Oracle® Communications Network Charging and Control

REST Client Technical Guide

Release 12.0.5
F55420-01
April 2022

ORACLE

Oracle Communications Network Charging and Control REST Client Technical Guide, Release 12.0.5

F55420-01

Copyright © 2022, 2022, Oracle and/or its affiliates.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software" or "commercial computer software documentation" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government’s use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

Contents

Preface

The scope of this document includes all the information required to install, configure and administer the RESTClient application.

Audience

This document is intended for system administrators and persons installing, configuring and administering the RESTClient application. However, sections of the document may be useful to anyone requiring an introduction to the application.

Prerequisites

A solid understanding of UNIX and a familiarity with IN concepts are an essential prerequisite for safely using the information contained in this technical guide. Attempting to install, remove, configure or otherwise alter the described system without the appropriate background skills, could cause damage to the system; including temporary or permanent incorrect operation, loss of service, and may render your system beyond recovery.

Although it is not a prerequisite to using this guide, familiarity with the target platform would be an advantage.

This manual describes system tasks that should only be carried out by suitably trained operators.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

1

System Overview

This chapter provides a high-level overview of the application. It explains the basic functionality of the system and lists the main components.

It is not intended to advise on any specific Oracle Communications Network Charging and Control (NCC) network or service implications of the product.

What is RESTClient?

The RESTClient (REST) interface is used to send REST requests from NCC to REST server endpoints.

Request Processing

RESTClient accepts the requests in xml format on a specific port that is configured and translates the xml request to JSON format. RESTClient then forwards the JSON request to REST server, which is accepted at the REST server endpoint.

Response Handling

RESTClient encapsulates response received from the REST server, transforms it to xml, and sends it back to the requesting process (DAP) with a response code of 200. The actual result code or error code is encoded in the response xml.

Features

- RESTClient supports requests to Balance Transfer and Apply Loan endpoints in the Oracle Communications Billing and Revenue Management (BRM) REST server.
- RESTClient also supports generic request types, which can be forwarded towards any REST server endpoints with required design time customizations.

2
Configuration

This chapter explains how to configure the Oracle Communications Network Charging and Control (NCC) application.

RESTClient Configuration

RESTClient reads its configuration from the **config.json** file. The **config.json** file is located in the **/IN/service_packages/REST/etc** directory.

RESTClient config.json Section

To organize the configuration data within the config file, some sections are nested within other sections. Configuration details are opened and closed using { }.

- Groups of parameters are enclosed with curly brackets – { }
- Comments are prefaced with a “//” at the beginning of the line

Editing the File

Open the configuration file on your system using a standard text editor. Do not use text editors, such as Microsoft Word, that attach control characters. These can be, for example, Microsoft DOS or Windows line termination characters (for example, ^M), which are not visible to the user, at the end of each row. This causes file errors when the application tries to read the configuration file.

Always keep a backup of your file before making any changes to it. This ensures you have a working copy to which you can return.

Loading Config Changes

If you change the configuration file, you must restart the service to enable the new options to take effect.

Wallet Management for oAuth

You need to create an Oracle wallet to store and manage OAM server clientId and clientSecrets, after installing the REST client (and before triggering any Auth requests). Wallets are created using **/u01/app/oracle/product/12.2.0/bin/mkstore** tool.

Perform the following steps:

1. Create an empty Oracle wallet.
2. Store the credentials of OAM server for Auth requests.

Example

```
mkstore -wrl /IN/service_packages/REST/etc/wallet -createCredential
REST username password
```

```
mkstore -wrl /IN/service_packages/REST/etc/wallet -createCredential
connect_string username password
```

> **Note:**
>
> connect_string should be different for different credentials.

Configuration

1. Configure location of the wallet in **config.json** file. For example, **/IN/service_packages/REST/etc/wallet**.
2. Generate the base64 encoded value of the wallet password and configure it in **config.json** file. For example, to generate the base64 encoded wallet password, run the following command:

   ```
   echo -n "wallet_password" | base64
   ```

3. Configure the clientId in **config.json** file.

SSL Configuration

When endpoint contains https, SSL configuration is used for certification validation. SSL configuration is taken from default java configuration. Default truststore is present in **java/bin** directory.

