IBM Industry Customer Intelligence Solutions
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Behavior Based Customer Insight for Banking Solution Guide

IBM

Product Information

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

Contents

Introduction

The IBM Behavior Based Customer Insight for Banking 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 Customer Insight for Banking solution. It provides information on installation, configuration, and use of the Behavior Based Customer Insight for Banking 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 Customer Insight for Banking have accessibility features. For more information, see Appendix A, "Accessibility features," on page 43.

Behavior Based Customer Insight for Banking 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.

Samples disclaimer

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Chapter 1. Overview

The IBM Behavior Based Customer Insight for Banking solution provides pre-built industry-specific analytics that help retail banks to plan and deliver programs for acquiring, growing, and retaining customers while also increasing revenue.

The solution, which works with IBM Predictive Customer Insight, helps banks to address key challenges through advanced analytics. It provides insights into customers needs so that banks can deliver timely offers to their customers. This integrated solution uses a solution data model, reporting and dashboard templates, and predictive and application interfaces for integration with operational systems. It uses enterprise and third-party data that is related to bank accounts, historical and current transactions, and customer information. Insights provided by the solution help bankers to create tailored offers for products and improve the overall customer experience.

The solution provides behavior-based segmentation, insights into propensities for key activities (life events), and demographic peer-grouping. Behavior-based segmentation groups customers based on their spending habits. A customer's propensity for key activities is generated from historical cash flow patterns. In addition to segmentation, there is also demographic peer-grouping, which identifies and categorizes peer groups based on factors such as age, marital status, and income. Interactive dashboards provide bankers with easy access to insights.

Scope of the solution

This version of the solution provides prebuilt models for the following analytics:
- Behavioral segmentation
- Churn propensity and partial churn
- Cross-sell and upsell propensity
- Life event model
- Email tone analysis
- Customer profitability and lifetime value analysis
- Customer cash flow analysis
- Customer peer group analysis
- Overdraft prediction (weekly and daily)
- Large deposit prediction

All analytics within the scope of the solution relate to information on the retail bank's customers and prospects within the limits on the number of customers that is purchased in the license entitlement. The solution must not be used for analytics other than those in the solution scope described here.

Chapter 2. Using the Behavior Based Customer Insight for Banking solution

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

The following analytics reports are available:

- Tree Map Analysis report, which shows the numbers of customers in each segment who have a propensity for the selected events.
- Peer Group Analysis report, which lists customers from a selected segment in terms of the propensity for a selected event.
- Segment Distribution report, which provides segmentation distribution and segmentation definitions.
- Customer Details report, which provides details for an individual customer.
- Customer Insight Report, which is a report that is provided to the customer.

An example of providing customized service to customers

This example, which is fictitious, shows how the solution can be used to increase customer satisfaction and company revenues.

An account manager at the bank, Christina, wants to determine which customers are most likely to accept an offer to apply for a credit card. Her goal is to help customers to purchase the things they need while also generating higher credit card revenue for the bank.

Christina brings up the Tree Map Analysis report to determine which segments of customers include the most people who have a propensity to accept a credit card offer. She selects all the customer segments available, selects **Cross-sell** > **Credit Card** as the key activity, and clicks **Apply**.
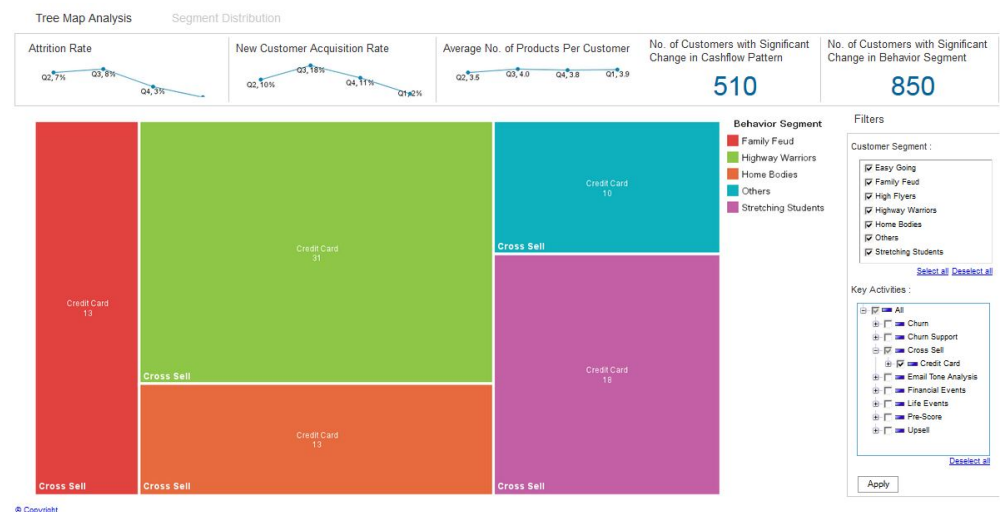
The report shows Christina that the Highway Warriors segment contains the most customers with a propensity to accept a credit card offer. Christina hovers her mouse pointer over the Highway Warriors rectangle and sees that 31 customers

from this segment have a propensity to accept a credit card offer.
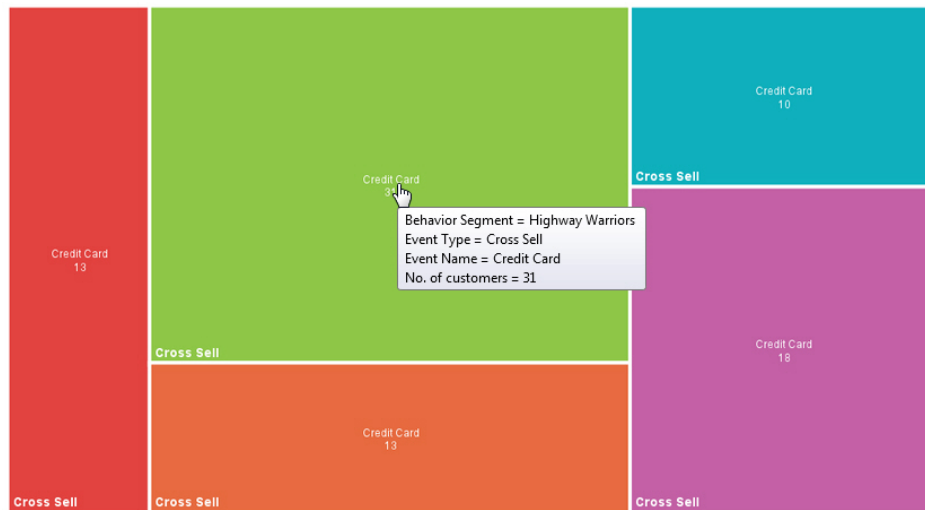
To view a list of the 31 customers, Christina clicks the rectangle to go to the Peer Group Analysis report.

The following Peer Group Analysis report shows a list of all customers who belong to the Highway Warriors segment and have some level of propensity to accept a credit card offer. Customers that are below a certain threshold are considered to have no propensity and are not included in the list. In the heat map chart, customers are divided into groups according to their age, education, income, and number of dependents. The chart shows the propensity level for credit card propensity and is color coded to highlight the number of customers. Today Christina wants a list of customers from all peer groups that have a high propensity to accept a credit card offer, so in the bubble chart, she clicks the bubble for high propensity. The list now displays only the customers with a high propensity to accept a credit card offer.

Christina decides to contact each customer on the list to make a credit card offer. She selects the customer Rowan Byers, and the following report is displayed. It provides information about Rowan, including current products, channel usage, social interaction, and predictive insights. Christina explores Rowan's behaviors by clicking **Customer Behavior Metrics**, **Credit/Debit Trends**, and **Insights on Debits** to determine the credit card product that is best suited to Rowan's needs. With the

insights, Christina is prepared to make an offer to Rowan that is likely to be accepted.
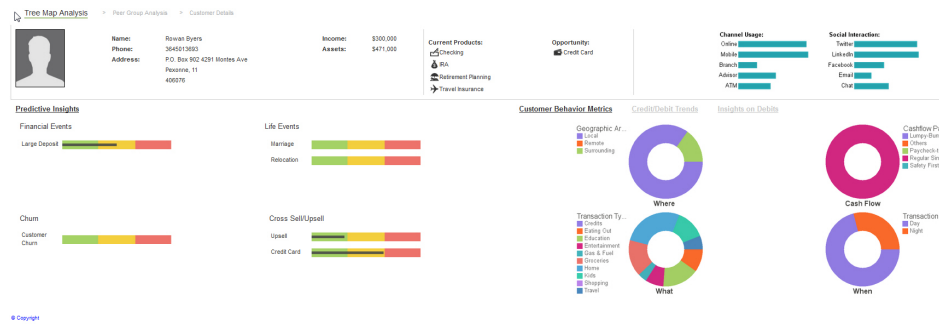
Christina continues her analysis for the other customers who have a high propensity to accept a credit card offer. By employing the solution, Christina uses her time efficiently to provide her customers with the products that they need while also increasing revenue for the bank.

