

IBM Industry Customer Intelligence Solutions
Last updated: 2016-02-09

*Behavior Based Client Insight for
Wealth Management Solution Guide*

IBM

Note

Before using this information and the product it supports, read the information in "Notices" on page 57.

Product Information

This document applies to IBM Industry Customer Intelligence Solutions Version 1.0.0 and may also apply to subsequent releases.

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Introduction

The IBM Behavior Based Client Insight for Wealth Management solution gives you the information and insight that you need to provide proactive service to your customers.

Audience

This guide is intended for administrators and users of the Behavior Based Client Insight for Wealth Management solution. It provides information on installation, configuration, and use of the Behavior Based Client Insight for Wealth Management solution.

Finding information

To find product documentation on the web, including all translated documentation, access IBM® Knowledge Center (<http://www.ibm.com/support/knowledgecenter>).

Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products. Some of the components included in the Behavior Based Client Insight for Wealth Management have accessibility features. For more information, see Appendix A, “Accessibility features,” on page 35.

Behavior Based Client Insight for Wealth Management HTML documentation has accessibility features. PDF documents are supplemental and, as such, include no added accessibility features.

Forward-looking statements

This documentation describes the current functionality of the product. References to items that are not currently available may be included. No implication of any future availability should be inferred. Any such references are not a commitment, promise, or legal obligation to deliver any material, code, or functionality. The development, release, and timing of features or functionality remain at the sole discretion of IBM.

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Chapter 1. Overview

The IBM Behavior Based Client Insight for Wealth Management provides pre-built industry-specific analytics that help retail wealth management firms to plan and deliver programs for acquiring and retaining clients while increasing profitability through improved client satisfaction.

The solution includes IBM Predictive Customer Intelligence, a solution data model, reporting and dashboard templates, predictive and prescriptive models, and application interfaces for integration with operational systems. It uses enterprise and third-party data that is derived from historical and current transactions and other client information. The solution combines client data with historical perspective to help financial advisors make optimal financial recommendations to clients.

The Behavior Based Client Insight for Wealth management solution provides advisors with personalized insights into client behavior. The solution identifies opportunities based on client behavior segmentation and life event prediction.

Scope of the solution

This version of the solution provides prebuilt models for the following analytics:

- Behavioral segmentation
- Life event prediction

All analytics in the scope of the solution relate to information on the firm's clients and prospects within the limits of the number of clients purchased in the license entitlement. The solution must not be used for analytics other than those in the solution scope.

Chapter 2. Installation and configuration

The installation and configuration of the IBM Behavior Based Client Insight for Wealth Management solution involves downloading the solution package from Passport Advantage and then configuring the various parts of it within your environment.

The solution is for use with IBM Predictive Customer Intelligence.

Prerequisites

Before you install the IBM Behavior Based Client Insight for Wealth Management solution, there are prerequisites that must be met.

The following conditions must be met before the solution is installed:

- IBM Predictive Customer Intelligence version 1.1.0 is installed and configured and you have applied all known fix packs.
- You have a Red Hat Enterprise Linux operating system that you can install to. The Solution Installer works only on that version of Linux.
- You understand your deployment environment. There is a combination of nodes that you must install to, so you must determine where you want the various components of the solution to reside.
- You must have administration rights and have the ability to copy files between computers.

Contents of the download package

The Behavior Based Client Insight for Wealth Management package, which you download from Passport Advantage, contains several parts.

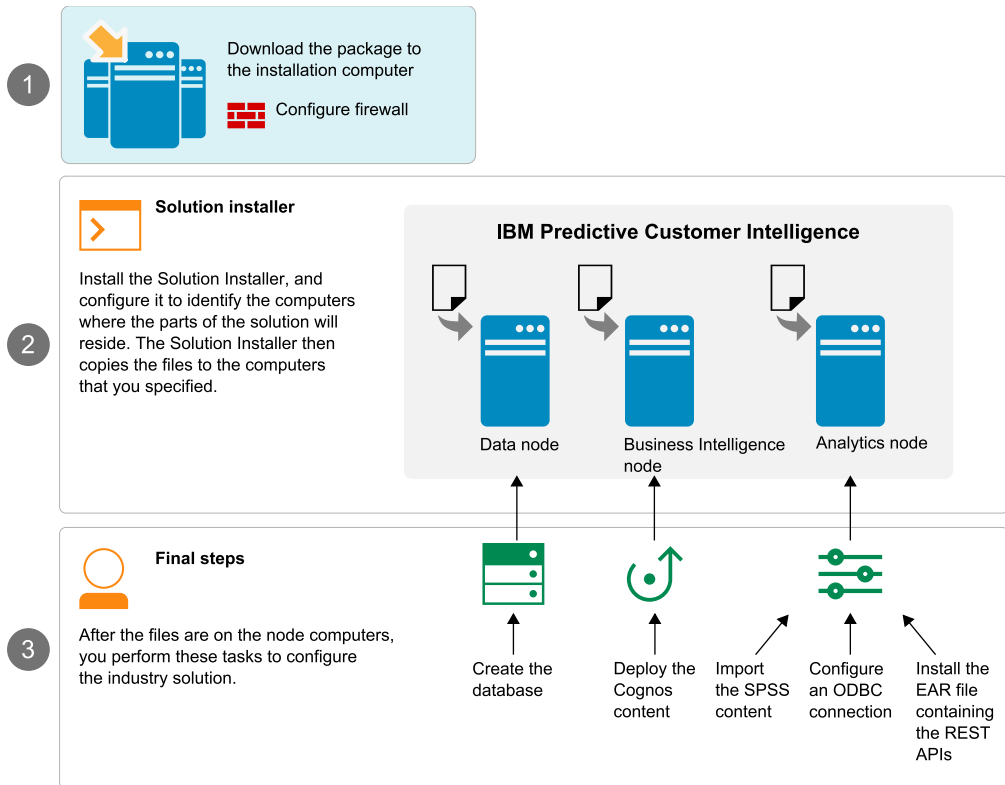
The following parts are included in the package:

- Solution installer
- DB2 databases
- SPSS project streams, models, and rules
- Cognos BI reports, Framework Manager models, and Dynamic cube models
- EAR file that contains the REST APIs

Overview of the installation and configuration process

There are several groups of tasks that you must complete to install and configure the Behavior Based Client Insight for Wealth Management solution.

The following diagram provides a high-level overview of the installation and configuration process. If you are viewing this diagram from the IBM Knowledge Center, you can click on a task to go to the procedure for that task.



To install the solution, you must complete the following tasks:

1. On the computer from which you want to install the solution, download the tar.gz file from IBM Passport Advantage.
2. Plan where you want the various parts of the solution to reside.
3. Open the ports that are required for the installation. You can do this by running the firewall.sh script, manually opening the ports on the installation node, or disabling the firewall. You also must open ports on the other node computers that are used for the solution.
4. On the installation computer, run the setup.sh file to install the solution installer, and then run the solution installer to deploy files to the locations that you specify.
5. On the Data Node computer, create the DB2 database.
6. On the Analytics Node computer, import the SPSS project streams, models, and rules.
7. On the Analytics node computer, configure the data view for the SPSS models.
8. On the Business Intelligence node computer, install the Cognos content.
9. Copy the Framework Manager model to a Microsoft Windows computer.
10. On either the Business Intelligence Node or Analytics Node computer, install the EAR file.

Planning the installation and configuration of the solution

Prepare a deployment plan to specify which part of the solution is to be deployed and on which computer node.

Note: Ensure that the system ports that will be used by this solution are not used by any other application.

Downloading the solution

You must download the Behavior Based Client Insight for Wealth Management solution from IBM Passport Advantage.

Before you begin

You must have a Passport Advantage account and be entitled to the package.

About this task

Passport Advantage contains package repositories. Instead of downloading the package from Passport Advantage and creating a repository locally, you access the repository on Passport Advantage.

Procedure

1. Set the Passport Advantage preference to **Connect to Passport Advantage**.
2. Download the tar.gz file.
3. Move the tar file to the Linux computer from which you want to run the installation.
4. Decompress the tar file.

Modifying the sudoers file for the user who runs the installation

To run the Behavior Based Client Insight for Wealth Management installation, you must be either root user or have sudo permission on each node computer, and you must disable requiretty during the installation.

To install with sudo user permissions, you must add the user to the sudoers file.

Procedure

1. Log in as root user.
2. Enter the following command to open the sudoers file for editing:
`visudo -f /etc/sudoers`
3. Locate the following line:
`Defaults requiretty`
4. Press the I key to insert text.
5. Type a number sign (#) in front of `Defaults requiretty` to comment out the line. For example, the line will appear as `#Defaults requiretty`
6. If you run the installer as a user with sudo user permissions, go to the end of the file, and add the following line for your user:
`username ALL=(ALL) NOPASSWD: ALL`
7. Press the Esc key, and enter `:wq` to save and close the file.
8. Repeat these steps on each computer on which you install a Behavior Based Client Insight for Wealth Management node.

Computer firewall settings required for the installation

The solution installer requires bidirectional communication with each node when you install a server component or server artifact component, and your firewall can interfere with this communication.

To ensure bidirectional communication, you must configure your firewall settings for the installation. Alternatively, you can temporarily disable your firewall during the installation.

A script is provided to open all necessary ports on the installation node. You can either use the `firewall.sh` script, open the ports manually, or disable the firewall settings.

In addition to opening ports on the installation node computer, you must open some ports on each computer to which content from the solution will be copied.

Disabling firewall settings during installation (optional)

If you choose to temporarily disable your computer's firewall during the installation of the IBM Behavior Based Client Insight for Wealth Management solution, ensure that you enable the firewall on each node after the installation is complete.

About this task

Important: If you disable your computer's firewall during the installation, you must still ensure that the required ports are opened on each node computer when you restart your firewall.

Procedure

1. Log on to the computer as the root user or as a user with sudo permissions.
2. Type the following command:

```
/etc/init.d/iptables stop  
/etc/init.d/iptables save
```
3. Repeat these steps on each computer on which you install a node and on the server from which you are running the installation.

What to do next

After the installation is complete, on each node, type `/etc/init.d/iptables start` to restart your firewall.

Configuring your firewall settings on the installation node computer by using the firewall script

You can run the `firewall.sh` script to open the ports on the installation node.

About this task

The `firewall.sh` script opens the following ports on the solution installer node:

- 8080 incoming
- 443 incoming
- 9683 incoming
- 22 outgoing

Procedure

1. As the root user or as a user with sudo permissions, log on to the computer that contains the solution installer node.

2. Back up your existing firewall settings by typing the following command:
`/etc/init.d/iptables save.`
3. Run the `firewall.sh` script.

Manually configuring firewall settings on the installation node

If you prefer not to disable your firewall settings or use the `firewall.sh` script, you can manually configure your firewall settings on the installation node.

Procedure

1. As the root user or as a user with sudo permissions, log on to the computer that contains the solution installer node .
2. Back up your existing firewall settings by typing the following command: .
`/etc/init.d/iptables save`
3. On the computer that contains the solution installer node, add rules for the ports that are required by the installer by typing the following commands:

```
iptables -I INPUT -p tcp --dport 8080 -j ACCEPT
iptables -I OUTPUT -p tcp --sport 8080 -m state --state
RELATED,ESTABLISHED -j ACCEPT

iptables -I INPUT -p tcp --dport 443 -j ACCEPT
iptables -I OUTPUT -p tcp --sport 443 -m state --state
RELATED,ESTABLISHED -j ACCEPT

iptables -I INPUT -p tcp --dport 9683 -j ACCEPT
iptables -I OUTPUT -p tcp --sport 9683 -m state --state
RELATED,ESTABLISHED -j ACCEPT

iptables -I OUTPUT -p tcp --dport 22 -j ACCEPT
iptables -I INPUT -p tcp --sport 22 -m state --state
RELATED,ESTABLISHED -j ACCEPT
```

Configuring firewall settings on other computers that will contain content from the solution

On all node computers to which content from the solution will be copied, the ports 443, 9683, and 8080 must be opened for the installation process.

Procedure

1. On each of the computers to which content for the solution will be copied, add rules for the ports that are required by the installer by typing the following commands:


```
iptables -I OUTPUT -p tcp --dport 443 -j ACCEPT
iptables -I INPUT -p tcp --sport 443 -m state --state RELATED,ESTABLISHED -j ACCEPT

iptables -I OUTPUT -p tcp --dport 9683 -j ACCEPT
iptables -I INPUT -p tcp --sport 9683 -m state --state RELATED,ESTABLISHED -j ACCEPT

iptables -I OUTPUT -p tcp --dport 8080 -j ACCEPT
iptables -I INPUT -p tcp --sport 8080 -m state --state RELATED,ESTABLISHED -j ACCEPT
```
2. Type the following command to save your firewall settings:
`/etc/init.d/iptables save`
3. Type the following command to restart your firewall:
`/etc/init.d/iptables restart`
4. Verify that your changes are applied by using the following command:
`iptables -L`
 The added port appears in the list.
5. Repeat these steps on each computer on which you will install an IBM Behavior Based Client Insight for Wealth Management node.

