

# **Brekeke Customer Interaction Manager Administrator's Guide**

**Version 2.7**

**Brekeke Software, Inc.**

### Version

Brekeke Customer Interaction Manager v2.7 Administrator's Guide

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# 1. Introduction

The Brekeke Customer Interaction Manager (Brekeke CIM) is designed to work with Brekeke PBX<sup>1</sup> and build a full-scale call center system. The Brekeke CIM provides the following functionalities:

<b>Call Center Feature</b>	Basic feature in order to work on inbound and outbound work tasks. Brekeke CIM includes Web based client (CIM client) for Agents to work and you can run call center without special applications other than phone devices.
<b>Status Management</b>	Manages agent status.(i.e., Offline, Ready, Talking, Wrap Up, Idle, Work) Reason code can be specified for each state if needed.
<b>Account Management</b>	Manages the user accounts for Brekeke Contact Center Suites. There is three types with different permissions: General Users, Supervisor (SV), and Administrator.
<b>Login Management</b>	Manages the user login information for Brekeke Contact Center Suites. Single Sign On feature is offered for seamless use of the application.
<b>ACD</b>	Feature that selects agents and distribute calls to a specific group of agents (Incoming calls, Dialer) routing calls based on pre-set conditions such as agent's idle time and skill level, to achieve the most effective call center operation.
<b>Dialer</b>	Automates outbound jobs using the call list. There are four types of dialing: Predictive Dialing, Progressive Dialing, Preview Dialing and Automated Voice Dialing. <sup>2</sup>
<b>Log Output</b>	Outputs logs for applications such as MIS (Management Information System). It can be used in order to use Brekeke Contact Analytics Historical report or Real time report features.
<b>Application Integration</b>	Through CIM client, it can be easily integrated with CRM applications that is being used by agents who processes the calls. Additionally, the APIs such as JavaScript or .NET in order to setup complicated integrations.
<b>Related Calls</b>	This is a feature where the agent associated to the call and prioritize for the call to be routed to the agent. Agent Routing based on the various conditions can be setup.

<sup>1</sup> For details about Brekeke PBX product, please visit Brekeke Software, Inc. homepage, the Brekeke PBX product page at <http://www.brekeke.com>.

<sup>2</sup> Dialer application such as Brekeke Outbound CRM is required for Predictive, Progressive and Automated Voice Dialing are used.



## 2. Overview

### 2.1. Brekeke PBX and Brekeke CIM

#### 2.1.1. Role of Brekeke CIM

Brekeke PBX offers extensive coverage of IP-PBX software for office usages. Without using Brekeke CIM, it is possible to create a simple call center by developing your own application utilizing Brekeke PAL or Web Services that integrates with Brekeke PBX.

However, the solution mentioned above requires series of development cycles and it could be challenging to develop a sophisticated call center. By utilizing Brekeke CIM, one can construct a reliable and efficient call center system.

#### 2.1.2. Interfacing with Brekeke PBX

When Brekeke CIM started, it initiates connection to Brekeke PBX. Brekeke PBX notify call information to Brekeke CIM when they are connected. Brekeke CIM sends information such as when it assigned a call to an agent or put a call into a queue. Brekeke PBX handle call routing according to the information received from Brekeke CIM. If Multi-Tenant Edition of Brekeke CIM is used, it works with each tenant within the Brekeke PBX. Brekeke CIM can either run on the same server where Brekeke PBX is installed on<sup>3</sup>, or on a separate server. By installing Brekeke CIM in a separate server from Brekeke PBX, the reliability of the system increase since Brekeke PBX continues to provide the basic calling features even when failure occurred at Brekeke CIM.

#### 2.1.3. Brekeke PBX User and Brekeke CIM Agent

The agent of Brekeke CIM is required to be set as a user of Brekeke PBX. Brekeke PBX automatically creates a user when the system cannot find the user name which corresponds with the agent who had logged in to the system. The user of Brekeke PBX can use all IP-PBX feature of Brekeke PBX even when it is not registered as an agent of Brekeke CIM. With this characteristic, one Brekeke PBX can possible to serve both as an office PBX and telephony platform for call center operation.

#### 2.1.4. Comparing Operation using Stand-alone Brekeke PBX or with Brekeke CIM

	Stand-alone Brekeke PBX	With Brekeke CIM
Incoming Call Distribution	Routing incoming calls by simple call routing functions: schedule, top-down, or Round-robin	Routing inbound calls based on pre-set conditions such as agent's waiting time and skill level, to

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<sup>3</sup> Brekeke CIM and Brekeke PBX can be deployed in one Tomcat.

		achieve the most effective call center operation. Creating customized routing call is possible with writing a script.
Dialer	Preview Dialing	Supports four types of Dialings: Predictive Dialing Progressive Dialing Preview Dialing IVR Dialing <sup>4</sup>
Agent Status Management	No status management feature supported for call center usage. Possible to create an application to manage status using Brekeke PAL and Web Service feature.	Manages agent status. (i.e., Offline, Ready, Talking, Wrap Up, Idle, Work)
Application Integration	Application Integration is possible with Brekeke PAL or Web Service	Application Integration is possible with CIM client.
Report	Call log generated by Brekeke PBX	Agent status logs which enable to collect agent performance and other types of reports for performance analyzation. <sup>5</sup>

## 2.2. CIM client

This is the client feature that can be used by agents for the Call Center.

There are two types of CIM client; web widget type and .NET type and it provides features to change Agent status, operates the calls, displays necessary information. Additionally, without any special customization, the application screen such as CRM can be automatically popped when an agent received a call. Using the APIs provided for CIM client, more complicated advanced application integration can be achieved as well.

<sup>4</sup> Brekeke Outbound Dialer is required when Predictive Dialing, Progressive Dialing and IVR Dialing are used.

<sup>5</sup> Through Brekeke Contact Analytic, status can be viewed and results can be analyzed.

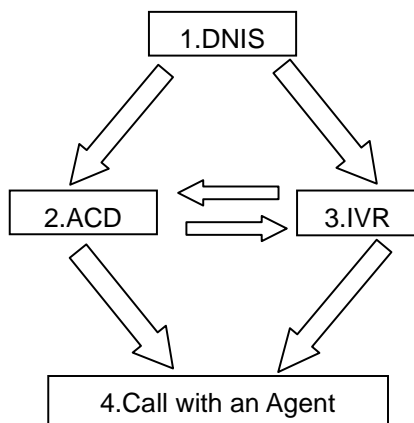
### 3. Process Overview

#### 3.1. External Calls and Internal Calls

The Brekeke CIM distinguishes calls in two categories: external calls and internal calls. By default settings, the Brekeke CIM recognize the telephone number longer than 6 digits as external calls, if the number is shorter than that, it is recognized as internal calls. (You can change this settings in advanced settings). For the telephone number that caller ID is not available, it is recommended that to set the number to replace with a specific number in ARS IN of Brekeke PBX. For example, 9999999999.

#### 3.2. Processing Incoming calls

The Brekeke PBX route an incoming call by settings defined at Pattern-In at ARS. The Brekeke PBX notifies the Brekeke CIM that a call is received. After receiving such notification the Brekeke CIM processes the call as shown below:



1. Route the call according to the rules set by DNIS (phone number) and time (schedule) to either forward to a destination with ACD or other destinations like an IVR.

2. When a call is forwarded to the destination with ACD, the call is handled according to rules set at the ACD. For typical settings with an ACD, the call is forwarded to an agent who is in “Ready” status to receive calls. If there is no agent is ready to answer the call, it will be placed in the call queue. When an agent status changes to “Ready” to accept a call, the call in the queue is forwarded to the agent. When the call is not answered after a pre-set wait time, such calls can be set to be forwarded to an IVR and ask the caller to choose whether to continue waiting or wish to receive a call back.

3. When a call is forwarded to an IVR, the Brekeke CIM routes the call based on the entry made by the caller (i.e., select the nature of inquiry or enter customer number) to appropriate ACD or an agent.

4. The system forwards the call to an agent and the call is started.

### 3.3. Processing Outbound Calls

There are four ways to make outbound calls as shown below:

1. Preview dialing via external applications such as CRM (i.e., Click-to-Call)
2. Call button at CIM client
3. Dialer functions (i.e., Predictive Dialing, Progressive Dialing, IVR Dialing)
4. Dialing from a phone (This method is not recommended.)<sup>6</sup>

For the method 1~3 above, the Brekeke CIM sends a request to Brekeke PBX to make outbound calls

### 3.4. ACD (Automatic Call Distributor)

An agent can be assigned under multiple ACDs. Each ACD has inbound rules to route calls. Also each ACD can run a different dialer.

### 3.5. IVR (Interactive Voice Response)

IVR is used for various purposes, such as asking for the selection of nature of inquiries, entering customer number or making after business hour announcement. For details for how to build an IVR system, please refer to the document “Brekeke PBX Developer’s Guide - IVR”.

### 3.6. Call Queue

Call queue is commonly used to place a call in queue, when there is no agent in “Ready” status to receive a call. While waiting in the queue, usually customer hears on-hold music or customized announcement, and call will be forwarded to an agent when an agent became “Ready” to receive the call.

With Brekeke CIM, each ACD has one queue. By default, the guidance file set as “queue” at Brekeke PBX will be played repeatedly while a call is in a queue,. Announcement to report real-time information, such as the number of existing wait calls or expected wait time can be created by utilizing IVR of Brekeke PBX. Please refer to “Replay of guidance When a Call is in Queue”, for the instruction of how to write scripts to extend these call queueing announcements.

