

FortiVoice - IVR Technical Note

Version 6.4.0

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FortiVoice 6.4.0 IVR Technical Note

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TABLE OF CONTENTS

Change Log	4
Introduction	5
Data collectors	6
SIP header collector	6
Digits collector	6
RESTful collector	7
FortiVoice and FortiCare RESTful integration	8
Call routing using ERC	8
Assign IVR to the auto attendant	9
Configure the RESTful service	10
Configure the IVR	11
Configure the digits collector	11
Configure the RESTful collector	12
Configure IVR handling	14
Configure exception handling	15
Summary	16

Change Log

Date	Change Description
2020-09-04	Initial release of the FortiVoice 6.4.0 IVR Technical Note.

Introduction

FortiVoice interactive voice response (IVR) is an advanced version of the auto attendant. It allows interaction with callers through the use of voice and DTMF tones input using the keypad. Callers proceed according to the IVR audio instructions to reach the callees or get the information they need.

To set up IVR, you must configure how data is collected, define matching conditions based on that data, and then define the action for these matching conditions. Based on the information collected from callers and by interacting with the backend database, FortiVoice IVR can prioritize the calls using call queues and present caller information to the agents.

FortiVoice IVR also interfaces with the RESTful web service for querying caller information from the database. For more information, see [FortiVoice and FortiCare RESTful integration](#).



IVR is only fully configurable using the UI, not the CLI.

To use IVR efficiently and to its maximum potential, it is important to understand the concepts involved before configuring IVR, including the various data collectors.

Data collectors

There are three data collector types:

- **SIP header collector:** Collects and stores the SIP header fields from the SIP INVITE.
- **Digits collector:** Collects and stores the digit-input from the caller's phone keypad.
- **RESTful collector:** Collects and stores information from the RESTful service.

IVR call handling is processed based on the information gathered from the collector configurations.

For example, FortiVoice IVR can collect customer information based on their FortiCare subscription through the RESTful collector. The agent can use this information to correctly dispatch their call to different call queues accordingly. For more information, see the configuration example [FortiVoice and FortiCare RESTful integration](#).

Note that IVR can be configured to make use of one collector, some collectors, or all collectors, depending on the requirement.

SIP header collector

The SIP INVITE is fundamental to every SIP phone call, as it is the initial request message sent out by the caller inviting the intended recipient for a session. These invites are made up of SIP headers used to identify the source and destination, among other various forms of information.

However, various values of these SIP headers, such as user names, IP and email addresses, is not what is relevant. FortiVoice uses the SIP header collector to parse the names of the SIP headers and pass along identifying information of a caller for inter-PBX communication.

For example, one PBX can be located in Ottawa and another one in Vancouver. Both PBXs are responsible for your company's support services. A customer calls into the Ottawa call center, and the Ottawa PBX retrieves the customer's identifying information. If the call must then be transferred over to the Vancouver PBX, the SIP collector transmits the identifying information to that PBX. With this transfer, customers do not have to provide their identifying information again.

The SIP collector can furthermore make use of SIP header variables, allowing certain information to be appended to the agent console, the SIP header of the call being transferred between PBX systems, to remote CDR databases, and to IVR reports.

Digits collector

The digits collector operates similarly to the SIP header collector in that it gathers the information it needs. However, the SIP header collector is somewhat passive in its method meaning that there is little to no effort from the caller's perspective. The digits collector requires the caller to provide an active input to successfully route the call to the next IVR phase.

The auto attendant routes callers depending on the number or key that they press. You configure these keys and associated actions in the auto attendant. For more information, see [Assign IVR to the auto attendant on page 9](#). The digits collector of an IVR can only operate when you set the action of an auto attendant dial plan to route the call to an IVR profile.

The digits collector configuration includes the following sections:

- Assign an audio prompt. This recording indicates to the caller that they must press the digit that corresponds to their need, or enter multiple digits in cases where they must enter a unique identifying number.
- Set the minimum and maximum number of digits allowed for the input, the maximum number of invalid attempts allowed, and timeout settings.

RESTful collector

FortiVoice IVR can interface with the RESTful web service for querying caller information from a database.

