IVR Manager Enterprise

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Administration Guide

Product Description and Architecture

IVR Manager provides Auto Attendant functionalities for Cisco Unified Communications environments.

Cisco voice gateways can be programmed with TCL scripts to answer incoming calls, prompt audio messages and connect with selected numbers/extensions. Imagicle IVR Manager programs the TCL engine to provide those functionalities.

IVR Manager provids an easy to use web interface to manage attendant scripts and send them to the gateways in your Cisco UC environment.

IVR Manager Global Administrators can define behaviors (scripts) to be activated on any gateway (ex: day, night, holidays) and related audio messages together with the schedules for activating them based on the local time of the gateway.

In multi-site or multi-tenant environments, Superusers can modify the behaviors of their site only.

Normal Users can temporarily change the current behavior through the web interface or directly from their IP Phone. for instance to set the "All Operator Busy" behavior during breaks or to manually activate the day/night behaviors when getting/leaving the office.

Main features

The IVR Manager provides ready to go scripts covering the most common needs. All the scripts are customizable with audio messages and destination numbers to be connected.

- Basic Auto Attendant - Plays a welcome message, queue the call trying to connect to the operator
- Multiple selections - Plays a welcome and wait for selection to connect based on the choise (1 for ..., 2 for ..., ...)
- Blast Call - Plays a welcome message and tries to connect a group of phones
- Direct Inward Dial - Plays a welcome message and waits for selection to connect to a specific number/extension (DID simulation)
- Hunt groups - Plays a welcome message and tries to connect the call to a list of phones
- Night behavior - Plays message and connects to voicemail or drops the call
- Many others available in the package (together with detailed description)

Additional scripts can be developed by Imagicle, please contact us for any special need.

Architecture

The IVR Manager is intended for distributed Cisco UC environment to provide:

1. Centralized web based management of auto attendant on a single server
2. Creation of unlimited behaviors for the distributed gateways
3. Send behavior to the gateway to be run locally (no WAN bandwidth usage)
   a. Una tantum connection to the gateway scripts, audio files, scheduling to be loaded
   b. Multi-tasking to send to several gateways concurrently

Note: IVR Manager requires one time configuration on the voice gateway to associate enable the script to a voice port or a dial-peer. Scripts cannot run if the voice port is configured in MGCP.

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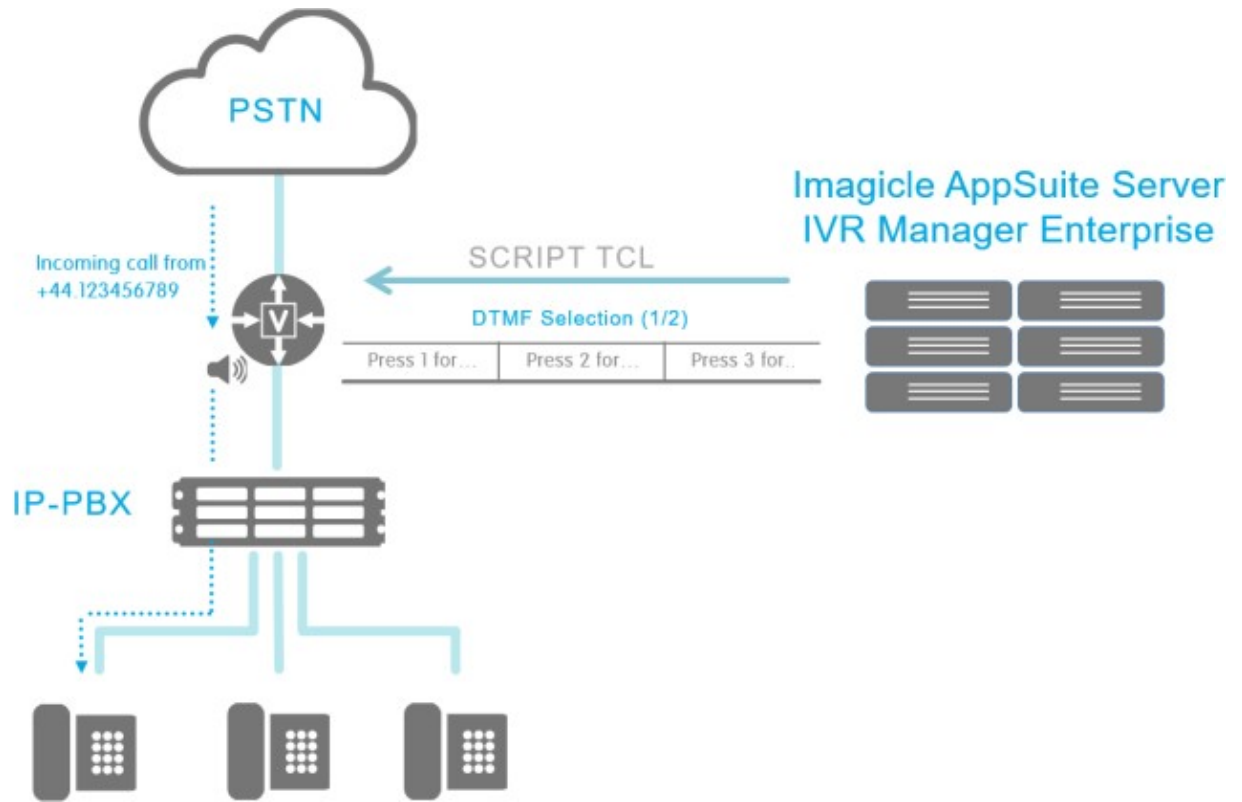
Configuration Task List

