Avaya Solution & Interoperability Test Lab

Configuring Avaya Voice Portal with Avaya Communication Manager and Designing a Sample Speech Application using Avaya Dialog Designer – Issue 1.0

Abstract

These Application Notes describe how to configure the Avaya Voice Portal (VP) with Avaya Communication Manager. Avaya VP is a Web based and speech enabled interactive voice response system that can accept both traditional DTMF touch tone inputs and prerecorded audio files for output, and VoiceXML2.0 compliant speech applications to guide callers through call flows. In the configuration described in these Application Notes, the Avaya VP system is comprised of a Voice Portal Management System (VPMS) server, a Media Processing Platform (MPP) server and Avaya Dialog Designer. The reference network of the Voice Portal System described in these Application Notes consists of an Application server, IBM WebSphere Voice server, and Microsoft SQL server. These Application Notes also provides a guide for building a sample speech application using the Avaya Dialog Designer. This sample speech application was used to verify the Avaya VP integration of external servers and speech applications which includes an Application server, IBM Automated Speech Recognition and Text to Speech applications, and Microsoft SQL server.

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1. Introduction

These Application Notes describe how to configure the Avaya Voice Portal with Avaya Communication Manager. Avaya VP is a Web based and speech enabled interactive voice response system that can accept both traditional user DTMF touch tone inputs and prerecorded audio files for output, and VoiceXML2.0 compliant speech applications to guide callers through call flows. The Avaya Voice Portal system is comprised of a Voice Portal Management System (VPMS) server, a Media Processing Platform (MPP) server and Avaya Dialog Designer (DD). The IBM Automated Speech Recognition (ASR) application and the IBM Text-to-Speech (TTS) application were installed on the IBM WebSphere Voice Server and used as the VoiceXML2.0 compliant speech applications for speech recognition and to convert ASCII text into synthesized speech. The Application server is a web based and J2EE compliant server. The Application server consists of an Apache Tomcat application and user created speech applications. The speech applications are deployed to the Application server and invoked by the MPP. In these Application Notes, the Application server is installed on a Windows based platform.

Media Processing Platform (MPP) – The MPP communicates with Avaya Communication Manager to provide voice response media service. The function of the MPP is described as follows:

- Uses H.323, SIP, and RTP protocols to communicate with Avaya Communication Manager. In these Application Notes, the MPP uses the H.323 protocol to register IP Softphones to the C-LAN located in the G650 Media Gateway. The IP Softphones are mapped to the sample speech application.

- Runs the Avaya VoiceXML browser to interpret VoiceXML2.0 compliant speech applications.

- Provides proxy interfaces to communicate with the TTS servers and ASR servers. The MPP uses Media Resource Control Protocol (MRCP) to control ASR and TTS servers. The MPP sends utterances to the IBM ASR application for speech recognition processing. To prompt text to a caller, the MPP sends the ASCII text to the IBM TTS application for converting text into synthesized speech.

Voice Portal Management System (VPMS) manages the MPPs and provides a web interface for administering Avaya Voice Portal (VP). The VPMS is the centralized management system for the Avaya VP.

The Dialog Designer (DD) is used to develop a speech application. The speech application is a set of servlets, grammars and artifacts needed to generate VoiceXML at run-time. The sample speech application consists of a set of nodes which includes prompt and grammar files, and data nodes. The sample speech application call flow prompts the caller to enter a four digit account number. Built-in DTMF grammar accepts touch tone inputs while voice grammar is used to accept voice inputs. The data node, configured to run database query operations, then sends the

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account number to the Microsoft SQL database server to query the account balance. When the query is returned, the announce node plays to the caller the account number and account balance.

1.1. Avaya Voice Portal Call Flow

After the sample speech application is deployed to the Apache Tomcat server, use the VPMS web configuration to administer the sample application with a hunt group number. When the number is called, Avaya Communication Manager directs the call to the MPP to start the call. The call flow is described as follows:

1. A customer originates a call to find the account balance.
2. The call is received at the Avaya Communication Manager.
3. Avaya Communication Manager directs the call to the MPP via the H.323 VoIP connection.
4. The MPP maps the DNIS number to a speech application.
5. The MPP Voice Browser connects to the Application server where speech applications reside.
6. The MPP receives the VoiceXML page from the Application server and interacts with the caller.
7. The MPP sends the text prompt “Please enter your account number” to the TTS application which converts the text into synthesized speech and sends the synthesized speech to the MPP.
8. The MPP prompts the caller with the synthesized speech.
9. The caller responds verbally with a 4-digit account number.
10. The MPP sends the caller’s verbal response to the ASR application.
11. The ASR application returns the account number to the MPP.
12. The MPP sends the account number to the Application server for database query.
13. The Application server connects to the SQL server and queries for the account balance.
14. The SQL server returns the account balance to the Application server.
15. The Application server returns the account balance to the MPP.
16. The MPP sends the account number and account balance to the TTS application.
17. The TTS application returns the synthesized speech to the MPP.
18. The MPP responds to the caller with the synthesized speech saying the account number and account balance.
19. Call ends.

1.2. Test Configuration

Figure 1 illustrates the Retail Store Headquarters configuration used to verify these Application Notes. The Headquarters consists of a pair of Avaya S8710 Media Servers with one Avaya G650 Media Gateway. All IP telephones register to Avaya Communication Manager running on the Avaya S8710 Media Servers at the Headquarters.

Note: These Application Notes assume that the Retail Store Headquarters depicted in **Figure 1** is already in place, as well as Avaya Communication Manager, Avaya Media Gateway, routers,

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switches, Microsoft SQL server, Application server, and IBM WebSphere Voice server. Please consult the appropriate documentation listed in the References section of this document for more information on setting up these components. The focus of these Application Notes is to configure the Voice Portal system with Avaya Communication Manager.

Name	IP Address
C-LAN	30.1.1.4
MedPro	30.1.1.5
VPMS	30.1.1.12
MPP	30.1.1.11
Dialog Designer	30.1.1.16
Application server	30.1.1.15
IBM TTS/ASR	30.1.1.14
Microsoft SQL server	30.1.1.17

Table 1 - IP Address Assignment

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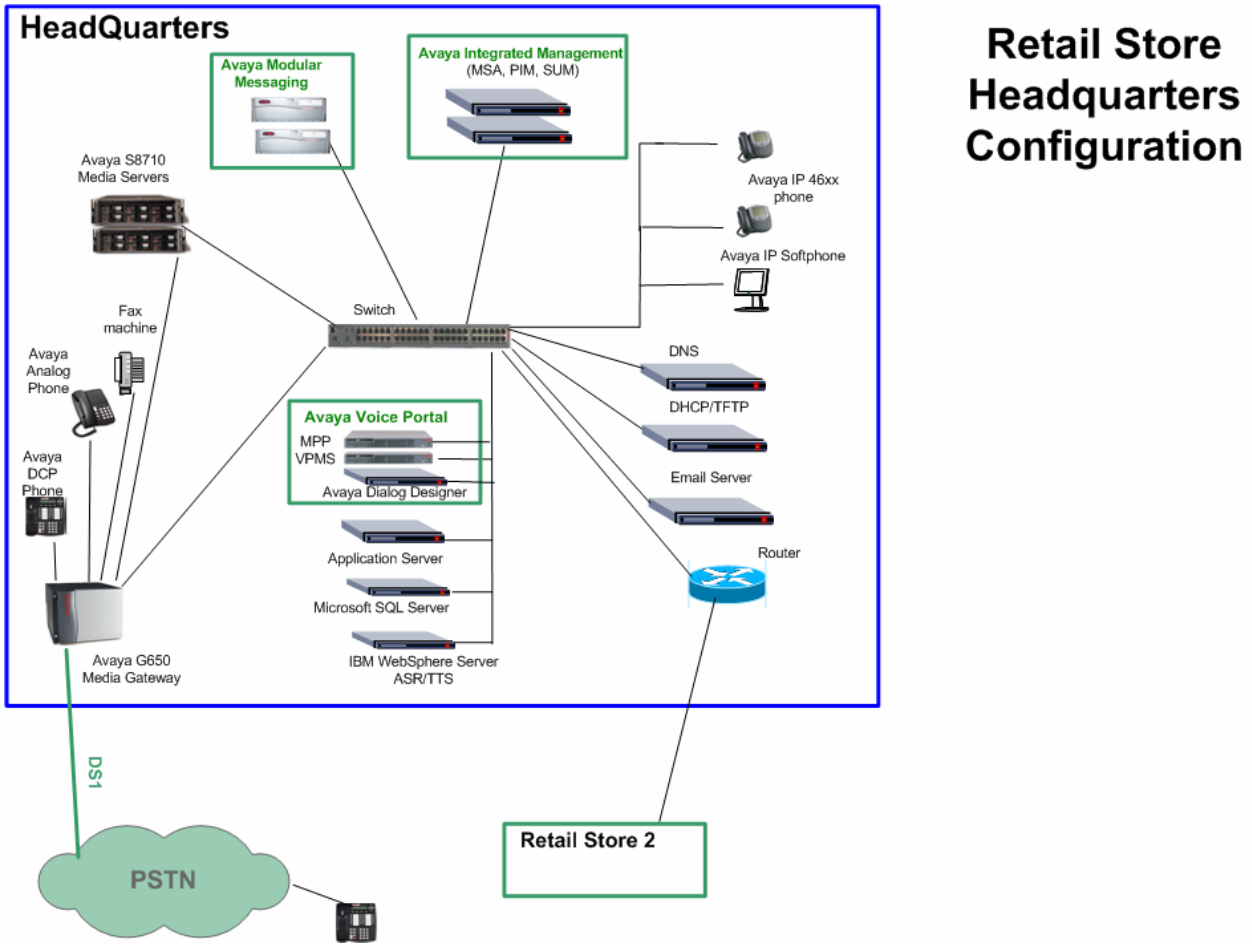

Figure 1: Network Configuration Diagram

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2. Equipment and Software Validated

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

Equipment	Software
Avaya Communication Manager Avaya S8710 Media Server	 3.1.2 (R013x.01.2.632.1)
Avaya G650 Media gateway IPSI (TN2312BP) C-LAN (TN799DP) MEDPRO (TN2302AP)	 HW 10 FW 031 HW 017 FW 017 HW 20 FW 112
Avaya Voice Portal ▪ Voice Portal Management System ▪ Media Processing Platform ▪ Dialog Designer	 3.0.1.0.2303 3.0.1.0-2308 3.0.20
Application Server ▪ Apache Tomcat ▪ J2sdk ▪ Microsoft Windows 2003 Server	 5.0.28 1_4_1_02 SP 1
IBM WebSphere Voice Server ▪ ASR ▪ TTS ▪ Microsoft Windows 2003 Server	WAS 5.1 WVS 5.1.3 WVS 5.1.3 SP 1
Microsoft SQL Server	SQL 2000 SP 4

Table 2 - Equipment and Version Validated

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3. Configure Avaya Communication Manager

This section details the administration on Avaya Communication Manager that must be performed for the Avaya Voice Portal. The following commands are issued at the Avaya System Access Terminal (SAT) on the S8710 Media Server at the Headquarters location.

Step	Description
1.	Issue the **display system-parameters customer-options** command and verify that there are sufficient **IP_API_A** licenses. If not contact an authorized Avaya account representative to obtain these licenses.
2.	Issue the **change system-parameters features** command. On Page 6 of the **system-parameters features** form, set **7434ND** to "**y**".

```
display system-parameters customer-options                    Page  10 of  11
                     MAXIMUM IP REGISTRATIONS BY PRODUCT ID

Product ID  Rel. Limit          Used
IP_API_A       : 2400           0
IP_API_B       : 2400           0
IP_API_C       : 2400           0
IP_Agent       : 2400           0
IP_IR_A        : 2400           0
IP_Phone       : 12000          9
IP_ROMax       : 12000          0
IP_Soft        : 2400           0
IP_eCons       : 20             0
               : 0              0
```

```
change system-parameters features                              Page   6 of  17
                        FEATURE-RELATED SYSTEM PARAMETERS
         Public Network Trunks on Conference Call: 5              Auto Start? n
   Conference Parties with Public Network Trunks: 6                Auto Hold? n
 Conference Parties without Public Network Trunks: 6           Attendant Tone? y
         Night Service Disconnect Timer (seconds): 180          Bridging Tone? n
                  Short Interdigit Timer (seconds): 3          Conference Tone? n
              Unanswered DID Call Timer (seconds):             Intrusion Tone? n
              Line Intercept Tone Timer (seconds): 30    Mode Code Interface? n
                 Long Hold Recall Timer (seconds): 0
                      Reset Shift Timer (seconds): 0
    Station Call Transfer Recall Timer (seconds): 0
                               DID Busy Treatment: tone

               Allow AAR/ARS Access from DID/DIOD? y
                 Allow ANI Restriction on AAR/ARS? n
     Use Trunk COR for Outgoing Trunk Disconnect? n
                  7405ND Numeric Terminal Display? n                  7434ND? y
DISTINCTIVE AUDIBLE ALERTING
             Internal: 1   External: 2   Priority: 3
                       Attendant Originated Calls: external
```


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Step	Description
3.	Issue the **change ip-codec-set 1** command. Enter the following values: • Audio codec: Enter "**G.711MU**". The value administered here will be used in Voice Portal configuration Section 4 Step 5. • Silence Suppression: Retain the default value "**n**". • Frames Per Pkt: Enter "**3**". • Packet Size (ms): Enter "**30**". • Media Encryption: Voice Portal supports Media Encryption. Enter the value based on the system requirement, for example "**aea**". **change ip-codec-set 1** Page 1 of 2 IP Codec Set Codec Set: 1 Audio Codec / Silence Suppression / Frames Per Pkt / Packet Size(ms) 1: **G.711MU** **n** **3** **30** 2: 3: 4: 5: **Media Encryption** 1: **aea** 2: 3:

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Step	Description
4.	Issue the **change ip-network-region <n>** command, where <**n**> is a valid network region number. On Page 1, set the **Intra-region IP-IP Direct Audio**, and **Inter-region IP-IP Direct Audio** fields are set to "**yes**".

```
change ip-network-region 1                                    Page   1 of  19
                              IP NETWORK REGION
  Region: 1
Location: 1       Authoritative Domain:
    Name: Retail-HQ
MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: yes
      Codec Set: 1              Inter-region IP-IP Direct Audio: yes
   UDP Port Min: 5000                      IP Audio Hairpinning? n
   UDP Port Max: 5999
DIFFSERV/TOS PARAMETERS                 RTCP Reporting Enabled? y
 Call Control PHB Value: 46      RTCP MONITOR SERVER PARAMETERS
        Audio PHB Value: 46       Use Default Server Parameters? y
        Video PHB Value: 26
802.1P/Q PARAMETERS
 Call Control 802.1p Priority: 6
        Audio 802.1p Priority: 6
        Video 802.1p Priority: 5      AUDIO RESOURCE RESERVATION PARAMETERS
H.323 IP ENDPOINTS                                     RSVP Enabled? n
  H.323 Link Bounce Recovery? y
 Idle Traffic Interval (sec): 20
   Keep-Alive Interval (sec): 5
            Keep-Alive Count: 5
```


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Step	Description
5.	Issue the **add station <n>** command, where <**n**> is a valid unused station number, for example **2220011**. The station numbers correspond to the stations assigned to the VP ports and will be used later in Section 4 Step 4. On Page 1, enter the following values: • Type: Enter station type "**7434ND**". • Port: Enter "**IP**". • Name: Enter a descriptive name. • Security Code: Enter a valid station security code. • Display Module: Enter "**y**". • Display Language: Enter "**english**". • IP Softphone: Enter "**y**". **add station 2220011** Page 1 of 5 STATION Extension: 2220011 Lock Messages? n BCC: 0 **Type: 7434ND** **Security Code: *** TN: 1 Port: IP Coverage Path 1: COR: 1 Name: **Voice Portal 1** Coverage Path 2: COS: 1 Hunt-to Station: STATION OPTIONS Loss Group: 2 Personalized Ringing Pattern: 1 Data Module? n Message Lamp Ext: 2220011 **Display Module? y** **Display Language: english** Coverage Module? n Media Complex Ext: **IP SoftPhone? y** IP Video Softphone? n

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Step	Description
	On Page 2, set the **Multimedia Mode** field to "**enhanced**".

```
add station 2220011                                          Page   2 of   5
                                    STATION
FEATURE OPTIONS
           LWC Reception: spe              Auto Select Any Idle Appearance? n
          LWC Activation? y                          Coverage Msg Retrieval? y
  LWC Log External Calls? n                                  Auto Answer: none
            CDR Privacy? n                               Data Restriction? n
   Redirect Notification? y                     Idle Appearance Preference? n
 Per Button Ring Control? n                   Bridged Idle Line Preference? n
   Bridged Call Alerting? n                      Restrict Last Appearance? y
  Active Station Ringing: single          Conf/Trans on Primary Appearance? n

        H.320 Conversion? n          Per Station CPN - Send Calling Number?
       Service Link Mode: as-needed
         Multimedia Mode: enhanced
    MWI Served User Type:                        Display Client Redirection? n
              AUDIX Name:                      Select Last Used Appearance? n
                                                 Coverage After Forwarding? s

 Remote Softphone Emergency Calls: as-on-local Direct IP-IP Audio Connections? y
 Emergency Location Ext: 2220011   Always Use? n      IP Audio Hairpinning? y
```

On Page 3, set items 1 and 2 of the **BUTTON ASSIGNMENTS** fields to "**call-appr**".

```
add station 2220011                                          Page   3 of   5
                                    STATION
 SITE DATA
       Room:                                          Headset? n
       Jack:                                          Speaker? n
      Cable:                                         Mounting: d
      Floor:                                       Cord Length: 0
   Building:                                         Set Color:


ABBREVIATED DIALING
     List1:                    List2:                    List3:

BUTTON ASSIGNMENTS
 1: call-appr                          6:
 2: call-appr                          7:
 3:                                    8:
 4:                                    9:
```

On Page 5, set item 1 of the **DISPLAY BUTTON ASSIGNMENTS** field to "**normal**".

```
add station 2220011                                          Page   5 of   5
                                    STATION

DISPLAY BUTTON ASSIGNMENTS

 1: normal
 2:
 3:
```


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Step	Description
6.	Repeat Step 5 as necessary to add additional stations **2220012** - **2220016**.
7.	Issue the **add hunt-group <n>** command, where **<n>** is an unused hunt group number. On Page 1, enter the following values and leave the rest with the default values. • Group Name: Enter a descriptive name. • Group Extension: Enter a valid group extension, for example **2220511**. • ISDN/SIP Caller Display: Enter "**grp-name**". On Page 3, enter the Voice Portal station numbers in the **Ext** fields of the **GROUP MEMBER ASSIGNMENTS**. The station numbers were administered in Step 5 - 6.

```
Add hunt-group 11                                              Page   1 of  60
                                  HUNT GROUP

            Group Number: 11                                 ACD? n
              Group Name: Account Balance                     Queue? n
       Group Extension: 2220511                            Vector? n
            Group Type: ucd-mia                    Coverage Path:
                    TN: 1            Night Service Destination:
                   COR: 1                       MM Early Answer? n
          Security Code:                  Local Agent Preference? n
 ISDN/SIP Caller Display: grp-name
```

```
add hunt-group 11                                              Page   3 of  60
                                  HUNT GROUP
          Group Number: 11      Group Extension: 2220511   Group Type: ucd-mia
  Member Range Allowed: 1 - 1500       Administered Members (min/max): 1   /6
                                       Total Administered Members: 6
GROUP MEMBER ASSIGNMENTS
      Ext      Name (24 characters)           Ext      Name (24 characters)
   1: 2220011  VP ST 1                   14:
   2: 2220012  VP ST 2                   15:
   3: 2220013  VP ST 3                   16:
   4: 2220014  VP st 4                   17:
   5: 2220015  VP ST 5                   18:
   6: 2220016  VP ST 6                   19:
   7:                                    20:
   8:                                    21:
   9:                                    22:
```