Chapter 3. Reports

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

The following reports are available:

- Tree Map Analysis
- Peer Group Analysis
- Customer Details
- Segmentation Distribution
- Customer Insight

Tree Map Analysis report

The Tree Map Analysis report shows the number of customers from the selected segments who have a propensity for the activity or activities that you select.

The line charts on the report show how attrition rate, new customer acquisition rate, and average number of products per customer change during the year. The numbers also indicate those customers who have significant changes in their cash flow pattern and behavior segment.

The Tree Map chart provides a visual representation of the number of customers in each behavioral segment who have propensities for various events. You can use filters to change the chart by specifying a segment and activities. For example, if you want to view the customers in the Home Bodies and Stretching Students segments who have a propensity to go into overdraft in the near future, select **Home Bodies** and **Stretching Students** from the Customer Segments section and **Financial Events** > **Overdraft** from the Key Activities section, and then click **Apply**.

From the Tree Map Analysis report, click **Segment Distribution** to go to the Segment Distribution report, or click any rectangle in the Tree Map to go to the Peer Group Analysis report for the segment and event represented by the rectangle.
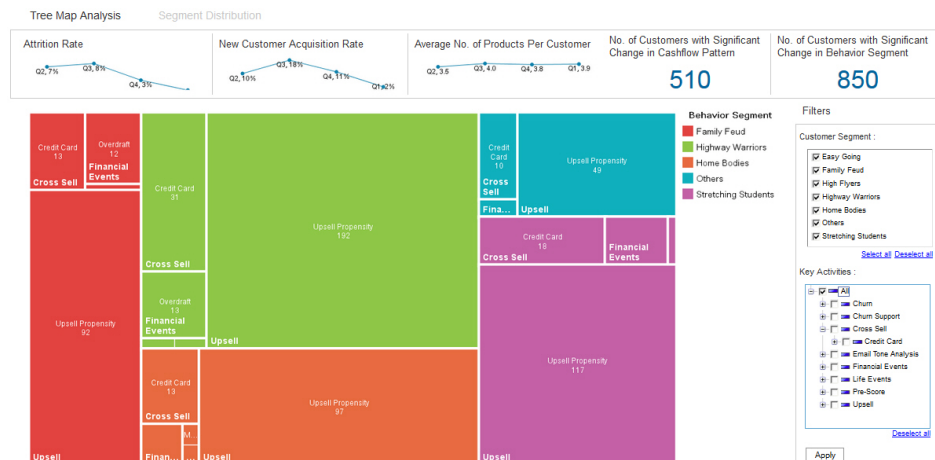
Peer Group Analysis report

The Peer Group Analysis report shows the propensity for a selected event by customers within a behavioral segment who are organized by peer group. The report provides insight into the number of customers within each peer group that have low, medium, and high propensities for the selected event.

To access the Peer Group Analysis report from the Tree Map Analysis report, click one of the rectangles in the report. To access it from the Segment Distribution report, click the name of a behavioral segment.

In the report, customers are divided into groups according to their age, education, income, and number of dependents. Each cell in the chart indicates the number of customers of a specific peer group and propensity level for a selected event. You can click each cell to filter the customers that appear in the customer list. For example, to view the customers in the cluster-1 peer group who have a medium propensity for the selected event, click the cell that is in row **cluster-1** and column **Medium**. To view a description of the criteria for each peer group, click the **Show Descriptions** link.

You can filter the customers shown in the customer list by clicking bars in the bar chart or bubbles in the bubble chart. To see details for a customer, click the customer name from the customer list. To remove the filters that are applied in the peer group chart, the bar chart, or bubble chart, click the corresponding **Clear Filter** label.

If you want to export the customer list as a CSV file, for example, to display it in a spreadsheet, click **Export to CSV**. The exported list includes the customer name, address, phone number, and propensity for the selected event.
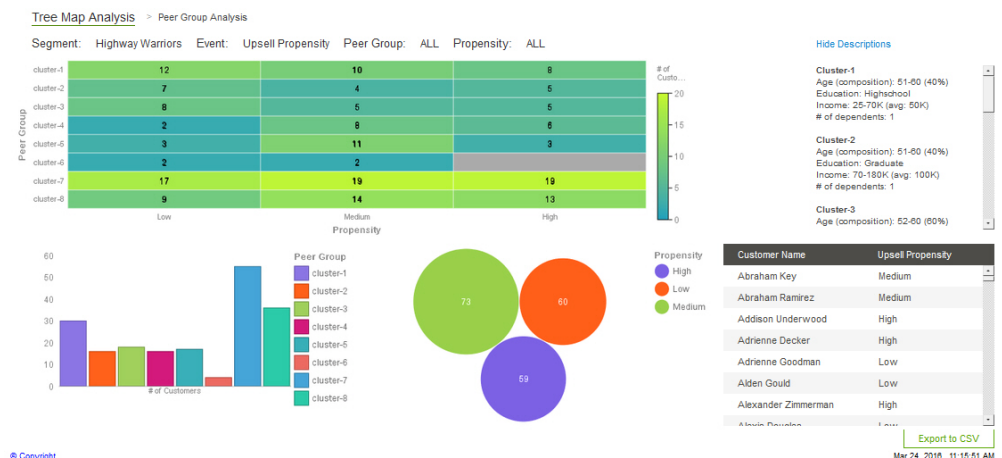
Customer Details report

The Customer Details report provides details about the customer who you select and provides predictive insights that include suggested products or services for that customer.

To access the Customer Details report, click the name of the customer on the Peer Group Analysis report.

You can change the information displayed in the graph by clicking **Customer Behavior Metrics**, **Credit/Debit Trends**, or **Insights on Debits**.
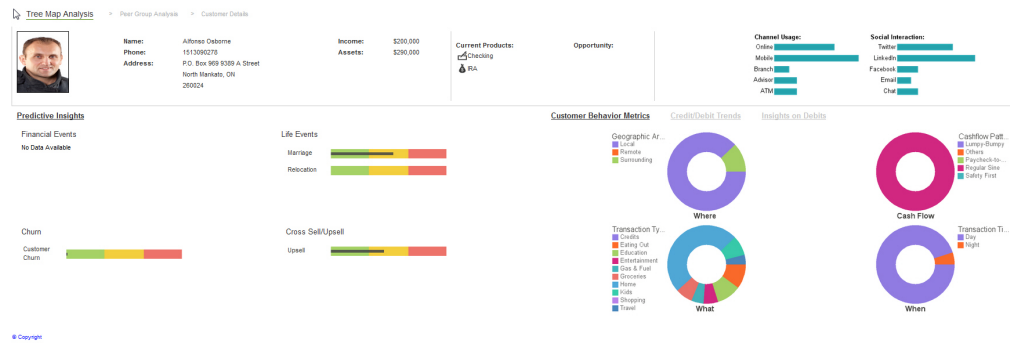
Segment Distribution report

The Segment Distribution report shows the distribution of your customers across the various segments. It provides detailed information about each segment.

You access the report by clicking the **Segment Distribution** link on the Tree Map Analysis report.

The bubbles in the report show the percentage of customers in each segment. When you click the bubble for a segment, the Segmentation Definitions section displays further information about the selected segment. You can hover your mouse pointer over each chart in this report to view details.

To view the numbers of customers in a segment who have a propensity for a particular event, click the **Select Event** button, select the event that you want to view, and click **Apply**. The bars indicate the numbers of customers in each segment. You can view the number of customers by hovering your mouse pointer over a bar.
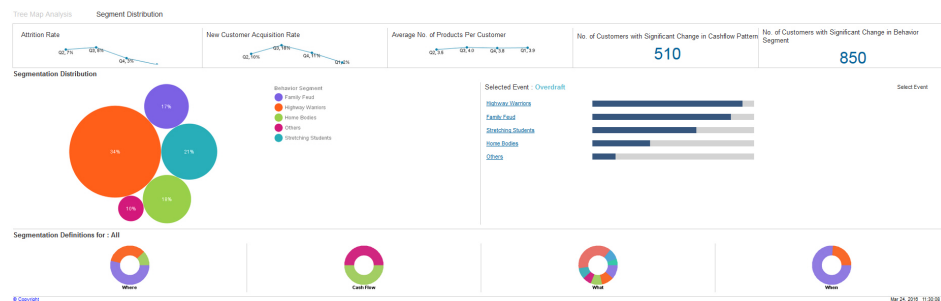
Customer Insight report

The Customer Insight report is provided to the customer. It contains information about the customer's spending and cash flow and provides comparisons with averages for the customer's peer group. It also provides suggestions for products that are appropriate to the customer's financial situation.

The Customer Insight View report, which can be delivered to customers through the bank's online banking system, provides customers with insights that help them manage their finances..