To import the certificate, run the **keytool** command as an administrator or root user. For example:

```
keytool -importcert -alias cert_alias_name -file  ./ssl_cert.pem -
keystore /usr/java/jdk1.8.0_261/jre/lib/security/cacerts
```

3
Background Processes

This chapter explains the process which runs automatically as part of the Oracle Communications Network Charging and Control (NCC) application. This process is started automatically by the system services (**/IN/bin/OUI_systemctl.sh**) in the SLC node.

RESTClient

Purpose

The RESTClient (REST) interface is used to trigger REST requests towards REST server endpoints.

Startup

This task is started by the system services, by the following line in the service files:

/IN/service_packages/REST/bin/RestClientStartup.sh config.json

Configuration

The high-level structure of the REST client is shown below:

```
{
  "maxthreadcount": 1000,
  "port": 4050,
  "webroot": "/tmp",
  "walletlocation": "Location",
  "walletkey": "key",

  "restendpoint": {
    "BalanceTransfer" : {
      "endpoint" : "BalanceTransferEndpoint",
      "servergroupid" : "BRM",
      "resourceid": 840,
      "chargesource": false,
      "chargedestination": false
    },
    "ApplyLoan" : {
      "endpoint" : "ApplyLoanEndpoint",
      "serviceType" : "/service",
      "servergroupid" : "BillingCare",
      "resourceid": 840
    },
    "GenericRequest" : {
      "endpoint" : "GenericRequestEndpoint",
      "type" : "POST",
      "servergroupid" : "BillingCare"
    }
  },
```

```
  "serverlist": {
    "BRM": {
      "tokenendpoint":"BRMOAuthEndpoint",
      "clientid":"username"
    },
    "BillingCare": {
      "tokenendpoint":"BCOAuthEndpoint",
      "clientid":"username"
    }
  }
}
```

Parameters

Parameters of the REST client are listed below.

maxthreadcount

Syntax:	`maxthreadcount: "value"`
Description:	Maximum number of thread the java process can have.
Type:	Integer
Optionality:	Optional
Allowed:	NA
Default:	1000
Example:	`maxthreadcount: "1000"`

port

Syntax:	`port: "value"`
Description:	Port on which REST client is listening to DAP requests.
Type:	Integer
Optionality:	Optional
Allowed:	NA
Default:	4050
Example:	`port: "4050"`

webroot

Syntax:	`webroot: "value"`
Description:	Path to which client will be listening. When “/” is specified, the client will be listening to “http://localhost:port/”. In API, “/” should be present at the end in the DAP configuration screen.
Type:	String
Optionality:	Optional
Allowed::	NA
Default:	"/"
Example:	`webroot: "/tmp"`

walletlocation

Syntax:	`walletlocation: "value"`
Description:	Location where the wallet is created, which stores the REST endpoint username and password.
Type:	String
Optionality:	Optional
Allowed:	NA
Default:	"/IN/service_packages/REST/etc/wallet"
Example:	`walletlocation: "/IN/service_packages/REST/etc/wallet"`

walletkey

Syntax:	`walletkey= "value"`
Description:	Base64 encrypted password for the wallet.
Type:	String
Optionality:	Mandatory
Allowed:	NA
Default:	“”
Example:	`walletkey: "key”`

restendpoint

Syntax:	`"value" : { "endpoint" : "value", "type" : "value", "servergroupid" : "value" }`
Description:	Group of REST operations.
Type:	JSON
Optionality:	Optional
Allowed:	NA
Default:	NA
Example:	`{ "BalanceTransfer" : { "endpoint" : "BalanceTransferEndpoint" "servergroupid" : "BillingCare" } "ApplyLoan" : { "endpoint" : "ApplyLoanEndpoint", "servergroupid" : "BRM" } }`