The RESTful collector references both the SIP header and digit collectors. With a successful querying of the database, IVR handling is then processed. For more information, see [Configure IVR handling on page 14](#).

You can configure the IVR RESTful interface to use HTTPS and authentication credentials to send the request. The RESTful interface supports HTTP versions 1.0 and 1.1, as well as GET and POST request methods. To send requests, the service uses either password-based or OAUTH authentication.

You can define fields to retrieve the appropriate data for successful call routing. A standard format for these fields is XPath, an XML syntax that uses specific path expressions to select fields in an XML document for successful customer retrieval and identification. For more information, see [Configure the RESTful collector on page 12](#).

FortiVoice and FortiCare RESTful integration

This example shows the FortiVoice IVR RESTful integration with FortiCare, however it can be implemented with other systems, such as Salesforce. When the RESTful service is set up and a caller dials in, the FortiVoice unit sends the caller information inquiry to the RESTful web service which sends back the information to the agent who processes the call.

In this example, FortiVoice retrieves the customer information by using the Express Routing Code (ERC), a unique customer ID.

Call routing using ERC

Each customer has identifying data stored in FortiCare. The data is stored in the following format:

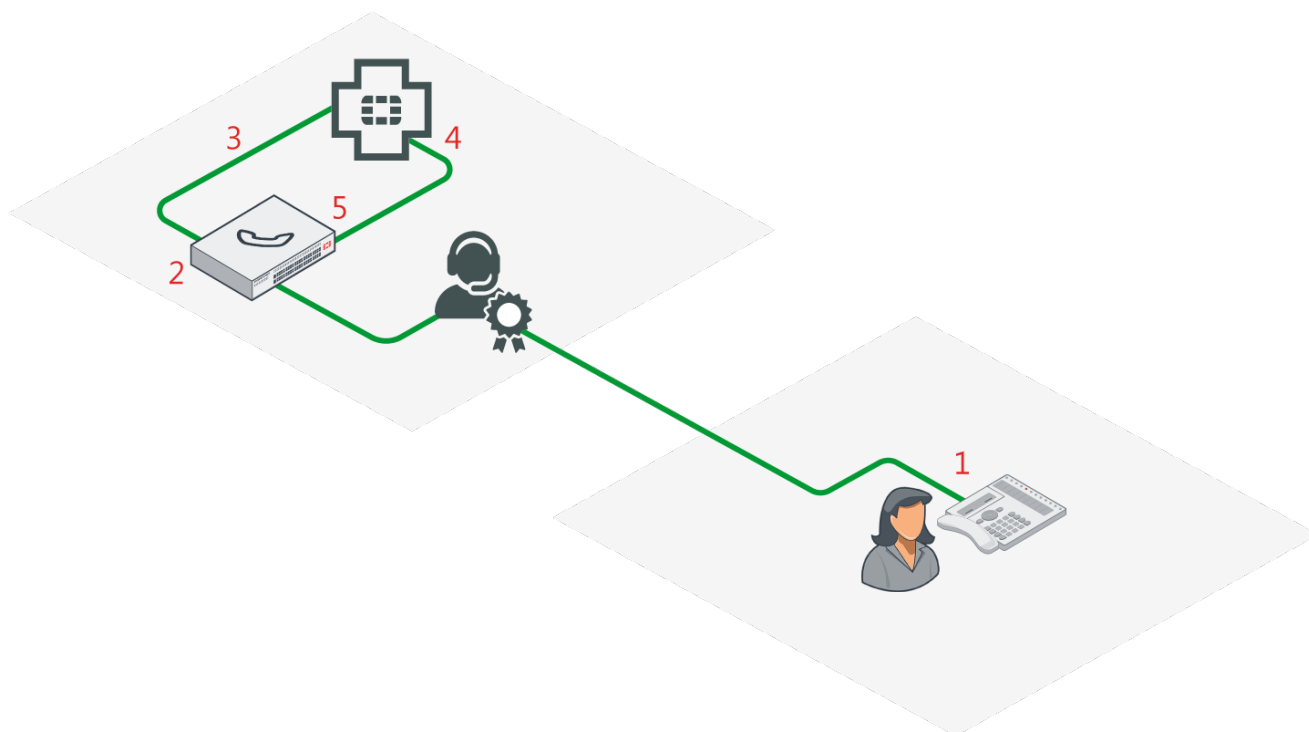
`Company, ProfileType, ERCCode, FirstName, LastName, PhoneGroup, Region, Email`

In this example, FortiVoice uses the ERC (`ERCCode`) as a customer ID to query the customer information from FortiCare. With a successful match, the call is then routed by `PhoneGroup` to the call queue.