Warning: you must install and configure the Application Suite before being able to configure the single applications.
Please go through the AppSuite Deployment, Main Configuration, and User Management sections before reading on.

To have your first script running on a gateway, you must accomplish the following tasks:

- Add a **gateway** to the list
- Load your custom **audio files**
- Prepare a **behavior** (script+voice message + destination)
- Prepare a **dispatcher** (i.e. a scheduler script)
- **Assign** the dispatcher to the gateway
- **Send** the dispatcher and the behavior to the gateway
- Manually **edit** the gateway configuration to associate the **dispatcher** with a voice port or a dial-peer
- **Test** the script making a call

Additional multi-site configuration steps:

- Create a **Zone** for each site or for each group of sites
- **Set** the zone property of the gateways, behaviors and dispatchers to limit visibility
- Assign the **users** to a zone so that they can view the zone gateways, behaviors and dispatchers
- **Assign** the dispatchers to the gateways
- **Resend** the configuration to the gateways

To allow some user to change the behavior from the IP Phone:

- Change the **user permission level** for the application
- Assign **additional behaviors** to a dispatcher
- Edit the list of **users** who can manually modify the behavior
- **Resend** the configuration
- On the pbx, add a **new XML service** for IVR Manager

All the steps are detailed in the following sections.

Product Configuration

Gateway management

You need to add the gateways to send the IVR behaviours. The IVR Manager sends the proper commands for the gateway to execute the behaviour through an hidden telnet connection. So the following parameters are needed for each gateway:

- **IP address** or DNS name: must be unique
- **Username** (leave blank if not used in the telnet account)
- **Password** (leave blank if not used in the telnet account). Passwords are shown in clear text while editing, but are hidden in the gateway list.
- **enable password** of the gateway

The provided username and password needs to give *access level 15* to the gateway.

Leave the Zone combo box at default (Global) at this stage. When you click **insert**, the data you entered will be validated and the gateway will be added to the list below the input form. You'll be able to edit the gateway details from this list.

Note: the input form is optimized for keybord usage. You can move between the input boxes pressing the TAB key. When you press Enter, the gateway will be added and the focus will return to the top in put box. This simplifies entering a long list of gateways.

Audio files management

You also need to upload the audio messages to include in the IVR behaviours. A simple web form let upload any .wav files converting in the appropriate voice gateway compatible ones.

