

GridDB

Web API Guide

Introduction

This manual describes GridDB WebAPI's function, configuration method, and notes.

Please read this manual prior to using the GridDB.

Trademarks

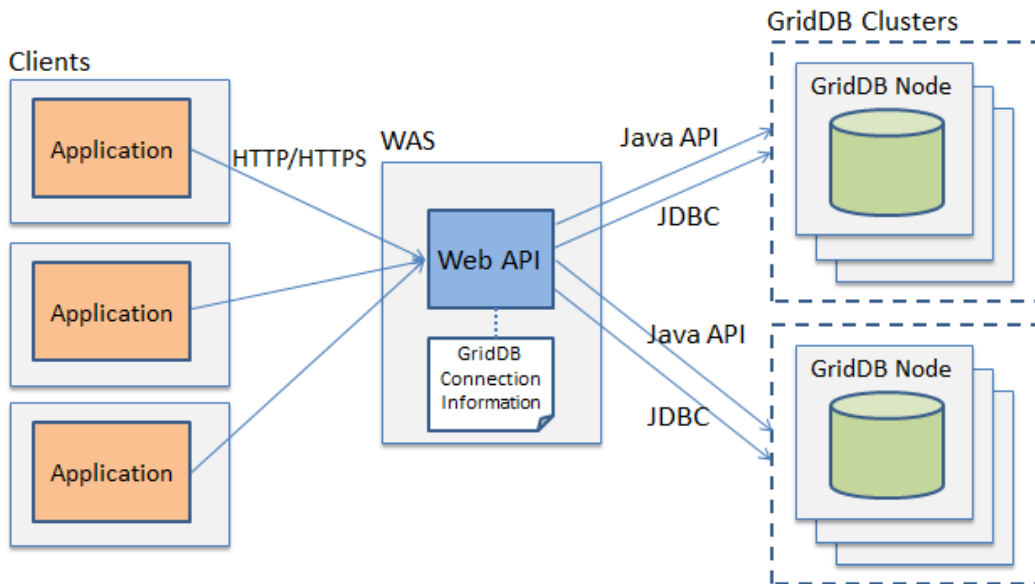
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1. About the GridDB Web API

GridDB provides a Web API to register rows, acquire rows and execute a SQL SELECT statement for GridDB cluster. The Web API is configured as a web application.



[Memo]

- Operations such as data registration and search can be performed for cluster.
- GridDB Web API is a web application that runs on Apache Tomcat.
- Multiple clusters can be operated from one Web API (web application).

2. Functions

The functions of GridDB Web API are shown in this chapter.

Function	Description
Row registration	Registers rows to the container.
Row acquisition	Acquires rows from the container.
SQL SELECT execution	Executes a SQL SELECT statement

2.1 Row registration

This function registers the rows to the container. Specify the rows to be registered in JSON format. Multiple rows can be registered in one container.

[Memo]

- The container to be registered must exist.
- When the container has no row key, a row will be newly created.
- When the container has a row key, if a row has the row key that already exists in the container will be updated, otherwise a row will be newly created.
- When an exception occurs during row registration processing, only some rows may be registered. Therefore, when retrying with an HTTP client when an exception occurs, the same row data may be registered duplicately in a container has no row key.

■Path

`/:cluster/dbs/:database/containers/:container/rows`

Path parameter	Description
<code>:cluster</code>	Cluster name
<code>:database</code>	Database name (Specify "public" for public (default) database.)
<code>:container</code>	Container (table) name

■HTTP method

POST

■Request

□Request header

Field	Description	Required
Content-Type	Specify "application/json"	✓
X-GridDB-User	Specify the user to access GridDB	✓
X-GridDB-Password	Specify the password of the user.	✓

□ Request body

Specify the rows as following JSON format.

Property	Description	Required
rows	An array of the rows. Row is an array of the column values.	✓

(Example) Specifying 3 rows

```

{
  "rows" : [
    ["2016-01-16T10:25:00.253Z", 100.5, "success", true ],
    ["2016-01-16T10:35:00.691Z", 173.9, "error", false ],
    ["2016-01-16T10:45:00.691Z", 328.2, null, false ],
  ]
}

```

• Description of a column value of a row

Depending on the column data type, describe a column value with the following JSON data type.