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Step	Description
8.	Select a C-LAN to be used in Section 4 Step 4 for Voice Portal H.323 provisioning. Issue the **display node-names ip** command. Note the C-LAN IP address "**30.1.1.4**".

```
display node-names ip
                                    IP NODE NAMES
    Name                  IP Address
C-LAN                  30 .1  .1  .4
G250-HQ1-lsp           40 .1  .1  .1
HQ-VAL                 30 .1  .1  .16
MM-MAS                 30 .1  .1  .9
Medpro                 30 .1  .1  .5
RS1-IPO                11 .1  .1  .1
RS2-G350               22 .1  .1  .22
RS4-IPSO               44 .1  .1  .1
default                0  .0  .0  .0
procr                  30 .1  .1  .1
```


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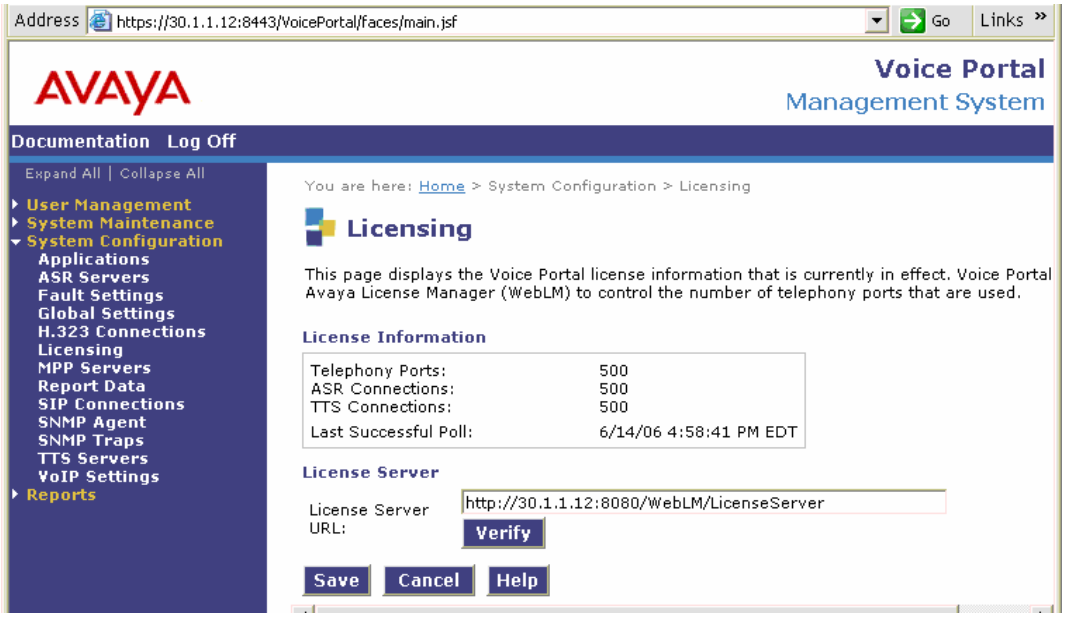
4. Configure Avaya Voice Portal System

This section details the administration of the Avaya Voice Portal Management System (VPMS) and the Media Processing Platform (MPP). It is assumed that the Avaya VPMS and MPP are installed and have the appropriate license. Please refer to the **Avaya Voice Portal Installation Guide** [2] for a description of these procedures. Avaya Voice Portal System is configured using the web interface. The VPMS web interface is accessed by typing the following URL on a web browser and then pressing Enter:

http://<hostname or IP address of VPMS server>:8080/VoicePortal

Step	Description
1.	Log in to VPMS using proper credentials.
2.	In the left pane of the **Voice Portal Management System,** click on **System Configuration → Licensing**. Verify that there are sufficient licenses for **Telephony Ports**, **ASR Connections**, and **TTS Connections**. If not, contact an authorized Avaya account representative to obtain these licenses. 

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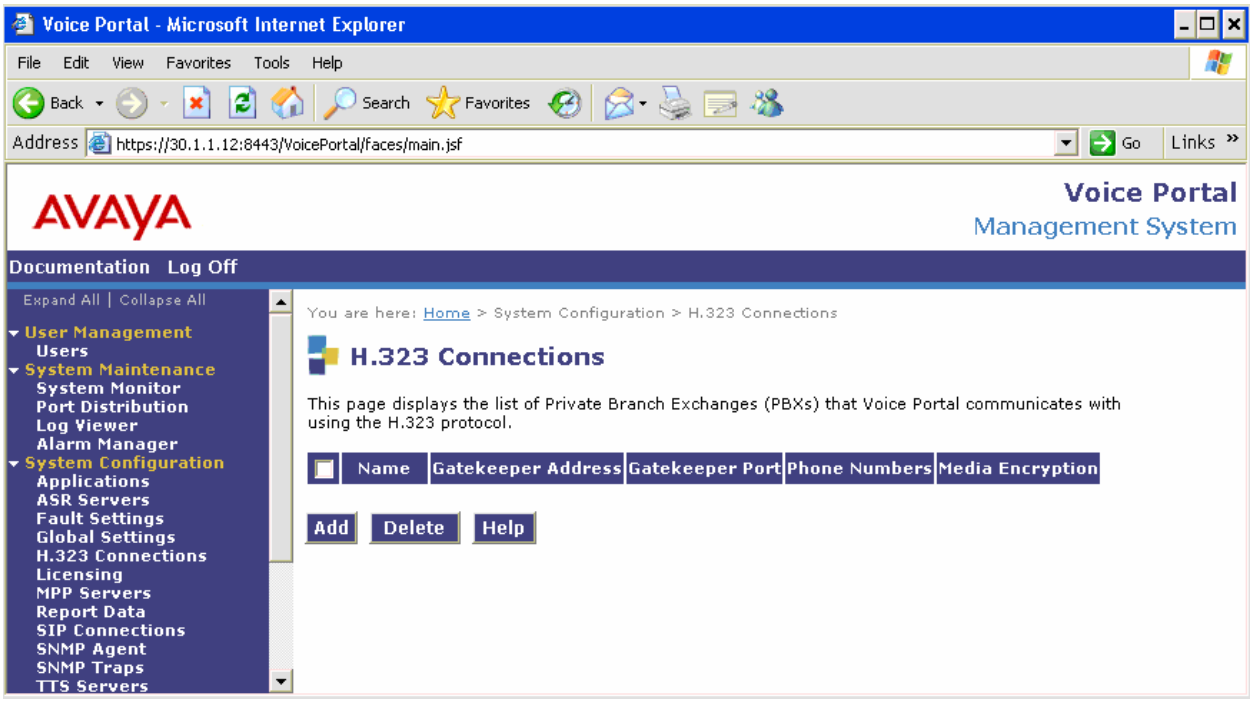
Step	Description
3.	In the left pane of the **Voice Portal Management System,** click on **System Configuration → H.323 Connections**. The **H.323 Connections** screen appears. Click **Add**. 

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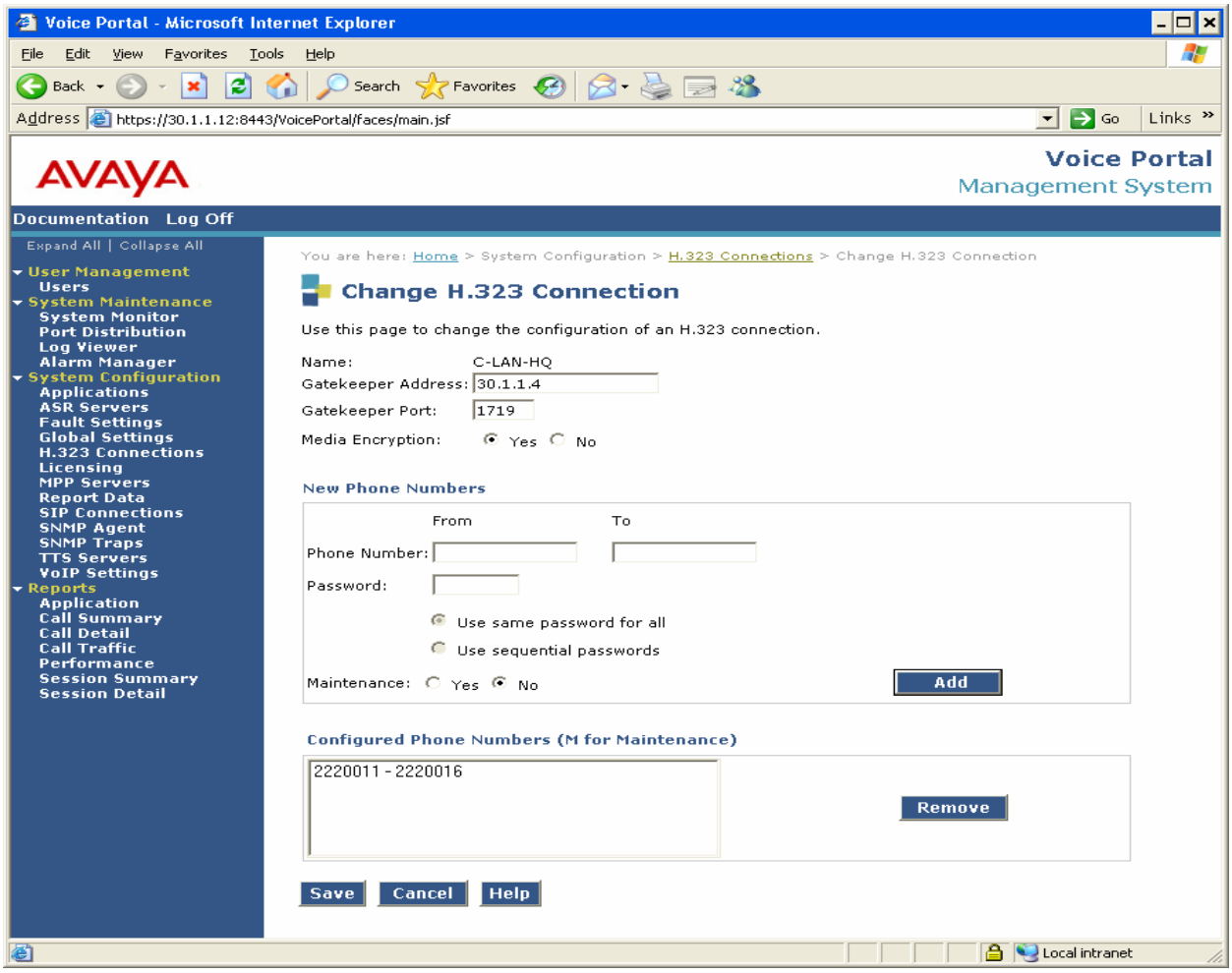
Step	Description
4.	The **Add H.323 Connection** screen appears. Enter the following values: • Name: Enter a descriptive name, for example "**C-LAN-HQ**". • GateKeeper Address: Enter the ip address of the C-LAN "**30.1.1.4**". The C-LAN ip addess can be found in Section 3 Step 8. • GateKeeper Port: Use the default value. • Media Encryption: Check "Yes". This is administered in Section 3 Step 3. • New Phone Number: ▪ From: Enter the first station number "**2220011**" administered in Section 3 Step 5. ▪ To: Enter the last station number "**2220016**" administered in Section 3 Step 6. ▪ Password: Enter station password. ▪ Check **Use same password for all**. ▪ Click **Add**. Scroll down to the bottom of the screen, and click **Save**. 

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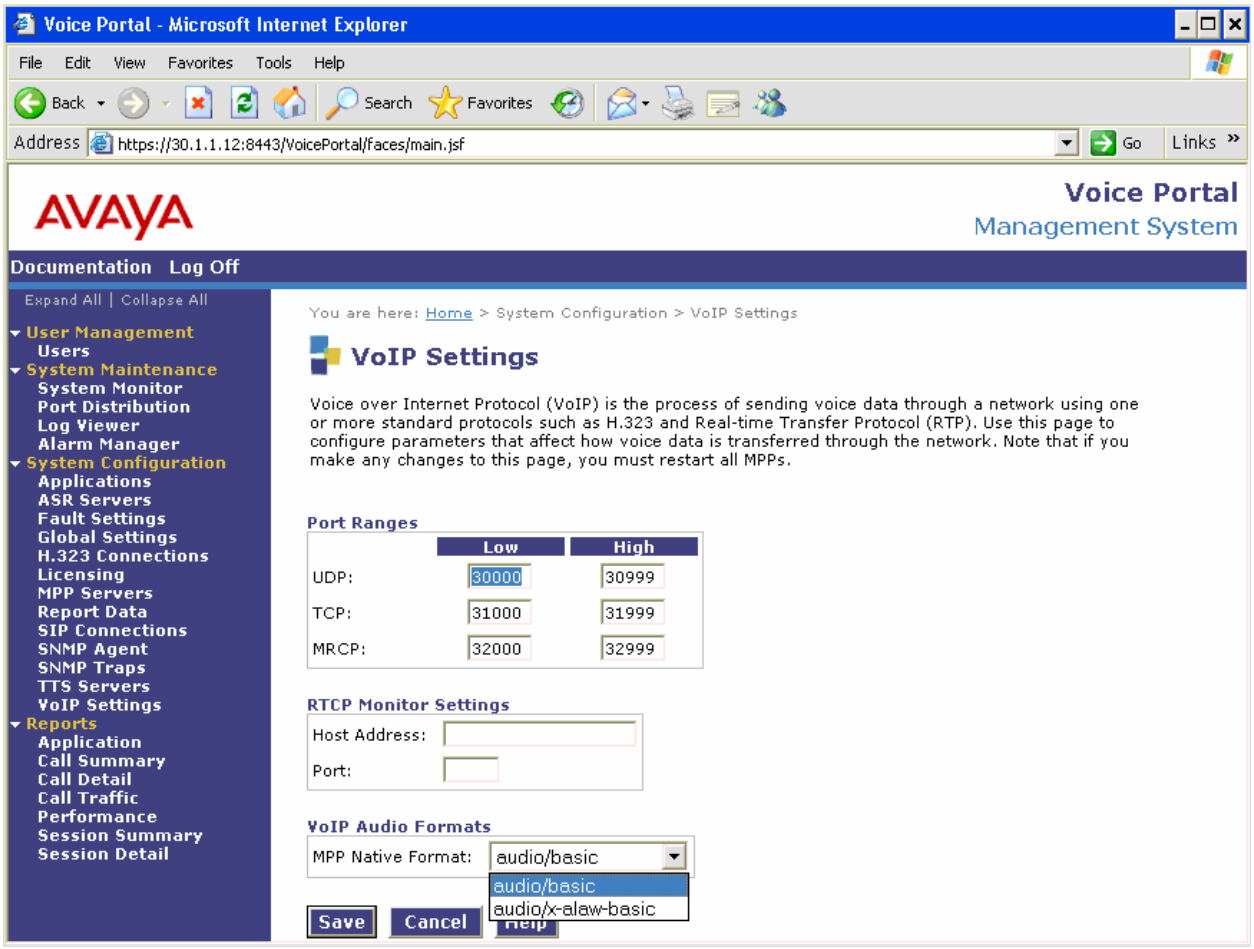
Step	Description
5.	In the left pane of the **Voice Portal Management System,** click on **System Configuration → VoIP Settings**. The **VoIP Settings** screen appears. Select "**audio/basic**" from the **MPP Native Format** drop down list. This setting is equivalent to the codec setting "**G711MU**" on Avaya Communication Manager administered in Section 3 Step 3. Retain the default values for all other fields. Click on **Save**. 

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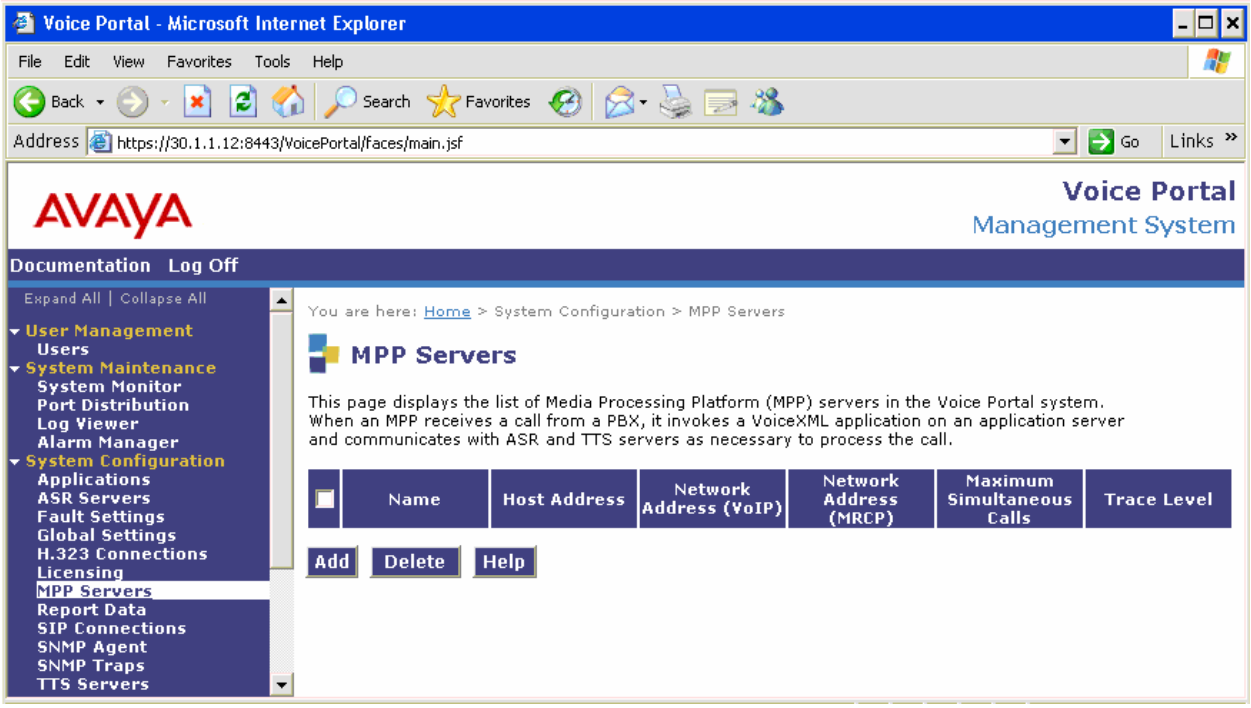
Step	Description
6.	In the left pane of the **Voice Portal Management System,** click on **MPP Servers**. The **MPP Servers** screen appears. Click **Add**. 

