

Tasks have input and output parameters and they can accept or generate data. Process variables are required in order for data to flow between different tasks; i.e., the output of one task becomes an input to another task.



# DSBPM Exercise 1: Design and Execute a BPM Process

## Purpose of the Exercise

The purpose of this exercise is as follows:

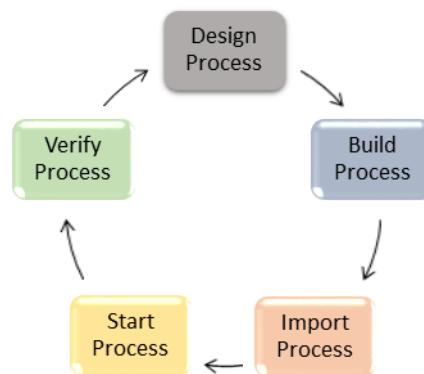
- Design a process using the DSBPM DESIGNER
- Execute the process in the DSBPM Engine

In this exercise, a simple loan application process will be designed to get to know the different DSBPM components involved in designing and managing a BPM process.

## Loan Application Workflow



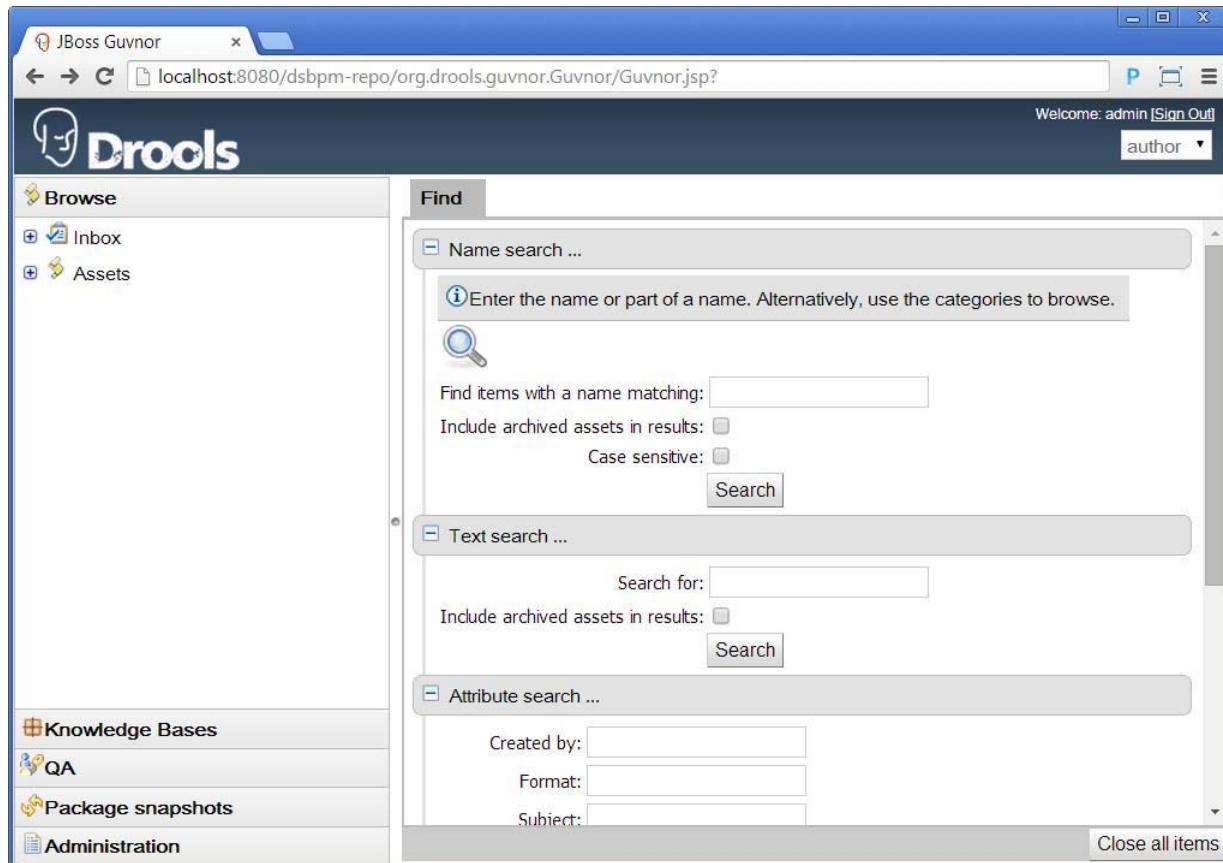
## Exercise Workflow



The details of the workflow will now be explained in order to accomplish the loan application workflow.

**Design  
Process**

1. Refer to *DSIS Installation & Verification* and *DSIS Install Exercises* to correctly install and verify DSBPM if this has not already been done.
  
2. To design a process, launch DSBPM Repo (<http://localhost:8080/dsbpm-repo/>) and the *DSBPM Repo (Guvnor)*.  
The Main Screen appears.



**Figure 1: DSBPM Repo (Guvnor) Main Screen**

3. Select **Knowledge Bases** from the **Main Features** area, as shown in **Main Features and Content Display Areas of DSBPM Repo**.

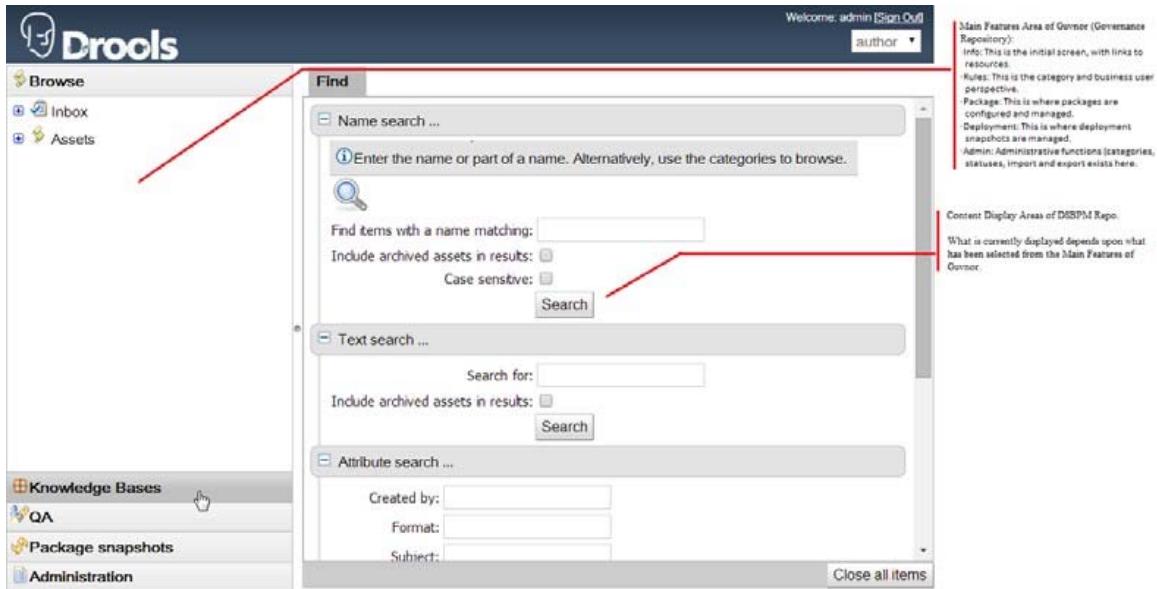
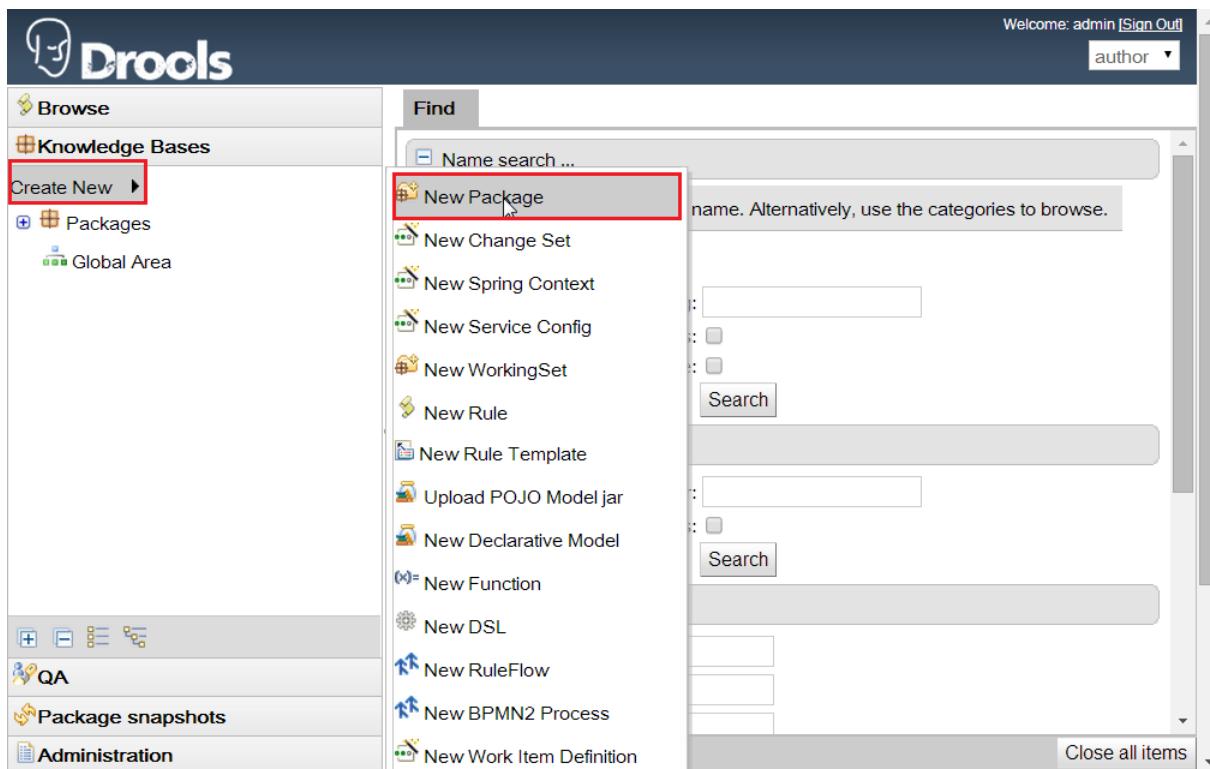


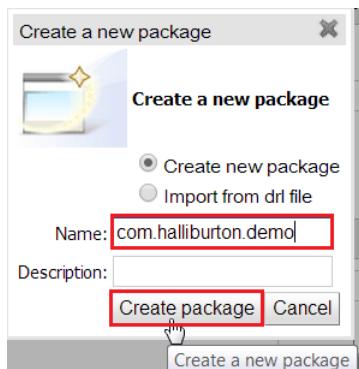
Figure 2: Main Features and Content Display Areas of DSBPM Repo

4. Select **Create New** (after **Knowledge Bases** expands), and then **New Package** (after **Create New** expands and presents a drop-down menu). This has been illustrated in *Create New Package*.



**Figure 3: Create New Package**

5. The Create a new package dialog box displays. Provide the package name as **com.halliburton.demo** and click **Create package**.



**Figure 4: Create a new package wizard**

6. Expand the **Packages > com > halliburton > demo** tree in the **Designer Palette** to select the newly created package. This has been illustrated in the *Expanding Packages Tree Structure*.

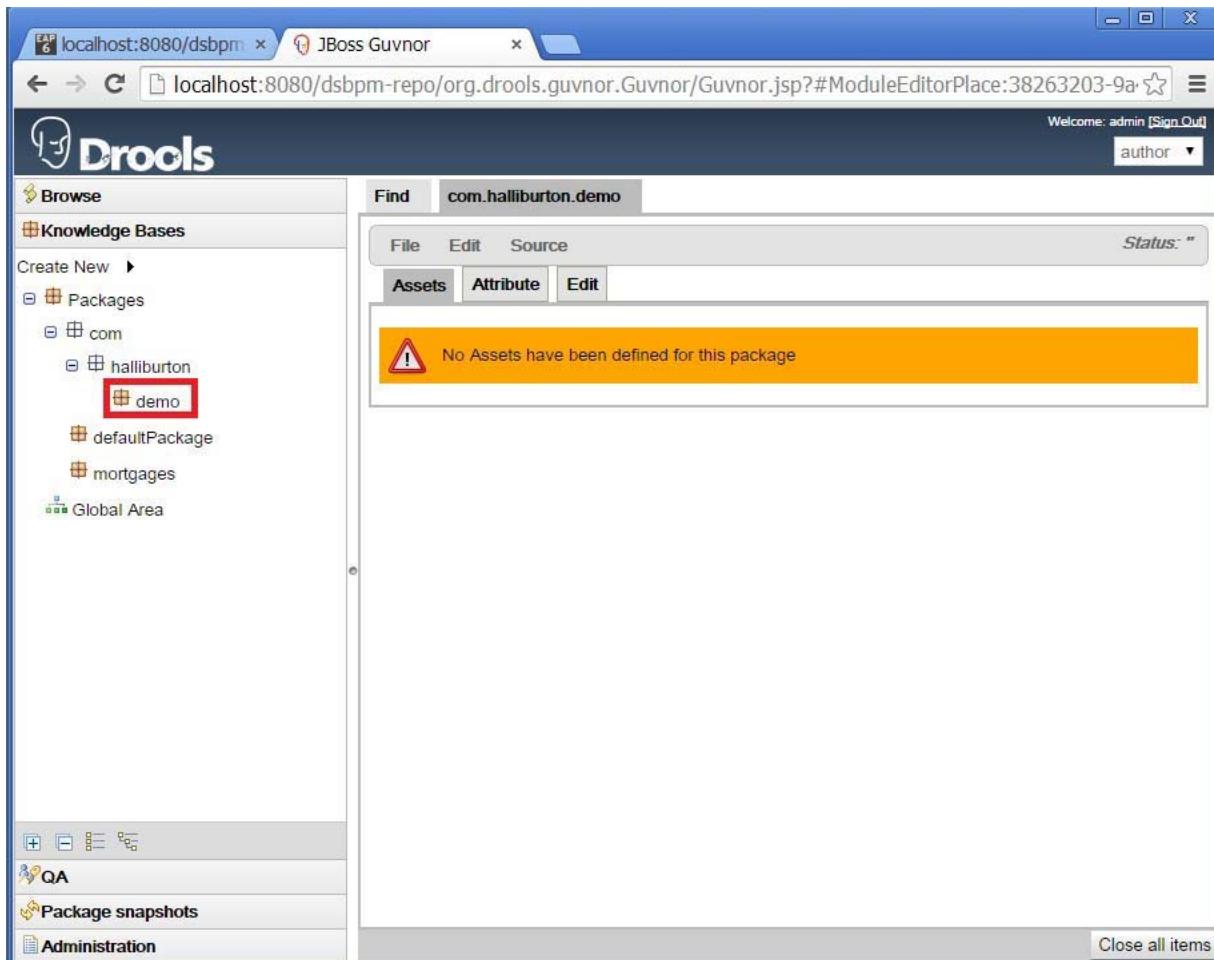
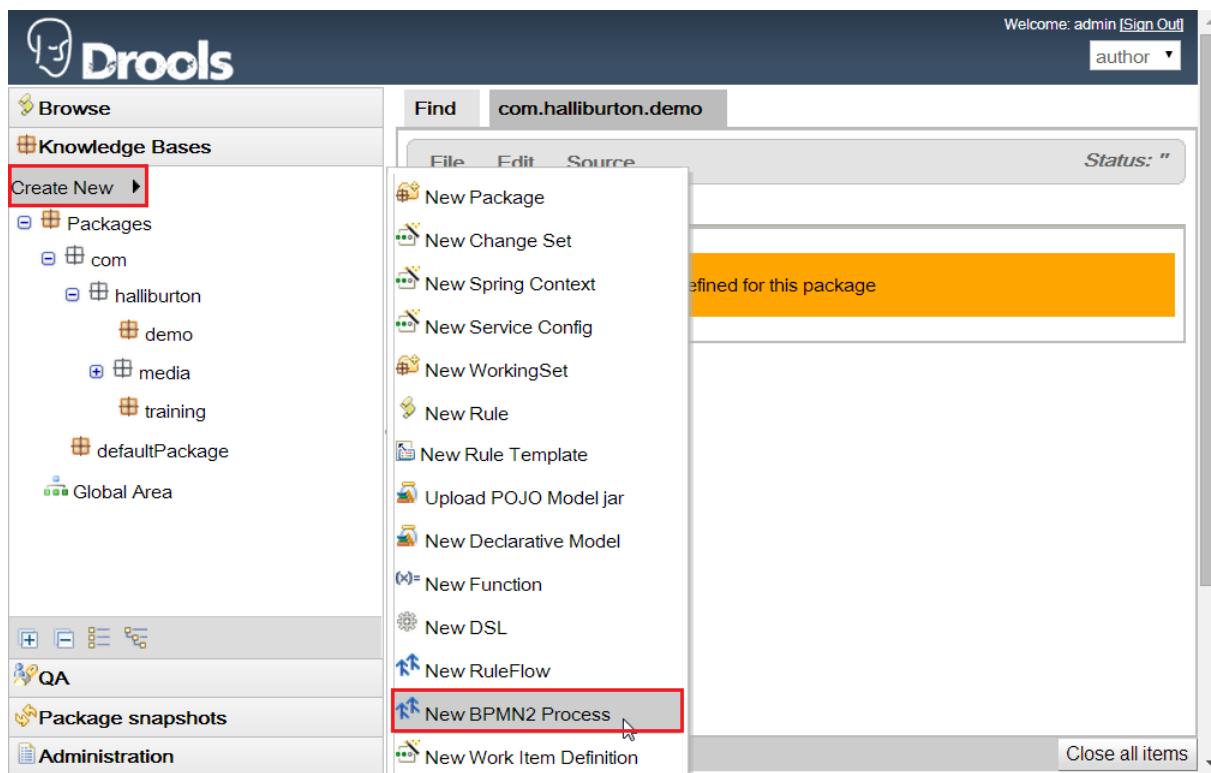


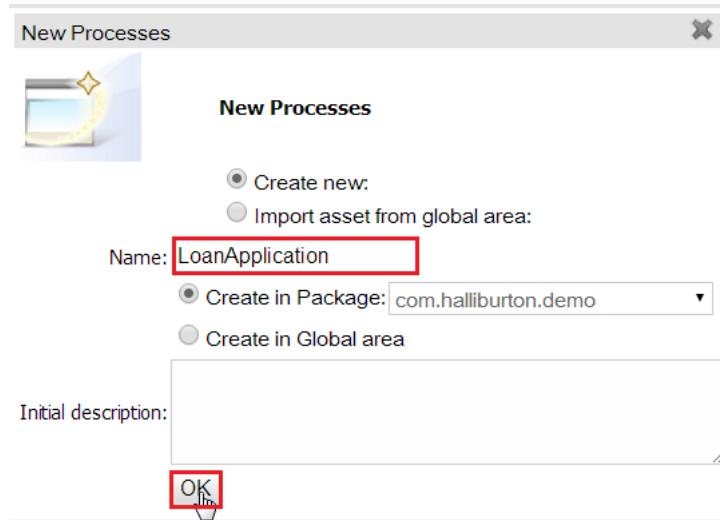
Figure 5: Expanding Packages Tree Structure

7. Create a new BPMN2 process that will contain the loan application workflow by selecting **Create New > New BPMN2 Process** in the **Designer Palette**. Refer to *Creating a New BPMN2 Process*.



**Figure 6: Creating a New BPMN2 Process**

8. The New Processes dialog box displays. Provide the process name as **LoanApplication** and then click **OK**.

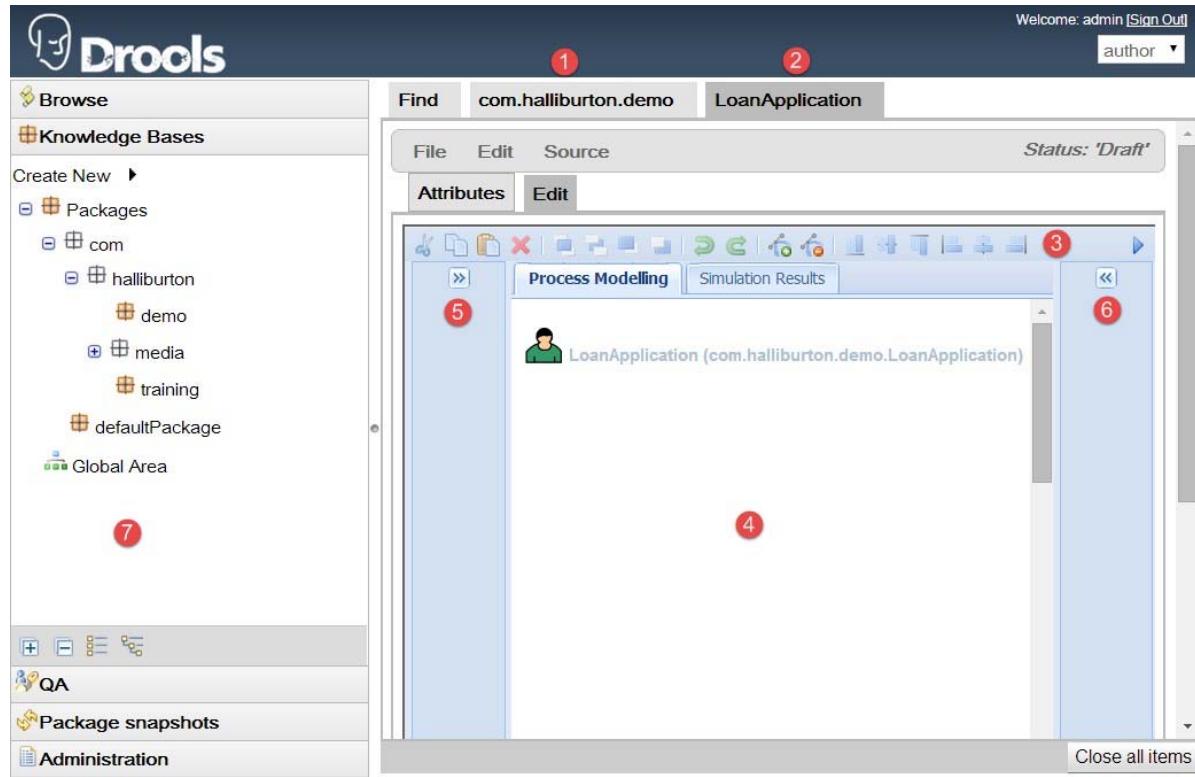


**Figure 7: New Processes Wizard**

**Note**

Do not add a space in the process name.

9. Wait for the Process Designer window to open. The components of the Process Designer window display after the window opens.



**Figure 8: Process Designer Window**

1	Tab to access package
2	Tab to access process
3	Designer Toolbar
4	Designer canvas
5	Designer Palette <sup>1</sup>
6	Properties Panel <sup>1</sup>
7	Knowledge Bases

1. Will open after selecting the arrow above the number.

**Figure 9: Process Designer Window Components**

10. Select the arrow that slides open (to the right) the **Designer Palette** as shown in *Sliding Open the Designer Palette*. This panel consists of the widgets required to design a process.

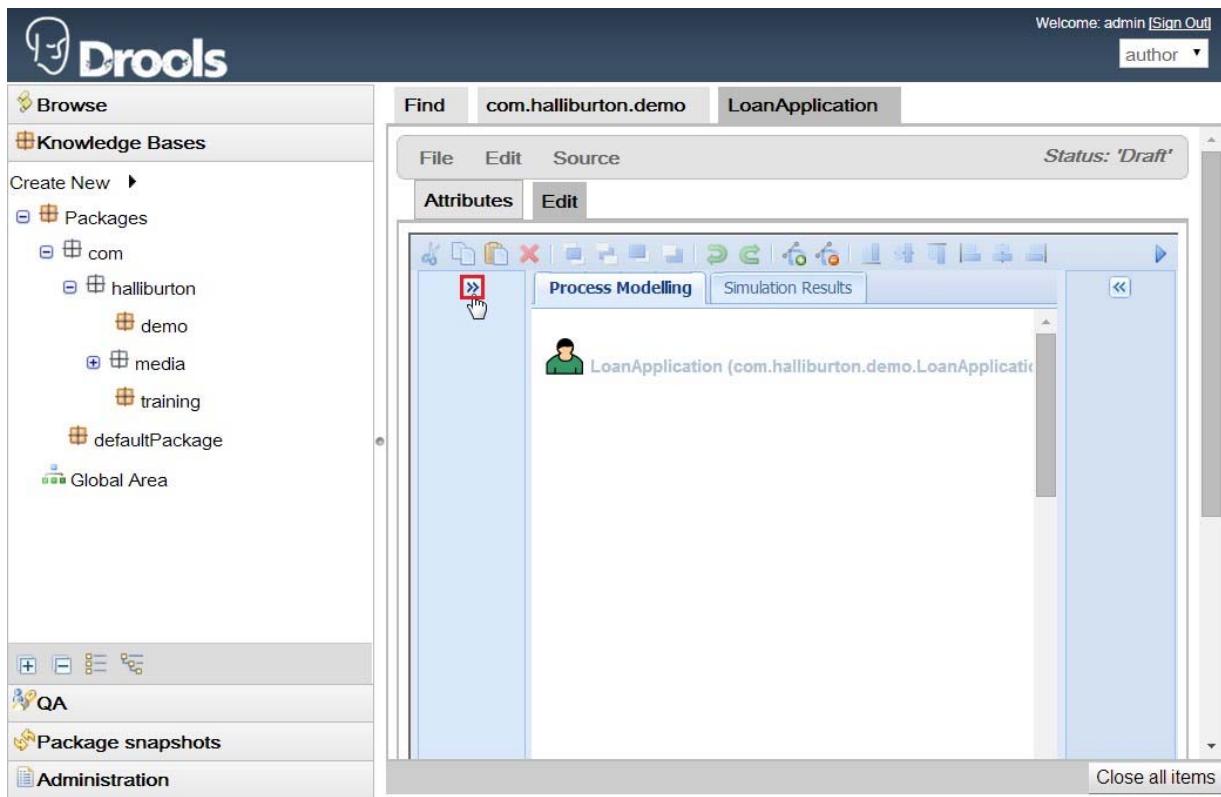


Figure 10: Sliding Open the Designer Pallet

11. Expand the Start Events Tree in the Designer Palette.

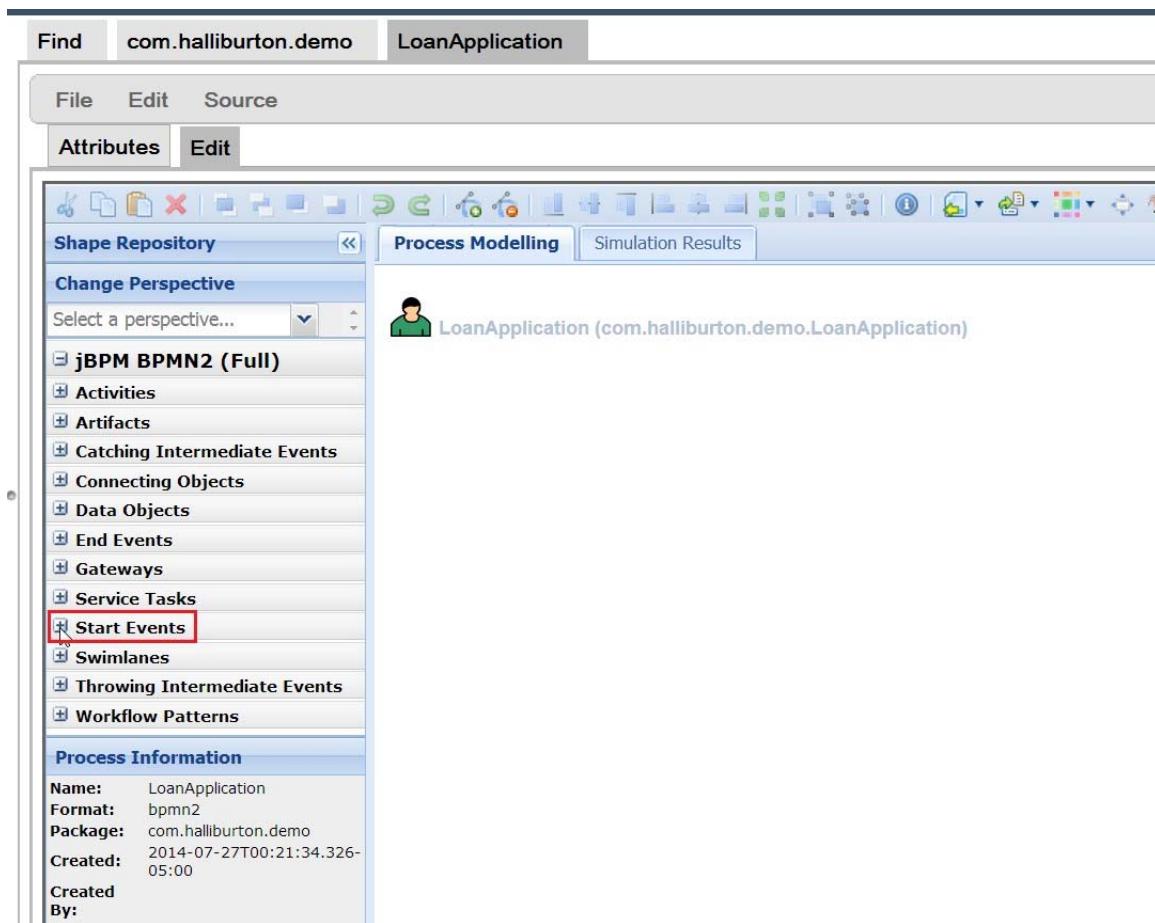


Figure 11: Start Events Tree in the Designer Palette

12. Hover over **Start Event** as shown in **Start Event** in the **Designer Palette**.

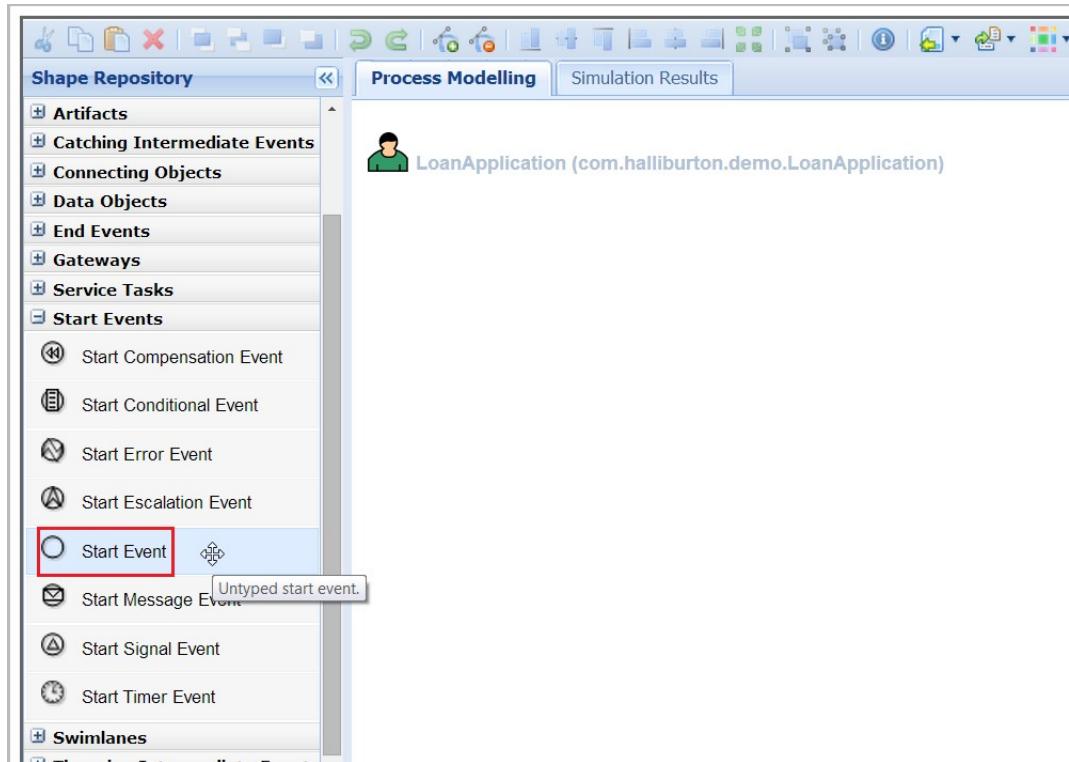
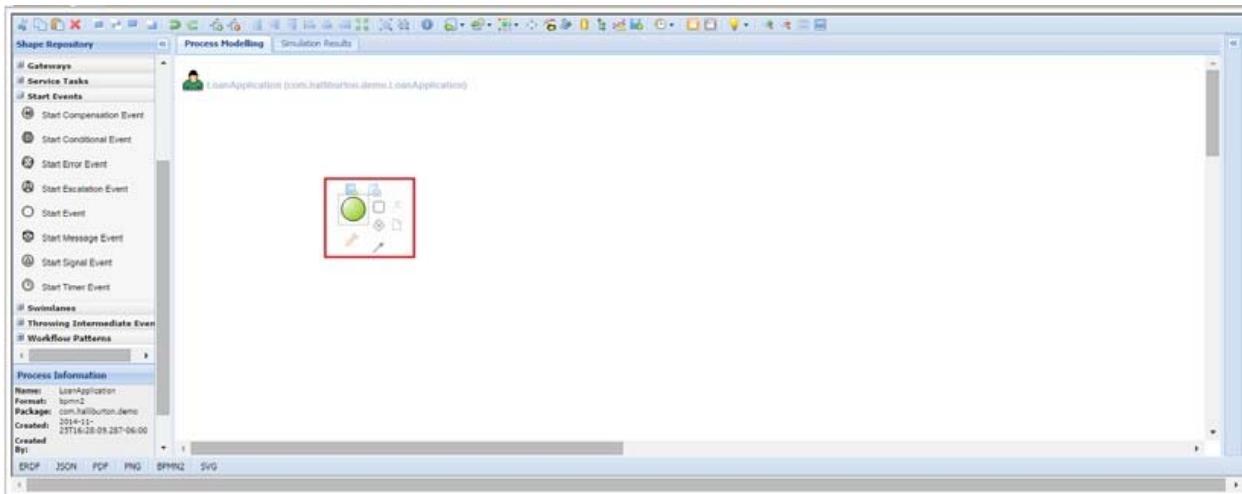


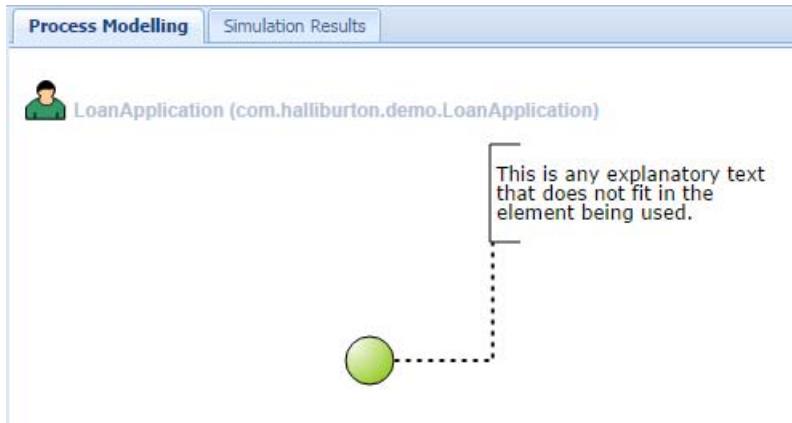
Figure 12: Start Event in the Designer Palette

13. Drag-and-drop the **Start Event** onto the Designer Canvas. The Start Event on the Designer Canvas displays the BPMN 2 notation for a Start Event surrounded by selectable icons. The meanings of these icons are described in the table below: Start Event's Associated Icons and Their Meanings/Definitions.



**Figure 13: Start Event on the Designer Canvas**

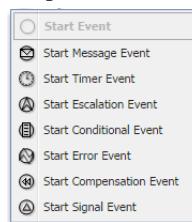
Icon	Meaning	Definition
	Add to Process Dictionary	Add element in the Process Dictionary.
	View Node Source	Node source code, in XML; for example:
	Task - Click or drag <sup>1</sup>	A task is one of the four types of activities <sup>2</sup> that represent work performed within a Business Process. Specifically, a task represents a single unit of work that is not or cannot be broken down to a further level of business process detail without diagramming the steps in a procedure (which is not the purpose of BPMN). ( <a href="#">Business Process Model and Notation, 2014</a> )

	Text Annotation - Click or drag <sup>1</sup>	Double-click to add annotation after the annotation has been created by either clicking or dragging:  
	Data-based Exclusive (XOR) Gateway - Click or drag <sup>1</sup>	Gateways are used to control how Sequence Flows interact as they converge and diverge within a Process.
	Data Object - Click or drag <sup>1</sup>	Data Objects provide information about what activities require and/or what they produce. They represent a singular object or a collection of objects. This icon is the primary construct for modeling data within the process flow. Data Object has a well-defined life-cycle, with resulting access constraints.
	Edge - Drag <sup>1</sup>	Identifies an edge of an object that may be dragged to another to connect the two objects <sup>3</sup> .
	Tools - Morph Shape <sup>4</sup>	Changes the current shape to one within a drop-down list that is also displayed.
	Intermediate Event	Intermediate Events occur between a Start Event and an End Event. They will affect the flow of the Process or Choreography, but will not start or (directly) terminate the Process.
	End Event	An End Event indicates where a Process or Choreography will end.

1. Two further icons appear when this icon is selected: <sup>1</sup>

2. An activity is represented with a rounded-corner rectangle and describes the work which must be done. The four types are: Task, Sub-process, Transaction and Call Activity. (Business Process Model and Notation, 2014)

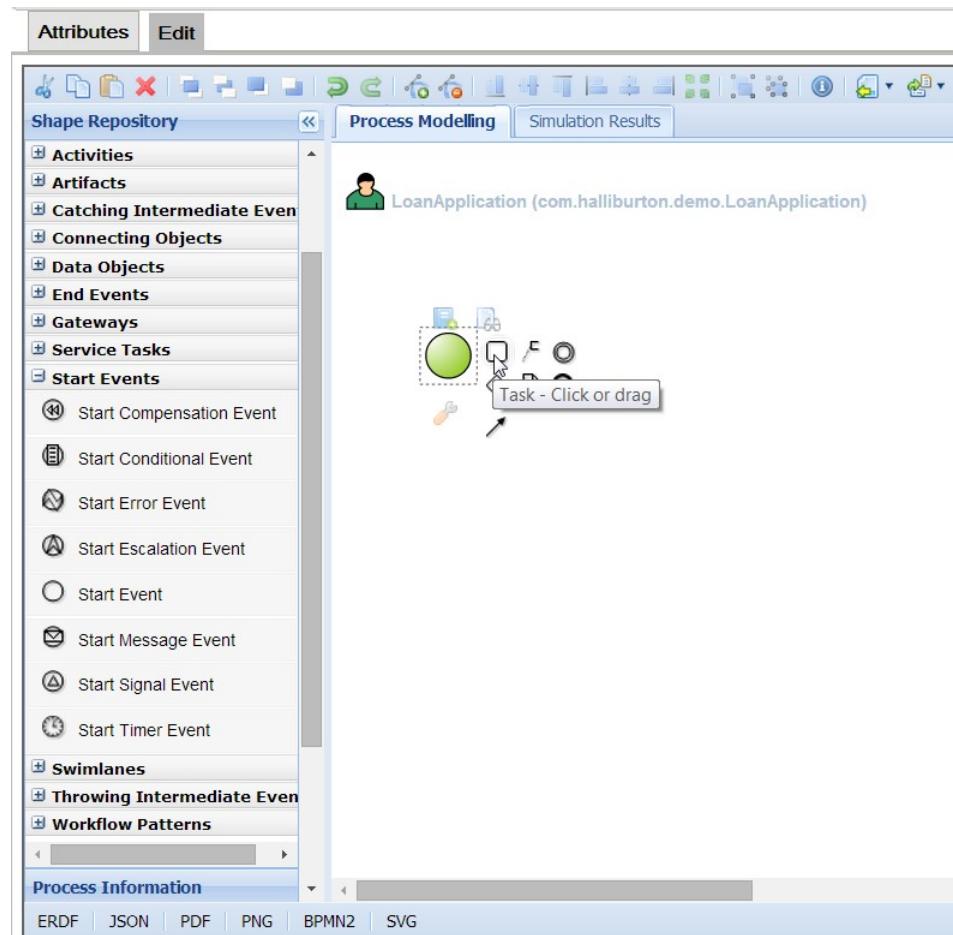
3. Refer to *Connecting XOR Gateway with Email Task* for an example of its use.



4. A drop-down menu appears to morph (or change) the shape

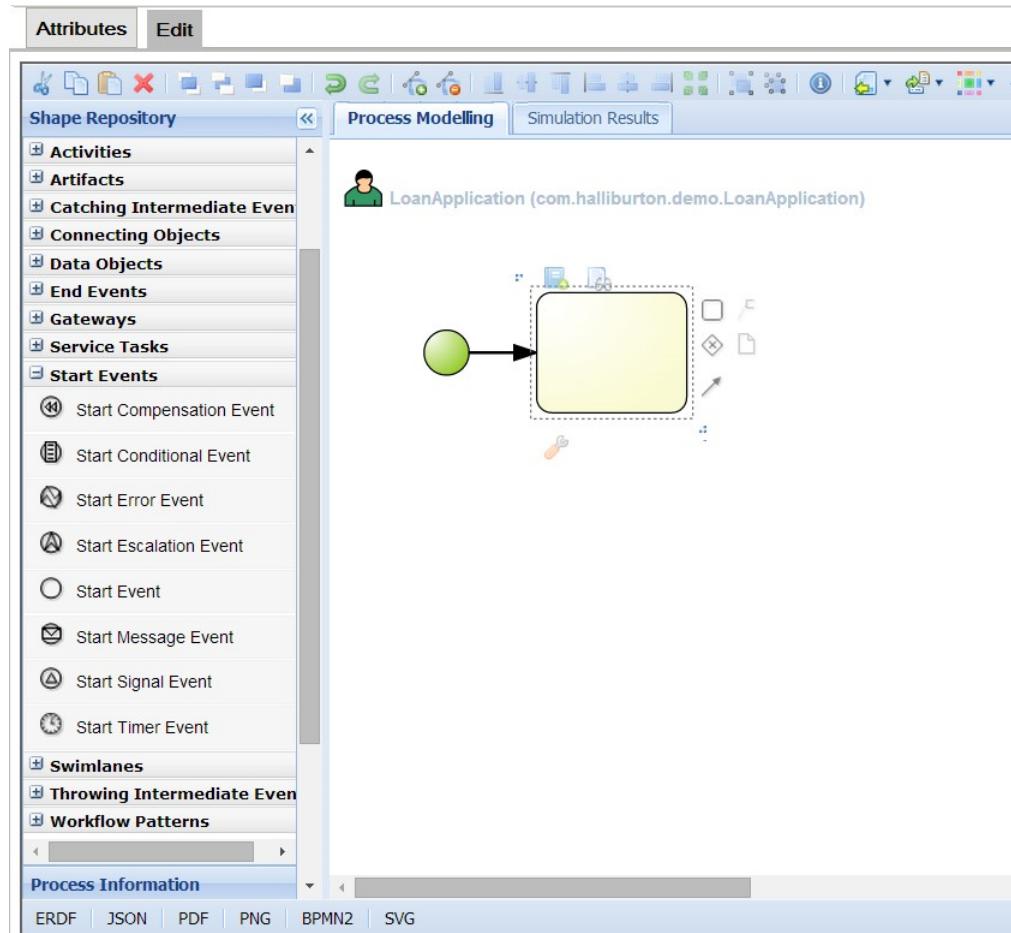
**Figure 14: Start Event's Associated icons and Their Meanings/Definitions**

14. Click **Task**, an important and widely-used icon, as shown in **Selecting Task icon from Start Event**.



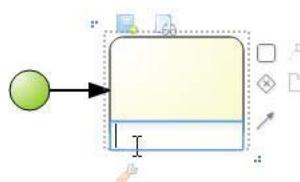
**Figure 15: Selecting Task icon from Start Event**

15. A new task is added to the Designer Canvas, as shown in **Adding a Task**.



**Figure 16: Adding a Task**

16. Double-click the task to open a text box within the shape, as shown in **Opening a Text Box within a Task**.



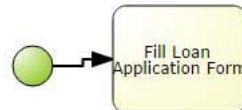
**Figure 17: Opening a Text Box within a Task**

- a) Enter the name **Fill Loan Application Form** in the task<sup>1</sup> text box. Refer to **Task with a Name** to see how the Designer Canvas should appear after the name is provided.



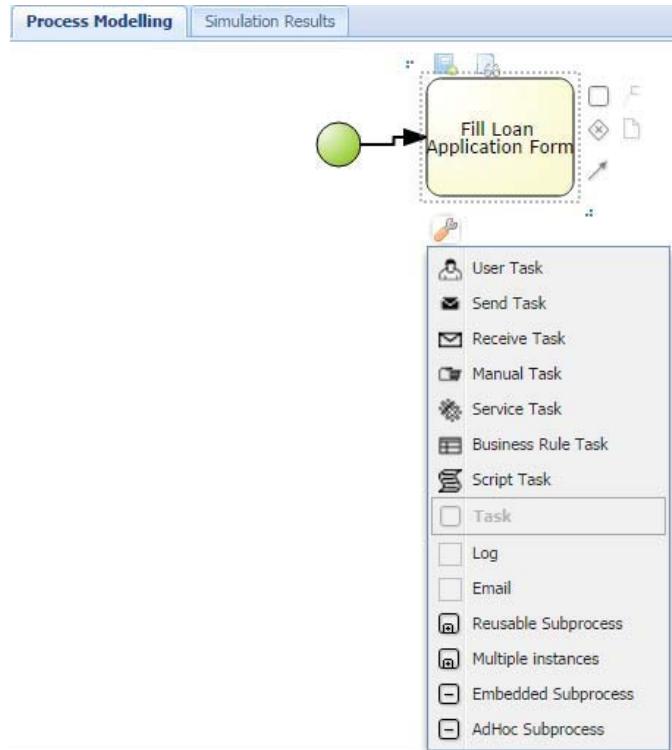
Process Modelling   Simulation Results

 LoanApplication (com.halliburton.demo.LoanApplication)



**Figure 18: Task with a Name**

17. If necessary, click the task again to display the  icon appears. A drop-down list of options that this task may morph (or change) into appears, as shown in *Task Morph Possibilities*.



**Figure 19: Task Morph Possibilities**

- 
1. All icons, including the Task icon, may be resized as needed to make any of the contents legible.

18. Select **User Task** since filling out a loan application form is a typical workflow task where a human performer accomplishes the task with the assistance of a software application and is scheduled through a task list manager of some sort<sup>2</sup>. Refer to *Task Morphed to a User Task* to review what the Designer Canvas should look like now.



**Figure 20: Task Morphed to a User Task**

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2. A Manual Task, on the other hand, is a task that is expected to be performed without the aid of any business process execution engine or any application. An example of this could be a telephone technician installing a telephone at a customer location. (Brookshier, Daniel, 2011).

19. To change the properties of the **Fill Loan Application** User Task, select the task and click the arrow to open the Properties Panel (as shown in *Selecting a Task to Change Its Properties*).

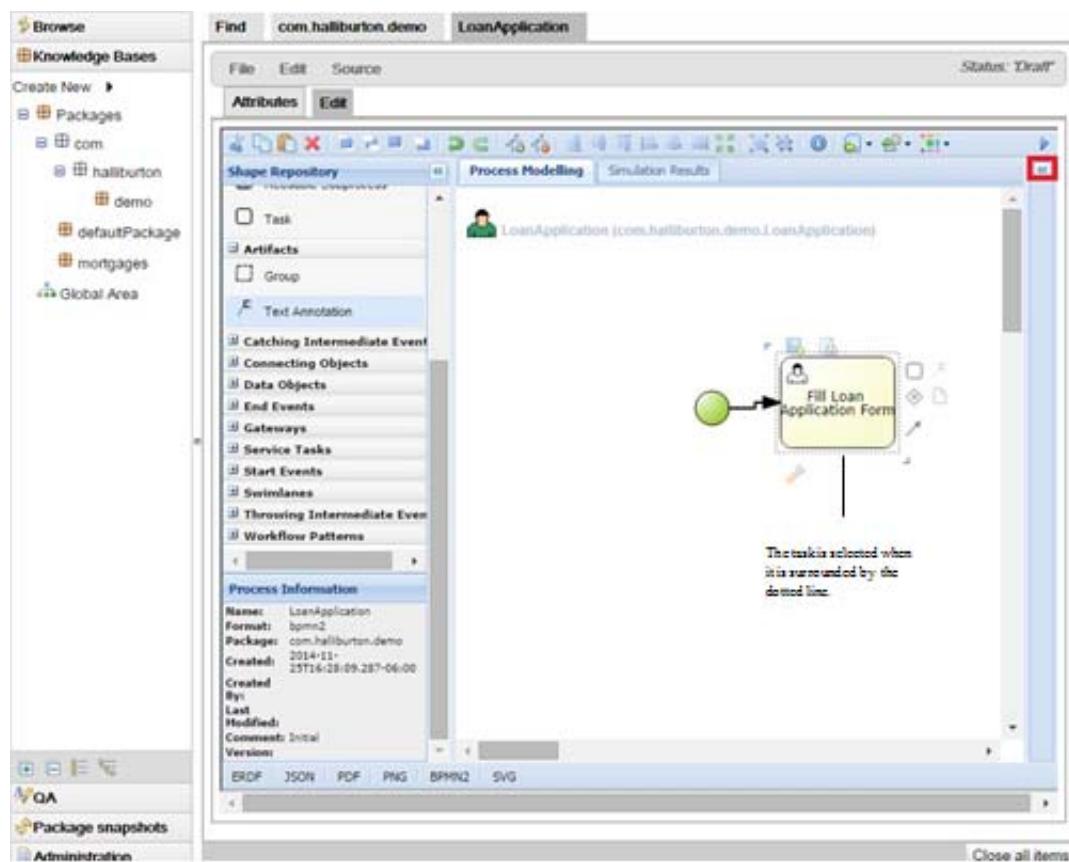
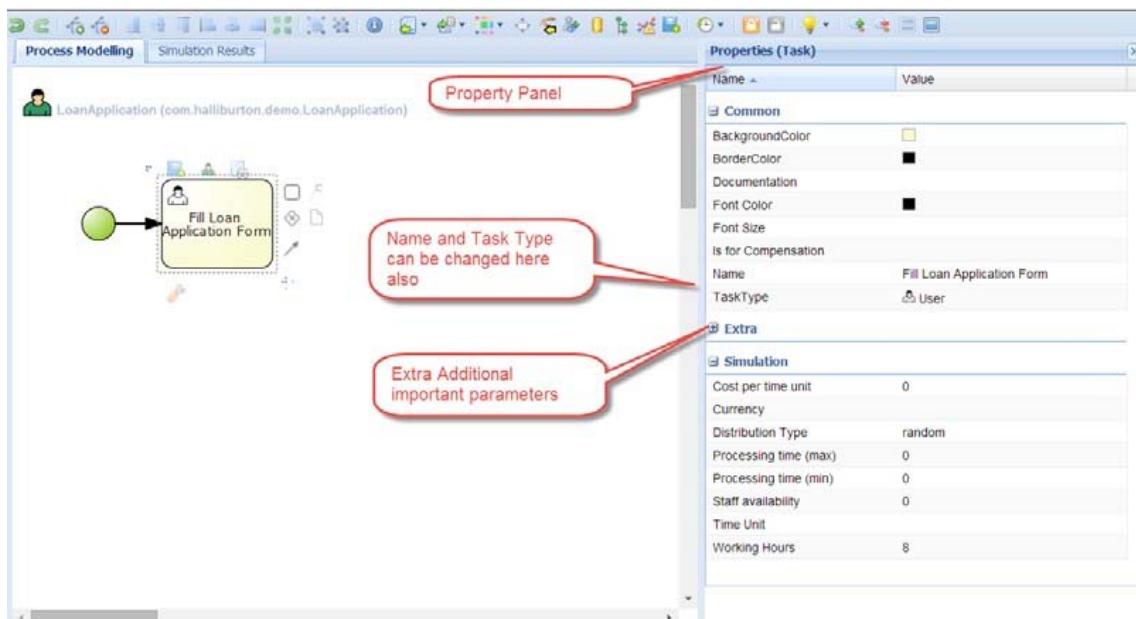


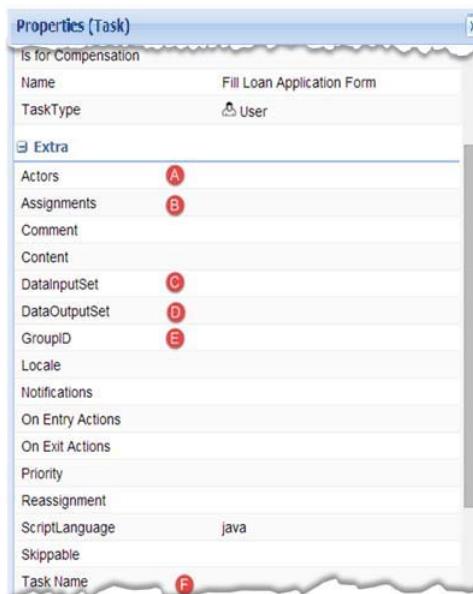
Figure 21: Selecting a Task to Change Its Properties

20. The Designer Canvas now shows the open Properties Panel, which has slid open from right to left. Refer to *Designer Canvas with Open Properties Panel* for a visual of this panel.

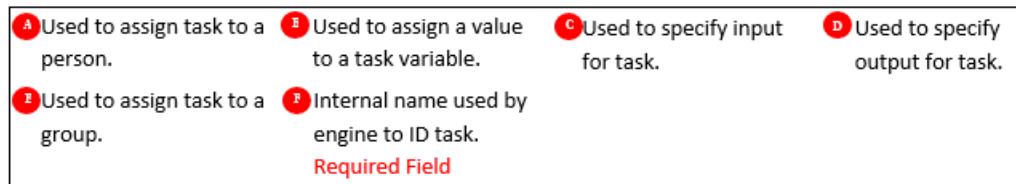


**Figure 22: Designer Canvas with Open Properties Panel**

21. Expand the **Extra** tree as shown in **Extra Tree in Properties Panel Expanded**. The properties with the red circle plus letter (A - F, inclusive) are further explained in the *Important User Task Properties Which Need Configuration* table.

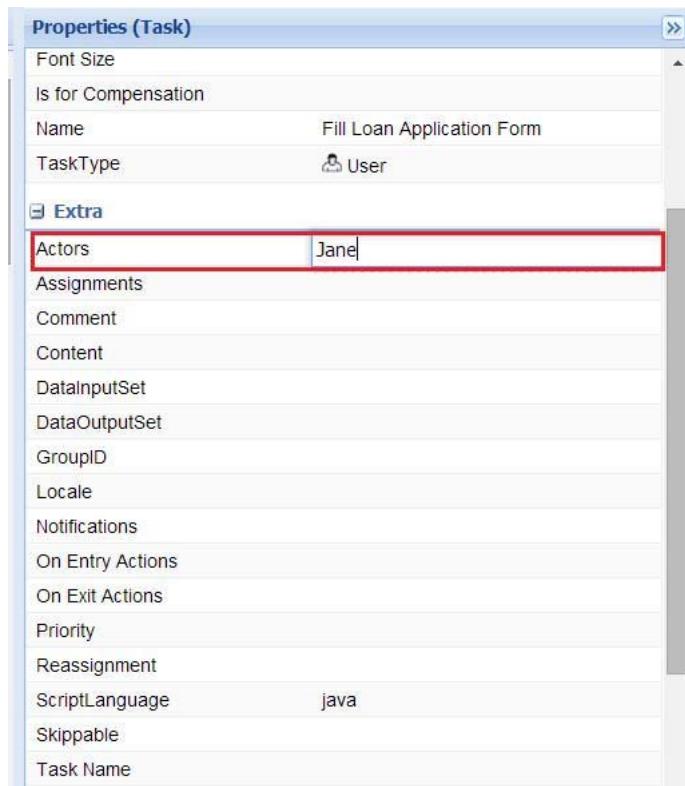


**Figure 23: Extra Tree in Properties Panel Expanded**

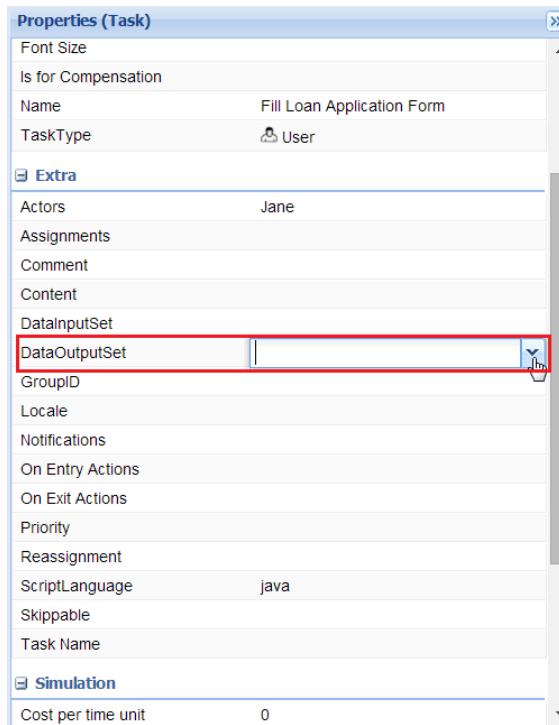
**Figure 24: Important User Task Properties which need Configuration**

22. Provide field values as per the steps (a - c) below:

- To assign this task to a person named **Jane**, enter **Jane** in the **Actors** field.

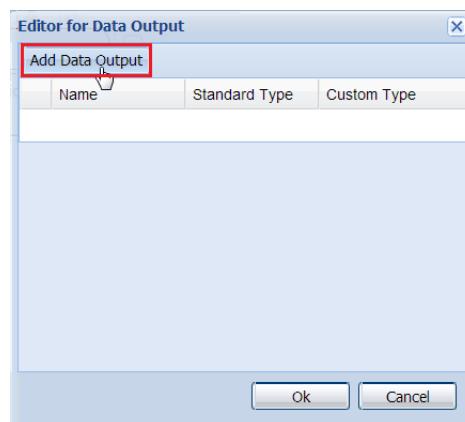
**Figure 25: Assigning a Value to Actors Field in Properties Panel for a User Task**

- b) **DataoutputSet** is used to specify data fields required for a loan application, such as details about the applicant and the amount of the loan. Click the down arrow to construct the data fields as shown in *Opening the Editor for Data Output*.



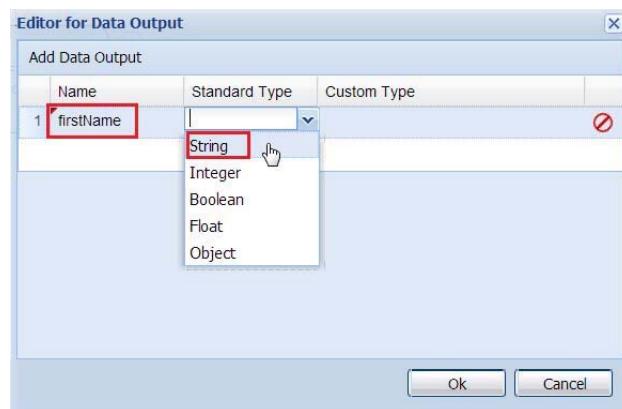
**Figure 26: Opening the Editor for Data Output**

- i) After the Editor for Data Output displays, click **Add Data Output** as shown in image below.



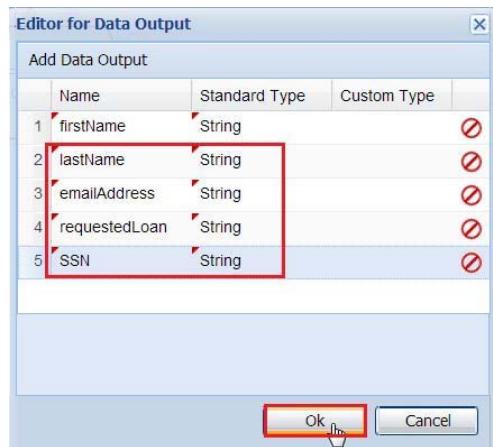
**Figure 27: Selecting Add Data Output in the Open Editor for Data Output**

- ii) Provide the value **firstName** in the **Name** column and select **String** from the drop-down list in the **Standard Type** column.



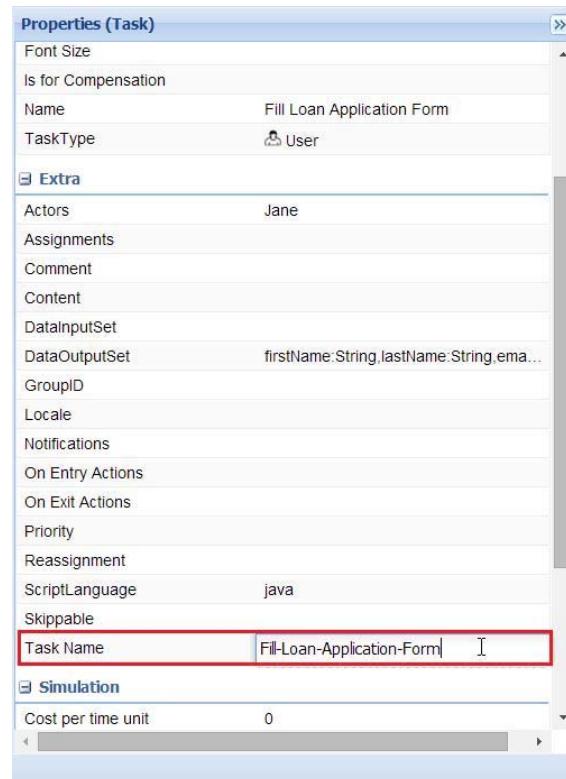
**Figure 28: Specifying firstName as a String in Editor for Data Output**

- iii) Repeat steps i and ii above until all of the remaining fields as shown in the image below are supplied. When done, click **OK**.

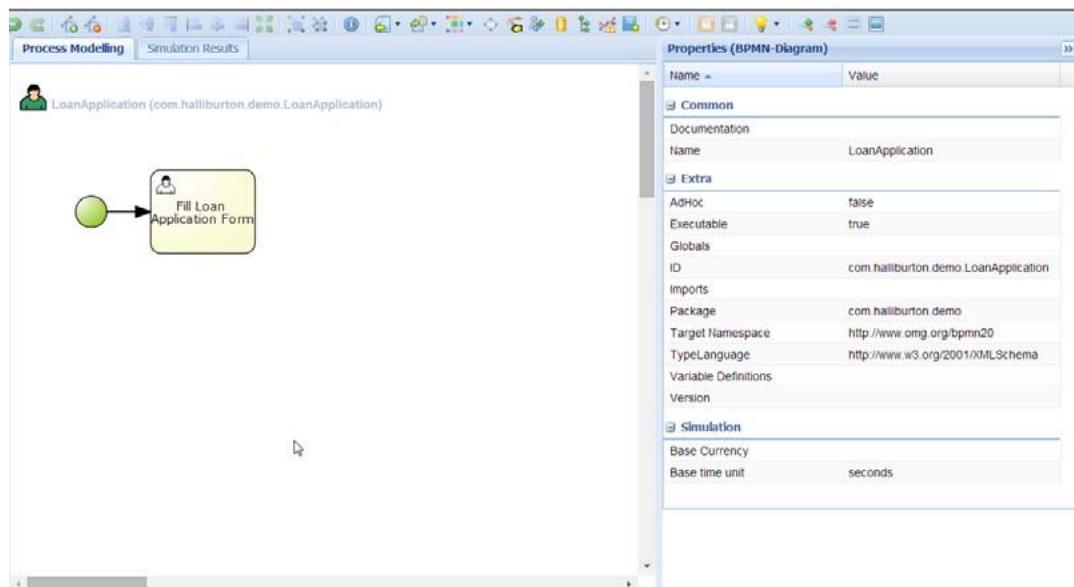


**Figure 29: Data Output Completed**

- c) Enter the **Task Name** (without spaces) as, **Fill-Loan-Application-Form**. It is the internal name used by engine to identify this task. This field is mandatory.

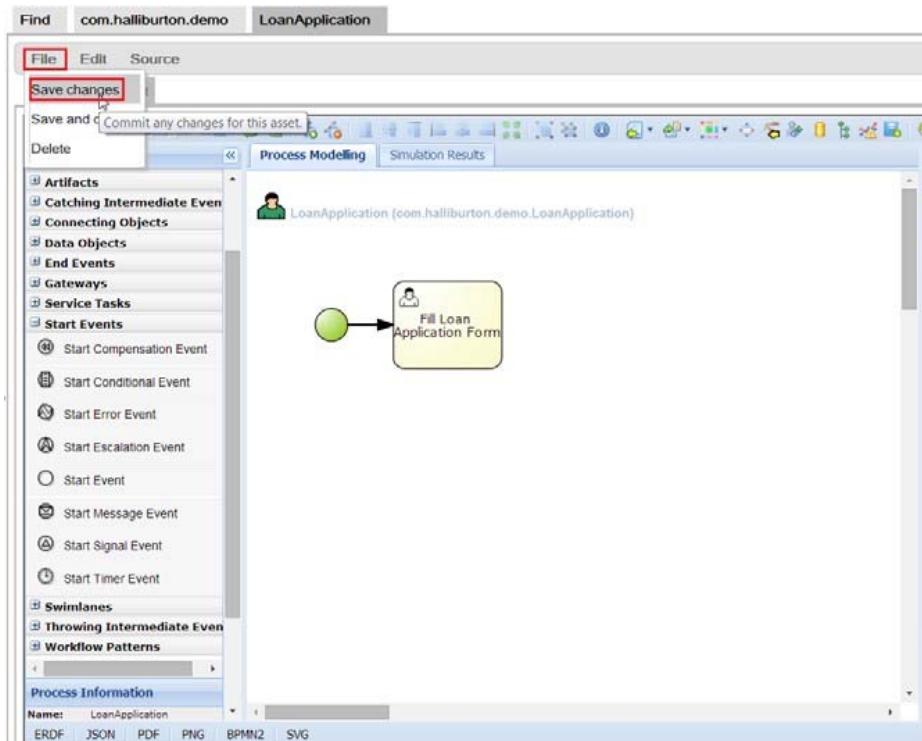


23. Select the Designer Canvas again. Notice that the Properties Panel reflects the properties for the process (not the User Task) now.



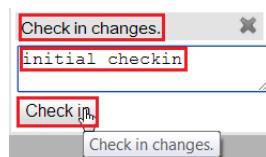
**Figure 30: Properties Panel Showing Process Properties**

24. Save the changes by selecting **File > Save changes** as shown in *Saving Changes* and Check in Changes.



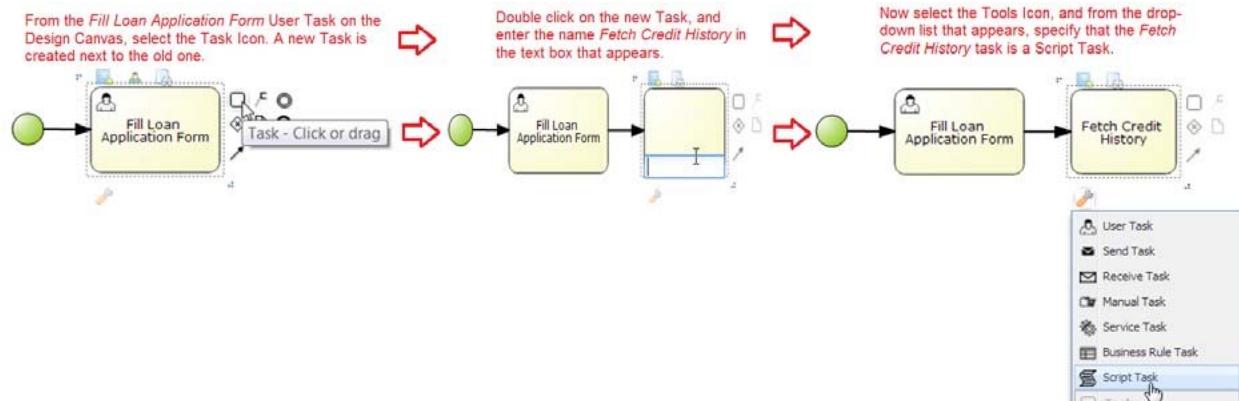
**Figure 31: Saving Changes**

- a) The *Check in changes* overlay window opens. Specify the comment **initial checkin** and click **Check in**. The process has been saved at this point.



**Figure 32: Check in Changes**

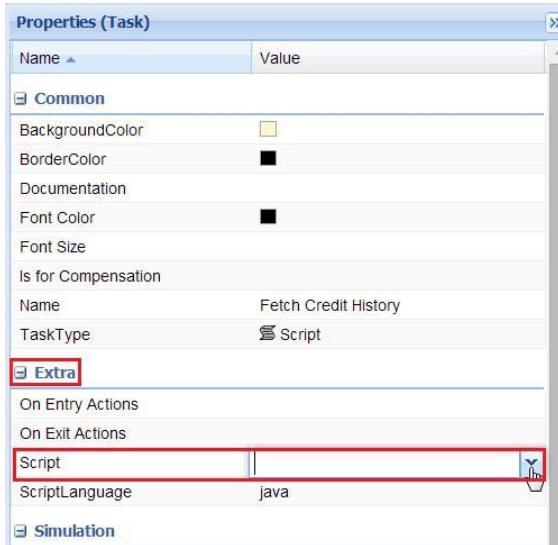
25. Add the next task with the name **Fetch Credit History**. The task type is a **Script Task** because human intervention is not required for its completion. A Script Task is executed by the business process engine, and it is implemented in a scripting language that the engine can interpret. After the engine has run the script, the script and its associated task are completed. Refer to *Steps to Create a New Task (Script)* for help with remembering the steps required to create this task.



**Figure 33: Steps to Create a New Task (Script)**

26. Be sure to select the **Fetch Credit History** Script Task on the Designer Canvas before opening the Properties Panel. Expand the **Extra** tree (as shown in *Expanding Extra Tree to Access Script Property*) to click the arrow associated with the Script property.

This action opens the *Expression Editor*, which will be used to compose the logic of this Script Task.

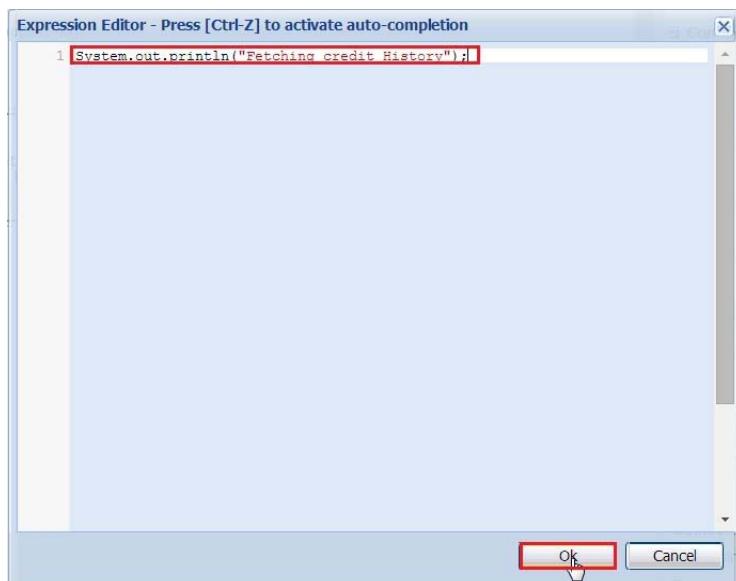


**Figure 34: Expanding Extra Tree to Access Script Property**

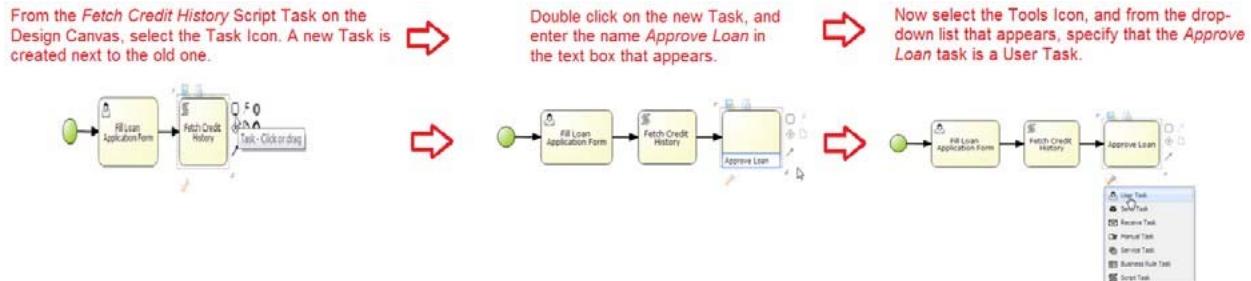
27. The following line of Java code will be used to simulate fetching credit history for this loan:

```
System.out.println ("Fetching credit History");
```

This line of code prints the line of text that is within the quotation marks to the console. Realistically, this Script Task uses a Web Service to contact the three credit reporting agencies for a combined score that would then be persisted locally to determine if the loan would be awarded. Click **OK** after entering this single line of code.