The solution installer

The solution installer provides automation that helps you to install the solution.

The Industry Solution Installer runs on the latest versions of Chrome and Firefox. It is not tested on Safari and does not run on Internet Explorer.

The Industry Solution installer provides the following functionality:

- Deployment of the required files to defined nodes.
- The option to create a new configuration or start from a configuration that you previously saved.
- Automated validation.
- Electronic license acceptance.
- Automated clean-up of installed files if the license is declined.

The `setup.sh` script installs `nodejs`, `Chef client`, and `Chef server`. It extracts and uploads the cookbooks and sets up everything so that `Chef` can be used to install the software.

Installing the solution installer

Before you can configure and deploy the nodes in your solution, you must install the Solution Installer.

About this task

Here's a short video that shows you how to install the Solution Installer:

<https://youtu.be/9u6ZOk8iyt4>

The steps that are shown in the video are described in the following procedure.

Procedure

1. Log on to the computer where you downloaded the solution package.
2. Decompress the solution package.
3. Go to the solution installer directory in the following location:
`opt/IBM/IS_Wealth_Customerinsight_1.0.1/SolutionInstaller`.
4. If you haven't already opened the ports required by the solution installer, you can open them by running the following command:

```
./firewall.sh
```

5. Enter the following command:

```
./setup.sh username first name last name email
```

Username is the name that can be used to log on to the Chef server. It must be all lowercase characters. First and last names are for display purposes only. Email is used for notifications from Chef server. The password for the user that is created in chef is optional. If it is not included, it will be prompted for at login.

The web server is started and the URL for the Solution Installer displays in the command line window.

6. A browser window might open automatically. If it doesn't, copy and paste the URL into a web browser and bookmark it.

What to do next

Use the Solution Installer to deploy the installation files to the nodes in your solution.

Deploying the installation files on the nodes

You use the Solution Installer to deploy the installation files to the appropriate nodes in your solution.

Before you begin

Ensure that you know the URL for accessing the Solution Installer.

Ensure that you know the following information for each of the nodes in your solution:

- Host name or IP address
- A user ID and password that has write permissions to the /opt/ directory.

Each node must also meet the following requirements:

- Has a valid DNS name that is resolvable.
- Does not have Chef server or client software installed on it.

About this task

In this task, you create an installation configuration of your solution by dragging objects onto a canvas, adding components to the objects, and defining properties for the components.

Important: The Industry Solution Installer runs on the latest versions of Chrome and Firefox. It does not run on Internet Explorer and it is untested on Safari.

Procedure

1. In a web browser, go to the Solution Installer.
2. Read the license agreement and click **Accept**.
3. Click **New Configuration** and then click **OK**.
4. From the Mandatory Content List pane, select **Node**.
A visual representation of an empty node is displayed on the canvas.
5. In the Property Editor, type a name for the node, and in the **Host Name** box, specify the server on which the node will be placed.
For example, you might create a node that is named BI Node.
6. Enter a user name and password for a user that has sudo access.
If you click **Validate** before all the mandatory content is added, a message indicates that the node is not valid. For example, if you validate the BI Node before adding Cognos BI Content, then a message indicates that the node is not yet valid.
7. From the **Optional Content** list, drag any content that you want to add into the appropriate node. The reason that this content is optional is because you might already have some of the necessary components installed in your environment.
8. For every node that you want to add content to, define the node and then drag content objects onto it.

9. If you want to save the configuration to use or refer to in the future, click **Save Configuration**.
10. Click **Validate**. The progress of the validation is displayed. If the validation fails, look at the log file to troubleshoot the problem.
11. After all nodes are defined, the contents are specified, and each node is validated, click **Run**. The scripts and files that are used to install and configure the solution are copied to the target nodes.

What to do next

Complete the installation of the solution on each of the nodes.

Creating the database

Before you can use the IBM Behavior Based Client Insight for Wealth Management solution, you must create a database.

About this task

There are two scripts to be run; one to create the database, and another to populate the database. The installer will have copied the compressed file to your data node computer.

Procedure

1. Log on to the data node computer as root user.
2. On the data node computer, if the compressed file is not already decompressed, then decompress it.
3. Open a terminal window, and go to the directory where the content files were decompressed.
4. Type the following command to change the permissions for the files:
`chmod -R 755 *sh`
5. Change to the database instance owner.
 For example, `su db2inst1`
6. In the decompressed folder, run the `./Install_DB.sh` script.
7. Do the following action:
 - a. If you want to load the sample data that is provided with the solution, then run the `./Load_Data.sh` script.
 - b. If you do not want to load the sample data, then run the following SQL commands:

```
INSERT INTO PCIWLTH.CUSTOMER_SEGMENT_MINI_DIMENSION (ANNUAL_INCOME,
IMPORTANCE_RATING,LOYALTY_RATING,MARKET,NET_WORTH,PERFORMANCE_RATING,PERFORMANCE_STATUS,
POPULATION_DATE,POPULATION_DESCRIPTION,POPULATION_TIME,PRIMARY_BRANCH_PROXIMITY,
PROFITABILITY,RELATIONSHIP_AGE,RELATIONSHIP_VALUATION,RETENTION_RATING,
SATISFACTION_RATING,SEGMENT_NAME,SOURCE_SYSTEM_CODE,SOURCE_SYSTEM_NAME,
UNIQUE_ID_IN_SOURCE_SYSTEM) values (null,null,null,null,null,null,null,null,null,
null,null,null,null,null,null,null,null,null,'Conserver',null,null,null);
INSERT INTO PCIWLTH.CUSTOMER_SEGMENT_MINI_DIMENSION (ANNUAL_INCOME,IMPORTANCE_RATING,
LOYALTY_RATING,MARKET,NET_WORTH,PERFORMANCE_RATING,PERFORMANCE_STATUS,POPULATION_DATE,
POPULATION_DESCRIPTION,POPULATION_TIME,PRIMARY_BRANCH_PROXIMITY,PROFITABILITY,
RELATIONSHIP_AGE,RELATIONSHIP_VALUATION,RETENTION_RATING,SATISFACTION_RATING,
SEGMENT_NAME,SOURCE_SYSTEM_CODE,SOURCE_SYSTEM_NAME,UNIQUE_ID_IN_SOURCE_SYSTEM)
values (null,null,null,null,null,null,null,null,null,null,null,null,null,null,
null,null,'Indifferent',null,null,null);
INSERT INTO PCIWLTH.CUSTOMER_SEGMENT_MINI_DIMENSION (ANNUAL_INCOME,IMPORTANCE_RATING,
LOYALTY_RATING,MARKET,NET_WORTH,PERFORMANCE_RATING,PERFORMANCE_STATUS,POPULATION_DATE,
```



```

POPULATION_DESCRIPTION,POPULATION_TIME,PRIMARY_BRANCH_PROXIMITY,PROFITABILITY,
RELATIONSHIP_AGE,RELATIONSHIP_VALUATION,RETENTION_RATING,SATISFACTION_RATING,
SEGMENT_NAME,SOURCE_SYSTEM_CODE,SOURCE_SYSTEM_NAME,UNIQUE_ID_IN_SOURCE_SYSTEM) values
(null,null,null,null,null,null,null,null,null,null,null,null,null,null,null,
null,'Straight Arrow',null,null,null);
INSERT INTO PCIWLTH.CUSTOMER_SEGMENT_MINI_DIMENSION (ANNUAL_INCOME,IMPORTANCE_RATING,
LOYALTY_RATING,MARKET,NET_WORTH,PERFORMANCE_RATING,PERFORMANCE_STATUS,POPULATION_DATE,
POPULATION_DESCRIPTION,POPULATION_TIME,PRIMARY_BRANCH_PROXIMITY,PROFITABILITY,
RELATIONSHIP_AGE,RELATIONSHIP_VALUATION,RETENTION_RATING,SATISFACTION_RATING,
SEGMENT_NAME,SOURCE_SYSTEM_CODE,SOURCE_SYSTEM_NAME,UNIQUE_ID_IN_SOURCE_SYSTEM) values
(null,null,null,null,null,null,null,null,null,null,null,null,null,null,
null,'Individualistic',null,null,null);
INSERT INTO PCIWLTH.CUSTOMER_SEGMENT_MINI_DIMENSION (ANNUAL_INCOME,IMPORTANCE_RATING,
LOYALTY_RATING,MARKET,NET_WORTH,PERFORMANCE_RATING,PERFORMANCE_STATUS,POPULATION_DATE,
POPULATION_DESCRIPTION,POPULATION_TIME,PRIMARY_BRANCH_PROXIMITY,PROFITABILITY,
RELATIONSHIP_AGE,RELATIONSHIP_VALUATION,RETENTION_RATING,SATISFACTION_RATING,
SEGMENT_NAME,SOURCE_SYSTEM_CODE,SOURCE_SYSTEM_NAME,UNIQUE_ID_IN_SOURCE_SYSTEM) values
(null,null,null,null,null,null,null,null,null,null,null,null,null,null,
null,null,'Hedgers',null,null,null);
INSERT INTO PCIWLTH.CUSTOMER_SEGMENT_MINI_DIMENSION (ANNUAL_INCOME,IMPORTANCE_RATING,
LOYALTY_RATING,MARKET,NET_WORTH,PERFORMANCE_RATING,PERFORMANCE_STATUS,POPULATION_DATE,
POPULATION_DESCRIPTION,POPULATION_TIME,PRIMARY_BRANCH_PROXIMITY,PROFITABILITY,
RELATIONSHIP_AGE,RELATIONSHIP_VALUATION,RETENTION_RATING,SATISFACTION_RATING,
SEGMENT_NAME,SOURCE_SYSTEM_CODE,SOURCE_SYSTEM_NAME,UNIQUE_ID_IN_SOURCE_SYSTEM) values
(null,null,null,null,null,null,null,null,null,null,null,null,null,null,
null,null,'Others',null,null,null);

```

What to do next

Verify that the tables are created and the data is successfully loaded into the input tables by checking the out.log file, which is in the db2inst1 home directory. In the log file, search for the text: rows were rejected. The value should be zero. If it is not, there are data load issues.

Creating and running stored procedures

If, when you created the database for the Behavior Based Client Insight for Wealth Management solution, you chose not to load the sample data, then you need to run additional commands to create and run stored procedures. If you loaded the sample data, then you do not need to complete this task.

Before you begin

Save the SEGMENT_SUMMARY_PATTERN procedure into the SEGMENT_SUMMARY_PATTERN.sql file.

Procedure

Go to the following location to download the code for creating the stored procedures: Industry Solutions techdoc (<http://www.ibm.com/support/docview.wss?uid=swg27046047>).

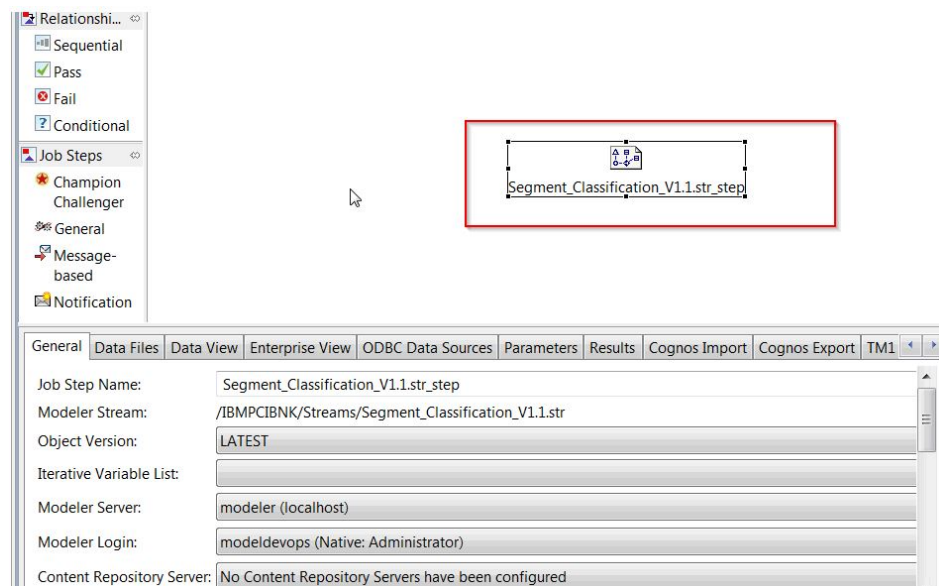
Importing IBM SPSS project streams, models, and rules

IBM SPSS project streams, models, rules, and other artifacts are contained in a repository export file (.pes) for the IBM Behavior Based Client Insight for Wealth Management solution. If you want to modify or view these artifacts, you must copy the export file to the computer where IBM SPSS Collaboration and Deployment Services Deployment Manager is installed, and open the file.