Welcome **Alfonso Osborne**

Product Selection

Checking   IRA

Transactions

Date	Transaction	Amount
2016-01-30	Education	$9.00
2016-01-30	Gas & Fuel	$34.93
2016-01-30	Groceries	$65.33
2016-01-30	Home	$126.99
2016-01-30	Kids	$5.00
2016-01-31	Eating Out	$41.92
2016-01-31	Entertainment	$116.79
2016-01-31	Groceries	$10.92
2016-01-31	Home	$482.92
2016-01-31	Travel	$12.97

Monthly Spending Trend

You spent an average of
($8,033) less than your peers

Of your peers :

You
Peers

$25,000
$20,000
$15,000
$10,000
$5,000
$0

Amount Spent

November   December

Cash Flow Summary

Amount
6,000
4,000
2,000
0
-2,000
-4,000

-11 -10 -9 -8 -7 -6 -5 -4 -3

Week

Balance
120,000
100,000
80,000
60,000
40,000
20,000
0

Transaction Type, Balance
Credits
Eating Out
Education
Entertainment
Gas & Fuel
Groceries
Home
Kids
Travel
Balance
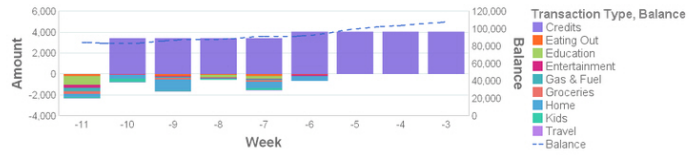
Chapter 4. Creating and managing customer segments

In the Behavior Based Customer Insight for Banking solution, users with the appropriate permissions can add, edit, or delete behavioral customer segments by using the Segmentation Tool.

For more information, see "Customizing segments" on page 62

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 table shows the categories that are available:

Table 1. Banking data dictionary

Category	Sub-category
WHEN	Day, Night
WHERE	Remote, Local, Surrounding
WHAT	Home, Eating Out, Kids, Shopping, Travel, Credits, Entertainment, Gas & Fuel, Education, Groceries
CASHFLOW	Regular Sine, Paycheck-to-Paycheck, Lumpy-Bumpy, Safety-First, Others

The categories in the table are defined based on the customer transactions data.

WHEN
Implies when users spend their money.

WHERE
Implies where users spend their money.

WHAT
> Implies what users spend their money on.

CASHFLOW
> Implies a user's cash flow characteristics.

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 whose spending is mostly on Education, you select **WHAT** as the category and **Education** 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 Customer Insight for Banking 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** for 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 Customer Insight for Banking 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 Customer Insight for Banking 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 5. Installation and configuration

The installation and configuration of the IBM Behavior Based Customer Insight for Banking 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.

Overview of the installation and configuration process

There are several groups of tasks that you must complete to install and configure the Behavior Based Customer Insight for Banking 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.

The diagram assumes that you are installing the solution to a Linux environment. If you are installing to a Windows environment, you won't use the Solution Installer but must copy the files manually to the appropriate nodes. For more information, see "Installing the solution in a Microsoft Windows environment" on page 22.

Installing the Solution

1
Plan the deployment of the solution
Ensure that you have the required prerequisites
Download the solution installer

2
Configure the firewall for the solution installer
Install and run the solution installer

3
Identify the node computers
Deploy the solution content

4
Install and configure the solution content

Data node
● create the database

Business Intelligence node
● deploy the report content

Predictive Analytics node
● import the predictive streams
● create an ODBC connection
● install the application and API

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

1. Plan where you want the various parts of the solution to reside.
2. Ensure that you have the required prerequisites.
3. On the computer from which you want to install the solution, download the tar.gz or .zip file from IBM Passport Advantage®.
4. Open the ports that are required for the installation. On Linux operating systems, 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.
5. If you are installing to Linux operating systems, 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. If you are installing to Microsoft Windows operating systems, copy files to the appropriate node computers.
6. On the Data Node computer, create the DB2® database.
7. On the Business Intelligence node computer, install the Cognos® content.
8. On the Analytics Node computer, import the SPSS® project streams, models, and rules.
9. On the Analytics node computer, configure the data view for the SPSS models.
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.

Prerequisites

Before you install the IBM Behavior Based Customer Insight for Banking 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.
- If you are installing to a Linux environment and plan to use the Solution Installer, 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 have administration rights and the ability to copy files between computers.

Contents of the download package

The Behavior Based Customer Insight for Banking package, which you download from Passport Advantage, contains several parts.

The following parts are included in the package:
- Solution installer (if you chose the Linux package)
- DB2 databases
- SPSS project streams, models, and rules
- Cognos BI reports and Dynamic cube models
- EAR file that contains the REST APIs

Downloading the solution

You must download the Behavior Based Customer Insight for Banking 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 (or the .zip file if you're installing in a Microsoft Windows environment).
3. Move the tar or zip file to the computer from which you want to run the installation.
4. Decompress the file.

Modifying the sudoers file for the Linux user who runs the installation

To run the Behavior Based Customer Insight for Banking installation in a Linux environment, 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 appears 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 Customer Insight for Banking node.

Configuring computer firewall settings required for the installation on Linux

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 Customer Insight for Banking 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 a Linux 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 Customer Insight for Banking node.

The Industry Solution Installer

The Industry Solution Installer provides automation that helps you to install the
solution.

Note: The Industry Solution Installer can only be used if you are installing the
solution to Linux computers. If you are installing to Windows computers, see
"Installing the solution in a Microsoft Windows environment" on page 22.

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 software

Before you use the Solution Installer to configure and deploy the nodes in a Linux
environment, you must install the Solution Installer.

Before you begin

The working directory for solution installation files is opt/IBM

About this task

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

http://youtu.be/9u6ZOk8iyt4

Please note the version numbers shown in the video may been updated (the video will still be relevant). 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. If the Solution Installer (including the PCI Solution Installer) has been run on the computer previously, run the following command:

   `./cleanupClient.sh`
4. Go to the solution installer directory in the following location:
   `opt/IBM/IS_Banking_Customerinsight_1.0.1/SolutionInstaller`.
5. If you haven't already opened the ports that are required by the solution installer, you can open them by running the following command:

   `./firewall.sh`
6. Enter the following command:

   `sh setup.sh` *username first_name last_name email password*

   This command creates a user (with the details supplied) for accessing the Solution Installer web server.

   The web server is started and the URL for the Solution Installer displays in the command line window.
7. 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 username 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.
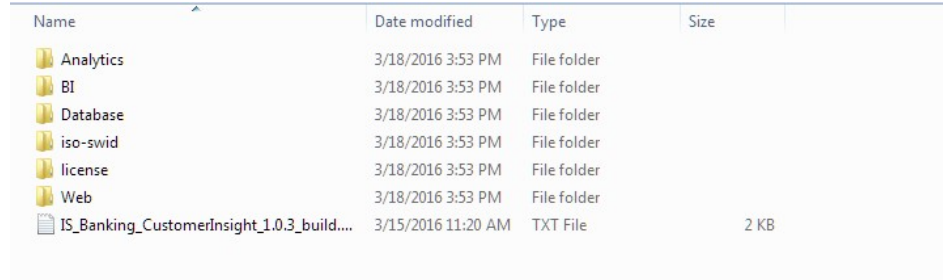
What to do next

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

Installing the solution in a Microsoft Windows environment

The IBM Behavior Based Customer Insight for Banking solution can be installed to a Microsoft Windows environment. To install to a Windows environment you must manually copy the files to the appropriate computers.

Procedure

1. Unzip the Banking for windows folder. You will see the following folders

Name	Date modified	Type	Size
Analytics	3/18/2016 3:53 PM	File folder	
BI	3/18/2016 3:53 PM	File folder	
Database	3/18/2016 3:53 PM	File folder	
iso-swid	3/18/2016 3:53 PM	File folder	
license	3/18/2016 3:53 PM	File folder	
Web	3/18/2016 3:53 PM	File folder	
IS_Banking_CustomerInsight_1.0.3_build....	3/15/2016 11:20 AM	TXT File	2 KB

2. Deploy the components to the required nodes. For example, deploy the Database folder to the db node, BI to the Business Intelligence node and so on.

3. The Non-Production swidtag file is available in the Database folder. You might need to switch the license to non-production depending on your requirements. By default, the swidtag folder has the production license. For information about the license files, see "Product license files" on page 39

Creating the database

Before you can use the IBM Behavior Based Customer Insight for Banking 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 has copied the compressed file to your data node computer.

Procedure

1. On the data node computer, if the compressed file is not already decompressed, then decompress it.

2. If you are using a Microsoft Windows operating system, complete the following steps:

   a. Log on to the data node computer as the DB2 instance owner user

   b. Go to the folder where files were decompressed.

   c. Double-click `Install_DB.bat`.

3. If you are using a Linux operating system, complete the following steps:

   a. Log on to the data node computer as the root user.

   b. Open a terminal window, and go to the directory where the content files were decompressed.

   c. Type the following command to change the permissions for the files:

   `chmod -R 755 *sh`

   d. Change to the database instance owner.

   For example, `su db2inst1`

   e. In the decompressed folder, run the `./Install_DB.sh` script.

4. Optional: If you want to load the sample data that is provided with the solution, then run the `./Load_Data.sh` script.

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.

Loading data

Use the banking data ingestion process to load your data from CSV files into the Behavior Based Customer Insights dimensional data warehouse model.

Increasing the transaction log file size

If you are loading data and you get an error that says the transaction log file is full, you must increase the size of the log file.

If the database log file was not created large enough for the application to create log files, then you see the following error message:

```
Error: "SQL0964C The transaction log for the database is full.
SQLSTATE=57011"
```

The size of the transaction log entirely depends on the volume of data that is being processed. To correct the error, you can increase the transaction log file size.

