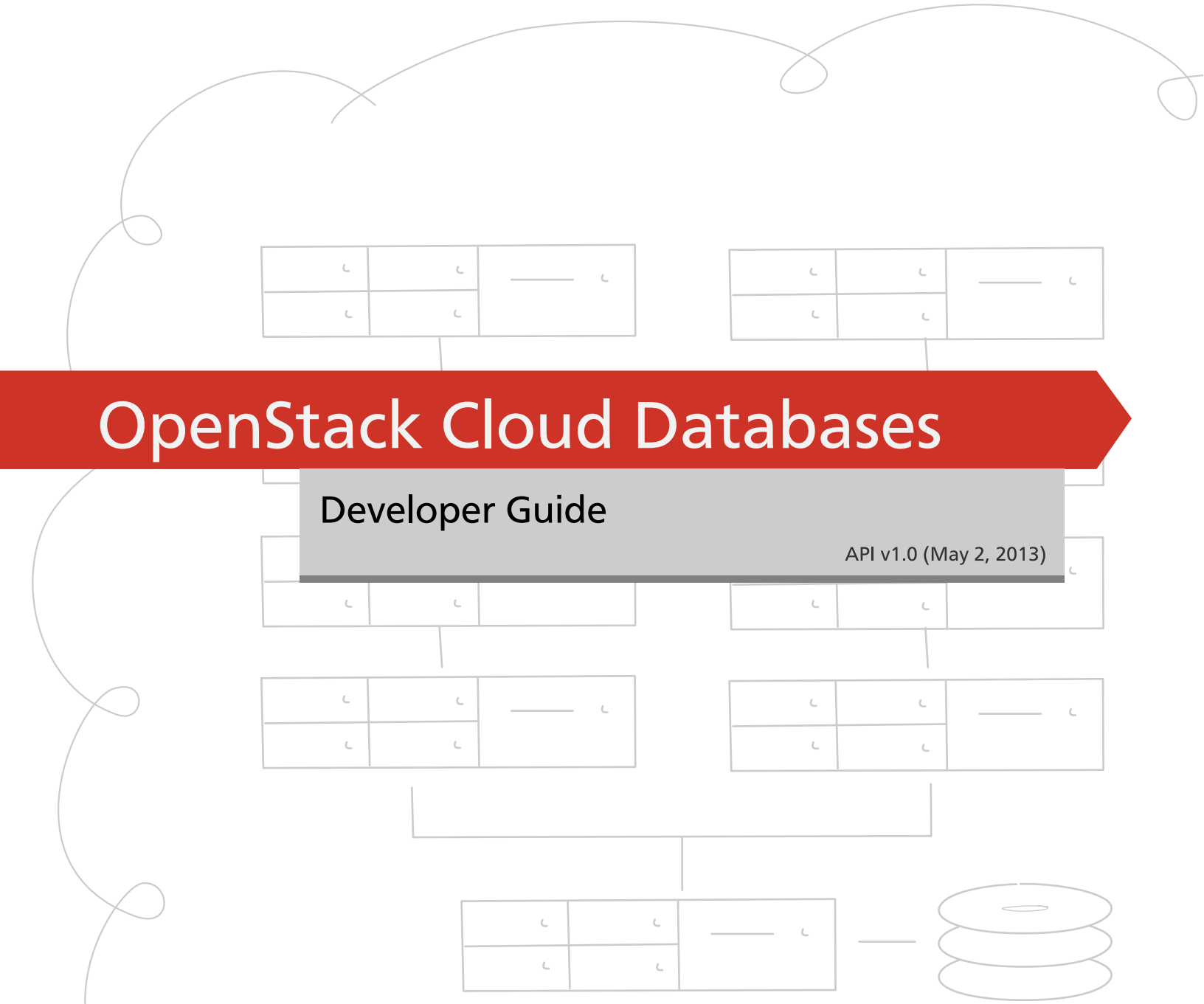

OpenStack Cloud Databases

Developer Guide

API v1.0 (May 2, 2013)

docs.openstack.org

OpenStack Cloud Databases Developer Guide

API v1.0 (2013-05-02)

This document is intended for software developers interested in developing applications using the OpenStack Cloud Databases Application Programming Interface (API).