Note that for this example, an IVR called *ERC* has already been created. In addition, custom audio greetings/prompts, the auto attendant, and a call queue have already been created.

Workflow:

1. Customer calls in to the Fortinet call center.
2. FortiVoice collects customer ID through IVR system.
3. According to the configuration, FortiVoice sends a RESTful request to FortiCare along with the customer ID.
4. FortiCare receives the request, searches for the customer by customer ID, and responds with a search result.
5. FortiVoice parses the response from FortiCare and utilizes the customer information (if any) according to the configuration, such as dispatch the call to a corresponding call queue.



Assign IVR to the auto attendant

1. Go to **Call Feature > Auto Attendant > Auto Attendant** and edit the appropriate auto attendant (in this example, *MainTAC*).
2. This auto attendant is configured for customer services operating in the Americas. Make sure that your IVR is

assigned to a dial pad key action. In this example, the customer dials 2 to initiate the identification query process.

Auto Attendant

Name:

Default language:

Greeting mode: **Simple**

Greeting:

Ringing for: seconds before answer

Time out action after: second(s):

Invalid input action after: attempt(s):

Dial Pad Key Action

Key ...	Action	Target
1	Call Queue	CS_Americas
2	IVR	ERC
3	Go to Voicemail	7702 (7702) Administrator
4	Start Over	--

+ Advanced

Configure the RESTful service

1. Go to **Call Center > IVR > RESTful Service** and click **New**.
2. Enter a **Name**.
3. Set **Protocol** to **HTTP 1.0**.
4. Set **Authentication** to **Password**, and complete the remaining fields, as required.

FortiCare provides you with the **Username** and **Base URL** which are used to retrieve customer information.

RESTful Service

Name:	<input type="text" value="FortiCare"/>
Protocol:	HTTP 1.0 HTTP 1.1
Authentication:	Password ▼
Username (*):	<input type="text" value="fortinet-us.com\erccodequery"/>
Password (*):	<input type="password" value=""/>
Base URL:	<input type="text" value="https://forticare.fortinet.com/CustomerSupport/WebServices/FortiVoiceRestServices.svc/getCustomer"/> Test
SSL verification	<input type="checkbox"/>
Description:	<input type="checkbox"/>

Create
Cancel

Configure the IVR

You can configure the IVR to use one or multiple data collectors, depending upon the requirement. This example incorporates the use of the digits and RESTful collector.

To configure the IVR, complete the following procedures:

- [Configure the digits collector on page 11](#)
- [Configure the RESTful collector on page 12](#)
- [Configure IVR handling on page 14](#)
- [Configure exception handling on page 15](#)

Configure the digits collector

1. Go to **Call Center > IVR > IVR** and edit the ERC IVR.
The *IVR Configuration* dialog opens.
2. Click **Add Digits Collector**.
3. Enter a **Name**. This example uses **Code**.
4. Assign an audio **Prompt** for the customer to be asked to enter their ERC.
5. Configure the **Digits Settings**, as necessary.