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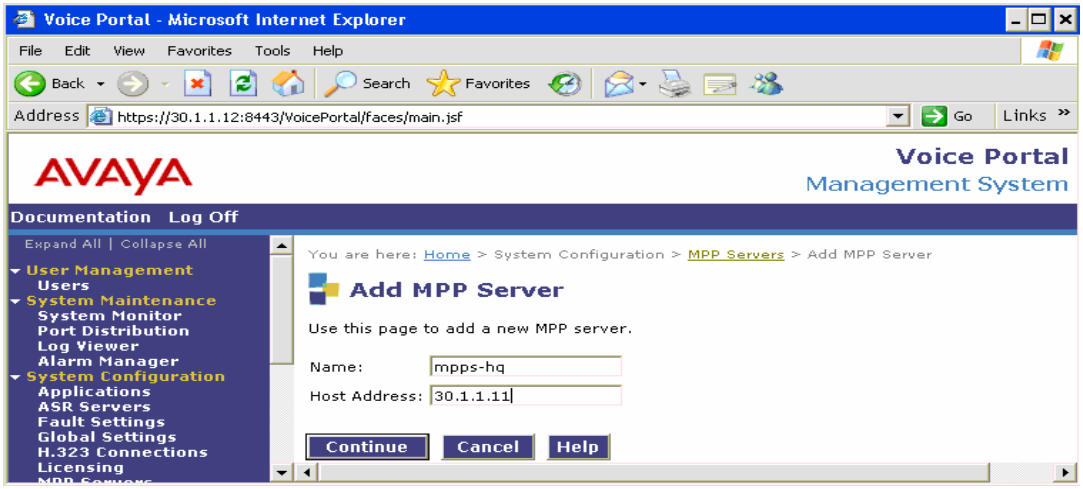
Step	Description
7.	The **Add MPP Servers** screen appears. Enter the following values: • Name: Enter a descriptive name, for example "**mpps-hq**". • Host Address: Enter the ip address of the MPP server, for example "**30.1.1.11**". Click **Continue**. 

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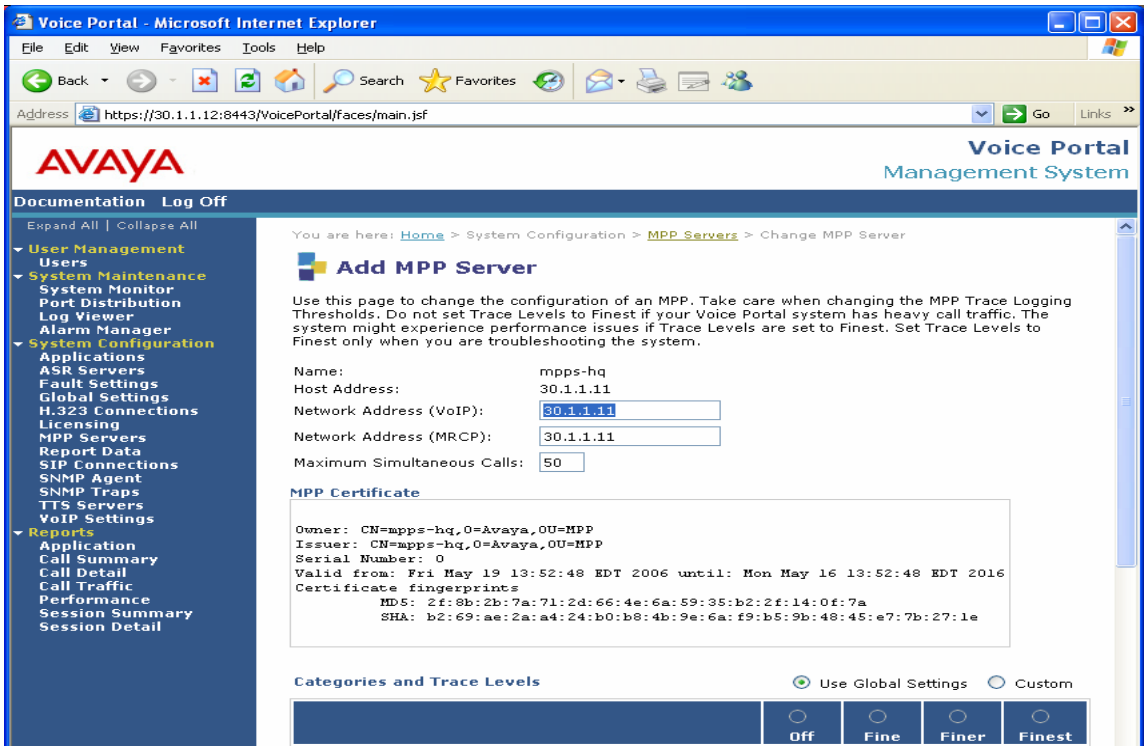
Step	Description
8.	A new **Add MPP Servers** screen appears. In the **Maximum Simultaneous Calls** field, enter the maximum number of simultaneous calls. The valid number is in the range of 1 to 128. Retain the default values for all other fields. Scroll down to the bottom of the screen and click **Save**. 

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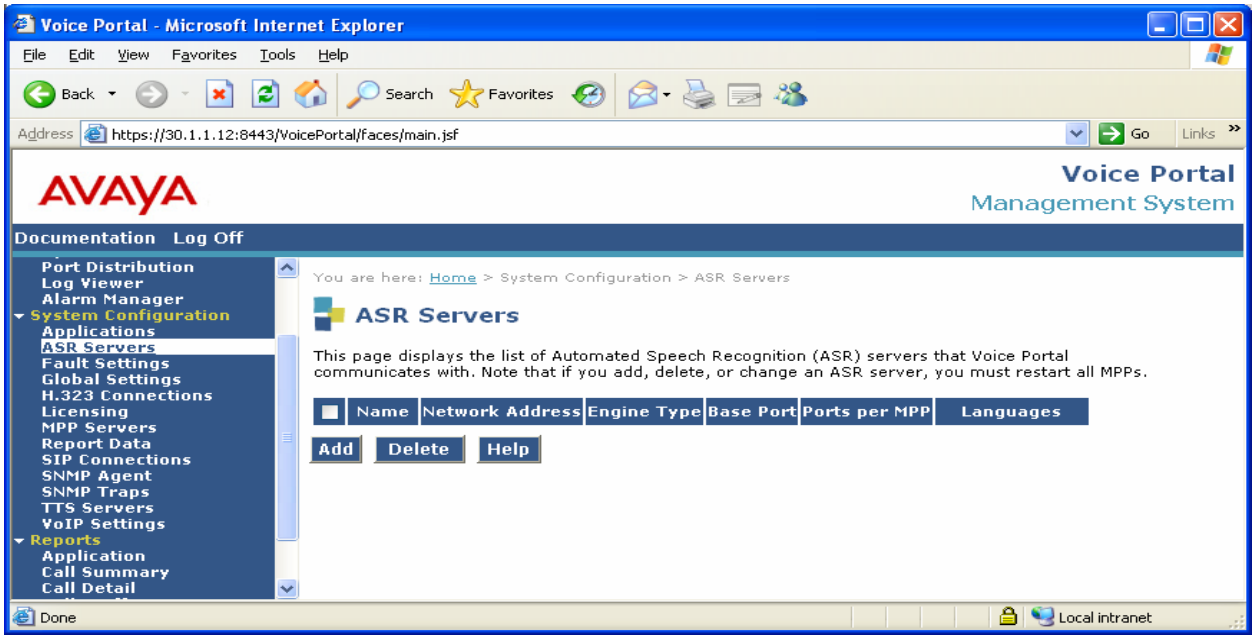
Step	Description
9.	In the left pane of the **Voice Portal Management System,** click on **ASR Servers**. The **ASR Servers** screen appears. Click **Add**. 

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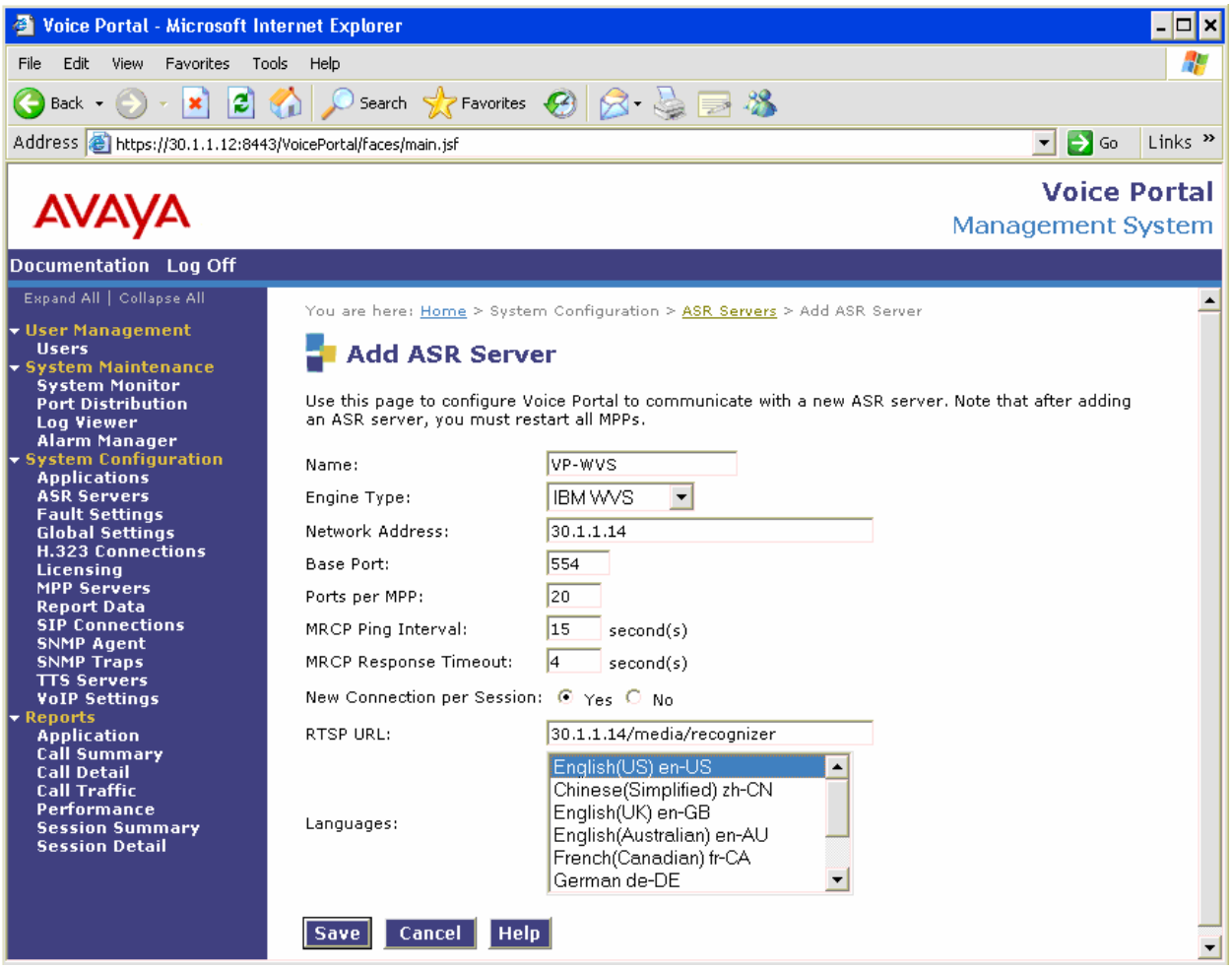
Step	Description
10.	The **Add ASR Server** screen appears. Enter the following values and retain the rest of the default values. • Name: Enter a descriptive name, for example "**VP-WVS**". • Engine Type: Select "**IBM WVS**" from the **Engine Type** drop down list. • Network Address: The ASR Engine is installed on the IBM WebSphere server. Enter the IP address of the IBM WebSphere server address. • Ports per MPP: Enter a valid number that a MPP can connect to on this ASR. The valid numbers are 1 to 1000. Click **Save**. 

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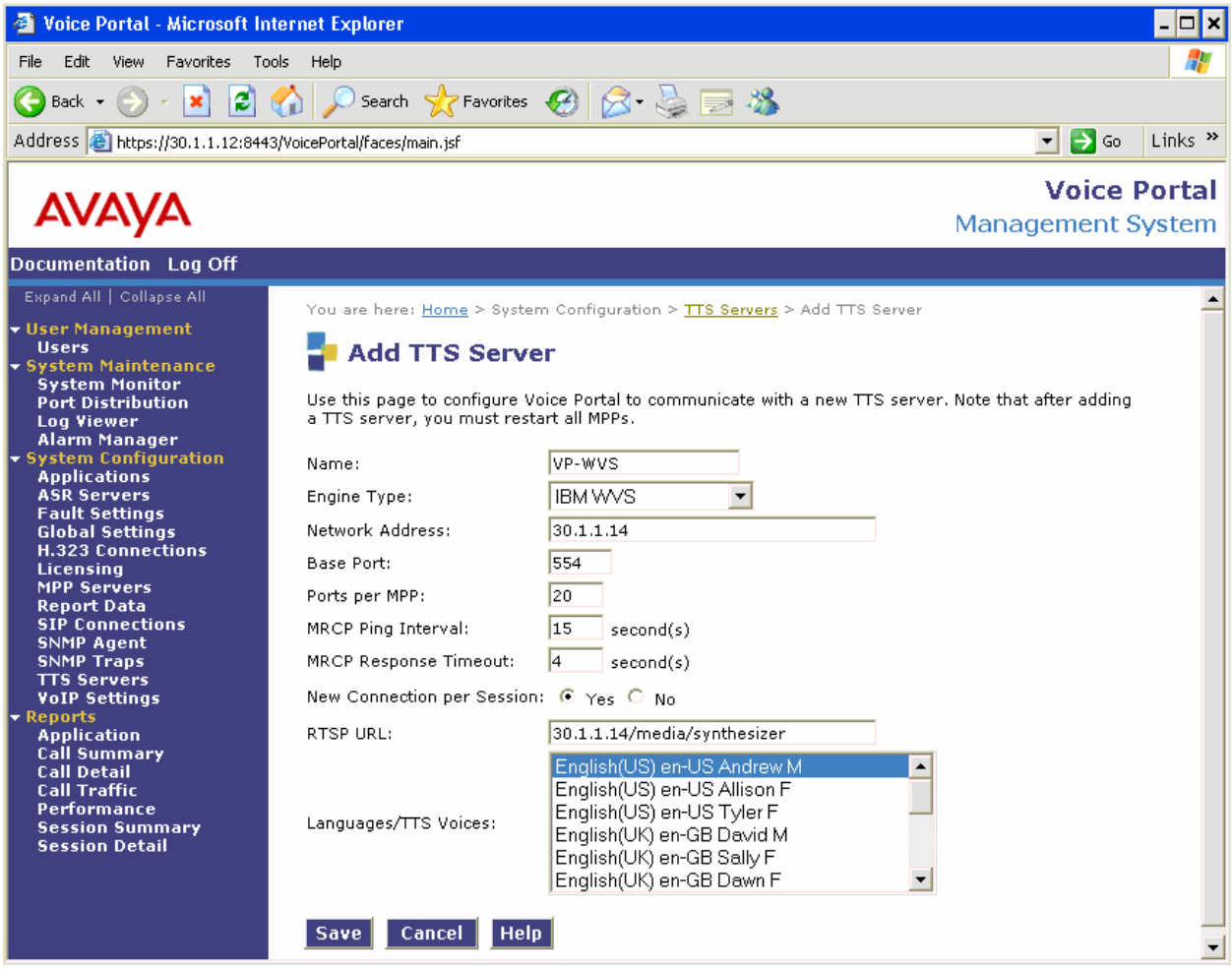
Step	Description
11.	In the left pane of the **Voice Portal Management System,** click on **TTS Servers**. The **TTS Servers** screen appears. Click on **Add**. The **Add TTS Server** Screen appears. Enter the following values and retain the rest of the default values. • Name: Enter a descriptive name, for example "**VP-WVS**". • Engine Type: Select "**IBM WVS**" from the **Engine Type** drop down list. • Network Address: The TTS Engine is installed on the IBM WebSphere server. Enter the IP address of the IBM WebSphere server address. • Ports per MPP: Enter a valid number that a MPP can connect to on this TTS. The valid numbers are 1 to 1000. Click **Save**. 

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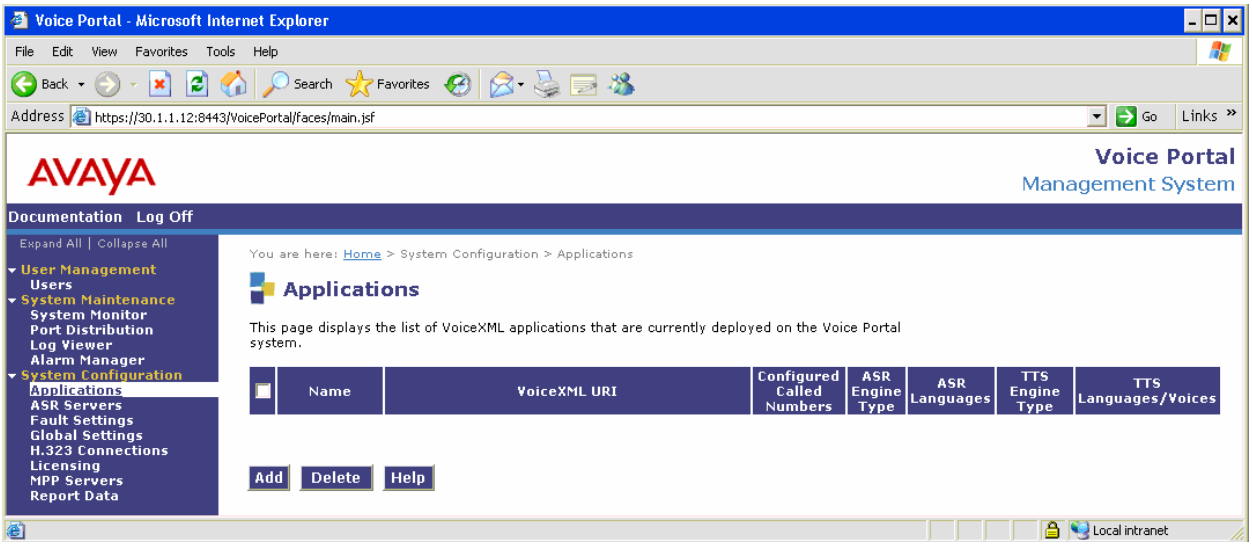
Step	Description
12.	In the left pane of the **Voice Portal Management System,** click on **Applications**. The **Applications** screen appears. Click **Add**. 

