



Avaya Solution & Interoperability Test Lab

Application Notes for Teleopti WFM with Avaya IP Office Contact Center – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Teleopti WFM to interoperate with Avaya IP Office Contact Center. Teleopti WFM is a work force management solution.

In the compliance testing, Teleopti WFM used the Web Service Collection interface from Avaya IP Office Contact Center to monitor real-time agent states, for analysis and display of agent states and adherence against planned schedules.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as any 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 Teleopti WFM to interoperate with Avaya IP Office Contact Center. WFM is a work force management solution.

In the compliance testing, WFM used the Web Service Collection (WSC) interface from IP Office Contact Center to monitor real-time agent states, for analysis and display of agent states and adherence against planned schedules.

The DirectoryWS web service of WSC is used by WFM to obtain basic and detail information on agents, and the MonitoringWS web service is used by WFM to monitor agents' working and logging states.

The IP Office Contact Center configuration included connection to an IP Office Server Edition environment consisted of two IP Office systems, a primary Linux server and an expansion IP500V2 that were connected via Small Community Network (SCN) trunks.

2. General Test Approach and Test Results

The feature test cases were performed both automatically and manually. Upon start of the WFM application, the application established WSC connectivity to IP Office Contact Center for obtaining agent information and for requesting agent monitor.

For the manual part of the testing, each call was handled manually on the agent desktop running the IP Office Contact Center User Interface to alter agent states.

The serviceability test cases were performed manually by disconnecting/reconnecting the Ethernet connection to WFM.

The verification of agent states included viewing of the reported agent states over the WFM web interface. For simplicity, the testing did not include creation of agent schedules.

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.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in these DevConnect Application Notes included the enablement of supported encryption capabilities in the Avaya products. Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these Application Notes, the interface between IP Office Contact Center and WFM utilized the enabled capabilities of TLS.

2.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing focused on verifying the following on WFM:

- Use of WSC DirectoryWS web service to obtain agent basic and detail information.
- Use of WSC MonitoringWS web service to monitor agent working and logging states.
- Proper reporting of agent states for scenarios involving log in, log out, on/off break, after call work, inbound, outbound, internal, external, personal, hold/reconnect, transfer, conference, multiple agents, long duration, and outbound campaign.

The feature testing included agents on both IP Office systems.

The serviceability testing focused on verifying the ability of WFM to recover from adverse conditions, such as disconnecting/reconnecting the Ethernet connection to WFM.

2.2. Test Results

All test cases were executed and verified.

The one observation on WFM is that by design, all agent states were initially reported as **Ungrouped states** by default. WFM required all desired agent states to manually occur and therefore captured by the application, before the administrator can configure the preferred reporting of such states.

2.3. Support

Technical support on WFM can be obtained through the following:

- **Phone:** <https://www.teleopti.com/wfm/about/contact/contact-me.aspx>
- **Email:** servicedesk@teleopti.com

3. Reference Configuration

WFM can be configured on a single server or with components distributed across multiple servers. The compliance testing used a single server configuration, as shown in **Figure 1**.

The detailed administration of basic connectivity between IP Office Contact Center and IP Office, and of contact center devices is not the focus of these Application Notes and will not be described.

The contact center devices used in the compliance testing is shown in the table below. In the testing, WFM monitored all agents shown below.

Contact Center Devices	Values
Supervisor User	37880
Agent Phones	21031, 22031
Agent Users	37881-4
Agent Names	Agent1-4

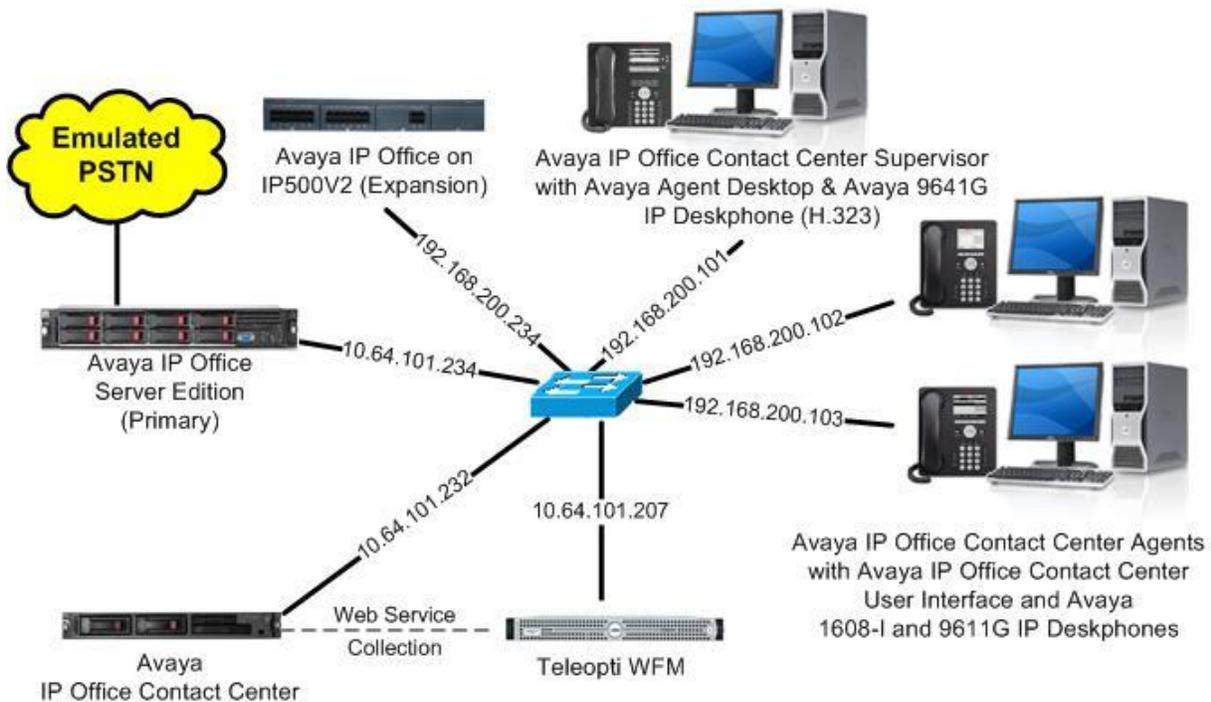


Figure 1: Compliance Testing Configuration

4. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment/Software	Release/Version
Avaya IP Office Contact Center	10.1.0.0
Avaya IP Office Contact Center User Interface on Windows 10	10.1.0.0
Avaya IP Office Server Edition (Primary) in Virtual Environment	10.1.0.0.0
Avaya IP Office on IP500 V2 (Expansion)	10.1.0.0.0
Avaya 1608-I IP Deskphone (H.323)	1.3110
Avaya 9611G & 9641G IP Deskphone (H.323)	6.6506
Teleopti WFM on Windows Server 2012 <ul style="list-style-type: none">• Web• Log Server• Microsoft SQL Server 2017	8.6.504.50953 R2 Standard 8.6.504.50953 7.2.1.74979 RC1

Compliance Testing is applicable when the tested solution is deployed with a standalone IP Office 500 V2 and also when deployed with IP Office Server Edition in all configurations.