Digits Collector

Name:

Code

Prompt:

ENG_EnterERC

+

Enable read back

☐

Action on returned data:

None

Customized

☐

 Add to agent console - Display name:

☐

 Add to SIP header - Field name:

☐

 Add to remote CDR - Field name:

☐

 Add to report - Field name:

Description:

Customer enters ERC or * for Main Auto Attendant

Digits Settings

Min digits:

1

Max digits:

9

Max invalid input allowed:

3

Timeout:

20

(Seconds)

Max timeout allowed:

3

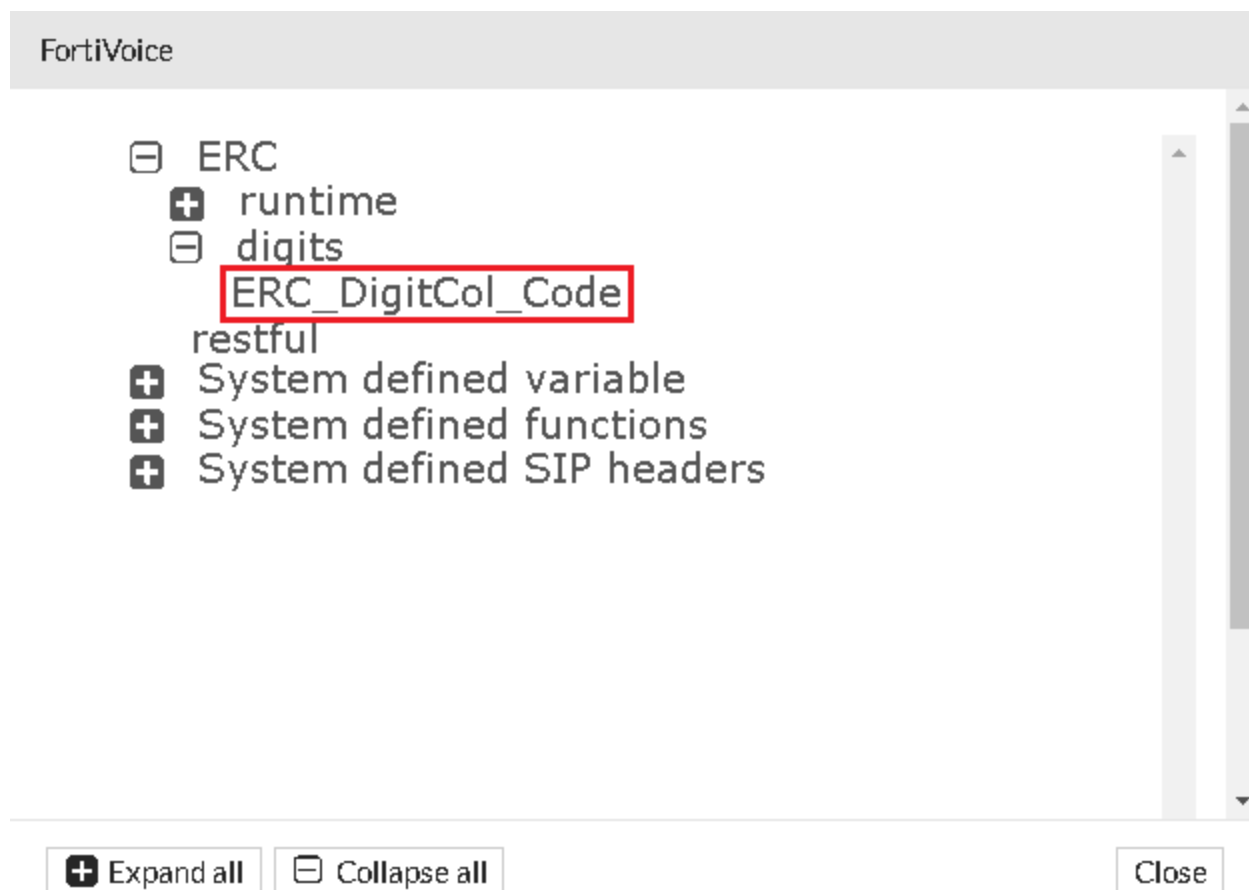
Create

Cancel

6. To save the changes and return to the *IVR Configuration* dialog, click **Create**.

Configure the RESTful collector

1. Click **Add RESTful Collector**.
2. Enter a **Name**.
3. In **Service**, select the FortiCare RESTful service configured earlier.
This action automatically fills in the **URL** field.
4. In **Parameters**, click **Add Variable**.
A tree with the system defined and user defined options is available.
5. Assign the digit collector configured earlier, as shown.