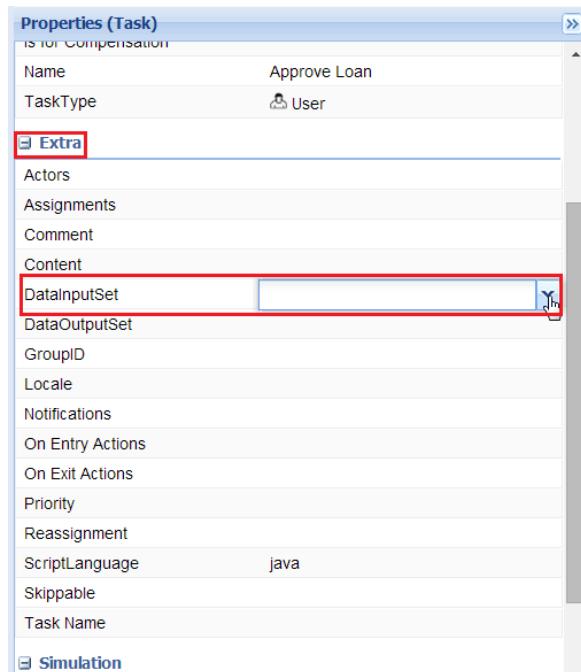


28. Add the next task with the name **Approve Loan**. The task type is a **User Task** (which is the same as the *Fill Loan Application Form*) since approving a loan is a typical workflow task where a human performer accomplishes the task with the assistance of a software application and is scheduled through a task list manager of some sort<sup>3</sup>. Refer to Steps to Create a New Task (User) for help with remembering the steps required to create this task.



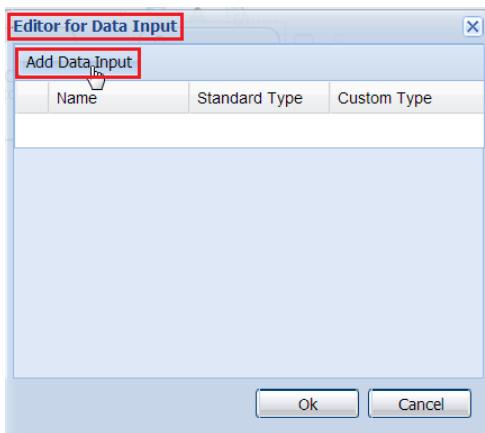
**Figure 35: Steps to Create a New Task (User)**

29. Edit the properties of the **Approve Loan** task. As before, expand the **Extra** tree. Click the arrow for **DataInputSet**.



3. A Manual Task, on the other hand, is a task that is expected to be performed without the aid of any business process execution engine or any application. An example of this could be a telephone technician installing a telephone at a customer location. (Brookshier, Daniel, 2011)

30. The Editor for Data Input displays. Click **Add Data Input**.



31. Create the **datainput** set, which represents all of the information needed for the approver to approve the loan, as shown in Editing Data Input. Recall that for all four fields, the Add Data Input button must be clicked. When done entering this information, click **OK**.

Name	Standard Type	Custom Type
1 firstName	String	Ø
2 lastName	String	Ø
3 requestedLoan	String	Ø
4 creditHistory	Integer	Ø

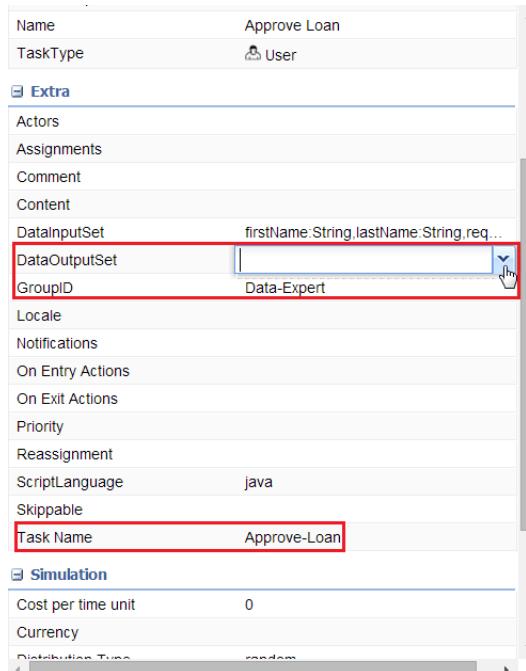
At the bottom are two buttons: "Ok" and "Cancel". The "Ok" button has a red box drawn around its outline.

**Figure 36: Editing Data Input**

32. Provide the **GroupID** as **Data-Expert** and **Task Name** as **Approve-Loan** as shown in *Providing GroupID and Task Name*. Select the arrow for **DataOutputSet** (also as shown in *Providing GroupID and Task Name*) to open the *Editor for Data Output*.

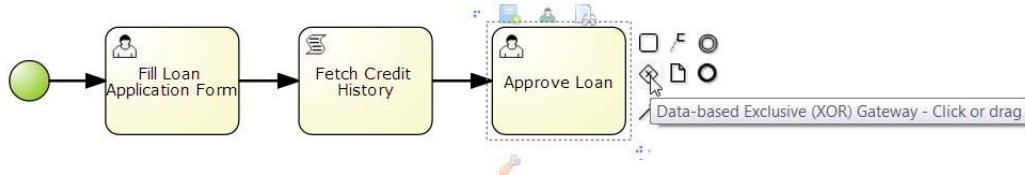
**Figure 37: Providing GroupID and Task Name**

33. This time, only one field will be created. That field will be named **loanApproved** and will be of **Standard Type Boolean** (meaning it can either be **true** if the loan was approved or **false** if not). Refer to *Creating a Boolean Standard Type for Data Output*.

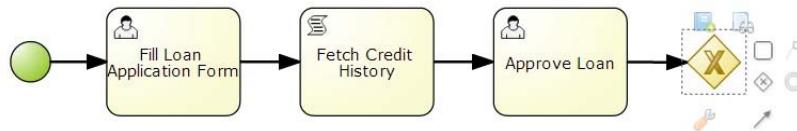


**Figure 38: Creating a Boolean Standard Type for Data Output**

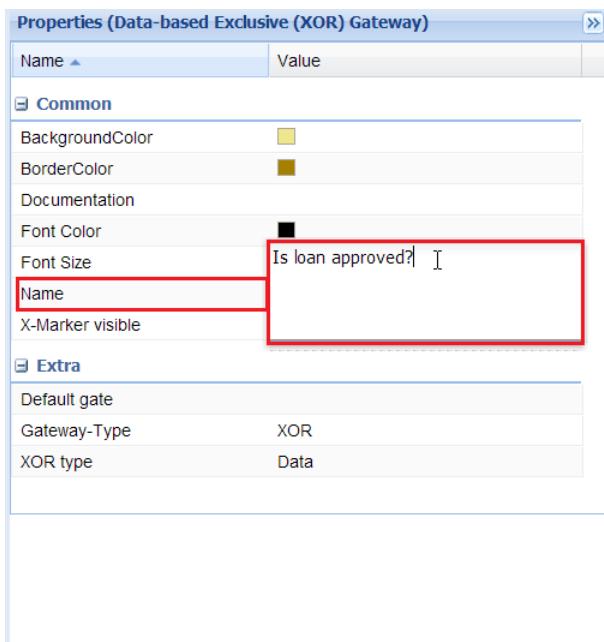
34. Add the next element, which is a XOR gateway, to split the process execution path based on the loan approval decision. As shown in *Selecting XOR Gateway from User Task*, select the **Data-based Exclusive (XOR) Gateway** icon from the **Approve Loan** User Task. Drag-and-drop it to the desired location on the Designer Canvas as portrayed in *Designer Canvas with XOR Gateway Element*.



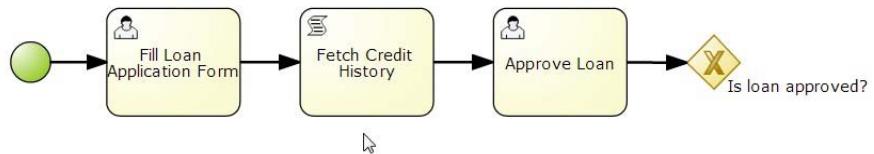
**Figure 39: Selecting XOR Gateway from User Task**

**Figure 40: Designer Canvas with XOR Gateway Element**

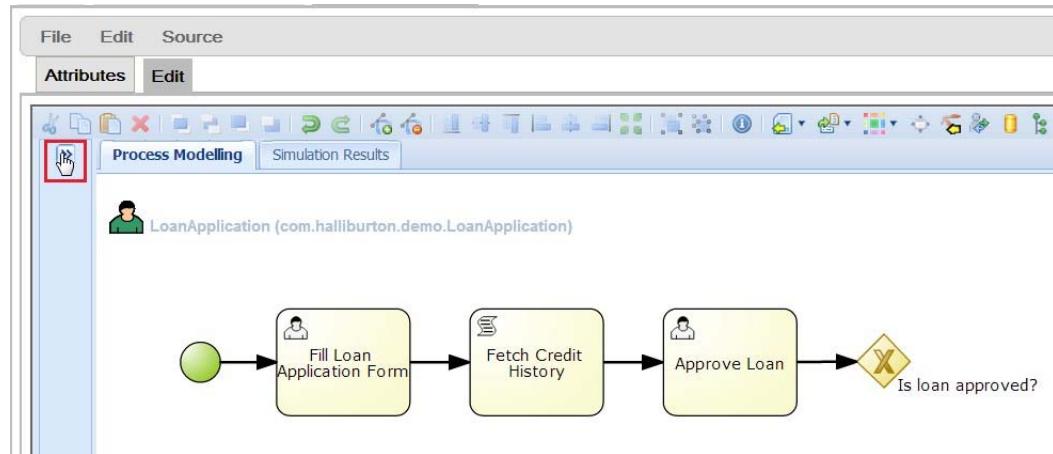
35. Access the Properties panel after selecting the XOR Gateway element and provide a name of **Is loan approved?** as shown in:

**Figure 41: Providing a Name for the Data-based Exclusive (XOR) Gateway using the Properties Panel**

36. Select the Designer Canvas again to see the XOR Gateway element correctly labeled and placed, as shown in *XOR Gateway on Designer Canvas*.

**Figure 42: XOR Gateway on Designer Canvas**

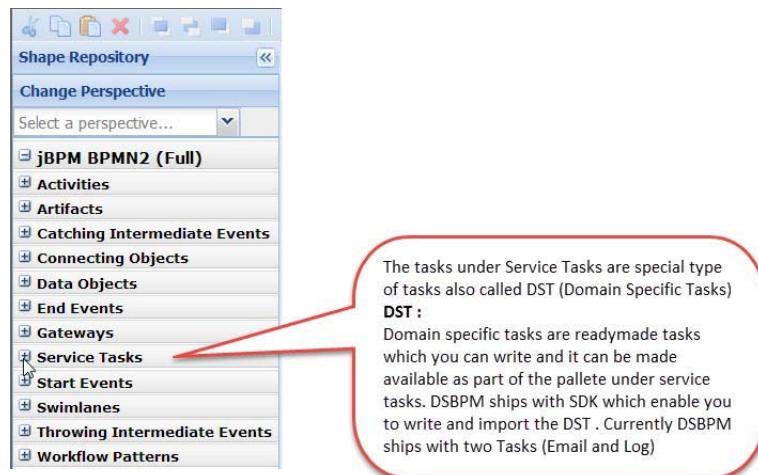
37. Accessing the Designer Palette shows how to open this panel by clicking the arrow to the left of the Design Canvas.



**Figure 43: Accessing the Designer Palette**

38. Using the Designer Palette, add a **Service Task** named **Email** to the Designer Canvas in order to provide email send capability. The first step to adding Email is to expand the **Service Tasks** tree in the Designer Palette as illustrated in *Concept of Domain Specific Tasks (DSTs)*.

Domain Specific Tasks (DSTs) are important tasks that extend the Designer Palette by allowing a developer to write new DSTs that provide additional functionality to the system, and allowing a developer/designer to use the DSTs within the design process.

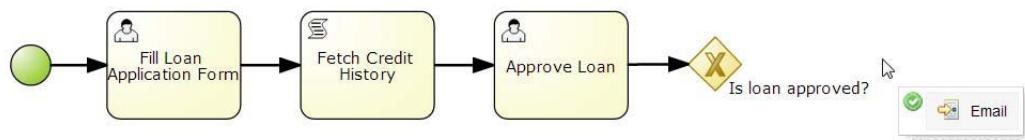


**Figure 44: Concept of Domain Specific Tasks (DSTs)**

39. Drag the Email Task and drop it onto the Designer Canvas. Refer to *Expanding Service Tasks to Drag Email Task and Email Task Dragged and Dropped Onto Designer Canvas.*

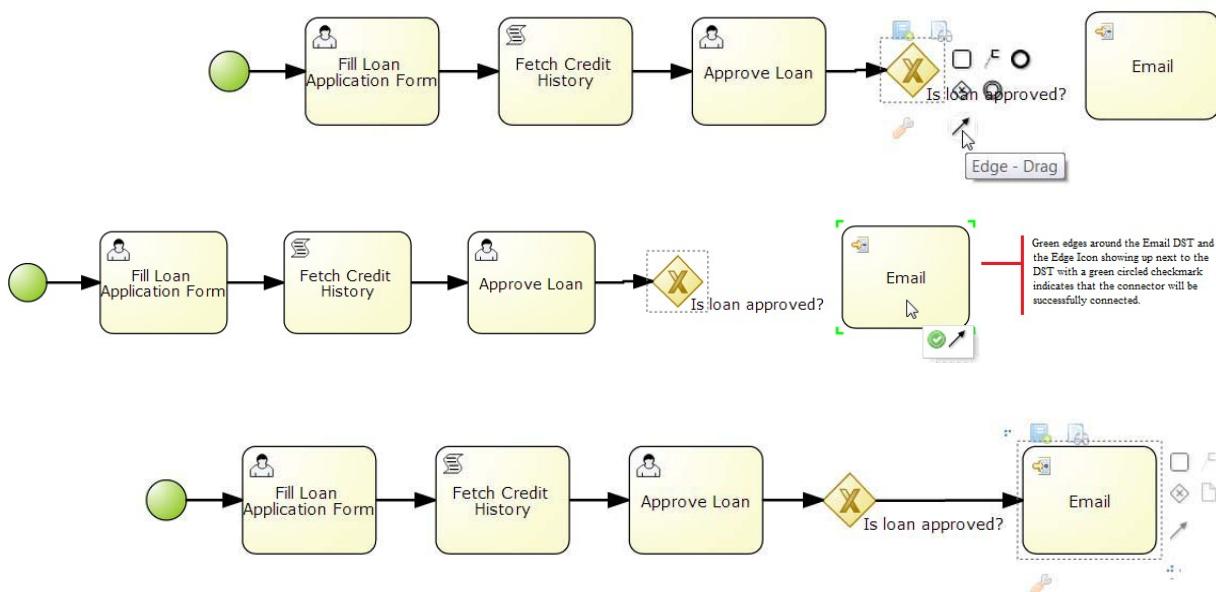


**Figure 45: Expanding Service Tasks to Drag Email Task**



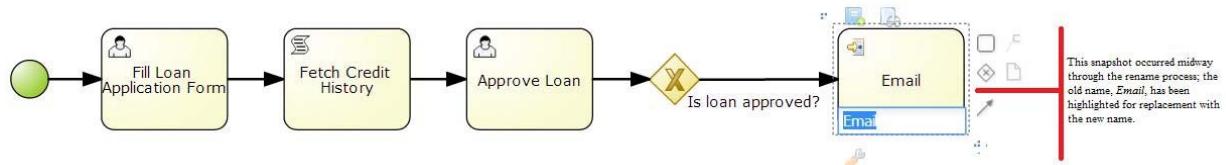
**Figure 46: Email Task Dragged and Dropped Onto Designer Canvas**

40. Connect the XOR Gateway with the Email Task by clicking and dragging the arrow (Edge icon) to the Email task. This is shown in *Connecting XOR Gateway with Email Task*.



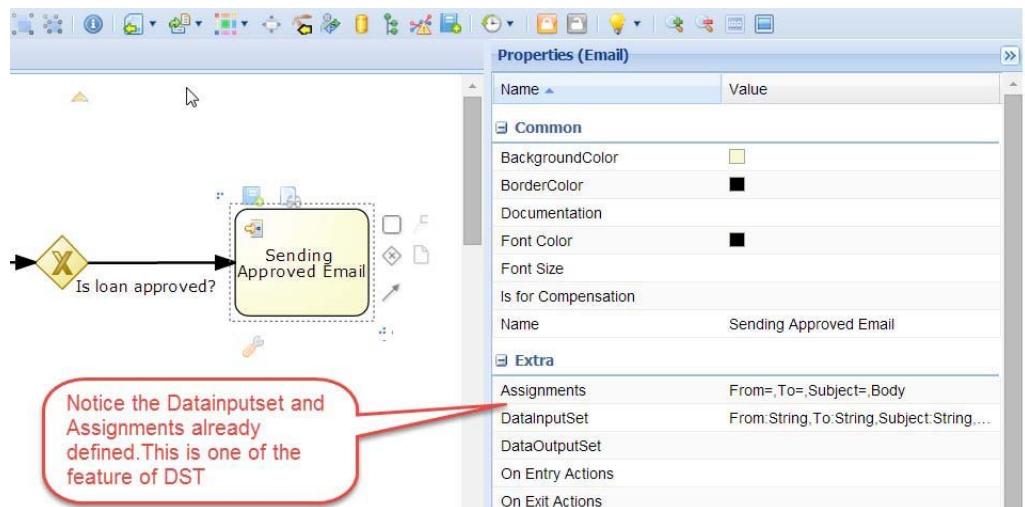
**Figure 47: Connecting XOR Gateway with Email Task**

41. Rename the Email Task to **Sending Approved Email** as shown in *Renaming Email Task*.



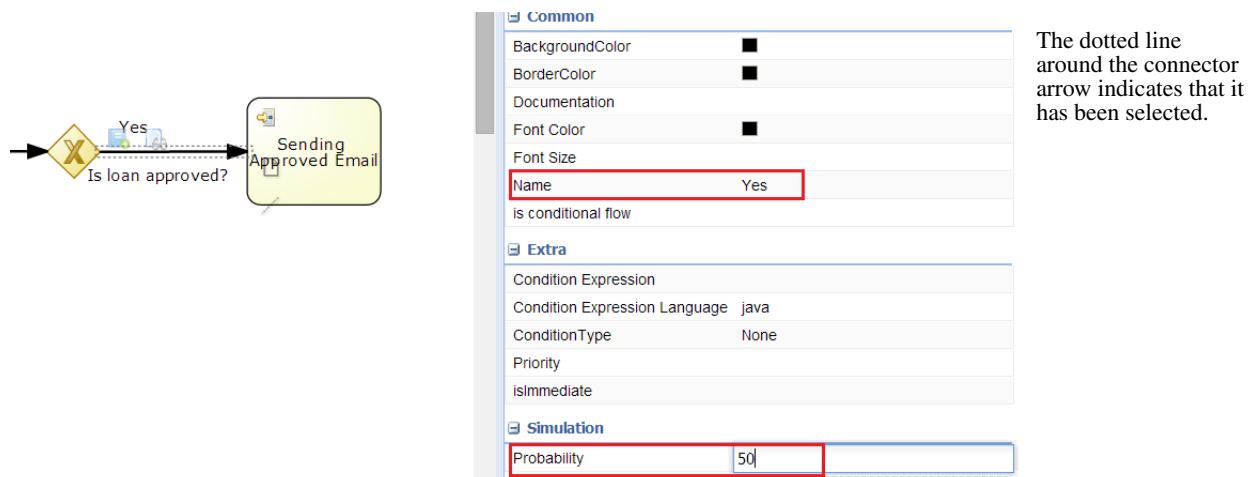
**Figure 48: Renaming Email Task**

42. Access the Properties Panel after selecting the Sending Approved Email DST on the Designer Canvas. One of the features of a DST is that properties can be pre-assigned at creation time of the DST, as shown by *DST Preassigned Properties*.



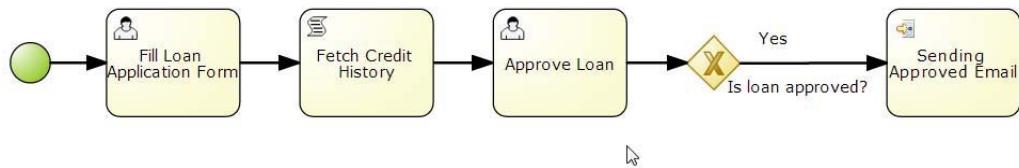
**Figure 49: DST Preassigned Properties**

43. Select the connector arrow between the XOR Gateway and the Sending Approved Email DST. Access the Properties Panel and give the **Name** as **Yes** and Probability as **50**. See *Assigning Name to Connector Arrow for XOR Gateway* and *Assigning it Properties*.



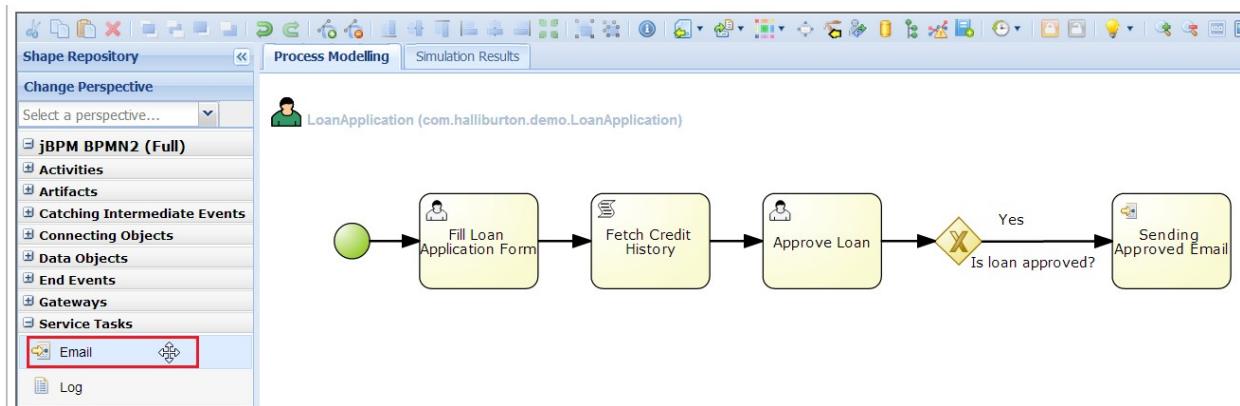
**Figure 50: Assigning Name to Connector Arrow for XOR Gateway and Assigning It Properties**

44. Select the Designer Canvas again. The process should now look like *Loan Application Process Design with DST*.

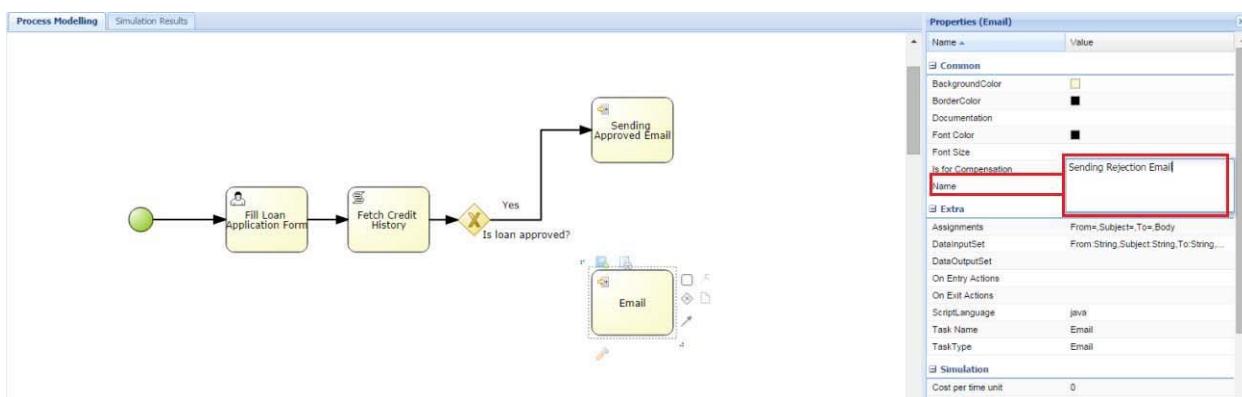


**Figure 51: Loan Application Process Design with DST**

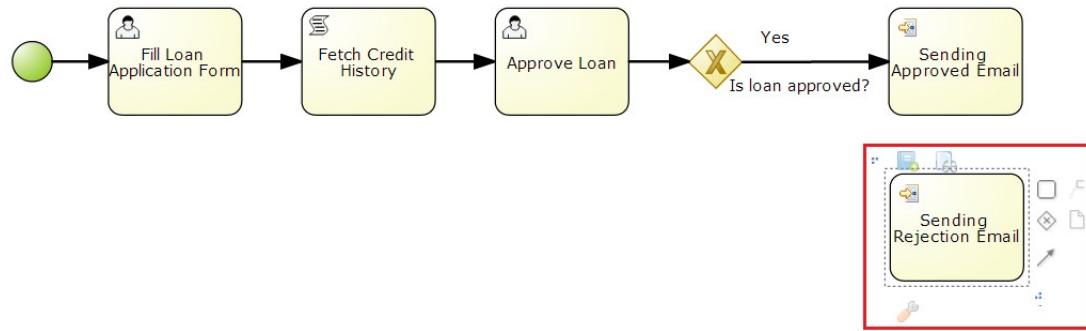
45. Add another Email DST, named *Sending Rejection Email*, to send a rejection mail if the loan is not approved. This is a repeat of the workflow that created the Sending Approved Email DST, and is represented by *Figure 50 - Figure 52*.



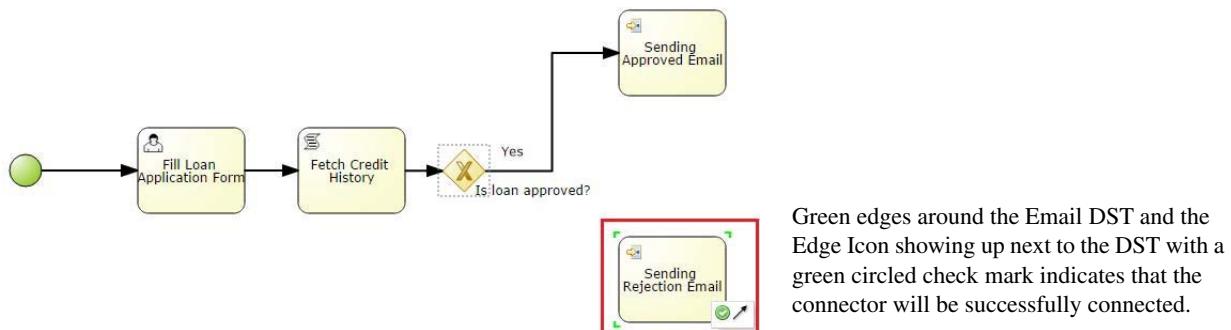
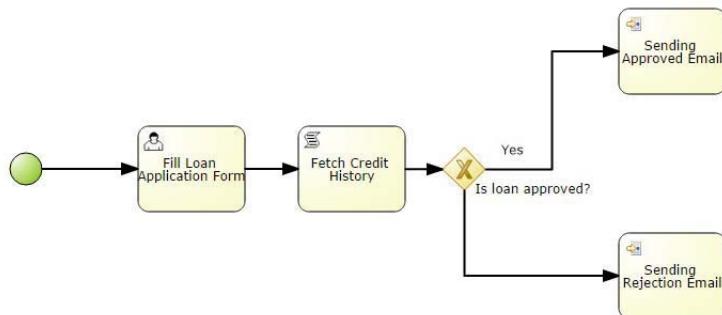
**Figure 52: Expanding Service Tasks in Designer Palette in Anticipation of Dragging Email DST onto the Designer Canvas**



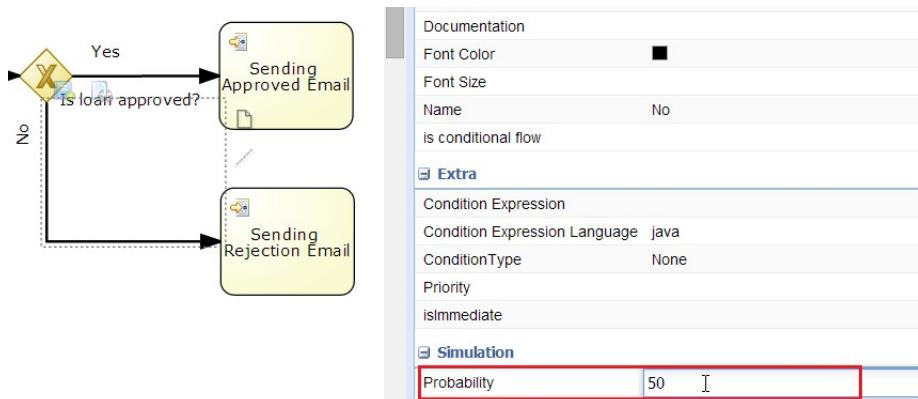
**Figure 53: Renaming the Email DST**

**Figure 54: Renamed Email DST as it Appears on the Designer Canvas**

46. Connect the new Email DST with the XOR Gateway using the Edge icon as shown in *Connecting Another Email DST Using the Edge icon. Designer Canvas after Email DST Connected to the XOR Gateway* shows the final appearance after the connection operation.

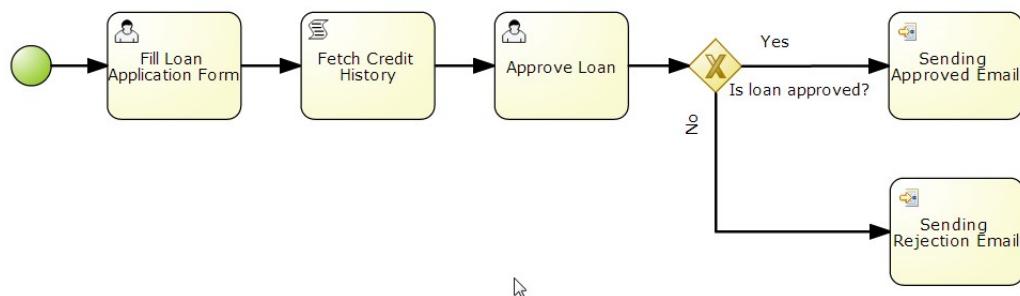
**Figure 55: Connecting another Email DST using the Edge icon****Figure 56: Designer Canvas after Email DST Connected to the XOR Gateway**

47. Now create the **No** path for the XOR Gateway in the same workflow as the creation of the **Yes** path. Select the connector arrow, and access the Properties Panel to provide the Name as **No** and the Probability as **50**.



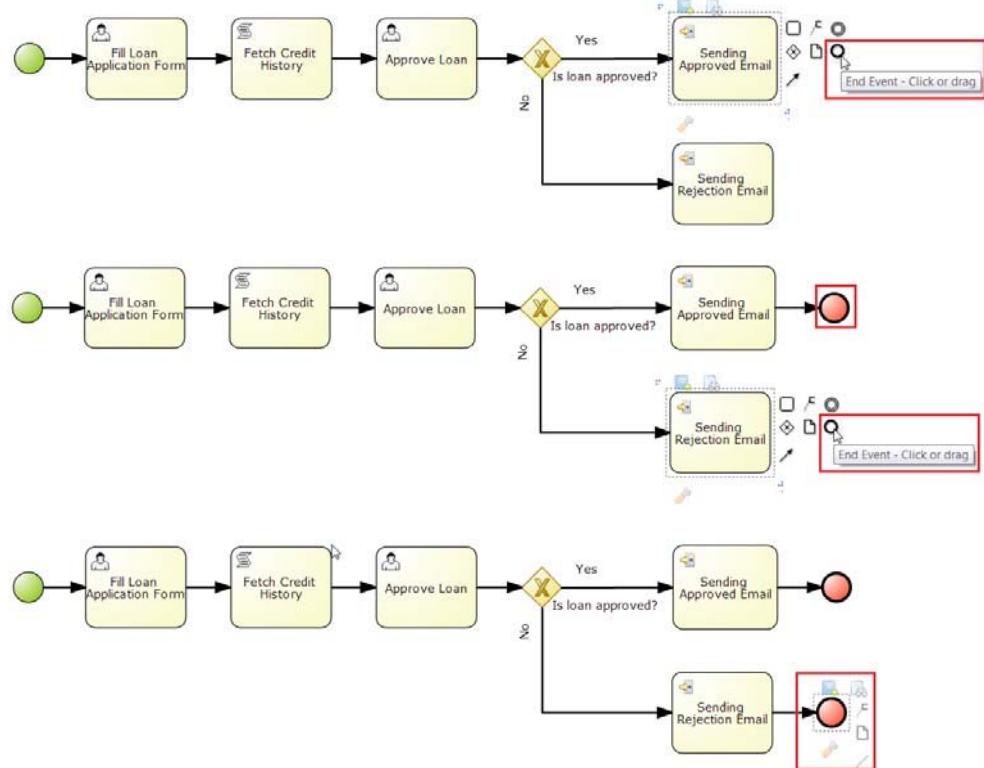
**Figure 57: Creating Other (“No”) Path for XOR Gateway and DST**

48. Click the **Designer Canvas**. The process now looks like what is shown in *Process with Both Paths for XOR Gateway on Designer Canvas*.



**Figure 58: Process with Both Paths for XOR Gateway on Designer Canvas**

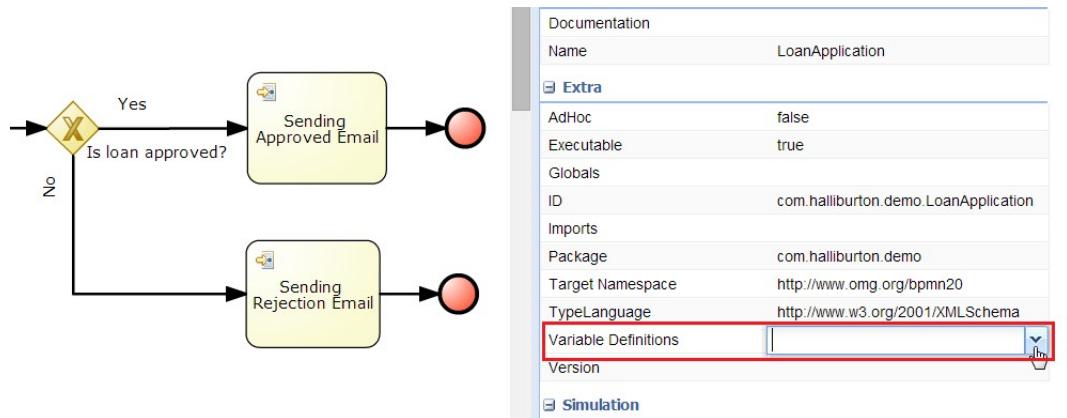
49. End the process flow by adding an End Event to each of the two process execution paths as shown in *Ending the Process Flow by Adding End Events*.



**Figure 59: Ending the Process Flow by Adding End Events**

50. Now it is time to define the global process instance variables (available to all tasks) by selecting the Designer Canvas (as before, only this time for the entire process) in order to access the Properties Panel (once again, as before). It is here in the Properties Panel that properties for the entire process (not just a Task or single element) are edited (as before) and Variable Definitions are created (something new). Refer to *Selecting Properties Panel for Entire*

*Process and Selecting Variable Definitions to define Global Process Variables.*

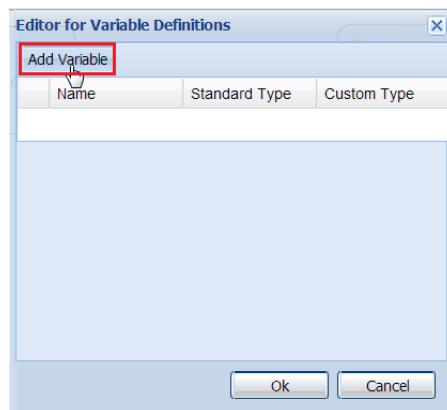


**Figure 60: Selecting Properties Panel for Entire Process and Selecting Variable Definitions to define Global Process Variables**

51. Adding a list of variables is similar to Adding Data Output (explained in Step 24) and Adding Data Input (explained in Step 32) that has already been performed.

The Editor for Variable Definitions after performing the previous step, *Selecting Properties Panel for Entire Process and Selecting Variable Definitions to Define Global Process Variables*. After the editor displays, variables can be added by clicking **Add Variable** for each variable to be added, as shown in the image below.

The variables that need to be added now are listed in Loan Application Variables. Once added, click **OK** to move to the next step in this workflow.

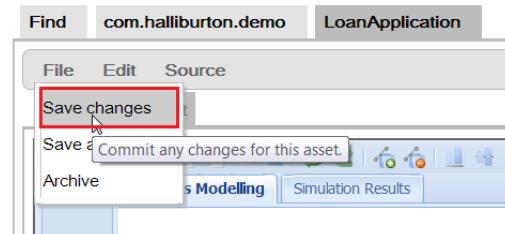


**Figure 61: Add Variable**

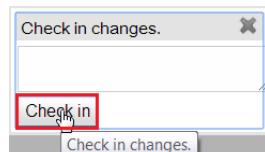
Editor for Variable Definitions		
Add Variable		
	Name	Standard Type
1	candidateFirstName	String
2	candidateLastName	String
3	candidateEmailAddress	String
4	candidateSsn	String
5	candidateLoanAmount	String
6	candidateCreditHistory	Integer
7	candidateLoanApproved	Boolean

**Figure 62: Loan Application Variables**

52. At this point, **Save Changes** and **Check In Changes**.



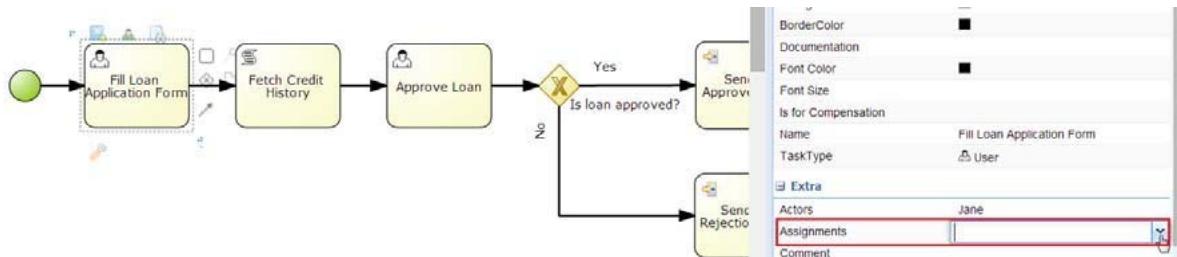
**Figure 63: Save Changes**



**Figure 64: Check in Changes**

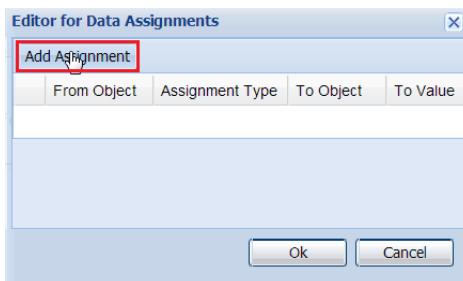
53. Select the *Fill Loan Application Form* User Task and open the Properties Panel. Within this panel, select the **Assignments**

property to *Assign Values for the Task Variables (Fill Loan Application Form User Task)*.



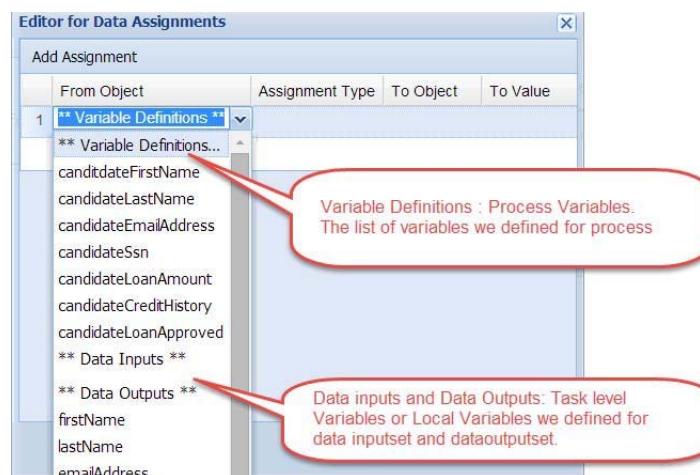
**Figure 65: Assign Values for the Task Variables (Fill Loan Application Form User Task)**

54. As before, click **Add Assignment** for each variable that needs to be assigned to the **Fill Loan Application Form** User Task through the use of the **Editor for Data Assignments**.



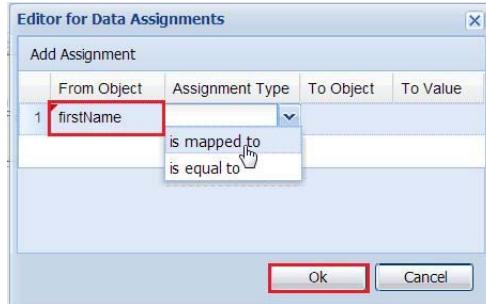
**Figure 66: Editor for Data Assignments**

Every column within this first row of data has a drop-down list that appears when the down arrow within that column is selected, as shown in the image below.

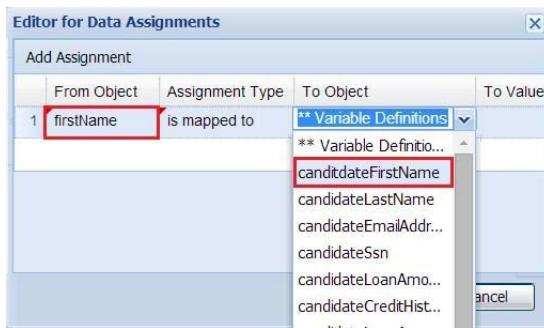


**Figure 67: Data Assignment Row's Drop-Down List**

55. For this first row, map the **firstName** to **candidateFirstName** as shown within *First Row Data Assignments Mappings - Part 1* and *First Row Data Assignments Mapping - Part 2*.

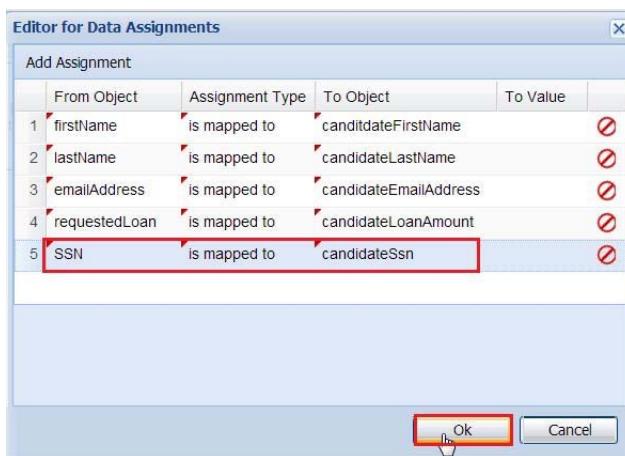


**Figure 68: First Row Data Assignments Mappings - Part 1**



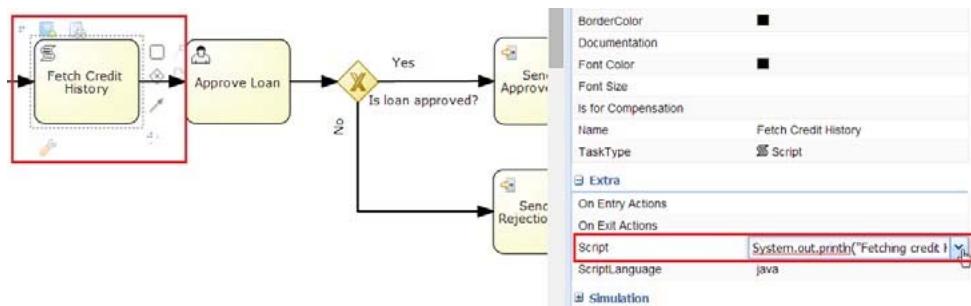
**Figure 69: First Row Data Assignments Mapping - Part 2**

56. Complete adding all assignments per the image below. After this is completed, click **OK**.



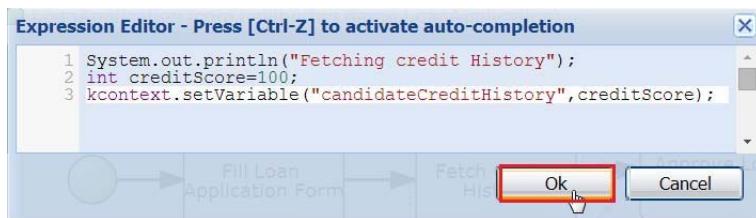
**Figure 70: All Data Assignment Mappings for the Fill Loan Application Form User Task**

57. Select the **Fetch Credit History** Script Task to edit the script (created earlier, in Step 29). Refer to *Editing the Script for a Script Task*



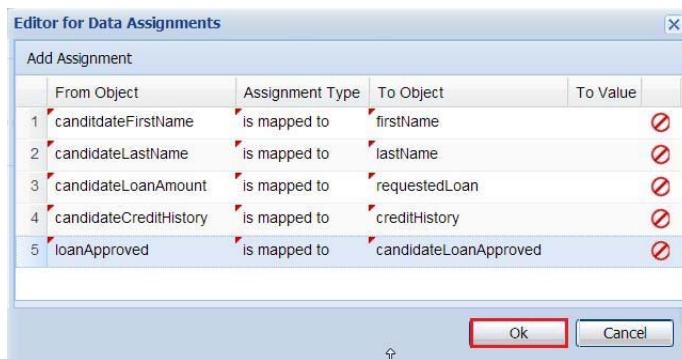
**Figure 71: Editing the Script for a Script Task**

58. Refer to *Using Expression Editor to Modify Existing Script* to edit the script, and click **OK** when done.



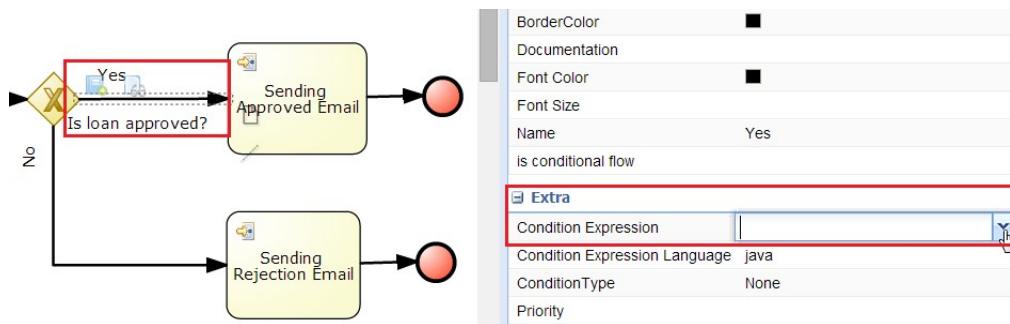
**Figure 72: Using Expression Editor to Modify Existing Script**

59. Now create Data Assignments for the **Approve Loan** User Task similar to what was done with the **Fill Loan Application Form** User Task. When completed, the values will be as shown in *Data Assignments for the Approve Loan User Task*. Then click **OK**.



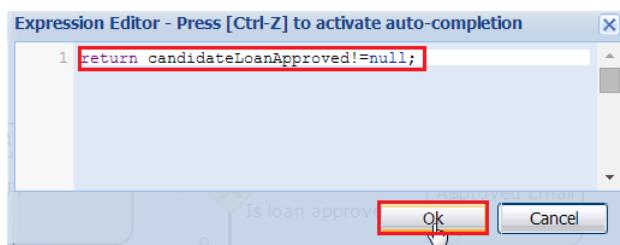
**Figure 73: Data Assignments for the Approve Loan User Task**

60. Click the connector arrow associated with the Yes execution path and open the *Properties Panel* (as before). Expand the **Extra** tree, and select the parameter **Condition Expression**. The *Expression Editor* will open.



**Figure 74: Selecting Condition Expression in Properties Panel for a Connector Arrow**

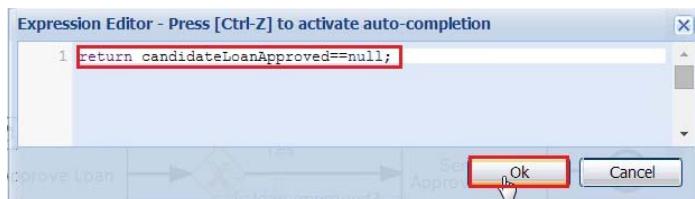
61. Add the expression as shown in *Adding an Expression using the Expression Editor*. During execution of the designed BPM process, this piece of code will be executed in order to decide which path to take when the XOR Gateway is executed. At that time, the evaluation of the expression returns a boolean value (either **true** or **yes** if the **candidateLoanApproved** variable is not null<sup>4</sup> or **false** or **no** if the variable is null). Click **OK** when done.



**Figure 75: Adding an Expression using the Expression Editor**

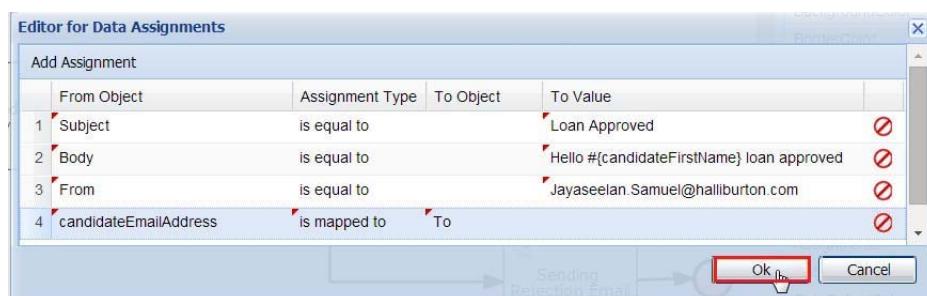
4. Null is a special programming value that, when “present”, indicates that no value has been assigned to a variable. It can be considered to be a space holder for nothing.

62. Repeat what was done for the connector arrow associated with the Yes execution path, only for the No execution path. When the Expression Editor step is reached, provide the expression as shown in *Adding an Expression for the No Execution Path*. Click **OK** when done.



**Figure 76: Adding an Expression for the No Execution Path**

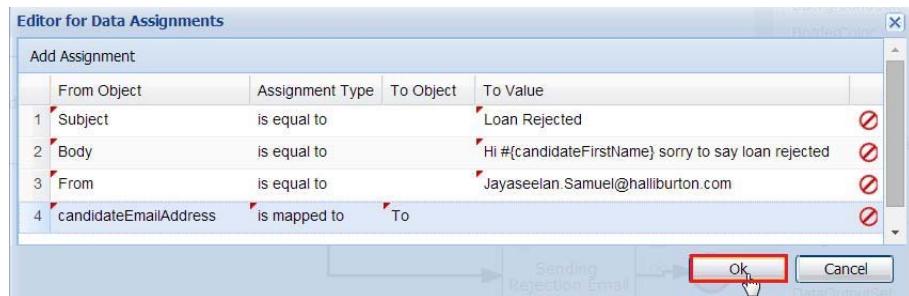
63. Click **Sending Approved Email DST**, open the *Properties Panel*. Expand the **Extra** tree and select the **Assignments** property. The *Editor for Data Assignments* will open. Add the assignments as shown in *Assignments for Sending Approved Email DST*, and click **OK** when done.



**Figure 77: Assignments for Sending Approved Email DST<sup>5</sup>**

5. Note that the “is equal to” Assignment Type assigns a constant value unless the #{processvariablename} syntax is used to provide a dynamic expression. So, for example, Hello #{candidateFirstName} loan approved in *Figure 75: Assignments for Sending Approved Email DST* would appear as Hello Jane loan approved if the loan candidate’s first name had been entered as Jane.

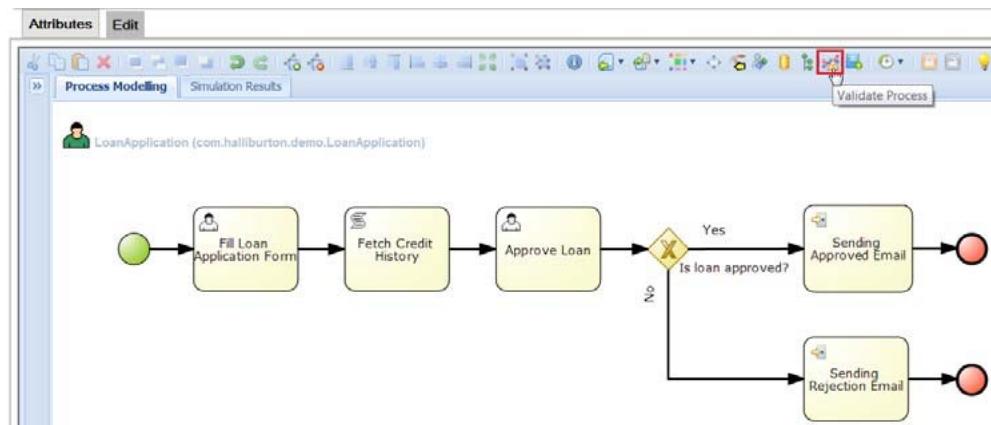
64. Click **Sending Rejection Email DST**, and open the *Properties* Panel. Expand the **Extra** tree and select the **Assignments** property. The *Editor for Data Assignments* will open. Add the assignments as shown in *Assignments for Sending Approved Email DST*, and click **OK** when done.



**Figure 78: Assignments for Sending Rejection Email DST**

65. Save the changes as was depicted in *Saving Changes and Check in Changes*, only providing an appropriate check in comment for the step in the process.

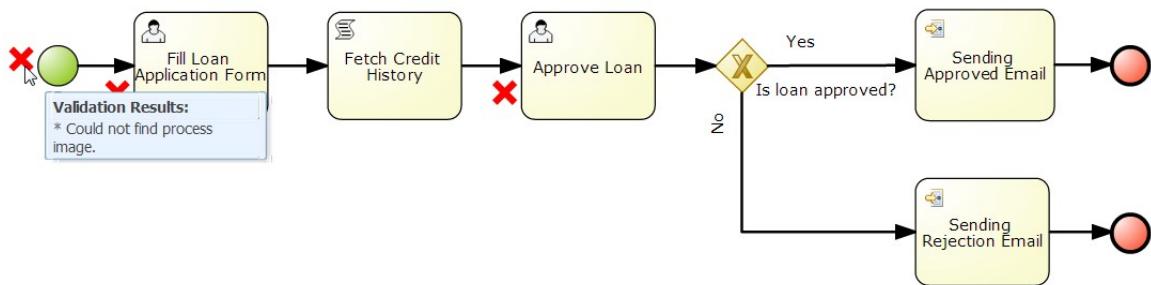
66. Click the **Validate Process** icon to validate the process as shown in *Selecting icon to Validate the Process*.



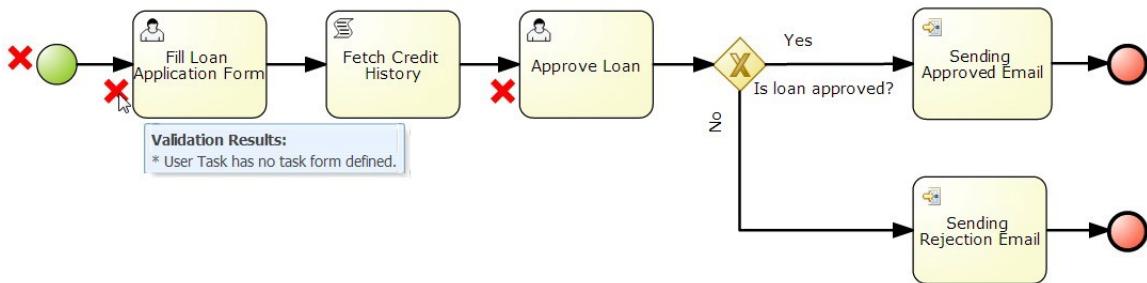
**Figure 79: Selecting icon to Validate the Process**

67. The validation errors are indicated on the Designer Canvas by red crosses next to the item causing the error. By hovering the cursor over the red cross, a description of the error pops up as shown in *Appearance of Validation Error “Could not process Image” on the*

*Designer Canvas and Appearance of Validation Error “User Task has no task form defined” on the Designer Canvas.*

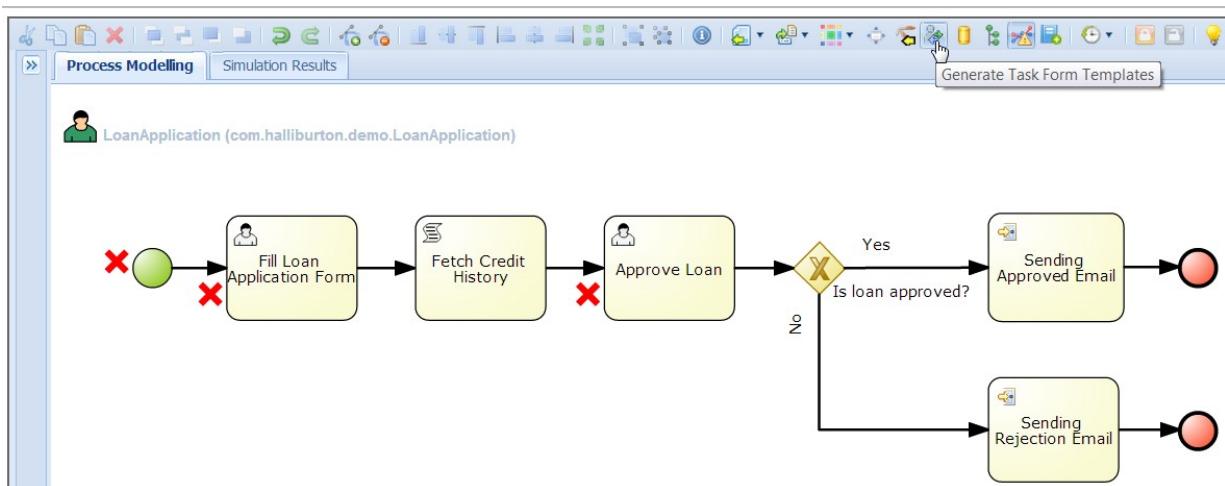


**Figure 80: Appearance of Validation Error “Could not process Image” on the Designer Canvas**



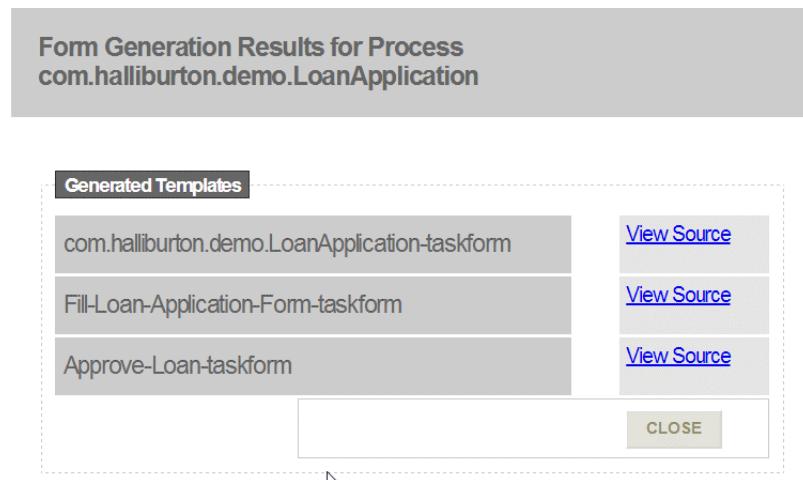
**Figure 81: Appearance of Validation Error “User Task has no task form defined” on the Designer Canvas**

68. Click the **Generate Task Form Templates** icon to resolve that the **User Task has no task form defined** error.



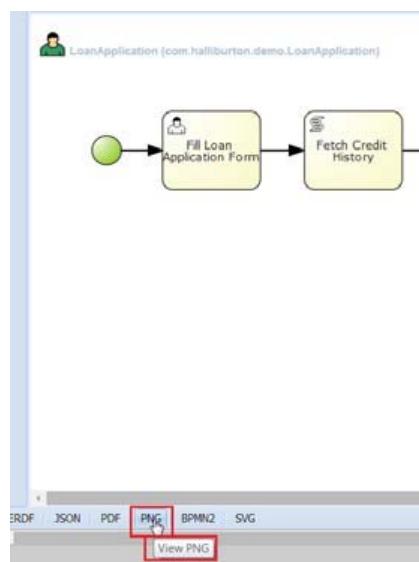
**Figure 82: Generating Task Form Templates**

69. In the process, three forms are generated by clicking on <sup>6</sup>.



**Figure 83: Forms Generated by Selecting “Generate Task Form Templates”**

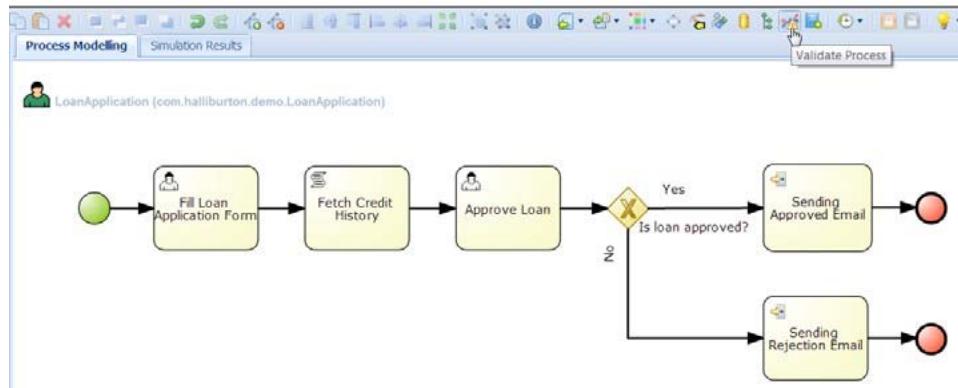
70. Select the Designer Canvas again, and then click **PNG** to resolve the *Could not find process image error*. This action will create the process image in PNG format. Note that the red cross marks, indicating errors, are no longer present. Since the underlying problems have now been resolved. Refer to *Resolving “Count not find process image error” and Observing an Error-Free Designer Canvas*.



**Figure 84: Resolving “Count not find process image error” and Observing an Error-Free Designer Canvas**

6. The number of forms generated will vary, depending upon the number of User Tasks that are present within the process being designed.

71. Click the **Validate Process**  icon to validate the process again. The Designer Canvas should appear error-free, as shown in *Error Free Designer Canvas*:



**Figure 85: Error Free Designer Canvas**

72. Save the changes as was depicted in *Saving Changes and Check in Changes*, only providing an appropriate check in comment for this final step in the process.

This completes the  . Now the  will be explained as the next step in the exercise's workflow to continue the realization of the loan application workflow.

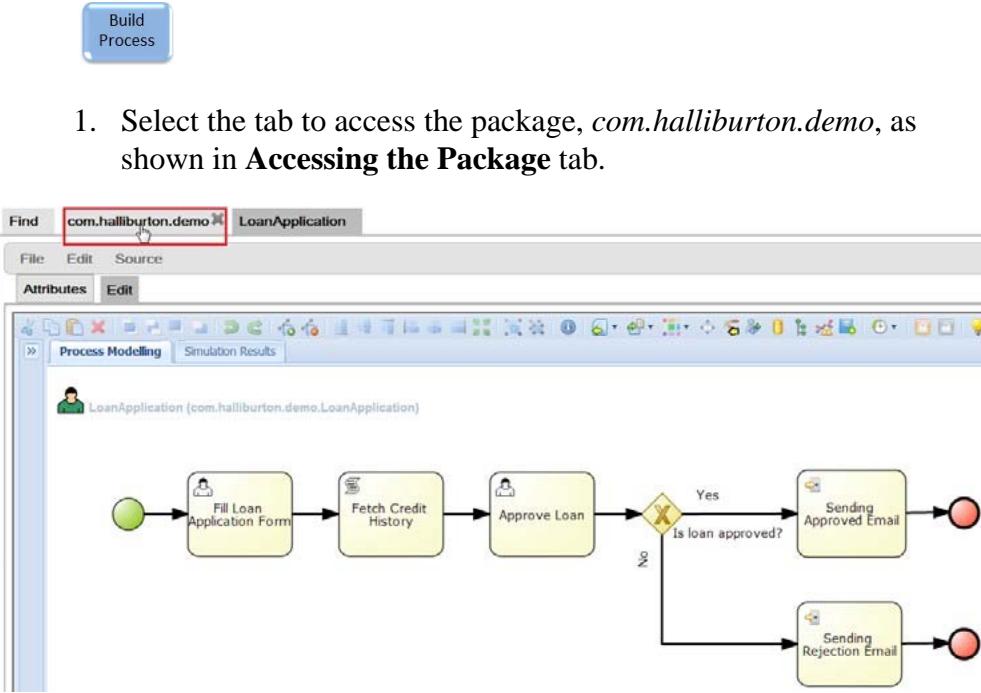


Figure 86: Accessing the Package Tab

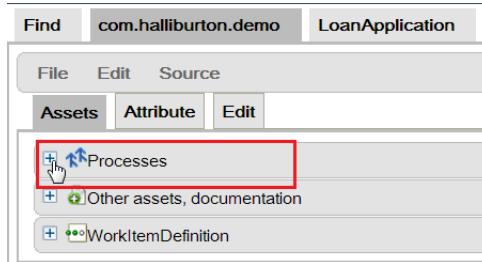
1. Select the tab to access the package, *com.halliburton.demo*, as shown in **Accessing the Package tab**.
2. After the package is selected, expand the **Processes** tree structure that appears under the **Assets** tab as shown in *Package Summary Screen Showing a Valid Process*. A green checkmark under the **Valid** column shows that the process is valid and the process' name under the Name column displays **LoanApplication**.

The screenshot shows the 'Package Summary' screen. The title bar includes 'Find', 'com.halliburton.demo', and 'LoanApplication'. The main area has tabs for 'Assets', 'Attribute', and 'Edit'. Under the 'Assets' tab, there is a tree view with a node labeled 'Processes'. Below the tree is a table with the following data:

Format	Valid	Name	Status
		LoanApplication	Draft

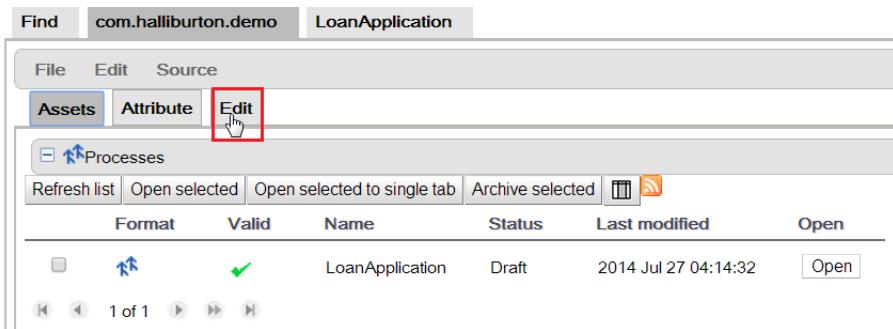
Figure 87: Package Summary Screen Showing a Valid Process

3. Now collapse the **Processes** tree structure that appears under the **Assets** tab as shown in *Collapsing the Processes Tree Structure within the Content Display Area of DSBPM Repo Main Screen*.



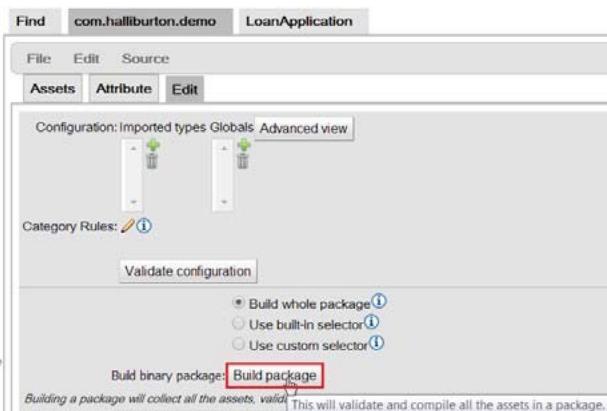
**Figure 88: Collapsing the Processes Tree Structure within the Content Display Area of DSBPM Repo Main Screen**

4. Select the **Edit** tab as shown in *Selecting the Edit Tab*.



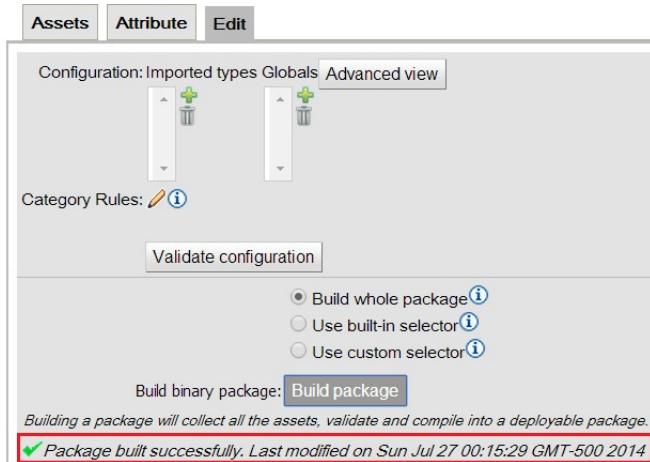
**Figure 89: Selecting the Edit Tab**

5. Build the package by selecting **Build package** on the screen that appears after the **Edit** tab has been selected.



**Figure 90: Selecting to Build package**

6. After the build process has completed, a **Package Built Successfully** Message appears.



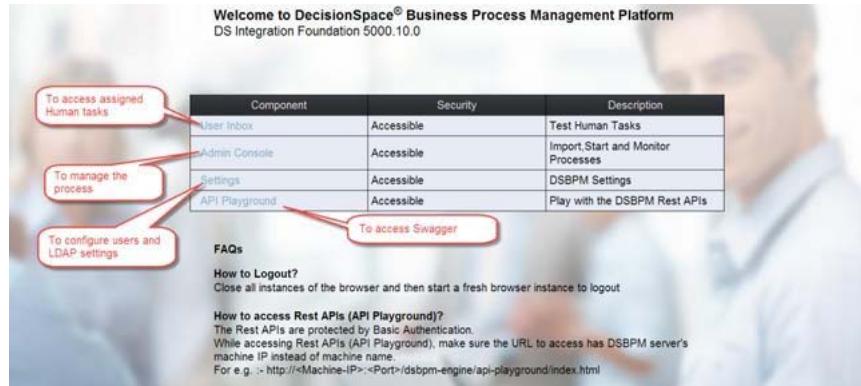
**Figure 91: Package Built Successfully Message**

This completes the  and now the  will be explained now as the next step in the exercise's workflow in order to continue the realization of the loan application workflow.



Now the successfully-built process must be imported into the DSBPM Engine in order to be executed.

1. Go to <http://localhost:8080/dsbpm-engine/> and log on as superadmin/superadmin. The *DSBPM Platform Welcome* screen displays.