Procedure

1. Copy the .pes file to the computer where IBM SPSS Collaboration and Deployment Services Deployment Manager is installed.
2. In IBM SPSS Collaboration and Deployment Service Deployment Manager, right-click **Content Repository**, and click **Import**.
3. Browse to the .pes file
4. Select the following options:
 - **Resolve conflicts globally**
 - **Add new version of target item or rename source item, Use labels from source.**
 - **Continue import even if some objects cannot be imported due to locking conflicts.**
 - **Resolve Invalid Version Conflicts, Import.**
 - **Resource Definitions, Recommended - Import if there are no Duplicate ID conflicts or Duplicate Name conflicts.**
5. Click **OK**.
6. Under **Resource definitions / Credentials**, create a new credential named IBMPCIWEATH.
7. Under **Resource definitions / Data Sources**, create a new data source named IBMPCIWEATH.
8. After the .pes file is imported to the CnDS, open the job and click the step that is listed in the job.

Note: The following screen captures use a data source name for another industry solution. When referring to the screen captures, substitute WEALTH for the data source name PCIBNK.



Make sure that **Modeler Server** and **Modeler Login** fields are set to the correct definitions.

9. Click the **ODBC Data Sources** tab, and make sure that ODBC DSN and credentials are set to the newly created data source and credential.

Node Name	Node Type	ODBC DSN	Credentials	Database Table
PCIBNK.CUSTOMER_...	Database Export	IBMPCIBNK	IBMPCIBNK (: cfdbadmin)	PCIBNK.CUSTO...
cfdbadmin@PCIBNK	Database Source	IBMPCIBNK	IBMPCIBNK (: cfdbadmin)	PCIBNK.SEGME...
PCIBNK.CUSTOMER_...	Database Source	IBMPCIBNK	IBMPCIBNK (: cfdbadmin)	PCIBNK.CUSTO...

Results

Content folders and resource definitions are added to the repository alongside any existing content.

Configuring the data view for IBM SPSS models

To configure the data view, IBM SPSS® Modeler must be connected to the IBM Behavior Based Client Insight for Wealth Management database through an ODBC data source connection.

If your IBM Predictive Customer Intelligence environment uses the IBM SPSS Modeler client logged in to a Modeler server, complete the steps on the Predictive Analytics node computer (where IBM SPSS Modeler Server is installed).

If your IBM Predictive Customer Intelligence environment uses the IBM SPSS Modeler Client in a stand-alone environment, complete the steps on the client computer where IBM SPSS Modeler client is installed.

The Behavior Based Client Insight for Wealth Management solution uses the Analytic Data View and JDBC source connections for accessing IBM Analytical Decision Manager. When the Behavior Based Client Insight for Wealth Management files are imported through IBM SPSS Collaboration and Deployment Services Deployment Manager, a new version of the Enterprise View is created that contains the tables for the solution.

Procedure

1. Catalog the database on the client computer.
 - a. Click **Start > IBM DB2 > DB2COPY1 (Default) > DB2 Command Window - Administrator**.
 - b. Enter the following command to catalog the database node:

```
db2 catalog tcpip node NODE_NAME remote data_node_name server PORT_NUMBER
NODE_NAME can be any value. PORT_NUMBER is 50000 by default.
```
 - c. Enter the following command to catalog the PCI database:

```
db2 catalog database WEALTH at node NODE_NAME authentication server
```

 You must use the same *node_name* that you used in the **db2 catalog database** command.
2. Create an ODBC DSN to point to the Behavior Based Client Insight for Wealth Management database. The database account that is provided in the ODBC connection must be the same user that was used for creating the tables.
3. In the Deployment Manager client, under **Resource Definitions, Credentials**, open the **db2admin** credentials and update the user ID and password to the DB2® administrator account of the data node computer.

Configuring ODBC for IBM SPSS Modeler Server

To use an ODBC data source with IBM SPSS Modeler Server on a Linux operating system, you must configure the environment.

Procedure

1. Stop the IBM SPSS Modeler Server.
2. Go to the /root/SDAP71 directory.
The driver files are installed as part of the Behavior Based Client Insight for Wealth Management Server deployment.
3. Run the setodbcpath.sh script to update the ODBC path in the scripts.
4. Edit the odbc.sh script to add the definition for ODBCINI to the bottom of the script. For example:

```
ODBCINI=/usr/spss/odbc/odbc.ini; export ODBCINI
```

ODBCINI must point to the full file path of the odbc.ini file for IBM SPSS Modeler. The odbc.ini file lists the ODBC data sources that you want to connect to. A default odbc.ini file is installed with the drivers.

5. In the odbc.ini file, add the data source and specify the driver in the [ODBC Data Sources] section of the file.

For example, add the data source as:

```
[ODBC Data Sources]WEALTH=IBM DB2 ODBC Driver
```

6. In the odbc.ini file, create an ODBC data source connection for the WEALTH database.

For example, include the following content:

```
[WEALTH]
Driver=/opt/ibm/db2/V10.1/lib64/libdb2o.so
DriverUnicodeType=1
Description=IBM DB2 ODBC Driver
ApplicationUsingThreads=1
AuthenticationMethod=0
BulkBinaryThreshold=32
BulkCharacterThreshold=-1
BulkLoadBatchSize=1024
CharsetFor65535=0
#Database applies to DB2 UDB only
Database=WEALTH
DefaultIsolationLevel=1
DynamicSections=200
EnableBulkLoad=0
EncryptionMethod=0
FailoverGranularity=0
FailoverMode=0
FailoverPreconnect=0
GrantAuthid=PUBLIC
GrantExecute=1
GSSClient=native
HostNameInCertificate=
IpAddress=IP_Address_of_DB_server
KeyPassword=
KeyStore=
KeyStorePassword=
LoadBalanceTimeout=0
LoadBalancing=0
LogonID=db2inst1
MaxPoolSize=100
MinPoolSize=0
Password=password
PackageCollection=NULLID
PackageNamePrefix=DD
```

```

PackageOwner=
Pooling=0
ProgramID=
QueryTimeout=0
ReportCodePageConversionErrors=0
TcpPort=50000
TrustStore=
TrustStorePassword=
UseCurrentSchema=0
ValidateServerCertificate=1
WithHold=1
XMLDescribeType=-10

```

Important: You must use the driver library `libdb2o.so` with IBM SPSS Modeler.

Ensure that you set `DriverUnicodeType=1` to avoid buffer overflow errors when you connect to the database.

7. If you are using the 64-bit version of IBM SPSS Modeler Server, define and export `LD_LIBRARY_PATH_64` in the `odbc.sh` script:

```

if [ "$LD_LIBRARY_PATH_64" = "" ]; then
LD_LIBRARY_PATH_64=<library_path>
else
LD_LIBRARY_PATH_64=<library_path>:$LD_LIBRARY_PATH_64
fi
export LD_LIBRARY_PATH_64

```

Where `<library_path>` is the same as for the `LD_LIBRARY_PATH` definition in the script that was initialized with the installation path. For example, `/usr/spss/odbc/lib`.

Tip: You can copy the `if` and `export` statements for `LD_LIBRARY_PATH` in the `odbc.sh` file, append them to the end of the file. Then, replace the `LD_LIBRARY_PATH` strings in the newly appended `if` and `export` statements with `LD_LIBRARY_PATH_64`. Here is an example of the `odbc.sh` file for a 64-bit IBM SPSS Modeler Server installation:

```

if [ "$LD_LIBRARY_PATH" = "" ]; then
LD_LIBRARY_PATH=/usr/spss/odbc/lib
else
LD_LIBRARY_PATH=/usr/spss/odbc/lib:$LD_LIBRARY_PATH
fi
export LD_LIBRARY_PATH
if [ "$LD_LIBRARY_PATH_64" = "" ]; then
LD_LIBRARY_PATH_64=/usr/spss/odbc/lib
else
LD_LIBRARY_PATH_64=/usr/spss/odbc/lib:$LD_LIBRARY_PATH_64
fi
export LD_LIBRARY_PATH_64
ODBCINI=/usr/spss/odbc/odbc.ini; export ODBCINI

```

Ensure that you export `LD_LIBRARY_PATH_64`, and define it with the `if` loop.

8. Configure IBM SPSS Modeler Server to use the driver. Edit `modelersrv.sh` and add the following line immediately after the line that defines `SCLEMDNAME`:
`. <odbc.sh_path>`

Where `odbc.sh_path` is the full path to the `odbc.sh` file.

For example: `. /usr/spss/odbc/odbc.sh`

Ensure that you leave a space between the first period and the file path.

9. Save `modelersrv.sh`.
10. Configure the IBM SPSS Modeler Server to use the ODBC wrapper named `libspssodbc_datadirect.so`.

- a. Go to the `/usr/IBM/SPSS/ModelerServer/16.0/bin` directory.
 - b. Remove the existing `libspssodbc.so` soft link by using the following command:


```
rm-fr libspssodbc.so
```
 - c. Link the new wrapper to `libspssodbc.so` by using the following command:


```
ln-s libspssodbc_datadirect_utf16.so libspssodbc.so
```
11. Configure the `db2cli.ini` file in `<db2 instance home>/sqllib/cfg/db2cli.ini` to add the sections for each database.
- ```
[WEALTH]
Database=WEALTH
Protocol=TCPIP
DriverUnicodeType=1
Port=50000
Hostname=ip or hostname
UID=username
PWD=password
```
12. Save the `odbc.ini` file.

## What to do next

To test the connection, do the following steps:

1. Restart IBM SPSS Modeler Server.
2. Connect to IBM SPSS Modeler Server from a client.
3. Add a database source node to the canvas.
4. Open the node and verify that you can see the data source names that you defined in the `odbc.ini` file.

For more information and troubleshooting tips for connecting to data sources, see the SPSS Modeler documentation ([www.ibm.com/support/knowledgecenter/SS3RA7\\_16.0.0](http://www.ibm.com/support/knowledgecenter/SS3RA7_16.0.0))

---

## Deploying the IBM Cognos content

For IBM Cognos Business Intelligence, you must catalog the database, create a data source connection, and then deploy the content files for the IBM Behavior Based Client Insight for Wealth Management solution.

### Preparing the IBM Cognos content

You must move the IBM Cognos® Framework Manager content for the IBM Behavior Based Client Insight for Wealth Management solution to the Cognos Deployment folder.

The Solution installer supports copying content only to Linux nodes. If you are modifying the Framework Manager model, it must be copied to a Windows computer. Instructions for doing this by using the browser's download capabilities are included in the SolutionInstaller > NodeRoot > Downloads > IS\_<Solution\_Name>\_1.0 folder, in a file that is called IS\_<SolutionName>\_1.0\_ClientDeployment Files.txt.

### Procedure

1. Copy the IBM Cognos Framework Manager model file from the computer where you deployed the solution to the computer where you installed IBM Cognos Framework Manager, and decompress the file.

- The Framework Manager file is named `\BI\Client_ClientInsight_CD.fmd`.
2. If you want to edit the Framework Manager models, you must catalog the Behavior Based Client Insight for Wealth Management database on the computer where Framework Manager is installed.
    - a. Click **Start > IBM DB2 > DB2COPY1 (Default) > DB2 Command Window - Administrator**.
    - b. Enter the following command to catalog the database node:
 

```
db2 catalog tcpip node NODE_NAME remote data_node_name server PORT_NUMBER
```

*NODE\_NAME* can be any value. *PORT\_NUMBER* is 50000 by default.
    - c. Enter the following command to catalog the PCI database:
 

```
db2 catalog database WEALTH at node NODE_NAME authentication server.
```

You must use the same *node\_name* that you used in the DB2 catalog database command.
  3. Download IBM Cognos Business Intelligence Cube Designer software from Passport Advantage. Cube Designer requires Framework manager to be installed on the same node as well.
  4. Go to the location where the installation files were downloaded and extracted and then double-click the `issetup.exe` file.
  5. Select the language to use for the installation. The language that you select determines the language of the user interface. All supported languages are installed. You can change the user interface to any of the installed languages after installation.
  6. On the Installation Location panel, select the location where Framework Manager is installed.
  7. Accept the defaults on the Component Selection page.
  8. Follow the directions in the installation wizard to copy the required files to your computer.
 

If you are installing in a directory that contains other IBM Cognos Business Intelligence components, you are prompted to create backup copies of the files that will be replaced.
  9. In the Finish page of the installation wizard, complete the following steps:
    - a. If you want to see the log files, click **View** for the appropriate log file.
    - b. If you want to see late-breaking information about the product, select the check box for IBM Cognos Release Notes.
    - c. Click **Finish**.