.**wav** files (PCM format) will be converted to .au (raw format, 8 bits, 8 kHz, mono). The label is required and will be visible during audio file selection in other pages. Optionally, if the message contains speech, you can also enter the transcript of what is said in the audio file for your reference.

The file name must be unique.

Pressing the "play" icon will download the audio file, to be opened with your favourite media player.

From this page you can also delete any audio file, as long as it is not in use by any behavior in the system.

IVR behaviors management

IVR Manager basic elements are behaviors and schedules.

- **Behaviors** define the call flow and relative parameters (such as audio files to be prompted and involved numbers/extensions)
- **Schedules** define *when* applying certain behaviors.

Behaviors define how the IVR will respond to incoming calls.

You have to create a different behavior for every different call handling procedure you want to implement, for example a day behavior and a separate night behavior.

Through the **behaviours** submenu of IVR Manager, you can manage the behaviours. Click "Create New Behavior" to add a new one. A list with a detailed description of the call flow implemented by the each behaviour will be displayed.

Example:

Basic Auto-Attendant provides autoanswer to incoming calls prompting welcome_msg message, then it tries to connect the call to the agent. If the agent is busy or does not answer within the alert_time seconds (default: 35 seconds), the script prompts the Busy message and retries.

Select the script to use as template for the behavoiur you want; you'll customize the behavoiour selecting audio files and destination numbers in the next step.

You need to decide a name for your new behavoiur.

The behaviour name must be unique.

In our example, set "day" as behavior name to configure the script as the normal opening hours IVR: select the audio messages and the agent/operator to be connected.

Create another behavior with name "night" to configure the script with the normal office closed IVR: select the Night standard script, the office closed audio message and (optionally) the voicemail number for keeping the message.

You have configured a very basic sample of day and night behavior for your company attendant. Next section will show how to schedule the automatic change between those.

Schedule behaviors (dispatchers)

Schedule behaviors means create a set of rules for defining **when** to activate a certain behavior. Start creating a "dispatcher", which is the element including those rules based on dates and hours.

Dispatchers allow you to switch between different behaviors from a single entry point. After a dispatcher is configured, it can be assigned to one or more gateways to provide an entry point for the incoming calls. You cannot use behaviours without a dispatcher.

The name of the dispatcher is used to uniquely identify the "service" on the Cisco gateway it is loaded onto. The string "sv_" is always prepended to the dispatcher's name on the gateway.

The dispatcher name must be unique.

The dispatcher configuration allows setting of Date interval, Days of the week and time interval for a certain behavior to be selected.

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Leaving the intervals at default will always be running the selected behavior (as matching any date/time): this is used when only one behavior is needed (no different day and night ones).

You can define as many rules as needed, for e.g. two rules for day and nights: **rules are matched top-down**. When there is more than a rule, the highest one is checked first. If it does not match with current date and time the second one is checked. When a rule is matched, the selected **behavior** is run. To change the **priority** of a rule, move it up or down with the arrows at the top left of its panel.

If no rule is matched, the **default behavior (pass-through)** will automatically be applied to avoid the voice gateway not managing the call.

Note: dispatcher is what you need to associate to the voice gateway configuration under the dial peers sections. See Cisco Gateway configuration section for details.

See below a typical day and night rules configuration:

Please mind the following:

- A single dispatcher can point to different beahviours
- The same behaviuor can be used in different dispatchers
- A dispatcher cannot point to other dispatchers
- Behaviors can be also be activated manually, but only if referenced in a dispatcher

Associatiation to gateways

The "Assign to gateways" menu of IVR Manager allows the created dispatchers to be associated to the Cisco gateway to apply the IVR to. Here you can choose which dispatchers will be loaded onto each gateway individually. This selection is preliminary to the actual sending of the configuration.

You must ensure that all the dispatchers that are referenced by a dial-peer on a Cisco gateway are also explicitly assigned to that gateway in this page.

All the behaviors that are referenced by a dispatcher will be loaded automatically, without the need to assign them explicitly. You can also edit configuration details that are specific to a dispatcher when it is loaded onto a specific gateway.