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<sup>6</sup> The outbound calls initiated from a phone may cause mismatch between agent status at Brekeke CIM and the actual phone status. For example, it is possible for a call to be received when an agent to pick up a handset to make a call since Brekeke CIM recognize the agent as in “Ready” status to receive a call.

## 4. Installation

### 4.1. System & Software Requirements

Brekeke CIM runs on the following environments:

<b>OS</b>	Microsoft Windows 7 or later, Red Hat Linux
<b>Java</b>	Java SE 7 or later( <i>Java provided by Oracle</i> )
<b>Memory</b>	4GB minimum
<b>Apache Tomcat</b>	Version 7.0.53 or later
<b>Brekeke PBX</b>	Version 3.3.4.4 or later
<b>Database</b>	MySQL 5.5 or later

### 4.2. Installation Steps

#### 4.2.1. Installing Brekeke PBX

Install Brekeke PBX following the instruction found at Brekeke PBX Administrator Guide (Basic). Brekeke CIM can either run on the same server where Brekeke PBX is installed on, or on a separate server.

#### 4.2.2. Installing Java SE

- 1) Install the appropriate version of JRE or JDK for the type of OS you are running.
- ✓ *When Brekeke PBX and Brekeke CIM are installed on the same machine, this step can be omitted.*

#### 4.2.3. Installing Tomcat

- 1) Access the website <http://tomcat.apache.org/index.html>
  - 2) Download the binary file of the appropriate version of Tomcat for the type of OS you are running.
  - 3) Set JRE or JDK Install directory for the environment variable JAVA\_HOME.
  - 4) Install the downloaded file.
- ✓ *We recommend adding `liveDeploy="false"` to the `server.xml` file at Tomcat installation directory/`conf/` as below:*

```
<Host name="localhost" appBase="webapps"
      unpackWARs="true" autoDeploy="true" liveDeploy="false"
      xmlValidation="false" xmlNamespaceAware="false">
```

#### 4.2.4. Installing database

Install the database. Please refer to the instruction manual provided by the manufacture for instruction for how to install the database.

#### 4.2.5. Installing Brekeke CIM

- 1) Copy the file cim.war directly into the webapps directory which is under the Tomcat installation directory.

#### 4.2.6. Starting Tomcat

- 1) Start Tomcat.
- 2) Open a web browser and specify the URL <http://localhost:8080> (If you chose a port number other than the default “8080”, specify the appropriate port number in the URL.)
- 3) Tomcat has started successfully if the Apache Jakarta Project page is displayed.

#### 4.2.7. Starting Brekeke

- 1) At web browser, specify the URL <http://localhost:8080/cim/> (If you chose a port number other than the default “8080”, specify the appropriate port number in the URL.)
  - 1) The dialog to activate your license will display

### 4.3. Initialization Steps

#### 4.3.1. Activating License

- 1) Paste the Product ID in the text box
- 2) After clicking [Activate] button, please follow the instructions on the screens to complete the activation.
- 1) When the activation is completed, you will proceed to CRM Initialization Configuration page.

#### 4.3.2. Initializing Database for configuration information

- 1) By clicking [Initializing Database] button, proceed to [Initializing Database] page.
- 2) From the page, initialize the database. (Please refer to [Settings].)
- 3) When initialization is completed, it will proceed onto [Database] page.
- 4) Click on [Save] button, it will save the settings.
- 5) Confirmation dialog “Database has been change, logging off, is that okay?”. Click [OK] will proceed to [Licensing] screen.

#### 4.3.3. Set Tenant Name at Brekeke PBX (Single-Tenant)

Set the same tenant name at Brekeke CIM as the tenant name set at Brekeke PBX. You will be logged off after changing tenant settings.

#### 4.3.4. Settings for connecting with Brekeke PBX

- 1) Login to Brekeke CIM. (Default credential is User ID: sa, Password: sa)
- 2) From [Setting] > [System] page, set the connection settings with Brekeke PBX. (Please refer to “Settings”)
- 3) Use [Save] button to save the settings.

#### 4.3.5. Settings at Brekeke PBX

- 1) At [Brekeke PBX Admin] > [Options] > [Settings], in the [Web Service Client Address], describe the pattern that matches the IP address of the Brekeke CIM. (For example, ^ 192 \ .168 \ . \* \$) using the regular expression.
- 2) At [Brekeke PBX Admin] > [Options] > [Advanced], add the following properties.  
`statusboard.passthrough.events=35,36`  
This property is to notify events related to call hold to Brekeke CIM.  
`statusboard.savedata.switch=false`  
When this property is set, Brekeke PBX does not accumulate unnecessary information in Brekeke PBX, thus the performance of Brekeke PBX will be improved.  
`statusboard.block.event.ringing=true`  
RINGING event is not used in Brekeke CIM. The performance of Brekeke CIM will be improved using this property.  
`pbx.usersetting.default.recording=true`  
Turn the call recording on when new user is created.

#### 4.3.6. Confirm CIM is working properly

- 2) Login to Brekeke CIM.
- 3) In the [Maintenance] > [Start/Stop] screen, start CIM
- 4) When the status information area on the left show CIM → Runing, PBX Connection → Connected, CIM is started and running successfully.

## 5. Admin Menu (Multi-Tenant Edition)

This menu is displayed only when logged in as system administrator of Brekeke CIM Multi-Tenant Edition.

## 5.1. Tenant

Tenant list is displayed. Create new Brekeke CIM tenant by clicking on [New]. Enter the same tenant name set at the Brekeke PBX. By clicking on the tenant name, you can access the tenant's main menu.

## 5.2. Users

You can create, edit or delete account as system administrator. Similar page also exists under main menu. (For more details, please refer to [Main Menu]>[Account].)

## 5.3. Log

### 5.3.1. Event log

Event of the whole system is displayed here. A similar page exists under main menu. (For more details, please refer to [Main Menu]>[Log].)

### 5.3.2. Help log

Help Histories of the system is displayed here. Similar page exists under main menu.(For details, please refer to [Main Menu]>[Log].

### 5.3.3. Error log

Error histories of the system are displayed here. (For details, please refer to [Main Menu]>[Log].

## 5.4. Settings

### 5.4.1. System

Here, you set default system options. Similar page exists under main menu. The default setting will be applied to tenants when there is no settings set at tenant's main menu. For details of the setting items, please refer to [Main Menu]>[Settings].

### 5.4.2. Security

Set the default settings for user's IP addresses that are allowed to access the system. Similar page exists under main menu. If it's set in the tenant's main menu, they that would be used instead. For details of the setting fields, please refer to [Main Menu]>[Settings].

### 5.4.3. Other items

Other setting items are same as Brekeke CIM Single-Tenant Edition. For details, please refer to [Main Menu].



## 6. Tenant Menu (Multi-Tenant Edition)

This is the main menu for each tenant when logged in as System Administrator credential to Brekeke CIM(Multi-Tenant Edition).

### 6.1. Maintenance

#### 6.1.1. Start and Stop

Change state of CIM under the tenant. Tenant users are unable to change CIM state, therefore in Multi-Tenant Edition, System Administrator will manage the state of CIM for each tenant. For details of the setting fields, please refer to [Main Menu]>[Start/Stop].

#### 6.1.2. Resources

Configure application resources that are available for Multi-Tenant edition for each tenant.

Fields	Description
General	
Max User Sessions	Limits the max number of sessions for users in Brekeke Contact Center Suite.
Max Agent Logins	Limits the max number of sessions for agents in Brekeke Contact Center Suite.
Edit Script	Limits the editing of scripts by tenant user
CIM Client	
Chat Feature	Controls the availability of chat feature for the CIM client
Related Call Feature	Controls the availability of related call feature for the CIM client

## 7. Main Menu

### 7.1. Users

#### 7.1.1. Users

Display a list of agents. To create a new agent, click on [New] button to be directed to a new page. To edit, click on the specific User ID to be directed to the edit page. Select checkbox of a user, to delete, to assign ACD, or to change agent's skill. When logged in as Supervisor (SV), only regular users can be created, edited and deleted.

When a user is selected by checkbox

Name	Description
Delete	Delete selected user. You will not be able to remove the user who is currently logged in.
Skill	Bulk Edit(Add or Change) skills for selected users using the [Update] button.
ACDFor selected ACD, assign users by clicking on [Assign] button. To un-assign users, click on [Cancel Assignment] button to cancel the assignment of selected users.	

## Filters

Name	Description
Type	Select user type
Filter(Filter Fields)	Select field to filter selections by keyword
Filter (Regular Expression)	Specify the expression for keyword
Filter (Keyword)	Specifies keywords.
Rows	The maximum number of rows that search result displays agents.

## 7.1.2. Edit Users (or Create New Users)

Configure settings of common information related to all user types

Name	Description
General	
User ID	Display User ID. Set User ID when creating a new agent. ID cannot be changed once created.
User Name	Name of the user
Password	Password for user. Password is case sensitive.
Password (Confirm)	To confirm password, enter it again.
Type	Select user type. For more details, please refer to 'Users'.
Group	Select group where the user belongs to.
Continuous Connection	If enabled, the device is called when logged in and the device is continuously logged in until logged out.
Description	The descriptions for the User. Please freely use this field.
Skill	
Skill	Select skill and set level of the skill.
ACD	

ACD	Display ACD ID that this agent belongs to. To assign an agent to the ACD, go to Users screen or ACD Edit screen to assign agents.
-----	---

- ✓ Changes made to agents will not be applied to agents who are online. To apply the changes, agents need to sign-off and sign-in.