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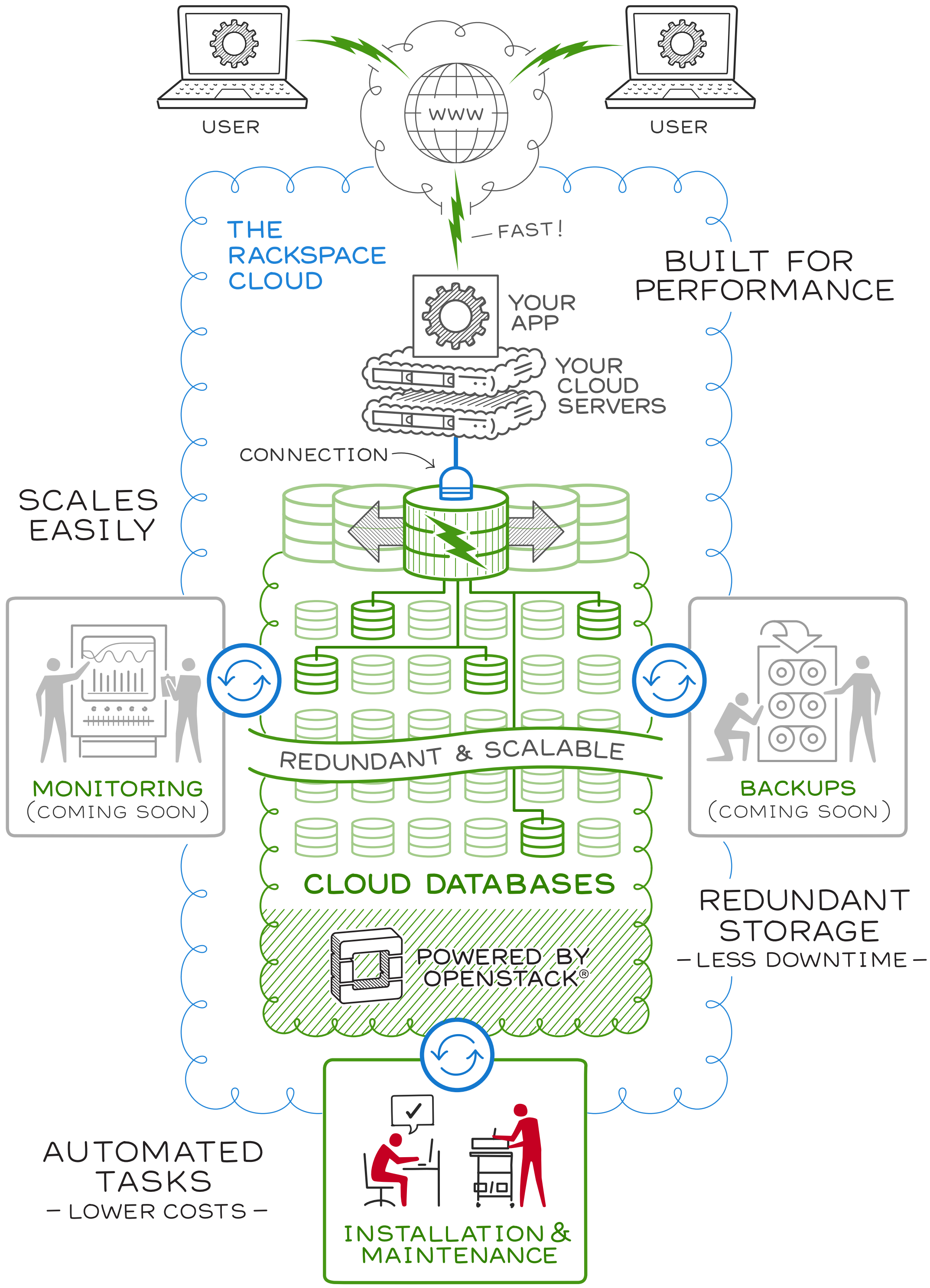
1. Overview

OpenStack Cloud Databases is an OpenStack-based MySQL relational database service that allows customers to easily provision database instances of varying virtual resource sizes without the need to maintain and/or update MySQL. Interactions with Cloud Databases occur programmatically via the Cloud Databases API as described in this developer guide.

Note

OpenStack recommends that Cloud Databases users back up their data using **mysqldump** until backups are supported in Cloud Databases.

The following figure shows an overview of Cloud Databases Infrastructure:



Reviewer: need to edit graphic above so it says "The Cloud" rather than "The Rackspace Cloud".

1.1. Intended Audience

This Guide is intended to assist software developers who want to develop applications using the Cloud Databases API. It assumes the reader has a general understanding of databases and is familiar with:

- ReSTful web services
- HTTP/1.1 conventions
- JSON and/or XML data serialization formats

1.2. Document Change History

This version of the Developer Guide replaces and obsoletes all previous versions. The most recent changes are described in the table below:

Revision Date	Summary of Changes
May 2, 2013	• This document is for the initial OpenStack review.

1.3. Additional Resources

You can download the most current versions of this and other API-related documents from http://docs.openstack.org/.

We welcome feedback, comments, and bug reports at https://bugs.launchpad.net/reddwarf.

This API uses standard HTTP 1.1 response codes as documented at: http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html.

2. Concepts

To use the Cloud Databases API effectively, you should understand several key concepts:

2.1. Database Instance

A database instance is an isolated MySQL instance in a single tenant environment on a shared physical host machine.

2.2. Database

A MySQL database within a database instance.

2.3. Flavor

A flavor is an available hardware configuration for a database instance. Each flavor has a unique combination of memory capacity and priority for CPU time.

2.4. Volume

A volume is user-specified storage that contains the MySQL data directory. Volumes are automatically provisioned on shared Internet Small Computer System Interface (iSCSI) storage area networks (SAN) that provide for increased performance, scalability, availability and manageability. Applications with high I/O demands are performance optimized and data is protected through both local and network RAID-10. Additionally, network RAID provides synchronous replication of volumes with automatic failover and load balancing across available storage clusters.

3. General API Information

The Cloud Databases API is implemented using a ReSTful web service interface. Like other cloud products, the Database Service shares a common token-based authentication system that allows seamless access between products and services.

Note

All requests to authenticate against and operate the service are performed using SSL over HTTP (HTTPS) on TCP port 443.

3.1. Authentication

Each HTTP request against the Cloud Database service requires the inclusion of specific authentication credentials. A single deployment may support multiple authentication schemes (OAuth, Basic Auth, Token). The authentication scheme used is determined by the provider of the Cloud Database service. Please contact your provider to determine the best way to authenticate against this API.

Note

Some authentication schemes may require that the API operate using SSL over HTTP (HTTPS).

3.2. Cloud Databases Service Versions

The Cloud Databases version defines the contract and build information for the API.

3.2.1. Contract Version

The contract version denotes the data model and behavior that the API supports. The requested contract version is included in all request URLs. Different contract versions of the API may be available at any given time and are not guaranteed to be compatible with one another.

