Avaya Solution & Interoperability Test Lab

Application Notes for CCT Solutions Workflow Scheduler with Avaya Interaction Center – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for CCT Solutions Workflow Scheduler to interoperate with Avaya Interaction Center (IC). CCT Solutions Workflow Scheduler is a pluggable solution that enables Avaya Interaction Center to schedule workflows at a specific point in time or at a specific interval repetitively. The details of the Avaya Interaction Center 7.1 software environment set up are outside the scope of this document.

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

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1 Introduction

These Application Notes describe the configuration steps required for CCT Solutions Workflow Scheduler to interoperate with Avaya Interaction Center (IC). CCT Solutions Workflow Scheduler is a workflow scheduling solution that allows Avaya Interaction Center to schedule workflows at a specific point in time or at a specific interval repetitively. The addition of the Workflow Scheduler now enables Avaya Interaction Center to execute workflows at a desired interval or time of day without the need to monitor for events.

1.1 Interoperability Compliance Testing

The interoperability compliance testing focused on verifying CCT Solutions Workflow Scheduler for the following:

- Verifying the result (database updates, flat file report generation, etc.) after successful execution of the workflow.
- Viewing of alarms on the Avaya Interaction Center Alarm Monitor to verify the workflow gets triggered by the workflow scheduler.
- Receiving alarms at the designated period of time according to the workflow scheduler parameter settings.
- Receiving alarms concurrently at designated time intervals for multiple workflows scheduled for multiple server domains.

CCT Solutions Workflow Scheduler functionality was compliance tested with respect to the following configurable parameters:

- Repeat Interval in Weeks
- Day of week
- Start Hour and Start Minute
- Repeat Interval in Seconds
- Show next execution time in Alarm Monitor?

1.2 Support

Technical support on CCT Solutions Workflow Scheduler can be obtained by contacting CCT Solutions directly.

Address: CCT Solutions GmbH,
Sigma Technopark,Geb. 10b,
Werner von Siemens Strasse 6,
86159 Augsburg, Germany
www.cct-solutions.com
Phone: +49-821-455152455
Email: helpdesk@cct-solutions.com

2 Reference Configuration

The compliance test configuration utilized two servers to host Avaya Interaction Center (IC) components, as shown in **Figure 1** below. The CCT Solutions Workflow Scheduler (WFScheduler) application is installed on a Windows 2003 Server which is the primary Avaya IC Server, and networked to the secondary Avaya IC Servers via TCP/IP.

WFScheduler, a built-in service using the Avaya Interaction Center ORB Toolkit, is installed on the primary Interaction Center Server. The administration of Avaya IC is assumed to be in place and will not be described. In addition, the network infrastructure includes a Microsoft SQL 2000 Server on the primary IC Server in the test configuration for database support.

These Application Notes assume all network infrastructures are in place and configured, and the focus will be on the configuration of the Avaya Interaction Center Servers and CCT Solutions WFScheduler.
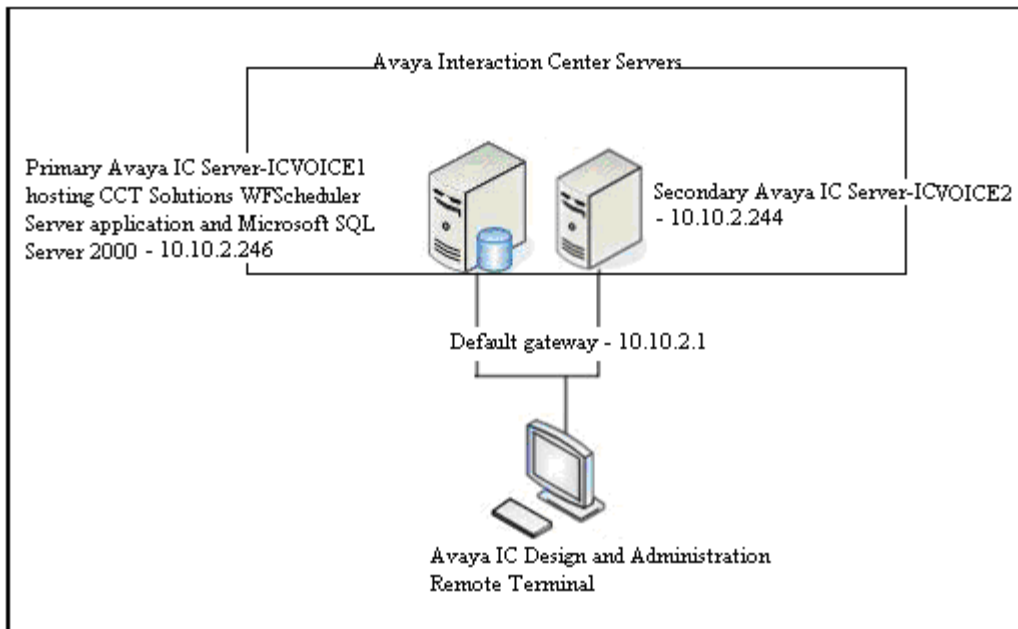
Figure 1: Test Configuration for CCT Solutions Workflow Scheduler

2.1 Functional Overview

The CCT Solutions Workflow Scheduler (WFScheduler) is an Avaya Interaction Center service developed by CCT Solutions adhering to the CORBA specifications of Avaya Interaction Center 7.x. It is a service that can be created and used through Avaya Interaction Center Manager like any other built-in Avaya Interaction Center service such as Agent Data Unit (ADU), Electronic Data Unit (EDU) and Telephony Server (TS), etc., as in **Figure 2** below**.**

Avaya Interaction Center 7.1

CORBA Servers

Builtin Servers

ADU
Alarm
EDU
…
WorkFlow

Custom Server
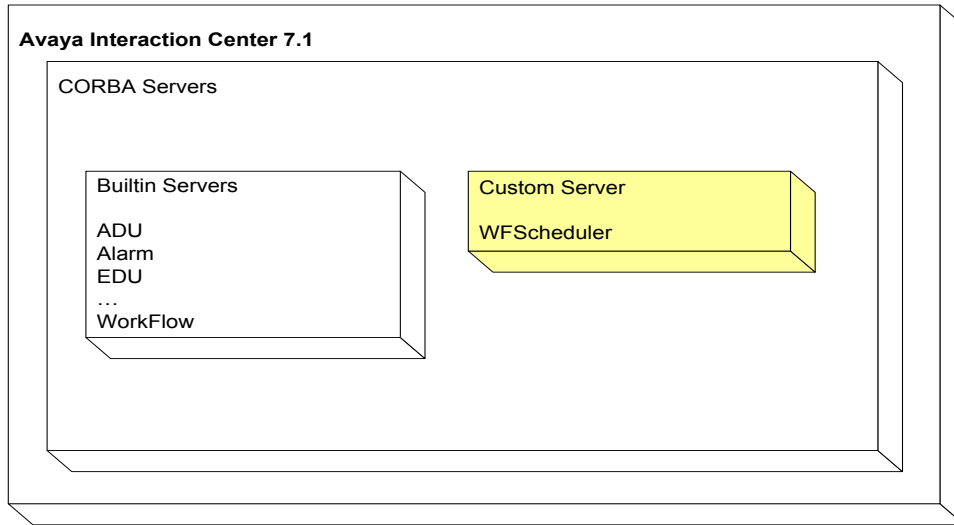
WFScheduler

Figure 2: High level component diagram for CCT Solutions Workflow Scheduler

Avaya Interaction Center workflows are designed to get executed through triggers which are events of interest from other servers. However, if it is required to execute a workflow at a specific point in time or at a specific interval repetitively, Avaya Interaction Center does not support such a feature out of the box. CCT Solutions WFScheduler allows scheduling workflows at the required time and/or repeatedly through a flexible user interface integrated into IC Manager as in **Figure 3** below.
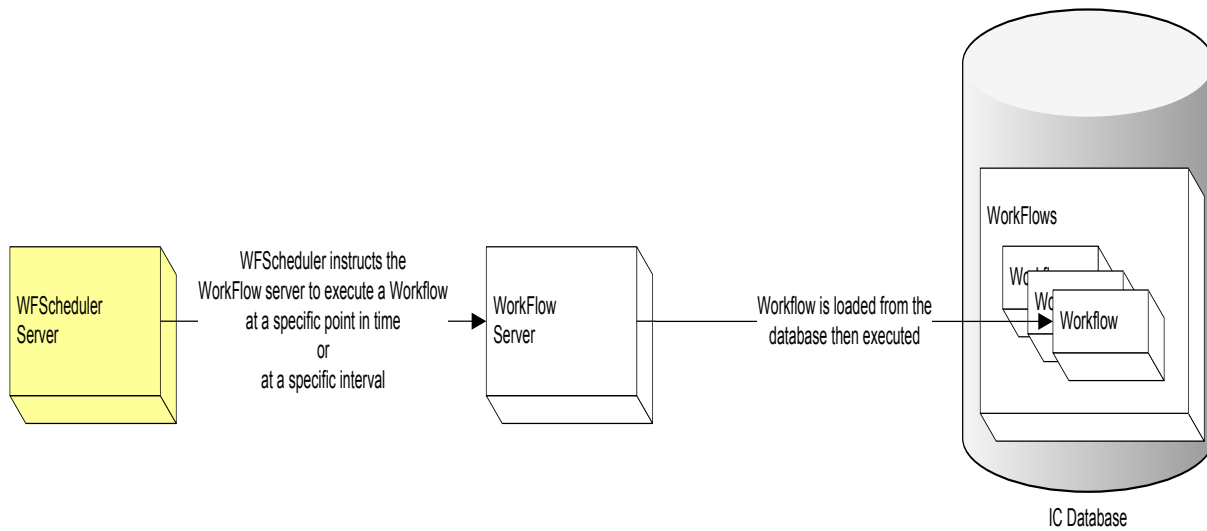
Figure 3: Functional Flow of WFScheduler

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3 Equipment and Software Validated