Column data type			JSON data type	Example
Primitive	Boolean type	BOOL	Boolean value (true false) or String value ("true" "false")	true
	String type	STRING	Text string	"GridDB"
	Integer type	BYTE/SHORT/ INTEGER/LONG	Number or text string	512
	Floating point type	FLOAT/DOUBLE	Number or text string	593.5
	Time type	TIMESTAMP	Text string • UTC • Format YYYY-MM-DDThh:mm:ss.SSSZ	"2016-01-16T10:25:00.253Z"
	Spatial type	GEOMETRY	Text string (WKTrepresentation)	"POLYGON((0 0,10 0,10,0 10,0 0))"

Array	Boolean type	BOOL	Array of boolean values or Array of text string values	[true, false, true]
	String type	STRING	Array of text string values	["A","B","C"]
	Integer type	BYTE/SHORT/INTEGER/LONG	Array of numbers or Array of text string values	[100, 39, 535]
	Floating point type	FLOAT/DOUBLE	Array of numbers or Array of text string values	[3.52, 6.94, 1.83]
	Time type	TIMESTAMP	Array of text string values (Format is same as the primitive one)	["2016-01-16T10:25:00.253Z", "2016-01-17T01:42:53.038Z"]

[Memo]

- BLOB type is unsupported. An error occurs when specifying the container that has the BLOB column.
- If a NULL value (null of JSON data type) is specified as column value, it operates as follows:
 - When the NOT NULL constraint is specified for the column : Registration error will occur.
 - Otherwise : A NULL value will be registered.

■Response

□Status code

Please refer to 2.4.4.

□Response body

If processing is successful, the following JSON data will be returned.

Property	Description
count	The number of processed rows.

Please refer to 2.4.5 for the response body in case of failure.

2.2 Row acquisition

This function acquires the rows from the container (table). It is also possible to narrow down the rows to be acquired by specifying conditions.

■Path

`/:cluster/dbs/:database/containers/:container/rows`

Path parameter	Description
<code>:cluster</code>	Cluster name
<code>:database</code>	Database name (Specify "public" for public (default) database.)
<code>:container</code>	Container (table) name

■HTTP method

GET

■Request

□Request header

Field	Description	Required
Content-Type	Specify "application/json" when specifying the body as JSON.	✓ (when specifying the body)
X-GridDB-User	Specify the user to access GridDB	✓
X-GridDB-Password	Specify the password of the user.	✓

□Request body

The upper limit of the rows to be acquired and some conditions can be specified.

If all conditions are omitted, all rows of the container can be acquired.

Property	Description	JSON data type	Required
offset	Acquisition start position	An integer from 0	-
limit	The number of rows to be acquired	An integer from 0	-
condition	Condition expression	Text string	-
sort	Sorting expression	Text string	-

[Memo]

- If "limit" is set to 0 (zero), all rows matching the condition can be acquired.
- "offset" can be used together with "limit".

(Example) Acquires row data with a column "id" value of 50 or more, sorts it in descending order by the value of "id", and acquires 100 values from the 11th

```
{
  "offset" : 10,
  "limit"  : 100,
  "condition" : "id >= 50",
  "sort" : "id desc"
}
```

■Response

□Response body

Acquired rows will be returned as the following JSON data.

Property	Description	JSON data type
columns	An array of column information	Array
name	Column name	Text string
type	Data type	Text string
rows	An array of the rows	Array

(Example)

```
{
  "columns" : [
    {"name": "date", "type": "TIMESTAMP" },
    {"name": "value", "type": "DOUBLE" },
    {"name": "str", "type": "STRING" }
  ],
  "rows" : [
    ["2016-01-16T10:25:00.253Z", 100.5, "normal" ],
    ["2016-01-16T10:35:00.691Z", 173.9, "normal" ],
    ["2016-01-16T10:45:00.032Z", 173.9, null ]
  ]
}
```

• Column data type

Depending on the column data type, column values with the following JSON data type will be returned.

Column data type			JSON data type	Example
Primitive	Boolean type	BOOL	Boolean value (true false) or String value ("true" "false")	true
	String type	STRING	Text string	"GridDB"
	Integer type	BYTE/SHORT/ INTEGER/LONG	Number or text string	512
	Floating point type	FLOAT/DOUBLE	Number or text string	593.5
	Time type	TIMESTAMP	Text string • UTC • Format YYYY-MM-DDThh:mm:ss.SSSZ	"2016-01-16T10:25:00.253Z"
	Spatial type	GEOMETRY	Text string (WKTRepresentation)	"POLYGON((0 0,10 0,10 10,0 10,0 0))"
Array	Boolean type	BOOL	Array of boolean values or Array of text string values	[true, false, true]
	String type	STRING	Array of text string values	["A", "B", "C"]
	Integer type	BYTE/SHORT/ INTEGER/LONG	Array of numbers or Array of text string values	[100, 39, 535]
	Floating point type	FLOAT/DOUBLE	Array of numbers or Array of text string values	[3.52, 6.94, 1.83]
	Time type	TIMESTAMP	Array of text string values (Format is same as the primitive one)	["2016-01-16T10:25:00.253Z", "2016-01-17T01:42:53.038Z"]

[Memo]

- BLOB type is unsupported. An empty string will be returned when specifying the container that has the BLOB column.
- If a column value is NULL value, the null of JSON data type will be returned.
- Partitioned container is unsupported for row acquisition.

