



Avaya Solution & Interoperability Test Lab

Application Notes for Calabrio Workforce Management Release 9.2(1) SR3 with Avaya Aura® Contact Center Release 6.4 – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Calabrio Workforce Management 9.2(1) SR3 to interoperate with Avaya Aura® Contact Center Manager Server Release 6.4. Calabrio Workforce Management is a work force management solution that provides forecasting, scheduling, and monitoring of work for contact centre representatives. Calabrio Workforce Management uses the historical call volumes from Contact Center Manager Server to produce forecasts and schedules for contact center representatives, and then uses the real-time agent status data from Contact Center Manager Server to check the representative adherence to the schedules.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration steps required for Calabrio Workforce Management (hereafter known as WFM) to interoperate with Avaya Aura® Contact Center Manager Server (hereafter known as CCMS).

Calabrio WFM uses the historical call volumes from CCMS to produce forecasts and schedules for contact center representatives, and then uses the real-time agent status data from CCMS to check the representative adherence to the schedules. The collection of historical Directory Number (DN)/Skillset/Agent call volumes from the CCMS is done querying the statistical database via Open Database Connectivity (ODBC).

The integration of real-time Agent status changes is done using the Avaya SDK client on the Calabrio server. TCP/IP communication is established at the start up of the Real-Time service in the Calabrio system.

2. General Test Approach and Test Results

The General test approach was to verify that the WFM was able to integrate with CCMS. WFM uses the RTD SDK to connect to the Avaya Aura® Contact Center (Contact Center) to monitor a wide range of real time statistics that are available from Contact Center. It uses the ODBC to collect historical records.

Compliance Test bed was setup with historical data populated. Each test was run as described in the test plan developed by Calabrio. The test cases verified the correct configuration of the Calabrio WFM connection to Contact Center Manager Server. The test cases also verified the correct acquisition of data by Calabrio WFM.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

The interoperability compliance testing focused on verifying Calabrio for the following on both Historical and Real-time data:

- Installation and configuration
- Historical data collection
- Historical data capture (processing)
- Real Time data acquisition and display

2.2. Test Results

The objectives outlined in the **Section 2.1** were verified and met. All test cases were executed and passed with the following observations,

- WFM will show the status as “After Contact Work” for a non-ACD call and “Talk” for an ACD call.
- WFM will show the status as “Logged Out” if an agent puts the phone in Make Set Busy state.
- WFM captures historical data every 30 minutes, 15 minutes after the interval ends. For example, to see data for the 10:00 – 10:30 interval user must wait until at least 10:45.
- WFM will not collect data or show agent activity or status if any connection is lost between WFM server and CCMS due to power or network disruption.

2.3. Support

Technical support for Calabrio CQM can be obtained by contacting Calabrio via

Web: <http://calabrio.com/about-calabrio/services/> or

Phone: +1 (800) 303-1248 (North America)

+1 (763) 592-4680 (International)

Email: calabriosupport@calabrio.com

3. Reference Configuration

A server with the Calabrio WFM software is installed and a CCMS platform is available during the test execution. Microsoft SQL Server is installed co-resident with the Calabrio WFM Application.

The Calabrio server has the RTDSDK client for Real-Time data integration.

Calabrio WFM integration with Avaya Aura® Contact Center is achieved through ODBC access to CCMS_STAT database namespace and TCP/IP communication with the RTD package.

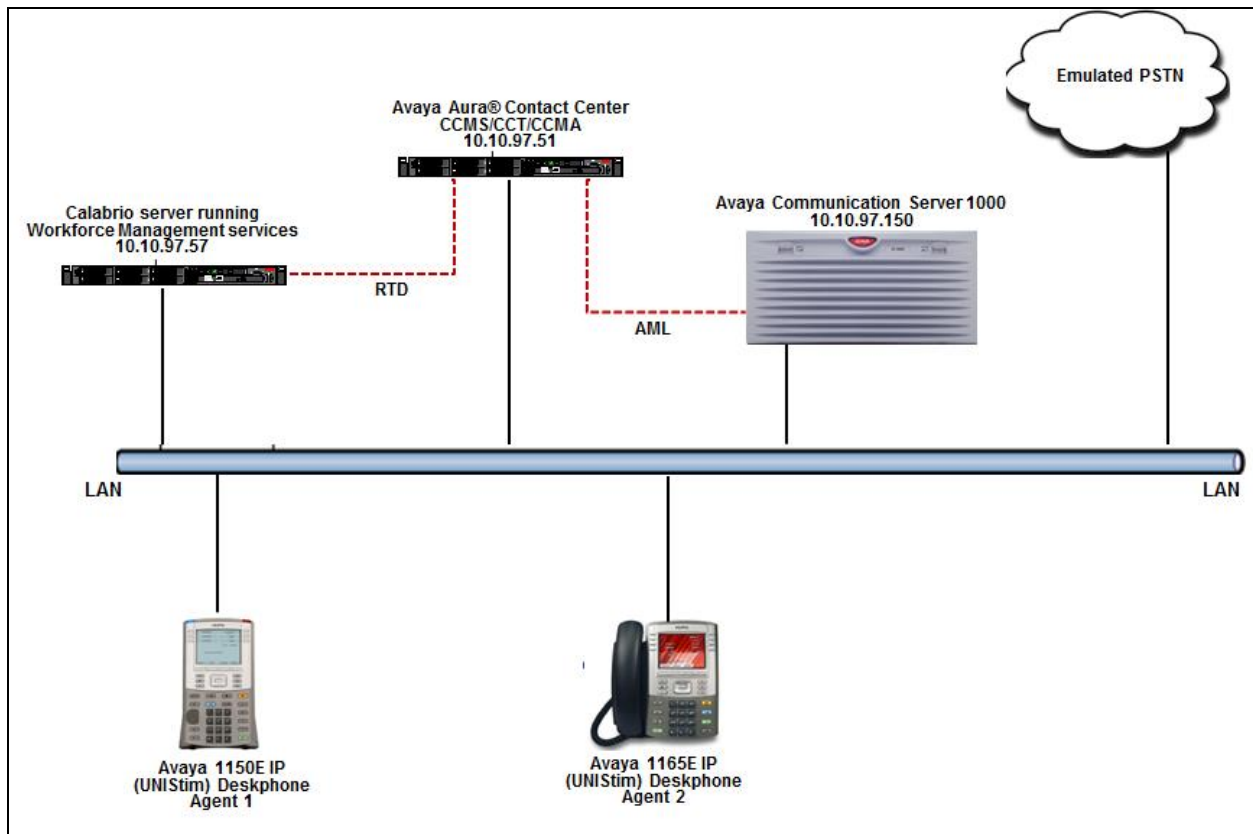


Figure 1: Reference Configuration

4. Equipment and Software Validated

The following equipment and software were used during the lab testing:

Equipment	Release/Version
Avaya Communication Server 1000	7.65 SP4
Avaya Aura® Contact Center	6.4.212.0-0603_Service Pack
Avaya IP (UNISim) Deskphones: 1150E 1165E	0x27C8V 0x25C8V
Calabrio WFM Server OS Calabrio WFM Desktop OS launching Calabrio One	Windows Server 2008 R2 Enterprise SP1 64-bit 9.2.1 SR3 Windows 7 Professional SP1 32-bit

5. Configure Avaya Communication Server

This section describes the steps to configure the CCMS so that the WFM server is able to connect to it. Assumption is made that the CCMS is installed successfully and all the required scripts are running. Assumption is also made that the CCMS is interfaced and working successfully with the Avaya Communication Server 1000 (Communication Server 1000). For additional information on CCMS and Communication Server 1000 installation and configuration refer to **Section 9**.