endpoint

Syntax:	`endpoint: "value"`
Description:	Endpoint to which the request is triggered.
Type:	String
Optionality:	Optional
Allowed:	NA
Default:	“”
Example:	`endpoint: "http:localhost:restopertion/"`

type

Syntax:	`type: "value"`
Description:	The type of request. This applies to GenericRequest handler only.
Type:	String
Optionality:	Optional
Allowed:	The allowed values are: • **GET**: Request will be triggered without body. • **POST**: XML Request body will be converted to JSON body and triggered.
Default:	POST
Example:	`type: "POST"`

servergroupid

Syntax:	`servergroupid: "value"`
Description:	ID of the oauth credential present in serverlist.
Type:	String
Optionality:	Optional
Allowed:	Servergroupid should be present in the `serverlist`, so that corresponding oAuth endpoint and clientid is used to generate the token.
Default:	“”
Example:	`servergroupid: "BRM"`

resourceid

Syntax:	`resourceid: "value"`
Description:	Resourceid used for requesting **BalanceTransfer** and **ApplyLoan**.
Type:	Integer
Optionality:	Optional
Allowed:	Only used in **BalanceTransfer** and **ApplyLoan**.
Default:	840
Example:	`resourceid: "840"`

chargesource

Syntax:	`chargesource: "Boolean"`

Description:	This is a boolean flag to indicate whether the source account to be charged for balance transfer. The `<chargeSource>` xml input field will hold this value. If xml does not carry this information, then a default value is taken from the **config.json** file.
Type:	Boolean
Optionality:	Optional
Allowed:	Only used in BalanceTransfer.
Default:	false
Example:	`chargesource: "false"`

chargedestination

Syntax:	`chargedestination: "Boolean"`
Description:	This is a boolean flag to indicate whether the target/destination account to be charged for balance transfer. The `<chargeDestination>` xml input field will hold this value. If xml does not carry this information, then a default value is taken from the **config.json** file.
Type:	Integer
Optionality:	Optional
Allowed:	Only used in BalanceTransfer.
Default:	false
Example:	`chargedestination: "false"`

serviceType

Syntax:	`serviceType : "value"`
Description:	This is the MSISDN Service type for which apply loan details are requested. The `<serviceType>` xml input field will hold this value. If xml does not carry this information, then a default value is taken from the **config.json** file
Type:	String
Optionality:	Optional
Allowed:	Only used in ApplyLoan.
Default:	/service
Example:	`serviceType : "/service"`

serverlist

Syntax:	`"value": {`
	`"tokenendpoint":"value",`
	`"clientid":"value"`
	`}`

Description:	Group of OAuth credentials.
Type:	JSON
Optionality:	Mandatory
Allowed:	NA

Default:	NA

Example:	<pre>"BRM": {
	"tokenendpoint":"OAuthendpoint",
	"clientid":"username"
	}</pre>

tokenendpoint

Syntax:	`tokenendpoint: "value"`
Description:	Endpoint to which token request will be triggered.
Type:	String
Optionality:	Mandatory
Allowed:	NA
Default:	“”
Example:	`tokenendpoint: "OAuthendpoint"`

clientid

Syntax:	`clientid: "value"`
Description:	Username used for OAuth token request. Corresponding password should be added in the wallet.
Type:	String
Optionality:	Mandatory
Allowed:	NA
Default:	NA
Example:	`clientid: "username"`

4
About Installation

This chapter provides information about the installed components for the Oracle Communications Network Charging and Control (NCC) application described in this guide. It also lists the files installed by the application that you can check for, to ensure that the application is installed successfully.

Installation Overview

For information about the following requirements and tasks, see *Installation Guide*:

- NCC system requirements
- Pre-installation tasks
- Installing and removing NCC packages

RESTClient Package

Installation of Oracle Communications Network Charging and Control RESTClient includes **restScp** package on SLC.

Checking the Installation

Refer to the following checklist to ensure that RESTClient is installed correctly.

Checklist - SLC

Follow the steps in this checklist to ensure RESTClient is installed correctly on an SLC machine.