## Creating a data source connection to the database

You must create a data source connection to the Behavior Based Client Insight for Wealth Management database.

### Procedure

1. Open a web browser.
2. Go to the IBM Cognos BI portal URL.
 

For example, go to `http://bi_node_name/ibmcognos/`.
3. On the **Welcome** page, click **Administer IBM Cognos Content**.
4. Click the **Configuration** tab, and click **Data Source Connections**.
5. Click **New Data Source**.
6. In the **Name** box, type `WEALTH`, and then click **Next**.

7. In the connection page, select **IBM DB2**, ensure that **Configure JDBC connection** is selected, and click **Next**.
8. In the **DB2 database name** field, type **WEALTH**.
9. Leave **DB2 connect string** blank.
10. Under **Signons**, select both **Password** and **Create a signon that the Everyone group can use**, and then type the user ID and password for the DB2 instance owner user that you used to create the database, and click **Next**.

**Tip:** To test whether the parameters are correct, click **Test the connection**. After you test the connection, click **OK** to return to the connection page.

11. In the **Server name** box, enter the name or IP address of your data node computer.
12. In the **Port number** box, enter the DB2 port number. The default is 50000.
13. In **Database name**, type **WEALTH**.

**Tip:** To test whether the parameters are correct, click **Test the connection**. After you test the connection, click **OK** to return to the connection page.

14. Click **Finish**.

## Deploying dynamic cubes for the sample data

If you choose to use the sample data for the Behavior Based Client Insight for Wealth Management solution, you must deploy the dynamic cubes.

### Before you begin

You must create a data source connection to the database that contains the data by completing the steps in the following link:

Creating a data source in the Cognos Administration portal ([http://www.ibm.com/support/knowledgecenter/SSEPGG\\_10.5.0/com.ibm.dwe.migrate.doc/data\\_source\\_cs\\_cognos.html](http://www.ibm.com/support/knowledgecenter/SSEPGG_10.5.0/com.ibm.dwe.migrate.doc/data_source_cs_cognos.html))

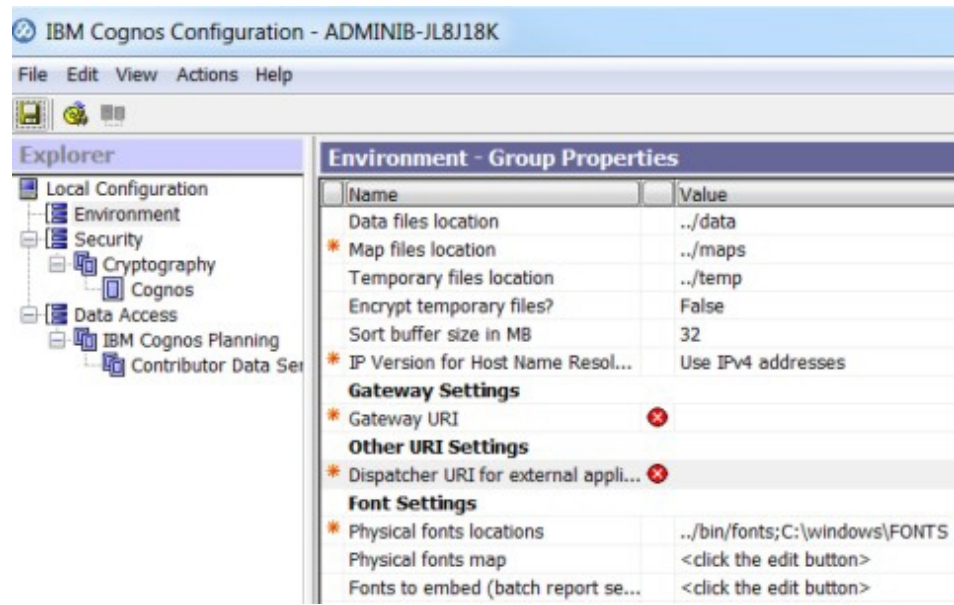
### Procedure

1. Add the dispatcher and gateway information of the computer in which the data source is created to the Cognos configuration of the local system from which cubes are published (the computer on which the cube designer is installed).

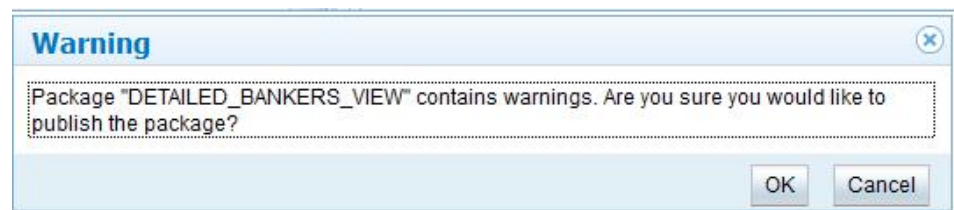
Use the following URI to set the dispatcher and the gateway:

- Gateway URI: <http://localhost:80/ibmcognos/cgi-bin/cognos.cgi>
- Dispatcher URI: <http://localhost:9080/p2pd/servlet/dispatch>





2. Open IBM Cognos Cube Designer and click **Open Existing** to load the .fmd file.
3. In Cognos Cube Designer, click the data source to display the Properties window.
4. Change the Content Manager data source to the name of the data source connection that is created in Cognos Server
5. Change the schema name to the name under which data objects are created.
6. Right-click the data source and refresh the metadata.
7. To publish the cubes, right-click a package and click **Publish**. The following message appears.



8. Click **OK**.  
Cubes are published to the Cognos server. A message appears to indicate that the cubes are published successfully.
9. Check the status of the cube in Cognos Administration under **Data Sources**. Initially all cubes have a status of **Unknown**.
10. Select all the cubes that you published, right-click next to the cube, select **Add data store to server group**, and click **OK**. Now the cubes move to an **Unavailable** status.
11. From the same menu, click **Start**. If an error message is encountered when you publish the cube, check the log file in C:\Program Files\IBM\cognos\c10\_64\logs\XQE on the computer in which IBM Cognos BI is installed. Open the most recent log file with a file name that starts with xqe1og followed by a date and time stamp. The error message in the log looks similar to the following message:

```
<event component="XQE" group="MDXEngine" level="ERROR" thread="272"
timestamp="2015-06-19 10:21:16.719" contextId="10892"
requestId="wvq2MqyClyMC2G4dyv19MdMjyywsGjhhqs4j4q8q"
rolapCube="LIFE_EVENT_HISTORY_FACT"
sessionId="9380_891386e6-16a7-11e5-8029-fb9fdf7b972d">
<![CDATA[XQE-D8-0006 Unable to logon to the data source.
```

## Deploying the IBM Cognos reports

You must deploy the Behavior Based Client Insight for Wealth Management reports by using IBM Cognos Administration.

### Procedure

1. Open a web browser.
2. Go to the IBM Cognos BI portal URL.
3. On the **Welcome** page, click **Administer IBM Cognos Content**.
4. On the **Configuration** tab, click **Content Administration**.
5. On the toolbar, click the **New Import** button.
6. In the **Deployment Archive** pane, select the deployment archive, and click **Next**.

The deployment archive is named `Wealth_CustomerInsight_BIContent.zip`.

7. In the **Specify a name and description** pane, accept the default or enter a new name, and click **Next**.
8. In the **Select the public folders and directory content** pane, select all of the packages in the table, leave the **Options** as default, and click **Next**.

**Note:** Ensure that the **Disable after import** option is cleared.

9. In the **Specify the general options** pane, accept the defaults, and click **Next**.
10. On the **Review the summary** page, click **Next**.
11. On the **Select an action** page, select **Save and run once**, and click **Finish**.
12. On the **Run with options** page, accept the defaults, and click **Run**, and then click **OK**.
13. Select **View the details of this import after closing this dialog** and click **OK**.

14. In IBM Cognos Administration, click the **Home** button.

The Behavior Based Client Insight for Wealth Management content is available in **Public Folders** in the `Wealth_CustomerInsight_BIContent.zip` file.

15. Rave libraries are also available as part of the solution. They are packaged in the `Wealth_CustomerInsight_Rave.zip` file.
16. Go to the IBM Cognos BI portal URL.  
For example, go to `http://bi_node_name/ibmcognos/`.
17. On the Welcome page, click **Administer IBM Cognos Content**.
18. On the libraries tab, click the **Import** button.
19. Select the `Wealth_CustomerInsight_Rave.zip` file, and click **Import**.

---

## Installing the EAR file

The EAR file contains the REST APIs that you use to embed the IBM Behavior Based Client Insight for Wealth Management solution in your existing system.

## Procedure

1. Log in to the WebSphere Application Server Network Deployment administrative console.
2. Load the IS\_Wealth\_Solution\_EAR.ear file into one of the WebSphere Application Server nodes, either the BI node or the Analytics node.
3. Install the application through WebSphere Application Server.
4. Click the **Applications** link, and then click **Install New Application**.
5. From the Specify the EAR, WAR, JAR, or SAR module to upload and install page, select **Local file system**, and then browse to the location on your system of the EAR file.
6. Start the installed application, IS\_Wealth.



---

## Chapter 3. Creating and managing customer segments

In the Behavior Based Client Insight for Wealth Management solution, you can add, edit, or delete behavioral customer segments by using the Segmentation Tool.

For more information, see “Customizing segments” on page 52

The following screen capture shows the Segmentation Tool page when it is opened. When the **Hints** control is set to **ON**, a description is displayed when you hover your mouse pointer over each field on the page.

The following tables shows the categories that are available:

Table 1. Wealth data dictionary

| Categories  | Sub-categories                                                                              |
|-------------|---------------------------------------------------------------------------------------------|
| ASSETS      | Bonds, Commodities, Credits, Derivatives, Estate Funds, Forex, Money Market, Stocks, Others |
| TRADING     | Bonds, Commodities, Credits, Derivatives, Estate Funds, Forex, Money Market, Stocks, Others |
| FUNDING     | Regular, Rare, Lumpy                                                                        |
| INTERACTION | Rare, Frequent, Less Frequent                                                               |

The above categories are defined based on the customer transactions data.

### ASSETS

Assets owned by the user in any of the listed sub-categories.

### TRADING

Trading activity performed by the user in any of the listed sub-categories.

## FUNDING

Funding pattern for the user.

## INTERACTION

Interaction pattern for the user. Implies interaction with the wealth manager.

With the Segmentation Tool you can create or change the rules that determine which customers are assigned to each segment. The tool uses mean and standard deviation to target certain percentages of customers.

For example, if you want to create a segment for the top 25 percent of customers who have assets consisting mostly of stocks, you select **Assets** as the category and **Stocks** as the value. You choose **greater** in the **Operator** field, choose **plus** in the **+/-** field, and type 0.67 in the **Multiplier/Count** field. If you want to select the top 10 percent of customers, you would use 1.28 as your multiplier. Mean and standard deviation are automatically calculated based on the data in your database.

---

## Editing a segment

In the Behavior Based Client Insight for Wealth Management solution, you can use the Segmentation Tool to make changes to an existing customer segment.

### Procedure

1. Open the Segmentation Tool page.
2. In the **Segment Name** box, select the segment that you want to edit.
3. Click **Edit**.
4. To change an existing rule, in the Definition section, you can select a different operator, **+/-**, and multiplier/count. You can delete an existing rule by clicking **X** beside the rule. To clear all rules, click **Clear**.

**Note:** If you select **range** as your operator, then **+/-** is automatically selected. Some categories may not require you to choose an operator, **+/-**, or multiplier/count.

5. To add a new rule to the segment, select a category, and click **Add Rule**. A new line is added to the Definition section of the page.
6. Click **Update** to save your changes.

---

## Deleting a segment

In the Behavior Based Client Insight for Wealth Management solution, you can use the Segmentation Tool to delete an existing customer segment.

### Procedure

1. Open the Segmentation Tool page.
2. In the **Segment Name** box, select the segment that you want to delete.
3. Click **Delete**.

---

## Adding a new segment

In the Behavior Based Client Insight for Wealth Management solution, you can use the Segmentation Tool to add a new customer segment.

## Procedure

1. Open the Segmentation Tool page.
2. Click **Add New**.
3. In the **Segment Name** box, type a name for the new segment.
4. In the **Category** box, select the category of rule that you want to add to the new segment, and click **Add Rule**. A line is added to the Definition section of the page.

**Note:** If you select **range** as your operator, then +/- is automatically selected. Some categories may not require you to choose an operator, +/-, or multiplier/count.

5. To add more rules, repeat step 4.
6. After you define all the rules that you want to add to the new segment, click **Submit**.