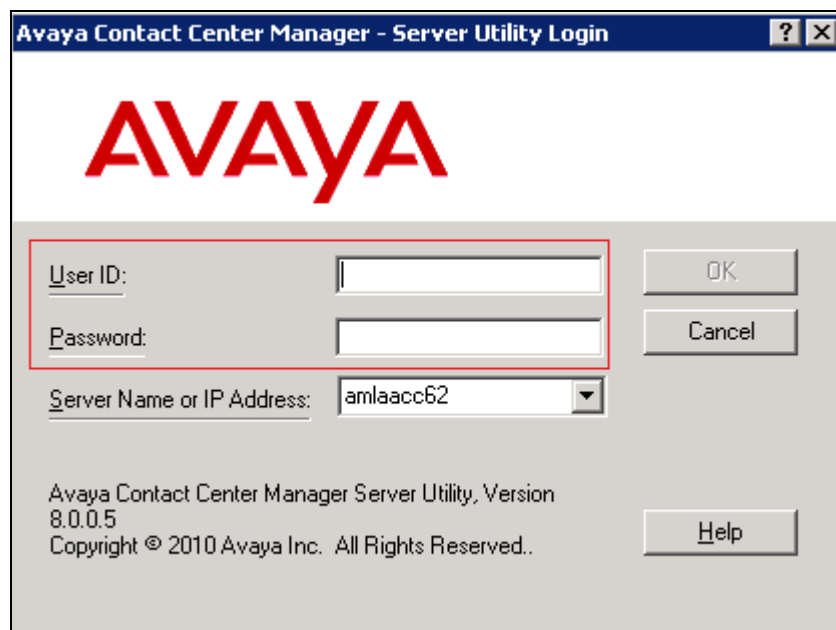
Here is a summary of CCMS Configuration:

- Creating new user to interface with WFM server.

5.1. Configuring a New User

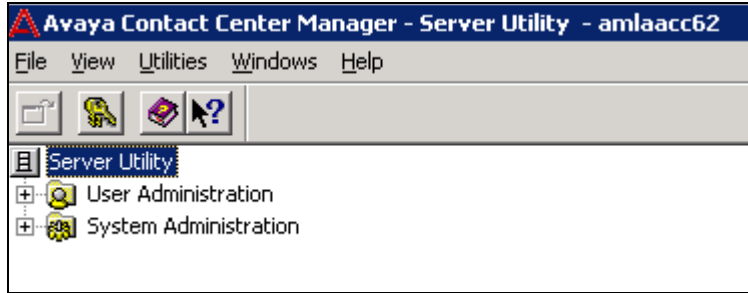
This section explains the steps to add a new user that is required to interface and connect to the WFM server. To add a new user, navigate through **Start → All Programs → Avaya → Server Utility** on the server the CCMS is installed on (not shown).

Screen below shows the **Server Utility Login** screen. Enter the administrator **User ID** and **Password**. Click on **OK** to continue.

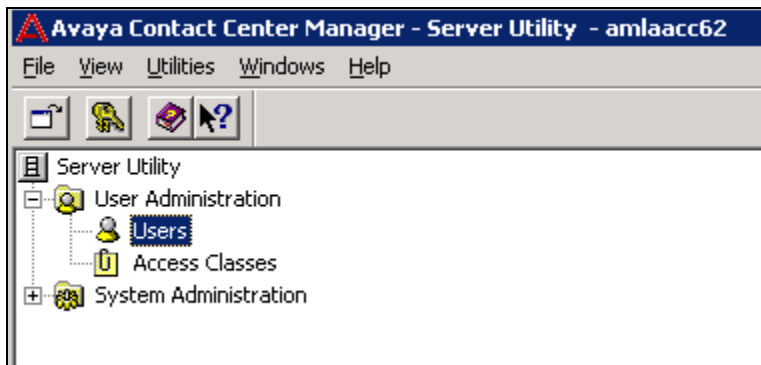


The screenshot shows a dialog box titled "Avaya Contact Center Manager - Server Utility Login". At the top center is the Avaya logo in red. Below the logo are three input fields: "User ID:" (with a red box around it), "Password:" (with a red box around it), and "Server Name or IP Address:" (with a dropdown menu showing "amlaacc62"). To the right of these fields are "OK" and "Cancel" buttons. At the bottom left, there is text: "Avaya Contact Center Manager Server Utility, Version 8.0.0.5" and "Copyright © 2010 Avaya Inc. All Rights Reserved.". To the right of this text is a "Help" button.

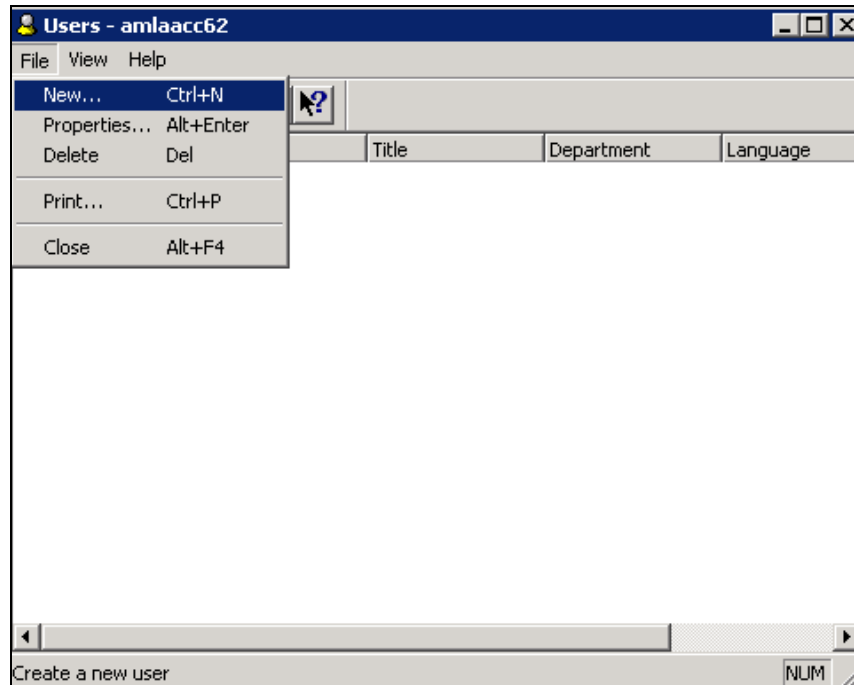
Screen below shows the **Server Utility** main screen.