6. In the **Fields** section, click **New**.
7. Set the **Field** name to *Company*.
8. In **Query**, enter the following XPath query:
`//*[local-name()='Name'][1]/text()`
9. Define the remaining fields, as required.
When complete, your *RESTful Collector* dialog can look similar to the following example:

RESTful Collector

Name:

Service:

Method:

Parameters: \$ivr.ERC.digits.ERC_DigitCol_Code\$ ☒ [\[Add Variable...\]](#)

URL: https://forticare.fortinet.com/CustomerSupport/WebServices/FortiVoiceRestServices.svc/getCustomer

HTTP headers: ☒ [\[Add Variable...\]](#)

Timeout: (Seconds)

Max retry allowed:

Description: Collect information from FortiCare based on ERC value entered ☒

Fields

Field	Query	Display Name
Company	//*[local-name()='Name'][1]/text()	
First_Name	//*[local-name()='FirstName'][1]/text()	
Last_Name	//*[local-name()='LastName'][1]/text()	
Region	//*[local-name()='Region'][1]/text()	
Email	//*[local-name()='Email'][1]/text()	
Profile_Type	//*[local-name()='ProfileType'][1]/text()	
ERC_Code	//*[local-name()='ERCCode'][1]/text()	
Result	//*[local-name()='Result'][1]/text()	
Phone_Group	//*[local-name()='PhoneGroup'][1]/text()	

These are examples of some typical fields. However, it is specifically the **Phone_Group** field that will be utilized in the IVR handling for successful call routing.

10. To save the changes and return to the *IVR Configuration* dialog, click **Create**.

Configure IVR handling

All collector configurations can only take effect after IVR handling is set up. IVR handling can be configured to function unconditionally, in which case the system default conditions apply, and a predetermined action will take effect.

IVR handling can also be configured to function conditionally, where self or system defined variables must be met before an action can take effect. These variables offer varying degrees of control and functionality.

1. Click **Add IVR Handling**.
2. Disable **Unconditional**.
3. In **Variable**, click **Add**.
4. Navigate through the IVR tree and click the **Phone_Group** field created earlier.
5. Leave **Operator** set to = (*Equal*).

- Enter a **Value**, as required (in this example, *109*). This value is the user's phone group that will be used to route the call to the appropriate call queue.
- In the **Action** section, click **New**, and create the following three actions as shown below:

IVR Handling

Condition

Unconditional ☐

Variable: \$ivr.ERC.restful.ERC Restful CustomerInfo.Phone_Group\$

Operator: = (Equal)

Value: 109 [Add Variable...](#)

Description: ☒

Action

+ New...

Edit...

Delete

Move ▼

Total: 3

Action Type	Action Info
Play Announcement	ENG_CallForwarded
Set Queue Priority	1
Call Queue	CS_Americas

Create

Cancel

In this example, when a user is prompted to enter their ERC, FortiVoice sends a query to FortiCare to retrieve all information about that specific ERC. If the phone group value within that ERC matches the one specified (109), FortiVoice sequentially executes the actions in the order they are listed: Play a custom announcement (in the example, a call forwarded announcement), set the call queue to the highest priority (1), and deliver the call to the appropriate call queue (regional customer services).

- To save the changes and return to the *IVR Configuration* dialog, click **Create**.

Configure exception handling

If the system encounters an unknown error from the digits collector or the RESTful service, exception handling can be implemented to make sure that calls can still be forwarded to the appropriate call queue.

- Click **Add Error Handling**.
- Set **Error type** to **Unspecified**, for unknown errors the system may encounter.
- Click **New** and create two actions: a call forward announcement followed by an action to route the call to the customer service call queue, as shown below.
- Make sure to click **Create** when finished.

IVR Exception Handling

Error type: **Unspecified** Restful

+ New...
Edit...
Delete
Move ▼
Total: 2

Action Type	Action Info
Play Announcement	ENG_CallForwarded
Call Queue	CS_Americas

Create
Cancel

- Under **Exception Handling**, click **New**.
- Set **Error type** to **Restful**.
- Create the same two actions as before, and click **Create** when finished.
You will have four exception handling actions, as shown below.