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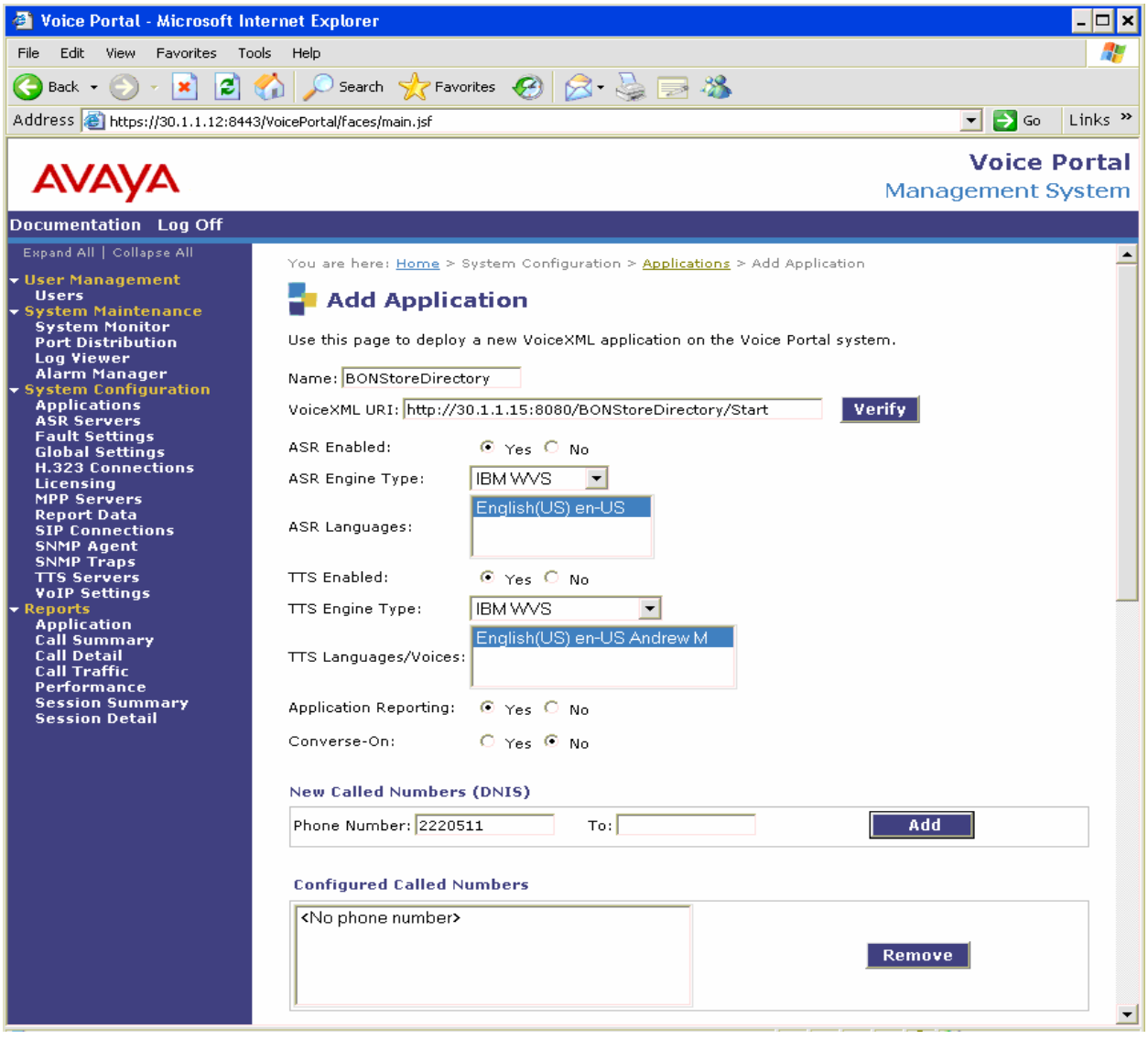
Step	Description
13.	The **Add Application** screen appears. Enter the following values: • Name: Enter a descriptive name. • VoiceXML URI: Enter "**http://<application server IP address>:8080/<application name>/Start**", for example: "**http://30.1.1.15:8080/BONStoreDriectory/Start**". • Phone Number: Enter the hunt-group number added in Section 3, Step 7, and then click **Add.** Retain the rest of the default values. Scroll down to the bottom of the screen, and click **Save**. 

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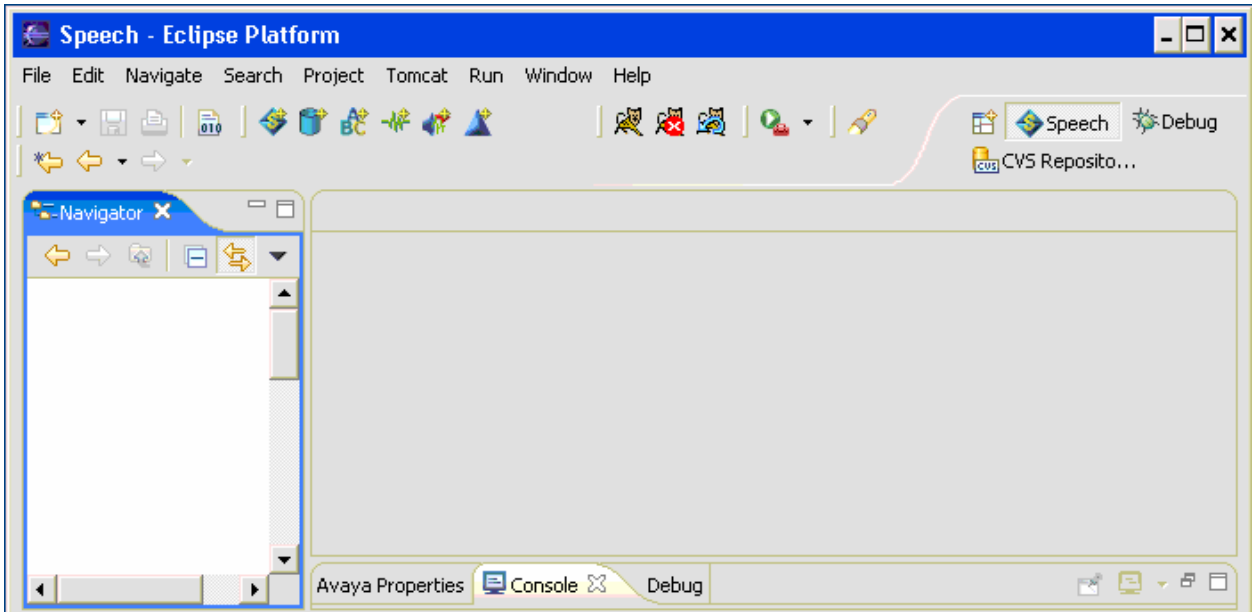
5. Design and Generate Speech Application

These Application Notes assume that the Dialog Designer (DD) depicted in **Figure 1** is already installed. Refer to [3] for detailed information about installation procedure. The DD was used to develop and generate the speech application. The speech application is a set of servlets, grammars and other artifacts which are needed to generate VoiceXML at run-time.

5.1. Develop the Speech Application

This section describes the steps necessary to design a sample application with a database connector using the Dialog Designer. It is assumed that the Dialog Designer, Microsoft SQL server and the Microsoft JDBC driver were already installed. In this sample application, the database name "RetailStore" and the database table "consumerAccount" must be created before the DD database connector configuration in Steps 6 and 7 can be performed.

Step	Description
1.	Launch the Dialog Designer. From the DD server, navigate to **Start → Programs → Eclipse.** The **Speech - Eclipse Platform** screen appears. In the **Speech - Eclipse Platform** window, click **File→ New → Speech Project**. 

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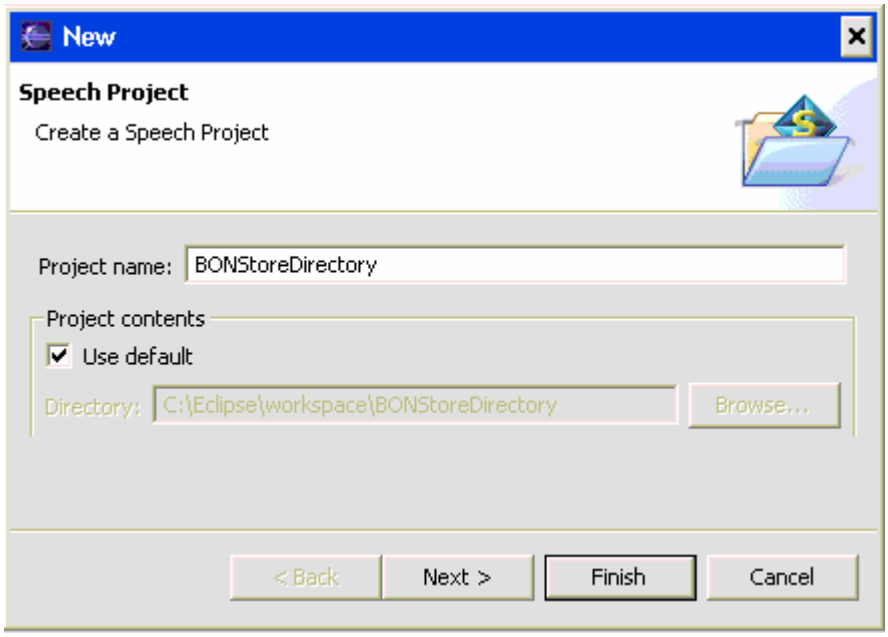
Step	Description
2.	The **New Speech Project** screen appears. Enter a descriptive project name, for example "**BONStoreDirectory**". Check the **Use default** checkbox. Click **Finish**. 

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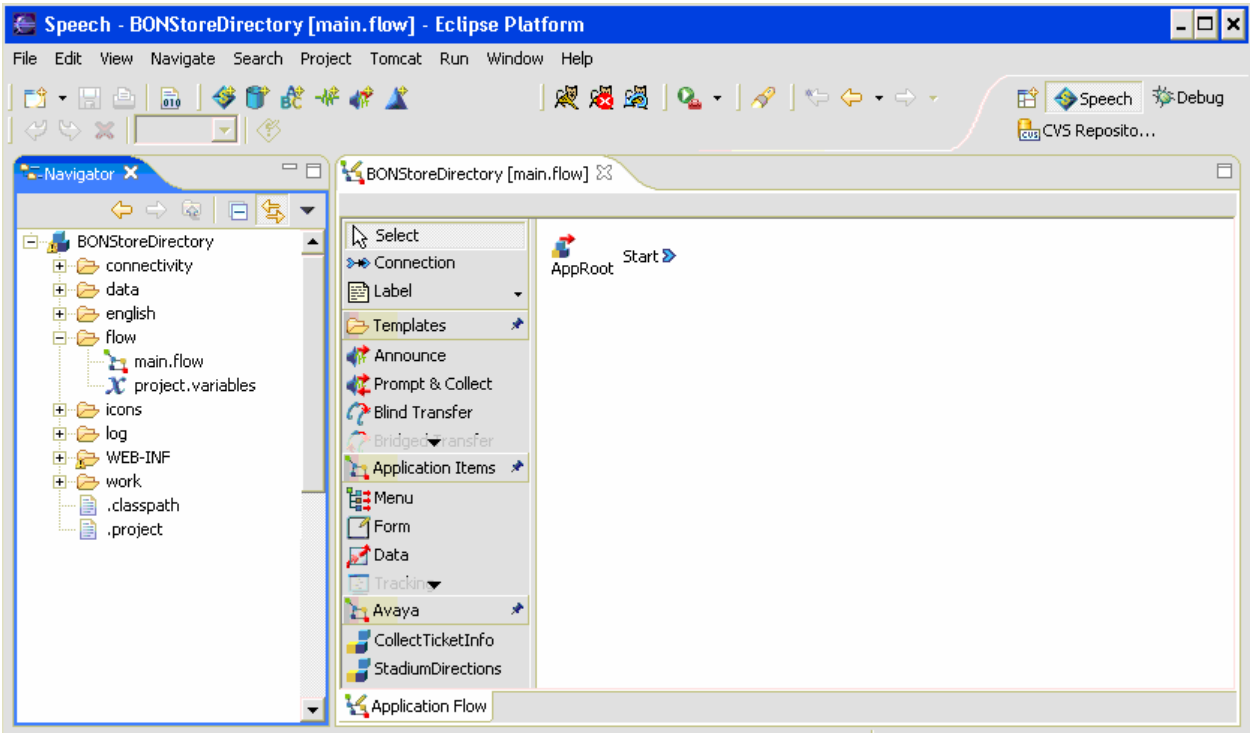
Step	Description
3.	Add data source to the BONStoreDirectory project. In the **Navigator** view, click on **BONStoreDirectory.** In the popup window that appears, select **Property** followed by **Dialog Designer**. 

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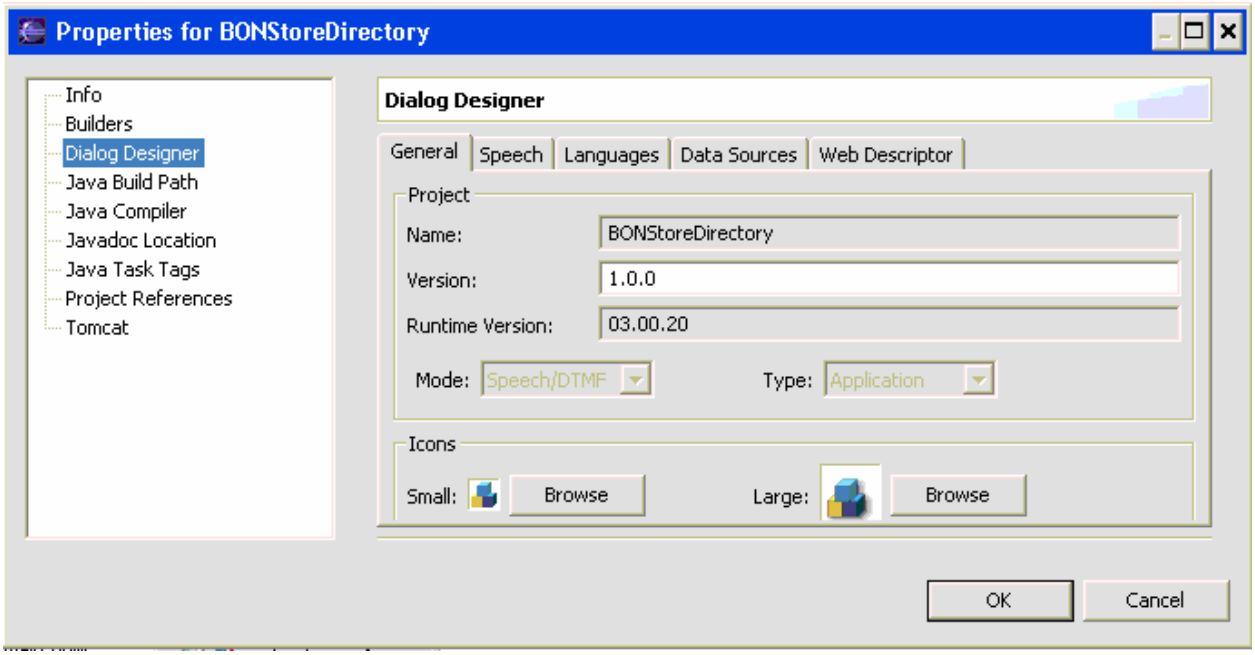
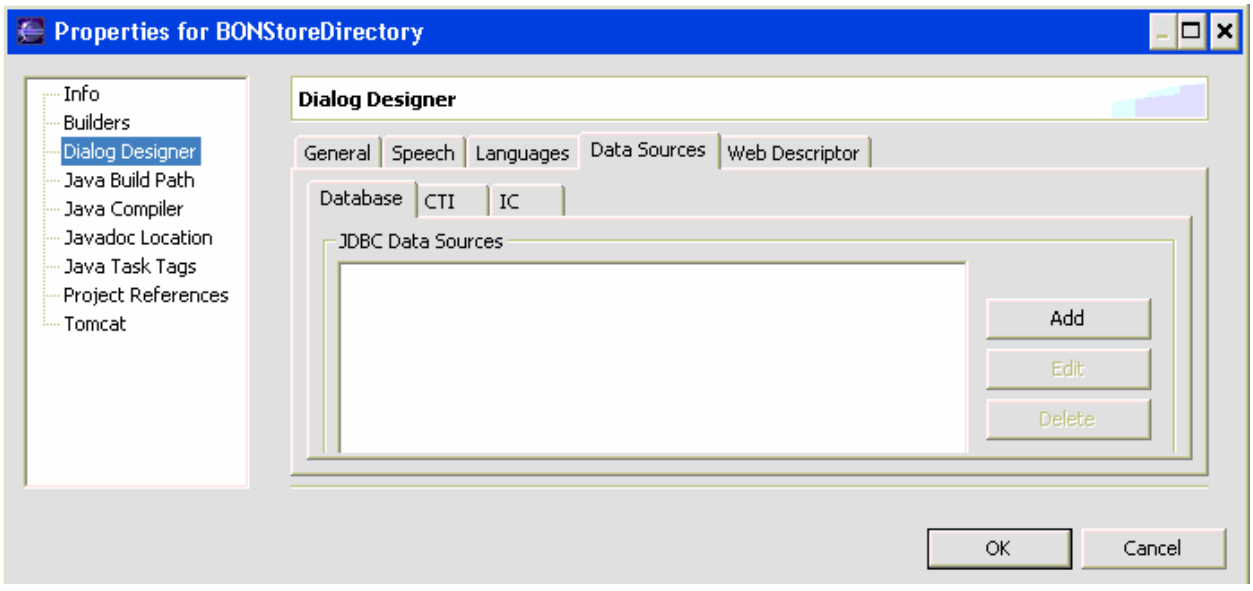
Step	Description
4.	The **Properties for BONStoreDirectory** screen appears. Click the **Data Sources** tab. 
5.	The **JDBC Data Sources** appears. To add JDBC data source, click **Add**. 

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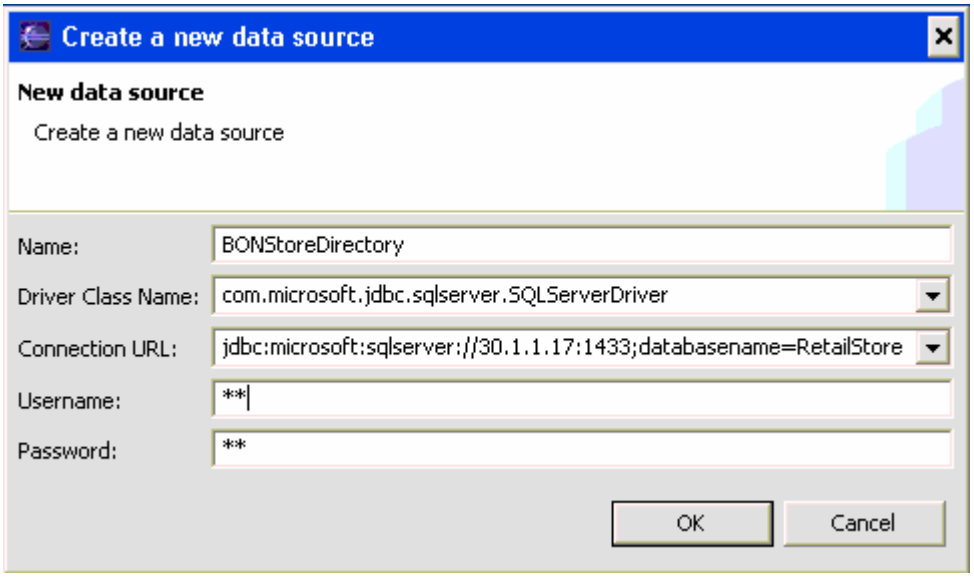
Step	Description
6.	In the **Create a new data source** window, enter the following values. • Name: Enter a descriptive name, for example "**BONStoreDirectory**". • Driver Class Name: Select "**com.microsoft.jdbc.sqlserver.SQLServerDriver**" from the pull-down menu. • Connection URL: Select "**jdbc:microsoft:sqlserver://30.1.1.17:1433;databasename=RetailStore**" from the pull-down menu. The IP address 30.1.1.17 is the IP address of the SQL server. 1433 is the port number used by the JDBC connector. RetailStore is the database name in the SQL server. **Note**: The database name must be already created in the SQL server prior to performing this step. • Username/Password: Enter the proper credentials. Click **OK**. 