To add a new user, expand the **User Administration** tree and double-click on **Users** as shown in the screen below.



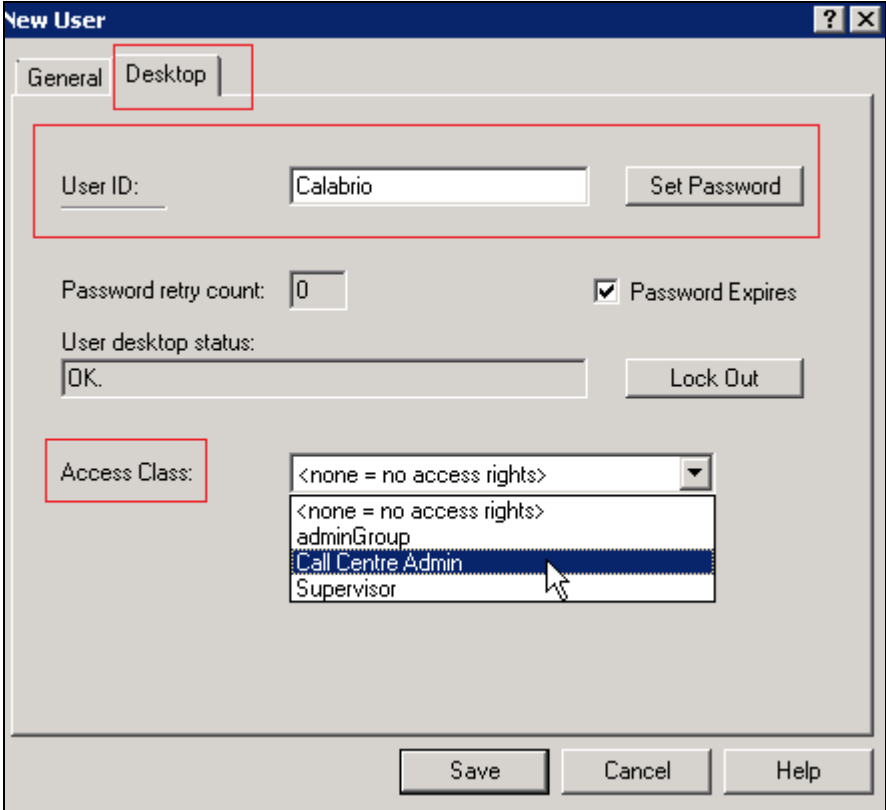
Screen below shows the **Users** screen. Click on **File** and select **New**.



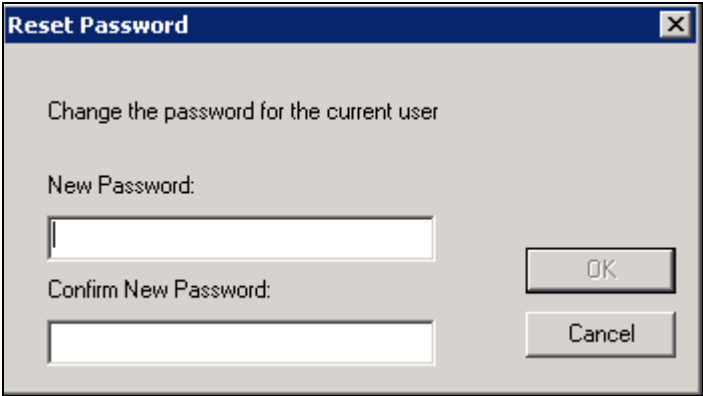
Screen below shows the New User being configured. Populate the **First name** and **Last name** fields that is seen under the **General** tab.

The screenshot shows a 'New User' configuration window with two tabs: 'General' and 'Desktop'. The 'General' tab is active. The 'First name' field is populated with 'Calabrio' and the 'Last name' field is populated with 'WFM'. Below these are a 'Comments' text area, a 'Title' text field, a 'Department' text field, and a 'Language' dropdown menu set to 'English'. At the bottom of the window are three buttons: 'Save', 'Cancel', and 'Help'.

From the **Desktop** tab populate the **User ID** field and select **Call Centre Admin** under **Access Class** field as shown in the screen below. Click on **Set Password** to continue.

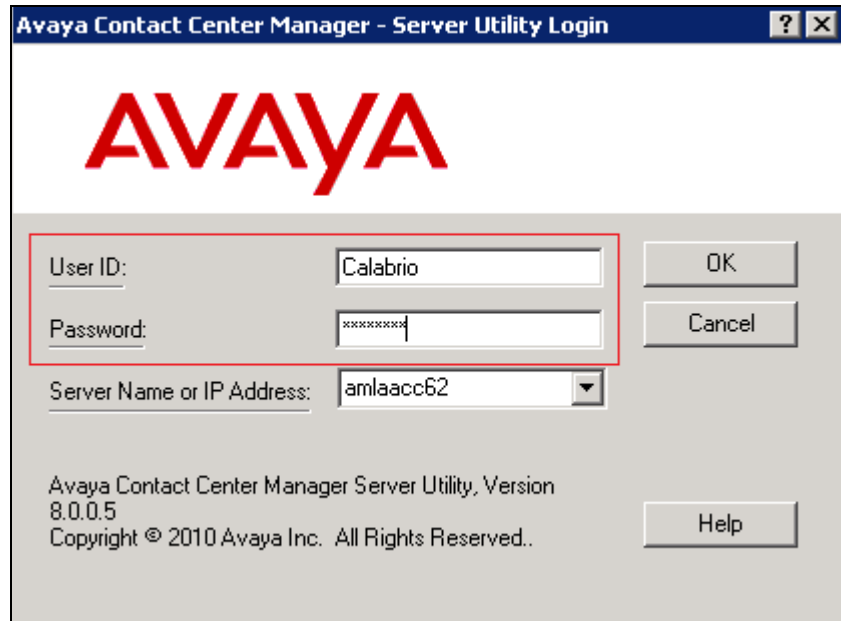


Configure the password and click on **OK** to continue as shown in below. Click on the **Save** button, that is seen in the screen above, to complete the configuration of New User.

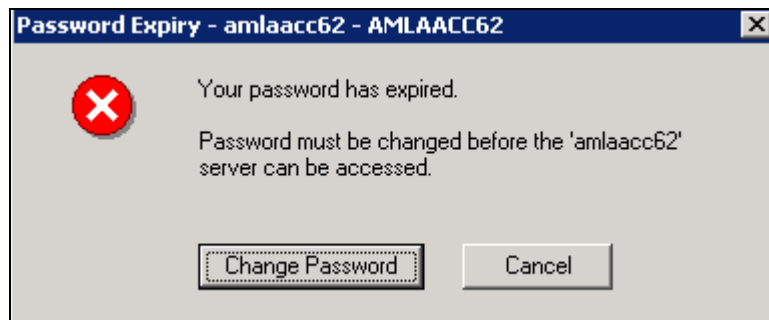


To confirm the configuration of the New User created, exit from the Server Utility application and navigate back to it as explained in **Section 5.1**.