Example 3.1. Example Request URL (contract version in bold)

```
https://openstack.example.com/v1.0/1234
```

Note

This document pertains to contract version 1.0.

3.2.2. API Version

The API List Versions call is available to show the current API version as well as information about all versions of the API. Refer to Section 4.1, "API Versions" [16] for details.

3.3. Date/Time Format

The Database Service uses an ISO-8601 compliant date format for the display and consumption of date/time values.

The system timezone is in UTC. MySQL converts TIMESTAMP values from the current time zone to UTC for storage, and back from UTC to the current time zone for retrieval. This does not occur for other types, such as DATETIME.

Example 3.2. DB Service Date/Time Format

```
yyyy-MM-dd'T'HH:mm:ss.SSSZ
```

See the table below for a description of the date/time format codes.

May 19th, 2011 at 8:07:08 AM, GMT-5 would have the following format:

```
2011-05-19T08:07:08-05:00
```

Table 3.1. Explanation of Date/Time Format Codes

Code	Description
yyyy	Four digit year
MM	Two digit month
dd	Two digit day of month
T	Separator for date/time
HH	Two digit hour of day (00-23)
mm	Two digit minutes of hour
ss	Two digit seconds of the minute
SSS	Three digit milliseconds of the second
Z	RFC-822 timezone

3.4. Pagination

To reduce load on the service, list operations return a maximum of 20 items at a time. This is referred to as *pagination*. Cloud Databases has separate paging limits for instances, databases, and users, which are currently all set to 20. If a request supplies no limit or one that exceeds the configured default limit, the default is used instead.

Pagination provides the ability to limit the size of the returned data as well as retrieve a specified subset of a large data set. Pagination has two key concepts: limit and marker. *Limit* is the restriction on the maximum number of items for that type that can be returned. *Marker* is the ID of the last item in the previous list returned. The ID is the UUID in the case of instances, and the name in the case of databases and users. For example, a query could request the next 10 instances after the instance "1234" as follows: `?limit=10&marker=1234`. Items are displayed sorted by ID.

Pagination applies only to the calls listed in the following table:

Verb	URI	Description
GET	/instances/	Lists the status and information for all database instances.

Verb	URI	Description
GET	/instances/{instanceId}/databases	Lists databases for the specified instance.
GET	/instances/{instanceId}/users	Lists the users in the specified database instance.

If the content returned by a call is paginated, the response includes a structured link much like an instance item's links, with the basic structure `{"href": "<url>", "rel": "next"}`. Any response that is truncated by pagination will have a *next* link, which points to the next item in the collection. If there are no more items, no *next* link is returned.

See the examples of paged List Instances calls that follow.
Reviewer: Need new examples that show OpenStack host.

Example 3.3. List Instances Paged Request: XML

```
GET /v1.0/1234/instances?limit=2 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 3.4. List Instances Paged Request: JSON

```
GET /v1.0/1234/instances?limit=2 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

Notice that the paged request examples above set the limit to 2 (`?limit=2`), so the responses that follow each show 2 instances and return a *marker* set to the UUID of the last item in the returned list (`?marker=4137d6a4-03b7-4b66-b0ef-8c7c35c470d3`). Also a link is provided to retrieve the next 2 results (`limit=2`) in the link element identified by the attribute `rel="next"` (XML) or `"rel":"next"` (JSON):

Example 3.5. List Instances Paged Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 1538
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<instances xmlns="http://docs.openstack.org/database/api/v1.0">
    <instance id="098653ba-218b-47ce-936a-e0b749101f81" name=
"xml_rack_instance" status="ACTIVE">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/instances/
098653ba-218b-47ce-936a-e0b749101f81" rel="self"/>
            <link href="https://openstack.example.com/instances/
098653ba-218b-47ce-936a-e0b749101f81" rel="bookmark"/>
        </links>
        <volume size="2"/>
        <flavor id="1">
            <links>
                <link href="https://openstack.example.com/v1.0/1234/flavors/1"
 rel="self"/>
                <link href="https://openstack.example.com/flavors/1" rel=
"bookmark"/>
            </links>
        </flavor>
    </instance>
    <instance id="44b277eb-39be-4921-be31-3d61b43651d7" name=
"json_rack_instance" status="ACTIVE">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/instances/
44b277eb-39be-4921-be31-3d61b43651d7" rel="self"/>
            <link href="https://openstack.example.com/instances/
44b277eb-39be-4921-be31-3d61b43651d7" rel="bookmark"/>
        </links>
        <volume size="2"/>
        <flavor id="1">
            <links>
                <link href="https://openstack.example.com/v1.0/1234/flavors/1"
 rel="self"/>
                <link href="https://openstack.example.com/flavors/1" rel=
"bookmark"/>
            </links>
        </flavor>
    </instance>
    <links>
        <link href="https://openstack.example.com/v1.0/1234/instances?marker=
44b277eb-39be-4921-be31-3d61b43651d7&amp;limit=2" rel="next"/>
    </links>
</instances>
```