**Figure 92: DSBPM Platform Welcome Screen**

2. Click *Admin Console* as shown in *Selecting the Administration Console from the DSBPM Platform Welcome* screen.

Component	Security	Description
User Inbox	Accessible	Test Human Tasks
Admin Console	Accessible	Import, Start and Monitor Processes
Settings	Accessible	DSBPM Settings
API Playground	Accessible	Play with the DSBPM Rest APIs

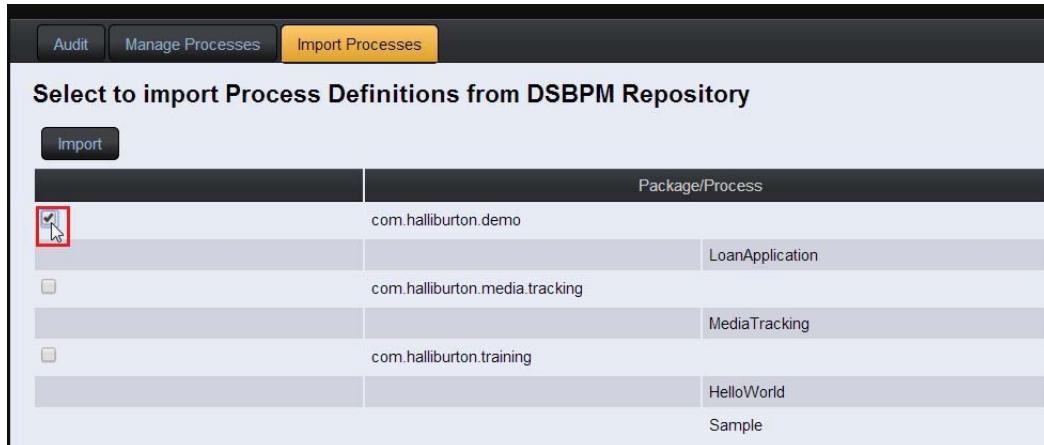
**Figure 93: Selecting the Administration Console from the DSBPM Platform Welcome Screen**

3. Select the **Import Processes** tab.



**Figure 94: Select Import Processes Tab**

4. Select the check box to select the package to import as shown in *Selecting the Package to Import*.



**Figure 95: Selecting the Package to Import**

5. Click **Import** as shown in *Import the Process*. The alert *Package imported Successfully - Refresh the Browser* will appear. Click **OK** and refresh the browser.

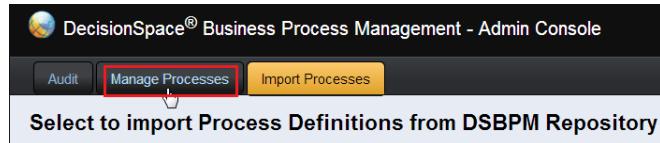


**Figure 96: Import the Process**

This completes the . Now the will be explained as the next step in the exercise's workflow to continue the realization of the loan application workflow.



1. Select the **Manage Processes** tab.



**Figure 97: Manage Processes Tab**

2. Click **Start Process Instance** in the **Manage Processes**.



**Figure 98: Start Process Instance**

3. Click **Start Process Instance** in the Form Window that is now presented. An alert appears with the message **Successful launch of the process instance**. After this message appears, select **Close in Start Process Instance from Form Window**. The previous **Manage Processes** tab will appear once again, only now the **Process Shows One (1) Instance Running**.

 A screenshot of a modal dialog box titled "Start Process Instance". It contains a table with seven rows, each with a label in the first column and a text input field in the second column. The labels are: "candidateFirstName", "candidateLastName", "candidateEmailAddress", "candidateSsn", "candidateLoanAmount", "candidateCreditHistory", and "candidateLoanApproved". At the bottom of the dialog is a red-bordered "Start Process Instance" button.

**Figure 99: Start Process Instance in the Form Window**

Name	
candidateFirstName	
candidateLastName	
candidateEmailAddress	
candidateSsn	
candidateLoanAmount	
candidateCreditHistory	
candidateLoanApproved	

Start Process Instance

**Figure 100: Select Close in Start Process Instance from Form Window**

Package/Process	Description	Instances
com.halliburton.demo	LoanApplication	1

**Figure 101: Process Shows One (1) Instance Running**

This completes the and now the will be explained now as the next step in the exercise's workflow in order to continue the realization of the loan application workflow.



1. Select the **Audit** tab.



**Figure 102: Select Audit Tab**

2. Select Started Process.



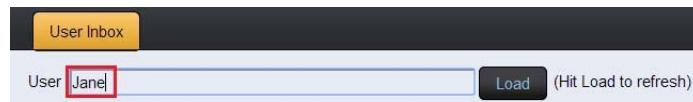
**Figure 103: Select Started Process**

3. Return to DSBPM Platform Welcome screen. Select **User Inbox** on the DSBPM Platform Welcome screen.

Component	Security	Description
User Inbox	Accessible	Test Human Tasks
Admin Console	Accessible	Import, Start and Monitor Processes
Settings	Accessible	DSBPM Settings
API Playground	Accessible	Play with the DSBPM Rest APIs

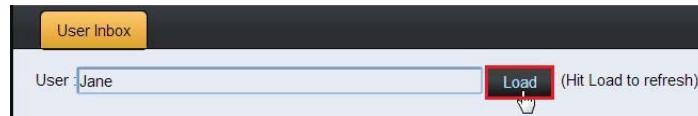
**Figure 104: Select User Inbox from DSBPM Platform Welcome Screen**

4. After the User Inbox opens, enter the user name **Jane** as shown in *Providing a User Name in the User Inbox*.



**Figure 105: Providing a User Name in the User Inbox**

5. Click **Load** to load the contents of Jane's inbox as shown in *Figure 106: Loading a User's Inbox*



**Figure 106: Loading a User's Inbox**

6. Click the **View Form** link listed as an **Action** associated with the only task within Jane's Inbox in order to access the user task form. This is illustrated in *Figure 107: Accessing User Task Form from User Inbox*.

User Inbox			
User	Load	(Hit Load to refresh)	
Id	TaskName	Type	Action
1	Fill Loan Application Form	Personal	<a href="#">View Form</a>

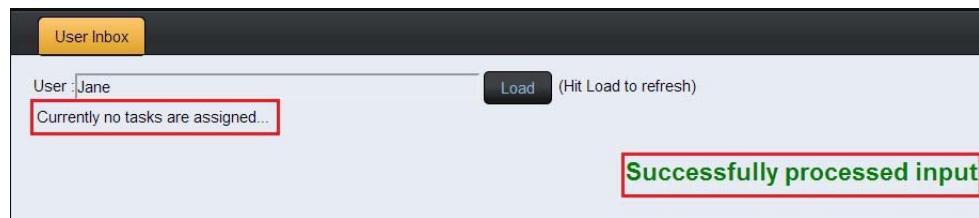
**Figure 107: Accessing User Task Form from User Inbox**

7. Fill in the requested information and then click **Submit** as shown in *Completing a User Task Form with Requested Information*.

A screenshot of a "User Task Form" titled "User Task Form: LoanApplication.Fill-Loan-Application-Form". The form is divided into two sections: "Task Inputs" and "Task Outputs". In the "Task Inputs" section, there are five input fields with their corresponding values: "firstName" (Jay), "lastName" (Sam), "emailAddress" (jayaseelan.samuel@halliburton.co), "requestedLoan" (1000), and "SSN" (3034505670). The "requestedLoan" field is highlighted with a yellow background. At the bottom right of the form is a red rectangular button labeled "SUBMIT".

**Figure 108: Completing a User Task Form with Requested Information**

Once submitted, a message **Successfully processed input** appears. This completes the **Fill Loan Application Form** task, and it is removed from the user's inbox.



8. Now repeat the creation and loading of a User Inbox for a user named **Bob**. Refer to Steps 4 and 5 above, as detailed for **Jane**. However, in **Bob's** case, it is a task and not a form that requires his action.
9. Click **Claim Task** after Bob's Inbox is loaded to access the task, as shown in *Claiming Ownership of a Task*. Since this task was assigned to a Group, **Bob's** first step is to claim the task in order to establish ownership. After the alert **Task Successfully Claimed** is received, click **OK**.



Figure 109: Claiming Ownership of a Task

10. Now **Bob** has a form that he may complete, as illustrated in *Viewing a Form from User Inbox*.



Figure 110: Viewing a Form from User Inbox

11. In this case, **Bob** will click the check box **loanApproved** and click **Submit** as shown in **Completing a Check box Form**.

User Task Form: LoanApplication.Approve-Loan

Task Inputs

firstName	Jay
lastName	Sam
requestedLoan	1000
creditHistory	0

Task Outputs

loanApproved	<input checked="" type="checkbox"/>
--------------	-------------------------------------

SUBMIT

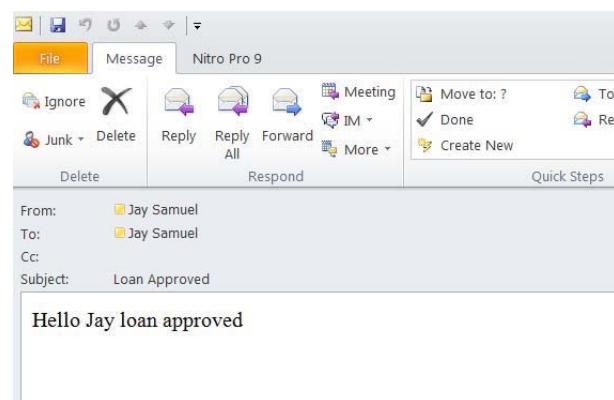
**Figure 111: Completing a Check box Form**

The message **Successfully Processed Input** will now appear. This completes the **Approve Loan** task.



**Figure 112: Successfully Processed Input**

Finally, a loan approved email is delivered by correct execution of the XOR Gateway.



**Figure 113: Loan Approved Email**

This completes **DSBPM Exercise 1: Design and Execute a BPM Process**.

## DSBPM Exercise 2: Add User and LDAP Settings

### Purpose of the Exercise

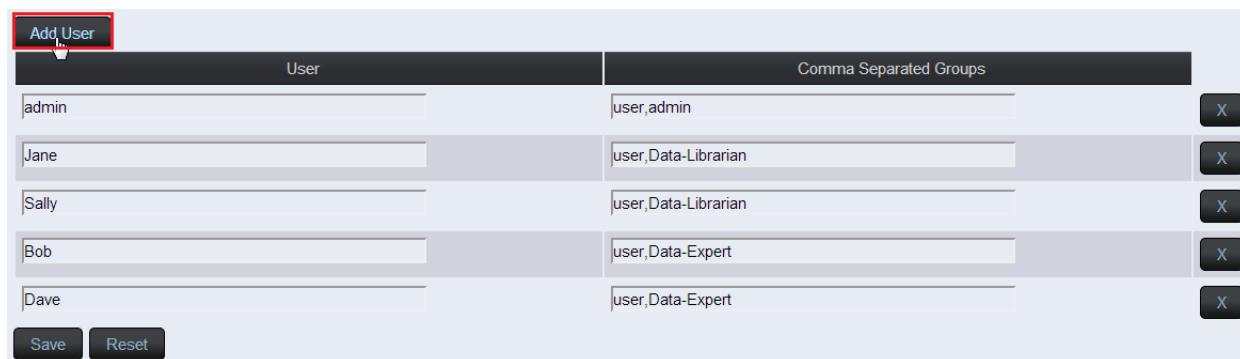
To show how to configure users for task assignments.

### Add Internal Users

1. Go to DSBPM Engine (<http://localhost:8080/dsbpm-engine/>) and click **Settings**.

Component	Security	Description
User Inbox	Accessible	Test Human Tasks
Admin Console	Accessible	Import,Start and Monitor Processes
Settings	Accessible	DSBPM Settings
API Playground	Accessible	Play with the DSBPM Rest APIs

2. Click **Add User**.



The screenshot shows a user management interface. At the top left is a red box labeled "Add User". Below it is a table with two columns: "User" and "Comma Separated Groups". The "User" column contains five entries: admin, Jane, Sally, Bob, and Dave. The "Comma Separated Groups" column contains corresponding group assignments: user,admin; user,Data-Librarian; user,Data-Librarian; user,Data-Expert; and user,Data-Expert. Each entry in the "Groups" column has a small "X" button to its right. At the bottom left are "Save" and "Reset" buttons.

User	Comma Separated Groups
admin	user,admin
Jane	user,Data-Librarian
Sally	user,Data-Librarian
Bob	user,Data-Expert
Dave	user,Data-Expert

3. Enter the user and the group name and click **Save**. An alert displays: **New Settings Successfully published to the server.**

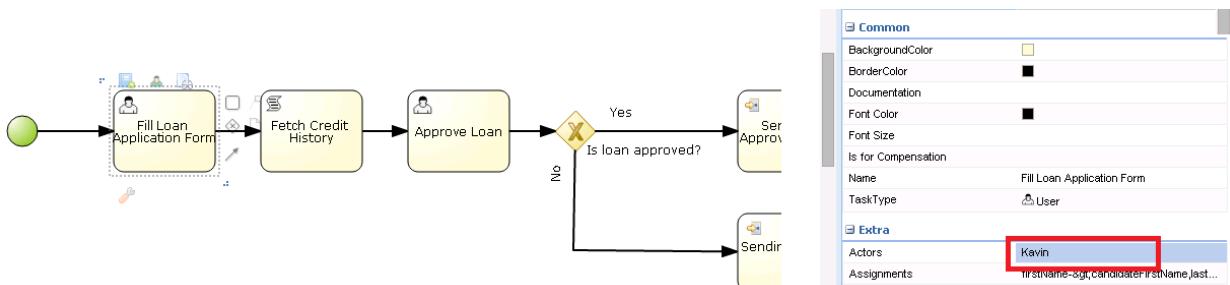
User	Comma Separated Groups
admin	user,admin
Jane	user,Data-Librarian
Sally	user,Data-Librarian
Bob	user,Data-Expert
Dave	user,Data-Expert
Kavin	User,Data-Librarian

**Save** **Reset**

User	Comma Separated Groups
admin	user,admin
Jane	user,Data-Librarian
Sally	user,Data-Librarian
Bob	user,Data-Expert
Dave	user,Data-Expert
Kavin	User,Data-Librarian

**Save** **Reset**

4. Go to **DSBPM Repo** (<http://localhost:8080/dsbpm-repo/>). Open the **LoanApplication** Process and assign the **Actor** to the **Fill Loan Application Form** task as the user that has just been created.



5. Save the Changes and build the package.



6. Go to the **DSBPM Engine** (<http://localhost:8080/dsbpm-engine/>) import the process and start process.
7. Go to the user inbox and enter the name as **Jay** and click **Load**. The following task displays.

The screenshot shows a user inbox interface. At the top, there is a search bar with the placeholder "User" containing the text "Kavin". To the right of the search bar is a blue button labeled "Load" with a red box drawn around it. Below the search bar is a table header row with columns: Id, TaskName, Type, and Action. Under the "Action" column, there is a link labeled "View Form". In the main table body, there is one row with the following values: Id=5, TaskName="Fill Loan Application Form", Type="Personal", and Action="View Form".

This shows how to add a user in dsbpm and assign a task to that user. Next, LDAP users will be configured with DSBPM.

## Configure LDAP

1. Go to **DSBPM Engine** and click **Settings**.

Component	Security	Description
User Inbox	Accessible	Test Human Tasks
Admin Console	Accessible	Import,Start and Monitor Processes
<a href="#">Settings</a>	Accessible	DSBPM Settings
API Playgroud	Accessible	Play with the DSBPM Rest APIs

2. Choose **LDAP** from the drop-down.

The screenshot shows the DSBPM Settings page. At the top, there is a yellow button labeled "Settings". Below it, a message says "View and Change DSBPM Settings here". There is a dropdown menu labeled "Choose :" with "UserGroupProperties" selected. A red box highlights the word "LDAP" in a dropdown menu below it. Below the dropdown, there is a text input field with "Define your connection to desired Groups." and a red box highlighting the word "LDAP" in it. At the bottom, there is a black button labeled "Add User".

3. The following screen shows the default configuration. Change these settings to point to the AD which needs to be configured.

Choose : LDAP ▾

Import User and Groups from LDAP Server

Name	Value
LDAP Server Name	localhost
LDAP Server Port	389
Bind User	CN=administrator,OU=DSIS,DC=landmark,DC=com
Bind Password	*****
LDAP User Context	OU=DSIS,DC=landmark,DC=com
LDAP User Id Attribute	sAMAccountName
LDAP Role Context	OU=DSIS,DC=landmark,DC=com
LDAP Role Id Attribute	CN
LDAP User Role Context	OU=DSIS,DC=landmark,DC=com
LDAP User Filter	(sAMAccountName={0})
LDAP Group Filter	(cn={0})
LDAP User Role Filter	(member={0})
Is User ID DN?	No ▾
Admin User	Administrator

**Save** **Reset**

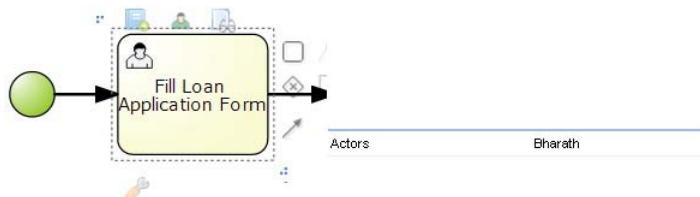
4. Change the settings as below and click **Save**. (These are the AD settings for HOU-DC01)

**BindUserCN=administrator,OU=DSIS,DC=landmark,DC=com**

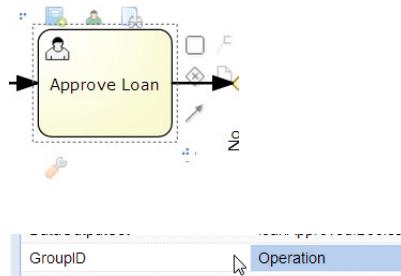
Name	Value
LDAP Server Name	localhost
LDAP Server Port	389
Bind User	CN=administrator,OU=DSIS,DC=landmark,DC=com
Bind Password	*****
LDAP User Context	OU=DSIS,DC=landmark,DC=com
LDAP User Id Attribute	sAMAccountName
LDAP Role Context	OU=DSIS,DC=landmark,DC=com
LDAP Role Id Attribute	CN
LDAP User Role Context	OU=DSIS,DC=landmark,DC=com
LDAP User Filter	(sAMAccountName={0})
LDAP Group Filter	(cn={0})
LDAP User Role Filter	(member={0})
Is User ID DN?	No
Admin User	Administrator

**Save** **Reset**

5. Go to **DSBPM Repo** and open the **Loan Application** Process. Click **Fill Loan Application Form** and give the Actor as **apirlo**. Apirlo is an ldap user.



6. Click **Approve loan** and give the Group id as **Operation**.



7. Save the changes and build the package.
8. Go to the admin console import the process and start the process
9. Go to user inbox give the user as apirlo and click **Load**.

The screenshot shows a user inbox interface. At the top, there is a search bar labeled "User: bharath" and a "Load" button with a tooltip "Hit Load to refresh". Below the search bar is a table with four columns: "Id", "TaskName", "Type", and "Action". A single row is visible in the table:

Id	TaskName	Type	Action
6	Fill Loan Application Form	Personal	<a href="#">View Form</a>

This confirms that the LDAP setting is working fine. Let us see now how these notifications integrate with the Portal.

**ftotti ,finzaghi- user belongs to an operation group**

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## DSBPM Exercise 3: How to Create a DST

---

### **Purpose of the Exercise**

To show how to create and import a DST using DSBPM SDK and show how to use DST in the process.

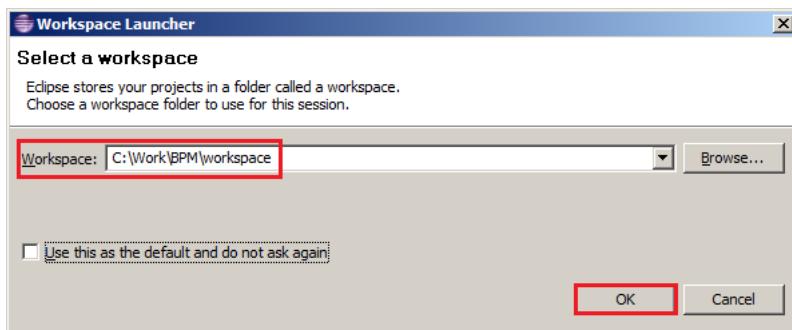
### **Prerequisites**

- JAVA JDK 1.6 installed
- Ant 1.9+ installed

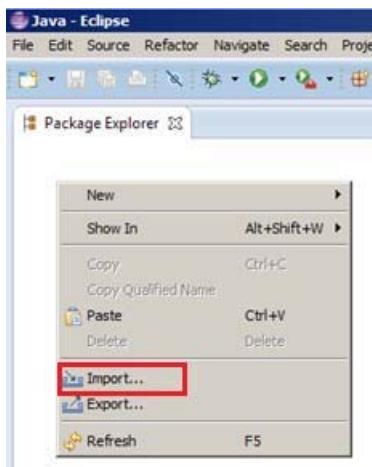
### **Skillset**

- Java
  - Eclipse IDE
1. Create the following directory structure:
    - a) C:\Work\BPM\SDK
    - b) C:\Work\BPM\dst
    - c) C:\Work\BPM\workspace
  2. Copy the tools folder from **C:\Landmark\DSIntegrationServer5000.10.4.0\ApplicationServer\artifacts\examples\ds-bpm** to **C:\Work\BPM\SDK**.
  3. Copy **DSDSConnector.zip** to **C:\Work\BPM\dst** and extract the zip. (Use the **Extract Here** option).

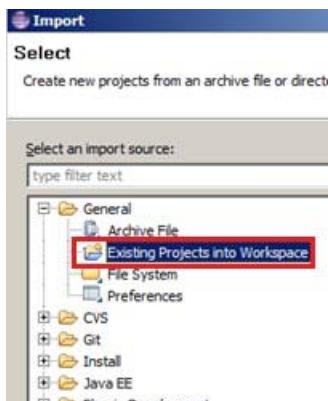
4. Import the DSDSConnector project to eclipse. Use the Eclipse which DecisionSpace Data Server has installed.
  - a) Run the Eclipse as administrator:  
Give the Workspace as **C:\Work\BPM\workspace** and click **OK**.



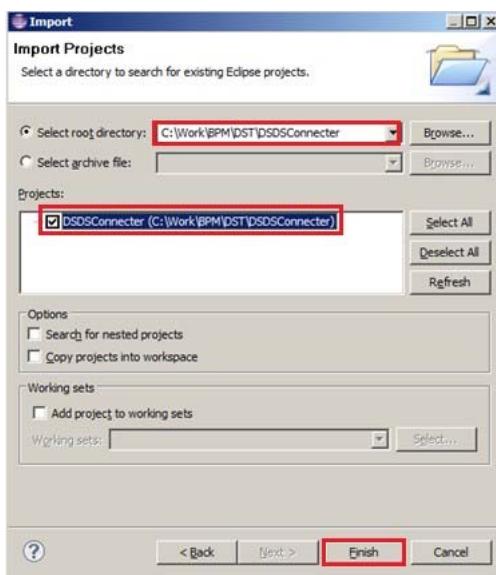
- b) After Eclipse opens, right-click inside the **Package Explorer** and click **Import**.



- c) Expand General and select **Existing Projects into workspace** and click **Next**.



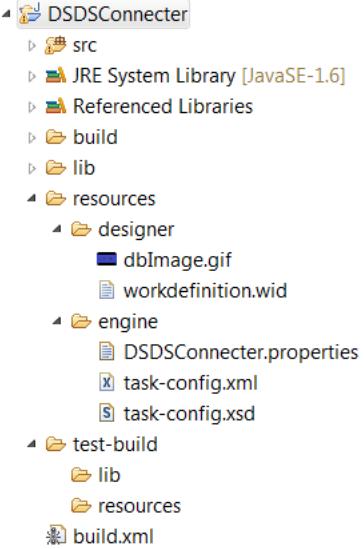
- d) Select the root directory where **DSDSConnector.zip** was extracted and click **Finish**. Here, it was extracted under **C:\Work\BPM\dst\**.



Below is the Project structure that is displayed in the “Package Explorer “after successful import.

**Note**

This is ALL prototype code - it is not intended to serve as any form of coding standard.

<p>Project name: <b>DSDSConnector</b></p>  <p>The diagram shows the Eclipse Project layout for DSDSConnector. It includes a project folder containing src, JRE System Library [JavaSE-1.6], Referenced Libraries, build, lib, resources (which contains designer and engine), test-build, and build.xml.</p> <ul style="list-style-type: none"><li>• <b>src</b>: contains all the Java source code.</li><li>• <b>lib</b>: contains all required libraries which help to compile and run the domain-specific task.</li><li>• <b>resources</b>: contains icon file in GIF format, workflowdefinition.wid, task-config.xml and task-config.xsd (see below for more info).</li><li>• <b>build.xml</b> - Build script to build the project.</li></ul>	
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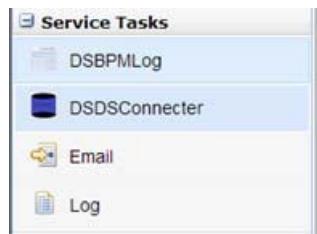
<pre>         4 📂 SRC           4 📂 com.lgc.ds bpm.domain task.tasks.generic             4 DSDSConnector.java </pre>	<p>TaskConfig - not used (see resources below)</p> <p>VDB Version Info: loaded from properties file (in the classpath)</p> <p><b>On executeWorkItem():</b></p> <ul style="list-style-type: none"> <li>Pull out input variables:</li> </ul> <pre> String connectionUrl=(String) workItem.getParameter("ConnectionUrl"); </pre> <pre> String connectionUser=(String) workItem.getParameter("ConnectionUser"); </pre> <pre> String connectionPW=(String) workItem.getParameter("ConnectionPW"); </pre> <pre> String sqlQuery=(String) workItem.getParameter("SqlQuery"); </pre> <ul style="list-style-type: none"> <li>Load the TEIID driver.</li> </ul> <pre> Class.forName("org.teiid.jdbc.TeiidDriver"); </pre> <ul style="list-style-type: none"> <li>Execute the query using TEIID JDBC driver.</li> <li>Store the result in the output variable:</li> </ul> <pre> Map&lt;String, Object&gt; result = new HashMap&lt;String, Object&gt;(); result.put("dsdsFetchResponse", dsdsFetchResponse); manager.completeWorkItem(workItem.getId(), result); </pre>
<pre>         4 📂 lib           4 drools-core-5.5.0.Final.jar           4 ds bpm-domain-task-test.jar           4 ds bpm-domain-task.jar           4 jackson-annotations-2.2.3.jar           4 jackson-core-2.2.3.jar           4 jackson-databind-2.2.3.jar           4 jbpm-flow-5.4.0.Final.jar           4 junit-4.8.1.jar           4 knowledge-api-5.5.0.Final.jar           4 mockito-all-1.9.0-rc1.jar           4 teiid-8.4.0.Final-jdbc.jar </pre>	<p>The libs which are not highlighted are core libraries that should be there for all DST.</p> <p>The libs which are highlighted in yellow are extra libraries required for this specific DST.</p> <p>teiid-8.4.0.Final-jdbc.jar – TEIID driver.</p>

<pre>         ▾ resources           ▾ designer             dbImage.gif             workdefinition.wid         ▾ engine           DSDSConnecter.properties           task-config.xml           task-config.xsd       </pre>	<p><b>Designer:</b></p> <p>Palette image - dbimage.gif</p> <p>wid file: REQUIRED BY Designer. Specifies:</p> <ul style="list-style-type: none"> <li>The DST metadata (name, input/output variables, etc.).</li> <li>Path to the image file for the task in the palate.</li> </ul> <pre> import org.drools.process.core.datatype.impl.type.StringDataType; [ [     "name" : "DSDSConnecter",     "parameters" : [         "ConnectionString" : new StringDataType(),         "ConnectionUser" : new StringDataType(),         "ConnectionPW" : new StringDataType(),         "SqlQuery" : new StringDataType()     ],     "results" : [         "dsdsFetchResponse" : new StringDataType()     ],     "displayName" : "DSDSConnecter",     "icon": "\$protocol\$://\$host\$/dsbpme-engine/icons/domain-tasks/DSDSConnecter/dbImage.gif" ] ] </pre> <p><b>Engine:</b></p> <p>Task-config.xml -&gt; Required file by the DSBPM Engine - contains 2 things:</p> <ul style="list-style-type: none"> <li>The class name that should be invoked for this DST.</li> <li>Any properties that will be passed to the constructor of the DST.</li> </ul> <p>(NOTE: This part of the task-config file is not used in this DST)</p> <pre> &lt;?xml version="1.0" encoding="UTF-8"?&gt; &lt;DSDomainTask name="DSDSConnecter"&gt;   &lt;TaskClass     class="com.lgc.dsdpme.domaintask.tasks.generic.     DSDSConnecter" /&gt;   &lt;TaskConfig&gt;     &lt;/TaskConfig&gt; &lt;/DSDomainTask&gt; </pre> <p>Task-config.xsd - defines the schema for task-config.xml.</p> <p>Property file -Another way of reading default property in run time.</p>
--	---

build.xml	<p>Build the project using ANT build:</p> <ol style="list-style-type: none"> <li>The following changes need to be made in build.xml to mention the name and jar file for the distribution. The build.xml file can also be changed in eclipse.</li> </ol> <pre> &lt;zip destfile="\${jar}/DSDSConnector.jar"&gt;   &lt;zipfileset dir="\${build}/META-INF" prefix="META-INF" /&gt;   &lt;zipfileset dir="\${classes}" /&gt; &lt;/zip&gt; &lt;zip destfile="\${dist}/DSDSConnector.zip"&gt;   &lt;zipfileset dir="\${jar}" includes="DSDSConnector.jar" /&gt;   &lt;zipfileset dir="\${build}/lib" includes="**/*.jar" /&gt;   &lt;zipfileset dir="." includes="module.xml" /&gt; &lt;/zip&gt; </pre> <ol style="list-style-type: none"> <li>Open the command prompt as <b>administrator</b>. Change the directory to the DST project.</li> </ol> <pre>cd C:\Work\BPM\dst\dsdsc</pre> <ol style="list-style-type: none"> <li>Set the java home to JDK6.</li> </ol> <pre>set JAVA_HOME=C:\Program Files\Java\jdk1.6.0_45</pre> <ol style="list-style-type: none"> <li>Run <b>ant package</b>. This will Generate a zip file for distribution if the build is successful.</li> </ol> <pre>C:\Work\BPM\dst\dsdsc&gt;ant package</pre>
Take Backup	<ol style="list-style-type: none"> <li>Stop the DSBPM server.</li> <li>Open the command prompt as administrator. Change the directory to SDK tools directory.</li> </ol> <pre>cd C:\Work\BPM\SDK\tools</pre> <ol style="list-style-type: none"> <li>Take Backup: backup "&lt;DSBPM Install Directory&gt;".</li> </ol> <pre>C:\Work\BPM\SDK\tools&gt;backup C:\Landmark\DSBPM5000.10.1.0</pre>
To import	<ol style="list-style-type: none"> <li>Import the DST: import "&lt;Directory containing DomainTask zips&gt;" "&lt;DSBM Install Directory&gt;"</li> </ol> <pre>C:\Work\BPM\SDK\tools&gt;import C:\Work\BPM\dst\dsdsc\build\dist C:\Landmark\DSBPM5000.10.1.0</pre> <ol style="list-style-type: none"> <li>Start the DSBPM server.</li> </ol>

## To use the DST in the Process

1. Open the **DSBPM Repo** (<http://localhost:8080/dsbpm-repo>).
2. Create a new package called **com.halliburton.dstdemo**.
3. Create a new BPMN2 Process called **DSTDemoProcess**.
4. Open the Designer Palette.
5. Create a Start Event.
6. Expand Service Tasks. **DSDSConnector** should now appear as a Service Task.



7. Hover over **DSDSConnector** and drag-and-drop it onto the designer canvas.
  8. Connect the start event and **DSDSConnector**.
  9. End the process with End event.
- 
- ```
graph LR; Start(( )) --> DSDSConnector[DSDSConnector]; DSDSConnector --> End(( ));
```
10. Click the **DSDSConnector** task and access the property panel for the task. Change the assignments as shown in the screenshot below and click **OK**.
- SqlQuery:** select total\_depth from well where wellid.eq.653

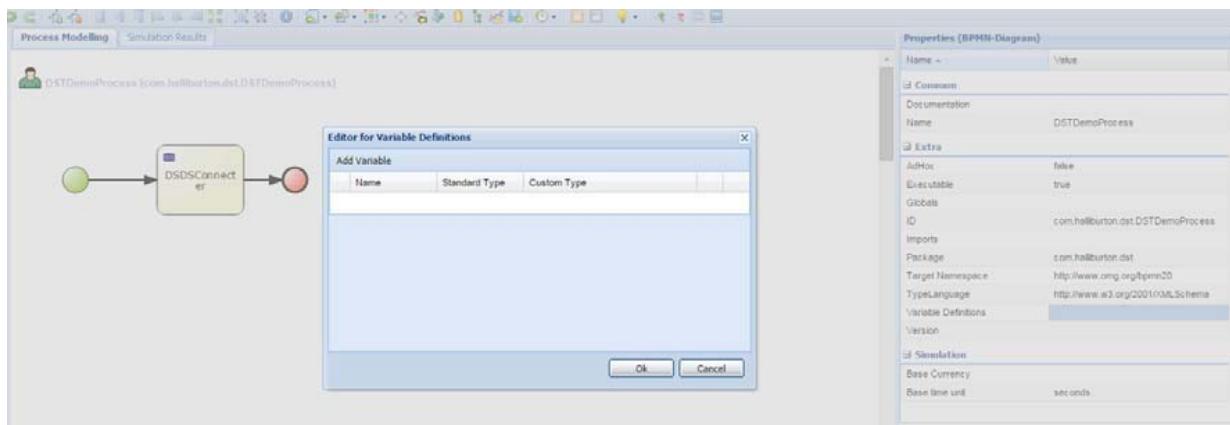
**ConnectionUrl:**

jdbc:teiid:OpenWorks@mm://localhost:31000;version.eq.1

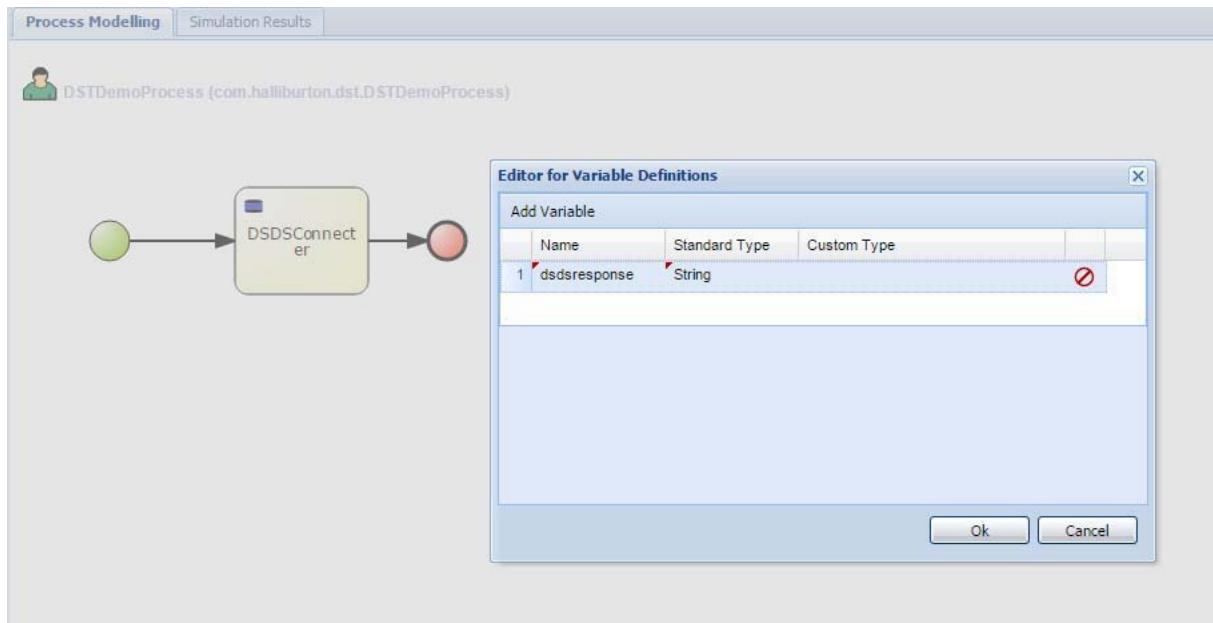
| Editor for Data Assignments |                 |              |                 |                                     |                          |
|-----------------------------|-----------------|--------------|-----------------|-------------------------------------|--------------------------|
| Add Assignment              |                 |              |                 |                                     |                          |
| From Object                 | Assignment Type | To Object    | To Value        |                                     |                          |
| 1 ConnectionPW              | is equal to     |              | user            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2 ConnectionUser            | is equal to     |              | user            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3 SqlQuery                  | is equal to     |              | select total... | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4 ConnectionUrl             | is equal to     |              | jdbc:teiid.O... | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5 dsdsFetchResponse         | is mapped to    | dsdsresponse |                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

11. Click on the background of the process (White area).

12. In the properties window, click **Variables Definition**.

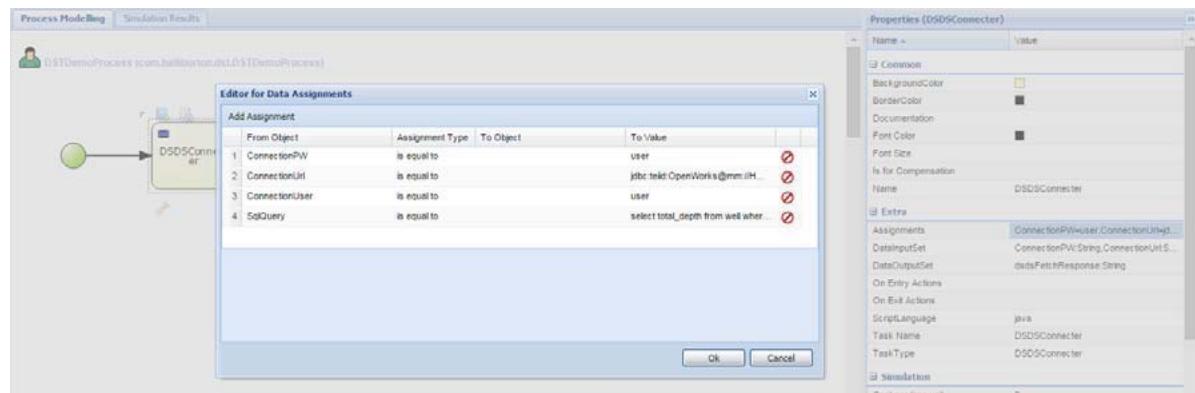


13. Click **Add Variable** and add a variable called ddsresponse of type string.



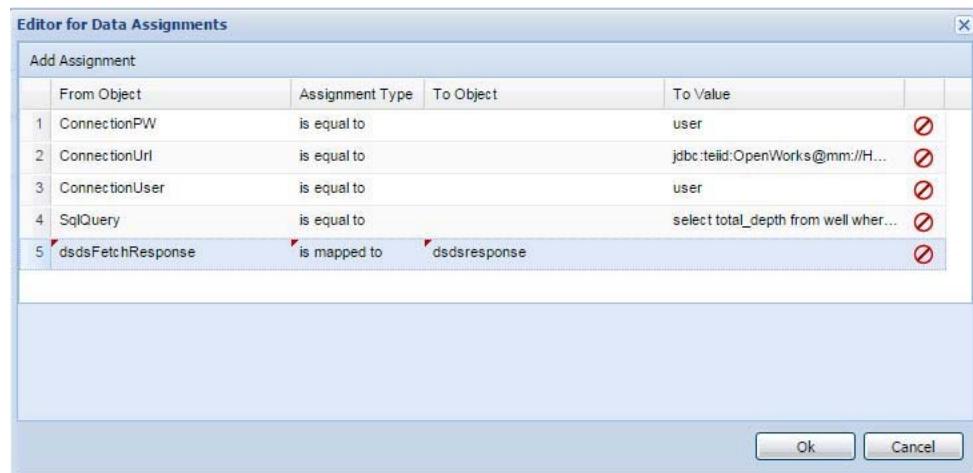
14. Click **OK**.

15. Select the DSDSConnector task and click the **Assignments** item in the properties window.



16. Add a new assignment:

- a) From Object: dsdsFetchResponse
- b) Assignment Type: is mapped to
- c) To Object: dsdsresponse
- d) To Value: Empty



17. Click **OK**.

18. Save changes.

19. Validate the process.

20. Generate the PNG.

21. Build the package.

22. Go to **DSBPM Engine** (<http://localhost:8080/dsbpm-engine/>).

23. Import the process.

24. Run the process.

25. After the process completes, select the **Audit** tab and click the instance which has completed and verify the process data. **dsdsresponse** is assigned to the result.

| Process Data |                         |
|--------------|-------------------------|
| Name         | Value                   |
| dsdsresponse |                         |
| dsdsresponse | [{"total_depth":502.0}] |

# **Chapter 6**

# ***DS Analytics***

---

## **Introduction**

---

DecisionSpace Analytics is a platform that provides a comprehensive solution to perform *business intelligent analytics* on all enterprise data. Data trends can also be discovered and visualized in a graphical and responsive mobile-enabled dashboard.

Regardless of the format and structure of the data (flat file, relational database, Hadoop, NoSQL, analytic, social media streams, operational stores, cloud), Analytics helps find the right answers.

The platform can be used to customize reports, queries and transformations, and even extend its functionality using the Analytics API.

The features of Analytics are as follows:

- **Exploring and visualizing Data and Big Data**

DecisionSpace Analytics helps business analysts, data analysts, data scientists, and others to quickly connect, explore, discover, and visualize data.

The Data Integration component provides visual tools to define and analyze data from many types of data sources including Hadoop, interface with Cloudera, Intel, MapR, Hortonworks, Cassandra, Splunk, Impala, MongoDB, DataStax, Hive and many others. MapReduce processes large data sets across clustered computers.

Since, Analytics is a comprehensive platform that encompasses business analytics and data integration, reports can be created that feature big data and use technologies such as Weka to perform predictive analytics.

- **Visually Integrating and Connecting to Data**

Use Analytics to extract and integrate data from multiple data sources (with or without data warehouses or data marts) and also from DecisionSpace Data Server Virtual Databases (VDBs). The easy-to-use data wizard can be used to quickly create and test connections. Use the Spoon visual design tool to transform data into structures that fit the reporting and analytical needs, and to enrich the data.

- **Creating Reports**

A full complement of reporting and modeling tools are available. Intuitive interfaces that include drag-and-drop functionality help even novice users rapidly create print-ready reports from a variety of data sources and with over 25 chart options available out of the box. Tools range from *Interactive Reports* and *Analyzer* (which together allow the creation of quick reports to answer immediate business questions), to *Dashboard Designer* (which allows the creation of many reports at once).

- **Flexible Deployment**

The Analytics Suite can be installed on Windows and Linux platforms. Install all components on a single computer or distribute them across the network. Or create clusters to support enterprise-level implementations.

**Note**

DecisionSpace Analytics must be installed (refer to Appendix B) before starting the exercises.

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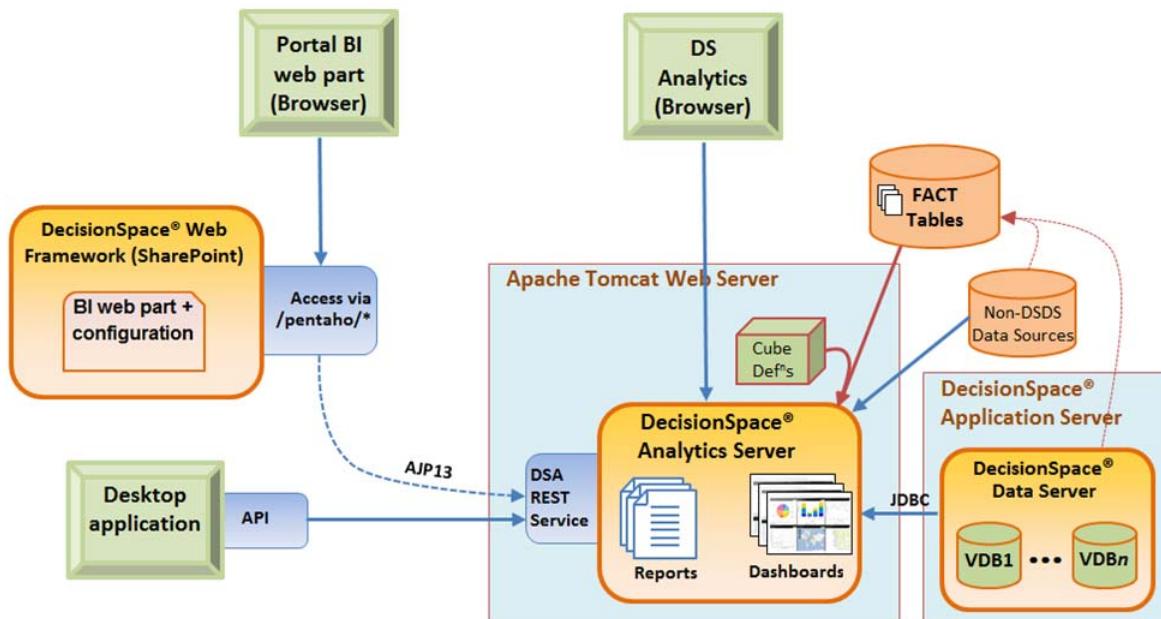
## DecisionSpace Analytics Architecture

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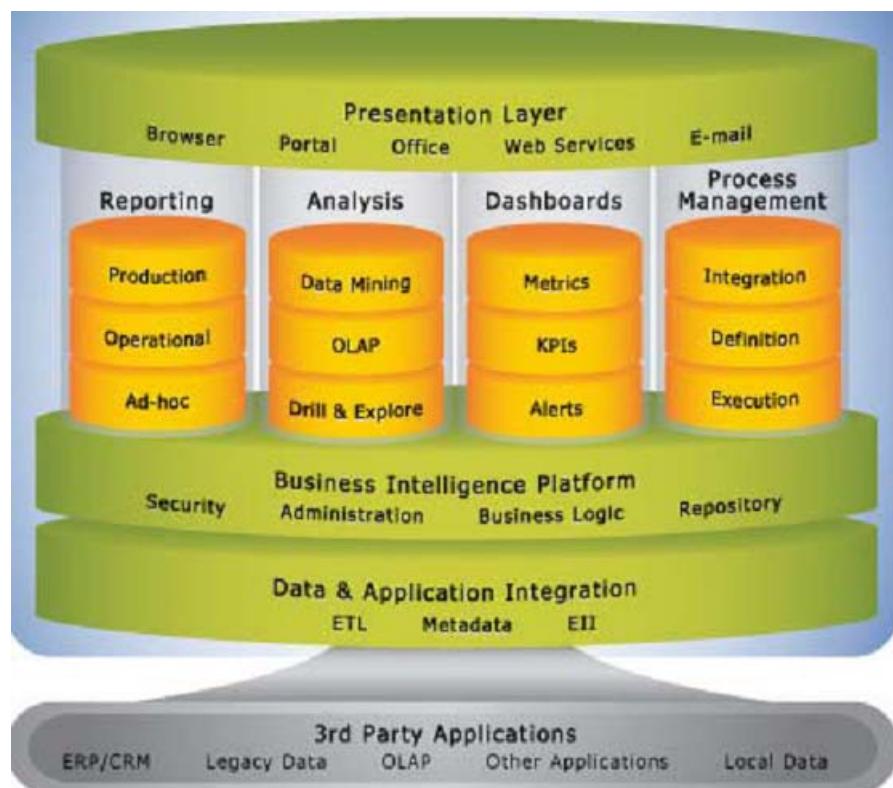
The underlying technology leveraged by DecisionSpace Analytics is the open source Pentaho Enterprise Edition version 5.0. Pentaho provides the Business Analytic and Data Integration components. Overall, there are three components which make up the Analytics:

- **Business Analytics** (BA) components can be used to create compelling visualization, reports, and dashboards based on user-designed data models.
- **Data Integration** (DI) components allow connecting to and extracting data from diverse data sources, such as relational and NoSQL databases and Hadoop. Data Integration provides a visual interface that can be used to transform data to support business analytics.
- **DecisionSpace Web Framework Integration** enables interactive reports, analysis reports, and dashboards that were created from the Analytics to be viewed in the Web Framework. Refer to the *Analytics* chapter of the *DecisionSpace Web Framework Administration Guide* to deploy and configure the *BI Analysis* feature in the Web Framework.
  - LDAP/Active Directory Integration
  - Single Sign On/Integrated Windows Authentication
  - DecisionSpace Analytics repository listing in DS Web Framework
  - DecisionSpace Analytics Report/Dashboard view in DS Web Framework web part
  - Inter Web - part communication with other web parts

## DecisionSpace Analytics Integration with DSIS



## DecisionSpace Analytics Platform



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## Business Analytics

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The Business Analytics components of DecisionSpace Analytics comprise the BA Server and Design Tools that can be used to provide valuable insight into business trends and performance of data.

The Business Analytics components are divided into four categories:

- BA Server
- DecisionSpace Analytics User Console
- Web-based Design Tools
  - Report Designer
  - Analyzer
  - Interactive Reporting
  - Dashboard Designer
  - Mobile
- Client-based Design Tools
  - Aggregation Designer
  - Metadata Editor
  - Schema Workbench

### **Business Analytics Server**

The **Business Analytics Server** (BA Server) processes reporting, analysis and dashboard content. The BA Server hosts the centralized BA Repository (PostgresSQL) for secure sharing of all BA data solutions. It also provides scheduling and audit functionality. The BA server is managed through its web-based tool, the **DecisionSpace Analytics User Console**. Use the User Console to create business analytics content, display and schedule reports, and manage security.

## Starting and Stopping the Business Analytics Server

To work with the User Console, the BA server must be running and the repository should be available. DecisionSpace Analytics provides different ways to start and stop the service.

### **Verify Services have been Started before Proceeding**

The following services should have been started:

- DecisionSpace Data Server (Data Server) data sources:
  - For OpenWorks: OracleServiceOW5K,  
Oracleowdb\_06101706TNSListener
  - For EDM: SQL Server (EDM5000), SQL Server  
(EDM\_OLAP), SQL Server Browser
- DecisionSpace Integration Server 5000.10.4.0
- SharePoint: SQL Server (SHAREPOINT)

To verify that these services have been started, select **Start > Control Panel > Administrative Tools > Services**. In the Services window, review the desired service to check (i.e., OracleServiceOW5K) from the list and verify that it says *Started* beneath the **Status** column.

### **Data Server VDBs**

Using Data Server, verify that the following VDBs have Active deployment:

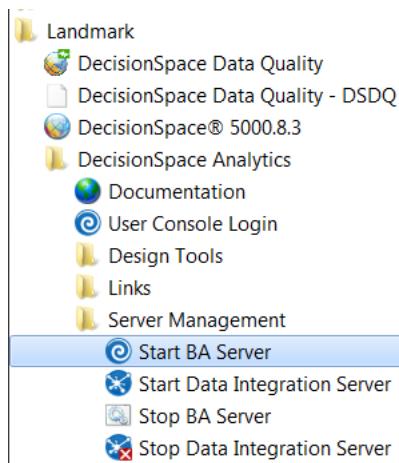
- OpenWorks
- EDM\_SqlServer
- EDMOWFederatedWell

## Windows

### From the Windows Start Menu

The BA server is deployed in an Apache Tomcat application server. Manage the BA Server by clicking **Start > All Programs > Landmark > DecisionSpace Analytics > Server Management**, and then select one of these menu items:

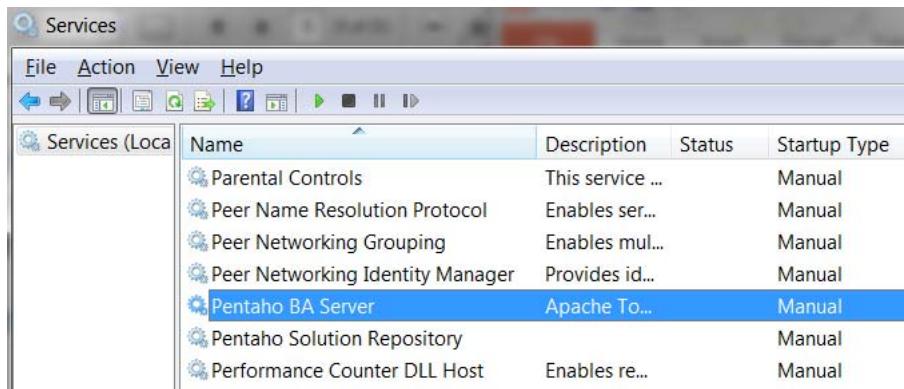
- Start BA Server
- Stop BA Server



## From the Windows Services

Select **Start > Control Panel > Administrative Tools > Services**. In the Services window, right-click the **Pentaho BA Server** and select Start to start the service or Stop to stop the service.

For starting and stopping the BA Server on Linux and other configuration settings, refer to the `Pentaho config_ba_server.pdf` guide which comes with the DecisionSpace Analytics installation.



## DecisionSpace Analytics User Console

The DecisionSpace Analytics User Console is a web-based user interface which can be used to analyze data, create interactive reports, dashboard reports and build integrated dashboards. In addition to its design features, the User Console includes administration features for configuring the Business Analytics and Data Integration servers, maintaining Pentaho licenses, setting up security, managing report scheduling and tailoring system performance to meet requirements.

The web-based design tools such as Interactive Reporting, Analyzer and Dashboard Designer are all run from the DecisionSpace Analytics User Console.

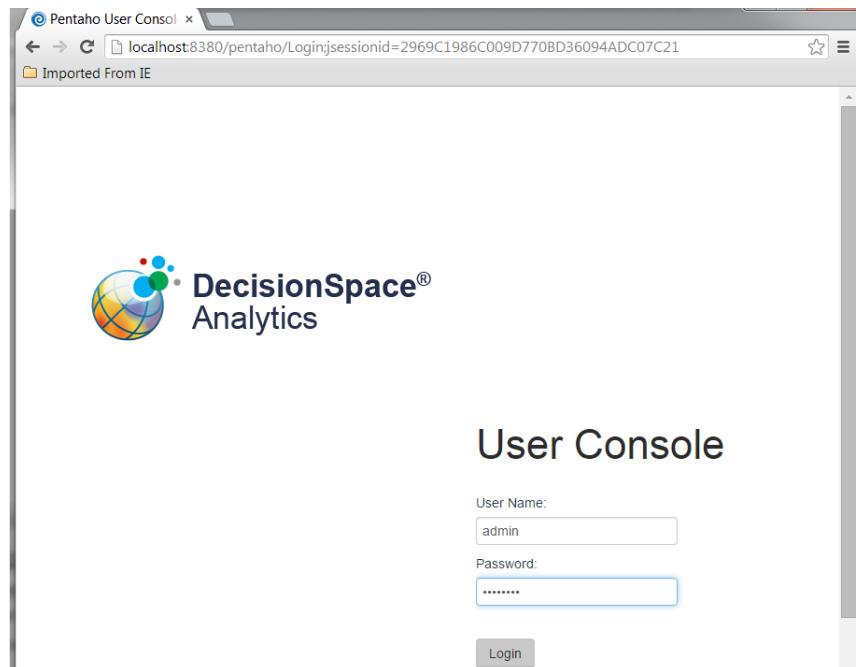
The User Console does not require any special skills or knowledge to use its design environment. However, to use its system administration features, the user must know where data is stored and how to access it, as well as details about system configuration and security providers.

### Starting the DecisionSpace Analytics User Console

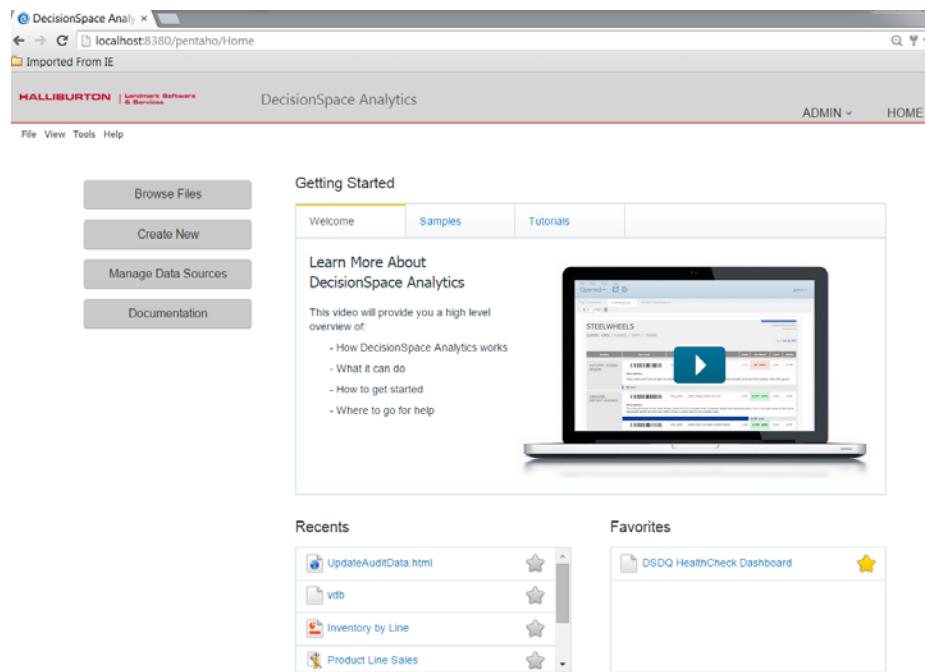
Before starting the User Console, the BA (Business Analytics) Server must already be started. To start the User Console, do as follows:

**Start > All Programs > Landmark > DecisionSpace Analytics > User Console Login**

The DS Analytics User Console Login screen opens in the default browser. Log on to the User Console using the default administrative credentials (user: **admin** and password: **password**) or other credentials that have been designated/created for administrative purposes.



If the log on is successful, the DS Analytics Home page opens. This page serves as the starting place for the User Console and all the tasks that can be performed with it.



## Components of the DecisionSpace Analytics User Console

### **Getting Started**

This section is packed with instructional videos the user can watch to learn about DS Analytics. The tutorials walk the user through creating a data source to be used for Interactive Report and Analyzer Report, and then integrate all the reports in a dashboard. With these tutorials, a user can easily get started with using DS Analytics. Samples of reports and dashboards are also provided.

- **Welcome** shows an introductory video about Pentaho products.
- **Samples** holds a variety of sample reports and dashboards that can be used to become familiar with the software.

- **Tutorials** contain a number of tutorial videos that provide a visual tour of the User Console, reports and dashboards.

#### Getting Started

Welcome      Samples      Tutorials

Learn More About DecisionSpace Analytics

This video will provide you a high level overview of:

- How DecisionSpace Analytics works
- What it can do
- How to get started
- Where to go for help

#### Recents

Shows a list of the most recently opened files. Clicking the star next to the file adds it to the Favorites list. Clicking on a file itself will open it in a new tab in the User Console window.

#### Recents

|  |                      |  |
|--|----------------------|--|
|  | UpdateAuditData.html |  |
|  | vdb                  |  |
|  | Inventory by Line    |  |
|  | Product Line Sales   |  |

#### Favorites

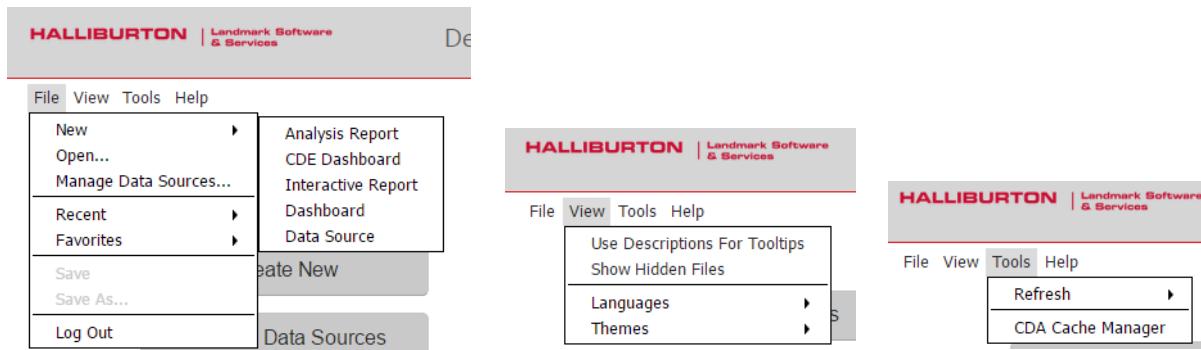
This maintains a list of favorite reports and dashboards. Clicking an item will open it in a new tab in the User Console window.

#### Favorites

|  |                            |
|--|----------------------------|
|  | DSDQ HealthCheck Dashboard |
|--|----------------------------|

### Menu Bar Top-Left

Provides basic options to create, open new, or open existing reports to manage data sources.



### Menu Bar Top-Right

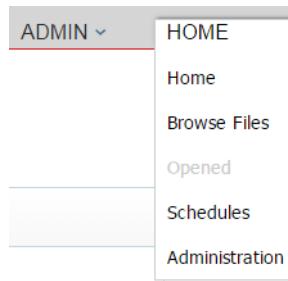
**ADMIN** can be used to log out of the User Console.



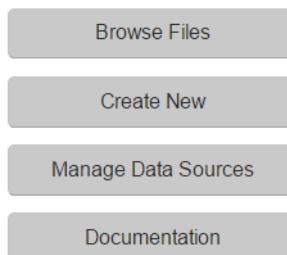
**HOME** can be used to launch the selected view/page.

- **Home** displays the User Console Home page.
- **Browse Files** - see the Browse Files description under the **Action Buttons** section below.
- **Opened** is activated after a file is opened from the Browse Files page. This provides a simple space to work with the files.
- **Schedules** displays the Manage Schedules view which displays a list of active scheduled reports. The list of schedules shows which reports are scheduled to run, the recurrence pattern for the schedule, when it was last run, when it is set to run again, and the current state of the schedule.

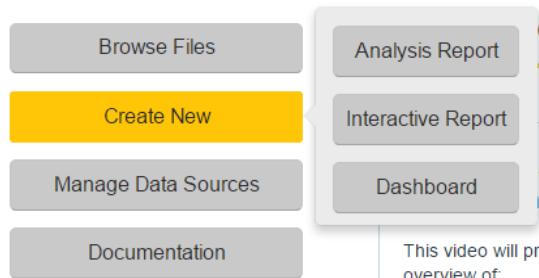
- **Administration** displays the administration window that can be used to manage users' authentication and authorization, setup mail server and licenses, and schedule deletion of generated files.



### Action Buttons



- **Browse Files** keeps the files organized and can be used to traverse the folders and files in the repository and to act on them. For example, folders can be created, deleted or renamed. Files can be uploaded or downloaded from the repository.
- **Create New** can be used to create new Analysis Report, Interactive Report or a Dashboard.
- **Manage Data Sources** can be used to create, update, or delete data sources.
- **Documentation** opens another window which has links to Pentaho documentation.

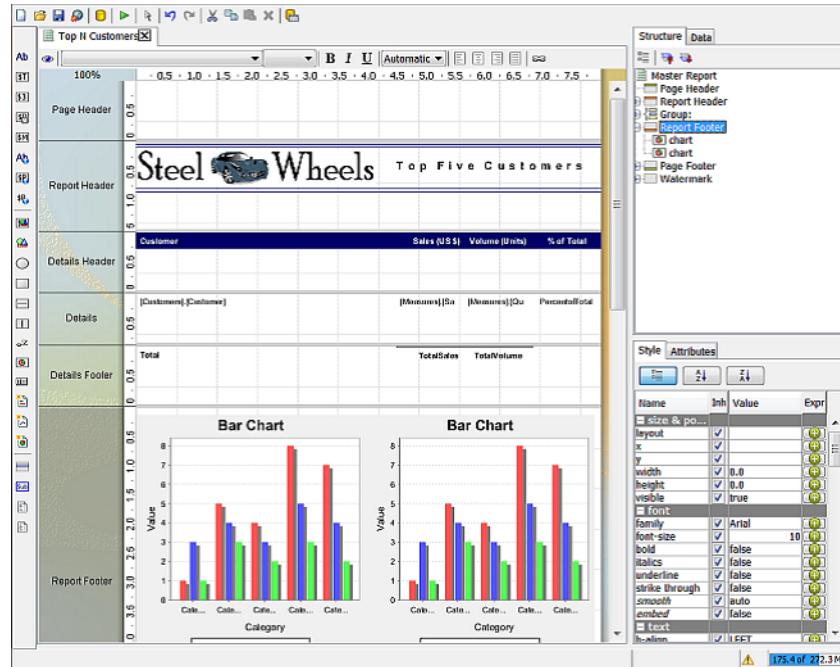


## Web-based Design Tools

The Web-based Design Tools include a host of reporting tools including: Report Designer, Analyzer, Interactive Reporting, Dashboard Designer and Mobile.

### Report Designer

Report Designer is a sophisticated report creation tool that can be used to generate highly detailed, pixel perfect reports using virtually any data source. Created reports are operating system files, not integrated into the BA repository, but they can be imported into or exported out of the BA repository.



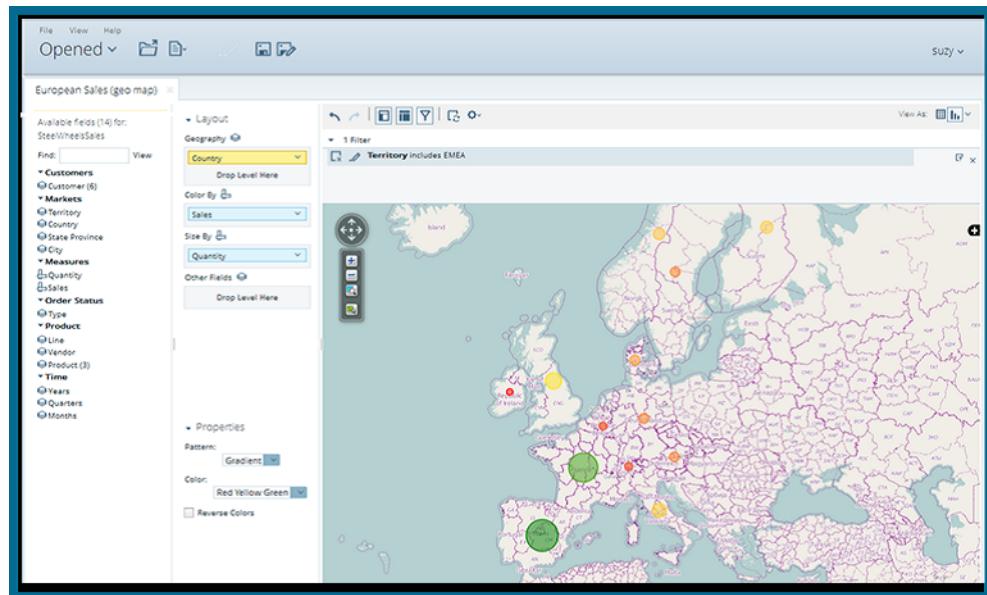
### Analyzer

The Analyzer helps filter and visualize data to make informed business decisions. Use the Analyzer to filter data, add query parameters, configure drill-down links, apply conditional formatting, and generate hyperlinks. Analyzer can also be used to create geographic, scatter chart, heat grid, and multi-chart visualizations.

The features include the ability to:

- Access DS Analytics data sources.

- Create Web-based, drag-and-drop report.
- Perform advanced sorting and filtering.
- Customize totals and user-defined calculations.



## Interactive Reporting

Create template-based, on-demand reports in an intuitive drag-and-drop environment. Quickly add elements to the report and format them as required. The features include the ability to:

- Access DecisionSpace Analytics Metadata data sources.
- Easily interact with reports.
- Use a drag-and-drop designer to add, move, and delete fields within the report canvas.
- Use inline formatting, filtering, sorting, grouping, aggregations, and summary calculations.
- Design and edit reports with WYSIWYG (What You See Is What You Get) software.

- Create reports based on templates.

| Product Name      | Scale | Items Sold | Sales           |
|-------------------|-------|------------|-----------------|
| 1968 Ford Mustang | 1:12  | 222        | \$38,112        |
|                   |       |            | <b>\$38,112</b> |

| Product Name                        | Scale | Items Sold | Sales           |
|-------------------------------------|-------|------------|-----------------|
| 1958 Chevy Corvette Limited Edition | 1:24  | 456        | \$22,101        |
| 1966 Shelby Cobra 427 S/C           | 1:24  | 347        | \$15,435        |
| 1982 Camaro Z28                     | 1:18  | 379        | \$19,517        |
|                                     |       |            | <b>\$77,053</b> |

| Product Name       | Scale | Items Sold | Sales           |
|--------------------|-------|------------|-----------------|
| 1949 Jaguar XK 120 | 1:24  | 392        | \$34,650        |
|                    |       |            | <b>\$34,650</b> |

## Dashboard Designer

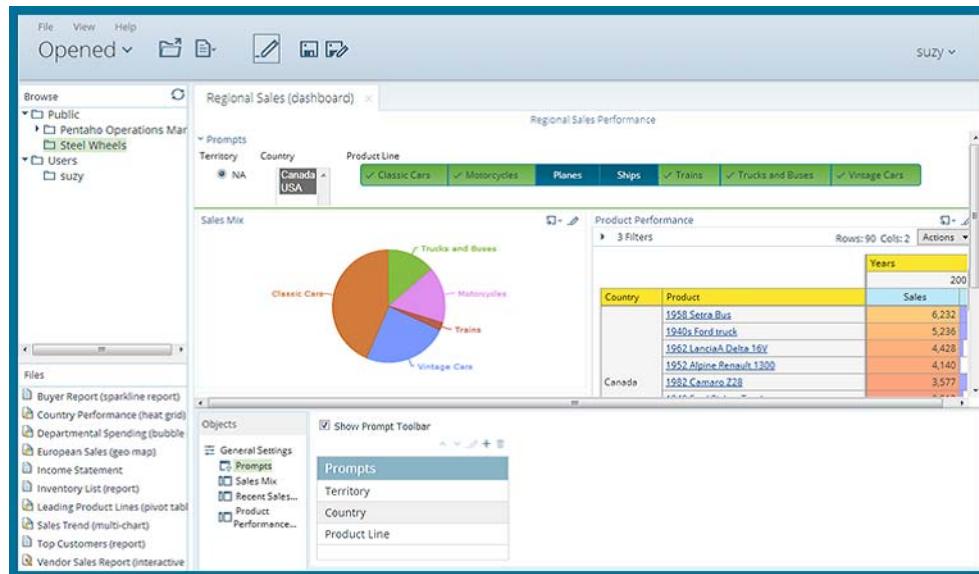
A dashboard is several different reports brought together inside one screen. Use the Dashboard Designer to create an interface to view many different reports at once, have quick access to web pages that are visited often, or view dynamic charts and graphs within one space while creating reports in another.

Choose layout templates, themes, and content to create visually attractive dashboards that help decision makers recognize critical knowledge at a glance. Embed a wide variety of content in the web-based display, including Interactive Reports, Analyzer visualizations, graphics, charts, web pages, even collaborative content. Mobile and desktop users can personalize dynamic dashboards to reflect their preferences.

The features include the ability to:

- Create dashboards by selecting the layout, theme, and content to be displayed.
- Include any type of reports, external web pages, or dashboard internal elements (charts and data grid) that access Metadata data sources.
- Add dynamic filter controls.

- Drive content within a dashboard using other dashboard content.  
Content types include:
  - Charts: simple bar, line, area, pie, dial charts created with Chart Designer
  - Data Tables: tabular data
  - URLs: Web sites that are to be displayed in a dashboard panel



## Mobile

Mobile is an application built specifically for the Apple iPad. View and edit Analyzer reports or review reports made by the Dashboard Designer, Interactive Reporting and Report Designer.

## **Client-based Design Tools**

The Client-based Design Tools include: Aggregation Designer, Metadata Editor and Schema Workbench.

## Aggregation Designer

Aggregation Designer provides a simple interface that can be used to create aggregate tables from levels within the specified dimensions. Based on these selections, the Aggregation Designer generates the Data Definition Language (DDL) for creating aggregate tables, the Data Manipulation Language (DML) for populating them, and an updated Mondrian schema which references the new aggregate tables. Use this tool to improve the performance of the Pentaho Analysis (Mondrian) OLAP cubes.

## Metadata Editor

The Metadata Editor is a tool that can be used to build metadata domains and relational data models. A Metadata Model maps the physical structure of the database into a logical business model. These mappings are stored in a centralized metadata repository and allow administrators to:

- Create business-language definitions for complex or cryptic database tables.
- Decrease the cost and impact associated with low level database changes.
- Set security parameters limiting user's report access to data.
- Drive formatting on text, date, and numeric data improving report maintenance.
- Localize the information to the user's regional settings.