5. Configure Avaya IP Office Contact Center

This section provides the procedures for configuring IP Office Contact Center. The procedures include the following areas:

- Launch Administration
- Verify license
- Launch User Interface
- Administer agents
- Administer registry
- Restart services

The Certificate Authority root certificate and the IP Office Contact Center server identity certificate are assumed to be pre-installed on the IP Office Contact Center server.

5.1. Launch Administration

From the IP Office Contact Center server, access the Administration web-based interface by using the URL “https://host-name:28443/Administration” in an Internet browser window, where “host-name” is the host name of the IP Office Contact Center server.

Log in using the administrator credentials.

IP Office Contact Center Administration

User Name

Password

Language ▼

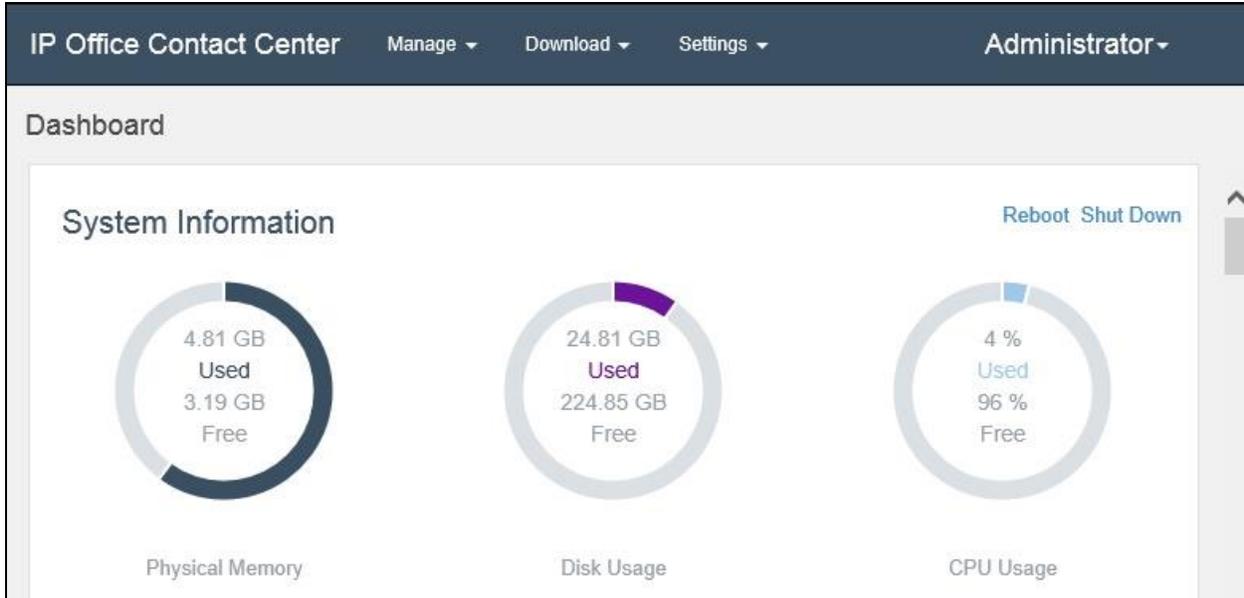
By logging in, you agree to be bound by the terms of the [End User License Agreement](#).

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Best viewed in Internet Explorer 11, Google Chrome 39, or Mozilla Firefox 34 or greater

5.2. Verify License

The **Dashboard** screen is displayed. Select **Settings** → **License** from the top menu.



The **License Manager - Information** screen is displayed next. Scroll the screen as necessary, and verify that there is sufficient license for **Number of concurrent Team Leaders**, as shown below.

The screenshot shows the 'License Manager - Information' screen. The top navigation bar is the same as in the previous screenshot. The main content area contains a form with the following fields:

- WebLM Address *: 10.64.101.235
- Port Number *: 52233
- URN *: /WebLM/LicenseServer
- WebLM Client ID: Client ID

Below the form is a table with the following data:

Feature	Expiration D...	Licensed	Acquired
Number of concurrent User with Extended Voice features	Permanent	10	3
Number of concurrent Team Leaders	Permanent	10	1
Number of concurrent Supervisors	Permanent	10	1
Number of IPOCC Wallboard	Permanent	10	0

5.3. Launch User Interface

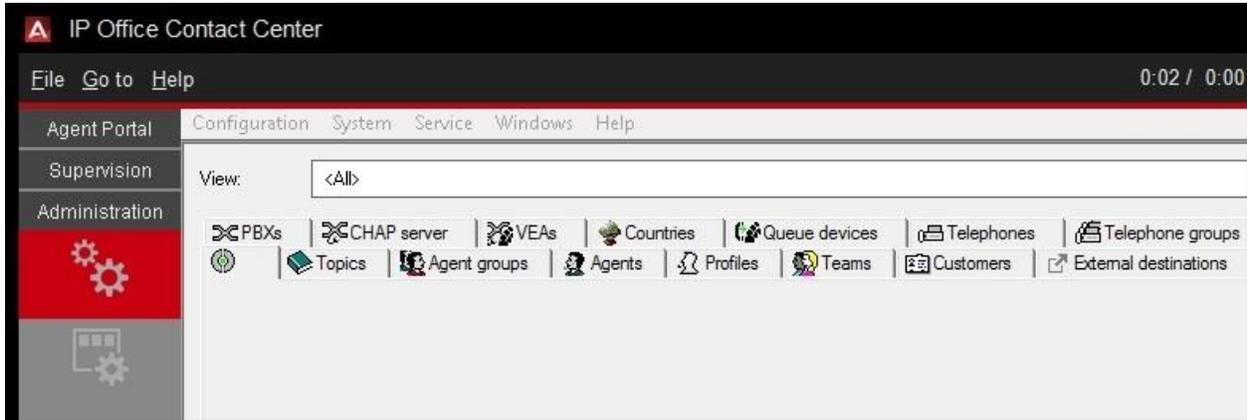
From the IP Office Contact Center server, select **Start** → **Apps**, and click on **User Interface** to display the screen below. Log in using administrative credentials.