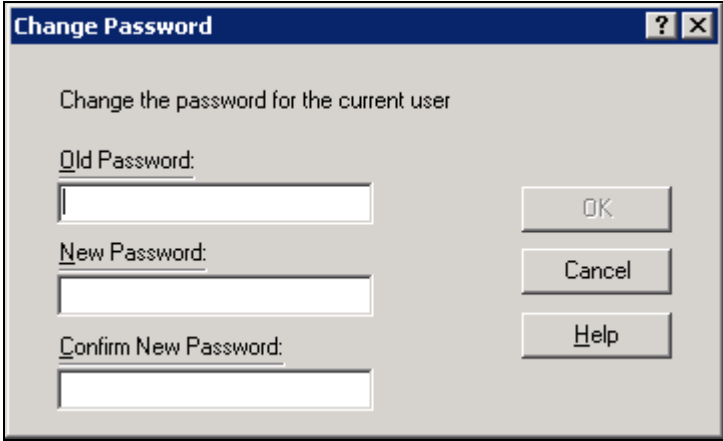
Screen below shows the **Server Utility Login** screen. Populate the **User ID** and **Password** fields with the values that were configured above. Click on **OK** to continue.



While logging in for the first time using the new user, the system forces the password to be changed. Click on **Change Password** as shown in the screen below.



Configure the required fields and click on **OK** to complete the changing of the password as shown in the screen below.



The above user login was used by Calabrio WFM to obtain Realtime and Historical data from CCMS.

Historical data was generated by running voice traffic on the system over the course of a week.

6. Configure Calabrio WFM

This section only provides the detailed configuration on the WFM server required for collecting historical data and real time agent status. During compliance testing all WFM services discussed in this document were hosted on a single server. For more information about how to install and configure Calabrio WFM server, refer to **Section 9**.

6.1. Creating a CCMA User for WFM

The New User created in **Section 5.1** is used by WFM as follows:

- It is used by the WFM Capture service to access views in the Avaya Caché database
- It is used by the WFM RTE service to establish an RTD connection to the Avaya Aura® Contact Center Manager Server (CCMS)

Note: Creating a CCMA user for WFM is required for Avaya Aura® Contact Center Release 6 or higher

6.2. Installing the Avaya Aura® Contact Center Real Time Data SDK

Install the Avaya Aura® Contact Center Real Time Data Software Development Kit (Contact Center RTD SDK) on the server that hosts the WFM Transaction services. The version of the RTD SDK must match the version of Contact Center that is installed.

If there is an older version of the RTD SDK already installed, it needs to be uninstalled before the newer version is installed.

6.3. Installing the InterSystems Caché ODBC Driver

The InterSystems Caché ODBC driver needs to be installed on the server that intends to host the WFM Capture services.

An abbreviated installation procedure is provided below. For detailed information about how to install the driver, see the InterSystems Caché installation documentation.

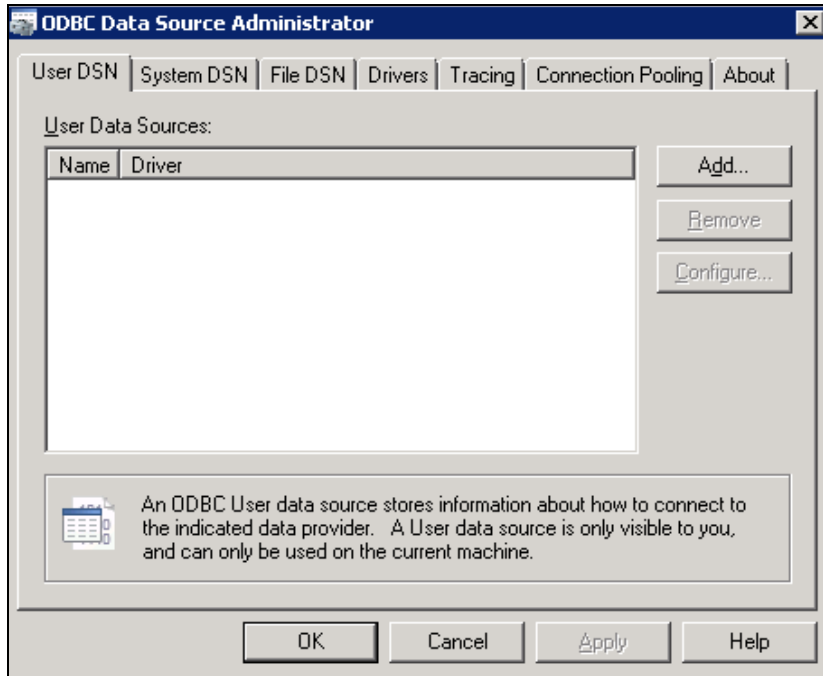
The ODBC driver is distributed with Contact Center Release 6 and higher. It is required to collect historical information from the Avaya database.

6.3.1. To install the ODBC driver

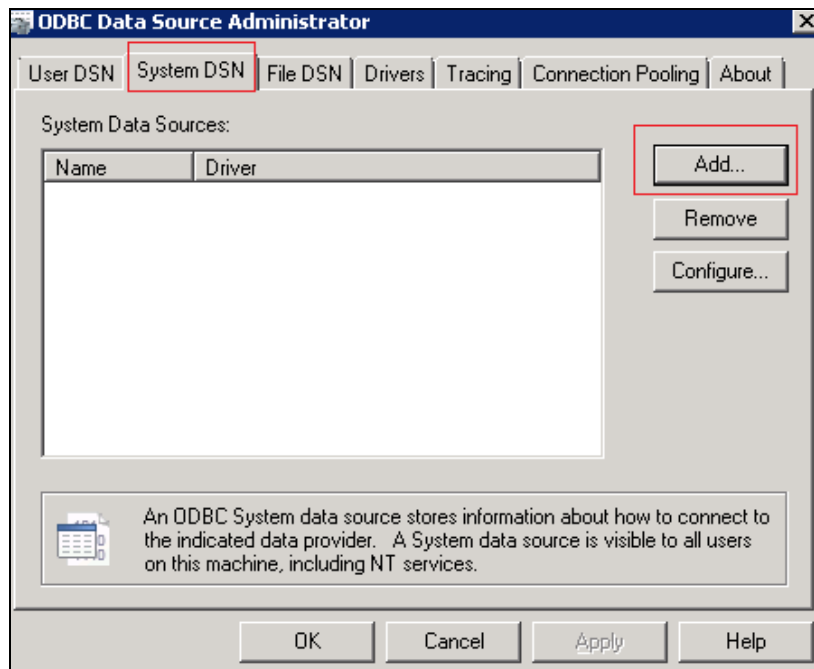
Run the Caché ODBC setup utility (ODBCDriver_x64.exe) and follow the prompts (not shown).