1. Log in to the SLC machine as root.
2. Check that the following directory structure exists, with subdirectories:
   /IN/service_packages/REST
3. Check that directories contain subdirectories and that all are owned by:
   smf_oper user (group esg)

Process list - SLC

If the application is running correctly, **RESTClient.jar** process should be running on each SLC, started during OUI_systemctl startup.

RESTClient Directories and Files

The RESTClient installation on SLC creates the following directories:

- **/IN/services_packages/REST/bin**
- **/IN/services_packages/REST/lib**
- **/IN/services_packages/REST/etc**

- **/IN/services_packages/REST/tmp**

Installing RESTClient installs the following interface:

/IN/services_packages/REST/bin/RESTClient.jar

Installing RESTClient installs the following configuration file:

/IN/services_packages/REST/etc/config.json.example

> **Note:**
>
> You need to create the **config.json** file with actual values required during runtime.

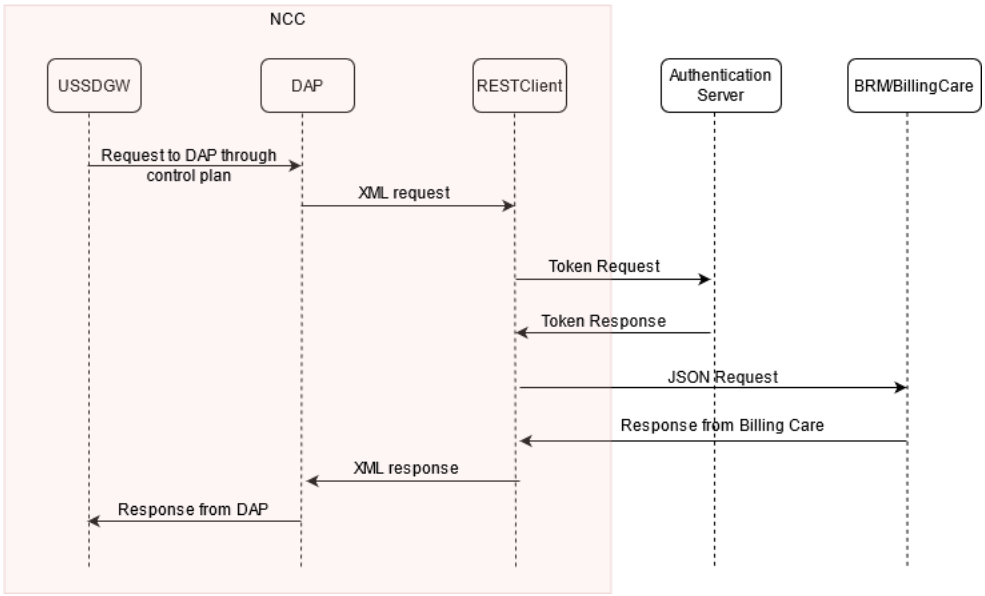
5
RESTClient Call Flows

This chapter provides a sample REST request flow.

Request Flow

Figure 5-1 shows the request and response exchange between USSDGW, DAP, RESTClient, and REST server. The flow depicts a simple scenario where RESTClient receives an xml request from DAP. RESTClient converts the incoming xml request from DAP to a JSON request and that JSON request is sent to the REST server (BRM). RESTClient then receives a response from the REST server. The response is sent back to DAP and a message will be sent to the subscriber based on the response from the REST server.

Figure 5-1 REST Request Flow



6
Supported Request Type

RESTClient supports three types of requests:

- BalanceTransfer
- ApplyLoan
- GenericRequest

> **Note:**
>
> If the location fetch fails during BalanceTransfer or ApplyLoan APIs, NCC does not send any location attributes to BRM. In such cases, taxes are applied based on how it is configured in the BRM system.

BalanceTransfer

BalanceTransfer request is triggered when the following parameter is present in the input xml request:

```
<operation>BalanceTransfer</operation>
```

> **Note:**
>
> - Configure **BalanceTransfer** under **restendpoint** in **config.json** file.
> - The output request will be always POST.