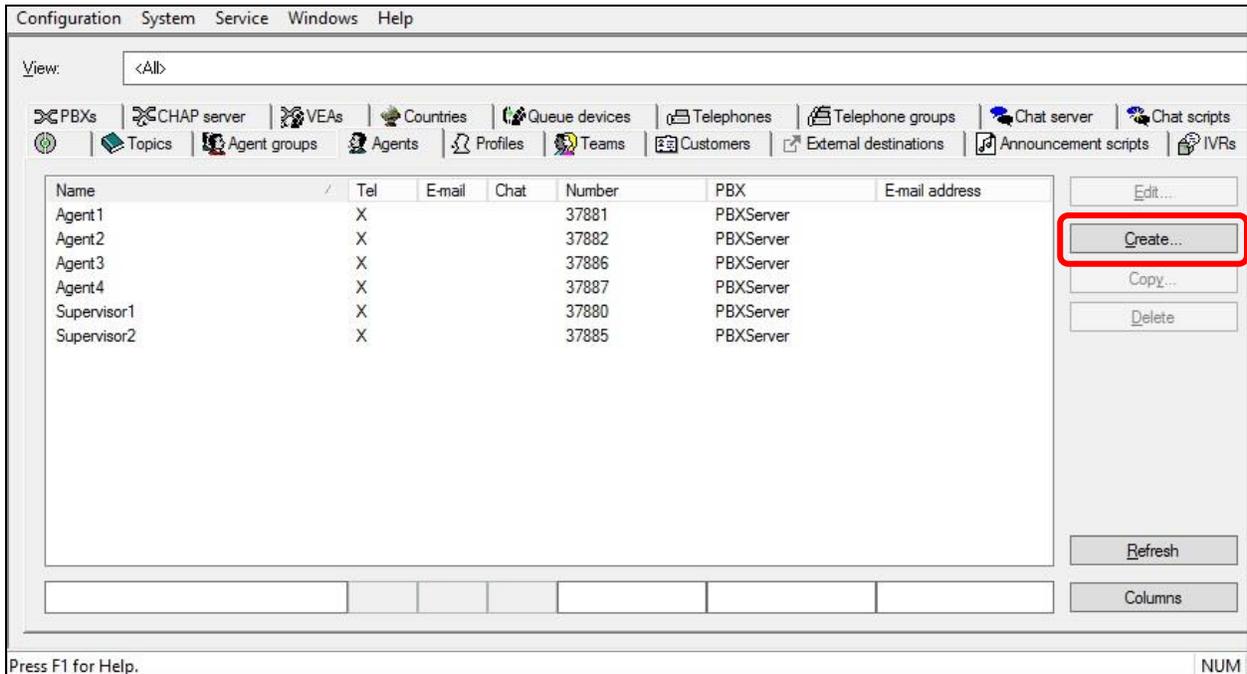
The screenshot shows the Avaya IP Office Contact Center user interface. At the top center is the Avaya logo in red. Below the logo is a horizontal line, followed by the text "IP Office Contact Center" in bold black font. Underneath, there are three input fields: "Username" with a dropdown arrow, "Password" with a text box, and "Telephone Extension" with a dropdown arrow showing "<None>". To the right of these fields are two buttons: "Login" and "Exit". The bottom of the screen has a dark gray footer bar.

5.4. Administer Agents

The **IP Office Contact Center** screen is displayed. Expand **Administration** in the left pane, and click on the **Settings** icon shown below.



Select the **Agents** tab, to display a list of agent users. Select **Create** to create a new agent user for WFM.



The **[Agent] – Create** screen is displayed. Enter desired **System name** and **Login name**, and retain the default values in the remaining fields. Select **Password**.

The screenshot shows the "[Agent] - Create" dialog box with the "General" tab selected. The "System name" and "Login name" fields are both set to "Teleopti". The "Task types" section has "Telephony", "E-mail", and "Chat" checkboxes, all of which are unchecked. The "Alias" field is empty, and the "Language" dropdown is set to "<System language>". Under "Title", the "Ms." radio button is selected. The "Last name", "First name", "Employee ID", and "Cost center" fields are empty. The "Predefined profile" dropdown is set to "<None>". The "Privileges" dropdown is set to "User defined", and its selection button is highlighted with a red box. The "Address book profile" dropdown is set to "Standard". On the right side, the "Password..." button is highlighted with a red box, along with a "2nd password..." button. Other buttons include "Variables...", "Skills...", "Availability...", "Authorization...", and "Image". At the bottom right, there are "OK" and "Cancel" buttons.

In the **Overwrite Login Password** pop-up box, enter desired password, and click **OK**.

The **[Agent] – Create** screen from above is displayed again. Click on the box next to **Privileges**.

The screenshot shows the "Overwrite Login Password" dialog box. It has two text input fields: "New password:" and "Confirm password:". Both fields are filled with black dots, indicating that a password has been entered. To the right of each field is a button: "OK" for the first field and "Cancel" for the second. The dialog box has a blue title bar and a close button (X) in the top right corner.

The **Agent privileges** screen is displayed. Check all parameters under **Team leader**, as shown below.

Agent	UI	E-mail	Configuration	Variables
Reporting	Realtime Information	Task Flow Editor	Others	
— Agent				
<input type="checkbox"/> Callback from call list	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> All agents (Authorization)	<input type="checkbox"/>
<input type="checkbox"/> Delete from call list	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Pick up	<input type="checkbox"/>
			<input type="checkbox"/> Redirect	<input type="checkbox"/>
			<input type="checkbox"/> Redirect from Queue	<input type="checkbox"/>
— Team leader				
<input checked="" type="checkbox"/> Realtime information	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Trunk realtime information	<input type="checkbox"/>
<input checked="" type="checkbox"/> Remote functions	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Agent History	<input type="checkbox"/>
<input checked="" type="checkbox"/> Out of office notice	<input type="checkbox"/>	<input type="checkbox"/>		
— Supervisor				
<input type="checkbox"/> Configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Supervisor Emergency	<input type="checkbox"/>
<input type="checkbox"/> Silent Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Supervisor Assistance	<input type="checkbox"/>

The [Agent] – Create screen is displayed again. Select **Authorization**.

The screenshot shows the 'General' tab of the '[Agent] - Create' dialog. It contains various input fields for system and user information, task type checkboxes, and buttons for password, variables, skills, and availability. The 'Authorization...' button at the bottom right is highlighted with a red rectangular box.

The **Authorizations** screen is displayed. Select the **Topic** tab. Select the desired topics to be monitored by WFM, followed by **Add**. In the compliance testing, the **<All>** entry was selected to enable WFM to monitor all topics.