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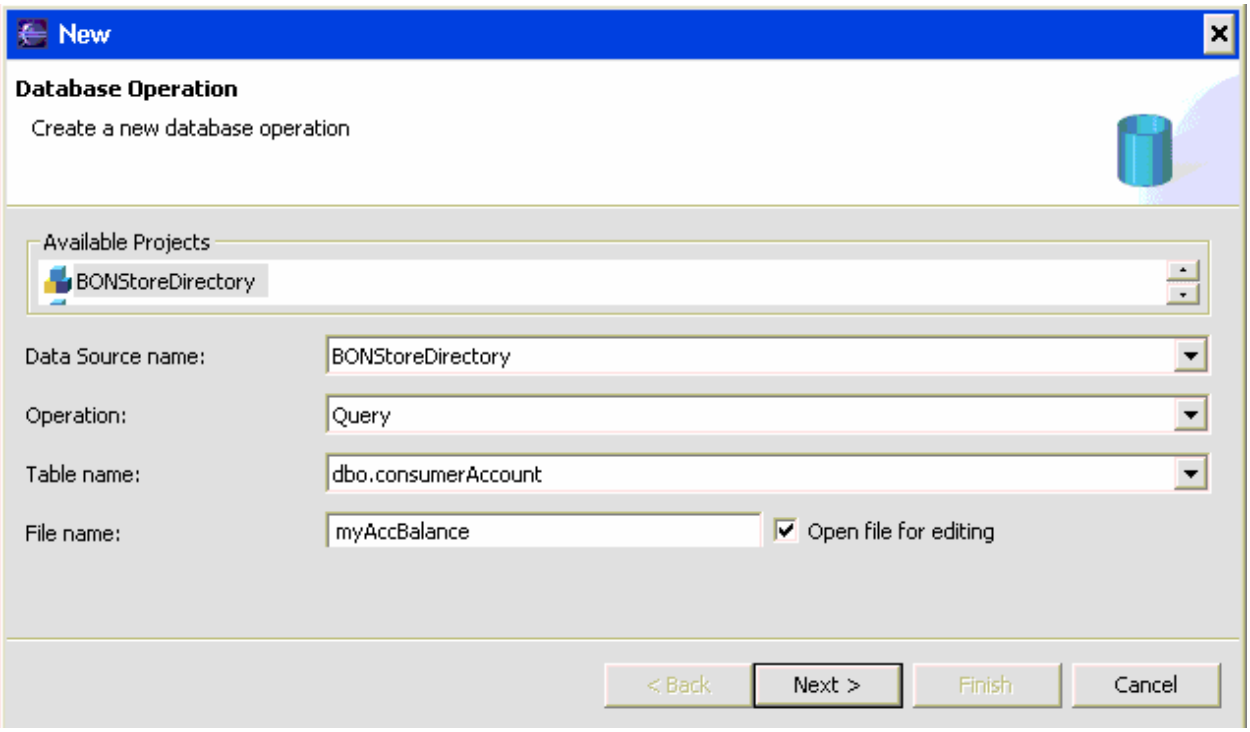
Step	Description
7.	Add a new database operation. In the **Navigator** view, click **connectivity → dboperations → New → Database Operation File**. The **Database Operation** screen appears. Enter the following values, and then click **Next**. • Data Source name: Select "**BONStoreDirectory**" from the drop down list. The name **BONStoreDirectory** was administered in Step 6. • Operation: Select "**Query**" from the drop down list. • Table name: Select "**dbo.consumerAccount**" from the drop down list. **Note**: The database table must be already created in the SQL server prior to performing this step. • File name: Enter a descriptive name, for example "**myAccBalance**". • Mark the **Open file for editing** checkbox. 

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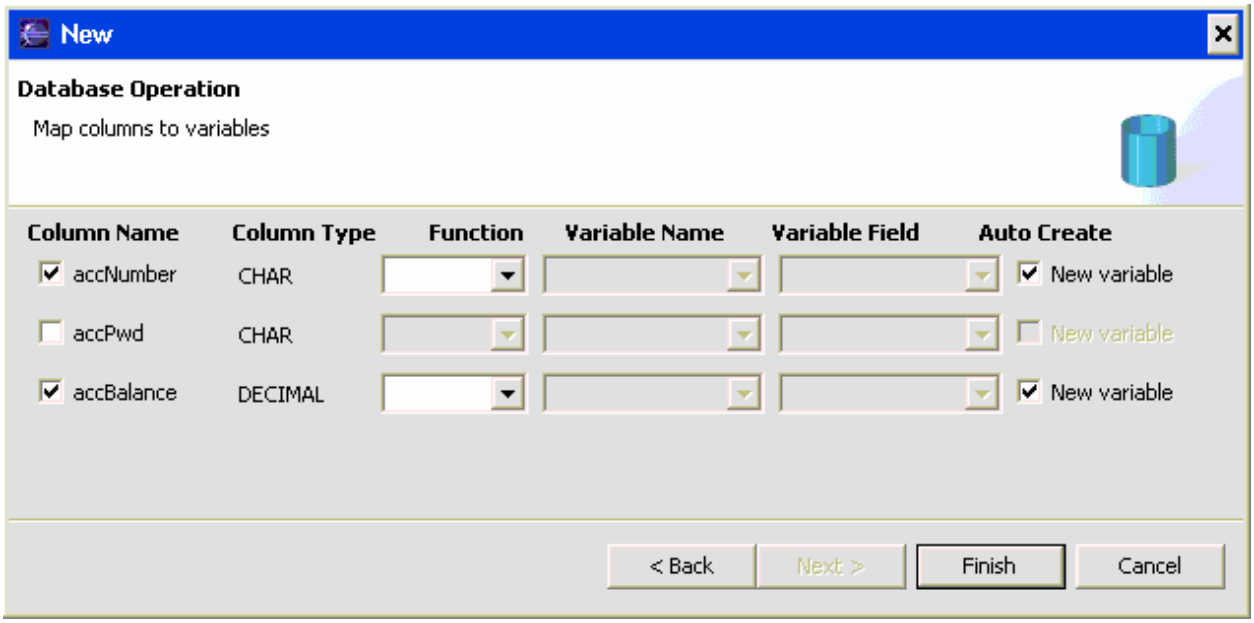
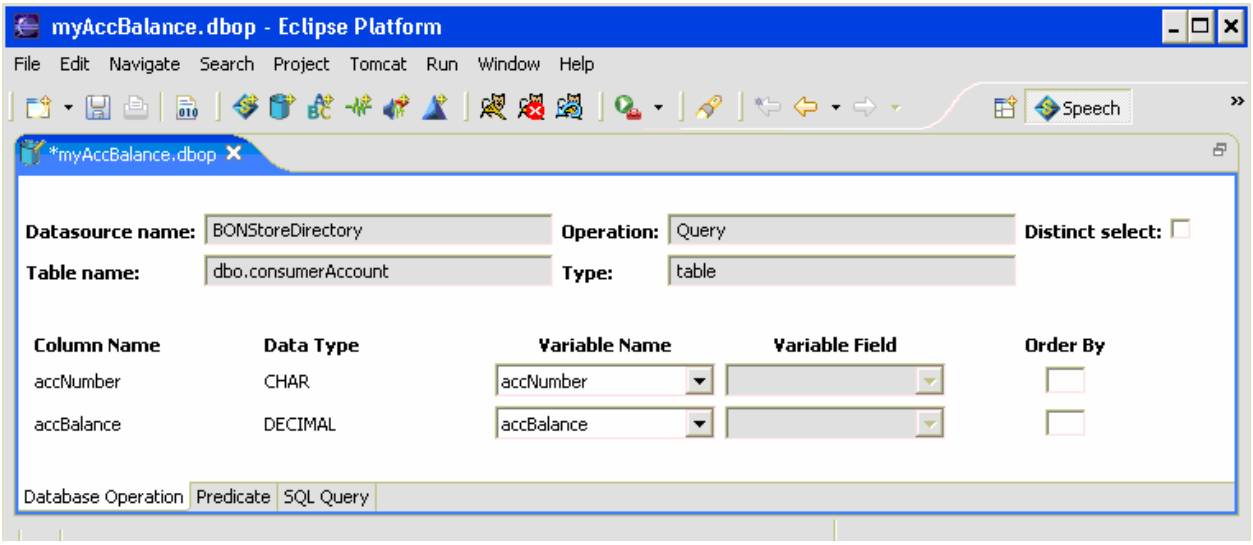
Step	Description
8.	The **Map columns to variables** screen appears. To create new variables, check the **accNumber** and **accBalance**, and **New variable** checkboxes. **Note**: The accPwd column exists in the database table, but is not required in this database operation. Click **Finish**. 
9.	The **myAccBalance.dbop** screen appears in the workspace. This database query operation uses account number to query the account balance. To set the query condition, click the **Predicate** tab. 

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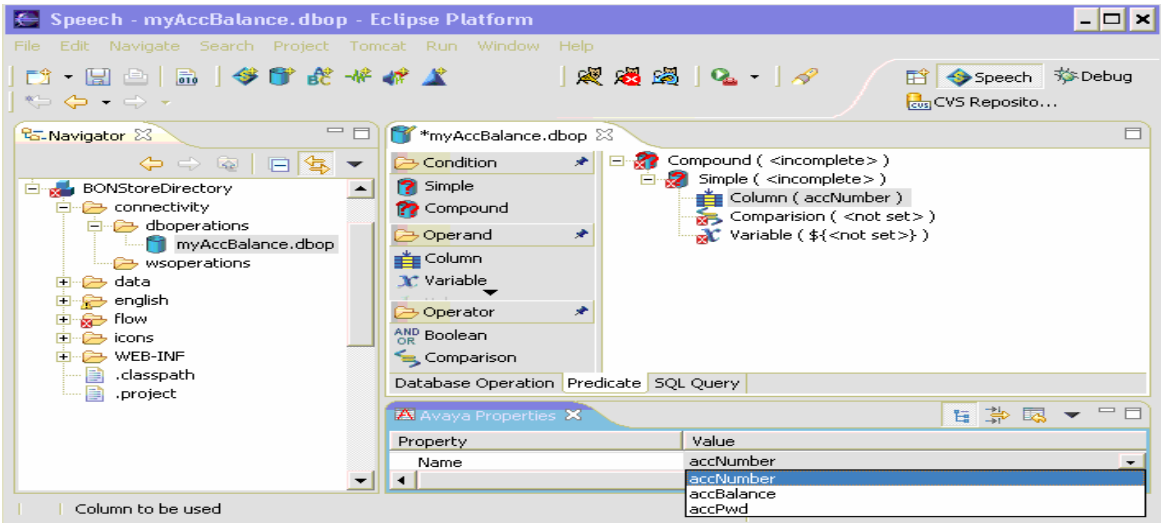
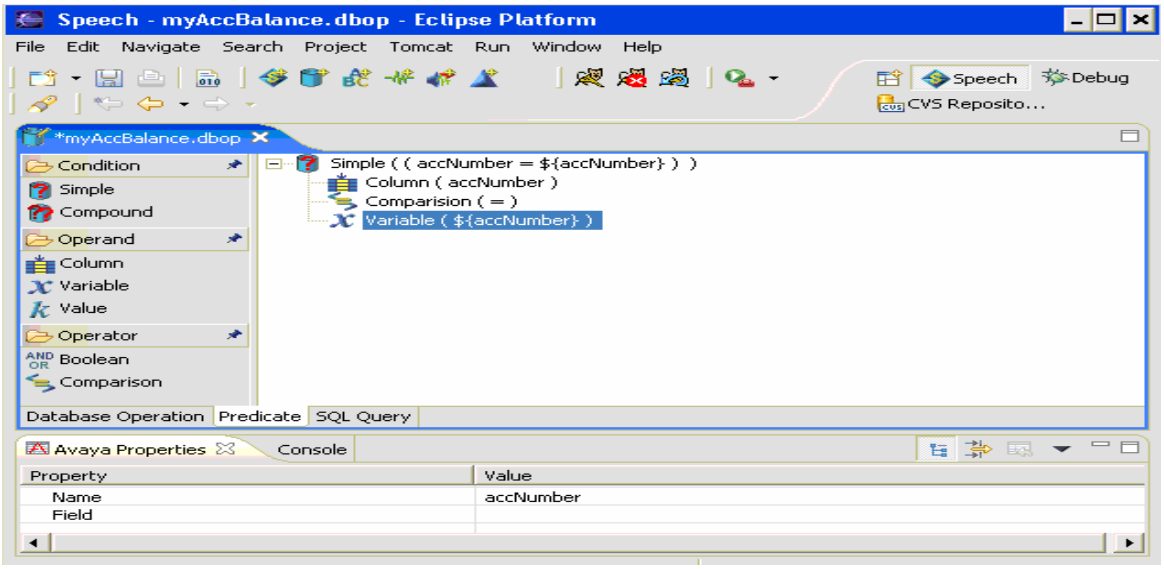
Step	Description
10.	The **Predicate** tab appears. The following steps, add a **Simple** database operation for account balance query. • From the palette, under **Condition**, select **Simple**, and place it in the workspace. • Under **Operand**, select **Column**, and place it in the workspace under **Simple**. In the **Avaya Properties** view, for the **Name** property, select "**accNumber**" from the **Value** drop down list. • Under **Operator**, select **Comparison**, and place it in the workspace under Column. In the **Avaya Properties** view, for the **Name** property, select "**=**" from the **Value** drop down list. • Under **Operand**, select **Variable**, and place it in the workspace under Comparison. In the **Avaya Properties** view, for the **Name** property, select "**accNumber**" from the **Value** drop down list.  

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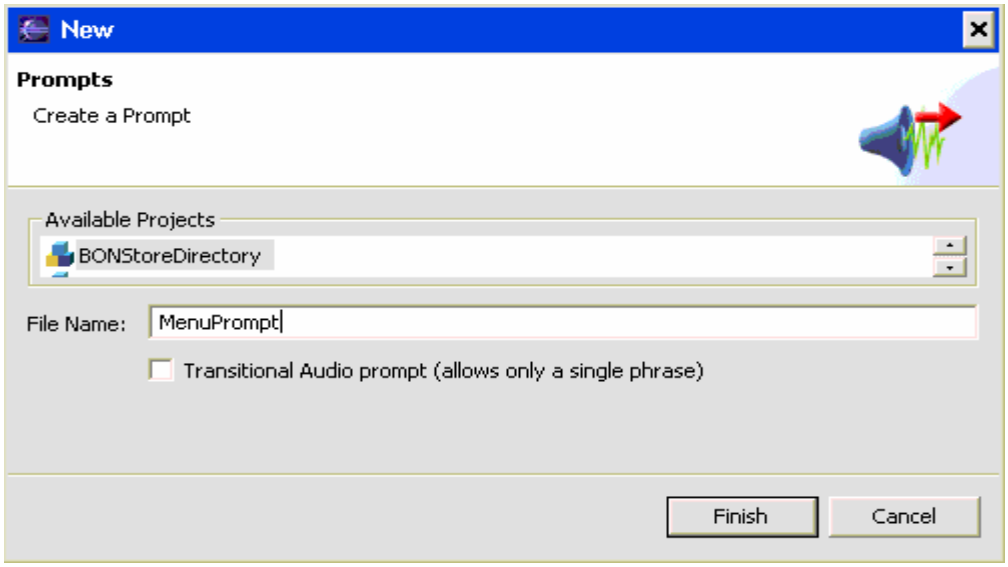
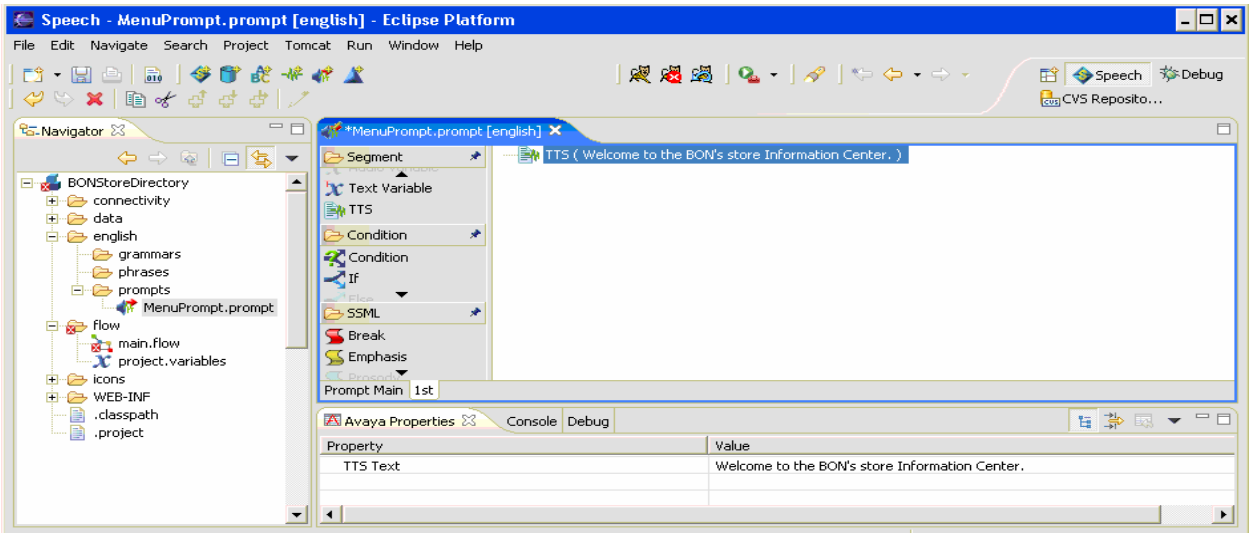
Step	Description
11.	To create a new prompt file, click **File → New → Prompt File** from Dialog Designer main screen. The **Prompts** screen appears. In the **Available Projects** click on project name **BONStoreDirectory**. Enter a descriptive name in the **File Name** field, for example "**MenuPrompt**". Click **Finish**. 
12.	The **MenuPrompt.prompt [english]** appears in the work place. In the **Avaya Properties** view, **TTS Text** Property, enter the text in the **Value** field, for example "**Welcome to the BON's Store Information Center**". To save the change, click on the **Save** tab. 

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Step	Description
13.	Repeat Steps 11 - 12 to add additional text to speech prompts as necessary. For the testing, "**NoMatch**", "**NoInput**", "**echoAccount**" and "**returnBalanceVoice**" text prompt files were created.