Configure settings related to SV or Administrator(Only System Administrator can configure these settings)

Name	Description
Administrator Group	
Group	Select group for agents(normal users) managed in call center. When you associate agents under the group, the user can use Help detection or Supervisor's functionalities.
Edit Permission(Only SV)	
Group	For each group, specify the edit permission(Read, Write) on the SV's Manage screen. (R: View Only, W: Allowed to Create/Edit/Delete)
group	Specify the permission of the target group. You will not be able to create new group or delete existing group.対象グループに対する権限を指定します。ただし、グループの新規作成と削除はできません。
user	Specify the permission of the normal users who belong to the target group. You will not be able to create/edit/delete Administrator or SV users.
acd	Specify the permission for ACD in the target group.
dnis	Specify the permission for DNIS in the target group.
schedule	Specify the permission for schedule in the target group.
skill	Specify the permission for skills in the target group.
script	Specify the permission for scripts in the target group.
log	Specify the permission for logs in the target group.

- ✓ Changes made to agents will not be applied to SV who are online. To apply the changes, users need to sign-off and sign-in.

### 7.1.3. Import

You can import a CSV file in order to create users

## I. Select a CSV file to import

Select “Use First Field as Header and Map fields” checkbox if the first record of the CSV is header and auto map the fields.

## II. Click on Import button.

As soon as the button is clicked, the CSV file is uploaded and when completed, the user is transferred to the Field Mapping screen.

## III. First few records from the imported CSV file as as sample set, use the select box in the header of the list and assign the fields to each columns.

## IV. Click on Register button.

Each records are validated and the valid records are added as users.

## Fields on the screen (Select File screen)

Name	Description
CSV File to import	Select the CSV file to import for registering users. Only extension that can be specified is CSV.
Use First Field as Header and Map fields	If this checkbox is selected, on the field mapping screen that is displayed after clicking the import button, the first field as header and map the fields automatically if matched.
Import	Import selected CSV file After the upload is completed, you will be transferred to field mapping screen.

## Fields on the screen (Field Mapping Screen)

Name	Description
Column Selector	Assign Use Information column for all the fields being imported. It is not allowed to assign the same column twice.
Ignore the first row	The first record is ignored for user registration. Select when the CSV includes the header row as the first record.
Recover Mode for Record	Specify the action if any records include unrecoverable information in any columns.  If “Ignore the unrecoverable info” is selected, those columns are ignored if it's possible to omit them.(If required, then that causes error)  If “Error the unrecoverable info” is selected, the record errors out.

Action for Duplicate Data	<p>Specify the action when the same user ID data already exists.</p> <p>If “Skip record and continue import” is selected, the record is skipped.</p> <p>If “Overwrite(partial)” is selected, only the fields that are imported are overwritten and other fields are kept untouched.</p> <p>If “Overwrite(complete)” is selected, the fields that are being imported are overwritten and other fields are also overwritten with the default value.</p> <p>If “Cancel Import” is selected, if any records are considered duplicated, the process is cancelled and all the registration is reverted.</p>
Action for Errors	<p>Specify the action to take when the records cause error.</p> <p>If “Skip record and continue import” is selected, the record is skipped.</p> <p>If “Cancel Import” is selected, if any records are considered duplicated, the process is cancelled and all the registration is reverted.</p>
Register	Start the user registration and proceeds to the process results screen.
Cancel	Cancel the user registration and go back to Select File screen.

#### 7.1.4. Export

Export the user data in CSV format.

Fields on the screen

Name	Description
Filter	Specify the filter that filters users to export to CSV file.
Exported fields	<p>Select fields to export to CSV</p> <p>Fields that are set in the selected list are exported to CSV file.</p> <p>When the arrow button is clicked with an item selected, it moves between unselected list and selected list.</p> <p>Please select at least one item.</p>
Add field names in the first row	Check this when field names should be exported as the first row in the CSV file.
Export	Start Exporting.

✓

## 7.2. ACD

### 7.2.1. ACD List

Display a list of ACD. To create a new ACD, click on [New ACD] button to be directed to a new page. To edit, click on the specific ACD ID to be directed to the edit page.

### 7.2.2. Create or Edit ACD

Edit ACD settings.

Name	Description
General	
ACD ID	Display ACD ID. Set ID when creating a new ACD. ACD ID cannot be modified once created.
Group	Select group where the ACD belongs.
Description	Enter descriptions of the ACD.
Level	Level of the ACD. (Default: 20)
Agent selection	
Filter function Parameter	Set the name of filter function and parameters. Filter function is used to extract valid agents in advance prior to ACD assigns a call to an agent. For the details of filter function, please refer to "Select Agents - Filter Function".
Priority function Parameter	Set the name of priority function and parameters. Priority function is used to set the priority of each agent when the system select an agent to assign the call. For more information about the priority function, please refer to "Assign Agents - Priority Function".
Queue	
Maximum calls in queue.	If the number of calls has been set, calls will be originated from the ACD. (Default: 10 )
Next (When Queue is full)	ACD ID or extension number (i.e., IVR) to transfer calls when a call cannot go in the queue because it is already full.
Timeout (second)	Specify the longest of waiting time in a queue. (Default: 300)
Next (Timeout)	ACD ID or extension number (ex: IVR) to transfer calls when a timeout has occurred in a queue.
IVR Function	Set function for playing voice prompts while a call is in a queue.

	This script will be written in the notes field in Brekeke PBX settings. Enter the name of the note and the function connected with dot(.). If this setting is left empty, guidance set at “queue” will be played repeatedly. For more information about guidance function, please refer to “Play Recorded Message When a Call is in Queue”.
Position function Parameter	Set the name of position function and its parameters. Position function can determine the position of the call in the queue.  For more details about its scripts, please refer to the “Positioning function”. If this setting is empty, calls will always be added in the back of a queue.
Inbound Calls	
Auto Answer	Set whether if automatic off-hook will be used for the inbound calls. When automatic off-hook feature is set at the phone, this setting is not necessary.
Minimum Standby Agents	Specify the number of agents that you want to keep in “Ready” status for emergency when receiving incoming calls. (Default: 0)
Call	
Calling Number	Specify the standard calling number that will be used when Agents tied to ACD or Dialers makes outbound calls.
Dialer	
ON/OFF	Set to “ON” to enable Dialer. Set to “OFF” to disable dialer.
Phonebook Application URL	Set the application interface URL of the Dialer Integrations applications such as Brekeke CRM,
Standard Values	
Waiting Alert Threshold Value	Specify the waiting alert threshold value in two levels. Alert functionality is used in CIM Client or Brekeke Contact Analytics.

### 7.2.3. Assign Agent Groups

Display a list of assigned groups. When assignment by group, you can only assign standard users that belong to the group. Therefore if System Administrator or SV(Supervisor) needs to be assigned to ACD, user ID must be specified. If logged in as SV, you will not be able to assign by group.

#### 7.2.4. Assign Agents

Display a list of agents. To assign agent to an ACD, select the appropriate agents by checking on the checkboxes, and click on [Assign] button. When you logged in as SV(Supervisor), you can only assign standard users who has the Read permission to ACD. For the details of filter, please refer to the section “Main Menu > Users”.

### 7.3. Rules

#### 7.3.1. DNIS

Display a list of DNIS. Delete a DNIS by clicking on [Delete] button. To create a new DNIS, click on [New] button to be directed a new page. To edit, click on the specific DNIS to be directed to DNIS's edit page.

#### 7.3.2. Create or Edit DNIS

Specify settings for DNIS. These settings will be applied to incoming calls.

Name	Description
DNIS	Set DNIS when creating a new script. DNIS cannot be modified once created.
Group	Select group that the DNIS belongs to.
Description	Enter descriptions for the DNIS.
Schedule	
Schedule	Set schedule for this DNIS. Specifying the schedule, depending on the days of the week or time range, the call process method can be altered. When a call is received, the CIM looks for a matched schedule from top down.. If matched schedule setting is found, it processes the call according to the setting value: Target ID, URL, and Parameters. If there is no matched schedule found, the call will be terminated.
Target ID	ID for ACD, or extension number of forwarding destination (for many cases, this will be the number for IVR).
URL for application	Specify URL for the application such as CRM or other third-party applications that should pop when agent receives a call. Set the variable using #~#.
Parameters	Set the parameters to the calls. Specify multiple by using the format <i>p1=value, p2=value</i> . If existing call parameters are



	specified, the value will be overwritten.
Script	Set the scripts. As soon as a DNIS is processed, the script will be called. You can set priority of calls or modify the target ID. If this setting is not necessary, leave this setting blank.

### 7.3.3. Schedule

Display a list of schedule. To create a new schedule, click on [New] button to be directed a new page. To edit, click on the specific schedule name to be directed to the edit page.

### 7.3.4. Create or Edit Schedule

Specify settings for schedule. At schedule detail page, a list of schedule is displayed according to date and time. Here, you can create, copy, delete and modify display sorted by priority.

Name	Description
Schedule	Set schedule name when creating a new script.
Group	Select group that the schedule belongs to.
Description	Enter descriptions for the schedule.
Start	Set start date of the schedule
End	Set end date of the schedule
Schedule Details	
No.	Number will be assigned to each schedule in order starting from 1. When there is more than one schedule valid for specified time and date, the schedule with smaller number will be applied.
Date Settings	Display the type of dates To Edit, click on the specific date settings to be directed to the edit schedule (Edit Date) page.
Time Setting	Display the specified hours for the schedule if any. To Edit, click on the specific time settings to be directed to the edit schedule (Edit Time) page.