6.3.2. To create the ODBC connection acdDbMainCC7

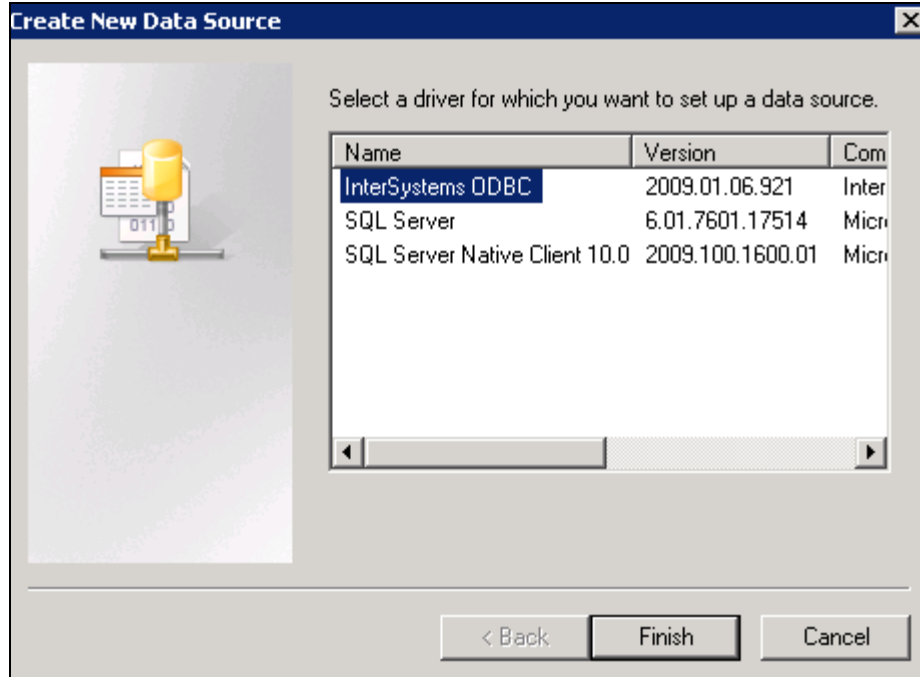
Click **Start** → **Run**, type **odbcad32**, and press Enter to open the Data Sources (ODBC) Manager. Screen below shows the **ODBC Data Source Administrator** window.



Click on the **System DSN** tab. Click on the **Add** button as shown in the screen below.



From the list, select **InterSystems ODBC** and then click on the **Finish** button.



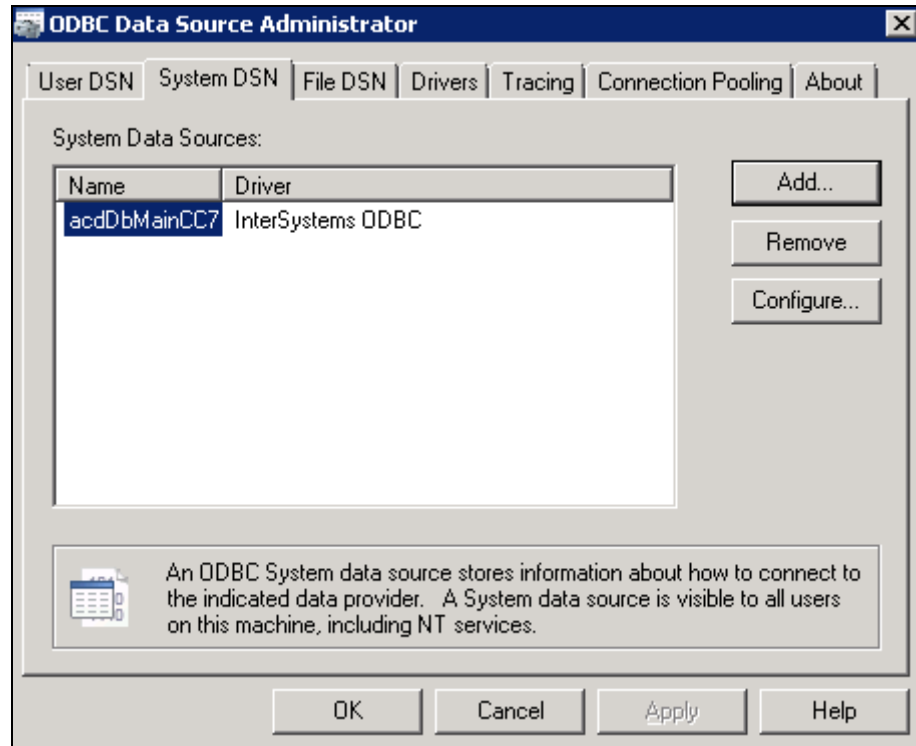
The **InterSystems Caché ODBC Data Source Setup** window is opened as shown below. Configure the values as follows,

- **Name:** *acdDbMainCC7*
- **Description:** A descriptive name. During compliance testing *Avaya AACC 6 ACD* was used. This field is optional.
- **Host (IP Address):** The IP address of the Avaya CCMS server. During compliance testing *10.10.97.51* was used.
- **Port:** *1972*. Note that this is the default port number. Consult with Avaya if this has been changed on the default port for the connection to the Caché database.
- **Caché Namespace:** *CCMS_STAT*
- **Authentication Method:** Select the *Password* option
- **User name:** User name as created in **Section 5.1**. Note that this field is case sensitive.
- **Password:** The password assigned to the user created in **Section 5.1**. Note that this field is case sensitive.
- **Misc:** If the Caché database was installed with Unicode support, select the *Unicode SQL Types* check box. Otherwise, leave all check boxes clear.

Click on the **Test Connection** button to confirm that all parameters are valid. Click **OK** to save the changes and create the ODBC entry.

The screenshot shows the 'InterSystems Caché ODBC Data Source Setup' dialog box. The 'Data Source' section has 'Name' set to 'acdDbMainCC7' and 'Description' set to 'Avaya AACC 6 ACD'. The 'Connection' section has 'Host (IP Address)' set to '10.10.97.51', 'Port' set to '1972', and 'Caché Namespace' set to 'CCMS_STAT'. The 'Authentication Method' section has 'Password' selected. The 'User Name' field contains 'Calabrio' and the 'Password' field is masked with dots. The 'Misc' section has 'Unicode SQL Types' checked. The 'Test Connection' button is highlighted with a red box, and the 'OK' button is also highlighted with a red box. The 'Ping' button is also visible. The '# Times' field is set to '1000'. The 'Help' button is at the bottom right.

Screen below shows the **ODBC Data Source Administrator** window with the System Data Source discussed above added.