In the "To" combo box, select the voice gateways to send the dispatcher(s) to, leave < ALL > to send to all configured gateways in the "Gateway management" previous section.

In the "Assign" combo box, select the dispatchers to be sent to the selected gateways, then click on the "Assign" button

GATEWAY▲	APPLICATION	USERS	CLEAN
VG-London (192.168.204.50)	sv_main ⚙ sv_day ⚙ sv_night	✏	🗑
VG-Milano (192.168.201.9)	sv_main ⚙ sv_day ⚙ sv_night	✏	🗑
VG-Rome (192.168.204.51)	sv_main ⚙ sv_day ⚙ sv_night	✏	🗑

This way the main dispatcher will be sent to both London and Rome gateway for local execution. Each gateway will apply the set of rules configured in the dispatchers for running the day and night behaviors based on the local time: if they are in different time zones, the local time will be successfully applied and, as per our example, the day behavior will start at local 8:00 and night at 18:00 as we would expect to.

Next section will show the page to control the IVR Manager for sending the commands to the selected voice gateways.

Sending configuration to gateways

The sending configuration menu trigger the execution of the telnet sessions to the selected gateways for sending the needed commands to apply the configured dispatcher.

Select one, more or all gateways and click on send: the uploading configuration page will appear, showing the operation in progress.

You can see the log of the operation by clicking the gateway icon. It is possible to check the list of the commands being sent by the log files.

At the end of the sending operation, the status will be updated:

The sending page is automatically updated with the last status of the sending command operation:

The IVR Manager has been successfully configured and commands being sent to the gateway. The next section shows how applying the configured dispatcher to the Cisco gateways for answering calls to specific numbers/incoming calls.

PBX Configuration

Cisco Gateway Basic configuration

In order to activate the IVR on the voice gateway you only need to specify where applying the IVR. This will be done once because the further operations will be automatically managed by IVR Manager itself.

Supposing you have the company PSTN number 870978651 configured as follow:

```
dial-peer voice 1 pots
incoming called-number 870978651
direct-inward-dial
port 1/0
```

and you would like to add the main dispatcher running the day and night behavior as previously configured.

You only need to add the following command: service sv_main

The dial peer will become as follow:

```
dial-peer voice 1 pots
service sv_main
incoming called-number 870978651
direct-inward-dialport 1/0
```

Also add in global configuration mode the command:

```
application
global
service alternate DEFAULT
```

Should the dispatcher fail to load, the DEFAULT IVR Behavior will apply, i.e passing through the call without treating.

Cisco Gateway Advanced configuration

Main Concepts

On Cisco voice gateways you can have for voice configuration:

- pots dial-peer
- voip dial-peer

Each of these can handle incoming and outgoing leg. Examples:

```
dial-peer voice 1 pots
            description THIS IS A POTS DIAL-PEER HANDLING AN INCOMING LEG USED FOR CALLS FROM PSTN
            incoming called-number 2978651
      !
      dial-peer voice 2 pots
            description THIS IS A POTS DIAL-PEER HANDLING AN OUTGOING LEG USED FOR CALLS TO PSTN
            destination pattern 0T
            port 1/0:15 (depending on the physical ISDN PRI/BRI or analog ports installed)
      !
      dial-peer voice 3 voip
            description THIS IS A VOIP DIAL-PEER HANDLING AN INCOMING LEG.
            incoming called-number 7...
            dtmf-relay h245-alphanumeric
            codec g711ulaw
      no vad
   !
      dial-peer voice 4 voip
            description THIS IS A VOIP DIAL-PEER HANDLING AN OUTGOING LEG.
            destination-pattern 8000
```

```
                    session target ipv4:<ip_address>
                    dtmf-relay h245-alphanumeric
                    codec g711ulaw
                    no vad
```

But you can also collapse incoming and outgoing leg on the same dial-peer:

```
dial-peer voice 5 voip
incoming called-number 7...
destination-pattern 8000
session target ipv4:<ip_address>
dtmf-relay h245-alphanumeric
codec g711ulaw
no vad
```

IVR on Voip dial-peer

Until this chapter we have always seen IVR scripts applied on pots dial-peer.