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

Equipment	Software
Avaya Interaction Center Server on Avaya 8500c (Installed on Primary IC server)	Avaya Interaction Center 7.1 Microsoft Windows Server 2003 (SP2)
Avaya Interaction Center Server on Avaya 8500c (Installed on Secondary IC server)	Avaya Interaction Center 7.1, Microsoft Windows Server 2003 (SP2)
Microsoft SQL Server on Avaya 8500c (Installed on Primary IC server)	Microsoft SQL Server 2000 (SP4) Microsoft Windows Server 2003 (SP2)
CCT Solutions Workflow Scheduler (Wfscheduler.exe) on Avaya 8500c (Installed on Primary IC server)	CCT Solutions Workflow Scheduler 1.0 Microsoft Windows Server 2003 (SP2)
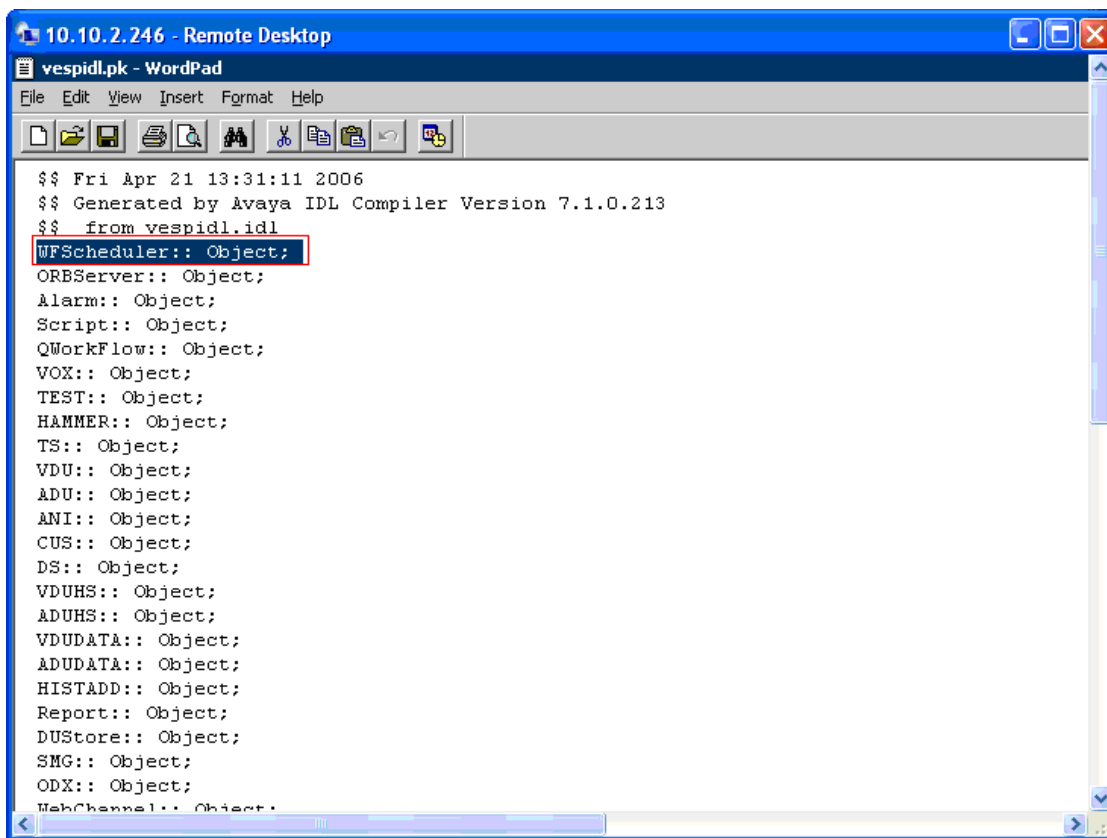
Links to further details on recommended hardware specifications and requirements for Avaya Interaction Center are provided in Section 9 of this document.

4 Configure Avaya IC 7.1 with CCT Solutions WFScheduler

4.1 Adapt the vespidl.pk system file

The "vespidl.pk" file of the core-ORB Server must be adapted. This file can be found in the "IC71\etc\" folder on the core server. The file "Install_WorkflowScheduler_Vesp.txt" in the CCT Solutions Workflow Scheduler Installation directory contains two text blocks which needs to be inserted in the "vespidl.pk" file. The two text blocks are "Header" and "Body". Both blocks have to be copied in the appropriate header and body positions of the "vespidl.pk" file.

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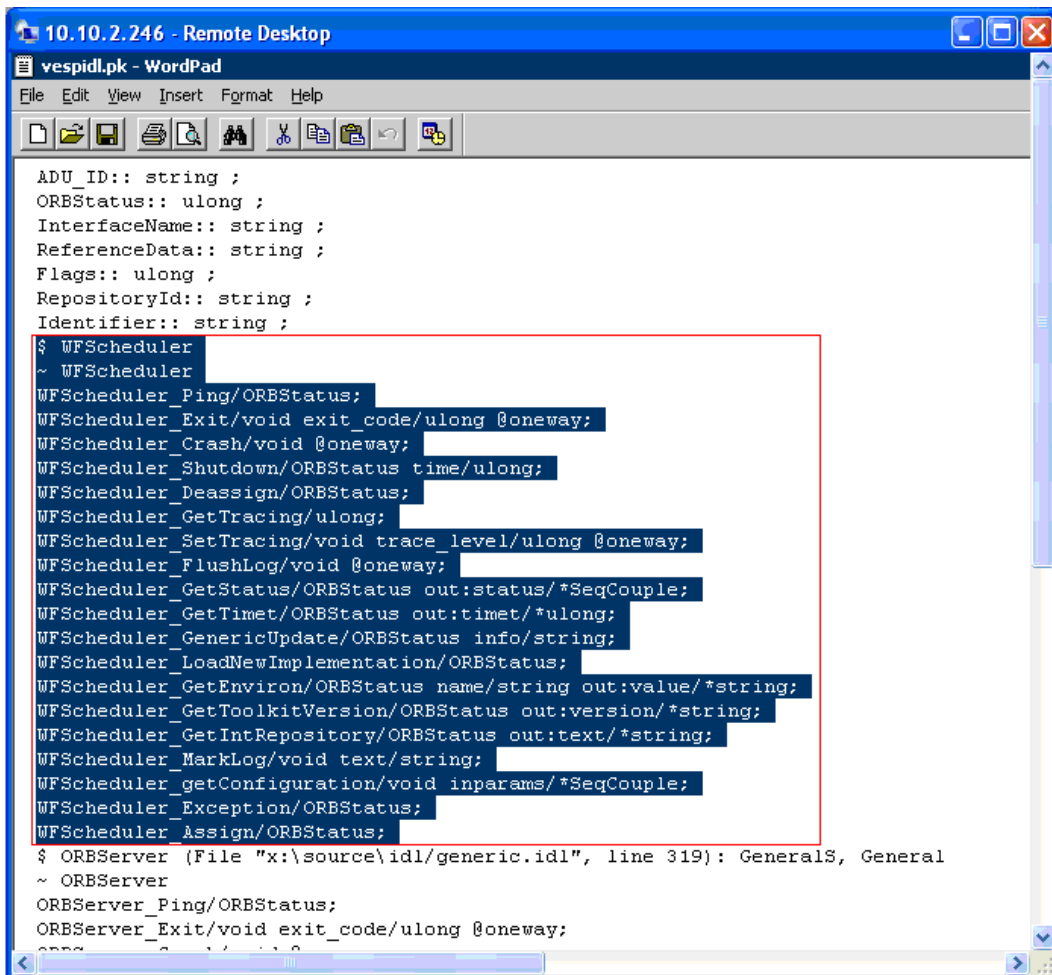
Include an entry of the **WFScheduler** object in the header information part (the contents are provided in the file "Install_WorkflowScheduler_Vesp.txt" with the packaged scheduler deliverable).

Figure 4: vespidl.pk file showing WFScheduler header configuration

Include entries of the **WFScheduler** object body in the body information part (the contents are provided in the file "Install_WorkflowScheduler_Vesp.txt" with the packaged scheduler deliverable).

Figure 5: vespidl.pk file showing WFScheduler body configuration

4.2 Adapt the sc.xml file

The file "sc.xml" defines the User-Interface of the Workflow Scheduler in Avaya Interaction Center Manager and must also be adapted. Please make a backup of the current file by using the menu function **Manager→Options→Environment→Export Configuration**.
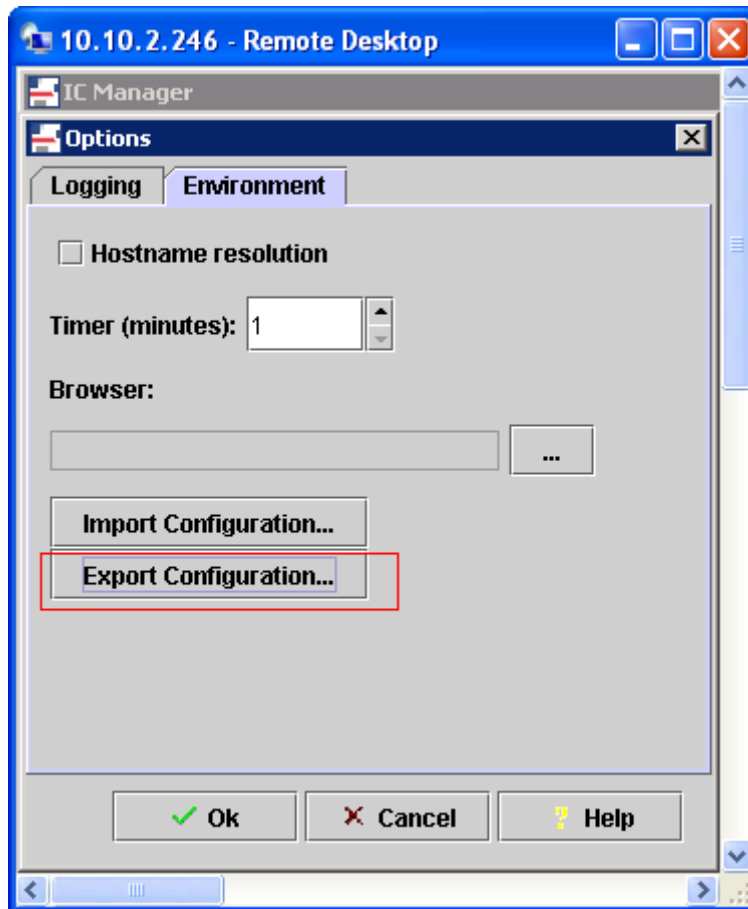
Figure 6: IC Manager→Options→Environment→Export Configuration

Take a backup of the current "sc.xml" file locally and open an XML Editor. The text blocks of the file "WorkflowSheduler_SC_XML_EN.txt" from the CCT Solutions Workflow Scheduler Installation directory have to be inserted. There are two blocks which have to be inserted in the header and the body of the XML file.

Search for the appropriate DTD (Data Type Definition) tag names like **server interface** and **serverConfig** in the "sc.xml" file and then insert each of the below parameter tags in the appropriate DTD group name as in **Figure 7** and **Figure 8**.