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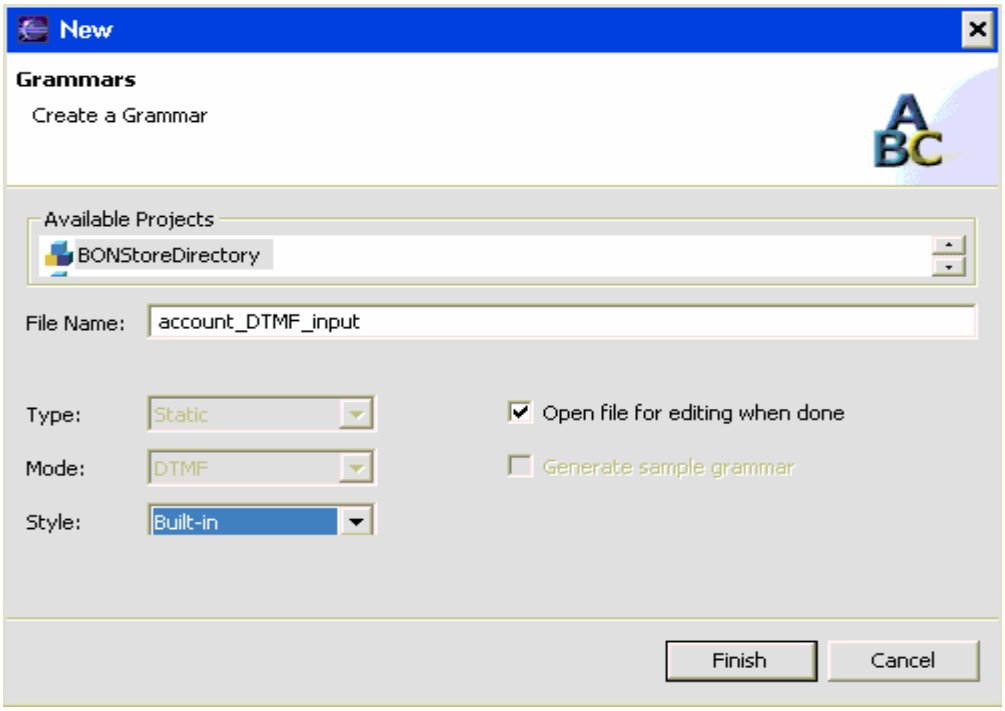
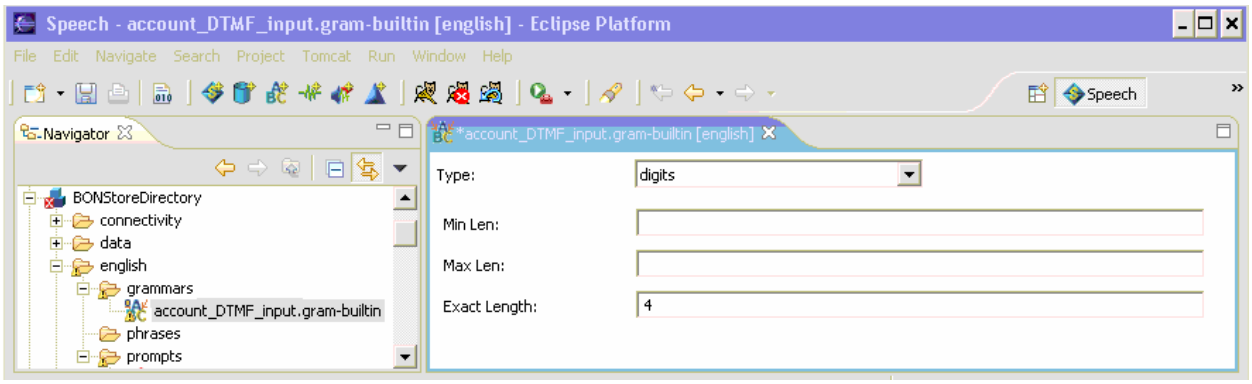
Step	Description
14.	To create a DTMF grammar file, click **File → New → Grammar File** from Dialog Designer main screen. The **Grammars** screen appears. Enter a descriptive name in the **File Name** field, for example "**account_DTMF_input**". Select "**Built-in**" from the **Style** drop down list and retain the default values for other fields. Click on **Finish**. This file will be used in Step 15.  A new page appears. Select "**digits**" from the **Type** drop down list. The sample configuration uses a 4 digit account number. To set the grammar file to accept exactly 4 digits, enter "**4**" in the **Exact Length** field. Click the **Save** icon. 

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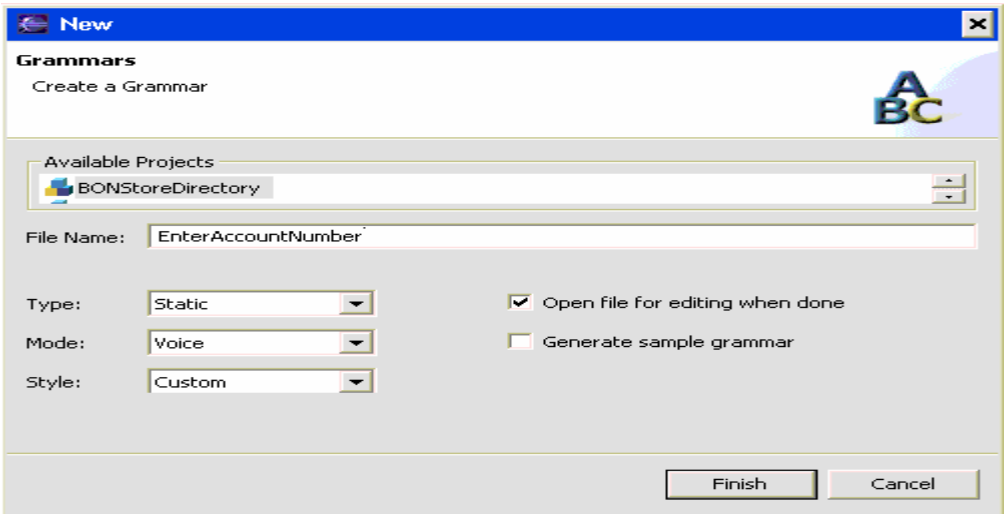
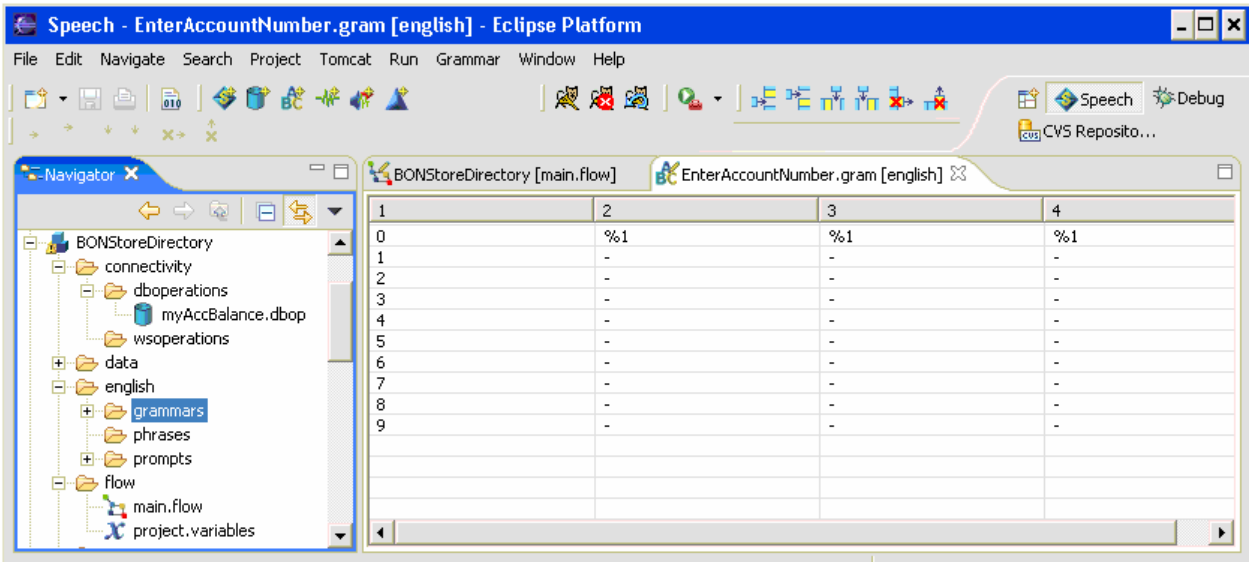
Step	Description
15.	To create a static grammar file, click **File → New → Grammar File**. The **New Grammars Create a Grammar** screen appears. Enter a descriptive name in the **File Name** field. Retain the default values for other fields. Click **Finish**.  A **EnterAccountNumber.gram [english]** appears in the workspace. Edit the grammar file to collect any digits from 0 to 9. Enter digit 0 in row one of column 1 and then click the **Enter** button. The icons to **add/delete a grammar row/column** appear. Click the **add rows** icon to add additional 9 rows. In column 1 of the new rows enter a unique digit from 1 to 9. To collect 4 responses in a single grammar file, click **add columns** icon to add additional 3 columns. In row one of columns 2 to 4, enter "**%1**". Click the **Save** icon. 

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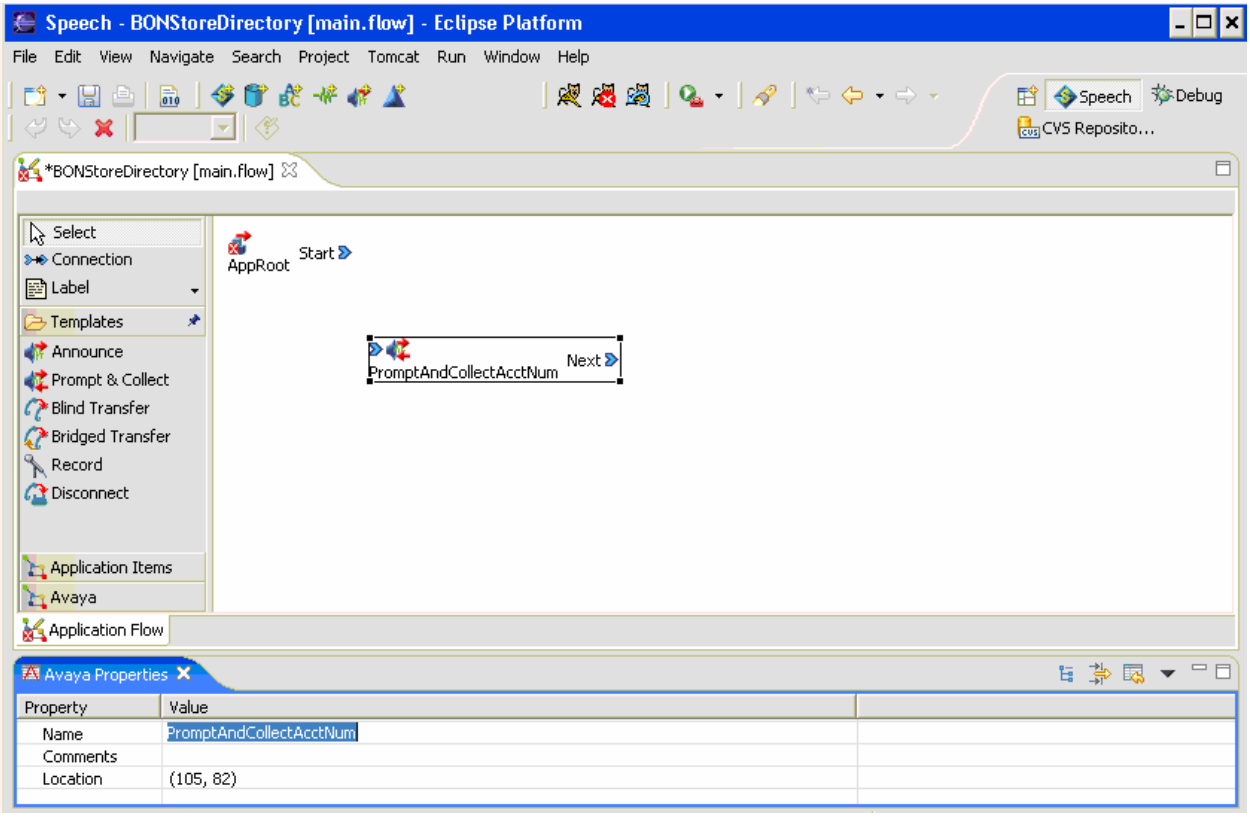
Step	Description
16.	Add a **Prompt & Collect** node to the call flow. In the **Navigator** view, click **BONStoreDirectory → flow → main.flow**. The work flow editor palette and the **BONStoreDirectory [main.flow]** workspace appear. From the palette, select the **Prompt & Collect** node and place it in the workspace. In the **Avaya Properties** view, edit the name in the **Value** field to a descriptive name, for example "**PromptAndCollectAcctNum**". Click **Save**. 

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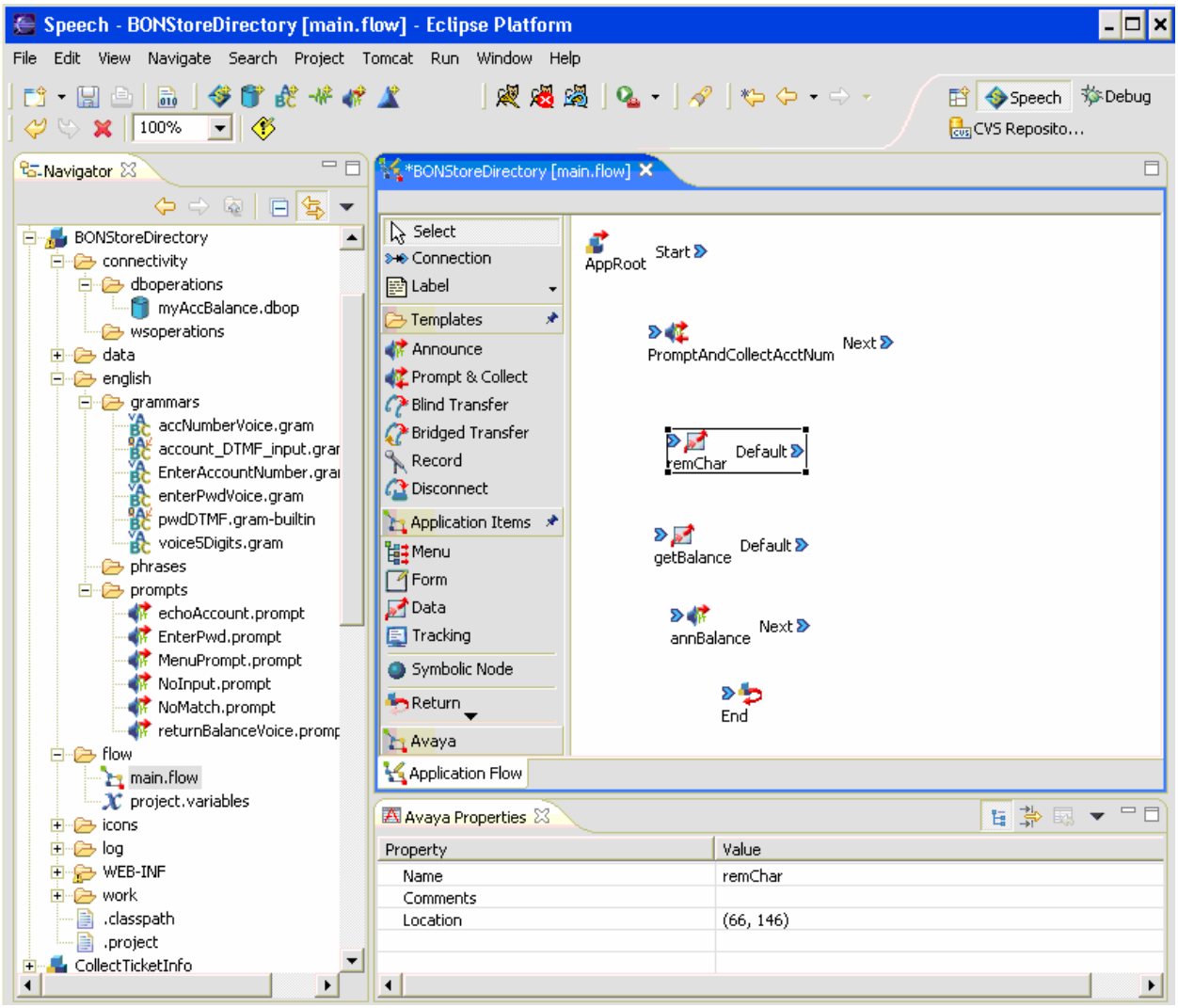
Step	Description
17.	Repeat Step16 to place the following nodes in the workspace. • Select the **Data** node and place it in the workspace. In the **Avaya Properties** view, Name Property, enter a descriptive name in the **Value** field, for example "**remChar**". • Select the **Data** node and place it in the workspace. In the **Avaya Properties** view, Name Property, enter a descriptive name in the **Value** field, for example "**getBalance**". • Select the **Announce** node and place it in the workspace. In the **Avaya Properties** view, Name Property, enter a descriptive name in the **Value** field, for example "**annBalance**". • Select the **Return** node and place it in the workspace. In the **Avaya Properties** view, Name Property, enter a descriptive name in the **Value** field, for example "**End**". Click the **Save** icon. 

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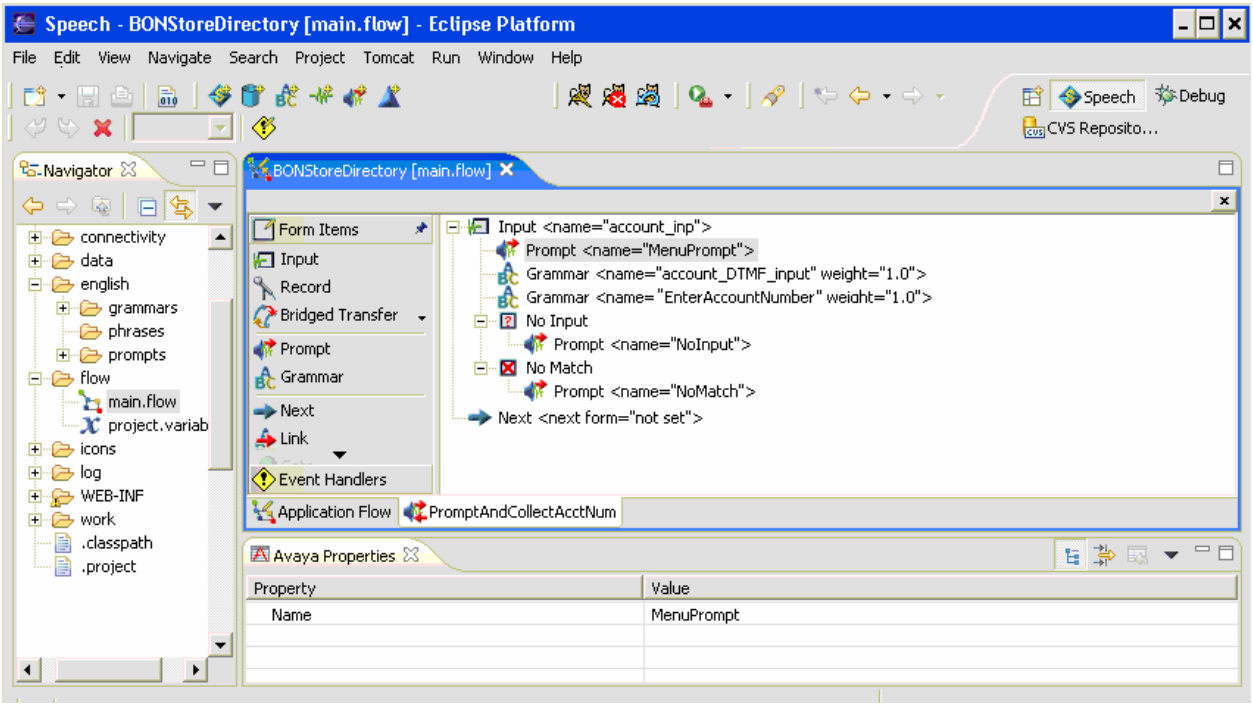
Step	Description
18.	In the workspace as shown in Step 17, double click on the **PromptAndCollectAcctNum** node. The **PromptAndCollectAcctNum** appears in the workspace. Click on each item to enter the following values in the **Avaya Properties**: • Input: Enter a descriptive name, for example "**account_inp**". • Prompt: Enter the name of the prompt file, "**MenuPrompt**", created in Step 12. • Grammar: To collect caller touch tone inputs, enter the name of the grammar file, created in Step 14, "**account_DTMF_input**". • Grammar: For caller utterance, enter the name of the grammar file, created in Step 15, "**accNumberVoice**". • No Input: Enter the name of the prompt file name "**NoInput**" created in Step 13. • No Match: Enter the name of the prompt file name "**NoMatch**" created in Step 13. • Next: Leave it "**not set**". Click the **Save** icon. 