An important feature of IVR based on Cisco gateways is the capability to apply an IVR script to a voip dial-peer more than to a pots one.

Following a sample configuration of such case:

```
    application
    global
    service alternate DEFAULT
    !
    voice service voip
        allow-connections h323 to h323
    !
    voice translation-rule 9
        rule 1 /.*/ /646/
    !
    voice translation-profile ivrmanager
         translate called 9
    !
    dial-peer voice 1 voip
        service sv_main
        translation-profile incoming ivrmanager
        incoming called-number 8888  // 8888 is a virtual number to catch the call for the IVR script
        dtmf-relay h245-alphanumeric
        codec g711ulaw
        no vad
```

Please, notice that an IVR behaviour triggered by a voip dial-peer cannot transfer to another IVR Manager dispatcher defined on the same router.

Troubleshooting

if experiencing audio issue for some audio files, add this commands in the voice gateway configuration

```
http client cache memory file 10000
http client connection timeout 10
http client connection idle timeout 10
http client response timeout 300
```

Usage

Overriding schedules

If needing to change the active behavior outside of the scheduled times (ex: for a break during the morning, or an unattended reason), allowed Users can override the behavior through both the web interface or directly from their IP Phones. The current behavior can be changed either through the web interface or through the IP Phone.

Task list to enable overriding schedules

1. Configure and test a working dispatcher
2. Select the eligible behaviors for that dispatchers
3. Authorize some of the users to override the current behavior
4. If you want the users to be able to change the behavior through the IP phone, configure a service on the CuCM/CuCME

1. Configure and test a working dispatcher

To do this, follow the instructions in the previous sections of this guide.

2. Select the behaviors

The behaviors allowed for the override must be selected in the dispatcher configuration.

Following our example we would configure the main dispatcher to allow manual modifications of the current behavior with day and night behaviors, for example because of a break or a early opening/closing on a given day.

In the list at the bottom of the dispatcher configuration page, move the behaviors to the right and press Save.

If no behavior is displayed, create them in the Behaviors page.

AVAILABLE BEHAVIORS	<->	MANUALLY SELECTABLE BEHAVIORS

3. Authorize users

In the main menu, click on the IVR Manager Icon, then open the Assign to Gateway page.

Locate the gateway on which the dispatcher is running. Press the **Users** button.

Move the users you want to authorize from the list of the available users (left) to the authorized users (right).

Repeat for each gateway and dispatcher.

Note: If no user is displayed, check users' permissions in the users management for the IVR Manage application. Then click on the Users page in the IVR Manager menu.

4. Changing the Schedule Through The Cisco IP Phone interface

To activate the XML service on Cisco XML enabled phones, you have to add the following XML service on the Cisco Unified CallManager:

```
http://Server_IAS/fw/Apps/Ivory/xml/overrides
```

This can be configured through the URL Services field or through the XML service management application (if available).

IP phone is identified through the MAC address or username of logged in user if extension mobility is used. See the Multilevel administrator section for details on how activating IVR Manager services to users.

How Users Can Change the Schedule Through the Web interface

Through the "Change active behavior" page on the IVR Manager menu, allowed users get access for overriding schedules by setting a specific behavior on the selected gateway.

Click on the "Activate" button relative to the Day behavior to activate the behavior on the London Gateway.

When back from the break and need to reactivate the scheduled behavior based on time of the day/week set, it is possible to click on "Activate" for the scheduled behavior.

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Multilevel Administration

The IVR Manager administration and control of allowed operations of each user depend on two properties:

1. Application access level, you can set on the "Edit User Permissions" page of the Main -> User Management menu
2. Zone assigned to the user through the relative IVR Manager -> Zones menu.