1. **Server interface** tag
   <server interface="WFScheduler" name="WFScheduler" class="GenericServer">
   </server>
2. **Server Config** tag
   <serverConfig name="WFScheduler">
   </server>

Add the **server interface** DTD tag block within a well formed "<servers**>**" tag (the contents are provided in the file "WorkflowSheduler_SC_XML_EN.txt" with the packaged scheduler deliverable).

Figure 7: Content of server interface tag for WFScheduler in sc.xml file

Then add the **serverConfig** DTD tag block (the contents are provided in the file "WorkflowSheduler_SC_XML_EN.txt" with the packaged scheduler deliverable).

Figure 8: Content of serverConfig tag for WFScheduler in sc.xml file

Save the changes and then open Avaya IC Manager menu tab, **Manager→Options →Environment→Import Configuration,** to import the changed file.
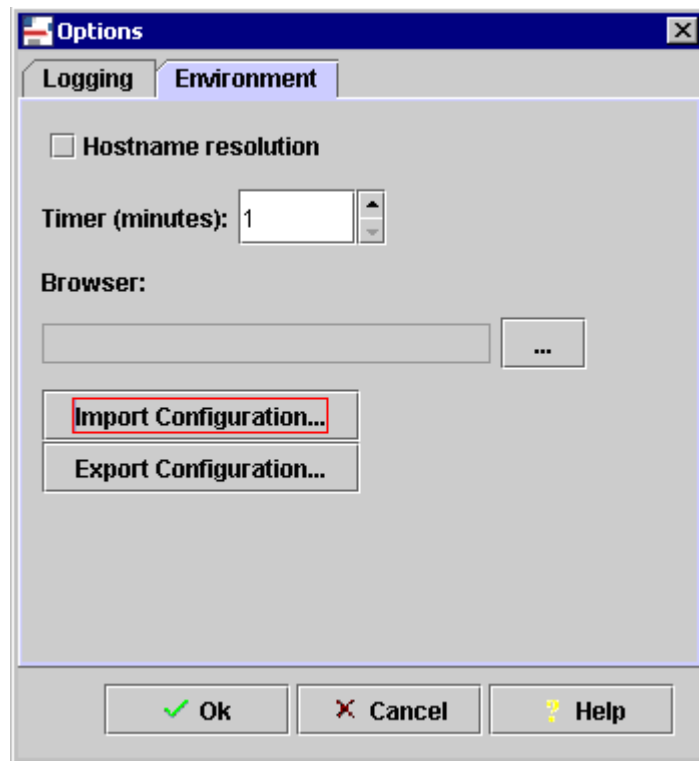

Figure 9: IC Manager→Options→Import Configuration

Note:
If there is error in the XML file, view the error message and correct it. The file must be a valid XML file. Avaya Interaction Center Manager must be restarted to view the changes.

4.3 Install the Workflow Scheduler Executable

Copy the "wfscheduler.exe" into the Avaya IC Installation bin directory i.e.,"/Avaya/IC 71/bin/".
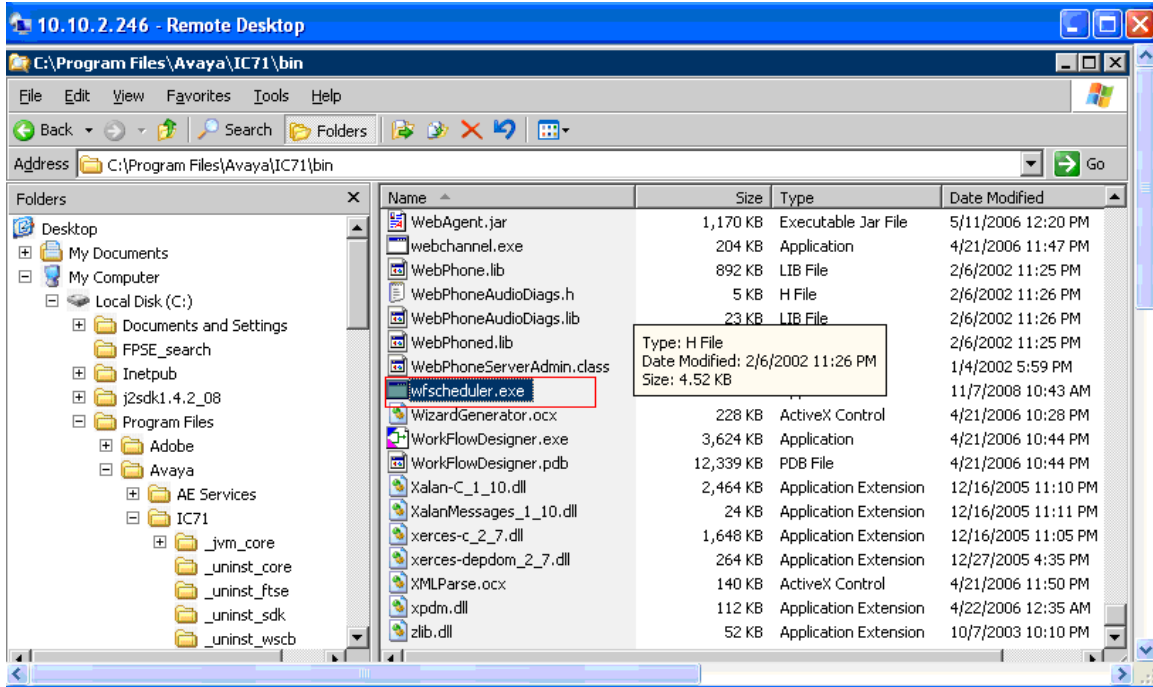
Figure 10: WFScheduler executable file location in Avaya IC71 bin directory

Note: The executable can be installed on a Windows Server only.

4.4 Update the Workflow Scheduler Executable

In case of updating the Workflow Scheduler executable, make sure that no existing workflow scheduler is running on the Avaya Interaction Center Server. Stop and remove any workflow scheduler running on the system before installing the new executable over the old one.

5 Integrate CCT Solutions Workflow Scheduler with Avaya IC

A new Corba Server can be added to the system from the Avaya IC Manager menu **Server→New**. Select the Workflow Scheduler from the list of available Servers.
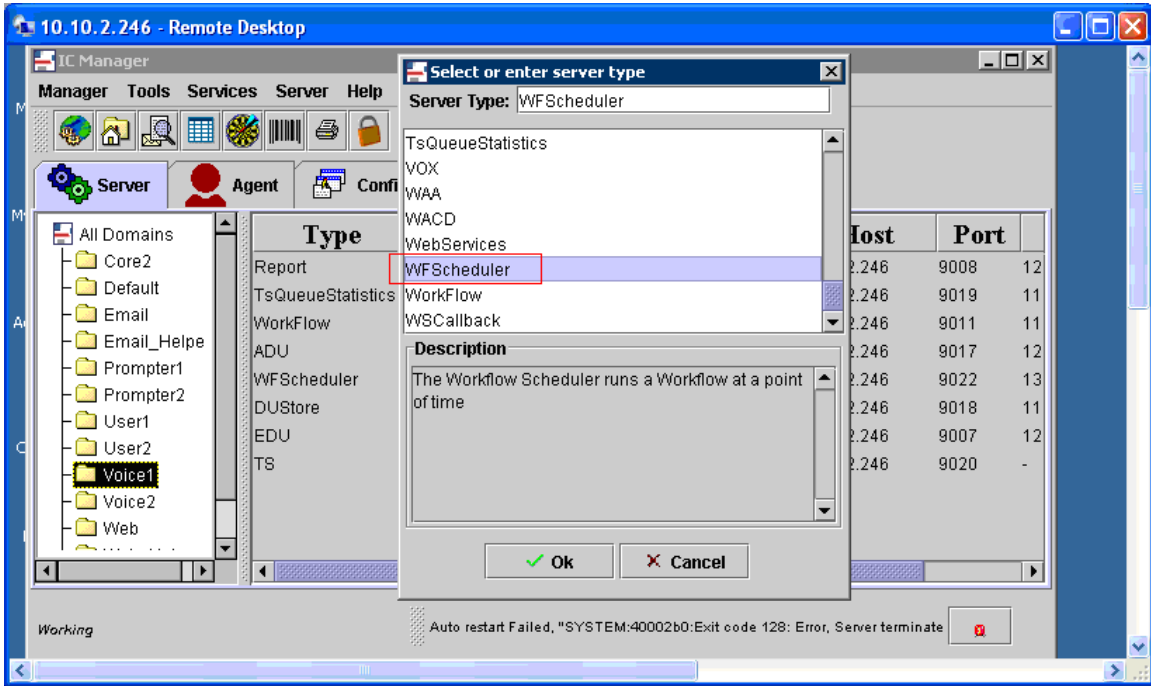

Figure 11: Select Server→New→WFScheduler

The Workflow Scheduler GUI opens up. Enter a preferred **Name**, **Domain** and **Host** (IP address) of the new workflow scheduler Server.

Note: The **Host** drop down gets disabled and shows the primary Avaya IC Server IP if the **Domain** name is selected before selecting the **Host** IP address.
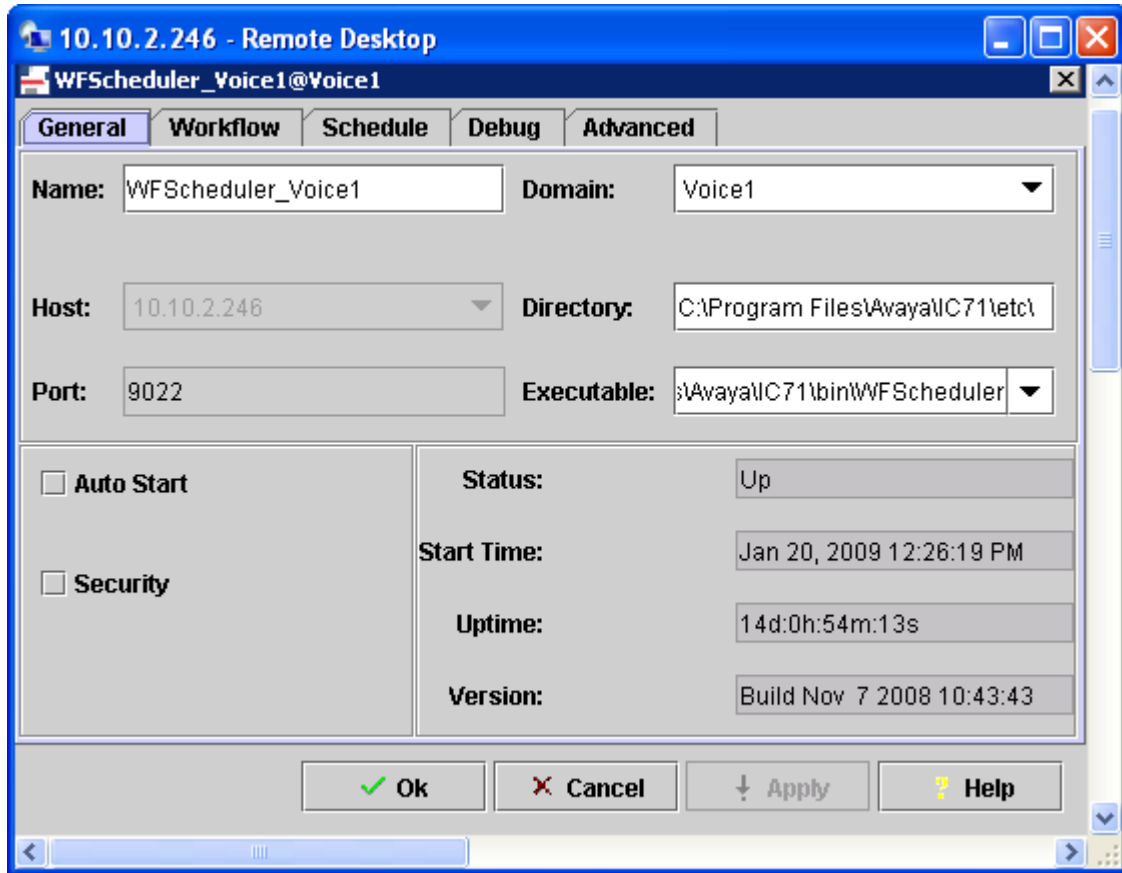
Figure 12: WFScheduler Panel