Input Request

Table 6-1 describes the parameters accepted in the XML `<requestDetails>` tag.

Table 6-1 Input Request Parameters

Notification Type	Mandatory/ Optional	Description
sourceMSISDN	Mandatory	Source MSISDN for BalanceTransfer.
destinationMSISDN	Mandatory	Destination MSISDN for BalanceTransfer.
transferAmount	Mandatory	Amount to be transferred from source to destination.
transferAmountType	Optional	ResourceId of the amount passed. If not present in the input request, default value of **resourceid** from the config file is used.

Table 6-1 (Cont.) Input Request Parameters

Notification Type	Mandatory/ Optional	Description
chargeSource	Optional	Boolean flag to indicate whether the source account will be charged. If not present in the input request, default value of **chargesource** from the config file is used.
chargeDestination	Optional	Boolean flag to indicate whether the target or destination account will be charged. If not present in the input request, default value of **chargedestination** from the config file is used.
sourceZoneMapTarget	Optional	Cellid for source MSISDN. If not present in the input request, location will not be sent to the REST server.
targetZoneMapTarget	Optional	Cellid for destination MSISDN. If not present in the input request, location will not be sent to the REST server.

Sample XML Input Request

Following is a sample XML input request sent out from DAP module.

```
<operation>BalanceTransfer</operation>
<requestDetails>
<sourceMSISDN>90989098</sourceMSISDN>
<destinationMSISDN>89878987</destinationMSISDN>
<transferAmount>10</transferAmount>
<transferAmountType>840</transferAmountType>
<chargeSource>true</chargeSource>
<chargeDestination>false</chargeDestination>
<sourceZoneMapTarget>52021005DC03EA</sourceZoneMapTarget>
<targetZoneMapTarget>52121005DC03EA</targetZoneMapTarget>
</requestDetails>
```

REST Request Parameters

Table 6-2 lists the parameters sent to the REST server.

Table 6-2 REST Request Parameters

Notification Type	Mapping From Input Request
sourceRef.id	From **sourceMSISDN**.
sourceRef.type	Always set as **service**.
targetRef.id	From **destinationMSISDN**.
targetRef.type	Always set as **service**.
transferAmount	From **transferAmount**.

Table 6-2 (Cont.) REST Request Parameters

Notification Type	Mapping From Input Request
transferAmountType	From **transferAmountType**. If not present in the input request, **restendpoint.BalanceTransfer.resourceid** from the config file is used.
chargeSource	From **transferAmountType**. If not present in the input request, **restendpoint.BalanceTransfer.chargesource** from the config file is used.
chargeDestination	From **transferAmountType**. If not present in the input request, **restendpoint.BalanceTransfer.chargedestination** from the config file is used.
description	Same as operation name.
sourceLocation. zoneMapTarget	From **sourceZoneMapTarget**.
targetLocation. zoneMapTarget	From **targetZoneMapTarget**.

Sample REST API Request

Following is a sample REST API request sent out from RESTClient towards REST endpoint.

```
{
  "description" : "BalanceTransfer",
  "sourceRef" : {
    "id" : "90989098",
    "type" : "service"
  },
  "targetRef" : {
    "id" : "89878987",
    "type" : "service"
  },
  "transferAmount" : 10,
  "transferAmountType" : 840,
  "chargeSource" : true,
  "chargeDestination" : false,
  "sourceLocation" : {
    "zoneMapTarget" : "52021005DC03EA"
  },
  "targetLocation" : {
    "zoneMapTarget" : "52121005DC03EA"
  }
}
```

REST API Response

Tags present in the response will not be validated. JSON message will be directly converted to XML.