Procedure

1. If you are using a Microsoft Windows operating system, complete the following steps:
   a. Log on to the data node computer as the DB2 instance owner user.
   b. In a command window, enter the following command to connect to the database:
      `db2 connect to <databaseName>`
   c. Enter the following command to get the configuration information for the database:
      `db2 get db config for <databaseName>`
   d. Check the value for **logfilsiz**.
2. If you are using a Linux operating system, complete the following steps:
   a. Log on to the data node computer as the root user.
   b. Open a terminal window.
   c. Change to the database instance owner.
      For example, `su db2inst1`
   d. Enter the following command to connect to the database:
      `db2 connect to <databaseName>`
   e. Enter the following command to get the configuration information for the database:
      `db2 get db config for <databaseName> | grep -i logfilsiz`
3. Increase the **logfilsiz** value by entering the following command:
   `db2 UPDATE db cfg for <databaseName> using LOGFILSIZ <new_value>`
   For operations on a table that hold 2 million records, the **logfilsiz** value should be 40000 as a minimum. For example, the command would be: `db2 UPDATE db cfg for BANKING using LOGFILSIZ 40000`.

4. Enter the following commands to apply the configuration change:
   a. `db2 force applications all`
   b. `db2stop force`
   c. `db2start`

Scripts and tables used for loading data

Several scripts are used to load data.

Note: Ensure that your database log file has sufficient space before you load the data. For more information, see "Increasing the transaction log file size" on page 24.

The data loading process follows a sequence of steps as shown in the following diagram:

Data warehouse
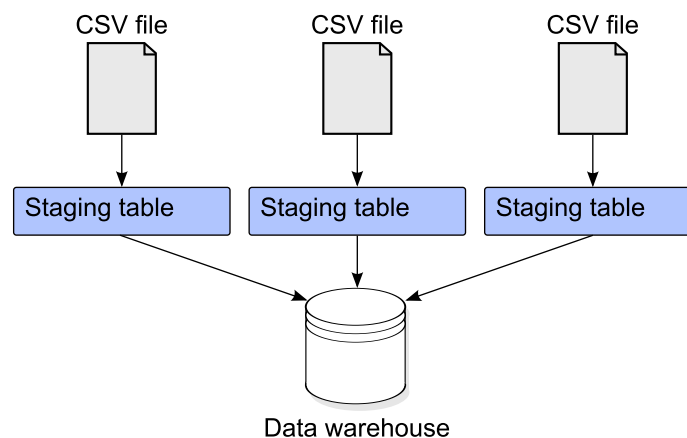
Scripts used to load data

There are several scripts to load data:

Install_DB.bat / Install DB.sh
> This script creates the database, schema, and tables (the Behavior Based Customer Insights data model and staging tables).

Load_Data.bat / Load_Data.sh
> This script loads the sample data. Running this script is optional.

Load_staging_tables.bat / Load_staging_tables.sh
> This script loads data from the CSV files into the staging tables. To ensure a proper load, name each CSV file with the name of the corresponding staging table. If the names of the CSV files are different, then you must modify the script.

Load_Dimension_Tables.bat / Load_Dimension_Tables.sh
> This script populates the Behavior Based Customer Insights tables with the staging data and other dimension tables. You must ensure that all of the sample data CSV files are present in the same path when you run this script. The dimension tables use the sample data CSV files.

CSV files used to populate tables

Other tables must also be populated for the analytics and reports to work. Most of these tables are lookup tables. The following tables are populated by the sample data CSV files:

CASHFLOW_DIMENSION
> This CSV contains the list of different cashflow types and it populates the Cashflow dimension table. This table stores the type of cashflow with an associated ID. The ID is used by the IBM SPSS Cashflow Classification stream to assign a Cashflow type to a customer.

GEOGRAPHIC_AREA_NAME_DIMENSION
> This CSV contains the list of geographic area types (such as Local, Surrounding, and Remote) and it populates the Geographic Area Name dimension table. This table stores the geographic area name with an associated ID. The ID is used to tag the transaction of a customer to identify whether the transaction is made in Local, Surrounding, or Remote relative to the customer location.

TIME_OF_DAY_NAME_DIMENSION
> This CSV contains the list that identifies the different times of day (such as Day, Night, and Evening) and it populates the Time of Day Name dimension table. This table stores the time of day name with an associated ID. The ID is used to tag the transaction of a customer to identify when the transaction occurred.

PEER_SEGMENT_DIMENSION
> This CSV contains the list of peer segment names and it populates the Peer Segment Dimension table. This table stores the name of the peer segment with an associated ID. The ID is used by the IBM SPSS Party Peer Group stream to assign a customer to a peer group.

MARKET_SEGMENT_DIMENSION
> This CSV contains the list of Behavior segment names and it populates the Market Segment Dimension table. This table stores the name of the Market Segment with an associated ID. The ID is used by the IBM SPSS Customer Behavior Segmentation stream to assign a customer to a segment.

PRODUCT_SEGMENT_DIMENSION
> This CSV contains the list of Product segments that a customer might fall into based on the number of products that they own. This file populates the Product Segment Dimension table. This table stores the name of Product Segment with an associated ID that is used in the customer product segment fact table to map the customer with the product segment.

SEGMENT_DATA_DIC
> This CSV contains the list of dimension tables that are considered in the customer behavior segmentation. This file populates the Segment Data Dic table. The table is used by the IBM SPSS Customer Behavior Segmentation stream to identify the dimensions that are used in behavior segmentation.

SEGMENT_DEFINITION_LIB
> This CSV contains the list of rules that form a segment. This file populates the Segment Definition Lib table that is used by the IBM SPSS Customer Behavior Segmentation stream to segment the customers based on these rules.

CATEGORY DIMENSION
> This CSV contains the list of categories, such as Low, Medium, and High.

This file populates the Category Dimension table. This is a lookup table that is used to identify the category into which the propensity score falls.

OVERDRAFT SEGMENT
This CSV contains the different overdraft segments. The file populates the Overdraft Segment table that contains the segment name associated with an ID. The ID is used by the IBM SPSS Overdraft Segmentation stream to classify the customer under different segments.

EMPLOYEE DIMENSION
This CSV contains the employee information. Currently, it is an Employee ID and Name. The information is used to map the customer with the employee so that you can know which customer is managed by which bank employee.

ANALAYTICS_EVENT_DIMENSION
This file contains the different types of analytics that are used in the Behavior Based Customer Insights solution. This file populates the Analytics Event Dimension table that contains the Event name with an associated ID. The table is used by the analytic streams to identify the result of each analytic. For example, Event ID 1 identifies the Analytics Event overdraft, and all the results from the overdraft stream in the Analytics score Fact table has Event ID of 1.

Refreshing the dynamic cubes after you load data

In the Behavior Based Customer Insights solution, reports are built on IBM Cognos dynamic cubes that which fetch data from Materialized Query Tables (MQTs) in the database. After you change the underlying data, you must refresh the MQTs and the cache for the dynamic cubes.

Procedure

1. Refresh the MQTs.
   a. On a computer that is running a Microsoft Windows operating system, log on to the data node computer as the DB2 instance owner user.
   b. In a command window, run `BANKING_REFRESH_MQTs.bat`.
      Ensure that the commands complete successfully.
2. Refresh the dynamic cube cache.
   a. Open IBM Cognos Administration.
   b. On the **Status** tab, click **Dynamic Cubes**.
   c. In the **Data Stores** pane, select all of the cubes.
   d. Click **Group Actions**, and select **Stop immediately**.
      The **Status** column should be **Unavailable**.
   e. Click **Group Actions**, and select **Start**.
      The cubes are refreshed.

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 Customer Insight for Banking 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 from the computer where you ran the Solution Installer to the computer where IBM SPSS Collaboration and Deployment Services Deployment Manager is installed.

   The `.pes` file is available from the `SolutionInstaller/NodeRoot/Downloads/ IS_Banking_CustomerInsight_1.0.3/Analytics` folder on the computer where you ran the Solution Installer.

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:

   - Select **Resolve conflicts globally** , and the following options:
     - Select **Add new version of target item or rename source item**, and select **Source** for **Use labels from**.
     - For **Lock Resolution**, select **Continue import even if some objects cannot be imported due to locking conflicts**.
   - For **Resolve Invalid Version Conflicts**, select **Import**.
   - For **Resource Definitions**, select **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 `IBMPCIBNK`.