The goal of the Metadata Editor is to simplify the experience of business users when they are creating reports. It encapsulates both the physical descriptions of database objects and the logical model (the business model), the abstract representation of the database.

Refer to *Pentaho pme\_user\_guide.pdf* for detailed explanation on *Metadata Editor*.

## Schema Workbench

Schema Workbench can be used to edit and create multidimensional (Mondrian) models. Use this tool to create multidimensional models graphically or define them by hand-coding XML files.

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## Data Integration Components

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Data Integration can be used to collect data from disparate sources such as databases, files and applications, and turn the data into a unified format that is accessible and relevant to end users. The Data Integration tool provides an Extraction, Transformation and Loading (ETL) engine that facilitates the process of capturing the right data, cleansing of data and storing data using a uniform and consistent format.

Support for slowly changing dimensions and surrogate key for data warehousing allows data migration between databases and application. It is flexible enough to load giant datasets, and can take full advantage of cloud, clustered, and massively parallel processing environments. Cleanse the data using transformation steps that range from very simple to very complex. Finally, leverage ETL as the data source for reporting tools.

The Data Integration components are divided into the following categories:

- DI Server
- Design Tools
  - Spoon
  - Kitchen, Pan, and Carte
- Plugins
- Instaview
- Agile BI

### **DI Server**

The Data Integration Server (DI Server) is a dedicated enterprise class server for ETL and Data Integration. It is used to execute Data Integration jobs and transformation. It also provides services such as scheduling and content management (including revision history and security integration). Perform configuration tasks on the DI Server before performing data extraction, transformation, and load.

## Starting and Stopping the Data Integration Server

DecisionSpace Analytics provides different ways to start and stop the DI service.

### Windows

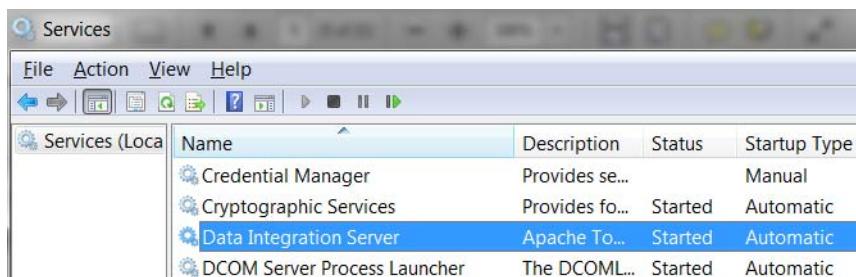
#### From the Windows Start Menu

Manage the DI Server by selecting **Start > All Programs > Landmark > DecisionSpace Analytics > Server Management** and then select one of these menu items:

- Start Data Integration Server
- Stop Data Integration Server

#### From the Windows Services

Select **Start > Control Panel > Administrative Tools > Service**. In the Services window, right-click the Data Integration Server, and select **Start** to start the service or **Stop** to stop the service.

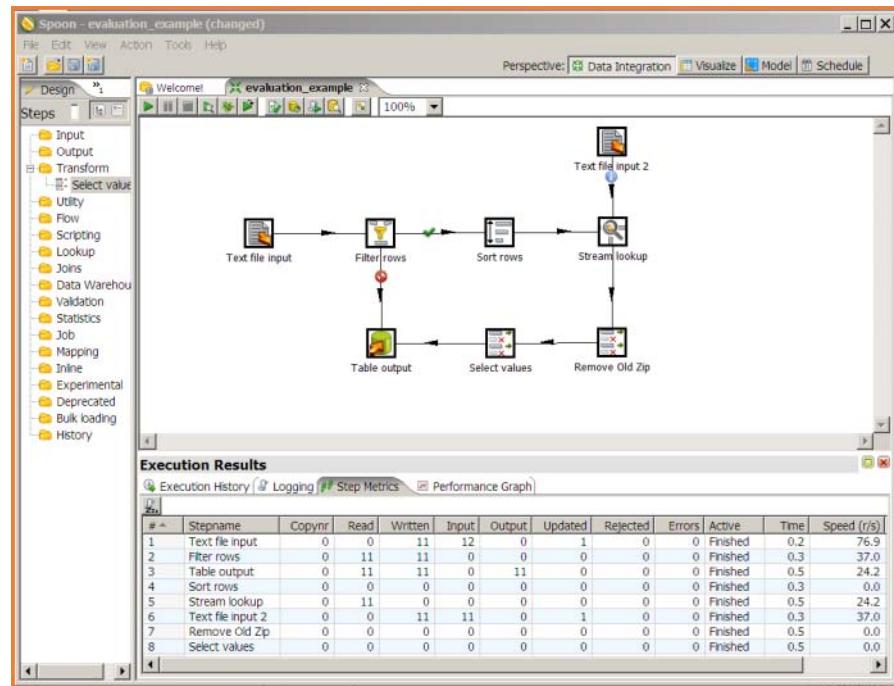


| Name                         | Description    | Status  | Startup Type |
|------------------------------|----------------|---------|--------------|
| Credential Manager           | Provides se... | Manual  |              |
| Cryptographic Services       | Provides fo... | Started | Automatic    |
| Data Integration Server      | Apache To...   | Started | Automatic    |
| DCOM Server Process Launcher | The DCOML...   | Started | Automatic    |

For starting and stopping the DI Server on Linux, please refer to the *Pentaho config\_pdi\_server.pdf* guide which comes with the DecisionSpace Analytics installation.

## Spoon

The DI Server is a core component that executes data integration jobs and transformations using the Pentaho Data Integration Engine. It also provides services that can be used to schedule and monitor scheduled activities. Drag job entries onto the Spoon canvas, or choose from a rich library of more than 200 pre-built steps to create a series of data integration processing instructions.



## Kitchen, Pan, Carte

Pan is used to execute PDI transformations which represent a data stream through a set of independent tasks. Kitchen can orchestrate PDI jobs, which contain transformations and other job entries as part of a larger business process. Use Carte to set up dedicated, remote PDI servers to coordinate jobs across a collection of clustered computers, and execute transformations within a cluster of Carte cluster nodes.

## Instaview

The Instaview software uses templates to manage the complexities of data access and preparation. Instaview automatically generates transform and metadata models, executes them, and can be used to visualize the results.

The screenshot shows the Instaview software interface. On the left, there is a list of 'Available fields (33) for: Instaview' including various dimensions like Quota, Quantityordered, Sales, Yearid, and several Address and Contact fields. A red box highlights the 'Territory' field. In the center, there's a 'Layout' panel with sections for 'Rows', 'Columns', and 'Measures'. Under 'Rows', 'Country' is selected. Under 'Measures', 'Sales' is selected. A red arrow points from the highlighted 'Territory' field in the available fields list to the 'Rows' section of the layout panel. On the right, a preview window titled 'View 1' shows a table with 'Country' and 'Sales' columns, listing countries and their corresponding sales values. The table data is as follows:

| Country     | Sales   |
|-------------|---------|
| Australia   | 630623  |
| Austria     | 202063  |
| Belgium     | 108413  |
| Canada      | 228079  |
| Denmark     | 245637  |
| Finland     | 329582  |
| France      | 1119917 |
| Germany     | 229472  |
| Ireland     | 57756   |
| Italy       | 374674  |
| Japan       | 188168  |
| Norway      | 307464  |
| Philippines | 94016   |
| Singapore   | 115499  |
| Singapore   | 172990  |
| Spain       | 1215687 |
| Sweden      | 219014  |

## Agile BI

Agile BI is an accelerated development approach which links Spoon's data integration to Analyzer and its visualizations. The analyzed results can be seen immediately as the data mart or data models are changed, without leaving Spoon. This technique helps data design professionals and business users work together to rapidly resolve business analysis concerns.

## DecisionSpace Analytics Reporting

This section covers the simple workflows for creating Interactive Reporting, Analyzer (Analytical Reporting) and creating a Dashboard. The type of reporting created depends on the business requirements and expertise. Use below table as a guideline.

|                | <b>Interactive Reports</b>                                                                                                                                                                                                                                                       | <b>Analyzer Reports</b>                                                                                                                                                                                                                   | <b>Dashboard Designer</b>                                                                                                                                                                                                                 |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Summary        | Web based design interface which is used to create both simple and on-demand operational reports without depending on IT or report developers. The resulting report is in tabular form.                                                                                          | An intuitive analytical visualization tool that filters and drills down into business information contained in Analysis data sources. Can be used to perform “what-if” analysis and render information in graphical forms (charts, etc.). | Allows users to create dashboards with little or no training. The dashboard is several different reports brought together inside one screen.                                                                                              |
| Expertise      | Knowledge of basic computer functions, such as operating systems and web browsers.                                                                                                                                                                                               | Knowledge of basic computer functions, such as operating systems and web browsers.                                                                                                                                                        | Knowledge of basic computer functions, such as operating systems and web browsers                                                                                                                                                         |
| Recommendation | Use <b>Interactive Reports</b> to create a tabular report that answers an immediate business question, looks professional, can be printed quickly, and provides significant control over formatting elements such as fonts, column width or sorting background colors, and more. | Use <b>Analyzer Reports</b> to compile data quickly while visually exploring data, perform advanced sorting and filtering of data, and see chart visualizations that include detailed stop-lighting.                                      | Use <b>Dashboard Designer</b> to create an interface to view many different reports at once, have quick access to web pages that are visited often, or view dynamic charts and graphs within one space while creating reports in another. |

In the following discussion, simplified workflow for creating reports and dashboard will be illustrated. But first a data source needs to be defined and modeled in order to create reports.

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## DSA Exercise 1: DS Analytics Integrated Windows Authentication and SSO

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### **Purpose of the exercise:**

Describes how to setup Pentaho to use integrated Windows Authentication and SSO feature which is a prerequisite for using DecisionSpace Analytics plug-in.

### **Outcome of the exercise:**

After successful setup, user can access Pentaho user console through link from DecisionSpace Web Framework.

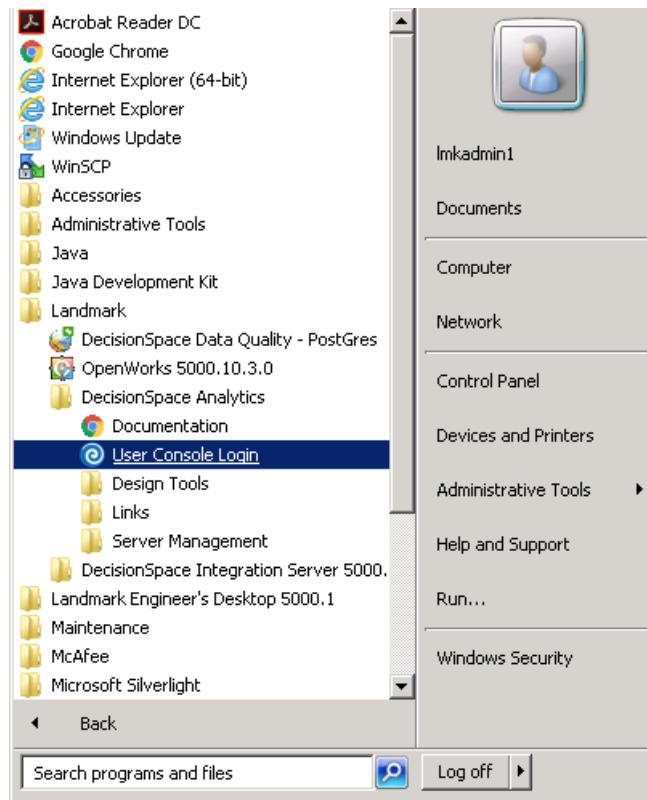
### **Exercise workflows:**

- Configure LDAP and SSO in Pentaho
- Restart Pentaho BA service
- Configure TOMCAT
- ISAPI filter to connect Tomcat server (Pentaho) with IIS (Web Framework)
- Restart Web Service hosting the DecisionSpace Web Framework portal
- Verify Setup

## 1. Configure LDAP and SSO in Pentaho.

Pentaho Business Analysis server supports integrating LDAP/Microsoft Active Directories as its credential provider.

- Go to Start > All Programs > Landmark > DecisionSpace Analytics > User Console.



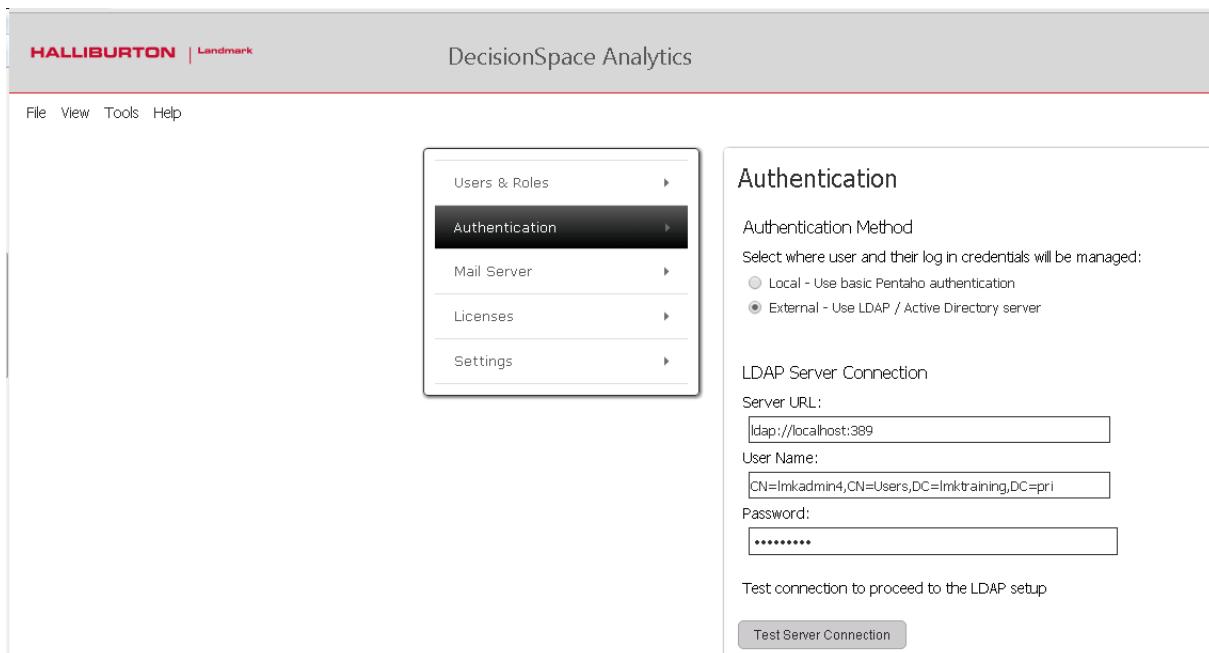
- From the User Console Home menu, click Administration, and then select Authentication from the left panel.
- The Authentication interface appears. Local - Use basic Authentication is selected by default.
- Select the External - Use LDAP/Active Directory server option.
- The LDAP Server Connection fields populate with a default URL, User Name, and Password.

- f) Change the Server URL, User Name, and Password as required.

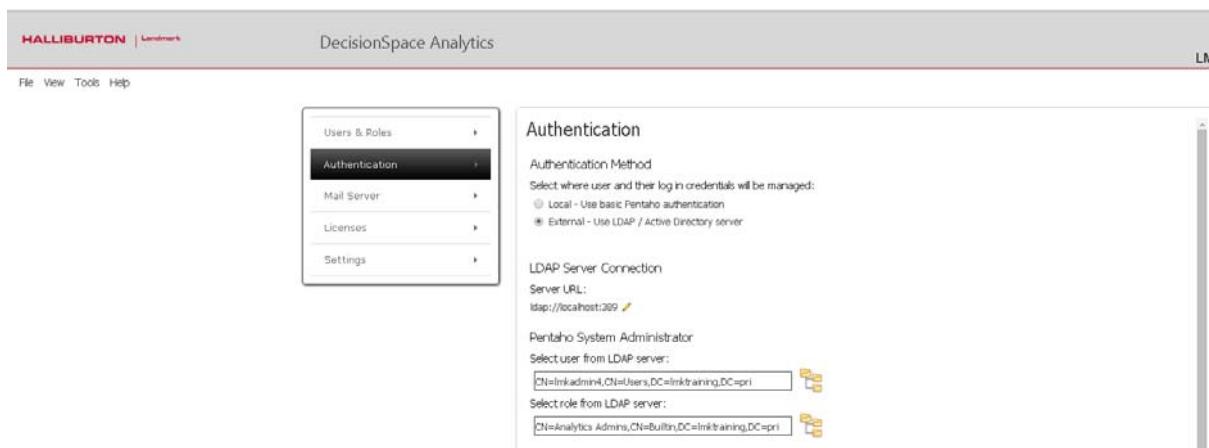
**Note**

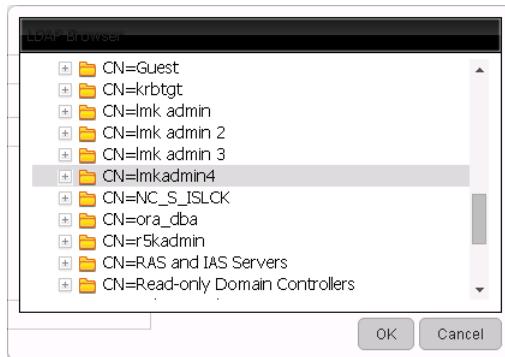
The User Name field must be populated with the distinguishedName (DN) attribute from the Active Directory server.

- g) Click Test Server Connection to verify the connection to your LDAP server and to enable the configuration screen.



- h) Click the node to select the Pentaho System Administrator user and role that match your LDAP configuration and then click **OK**.





- i) Follow step h to select the System Administrator role from the LDAP server by clicking the node.
- j) Select Custom Configuration from the LDAP Provider drop-down list and complete the rest of the configuration that appears on this selection.
- k) User Search - This section of the configuration requires the “path” in the Active Directory in which Pentaho has to search for Users whenever a new username and password are entered for authentication.
  - Search Base: The username will be searched in this location
  - Search Filter: This is the filter/attribute of the Active Directory against which the entered username will be validated

LDAP Configuration

LDAP Provider:

Custom Configuration ▾

User Search

Search Base:

Search Filter:

Click **Test** to display a window to enter a user name to test the configuration. Successful configuration should return all the properties of the User as defined in the Active Directory.

- l) Roles - This section is used to fetch all the “Roles” in the provided location and populate them in the “Users & Roles” section of DSA Administration once LDAP is configured.

Roles

Role Attribute:

Role Search Filter:

Role Search Base:

Click **Test** to display a window with a list of roles/groups available in the Role Search Base location.

- m) Populator - This section matches fully distinguished user names from the User Search to fetch distinguished role names for roles those users belong to.

Populator

Group Role Attribute:

Group Search Base:

Group Search Filter:

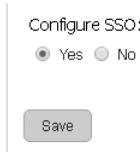
Role Prefix:

Convert To Upper Case:  
 Yes  No

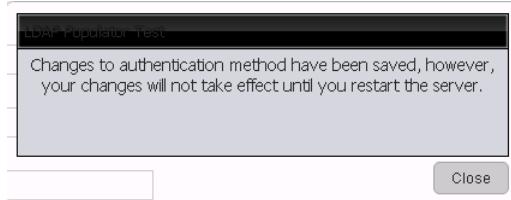
Subtree:  
 Yes  No

Click **Test** to display a window to enter a User Name or User DN to validate the roles. Successful test will display the “Authenticated” message.

- n) Select **Yes** in the Configure SSO section and click **Save**.



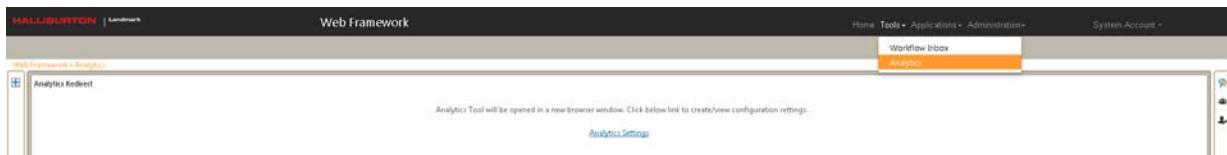
- o) If configuration is successful, the following message displays.



- p) Close the browser window and restart the “Pentaho BA Server” service from the Services console.
- q) Reopen the DSA User Console from the Start menu and login with Active Directory credentials to verify LDAP and SSO configuration.

## 2. Configure ISAPI Filter at DecisionSpace Web Framework server.

- a) Launch the Web Framework console by selecting **Start > All Programs > Landmark > DecisionSpace Integration Server > Launch Web Framework**.
- b) Login as administrator.
- c) Select **Tools > Analytics** from the navigation bar in the top-right to open the Analytics configuration settings page.



- d) In the Host IP section, enter the fully qualified host name or the IP address of the server on which DSA is installed and LDAP is configured, and then click **Submit**.
- e) When the successful completion screen displays, close the browser, relaunch the web framework, and navigate to **Tools > Analytics** to open the Analytics User Console with the same

user in Web Framework as the one logged in to DSA in a separate window.

**Note**

Unblock the pop-up blocker before opening the Analytics page from Web Framework.

## Exercise 2: Create JDBC Connections to Data Sources

### Purpose of the Exercise

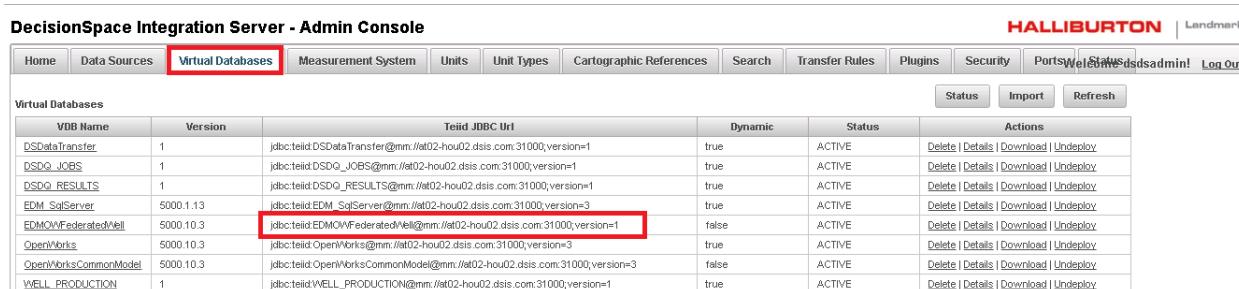
Create two JDBC connections to use later for generating reports:

- Connection to a Data Server VDB previously created in Data Server exercises Data Server VDB.
- Connection to an EDM OLAP MS SQL database (EDM\_O LAP).

### Outcome of the Exercise

After successful creation of JDBC connections, they can be used for exercises 2, 3, and 4.

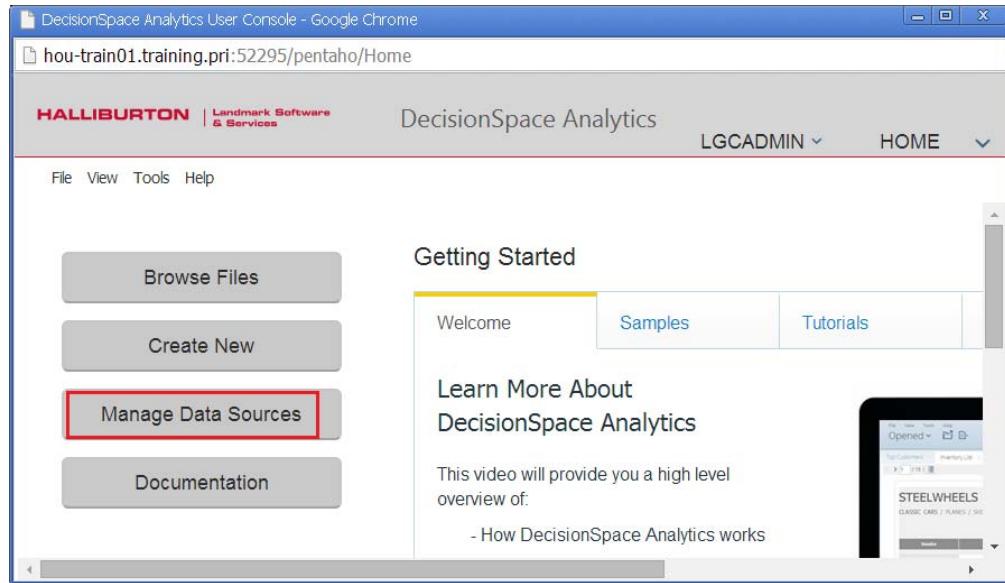
- 1. Find the JDBC Connection String to connect to EDMOWFederated.**
  - a) Open the Data Server Console.
  - b) Select the **Virtual Databases** tab. Copy the Teiid JDBC Url for the **EDMOWFederatedWell** VDB.



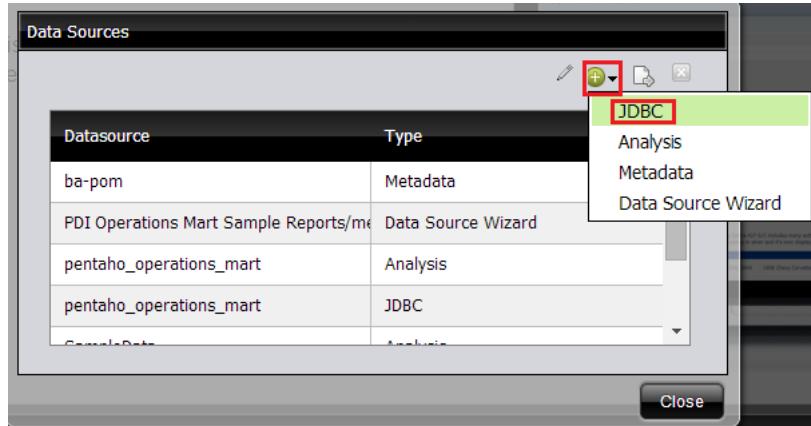
| Virtual Databases    |           |                                                                          |         |        |                        |                         | Status                   | Import                   | Refresh |
|----------------------|-----------|--------------------------------------------------------------------------|---------|--------|------------------------|-------------------------|--------------------------|--------------------------|---------|
| VDB Name             | Version   | Teiid JDBC Url                                                           | Dynamic | Status | Actions                |                         |                          |                          |         |
| DSDataTransfer       | 1         | jdbc:teiid:DSDataTransfer@mm://at02-hou02.dsis.com:31000;version=1       | true    | ACTIVE | <a href="#">Delete</a> | <a href="#">Details</a> | <a href="#">Download</a> | <a href="#">Undeploy</a> |         |
| DSDQ_JOBS            | 1         | jdbc:teiid:DSDQ_JOBS@mm://at02-hou02.dsis.com:31000;version=1            | true    | ACTIVE | <a href="#">Delete</a> | <a href="#">Details</a> | <a href="#">Download</a> | <a href="#">Undeploy</a> |         |
| DSDQ_RESULTS         | 1         | jdbc:teiid:DSDQ_RESULTS@mm://at02-hou02.dsis.com:31000;version=1         | true    | ACTIVE | <a href="#">Delete</a> | <a href="#">Details</a> | <a href="#">Download</a> | <a href="#">Undeploy</a> |         |
| EDM_SqlServer        | 5000.1.13 | jdbc:teiid:EDM_SqlServer@mm://at02-hou02.dsis.com:31000;version=3        | true    | ACTIVE | <a href="#">Delete</a> | <a href="#">Details</a> | <a href="#">Download</a> | <a href="#">Undeploy</a> |         |
| EDMOWFederatedWell   | 5000.10.3 | jdbc:teiid:EDMOWFederatedWell@mm://at02-hou02.dsis.com:31000;version=1   | false   | ACTIVE | <a href="#">Delete</a> | <a href="#">Details</a> | <a href="#">Download</a> | <a href="#">Undeploy</a> |         |
| OpenWorks            | 5000.10.3 | jdbc:teiid:OpenWorks@mm://at02-hou02.dsis.com:31000;version=3            | true    | ACTIVE | <a href="#">Delete</a> | <a href="#">Details</a> | <a href="#">Download</a> | <a href="#">Undeploy</a> |         |
| OpenWorksCommonModel | 5000.10.3 | jdbc:teiid:OpenWorksCommonModel@mm://at02-hou02.dsis.com:31000;version=3 | false   | ACTIVE | <a href="#">Delete</a> | <a href="#">Details</a> | <a href="#">Download</a> | <a href="#">Undeploy</a> |         |
| WELL_PRODUCTION      | 1         | jdbc:teiid:WELL_PRODUCTION@mm://at02-hou02.dsis.com:31000;version=1      | true    | ACTIVE | <a href="#">Delete</a> | <a href="#">Details</a> | <a href="#">Download</a> | <a href="#">Undeploy</a> |         |

**2. From the Analytics Console, create a JDBC Connection to the EDMOWFederated VDB:**

- a) Click **Manage Data Sources** to display the Data Sources dialog box.



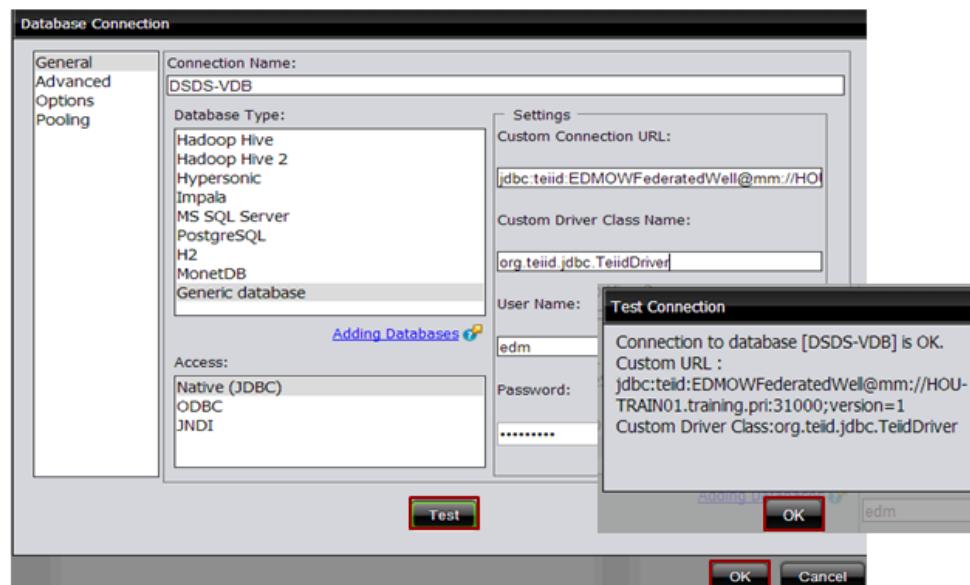
- b) In the Data Sources dialog box, click the **Add** icon and select **JDBC** from the drop-down list.



- c) In the Database Connection window, enter or select these parameters:
- Connection Name: **DSDS-VDB**.
  - Database Type: **Generic Database**.

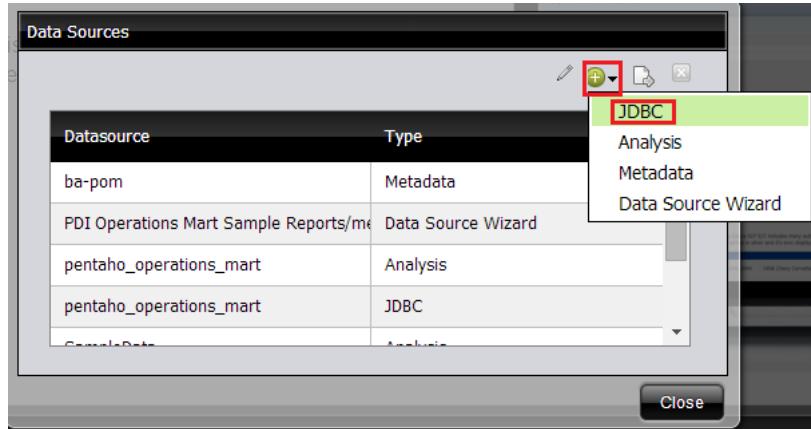
- Custom Connection URL: **enter the JDBC string for the EDMOWFederated VDB (copied earlier).**
- User Name: **edm**
- Password: **Landmark1**
- Custom Driver Class Name: **org.teiid.jdbc.TeiidDriver**
- Click **Test**, make sure it is successful, and then click **OK**, first in the Test Connection window and then in the Database Connection window, to finish.

A JDBC connection to the EDMOWFederated VDB is created in Data Server.



**3. From the Analytics Console, create a JDBC connection to EDM OLAP database.**

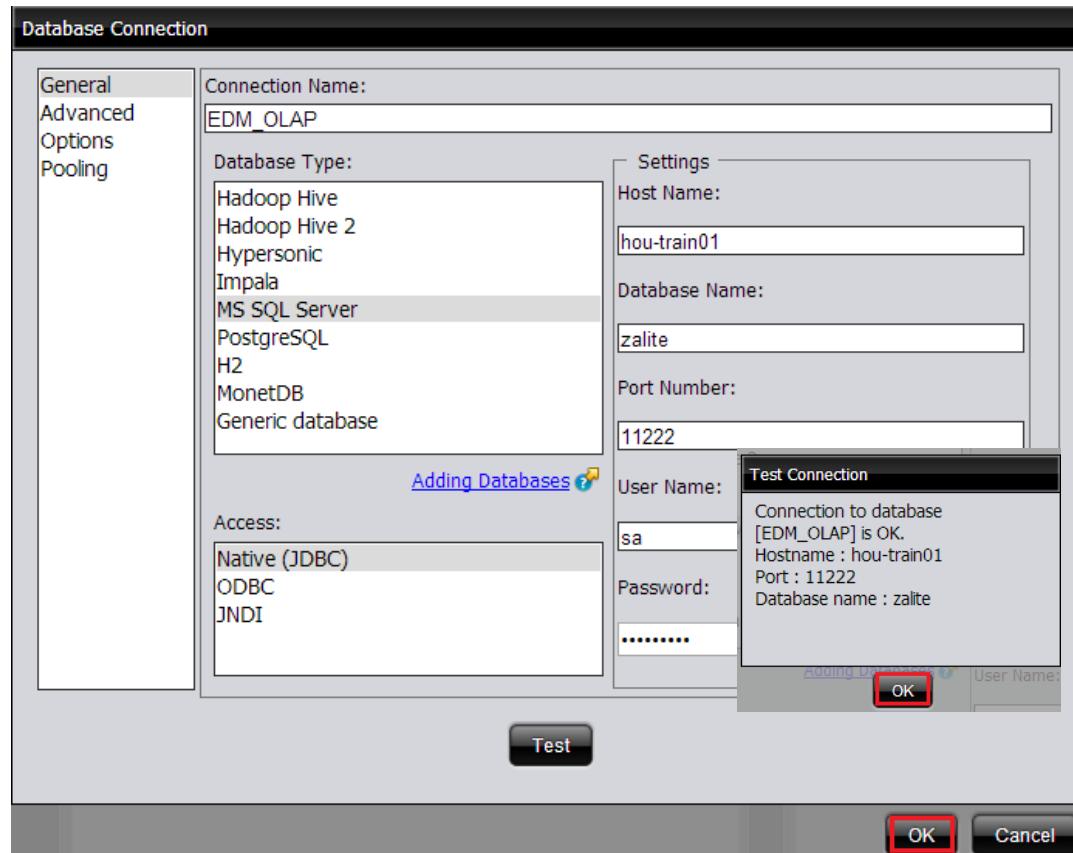
- a) From the Analytics console, once again, click **Manage Data Source** to display the Data Sources dialog box, and then click the **Add** (+) icon and select **JDBC** from the drop-down list.



- b) In the Database Connection window, enter:

- Connection Name: **EDM OLAP**
- Database Type: **MS SQL Server**
- Access: **Native (JDBC)**
- Host Name: **HOU-TRAIN01**
- Database Name: **zalite**
- Port Number: **11222**
- User Name: **sa**
- Password: **Landmark1**

4. Click **Test**, make sure it is successful, and then click **OK** to finish in both the *Test Connection* and the *Database Connection* windows.



5. Two JDBC connections have been created; one to DSDS-VDB (EDMOWFederated) and the other to EDM OLAP.

| Data Sources                                |                    |
|---------------------------------------------|--------------------|
| Datasource                                  | Type               |
| ba-pom                                      | Metadata           |
| DSDS-VDB                                    | JDBC               |
| EDM OLAP                                    | JDBC               |
| PDI Operations Mart Sample Reports/metadata | Data Source Wizard |

## ***Creating Interactive Reports***

The Interactive Reports tool creates a tabular data report in an intuitive drag-and-drop environment where data source elements can be added to the report and formatted as desired.

To help design the most effective report, consider the following questions:

- What type of information to include in the report?
- Which columns in the data source provide that information?
- How is data going to be grouped in the report?
- What are the parameters of the report?
- Which report formatting to use for the report?

---

## Exercise 3: Create an Interactive Report

---

### **Purpose of the Exercise**

Create a Well list interactive report using the previously created JDBC connection to DSDS VDB. Following is an overview of the workflow to be used to create the interactive report:

- Create a data model from a desired existing data connection using the **Data Source Wizard** option.
- Then create a new Interactive Report which will consume the data model created above.
- In the Interactive Report window, drag-and-drop data attributes to the report.
- Name the report and save it to the repository.

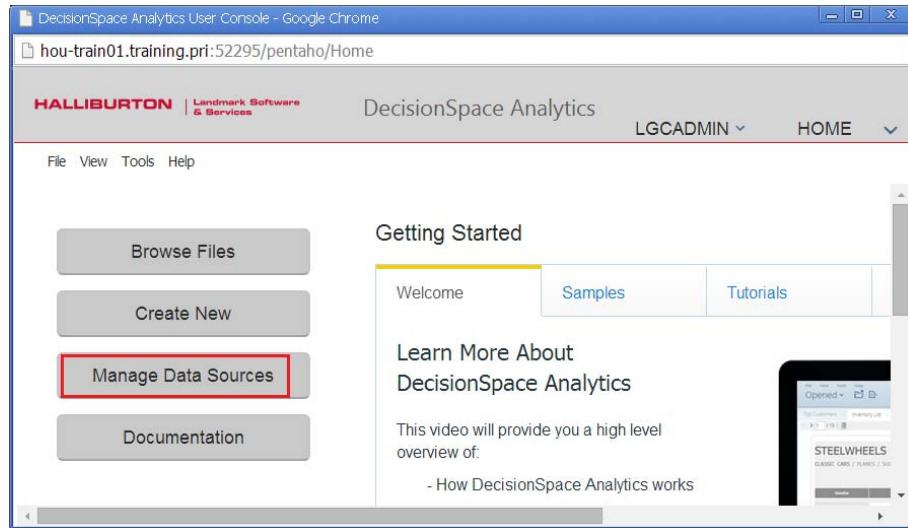
### **Outcome of the Exercise**

The user will know how to create and design an interactive report, change the report details, and schedule the report to run now or in the future.

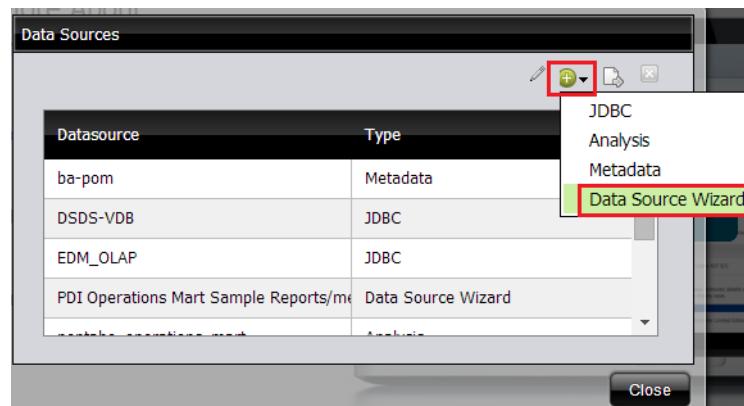
### **Exercise Workflow**

1. Open the DecisionSpace Analytics User Console.
2. Create a Data Source for an interactive report.

- a) Click **Manage Data Sources** to display the Data Sources dialog box.



- b) In the Data Sources dialog box, click and select **Data Source Wizard**.

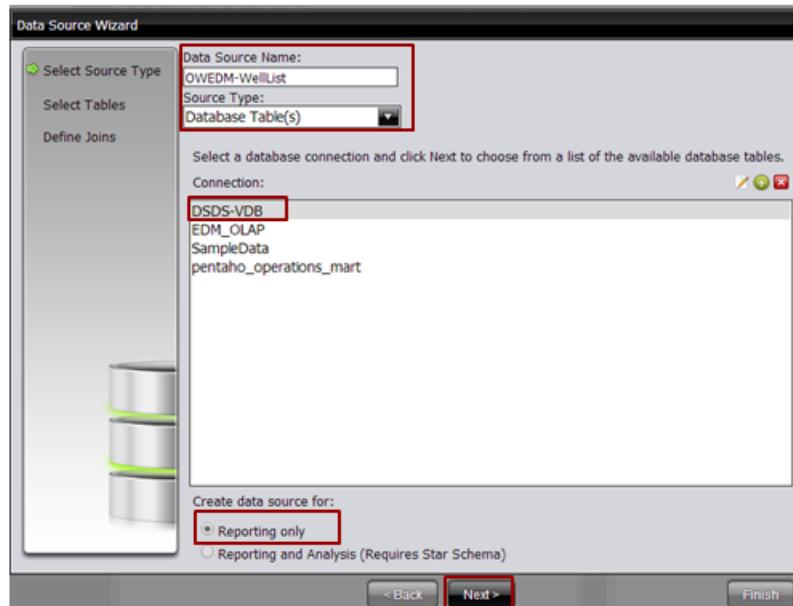


- c) In the Data Source Wizard dialog box, enter or select:

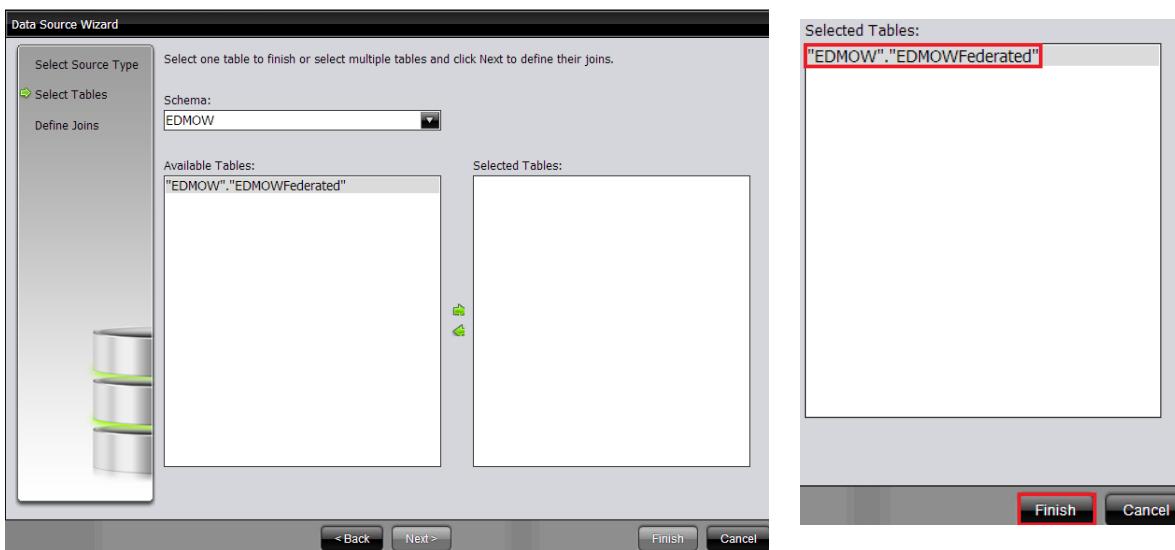
- Data Source Name: **OWEDM-WellList**
- Source Type: **Database Table(s)**

- Connection: **DSDS-VDB**

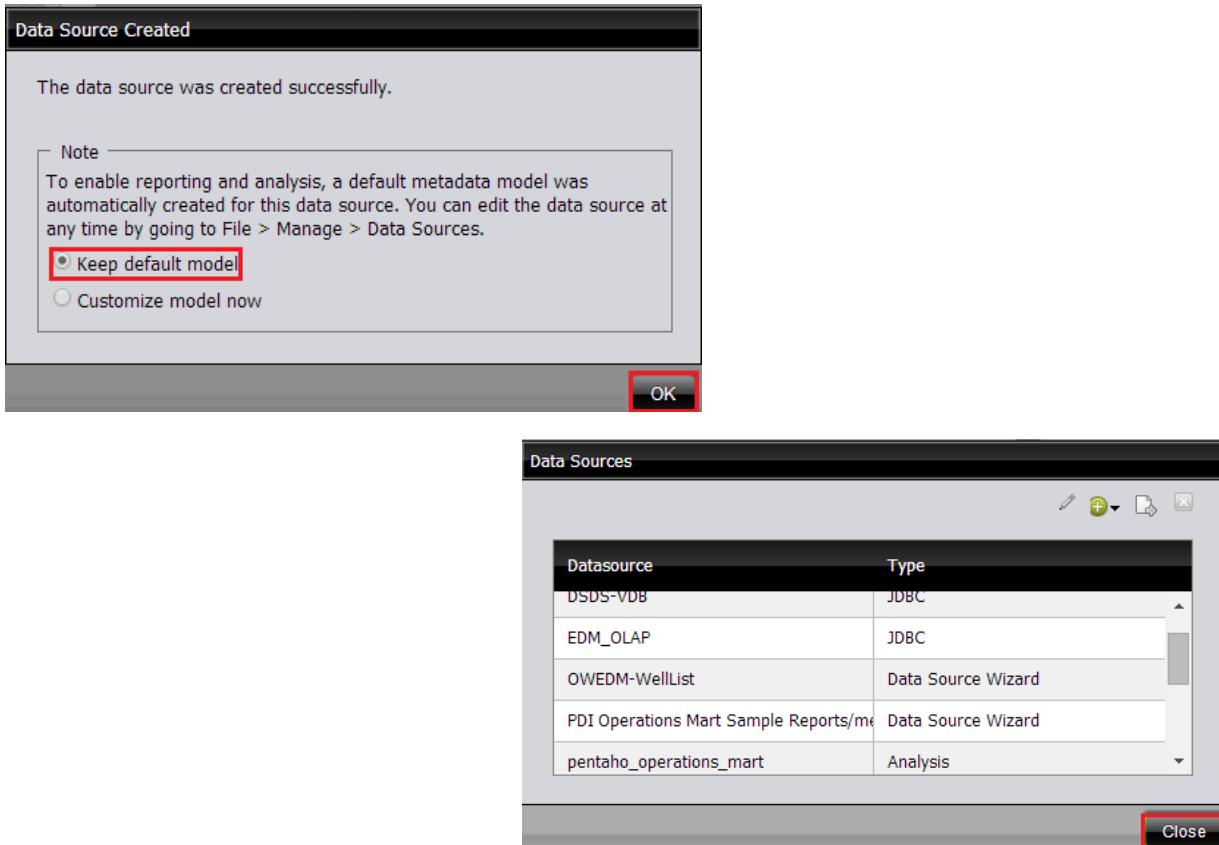
d) Select **Reporting Only** and click **Next**.



e) Enter **EDMOW** for Schema. From **Available Tables** select **EDMOW.EDMOWFederated**, and use the right arrow icon to move it to **Selected Tables**. Click **Finish** to complete.

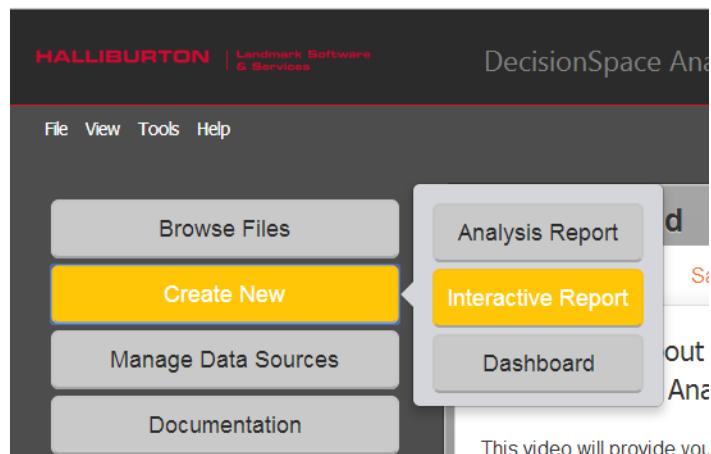


- f) In the Data Source Created dialog box, select **Keep default model** and click **OK**. Click **Close** on the Data Sources dialog box to return to the main Analytics window.



### 3. Create an interactive report.

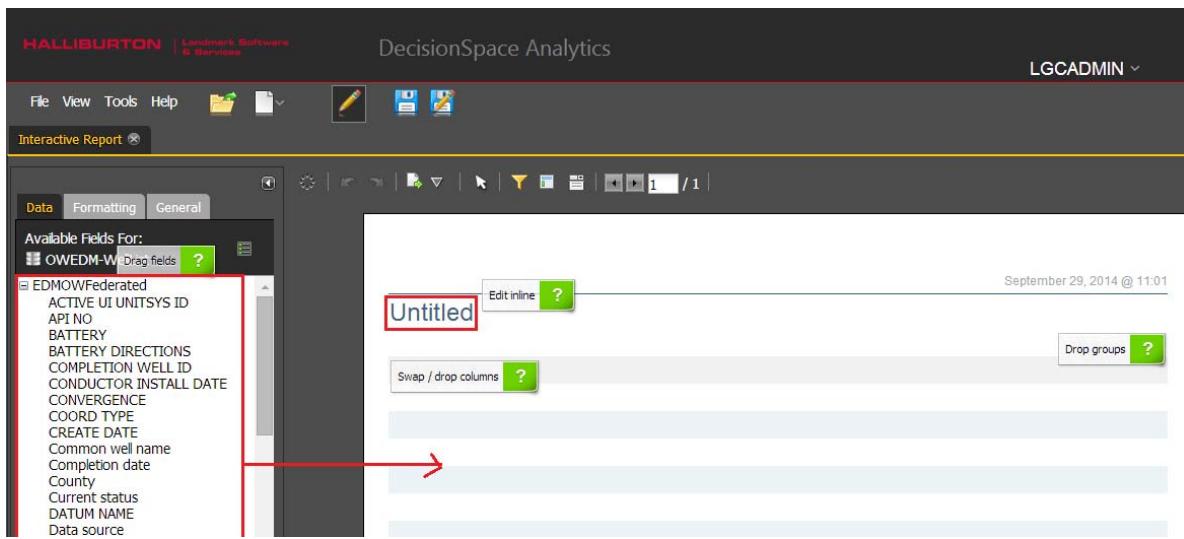
- a) Click **Create New > Interactive Report**.



- b) In the Select Data Source dialog box, select **OWEDM-WellList** and click **OK**. Then click **Get Started**.

The image contains two side-by-side screenshots. On the left is a 'Select Data Source' dialog box. It has a label 'Specify which data source you want to report on. This will determine which fields you will have available.' Below this is a 'Data Sources:' list containing 'BA Operations Mart - Content', 'BA Operations Mart - User Session', 'Human Resources', 'Inventory', 'OWEDM-WellList' (which is highlighted with a red box), and 'Orders'. There is a 'Select Data Source' button at the bottom. At the very bottom of the dialog are 'Ok' and 'Cancel' buttons, with 'Ok' also highlighted with a red box. On the right is a screenshot of the 'DecisionSpace Analytics Interactive Reporting' interface. It features a central preview area showing a report titled 'Report Name: All Wells In A' with a table of data. To the right of the preview are several features listed: 'Drag and Drop Report Creation', 'Sort Filter and Group Data', 'Inline Editing', 'Custom Report Templates', and 'Export as PDF, Excel, CSV or HTML'. At the bottom right of this interface is a 'Get Started' button, also highlighted with a red box.

#### 4. Design a report with table columns and title.



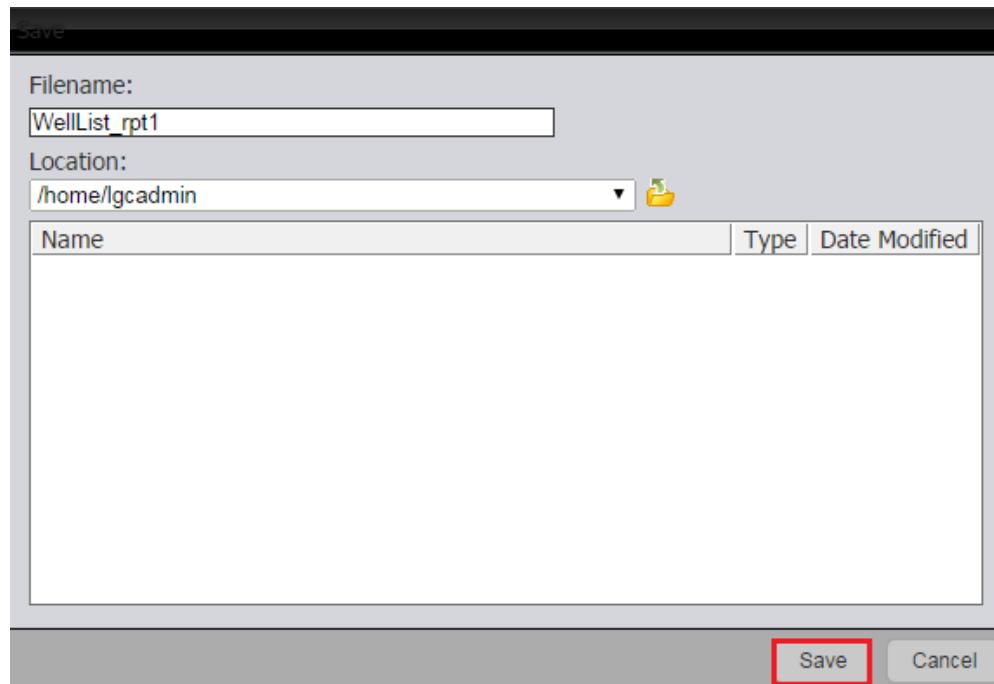
- Change the report title from **Untitled** to **Common Well List in EDM and OpenWorks**.
- Drag-and-drop any EDM and OpenWorks columns from **Available Fields** in the **Data** tab to the right pane.

The screenshot shows the same software interface after changes. The report title is now 'Common Well List in EDM and OpenWorks'. The main area displays a table with the following data:

| Well name | Total depth | X coordinate | Y coordinate |
|-----------|-------------|--------------|--------------|
| NPR-3     | 590         | 798525       | 959717       |
| NPR-3     | 2450        | 798867       | 968706       |
| NPR-3     | 2454        | 798458       | 960899       |
| NPR-3     | 2840        | 790157       | 971357       |
| NPR-3     | 5700        | 802980       | 955527       |
| NPR-3     | 6864        | 802788       | 953598       |

- Click the **Save** icon to save the report. Save it as **WellList\_rpt1** in **/home/lgcadmin** and click **Save**.

Continue with editing the **WellList\_rpt1** report.



- d) Add a group column by clicking the **Layout** icon to display Groups specification. From the **Available Fields For:** list, drag-and-drop **Current Status** to the **Groups** area.

**Note**

To remove a group, click and hold, then drag it to the recycle bin that pops up on the bottom-right of the window.

The screenshot shows the DecisionSpace Interactive Report interface. On the left, a sidebar lists "Available Fields For: OWEDM-W" including fields like Common well name, Completion date, County, Current status, DATUM NAME, Data source, Elev type, Elevation, Elevation ddsunit, FIELD NAME, FIELD NUMBER, Field, GEO DESCRIPTION, GEO LATITUDE, and GEO LONGITUDE. A red arrow points from the "Current status" field in the sidebar to the "Groups" section in the main report area.

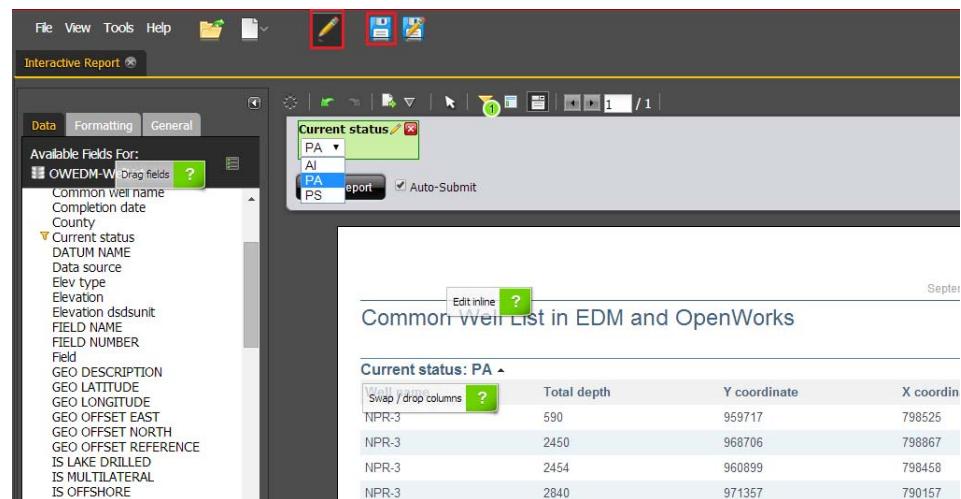
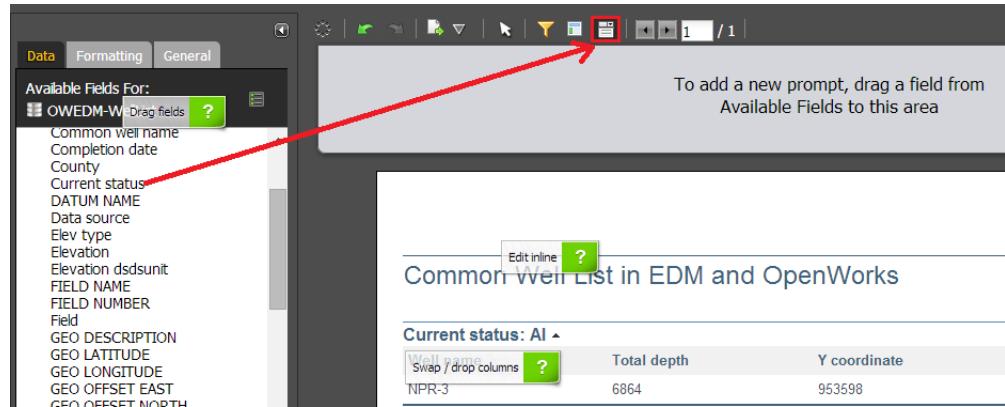
The main report area has tabs for "Data", "Formatting", and "General". Under "Data", the "Groups" section is set to "Current status". The "Columns" section includes "Well name", "Total depth", "Y coordinate", and "X coordinate". The report title is "Common Well List in EDM and OpenWorks" and the date is "September 29".

| Well name | Total depth | Y coordinate | X coordinate |
|-----------|-------------|--------------|--------------|
| NPR-3     | 590         | 959717       | 798525       |

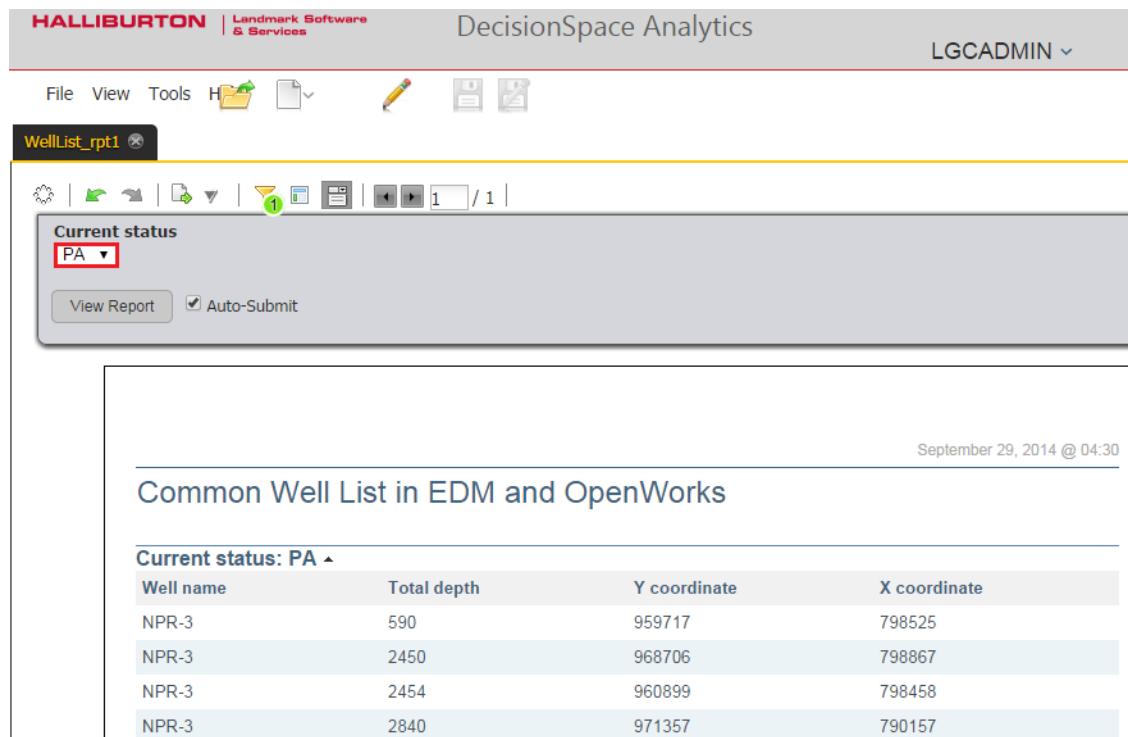
Below this, there are three sections for different current statuses:

- Current status: AI**: Shows one row for NPR-3 with Total depth 6864, Y coordinate 953598, and X coordinate 802788.
- Current status: PA**: Shows four rows for NPR-3 with Total depths 590, 2450, 2454, and 2840, and coordinates 959717, 968706, 960899, and 971357 respectively.
- Current status: PS**: Shows one row for NPR-3 with Total depth 5700, Y coordinate 955527, and X coordinate 802980.

- e) Add a prompt parameter. Click the **Prompts** icon, and then drag-and-drop the **Current status** column to the **Prompts** area.



- f) Click the **Save**  icon to save the report.
- g) Turn off editing by clicking the **Edit Content**  icon to show a complete report view.

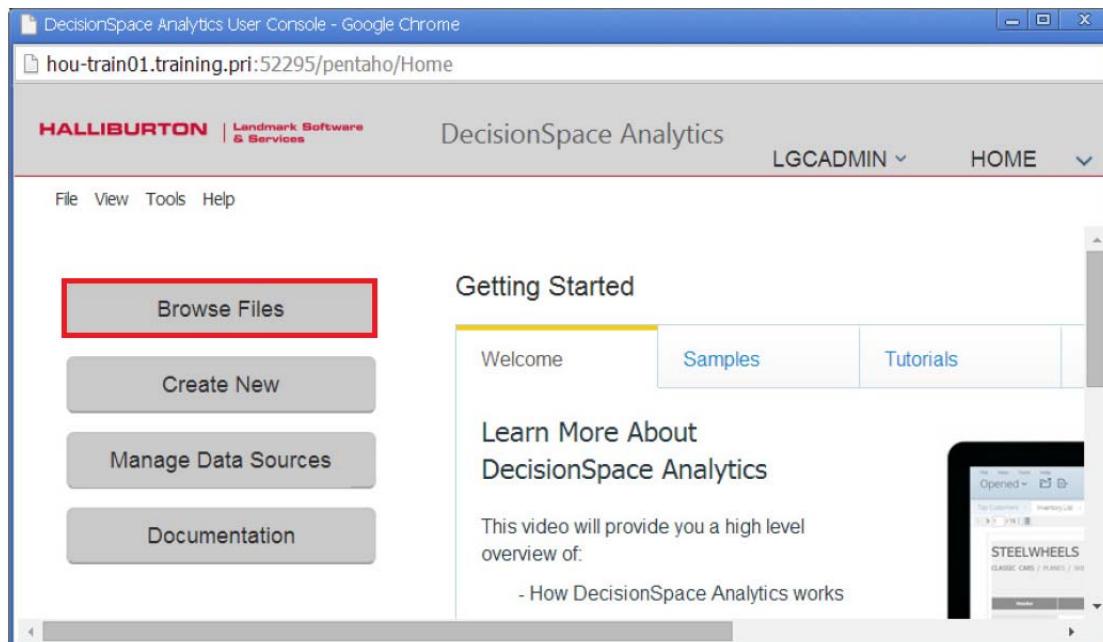


The screenshot shows the DecisionSpace Analytics interface. At the top, there's a header with the HALLIBURTON logo, Landmark Software & Services, and the title "DecisionSpace Analytics". A dropdown menu shows "LGCADMIN". Below the header is a toolbar with various icons for file operations like Open, Save, Print, and Edit. A sub-menu bar for "WellList\_rpt1" is visible. On the left, a sidebar displays "Current status: PA" with a dropdown arrow, and buttons for "View Report" and "Auto-Submit". The main content area is titled "Common Well List in EDM and OpenWorks" and contains a timestamp "September 29, 2014 @ 04:30". Below the title is a table with the following data:

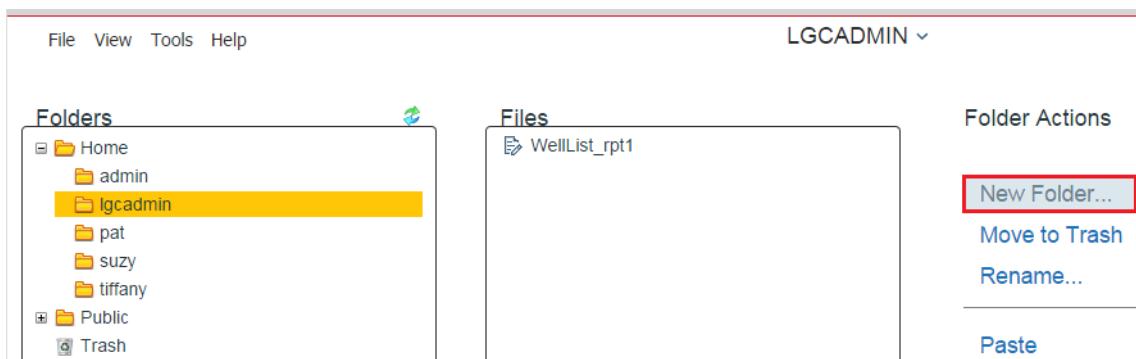
| Well name | Total depth | Y coordinate | X coordinate |
|-----------|-------------|--------------|--------------|
| NPR-3     | 590         | 959717       | 798525       |
| NPR-3     | 2450        | 968706       | 798867       |
| NPR-3     | 2454        | 960899       | 798458       |
| NPR-3     | 2840        | 971357       | 790157       |

## 5. Schedule the report to be run at a future time.

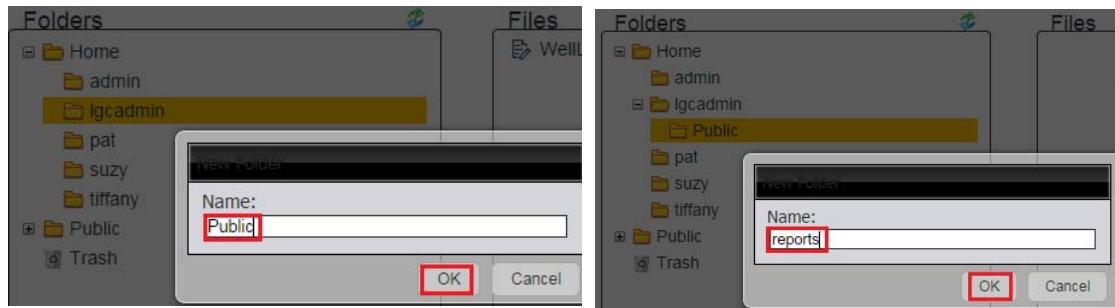
- a) Close the **WellList\_rpt1** tab. Back in the main window, click **Browse Files** to find the report in the BA repository.



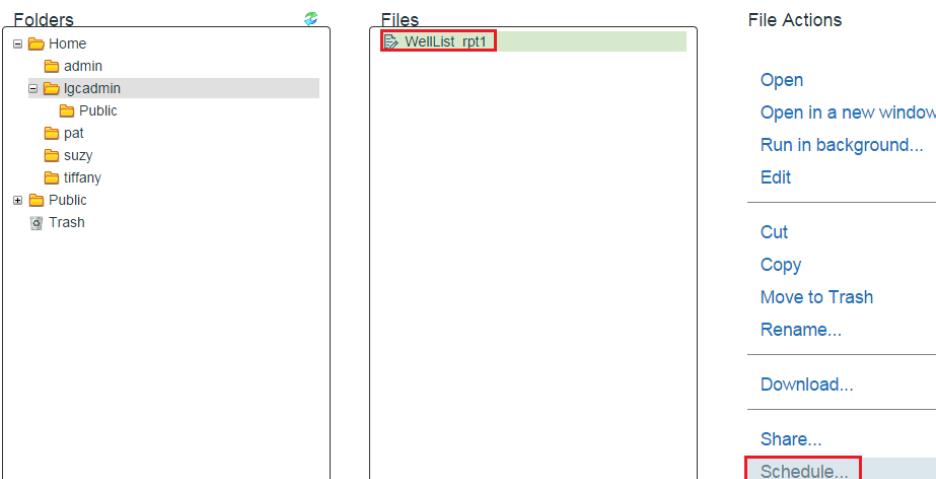
- b) Create new folders (**/Home/lgcadmin/Public/reports**) to store the reports. Make sure to highlight the parent folder first before clicking **New Folder...** to create a child folder.



- c) Create new folders: /Home/lgcadmin/Public and Home/lgcadmin/Public/reports.



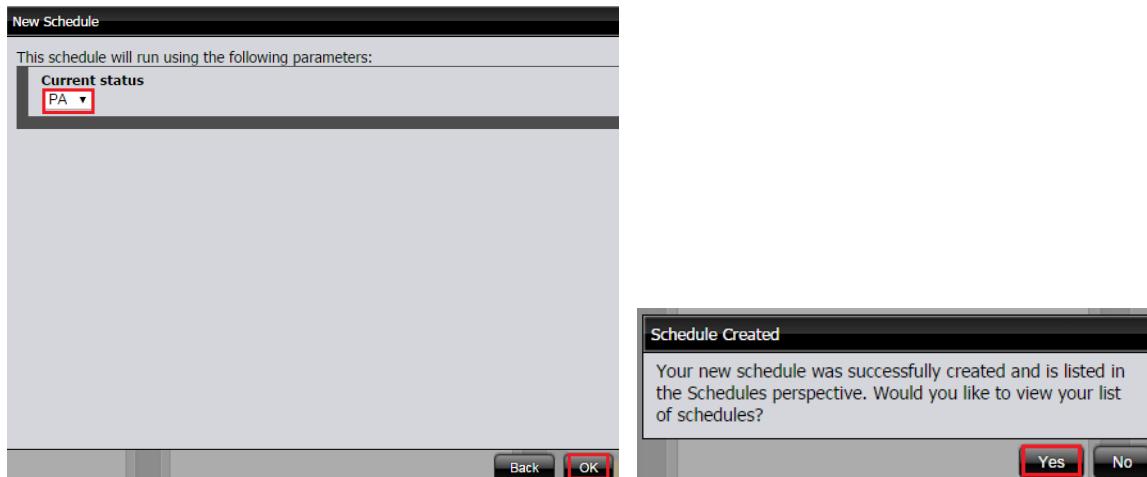
- d) Click WellList\_rpt1 then click Schedule.



- e) In the New Schedule dialog box, enter:  
**Schedule Name: WellList\_rpt1\_Schedule1**,  
Generated Content Location: **/home/lgcadmin/Public/reports**,  
and click **Next**. Enter future date and time, and then click **Next**.



- f) Set the **Current Status** to **PA** and click **OK**.



- g) Use the Manage Schedules window to view and edit report schedules, and also run the report.
- h) To run the report now, select **WellList\_rpt1\_Schedule** report and click  to execute.