2.3 SQL SELECT execution

This function executes a SQL SELECT statement in a GridDB database.
It can be used only for GridDB Advanced Edition/Vector Edition.

■Path

`/:cluster/dbs/:database/sql`

Path parameter	Description
<code>:cluster</code>	Cluster name
<code>:database</code>	Database name (Specify "public" for public (default) database.)

■HTTP method

GET or POST

■Request

□Request header

Field	Description	Required
Content-Type	Specify "application/json"	✓
X-GridDB-User	Specify the user to access GridDB	✓
X-GridDB-Password	Specify the password of the user.	✓

□Request body

Specify a SQL SELECT statement as following JSON format.

Field	Description	JSON data type	Required
type	Type of query statement (Only "sql-select" can be specified.)	Text string	-
stmt	A SQL SELECT statement	Text string	✓

(Example)

```
{
  "type" : "sql-select",
  "stmt" : "select* from emp"
}
```

■Response

□Response body

Acquired rows will be returned as the following JSON data.

Property	Description	JSON data type
columns	An array of column information	Array
name	Column name	Text string
type	Data type	Text string
rows	An array of the rows	Array

(Example)

```
{
  "columns" : [
    { "name": "date", "type": "TIMESTAMP" },
    { "name": "value", "type": "DOUBLE" },
    { "name": "str", "type": "STRING" }
  ],
  "rows" : [
    [ "2016-01-16T10:25:00.253Z", 100.5, "normal" ],
    [ "2016-01-16T10:35:00.691Z", 173.9, "normal" ],
    [ "2016-01-16T10:45:00.032Z", 173.9, null ]
  ]
}
```

- Column data type

Depending on the column data type, column values with the following JSON data type will be returned.

Column data type			JSON data type	Example
Primitive	Boolean type	BOOL	Boolean value (true false) or String value ("true" "false")	true
	String type	STRING	Text string	"GridDB"
	Integer type	BYTE/SHORT/ INTEGER/LONG	Number or text string	512
	Floating point type	FLOAT/DOUBLE	Number or text string	593.5
	Time type	TIMESTAMP	Text string • UTC • Format YYYY-MM-DDThh:mm:ss.SSSZ	"2016-01-16T10:25:00.253Z"

[Memo]

- In case that column value is NULL, null will be returned for the column in JSON data.
- BLOB, GEOMETRY and array types are not supported in this function.
- For BLOB columns, "BLOB" will be returned as data type, and an empty string will be returned as data value in case that the column value is not NULL.
- For GEOMETRY and array columns, "UNKNOWN" will be returned as data type, and null will be returned as data value.

2.4 Common function (HTTP request/response)

This chapter describes the HTTP request /response part common to each function.

2.4.1 URI

The URI to be accessed when using the Web API.

`http://WAS domain/griddb/v1/:path`

- Specify the WAS domain according to the environment of the web application server on which the Web API is deployed.
- Specify path of each function as ":path".
- It is not allowed in this version's GridDB WEB APIs that clusters, databases and containers which name contains any special characters('-', '.', '/', '=') are specified in the path.

2.4.2 Request header

Specify the following headers to the request header.

Field	Description	Required
Content-Type	Specify "application/json" when specifying the body as JSON.	✓ (when specifying the body)
X-GridDB-User	Specify the user to access GridDB	✓
X-GridDB-Password	Specify the password of the user.	✓

2.4.3 Request body

Specify the request body as JSON format. Please refer to the JSON format of each functions.

[Memo]

- Write JSON format data in UTF-8.
- Write the date in UTC and in the following format:

YYYY-MM-DDThh:mm:ss.SSSZ

Otherwise, an error will occur.

(Example)

2016/01/17T14:32:33.888Z -> An error occurs caused by incorrect separator string.

2016-01-18 -> An error occurs caused by no time specification.

2.4.4 Response code

The following response code will be returned.

Code	Description
200	Success
400	Incorrect request data
403	Specified resource is not found
500	An error occurs in Web API or GridDB

2.4.5 Response body

Refer to the section on each function for the response body when the processing succeeds.

If processing fails, an error message is returned as response body in the following format:

```
{  
  "version": "v1",  
  "errorCode": "Error code",  
  "errorMessage": "Error message"  
}
```

3. Installation and setup

3.1 Installation

(1) Installing the client package

Install the client package.

```
rpm -Uvh griddb-xx-client-X.X.X-linux.x86_64.rpm
```

After installing, Web API .war file and configuration files are installed as follows:

<code>/usr/gridstore/webapi/griddb.war</code>	-> Web API .war file
<code>/var/lib/gridstore/webapi/conf/griddb_webapi.properties</code>	-> Configuration file
<code>/repository.json</code>	-> Cluster information definition file
<code>/log</code>	-> Log output directory

(2) Deploying on the web application server

Deploy the Web API .war file on the web application server.