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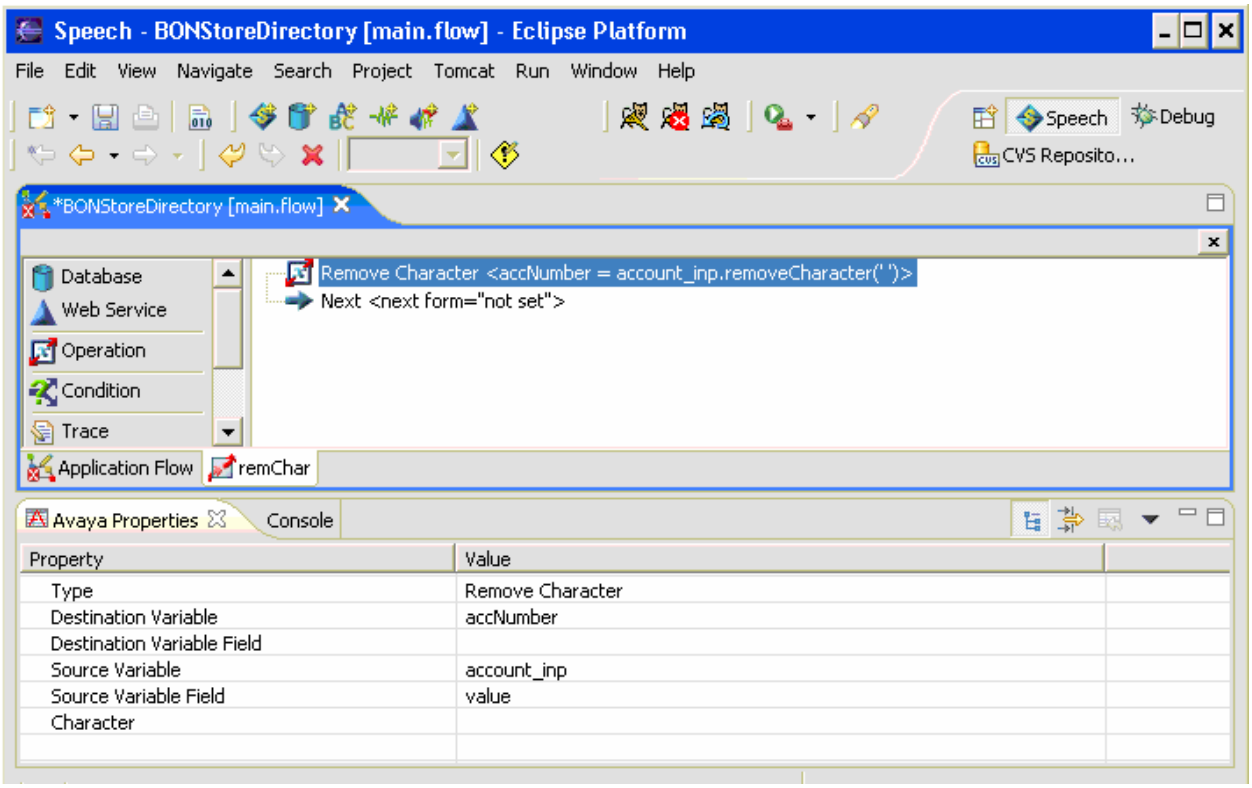
Step	Description
19.	The **remChar** node is needed to remove space characters added by the speech to text conversion. In the workspace as shown in Step 17, click on the **remChar** node. In the **Avaya Properties** view, enter the following values: • Type: Select "**Remove Character**" from the drop down list. • Destination Variable: Select "**accNumber**" from the drop down list. • Source Variable: Select "**account_inp**" from the drop down list. • Source Variable Field: Select "**value**" from the drop down list. Click the **Save** icon. 

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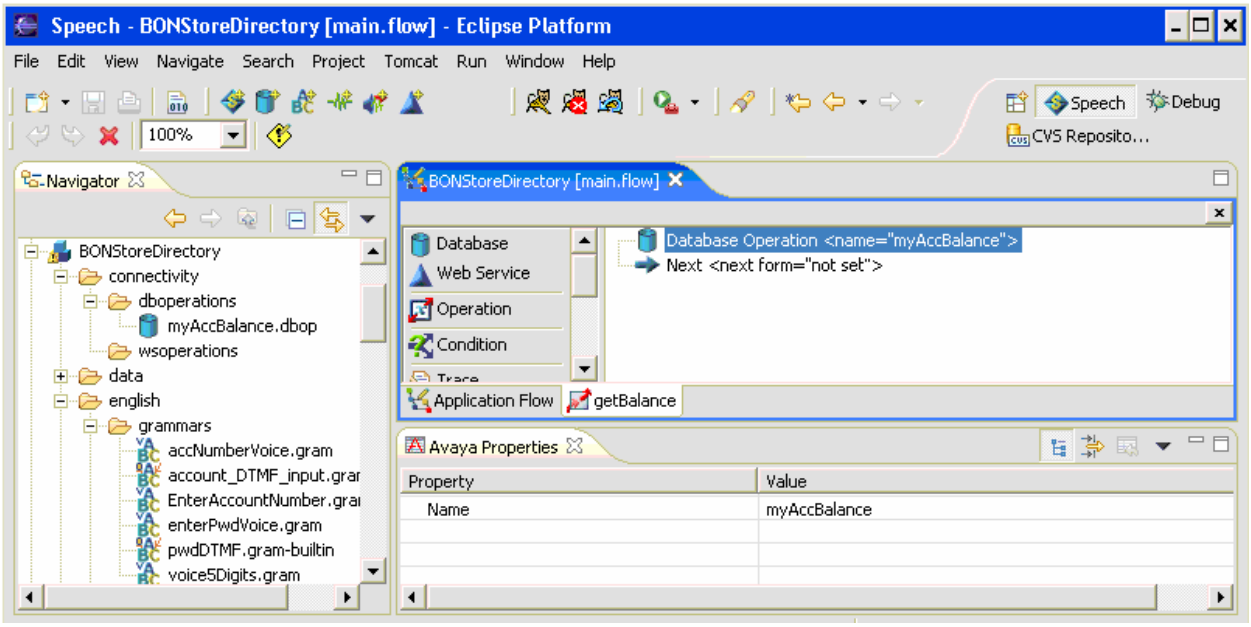
Step	Description
20.	The **getData** node is used to send the database query to the SQL server. In the workspace as shown in Step 17, double click on the **getData** node. The **getData** appears in the workspace. Click on **Database Operation**. In the **Avaya Properties**, Property **Name**, enter the database name "**myAccBalance**" in the **Value** field. The database operation was created in Steps 7 - 10. 

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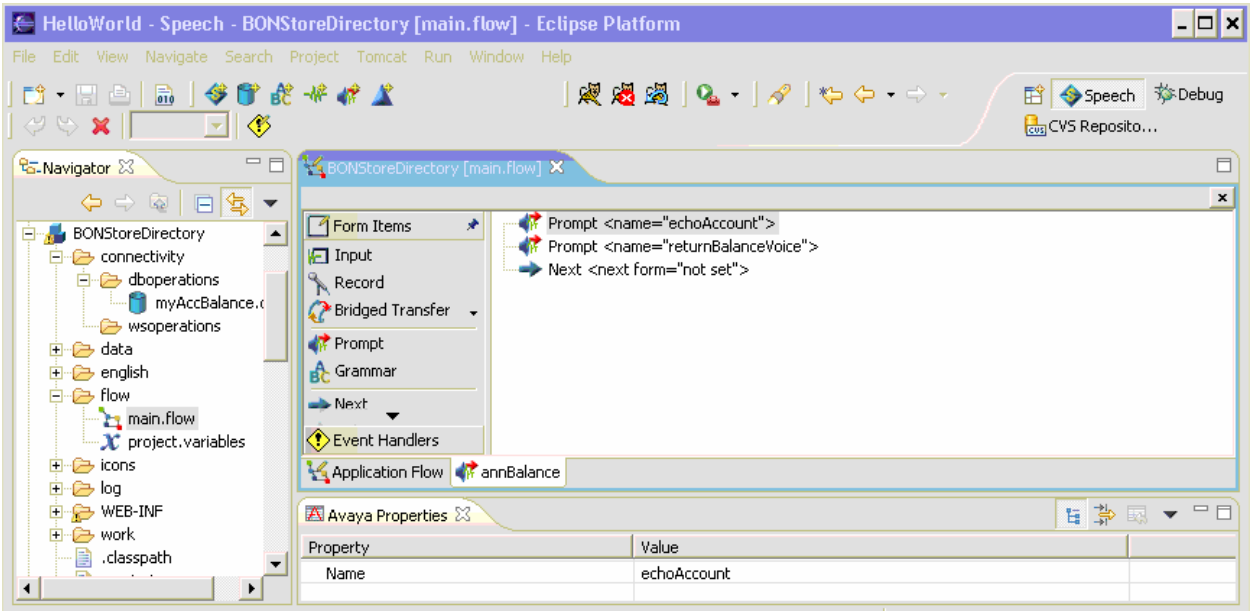
Step	Description
21.	When the database query is returned, the **annBalance** node is used to read the account number and account balance back to the caller. The Prompt files were created in Step13. • In the workspace as shown in Step 17, double click on the **annBalance** node. The **annBalance** node appears. • From the palette, click on **Prompt** and place it in the workspace. In the **Avaya Properties**, enter the name of the Prompt file "**echoAccount**" in the **Value** field. • Repeat the previous bullet item to add the second Prompt file with the file name "**returnBalanceVoice**". Click the **Save** icon. 

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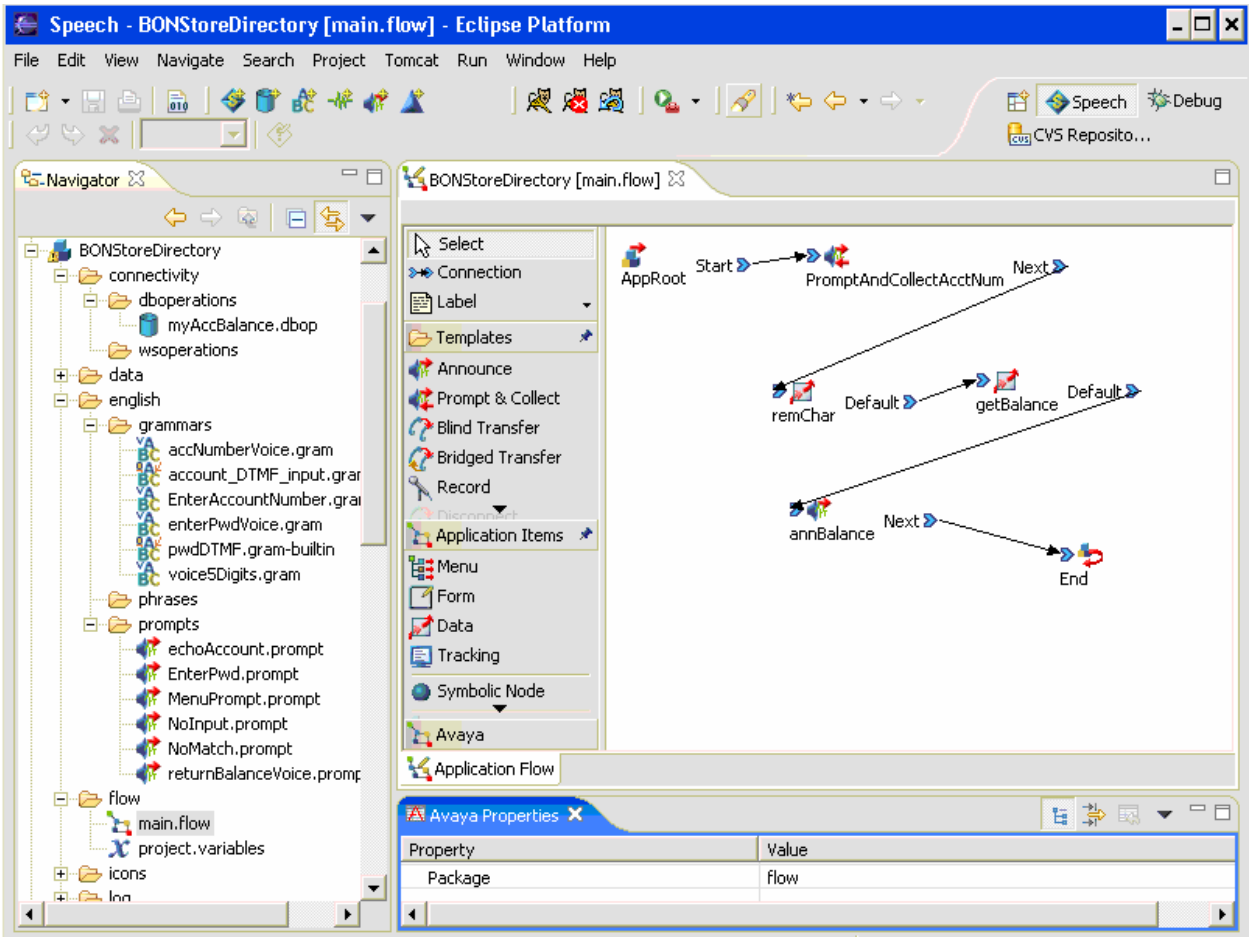
Step	Description
22.	Use the following procedure to connect nodes in the call flow diagram. • In the palette, click on Connection, and click the outgoing connection point on the **Start** node. • Click the incoming connection point on **PromptAndCollectAccNum** node. Repeat above steps to complete the call flow connection as shown below. Click the **Save** icon. 

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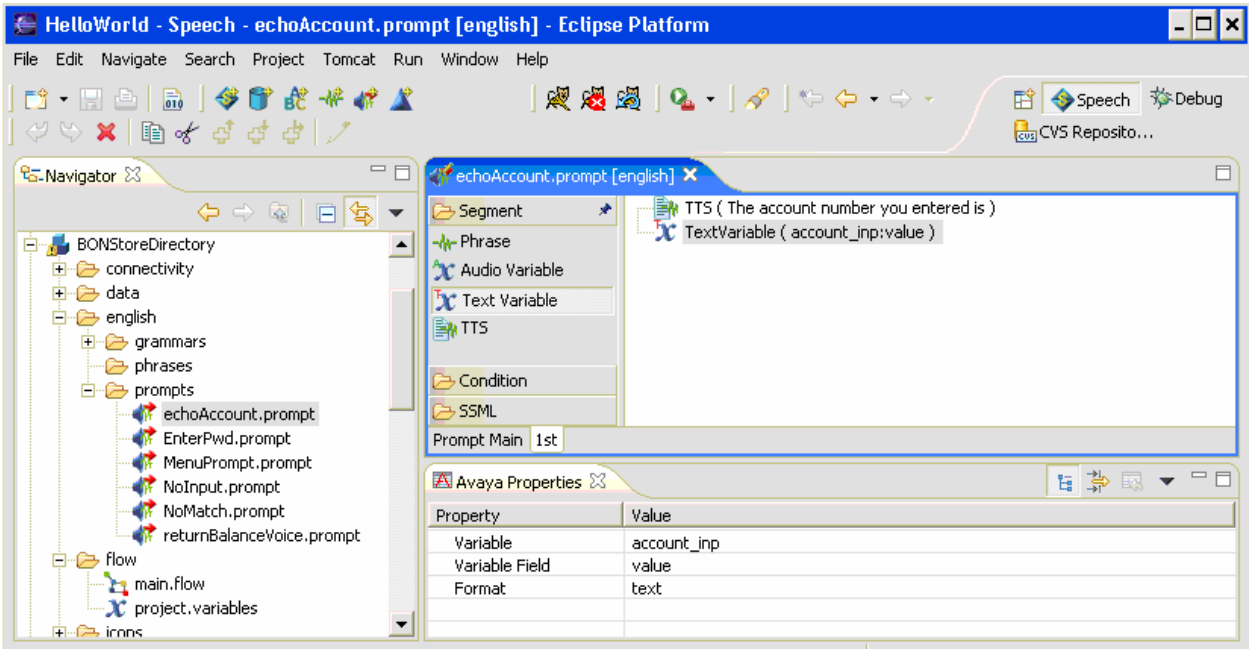
Step	Description
23.	To add a text variable in the **echoAccount** prompt file, open the **echoAccount** prompt file. Click on **Text Variable** and place it in the workspace. In the **Avaya Properties**, enter the following values: • Variable: Enter "**account_inp**". The account_inp is created in Step 18. • Variable Field: Select "**value**" from the drop down list. • Format: Enter "**text**". 
24.	Similarly, using Step 23 as a guide adds the text variable **accNumber** in the **returnBalanceVoice** prompt file.

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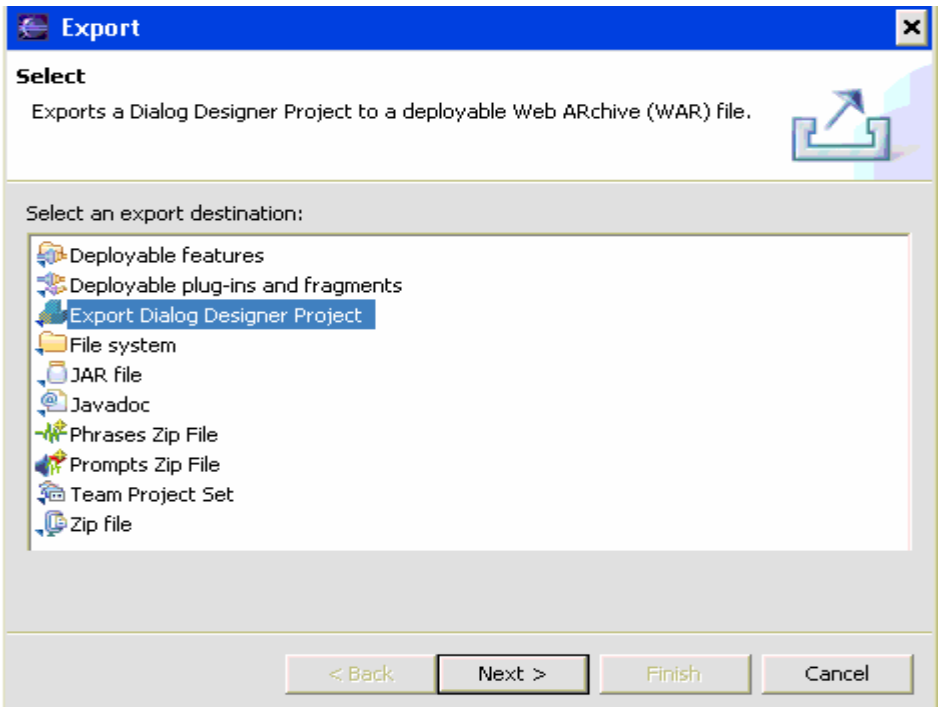
5.2. Export Project

This section describes the steps necessary to export the sample speech application project from the Avaya Dialog Designer (DD) to the Application server. It is assumed that the WebLM and the DD license file are already installed on the Apache Tomcat server.

Step	Description
1.	In the **Navigator** view, right click on **BONStoreDirectory → Export**. The **Export** screen appears. In the **Select an export destination** list, select "**Export Dialog Designer Project**", and then click **Next**. 