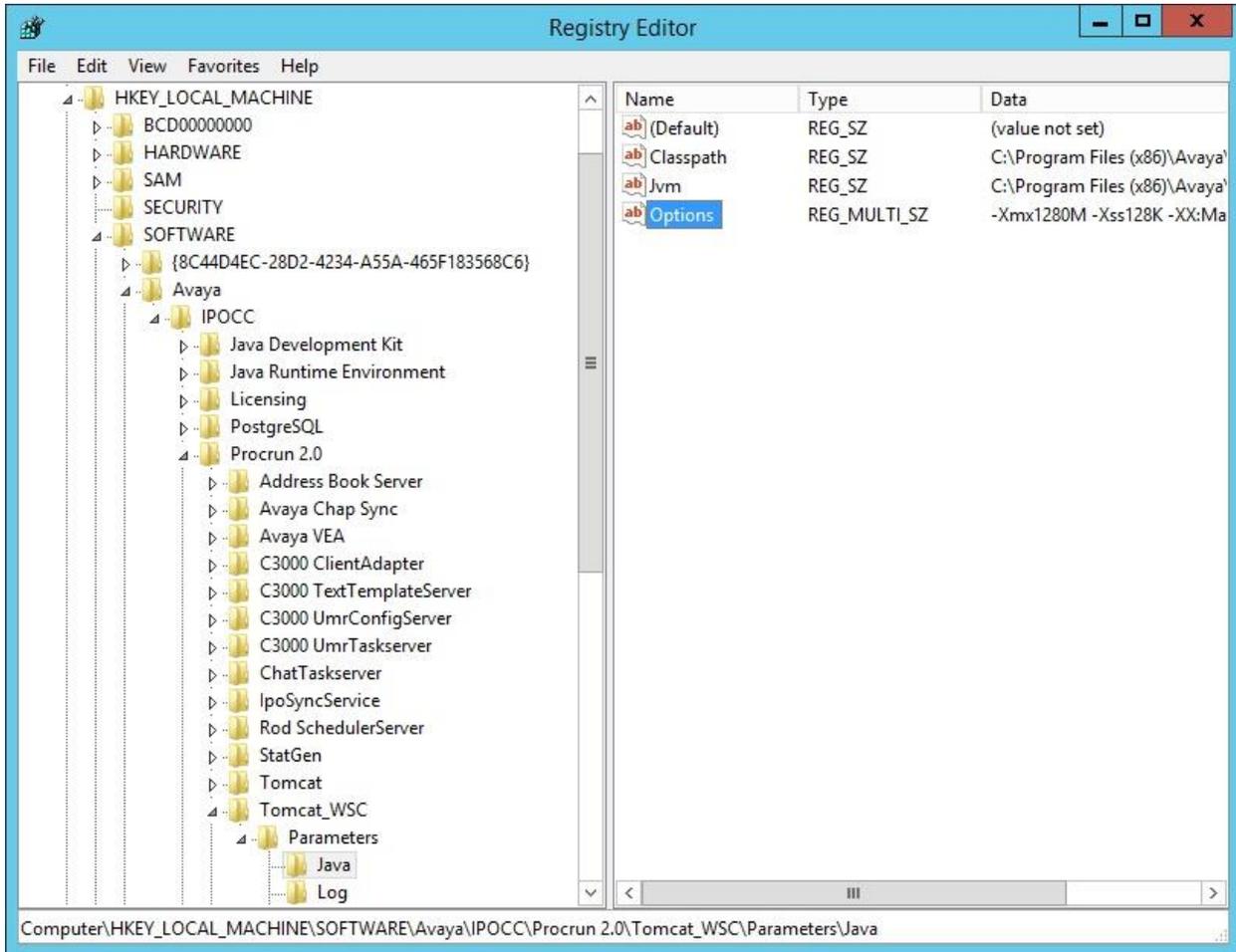
Repeat this procedure to set the desired resources to be monitored by WFM in all remaining tabs. In the compliance testing, the **<All>** entry was selected in all tabs.

The screenshot shows the 'Authorizations' dialog box with the 'Topic' tab selected. A list of topics is displayed, with '<All>' selected. Below the list is an 'Add' button. On the right, there are radio buttons for 'Assigned', 'Free', and 'All', with 'All' selected. The 'View' dropdown is set to '<All>'.

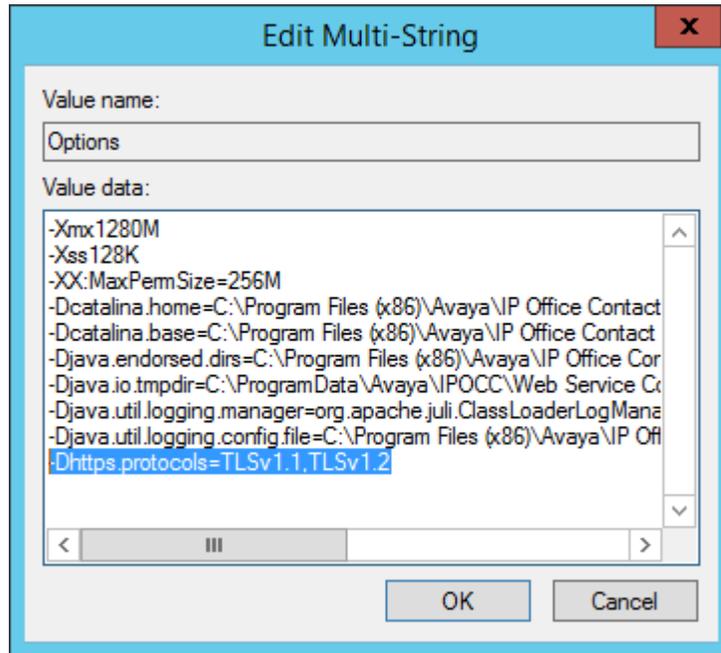
5.5. Administer Registry

For IP Office Contact Center servers that are upgraded from release 9.x, the registry setting needs to be updated to enable support for TLS 1.1 and 1.2.

Select **Start** → **Run**, and enter “regedit” to display the **Registry Editor** screen. Navigate to **Computer** → **HKEY_LOCAL_MACHINE** → **SOFTWARE** → **Avaya** → **IPOCC** → **Procrun 2.0** → **Tomcat_WSC** → **Parameters** → **Java**, and double click on the **Options** parameter shown below.