After entering the required server details click on the **OK** Button and the new server will be listed on the current list of servers in the Avaya IC Manager. The Workflow Scheduler Server can be started by clicking the green traffic light button on the Menu Bar and can be stopped by clicking the red traffic light button.
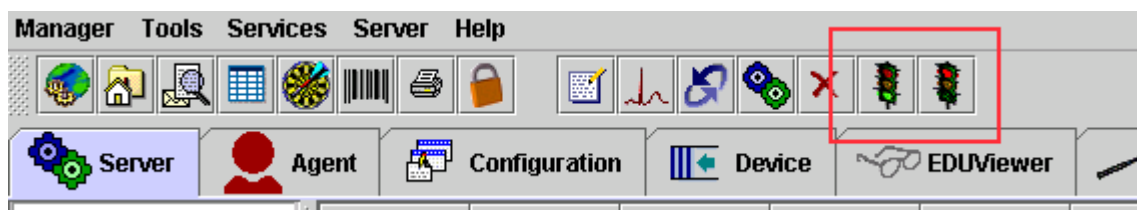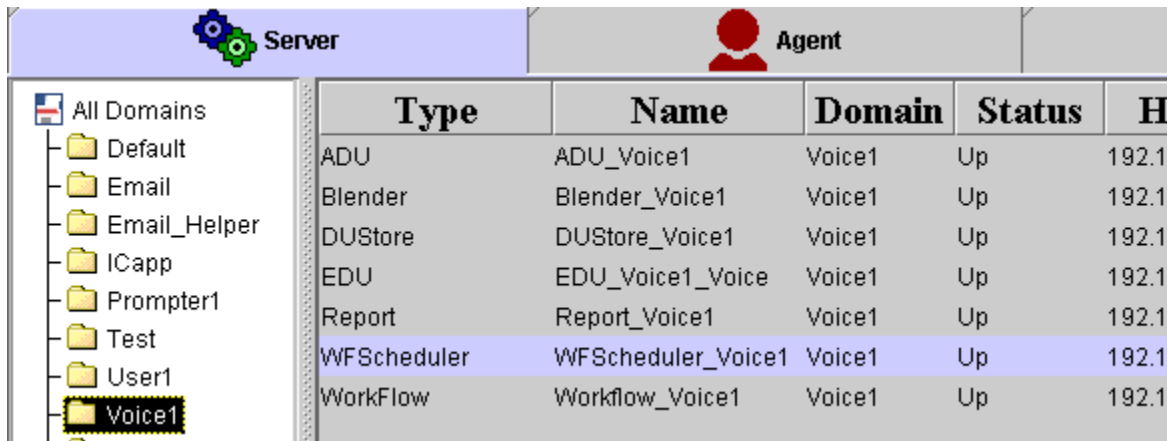
Figure 13: Avaya Interaction Center Manager start/stop service button

5.1 Description of Avaya Interaction Center System and CCT Solutions Workflow GUI

After the Avaya IC Manager GUI is extended by the CCT Solutions Workflow Scheduler, the administration and configuration of the time scheduling function and the Workflow can be done using the Avaya IC Manager GUI.

The GUI of the Workflow Scheduler can be opened in Avaya IC Manager by double clicking on the Workflow Scheduler (**WFScheduler**) in the Server List.

Figure 14: IC Manager Server tab

The WFScheduler server pop up window opens up with the tabs **General**, **Workflow**, **Scheduling**, **Debug** and **Advanced**. All Workflow Scheduler configurations are done here.

Important: After new configuration is complete, the Workflow Scheduler must be restarted to make sure that the changed options are applied. Otherwise, the previous WFScheduler configuration will be in use.

5.1.1 General Tab

The **General** tab shows the basic configuration of the Workflow Scheduler Server such as the **Name** of the Server, **Domain**, **Host** and **Port**. The frame on the bottom-right shows the **Status** of the Server, such as **Start Time**, **Uptime** and **Version** of the Server.
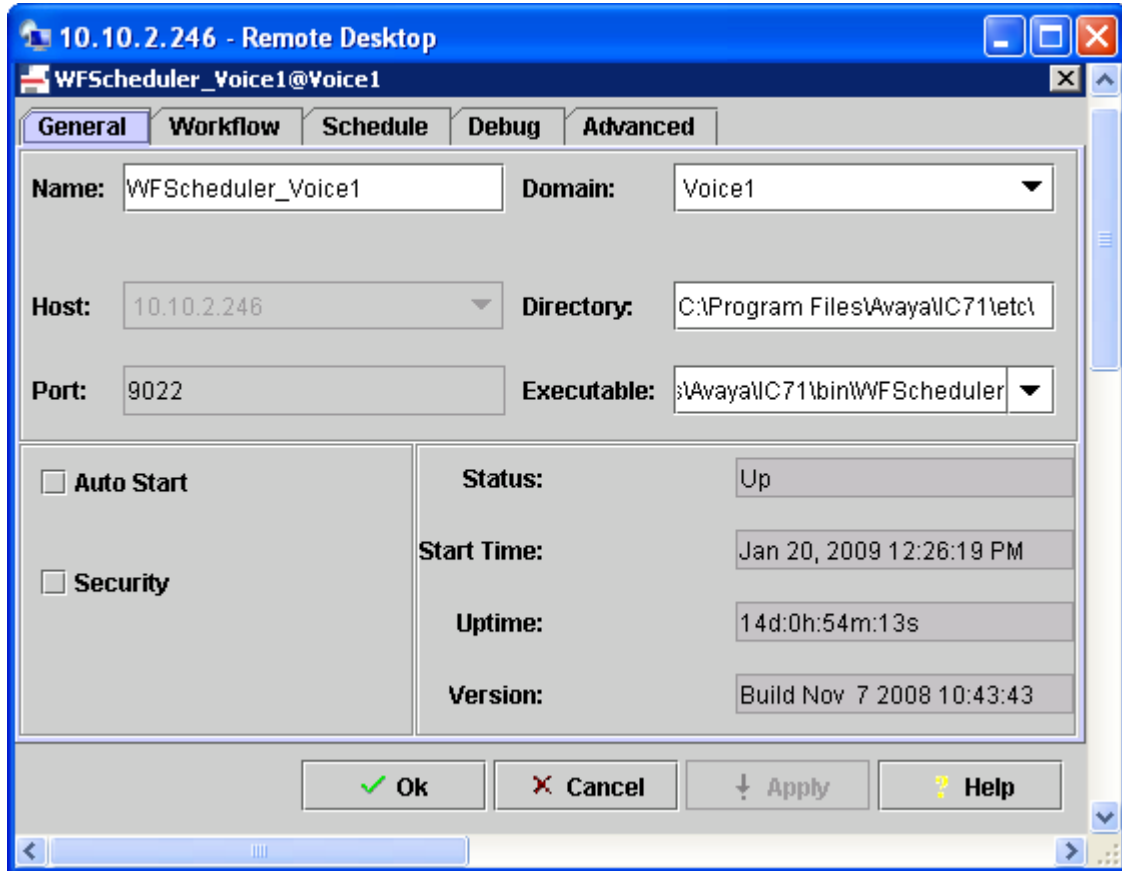

Figure 15: CCT Solutions Workflow General tab in Avaya Interaction Center Manager GUI

5.1.2 Workflow Tab

In the **Workflow** tab, the Workflow can be defined which will be started at a specific point of time. The **Workflow Server** defines the name of the Workflow Server on which the workflow will be started. The **Flow Set** is the name of the Workflow Project. The **Initialisation Flow** defines the flow in a Flow Set that has to be started.