---

## Chapter 4. Reports

The Behavior Based Client Insight for Wealth Management solution provides reports with dashboard templates, sample predictive models, and application interfaces for integration.

The reports provide information about clients, including financial positions and psychographic profiles based on life event models and transaction history.

The following analytics reports are provided:

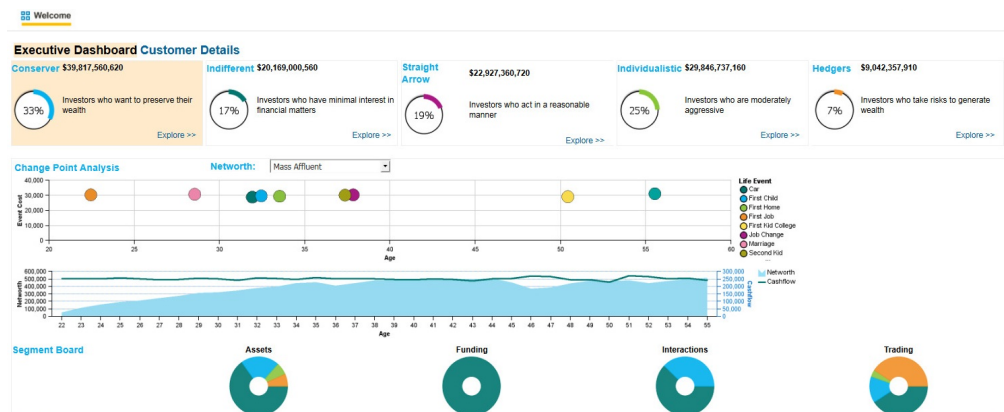
- Executive Dashboard
- Customer Summary
- Customer Details

---

### Executive Dashboard

When you log in to the solution, the Executive Dashboard provides analysis for each segment. Customers are divided into segments based on their investment characteristics. You can view each segment's total net worth and its percentage of the total net worth of your customer base.

To view the analysis for a segment, click the name of the segment. The following screen capture shows the executive dashboard with the **Conservor** segment.



The **Change Point Analysis** charts provide the average cost and age of life events, and the average net worth, for the selected segment. You can view age and cost of the life event when you hover your mouse pointer over a bubble. You can use the **Networth** box to filter for customer groups that have different net worths.

The **Segment Board** section of the dashboard provides investment characteristics of each segment. It shows how customers of the selected segment distribute their assets, fund their portfolios, interact with the company, and trade securities. Specific information is provided when you hover your mouse pointer over each pie slice.

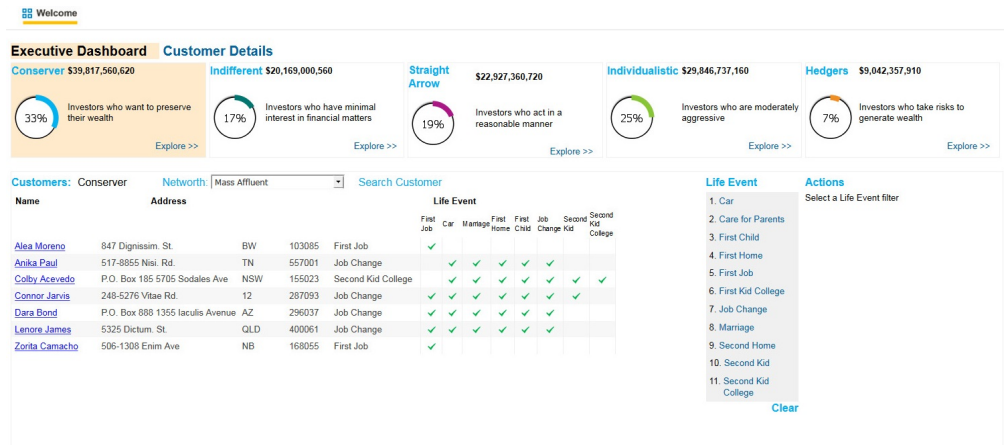
---

### Customer Summary report

The Customer Summary report provides a list of customers from the segment and net worth that you select.

The **Life Event** table indicates life events that have already taken place for each client. The current or most recent life event is listed in the chart and each life event that has occurred is indicated by a check mark. You can click a life event in the **Life Event** list to filter the clients. For example, if you choose **Job Change** as the life event, only those customers whose current or most recent life event is job change are shown on the page. Suggested actions related to the selected life event are also shown.

The following screen capture shows the report when the Conserver segment and Mass Affluent net worth are selected.



## Customer Details report

The Customer Details report provides detailed information for the selected customer.

To access the Customer Details report, on the Customer Summary report, click the name of the customer who you want to get further information on.

In the **Customer Details** section of the report, the **Last Met** field indicates the date of the most recent meeting with the client. The **Follow Up** field indicates the recent life event to address at the next meeting with the client.

The **Channel Usage** section shows the number of times each channel has been used for communication with the company.

The **Social Interaction** section shows the number of times the customer mentioned your wealth management firm in social interactions.

The **Change Point Analysis** indicates life events that the customer has experienced.

The following screen capture shows the report for a selected customer.

### Executive Dashboard Customer Details

Search Customer

#### Customer Details



Name: **Anika Paul**      Income: \$150,000.00  
Phone: 4359045516      Assets: \$11,114.99  
Address: 517-8855 Nisi Rd.  
TN 557001  
Last Met: 2014-01-01  
Follow Up: Job Change

#### Actions

##### For Anika Paul

1. Roll Over IRA (33 % of peers)
2. New Health Insurance (35 % of peers)
3. Retirement Account (57 % of peers)

#### Channel Usage

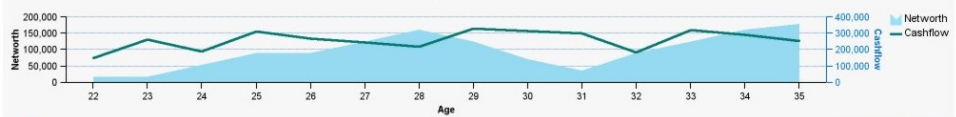
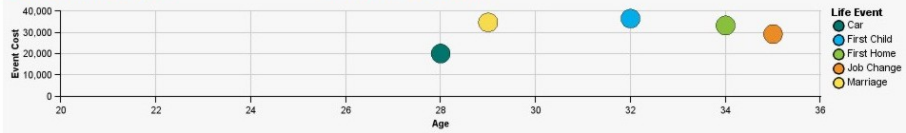


#### Social Interaction



#### Change Point Analysis

##### Networth.Mass Affluent



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Sep 17, 2015 9:37:42 AM



# Chapter 5. Using the Behavior Based Client Insight for Wealth Management solution

The solution provides reporting and dashboard templates and sample predictive models.

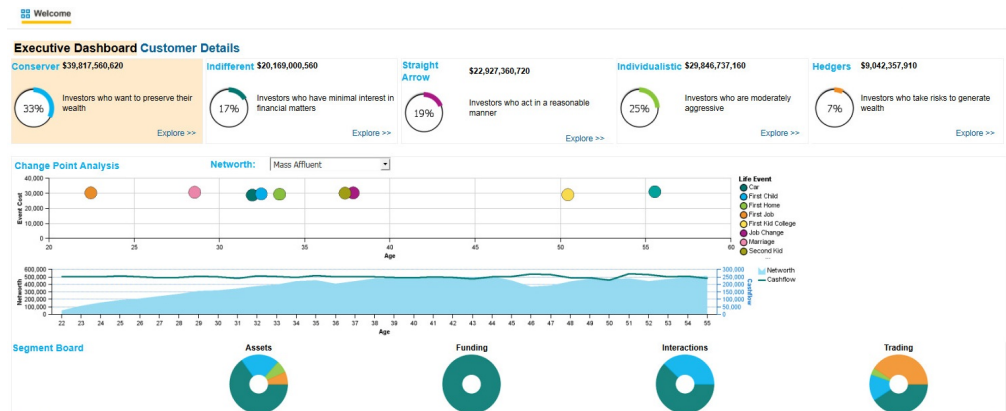
For each client, historical data analysis is used to generate a life event model and transaction history. The solution analyzes each client’s financial position and also develops a psychographic profile, which defines such things as the customer’s willingness to accept risk for the potential of higher returns. The solution uses this information to divide the client base into segments and provide predictions about life events. It provides wealth advisors with suggestions for the best actions to take for each client.

## An example of the Behavior Based Client Insight for Wealth Management solution in action

This fictitious example shows how the application provides insight that helps an investment advisor to provide the best possible recommendations for a client.

Christina Sizemore is a financial advisor with 60 clients under management. Her employer, ABC Finance, a traditional full-service wealth management firm, has recently experienced flat revenue growth and is losing clients to the new internet-based robo-advisor firms. ABC Finance has been in the wealth management business for 50 years and has accumulated a large amount of historical client data, including client profile, interaction, and transaction data. The company recognizes that the accumulated information is a valuable resource that can provide them with competitive advantage if they can use it to gain insight into their clients’ behaviors. ABC Finance decides to invest in the IBM Behavior Based Client Insight for Wealth Management solution.

Christina arrives at the office and looks at her calendar to view her customer appointments for the day. To prepare for the customer appointments, Christina starts the IBM wealth management portlet on her desktop and sees the following view.

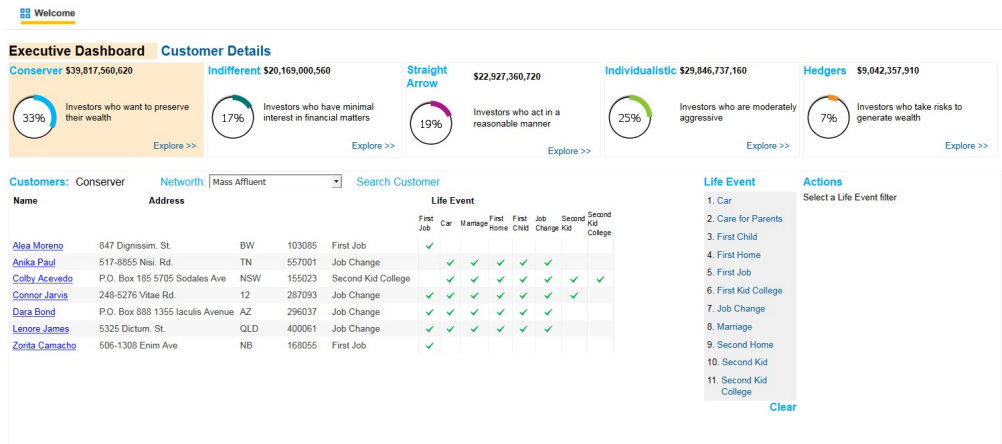


The Executive Dashboard shows the various behavioral segments: Conservator, Indifferent, Straight Arrow, and so on, followed by a change point analysis and

average net worth for the segment that is selected. For the chosen segment, this view shows the distribution of four types of data – Assets, Funding, Interactions, and Trading.

Christina clicks the various behavioral segments to view the segment-specific information. Christina’s first customer of the day is Anika Paul. Christina has been helping Anika to manage her investments for the past five years and is familiar with the account. She looks at Anika’s profile and sees that Anika is in the Conserver behavioral segment, which is shown in the following image. Conserver investors invest in assets that have very little risk of losing value. Therefore, their investments tend to grow slowly. They are comfortable investing in government bonds, money market funds, guaranteed investment certificates, and sometimes high-quality dividend-paying stocks.

To prepare for her appointment with Anika, Christina wants to understand the Conserver segment better. She drills down into the segment to display the following dashboard.



The dashboard displays the names of customers in this segment who are nearing life events. Christina selects Anika's name in the list of customers to display the following view that suggests specific actions to discuss with Anika.



When Anika arrives for her appointment, Christina is able to discuss a financial plan that Anika is comfortable with and provides options for investments, retirement savings, and health insurance.





---

## Appendix A. Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products.

For information about the commitment that IBM has to accessibility, see the IBM Accessibility Center ([www.ibm.com/able](http://www.ibm.com/able)).

IBM Cognos HTML documentation has accessibility features. PDF documents are supplemental and, as such, include no added accessibility features.

### Report output

In IBM Cognos Administration, you can enable system-wide settings to create accessible report output. For more information, see the *IBM Cognos Business Intelligence Administration and Security Guide*. In IBM Cognos Report Studio, you can enable settings to create accessible output for individual reports. For more information, see the *IBM Cognos Report Studio User Guide*. You can access the previously mentioned documents at IBM Knowledge Center (<http://www.ibm.com/support/knowledgecenter>).



---

## Appendix B. Troubleshooting

This section contains troubleshooting information for the Behavior Based Client Insight for Wealth Management installation.

---

### Troubleshooting a problem

Troubleshooting is a systematic approach to solving a problem. The goal of troubleshooting is to determine why something does not work as expected and how to resolve the problem.