Sample REST API Response

Following is the snippet of response received from the REST endpoint.

```
{
    "extension": null,
    "id": "0.0.0.1+-event-audit-transfer_balance+335711686285720131",
    "uri": "http://hostname:port/bcws/webresources/v1.0/billunits/
balancegroups/transferbalance/0.0.0.1+-event-audit-
transfer_balance+335711686285720131",
    "transferAmount": 10,
    "transferAmountType": 840,
    "sourceRef": {
        "id": "90989098",
        "type": "service"
    },
    "targetRef": {
        "id": "89878987",
        "type": "service"
    },
    "sourceBucket": [
        {
            "validFrom": 1647993600000,
            "validTo": 0,
            "currentBalance": 2147485311.57
        }
    ],
    "targetBucket": [
        {
            "validFrom": 1647993600000,
            "validTo": 0,
            "currentBalance": -2147483808.93
        },
        {
            "validFrom": 1632230093000,
            "validTo": 1703164493000,
            "currentBalance": 0
        }
    ],
    "sourceTransferFee": {
        "amount": 3.00,
        "feeTax": 0.30,
        "resourceId": 840
    },
    "targetTransferFee": {
        "amount": 3.00,
        "feeTax": 0.60,
        "resourceId": 840
    }
}
```

where, *hostname* and *port* is the hostname and port of the machine where REST server is running.

XML Response

XML response will have extra tag `<rest_result_code>` containing the status code from REST response header. The status code from RESTClient to DAP will always will be 200. `<rest_status_code>` can be used for checking the status code from REST server.

Sample XML Response

Following is the XML response received by DAP for a particular request.

```
<targetRef>
    <id>89878987</id>
    <type>service</type>
</targetRef>
<extension>null</extension>
<targetBucket>
    <currentBalance>-2.14748380893E9</currentBalance>
    <validFrom>1647993600000</validFrom>
    <validTo>0</validTo>
</targetBucket>
<targetBucket>
    <currentBalance>0</currentBalance>
    <validFrom>1632230093000</validFrom>
    <validTo>1703164493000</validTo>
</targetBucket>
<targetTransferFee>
    <amount>3.0</amount>
    <resourceId>840</resourceId>
    <feeTax>0.6</feeTax>
</targetTransferFee>
<transferAmount>10</transferAmount>
<sourceTransferFee>
    <amount>3.0</amount>
    <resourceId>840</resourceId>
    <feeTax>0.3</feeTax>
</sourceTransferFee>
<transferAmountType>840</transferAmountType>
<id>0.0.0.1+-event-audit-transfer_balance+335711686285720131</id>
<sourceRef>
    <id>90989098</id>
    <type>service</type>
</sourceRef>
<sourceBucket>
    <currentBalance>2.14748531157E9</currentBalance>
    <validFrom>1647993600000</validFrom>
    <validTo>0</validTo>
</sourceBucket>
<uri>http://hostname:port/bcws/webresources/v1.0/billunits/balancegroups/
transferbalance/0.0.0.1+-event-audit-transfer_balance+335711686285720131</
uri>
<rest_status_code>201</rest_status_code>
```

ApplyLoan

ApplyLoan request is triggered when the following parameter is present in the input request.

```
<operation>ApplyLoan</operation>
```

> **Note:**
>
> - Configure **ApplyLoan** under **restendpoint** in **config.json** file.
> - The output request will be always POST.

Input Request

Table 6-3 describes the parameters accepted in the XML `<requestDetails>` tag.

Table 6-3 Input Request Parameters

Notification Type	Mandatory	Description
sourceMSISDN	Mandatory	Source MSISDN for ApplyLoan.
loanAmount	Mandatory	Amount for loan.
loanResourceId	Optional	ResourceId of the amount passed. If not present in the input request, default value of **resourceid** from the config file is used.
sourceZoneMapTarget	Optional	Cellid for source MSISDN. If not present in the input request, location will not be sent to the REST server.

Sample XML Input Request

Following is a sample XML input request sent out from DAP module.

```
<operation>ApplyLoan</operation>
<requestDetails>
<sourceMSISDN>635495522</sourceMSISDN>
<loanAmount>5</loanAmount>
<loanResourceId>840</loanResourceId>
<serviceType>/service</serviceType>
<sourceZoneMapTarget>52021005DC03EA</sourceZoneMapTarget>
</requestDetails>
```

REST Request Parameters

Table 6-4 lists the parameters sent to the REST server.