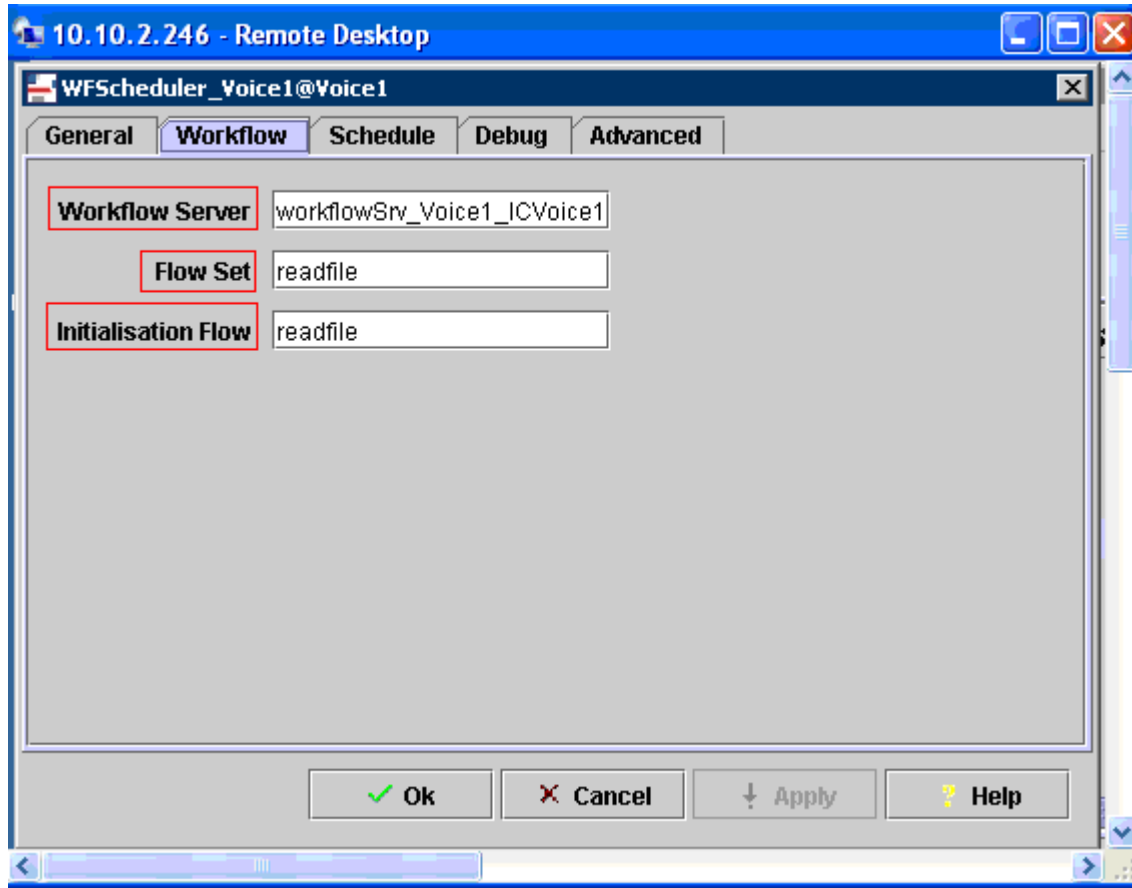**Note:** The **Workflow Server** and **Flow Set** name are case sensitive. The **Initialisation Flow** is required to be written in small letters.

Figure 16: CCT Solutions Workflow Scheduler Workflow tab in Avaya IC Manager GUI

5.1.3 Schedule Tab

The **Schedule** tab configures the point of time on which the Workflow will start.

- **Repeat Interval in Weeks**
  This parameter determines the weekly interval. When set to 1, the Workflow Set will start every week. When set to 3, the workflow will start every 3 weeks. Any numerical value can be entered for this field.

- **Day of week**
  In the Drop-Down Field, one can select whether the **Flow Set** should run every day or only on a specific day.

- **Start Hour and Start Minute**
  Determines the Hour and Minute (24 hour clock) of when the Flow Set should be executed (e.g., Hour 6, Minute 0 means Flow will execute at 06:00 am).

- **Repeat Interval in Seconds**
  Determines the interval in seconds for the Flow Set to be re-executed (e.g., 60, Flow will be executed every 60 seconds).

- **Show next execution time in Alarm Monitor?**
  Tick checkbox to display the execution timestamp of the work flow in the Alarm Monitor for logging purposes.
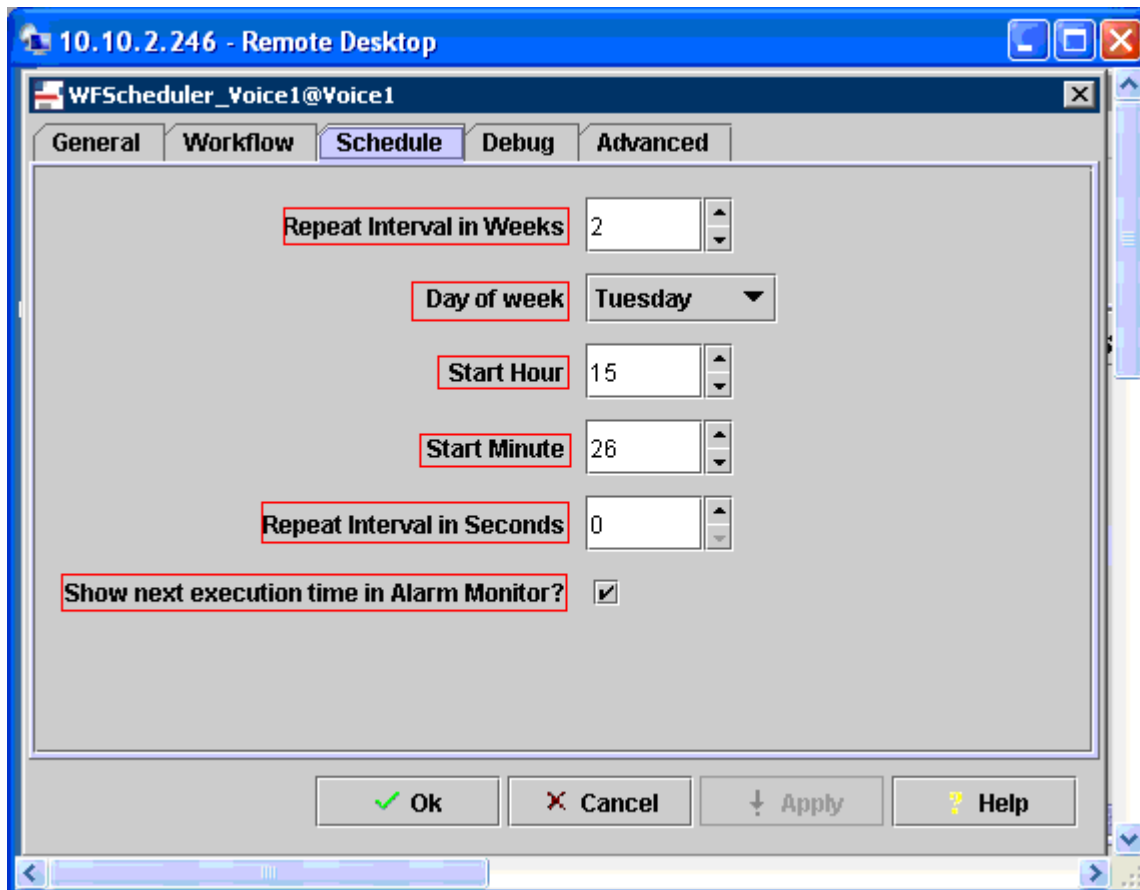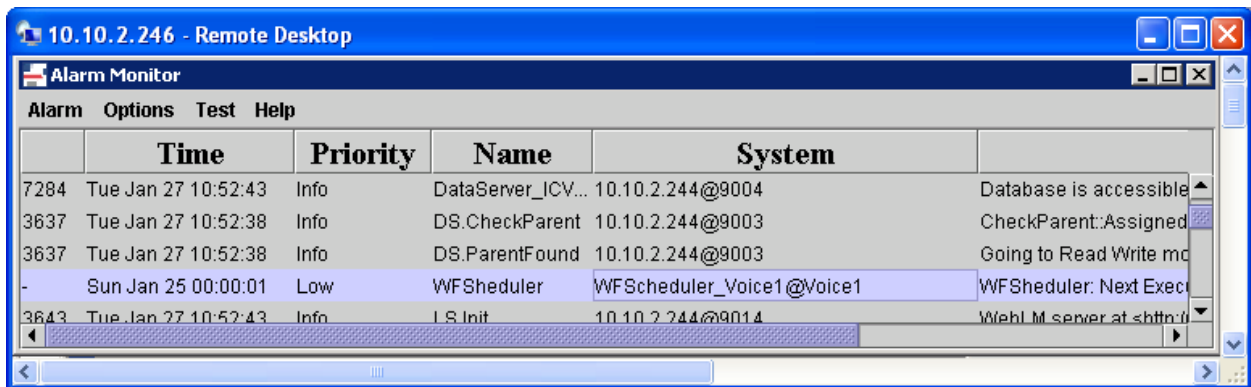
Figure 17: CCT Solutions Workflow Schedule tab in Avaya IC Manager GUI

For example, please see the following output in Alarm Monitor as in **Figure 18**.