7. Under **Resource definitions / Data Sources**, create a new data source named `IBMPCIBNK`.

8. After the .pes file is imported to the CnDS, open the job and click the step that is listed in the job.
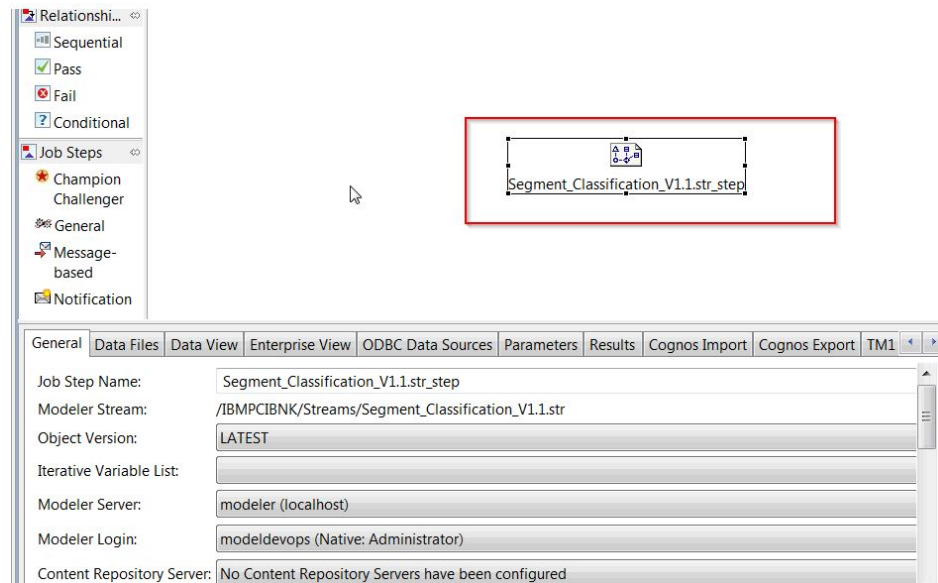
   Make sure that **Modeler Server** and **Modeler Login** fields are set to the correct definitions.

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.

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 Customer Insight for Banking 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 Customer Insight for Banking solution uses the Analytic Data View and JDBC source connections for accessing IBM Analytical Decision Manager. When the Behavior Based Customer Insight for Banking 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 BANKING 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 Customer Insight for Banking 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 on Linux

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/SDAP711 directory.

   The driver files are installed as part of the Behavior Based Customer Insight for Banking 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 end 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]BANKING=IBM DB2 ODBC Driver
   ```

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

   For example, include the following content:

   ```
   [BANKING]
   Driver=/opt/ibm/db2/V10.5/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=BANKING
   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.

```
[BANKING]
Database=BANKING
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)

Configuring ODBC for IBM SPSS Modeler Server on Windows

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

Procedure

1. From the Windows **Start** menu, click **Administrative Tools** > **Data Sources**
2. Click the **System DSN** tab to display the following window.
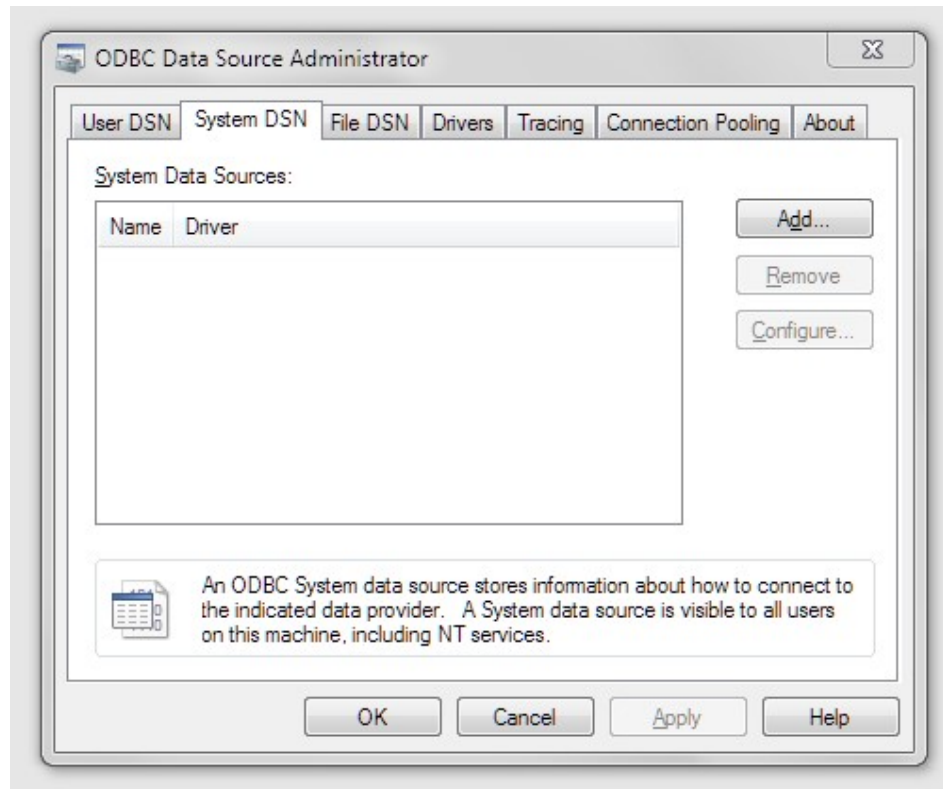
3. Click **Add**, select IBM DB2 ODBC DRIVER, and enter the data source name.

4. To populate the database aliases, catalog the databases by completing the following steps:

   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`*.

5. Configure the authentication for the data source.
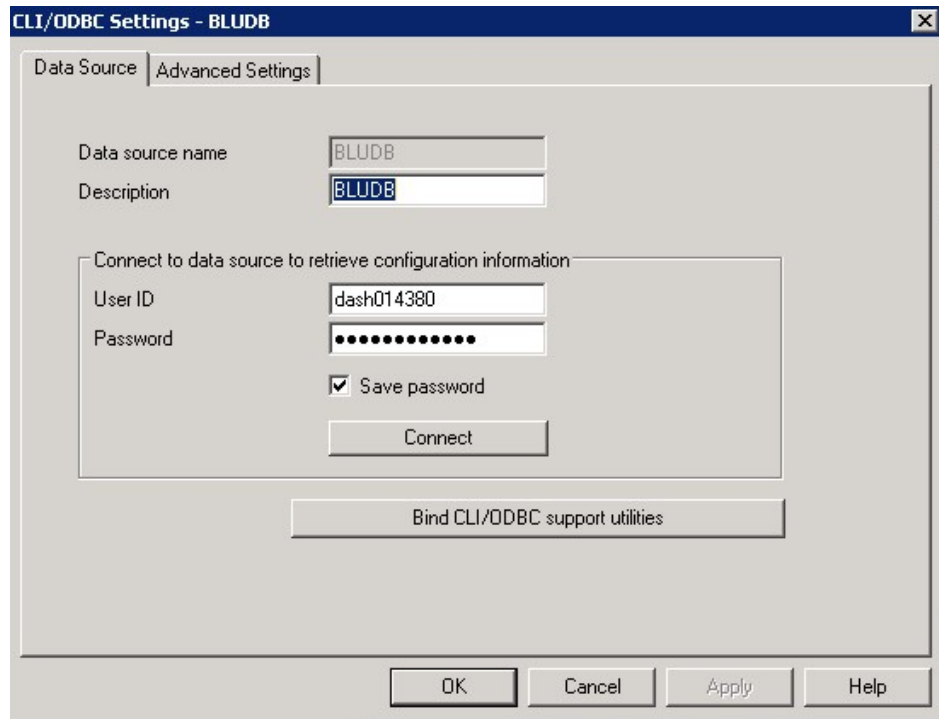
6. Enter the details and click **Connect**.

What to do next

To test the connection, do the following steps:

1. Restart IBM SPSS Modeler Server.

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)

Deploying the IBM Cognos content

For IBM Cognos Business Intelligence, you must create a data source connection, and then deploy the content files for the IBM Behavior Based Customer Insight for Banking solution.

Preparing the IBM Cognos content

You must move the IBM Cube Designer content for the IBM Behavior Based Customer Insight for Banking solution to the Cognos Deployment folder.

Procedure

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

   The file is named \BI\Banking_CustomerInsight_CD.fmd.

2. 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.

3. Go to the location where the installation files were downloaded and extracted and then double-click the `issetup.exe` file.

4. 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.

5. On the Installation Location panel, select the location where Framework Manager is installed.

6. Accept the defaults on the Component Selection page.

7. 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.

8. 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 Customer Insight for Banking 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 `BANKING`, 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 `BANKING`.
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 `BANKING`.

    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 Customer Insight for Banking 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:
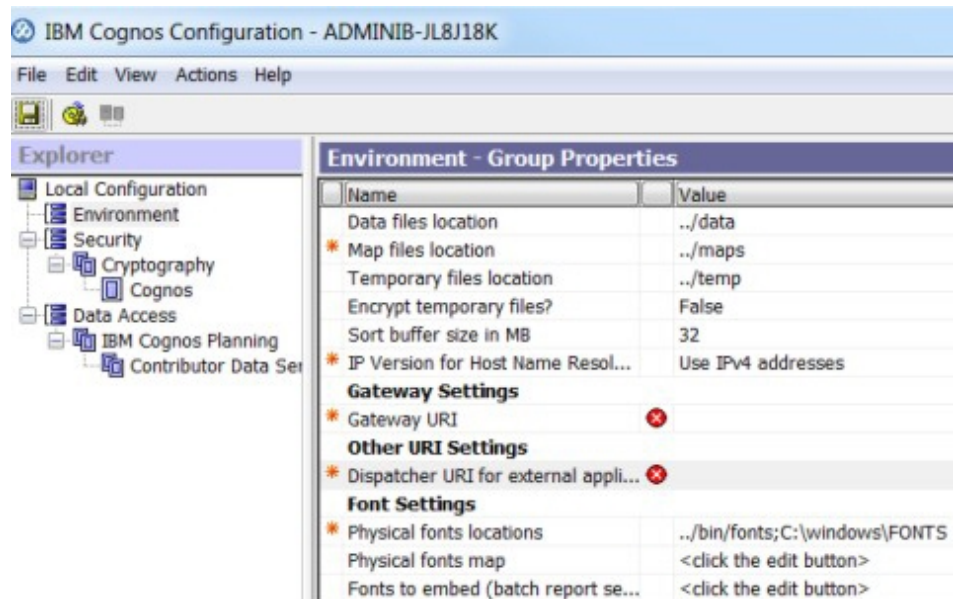
Creating a data source in the Cognos Administration portal (http://www.ibm.com/support/knowledgecenter/SSEPGG_10.5.0/com.ibm.dwe.migrate.doc/data_source_cs_cognos.html)

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.** If a message indicates that the package contains warnings, you can ignore the message.

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 `xqelog` 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="wvq2MqyClyMC2G4dyvl9MdMjyywsGjhhqs4j4q8q"
rolapCube="LIFE_EVENT_HISTORY_FACT"
sessionId="9380_891386e6-16a7-11e5-8029-fb9fdf7b972d">
<![CDATA[XQE-DS-0006 Unable to logon to the data source.
```