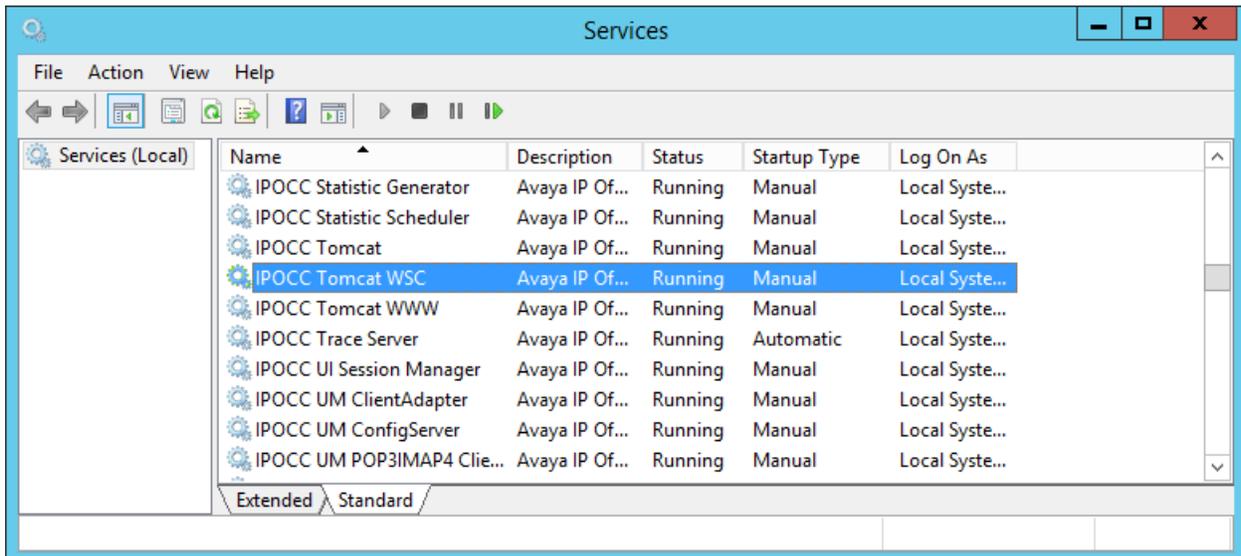


The **Edit Multi-String** dialog box is displayed. Add the “-Dhttps.protocols=TLSv1.1, TLSv1.2” line as shown below.



5.6. Start Services

Select **Start** → **Administrative Tools** → **Services** to display the **Services** screen. Restart the **IPOCC Tomcat WSC** service.



6. Configure Teleopti WFM

This section provides the procedures for configuring WFM. The procedures include the following areas:

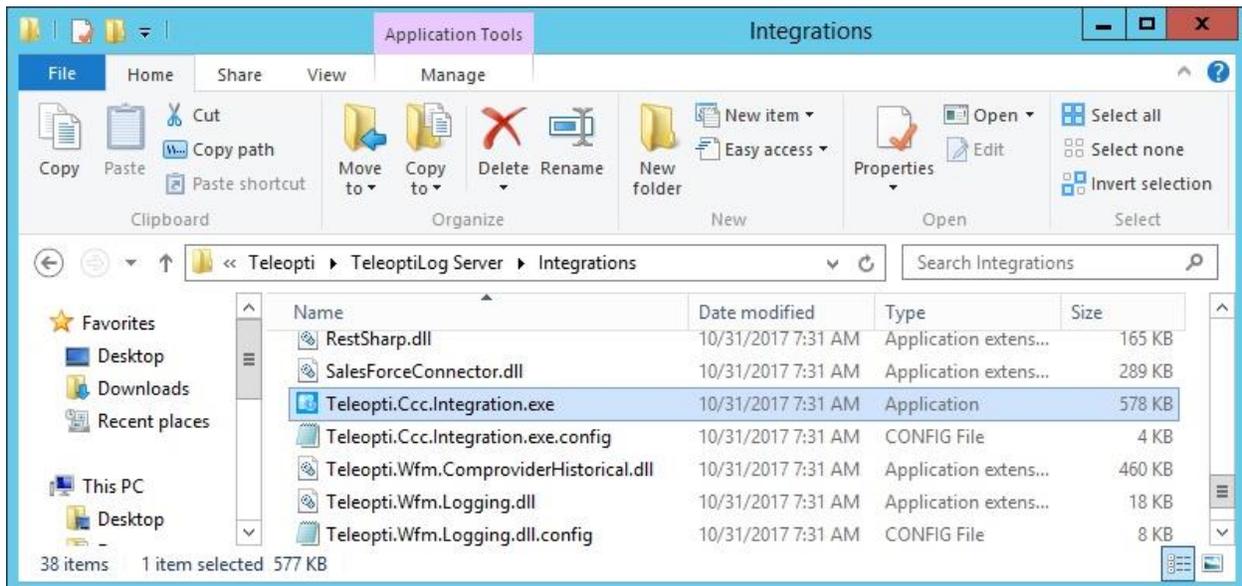
- Administer Teleopti WFM Integrations
- Administer agents
- Administer state groups and states
- Administer people

The configuration of WFM is typically performed by Teleopti Professional Services. The procedural steps are presented in these Application Notes for informational purposes.

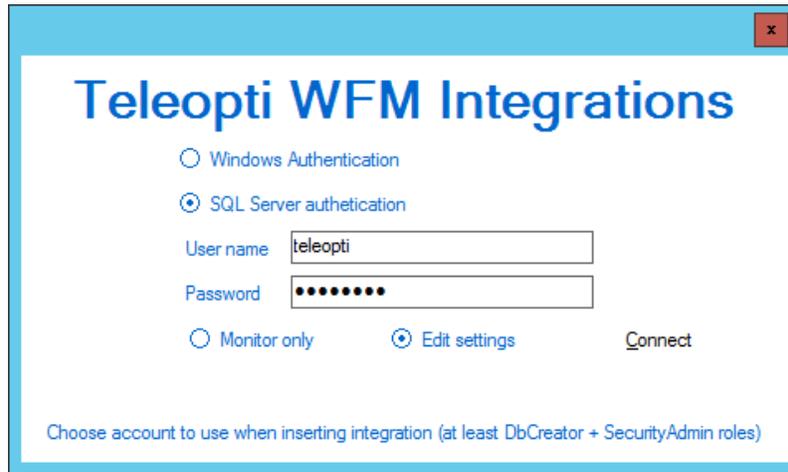
The Certificate Authority root certificate and the WFM server identity certificate are assumed to be pre-installed on the WFM server.

6.1. Administer Teleopti WFM Integrations

From the WFM server running the Log Server component, navigate to the **C:\Program Files (x86)\Teleopti\TeleoptiLog Server\ Integrations** directory, and double click on **Teleopti.Ccc.Integration.exe**.



The **Teleopti WFM Integrations** screen is displayed. Retain the default values and click **Connect**.



The screen below is displayed next. Select and expand the pertinent and pre-configured aggregation database in the left pane, followed by **RTA** under the relevant logging object, in this case **TeleoptiAgg_IPOCC → IPOCC → RTA**. This **Source** screen is displayed. Enter the following values for the specified fields.