Figure 18: Alarm Monitor window showing the next workflow execution alarm

5.1.4 Debug and Advanced Tabs

The **Debug** and **Advanced** tabs as shown below in **Figure 19** and **Figure 20** are standard Dialogs of the Avaya Interaction Center Manager, which contain no specific configurations for the Workflow-Scheduler.
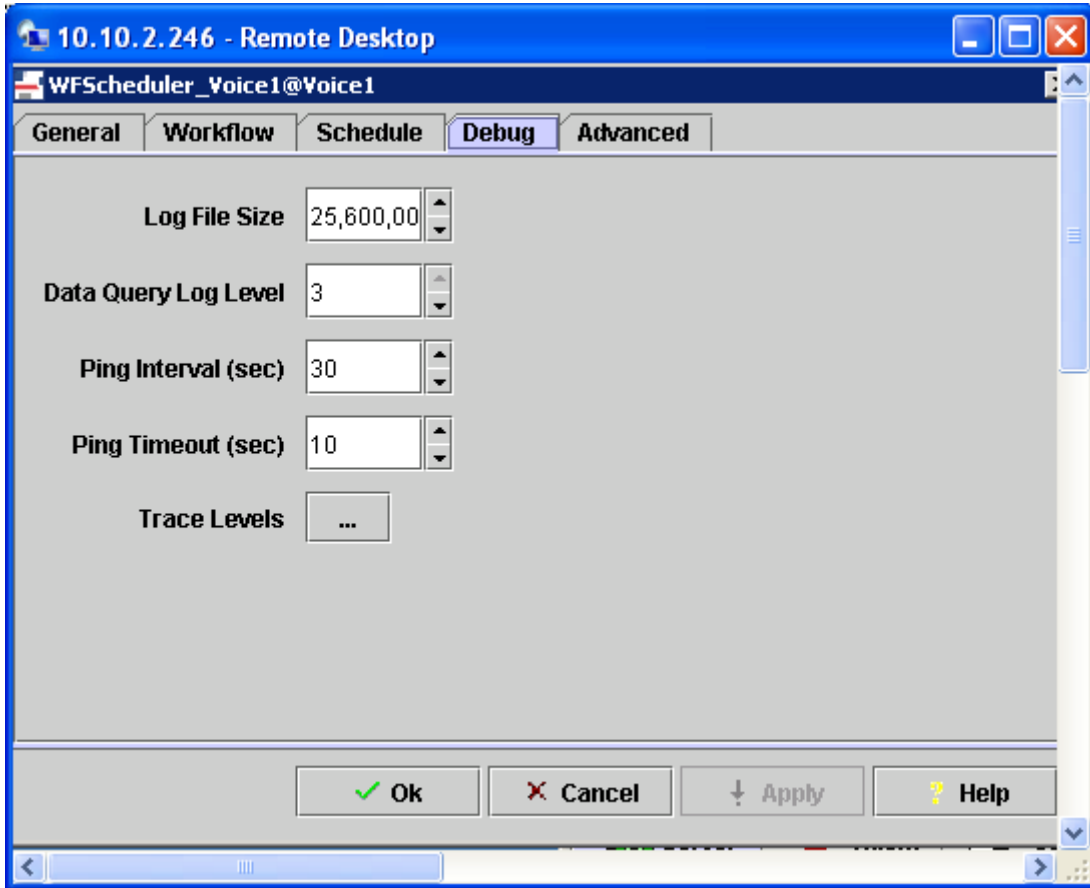
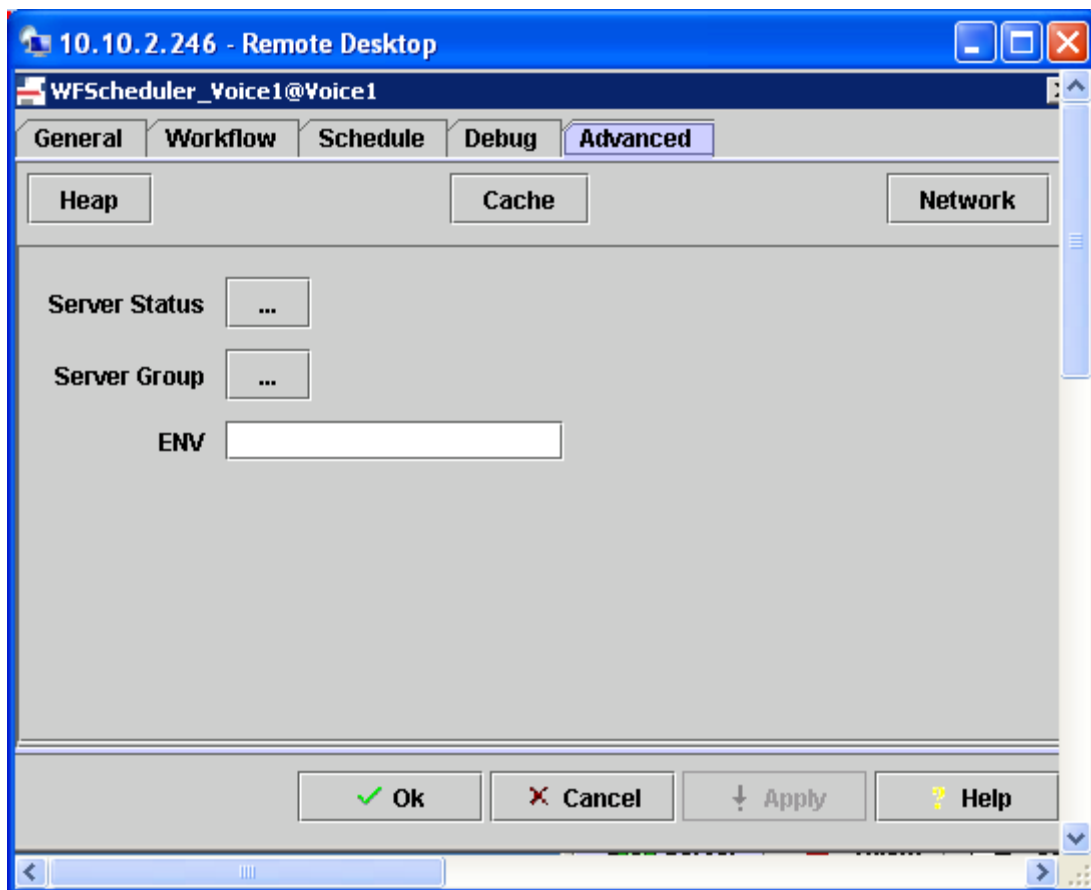

Figure 19: CCT Workflow Debug tab in Avaya IC Manager GUI

Figure 20: CCT Workflow Advanced tab in Avaya IC Manager GUI

5.1.5 Configuration of Avaya IC Test Workflows

Configuration of Avaya IC test workflows can be demonstrated by the following workflows:
Sample Workflows
The following sample workflow scenarios will be run one-at-a-time:
1. **Read work flow** - Event is triggered to import data from a ".csv" file into the **customer** table in Interaction Center Database.
2. **Create work flow** - Event is triggered to export data from the **customer** table in Interaction Center Database and write data onto a ".csv" file located in the C drive of the primary Avaya Interaction Center Server.

The first line of the CSV file must have field names and they must match or be a subset of the available column names in the customer table.

```
firstname,lastname,email,phone
John,Doe,jdoe@test.de,555-5615
Max,Mustermann,mmustermann@test.de,+049 (0) 1234 56789
Hans,Meier,hmeier@test.de,+049 (0) 4321 56789
```

Figure 21: Sample CSV file – customer.csv

Log in to the primary Avaya Interaction Center Server and copy the sample workflow in the Avaya IC workflow directory path i.e., "\..\Avaya\IC71\design\IC\Flows\Avaya\" as in **Figure 22**.
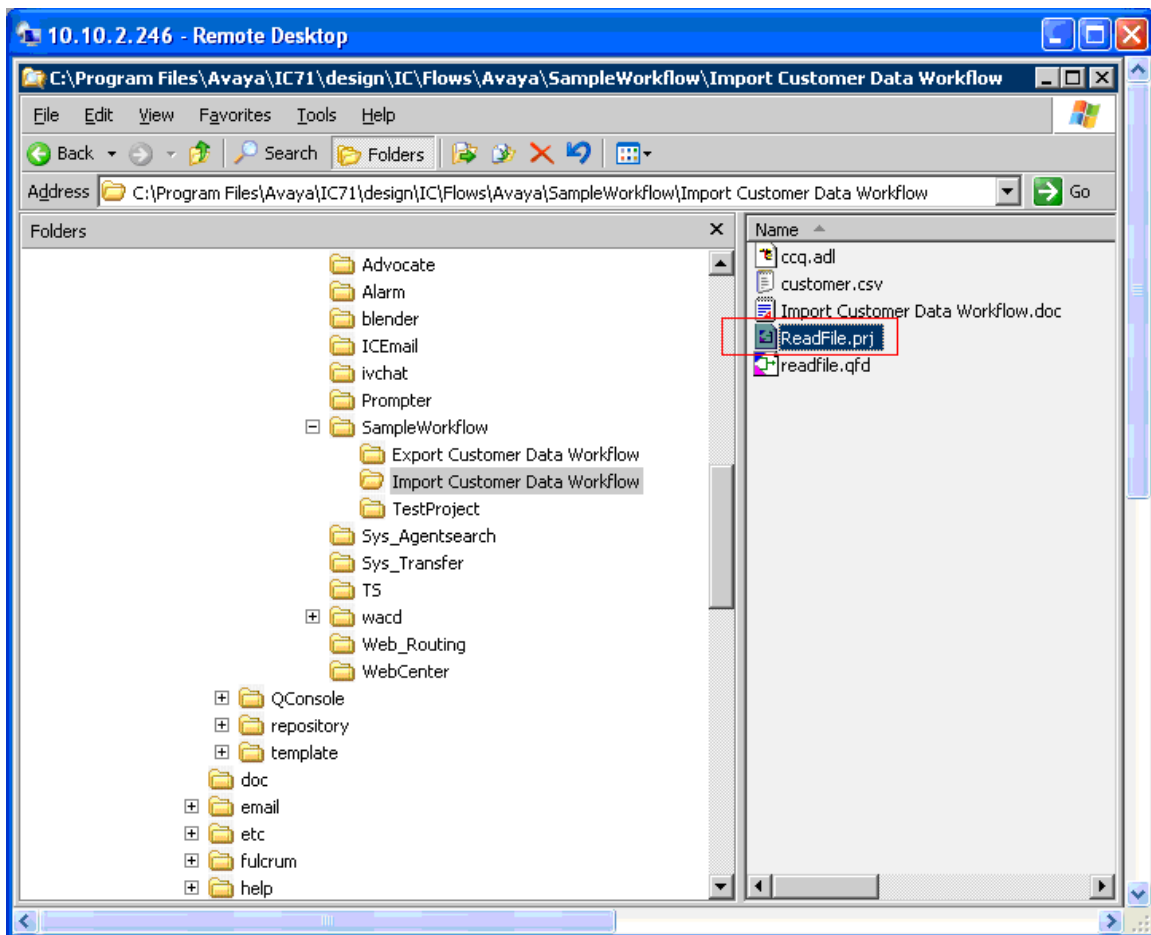
Figure 22: Sample workflow project - ReadFile.prj

After double clicking the ".prj" file, the workflow of the project opens up in **Avaya Workflow Designer** window as in **Figure 23**.
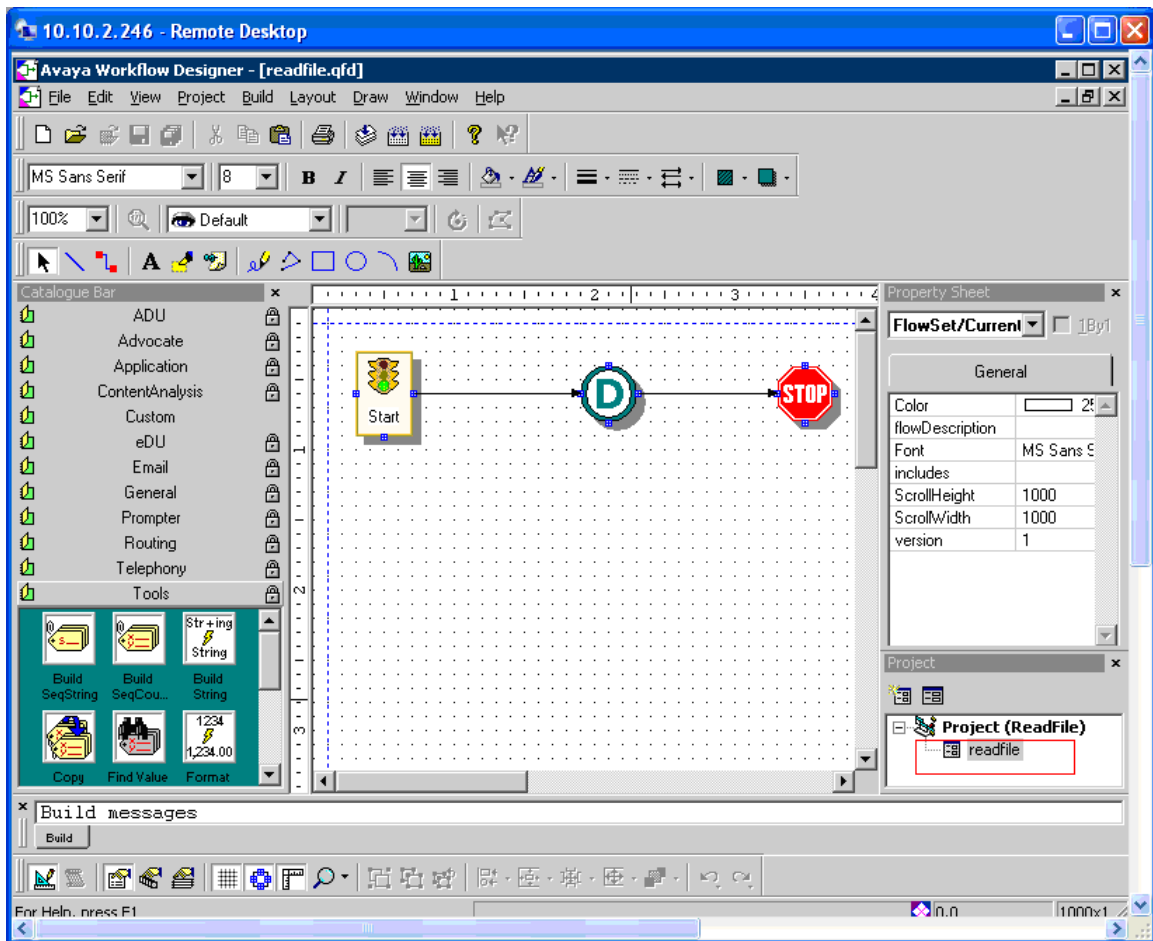
Figure 23: Avaya Workflow Designer window showing ReadFile project