Table 6-4 REST Request Parameters

Notification Type	Mapping From Input Request
accountRef.id	Always set as **"0.0.0.1+-account+1"**.
service.id	From **sourceMSISDN**.
service.type	From **serviceType**. If not present in the input request, **restendpoint.ApplyLoan. serviceType** from the config file is used.
amount	From **loanAmount**.
resourceId	From **loanResourceId**. If not present in the input request, **restendpoint.ApplyLoan.resourceid** from the config file is used.
zoneMapTarget	From **userLocation**. If not present in the input request, this parameter will not be sent.

Sample REST API Request

Following is a sample REST API request sent out from RESTClient towards REST endpoint.

```
{
    "accountRef": {
        "id": "0.0.0.1+-account+1"
    },
  "service": {
        "id" : "635495522",
        "type" : "/service"
    },
    "amount": 5,
    "resourceId": 840,
    "zoneMapTarget": "52021005DC03EA"
}
```

REST API Response

Tags present in the response will not be validated. JSON message will be directly converted to XML.

Sample REST API Response

Following is the snippet of response received from the REST endpoint.

```
{
    "extension": null,
    "availableLoanBalance": 172,
    "currentBalance": 800,
    "amount": 122,
    "loanFee": 10,
    "tax": 8.54,
    "balances": [],
    "availableLoanLimit": 9510.91,
    "creditLimit": 10000,
    "loanObj": {
```

```
        "id": "0.0.0.1+-event-billing-loan_debit+335782055029906029",
        "uri": null
    },
    "loanFeeObj": {
        "id": "0.0.0.1+-event-billing-loan_fee+335782055029904493",
        "uri": null
    }
}
```

XML Response

XML response will have extra tag `<rest_result_code>` containing the status code from REST response header. The status code from RESTClient to DAP will always will be 200. `<rest_status_code>` can be used for checking the status code from REST server.

Sample XML Response

Following is the XML response received by DAP for a particular request.

```
<extension>null</extension>
<amount>122</amount>
<loanFee>10</loanFee>
<loanObj>
    <id>0.0.0.1+-event-billing-loan_debit+335782055029906029</id>
    <uri>null</uri>
</loanObj>
<currentBalance>800</currentBalance>
<creditLimit>10000</creditLimit>
<loanFeeObj>
    <id>0.0.0.1+-event-billing-loan_fee+335782055029904493</id>
    <uri>null</uri>
</loanFeeObj>
<tax>8.54</tax>
<availableLoanLimit>9510.91</availableLoanLimit>
<availableLoanBalance>172</availableLoanBalance>
<rest_status_code>201</rest_status_code>
```

GenericRequest

For sending any request (other than BalanceTransfer and ApplyLoan) to a third party REST endpoint, generic request option can be used. You can configure the required operation with the corresponding endpoint in the **config.json** file and then use the same operation name in the input xml triggered from DAP to REST client.

Configure the new operation in the **config.json** file as follows:

```
"restendpoint": {
   "OperationName" : {
      "endpoint" : "restendpoint",
      "type" : "POST",
      "servergroupid" : "BRM"
    }
 }
```

> **Note:**
>
> - Generic request Handler supports POST and GET requests.
> - servergroupid and endpoint can be custom configurations.

Sample Configuration

```
"restendpoint": {
    "GenericBalanceTransferDetails" : {
      "servergroupid" : "BillingCare"
    }
}
```

Input Request

Table 6-5 describes the parameters accepted in the XML input request.

Table 6-5 Input Request Parameters

Notification Type	Mandatory/Optional	Description
operation	Mandatory	Operation name for the request which is configured.
type	Optional	If present, it will override the type present in the config for the operation.
endPoint	Optional	If present, it will override the endpoint present in the config for the operation.
requestDetails	Mandatory for POST	For GET, requestDetails will not be sent to the REST server. For POST, XML request will be converted to JSON and sent as body in the OUTPUT request.