- **AccessLoginName:** The agent user credentials from **Section 5.4**.
- **AccessPassword:** The agent user credentials from **Section 5.4**.
- **DirectoryWsHost:** The IP address of the IP Office Contact Center server.
- **DirectoryWsPort:** “18443”
- **MonitoringWsEndpointObser:** “5443”
- **MonitoringWsHost:** The IP address of the IP Office Contact Center server.
- **MonitoringWsPort:** “18443”
- **UseIpAddressForMonitorObs:** “YES”
- **UseSSL:** “True”



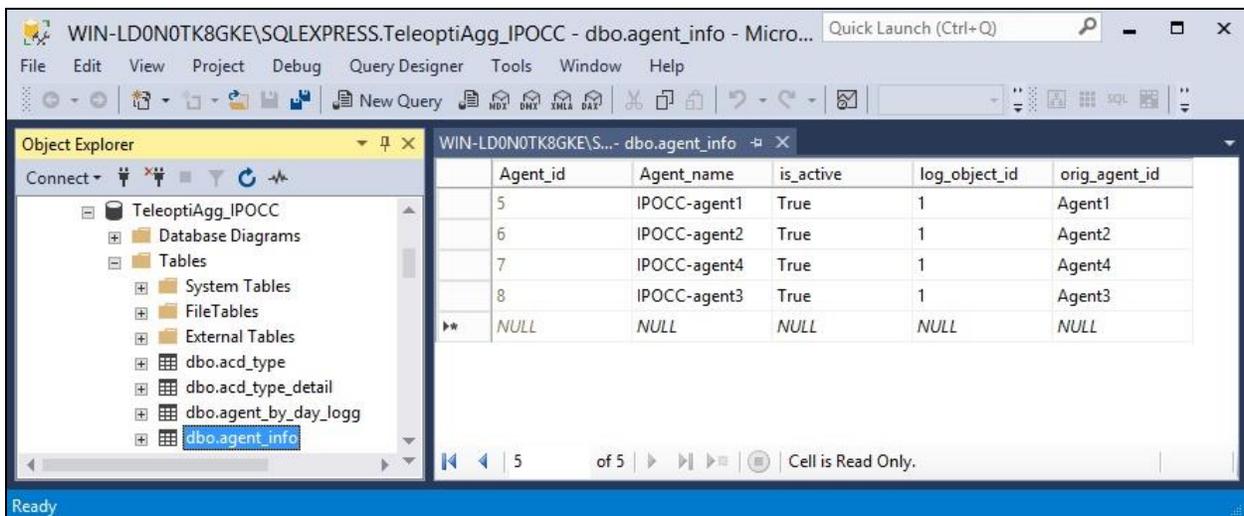
6.2. Administer Agents

From the WFM server running the SQL Server component, navigate to **Start → Apps → Microsoft SQL Server Management Studio 17** to launch and connect to the SQL Server.



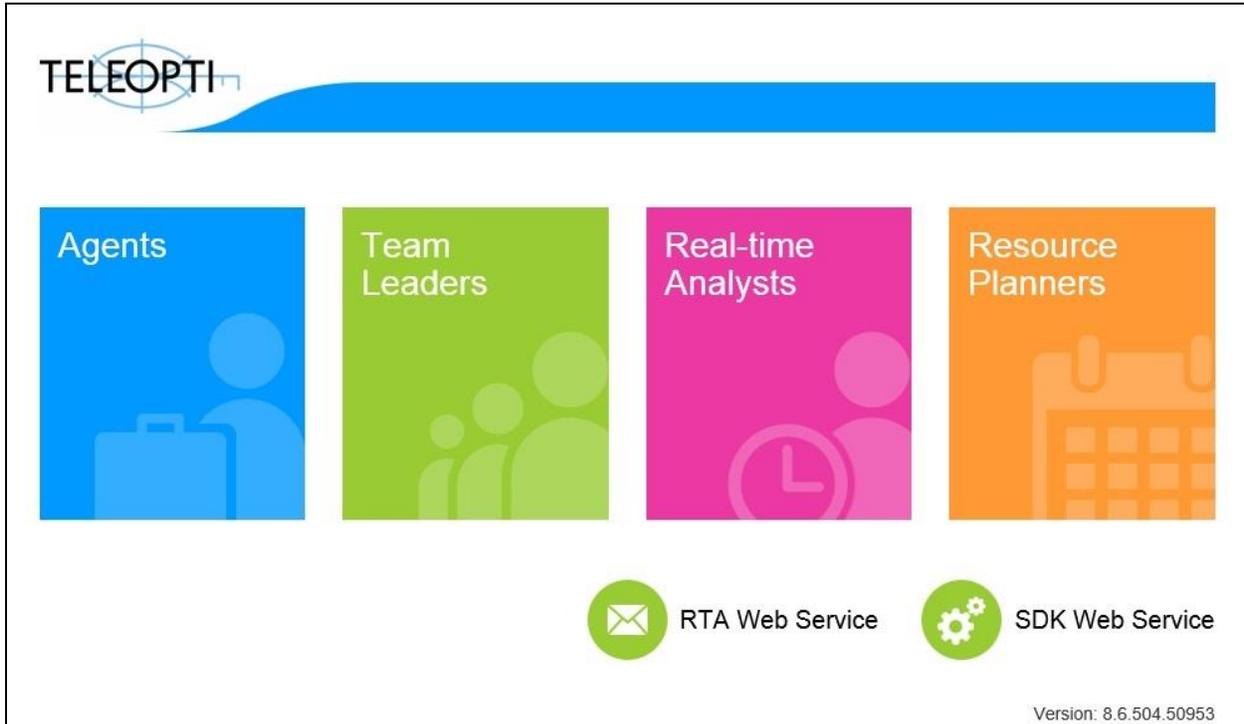
Expand the relevant database tables, in this case **TeleoptiAgg_IPOCC → Tables**. Right click on the **dbo.agent_info** entry and select **Edit Top 200 Rows**. In the right pane, add an entry for each agent to monitor from **Section 5.4**.

- **Agent_name:** A desired and unique name.
- **is_active:** “True”
- **log_object_id:** The relevant object ID, in this case “1”.
- **orig_agent_id:** The corresponding agent name from **Section 5.4**.