Then verify the parameter(s) set for the various stages of the workflow as illustrated below. The **Start** node has one property **DBNetwork** under the **Basic** tab and this must be set to **q_qualification** as in **Figure 24.**
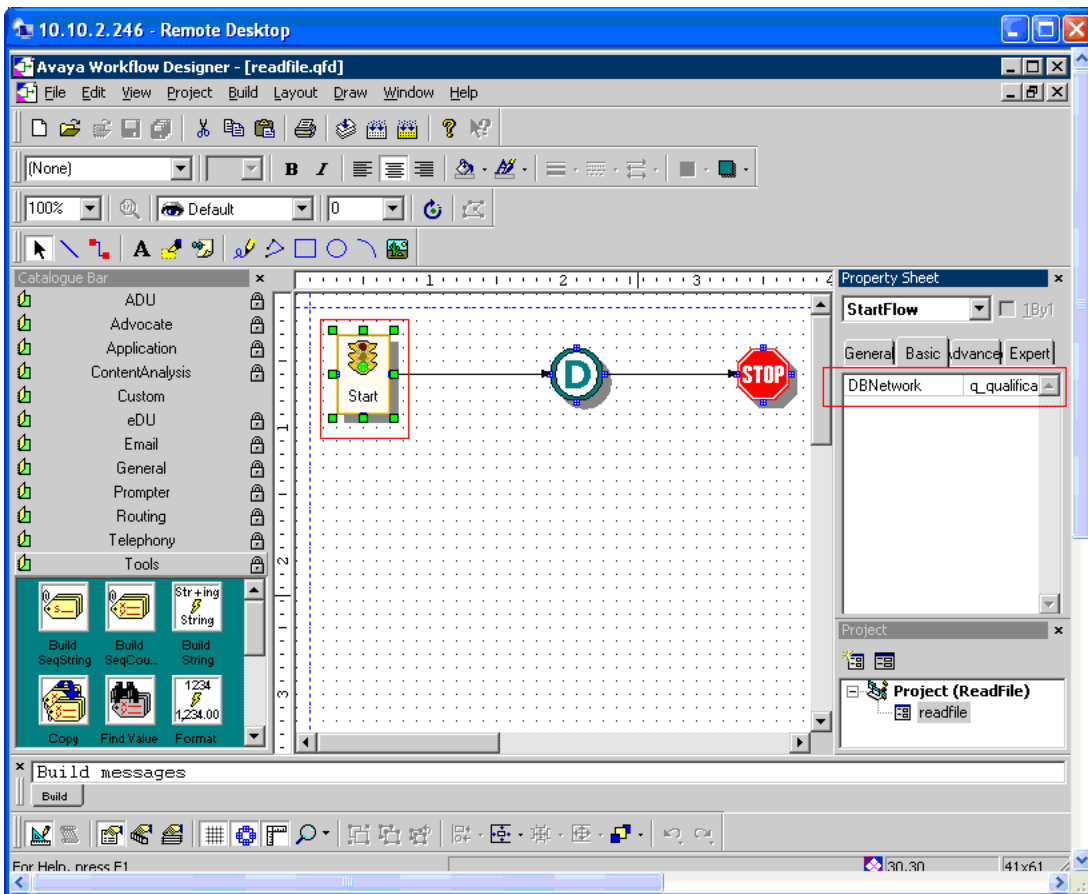

Figure 24: Start node properties of ReadFile project

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The Main block has two properties, **FilePath** and **TableName**. The **FilePath** must be set to the "customer.csv" file location is and **TableName** must be set to **customer** as in **Figure 25**.
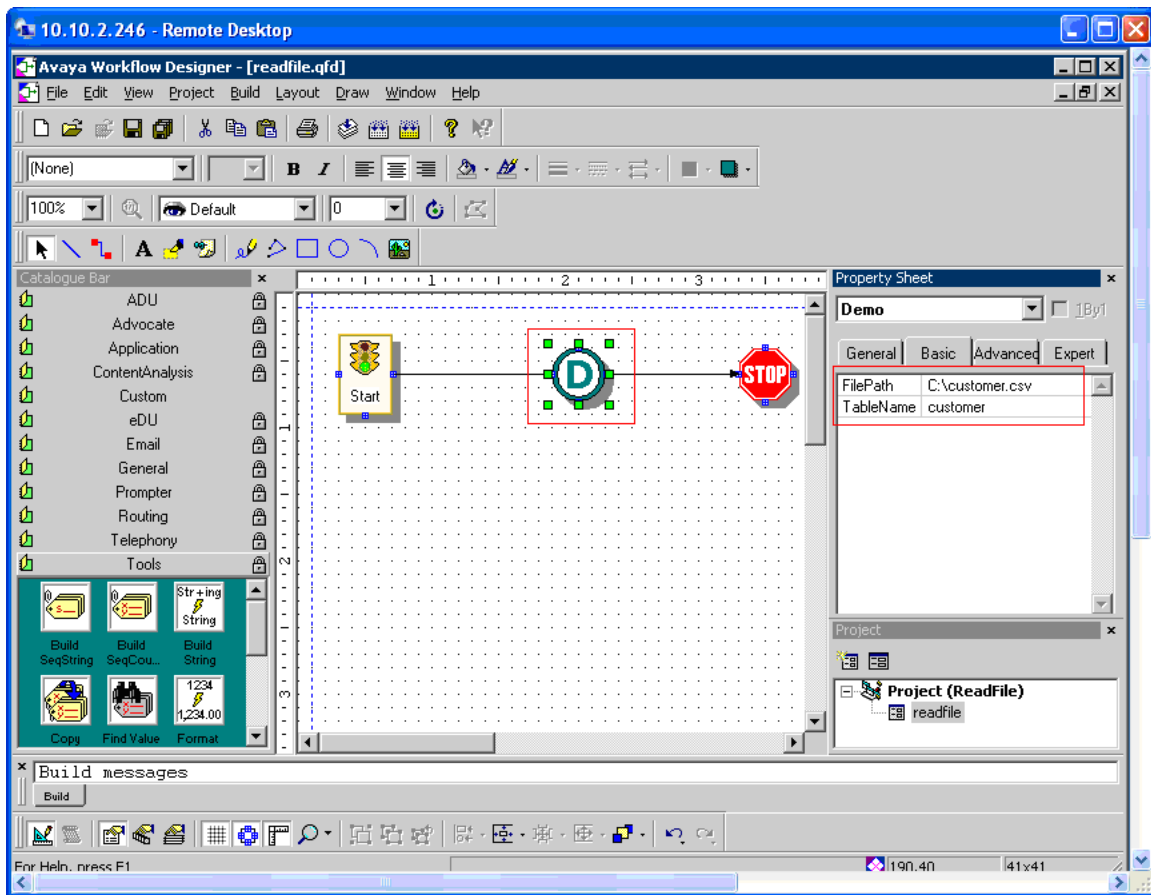
Figure 25: Main node properties of ReadFile project