Deploying the IBM Cognos reports

You must deploy the Behavior Based Customer Insight for Banking 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 `Banking_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 Customer Insight for Banking content is available in **Public Folders** in the `Banking_CustomerInsight_BIContent.zip` file.

15. Rave libraries are also available as part of the solution. They are packaged in the `Banking_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 `Banking_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 Customer Insight for Banking solution in your existing system.

Procedure

1. Log in to the WebSphere Application Server Network Deployment administrative console.
2. Load the `IS_Banking_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_Banking`.

Adding the default PCI Cognos port number to the web portal

After you deploy the web portal on your server, users will be able to access Cognos reports that are installed on the same computer.

About this task

Initially, the web portal is pointing to Cognos reports on port 80 by default. But IBM Predictive Customer Insight installs Cognos on port 81 by default. So you must complete the following procedure for the HTML files (except login.html) that are in the web portal's server folder on the server where you deployed the portal.

Note: For Websphere Application Server, the web portal's server folder will be similar to: <server_installation_directory>\profiles\AppSrv01\installedApps\ ADMINIB-TJGMVIINode01Cell\IS_<industry>_WebPortalEAR.ear\ IS_<industry>_WebPortal.war

Procedure

1. In a text editor, open the HTML file or files.
2. Locate the following piece of code:
   ```
   function loadIframe()
   {
   var host_name = window.location.hostname;
   document.getElementById("iframeElement").setAttrib
   }
   </script>
   ```
3. Add + ":81" to the code, as shown below:

```
function loadIframe()
{
var host_name = window.location.hostname + ":81";
document.getElementById("iframeElement").setAttrib
}
</script>
```
4. Save the HTML file or files.

Results

You are now able to access the Cognos reports from the web portal.

Downloading the solution content to a client computer

After you have the solution installer running, you can download the solution content files to any client computer.

The solution installer deploys the content files to the server computers that are running Red Hat Enterprise Linux operating systems where you have the server components running. You can also download the solution content to computers that are running Microsoft Windows operating systems. For example, to load the Collaboration and Deployment Services content on your client computer, you can download the pes file.

Before you begin

The solution installer must be running before you can download the solution content files.

Procedure

1. In a web browser, enter the following URLs to download the content deployment instructions:

   https://*solution_installer_hostname*:8080/Downloads/
   IS_Banking_CustomerInsight_1.0.3/
   IS_Banking_CustomerInsight_1.0.3_ClientDeploymentFiles.txt

2. Enter the following URLs to download the content:
   - To download the web application content, enter

     https://*solution_installer_hostname*:8080/Downloads/
     IS_Banking_CustomerInsight_1.0.3/Web/Banking_CustomerInsight_Web.zip
   - To download the SPSS content, enter

     https://*solution_installer_hostname*:8080/Downloads/
     IS_Banking_CustomerInsight_1.0.3/Analytics/
     Banking_CustomerInsight_str.zip
   - To download the Collaboration and Deployment Services content, enter

     https://*solution_installer_hostname*:8080/Downloads/
     IS_Banking_CustomerInsight_1.0.3/Analytics/
     Banking_CustomerInsight_CDS.pes

Product license files

After you install the Behavior Based Customer Insight for Banking solution, you must ensure that the appropriate swidtag file and license directory exists on each computer on which you installed a component.

Copying the component license files to each component computer

The `swidtag` file and `license` directory must exist on each server node computer and each computer on which you install a component of the IBM Behavior Based Customer Insight for Banking solution.

`swidtag` files are provided for both production and non-production use of the solution. You must copy the appropriate `swidtag` file for your usage.

Note: Do not rename the directory or files

If you installed on a Red Hat Enterprise Linux operating system by using the solution installer, the license files are automatically copied to each server node computer.

Procedure

1. On the computer where you decompressed the artifact files, go to the `iso-swid` or `iso-swid_NonProduction` directory, and decompress the file, if applicable.
2. Copy the `swidtag` file to each computer on which you installed a Behavior Based Customer Insight for Banking component.

   For example, on Microsoft Windows operating systems, copy the file so that you have a `C:\IBM\BBCI_Banking_1_0_3\iso-swid` directory that contains a swidtag file. On Linux operating systems, you would have an `/opt/IBM/BBCI_Banking_1_0_3/iso-swid` directory that contains a `swidtag` file.
3. From the directory where you decompressed the artifact files, decompress the `license.zip` file, and then copy the `license` directory to each computer where you installed a component of the solution.

   For example, On Microsoft Windows operating systems, copy the directory and contents so that you have a `C:\IBM\BBCI_Banking_1_0_3\license` directory that contains the license files. On Linux operating systems, you would have an `/opt/IBM/BBCI_Banking_1_0_3/license` directory that contains the license files.

Results

The following folders must exist on each computer on which you installed a component of the solution:

- On Microsoft Windows operating systems (both server and client components):

   `C:\IBM\BBCI_Banking_1_0_3\license` (containing the product license files)

   `C:\IBM\BBCI_Banking_1_0_3\iso-swid` (containing the product `swidtag` file)
- On Linux operating systems where a server component is installed:

   `/opt/IBM/BBCI_Banking_1_0_3/license` (containing the product license files)

   `/opt/IBM/BBCI_Banking_1_0_3/iso-swid` (containing the product `swidtag` file)

Updating your software tag file if you change product usage

If you change your usage of the IBM Behavior Based Customer Insight for Banking solution, such as to a non-production environment from a production environment, you must switch the software tags for your installation.

You must copy the appropriate software tag file to each computer on which a server or client component is installed.

Procedure

1. On the computer where you decompressed the artifact files, go to the `iso-swid` or `iso-swid_NonProduction` directory, and decompress the file, if applicable.

2. Copy the `swidtag` file to each computer on which you installed a component and replace the existing file.

   For example, on Microsoft Windows operating systems, copy the file so that you have a `C:\IBM\BBCI_Banking_1_0_3\iso-swid` directory that contains a `swidtag` file. On Linux operating systems, you would have an `/opt/IBM/BBCI_Banking_1_0_3/iso-swid` directory that contains a `swidtag` file.

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).

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 Customer Insight for Banking 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 **Search support** box (http://www.ibm.com/support/entry/portal/).	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).

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 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 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.

Churnrisk input is not applicable

For the /customer/bi/churn API, the churnrisk input is not currently applicable. If you want to view churn scores, use the /customer/bi/score/policy/{eventname} API.

Appendix C. Client data ingestion: SPSS streams

The Behavior Based Customer Insight for Banking 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 type 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:
- Banking Customer ETL – Customer demographic details (including contact information)
- Banking 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 Banking 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"

"Boston","US","vereen@yahoo.com","04017","MA","11 smith street","8572055850",
"1989-04-11","Shane Vereen","http://hostname/ibmcognos/samples/images/Customer/148.png",
"Married","Graduate"
```

Format for the CSV file input to the Banking Transaction ETL

```
"CALENDAR_DATE","NAME","FULL_NAME","BIRTH_DATE","PHOTO","MARITAL_STATUS","EDUCATION",
"DESCRIPTION","NAME","AMOUNT","DESCRIPTION","BALANCE","DESCRIPTION"
```

Notice that there are two instances of "NAME" and three instances of "DESCRIPTION".

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 as NAME(1).

The first instance of "DESCRIPTION" relates to the geographic area description.

The second instance of "DESCRIPTION" relates to transaction time description. In the stream, this is referred as DESCRIPTION(1).

The third instance of "DESCRIPTION" relates to the cash flow description. In the stream, this is referred as DESCRIPTION(2).