Exception Handling

+ New...
Edit...
Delete
Move ▼


Type	Action Type	Action Info
Unspecified	<u>Play Announcement</u>	ENG_CallForwarded
Unspecified	<u>Call Queue</u>	CS_Americas
Restful	<u>Play Announcement</u>	ENG_CallForwarded
Restful	<u>Call Queue</u>	CS_Americas

OK
Cancel

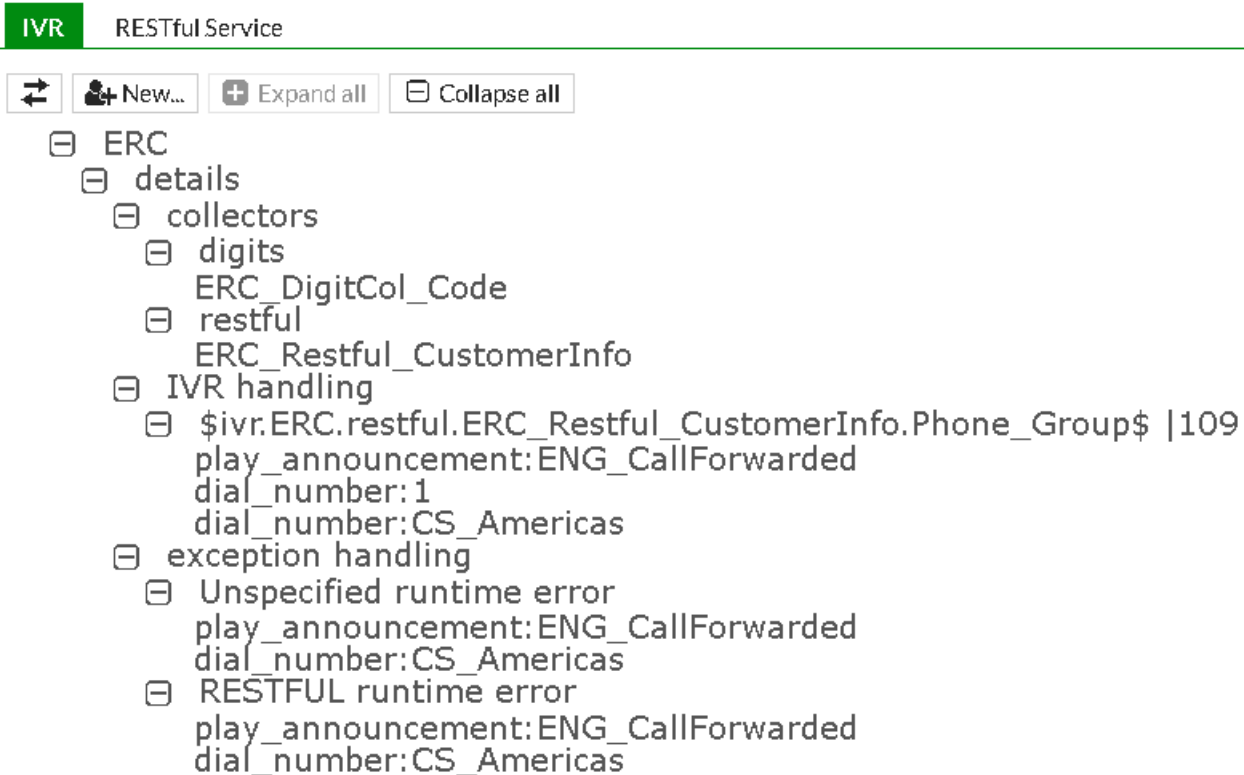
- Click **OK**.
The IVR configuration is complete.

Summary

By the end of this example configuration, several elements come together to perform a sequential pattern of actions, based on the data input by the caller and the conditions and actions applied within the IVR configuration.

- Go to *Call Center > IVR > IVR*.
- To switch to the expandable/collapsible screen, click *Switch* .

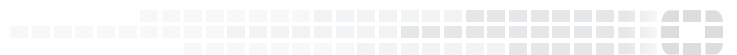
Here you can view the IVR tree that has been created. When fully expanded, this is what the full IVR tree looks like:



3. To immediately open the options dialog for a particular element, you can click any child-element in the IVR tree.



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