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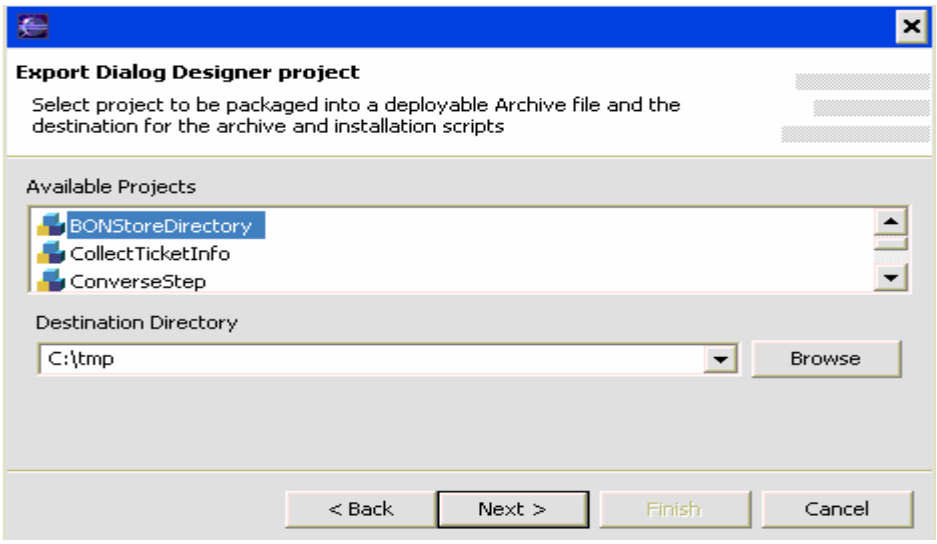
Step	Description
2.	The **Export Dialog Designer project** screen appears. Select the project name from the Available Projects, for example "**BONStoreDirectory**". To save the export project, enter the path and directory name, for example "**C:\tmp**", in the **Destination Directory** field. Click **Next**. 

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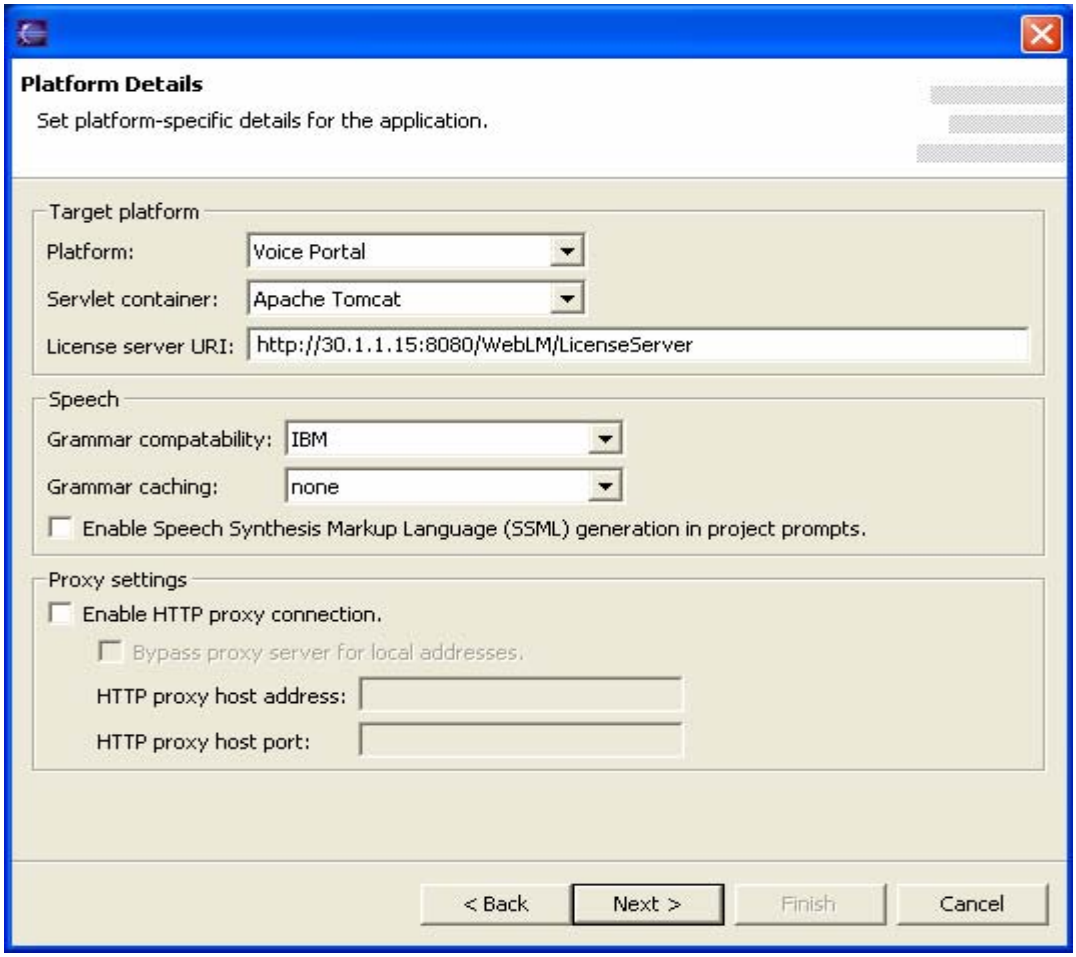
Step	Description
3.	The **Platform Details** screen appears. Enter the following values: • Platform: Select "**Voice Portal**" from the drop down list. • Servlet container: Select "**Apache Tomcat**" from the drop down list. • License server URI: "Enter the following **http:// <IP address of the WebLM server >:8080/WebLM/LicenseServer**". **Note**: The DD license file is installed on this WebLM. For example "**http//:30.1.1.15:8080/WebLM/LicenseServer**". • Grammar computability: From the drop down list, select the ASR server which will be used to process the voice recognition. For example, the "**IBM**" is used in this configuration. Retain the default values for all other fields. Click **Next**. 

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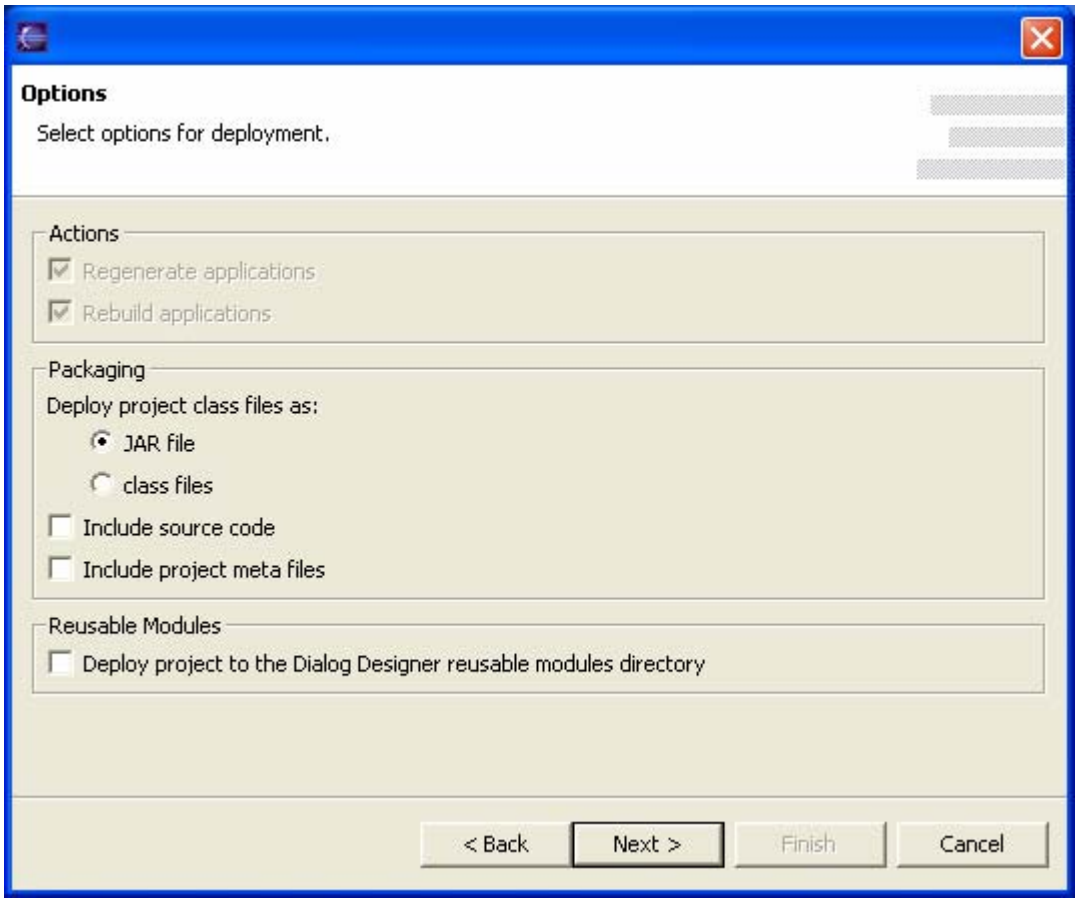
Step	Description
4.	The **Options** screen appears. For the testing, the JAR file is used to deploy the DD project class files. Verify that the **Jar file** is selected on the **Options** form. Retain the default values for all other fields. Click **Next**. 

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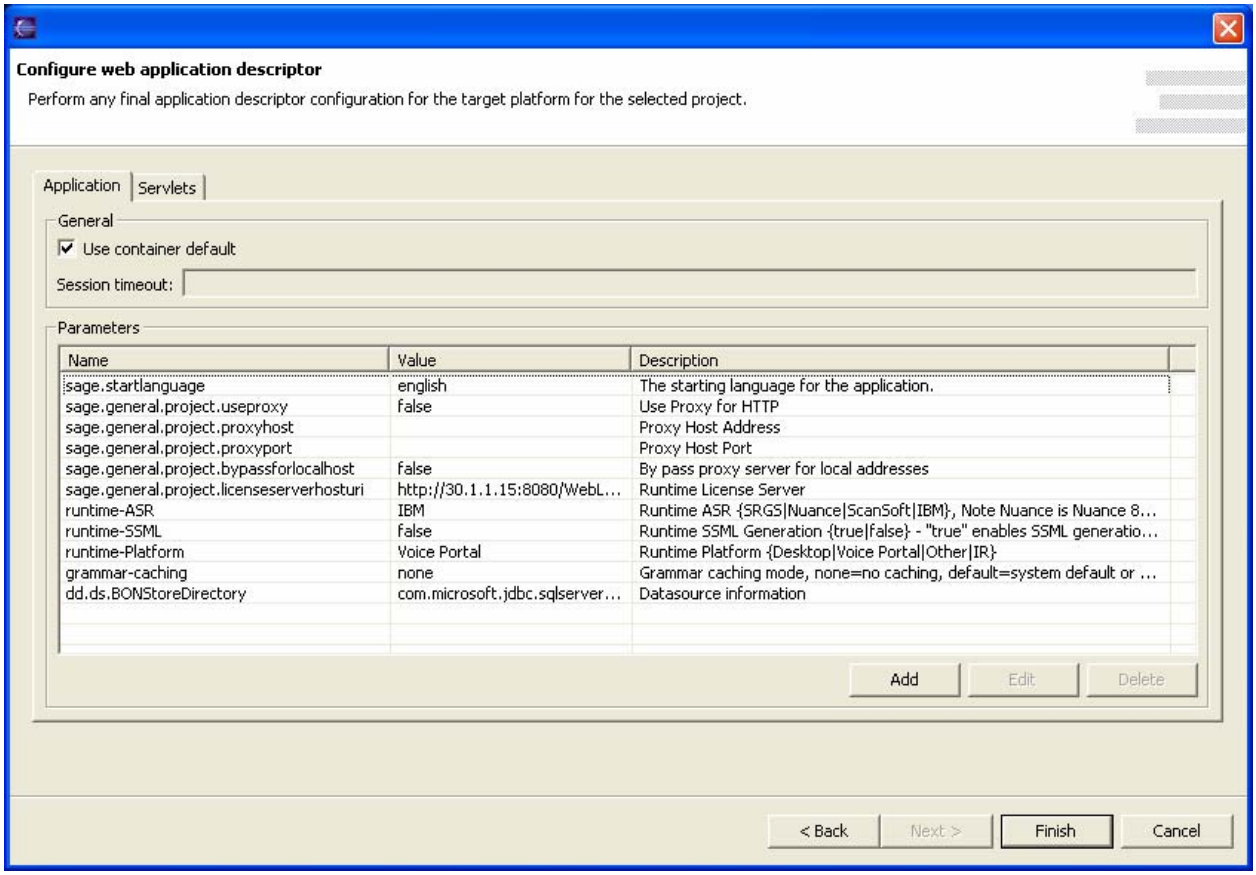
Step	Description
5.	The **Configure web application descriptor** screen appears, review the settings and click **Finish** to export the project. 
6.	The resulting Speech Application must be copied to the Application server. To do this, perform the following: 1. The DD creates a new **BONStoreDirectory.war** file under the **C:\tmp** directory which was administered in Step 2. 2. Copy the **BONStoreDirectory.war** file to the Application server under "**<Apache Tomcat Home>/Webapps/**". **Note**: The <**Apache Tomcat Home**> is the path to the Apache Tomcat home directory. The default <**Apache Tomcat Home**> path is: "**C:\Program Files\Apache Software Foundation\Tomcat 5.0**". 3. When the copy is done, restart the Tomcat server engine. The application is ready to run. Use the VPMS **Add Application** page, described in Section 4, Steps12 and 13, to add the sample application on the VP.

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6. Verification Steps

This section provides the tests that may be used to verify the proper VP configuration:

Step	Description
1.	Verify MPP stations register to the Avaya Communication Manager via the C-LAN. Issue the **list registered-ip-stations** command from the Avaya Communication Manager SAT to verify the stations 2220011 – 2220016, administered in Section 3, Steps 5 and 6, are registered in Avaya Communication Manager.

```
list registered-ip-stations

                          REGISTERED IP STATIONS

Station  Set     Product    Prod  Station         Net Orig    Gatekeeper     TCP
Ext      Type    ID         Rel   IP Address      Rgn Port    IP Address     Skt
301      4612    IP_Phone   1.800 30.1.1.199      1           30.1.1.4        y
2220011  7434ND  IP_API_A   3.  0 30.1.1.11       1           30.1.1.4        y
2220012  7434ND  IP_API_A   3.  0 30.1.1.11       1           30.1.1.4        y
2220013  7434ND  IP_API_A   3.  0 30.1.1.11       1           30.1.1.4        y
2220014  7434ND  IP_API_A   3.  0 30.1.1.11       1           30.1.1.4        y
2220015  7434ND  IP_API_A   3.  0 30.1.1.11       1           30.1.1.4        y
2220016  7434ND  IP_API_A   3.  0 30.1.1.11       1           30.1.1.4        y
2222000  4625    IP_Phone   2.500 30.1.1.110      1           30.1.1.4        y
2222001  4621    IP_Phone   2.302 30.1.1.111      1           30.1.1.4        y
3330010  4620    IP_Phone   2.300 40.1.1.112      1           30.1.1.4        y
3333001  4602+   IP_Phone   1.800 40.1.1.111      1           30.1.1.4        y
```


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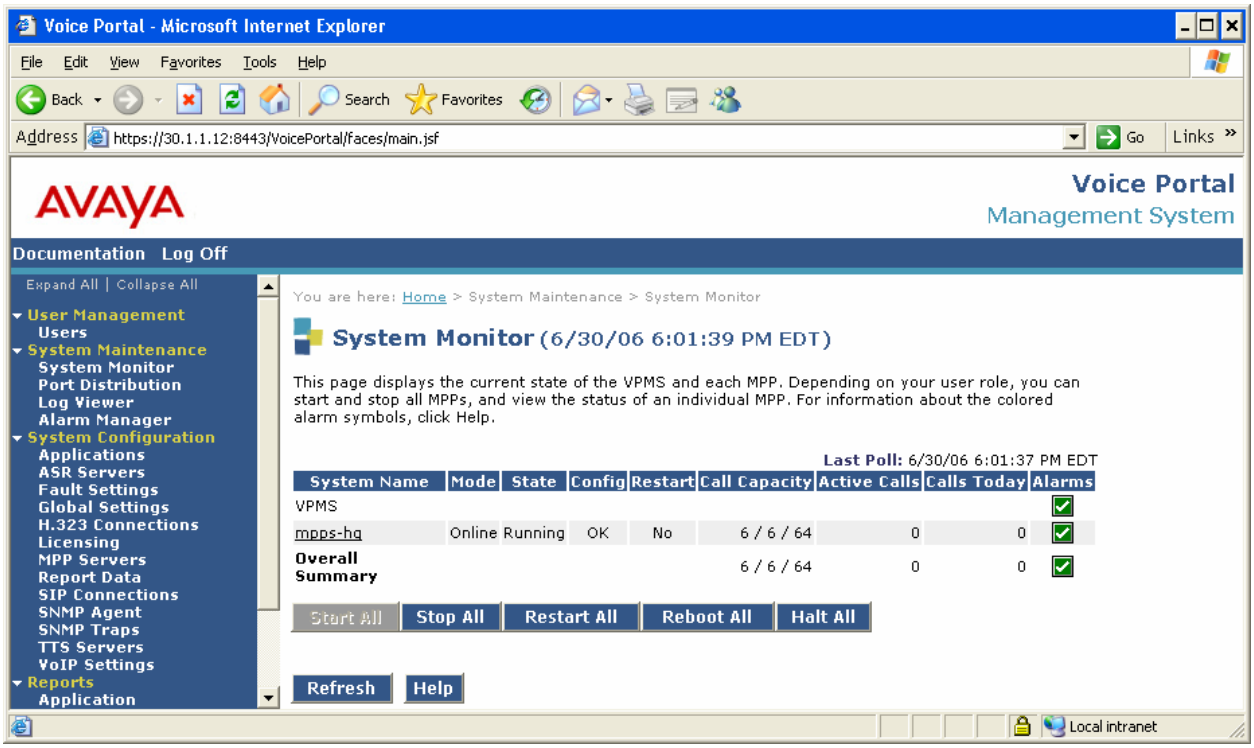
Step	Description
2.	From the VPMS, click on **System Maintenance → System Monitor**. Verify the status of the **System Monitor** as shown below: • Mode: Online • State : Running • Config: OK • Call Capacity: The number of stations displayed is the same as the number of stations administered. • Alarms: No alarms. 
3.	Verify the initial TTS speech is heard. Place a call to the hunt group number. Verify the "Welcome to the BONStore's account information center" and "Please enter your account number" are heard.
4.	Verify touch tone input is successfully processed. Place a call to the hunt group number. After prompted to enter the account number, press "2201" on the touch tone key pad. Verify the account number and account balance are heard.
5.	Verify voice input is successfully processed. Place a call to the hunt group number. After prompted to enter the account number, say "2201". Verify the account number and account balance are heard.

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Step	Description
6.	Verify "no input" is detected when caller does not enter the account number. Place a call to the hunt group and do not speak or press any touch tone key. Verify "no input" is heard.
7.	Verify "no match" is detected when caller enter less than 4 digits. Place a call to the hunt group and only say two digits. Verify "no match" is heard.
8.	Verify MPP can recover from the C-LAN connection failure. Disconnect C-LAN and reconnect C-LAN. Verify after C-LAN is reconnected, all IP stations are re-registered. Repeat Steps 3 - 5 to verify the call.

7. Conclusion

These Application Notes demonstrate how to provision the Avaya Voice Portal with Avaya Communication Manager to interact with the IBM TTS and ASR applications. These Application Notes also provides steps necessary to develop a sample speech application. The sample application was used to verify the Voice Portal configuration.

8. Additional References

The following documents can be found at http://support.avaya.com:

[1] *Administrator's Guide for Avaya Communication Manager, Issue 2, May 2006; Doc ID:* 03-300509

[2] "*Administering Avaya Voice Portal 3.0.1* ", April 2006

[3] "*Avaya Dialog Designer Developer's Guide* ", *Issue 1, August 2005*

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