6.4. Configure WFM for the InterSystems Caché ODBC Driver

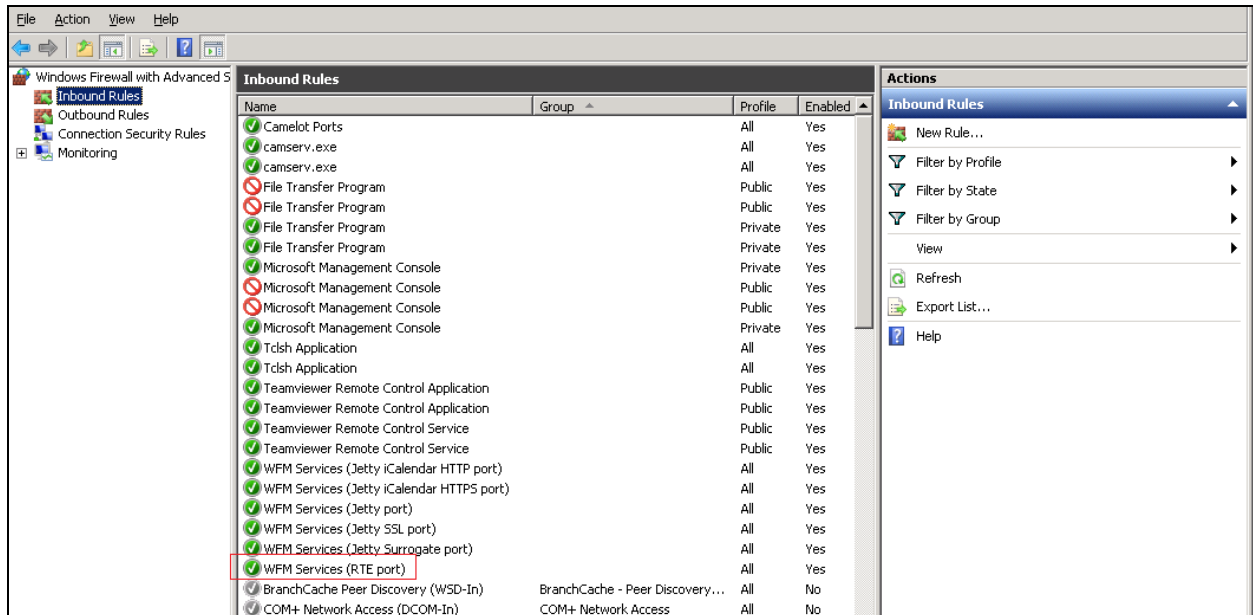
To configure WFM for the Contact Center InterSystems Caché ODBC driver, do the following after installing WFM.

6.4.1. On the server that hosts the WFM Transaction services:

To start the system configuration, launch the *PostInstall.exe* file which is typically found in the Program Files\Calabrio\WFO_WFM\bin folder. The **Workforce Management – Configuration Setup** window is opened (not shown). Minimize this utility as it starts without completing the steps.

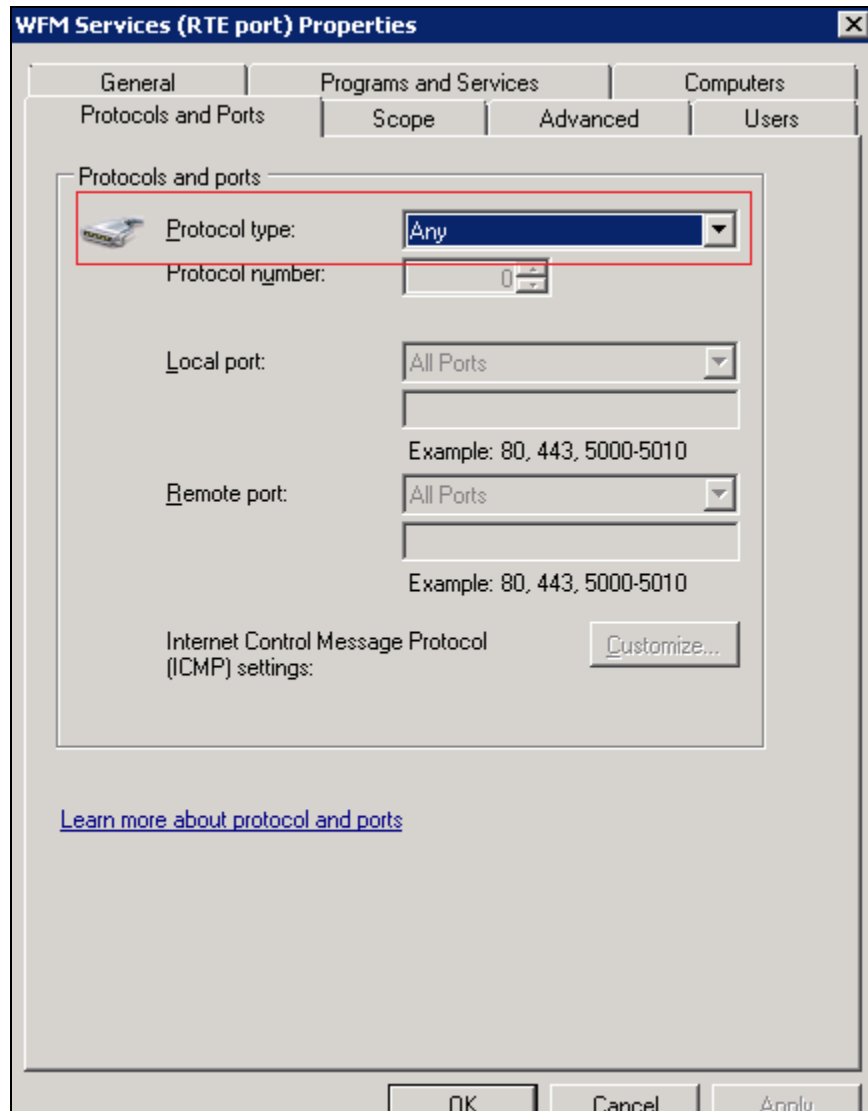
Access the Windows Firewall by navigating to **Start → Control Panel → Administrative Tools → Windows Firewall with Advanced Security**.

In the navigation tree on the left, select **Inbound Rules**. In the right pane, double-click **WFM Services (RTE port)** as shown in the screen below.



The **WFM Services (RTE port) Properties** window opens as shown below. From the **Protocols and Ports** tab, in the **Protocol type** drop down menu, select *Any*.

Click **Apply**, and then **OK**.



Maximize the utility window and complete the steps with the following values as shown in the screen below.

Select ACD: From the drop down select the configured name.

Select Language: From the drop down select the language.

IP Address or Host Name: The IP address of the CCMS. During compliance testing *10.10.97.51* was used.

Port: Enter the port used to connect to the Caché database on the CCMS. Default value = *1972*.

User Name: Enter the user name as configured in **Section 5.1**.

Password: Enter the password as configured in **Section 5.1**.

Click on **OK** to close the utility after configuring the required values.