**Manage Schedules**

| Schedule Name          | Repeats                      | Source File                                            | Output Location         | Last Run             | Next Run             | Created By     | Status |
|------------------------|------------------------------|--------------------------------------------------------|-------------------------|----------------------|----------------------|----------------|--------|
| PentahoSystemVersion   | Every day at 14:59:19        | PentahoSystemVersionCheck                              | -                       | 2014 Sep 29 14:59:19 | 2014 Sep 30 14:59:19 | system session | NORMAL |
| UpdateAuditData        | Every 30 minutes at 18:09:03 | /public/pentaho-operations-mart/update_audit_mart_data | /home/admin             | 2014 Sep 29 17:09:03 | 2014 Sep 29 17:39:03 | admin          | NORMAL |
| WellList_rpt1_Schedule | Run Once                     | /home/lcadmin/WellList_rpt1                            | /home/lcadmin/Public/re | -                    | 2014 Sep 30 07:00:00 | lcadmin        | NORMAL |

**Blockout Times**

No blockout times for scheduling have been created.

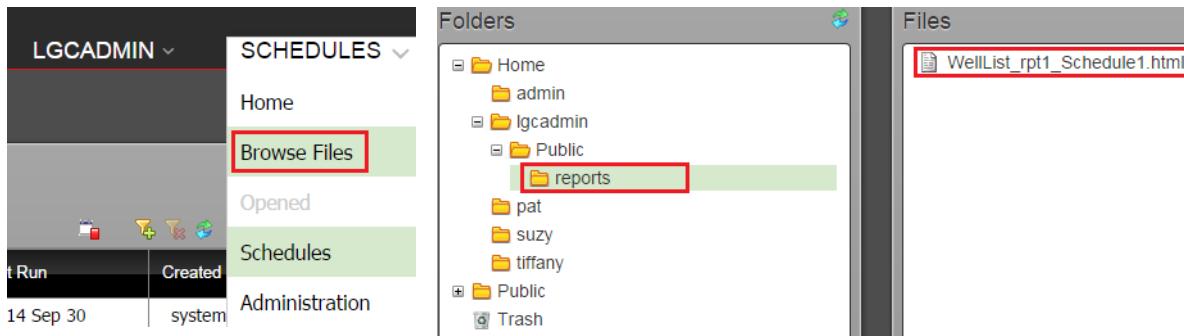
**Create Blockout Time**

**Execute Now**

Your file is being processed and will be in the selected location once it has completed.

**OK**

- i) Go to **SCHEDULES > Browse Files** and find the report output file in **/Home/lgcadmin/Public/reports**.



## ***Creating Analytic Reports***

The Analyzer tool is used for creating ROLAP-based reports and charts to visualize data trends and reveal useful information about the business.

The general workflow to create an analytical report involves:

- Creating Fact and Dimension tables in the target data source.
- Defining an OLAP cube to associate the facts with dimensions.
- Populating the Fact tables, using ETL (Spoon) if necessary.
- Defining Analytical Reports based on the OLAP cube definition.

To help design the most effective report, consider the following questions:

- What needs to be analyzed?
- What metrics (facts and measures) are needed?
- What criteria (dimensions) should be used for analysis?

---

## Exercise 4: Create a Simple OLAP Cube from a Data Source

---

### ***Purpose of the Exercise***

Create a simple cube using three EDM OLAP tables. This cube will be used later.

### ***Outcome of the Exercise***

Know how to create a cube model in Analytics.

### ***Workflows***

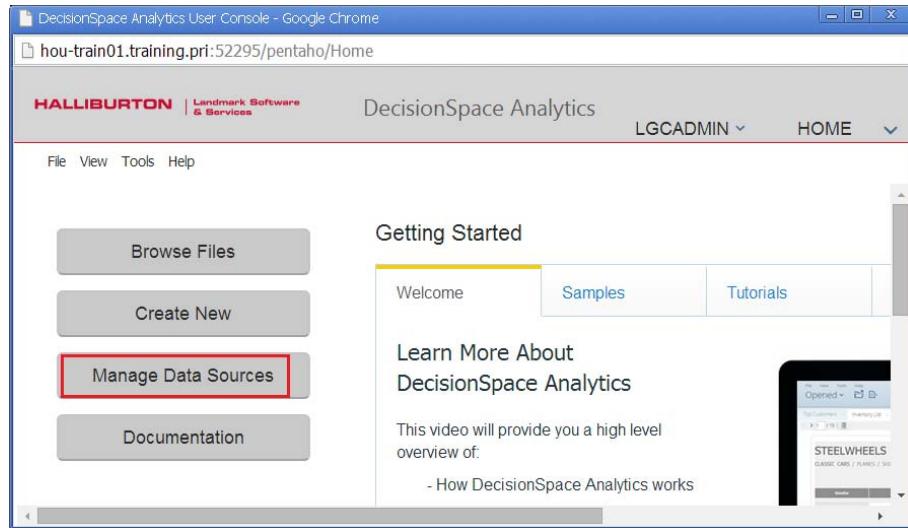
Create a data source named EDM\_O LAP\_TB. The JDBC Connection (EDM\_O LAP) to the external data source was created earlier in “Exercise 2: Create JDBC Connections to Data Sources” on page 6-31.

Create an OLAP model from the data source by defining tables and joins.

#### **1. Create a Data Source.**

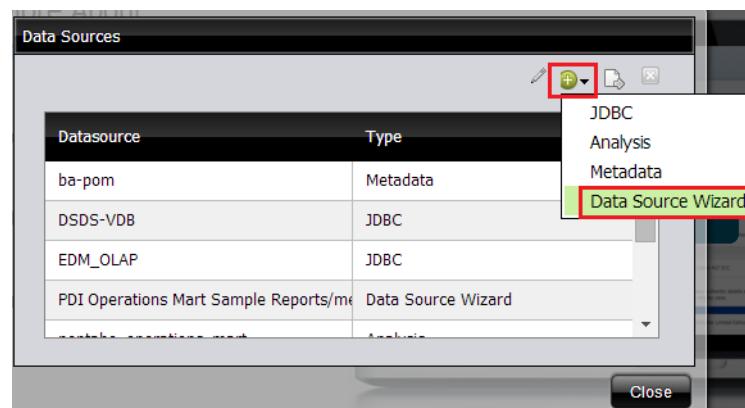
- a) From the Analytics Console main window, click **Manage Data Sources**.

- b) In the Data Sources dialog box, click the **Add** icon  and select **Data Source Wizard**.

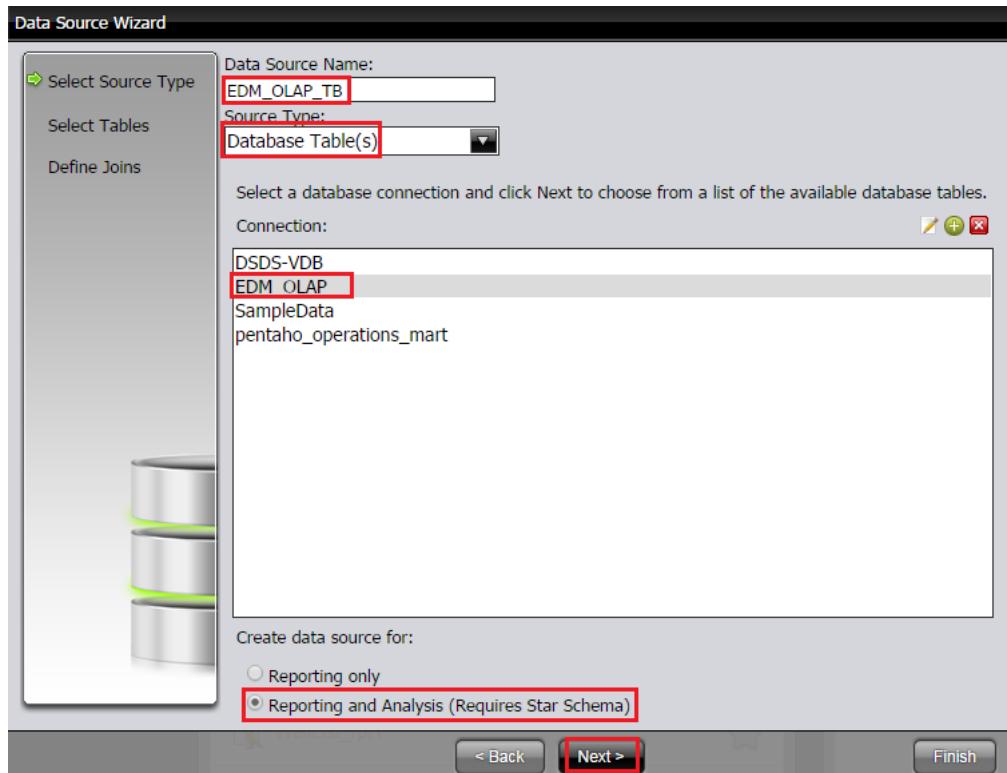


- c) In the Data Source Wizard dialog box, enter/select the following parameters:

- Data Source Name: **EDM\_O LAP\_TB**
- Source Type: **Database Table(s)**
- Connection: **EDM\_O LAP**



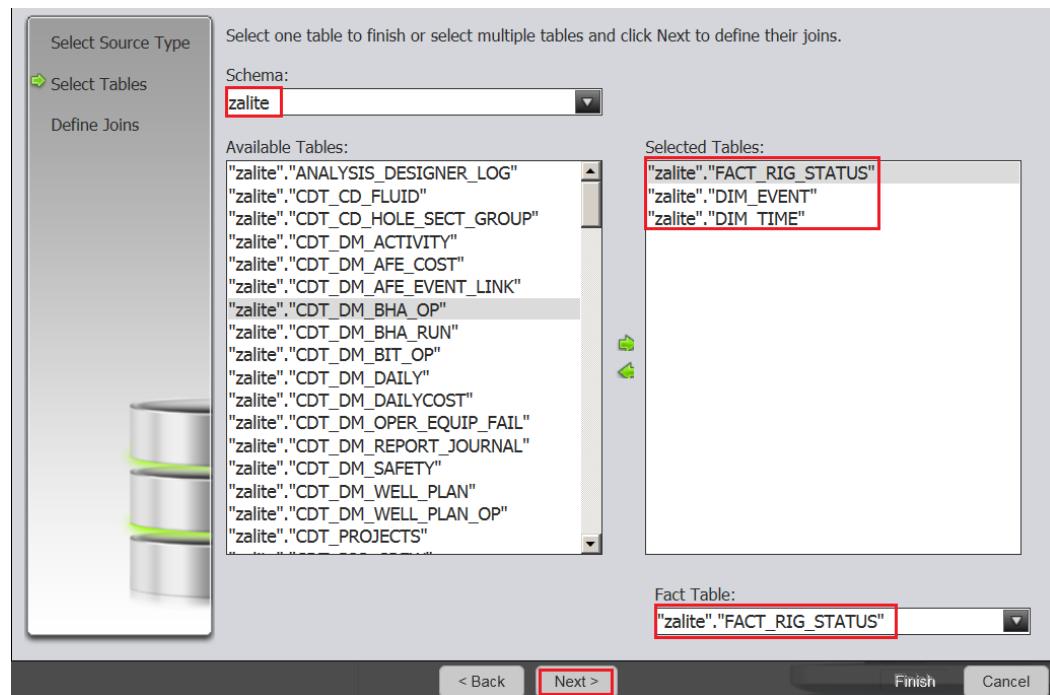
- d) Select **Reporting and Analysis (Requires Star Schema)**, and then click **Next**.



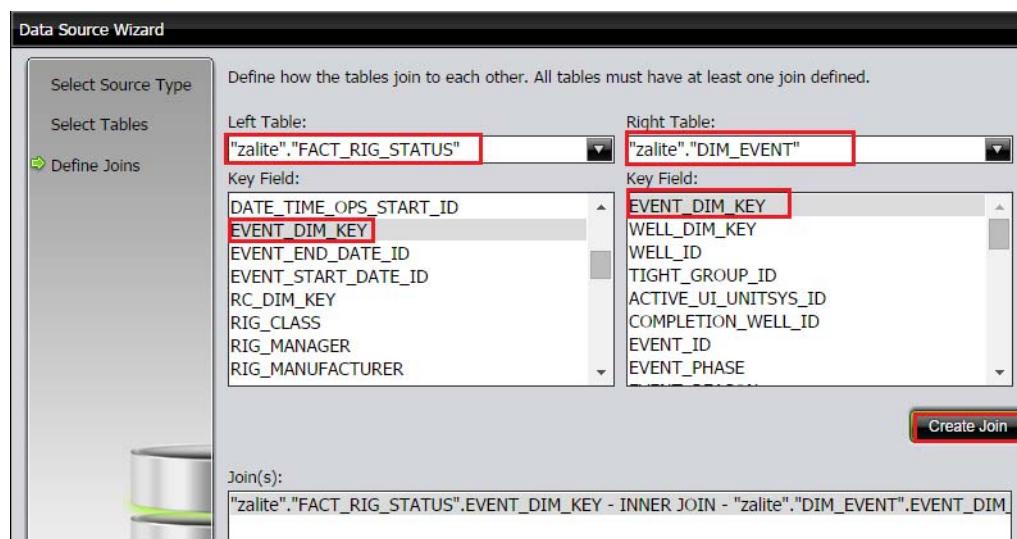
## 2. Choose tables and define conditions for the Data Source.

- In the **Schema** drop-down list, select **zalite**.
- Select tables (**FACT\_RIG\_STATUS**, **DIM\_EVENT**, **DIM\_TIME**) from the **Available Tables**, and move them to the **Selected Tables** list using icon.
- In the **Fact Table:** drop-down list, select **FACT\_RIG\_STATUS**.

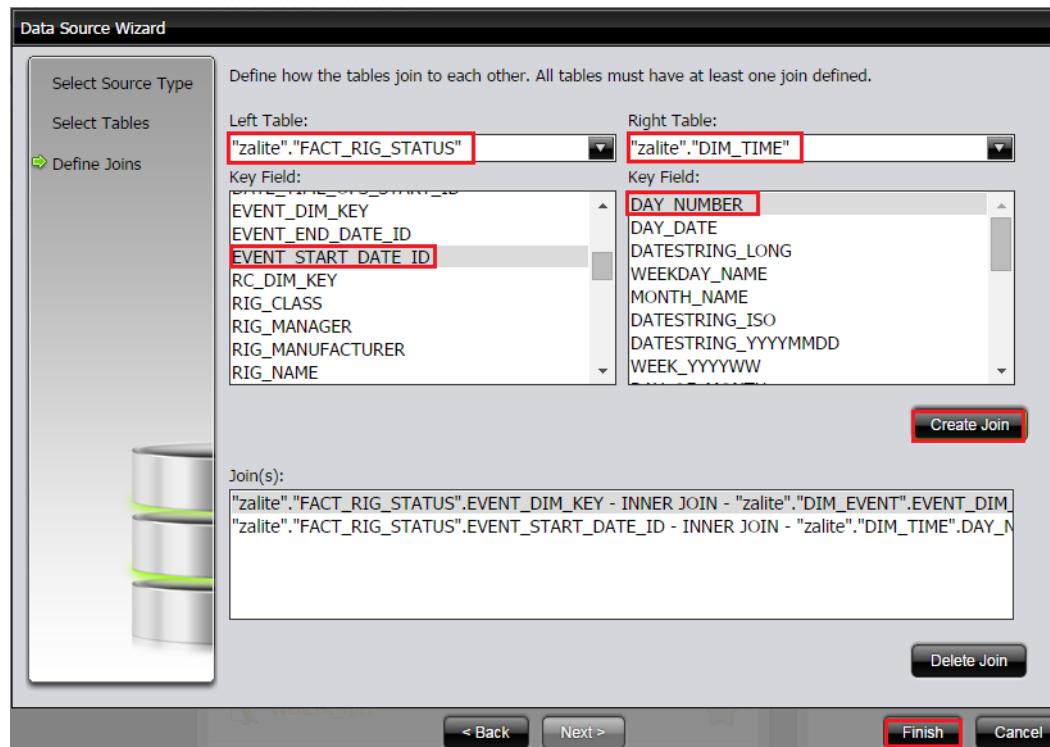
- Click **Next** to define joins between the tables.



- Create a join between **FACT\_RIG\_STATUS** and **DIM\_EVENT** tables based on **EVENT\_DIM\_KEY** columns.
- Select **EVENT\_DIM\_KEY** from both tables and then click **Create Join**.

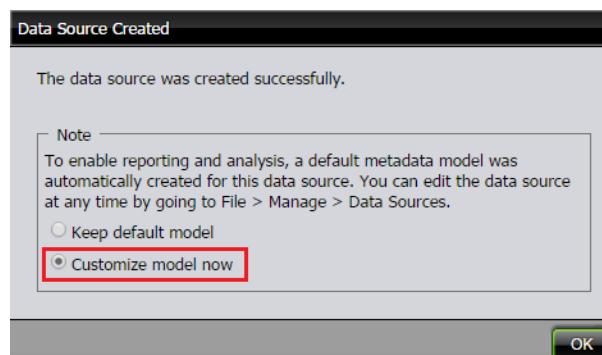


- Create another join between **FACT\_RIG\_STATUS'EVENT\_START\_DATE\_ID** and **DIM\_TIM'DAY\_NUMBER**, and then click **Finish**.



### 3. Customize the model for reporting.

- a) Click **Customize Model Now** and click **OK** to display the Data Source Model Editor dialog box.

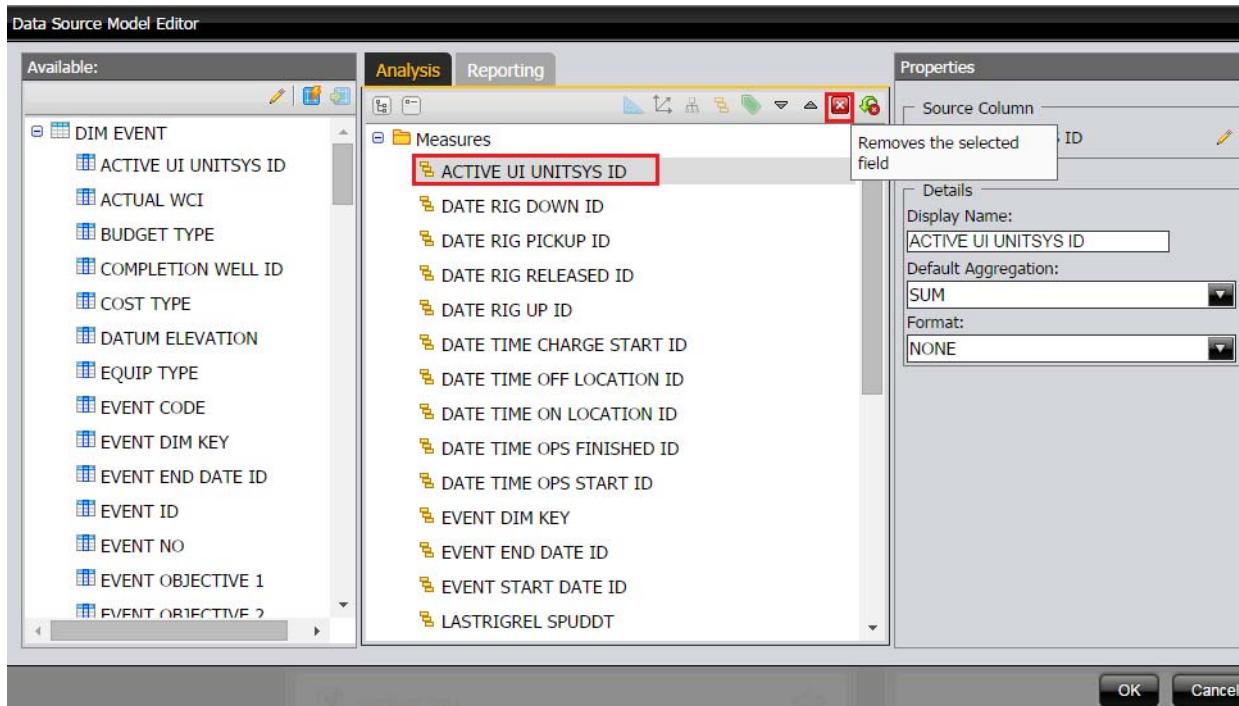


- b) In the Data Source Model Editor dialog box:

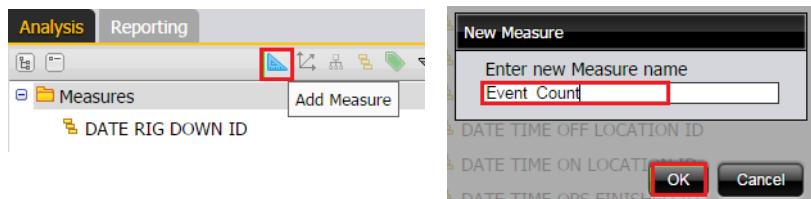
- **Delete a measure:**

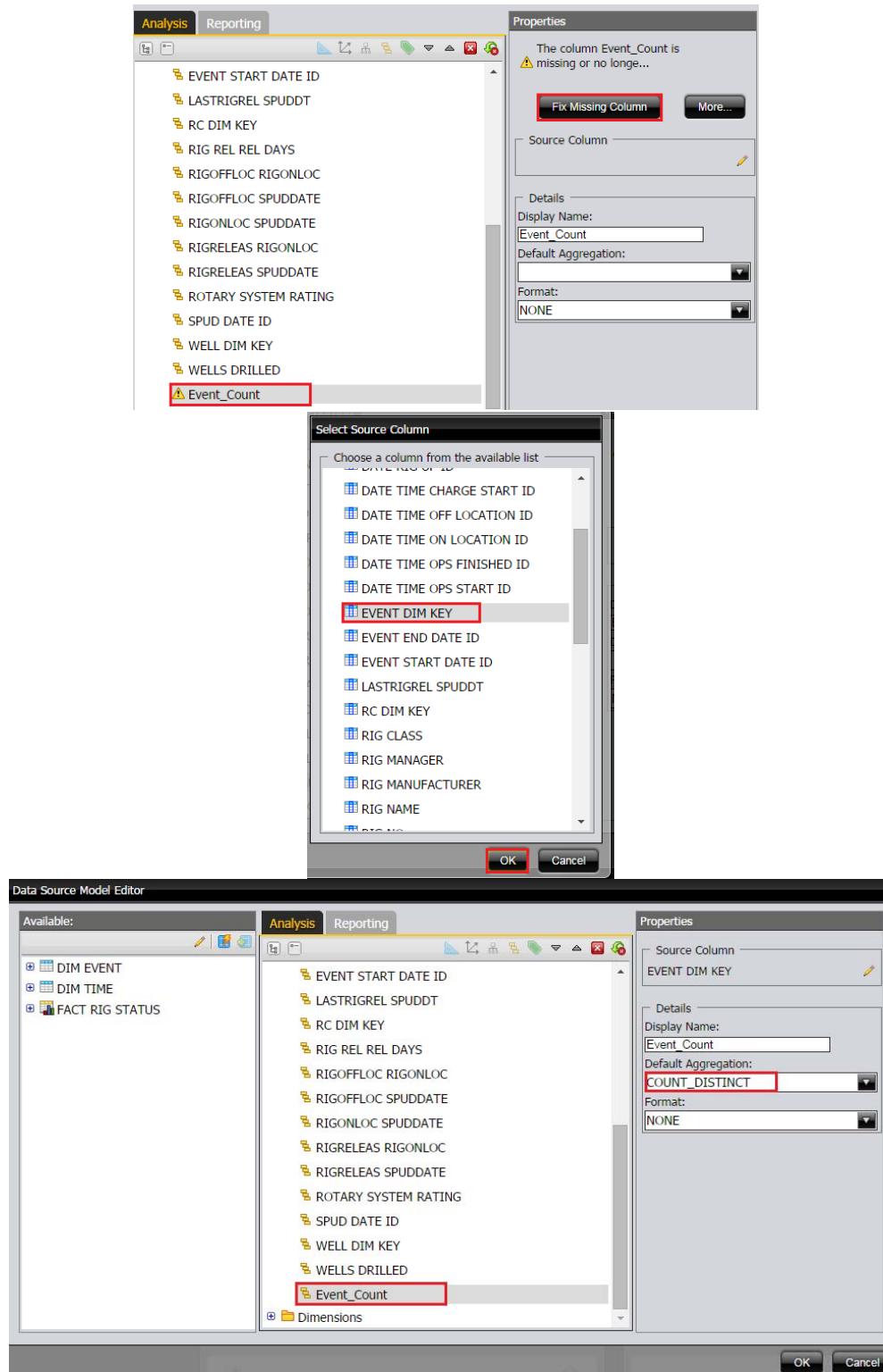
- Expand **Measures** in the **Analysis** tab.

- Click **ACTIVE UI UNITSYS ID** and click  to delete the measure.

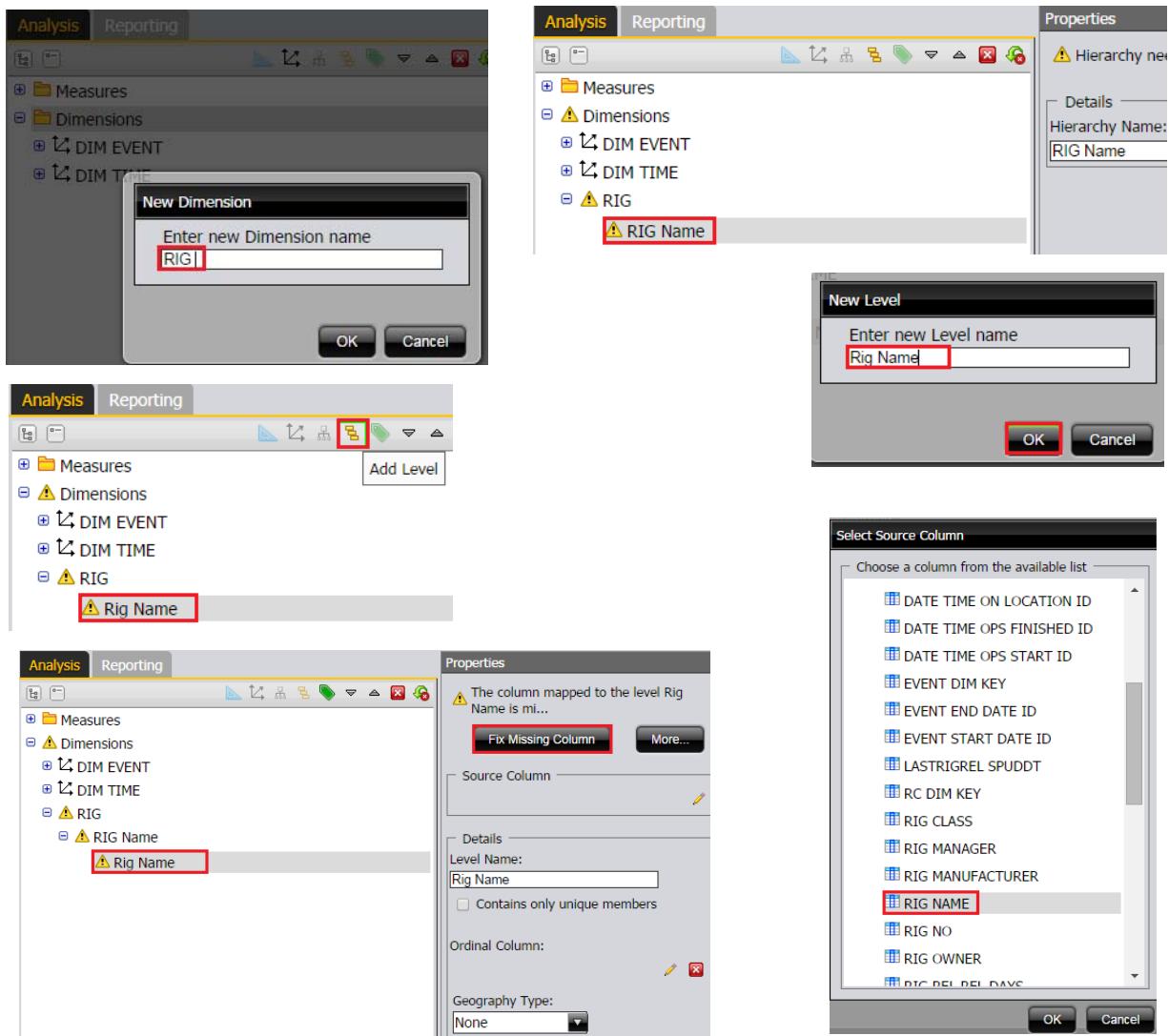


- **Add a measure:**
  - Click the **Measures** folder in the **Analysis** tab, and then click the **Add Measure**  icon.
  - Enter measure name: **Event\_Count** and click **OK**.
  - Click **Event\_Count** under the **Measures** folder to display missing columns.
  - Click **Fix Missing Column** and select **EVENT\_DIM\_KEY** from the available columns.
  - In the **Default Aggregation** drop-down list, select **COUNT\_DISTINCT**.

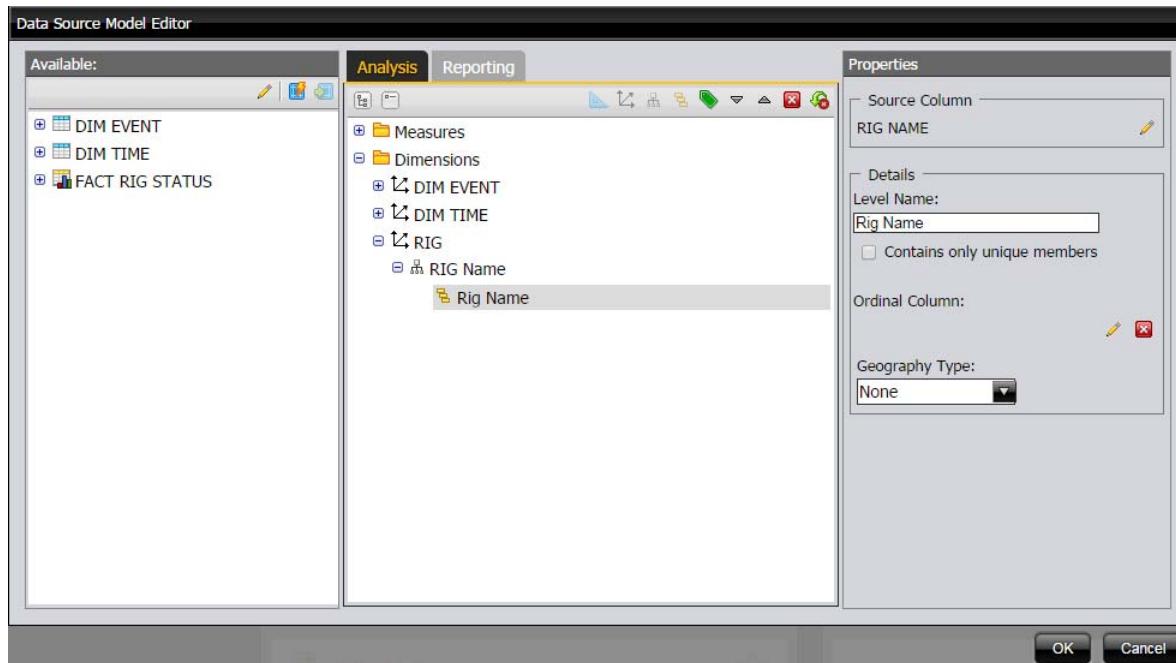




- **Add a new dimension**
  - Click the **Dimensions** folder in the **Analysis** tab and then click the **Add Dimension**  icon. Enter dimension name: **RIG**.
  - Click the RIG hierarchy and change the name to **RIG Name** in the **Hierarchy Name** box.
  - Click the **Add Level**  icon and enter level name **Rig Name**.
  - Click the **Fix Missing Column** and select **FACT RIG STATUS > RIG NAME**.



- c) Click **OK** to save the model. Then click **Close** to return to the main window.



| Data Sources |                    |
|--------------|--------------------|
| Datasource   | Type               |
| DSDS-VDB     | JDBC               |
| EDM_OLAP     | JDBC               |
| EDM_OLAP_TB  | Data Source Wizard |
| EDM_TB       | Analysis           |

A data source named **EDM\_OLAP\_TB** has been created. This data source contains a customized OLAP model.

## Exercise 5: Create Analysis Reports from an OLAP Model

### **Purpose of the Exercise**

Create analysis reports using the data cube created in “Exercise 4: Create a Simple OLAP Cube from a Data Source” on page 6-51.

### **Outcome of the Exercise**

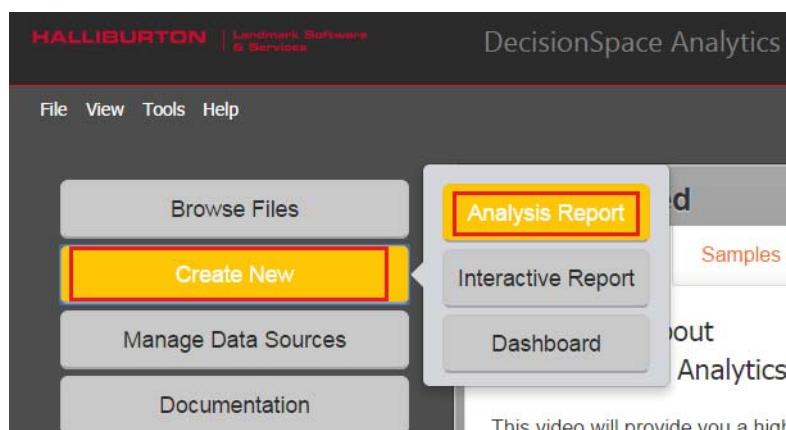
Know how to create a working analysis report that has drill down on the dimensions of the hierarchy.

### **Exercise Workflows**

Create an analysis report with the EDM\_OLAP\_TB data source.

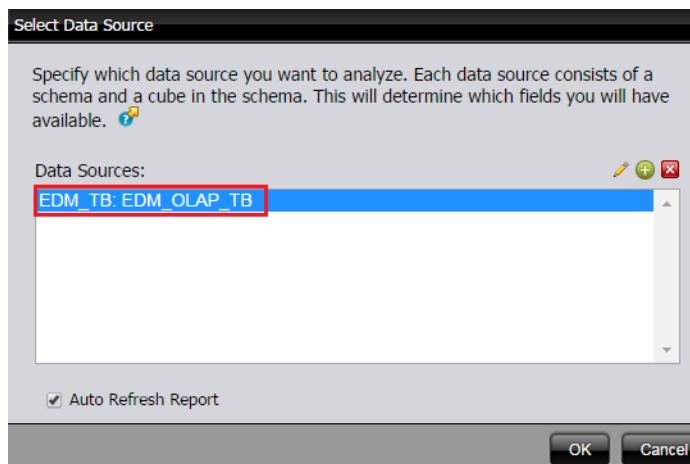
#### **1. Create a new Analysis Report.**

- In the DS Analytics Console, select **Create New > Analysis Report** to display Select Data Source dialog box.



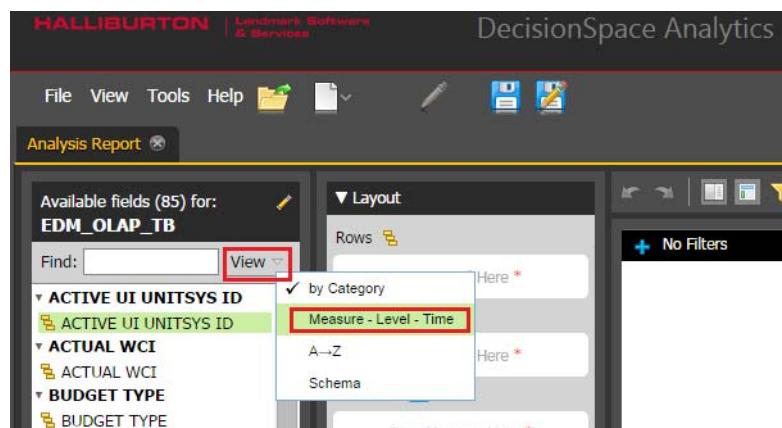
## 2. Select a data source.

- a) In the Select Data Source dialog box, select **EDM\_TB:EDM OLAP\_TB** and click **OK**.

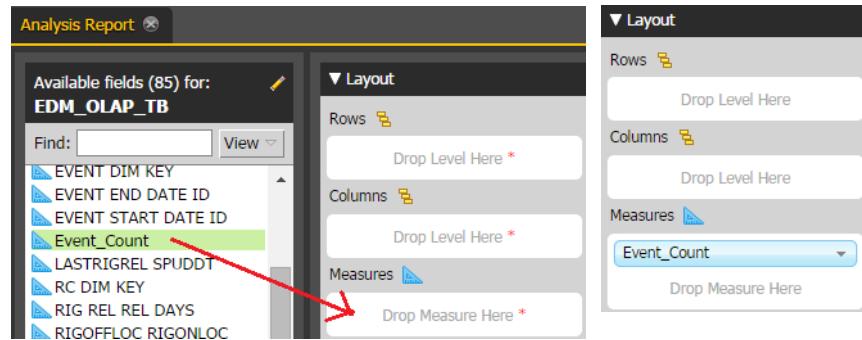


## 3. Design the report in the Analysis Report tab.

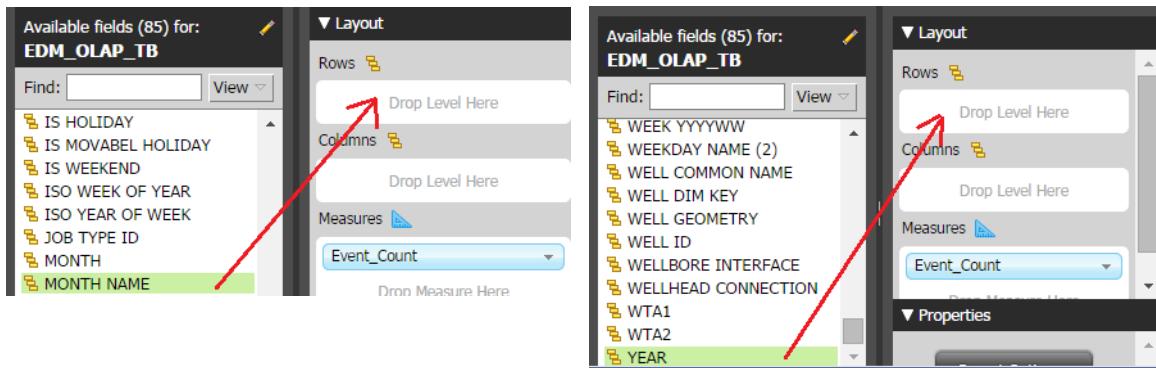
- a) Select **View > Measure - Level - Time**.



- b) Click and drag the measure Event\_Count from model and drop it in the **Layout > Measures** area.



- c) Click and drag the Levels YEAR and MONTH NAME from the model, and drop them into the **Layout > Rows** area one at a time.



- d) Click and drag the Level **EVENT TYPE** and drop it into the **Layout > Columns** area.

The screenshot shows the Analysis Report interface. On the left, the 'Available fields (85) for: EDM\_OLAP\_TB' panel lists various dimensions and measures. The 'EVENT TYPE' dimension is highlighted with a green background. A red arrow points from this highlighted field to the 'Columns' section of the 'Layout' panel on the right. The 'Layout' panel also shows 'MONTH NAME' and 'YEAR' in the 'Rows' section. Below the layout panels is the main report area, which displays a table with columns: MONTH\_NAME, YEAR, EVENT\_TYPE, COMPLETION, ORIG\_COMPLETION, ORIG\_DRILLING, PLAN\_2\_DRILL, and Event\_Count. The data in the table is as follows:

| MONTH_NAME | YEAR | EVENT_TYPE | COMPLETION | ORIG_COMPLETION | ORIG_DRILLING | PLAN_2_DRILL | Event_Count |
|------------|------|------------|------------|-----------------|---------------|--------------|-------------|
| April      | 1996 |            | -          | -               | 1             | -            |             |
| August     | 1997 |            | -          | -               | 1             | -            |             |
| December   | 1996 |            | 1          | -               | -             | 1            |             |
|            | 1997 |            | -          | -               | -             | -            |             |
| February   | 1996 |            | -          | -               | 1             | -            |             |
|            | 1997 |            | -          | -               | 1             | -            |             |
| January    | 1998 |            | -          | 1               | -             | -            |             |
| July       | 1997 |            | 1          | -               | 2             | -            |             |
|            | 1996 |            | -          | -               | 1             | -            |             |

#### 4. Edit the report.

- a) Right-click the **Dimensions** elements and select **Edit**. Change the names for display from **EVENT TYPE** to **JOB TYPE** and from **MONTH NAME** to **MONTH**.

The screenshot shows the 'Edit...' dialog for the 'MONTH\_NAME' dimension. The 'Name:' field is set to 'MONTH'. The 'Plural Name used in this report:' field is empty. Below the dialog, the 'Layout' panel shows 'YEAR' and 'MONTH\_NAME' in the 'Rows' section, with 'MONTH\_NAME' highlighted and a red box around the 'Edit...' button. The 'Columns' section contains 'EVENT\_TYPE'.

The screenshot shows the DecisionSpace interface. On the left, the 'Layout' panel displays dimensions: 'YEAR' and 'MONTH' under 'Rows', and 'JOB TYPE' under 'Columns'. Measures are listed as 'Event\_Count'. On the right, a data grid titled 'No Filters' shows data for 'JOB TYPE' (COMPLETION, ORIG COMPLETION, ORIG DRILLING) across years 1995 and 1996, months November through August, and various job types.

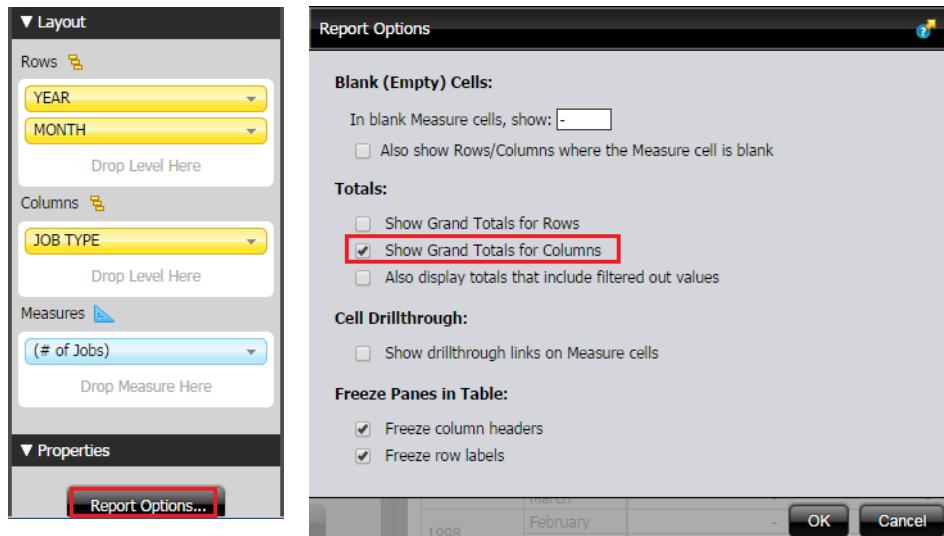
| YEAR   | MONTH     | JOB TYPE   |                 |               |
|--------|-----------|------------|-----------------|---------------|
|        |           | COMPLETION | ORIG COMPLETION | ORIG DRILLING |
| 1995   | November  | -          | 1               | -             |
|        | September | -          | -               | 1             |
|        | April     | -          | -               | 1             |
|        | December  | 1          | -               | -             |
|        | February  | -          | -               | 1             |
|        | June      | -          | -               | 1             |
|        | March     | -          | 1               | -             |
|        | November  | -          | -               | 2             |
|        | September | -          | -               | 1             |
|        | April     | -          | -               | -             |
| August | -         | -          | 1               |               |

- b) Right-click the **Measures** element **Event\_Count** and select **Column Name and Format**. Change the name for display from **EVENT\_COUNT** to **(# of Jobs)**.

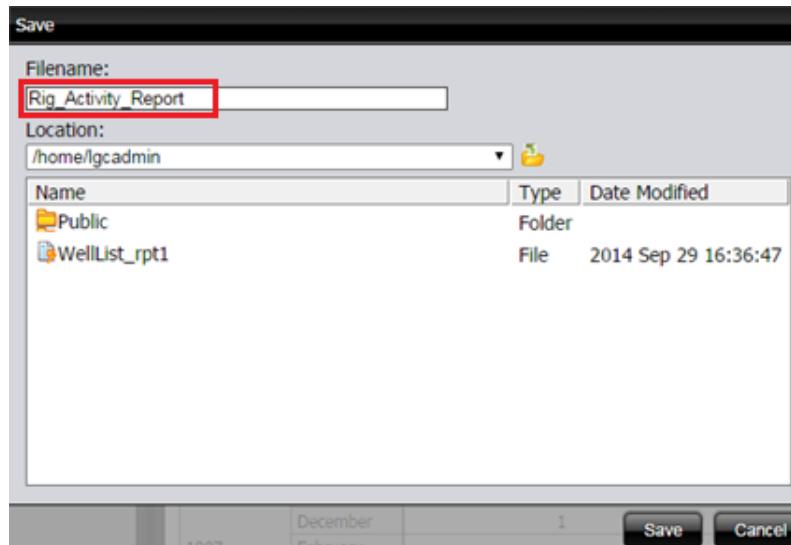
The screenshot shows the 'Edit Column' dialog. It has fields for 'Name' (# of Jobs), 'Original Name' (Event\_Count), 'Format' (Default), and 'MDX Format Expression'. The 'OK' button is highlighted with a red box. The background shows the same report layout as the previous screenshot.

- c) Right-click the **Columns** dimension **JOB TYPE** and select **Sort by Z->A**.

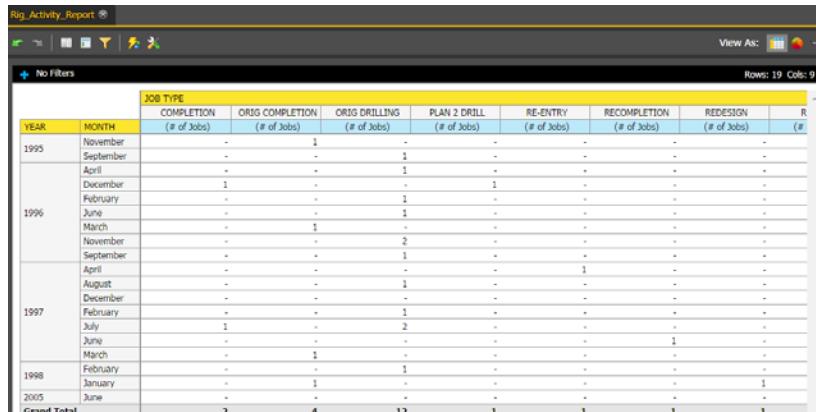
- d) Click the **Report Options...** to enable the option **Show Grand Totals for Columns**.



- e) Click **OK**. Then click the **Save** icon.
- f) Name the report **Rig\_Activity\_Report**. Click **Save**.

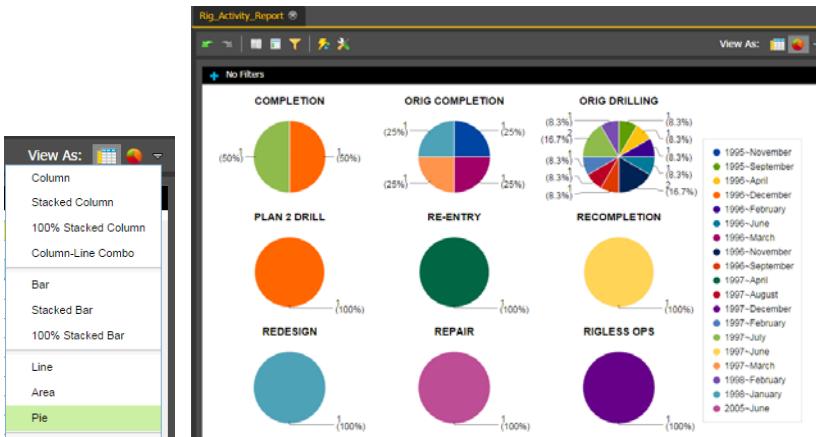


- g) To get a better view of the report, hide the available columns list and the layout. Click the  and  icons.



| YEAR                | MONTH     | JOB TYPE                  |                                |                              |                             |                         |                             |                         | R        |
|---------------------|-----------|---------------------------|--------------------------------|------------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|----------|
|                     |           | COMPLETION<br>(# of Jobs) | ORIG COMPLETION<br>(# of Jobs) | ORIG DRILLING<br>(# of Jobs) | PLAN 2 DRILL<br>(# of Jobs) | RE-ENTRY<br>(# of Jobs) | RECOMPLETION<br>(# of Jobs) | REDESIGN<br>(# of Jobs) |          |
| 1995                | November  | -                         | -                              | 1                            | -                           | -                       | -                           | -                       | -        |
|                     | September | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -        |
|                     | April     | -                         | -                              | -                            | -                           | 1                       | -                           | -                       | -        |
|                     | December  | 1                         | -                              | -                            | -                           | 1                       | -                           | -                       | -        |
|                     | February  | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -        |
|                     | June      | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -        |
|                     | March     | -                         | -                              | 1                            | -                           | -                       | -                           | -                       | -        |
|                     | November  | -                         | -                              | -                            | 2                           | -                       | -                           | -                       | -        |
|                     | September | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -        |
|                     | April     | -                         | -                              | -                            | -                           | -                       | 1                           | -                       | -        |
|                     | August    | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -        |
|                     | December  | -                         | -                              | -                            | -                           | -                       | -                           | -                       | -        |
|                     | February  | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -        |
|                     | July      | 1                         | -                              | -                            | 2                           | -                       | -                           | -                       | -        |
|                     | June      | -                         | -                              | -                            | -                           | -                       | -                           | 1                       | -        |
|                     | March     | -                         | -                              | 1                            | -                           | -                       | -                           | -                       | -        |
|                     | February  | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -        |
|                     | January   | -                         | 1                              | -                            | -                           | -                       | -                           | -                       | 1        |
| 2005                | June      | -                         | -                              | -                            | -                           | -                       | -                           | -                       | -        |
| <b>Grand Total:</b> |           | <b>3</b>                  | <b>4</b>                       | <b>12</b>                    | <b>1</b>                    | <b>1</b>                | <b>1</b>                    | <b>1</b>                | <b>1</b> |

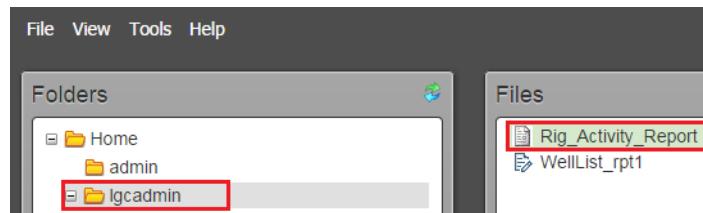
- h) View the report in different formats: Pie, Bar, etc. Click **Choose Another Chart Type** arrow  and select **Pie**. Close the **Report** tab.



## 5. Change the report dimensions to Rig Name.

### Find the Rig\_Activity\_Report:

- From the DS Analytics Console main window, click **Browse Files**. Select **Igcadmin** folder, then double-click the **Rig\_Activity\_Report** in the **Files** list.



### Begin editing:

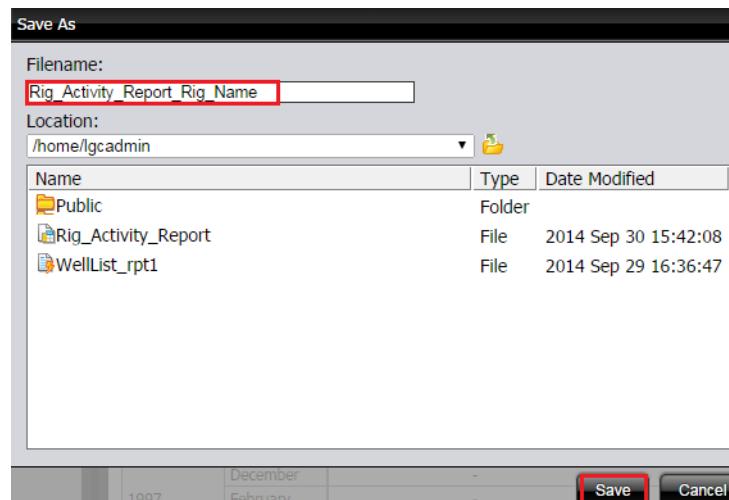
- Set the window layout for editing by clicking and icons.
- Right-click the **Columns** dimension **JOB TYPE**, and select **Remove from Report**.

| YEAR | MONTH     | JOB TYPE | COMPLETION | (# of Jobs) |
|------|-----------|----------|------------|-------------|
| 1995 | November  |          | -          |             |
|      | September |          | -          |             |
|      | April     |          | -          |             |
|      | December  |          | 1          |             |
|      | February  |          | -          |             |
|      | June      |          | -          |             |
|      | March     |          | -          |             |
|      | November  |          | -          |             |

- d) Drag-and-drop Level **Rig Name** to the **Columns** area.

The screenshot shows the 'Available fields (85) for EDM\_OLAP\_TB' interface. On the left, there's a tree view of fields under 'EDM\_OLAP\_TB'. One node, 'Rig Name', is highlighted with a green background. A red arrow points from this highlighted node to the 'Drop Level Here' button in the 'Columns' section of the right-hand 'Layout' panel. The 'Layout' panel also includes sections for 'Rows' (with 'YEAR' and 'MONTH' selected), 'Measures' (with '(# of Jobs)' selected), and 'Drop Measure Here'.

- e) Click the **Save As** icon, and enter a new report name: **Rig\_Activity\_Report\_Rig\_Name**.



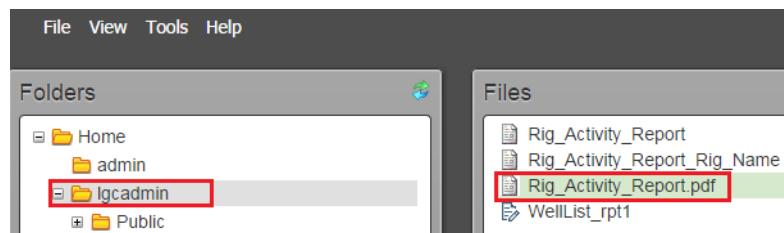
## 6. Schedule the tabular analysis report to run:

- From the main window, click **Browse File**. Select the report file **Rig\_Activity\_Report** and then click **Schedule...**
- Enter schedule name **Rig\_Activity\_Report** and click **Next**.
- Ignore scheduling and click **Next**.
- Select **PDF** file for output. Click **OK**.

Manage Schedules

| Schedule Name              | Repeats                      | Source File                                            | Output Location | Last Run             | Next Run             | Created By     | Status |
|----------------------------|------------------------------|--------------------------------------------------------|-----------------|----------------------|----------------------|----------------|--------|
| PentahoSystemVersionCheck  | Every day at 11:36:07        | PentahoSystemVersionCheck                              | -               | 2014 Sep 30 11:36:07 | 2014 Oct 1 11:36:07  | system session | NORMAL |
| UpdateAuditData            | Every 30 minutes at 18:09:03 | /public/pentaho-operations-mart/update_audit_mart_data | /home/admin     | 2014 Sep 30 16:09:03 | 2014 Sep 30 16:39:03 | admin          | NORMAL |
| <b>Rig_Activity_Report</b> | Run Once                     | /home/lgcadmin/Rig_Activity_Report                     | /home/lgcadmin  | -                    | 2014 Sep 30 01:00:00 | lgcadmin       | NORMAL |

- Run the report now. Click the **Execute Now**  icon and find the output file in the **/Home/lgcadmin** folder:



- Double-click the file name (**Rig\_Activity\_Report.pdf**) to open the report.

### Rig\_Activity\_Report

|             |           | JOB TYPE                  |                                |                              |                             |                         |                             |                         |                       |
|-------------|-----------|---------------------------|--------------------------------|------------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|-----------------------|
| YEAR        | MONTH     | COMPLETION<br>(# of Jobs) | ORIG COMPLETION<br>(# of Jobs) | ORIG DRILLING<br>(# of Jobs) | PLAN 2 DRILL<br>(# of Jobs) | RE-ENTRY<br>(# of Jobs) | RECOMPLETION<br>(# of Jobs) | REDESIGN<br>(# of Jobs) | REPAIR<br>(# of Jobs) |
| 1995        | November  | -                         | -                              | 1                            | -                           | -                       | -                           | -                       | -                     |
|             | September | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -                     |
|             | April     | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -                     |
|             | December  | 1                         | -                              | -                            | -                           | 1                       | -                           | -                       | -                     |
| 1996        | February  | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -                     |
|             | June      | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -                     |
|             | March     | -                         | 1                              | -                            | -                           | -                       | -                           | -                       | -                     |
|             | November  | -                         | -                              | 2                            | -                           | -                       | -                           | -                       | -                     |
| 1997        | September | -                         | -                              | 1                            | -                           | -                       | -                           | -                       | -                     |
|             | April     | -                         | -                              | -                            | -                           | 1                       | -                           | -                       | -                     |
|             | August    | -                         | -                              | 1                            | -                           | -                       | -                           | -                       | -                     |
|             | December  | -                         | -                              | -                            | -                           | -                       | -                           | -                       | -                     |
| 1998        | February  | -                         | -                              | -                            | 1                           | -                       | -                           | -                       | -                     |
|             | January   | -                         | 1                              | -                            | -                           | -                       | -                           | 1                       | -                     |
|             | June      | -                         | -                              | -                            | -                           | -                       | -                           | -                       | 1                     |
|             | March     | -                         | 1                              | -                            | -                           | -                       | -                           | -                       | -                     |
| Grand Total |           | 2                         | 4                              | 12                           | 1                           | 1                       | 1                           | 1                       | 1                     |

## Dashboard Designer

A dashboard manages multiple reports inside one screen.

To help design the most effective dashboard, consider the following questions:

- What kind of reports to display in the dashboard? Charts, grids, external web pages?
- Which layout provides the clearest picture contextually and visually?
- What kind of dynamic filtering is needed?

## Overview

- Assume that two reports have been previously created: Rig\_Activity\_Report and Rig\_Activity\_Report\_Rig\_Name.
- From the DecisionSpace Analytics Home page, create a new Dashboard with a desired layout.
- Manage these reports in the Dashboard: view the reports in various formats.
- There is an option to create a complex dashboard that uses report parameters to set the context for multiple data sources.

## Exercise 6: Create a Dashboard for Analysis Report

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### Purpose of the Exercise

Create an interactive dashboard to show reports created in “Exercise 5: Create Analysis Reports from an OLAP Model” on page 6-61.

### Outcome of the Exercise

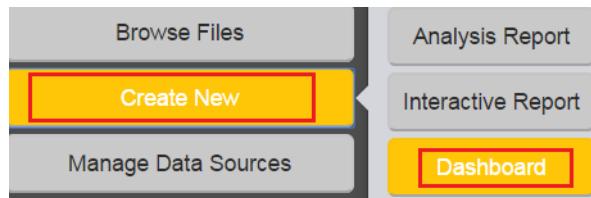
The user will know how to create an interactive dashboard. A dashboard is a highly graphical visual interface that can easily show key performance indicators and can have different formats and more friendly titles and descriptions.

### Exercise Workflows

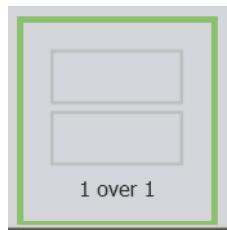
Create a dashboard and add the report into the dashboard.

#### 1. Create a dashboard.

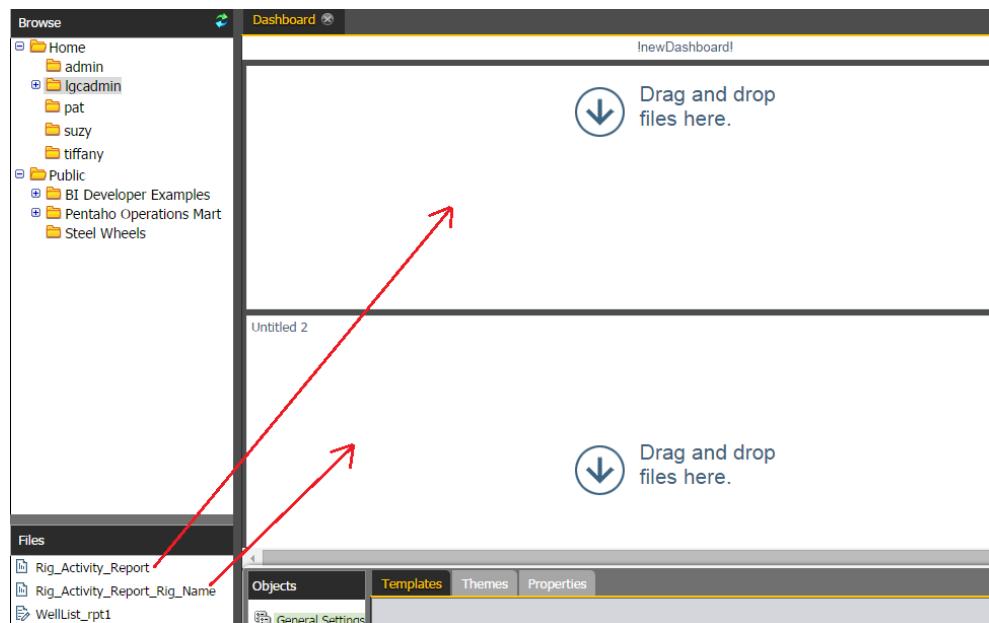
- a) From the Analytics Console window, select **Create New > Dashboard**.



- b) From the **Templates** tab, select the **1 over 1** layout.



- c) In the **Browse** panel, select **lgcadmin**. Drag-and-drop the **Rig\_Activity\_Report** file into the top panel. Drag-and-drop the **Rig\_Activity\_Report\_Rig\_Name** file into the bottom panel.



This is the appearance after the previous step has been performed.

| YEAR | MONTH     | Rig Name     |        |           |               |                    |              |
|------|-----------|--------------|--------|-----------|---------------|--------------------|--------------|
|      |           | ADRIATIC III | ALPINE | BIG DRILL | BILL JENNINGS | CENALTA WELL SERV. | DRILLING CO. |
| 1995 | November  | -            | -      | -         | -             | -                  | 1            |
|      | September | -            | -      | -         | -             | -                  | 1            |
|      | April     | -            | -      | 1         | -             | -                  | -            |
| 1996 | December  | -            | -      | -         | -             | -                  | 1            |
|      | February  | 1            | -      | -         | -             | -                  | -            |
|      | June      | -            | -      | -         | -             | -                  | 1            |

- d) Click **General Settings** in the Objects panel. Change the titles in the **Properties** tab:

The figure consists of three vertically stacked screenshots of a software interface, likely DecisionSpace Configuration Server.

- Screenshot 1:** Shows the Objects panel on the left with "General Settings" selected (highlighted with a red box). The Properties tab is active on the right, showing "Page Title: Rig Activity Report" (highlighted with a red box).
- Screenshot 2:** Shows the Objects panel with "Untitled 1" selected (highlighted with a red box). The Properties tab shows "Title: Rig Activity Report: Job Type" (highlighted with a red box), "Content: Rig\_Activity\_Report", and a Parameters/Content Linking table where "Output Type" is set to "PDF".
- Screenshot 3:** Shows the Objects panel with "Untitled 2" selected (highlighted with a red box). The Properties tab shows "Title: Rig Activity Report: Rig Name" (highlighted with a red box), "Content: Rig\_Activity\_Report\_Rig\_Name", and a Parameters/Content Linking table where "Output Type" is set to "PDF".

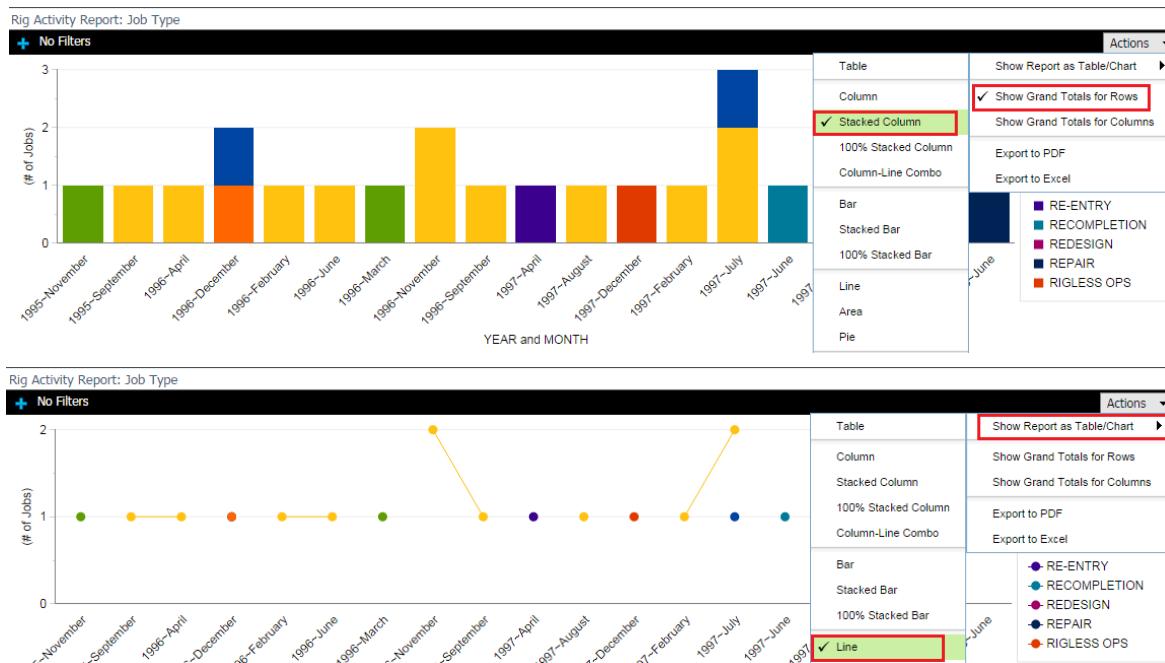
- e) Click the **Save As** icon to save the dashboard in /home/lgcadmin as **Rig\_Activity\_Report\_Dashboard**.

## 2. Play with the dashboard report visualization.

- a) Click the **Edit Content**  icon to display the dashboard in full screen.



- b) Click **Actions** to show different report formats.



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## Exercise 7: Create Dashboard with Parameter

---

### **Purpose of the Exercise**

To create a dashboard that uses report parameter to set context for multiple data sources.

### **Outcome of the Exercise**

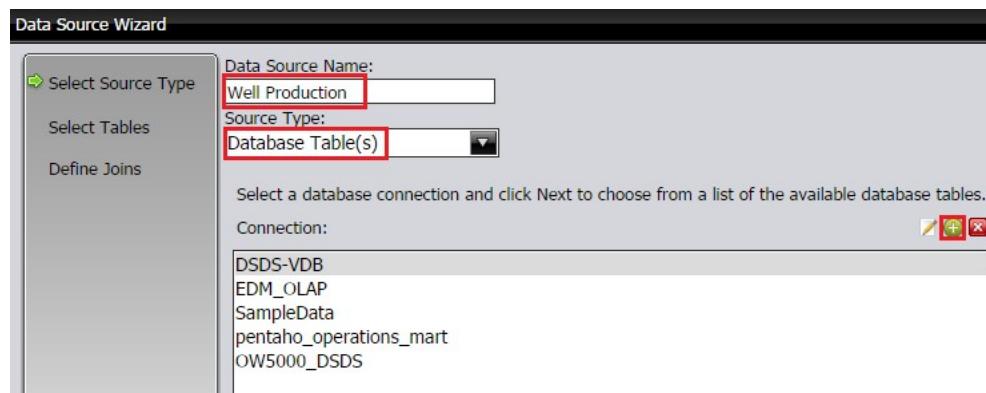
After successful creation of the dashboard, the user can select a Production Well in a drop-down, and view (as charts) its associated production data as well as the drilling events belonging to the Well.

### **Exercise Workflows**

- Create Well Production Data Source
  - a) Production data from Well Production through DSDS
- Create an Analyzer report from EDM\_O LAP cube
- Create a Dashboard
- Add Production data as Chart
- Add drilling events (analyzer report) as grid
- Add and configure report parameter to show Wells
- Change Chart and Grid reports to use the parameter

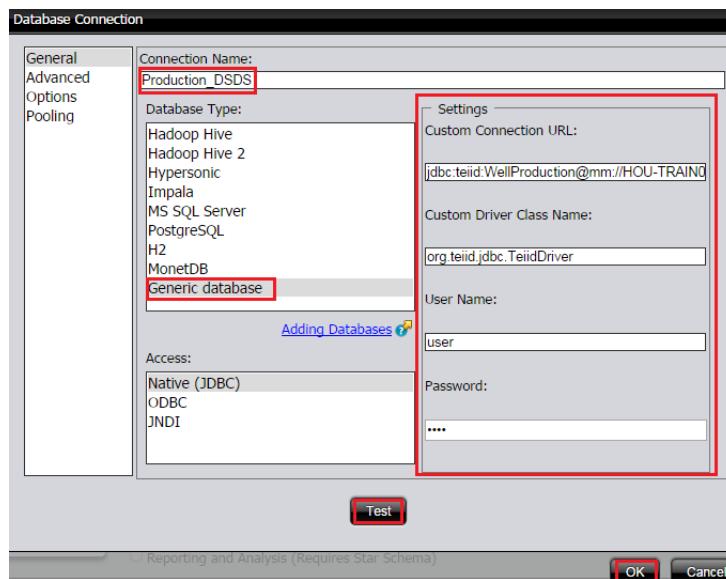
## 1. Create a Well Production data source

- a) If you haven't already, connect the well production database to DSIS and deploy the native model vdb
- b) From the main window of the DS Analytics Console, click **Manage Data Sources**.
- c) In the Data Sources dialog box, click the **Add** icon and select **Data Source Wizard**.
- d) In the Data Source Wizard dialog box, enter the following parameters:
  - Data Source Name: **Well Production**
  - Source Type: **Database Table(s)**
    - Select **Reporting only**
    - Click the **Add Connection** icon to display the Database Connection dialog box to create a new connection.

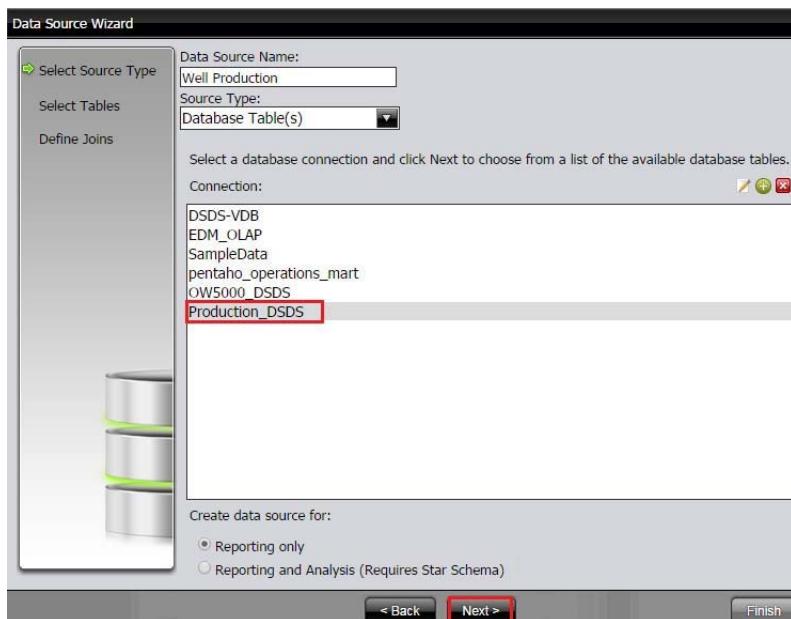


- e) In the Database Connection dialog box, enter the following parameters:
  - Connection Name: **Production\_DSDS** Database Type: **Generic database**
    - Access: **Native(JDBC)**
    - Custom Connection URL: **JDBC Connection string for the Production VDB (from DSIS)**

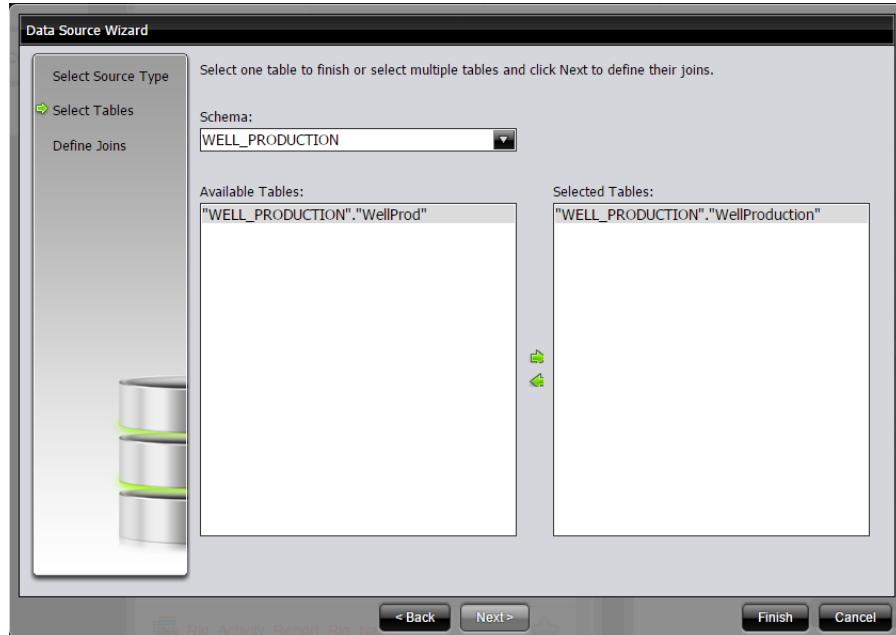
- Custom Driver Class Name: **org.teiid.jdbc.TeiidDriver**
- User Name: **user**
- Password: **user**
- Click **Test** and make sure the connection is working, and then click **OK**.