Review the following table to help you or customer support resolve a problem.

*Table 2. Troubleshooting actions and descriptions*

| Actions                                                                                                                                                                                                                                                     | Description                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A product fix might be available to resolve your problem.                                                                                                                                                                                                   | Apply all known fix packs, or service levels, or program temporary fixes (PTF).                                                                                                                                       |
| Look up error messages by selecting the product from the IBM Support Portal, and then typing the error message code into the <b>Search support</b> box ( <a href="http://www.ibm.com/support/entry/portal/">http://www.ibm.com/support/entry/portal/</a> ). | Error messages give important information to help you identify the component that is causing the problem.                                                                                                             |
| Reproduce the problem to ensure that it is not just a simple error.                                                                                                                                                                                         | If samples are available with the product, you might try to reproduce the problem by using the sample data.                                                                                                           |
| Ensure that the installation successfully finished.                                                                                                                                                                                                         | The installation location must contain the appropriate file structure and the file permissions. For example, if the product requires write access to log files, ensure that the directory has the correct permission. |
| Review all relevant documentation, including release notes, technotes, and proven practices documentation.                                                                                                                                                  | Search the IBM Knowledge Center to determine whether your problem is known, has a workaround, or if it is already resolved and documented.                                                                            |
| Review recent changes in your computing environment.                                                                                                                                                                                                        | Sometimes installing new software might cause compatibility issues.                                                                                                                                                   |

If the items in the table did not guide you to a resolution, you might need to collect diagnostic data. This data is necessary for an IBM technical-support representative to effectively troubleshoot and assist you in resolving the problem.

### Troubleshooting resources

Troubleshooting resources are sources of information that can help you resolve a problem that you are having with an IBM product.

#### Support Portal

The IBM Support Portal is a unified, centralized view of all technical support tools and information for all IBM systems, software, and services.

The IBM Support Portal lets you access all the IBM support resources from one place. You can tailor the pages to focus on the information and resources that you need for problem prevention and faster problem resolution. Familiarize yourself with the IBM Support Portal by viewing the demo videos ([https://www.ibm.com/blogs/SPNA/entry/the\\_ibm\\_support\\_portal\\_videos](https://www.ibm.com/blogs/SPNA/entry/the_ibm_support_portal_videos)).

Find the content that you need by selecting your products from the IBM Support Portal (<http://www.ibm.com/support/entry/portal>).

Before contacting IBM Support, you will need to collect diagnostic data (system information, symptoms, log files, traces, and so on) that is required to resolve a problem. Gathering this information will help to familiarize you with the troubleshooting process and save you time.

## **Service request**

Service requests are also known as Problem Management Reports (PMRs). Several methods exist to submit diagnostic information to IBM Software Technical Support.

To open a PMR or to exchange information with technical support, view the IBM Software Support Exchanging information with Technical Support page (<http://www.ibm.com/software/support/exchangeinfo.html>).

## **Fix Central**

Fix Central provides fixes and updates for your system's software, hardware, and operating system.

Use the pull-down menu to navigate to your product fixes on Fix Central (<http://www.ibm.com/systems/support/fixes/en/fixcentral/help/getstarted.html>). You may also want to view Fix Central help.

## **IBM developerWorks**

IBM developerWorks<sup>®</sup> provides verified technical information in specific technology environments.

As a troubleshooting resource, developerWorks provides easy access to the most popular practices, in addition to videos and other information: developerWorks (<http://www.ibm.com/developerworks>).

## **IBM Redbooks**

IBM Redbooks<sup>®</sup> are developed and published by the IBM International Technical Support Organization, the ITSO.

IBM Redbooks (<http://www.redbooks.ibm.com>) provide in-depth guidance about such topics as installation and configuration and solution implementation.

## **Software support and RSS feeds**

IBM Software Support RSS feeds are a quick, easy, and lightweight format for monitoring new content added to websites.

After you download an RSS reader or browser plug-in, you can subscribe to IBM product feeds at IBM Software Support RSS feeds (<https://www.ibm.com/software/support/rss>).

## Log files

Log files can help you troubleshoot problems by recording the activities that take place when you work with a product.

## Error messages

The first indication of a problem is often an error message. Error messages contain information that can be helpful in determining the cause of a problem.

---

## After the solution installer is run, Chef processes are still running after the cleanup.sh script is executed

After the cleanup.sh script is run on the solution installer node, all Chef processes should be terminated. However, in some cases Chef processes are still running.

If you try to run the solution installer setup.sh file again, you might receive a message that required ports are in use, or creation of the chef user might fail.

The solution to this issue is to reboot the installation node after you run the "cleanup.sh" script.

**Note:** This information applies only to the solution installer node and not the client/target nodes.

**Attention:** The solution installer runs on the latest versions of Chrome and Firefox. It is not tested on Safari and does not run on Internet Explorer.



---

## Appendix C. Client data ingestion: SPSS streams

The IBM solution works with IBM Predictive Customer Insight.

Two SPSS streams are provided that enable the client to ingest data into the solution database. The client data in a predefined Comma Separated Value (CSV) file format is provided to the stream as input, and the stream extracts the data from the CSV file and inserts the records into relevant tables in the solution database. The client data can be of the following types:

- Customer demographic details (including contact information)
- Customer transactions data

There are two separate streams for each of the types of data.

---

### Purpose of the SPSS streams

The SPSS streams act as an important ETL process between the client data and the solution database.

They perform the following operations:

- Extract raw client data from the CSV files
- Transform data according to the solution needs (such as eliminating the unwanted spaces)
- Filter the transformed data and load it into relevant tables in the solution database

By using the streams, clients can easily ingest large sets of data related to customers and their transactions.

The following two streams are provided:

- Wealth Customer ETL – Customer demographic details (including contact information)
- Wealth Transaction ETL - Customer transactions data

---

### CSV formats

This section provides the CSV formats for both customers and transactions.

**Important:** In the following CSV files, you must replace the NULL values by default values for the streams to work correctly.

#### Format for the CSV file input to the Wealth Customer ETL

"CITY","COUNTRY","EMAIL","POSTCODE\_AREA","STATE","STREET","FULL\_TELEPHONE\_NUMBER",  
"BIRTH\_DATE","FULL\_NAME","PHOTO","MARITAL\_STATUS","EDUCATION"

CITY > city where the customer lives

COUNTRY > country where the customer lives

EMAIL > customer's email address

POSTCODE\_AREA > postal code of the area where the customer lives

STATE > state where the customer lives

STREET > street address where the customer lives

FULL\_TELEPHONE\_NUMBER > customer's telephone number

BIRTH\_DATE > customer's date of birth

FULL\_NAME > customer's full name  
PHOTO > Link to the customer's photo (URL)  
MARITAL\_STATUS > customer's marital status  
EDUCATION > customer's most recently completed education

### Sample CSV file for customers

```
"CITY","COUNTRY","EMAIL","POSTCODE_AREA","STATE","STREET",
"FULL_TELEPHONE_NUMBER","BIRTH_DATE","FULL_NAME","PHOTO","MARITAL_STATUS","EDUCATION"
"Jamaica","US","vereen@yahoo.com","04017","MA","11 smith street","8572055850", "1986-06-17",
"Alfonso Osborne","http://hostname/ibmcognos/samples/images/Customer/3.png","Married","Graduate"
```

### Format for the CSV file input to the Wealth Transaction ETL

```
"CALENDAR_DATE","NAME","FULL_NAME","BIRTH_DATE","PHOTO",
"MARITAL_STATUS","EDUCATION","DESCRIPTION","NAME","NET_CASH_FLOW_AMOUNT"
```

Notice that in the format, there are two instances of "NAME".

The first instance of "NAME" relates to the channel name.

The second instance of "NAME" relates to the transaction type name. In the stream this is referred to as NAME(1).

CALENDAR\_DATE > date of the transaction  
NET\_CASH\_FLOW\_AMOUNT > transaction amount  
BIRTH\_DATE > customer's date of birth  
FULL\_NAME > customer's full name  
PHOTO > Link to the customer's photo(URL)  
MARITAL\_STATUS > customer's marital status  
EDUCATION > customer's most recently completed education.  
DESCRIPTION > relates to geographic area description

### Sample CSV file (transactions)

In the following sample there are three transactions related to the customer provided in the customer's csv file.

```
"CALENDAR_DATE","NAME","FULL_NAME","BIRTH_DATE","PHOTO",
"MARITAL_STATUS","EDUCATION","DESCRIPTION","NAME","NET_CASH_FLOW_AMOUNT"
"1980-04-07","In Person","Alfonso Osborne","1986-06-17",
"http://hostname/ibmcognos/samples/images/Customer/3.png",
"Married","Graduate","Remote","Credits","90937.90674"
"1985-12-07","In Person","Alfonso Osborne","1986-06-17",
"http://hostname/ibmcognos/samples/images/Customer/3.png",
"Married","Graduate","Remote","Credits","124841.22253"
"1985-12-07","In Person","Alfonso Osborne","1986-06-17",
"http://hostname/ibmcognos/samples/images/Customer/3.png",
"Married","Graduate","Remote","Money Market","-4815.30429"
```

---

## Prerequisites for the ETL streams

There are no prerequisites for the Wealth Customer ETL stream. However, there are prerequisites for the Wealth Transaction ETL stream.

The following prerequisites are required for the Wealth Transaction ETL to work:

- The Wealth Customer ETL stream must be run first to load the customer details into the INDIVIDUAL\_CUSTOMER\_DIMENSION table. This is because the Wealth Transaction ETL stream uses this table to establish relationship between the customer and his transactions.



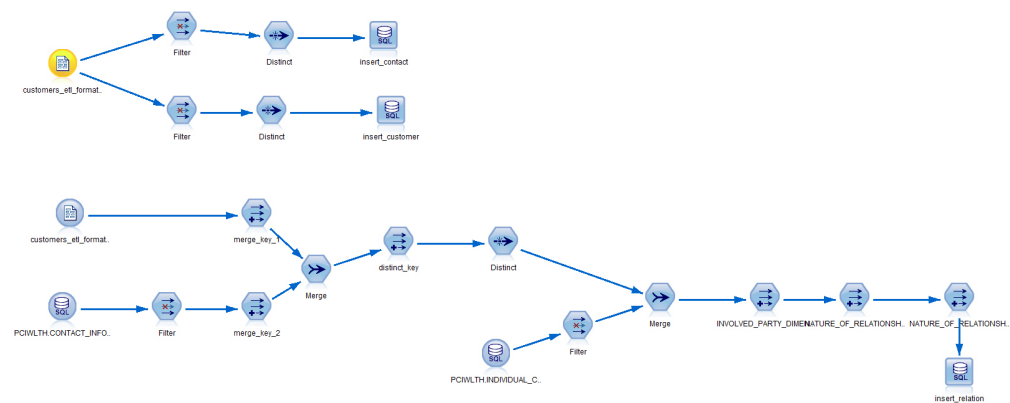
- Each customer is identified by a distinct key: (FULL\_NAME, BIRTH\_DATE, PHOTO, MARITAL\_STATUS, EDUCATION). A combination of all these values would uniquely identify a customer. Using this key as a reference, only transactions related to the customers that are loaded through the Wealth Customer ETL stream must be provided in the CSV input file for the Wealth Transaction ETL stream.
- The CALENDAR\_DATE provided in the CSV input file must be present in the CALENDAR\_DATE\_DIMENSION table of the Wealth solution database.
- The channel name (NAME) provided in the CSV input file must be present in the CHANNEL\_DIMENSION table of the Wealth solution database.
- The transaction type name (NAME(1)) provided in the CSV input file must be present in the TRANSACTION\_DIMENSION table of the Wealth solution database.
- The geographic area description (DESCRIPTION) provided in the CSV input file must be present in the GEOGRAPHIC\_AREA\_DIMENSION table of the Wealth solution database.

## End result of using the ETL streams

This page illustrates the results of the ETL streams.

### Wealth Customer ETL

The stream, shown in the following image, filters and loads the input data from the CSV file.



"BIRTH\_DATE", "FULL\_NAME", "PHOTO", "MARITAL\_STATUS", "EDUCATION" are inserted into the INDIVIDUAL\_CUSTOMER\_DIMENSION table. The combination of all these columns forms a distinct key that identifies a particular customer.