### 7.3.5. Schedule Details (Edit Date Settings)

Set date of the schedule

Name	Description
Every day	When selected, the schedule will be applied every day
Week	Select day of the week. Sunday to Saturday for the 1 <sup>st</sup> week to 5 <sup>th</sup> week of the months.

Date	Multiple starting and ending dates can be set for the schedule.
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### 7.3.6. Schedule Details (Edit Time Setting)

Set time for the schedule. The range will be evaluated as “Start Time  $\leq$  t < End Time”, therefore if you would like to specify the time from 12 to 1, you will need to configure as “12:00-13:00”

Name	Description
Starting Time	Set starting time for the schedule.
Ending Time	Set ending time for the schedule. When Ending Time is set at the same time as Starting Time, this schedule will be applied all day. When Ending Time set is earlier than Starting Time, the schedule will be applied between Starting Time~24:00 and 00:00~Ending Time.

### 7.3.7. Skills

Displays a list of skills. To create a new skill, click on [New Skill] button to be directed to a new page. To edit, click on a skill to be directed to the edit page.

### 7.3.8. Create or Edit Skill

Define Skills.

Name	Description
Skill Name	Set skill name when creating a new script. The skill name can be modified after creating.
Group	Select group that the skill belongs to.
Description	Enter descriptions for the skill.

### 7.3.9. Scripts

Displays a list of scripts. To create a new script, click on [New Scripts] button to be directed a new page. To edit, click on the specific script name to be directed to the edit page.

### 7.3.10. Create or Edit Script

Edit script. Scripts whose name starts with \_ (underscore) are default scripts and they cannot be modified. The script that is being viewed can be executed using [Execute] button in the Execute Script section at the bottom of the screen. More detail instructions on scripting can be found in the Scripts section.

Name	Description
Name	Display script name. Set script name when creating a new script. The script name cannot be modified once created.
Description	Enter descriptions for the script.
JavaScript	Write script using JavaScript. The script created here can be specified at ACD or DNIS settings by the name of script and function connected with period (.).
Execute Script	
Function Name	Specify the name of the function in the script.
Parameters1~5	Specify the strings. If you specify an instance of CTIServer class in action, please specify \$cim.

- ✓ Changes made to agents will not be applied to SV who are online. To apply the changes, users need to sign-off and sign-in. Scripts are critical that could affect behavior and the performance of the application, therefore it's not recommended for non-system administrator to maintain the code. Therefore in Multi-tenant edition, the default permission of Tenant users are set to not allow Create or Edit.

✓

## 7.4. Group

### 7.4.1. Groups

Displays a list of groups. To create a new group, click on [New] button to be directed to a new page. To edit, click on the specific group to be directed to edit page. When logged in as SV(Supervisor), it is allowed to view and edit existing group but not allowed to create new group or remove group.

### 7.4.2. Create or Edit Group

Specify settings for Group Information

Name	Description
General	
Group	Displays Group Name. Once it's created, the name cannot be changed.
Associated group	Set the group associated to the group. If logged in as SV, this cannot be modified.
Description	Description of the group.
Homepage URL	Specify the URL of the homepage.
CIM Client	

Chat	Limits the chat feature of the CIM client for the agents associated to the group.
Related Calls	Limits the related calls feature of the CIM client for the associated agents.
ACD Information	Limits the ACD Information feature of the CIM client for the associated agents.
Emergency Help	Limits the Emergency Help feature of the CIM client for the associated agents.

#### 7.4.3. Reason Code (Calls)

Set call reason code for each group. The setting is inherited using the group hierarchy. The reason call is attached to the call by Agent using CIM client and after it's reported in the logs, it is used, for example in the data compilation and data analysis applications.

Name	Description
Reason Code	Sets the reason code for the call
Description	Description for the reason code.
Set Required	Specify if the reason code field should be required or not to attach to the call when it ends(post processing). When it's set to required, Agents are required to attach the reason code in CIM client.

#### 7.4.4. Reason Code (Agent State)

Set call reason code for each group, for the three agent states(Ready, Idle, Work). The setting is inherited using the group hierarchy. The reason call is provided by Agent when the state is changed using CIM client and after it's reported in the logs, it is used, for example in the data compilation and data analysis applications.

Name	Description
Reason Code	Set reason code for Agent States(Ready, Idle, Work)
Description	Description of reason code
Set Required	Specify if the reason code field should be required or not to attach when the agent state is modified. When it's set to required, Agents are required to attach the reason code in CIM

	client.
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## 7.5. Logs

### 7.5.1. Event Log

Display information related to following events:

- User logs in to Brekeke CIM or log out.
- Connect and disconnect to Brekeke PBX

Using the “Search” button, by setting dates, you can narrow the log information display. When the event log is large, the information will be displayed in multiple pages. By clicking on the page number, or clicking on “Previous” and “Next” page links, you can view data in different pages.

Name	Description
Date	The date when the event occurred.
Event	Type of the event
Details	Display event details. The contents will be different depending on the event type.

### 7.5.2. Help Log

Emergency Help histories by agent is displayed

Name	Description
Date	The date when the help is requested.
Group	Associated group of the agent who requested the help.
Agent ID	Agent ID who requested the help
Status	Display help status in either Requesting or Closed

### 7.5.3. Error Log

Error log is displayed. By entering dates, the result will be narrowed down.

Name	Description
Date	The date when the error occurred.
Error	Type of the error
Details	Display error details by clicking on names

- ✓ With Brekeke CIM Multi-Tenant Edition, access this information from a tab menu located under [Admn Menu > Log].

## 7.6. Settings

### 7.6.1. System

Set initial settings for Brekeke CIM. There is no need to modify the settings once it is set. To take effect of the changes, Brekeke CIM needs to be restarted.

Name	Description
General	
Tenant Name	The tenant name will be displayed. (This will be displayed at main menu settings when Multi-Tenant Edition is used.)
Description	Description of the tenant. (This is set at main menu settings when Multi-Tenant Edition is used. )
Log expires (days)	Set time period to save log (This will be displayed at main menu settings when Multi-Tenant Edition is used.)
PBX connection settings	
Start	Specify the way CIM should be started, manual or automatic. When it's set to automatic, CIM is started when Brekeke CIM is started.
IP Address	IP address of Brekeke PBX to connect
Webservice Port	Port number of the web server of Brekeke PBX to connect.
PBX Port	Port number of Brekeke PBX to connect . This value can be confirmed at [PBX Admin > Options > Settings] PBX Settings page in Brekeke PBX Admin screen.
Account Password	
Password Expire Days	Set duration for the account password to expire
Alert period (days) before password expires.	Set number of date prior to expiration date that display reminder to change password

### 7.6.2. Database

Set database settings for the database and the log database. From [Initialize database], you will be directed to initialize page for each database. When database has been initialized here, all data will be updated automatically. Unless you are using a log analysis application such as Brekeke Contact Analytics, the log database settings are not necessary.

Name	Description
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Driver Class	Set class name for JDBC driver
URL	Set URL for the database that connect via JDBC
User Name	Set user name for JDBC connection
Password	Set password for JDBC connection

### 7.6.3. Initializing Database

Initialize database. By clicking on [Initialize], database will be created and initialized. By clicking [cancel], the page will be directed back to database screen.

Name	Description
Database Server	
IP Address	Set IP address of the database server
Port	Set port number of the database server (default: 3306)
Database	
Database Name	Set name of the database that creating/initializing
User Name	Set User ID that access the database
User Password	Set User's password
Database Administrator	
Administrator Name	Set ID of the database server administrator.
Administrator Password	Set the password of the database server administrator.

### 7.6.4. Security

Set security settings such as access permission to Brekeke CIM.

Name	Description
IP settings for the user with access permission	
IP settings for the application with access permission	
Default	Set default access permission from a user or a application to Brekeke CIM. When this is set to [Allow], all access from user and application that are not listed at [Blocked IP] list will be allowed. When this is set to [Block], access is allowed for the user and application that are listed at [Allowed IP].
Blocked IP/Allowed IP	Set IP address of blocked or allowed IP addresses
Application IP with permission to access	
Default	Sets default behavior when accessed from the applications to Brekeke CIM

Blocked IP/Allowed IP	Set IP address of blocked or allowed IP addresses
Access-Control-Allow-Origin settings	
Domain	<p>If an application registered to Brekeke CIM resides on a different domain, all requests are restricted due to the Same-Origin policy. In that case, the accessible domain needs to be configured in order to workaround the restriction.</p> <p>The setting value is configured as “http://&lt;ip address&gt;:&lt;port&gt;”.</p> <p>For example, if Brekeke CIM and Brekeke CRM values were as follows:</p> <p>http://192.168.1.10:8080/cim/ http://192.168.1.20:8080/crm/</p> <p>Then set this domain value as: “http://192.168.1.20:8080”</p>

#### 7.6.5. NAT

Sets the NAT (Network Address Translation) settings, which is necessary when Brekeke CIM and its associated applications configured on LAN are accessed from the external network.

This settings will be applied to the integrated applications or Brekeke CIM.

Name	Description
String before translation	Set the target string (address/port) that is being translated.
Host IP	Set regular expression describing IP addresses of .
String after translation	Set the translated string (address/port)

For example;

In order to allow access from the external network to Brekeke CIM located at LAN with local IP Address [192.168.1.10:8080] and the port forward destination is set at [123.123.123.123:18080].