```
CALENDAR_DATE > date of the transaction
AMOUNT > transaction amount
BALANCE > Current statement balance (after the transaction was made)
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 (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","AMOUNT","DESCRIPTION","BALANCE","DESCRIPTION"

"2014-06-20","Online","Shane Vereen","1989-04-11",
"http://hostname/ibmcognos/samples/images/Customer/148.png","Married",
"Graduate","Remote","Shopping","-79.00000","Day","19851.40757","Regular Sine"

"2014-06-22","Online","Shane Vereen","1989-04-11",
"http://hostname/ibmcognos/samples/images/Customer/148.png",
"Married","Graduate","Remote","Shopping","-777.00000","Day","19074.40757","Regular Sine"

"2014-06-27","Online","Shane Vereen","1989-04-11",
"http://hostname/ibmcognos/samples/images/Customer/148.png","Married",
"Graduate","Remote","Shopping","-200.00000","Day","18874.40757","Regular Sine"
```

Prerequisites for the ETL streams

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

The following perquisites are required for the Banking Transaction ETL to work:
- The Banking Customer ETL stream must be run first to load the customer details into the INDIVIDUAL_CUSTOMER_DIMENSION table. This is because the Banking 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 Banking Customer ETL stream must be provided in the CSV input file for the Banking Transaction ETL stream.
- The CALENDAR_DATE provided in the CSV input file must be present in the CALENDAR_DATE_DIMENSION table of the banking solution database.
- The channel name (NAME) provided in the CSV input file must be present in the CHANNEL_DIMENSION table of the banking solution database.
- The transaction type name (NAME(1)) provided in the CSV input file must be present in the TRANSACTION_DIMENSION table of the banking solution database.
- The geographic area description (DESCRIPTION) provided in the CSV input file must be present in the GEOGRAPHIC_AREA_DIMENSION table of the banking solution database.
- The transaction time description (DESCRIPTION(1)) provided in the CSV input file must be present in the TRANSACTION_TIME_DIMENSION table of the banking solution database.
- The cash flow description (DESCRIPTION(2)) provided in the CSV input file must be present in the CASHFLOW_PATTERN_DIMENSION table of banking solution database.
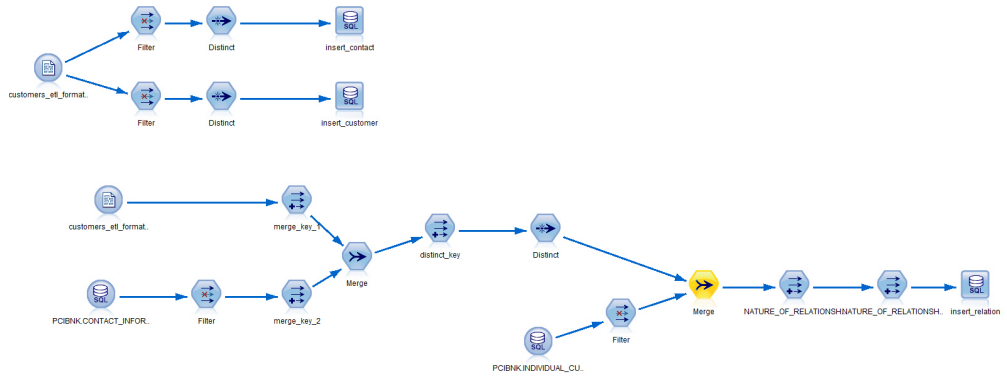
End result of using the ETL streams

This page illustrates the results of the ETL streams.

Banking Customer ETL

The stream, which is 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 customers and their 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.

Banking Transaction ETL

The stream, which is shown in the following image, filters and loads the input data from the CSV file.
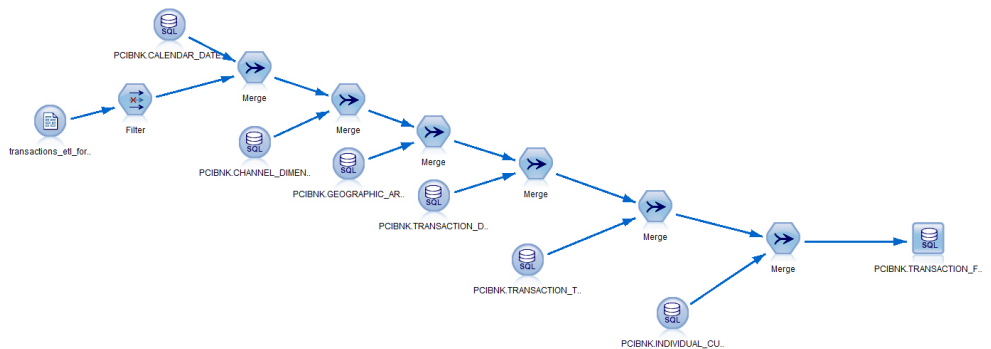
The stream performs the following steps:
- Merges the data from the transactions csv file with the CALENDAR_DATE_DIMENSION table using the CALENDAR_DATE field and picks up the corresponding CALENDAR_DATE_DIMENSION_IDs.
- Merges the data from the transactions csv file with the CHANNEL_DIMENSION table using the NAME field and picks up the corresponding CHANNEL_DIMENSION_IDs.

- Merges the data from the transactions csv file with the GEOGRAPHIC_AREA_DIMENSION table using the DESCRIPTION field and picks up the corresponding GEOGRAPHIC_AREA_DIMENSION_IDs.
- Merges the data from the transactions csv file with the TRANSACTION_DIMENSION table using the NAME field and picks up the correspondingTRANSACTION_DIMENSION_IDs.
- Merges the data from the transactions csv file with the TRANSACTION_TIME_DIMENSION table using the DESCRIPTION field and picks up the corresponding TRANSACTION_TIME_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 AMOUNT and BALANCE fields into the TRANSACTION_FACT table.

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:

   - `Banking.jar`
   - `Banking.properties`

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

2. In the `Banking.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={BANKING}     // Database name
   dbtablename={PCIBNK.INDIVIDUAL_CUSTOMER_DIMENSION}   // Table name
   ```

3. If you are in a Linux environment, 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/Banking.jar /root/Downloads/slmt/Banking.properties
   ```

4. If you are in a Windows environment, you can create a batch file with the following code to run the java file that generates the slmt tags for the solution.

   a. Make the appropriate changes for your deployment location. Also, ensure that the properties file is complete with details about the database node. You must also replace the tag id in the replace option to the ID from either the production or non production swidtag file.

      ```
      @echo off
      setlocal enableextensions disabledelayedexpansion
      Location to the java file. Make sure the properties file is filled with the proper values.
      cd C:\Java
      java -jar Banking.jar C:\Java\banking.properties
      set "search=b74be4a978bf4b66bd56271915f0ea5f"
      set "replace=<Tag ID from the ILMT file>"
      ```