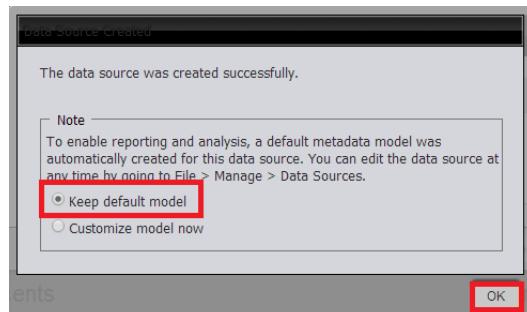
- The new database connection is added to the list. Select it and click **Next**.



- f) Select the **WellProduction** table and click the right arrow move it to the **Selected Tables** area. Click **Finish**.

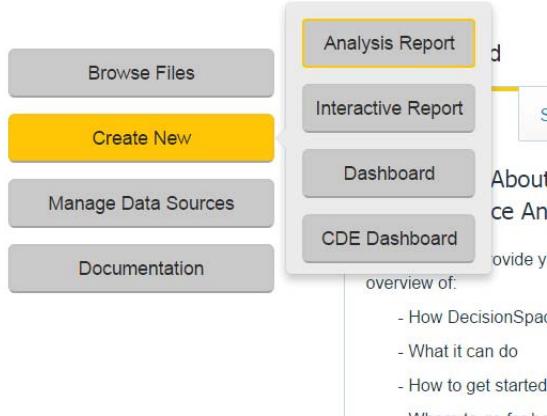


- g) In the Data Source Created dialog box, select **Keep default model** and click **OK**.

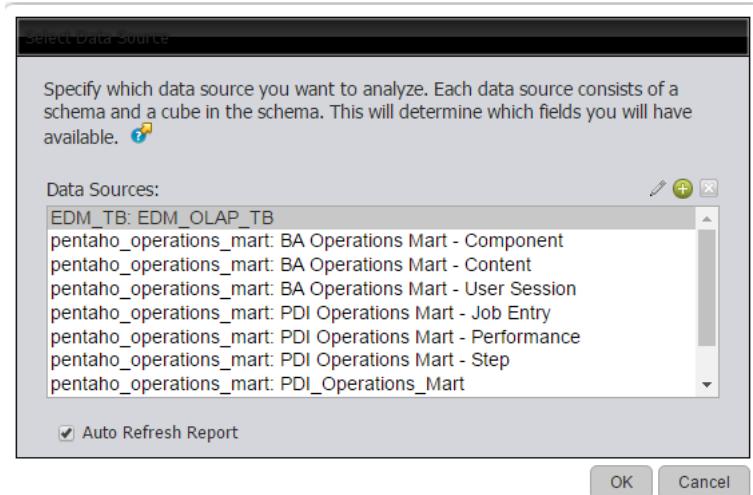


## 2. Create Analyzer report on EDM data source

- a) From the DSA user console, click **Create New** and select **Analyzer Report**:



- b) Select the EDM\_TB:EDM\_OLAP\_TB data source and click **OK**.

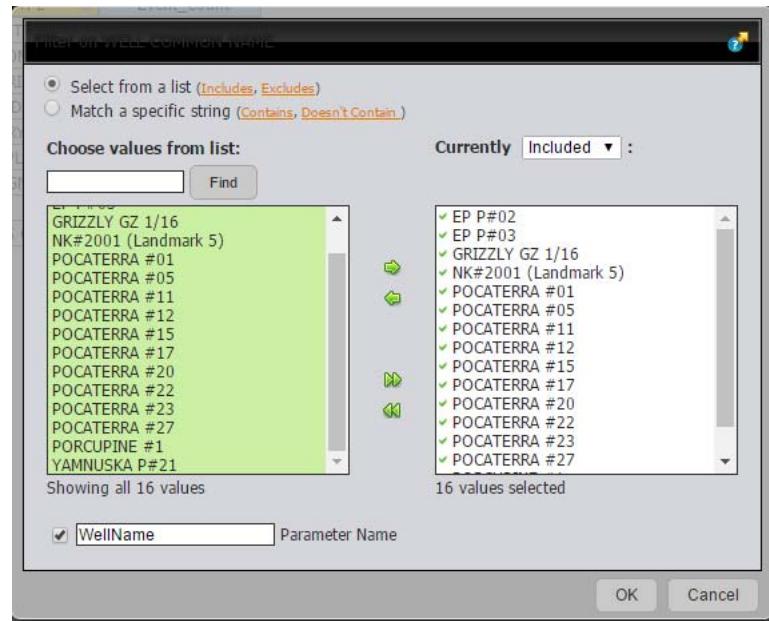


- c) Drag and drop EVENT TYPE in Rows and Event\_Count in Measures. This will show all the events that happened within this EDM database and the number of each event.

The screenshot shows the Analysis Report interface. On the left, the 'Available fields (85) for: EDM\_OLAP\_TB' pane lists various fields like Event\_Count, LASTRIGREL SPUDDT, RC DIM KEY, etc. In the center, the 'Layout' section has 'EVENT TYPE' in the Rows dropdown and 'Event\_Count' in the Measures dropdown. To the right, a table displays the data:

| EVENT TYPE      | Event_Count |
|-----------------|-------------|
| COMPLETION      | 2           |
| ORIG COMPLETION | 4           |
| ORIG DRILLING   | 12          |
| PLAN 2 DRILL    | 1           |
| RE-ENTRY        | 1           |
| RECOMPLETION    | 1           |
| REDESIGN        | 1           |
| REPAIR          | 1           |
| RIGLESS OPS     | 1           |

- d) Add WELL COMMON NAME in the Filters section:
- Choose all the values and add them to the Include list.
  - Select the ch/eck box at the bottom to enable the text box and provide a parameter name - WellName; and click **OK**.



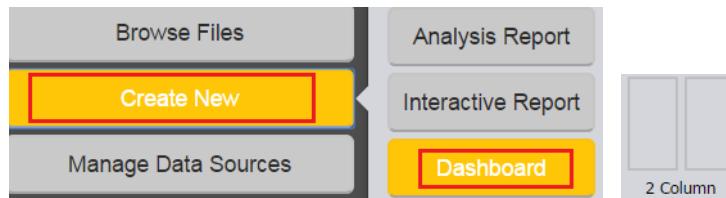
- e) This parameter name can be used to pass a filter value to this report as a parameter.

- f) Save this report as “Drilling Event Count”.

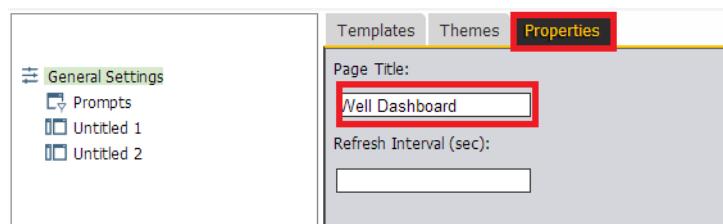
### 3. Create a Dashboard

From the DS Analytics Console window, select **Create New > Dashboard**.

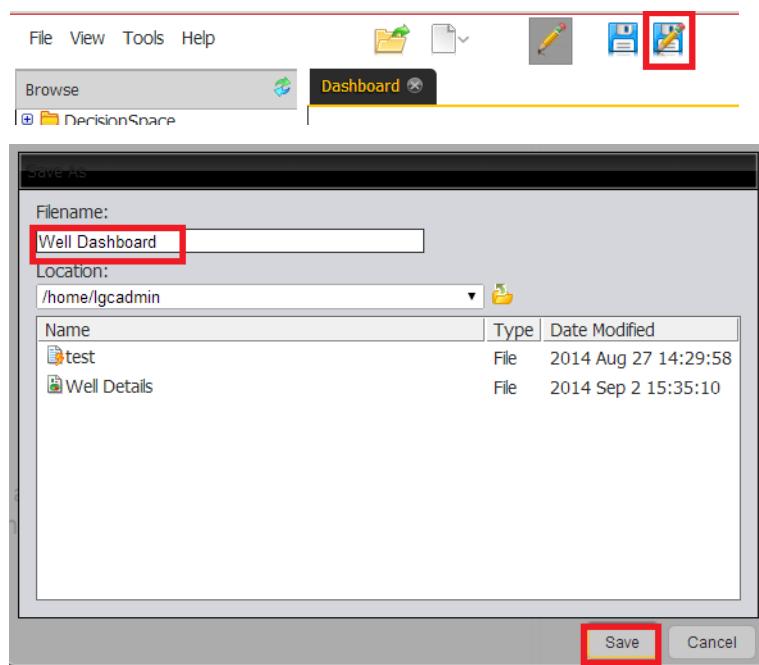
- a) From the **Templates** tab, select the **2 Column** layout.



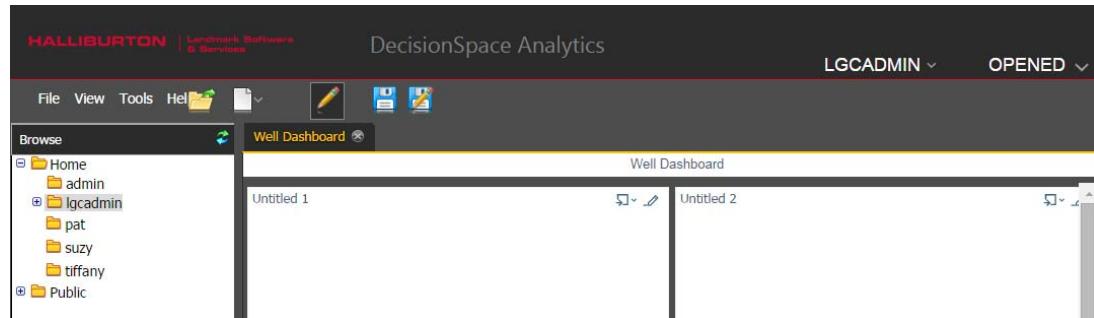
- b) Select the **Properties** tab and enter **Well Dashboard** as the title for the dashboard.



- c) Click the **Save As** icon on the top to save the dashboard. Name the file **Well Dashboard** in **/home/lgcadmin**.

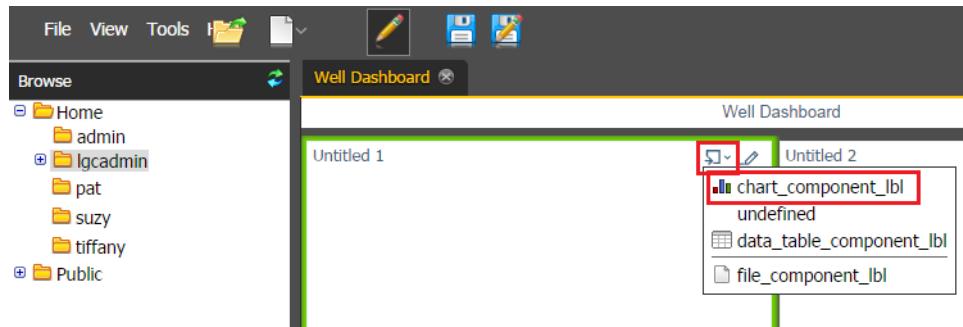


- d) After the dashboard is saved, the selected layout and the dashboard title are displayed as shown below:

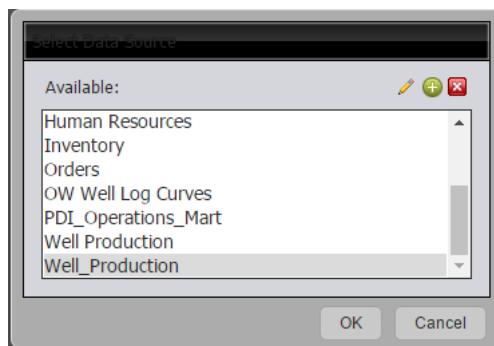


#### 4. Add Production data as Chart in the Dashboard

- a) In order to add a Chart to the dashboard, first select the left column (**Untitled 1**). Click the **Insert Content** icon and then select **chart\_component\_lbl** to display the Select Data Source dialog box.

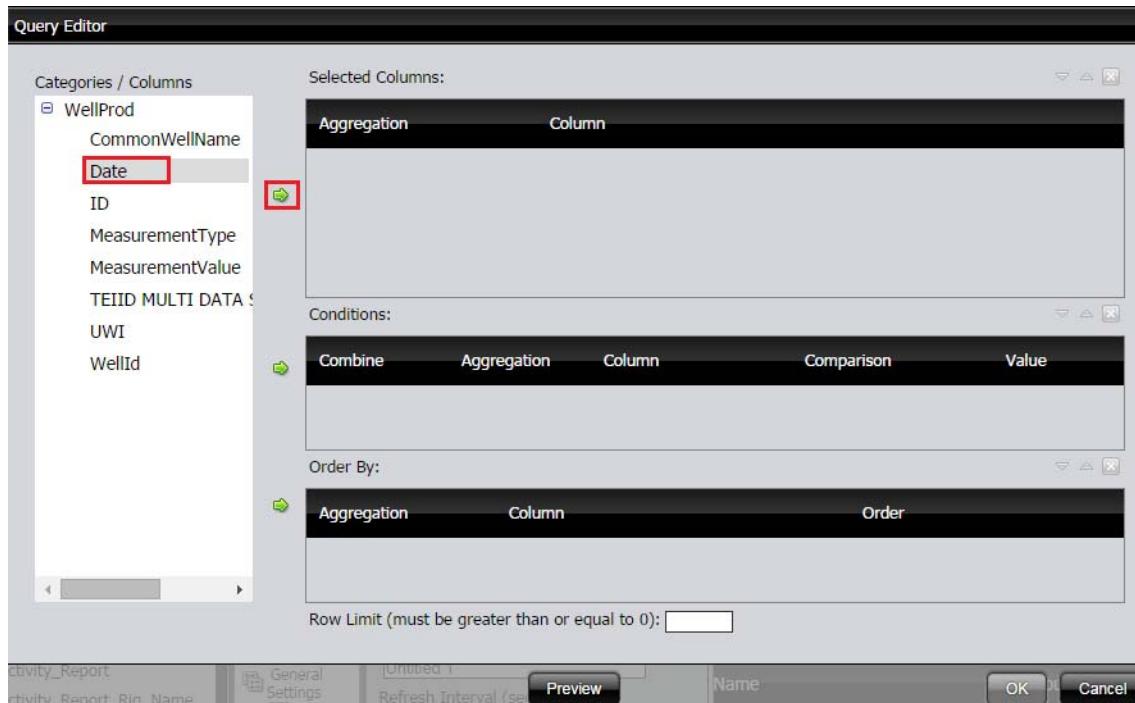


- b) In the Select Data Source dialog box, select **Well Production** and click **OK**. The Query Editor dialog box is displayed next.

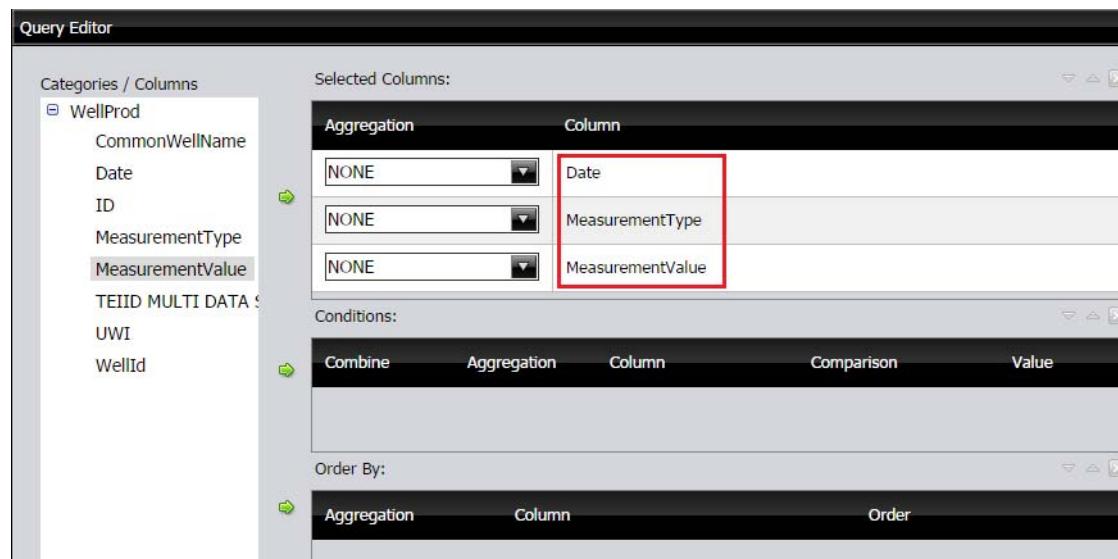


- c) In the Query Editor dialog box, enter the query that is needed for the chart. In this case, the **Date**, **MeasurementType**, and **MeasurementValue** columns are needed to view the production data for each well.

- d) Select the **Date** column and click the right arrow icon next to the **Selected Columns** section.

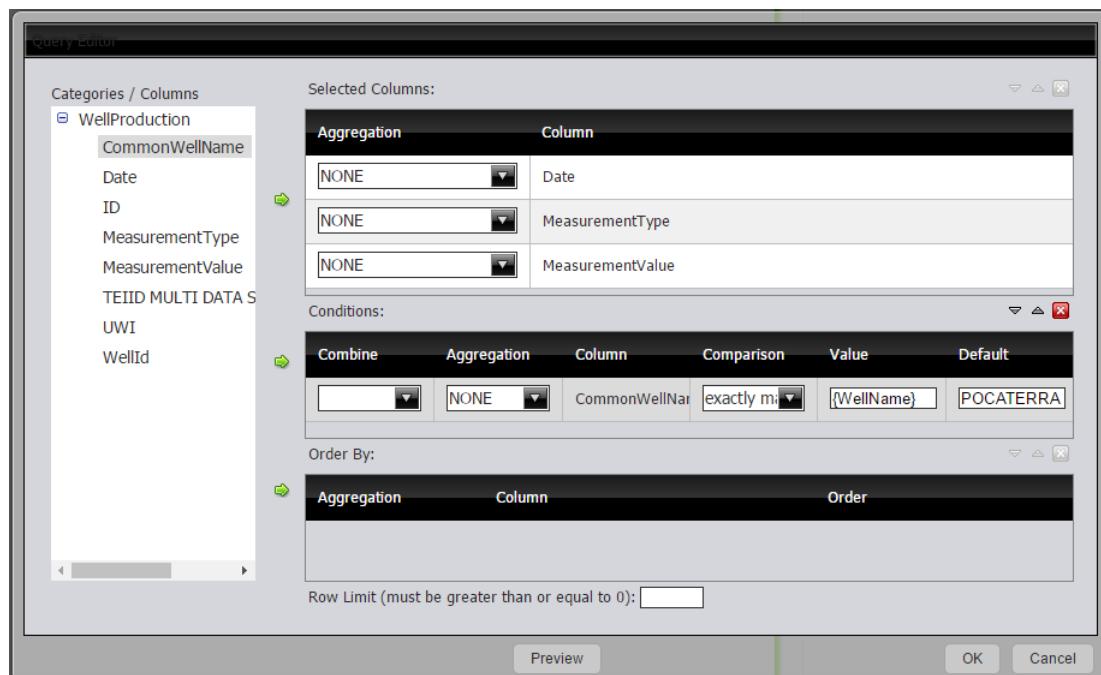


- e) Similarly, select the **MeasurementType** and **MeasurementValue** columns as well.



- f) To have a product chart based on a particular well, the data must be filtered based on Common Well Name.

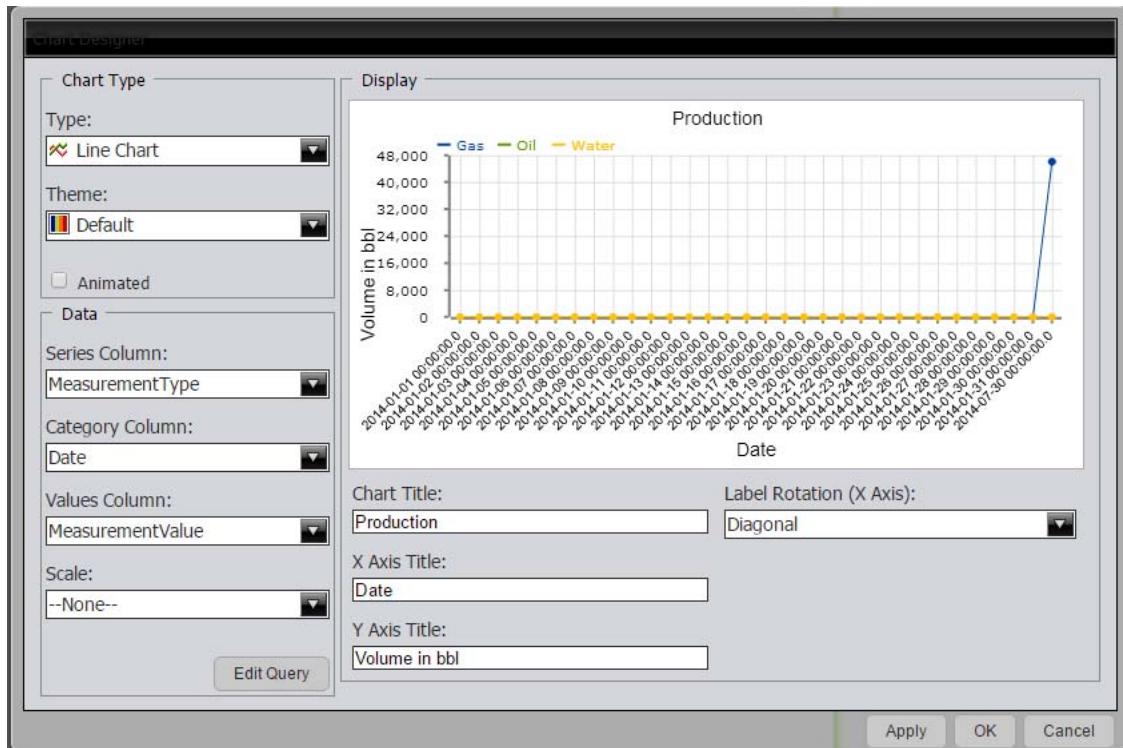
- g) To set a well name filter:
- Select the **Common Well Name** column and click the right arrow icon next to the **Conditions** section.
  - Set the filter values as follows: Aggregation **None**, Comparison **exactly matches**, Value **{WellName}**, Default **POCATERRA #05**.
- h) Click **Preview** to make sure the query is working. Click **Close** on the Preview dialog box.
- i) Then click **OK** on the Query Editor window.



- j) In the Chart Designer window, select the following options:
- Chart Type: **Line Chart**
  - Series Column: **MeasurementType**
  - Category Column: **Date**
  - Value Column: **MeasurementValue**
  - Chart Title: **Production**

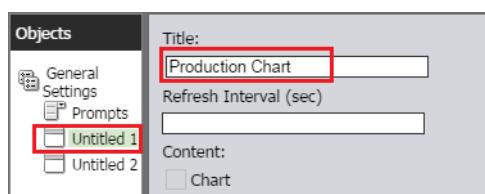
- X Axis Title: **Date**
- Y Axis Title: **Volume in bbl**
- Label Rotation: **Diagonal**

k) Click **OK** after the chart is displayed as shown below:

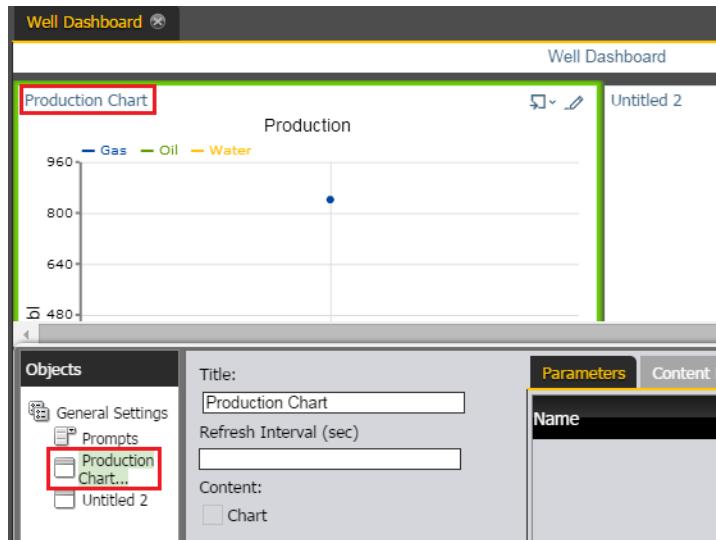


l) Back in the **Well Dashboard** tab, locate the Objects pane - click **Untitled 1** and enter title **Production Chart**.

m) Click the **Save** icon to save the dashboard.



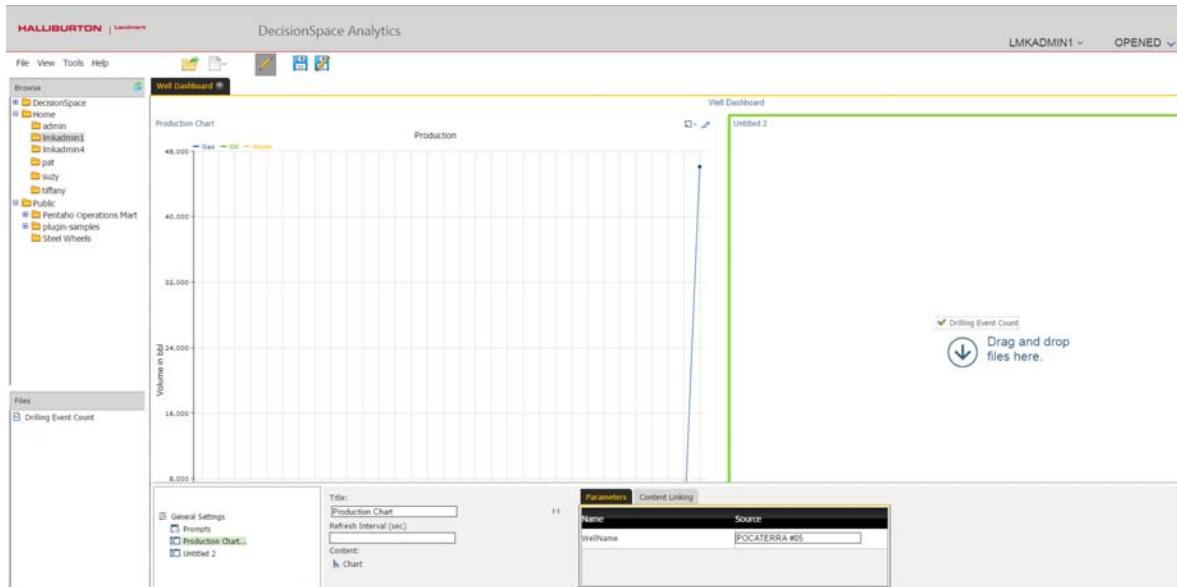
- n) Once saved, the new Title and the component name are shown in the dashboard.



- o) Click the Save icon to save the dashboard.

## 5. Add Drilling events count Analyzer report to the Dashboard

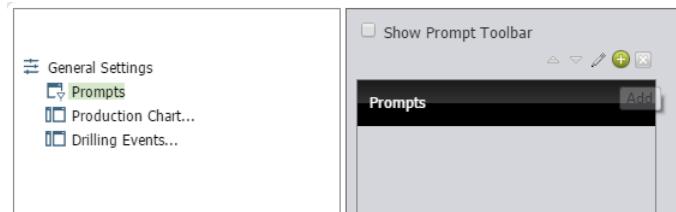
- a) From the Browse section on the left side in the dashboard editing screen, browse to the analyzer report just created. Drag and drop it on to the second panel of the dashboard.



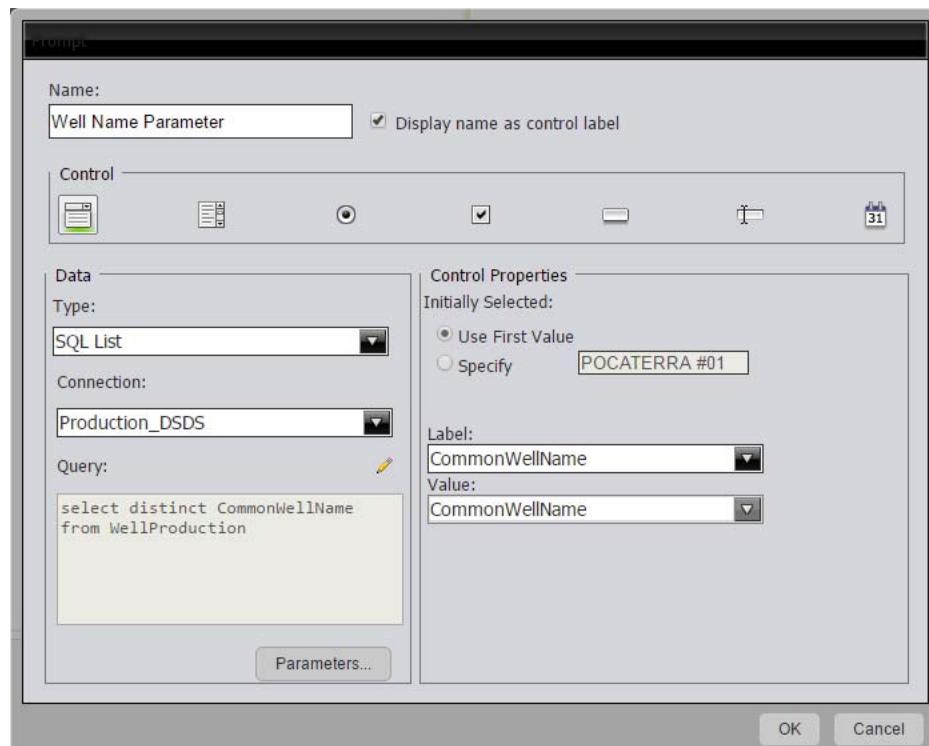
- b) In the General Settings section at the bottom, rename the title of the dashboard panel to Drilling Events and Save the dashboard.

## 6. Add Prompts/filters to dashboard and pass the value as a parameter to the charts

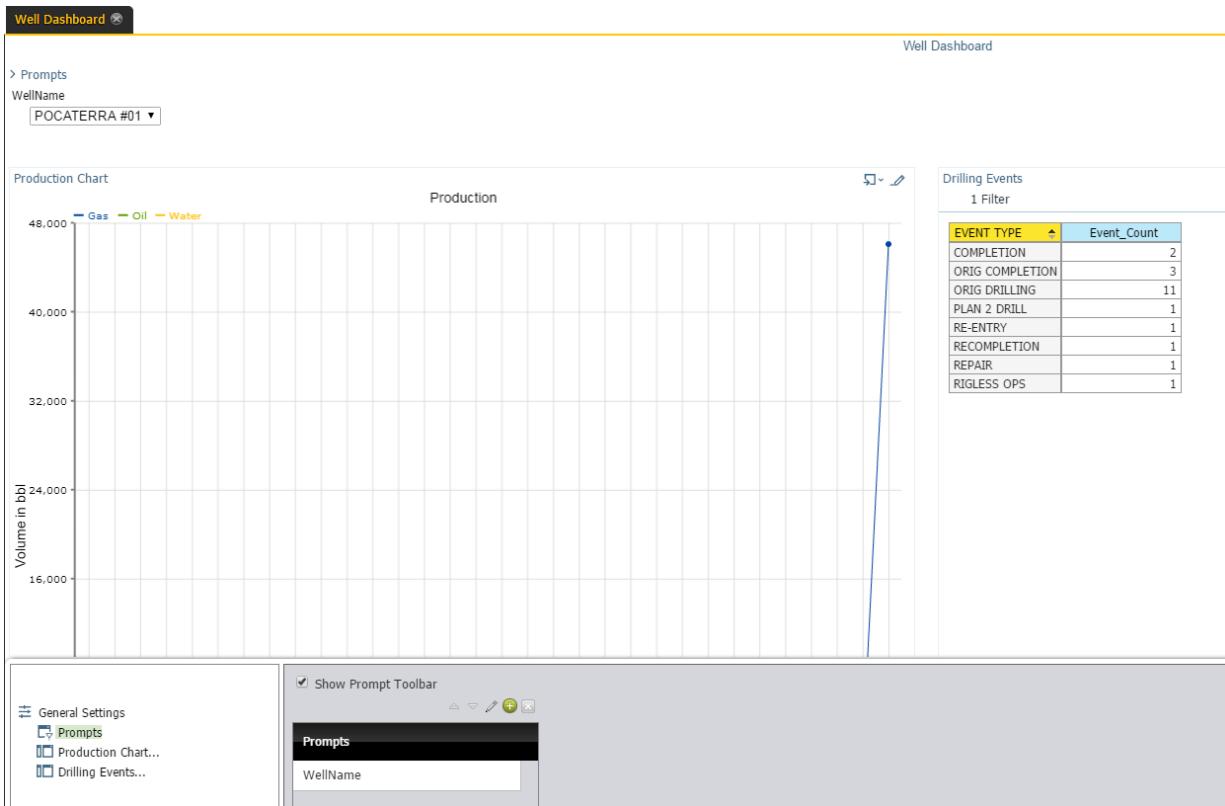
- a) In the Dashboard editing screen, in the Prompts section, click **Add New**.



- b) Enter the following information to fetch the list of wells to filter data on:
- Name: Well Name Parameter
  - Control: Drop-down
  - Type: SQL List
  - Connection: Production\_DSDS
  - Query: *select distinct CommonWellName from WellProduction*



- c) Test the query and click **OK**.
- d) In the General Settings section at the bottom, enable “Show Prompt Toolbar” in the Prompts tab to display the prompt on the top of the dashboard.

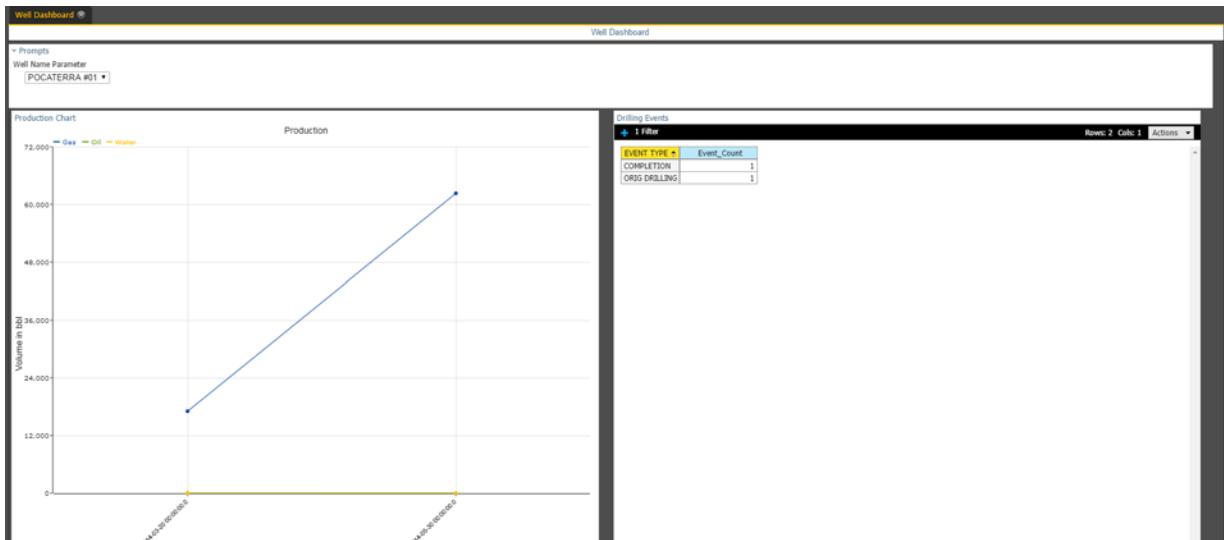


## 7. Configure the Well Name Parameter Prompt as a Parameter to Charts

- a) Click **Production Chart** in the General Settings section.
- b) In the Parameters tab on the right, the WellName parameter (added to the chart configuration) will be visible.
- c) Select “Well Name Parameter” from the drop-down and save the Dashboard.
- d) Similarly, for the Drilling Events chart, configure “Well Name Parameter” in the Parameters tab and save the Dashboard.

Next, close the Dashboard to exit the editing mode and then open the Dashboard from the Browse Files. The Dashboard can now be viewed.

When a well is selected from the Well Name prompt, the Production Chart and Drilling events for the selected well will reload as shown below:



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## What is OLAP

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Pentaho Analysis is built on the Mondrian online analytical processing (**OLAP**) engine. OLAP relies on a multidimensional data model that, when queried, returns a dataset that resembles a grid. The rows and columns that describe and bring meaning to the data in that grid are **dimensions**, and the hard numerical values in each cell are the **measures or facts**. In Analysis Reporting, dimensions are shown in yellow and measures are in blue.

OLAP requires a properly prepared data source in the form of a star or snowflake schema that defines a logical multidimensional database and maps it to a physical database model. After the initial data structure is in place, design a descriptive layer in the form of a Mondrian schema, which consists of one or more cubes, hierarchies, and members.

The data is prepared on a basic level for end-user tools like the Analyzer after the Mondrian schema is tested and optimized.

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## Exercise 8: Create Well Data Integration (MDM Exercise)

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### **Purpose of the Exercise**

To create an ETL workflow for well master data, move the data from OpenWorks database to EDM OLAP database with Kettle Spoon. Then create a report to view the OpenWorks wells in DS Analytics.

### **Outcome of the Exercise**

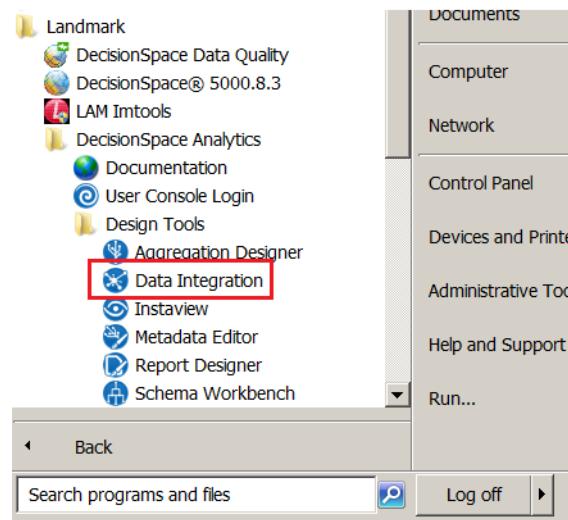
After successful completion of the exercise, users will have the skills to develop complex ETL processes in Pentaho Data Integration (PDI).

### **Exercise Workflows**

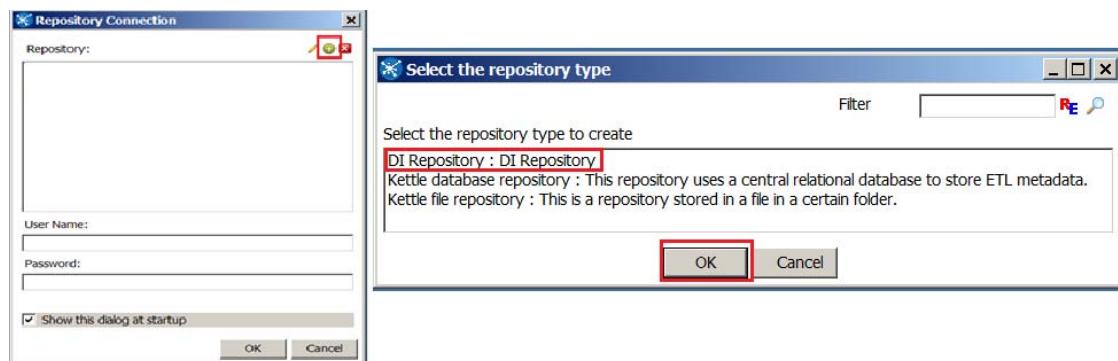
- Create Pentaho DI repository.
- Create two Data Source Connections:
  - a) Well data from OpenWorks (TEAPOT) through DSDS
  - b) Well data in EDM OLAP (ZALITE) through SQL Server
- Create a transformation/ETL.
- Create a job to execute the transformation.
- Create a new type of data source and a well report for the Open Works wells.

## 1. Start Pentaho DI and Create a DI repository.

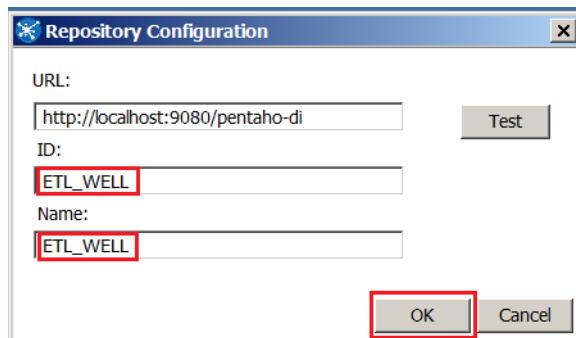
- a) Click **Data Integration** in the Start menu.



- b) Create a DI repository. Click the icon to create a new repository and select **DI Repository** (first in the list), and then click **OK**.



- c) Type in ID as ETL\_WELL and the same for Name, then test and click **OK**.

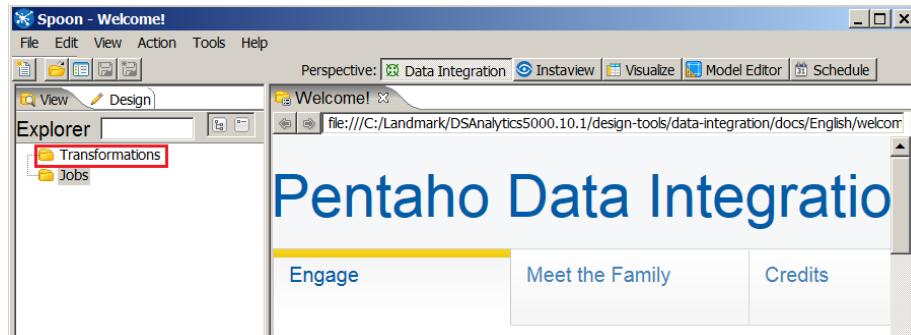


- d) Type **password** as password and click **OK**.

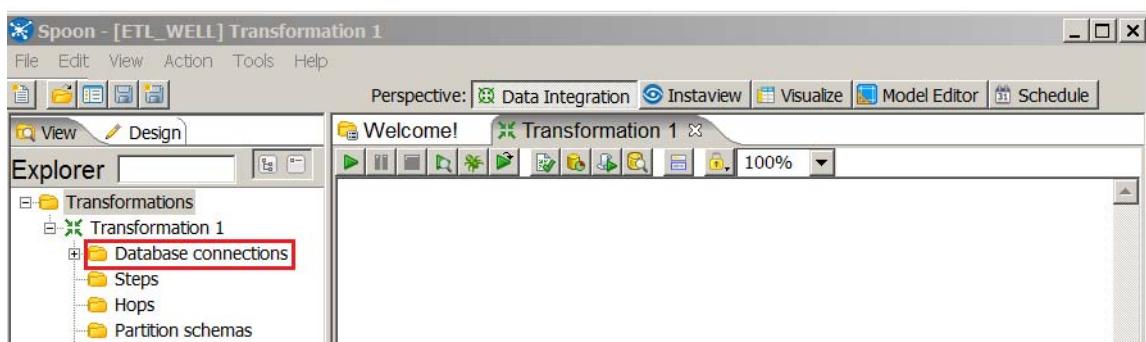


## 2. Create two Data Source Connections.

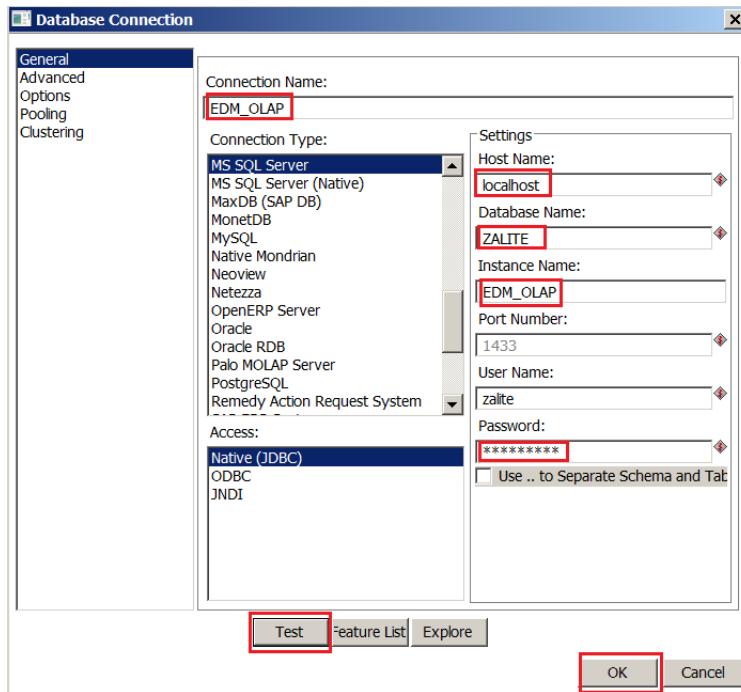
- a) On the Pentaho Spoon screen, right-click **Transformation** and select **New**.



- b) In the design panel of the new transformation, right-click the **Database Connection** and select **New**.

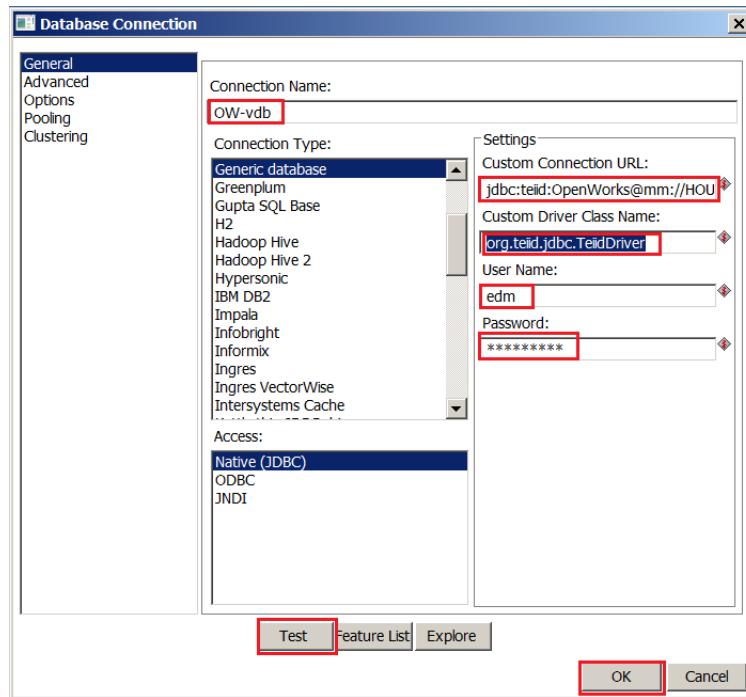


- c) Enter **EDM\_O LAP** as the connection name. Specify the database name and user name. Enter **Landmark1** as password. Click **Test** and then click **OK**.



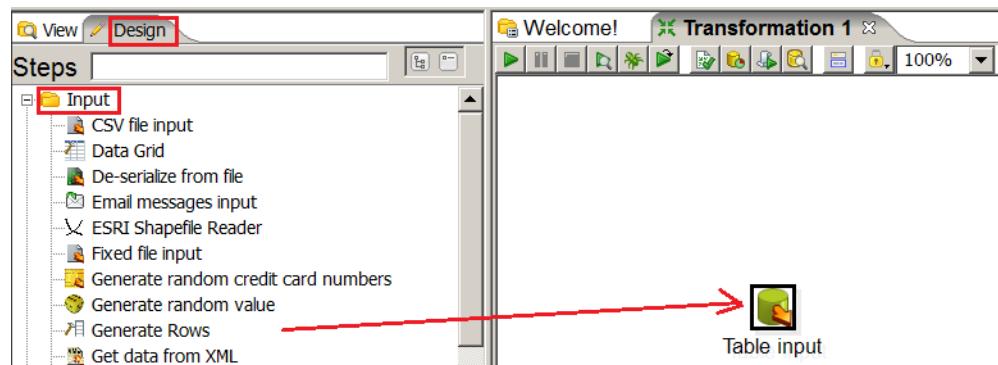
- d) Create OpenWorks data source through DSDS VDB.
- e) Right-click again on the **Database Connections** and select **New**.
- f) Then enter Connection Name: **OW-vdb**.
- g) Enter the Connection URL:  
`jdbc:teiid:OpenWorks@mm://HOU-TRAIN01.training.pri:31000`. Enter Custom Driver Class Name: `org.teiid.jdbc.TeiidDriver`.

- h) Enter **Landmark1** as password and click **TEST** and then click **OK**.



### 3. Create an ETL Transformation.

- a) Select the **Design** tab. Click **Input** and select **Table Input**. Drag-and-drop it into the canvas.

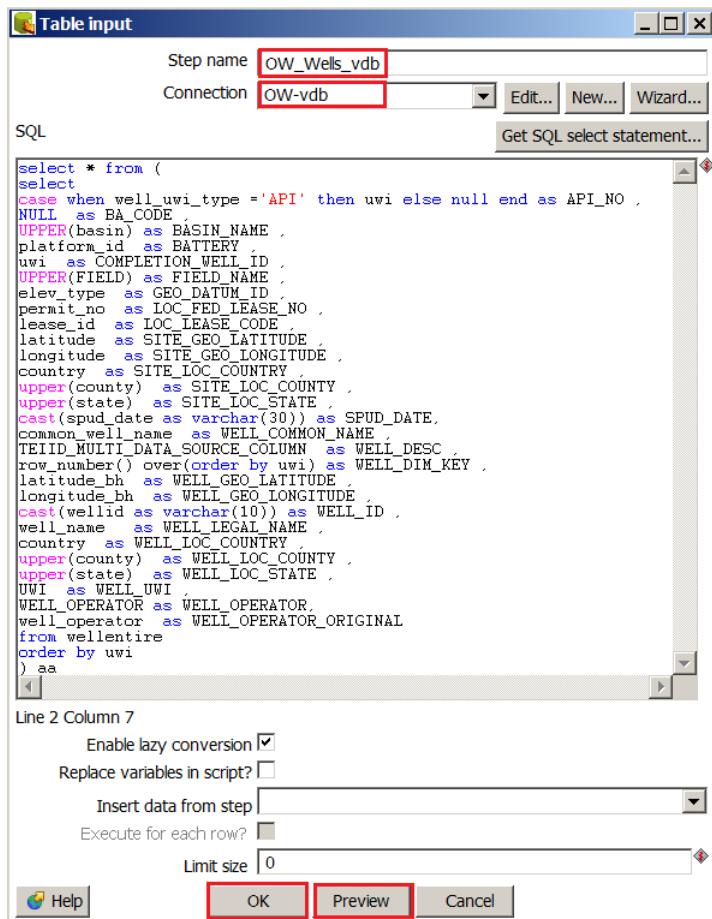


- b) Double-click the  icon for **Table Input**.
- c) Change the Step Name to **OW\_Wells\_vdb**; pick the Connect **OW-vdb**.

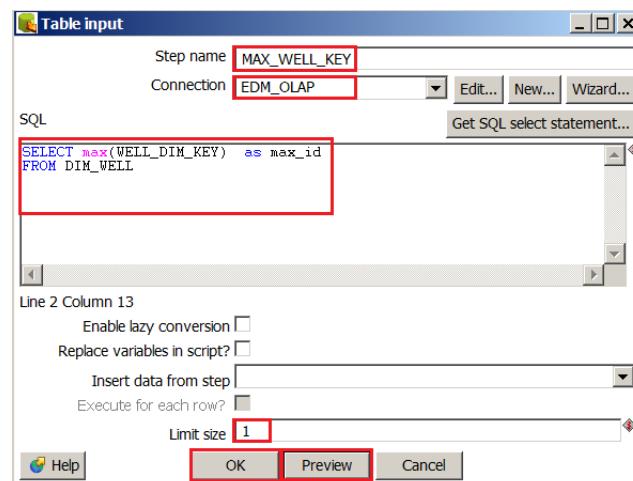
- d) Paste the following SQL for input mapping:

```
select * from (
select
case when well_uwi_type = 'API' then uwi else null
end as API_NO ,
NULL as BA_CODE ,
UPPER(basin) as BASIN_NAME ,
platform_id as BATTERY ,
uwi as COMPLETION_WELL_ID ,
UPPER(FIELD) as FIELD_NAME ,
elev_type as GEO_DATUM_ID ,
permit_no as LOC_FEDLEASE_NO ,
lease_id as LOCLEASE_CODE ,
latitude as SITE_GEO_LATITUDE ,
longitude as SITE_GEO_LONGITUDE ,
country as SITE_LOC_COUNTRY ,
upper(county) as SITE_LOC_COUNTY ,
upper(state) as SITE_LOC_STATE ,
cast(spud_date as varchar(30)) as SPUD_DATE,
common_well_name as WELL_COMMON_NAME ,
TEIID_MULTI_DATA_SOURCE_COLUMN as WELL_DESC ,
row_number() over(order by uwi) as N_WELL_DIM_KEY ,
latitude_bh as WELL_GEO_LATITUDE ,
longitude_bh as WELL_GEO_LONGITUDE ,
cast(wellid as varchar(10)) as WELL_ID ,
well_name as WELL_LEGAL_NAME ,
country as WELL_LOC_COUNTRY ,
upper(county) as WELL_LOC_COUNTY ,
upper(state) as WELL_LOC_STATE ,
UWI as WELL_UWI ,
WELL_OPERATOR as WELL_OPERATOR,
well_operator as WELL_OPERATOR_ORIGINAL
from wellentire
order by uwi
) aa
```

- e) Click **Preview** and then close the pop-up window, and click **OK** to save.

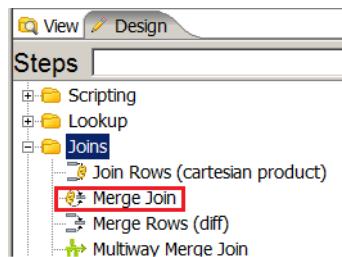


- f) Drag-and-drop another **Table Input** in the canvas. Double-click the icon to change the properties.



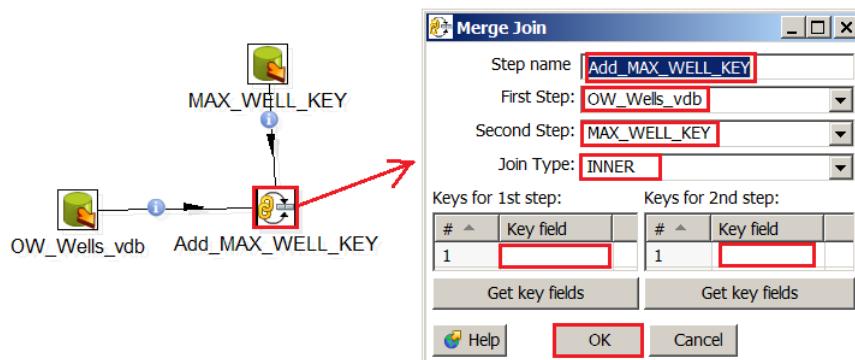
g) Click **Preview** to validate and then click **OK**. Click **File** and select **Save As** to save the transformation as **ETL\_OW\_WELLS**.

h) Drag-and-drop **Merge Join** from design.

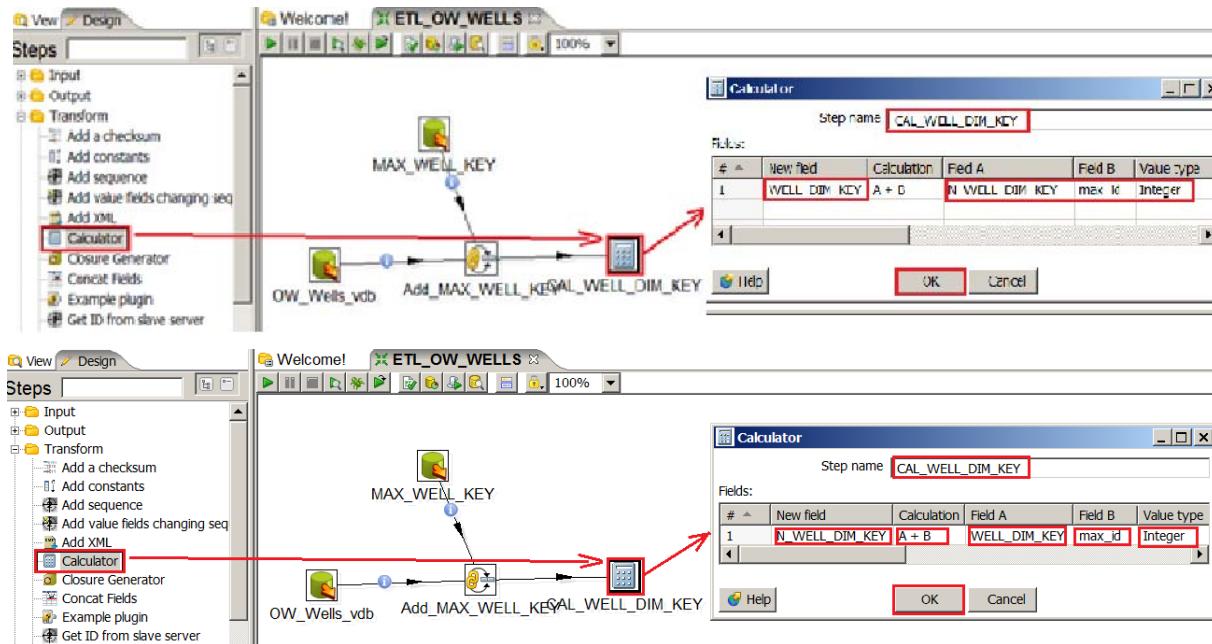


i) Build Hops from table inputs to the merge join.

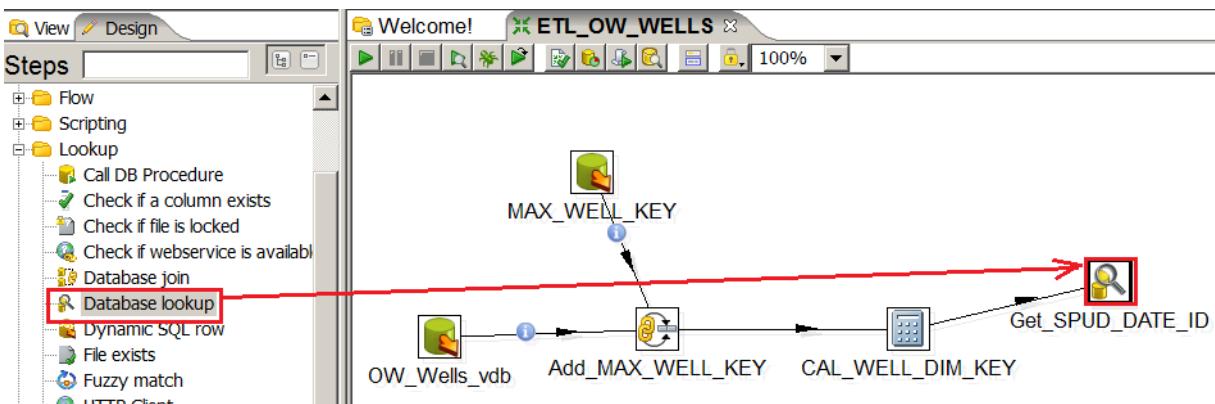
Click the table inputs and hold the **SHIFT** key and mouse button down while moving the mouse to the **merge join** icon. Double-click the merge join and edit the properties. Leave the **Key** field blank.



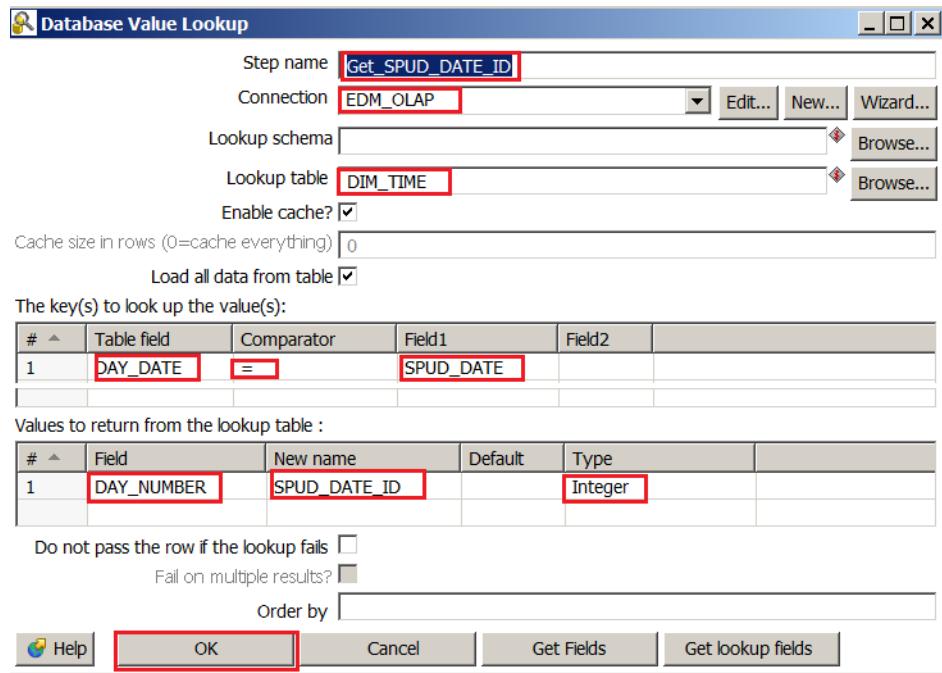
- j) Drag-and-drop a Calculator from the Transform steps. Build Hop to it from **Merge Join** and double-click to change the properties. Click **OK** and save.



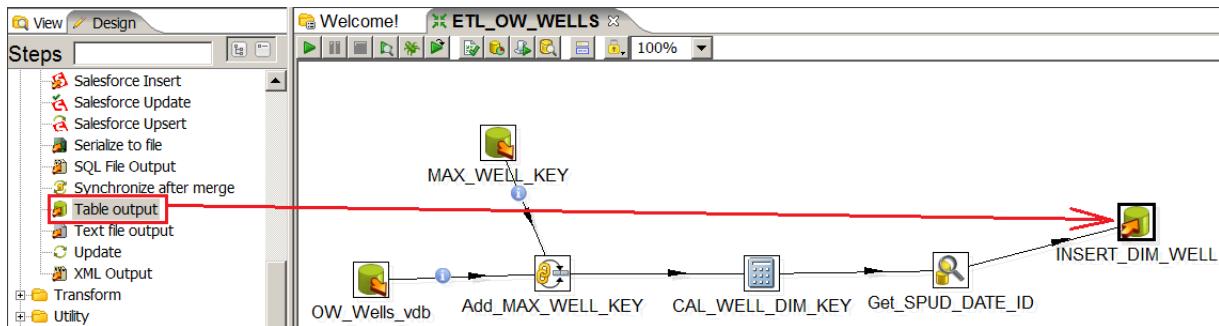
- k) Drag-and-drop a **Database lookup** step and build hop to it. Double-click to change properties.



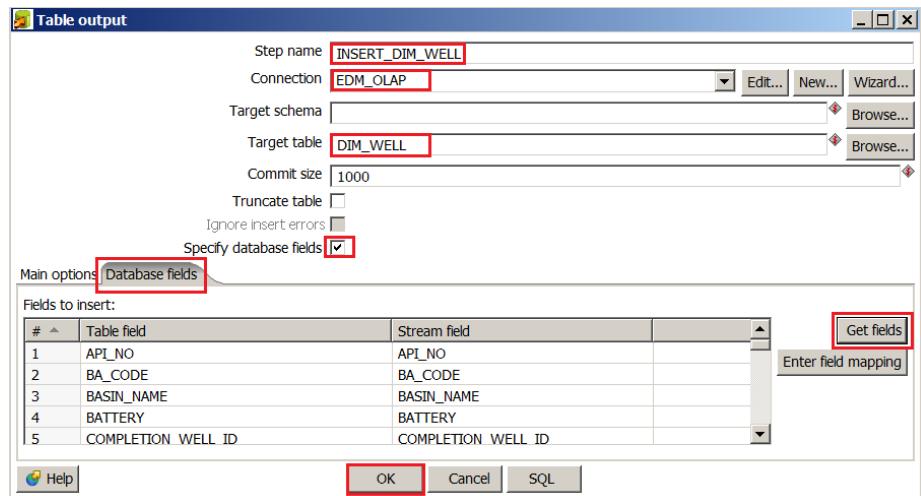
- 1) Change the Database Lookup as below. Click **OK**.



- m) Drag-and-drop a **Table Output**  to insert OpenWorks well data into the EDM OLAP database.

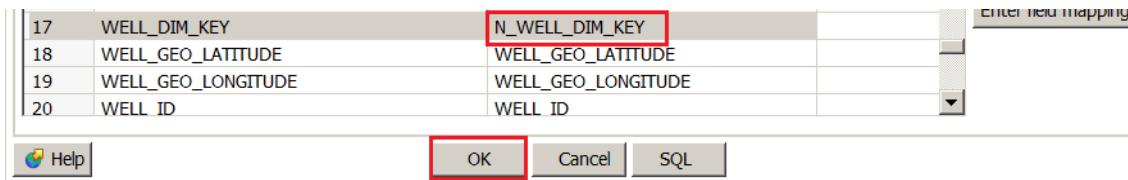


- n) Double-click to change the properties. Select the **Specify database fields** check box and select the **Database fields** tab.

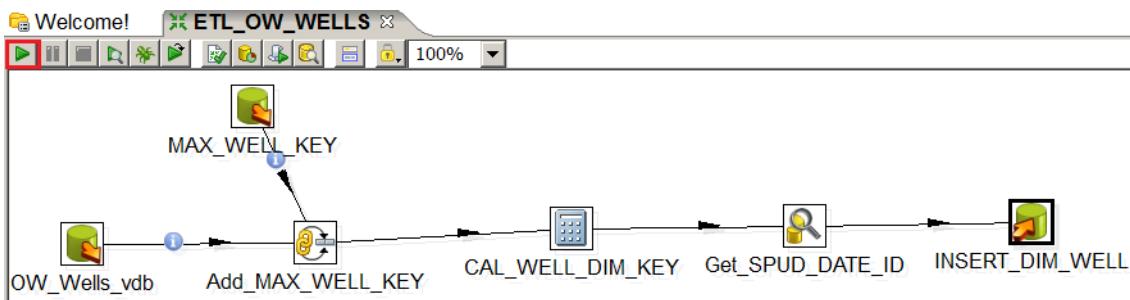


- o) Scroll down in the Table Field list and delete the rows for **max\_id**, **SPUD\_DATE**, and **N\_WELL\_DIM\_KEY**. Find the

**WELL\_DIM\_KEY** field and change its mapping to **N\_WELL\_DIM\_KEY** from the **Stream** field. Click **OK**.



- p) Open SQL Server Management Studio to check the count of **zalite.DIM\_WELL** table. Click **Run** .

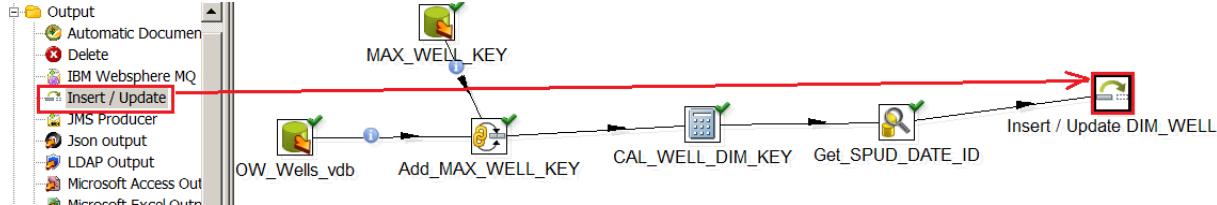


- q) Check the Execution Results and row count in **zalite.DIM\_WELL** table. Identify the new records from **OpenWorks ETL**.

| # | Stepname         | Copynr | Read | Written | Input | Output | Updated | Rejected | Errors | Active   | Time |
|---|------------------|--------|------|---------|-------|--------|---------|----------|--------|----------|------|
| 1 | MAX_WELL_KEY     | 0      | 0    | 1       | 1     | 0      | 0       | 0        | 0      | Finished | 0.1s |
| 2 | OW_Wells_vdb     | 0      | 0    | 1395    | 1395  | 0      | 0       | 0        | 0      | Finished | 5.0s |
| 3 | Add_MAX_WELL_KEY | 0      | 1396 | 1395    | 0     | 0      | 0       | 0        | 0      | Finished | 5.3s |
| 4 | CAL_WELL_DIM_KEY | 0      | 1395 | 1395    | 0     | 0      | 0       | 0        | 0      | Finished | 5.4s |
| 5 | Get_SPUD_DATE_ID | 0      | 1395 | 1395    | 42500 | 0      | 0       | 0        | 0      | Finished | 5.7s |
| 6 | INSERT_DIM_WELL  | 0      | 1395 | 1395    | 0     | 1395   | 0       | 0        | 0      | Finished | 6.2s |

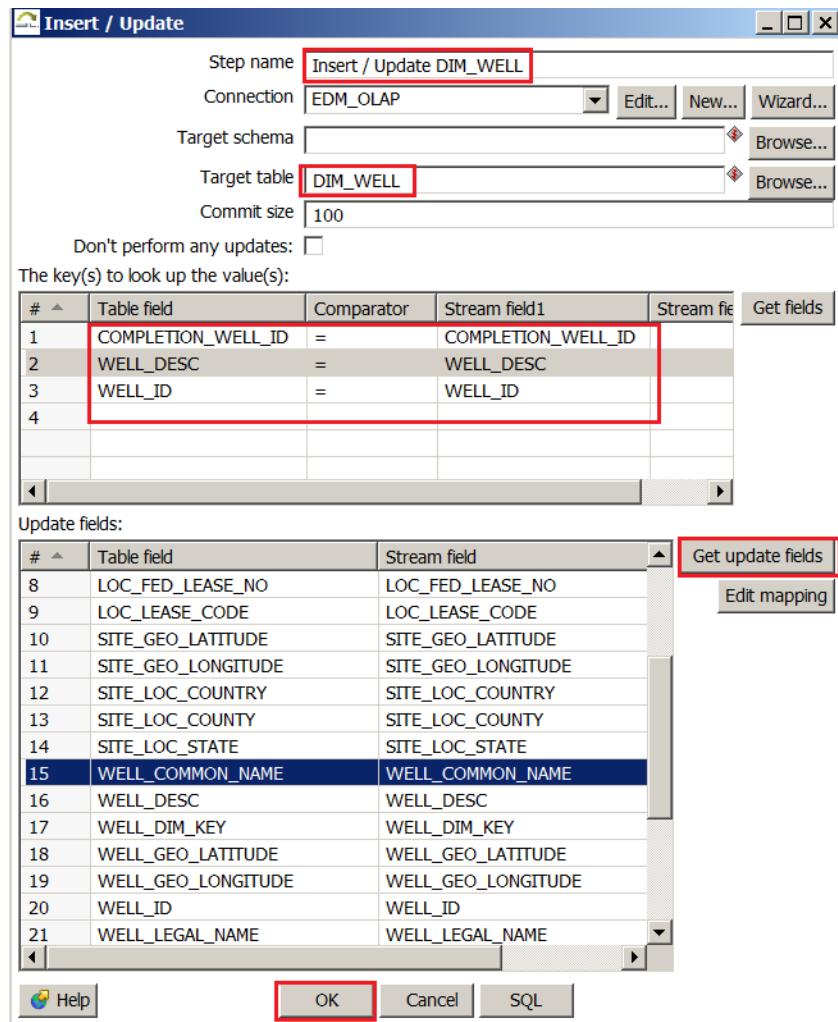
- r) Improve the ETL process with Update/Insert to avoid duplicated rows.