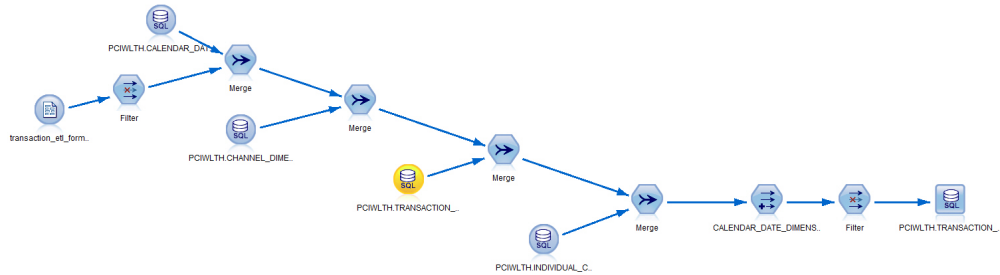
"CITY", "COUNTRY", "EMAIL", "POSTCODE\_AREA", "STATE", "STREET", "FULL\_TELEPHONE\_NUMBER" are inserted into the CONTACT\_INFORMATION\_DIMENSION table. The combination of all these columns forms a distinct key that identifies a particular contact.

After that, the stream establishes a relationship between a customer and his contacts. This relationship information is stored in the INVOLVED\_PARTY\_CONTACT\_INFORMATION\_BRIDGE table.

In total, three tables (INDIVIDUAL\_CUSTOMER\_DIMENSION, CONTACT\_INFORMATION\_DIMENSION and INVOLVED\_PARTY\_CONTACT\_INFORMATION\_BRIDGE) are populated as a result of running this stream.

## Wealth Transaction ETL

The stream, shown in the following image, filters and loads the input data from the CSV file.



The stream performs the following steps:

- Merges the data from the transactions csv file with the CALENDAR\_DATE\_DIMENSION table using the CALENDAR\_DATE field and picks up the corresponding CALENDAR\_DATE\_DIMENSION\_IDS.
- Merges the data from the transactions csv file with the CHANNEL\_DIMENSION table using the NAME field and picks up the corresponding CHANNEL\_DIMENSION\_IDS.
- Merges the data from the transactions csv file with the TRANSACTION\_DIMENSION table using the NAME field and picks up the corresponding TRANSACTION\_DIMENSION\_IDS.
- Merges the data from the transactions csv file with the INDIVIDUAL\_CUSTOMER\_DIMENSION table using the key: (FULL\_NAME, BIRTH\_DATE, PHOTO, MARITAL\_STATUS, EDUCATION) and picks up the corresponding INDIVIDUAL\_CUSTOMER\_DIMENSION\_IDS.
- Finally, it inserts the primary keys along with the corresponding NET\_CASH\_FLOW\_AMOUNT field into the TRANSACTION\_FACT table as a result of running this stream.

---

## Appendix D. Generating SLMT logs for license self-compliance

SLMT stands for software license metric tagging. It generates a log file that indicates the number of customers in your database so that you can monitor your license compliance.

### Procedure

1. From the Database folder, extract the `slmt.zip` file.

The following two files are in the `slmt` folder:

- `Wealth.jar`
- `Wealth.properties`

The `Wealth.jar` file contains the `slmt` source code to generate the xml files, and the `Wealth.properties` file provides the database details for the `Wealth.jar` file.

2. In the `Wealth.properties` file, modify the values for your environment.

The file contains the following information:

```
dbaddress={IP_Address/Hostname} // Contains the IP address/hostname of the database node
dbport={DB_Port} // Database port for DB2 on the above node
dbusername={DB_Username} // DB2 username
dbpassword={DB_Password} // DB2 port
dbname={WEALTH} // Database name
dbtablename={PCIWLTH.INDIVIDUAL_CUSTOMER_DIMENSION} // Table name
```

3. Set up a cron job to produce the tags daily.

Cron jobs are scheduler services that can be configured to run at a specific time.

For example, if the cron job is set to run at 11:59 PM daily, the `.jar` file runs at 11:59 and the SLMT log file records the number of customers. If customers are added to or removed from the database, it is reflected in the log file.

- a. Log in as root on the node where you want the tag files generated.
- b. Enter the following command: `crontab -e`
- c. Append the cron file with the following line  
`{Minute}{Hour}{Day_Of_Month}{Month}{Day_Of_Week} java -jar {Full_path_to_.jar_file} {Full_path_to_.properties_file}`

For example, to generate the xml files at 11:59 PM daily, use the following command:

```
59 23 * * * java -jar /root/Downloads/
slmt/Wealth.jar /root/Downloads/slmt/Wealth.properties
```

### Results

Now that the properties file and cron job are set up, you can determine the number of customers in the database by referring to the log file.

The xml files for `slm` tagging are generated in the `/opt/slm/*.slmtag` folder. Information is added until the log file reaches a certain size, and then a new log file is created.

The following code shows what the `slm` tag looks like:

```
<SchemaVersion>2.1.1</SchemaVersion>
<SoftwareIdentity>
 <PersistentId>b74be4a978bf4b66bd56271915f0ea5f</PersistentId>
```

```
<Name>Behavior Based Client Insight for Wealth Management</Name>
<InstanceId>/opt/ibm</InstanceId>
</SoftwareIdentity>
<Metric logTime="2015-12-08T19:57:18-08:00">
 <Type>Metric.RESOURCE_VALUE_UNIT</Type>
 <SubType>CUSTOMERS</SubType>
 <Value>1000</Value>
 <Period>
 <StartTime>2015-12-07T19:57:17-08:00</StartTime>
 <EndTime>2015-12-08T19:57:17-08:00</EndTime>
 </Period>
</Metric>
```

## Appendix E. JDBC connection to WebSphere Application Server

The IBM Behavior Based Client Insight for Wealth Management solution provides a set of RESTful APIs to allow you to create applications to programmatically execute operations. If you're using Websphere Application Server as your database, you must set up a JDBC connection to the server. The provided instructions and procedures are based on WAS v8.5.5.

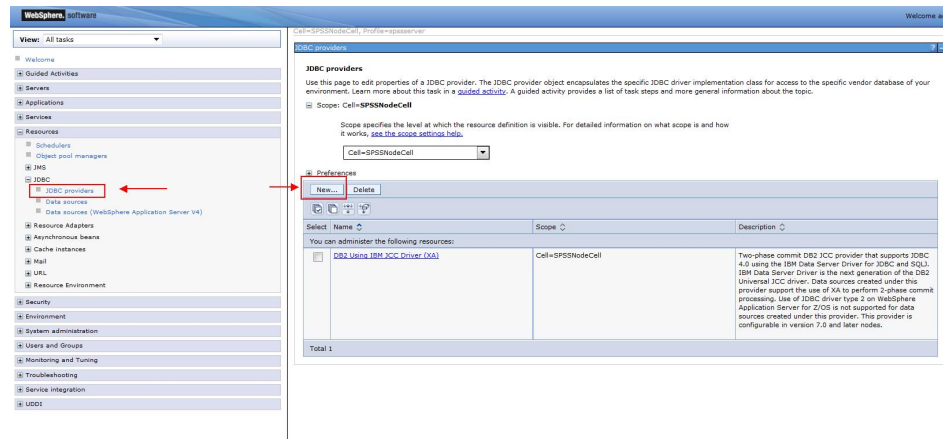
To set up your JDBC connection, you must complete the following tasks, in order:

1. "Configure the JDBC provider"
2. "Create an authentication alias" on page 48
3. "Configure the JDBC data source" on page 49

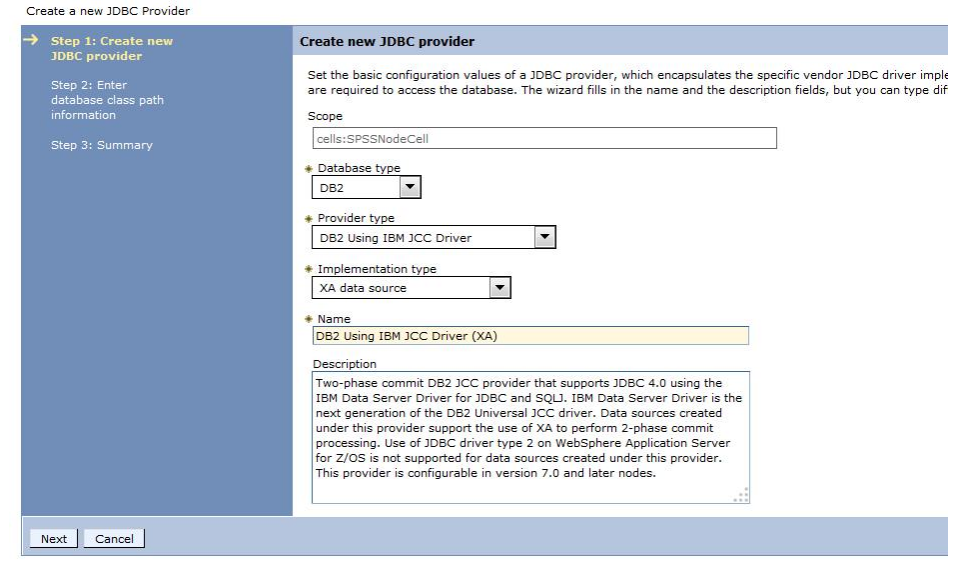
### Configure the JDBC provider

In this section, you'll set up the DB2 using IBM J2CC Driver (XA) for your JDBC connection.

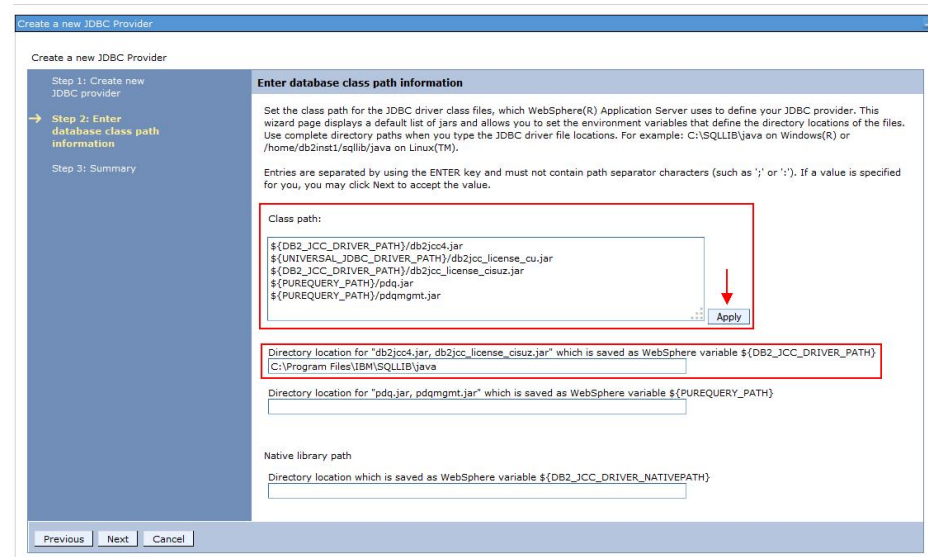
1. Log in to the WebSphere Application Server console.
2. Navigate to the JDBC providers section.



3. If you already have the *DB2 Using IBM J2CC Driver (XA)* setup, proceed to "Create an authentication alias" on page 48. Otherwise, create a new JDBC provider by clicking **New...**, as highlighted in the image.
4. Enter the JDBC provider details as per the following image, then click **Next**.



5. Use the default *Class path* settings, as shown in the following image, and click **Apply**.

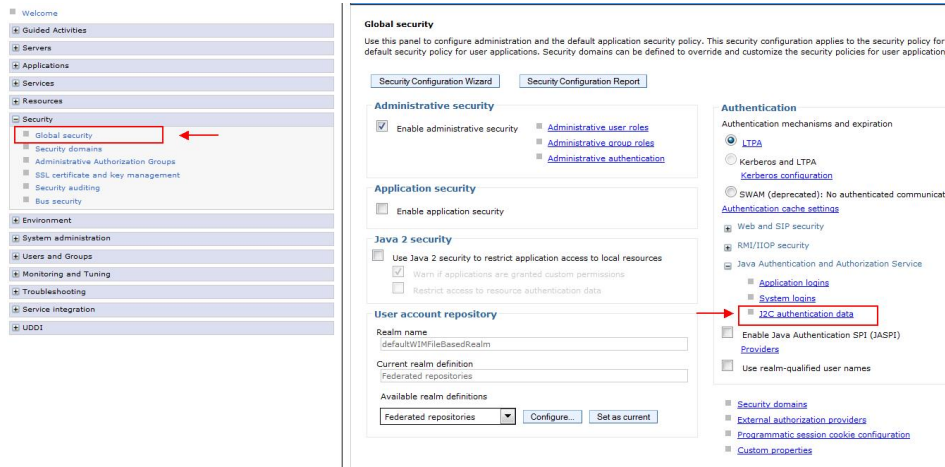


6. Specify the directory location where the db2jcc4.jar and db2jcc\_license\_cisuz.jar files are present on the server. The jar files are included in the WebSphere installation package.
7. Click **Next**.
8. Review the summary page and click **Finish**.