String before translation: 192.168.1.10:8080

Host IP: (?!192\.168\.)\.^\+\$.

String after translation: 123.123.123.123:18080

#### 7.6.6. Advanced Option

Set customize settings for integrating third-party applications or settings that cannot be defined at System Settings. To take effect of the change made here, Brekeke CIM needs to



be restarted.

#### agentstatus.count

Default value is 6. When 5 is set here, work status cannot be used. Set 5 here when integrating with ONYX CRM.

#### agentstatus.initialstatus

When an agent logs in, agent status is specified using the following value:

Offline: 0, Ready:1, Idle:2, On Call:3, Wrap up:4, Work:5

#### agentstatus.noanswer.acdcall

When an agent could not answer a call that distributed by ACD, agent status is specified using the following value: Offline: 0, Idle:2, Wrap up:4, Work:5

#### agentstatus.wrapup.auto

Set whether if status should change to “wrap up” when a call is completed. When “false” is set here, status will not be change to “wrap up” and it will be change to the same status that the agent had prior to the call.

#### callstate.incoming

Select whether if to use incoming status as call status for the calls distributed other than auto answer settings. When “true” is set here, the answer button will be valid at CIM agent when agent’s phone is ringing. Default setting is set for “false”.

#### callstate.incoming.page

Select whether if to use incoming status for call status for the calls distributed with auto answer settings. This settings cannot be applied to calls received with auto answer settings. When “true” is set here, the answer button will be valid at CIM agent when agent’s phone is ringing. Default setting is set for “false”.

#### ctiserver.auto\_create\_pbx\_user

When “true” is set here, PBX user at Brekeke PBX is automatically created when an agent logs in. Default setting is set for “false”.

#### ctiserver.auto\_delete\_pbx\_user

When “true” is set here, PBX user at Brekeke PBX is automatically delete when an agent logs out. Default setting is set for “false”.

#### ctiserver.auto\_remove\_pnumber

When “false” is set here, Phone ID will not be deleted when an agent logs out. Default setting is set for “true”.

#### existqueue.rate.acdlevel

Set ACD level coefficient that is used to define priority for agent assignment when there are several queue exists. (Default value is set as 10.0).

- ✓ Supported version 2.1 or later.

#### existqueue.rate.calllevel

Set Call level coefficient that is used to define priority for agent assignment when there are several queue exists. (Default value is set as 10.0).

- ✓ Supported version 2.1 or later.

#### external.pattern

Set pattern that phone number is considered as external telephone numbers. Default value is set as “[0-9]{6,}”. (With this default setting, the telephone number longer than 6 digit is considered as an external telephone number.)

#### help.notify.admin

When set “false”, the Help Notification for agents does not display on Administrator’s screen. Default value is set to true and it displays the help on Administrator and SV Admin screen.

#### log.event.agent.auth

When set “true”, login/logout actions to Agent Admin screen are recorded in the event log.

#### outgoing.filter.function

Set outgoing filter function. Specify using script name and function name connected with period (.).

- ✓ Supported version 2.1 or later.

**outgoing.filter.param**

Set character string to pass as the 4<sup>th</sup> parameter of outgoing filter function. Separate with comma (,) when specifying multiple character strings.

- ✓ Supported version 2.1 or later.

**paging.inbound\_direct**

When “false” is set here and the call is not routed with ACD (internal calls), automatic off-hook is disabled. Default value is set as “true”. You can set this settings for each agent group by setting as “group.<group>.paging.inbound\_direct=false”. Settings for each agent can be written as “agent.<agent ID>.paging.inbound\_direct=false”.

**paging.outbound**

When “false” is set here, automatic off-hook is disabled for preview outbound calls (excluding outbound calls routed with Dialer. Default value is set as “true”. You can set this settings for each agent group by setting as “group.<group>.paging.outbound=false”. Settings for each agent can be written as “agent.<agent ID>.paging.outbound=false”.

**pbxconnector.appname**

When the URL to access Brekeke PBX Admintool is <http://xxx.xxx.xxx.xxx:28080/pbx1/>, set “pbx1” should be set here.

**pbxconnector.statuswatcher.localport**

Set local port for interfacing with Brekeke PBX and Brekeke PAL. Two ports are necessary for a successful connection, if any of the ports of the two consecutive port numbers of the port number set here (e.g., 3333 and 3334) is used by other applications/devices, connection with Brekeke PBX will fail. Default value is 3333. When installing multiple Brekeke CIMs on one server, unique port numbers need to be used at each Brekeke CIM settings.

**phoneid.<ID>.acd**

Dynamically assigns agents who signed in with a specified Phone ID to specified ACD. Separate with comma (,) when specifying multiple character strings.

When set as phoneid.3001.acd=ACD0,ACD1, as soon as an agent with the phone ID 3001 signs in, the agent is dynamically assigned to ACD0 and ACD1.

reportdb.disabled

When set “true” here, report to log database will be disabled.

web.lang

Set display language. (English:en, Japanese:ja, Chinese:zh) When the preference is not set, the default language for the browser application will be used. When the change is set, it will be instantly applied.

widget.show.agent.name

When set “true”, an agent name will display on the Start button in the widget.

Default is “false” and an agent user ID is displayed on the Start button.

## 7.7. Maintenance

### 7.7.1. Start/Stop

Start or stop CIM. The menu on the left will show the current status. When Brekeke CIM is started, it attempts to connect Brekeke PBX. When “Auto” is set at [Settings] > [System] > [PBX connection setting], the PBX will be started automatically when the Brekeke CIM starts.

### 7.7.2. Application

Display a list of applications that registered at Brekeke CIM.

Name	Description
Name	Name of the application
Version	Version of the application
URL	URL where the application is running
Status	Status of the application
ID	ID of the application

### 7.7.3. Update Software

Update the software to the different version. After selecting the war file, click [Update] button to start the application updates. Restart the application server to complete the updates.

### 7.7.4. License

Activates license. Enter product ID and click [Activate] button and follow the instructions on the

screen to complete the activation.

## 8. Users

### 8.1. Types of Users

The Brekeke CIM manages three types of accounts: Administrator, SV(Supervisor), and Normal Users. Administrator manages the settings and the system operation of the call center. SV(Supervisor) owns the permission and manages day to day tasks, managing task settings and supervising agents. Normal users do not have a special permission.

### 8.2. Difference between Administrator and SV(Supervisor)

#### 8.2.1. Difference in Authorized Access for Administrative screen

	Administrator	SV(Supervisor)
Groups	○	△ (Group with permission only)
Users	○	△ (Group with permission only)
ACD	○	△ (Group with permission only)
DNIS	○	△ (Group with permission only)
Schedules	○	△ (Group with permission only)
Skills	○	△ (Group with permission only)
Script	△ (excludes tenant users)	△ (Group with permission only)
Logs	○	△ (Group with permission only)
Settings	○	×
Maintenance	○	×

#### 8.2.2. Supervise Functionalities

In order to earn permission to be the agent supervisor, associate the agent with the group to Admin Group such as system administrator or supervisor(SV). By doing this, the managed agents can perform supervisor functionality, call features such as silent monitor, tutor, join call or change agent status from the related report in the Brekeke Contact Analytics.

#### 8.2.3. Emergency Help Notification

Agent can request help when they require immediate assistance from their Supervisor (SV).<sup>7</sup> When logged in to the system as a Supervisor (SV), help requests are notified on CIM client or

<sup>7</sup> Click on [Help Notification] to notify help when CIM client is used.

Brekeke Contact Analytics' related report. Additionally, the status and histories of the help notifications can be confirmed at Help Log.

### 8.3. Summary for Login Management

On the login screen, enter the user ID and the password and for the users with agent feature enabled, it is required to enter the device ID to login to Brekeke CIM. The users for the Brekeke Contact Analytics, Brekeke CRM are managed under Brekeke CIM and they are shared among applications. If logged in to one of the applications, the user will be able to shift between the applications without reentering the login information.

## 9. Agents

### 9.1. Agents

These are users who interact with the customers at the call center operations. If agent feature is enabled in the settings, any type of users can become agent, however, normally, agent tasks are done by the normal users, SV(Supervisor) or Administrator who are advanced users mainly supervises agents or manages the projects.

### 9.2. Agent Group

Each agent belongs to an agent group. Supervisor (SV) can manage agents that he/she is authorized to manage for.

### 9.3. Skills

Multiple skill(s) can be assigned to an agent. For example, in order to increase efficiency in the operation in the inbound tasks, the system can be set to have priority routing to high skilled agent who can completes tasks faster, or the system can route calls to low skilled agents to handle basic questions and reserve high skilled agents for more difficult technical questions.

Each agent's skill is assigned when he/she logs in to the system, and the skill continued to be assigned him/her until they sign-out from the system. To modify skill of an agent, he/she needs to logout first and log in again.

### 9.4. Status

#### 9.4.1. Status Overview

Each agent holds status as shown below:

Status	Description
Offline	Not logged into CIM

Ready	Waiting for calls being routed from ACD (i.e., inbound, dialer)
On Call	On the call. This status includes ringing.
Wrap up	When the agent wraps up calls after the call ends.
Idle	Break, not at the desk – state for not working
Work	Working on some task. Unable to receive call from ACD.

#### 9.4.2. Available process by Agent Status

Depending on the agent status, available process can be different.