```
                    }
                ]
            },
            "id": "098653ba-218b-47ce-936a-e0b749101f81",
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/
instances/098653ba-218b-47ce-936a-e0b749101f81",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/instances/
098653ba-218b-47ce-936a-e0b749101f81",
                    "rel": "bookmark"
                }
            ],
            "name": "xml_rack_instance",
            "status": "ACTIVE",
            "volume": {
                "size": 2
            }
        },
        {
            "flavor": {
                "id": "1",
                "links": [
                    {
                        "href": "https://openstack.example.com/v1.0/1234/
flavors/1",
                        "rel": "self"
                    },
                    {
                        "href": "https://openstack.example.com/flavors/1",
                        "rel": "bookmark"
                    }
                ]
            },
            "id": "44b277eb-39be-4921-be31-3d61b43651d7",
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/
instances/44b277eb-39be-4921-be31-3d61b43651d7",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/instances/
44b277eb-39be-4921-be31-3d61b43651d7",
                    "rel": "bookmark"
                }
            ],
            "name": "json_rack_instance",
            "status": "ACTIVE",
            "volume": {
                "size": 2
            }
        }
    ],
    "links": [
        {
            "href": "https://openstack.example.com/v1.0/1234/instances?marker=
44b277eb-39be-4921-be31-3d61b43651d7&limit=2",
            "rel": "next"
        }
    ]
}
```

3.5. Faults

When an error occurs, the Database Service returns a fault object containing an HTTP error response code that denotes the type of error. In the body of the response, the system will return additional information about the fault.

The following table lists possible fault types with their associated error codes and descriptions.

Fault Type	Associated Error Code	Description
`badRequest`	400	There was one or more errors in the user request.
`unauthorized`	401	The supplied token is not authorized to access the resources, either it's expired or invalid.
`forbidden`	403	Access to the requested resource was denied.
`itemNotFound`	404	The back-end services did not find anything matching the Request-URI.
`badMethod`	405	The request method is not allowed for this resource.
`overLimit`	413	Either the number of entities in the request is larger than allowed limits, or the user has exceeded allowable request rate limits. See the `details` element for more specifics. Contact support if you think you need higher request rate limits.
`badMediaType`	415	The requested content type is not supported by this service.
`unprocessableEntity`	422	The requested resource could not be processed on at the moment.
`instanceFault`	500	This is a generic server error and the message contains the reason for the error. This error could wrap several error messages and is a catch all.
`notImplemented`	501	The requested method or resource is not implemented.
`serviceUnavailable`	503	The Database Service is not available.

The following two `instanceFault` examples show errors when the server has erred or cannot perform the requested operation:

Example 3.7. Example instanceFault Response: XML

```
HTTP/1.1 500 Internal Server Error
Content-Type: application/xml
Content-Length: 121
Date: Mon, 28 Nov 2011 18:19:37 GMT

<instanceFault code="500" xmlns="http://docs.openstack.org/database/api/v1.0">
    <message>
        The server has either erred or is incapable of performing the
 requested operation.
    </message>
</instanceFault>
```

Example 3.8. Example Fault Response: JSON

```
HTTP/1.1 500 Internal Server Error
Content-Length: 120
Content-Type: application/json; charset=UTF-8
Date: Tue, 29 Nov 2011 00:33:48 GMT

{
    "instanceFault": {
        "code": 500,
        "message": "The server has either erred or is incapable of performing
 the requested operation."
    }
}
```

The error code (`code`) is returned in the body of the response for convenience. The `message` element returns a human-readable message that is appropriate for display to the end user. The `details` element is optional and may contain information that is useful for tracking down an error, such as a stack trace. The `details` element may or may not be appropriate for display to an end user, depending on the role and experience of the end user.

The fault's root element (for example, `instanceFault`) may change depending on the type of error.

The following two `badRequest` examples show errors when the volume size is invalid:

Example 3.9. Example badRequest Fault on Volume Size Errors: XML

```
HTTP/1.1 400 None
Content-Type: application/xml
Content-Length: 121
Date: Mon, 28 Nov 2011 18:19:37 GMT

<badRequest code="400" xmlns="http://docs.openstack.org/database/api/v1.0">
    <message>
        Volume 'size' needs to be a positive integer value, -1.0 cannot be
 accepted.
    </message>
</badRequest>
```

Example 3.10. Example badRequest Fault on Volume Size Errors: JSON

```
HTTP/1.1 400 None
Content-Length: 120
Content-Type: application/json; charset=UTF-8
Date: Tue, 29 Nov 2011 00:33:48 GMT

{
    "badRequest": {
        "code": 400,
        "message": "Volume 'size' needs to be a positive integer value, -1.0
 cannot be accepted."
    }
}
```

The next two examples show `itemNotFound` errors:

Example 3.11. Example itemNotFound Fault: XML

```
HTTP/1.1 404 Not Found
Content-Length: 147
Content-Type: application/xml; charset=UTF-8
Date: Mon, 28 Nov 2011 19:50:15 GMT

<itemNotFound code="404" xmlns="http://docs.openstack.org/database/api/v1.0">
    <message>
        The resource could not be found.
    </message>
</itemNotFound>
```

Example 3.12. Example itemNotFound Fault: JSON

```
HTTP/1.1 404 Not Found
Content-Length: 78
Content-Type: application/json; charset=UTF-8
Date: Tue, 29 Nov 2011 00:35:24 GMT