Workforce Management - Configuration Setup

WFM Database
Create WFM DB
Data Retention Periods
Update KeyStore
ACD Connection
QM Connection
WFM Authentication
Email Distribution
Monitoring and Notification
Enterprise Settings
Start Services

ACD Connection

Select ACD: Avaya AACC 6
Select Language: English

Use GIS to capture ACD historical data manually

IP Address or Host Name: 10.10.97.51
Port: 1972
User Name: Calabrio
Password: *****

Capture Settings...

PREVIOUS NEXT

6.4.2. On the server that hosts the WFM Capture services:

Minimize the WFM Configuration Setup utility as it starts without completing the steps (not shown).

Copy <Avaya CCMS install folder>\Common Components\Cache\lib\CacheDB.jar to
C:\Program Files (x86)\Calabrio\WFO_WFM\ext

Edit C:\Program Files (x86)\Calabrio\WFO_WFM\config\wfmcapture.properties to add
CacheDB.jar to the classpath used by the Capture service. The classpath should be as follows:
*service4j.classpath=..\config;..\ext\calabriotime.jar;..\ext\SplkStd4J.jar;..\ext\wfm-
common.jar;..\ext\commons-dbc4-1.2.1.jar;..\ext\commons-collections-3.0.jar;..\ext\commons-
pool-1.2.0.jar;..\ext\jtds-
1.2.1.jar;..\ext\sqljdbc4.jar;..\ext\log4j.jar;..\ext\CacheDB.jar;..\lib\wfmcapture.jar*
Save and close the updated *wfmcapture.properties* file.

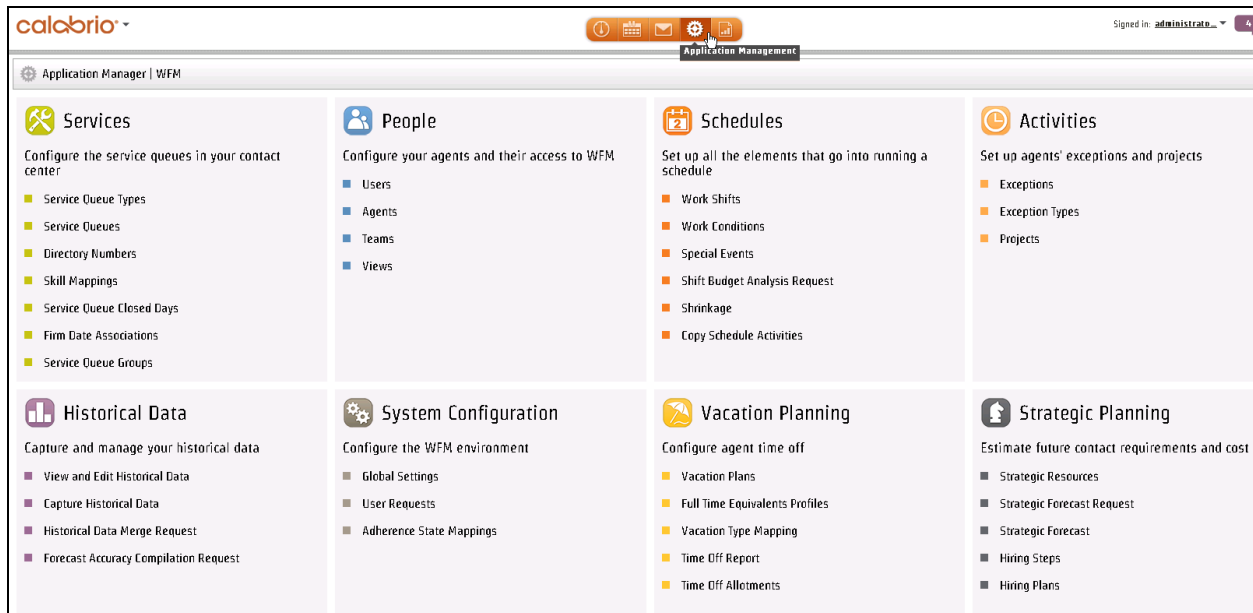
Maximize the WFM Configuration Setup utility and complete the steps. Click **OK** to close the utility (not shown).

6.5. Configure WFM Elements to Match Contact Center Elements

When configuring your WFM system, in order for Contact Center historical data to be applied correctly, ensure that the records for the following elements match those elements in the Contact Center,

- Service queues
- Directory numbers
- Agents
- Users
- Skill mappings

Most of the element information can be found in the Contact Center Manager Administration (CCMA) application. Some information must be obtained by running the Avaya RTD Cache tool and viewing the output. See your Avaya documentation for information on how to run the RTD Cache tool. All WFM administration pages are available under the Calabrio1 (C1) application when logging in as an administrator and going to Application Management. This can be accomplished by entering the IP address of the Calabrio server in an Internet browser and login using the correct credentials. Screen below shows the C1 Application Management main page.



6.5.1. Service Queues

To configure a Service queue, navigate to **Services** → **Service Queues** from the **Application Manager** screen (not shown). The **Service Queues** page is shown as below. The screen shows the values that were configured during compliance testing.

Configure the values to the above screen based on the description shown in the table below.

Avaya Data Source	Avaya Field Name	WFM Field Name
RTD Cache tool	Skillset ID	Service Queue ID
CCMA	Skillset Name	Service Queue Name
CCMA	Contact Type	Service Queue Type

6.5.2. Directory Numbers

To configure a Directory number, navigate to **Services → Directory Numbers** from the **Application Manager** screen (not shown). The **Directory Numbers** page is shown as below. Directory numbers are associated with skillsets in Contact Center. These need to be associated with the directory numbers that is equivalent service queues in WFM. The screen shows the values that were configured during compliance testing.

Configure the values to the above screen based on the description shown in the table below.

Avaya Data Source	Avaya Field Name	WFM Field Name
RTD Cache tool	App ID	Directory Number
CCMA	Application Name	Description
CCMA	Skillset	Service Queue

6.5.3. Agents

To configure an Agent, navigate to **People → Agents** from the **Application Manager** screen (not shown). The **Agents** page is shown as below. The WFM agent first name, last name, and employee ID should match the Contact Center values. The WFM ACD ID must match the Contact Center Login ID. The screen shows the values that were configured during compliance testing.

Configure the values to the above screen based on the description shown in the table below.

Avaya Data Source	Avaya Field Name	WFM Field Name
CCMA	First Name	First Name
CCMA	Last Name	Last Name
CCMA	Login ID	Employee ID
CCMA	Login ID	ACD ID

6.5.4. Users

To configure a User, navigate to **People → Users** from the **Application Manager** screen (not shown). The **Users** page is shown as below. The screen shows the values that were configured during compliance testing.