	External Calls (ACD)	Internal Calls	ACD (Dialer)	Calling (CIM client)	Calling <sup>8</sup> (Preview)	Log out
Offline	x	x	x	x	x	x
Ready	○	○	○	x	x	△
On Call	x	x	x	x	x	△
Wrap Up	x	○	x	x	x	△
Idle	x	○	x	x	x	○
Work	x	○	x	○	○	○

✓ △ --- Not recommended but it can be done optionally after the confirmation dialog.

#### 9.4.3. Update Status

Agent can confirm own status or modify own status through CIM client or through the applications integrated with the CIM client. However, depending on the applications integrated with the CIM client, it might limit the status change depending on the situation.

If an online agent closes the CIM client, the agent status automatically changes to Offline after a certain period of time.

Depends on the current status, the status changes is only possible to the following statuses:

Offline	When logged in, it automatically changes to “Work”
Ready	Automatically changes to “On Call” when a call is routed by ACD. This status can be changed to “Idle” or “Work”.
On Call	Automatically changes to “Wrap Up” when a call is ended. For the case of an outbound call, the agent status will be put on “Wrap Up” to record the attempted call even when the call was not answered by the callee (customer). For internal calls, the status will not change to wrap up and the status will be changed to the

<sup>8</sup> Depending on the application that performs Preview Dialing

	same status that agent had prior to the call. Agent can log out from this status although it is not recommended. <sup>9</sup> When agent did not answer the call distributed by ACD, agent will be automatically log out. (The flow of this status change can be changed in the settings.)
Wrap Up	This status can be changed to "Ready", "Idle", or "work".
Idle	This status can be changed to "Ready" or "Work". Agent can logout from this status.
Work	This status can be changed to "Ready" or "Idle". By making an outbound call or receiving internal call, the status automatically changes to "On Call". Agent can logout from this status.

---

<sup>9</sup> When an agent closes CIM client or application integrated with Brekeke CIM, the agent will be logged off, however, the call in session will not be terminated.



## 10. DNIS

### 10.1. DNIS process

Set routing according to DNIS (Dialed Number Identification Service) when incoming calls are received. Below, please find an example of how two DNIS are assigned to different ACDs.

DNIS	Schedule	Target ID	URL	Parameters	Scripts
6504016636	Holiday	7000			
	All	A100	http://brekeke.com/c=#agent#	app-info=#customer#	
6502004512	All	A200			

If 6504016636 receives a call, it will first check whether the current date and time falls on the Holiday schedule. If the Holiday schedule applies, the process is routed to 7000<sup>10</sup>. If not, it then checks whether it falls on the All schedule, if yes, the process is then routed to A100. When the call is routed to A100, an Application URL and parameters are assigned to the call, therefore, the Application URL is popped when the call reaches and agent and the parameters can be referenced from the script or the application. If the call does not fall into any schedules, then the call is terminated (the call is blocked).

#### 10.1.1. Variables for Application URL

The following variables can be used in Application Url, the variable is replaced when the call reaches to an agent.

Name	Description
#callid#	Call ID
#customer#	Customer's phone number
#tenant#	Tenant Name
#agent#	Agent who received the call
#acd#	ACD ID which routed the call
#customer_info#	Additional Customer Information
#project_info#	Additional Project Information
#app_info#	Integrated Application Information
#contactid#	Integrated Application ID

<sup>10</sup> If ACD with 7000 exists, the ACD performs the process. If ACD does not exist, it attempts to forward the call to Internal number 7000.

#### 10.1.2. Existing Call Parameters that can be set

When call is received at DNIS, the following existing call parameters can be set:

Name	Description
project_info	Project Information, it displays in the widget.
customer_info	Customer Information, it displays in the widget.
app_info	Integrated Application Information.
level	Call Level

#### 10.1.3. Settings at Brekeke PBX

When Brekeke PBX receive a call, it sends the phone number to Brekeke CIM as DNIS. When pattern IN at ARS settings has applied, the replaced phone number become DNIS. You can specify this phone number by writing `$cti.dnis=05055107629` at [Custom] settings of deploy pattern.

#### 10.1.4. Function that is called after processing DNIS

If there is a script set at the applicable DNIS schedule, the specified function will be called.

##### **Parameter**

1. `cim` - Instance of Brekeke CIM (CTIServer class)
2. `callinfo` - Object that manages call's information (CallInfo class)
3. `targetid` - Target ID (String class)

##### **Return Value**

Returns Target ID. When it is not replaced, it returns the third parameter.

#### 10.1.5. Example of Functions that will be called after processing DNIS

In the default script called “\_dnis” there are functions shown below. It sets call level (level parameter) for calls.

```
function setCallLevel(cim,callinfo, targetid ){
    var caller = callinfo.getCustomerNumber();
    var db = callinfo.getParam( "db" );
    var sql = callinfo.getParam( "sql" );
    caller = caller.replace( "'", "" );
    sql =sql.replace( "#caller#", caller );
    var db = cim.getDb( db );
    var con = db.getConnection();
    var st;
    var rs;
    try{
        con.setAutoCommit( true );
        st = con.createStatement();
        rs = st.executeQuery( sql );
        if( rs.next() ){
            var level = rs.getString( 1 );
            callinfo.setParam( "level", level );
        }
    }finally{
        db.close( st );
        db.close( rs );
        db.close( con );
    }
    return targetid;
}
```

#### 10.1.6. Configuration Sample at DNIS Setting Screen

Target ID	A200
URL	http://200.200.200.200/application
Parameters	sql=SELECT 50,phonenumber FROM viptable WHERE phonenumber=#caller#,db=vipdb
Script	_dnis.setCallLevel

In this example, first, Brekeke CIM check to see if caller (customer)’s telephone number exists at “viptable” in database called “vipdb”. If the number is found in the table, set 50 as call level. Settings related to “vipdb” can be found at [Settings] > [Advanced settings]. Please refer to “Brekeke CIM Developer’s Guide - Script” document for instruction for how to set scripts.

## 11. ACD

### 11.1. Overview

ACD (Automatic Call Distributor) is a function that assigns calls to agents. For inbound calls, it decides which agent to be assigned for the call. For automatic outbound calls using Dialer applications, it decides which agent to be assigned for the outbound call. When an inbound call cannot be assigned to an agent, it puts the call to queue. Each ACD administrates a queue.

### 11.2. Relationship between ACD and Agent

An agent can belong to multiple ACDs. ACD select agent to assign the call who belongs to its list who is in “Ready” state. As soon as an agent logs in, the user is tied to ACD. The relationship between an agent and an ACD continues until either the agent logs out or the ACD is deleted. To change the assigned ACD and the agent relationship, agent need to log out and log back in.

### 11.3. Assign Agents

When ACD assigns a call to an agent, the decision is based on the combination of filter function and priority function. When such functions are not defined, an agent with the longest wait time after status became “Ready” receive the call.

#### 11.3.1. Assign Agents - Filter Function

This function is called when an ACD assigns calls to agents. Also when outbound calls are set with multiplying rates (when pacing is used for a Predictive Dialer or IVR calls), this function is used to calculate the number of agents in “Ready” status.

This function is called in the following timing:

- When an ACD assigns inbound calls to agents
- When Dialer selects an agent
- When a call in queue is assigned to an agent

#### Parameter

1. cim - Instance of Brekeke CIM (CTIServer class)
2. acd – ACD object processing the call (ACD class)
3. agents – A list of agents that are in “Ready” status (java.util.List interface)
4. callinfo – Call information (CallInfo class) When Dialer count the number of agents in “Ready” status prior to make calls, this value will be “null”.
5. dialer – Dialer flag. When Dialer is making outbound calls, this value will be “true”. (boolean)

6. param – Parameter that is set from the product admintool. (Separate with comma (,) when specifying parameters as character string array.)
7. queue – Queue flag. For calls in a queue, this value will be “true”. (boolean)
8. countonly – Count only flag. When it is set to “true”, it returns the count of agents in “Ready” status. Agent list will not be used. (boolean)

**Return Value**

It returns the number of valid agents.

When “countonly” is set to “true”, there is no need to change agent’s element since the return value of “countonly” is used only for counting the number of agents in “Ready” status. When “countonly” is set to “false”, remove agents from “agents” that you do not assign calls. Make sure not to add agents that does not belong to the ACD. The purpose of this function is to remove irrelevant agents from “agents”. Using priority functions, a call will be assigned to an agent in “agents” with the highest priority. Common usage of this parameter is to filter agents with a specific conditions so that all agents won’t be assigned for outbound calls. In such case, an agent will be filtered when he/she has some special skill or when the agent belongs to other ACD. There is no need to match return value and the number of agents in “agents”. It is recommended to leave multiple agents in “agents”. For example, a call cannot be assigned to any agents if there is only one agent in “agents” and the agent logs out.

### 11.3.2. Example: Assign agent/filter functions

There are following functions in “\_acd” script.<sup>11</sup>

```
function filterSkillForOut ( cim, acd, agents, callinfo, dialer, param, queue, countonly ){
    if( callinfo != null && false == callinfo.isOutbound() ){
        return agents.size();
    }else{
        var skill = param[0];
        for( var i = agents.size() - 1; i >= 0; i-- ){
            var a = agents.get(i);
            if( a.getSkillLevel ( skill ) > 20 ){
                agents.remove( i );
            }
        }
        return agents.size();
    }
}
```

### 11.3.3. Example: Settings at ACD edit screen

Filter Function	_acd.filterSkillForOut
Parameter	english

With this example, the outbound calls made through Dialer will not be assigned to agents with 20 or more “english” skill. For incoming calls, there is no filter is set, thus every agents that are in “Ready” status will receive calls.