```
  for %%f in (C:\opt\slm\*.slmtag) do (
  for /f "delims=" %%i in ('type "%%f" ^& break ^> "%%f" ') do (
    set "line=%%i"
    setlocal enabledelayedexpansion
    set "line=!line:%search%=%replace%!"
    >>"%%f" echo(!line!
    endlocal
  )
  )
```

b. To automate the batch file, follow the instructions on the Microsoft.com website: http://windows.microsoft.com/en-US/windows/schedule-task#1TC=windows-7

Results

Now 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 Customer Insight for Banking</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 Customer Insight for Banking 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 58
3. "Configure the JDBC data source" on page 59

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.
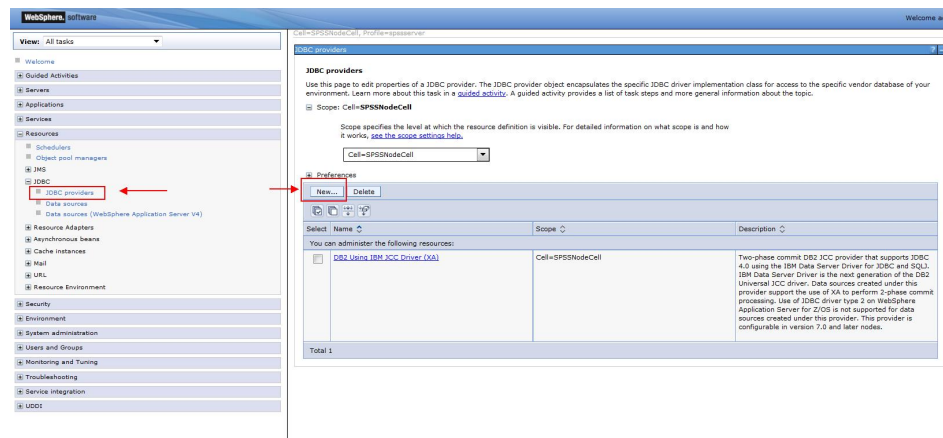
3. If you already have the *DB2 Using IBM J2CC Driver (XA)* setup, proceed to "Create an authentication alias" on page 58. Otherwise, create a new JDBC provider by clicking **New...**, as highlighted in the image.
4. Enter the JDBC provider details as per the following image, then click **Next**.
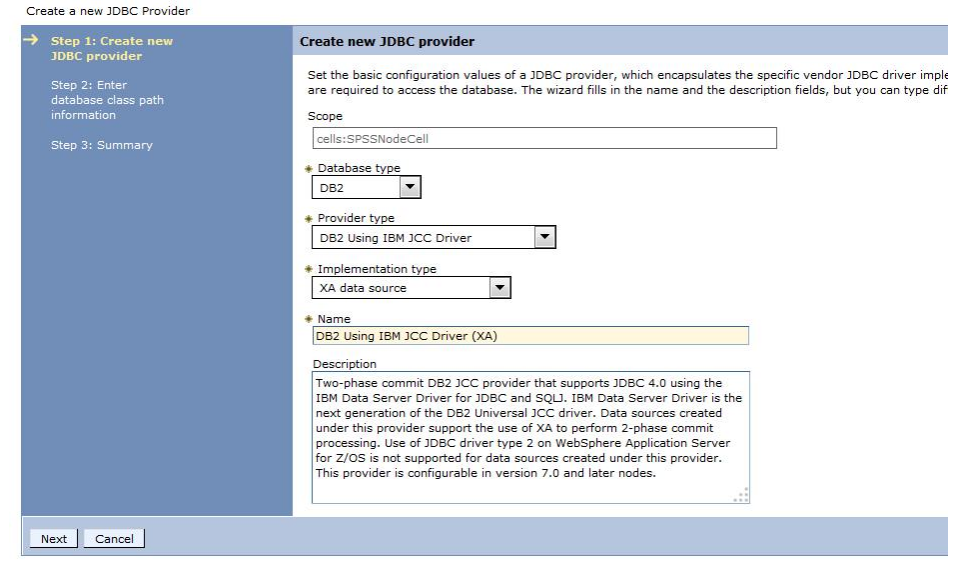
5. Use the default *Class path* settings, as shown in the following image, and click **Apply**.
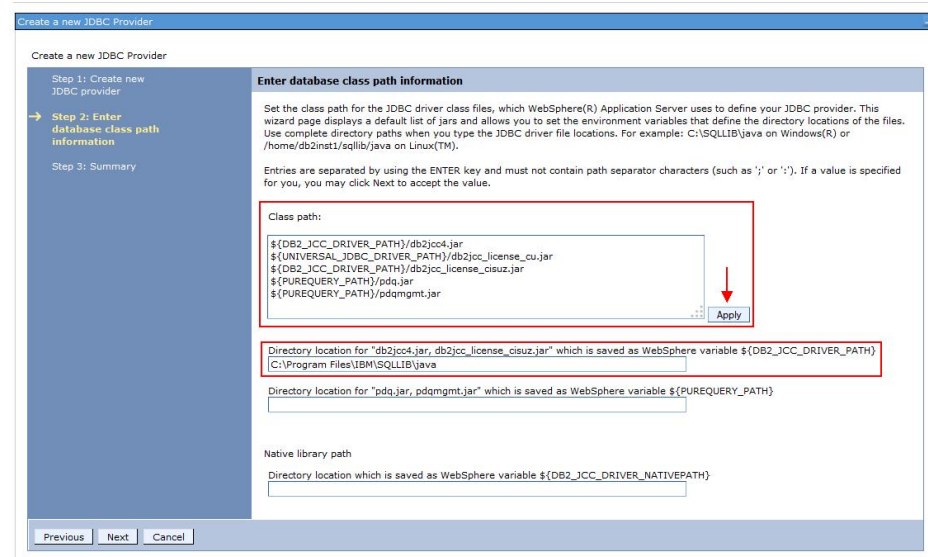
6. Specify the directory location where the db2jcc4.jar and db2jcc_license_cisuz.jar files are present on the server. The jar files are included in the WebSphere installation package.

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**.
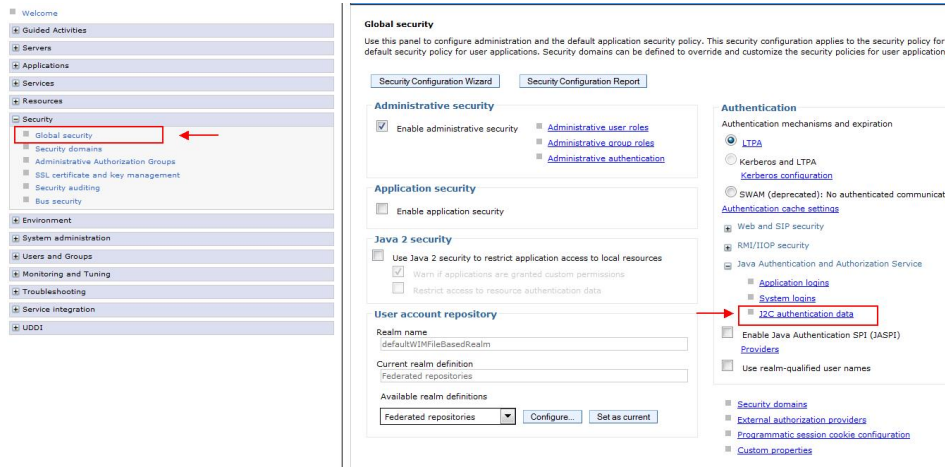
2. Click **New...**

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/pcibnk" in the **JNDI name** field. The **JNDI name** is used by the REST API to connect to the database.
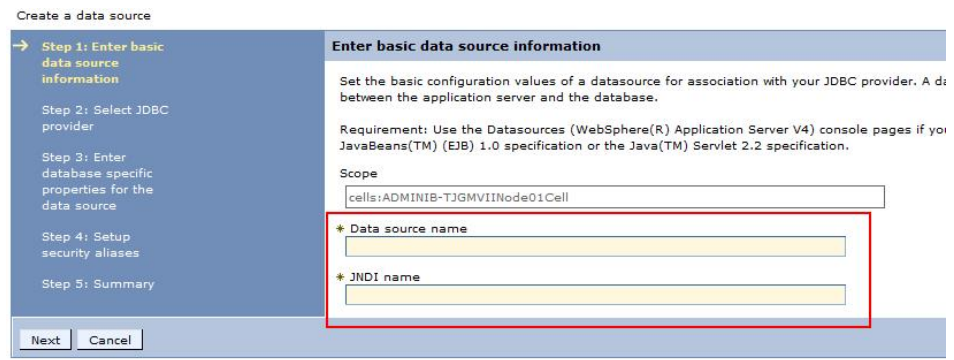
4. Click **Next**.

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**.

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

8. Verify the summary information and click **Finish**.
9. When you're prompted to save the server configuration changes, click **Save**.
10. 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 Customer Insight for Banking 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.

Behavior Based Customer Insight for Banking 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_Banking_EAR`) on a WebSphere Application Server, you can visit the following link to access the API documentation:

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

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

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_BANKING_ERR00
    Unknown error

IS_BANKING_ERR01
    A customerid is required.

IS_BANKING_ERR02
    The specified customer_id parameter is invalid.

IS_BANKING_ERR03
    The specified pagestart parameter is invalid.

IS_BANKING_ERR04
    The specified pagesize is invalid.

IS_BANKING_ERR05
    Unsupported activitytype. Currently supporting "overdraft" only.

IS_BANKING_ERR06
    Database error

IS_BANKING_ERR07
    An activitytype 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".

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 4, "Creating and managing customer segments," on page 11.

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. Banking data dictionary

Categories	Sub-categories
WHEN	Day, Night

Table 3. Banking data dictionary (continued)

Categories	Sub-categories
WHERE	Remote, Local, Surrounding
WHAT	Home, Eating Out, Kids, Shopping, Travel, Credits, Entertainment, Gas & Fuel, Education, Groceries
CASHFLOW	Regular Sine, Paycheck-to-Paycheck, Lumpy-Bumpy, Safety-First, Others

The categories in the table are defined based on the customer transactions data.

WHEN
> Implies when users spend their money.

WHERE
> Implies where users spend their money.

WHAT
> Implies what users spend their money on.

CASHFLOW
> Implies a user's cash flow characteristics.

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) 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.

Banking segment name: Home Bodies

The following sample JSON input defines these conditions:

- WHEN: Spend during day > (M + 0.6*SD). The operator value is **greater**.
- WHERE: Spend local > (M + 0.5*SD). The operator value is **greater**.
- CASHFLOW: Cash flow patter is Regular Sine (i.e., Regular Sine = 1). There would not be any condition in case of CASHFLOW category. By default, the **operator** value would be equal and deviation value set to 1. The operator value is **equal**.
- WHAT: Spend on "Home" > (M + 0.8*SD) AND Spend on "Eating Out < (M - 0.6*SD)". The operator value for Home is **greater**. The operator value for Eating Out is **greater**.

```
{
    "segment": "Home Bodies",
    "categories": [
        {
            "name": "WHEN",
            "subcategories": [
                {"name": "Day", "operator": "greater", "deviation": 0.6}
            ]
        },
        {
            "name": "WHERE",
            "subcategories": [
         {"name": "Local", "operator": "greater", "deviation": 0.5}
            ]
        },
        {
            "name": "CASHFLOW",
            "subcategories": [
                { "name": "Regular Sine", "operator": "equal", "deviation": 1}
            ]
        },
```

```
        {
            "name": "WHAT",
            "subcategories": [
                    {"name": "Eating Out","operator": "less", "deviation": 0.6},
            {"name": "Home","operator": "greater", "deviation": 0.8}
                    ]
        }
    ]
}
```

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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