Permission Level Reference

Level 1: No Access

Users with level 1 do not get access to the application

Level 2: Manually change active behavior

Base access level to let users accessing to the "Change Active Behavior" menu to change the active behavior on the gateway they have access to (based on the applied zone, see below). They don't need any username/password of the gateways

Level 6: Edit Zone configuration

Users with this access level can administer the gateways of their zone.

They have access to the same operations as Level 2 users plus:

- Add/Delete audio files
- Add/Delete/Modify behaviors of their zone
- Add/Delete/Modify dispatchers of their zone
- Send configuration to gateways of their zone

Behaviors added by Level 6 users will be available to other Level 6 users belonging to the same zone and to all the Level 8 users or higher.

Behaviors without the zone property set are available to all Level 6 users but they cannot modify.

Gateways without the zone property set can be managed by all Level 6 users but they cannot modify.

Level 8: Edit configuration

Users with this access level can access to all the application functionalities except of the list of gateways.

Level 10: Complete management

Zones

The Zones menu of IVR Manager allows the configuration of zones, representing a group of gateways that *users belonging to the same zone* can manage and administer.

Zones can represent geographical areas or branch offices. The main idea is that each zone will have different audio files and different IVR behaviors. Gateways, behaviors, and dispatchers can all be restricted to a specific zone.

First you define zones, then you assign them to users who will be their administrators.

If you don't need multilevel administration, do not define any zone.

Example: Define 2 zones with name UK and Italy.

Then move to the Gateway menu, to change the zone associated to the gateway:

- Assign UK to the London Gateway

- Assign Italy to the Rome Gateway

IP ADDRESS OR DNS NAME	DESCRIPTION	ZONE
192.168.201.9	VG-Milano	
192.168.204.50	VG-London	< Global > ⌄
192.168.204.51	VG-Rome	

< Global >
Italy
UK

ADD NEW GATEWAY

IP address or DNS name	
Zone	< Global > ⌄
Description	
Login	
Password	
Enable Password	

[Insert]   [Cancel]

IP ADDRESS OR DNS NAME	DESCRIPTION	ZONE	LOGIN	PASSWORD	ENABLE PASSWORD		
192.168.201.9	VG-Milano		Administrator	(hidden)		✏	🗑
192.168.204.50	VG-London	UK	cisco	(hidden)	(hidden)	✏	🗑
192.168.204.51	VG-Rome		cisco	(hidden)	(hidden)	✏	🗑

Having assigned a zone to the gateways, you need to assign zones to users through the Users menu of IVR Manager.

Users

This is a list of eligible "zone administrators". When you assign a zone to a IAS user he or she will be allowed to edit only the IVR behaviors, IVR dispatchers and gateways which belong to that zone. The global behaviors and dispatchers will be read only, i.e. the user will be able to use them but not to modify them.

In order for a user to become a zone administrator, in addition to assigning the zone, you have to adjust the user's privilege level for the IVR Manager application in the global User Management page.

Example:

Create a new user in the User Management, username UK_Manager. Then edit user's permissions and give Level 2 access to IVR Manager application ("Change active behaviour").

Then on the Users menu of IVR Manager assign the zone defined zone UK to the UK_Manager user.

USER	ZONE	
👤 101		🖊
👤 102		🖊
👤 uk_manager	< Global > ⌄	✓ ⊗
	< Global >	
👤 201	Italy	🖊
	UK	
👤 202		🖊
👤 647		🖊

Latest step is **assigning the main dispatcher to a zone**.

Now logging in as uk_manager in the Stonevoice Application Suite web interface, under the IVR Manager menu the user gets access to behaviors override.

Uk_manager can override the behavior of its zone (as it has privilege 2) through both the Web Interface and the IP Phone.

License Activation

IVR Manager is licensed per site, that is the total number of gateways (regional sites) you can manage.

The limit is imposed on the gateway list. When the maximum number of gateways is reached, you won't be able to add more gateways.

Evaluation

IVR Manager Enterprise will run for 30 days in evaluation mode. During evaluation, all the features will be available and you'll be able to configure 2 gateways.