{
    "itemNotFound": {
        "code": 404,
        "message": "The resource could not be found."
    }
}
```

3.5.1. Synchronous Versus Asynchronous Faults

Synchronous faults occur at request time. When a synchronous fault occurs, the fault contains an HTTP error response code, a human readable message, and optional details about the error. The following Database API calls are synchronous and may produce synchronous faults:

- List Users
- List Instances
- List Instance Details by ID
- List Databases
- Enable Root User
- List Root-Enabled Status
- List Flavors
- List Versions
- List Version Details

Asynchronous faults occur in the background while an instance, database, or user is being built or an instance is executing an action. When an asynchronous fault occurs, the system places the instance, database, or user in an ERROR state and embeds the fault in the offending instance, database, or user. When an asynchronous fault occurs, the fault contains an HTTP error response code, a human readable message, and optional details about the error. The following Database API calls are asynchronous and may produce asynchronous faults:

- Create Instance
- Delete Instance
- Create Database
- Delete Database
- Create User
- Delete User
- Resize Volume
- Resize Instance
- Restart Instance

Note

Note that an asynchronous operation, if it fails, may not give the user an error, and the operation can error out without a failure notification.

3.6. Database Instance Status

When making an API call to create, list, or delete database instance(s), the following database instance status values are possible:

- BUILD – The database instance is being provisioned.
- REBOOT – The database instance is rebooting.
- ACTIVE – The database instance is online and available to take requests.
- BLOCKED – The database instance is unresponsive at the moment.
- RESIZE – The database instance is being resized at the moment.
- SHUTDOWN – The database instance is terminating services. Also, SHUTDOWN is returned if for any reason the MySQL instance is shut down but not the actual server.

  Note

  If MySQL has crashed (causing the SHUTDOWN status), please call support for assistance.
- ERROR – The last operation for the database instance failed due to an error.

4. API Operations

Note

Do not use trailing slashes (/) at the end of calls to API operations, since this may cause the call to fail. For example, do not use **GET** /instances/detail/ (with the trailing slash at the end). Rather, use **GET** /instances/detail instead.

Verb	URI	Description
API Versions		
GET	`/`	Lists information about all versions of the API.
GET	`/{version}`	Returns detailed information about the specified version of the API.
Database Instances		
POST	`/instances`	Creates a new *database instance*.
GET	`/instances`	Lists the status and information for all database instances.
GET	`/instances/{instanceId}`	Lists status and details for a specified database instance.
DELETE	`/instances/{instanceId}`	Deletes the specified database instance.
POST	`/instances/{instanceId}/root`	Enables the root user for the specified database instance and returns the root password.
GET	`/instances/{instanceId}/root`	Returns true if root user is enabled for the specified database instance or false otherwise.
Database Instance Actions		
POST	`/instances/{instanceId}/action`	Restart the database service on the instance.
POST	`/instances/{instanceId}/action`	Resize the memory of the instance.
POST	`/instances/{instanceId}/action`	Resize the *volume* attached to the Instance.
Databases		
POST	`/instances/{instanceId}/databases`	Creates a new *database* within the specified instance.
GET	`/instances/{instanceId}/databases`	Lists databases for the specified instance.
DELETE	`/instances/{instanceId}/databases/{databaseName}`	Deletes the specified database.
Users		
POST	`/instances/{instanceId}/users`	Creates a user for the specified database instance.
GET	`/instances/{instanceId}/users`	Lists the users in the specified database instance.
PUT	`/instances/{instanceId}/users`	Changes the MySQL password of one or more users.
GET	`/instances/{instanceId}/users/{name}`	Lists the specified user's name and a list of databases that the user can access.
DELETE	`/instances/{instanceId}/users/{name}`	Deletes the user identified by {name} for the specified database instance.
GET	`/instances/{instanceId}/users/{name}/databases`	Shows a list of all databases a user has access to.
PUT	`/instances/{instanceId}/users/{name}/databases`	Grant access for the specified user to one or more databases for the specified instance.
DELETE	`/instances/{instanceId}/users/{name}/databases/{databaseName}`	Remove access to the specified database for the specified user.
Flavors		
GET	`/flavors`	Lists information for all available *flavors*.
GET	`/flavors/{flavorId}`	Lists all flavor information about the specified flavor ID.

4.1. API Versions

This section describes the versions that are supported for the Cloud Databases API.

Verb	URI	Description
GET	`/`	Lists information about all versions of the API.
GET	`/{version}`	Returns detailed information about the specified version of the API.

4.1.1. List Versions

Verb	URI	Description
GET	/	Lists information about all versions of the API.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation lists information about all versions of the API.

The following examples show the List Versions requests:

Example 4.1. List Versions Request: XML

```
GET / HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.2. List Versions Request: JSON

```
GET / HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List Versions responses:

Example 4.3. List Versions Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 261
Date: Wed, 25 Jan 2012 21:53:04 GMT

<versions xmlns="http://docs.openstack.org/database/api/v1.0">
  <version id="v1.0" status="CURRENT" updated="2012-01-01T00:00:00Z">
    <links>
      <link href="https://openstack.example.com/v1.0/" rel="self"/>
    </links>
  </version>
</versions>
```

Example 4.4. List Versions Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 153
Date: Wed, 25 Jan 2012 21:53:04 GMT
```


```
{
    "versions": [
        {
            "id": "v1.0",
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/",
                    "rel": "self"
                }
            ],
            "status": "CURRENT",
            "updated": "2012-01-01T00:00:00Z"
        }
    ]
}
```

4.1.2. List Version Details

Verb	URI	Description
GET	`/{version}`	Returns detailed information about the specified version of the API.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation returns detailed information about the specified version of the API.

The following examples show the List Version Details requests:

Example 4.5. List Version Details Request: XML

```
GET /v1.0/ HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.6. List Version Details Request: JSON

```
GET /v1.0/ HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List Version Details responses:

Example 4.7. List Version Details Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 218
Date: Wed, 25 Jan 2012 21:53:04 GMT

<version id="v1.0" status="CURRENT" updated="2012-01-01T00:00:00Z" xmlns=
"http://docs.openstack.org/database/api/v1.0">
 <links>
  <link href="https://openstack.example.com/v1.0/" rel="self"/>
 </links>
</version>
```