The screenshot displays the Calabrio ONE user configuration interface. On the left is a sidebar with a checklist of configuration steps: 'What Do You Want To Do?', 'User Information', 'Password', 'Activate', 'Display Time Zone', 'Roles', 'Link to an Agent', and 'Views'. The main content area is titled 'Users' and contains several sections:

- User Information:** Includes a 'SELECT USER' dropdown menu set to 'Agent1, Joe'. Below are input fields for 'FIRST NAME' (Joe) and 'LAST NAME' (Agent1). A 'USERNAME' field contains 'agent1'. A note states: 'The user's Calabrio ONE user name. In an Active Directory environment, this is the user's AD username.'
- Password:** A section for creating or resetting a password, with 'PASSWORD' and 'CONFIRM PASSWORD' input fields.
- Activate:** A section with a checked checkbox 'Activate this user' and a 'CREATION DATE' of '2014-08-14'.
- Display Time Zone:** A dropdown menu set to '[-0500/-0500] Calabrio/Server (CST/CDT)'.
- Roles:** A section with two boxes: 'Available' (containing Scheduler and Supervisor) and 'Assigned' (containing Agent). Arrows indicate the ability to move roles between these boxes.

Configure the values to the above screen based on the description shown in the table below.

Avaya Data Source	Avaya Field Name	WFM Field Name
CCMA	First Name	First Name
CCMA	Last Name	Last Name
CCMA	User ID (supervisors only)	Username (supervisors only)
CCMA	User Type	Roles

6.5.5. Skill Mappings

To configure Skill mappings, navigate to **Services** → **Skill Mappings** from the **Application Manager** screen (not shown). The **Skill Mappings** page is shown as below.

Associate agent with the skill mapping the same way that agent is associated with the skillset in Contact Center. Associate the service queue whose name was configured in **Section 6.5.1** as the Skill Mapping Name. The screen shows the values that were configured during compliance testing.

Configure the values to the above screen based on the description shown in the table below.

Avaya Data Source	Avaya Field Name	WFM Field Name
CCMA	Skillset Name	Skill Mapping Name (use the same name as the service queue)

7. Verification Steps

The historical data collected by WFM was verified against the data contained in the CCMS database. The real-time data collected by WFM was verified against the CCMS Real-time displays.

WFM captures two different types of data from Contact Center:

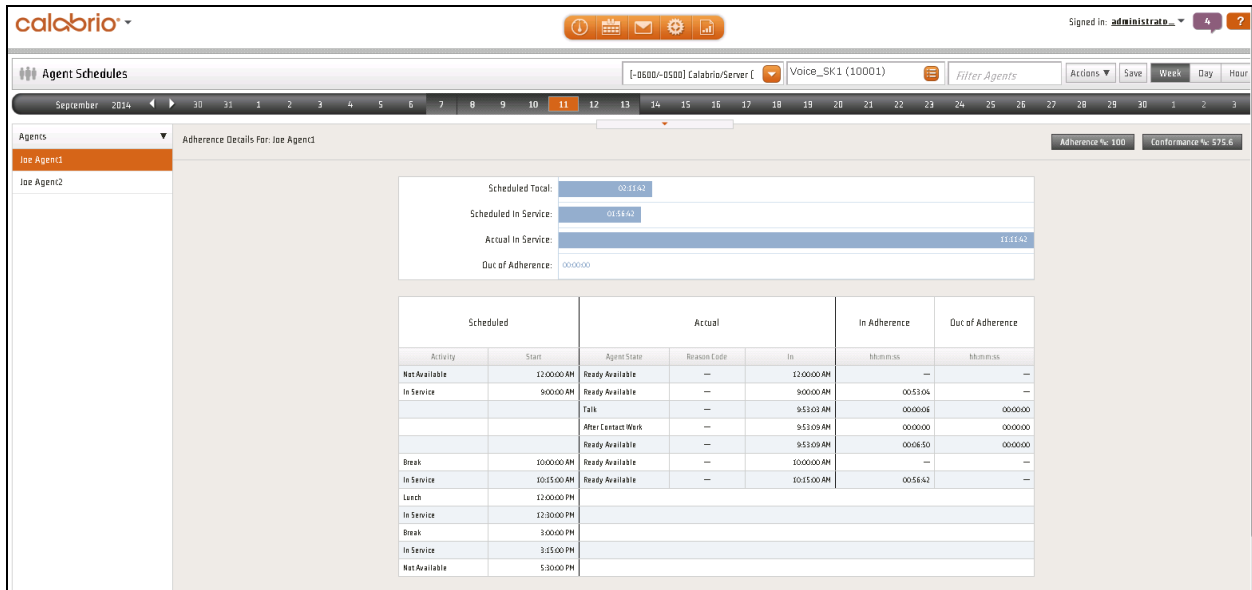
- Real Time (via RTD SDK)
- Historical (via ODBC)

7.1.1. Real Time Data

Schedules must exist for today for each agent that you wish to validate.

To validate real time agent state information:

1. Log in to C1 as a supervisor or higher.
2. Go to the Agent Schedules application.
3. Select today from the calendar bar.
4. Select a service queue that the agent belongs to.
5. Display real-time information by clicking on the agents' name.



7.1.2. Historical Data

WFM captures historical data every 30 minutes, 15 minutes after the interval ends. For example, to see data for the 10:00 – 10:30 interval user must wait until at least 10:45.

To validate historical data:

1. Log into C1 as a scheduler or higher.
2. Go to the Application Management application.
3. Launch the “View and Edit Historical Data” sub-application.
4. Select the service queue to validate.
5. Select the interval (I) zoom level.
6. Select the date to validate.

Time Interval	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00
03:00	0	0	0	0	0	0	0	0	0
03:30	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0
04:30	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0
05:30	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0
10:30	3	0	0	3	37	4	0	0	50
11:00	-	-	-	-	-	-	-	-	-

8. Conclusion

All of the executed test cases have passed and met the objectives outlined in **Section 2**. Calabrio Workforce Management 9.2(1) SR3 is considered compliant with Avaya Aura® Contact Center’s Contact Center Manager Server Release 6.4 for Real Time Display.

9. Additional References

Product documentation for Avaya Communication Server 1000 products may be found at:
<https://support.avaya.com/css/Products/>

[1] Avaya Communication Server 1000 Documents:

Avaya Communication Server 1000E Installation and Commissioning, Release 7.6, NN46041-310

Co-resident Call Server and Signaling Server Fundamentals - Avaya Communication Server 1000, Release 7.6, NN43001-509

Software Input Output Reference —Administration Avaya Communication Server 1000, NN43001-611

Element Manager System Reference – Administration - Avaya Communication Server 1000, Release 7.6, NN43001-632

[2] Avaya Aura® Contact Center R6.4 Documents:

Avaya Aura® Contact Center Planning and Engineering (NN44400-210)

Avaya Aura® Contact Center Installation (NN44400-311)

Avaya Aura® Contact Center Server Administration (NN44400-610)

Avaya Aura® Contact Center Overview (NN44400-111)

Avaya Aura® Contact Center Fundamentals (NN44400-110)

Avaya Aura® Contact Center Manager Administration – Client Administration (NN44400-611)

Product documentation for Calabrio WFM may be found by emailing at:

CIShelpdesk@calabrio.com or

Registering on: <https://portal.calabrio.com>

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