How to activate the license

The license can be activated by purchasing the product from Imagicle. You can enable the license in the license page as described in the Application Suite common configuration section of this guide.

To activate the license, follow the standard procedure you can find in the General configuration section.

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FAQ and Solutions

Enable SSH protocol to send configuration commands to Cisco routers

Applies from Application Suite 2011.6.1
to version Application Suite 201x (any version)

Applies to:

Description:

How to enable the ability of IVR Manager to send configuration commands to Cisco routers over SSH protocol.

Telnet is also supported.

How-to:

Please follow the list of instuctions below:

- Enable SSH access on each router first
- Apply the patch to IVR Manager
- Test SSH access with a third party terminal client such as putty before trying to send the configuration with IVR Manager.

How to apply the patch

Installation procedure:

1. Locate this folder **<StonevoiceAS>\Apps\Ivory\Component\Native**
2. <u>Download here the patch</u> and uncompress the contents in this folder.
3. Register the wodShh.dll component: from the command prompt, run:

   regsvr32 <StonevoiceAS>\Apps\Ivory\Component\Native\wodSSH.dll

Note: If you downloaded the patch from the internet, it is problaby marked as blocked. In windows explorer right click on the zip file and press the "unblock" button.

Troubleshooting tips

1. If the connection fails test it with putty
2. If SSH credentials fail, test the same using telnet
3. If connection succeeds but sending the configuration fails, set the log level to 6, retry, gather the log by copying to the clipboard and sent it to Imagicle technical support team. To set the log level, please refer to the included .ini reference file.

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IVR Manager and ISE authentication

Applies from Application Suite 201x (any version)
to version Application Suite 201x (any version)

Applies to

All Version

Description

"Send Configuration" in IVR Manager does not work and returns the error:
Error occured when trying to send configuration to Cisco voicegateway

Log file shows:

```
RESULTS:
StepsCount: 1
StepCurrent: 1
ResultLog:
08:09:47        Starting new log.
08:09:47              Thread Id: 48124
08:09:47        00,0000 Trying to reach 10.168.1.211:0 from 0.0.0.0
08:09:47        00,0000 Opening connection from 0.0.0.0 to 10.168.1.211:0
08:09:47        00,0000 Connection type: Telnet
08:09:47        00,0000 Connection successful
08:09:47        00,0781 Sending authentication information
08:09:47        00,0000 Waiting for router prompt...
08:09:48        00,9980 Sending username...
08:09:48        00,0000 Sending command: 'stonevoice'
08:09:48        00,0000 Pausing for 200 ms..
08:09:54        05,4609 -2147214328     !Command error          0
08:09:54        00,0000 Disconnecting (quit)...
08:09:54        00,0000 Pausing for 200 ms..
08:09:54        00,4355 Pausing for 200 ms..
08:09:55        00,4375 Pausing for 200 ms..
08:09:55        00,4375 Pausing for 200 ms..
08:09:55        00,2168 Connection has been shut down
```

Cause

The problem is caused by an unexpected username and password prompt.

Solution

Ensure that the prompt configured in ISE ends with a space, example:

Not "Username:" but "Username: " with ending space
Not "Password:" but "Password: " with ending space

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How to increase the maximum upload size for audio files in IVR Manager Enterprise

Applies from Application Suite 201x (any version)
to version Application Suite 201x (any version)

Description:

How to increase the maximum upload size for audio files in IVR Manager Enterprise

How-to:

1. Connect via RDP to the Imagicle Server
2. Create a new folder named "Settings" under \StonevoiceAS\Apps\Ivory\
3. Copy the attached file (IvorySettings.config) in the new folder \StonevoiceAS\Apps\Ivory\Settings
4. Edit IvorySettings.config with Notepad or Notepad++
5. Change the value
   <add key="MaxAudioFileLen" value="512000" />
   to
   <add key="MaxAudioFileLen" value="4000000" />

(In this example you can upload a file with a Maximum size of 4MB)