## Create an authentication alias

In this section, you'll specify the authorized users (IDs and passwords) who have access to the database.

1. From the WAS console, go to the **Global Security** section and click **J2C authentication data**.

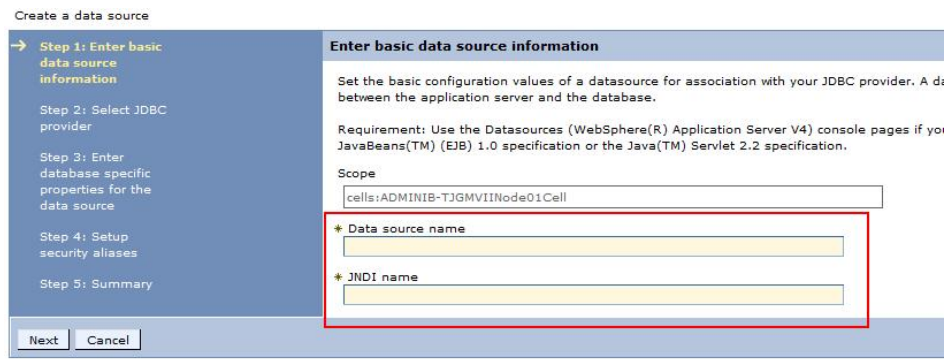


2. Click **New...**
3. In the next page, enter an arbitrary **Alias** name. Enter the User ID and Password that you use to connect to your database. The Description field is optional.
4. Click **Apply** and then **OK**.

## Configure the JDBC data source

In this section, you'll configure your JDBC data source and test the connection.

1. From the WAS console, go to the **Data Sources** section and click **New...**
2. In the next page, enter an arbitrary **Data source name**.
3. Enter "jdbc/pciwlth" in the **JNDI name** field. The **JNDI name** is used by the REST API to connect to the database.



4. Click **Next**.
5. Choose **Select an existing JDBC provider**. Select the JDBC provider that you created in the first task. Click **Next**.
6. Provide the **Database name** that you wish to access. Provide the **Server name** that you wish to connect to and the **Port number**. The remaining details can retain their default settings. Click **Next**.

Create a data source

Step 1: Enter basic data source information

Step 2: Select JDBC provider

→ Step 3: Enter database specific properties for the data source

Step 4: Setup security aliases

Step 5: Summary

**Enter database specific properties for the data source**

Set these database-specific properties, which are required by the database vendor JDBC driver to support the connection through the datasources.

| Name            | Value |
|-----------------|-------|
| * Driver type   | 4     |
| * Database name |       |
| * Server name   |       |
| * Port number   | 50001 |

Use this data source in container managed persistence (CMP)

Previous Next Cancel

- Set the authentication alias that you created earlier, then click **Next**.

Create a data source

Step 1: Enter basic data source information

Step 2: Select JDBC provider

Step 3: Enter database specific properties for the data source

→ Step 4: Setup security aliases

Step 5: Summary

**Setup security aliases**

Select the authentication values for this resource.

Authentication alias for XA recovery  
(none)

Component-managed authentication alias  
(none)

Mapping-configuration alias  
(none)

Container-managed authentication alias  
(none)

Note: You can create a new J2C authentication alias by accessing one of the current wizard selections will be lost.

[Global J2C authentication alias](#)  
[Security domains](#)

Previous Next Cancel

- Verify the summary information and click **Finish**.
- When you're prompted to save the server configuration changes, click **Save**.
- Select the JDBC data source that you have created and click **Test connection**. If successful, a message will appear indicating that a successful connection was established.



---

## Appendix F. REST API reference

The IBM Behavior Based Client Insight for Wealth Management solution provides a set of RESTful APIs to allow you to create applications to programmatically invoke operations and extend industry solutions capabilities.

The representational state transfer (REST) API provides a lightweight interface that uses HTTP requests to communicate to the server. The APIs can be used to extract and aggregate data for further processing in other systems. All supported resources are listed in the following sections and are actionable using a GET operation.

If a request returns an empty JSON response, this indicates that there were no records in the database that matched the parameters specified in the request. If an error occurred, one of the following error codes may be returned:

**IS\_WEALTH\_ERR00**

Unknown error

**IS\_WEALTH\_ERR01**

A customerid is required.

**IS\_WEALTH\_ERR02**

The specified customer\_id parameter is invalid.

**IS\_WEALTH\_ERR03**

The specified pagestart parameter is invalid.

**IS\_WEALTH\_ERR04**

The specified pagesize is invalid.

**IS\_WEALTH\_ERR05**

Database error

**IS\_WEALTH\_ERR06**

A segment parameter is required.

**IS\_WEALTH\_ERR07**

A networth parameter is required.

The Behavioral Segmentation REST API allows you to create your own segments and associated segment definitions. This is a generic API that applies to Behavior Based Customer Insight for Banking, Behavior Based Client Insight for Wealth Management, and Behavior Based Customer Insight for Insurance. The following error codes apply to the Behavioral Segmentation REST API.

**IS\_SEGMENTATION\_ERR00**

Unknown error

**IS\_SEGMENTATION\_ERR01**

Could not parse the JSON input. Please check the JSON input and try again.

**IS\_SEGMENTATION\_ERR02**

Failed to insert the segment into the database.

**IS\_SEGMENTATION\_ERR03**

Category does not exist in the data dictionary.

**IS\_SEGMENTATION\_ERR06**

Database error.

**IS\_SEGMENTATION\_ERR15**

No records found.

**IS\_SEGMENTATION\_ERR16**

Failed to create batch statements for insert.

**IS\_SEGMENTATION\_ERR17**

Failed to insert the segment definitions into the database.

**IS\_SEGMENTATION\_ERR18**

The industry parameter is required.

**IS\_SEGMENTATION\_ERR19**

The industry parameter is incorrect. Supported values are banking, wealth, or insurance.

**IS\_SEGMENTATION\_ERR20**

The segmented parameter is required.

Errors will include a “flag: false” indicator in the response body.

The URLs used to issue REST commands must adhere to the US-ASCII character set, including reserved and restricted characters. For example, a space must be URL-encoded as “%20”.

Behavior Based Client Insight for Wealth Management REST API reference documentation is accessible in a Swagger interface, which allows you to test supported operations directly from the API documentation. After deploying the EAR file (IS\_Wealth\_EAR) on a WebSphere Application Server, you can visit the following link to access the API documentation:

`http://<hostname>:<port>/iswealth-restapi`

The Swagger definition file can be accessed at: `/iswealth/utility/docs/json/get`

**Note:** For additional information on the Java API, please reference the provided Javadocs that are included in the installation package.

---

## Customizing segments

The Behavioral Segmentation REST API allows you to create and delete custom segments and their associated segment definitions. The Segmentation Tool provides an interface for quickly editing or creating new segments.

For information on using the Segmentation Tool, see the topic Chapter 3, “Creating and managing customer segments,” on page 23.

### Segment data dictionary

Segment definitions must conform to the behavioral categories defined in the segment data dictionary. All categories in the data dictionary are top-level and have a corresponding list of sub-categories. When creating a segment, you must provide conditions that define a segment at the sub-category level. The segment data dictionary for your industry solution is specified in the following table.

*Table 3. Wealth data dictionary*

| Categories | Sub-categories                                                                              |
|------------|---------------------------------------------------------------------------------------------|
| ASSETS     | Bonds, Commodities, Credits, Derivatives, Estate Funds, Forex, Money Market, Stocks, Others |

Table 3. Wealth data dictionary (continued)

| Categories  | Sub-categories                                                                              |
|-------------|---------------------------------------------------------------------------------------------|
| TRADING     | Bonds, Commodities, Credits, Derivatives, Estate Funds, Forex, Money Market, Stocks, Others |
| FUNDING     | Regular, Rare, Lumpy                                                                        |
| INTERACTION | Rare, Frequent, Less Frequent                                                               |

The above categories are defined based on the customer transactions data.

#### ASSETS

Assets owned by the user in any of the listed sub-categories.

#### TRADING

Trading activity performed by the user in any of the listed sub-categories.

#### FUNDING

Funding pattern for the user.

#### INTERACTION

Interaction pattern for the user. Implies interaction with the wealth manager.

### Segment definition

A segment definition is created by using any combination of these categories and the relevant sub-categories. As mentioned, conditions that define a segment are specified at the sub-category level. Some predefined segments are included in your industry solution. The REST API accepts the segment definition in the form of a JSON input string and persists it to the database. The JSON format for the segment definition is as follows:

```
{
 "segment": "segment_name",
 "categories": [
 {
 "name": "category_name",
 "subcategories": [
 {"name": "subcat_name", "operator": "value", "deviation": value}, ...
]
 }, ...
]
}
```

#### segment

This attribute is a string that holds the segment name.

#### categories

This is an array of categories.

Within the categories array for each category, you have:

**name** This attribute is a string that holds the category name.

#### subcategories

This is an array of subcategories.

Within the subcategories array for each subcategory, you have:

**name** This attribute is a string that holds the subcategory name.

**operator**

This attribute is a string that holds the operator value.

**deviation**

This is a float value that is used to specify “the number of times the standard deviation”.

The rules for **operator** values are determined by the following conditions.

- **greater**, if condition used is  $> (M + deviation * SD)$ .
- **upper**, if condition used is  $> (M - deviation * SD)$ .
- **lower**, if condition used is  $< (M + deviation * SD)$ .
- **less**, if condition used is  $< (M - deviation * SD)$ .
- **equal**, if condition used is = value.
- **greater num**, if condition used is  $> value$ .
- **less num**, if condition used is  $< value$ .
- **range**, if condition used is  $> (M - deviation * SD) \text{ AND } (M + deviation * SD)$ .

**Note:** Mean (M) and Standard Deviation (SD) values are calculated at the category level, for each category. These values are calculated by the Segmentation SPSS model using the customer transactions data. As a user, you supply the deviation value (i.e., the number of times the standard deviation).

The following example illustrates the segment definition structure.

**Wealth segment name: Indifferent**

The following sample JSON input defines these conditions:

- ASSETS: Bonds  $> (M - 1.0 * SD)$  ; Stocks  $< (M + 1.0 * SD)$ . The operator value for Bonds is **upper**. The operator value for Stocks is **lower**.
- TRADING: Bonds  $> (M + 0 * SD)$ ; Money Market  $> (M - 0.5 * SD)$ ; Stocks  $< (M + 0.5 * SD)$ ; and Others  $< (M - 0.5 * SD)$ . The operator value Bonds is **greater**. The operator value Money Market is **upper**. The operator value Stocks is **lower**. The operator value Others is **less**.
- FUNDING:
  - Funding pattern is **Not Lumpy** (i.e. Lumpy = 0). There would not be any Mean or Standard Deviation calculated in case of FUNDING category. The operator value is “equal” and deviation value set to 0.
  - Funding pattern is **Irregular** (i.e. Regular = 0). There would not be any Mean or Standard Deviation calculated in case of FUNDING category. The operator value is “equal” and deviation value set to 0.
- INTERACTION: Interaction pattern is “Rare” (i.e. Rare = 1). There would not be any Mean or Standard Deviation calculated in case of FUNDING category. The operator value is “equal” and deviation value set to 1.

```
{
 "segment": "Indifferent",
 "categories": [
 {
 "name": "ASSETS",
 "subcategories": [
 {"name": "Bonds", "operator": "upper", "deviation": 1},
 {"name": "Stocks", "operator": "lower", "deviation": 1}
]
 },
 {
 "name": "TRADING",
```

```

 "subcategories": [
 {"name": "Bonds", "operator": "greater", "deviation": 0},
 {"name": "Money Market", "operator": "upper", "deviation": 0.5},
 {"name": "Stocks", "operator": "lower", "deviation": 0.5},
 {"name": "Others", "operator": "less", "deviation": 0.5}
]
 },
 {
 "name": "FUNDING",
 "subcategories": [
 {"name": "Lumpy", "operator": "equal", "deviation": 0},
 {"name": "Regular", "operator": "equal", "deviation": 0}
]
 },
 {
 "name": "INTERACTION",
 "subcategories": [
 {"name": "rare", "operator": "equal", "deviation": 1}
]
 }
]
}

```

The Segmentation Framework REST APIs are part of the Framework Enterprise Application (IS\_Framework\_EAR). Once the EAR is deployed on a WebSphere Application Server, the interactive REST API documentation can be accessed from any browser at the following URL:

`http://<hostname>:<port>/isframework-restapi`

You can also create, edit, and delete custom segments using the browser interface that is available in the solution. Once the IS\_Framework\_EAR is deployed on a WebSphere Application Server, the interface can be accessed by navigating to the following URL:

`http://<hostname>:<port>/issegmentation-webportal`



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