Example 4.8. List Version Details Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 150
Date: Wed, 25 Jan 2012 21:53:04 GMT

{
    "version": {
        "id": "v1.0",
        "links": [
            {
                "href": "https://openstack.example.com/v1.0/",
                "rel": "self"
            }
        ],
        "status": "CURRENT",
        "updated": "2012-01-01T00:00:00Z"
    }
}
```

4.2. Database Instances

This section describes the operations that are supported for database instances.

Verb	URI	Description
POST	`/instances`	Creates a new *database instance*.
GET	`/instances`	Lists the status and information for all database instances.
GET	`/instances/{instanceId}`	Lists status and details for a specified database instance.
DELETE	`/instances/{instanceId}`	Deletes the specified database instance.
POST	`/instances/{instanceId}/root`	Enables the root user for the specified database instance and returns the root password.
GET	`/instances/{instanceId}/root`	Returns true if root user is enabled for the specified database instance or false otherwise.

4.2.1. Create Database Instance

Verb	URI	Description
POST	`/instances`	Creates a new *database instance*.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation asynchronously provisions a new database instance. This call requires the user to specify a *flavor* and a *volume* size. The service then provisions the instance with the requested flavor and sets up a volume of the specified size, which is the storage for the database instance.

Notes

- You can create only one database instance per **POST** request.
- You can create a database instance with one or more databases, and users associated to those databases.
- The default binding for the MySQL instance is port 3306.

The following table lists the required and optional attributes for Create Instance:

Table 4.1. Required and Optional Attributes for Create Instance

Applies To	Name	Description	Required
Instance	flavorRef	Reference (href) to a flavor as specified in the response from the List Flavors API call. This is the actual URI as specified by the href field in the link. Refer to the List Flavors response examples that follow for an example of the flavorRef. **Note** Rather than the flavor URI, you can also pass the flavor id (integer) as the value for flavorRef. Refer to Section 4.6.1, "List Flavors" [73] for details.	Yes
	(volume) size	Specifies the volume size in gigabytes (GB). The value specified must be between 1 and 50.	Yes
	name	Name of the instance to create. The length of the name is limited to 255 characters and any characters are permitted.	No
Database	name	Specifies *database* names for creating databases on instance creation. Refer to Section 4.4.1, "Create Database" [44] for the required xml/json format.	No
	character_set	Set of symbols and encodings. The default character set is `utf8`.	No
	collate	Set of rules for comparing characters in a character set. The default value for collate is `utf8_general_ci`.	No

Applies To	Name	Description	Required
User	name	Specifies user name for the database on instance creation. Refer to Section 4.5.1, "Create User" [52] for the required xml/json format.	No
	password	Specifies password for those users on instance creation. Refer to Section 4.5.1, "Create User" [52] for the required xml/json format.	No
	(database) name	Specifies names of databases that those users can access on instance creation. Refer to Section 4.5.1, "Create User" [52] for the required xml/json format.	No

Refer to Section 3.6, "Database Instance Status" [14] for a list of possible database instance statuses that may be returned.

Table 4.2. Create Database Instance Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.

The following examples show the Create Database Instance requests and responses:

Example 4.9. Create Database Instance Request: XML

```
POST /v1.0/1234/instances HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml

<instance xmlns="http://docs.openstack.org/database/api/v1.0" flavorRef="1"
 name="xml_rack_instance">
  <volume size="2"/>
  <users>
    <user password="demopassword" name="demouser">
      <databases>
        <database name="sampledb"/>
      </databases>
    </user>
  </users>
  <databases>
    <database collate="utf8_general_ci" name="sampledb" character_set="utf8"/>
    <database name="nextround"/>
  </databases>
</instance>
```

Example 4.10. Create Database Instance Request: JSON

```
POST /v1.0/1234/instances HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

```
{
    "instance": {
        "databases": [
            {
                "character_set": "utf8",
                "collate": "utf8_general_ci",
                "name": "sampledb"
            },
            {
                "name": "nextround"
            }
        ],
        "flavorRef": 1,
        "name": "json_rack_instance",
        "users": [
            {
                "databases": [
                    {
                        "name": "sampledb"
                    }
                ],
                "name": "demouser",
                "password": "demopassword"
            }
        ],
        "volume": {
            "size": 2
        }
    }
}
```

Example 4.11. Create Database Instance Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 724
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<instance created="2013-03-18 19:09:17.441489" id="098653ba-218b-47ce-936a-
e0b749101f81" name="xml_rack_instance" status="BUILD" updated="2013-03-18
 19:09:17.441606" xmlns="http://docs.openstack.org/database/api/v1.0">
    <links>
        <link href="https://openstack.example.com/v1.0/1234/instances/
098653ba-218b-47ce-936a-e0b749101f81" rel="self"/>
        <link href="https://openstack.example.com/instances/
098653ba-218b-47ce-936a-e0b749101f81" rel="bookmark"/>
    </links>
    <volume size="2"/>
    <flavor id="1">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/flavors/1"
 rel="self"/>
            <link href="https://openstack.example.com/flavors/1" rel=
"bookmark"/>
        </links>
    </flavor>
</instance>
```

Example 4.12. Create Database Instance Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 591
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "instance": {
        "created": "2013-03-18T19:09:17",
        "flavor": {
            "id": "1",
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/flavors/
1",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/flavors/1",
                    "rel": "bookmark"
                }
            ]
        },
        "id": "44b277eb-39be-4921-be31-3d61b43651d7",
        "links": [
            {
                "href": "https://openstack.example.com/v1.0/1234/instances/
44b277eb-39be-4921-be31-3d61b43651d7",
                "rel": "self"
            },
            {
                "href": "https://openstack.example.com/instances/
44b277eb-39be-4921-be31-3d61b43651d7",
                "rel": "bookmark"
            }
        ],
        "name": "json_rack_instance",
        "status": "BUILD",
        "updated": "2013-03-18T19:09:17",
        "volume": {
            "size": 2
        }
    }
}
```

For convenience, notice in the response examples above that resources contain links to themselves. This allows a client to easily obtain resource URIs rather than to construct them. There are two kinds of link relations associated with resources. A `self` link contains a *versioned* link to the resource. These links should be used in cases where the link will be followed immediately. A `bookmark` link provides a permanent link to a resource that is appropriate for long term storage.