- Delete the **Table Output** step and drag-and-drop a new step from the **Output** step list.
- Build Hop and double-click to change the properties.



iii) Click **Get update fields** and delete rows for **max\_id**, **SPUD\_DATE**, and **N\_WELL\_DIM\_KEY**.

iv) Click **OK** and then click **Save** .

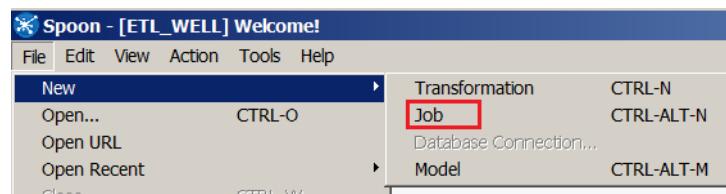


- v) Check the database table and **Execution Results** of re-run.

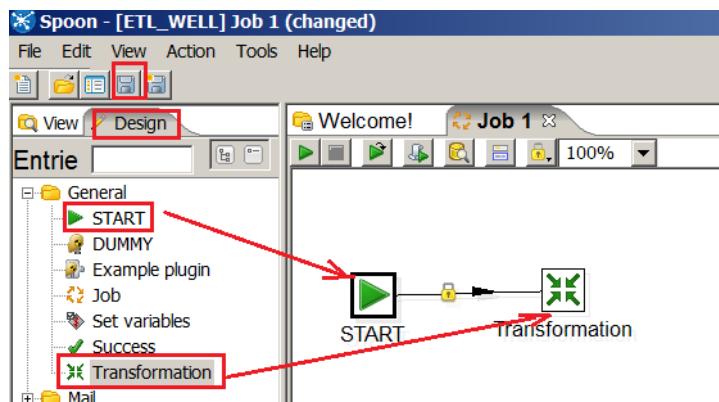
| Execution Results |                          |        |      |         |       |        |         |          |        |          |      |
|-------------------|--------------------------|--------|------|---------|-------|--------|---------|----------|--------|----------|------|
| #                 | Stepname                 | Copynr | Read | Written | Input | Output | Updated | Rejected | Errors | Active   | Time |
| 1                 | MAX_WELL_KEY             | 0      | 0    | 1       | 1     | 0      | 0       | 0        | 0      | Finished | 0.0s |
| 2                 | OW_Wells_vdb             | 0      | 0    | 1395    | 1395  | 0      | 0       | 0        | 0      | Finished | 0.1s |
| 3                 | Add_MAX_WELL_KEY         | 0      | 1396 | 1395    | 0     | 0      | 0       | 0        | 0      | Finished | 0.4s |
| 4                 | CAL_WELL_DIM_KEY         | 0      | 1395 | 1395    | 0     | 0      | 0       | 0        | 0      | Finished | 0.4s |
| 5                 | Get_SPUD_DATE_ID         | 0      | 1395 | 1395    | 42500 | 0      | 0       | 0        | 0      | Finished | 0.6s |
| 6                 | Insert / Update DIM_WELL | 0      | 1395 | 1395    | 1395  | 0      | 1395    | 0        | 0      | Finished | 5.0s |

## 6. Create a job to execute the transformation.

- a) Click **File** and select **New > Job**.



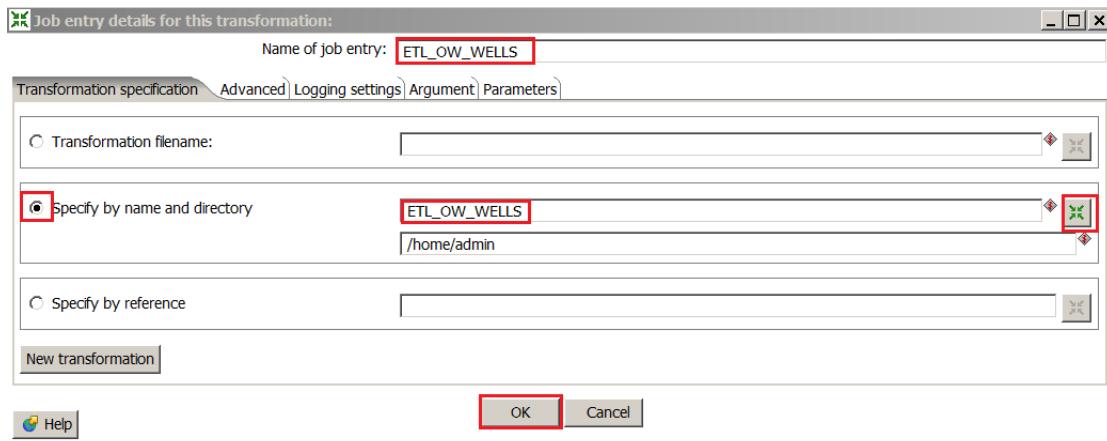
- b) In the **Design** tab, click **General** and drag-and-drop the following items in the canvas:



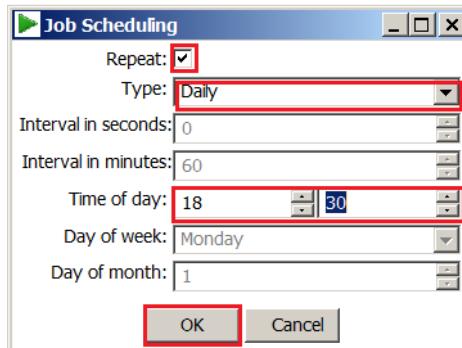
START , Transformation , and a Hop between them.

c) Click **SAVE**  and enter job name as **ETL OW WELLS**.

d) Double-click **Transformation** and change properties.



e) Double-click **START** to schedule the job.



f) Click run  to test and view the results.

7. **Create a new type of data source and a well report for the Open Works wells.**

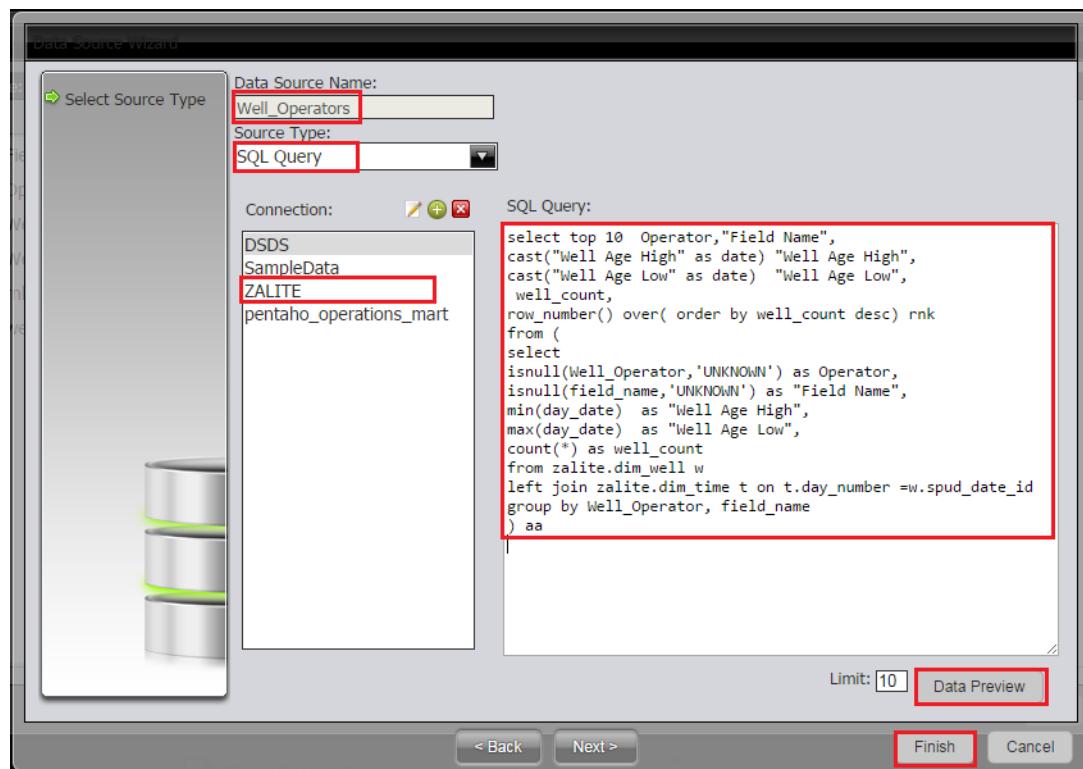
a) Start the DS Analytics user console and create a data source with the **Wizard**.

b) Choose Source Type: SQL Query.

- c) Copy and Paste the following SQL into the SQL pan.

```
select top 10 Operator,"Field Name",
cast("Well Age High" as date) "Well Age High",
cast("Well Age Low" as date) "Well Age Low",
well_count,
row_number() over( order by well_count desc) rnk
from (
select
isnull(Well_Operator,'UNKNOWN') as Operator,
isnull(field_name,'UNKNOWN') as "Field Name",
min(day_date) as "Well Age High",
max(day_date) as "Well Age Low",
count(*) as well_count
from zalite.dim_well w
left join zalite.dim_time t on t.day_number
=w.spud_date_id
group by Well_Operator, field_name
) aa
```

- d) Click **Data Preview** and then click **Finish**.



- e) Click **OK** to keep the default model.  
f) Create an Interactive Report with the new data source **Well\_Operators**.

The screenshot shows an 'Interactive Report' titled 'Top 10 Well Operators by Field.prpti'. The report interface includes a toolbar with various icons, a navigation bar at the top, and a main content area displaying a table. The table has columns: Rank, Operator, Field Name, Well Age High, Well Age Low, and Total Wells. The data is as follows:

| Rank | Operator                    | Field Name  | Well Age High | Well Age Low | Total Wells |
|------|-----------------------------|-------------|---------------|--------------|-------------|
| 1    | U.S. DOE                    | TEAPOT DOME | 1914-09-09    | 2006-04-24   | 1255        |
| 2    | Mammoth Production          | TEAPOT DOME | 1922-07-11    | 1967-12-08   | 83          |
| 3    | KANANASKIS RESOURCES LTD.   | UNKNOWN     | 1995-09-18    | 2001-02-01   | 14          |
| 4    | RMOTC                       | TEAPOT DOME | 2006-07-10    | 2007-09-02   | 13          |
| 7    | Howell Petroleum Corp.      | SALT CREEK  |               |              | 6           |
| 8    | Pacific Enterprises Oil Com | SALT CREEK  |               |              | 4           |
| 9    | CHINOOK RESOURCES LTD       | UNKNOWN     | 1996-11-21    | 1996-11-21   | 2           |
| 11   | UNKNOWN                     | UNKNOWN     |               |              | 19          |

The 'TEAPOT DOME' entry is highlighted in red. The report also includes a sidebar with 'Available Fields For: Well\_Operators' and a timestamp 'October 23, 2014 @ 10:11 AM'.

- g) Verify the Well in the **Teapot Dome** field from OpenWorks.



## Appendix A

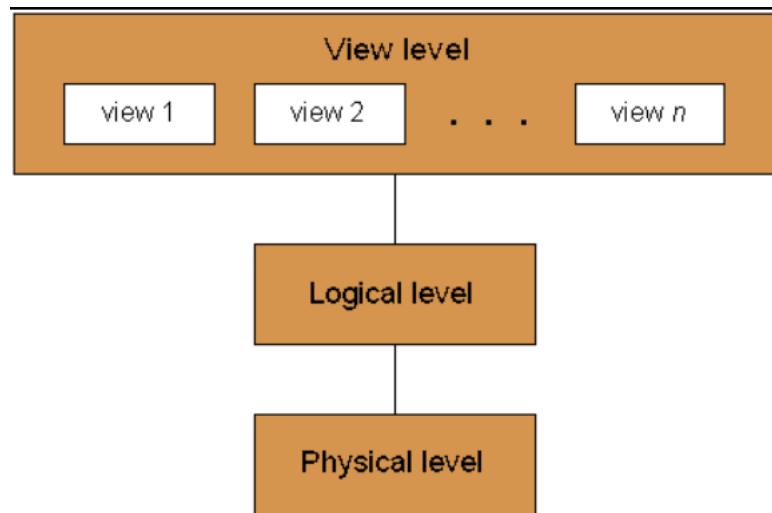
# *DecisionSpace Integration Server's Data Server: Key Concepts*

---

## Data Abstraction

---

Data abstraction enforces a clear separation between the abstract properties of a data type and the concrete details of its implementation. The abstract properties are those that are visible to client code that makes use of the data type—the interface to the data type—while the concrete implementation is kept entirely private, and indeed can change, for example to incorporate efficiency improvements over time. The idea is that such changes are not supposed to have any impact on client code, since they involve no difference in the abstract behavior. (Abstraction (computer science), 2014).



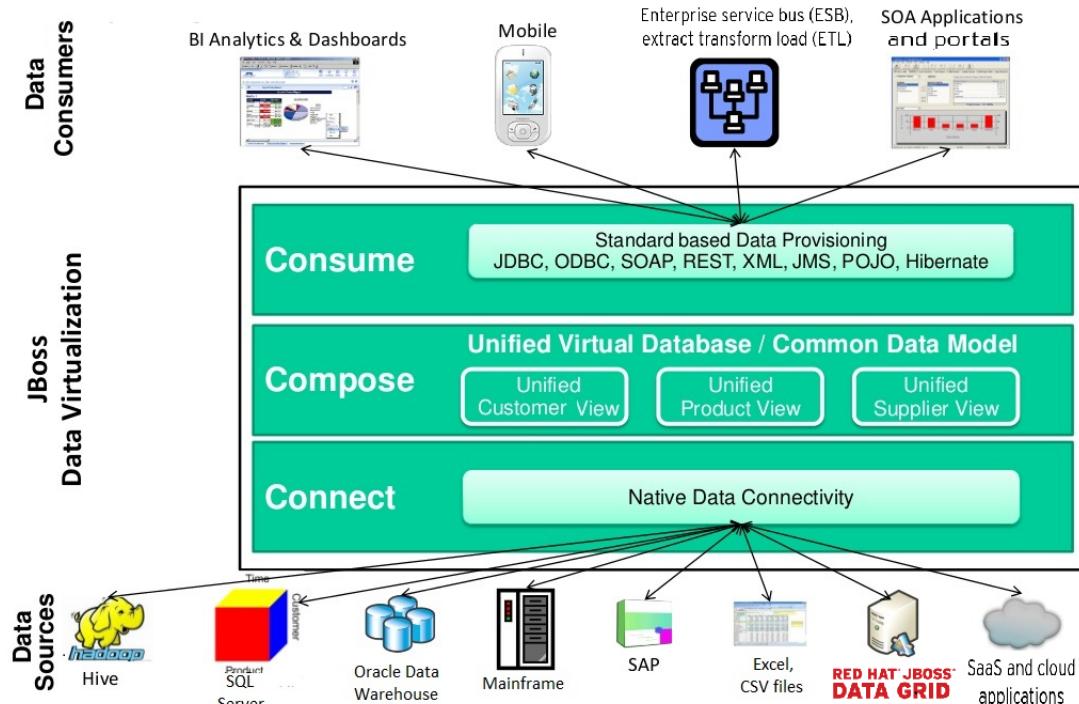
## Data Federation

---

Data federation technology, also called data virtualization<sup>1</sup> technology or data federation services, is software that provides an organization with the ability to collect data from disparate sources and aggregate it in a virtual database where it can be used for business intelligence (BI) or other analysis.

The virtual database created by data federation technology doesn't contain the data itself. Instead, it contains information about the actual data and its location (see metadata). The actual data is left in place.

Making a single call to multiple data sources and then integrating and organizing the data in a middleware layer is also called data virtualization, enterprise information integration (EII) and information-as-a-service, depending on the vendor<sup>2</sup>.



Data Virtualization and Business Intelligence (Rasheed, Syed; Peeples, Kenneth W.; 2013)

---

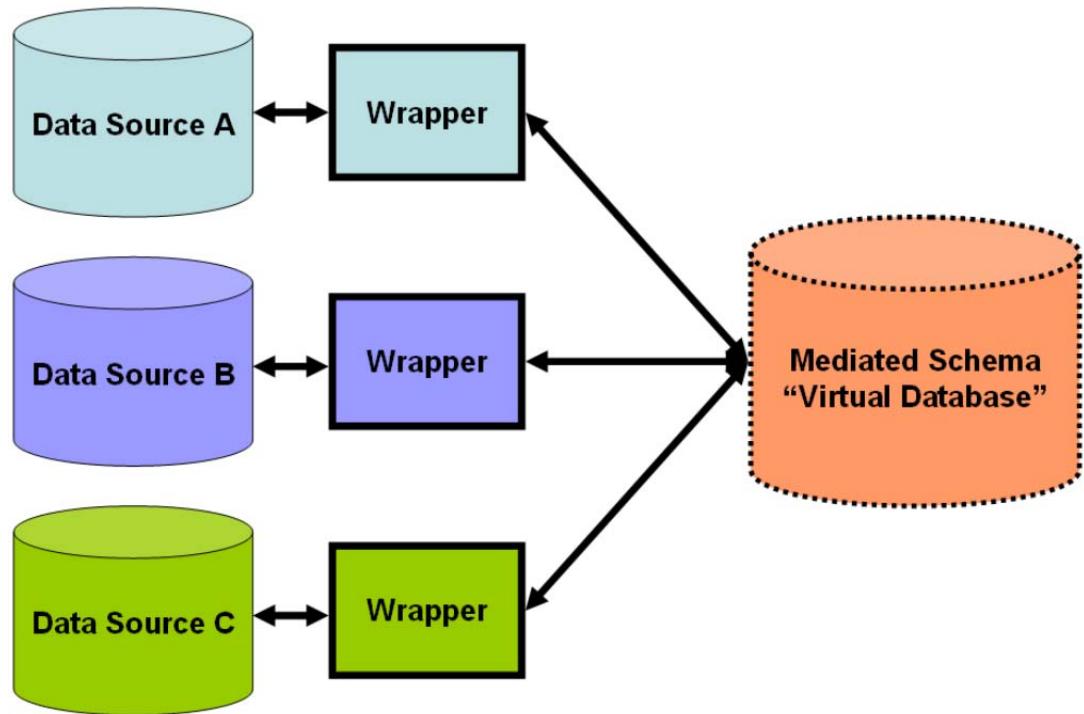
1. Data federation and data virtualization mean slightly different things, however. Please refer to the “Difference between Data Virtualization and Data Federation” on page A-5” Key Concept.

2. [Data federation technology \(data virtualization technology or data federation services\)](#)

## Data Integration

---

Data integration involves combining data residing in different sources and providing users with a unified view of these data<sup>3</sup>.



---

3. Data integration, 2014.

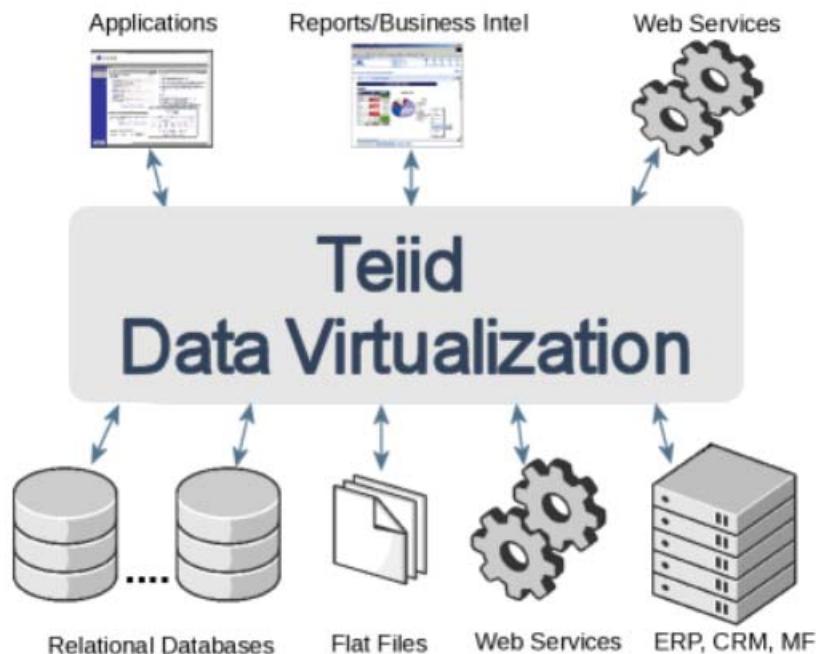
---

## Data Virtualization

---

Data virtualization is an umbrella term used to describe any approach to data management that allows an application to retrieve and manipulate data without needing to know any technical details about the data such as how it is formatted or where it is physically located. (Rouse, 2014)

Data Abstraction (presented above) is the concept, while Data Virtualization is an implementation of that concept.



(Teiid, 2014)

---

## Difference between Data Virtualization and Data Federation

---

The terms data virtualization and data federation can be confusing because some vendors use the labels interchangeably. They do, however, mean slightly different things.

The goal of data federation technology is to aggregate heterogeneous data from disparate sources and view... such data in a consistent manner from a single point of access.

The term data virtualization, however, simply means that the technical information about the data has been hidden. The goal is to present a view of the data that is tailored to a particular business need. Strictly speaking, it does not imply that the data is heterogeneous or that it can be viewed from a single point of access. (Rouse, 2014) Unlike Data Federation it does not attempt to impose a single data model on the data (heterogeneous data). (Data virtualization, 2014).

**Note**

Refer to images for Data Virtualization and Data Federation.

## H2 Database Engine

---

H2 is the Java SQL database. The main features of H2 are:

- Very fast, open source, JDBC API
- Embedded and server modes; in-memory databases
- Browser based Console application
- Small footprint: around 1.5 MB jar file size (H2 Database Engine, 2014).

### H2 Database Engine Cheat Sheet

#### Using H2

- H2 is open source, free to use and distribute.
- Download: [jar](#), [installer \(Windows\)](#), [zip](#).
- To start the H2 Console tool, double click the jar file, or run `java -jar h2*.jar`, `h2.bat`, or `h2.sh`.
- A new database is automatically created by default.
- Closing the last connection closes the database.

#### Documentation

Reference: [SQL grammar](#), [functions](#), [data types](#), [tools](#), [API](#)  
Features: [fulltext search](#), [encryption](#), [read-only \(zip/jar\)](#), [CSV](#),  
[auto-reconnect](#), [triggers](#), [user functions](#)

#### Database URLs

##### Embedded

`jdbc:h2:~/test` 'test' in the user home directory  
`jdbc:h2:/data/test` 'test' in the directory /data  
`jdbc:h2:test` in the current(l) working directory

##### In-Memory

`jdbc:h2:mem:test` multiple connections in one process  
`jdbc:h2:mem:` unnamed private, one connection

##### Server Mode

`jdbc:h2:tcp://localhost/~/test` user home dir  
`jdbc:h2:tcp://localhost//data/test` absolute dir  
Server start: `java -cp * jar org.h2.tools.Server`

##### Settings

`jdbc:h2:...,MODE=MySQL` compatibility (or HSQLDB,...)  
`jdbc:h2:...,TRACE_LEVEL_FILE=3` log to \*.trace.db

#### Using the JDBC API

```
Class.forName("org.h2.Driver");
Connection conn = DriverManager.getConnection("jdbc:h2:~/test");
conn.close();
```

#### Connection Pool

```
import org.h2.jdbcx.JdbcConnectionPool;
JdbcConnectionPool cp = JdbcConnectionPool.create("jdbc:h2:~/test", "sa", "sa");
Connection conn = cp.getConnection();
conn.close(); cp dispose();
```

#### Maven 2

```
<dependency>
<groupId>com.h2database</groupId>
<artifactId>h2</artifactId>
<version>1.4.182</version>
</dependency>
```

#### Hibernate

hibernate.cfg.xml (or use the HSQLDialect):

```
<property name="dialect">
  org.hibernate.dialect.H2Dialect
</property>
```

#### TopLink and Glassfish

Datasource class: `org.h2.jdbcx.JdbcDataSource`  
`oracle.toplink.essentials.platform.database.H2Platform`

H2 Database Engine, 2014

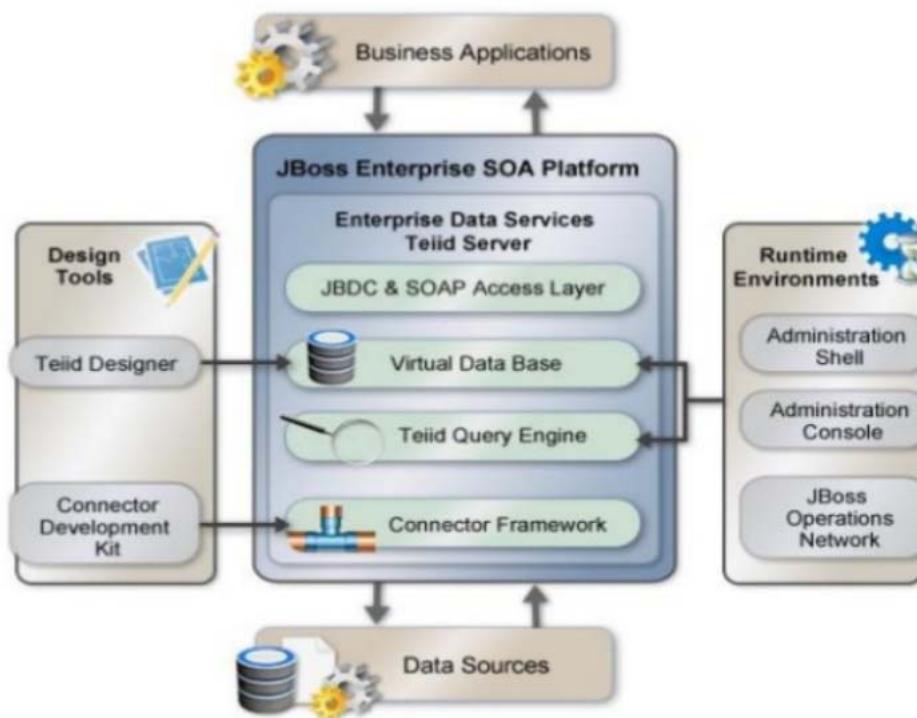
## JBoss Data Virtualization Components

---

JBoss Data Virtualization is a data federation and virtualization engine (the Teiid Server) that can be used to query multiple data sources (RDBMSs, web services, files, application, etc.) as though they were a single unified source.

It builds on the JBoss EAP and SOA Platforms and includes model-driven development tools and rich management capabilities along with a robust runtime.

The Teiid Server Runtime executes as an additional service/capability within the JBoss container. (Rasheed, Syed; Peeples, Kenneth W.;, 2013).



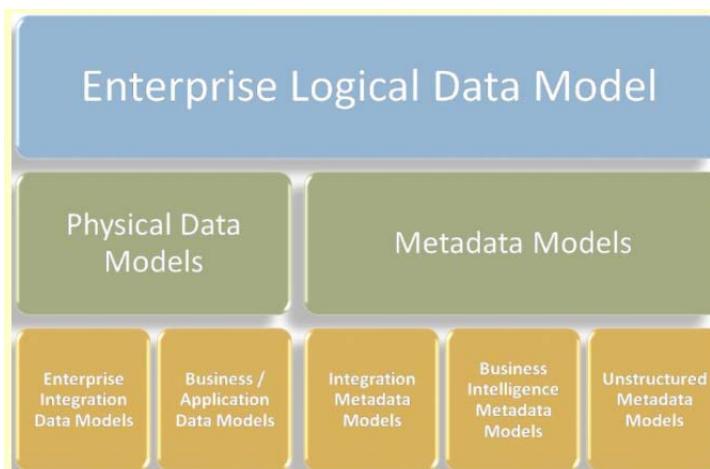
Rasheed, Syed; Peeples, Kenneth W.;, 2013

## **Logical Data Model**

---

A logical data model (LDM) is a type of data model showing a detailed representation of some or all of an organization's data, independent of any particular data management technology, and described in business language. It is typically represented as a diagram, organized in terms of entities and relationships, with underlying definitions. (Logical data model, 2014).

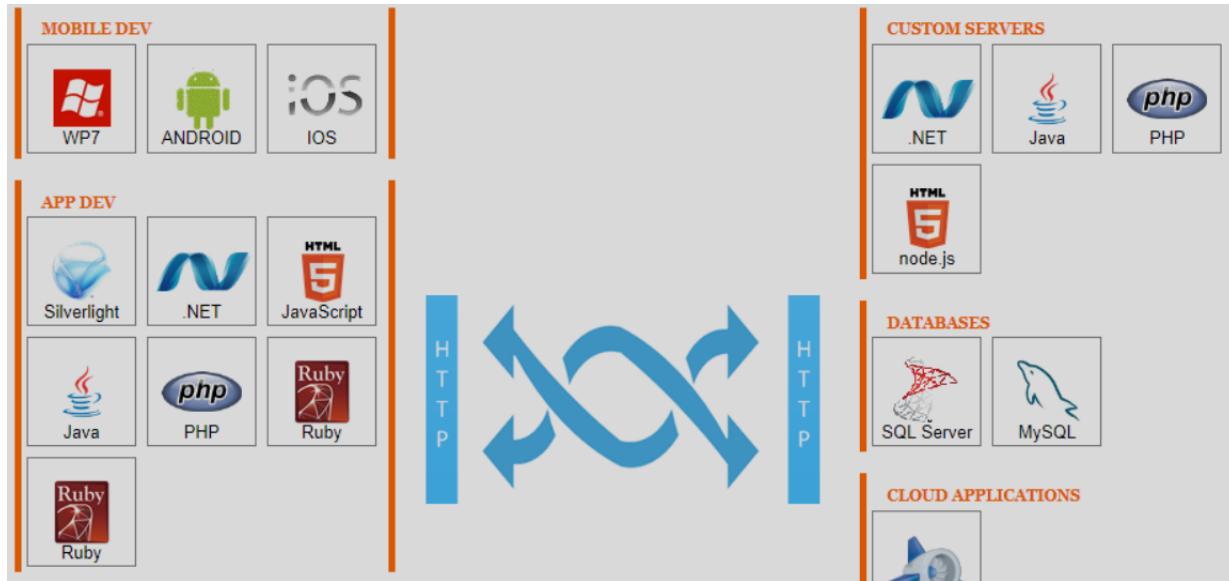
The logical data model is an evolution of the conceptual data model towards a data management technology such as relational databases. Actual implementation of the conceptual model is called a logical data model. To implement one conceptual data model may require multiple logical data models. Data modeling defines the relationships between data elements and structures (Malikaarachchi, 2010).



[Information Systems Analysis - IS 6840: Data Modeling for System Analysis by Varuni Mallikaarachchi](#)

## OData

The Open Data Protocol (OData) is a standardized protocol that enables the creation and consumption of REST APIs, which allow resources, identified using URLs and defined in a data model, to be published and edited by Web clients using simple HTTP messages. (OData).

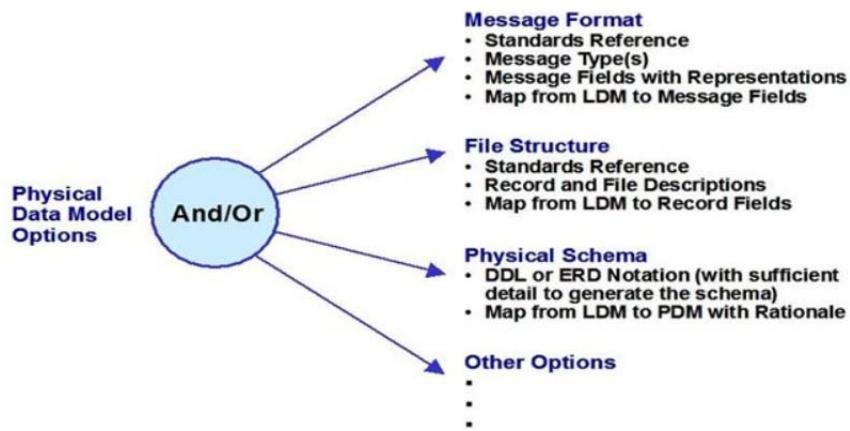


Open Data Protocol

## Physical Data Model

---

Physical data model is a representation of a data design which takes into account the facilities and constraints of a given database management system. Physical data model represents how the model will be built in the database. A physical database model shows all table structures, including column name, column data type, column constraints, primary key, foreign key, and relationships between tables. (Malikaarachchi, 2010).



[Information Systems Analysis - IS 6840: Data Modeling for System Analysis by Varuni Mallikaarachchi](#)

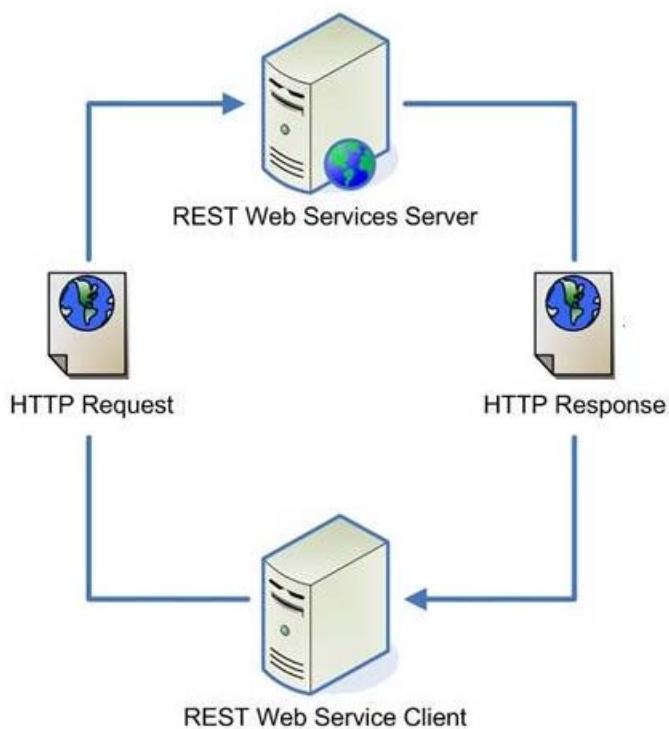
## **REST**

---

REST (Representational State Transfer) is generic design techniques used to describe how a web service can be accessed. It is a simpler alternative to the more complex SOAP/WSDL mechanisms.

REST Web Service follows these basic design principles:

- Use HTTP methods explicitly for CRUD
- Be stateless
- Expose directory structure-like URIs
- Transfer XML, JavaScript Object Notation (JSON) or both



---

## Teiid

---

Teiid is a data virtualization system that allows applications to use data from multiple, heterogeneous data stores.

Teiid is comprised of tools, components and services for creating and executing bi-direction data services. Through abstraction and federation, data is accessed and integrated in real-time across distributed data sources without copying or otherwise moving data from its system of record. (Teiid, 2014)

Refer to the [JBoss Teiid reference page](#) for more details.

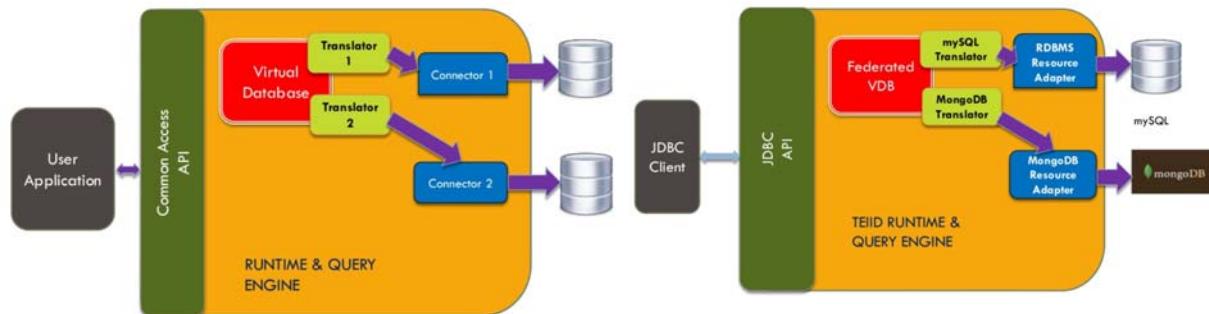
<b>Teiid Parts</b>	<b>Description of Parts</b>
Query Engine	The heart of Teiid is a high-performance query engine that processes relational, XML, XQuery and procedural queries from federated data sources. Features include support for homogeneous schemas, heterogeneous schemas, transactions and user defined functions.
Embedded	An easy-to-use JDBC Driver that can embed the Query Engine in any Java application.
Server	An enterprise ready, scalable, manageable, runtime for the Query Engine that runs inside JBoss AS that provides additional security, fault-tolerance and administrative features.
Connectors	Teiid includes a rich set of Translators and Resource Adapters that enable access to a variety of sources, including most relational databases, web services, text files and LDAP. Need data from a different source? Customer translators and resource adaptors can easily be developed.
Tools	<ul style="list-style-type: none"><li>• Create - Use Teiid Designer to define virtual databases contains views, procedures or even dynamic XML documents.</li><li>• Monitor &amp; Manage - Use the Teiid Web Console with just the AS or the Teiid RHQ plug-in to control any number of servers.</li><li>• Script - Use the Teiid AdminShell to automate administrative and testing tasks.</li></ul>

## Teiid Connector

Multiple resource adapters—that is, one resource adapter per type of EIS—are pluggable into an application server. This capability enables application components deployed on the application server to access the underlying EISs.

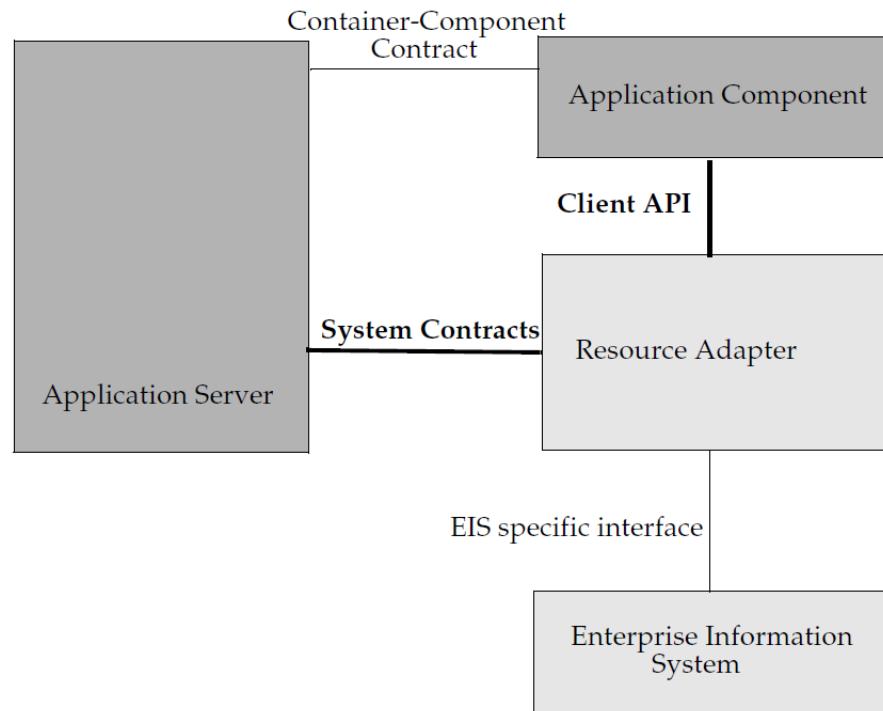
An application server and an EIS collaborate to keep all system-level mechanisms—transactions, security, and connection management-transparent from the application components. As a result, an application component provider focuses on the development of business and presentation logic for its application components and need not get involved in the system-level issues related to EIS integration. This leads to an easier and faster cycle for the development of scalable, secure, and transactional enterprise applications that require connectivity with multiple EISs.

Left image represents the concept, while the right image beneath the left image represents an implementation. Finally, the last image in this section is an overview of the connector architecture.



This architecture is demonstrated in the referenced slide share (Anil Allewar).

Overview of the Connector Architecture



(Java™ EE Connector Architecture Specification version 1.7, 2013)

## Teiid Designer

Teiid Designer, an Eclipse-based GUI tool, can be used to create [Virtual Data Bases] VDBs. This Eclipse-based tool can be used to define source models and import metadata and statistics from them, and can also be used to define relational and XML views on top of those sources. This can be used to abstract the structure of the information that is exposed and used in the applications from the underlying physical data structures. (Teiid, 2014)

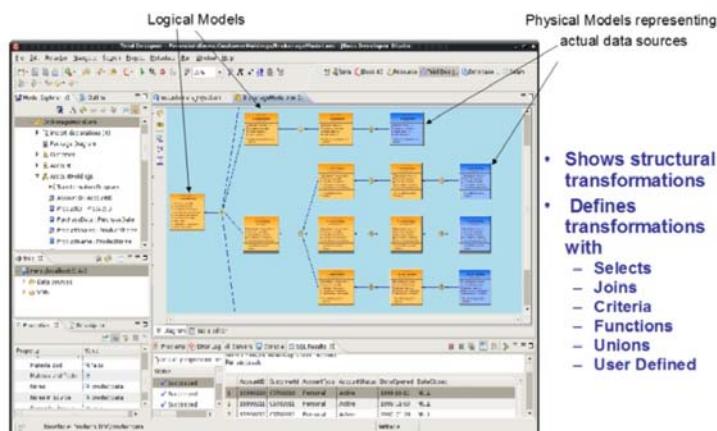
- Teiid Designer
  - ...to dynamically discover data source objects and apply data federation
  - Generate virtual database from 1 or more sources (Anil Allewar)

[Teiid Designer] Creates source models

- By importing metadata
- By manually defining metadata

Creates view models

Creates Virtual Databases (VDB) (Rasheed, Syed; Peeples, Kenneth W.;, 2013)



(Rasheed, Syed; Peeples, Kenneth W.;, 2013)

## **Teiid Resource Adapter**

---

- A resource adapter is a Java EE component that implements the Java EE Connector Architecture for a specific EIS. (What Is a Resource Adapter?, 2014)
- Examples of EISs include ERP, mainframe transaction processing, database systems, and legacy systems not written in the Java programming language. (J2EE Connector Architecture, 2014)
- Provides connectivity to the physical data source
- Integration provided through Java Connector Architecture (JCA) API
- Teiid - Supported EIS:
  - Amazon SimpleDB
  - Apache Accumulo
  - Apache SOLR
  - Cassandra
  - File
  - Google Spreadsheet
  - JPA
  - LDAP
  - Excel – as file
  - SalesForce
  - JDBC
    - MS access, DB2, derby, excel-odbc, greenplum, h2 , hive(for accessing Hadoop), oracle, teradata and most RDBMS
  - MongoDB
  - Object
  - OData
  - OLAP
  - Web Services
  - SAP Netweaver Gateway

(Anil Allewar)

- Can be a JCA Connector or any other custom connection provider. The reason Teiid recommends and uses JCA is this specification defines how one can write, package, and configure access to EIS systems in a consistent manner. There are also various commercial/open source software vendors already providing JCA Connectors to access a variety of back-end systems.
- Abstracts Translators from many common concerns, such as connection information, resource pooling, or authentication.

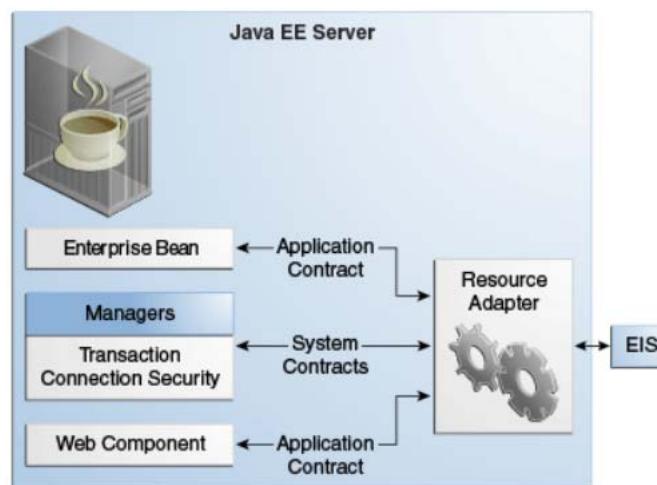
...for every Translator that needs to gather data from external source systems, it requires a resource adapter.

The following resource adapters are available to Teiid.

- **DataSource:** This is provided by the JBoss AS container. This is used by the JDBC Translator.
- **File:** Provides a JEE JCA based Connector to access defined directory on the file system. This is used by the File Translator.
- **WS:** Provides JEE JCA Connector to invoke Web Services using JBoss Web services stack. This is used by the WS Translator.
- **Salesforce:** Provides JEE JCA connector to access Salesforce by invoking their Web Service interface. Used by the SalesForce Translator. (jboss.org Community Documentation, 2014)

The Data Server provides customized resource adapters for:

- OpenWorks
- OPCDA
- InSite



(What is a Resource Adapter?, 2014)

**References:**

- Jboss.org Community Documentation (jboss.org Community Documentation, 2014), especially 1.3.1 Custom Resource Adapters for development procedure.
- Jboss.org Community Documentation (jboss.org Community Documentation, 2014), especially Chapter 2. Developing JEE Connectors for development procedure.
- J2EE Connector Architecture Tutorial by IBM developerWorks (Farrell, Willy;,, 2002)
- J2EE Connector Architecture White Paper: Integrating Java applications with existing Enterprise Applications (J2EE Connector Architecture White Paper: Integrating Java applications with existing Enterprise Applications, 2014)

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## Teiid Translator

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- Provides abstraction layer between Teiid Query Engine and source system
- Converts Teiid SQL commands to source specific execution commands [“native commands”] for the Teiid Resource Adapter to execute
- Converts result data from source system to Teiid specific format (Anil Allewar)

Teiid offers the following translators:

- **JDBC:** Works with many relational databases. The JDBC translator is validated against the following data systems: Oracle, Microsoft SQL Server, IBM DB2, MySQL, Postgres, Derby, Sybase, H2 and HSQL. In addition, the JDBC Translator can often be used with other 3rd-party drivers and provides a wide range of extensibility options to specialize behavior against those drivers.
- **File:** Provides a procedural way to access the file system to handle text files.
- **WS:** Provides procedural access to SML content via Web Services.
- **LDAP:** Accesses LDAP directory services.
- **Salesforce:** Works with Salesforce interfaces. (jboss.org Community Documentation, 2014)

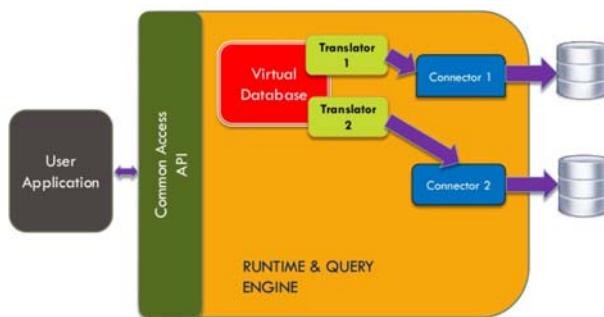
The Data Server provides customized translators for:

- OpenWorks
- EDM
- InSite
- OPC-DA
- PHUB

A Translator also defines the capabilities of a particular source, like whether it can natively support query joins (inner joins, cross joins, etc.) or support criteria.

A Translator [required] along with its Resource Adaptor [optional] must be configured on a Source Model....

A Translator is defined by using one of the default pre-built ones, or it can be custom defined by overriding the default properties of the pre-built ones. (Teiid, 2014)



(Anil Allewar)

### References:

- Joss.org Community Documentation (jboss.org Community Documentation, 2014), especially 1.2.1 Custom Translators for development procedure.
- Boss Community's Project Documentation Editor > Teiid Examples (Reddy, Ramesh; Halbert, Van;, 2013)

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## **Virtual Databases (VDBs)**

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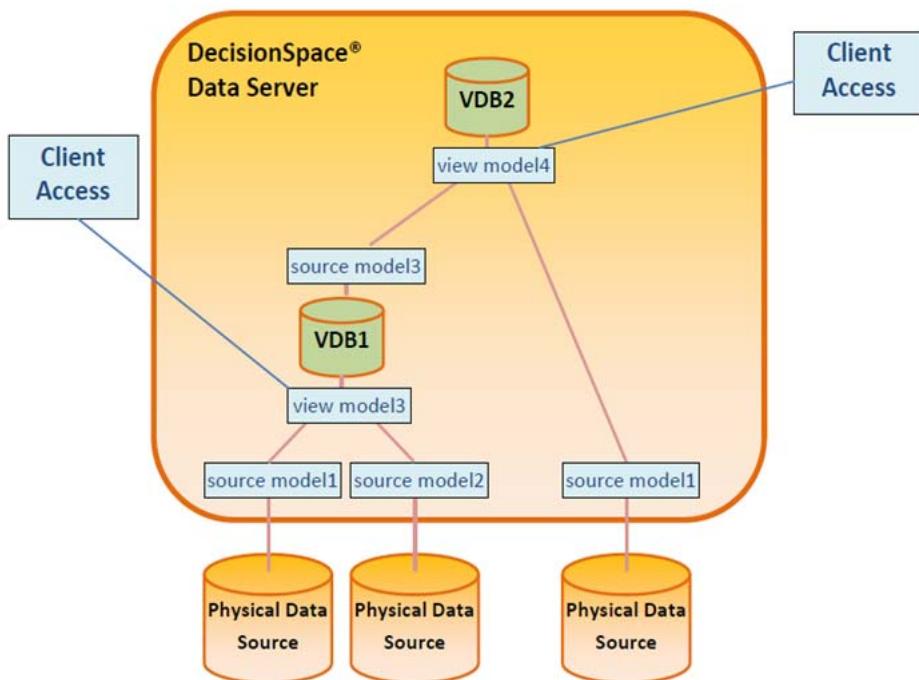
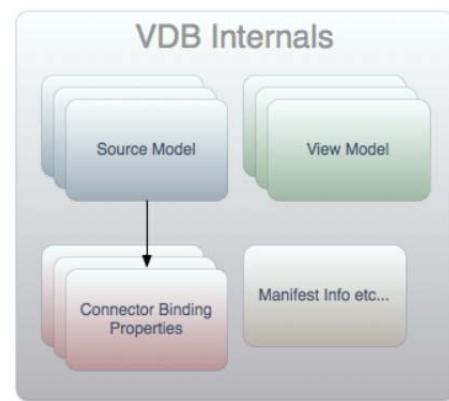
A virtual database (or VDB) is a container for components used to integrate data from multiple data sources, so that they can be accessed in an integrated manner through a single, uniform API.

A VDB contains models, which define the structural characteristics of data sources, views, and Web services. (Teiid, 2014)

- **Source Models**
  - structure and characteristics of physical data sources
- **View Models**
  - structure and characteristics of abstract structures to expose to the applications (Anil Allewar)
  - schema exposed by the VDB
  - represents an abstraction and transformation layer intended for business use
  - views can be relational, XML or Web services

A VDB uses views and procedures to abstract and transform the underlying data model to present only the required data model. It does not store any data, and behaves like a standard JDBC database schema. Data is exposed as a relational model, even if the underlying data source is not relations.

A VDB must be deployed to the Data Server runtime to be accessed. Once deployed, a VDB can be accessed through ODBC-SQL, JDBC-SQL, and REST based Web services.



(Teiid, 2014)

## Verifying Change to Measurement System using an Odata Query

As mentioned within the “Managing Measurement Systems” on page 2-31 of this Training Guide, the Measurement system is passed through the session property in the format: measurementsystem='xxx'. Therefore, an OData Query may be constructed as follows to determine the “fishneck\_length” value within the returned OData Query results:

[http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM\\_Server-EDMDATA/CD\\_REAMER\\_SUB\\_CATALOG?measurementsystem='SPE Preferred Metric'](http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM_Server-EDMDATA/CD_REAMER_SUB_CATALOG?measurementsystem='SPE Preferred Metric')

```

<entry>
  <id>http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM_Server-EDMDATA/CD_REAMER_SUB_CATALOG(CATALOG_ID='A77%20%20%20',CATALOG_ITEM_ID='A78%20%20')</id>
  <content type='application/atom+xml;type=entry'>
    <updated>2014-06-11T23:00:56Z</updated>
    <author>
      <name />
    </author>
    <link rel='edit' title='CD_REAMER_SUB_CATALOG' href='CD_REAMER_SUB_CATALOG(CATALOG_ID='A77%20%20',CATALOG_ITEM_ID='A78%20%20')' />
    <link rel='http://schemas.microsoft.com/ado/2007/08/dataservices/related/CD_CATALOG' href='CD_CATALOG(CATALOG_ID='A77%20%20',CATALOG_ITEM_ID='A78%20%20')/CD_NOZZLE_CATALOG' type='application/atom+xml;type=entry' />
    <link rel='http://schemas.microsoft.com/ado/2007/08/dataservices/related/CD_NOZZLE_CATALOG' href='CD_NOZZLE_CATALOG(CATALOG_ID='A77%20%20',CATALOG_ITEM_ID='A78%20%20')/CD_NOZZLE_CATALOG' type='application/atom+xml;type=feed' />
    <category term='EDM.CD_REAMER_SUB_CATALOG' scheme='http://schemas.microsoft.com/ado/2007/08/dataservices/scheme' />
    <content type='application/xml'>
      <cm:properties>
        <d:MATERIAL_NUM m:null='true' />
        <d:LINEAR_CAPACITY m:type='Edm.Single'>0.7948371</d:LINEAR_CAPACITY>
        <d:UPPER_FLOW_ID m:null='true' />
        <d:BIT_FLOW_ID m:null='true' />
        <d:IS_PORT_OPEN m:null='true' />
        <d:UPDATE_DATE m:type='Edm.DateTime' m:null='true' />
        <d:PRESS_RATING_TOP m:type='Edm.Single' m:null='true' />
        <d:CATALOG_ID m:type='Edm.String' m:null='true' />
        <d:PILOT_HOLE_SIZE m:type='Edm.Single' m:null='true' />
        <d:TFA m:type='Edm.Single' m:null='true' />
        <d:SECT_TYPE_CODE-BS></d:SECT_TYPE_CODE>
        <d:NOMINAL_SIZE_X3_1_2_X1_1_4></d:NOMINAL_SIZE>
        <d:API_INDICATOR_N></d:API_INDICATORS>
        <d:OD_ORIFICE m:type='Edm.Single' m:null='true' />
        <d:COMP_TYPE_CODE-BPR></d:COMP_TYPE_CODE>
        <d:FISHNECK_LENGTH m:type='Edm.Single'>0.9144</d:FISHNECK_LENGTH>
        <d:INTERNAL_REF m:null='true' />
        <d:PRESSURE_BURST m:type='Edm.Single' m:null='true' />
      </cm:properties>
    </content>
  </entry>

```

The change from "ft" to "us\_ft" mentioned in Creating Measurement Systems can also be verified using this method (observe that in the slide to the Left in Figure 53: 'US Oil Field' (Left) vs. 'test' (Right) to verify "ft" vs. "us\_ft", respectively), the highlighted FISHNECK\_LENGTH for 'US Oil Field' is 1.5 (highlighted in blue) whereas in the slide to the Right, the highlighted FISHNECK\_LENGTH for 'test' is 1.499997 (highlighted in blue)).

[http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM\\_Server-EDMDATA/CD\\_reamer\\_sub\\_catalog?measurementsystem='US Oil Field'](http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM_Server-EDMDATA/CD_reamer_sub_catalog?measurementsystem='US Oil Field')

```

<?xml version="1.0" encoding="utf-8"?>
<feed type="application/atom+xml">
  <entry>
    <id>http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM_Server-EDMDATA/CD_reamer_sub_catalog</id>
    <updated>2014-06-11T22:33:08Z</updated>
    <link rel="self" title="CD_reamer_sub_catalog" href="CD_reamer_sub_catalog" />
    <author>
      <name/>
    </author>
    <link rel="edit" title="CD_reamer_sub_catalog" href="CD_reamer_sub_catalog(CATALOG_ID='A77%20%20%20')/CATALOG_ITEM_ID='A78%20%20%20'" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CD_CATALOG" type="application/atom+xml;type=entry" title="CD_CATALOG" href="CD_reamer_sub_catalog(CATALOG_ID='A77%20%20%20')/CD_CATALOG" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CD_NOZZLE_CATALOG" type="application/atom+xml;type=feed" title="CD_NOZZLE_CATALOG" href="CD_reamer_sub_catalog(CATALOG_ID='A77%20%20%20')/CD_NOZZLE_CATALOG" />
    <category term="EDM_CD_reamer_sub_catalog" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <mp:properties>
        <cd:MATERIAL_NUM m:null="true" />
        <cd:LINEAR_CAPACITY m:type="Edm.Single" m:null="0.0015238095" />
        <cd:UPPER_APPL_ID m:null="true" />
        <cd:IS_BIT_FLOW m:null="true" />
        <cd:IS_PORT_OPEN m:null="true" />
        <cd:UPDATE_DATE m:type="Edm.DateTime" m:null="true" />
        <cd:PRESS_RATING_TOP m:type="Edm.Single" m:null="true" />
        <cd:CATALOG_ID_A m:type="Edm.String" />
        <cd:PILOT_HOLE_SIZE m:type="Edm.Single" m:null="true" />
        <cd:TFA m:type="Edm.Single" m:null="true" />
        <cd:SECT_TYPE_CODE_BS m:type="Edm.String" />
        <cd:NOMINAL_SIZE_3_1_2_X_1_4_D m:type="Edm.String" />
        <cd:PRESS_RATING_BOT m:type="Edm.Single" m:null="true" />
        <cd:APIL_INDICATOR_N m:type="Edm.String" />
        <cd:OD_ORIFICE m:type="Edm.Single" m:null="true" />
        <cd:COMP_TYPE_CODE_BPR m:type="Edm.String" />
        <cd:FISHNECK_LENGTH m:type="Edm.Single" />
        <cd:MANUFACTURER m:null="true" />
        <cd:LENGTH m:type="Edm.Single" />
      </mp:properties>
    </content>
  </entry>
</feed>

```

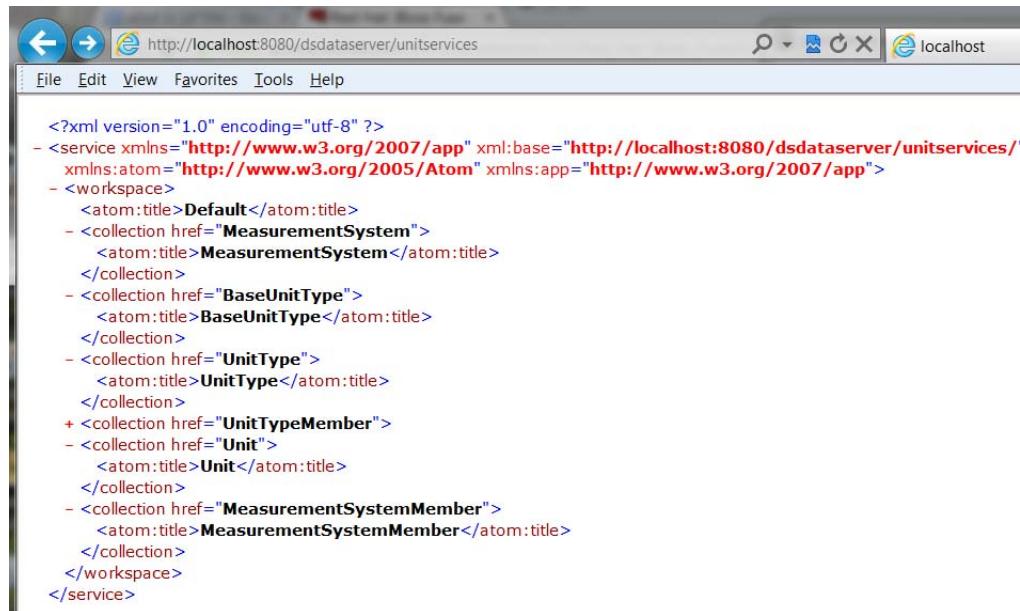
[http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM\\_Server-EDMDATA/CD\\_reamer\\_sub\\_catalog?measurementsystem='test'](http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM_Server-EDMDATA/CD_reamer_sub_catalog?measurementsystem='test')

```

<?xml version="1.0" encoding="utf-8"?>
<feed type="application/atom+xml">
  <entry>
    <id>http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM_Server-EDMDATA/CD_reamer_sub_catalog</id>
    <updated>2014-06-11T22:31:01Z</updated>
    <link rel="self" title="CD_reamer_sub_catalog" href="CD_reamer_sub_catalog" />
    <author>
      <name/>
    </author>
    <link rel="edit" title="CD_reamer_sub_catalog" href="CD_reamer_sub_catalog(CATALOG_ID='A77%20%20%20')/CATALOG_ITEM_ID='A78%20%20%20'" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CD_CATALOG" type="application/atom+xml;type=entry" title="CD_CATALOG" href="CD_reamer_sub_catalog(CATALOG_ID='A77%20%20%20')/CD_CATALOG" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CD_NOZZLE_CATALOG" type="application/atom+xml;type=feed" title="CD_NOZZLE_CATALOG" href="CD_reamer_sub_catalog(CATALOG_ID='A77%20%20%20')/CD_NOZZLE_CATALOG" />
    <category term="EDM_CD_reamer_sub_catalog" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <mp:properties>
        <cd:MATERIAL_NUM m:null="true" />
        <cd:LINEAR_CAPACITY m:type="Edm.Single" m:null="0.0015238095" />
        <cd:UPPER_APPL_ID m:null="true" />
        <cd:IS_BIT_FLOW m:null="true" />
        <cd:IS_PORT_OPEN m:null="true" />
        <cd:UPDATE_DATE m:type="Edm.DateTime" m:null="true" />
        <cd:PRESS_RATING_TOP m:type="Edm.Single" m:null="true" />
        <cd:CATALOG_ID_A m:type="Edm.String" />
        <cd:PILOT_HOLE_SIZE m:type="Edm.Single" m:null="true" />
        <cd:TFA m:type="Edm.Single" m:null="true" />
        <cd:SECT_TYPE_CODE_BS m:type="Edm.String" />
        <cd:NOMINAL_SIZE_3_1_2_X_1_4_D m:type="Edm.String" />
        <cd:PRESS_RATING_BOT m:type="Edm.Single" m:null="true" />
        <cd:APIL_INDICATOR_N m:type="Edm.String" />
        <cd:OD_ORIFICE m:type="Edm.Single" m:null="true" />
        <cd:COMP_TYPE_CODE_BPR m:type="Edm.String" />
        <cd:FISHNECK_LENGTH m:type="Edm.Single" />
        <cd:INTERNAL_REF m:null="true" />
        <cd:PRESSURE_BURST m:type="Edm.Single" m:null="true" />
      </mp:properties>
    </content>
  </entry>
</feed>

```

[http://DSDSServer:http\\_port/dsdataserver/unitsservices](http://DSDSServer:http_port/dsdataserver/unitsservices)



```

<?xml version="1.0" encoding="utf-8" ?>
- <service xmlns="http://www.w3.org/2007/app" xml:base="http://localhost:8080/dsdataserver/unitsservices/" xmlns:atom="http://www.w3.org/2005/Atom" xmlns:app="http://www.w3.org/2007/app">
- <workspace>
  - <collection href="MeasurementSystem">
    <atom:title>MeasurementSystem</atom:title>
  </collection>
  - <collection href="BaseUnitType">
    <atom:title>BaseUnitType</atom:title>
  </collection>
  - <collection href="UnitType">
    <atom:title>UnitType</atom:title>
  </collection>
  + <collection href="UnitTypeMember">
  - <collection href="Unit">
    <atom:title>Unit</atom:title>
  </collection>
  - <collection href="MeasurementSystemMember">
    <atom:title>MeasurementSystemMember</atom:title>
  </collection>
</workspace>
</service>

```

- **Query all Units**
  - [http://DSDSServer:http\\_port/dsdataserver/unitsservices/Unit](http://DSDSServer:http_port/dsdataserver/unitsservices/Unit)
- **Query a specific Unit** (unit-id 176 = OpenWorks rpm)
  - [http://DSDSServer:http\\_port/dsdataserver/unitsservices/Unit\(176\)](http://DSDSServer:http_port/dsdataserver/unitsservices/Unit(176))
- **Query all UnitTypes in a BaseUnitType** (BaseUnitType-id 34 = angular velocity)
  - [http://DSDSServer:http\\_port/dsdataserver/unitsservices/UnitType?\\$filter=base\\_type\\_id\\_eq\\_34](http://DSDSServer:http_port/dsdataserver/unitsservices/UnitType?$filter=base_type_id_eq_34)
    - OpenWorks: angular velocity, frequency
    - InSite: Engine Speed, Frequency, GB RotarySpeed, Rotary Speed, Rotation rate, Spinner rate, Viscometer spd
- **Query all Units in a Base Unit Type** (BaseUnitType-id 34 = angular velocity)
  - [http://DSDSServer:http\\_port/dsdataserver/unitsservices/Unit?\\$filter=base\\_type\\_id\\_eq\\_34](http://DSDSServer:http_port/dsdataserver/unitsservices/Unit?$filter=base_type_id_eq_34)
    - OpenWorks: c/s, dega/min, dega/sec, Hz, kHz, MHz, rad/s, rev/min, rev/s, rpm,
    - InSite: deg per min, dps, deg per sec, Hertz, KiloHertz, MegaHertz, rad per sec, rev per min, rev per sec
    - EDM: deg sec, rad s, rps
- **Query all Units in a Unit Type** (UnitType-id 43 = angular velocity)
  - [http://DSDSServer:http\\_port/dsdataserver/unitsservices/UnitTypeMember?\\$filter=unit\\_type\\_id\\_eq\\_43](http://DSDSServer:http_port/dsdataserver/unitsservices/UnitTypeMember?$filter=unit_type_id_eq_43)
    - Unit Ids: 156, 161, 162, 164, 165, 168, 170, 174, 176
    - Unit Names: c/s, dega/min, dega/sec, Hz, kHz, MHz, rad/s, rev/min, rpm

- **Query all UnitsTypes a Unit belongs to** (Unit-id 176 = OpenWorks *rpm*)
  - [http://DSDSServer:http\\_port/dsdataserver/unitservices/UnitTypeMember?\\$filter=unit\\_type\\_id eq 176](http://DSDSServer:http_port/dsdataserver/unitservices/UnitTypeMember?$filter=unit_type_id eq 176)  
Unit Type ids: 43, 314, 701  
Unit Type names: angular velocity (OW), frequency (OW), Revolutions/Minute (EDM)
- **Query all Unit Types in a Measurement System** (meassys\_id 1 = US Oil Field)
  - [http://DSDSServer:http\\_port/dsdataserver/unitservices/MeasurementSystemMember?\\$filter=measurement\\_id eq 1](http://DSDSServer:http_port/dsdataserver/unitservices/MeasurementSystemMember?$filter=measurement_id eq 1)
- **Query the Unit of a particular UnitType of a particular MeasurementSystem**  
MeasurementSystem-id: 1 = US OIL FIELD, 2 = SPE PREFERRED METRIC  
UnitType-id 449 = length
  - [http://DSDSServer:http\\_port/dsdataserver/unitservices/MeasurementSystemMember?\\$filter=measurement\\_id eq 1 and unit\\_type\\_id eq 449](http://DSDSServer:http_port/dsdataserver/unitservices/MeasurementSystemMember?$filter=measurement_id eq 1 and unit_type_id eq 449)  
Unit id = 1154 Unit name = feet
  - [http://DSDSServer:http\\_port/dsdataserver/unitservices/MeasurementSystemMember?\\$filter=measurement\\_id eq 2 and unit\\_type\\_id eq 449](http://DSDSServer:http_port/dsdataserver/unitservices/MeasurementSystemMember?$filter=measurement_id eq 2 and unit_type_id eq 449)  
Unit id = 1154 Unit name = meters
- **DSDS Odata API provides functions to do unit conversion:**
  - `convertSingleValue,convertDoubleArray, convertLong Array`

---

## Data Server Carto REST End Points

---

- Query all CRSs
  - [http://DSDSServer:http\\_port/dsdataserver/cartoservices/Carto](http://DSDSServer:http_port/dsdataserver/cartoservices/Carto)
- Query a particular CRS
  - [http://DSDSServer:http\\_port/dsdataserver/Carto\(667\)](http://DSDSServer:http_port/dsdataserver/Carto(667))
  - [http://DSDSServer:http\\_port/dsdataserver/cartoservices/Carto?\\$filter=crs\\_name eq 'utm-55'](http://DSDSServer:http_port/dsdataserver/cartoservices/Carto?$filter=crs_name eq 'utm-55')

### Specifying CRS Conversion

- OData Client, with URL
  - [http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM\\_SqlServer-EDMtraining/CD\\_WELL?cartosystem='utm-55'](http://localhost:8080/dsdataserver/dsl.svc/EDM/1/EDM_SqlServer-EDMtraining/CD_WELL?cartosystem='utm-55')
- .Net client, with request header
  - `e.RequestMessage.SetHeader("cartosystem", "utm-55");`
- JDBC Client
  - `teiid_session_set("cartosystem", "utm-55");`

## Default File-based Authentication

---

### Default File-based Authentication

```
<security-domain name="dsds-security-domain" cache-type="default">
    <authentication>
        <login-module code="UsersRoles" flag="required">
            <module-option name="usersProperties" value="${jboss.server.config.dir}/dsds-security-users.properties"/>
            <module-option name="rolesProperties" value="${jboss.server.config.dir}/dsds-security-roles.properties"/>
            <module-option name="password-stacking" value="useFirstPass"/>
        </login-module>
    </authentication>
</security-domain>
```

standalone-dsds.xml

```
user=example-role          dsds-security-roles.properties
dsds=dsds-user-role
dsdsadmin=dsds-user-role,dsds-admin-role
edn=dsds-user-role,dsds-admin-role
ednadmin=dsds-user-role,dsds-admin-role
```

dsds-security-users.properties

```
user=user
dsds=dsds
dsdsadmin=dsdsadmin
edn=Landmark1
ednadmin=Landmark1
```

## Code Snippet for Specifying a Measurement System in an Application

```
private void setUnitConversionSystem(Connection connection,
    String measurementSystem) throws SQLException {
    String sql = "select teiid_session_set(?,?)";
    PreparedStatement prepStmt = connection.prepareStatement(sql);
    prepStmt.setString(1, "measurementsystem");
    if (measurementSystem == null) {
        prepStmt.setNull(2, java.sql.Types.VARCHAR);
    } else {
        prepStmt.setString(2, measurementSystem);
    }
    prepStmt.execute();

    sql = "select teiid_session_get(?)";
    prepStmt = connection.prepareStatement(sql);
    prepStmt.setString(1, "measurementsystem");

    ResultSet resultSet = prepStmt.executeQuery();
    // Display the actual data
    while (resultSet.next()) {
        System.out.println("The measurement system set is:"
            + resultSet.getString(1));
    }
}
```

“SPE Preferred Metric” or  
“US Oil Field”

## Dynamic and Standard VDBs in XML Format to Show Internal Details

### OpenWorks VDB (Dynamic)

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<vdb name="OpenWorks" version="1">
  <description></description>

  <!-- Setting to use connector supplied metadata. Can be "true" or "cached". "true" will obtain metadata once for every launch of Teiid. "cached" will save a file containing the metadata into the deploy/<vdb name>/vdb version/META-INF directory -->
  <property name="UseConnectorMetadata" value="true" />

  <!-- Each model represents a access to one or more sources. The name of the model will be used as a top level schema name for all of the metadata imported from the connector.
  NOTE: Multiple model, with different import settings, can be bound to the same connector binding and will be treated as the same source at runtime. -->
  <model name="OVS-BBP"> ← Model name

    <!-- Each source represents a translator and data source. There are pre-defined translators, or you can create one. -->
    <!-- Property to let DSDB know of what type is the VDB model so that it we can be grouped accordingly. -->
    <property name="importer.importKeys" value="true"/>
    <property name="importer.useFullSchemaName" value="false"/>
    <property name="importer.widenUnsignedTypes" value="false"/>
    <property name="importer.schemaPattern" value="%"/>
    <property name="supports-multi-source-bindings" value="true"/> ← true indicates that this model is a multi-source
    <property name="multisource.columnName" value="TEIID_MULTI_DATA_SOURCE_COLUMN"/>
    <property name="multisource.addColumn" value="true"/>
    <source translator-name="delegate" connection-jndi-name="java:/NORWAY/5000.8.3" name="NORWAY" />
    <source translator-name="delegate" connection-jndi-name="java:/TEAPOT/5000.8.3" name="TEAPOT" />
  </model>
  <translator name="delegate" type="interceptor">
    <property name="delegateName" value="openworks" /> ← Translator
  </translator>
</vdb>
```

**NORWAY and TEAPOT**  
are *connection names* for the Data Sources

**SELECT \* FROM Well WHERE TEIID\_MULTI\_DATA\_SOURCE\_COLUMN='TEAPOT'**

### EDM VDB (Dynamic)

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<vdb name="EDM_SQLServer" version="1">
  <description></description>

  <!-- Setting to use connector supplied metadata. Can be "true" or "cached".
  "true" will obtain metadata once for every launch of Teiid.
  "cached" will save a file containing the metadata into the deploy/<vdb name>/vdb version/META-INF directory
  -->
  <property name="UseConnectorMetadata" value="true" />

  <!-- Each model represents a access to one or more sources.
  The name of the model will be used as a top level schema name for all of the metadata imported from the connector.
  NOTE: Multiple model, with different import settings, can be bound to the same connector binding and will be treated as the same source at runtime.
  -->
  <model name="EDM">

    <!-- Each source represents a translator and data source. There are pre-defined translators, or you can create one. -->
    <!-- Property to let DSDB know of what type is the VDB model so that it we can be grouped accordingly. -->
    <property name="importer.importKeys" value="true"/>
    <property name="importer.useFullSchemaName" value="false"/>
    <property name="importer.widenUnsignedTypes" value="false"/>
    <property name="importer.schemaPattern" value="dbo"/>
    <property name="supports-multi-source-bindings" value="true"/>
    <property name="multisource.columnName" value="TEIID_MULTI_DATA_SOURCE_COLUMN"/>
    <property name="multisource.addColumn" value="true"/>
    <source translator-name="delegate" connection-jndi-name="java:/UDTraining_EDM/5000.1.10" name="UDTraining_EDM" />
  </model>
  <translator name="delegate" type="interceptor">
    <property name="delegateName" value="EdmTranslator" />
  </translator>
</vdb>
```

## Federated VDB (Dynamic)

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<vdb name="EDH_SqlServer" version="1">
    <description></description>

    <!-- Setting to use connector supplied metadata. Can be "true" or "cached".
        "true" will obtain metadata once for every launch of Teiid.
        "cached" will save a file containing the metadata into
        the deploy/<vdb name>/vdb version/META-INF directory
    -->
    <property name="UseConnectorMetadata" value="true" />

    <!-- Each model represents a access to one or more sources.
        The name of the model will be used as a top level schema name
        for all of the metadata imported from the connector.