### 11.3.4. Assign Agents - Priority Function

After filter functions are applied (only when “countonly” is set to “false”), calls are assigned to an agent with high priority that the priority function is applicable.

#### Parameter

1. cim - Instance of Brekeke CIM (CTIServer class)
2. acd – ACD object that manages call (ACD class)
3. callinfo – Call information (CallInfo class)
4. agent – Agent object that calculate priority (Agent class)
5. waittime – Waiting period (milliseconds) (long)
6. param – Parameter that is set from the product admintool (Separate with comma (,) when specifying parameters as character string array.)

<sup>11</sup> The scripts name begin with underscore “\_” are default script included in Brekeke CIM. These scripts cannot be modified. When you wish to edit the script, create a new script by coping functions and saved with a different name. For other default scripts, please refer to “Brekeke Customer Interaction Manager Developer’s Guide - Script”.

### Return Value

Number value is returned. The bigger the number, the higher the priority. When the number value is smaller than 0, this function will be not applied to the agent.

#### 11.3.5. Example: Assign Agent/Priority Function

The following function exists for “\_acd” script.<sup>12</sup>

```
function calcSkillbasePriority( cim, acd, callinfo, agent, waitingtime, param ){
  var skill = agent.getSkillLevel( param[0] );
  var priority = ( waitingtime / 1000 ) + skill * param[1];
  return priority;
}
```

#### 11.3.6. Example: Setting at ACD Edit Screen

Script (Agent Priority)	_acd.calcSkillbasePriority
Parameter (Agent Priority)	French,2

With this example, the priority is determined with waiting time period from the time status became “Ready” and skill set at parameter. Parameter is set as “French,2”, an agent who has “French” skill is handled the same way as an agent who has been waiting twice as long as the agent with “French” skill. When skill is not set here, it is handled as 20. For example, in the case where the skill of agent A is 80 and agent B is 20 and agent A and B’s wait time is same, agent A has higher priority. When agent B is waiting 120 seconds longer than agent A, then agent B’s priority will be higher than agent A. Here is how a call will be handled with this settings.

1. The list of “Ready” agents who belongs to this ACD as “agents” parameter, Filter function is called. Then priority will be calculated for the agents who are filtered by the settings. With this example, “French” skills are used for the calculation for the priority.
2. Calls are assigned to the agent with the higher priority. When there is no agent that can be assigned, Brekeke CIM processed call according to the settings specified as the next step such as placing the call in queue.

<sup>12</sup> The scripts name begin with underscore “\_” are default script included in Brekeke CIM. These scripts cannot be modified. When you wish to edit the script, create a new script by coping functions and saved with a different name. For other default scripts, please refer to “Brekeke Customer Interaction Manager Developer’s Guide - Script”.

## 11.4. Call Queue

When customer calls and when there is no agent in “Ready” status to route the call according to the rules set at ACD, the call will be routed to queue. The call is put at the end of the queue. To place calls in the queue according to the priority, position function can be used. For detailed settings, please refer to “Function that is called after processing DNIS” and “Function that determines the priority of the agent”. Brekeke PBX supports call queue functionality; however, the call queue functionality explained in this document offers different functionality. The call queue functionality achieved with an integration of Brekeke CIM and Brekeke PBX can provide more sophisticated call queue feature.

### 11.4.1. Positioning Function

Compare priority between existing calls in the queue and the call that is received. First, the function will be called and priority will be calculated for the new call. In this case, the 5<sup>th</sup> parameter is set to “true”. Next, the function is called to calculate the priority from the call placed at the lowest priority in the queue and the process continue till it finds a call with higher priority than the new call. Then the new call will be placed after it.

#### Parameter

The following value will be submitted. For details about these parameter’s classes, please refer to “Script”.

1. cim - Instance of Brekeke CIM (CTIServer class)
2. acd - Object that manages call (ACD class)
3. callinfo – Information of the call that priority is calculated (CallInfo class)
4. waittime – Waiting period (milliseconds) (long)
5. level – Call level that is used to calculate priority to put into a queue. Specify as call parameter level. <sup>13</sup>
6. newcall – For a new call, “true” is set. For calls in a queue, “false” is set.
7. param – Parameter that is set from the product admintool (Separate with comma (,) when specifying parameters as character string array.)

#### Return Value

Number value is returned. The bigger the number, the higher the priority. A call with higher

---

<sup>13</sup> Call parameter is set by DNIS settings, transfer from an IVR, script and integration with a third-party application. level is mainly set by IVR or DNIS script.



priority will be placed at the front of the queue. This value is used only to decide relative position for calls within the queue.

#### 11.4.2. Example: Position function

The following function exists for “\_queue” script.<sup>14</sup>

```
function calcQueuePriority( cim, acd, callinfo, waitingtime, level, enter, param ){
    var priority = waitingtime / 1000 + level * param[0];
    return priority;
}
```

#### 11.4.3. Example: Setting at ACD Edit Screen

Position Function	_queue.calcQueuePriority
Parameter	2

With this example, priority is calculated using both time that the call became “on call” status and call level. When 2 is set as parameter, as call level increase by 1, the priority will be calculated the same way as 2 seconds of waiting time. For example, in the case where the call level of call A that is just entered in the queue is 80 and the call level of call B that is already in the queue is 20. When call A and B has the same wait time, call A will be placed higher in the queue. When call B has been waiting more than 120 seconds than call A, call A will be placed after call B.

#### 11.4.4. Priority to process a call that is already in a queue

For the version 2.1 or later, the following calculation will be applied to calculate priority when there are multiple call queues exist.

Priority = (Waiting time) + (ACD level) x (ACD level multiplier) + (Call level) x (Call level multiplier)

ACD level multiplier is set at “exitqueue.rate.acdlevel”, Call level multiplier is set at “exitqueue.rate.calllevel” under Advanced Option settings.

From version earlier than 2.1, calls in higher ACD level will receive priority.

<sup>14</sup> The scripts name begin with underscore “\_” are default script included in Brekeke CIM. These scripts cannot be modified. When you wish to edit the script, create a new script by coping functions and saved with a different name. For other default scripts, please refer to “Brekeke Customer Interaction Manager Developer’s Guide - Script”.

## 12. IVR

Brekeke CIM can be integrated with any third-party IVR applications; however, at this section, Brekeke PBX's IVR is used as an example. For details of IVR of Brekeke PBX, please refer to the document "Brekeke PBX Developer's Guide - IVR". Here three cases of IVR usage as introduced as examples of common IVR usages.

1. When call is received from a customer, prompt the caller to enter information, and distribute the call to ACD or agent. Also it can switch applications for agents according to the information entered.
2. Play recorded message or prompt to enter information when there is no available agent to answer or after operation hours.
3. Play recorded message when call is put into a queue.

For the case 1 of above example, commonly the call distribution is configured by setting the IVR as DNIS target. Then according to the information entered by the caller, the call will be forwarded to either ACD or agents.

### 12.1. Forwarding Calls to ACD from IVR

Set ACD ID as the forwarding destination when forwarding calls from IVR to ACD.

Forwarding Calls from IVR to ACD – Example using Brekeke PBX's IVR script

Write a script like the one shown below at Brekeke PBX's note. With this example, this script will be executed with user 9000. Set DNIS target to 9000 at DNIS settings to receive calls at this IVR.

```
function dispatchIncomingCall( ivr ){
    for( var i = 0; i < 5; i++ ){
        var ret = ivr.playAndInput( "{select123}", 1, 30000, "123456789#0*" );
        if( ret == "1" || ret == "2" || ret == "3" ){
            var rt = ivr.transfer( "acd" + ret , 5000 );
            if( rt == true ){
                ivr.dropcall();
            }
        }
    }
    ivr.dropcall();
}
```

With this example, this IVR plays guidance file called "select123". (The recorded guidance needed to be uploaded at Brekeke PBX.) This file plays, "For creating a new account, press 1. For canceling an existing account, press 2. For other inquiries, press 3". When 1 is selected, the

call will be routed to “acd1”. When 2 is selected, the call will be routed to “acd2”. When 3 is selected, the call will be routed to “acd3”. When other numbers other than 1-3 or there is no entry made, the guidance file will be played maximum 5 times and terminate the call. Parameter to ACD can be added by setting a forwarding destination by dividing with “/”. (e.g., acd1/glevel=3)

## 12.2. Forwarding Calls to Agent from IVR

A simple setting of forwarding calls to agents from IVR is to set agent ID as the forwarding destination. For the case when the agent is idle or not available, ACD can be also set as the forwarding destination. Set call forwarding with a parameter “acd=<ACD ID>” as the forward destination. For example, to route call to “acd2” when the routing attempt to agent 200 has failed, set “200/acd=acd2” as the forwarding destination.

### 12.2.1. Forwarding Calls to Agent from IVR - Example using Brekeke PBX's IVR script

Write a script like the one shown below at Brekeke PBX's note. With this example, this script will be executed with user 9001. Set DNIS target to 9001 at DNIS settings to receive calls at this IVR.

```
function dispatchIncomingCall2( ivr ){
  for( var i = 0; i < 5; i++ ){
    var ret = ivr.playAndInput( "{select123}", 1, 30000, "123456789#0*" );
    if( ret == "1" || ret == "2" || ret == "3" ){
      var rt = ivr.transfer( "10" + ret + "/acd=acd2", 5000 );
      if( rt == true ){
        ivr.dropcall();
      }
    }
  }
  ivr.dropcall();
}
```

With this example, this IVR plays guidance file called “select123”. (The recorded guidance needed to be uploaded at Brekeke PBX.) This file plays, “For creating a new account, press 1. For canceling an existing account, press 2. For other inquiries, press 3”. When 1 is selected, the call will be routed to agent 101. When 2 is selected, the call will be routed to agent 102. When 3 is selected, the call will be routed to agent 103. When these agents cannot answer calls, the call will be routed to “acd2”. When other numbers other than 1-3 or there is no entry made, the guidance file will be played maximum 5 times and terminate the call.