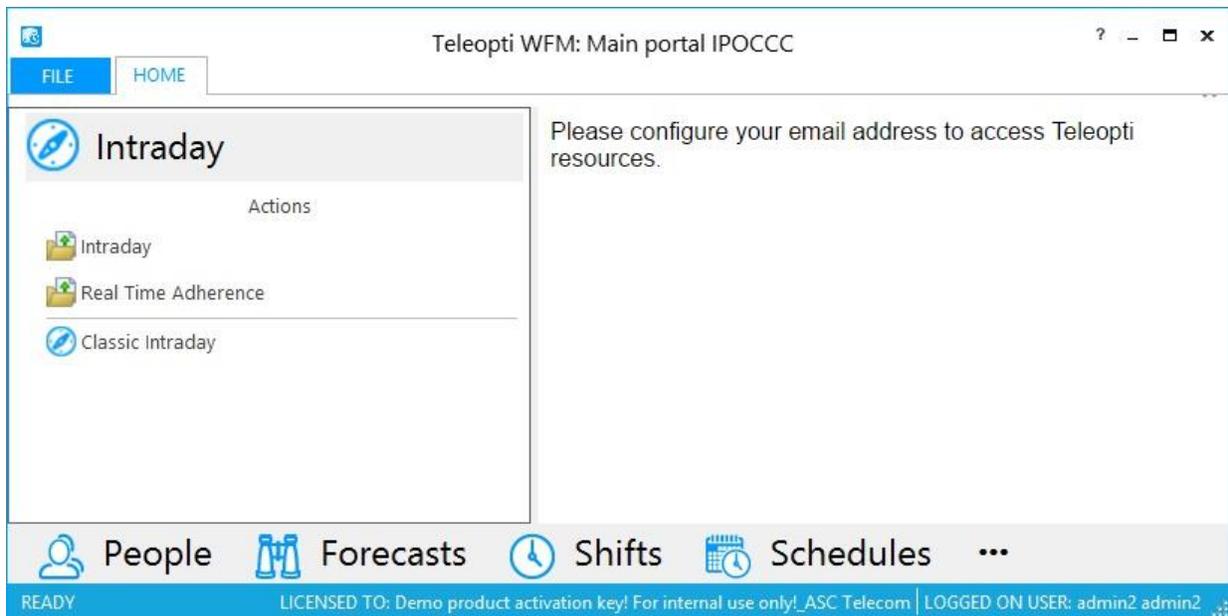


6.3. Administer State Groups and States

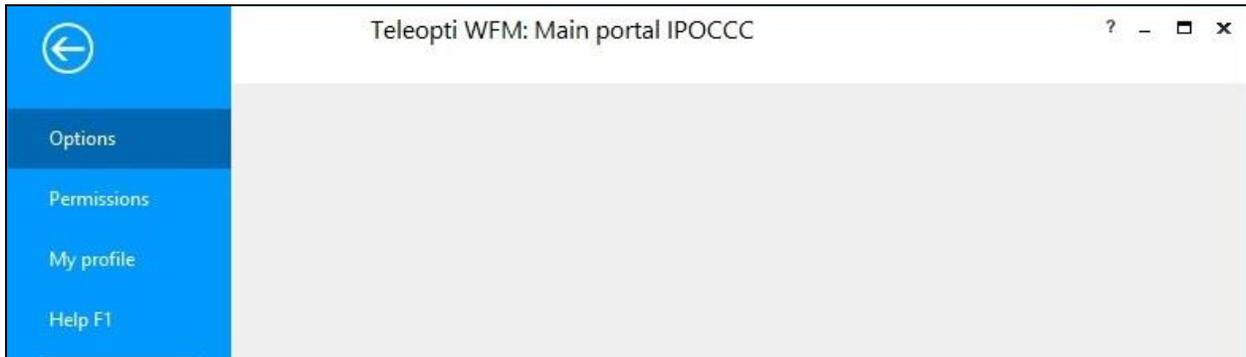
From the WFM server, access the web interface by using the URL “http://host-name/TeleoptiWFM” in an Internet browser window, where “host-name” is the host name of the WFM server running the Web component. Log in using the administrative credentials (not shown). The **TELEOPTI** screen below is displayed. Select **Resource Planners**.



The **Teleopti WFM: Main portal IPOCCC** screen is displayed next. Select the **FILE** tab.

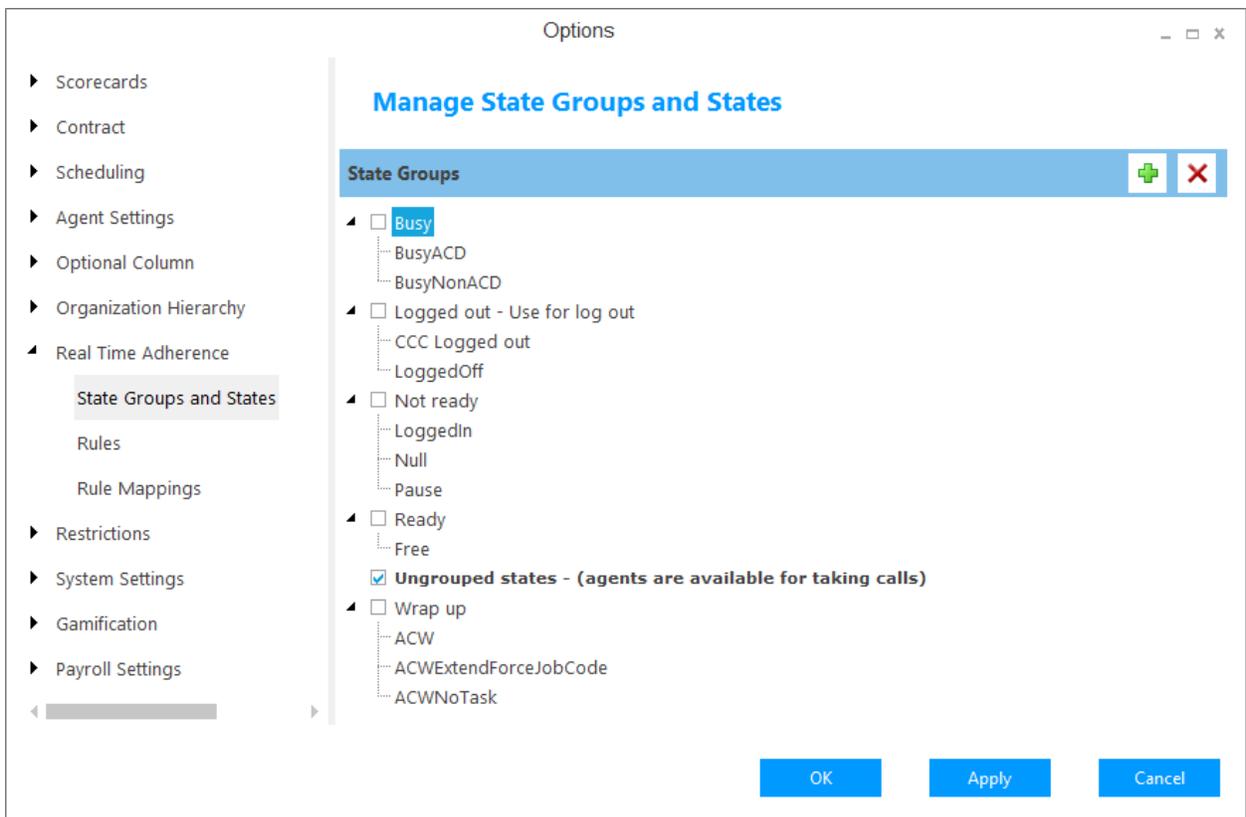


The screen is updated as shown below. Select **Options** in the left pane.