Build the Workflow in **Avaya Workflow Designer** window by clicking on the menu function **Build→Build Flow Set**. This process compiles then inserts the Workflow into the database so that all Workflow servers in Avaya IC can access it. The following output appears on successful build completion of the project.
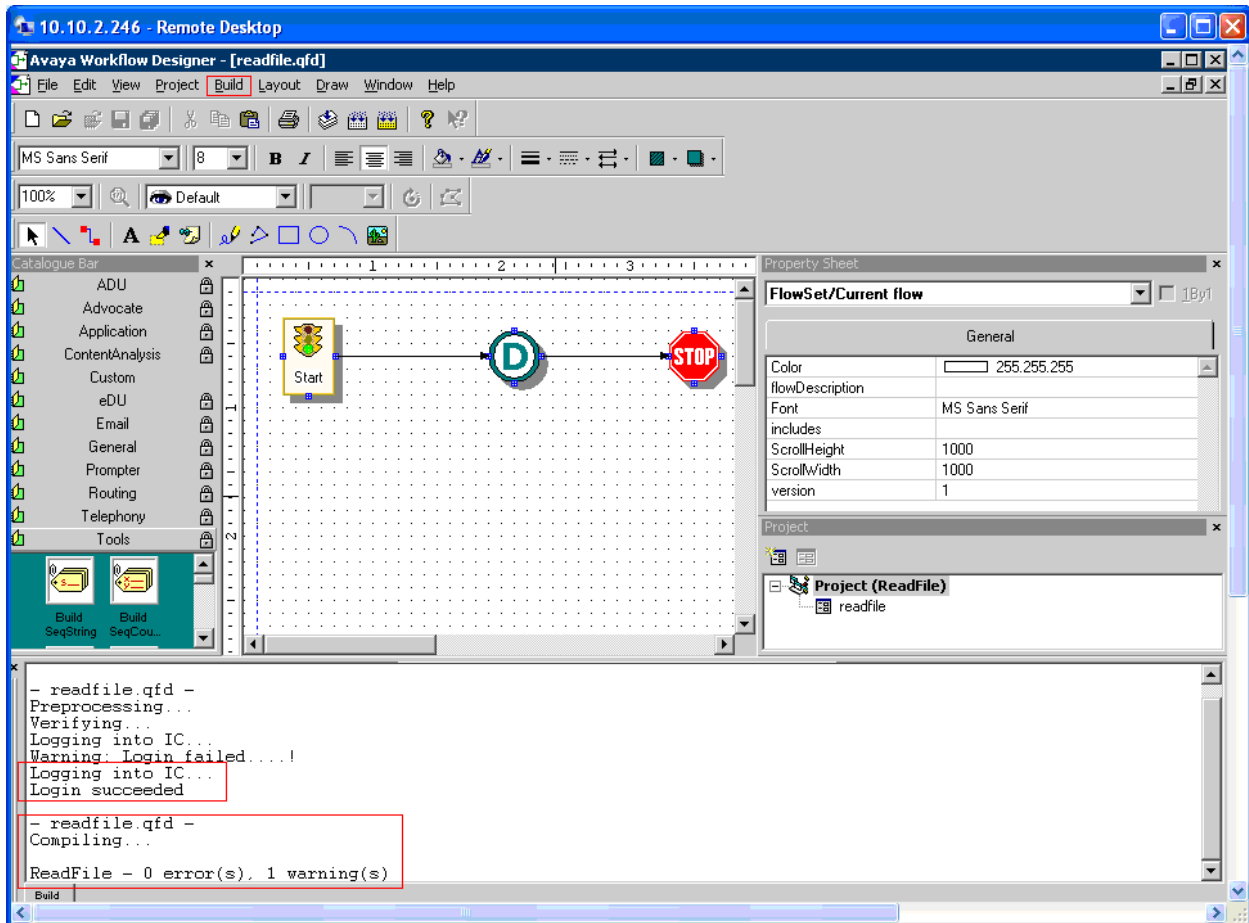
Figure 26: Build output of ReadFile project

After a successful build and deployment of the project workflow, it needs to be tested using the default **WorkFlow** server in Avaya IC Manager as in **Figure 27.**
In Avaya **IC Manager→ Server** tab select the primary domain and double click on **WorkFlow** server type. Then select **WorkFlow→Run Flow…**, enter the parameter in the form of **projectname.flowname** and click **OK**.
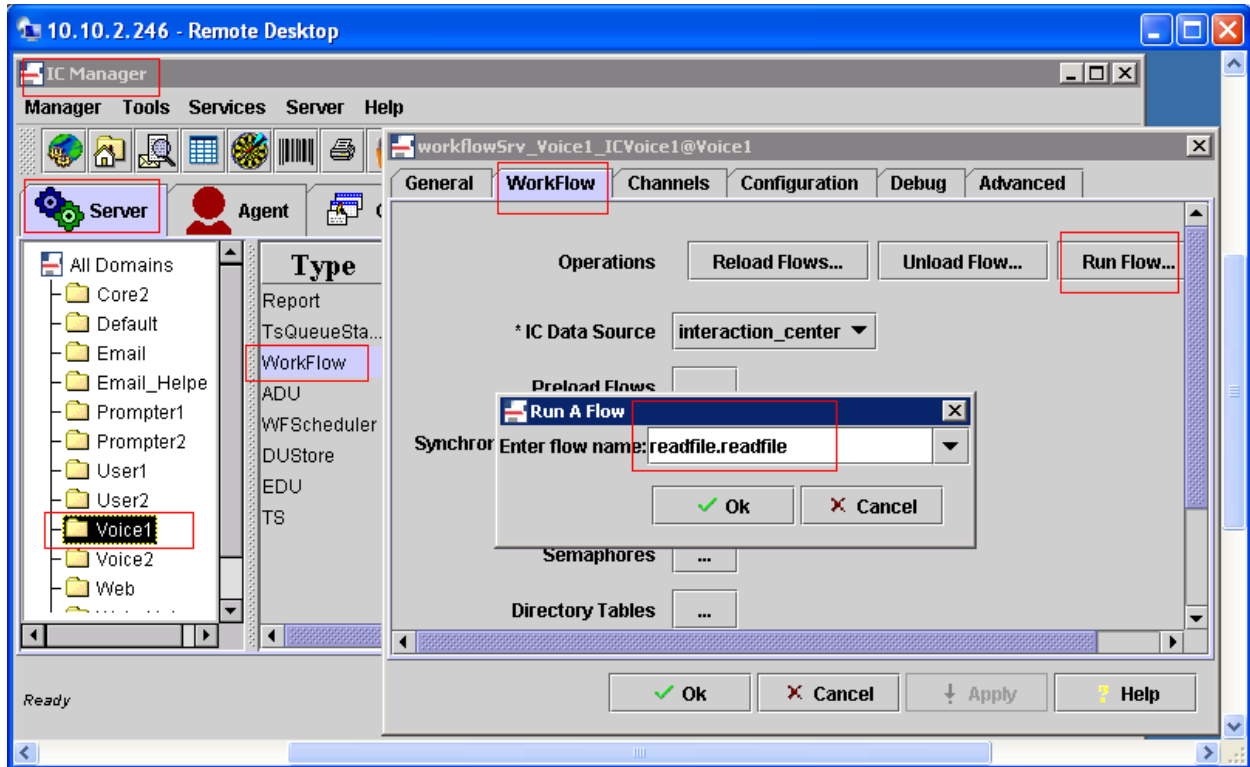
Figure 27: Running the work flow "readfile" from primary WorkFlow server

Confirm that the workflow has run successfully by verifying the workflow log entry in the Alarm Monitor of Avaya IC Manager as in **Figure 28**.

Figure 28: "readfile" workflow log entry in Avaya IC Manager Alarm Monitor

6 General Test Approach and Test Results

The functional test cases were run manually. Alarms were generated on the Avaya IC Manager of the primary Avaya Interaction Center Server for various combinations of configurable parameters in the WFScheduler's **Schedule** tab such as **Repeat Interval in Weeks**, **Day of Week**, etc. corresponding to the events triggered by CCT Solutions WFScheduler.

All test cases were executed and passed.

7 Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Interaction Center and CCT Solutions WFScheduler. From the **IC Manager** screen, select the **Server** tab and then select the **Voice** domain which is the primary Avaya IC Server. Right-click on the **WFScheduler** IC Server created in **Section 5** and click **Status**. Verify that the **Status** shows as **Up** as shown below in **Figure 29**.
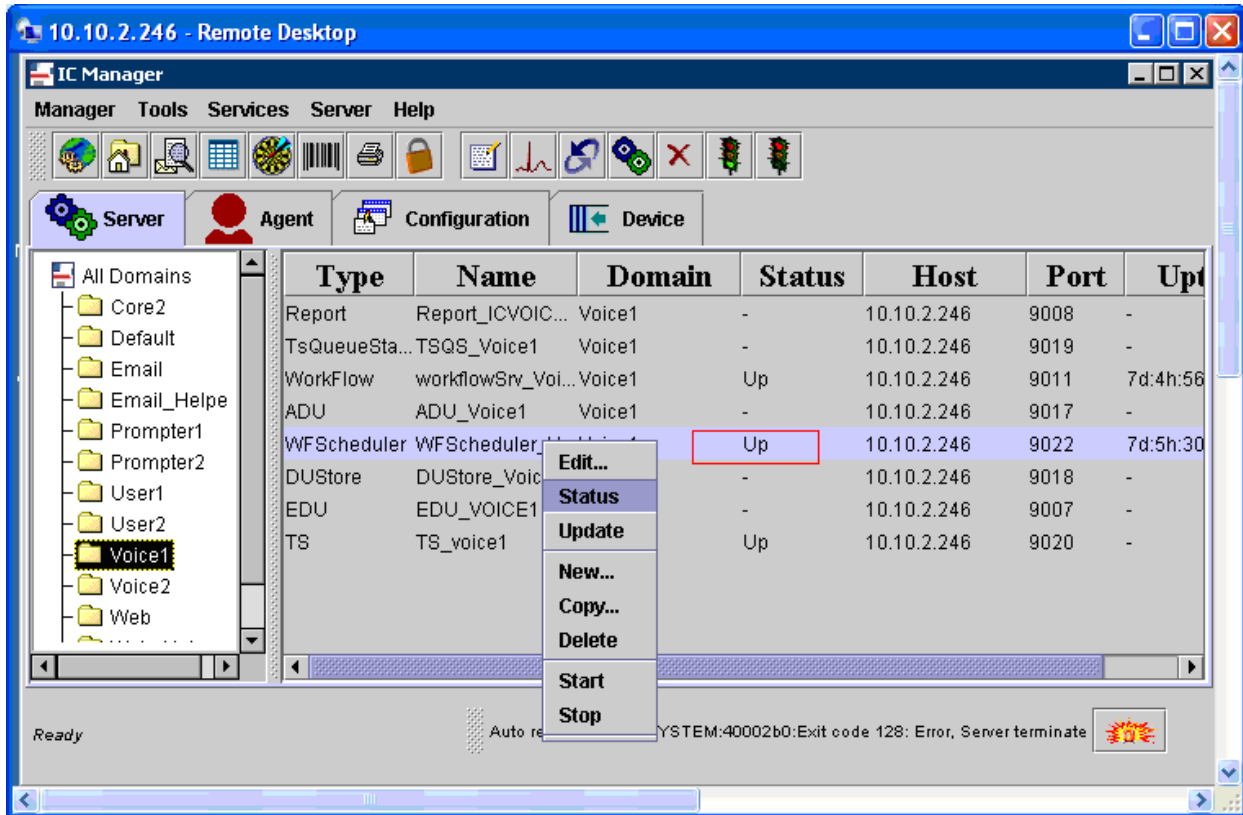

Figure 29: WFScheduler IC Server Status

8 Conclusion

These Application Notes describe the configuration steps required for CCT Solutions Workflow Scheduler to interoperate with Avaya Interaction Center. All functional test cases were completed successfully.

9 Additional References

Avaya product documentation can be found at http://support.avaya.com.

[1] *Avaya Interaction Center Release 7.1 Installation & Configuration*, May 2006, Document Number 07-300569

[2] *Avaya Interaction Center Release 7.1 IC Administration Volume 1: Servers & Domains*, Release 7.1, Issue 3, May 2006, Document Number 07-300570

The following documentations are provided by CCT Solutions.

[1] *CCT_Solutions_Technical Specification (English).doc*

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