4.2.2. List All Database Instances

Verb	URI	Description
GET	`/instances`	Lists the status and information for all database instances.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation lists the status and information for all database instances.

Refer to Section 3.6, "Database Instance Status" [14] for a list of possible database instance statuses that may be returned.

Table 4.3. List All Database Instances Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.

The following examples show the List All Database Instances Detail requests:

Example 4.13. List All Database Instances Request: XML

```
GET /v1.0/1234/instances HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.14. List All Database Instances Request: JSON

```
GET /v1.0/1234/instances HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List All Database Instances responses:

Example 4.15. List All Database Instances Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 1380
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<instances xmlns="http://docs.openstack.org/database/api/v1.0">
```

```
    <instance id="098653ba-218b-47ce-936a-e0b749101f81" name=
"xml_rack_instance" status="ACTIVE">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/instances/
098653ba-218b-47ce-936a-e0b749101f81" rel="self"/>
            <link href="https://openstack.example.com/instances/
098653ba-218b-47ce-936a-e0b749101f81" rel="bookmark"/>
        </links>
        <volume size="2"/>
        <flavor id="1">
            <links>
                <link href="https://openstack.example.com/v1.0/1234/flavors/1"
 rel="self"/>
                <link href="https://openstack.example.com/flavors/1" rel=
"bookmark"/>
            </links>
        </flavor>
    </instance>
    <instance id="44b277eb-39be-4921-be31-3d61b43651d7" name=
"json_rack_instance" status="ACTIVE">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/instances/
44b277eb-39be-4921-be31-3d61b43651d7" rel="self"/>
            <link href="https://openstack.example.com/instances/
44b277eb-39be-4921-be31-3d61b43651d7" rel="bookmark"/>
        </links>
        <volume size="2"/>
        <flavor id="1">
            <links>
                <link href="https://openstack.example.com/v1.0/1234/flavors/1"
 rel="self"/>
                <link href="https://openstack.example.com/flavors/1" rel=
"bookmark"/>
            </links>
        </flavor>
    </instance>
</instances>
```


Example 4.16. List All Database Instances Response: JSON


```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 1038
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "instances": [
        {
            "flavor": {
                "id": "1",
                "links": [
                    {
                        "href": "https://openstack.example.com/v1.0/1234/
flavors/1",
                        "rel": "self"
                    },
                    {
                        "href": "https://openstack.example.com/flavors/1",
```

```
                        "rel": "bookmark"
                    }
                ]
            },
            "id": "098653ba-218b-47ce-936a-e0b749101f81",
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/
instances/098653ba-218b-47ce-936a-e0b749101f81",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/instances/
098653ba-218b-47ce-936a-e0b749101f81",
                    "rel": "bookmark"
                }
            ],
            "name": "xml_rack_instance",
            "status": "ACTIVE",
            "volume": {
                "size": 2
            }
        },
        {
            "flavor": {
                "id": "1",
                "links": [
                    {
                        "href": "https://openstack.example.com/v1.0/1234/
flavors/1",
                        "rel": "self"
                    },
                    {
                        "href": "https://openstack.example.com/flavors/1",
                        "rel": "bookmark"
                    }
                ]
            },
            "id": "44b277eb-39be-4921-be31-3d61b43651d7",
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/
instances/44b277eb-39be-4921-be31-3d61b43651d7",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/instances/
44b277eb-39be-4921-be31-3d61b43651d7",
                    "rel": "bookmark"
                }
            ],
            "name": "json_rack_instance",
            "status": "ACTIVE",
            "volume": {
                "size": 2
            }
        }
    ]
}
```

4.2.3. List Database Instance Status and Details

Verb	URI	Description
GET	`/instances/{instanceId}`	Lists status and details for a specified database instance.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation lists the status and details of the specified database instance.

This operation lists the volume size in gigabytes (GB) and the approximate GB used.

Note

After instance creation, the `used` size of your volume will be greater than 0. This is expected and due to the automatic creation of non-empty transaction logs for mysql optimization. The `used` attribute is *not* returned in the response when the status for the instance is BUILD, REBOOT, RESIZE, or ERROR.

Refer to Section 3.6, “Database Instance Status” [14] for a list of possible database instance statuses that may be returned.

The list operations return a DNS-resolvable hostname associated with the database instance instead of an IP address. Since the hostname always resolves to the correct IP address of the database instance, this relieves the user from the task of maintaining the mapping. Note that although the IP address may likely change on resizing, migrating, and so forth, the hostname always resolves to the correct database instance.

Table 4.4. List Database Instance Status and Details Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the List Database Instance Status and Details requests:

Example 4.17. List Database Instance Status and Details Request: XML