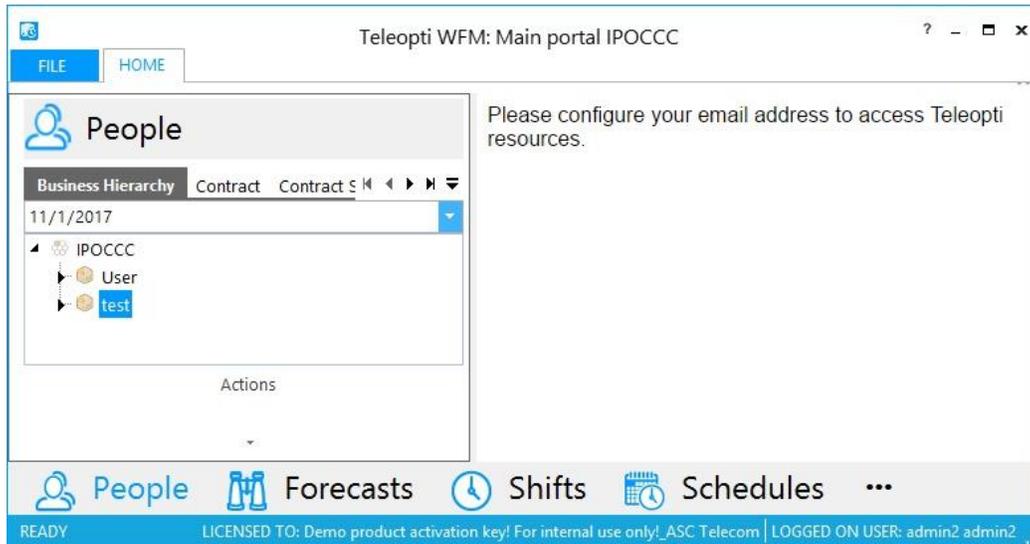
In the updated screen, select **Real Time Adherence → State Groups and States** in the left pane, to display the **Manage State Groups and States** screen.

The **Manage State Groups and States** screen will be initially empty, with only the **Ungrouped states** category. As new agent states are received from IP Office Contact Center, the states will begin to appear in this screen and shown under the **Ungrouped states** category. Follow reference [4] to create desired groups and drag the ungrouped states into the created groups. The screen below shows the states groups and states generated and configured in the compliance testing.



6.4. Administer People

Follow the procedures in **Section 6.3** to display the **Teleopti WFM: Main portal IPOCCC** screen. Select **People** from the bottom of the screen, followed by the **Business Hierarchy** tab in the left pane. Double click on the pre-configured site entry, in this case “test”.



The **People – Teleopti WFM** screen is displayed next. Follow reference [4] to create an entry for each agent from **Section 6.2**. Note that the available external logons shown in the right pane were automatically picked up from IP Office Contact Center via the WSC interface.

- **Full name:** A desired and unique name.
- **Site/Team:** Select the pertinent pre-configured site and team, in this case “test/test”.
- **External logon:** Select the pertinent logon name from the right pane, as shown below.

	Full name	Date	Site/Team	Skills	External logon
1	Agent1 Primary	10/16/2017	test/test		IPOCC-agent1 (IPOCC) default
2	Agent2 Primary	10/16/2017	test/test		IPOCC-agent2 (IPOCC) default
3	Agent3 Expansion	10/16/2017	test/test		IPOCC-agent3 (IPOCC) default
4	Agent4 Expansion	10/16/2017	test/test		IPOCC-agent4 (IPOCC) default

Has	External logon	Log object
<input checked="" type="checkbox"/>	IPOCC-agent1	IPOCC
<input type="checkbox"/>	IPOCC-agent2	IPOCC
<input type="checkbox"/>	IPOCC-agent3	IPOCC
<input type="checkbox"/>	IPOCC-agent4	IPOCC

7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of IP Office Contact Center and WFM.

Access the WFM web interface by using the URL “http://ip-address/TeleoptiWFM” in an Internet browser window, where “ip-address” is the IP address of the WFM server hosting the Web component. Log in using the appropriate credentials (not shown).

The **Teleopti WFM IPOCCC** screen is displayed. Select **Real Time Adherence** from the left pane, to display a list of monitored agents and their states. Verify that all agent states are reflected properly.

Name ↑	Site/Team	18:00	19:00	20:00	21:00	State
Agent1 Primary	test/test					Not ready
Agent2 Primary	test/test					Logged out
Agent3 Expansion	test/test					Logged out
Agent4 Expansion	test/test					Ready

Establish an ACD call from the PSTN with an IP Office Contact Center agent. Verify that the answering agent's state is updated properly, in this case "Agent4 Expansion" state updated to "Busy", as shown below.

The screenshot shows the 'Agents' dashboard in the Teleopti WFM IPOCCC application. The interface includes a sidebar with navigation options like 'Permissions', 'Requests', 'Real Time Adherence', 'Intraday', 'Teams', 'Reports', and 'MyTime'. The main area displays a list of agents with columns for Name, Site/Team, and State. A vertical timeline shows time slots from 18:00 to 21:00. Agent4 Expansion is currently in a 'Busy' state.

Name ↑	Site/Team	18:00	19:00	20:00	21:00	State
Agent1 Primary	test/test					Not ready
Agent2 Primary	test/test					Logged out
Agent3 Expansion	test/test					Logged out
Agent4 Expansion	test/test					Busy

8. Conclusion

These Application Notes describe the configuration steps required for Teleopti WFM to successfully interoperate with Avaya IP Office Contact Center. All feature and serviceability test cases were completed with observations noted in **Section 2.2**.

9. Additional References

This section references the product documentation relevant to these Application Notes.

1. *Using Avaya IP Office Contact Center Web Administration Portal*, Release 10.1, Issue 1, May 2017, available at <http://support.avaya.com>.
2. *Using the Avaya IP Office Contact Center Configuration and User Interface Configuration Modules*, Release 10.1, Issue 1, May 2017, available at <http://support.avaya.com>.
3. *Administering Avaya IP Office™ Platform with Manager*, Release 10.1, June 2017, available at <http://support.avaya.com>.
4. *Teleopti WFM Installation Guide*, 2017-06-02, available at <http://www.teleopti.com>.

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