Sample XML Input Request

This example shows a GET request for balance transfer audit object using Generic request Handler.

```
<operation>GenericBalanceTransferDetails</operation>
<endPoint>http://hostname:port/bcws/webresources/v1.0/billunits/
balancegroups/transferbalance/0.0.0.1+-event-audit-
transfer_balance+335887608146194890</endPoint>
<type>GET</type>
```

where, *hostname* and *port* is the hostname and port of the machine where REST server is running.

REST Request Parameters

```
{
    "endPoint": "http://hostname:port/bcws/webresources/v1.0/billunits/
balancegroups/transferbalance/0.0.0.1+-event-audit-
```

```
transfer_balance+335887608146194890",
    "type": "GET",
    "operation": "GenericBalanceTransferDetails"
}
```

REST API Response

Tags present in the response will not be validated. JSON message will be directly converted to XML.

Sample REST API Response

```
{
"extension":null,
"id":"0.0.0.1+-event-audit-transfer_balance+335887608146194890",
"sourceAccountRef":{
"id":"0.0.0.1+-account+37201",
"uri":"http://hostname:port/bcws/webresources/v1.0/accounts/0.0.0.1+-
account+37201"
},
"targetAccountRef":{
"id":"0.0.0.1+-account+34057",
"uri":"http://hostname:port/bcws/webresources/v1.0/accounts/0.0.0.1+-
account+34057"
},
"transferDate":1649681472000,
"sourceRef":{
"id":"0.0.0.1+-balance_group+40785",
"type":"balanceGroup"
},
"targetRef":{
"id":"0.0.0.1+-balance_group+34953",
"type":"balanceGroup"
},
"transferAmount":11,
"transferAmountType":840,
"chargeSource":false,
"chargeDestination":true,
"sourceImpactedBucket":
[{"validFrom":1647993600000,"validTo":0,"amount":11}],
"targetImpactedBucket":
[{"validFrom":1647993600000,"validTo":0,"amount":-11}],
"sourceTransferFee":null,
"targetTransferFee":{
"amount":3,
"feeTax":0.6,
"resourceId":840
}
}
```

XML Response

XML response will have extra tag `<rest_result_code>` containing the status code from REST response header. The status code from RESTClient to DAP will always will

be 200. <rest_status_code> can be used for checking the status code from REST server.

Sample XML Response

```
<targetRef>
<id>0.0.0.1+-balance_group+34953</id>
<type>balanceGroup</type>
</targetRef>
<extension>null</extension>
<targetImpactedBucket>
<amount>-11</amount>
<validFrom>1647993600000</validFrom>
<validTo>0</validTo>
</targetImpactedBucket>
<chargeSource>false</chargeSource>
<targetTransferFee>
<amount>3</amount>
<resourceId>840</resourceId>
<feeTax>0.6</feeTax>
</targetTransferFee>
<transferAmount>11</transferAmount>
<sourceTransferFee>null</sourceTransferFee>
<targetAccountRef>
<id>0.0.0.1+-account+34057</id>
<uri>http://hostname:port/bcws/webresources/v1.0/accounts/0.0.0.1+-
account+34057</uri>
</targetAccountRef>
<transferAmountType>840</transferAmountType>
<transferDate>1649681472000</transferDate>
<chargeDestination>true</chargeDestination>
<id>0.0.0.1+-event-audit-transfer_balance+335887608146194890</id>
<sourceAccountRef>
<id>0.0.0.1+-account+37201</id>
<uri>http://hostname:port/bcws/webresources/v1.0/accounts/0.0.0.1+-
account+37201</uri>
</sourceAccountRef>
<sourceRef>
<id>0.0.0.1+-balance_group+40785</id>
<type>balanceGroup</type>
</sourceRef>
<sourceImpactedBucket>
<amount>11</amount>
<validFrom>1647993600000</validFrom>
<validTo>0</validTo>
</sourceImpactedBucket>
<rest_status_code>200</rest_status_code>
```