        NOTE: Multiple model, with different import settings, can be bound to the
        same connector binding and will be treated as the same source at runtime.
    -->
    <model name="EDH">

        <!-- Each source represents a translator and data source. There are
            pre-defined translators, or you can create one. -->
        <!-- Property to let DSdataserver know of what type is the VDB model so
            that it can be grouped accordingly. -->

        <property name="importer.importKeys" value="true"/>
        <property name="importer.useFullSchemaName" value="False"/>
        <property name="importer.widenUnsignedTypes" value="false"/>
        <property name="importer.schemaPattern" value="dbo"/>
        <property name="supports-multi-source-bindings" value="true"/>
        <property name="multisource.columnName" value="TEIID_MULTI_DATA_SOURCE_COLUMN"/>
        <property name="multisource.addColumn" value="true"/>
        <source translator-name="delegate" connection-jndi-name="java:/DWtraining_EDH/5000.1.10"
            name="DWtraining_EDH" />
    </model>
    <translator name="delegate" type="interceptor">
        <property name="delegateName" value="EdmTranslator" />
    </translator>
</vdb>

```

## JDBC Access from a Java Application

```

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.ResultSetMetaData;
import java.sql.SQLException;
import java.sql.Statement;
import com.lgc.dsl.client.BaseOperations;

public class JDBCEntityOperations extends BaseOperations {
    /**
     * The Constant TEIID_SAMPLE_DB_URL_.
     */
    private static final String TEIID_SAMPLE_DB_URL =
        "jdbc:teiid:ExampleUDB@mm://localhost:31000;version=1;ApplicationName=Example";

    public static void main(String[] args) throws ClassNotFoundException,
        SQLException {
        String primaryKey = "TestWell";
        JDBCEntityOperations jdbcEntityOps = new JDBCEntityOperations();

        Class.forName("org.teiid.jdbc.TeiidDriver");
        Connection connection = DriverManager.getConnection(
            TEIID_SAMPLE_DB_URL, "user", "user");

        private void insertEntity(Connection connection, String primaryKey)
            throws SQLException {
            String sql = "INSERT INTO CD_WELL (WELL_ID, WELL_DESC,SITE_ID,REMARKS,TIGHT_GROUP_ID,
            TEIID_MULTI_DATA_SOURCE_COLUMN) VALUES (?, ?, ?, ?, ?, ?)";

            PreparedStatement prepStmt = connection.prepareStatement(sql);
            prepStmt.setString(1, primaryKey);
            prepStmt.setString(2, "TestDesc");
            prepStmt.setString(3, "SiteA");
            prepStmt.setString(4, "Test Create");
            prepStmt.setString(5, "testgrp");
            prepStmt.setString(6, "Example");

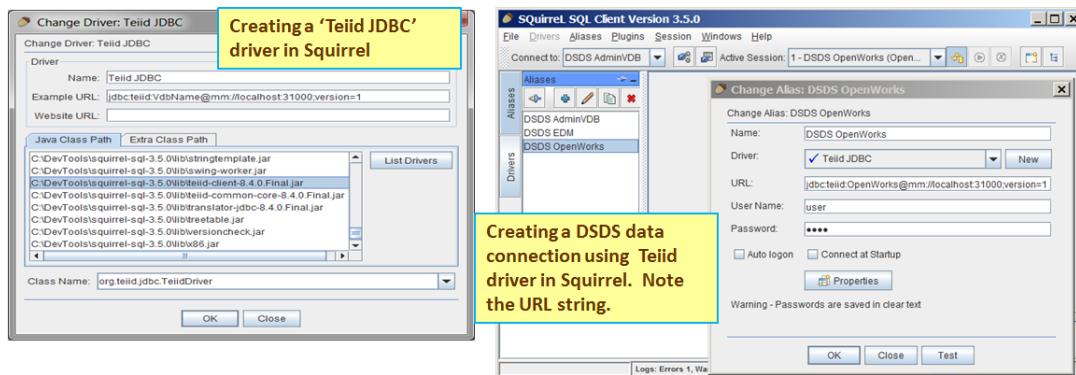
            int result = prepStmt.executeUpdate();

            System.out.println("The result of INSERT operation is: " + result);
        }
    }
}

```

## Setting Up the Squirrel SQL Tool for JDBC Access to the Data Server

- Install Squirrel (download the exe [squirrel-sql-3.5.x-standard.jar](#))
- Copy Teiid JDBC driver jar files (from DSDS installation) to the Squirrel lib folder. The driver enables Squirrel to access the VDBs deployed in DSDS
- In Squirrel, define a new driver (eg: [Teiid JDBC](#)) that uses the copied Teiid jars. The Java class path for the Teiid driver is [org.teiid.jdbc.TeiidDriver](#)
- In Squirrel, create a new data connection to a DSDS VDB using the Teiid JDBC driver and specify a JDBC Connection string to that VDB



---

## Consumer API Requirements

---

➤ **JAVA Options:**

- OData feed
  - Restlet generated Java objects; supports XML feed only (not generic, very specific to a particular VDB)
  - OData4j
- JDBC
  - JDBC API
  - Teiid JDBC jars

➤ **.NET Options:**

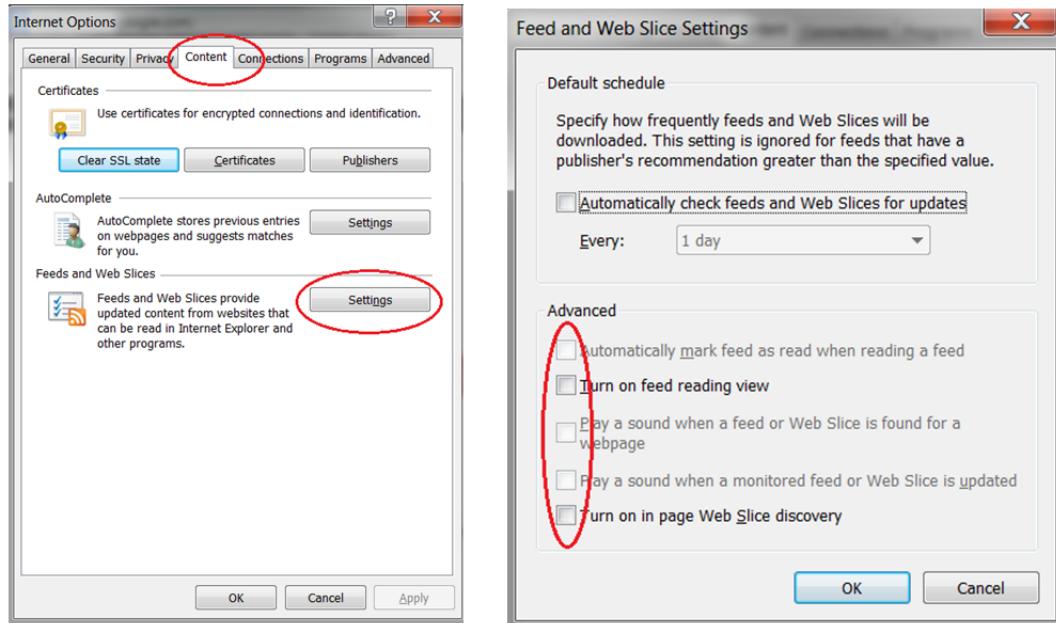
- Visual Studio 2012 or higher
- .NET framework 4.5 or higher
- Microsoft WCF Data Services Client based on Entity Framework (ODataLib and EdmLib); supports XML and JSON-Lite feeds (not JSON-Verbose)
- ODBC API, or ADO.NET
- Simple.OData.Client

## OData Access Using a Browser

---

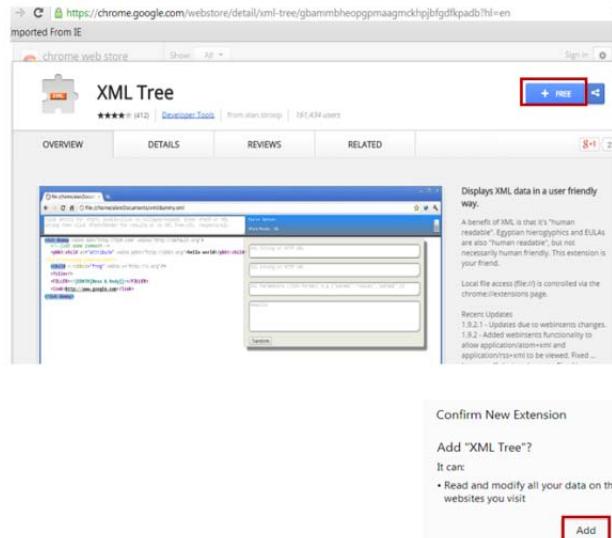
- If using Internet Explorer (version 9 or above), it must be configured to turn off all settings for **feed and web slices** in order to see the raw XML behind the feed.

IE > Tools > Internet Options

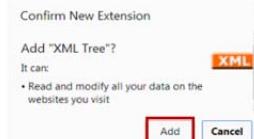


- If using Chrome, install the XML Tree plug-in to see the raw XML behind the feed:

<https://chrome.google.com/webstore/detail/xml-tree/gbammbheopgpmaagmckhpjbfdfkpadb?hl=en>



- In Chrome, navigate to the above URL.
- Click the **FREE** button to install XML Tree plug-in.
- Click **Add** on the **Confirm New Extension** dialog.



---

## OData Access from a Java Application

---

```
import org.odata4j.consumer.ODataConsumer;
import org.odata4j.consumer.ODataConsumers;
import org.odata4j.consumer.behaviors.OClientBehaviors;
import org.odata4j.core.OEntity;
import org.odata4j.core.OEntityKey;
import org.odata4j.core.OProperties;
import org.odata4j.core.OProperty;
import org.odata4j.edm.EdmEntityType;

public static void main(String[] args) throws Exception {
    ODataConsumer consumer = ODataConsumers
        .newBuilder()
        .withEndpoint("http://localhost:8080/dsdataserver/dsl.svc/ExpModel/1/ExampleVDB-Example/")
        .setClientBehaviors(OClientBehaviors.basicAuth("user", "user"))
        .build();

    ODataEntityOperations operationExample = new ODataEntityOperations();

    operationExample.startOperationLayout("readEntities");
    operationExample.readEntities(consumer);
    operationExample.closeOperationLayout();

    OEntityKey key = operationExample.createEntity(consumer);
    System.out.println("Created CD_WELL:" + key.toKeyString());

    private OEntityKey createEntity(ODataConsumer consumer) {
        OEntity wellToInsert = consumer.createEntity("CD_WELL")
            .properties(OProperties.string("TIGHT_GROUP_ID", "testGrp"))
            .properties(OProperties.string("REMARKS", "Test Create"))
            .properties(OProperties.string("WELL_ID", "TestWell"))
            .properties(OProperties.string("WELL_DESC", "TestDesc"))
            .properties(OProperties.string("SITE_ID", "SiteA")).execute();

        return wellToInsert.getEntityKey();
    }
}
```

## OData Access Examples using URL Conventions with the Internet Explorer

### Return Data Models for Active VDB Deployments

```

<?xml version="1.0" encoding="utf-8" ?>
- <feed xmlns="http://www.w3.org/2005/Atom" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices" xml:base="http://localhost:8080/dsdataserver/dsl.svc/">
  <title type="text">DataModel</title>
  <id>http://localhost:8080/dsdataserver/dsl.svc/</id>
  <updated>2014-06-11T16:03:48Z</updated>
  <link rel="self" title="DataModel" href="DataModel" />
- <entry>
  <id>http://localhost:8080/dsdataserver/dsl.svc/DataModel('EDM')</id>
  <title type="text" />
  <updated>2014-06-11T16:03:48Z</updated>
  - <author>
    <name />
  </author>
  <link rel="edit" title="DataModel" href="DataModel('EDM')"/> ↗
  <category term="DataModel_Set.DataModel" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  + <content type="application/xml">
    </entry>
- <entry>
  <id>http://localhost:8080/dsdataserver/dsl.svc/DataModel('OW5000')</id>
  <title type="text" />
  <updated>2014-06-11T16:03:48Z</updated>
  - <author>
    <name />
  </author>
  <link rel="edit" title="DataModel" href="DataModel('OW5000')"/> ↗
  <category term="DataModel_Set.DataModel" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  + <content type="application/xml">
    </entry>
</feed>

```

This DSDS Server has 2 data source models:  
 • EDM  
 • OW5000

### Drill Down to See a Model Version (e.g. OW5000)

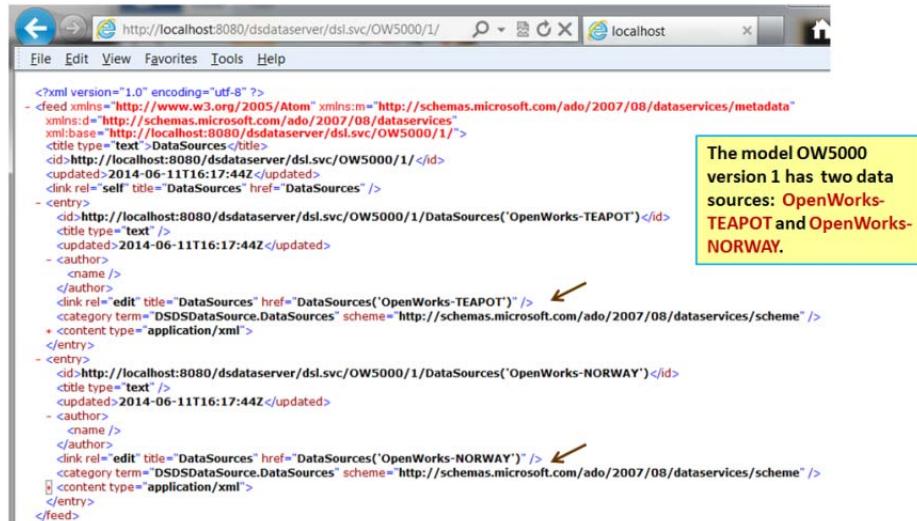
```

<?xml version="1.0" encoding="utf-8" ?>
- <feed xmlns="http://www.w3.org/2005/Atom" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices" xml:base="http://localhost:8080/dsdataserver/dsl.svc/OW5000/">
  <title type="text">DataModelVersion</title>
  <id>http://localhost:8080/dsdataserver/dsl.svc/OW5000</id>
  <updated>2014-06-11T16:14:03Z</updated>
  <link rel="self" title="DataModelVersion" href="DataModelVersion" />
- <entry>
  <id>http://localhost:8080/dsdataserver/dsl.svc/OW5000/DataModelVersion('1')</id>
  <title type="text" />
  <updated>2014-06-11T16:14:03Z</updated>
  - <author>
    <name />
  </author>
  <link rel="edit" title="DataModelVersion" href="DataModelVersion('1')"/> ↗
  <category term="DataModelVersion_NS.DataModelVersion"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  + <content type="application/xml">
    </entry>
- <entry>
  <id>http://localhost:8080/dsdataserver/dsl.svc/OW5000</id>
  <title type="text" />
  <updated>2014-06-11T16:14:03Z</updated>
  - <author>
    <name />
  </author>
  <link rel="edit" title="DataModelVersion" href="DataModelVersion" />
  <category term="DataModelVersion_NS.DataModelVersion"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  + <content type="application/xml">
    </entry>
</feed>

```

The OpenWorks OW5000 model only has one version. Currently only 5000.8.3 model is recognized by DSDS OW Connector.

## Select the Model Version (e.g. “1”) and Drill Down To See the Data Sources



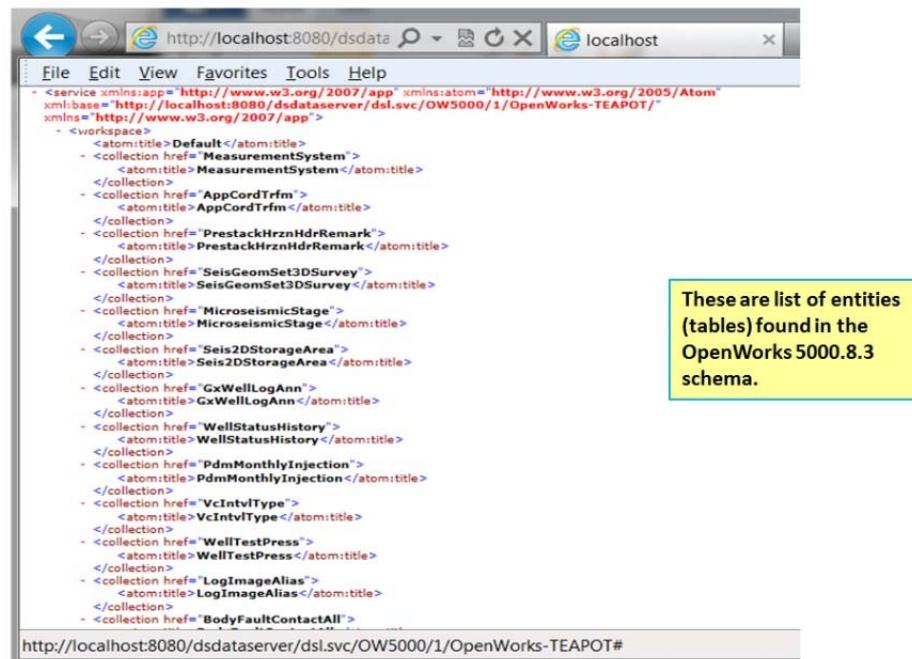
The screenshot shows a web browser window with the URL <http://localhost:8080/dsdataserver/dsl.svc/OW5000/1/>. The page displays an XML feed. A yellow callout box on the right side states: "The model OW5000 version 1 has two data sources: OpenWorks-TEAPOT and OpenWorks-NORWAY." Two red arrows point from the text "OpenWorks-TEAPOT" and "OpenWorks-NORWAY" in the callout box to the corresponding entries in the XML feed.

```

<?xml version="1.0" encoding="utf-8" ?>
- <feed xmlns="http://www.w3.org/2005/Atom" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns:a="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:b="http://localhost:8080/dsdataserver/dsl.svc/OW5000/1/>
<id>http://localhost:8080/dsdataserver/dsl.svc/OW5000/1</id>
<updated>2014-06-11T16:17:44Z</updated>
<link rel="self" title="DataSources" href="DataSources" />
- <entry>
  - <id>http://localhost:8080/dsdataserver/dsl.svc/OW5000/1/DataSources('OpenWorks-TEAPOT')</id>
  <title type="text" />
  <updated>2014-06-11T16:17:44Z</updated>
  - <author>
    <name />
  </author>
  <link rel="edit" title="DataSources" href="DataSources('OpenWorks-TEAPOT')"/> ↗
  <category term="DSDSDataSource.DataSource" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
+ <content type="application/xml" />
</entry>
- <entry>
  - <id>http://localhost:8080/dsdataserver/dsl.svc/OW5000/1/DataSources('OpenWorks-NORWAY')</id>
  <title type="text" />
  <updated>2014-06-11T16:17:44Z</updated>
  - <author>
    <name />
  </author>
  <link rel="edit" title="DataSources" href="DataSources('OpenWorks-NORWAY')"/> ↗
  <category term="DSDSDataSource.DataSource" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
+ <content type="application/xml" />
</entry>
</feed>

```

## Select the Data Source (e.g. OpenWorks-TEAPOT) and Drill Down to See the Entities



The screenshot shows a web browser window with the URL <http://localhost:8080/dsdataserver/dsl.svc/OW5000/1/OpenWorks-TEAPOT/>. The page displays a list of entities. A yellow callout box on the right side states: "These are list of entities (tables) found in the OpenWorks 5000.8.3 schema." A red arrow points from the word "entities" in the callout box to the list of entities in the XML feed.

```

<service xmlns:app="http://www.w3.org/2007/app" xmlns:atom="http://www.w3.org/2005/Atom"
  xmlns:base="http://localhost:8080/dsdataserver/dsl.svc/OW5000/1/OpenWorks-TEAPOT/"
  xmlns:workspace="http://www.w3.org/2007/app">
  <workspace>
    <atom:title>Default</atom:title>
    - <collection href="MeasurementSystem">
      <atom:title>MeasurementSystems</atom:title>
    </collection>
    - <collection href="AppCordTrfm">
      <atom:title>AppCordTrfm</atom:title>
    </collection>
    - <collection href="PrestackHrznHdrRemark">
      <atom:title>PrestackHrznHdrRemark</atom:title>
    </collection>
    - <collection href="SeisGeomSet3DSurvey">
      <atom:title>SeisGeomSet3DSurvey</atom:title>
    </collection>
    - <collection href="MicroseismicStage">
      <atom:title>MicroseismicStage</atom:title>
    </collection>
    - <collection href="Seis2DStorageArea">
      <atom:title>Seis2DStorageArea</atom:title>
    </collection>
    - <collection href="GxWellLogAnn">
      <atom:title>GxWellLogAnn</atom:title>
    </collection>
    - <collection href="WellStatusHistory">
      <atom:title>WellStatusHistory</atom:title>
    </collection>
    - <collection href="PdmMonthlyInjection">
      <atom:title>PdmMonthlyInjection</atom:title>
    </collection>
    - <collection href="VcIntvType">
      <atom:title>VcIntvType</atom:title>
    </collection>
    - <collection href="WellTestPress">
      <atom:title>WellTestPress</atom:title>
    </collection>
    - <collection href="LogImageAlias">
      <atom:title>LogImageAlias</atom:title>
    </collection>
    - <collection href="BodyFaultContactAll">

```

http://localhost:8080/dsdataserver/dsl.svc/OW5000/1/OpenWorks-TEAPOT#

## Select an Entity (e.g. Well) and Drill Down to See All the Well Records in the TEAPOT Project

```
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/TubingEquip" type="application/atom+xml;type=feed"
      title="TubingEquip" href="Well('477')/TubingEquip" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/DrillingObj" type="application/atom+xml;type=feed"
      title="DrillingObj" href="Well('477')/DrillingObj" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CorePropertyAlysDetail"
      type="application/atom+xml;type=feed" title="CorePropertyAlysDetail" href="Well('477')/CorePropertyAlysDetail" />
<category term="OW5000.Well" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
- <m:properties>
  <d:orig_x_lon_ddssunit>UNKNOWN</d:orig_x_lon_ddssunit>
  <d:wellid>477</d:wellid>
  <d:orig_y_lat_ddssunit>UNKNOWN</d:orig_y_lat_ddssunit>
  <d:x_cord_bh_ddssunit>feet</d:x_cord_bh_ddssunit>
  <d:latitude m:type="Edm.Double">43.24057931</d:latitude>
  <d:y_cord_bh_ddssunit>feet</d:y_cord_bh_ddssunit>
  <d:elevation m:type="Edm.Single">4992.5</d:elevation>
  <d:completion_date m:type="Edm.DateTime" m:null="true" />
  <d:field>teapot dome</d:field>
  <d:data_source m:null="true" />
  <d:latitude_bh_ddssunit>dega</d:latitude_bh_ddssunit>
  <d:x_cord_bh m:type="Edm.Double" m:null="true" />
  <d:longitude_bh_ddssunit>dega</d:longitude_bh_ddssunit>
  <d:country>USA</d:country>
  <d:plugged_back_td m:type="Edm.Single" m:null="true" />
  <d:plugged_back_td_ddssunit>feet</d:plugged_back_td_ddssunit>
  <d:x_coordinate_ddssunit>feet</d:x_coordinate_ddssunit>
  <d:orig_bh_y_lat_ddssunit>UNKNOWN</d:orig_bh_y_lat_ddssunit>
  <d:orig_y_lat m:type="Edm.Double">940009.7000000001</d:orig_y_lat>
  <d:well_number>51-MX-MYX</d:well_number>
  <d:total_depth m:type="Edm.Single">5193.0</d:total_depth>
  <d:elev_type>KB</d:elev_type>
  <d:platform_id m:null="true" />
  <d:y_coordinate m:type="Edm.Double">940009.7000000001</d:y_coordinate>
  <d:orig_x_lon m:type="Edm.Double">807265.8</d:orig_x_lon>
  <d:orig_bh_x_lon m:type="Edm.Double" m:null="true" />
```

---

## JDBC Driver Download Locations for Common Databases

---

- MySQL: <http://www.mysql.com/products/connector/>
- PostgreSQL: <http://jdbc.postgresql.org/>
- Oracle:  
[http://www.oracle.com/technology/software/tech/java/sqlj\\_jdbc/index.html](http://www.oracle.com/technology/software/tech/java/sqlj_jdbc/index.html)
- IBM: <http://www-306.ibm.com/software/data/db2/java/>
- Sybase:  
<http://www.sybase.com/products/allproductsaz/softwaredeveloperkit/jconnect>
- Microsoft: <http://msdn.microsoft.com/data/jdbc/>

## Where Are the Generated VDBs?

- VDBs can be found in **JBOSS\_HOME\standalone\data\content** folder
- Sub-folders under the content folder can be correlated with the **<deployment>** info in **standalone-dsds.xml** to determine the source of the VDB
- Deployed VDBs are downloadable from the DSDS Console **Virtual Databases** tab

**JBOSS\_HOME\standalone\data\content**

Name	Date modified	Type	Size
7c	6/10/2014 4:50 PM	File folder	
98	6/10/2014 4:41 PM	File folder	

**standalone-dsds.xml**

```

<deployments>
    <deployment name="EDH_SQLServer.1-vdb.xml" runtime-name="EDH_SQLServer.1-vdb.xml">
        <content sha1="983c4cf682e8fe39fcfed6ca2d647ab57a980cdcF"/>
    </deployment>
    <deployment name="OpenWorks.1-vdb.xml" runtime-name="OpenWorks.1-vdb.xml">
        <content sha1="7c9b828da24b231b6af2c0f2f61144a9e771a65a"/>
    </deployment>
</deployments>

```

## Data Source Attributes

### Common to XA and non-XA data sources

Parameter	Description
jndi-name	The unique JNDI name for the datasource.
pool-name	The name of the management pool for the datasource.
enabled	Whether or not the datasource is enabled.
use-java-context	Whether to bind the datasource to global JNDI.
spy	Enable <b>spy</b> functionality on the JDBC layer. This logs all JDBC traffic to the datasource. The <b>logging-category</b> parameter must also be set to <code>org.jboss.jdbc</code> .
use-ccm	Enable the cached connection manager.
new-connection-sql	A SQL statement which executes when the connection is added to the connection pool.
transaction-isolation	One of the following:  ➢ TRANSACTION_READ_UNCOMMITTED ➢ TRANSACTION_READ_COMMITTED ➢ TRANSACTION_REPEATABLE_READ ➢ TRANSACTION_SERIALIZABLE ➢ TRANSACTION_NONE
url-delimiter	The delimiter for URLs in a connection-url for High Availability (HA) clustered databases.
url-selector-strategy-class-name	A class that implements interface <code>org.jboss.jca.adapters.jdbc.URLSelectorStrategy</code> .
security	Contains child elements which are security settings. See <a href="#">Table 6.8, "Security parameters"</a> .
validation	Contains child elements which are validation settings. See <a href="#">Table 6.9, "Validation parameters"</a> .
timeout	Contains child elements which are timeout settings. See <a href="#">Table 6.10, "Timeout parameters"</a> .
statement	Contains child elements which are statement settings. See <a href="#">Table 6.11, "Statement parameters"</a> .

Parameter	Description	security parameters
user-name	The username to use to create a new connection.	
password	The password to use to create a new connection.	
security-domain	Contains the name of a JAAS security-manager which handles authentication. This name correlates to the application-policy/name attribute of the JAAS login configuration.	
reauth-plugin	Defines a reauthentication plugin to use to reauthenticate physical connections.	

Parameter	Description	timeout parameters
use-try-lock	Uses <code>tryLock()</code> instead of <code>lock()</code> . This attempts to obtain the lock for the configured number of seconds, before timing out, rather than failing immediately if the lock is unavailable. Defaults to <b>60</b> seconds. As an example, to set a timeout of 5 minutes, set <code>&lt;use-try-lock&gt;300&lt;/use-try-lock&gt;</code> .	
blocking-timeout-millis	The maximum time, in milliseconds, to block while waiting for a connection. After this time is exceeded, an exception is thrown. This blocks only while waiting for a permit for a connection, and does not throw an exception if creating a new connection takes a long time. Defaults to 30000, which is 30 seconds.	
idle-timeout-minutes	The maximum time, in minutes, before an idle connection is closed. The actual maximum time depends upon the <code>idleRemover</code> scan time, which is half of the smallest <code>idle-timeout-minutes</code> of any pool.	
set-tx-query-timeout	Whether to set the query timeout based on the time remaining until transaction timeout. Any configured query timeout is used if no transaction exists. Defaults to <b>false</b> .	
query-timeout	Timeout for queries, in seconds. The default is no timeout.	
allocation-retry	The number of times to retry allocating a connection before throwing an exception. The default is 0, so an exception is thrown upon the first failure.	
allocation-retry-wait-millis	How long, in milliseconds, to wait before retrying to allocate a connection. The default is 5000, which is 5 seconds.	
xa-resource-timeout	If non-zero, this value is passed to method <code>XAResource.setTransactionTimeout</code> .	

**Common to XA and non-XA data sources**
**statement parameters**

Parameter	Description
track-statements	Whether to check for unclosed statements when a connection is returned to a pool and a statement is returned to the prepared statement cache. If false, statements are not tracked. <b>Valid values</b> <ul style="list-style-type: none"><li>&gt; <b>true</b>: statements and result sets are tracked, and a warning is issued if they are not closed.</li><li>&gt; <b>false</b>: neither statements or result sets are tracked.</li><li>&gt; <b>nowarn</b>: statements are tracked but no warning is issued. This is the default.</li></ul>
prepared-statement-cache-size	The number of prepared statements per connection, in a Least Recently Used (LRU) cache.
share-prepared-statements	Whether asking for the same statement twice without closing it uses the same underlying prepared statement. The default is <b>false</b> .

**validation parameters**

Parameter	Description
valid-connection-checker	An implementation of interface <code>org.jboss.jca.adapters.jdbc.ValidConnectionChecker</code> which provides a <code>SQLException.isValidConnection(Connection e)</code> method to validate a connection. An exception means the connection is destroyed. This overrides the parameter <code>check-valid-connection-sql</code> if it is present.
check-valid-connection-sql	An SQL statement to check validity of a pool connection. This may be called when a managed connection is taken from a pool for use.
validate-on-match	Indicates whether connection level validation is performed when a connection factory attempts to match a managed connection for a given set. Specifying "true" for <code>validate-on-match</code> is typically not done in conjunction with specifying "true" for <code>background-validation</code> . <code>Validate-on-match</code> is needed when a client must have a connection validated prior to use. This parameter is true by default.
background-validation	Specifies that connections are validated on a background thread. Background validation is a performance optimization when not used with <code>validate-on-match</code> . If <code>validate-on-match</code> is true, using <code>background-validation</code> could result in redundant checks. Background validation does leave open the opportunity for a bad connection to be given to the client for use (a connection goes bad between the time of the validation scan and prior to being handed to the client), so the client application must account for this possibility.
background-validation-millis	The amount of time, in milliseconds, that background validation runs.
use-fast-fail	If true, fail a connection allocation on the first attempt, if the connection is invalid. Defaults to <b>false</b> .
stale-connection-checker	An instance of <code>org.jboss.jca.adapters.jdbc.StaleConnectionChecker</code> which provides a Boolean <code>isStaleConnection(SQLException e)</code> method. If this method returns <b>true</b> , the exception is wrapped in an <code>org.jboss.jca.adapters.jdbc.StaleConnectionException</code> , which is a subclass of <code>SQLException</code> .
exception-sorter	An instance of <code>org.jboss.jca.adapters.jdbc.ExceptionSorter</code> which provides a Boolean <code>isExceptionFatal(SQLException e)</code> method. This method validates whether an exception is broadcast to all instances of <code>javax.resource.spi.ConnectionEventListener</code> as a <code>connectionErrorOccurred</code> message.

**Non-XA data source**

Parameter	Description
jta	Enable JTA integration for non-XA datasources. Does not apply to XA datasources.
connection-url	The JDBC driver connection URL.
driver-class	The fully-qualified name of the JDBC driver class.
connection-property	Arbitrary connection properties passed to the method <code>Driver.connect(url, props)</code> . Each connection-property specifies a string name/value pair. The property name comes from the name, and the value comes from the element content.
pool	Contains child elements which are pooling settings. See <a href="#">Table 6.6, "Pool parameters common to non-XA and XA datasources"</a> .

**Pool parameters common to XA and non-XA**

Parameter	Description
min-pool-size	The minimum number of connections a pool holds.
max-pool-size	The maximum number of connections a pool can hold.
prefill	Whether to try to prefill the connection pool. An empty element denotes a <code>true</code> value. The default is <code>false</code> .
use-strict-min	Whether the pool-size is strict. Defaults to <code>false</code> .
flush-strategy	Whether the pool is flushed in the case of an error. Valid values are: <ul style="list-style-type: none"> <li>&gt; <code>FailingConnectionOnly</code></li> <li>&gt; <code>IdleConnections</code></li> <li>&gt; <code>EntirePool</code></li> </ul> The default is <code>FailingConnectionOnly</code> .
allow-multiple-users	Specifies if multiple users will access the datasource through the <code>getConnection(user, password)</code> method, and whether the internal pool type accounts for this behavior.

**XA data source**

Parameter	Description
xa-datasource-property	A property to assign to implementation class <code>XADatasource</code> . Specified by <code>name=value</code> . If a setter method exists, in the format <code>setName(value)</code> , the property is set by calling a setter method in the format of <code>setName(value)</code> .
xa-datasource-class	The fully-qualified name of the implementation class <code>javax.sql.XADatasource</code> .
driver	A unique reference to the classloader module which contains the JDBC driver. The accepted format is <code>driverName#majorVersion.minorVersion</code> .
xa-pool	Contains child elements which are pooling settings. See <a href="#">Table 6.6, "Pool parameters common to non-XA and XA datasources"</a> and <a href="#">Table 6.7, "XA pool parameters"</a> .
recovery	Contains child elements which are recovery settings. See <a href="#">Table 6.12, "Recovery parameters"</a> .

**XA pool parameters**

Parameter	Description
is-same-rm-override	Whether the <code>javax.transaction.xa.XAResource.isSameRM(XAResource)</code> class returns <code>true</code> or <code>false</code> .
interleaving	Whether to enable interleaving for XA connection factories.
no-tx-separate-pools	Whether to create separate sub-pools for each context. This is required for Oracle datasources, which do not allow XA connections to be used both inside and outside of a JTA transaction.
pad-xid	Whether to pad the Xid.
wrap-xa-resource	Whether to wrap the XAResource in an <code>org.jboss.tm.XAResourceWrapper</code> instance.

**recovery parameters**

Parameter	Description
recover-credential	A username/password pair or security domain to use for recovery.
recover-plugin	An implementation of the <code>org.jboss.jca.core.spi.recoveryRecoveryPlugin</code> class, to be used for recovery.

**Datasource connection URLs**

Datasource	Connection URL
PostgreSQL	<code>jdbc:postgresql://SERVER_NAME:PORT/DATABASE_NAME</code>
MySQL	<code>jdbc:mysql://SERVER_NAME:PORT/DATABASE_NAME</code>
Oracle	<code>jdbc:oracle:thin:@ORACLE_HOST:PORT:ORACLE_SID</code>
IBM DB2	<code>jdbc:db2://SERVER_NAME:PORT/DATABASE_NAME</code>
Microsoft SQLServer	<code>jdbc:microsoft:sqlserver://SERVER_NAME:PORT;DatabaseName=DATABASE_NAME</code>

**Datasource extensions**

Datasource Extension	Configuration Parameter	Description
<code>org.jboss.jca.adapters.jdbc.spi.ExceptionSorter</code>	<code>&lt;exception-sorter&gt;</code>	Checks whether an SQLException is fatal for the connection on which it was thrown
<code>org.jboss.jca.adapters.jdbc.spi.StaleConnection</code>	<code>&lt;stale-connection-checker&gt;</code>	Wraps stale SQLExceptions in a <code>org.jboss.jca.adapters.jdbc.StaleConnectionException</code>
<code>org.jboss.jca.adapters.jdbc.spi.ValidConnection</code>	<code>&lt;valid-connection-checker&gt;</code>	Checks whether a connection is valid for use by the application

---

## **Clustering: Additional Information**

---

- **High Availability** feature provided by databases:  
  
<http://www.oracle.com/technetwork/products/clustering/overview/index.html?origref=http://www.oracle.com/goto/rac>  
  
[http://msdn.microsoft.com/en-us/library/ee523927\(v=sql.100\).aspx](http://msdn.microsoft.com/en-us/library/ee523927(v=sql.100).aspx)
- **Jgroup** is a toolkit for reliable multicast communication
  - Group creation and deletion, group members can be spread across LANs or WANs.
  - Joining and leaving of groups
  - Membership detection and notification about joined/left/crashed members
  - Detection and removal of crashed members
  - Sending and receiving of member-to-group messages (point to multipoint)
  - Send and receiving of member-to-member messages (point to point)
- **Infinispan** is an extremely scalable, highly available key/value data store and distributed data grid platforms.
  - Used as a distributed cache to improve performance
  - Used as a NoSQL data store (pluggable cache store).
  - Add cluster ability and high availability to frameworks and libraries

## AdminVDB Stored Procedures

getModels()	No parameters. Returns a list of unique model names which are deployed in DSDS	
getDataSource('ModelName') <b>exec</b> getDataSource('OW5000');	Input parameter: model name. Returns a list of data sources for the specified model in the form	[ModelName, VDBName, VDBVersion, UserVersion, DataSource, JDBCConnectionURL, type, status]
getCartoSystemsList() 	No parameters. Returns a list of CRS systems supported by DSDS in the form	[CartoID, CartoName, CartoType, CartoParameters]
getMeasurementSystemsList()	No parameters. Returns a list of Measurements Systems supported by DSDS in the form	[MeasurementID, MeasurementName, IsCustom, Remark]
getUnitList('UnitName') <b>exec</b> getUnitList('rpm/s');	Input parameter: unit name. Returns the unit information in the form	[UnitID, BaseTypeID, UnitName, UnitLabel, FactorA, FactorB, FactorC, FactorD]
getUnitTypeList()	No parameters. Returns a list of unit types supported by DSDS in the form	[UnitTypeID, BaseTypeID, UnitTypeName]
getUnitTypeMemberList('UnitTypeName') exec getUnitTypeMemberList('length');	Input parameter: unit type name. Returns the unit information in the form	[UnitTypeID, UnitID]

## Accessing AdminVDB from a Java Application

```

String JDBC_CONNECTION_URL = "jdbc:teiid:AdminVDB@mm://localhost:31000";
String USER_NAME = "user";
String USER_PASS = "user";

Class.forName("org.teiid.jdbc.TeiidDriver");
Connection con = DriverManager.getConnection(JDBC_CONNECTION_URL, USER_NAME, USER_PASS);

String modelSQL = "EXECUTE getModels();";
Statement statement = con.createStatement();
ResultSet rset = statement.executeQuery(modelSQL);

String dataSourceSQL = "EXECUTE getDataSources(?);";
PreparedStatement ps = con.prepareStatement(dataSourceSQL);

while (rset.next()) {
    String modelName = rset.getString("ModelName");
    System.out.println("\nMODEL : " + modelName);
    ps.setString(1, modelName);
    if (ps.execute()) {
        ResultSetMetaData metadata = ps.getMetaData();
        ResultSet rs = ps.getResultSet();
        int columnCount = metadata.getColumnCount();
        for (int i = 0; i < columnCount; i++) {
            if (i > 0) {
                System.out.print("\t\t");
            }
            System.out.print(metadata.getColumnLabel(i + 1));
        }
        System.out.println("");
        for (int row = 1; rs.next(); row++) {
            for (int i = 0; i < columnCount; i++) {
                if (i > 0) {
                    System.out.print("\t\t");
                }
                System.out.print(rs.getString(i + 1));
            }
            System.out.println();
        }
        rs.close();
    }
}

```

---

## Applications Consuming Data Server Data

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- **Data Service (OData)**
  - DS Portal
  - DS Production Monitoring
- **Data Access (JDBC)**
  - DS Data Quality
  - DS Analytics
  - DS Search
  - DS Production Allocation
  - Petrel Connector Bi-directional Link
  - DS ETL

# *DecisionSpace Analytics Installation*

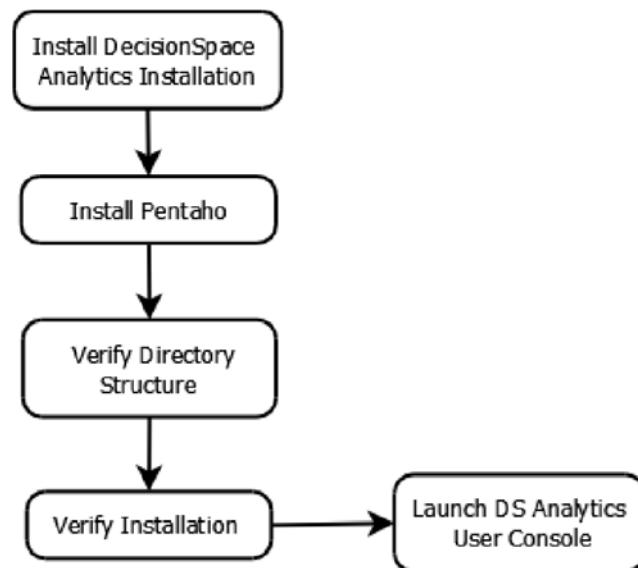
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## **Introduction**

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DecisionSpace Analytics is a platform that provides a comprehensive solution to perform business intelligent analytics on all enterprise data; and discover and visualize data trends in graphical and responsive mobile enabled dashboard. The platform can be used to customize reports, queries and transformations, and even extend its functionality using the DecisionSpace Analytics API.

### **Installation Workflow**



## **System Requirements**

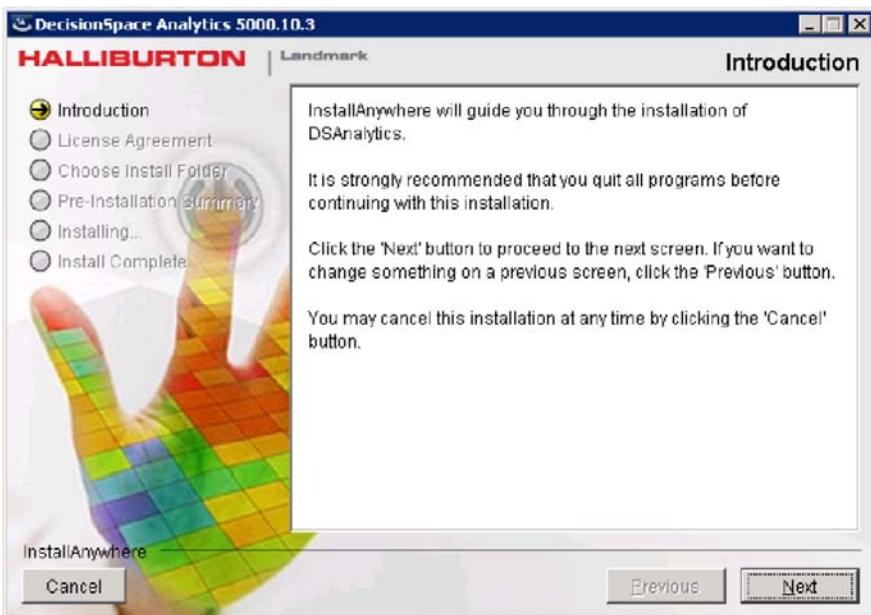
<b>DecisionSpace Analytics</b>	
<b>Resource</b>	<b>System Requirements</b>
Operating System	<ul style="list-style-type: none"><li>• Windows Server 2008 R2</li><li>• Windows 7 x64</li><li>• RHEL 5 and 6</li></ul>
Browser Compatibility	<ul style="list-style-type: none"><li>• Internet Explorer 9+ for all operations</li><li>• Google Chrome (29.0+) or Mozilla Firefox (24.0+)</li></ul>
Minimum System Requirements	<ul style="list-style-type: none"><li>• CPU: Dual-core processor</li><li>• Physical memory - 8 GB</li><li>• Hard-disk memory - 60 GB</li></ul>

## Installation Process

To install DS Analytics, refer to the following the steps:

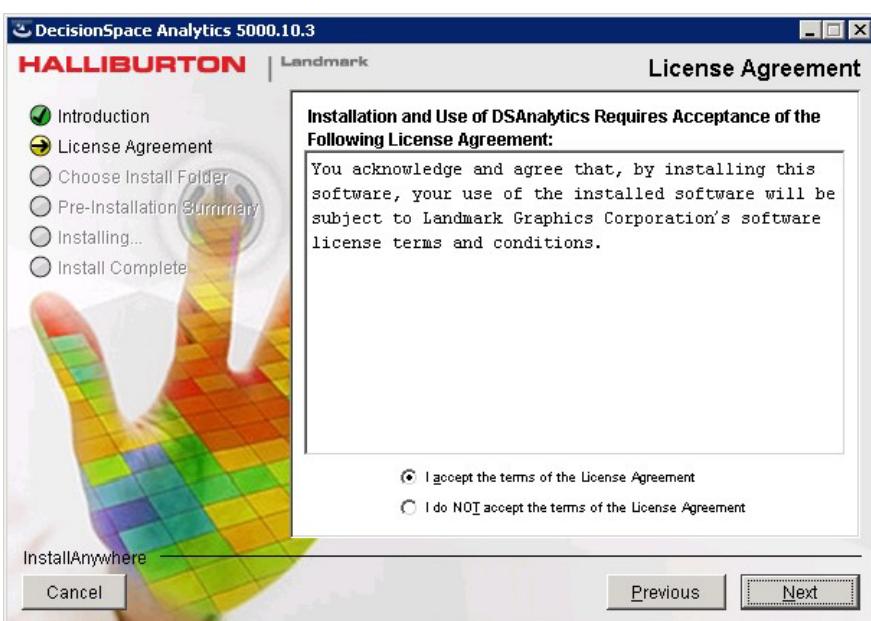
1. Log on to DS Analytics server as **TRAINING\lgcadmin** and run **C:\Installer\DSA\DSAnalytics\_10.3\_Win.exe**.

The DecisionSpace Analytics splash screen displays for a moment, and the InstallShield wizard launches and the Introduction screen displays.

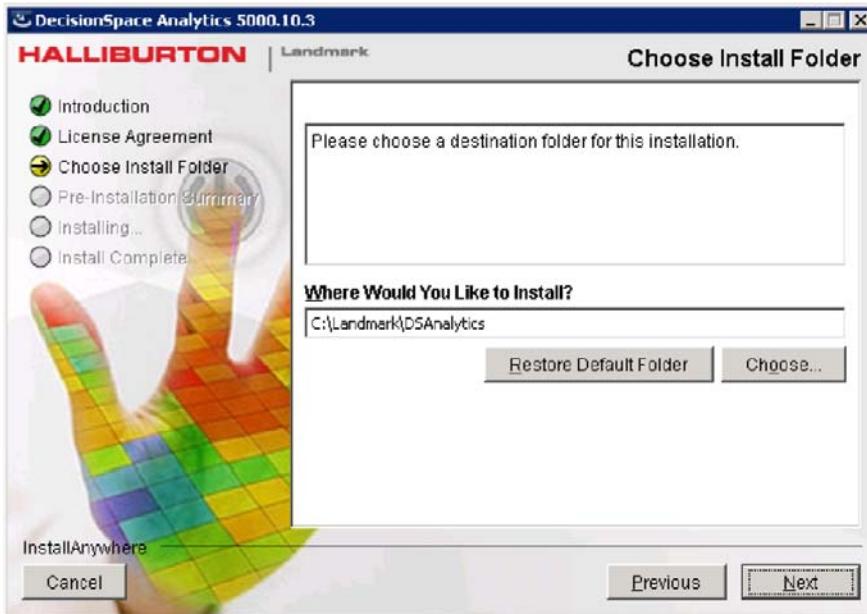


2. Read the Introduction and then click **Next**.

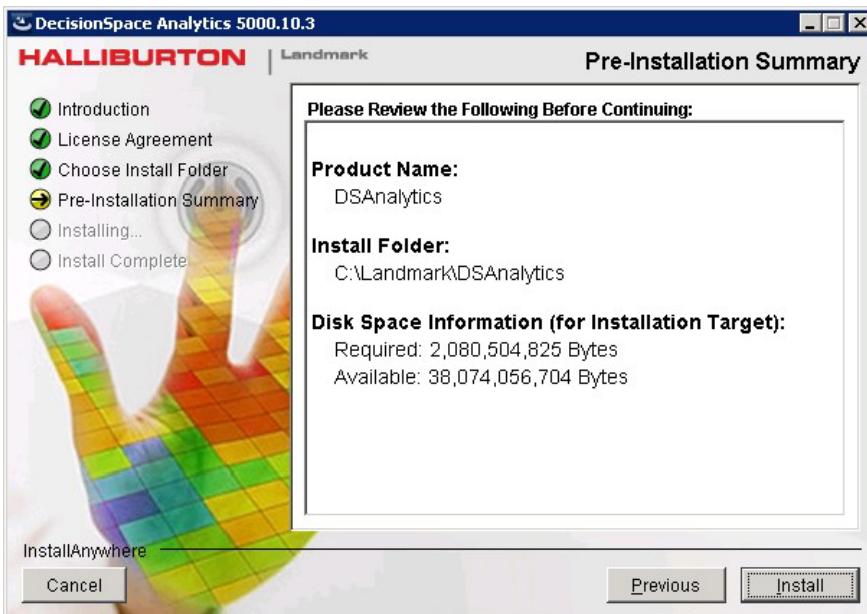
The License Agreement screen displays.



3. Read the license agreement and select the **I accept the terms of the License Agreement** option and then click **Next**.
4. After making the install selection(s), the Choose Install Folder screen displays.

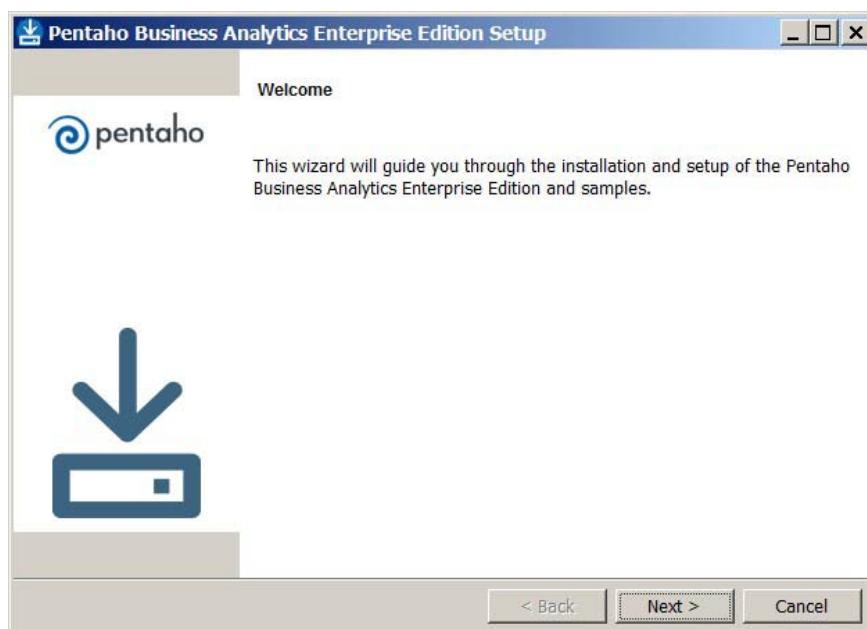
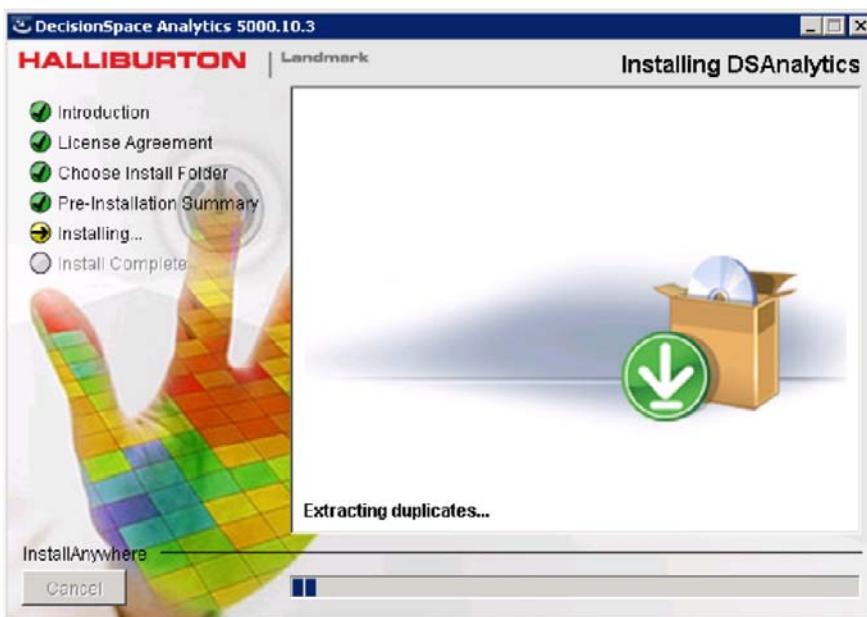


5. Accept the default Installation Path and click **Next**.  
The Pre-Installation Summary screen displays.



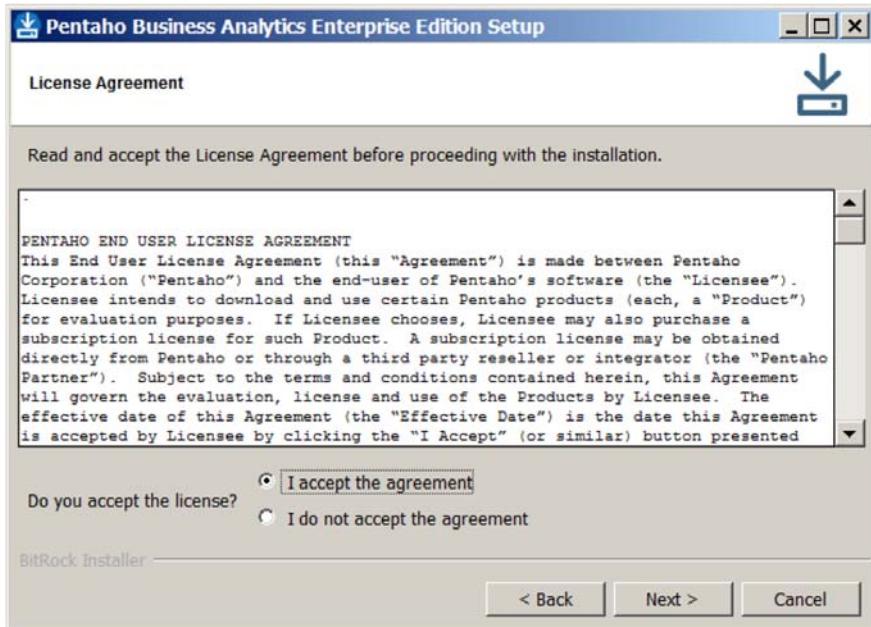
6. Verify the information (the required disk space may differ from the illustration above) and click **Install**.

The DS Analytics installer launches the Pentaho installer.

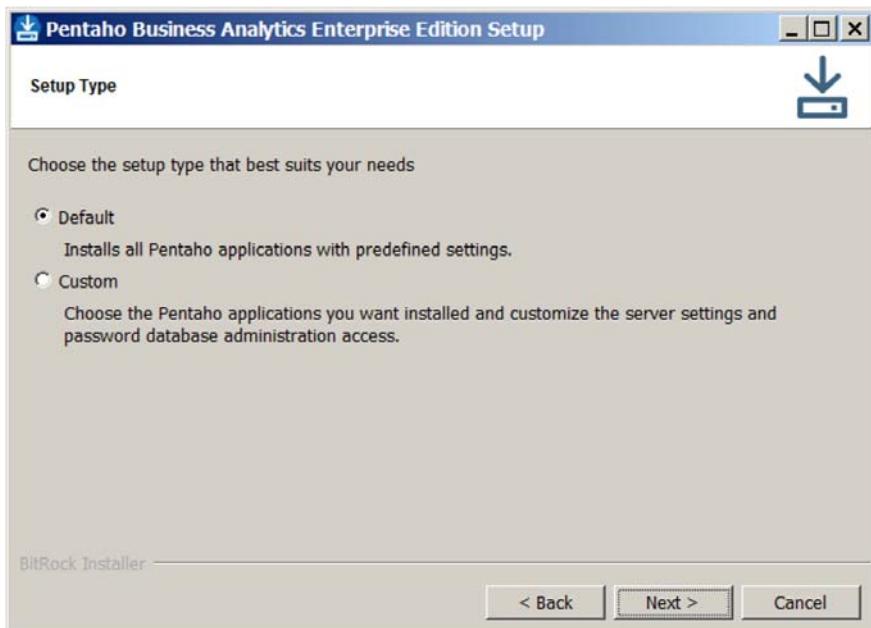


**7. Click **Next**.**

The License Agreement screen displays.

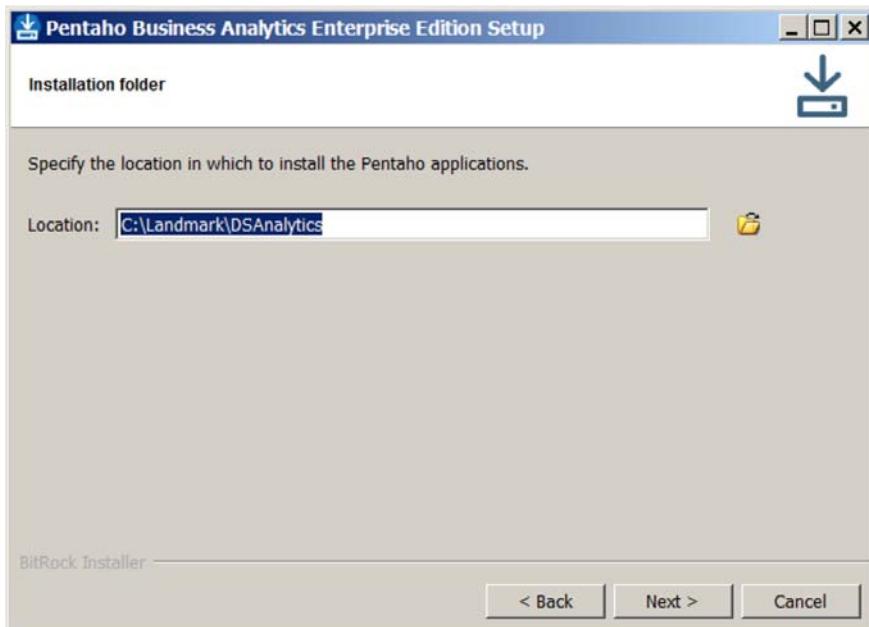


**8. Select the **I accept the agreement** option and click **Next**.**



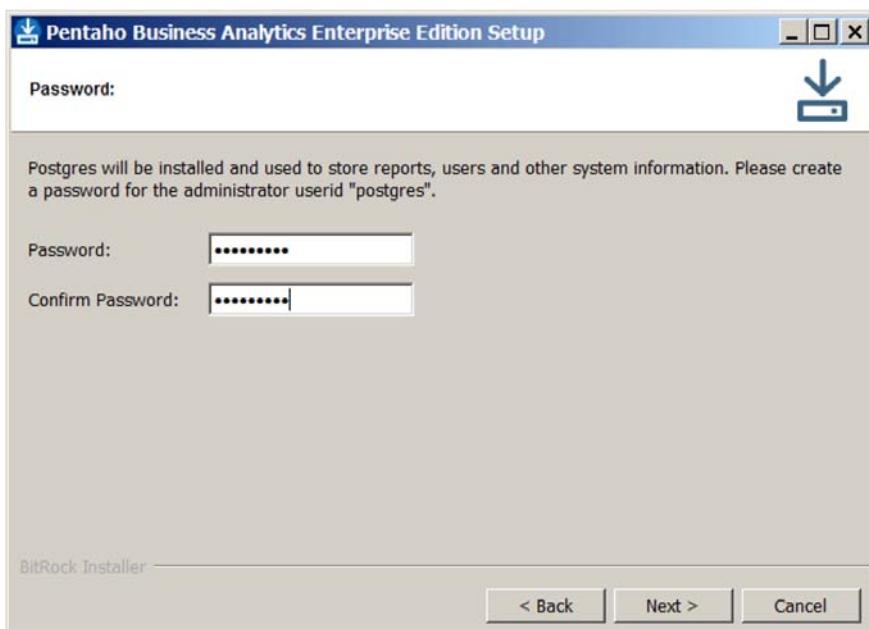
9. Select the **Default** option and click **Next**.

The Installation Folder screen displays.

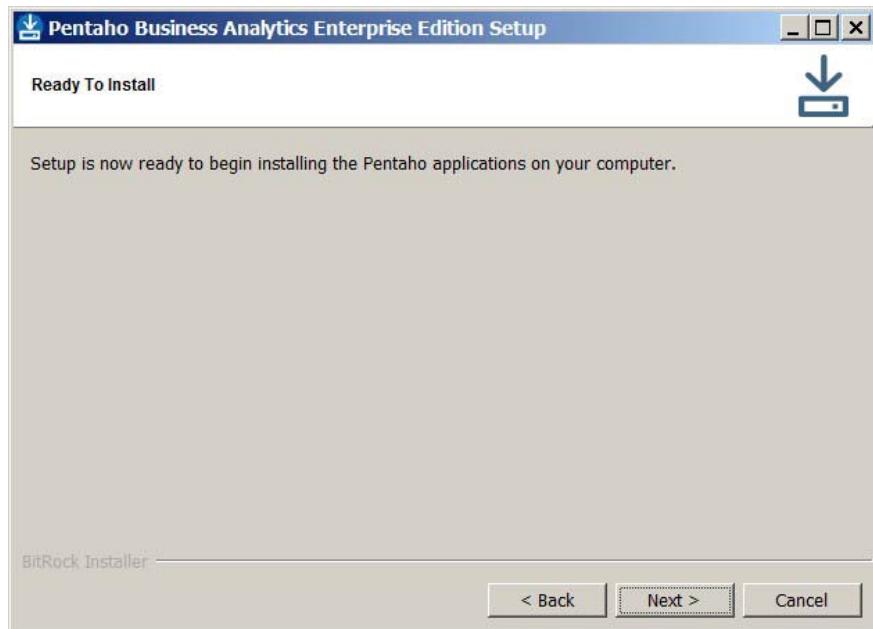


10. Accept the default Installation Path and click **Next**.

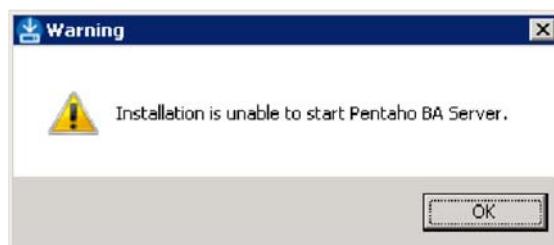
The PostgreSQL Password screen displays.



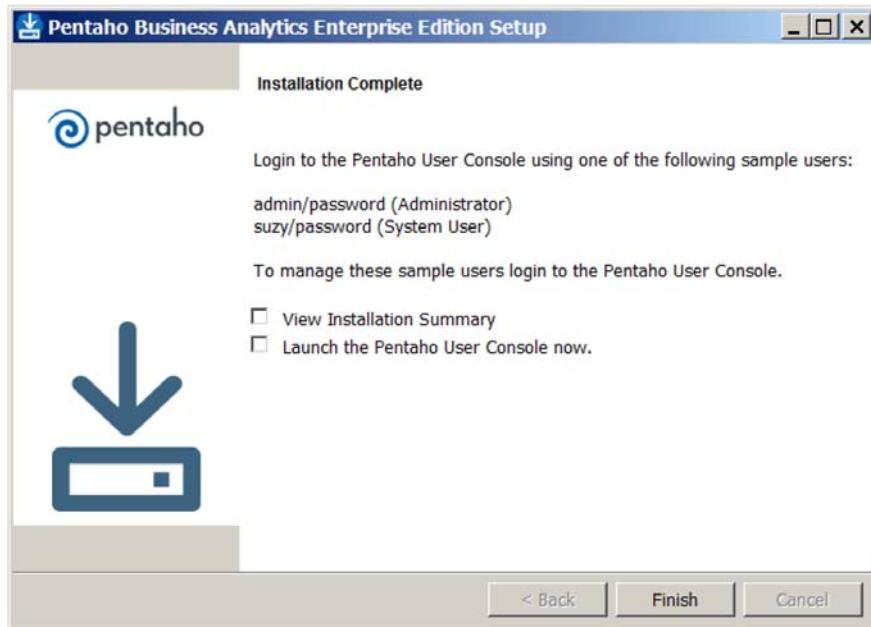
11. Enter **Landmark1** in the Password fields and click **Next**.  
The Ready To Install screen displays.



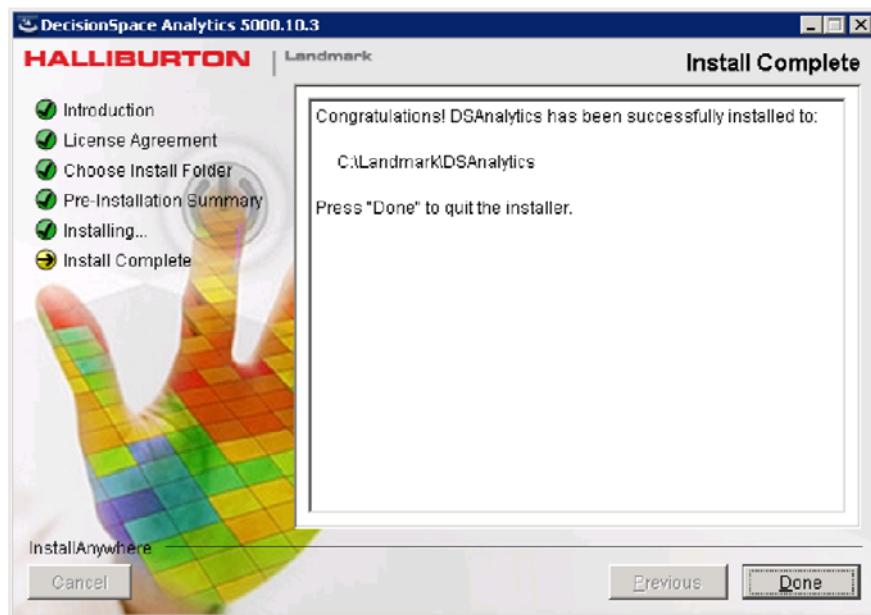
12. Click **Next**.
13. If the following error appears, click **OK** and refer to the troubleshooting steps under “DecisionSpace Analytics” on page A14.



14. When the Pentaho installation is complete, the following screen displays.



15. Click **Finish**. The DecisionSpace Analytics InstallShield wizard displays the Install Complete screen.



16. Click **Done**.

## **Directory Structure**

<b>Operating System</b>	<b>Location</b>
Windows	C:\Landmark\DSAnalytics

The DS Analytics software has the following directory structure after installation.

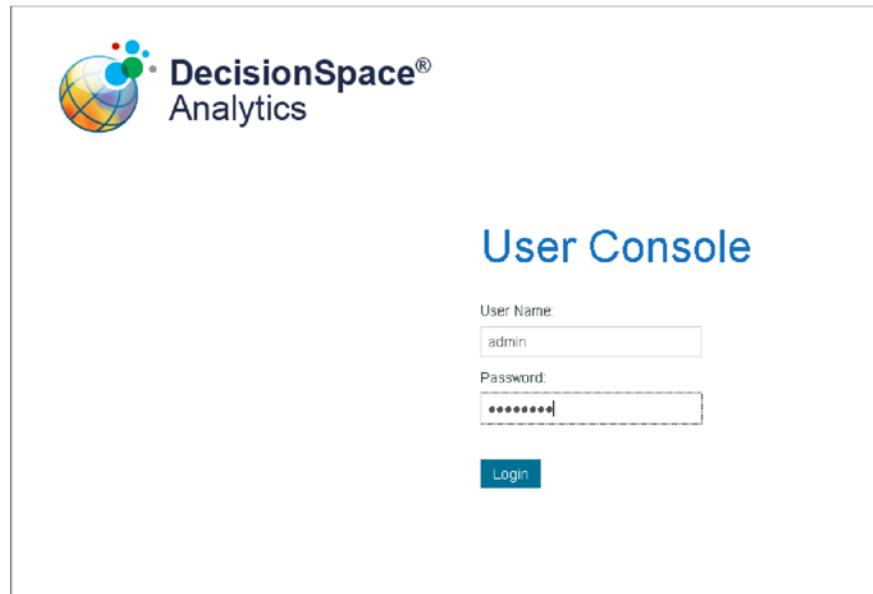
For example: **C:\Landmark\DSAnalytics\Server**.

<b>Folders</b>	<b>Description</b>
DSAnalytics	Root directory for Data Analytics
Server	Contains the Business Analytics and Integration server
Postgresql	Postgresql database
java	Java Runtime Environment to run JBOSS
Uninstall_DSAnalytics	Contains Data Analytics uninstaller
Documentation	Contains relevant documentation for DS Analytics
design-tools	Contains various design tools like aggregation designer, dataintegration, metadata-editor, report-designer, and schema workbench

## Installation Verification

Select **Start > All Programs > DecisionSpace Analytics > User Console Login.**

The DecisionSpace Analytics User Console window displays.



Use default admin/password to log on to the console.