### 12.3. Play Recorded Message When a Call is in Queue

Specify guidance to play when a call is in queue at the function set at Queue Function setting at [ACD Edit] screen.

#### 12.3.1. IVR Function - Example using Brekeke PBX's IVR Script

Write a script like the one shown below in Brekeke PBX's note. If you name the note "QueueScript", specify "QueueScript.playwaitingcount" as the ACD's [IVR Function].

```
function playwaitingcount(ivr){
  ivr.play("{queuegreeting}" );
  while( ivr.connected() ){
    var params = new Array();
    params[0] = "_queue.getWaitingCallCount";
    var count = ivr.callPbxMethod( "cti", params, 15000 );
    //ivr.getLogger().debug( "playwaitingcount. count=" + count );
    if( count == "0" ){
      ivr.play( "{queuenobody}" );
    }else if( count == "-1" || count == "-2" || count == "-3" ){
      ivr.play( "{queueerror}" );
    }else{
      ivr.play( "{queuecount1}{number:" + count + "}{queuecount2}" );
    }
    ivr.play( "{queuemusic}" );
  }
}
```

Using `Ivr.callPbxMethod()`, you can call `cti` method of PBX. The `cti` method can be used to call `cim` scripts. The example above calls a function called `getWaitingCallCount()` from the `_queue` script in `CIM`. This function is a queue for calls and it returns the queue number (These functionalities are supported in Brekeke PBX 3.1.7.7 or later and Brekeke CIM 2.5.1.5 or later). Additionally, you can create a script that predicts the wait time before being forwarded to an agent based on the number of waiting calls and produces "There's approximately 4 minutes of waiting." message on the fly.

In this example, following five recorded files should be uploaded in advance using [Prompt] menu in Brekeke PBX:

- queuegreeting — Greeting being read at the beginning
- queuenobody — Prompt in the case when there is no more waiting calls prior to the call
- queuecount1 — We are experiencing high volume of calls. There are
- queuecount2 — calls waiting to be answered. Please keep waiting or call us back later.
- queuemusic — On-hold Music etc

## 13. Processing Outbound Calls

### 13.1. Making Outbound Calls using Preview Dialing or CIM client widget

CIM Client API's Call method is used to make an outbound calls in either way. When CIM Client API Call method is called, Brekeke CIM changes the agent status to "On Call" and call the agent's terminal. Under general operation, the terminal is automatically set to off-hook. (When this setting is not enabled, agent manually picks up the headset). When the agent's terminal responds, then it makes outbound call to the customer and the call will be connected when the call is answered.

### 13.2. Processing Outbound Calls using Dialer

In order to process outbound calls using dialers, the dialers need to be started after the dialer application interface URL is specified in the phone book application URL field in ACD settings.

<sup>15</sup> Using Predictive Dialing, first, outbound calls are made to customers. When customer answers the call, it will be connected with an agent who is in "Ready" status. To achieve the highest efficiency of operations, it can be configured to determine the number of outbound calls depends on the number of agents who are in "Ready" status. Using Progressive Dialing, calls are connected to agents first and outbound calls are made to customers. While it is calling out the customers, the agents cannot be operated thus its efficiency maybe degraded, however, the advantage is that when customer answers the call, the call is always successfully connected.

### 13.3. Comparing Predictive Dialing and Progressive Dialing

	Predictive	Progressive	IVR
Order to connect	1. Customers 2. Agents	1. Agents 2. Customers	1. Customers 2. IVR (Calls can be connected to other destinations other than IVR.)
Number of Outbound Calls	The number of outbound calls can exceed the number of agents who are in "Ready" status. (Considering the rate of	The number of outbound calls is smaller than the number of agents who are in "Ready" status..	Generally, the number of outbound calls equal to the number of channels. It also can be set to correspond

<sup>15</sup> In order to use Brekeke CIM's dialer function, you need a Dialer Integration application such as Brekeke CRM.

	successful connections of calls, larger number of calls will be made.)		with the number of agent who are in "Ready" status.
Efficiency	The number of outbound calls should be determined by the calculation draw out from rate of failed sessions and ringing time.	Efficiency of the operation may be little lower than Predictive Dialing since ringing time must be count into the time processed for the operation. Comparing to Preview Dialing, the efficiency is higher since calls will be made automatically.	This option can achieve the highest efficiency since it can use up all outbound channels if calls are not connected to agents.
Certainty of calls	Calls will be terminated or forwarded to IVR when there is no available agent to answer the call. Adjustment to the number of outbound calls is necessary to avoid such situations.	All calls will be answered when the call is connected with customer.	All calls will be answered when the call is connected with customer.

#### 13.4. Outbound call filter function

When making outbound calls, Brekek CIM calls outbound call filter function that is set as script.

Outbound call filter function checks to see if the number is included in a list of "do not call".

✓ This feature is supported for the version 2.1 or later.

##### Parameter

1. cim - Instance of Brekeke CIM (CTIServer class)
2. contactinfo – Information of the callee (CallInfo class)
3. acd – Object that processes call (ACD class), set "null" for the outbound calls that are not made with Dialer
4. param – Parameter that is set at Advanced Option (Separate with comma (,) when specifying parameters as character string array.)

**Return Value**

Callee's phone number is returned. The member field in "ContactInfo" in second parameter is returned when the number is safe to call. When "null" is returned, outbound call will be blocked. You may change callee when a call is blocked.

## 14. Related Calls

### 14.1. Priority assignment by Related Calls

Related calls assigns specific calls to specific agent before the ACD assigns calls to an agent. Related agent will get notified through CIM client and by “Reserve”-ing the call, when the agent becomes “Ready” next, the call I received by the agent with high priority.(You can auto reserve as well). Related calls will not be routed by the standard ACD until it passes a certain period of time or when reserved agent becomes available. The guidance music is played for the customer while queuing. In order to use related calls, set the association of agent to a call in the DNIS scripts.

#### 14.1.1. Example: Last Agent Routing – Related Calls

As an example, when receiving a call, we will write a script so that the call is associated to the agent who received on the previous call from the same customer. The following script is created, when the script name is set to “LastAgent”, “LastAgent.setRelationToLastAgent” should be specified in the DNIS “Script”.

```
importPackage(Packages.jp.brekeke.cimutil);

function initialize(cti, params) {
    KeyValueMemory.initialize("", 7); // filePath, days
}

function memoryLastAgent(cti, agent, callinfo) {
    KeyValueMemory.set(callinfo.getCustomerNumber(), agent.getID());
}

function setRelationToLastAgent(cti, callinfo, targetid) {
    var caller = callinfo.getCustomerNumber();
    var lastAgent = KeyValueMemory.getLastValue(caller);
    if (lastAgent != null) {
        var agent = cti.getAgent(lastAgent);
        if (agent != null && agent.getStatus != 0) {
            callinfo.setRelatedAgent(lastAgent, true, 30000, "Last Agent");
        }
    }
    return targetid;
}
```



Associate call to the agent using the `callinfo.setRelatedAgent`. Specify the arguments, Agent ID, whether if reservations should be automatic, ACD Wait time(Milliseconds), Message to CIM Client. By looking at the customer ID, the previous agent is remembered and if the agent is logged in, the agent is associated to the call. Auto reserve is set to true, the wait time is set to 30 seconds so that means within 30 seconds of receiving call, if the agent becomes "Ready" state, then the call is routed to the agent automatically, if the agent does not become available, then after 30 seconds, ACD will route this call.

Additionally, in this example, it is using `KeyValueMemory` class to memorize the last worked agent for each customer ID. In order to initialize the process and memorize the process, the following events need to be defined in the Advanced Option:

```
cti.startup.event.function=LastAgent.initialize  
cti.dataoffered.event.function=LastAgent.memoryLastAgent
```

## 15. Integrating with a Third-Party Application

CIM client API should be used in order to achieve the complex integration with Brekeke CIM and external applications.

Please refer to "Brekeke CIM 2.7 Client API Specification" and "Brekeke CIM 2.7 Client Widget API Specification" or "Brekeke CIM 2.7 Client API.NET Specification".

## 16. Scripts

Using JavaScript, Brekeke CIM can be customized for various features. However, adding invalid scripts to the system could possibly cause the system failure or unexpected troubles, therefore it should be maintained by the system administrator. Please refer to "Brekeke CIM Developer's Guide" for sample code and list of accessible classes.

## 17. Maintenance

### 17.1. Database Maintenance

CIM Log database stores all the call records, each table contains each year's records. When there's not enough disk space on the server, the unnecessary records such as past year's call records. Make sure to validate that a new table is created in the database when a new year starts.

## 17.2. Uninstall

Stop Tomcat. Remove war file (e.g., cim.war) and the folder with same name (without file extension) under webapps directory. For uninstalling other software and applications (Brekeke PBX, Tomcat, Java SE, and Database), please follow to the uninstall instructions of each products.