Web API .war file
<code>/usr/gridstore/webapi/griddb.war</code>

3.2 Configuration

(1) Specifying cluster configuration (Required)

Specify the information of the cluster to be connected from the Web API in the cluster information definition file.

Cluster information definition file
<code>/var/lib/gridstore/webapi/conf/repository.json</code>

Based on the value of the cluster definition file (`gs_cluster.json`) of the cluster to be connected, specify the cluster configuration method to "mode", and the address information corresponding to the method.

• Property list

Property	Description	Required
clusters	An array of cluster information	✓
name	Cluster name	✓
mode	Cluster configuration method (MULTICAST FIXED_LIST PROVIDER)	✓
address	(MULTICAST) Multicast address for row registration and acquisition	✓ (MULTICAST)
port	(MULTICAST) Multicast port for row registration and acquisition	✓ (MULTICAST)
transactionMember	(FIXED_LIST) Connection destination list for row registration and acquisition	✓ (FIXED_LIST)
providerUrl	(PROVIDER) Provider URL for all functions	✓ (PROVIDER)
jdbcAddress	(MULTICAST) Multicast address for SQL SELECT execution	✓ (MULTICAST)
jdbcPort	(MULTICAST) Multicast port for SQL SELECT execution	✓ (MULTICAST)
sqlMember	(FIXED_LIST) Connection destination list for SQL SELECT execution	✓ (FIXED_LIST)

(Example) In case of the multicast method

```

{
  "clusters" : [
    {
      "name" : "defaultCluster",
      "mode" : "MULTICAST",
      "address" : "239.100.100.111",
      "port" : 31999
    }
  ]
}

```

[Memo]

In GridDB Standard Edition, when using SQL SELECT execution, the response code 500 and the following response body will be returned.

```
{
  "version": "v1",
  "errorCode": "E2060B",
  "errorMessage": "[145028:JC_BAD_CONNECTION] Connection problem occurred
(retryCount=x, elapsedMillis=xxxx, failureMillis=xxxx, queryTimeoutMillis=(not bounded),
loginTimeoutMillis=xxxx, operation=LOGIN, reason=[145028:JC_BAD_CONNECTION] Failed to
connect"
}
```

(2) Configuring Web API behaviors (Option)

Configure the behavior of the Web API.

If not setting it will work with the default values. Configure the values according to the system.

Configuration file

`/var/lib/gridstore/webapi/conf/griddb_webapi.properties`

Property	Description	Default value
GridDB configuration		
failoverTimeout	Timeout time (second) during an error retry when the Web API connected to a node constituting a cluster which failed connects to a replacement node.	5
transactionTimeout	The minimum value (second) of transaction timeout time.	30
containerCacheSize	The maximum number of the container information on the container cache.	100

Web API configuration		
maxGetRowSize	The upper limit of the size for row acquisition and SQL SELECT execution (MB) (1-2048)	20
maxPutRowSize	The upper limit of the size for row registration. (MB) (1-2048)	20
loginTimeout	The connection timeout in seconds for SQL SELECT execution (An integer value can be specified. When it is less than 0, SQL SELECT statement can not be executed.)	5

[Memo]

- Need to restart tomcat for the changes to take effect.

(3) Configuring log output directory (Option)

The Web API logs are output to the following directory by default.

Log output directory /var/lib/gridstore/webapi/log

To change the output directory, edit the following file:

Log output directory [WAS install directory]/webapps/griddb/v1/WEB-INF/classes/logback.xml

3.3 Starting and Stopping

To start or stop the Web API, start or stop the web application server.

3.4 Checking of operation

To check the operation of the Web API, use curl command in linux or another command.

(Example) Row acquisition

```
curl -H "X-GridDB-User:user" -H "X-GridDB-Password:password" http://host:port/griddb/v1/cluster/dbs/public/containers/test/rows
```

(Example) Row registration

```
curl -X POST -H "X-GridDB-User:user" -H "X-GridDB-Password:password" -H "Content-type: application/json" -d '{"rows":[{"value", 1}]}' http://host:port/griddb/v1/cluster/dbs/public/containers/test/rows
```

(Example) execution of SQL SELECT

```
curl -X POST -H "X-GridDB-User:user" -H "X-GridDB-Password:password" -H "Content-type: application/json" -d '{"stmt":"select * from test"}' http://host:port/griddb/v1/cluster/dbs/public/select
```

3.5 Uninstallation

Stop the web application server and remove [WAS install directory]/webapps/gridstore/v1 directory and the deployed .war file.