```
GET /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.18. List Database Instance Status and Details Request: JSON

```
GET /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81 HTTP/1.1
```

```
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

This operation does not require a request body.

The following examples show the List Database Instance Status and Details responses:

Example 4.19. List Database Instance Status and Details Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 747
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<instance created="2013-03-18 19:09:17.441489" id="098653ba-218b-47ce-936a-
e0b749101f81" name="xml_rack_instance" status="ACTIVE" updated="2013-03-18
 19:09:17.513134" xmlns="http://docs.openstack.org/database/api/v1.0">
    <links>
        <link href="https://openstack.example.com/v1.0/1234/instances/
098653ba-218b-47ce-936a-e0b749101f81" rel="self"/>
        <link href="https://openstack.example.com/instances/
098653ba-218b-47ce-936a-e0b749101f81" rel="bookmark"/>
    </links>
    <volume size="2" used="0.163685983978"/>
    <flavor id="1">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/flavors/1"
 rel="self"/>
            <link href="https://openstack.example.com/flavors/1" rel=
"bookmark"/>
        </links>
    </flavor>
</instance>
```

Example 4.20. List Database Instance Status and Details Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 621
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "instance": {
        "created": "2013-03-18T19:09:17",
        "flavor": {
            "id": "1",
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/flavors/
1",
                    "rel": "self"
                },
```

```
                {
                    "href": "https://openstack.example.com/flavors/1",
                    "rel": "bookmark"
                }
            ]
        },
        "id": "44b277eb-39be-4921-be31-3d61b43651d7",
        "links": [
            {
                "href": "https://openstack.example.com/v1.0/1234/instances/
44b277eb-39be-4921-be31-3d61b43651d7",
                "rel": "self"
            },
            {
                "href": "https://openstack.example.com/instances/
44b277eb-39be-4921-be31-3d61b43651d7",
                "rel": "bookmark"
            }
        ],
        "name": "json_rack_instance",
        "status": "ACTIVE",
        "updated": "2013-03-18T19:09:17",
        "volume": {
            "size": 2,
            "used": 0.16368598397821188
        }
    }
}
```

4.2.4. Delete Database Instance

Verb	URI	Description
DELETE	`/instances/{instanceId}`	Deletes the specified database instance.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), unprocessableEntity (422), itemNotFound (404)

This operation deletes the specified database instance, including any associated data.

Refer to Section 3.6, "Database Instance Status" [14] for a list of possible database instance statuses that may be returned.

Note

This operation is not allowed when the instance status is `BUILD`.

Table 4.5. Delete Database Instance Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the Delete Database Instance requests:

Example 4.21. Delete Database Instance Request: XML

```
DELETE /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.22. Delete Database Instance Request: JSON

```
DELETE /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

The following examples show the Delete Database Instance responses:

Example 4.23. Delete Database Instance Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: application/xml
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:18 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

Example 4.24. Delete Database Instance Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:18 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

This operation does not require a request body and does not return a response body.

4.2.5. Enable Root User

Verb	URI	Description
POST	`/instances/{instanceId}/root`	Enables the root user for the specified database instance and returns the root password.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation enables login from any host for the root user and provides the user with a generated root password.

Note

Changes you make as a root user may cause detrimental effects to the database instance and unpredictable behavior for API operations. When you enable the root user, you accept the possibility that we will not be able to support your database instance. While enabling root does not prevent us from a "best effort" approach to helping you if something goes wrong with your instance, we cannot ensure that we will be able to assist you if you change core MySQL settings. These changes can be (but are not limited to) turning off binlogs, removing users that we use to access your instance, and so forth.

Table 4.6. Enable Root User Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the Enable Root User requests:

Example 4.25. Enable Root User Request: XML

```
POST /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/root HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.26. Enable Root User Request: JSON

```
POST /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/root HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
```

```
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the Enable Root User responses:

Example 4.27. Enable Root User Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 89
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<user name="root" password="12345" xmlns="http://docs.openstack.org/database/
api/v1.0"/>
```

Example 4.28. Enable Root User Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 47
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "user": {
        "name": "root",
        "password": "12345"
    }
}
```

4.2.6. List Root-Enabled Status

Verb	URI	Description
GET	/instances/{instanceId}/root	Returns true if root user is enabled for the specified database instance or false otherwise.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation checks an active specified database instance to see if root access is enabled. It returns True if root user is enabled for the specified database instance or False otherwise.

Table 4.7. List Root-Enabled Status Request Parameters

Name	Style	Type	Description
tenantId	Template	String	The tenant ID of the owner of the specified instance.
instanceId	Template	String	The instance ID for the specified database instance.

The following examples show the Check Root User Access requests:

Example 4.29. List Root-Enabled Status Request: XML

```
GET /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/root HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.30. List Root-Enabled Status Request: JSON

```
GET /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/root HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the Check Root User Access responses:

Example 4.31. List Root-Enabled Status Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 90
```

```
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<rootEnabled xmlns="http://docs.openstack.org/database/api/v1.0">
    True
</rootEnabled>
```

Example 4.32. List Root-Enabled Status Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 21
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "rootEnabled": true
}
```

4.3. Database Instance Actions

This section describes the actions that are supported for database instances.

Verb	URI	Description
POST	`/instances/{instanceId}/action`	Restart the database service on the instance.
POST	`/instances/{instanceId}/action`	Resize the memory of the instance.
POST	`/instances/{instanceId}/action`	Resize the *volume* attached to the Instance.

4.3.1. Restart Instance

Verb	URI	Description
POST	`/instances/{instanceId}/action`	Restart the database service on the instance.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404), badMediaType (415)

The restart operation will restart only the MySQL Instance. Restarting MySQL will erase any dynamic configuration settings that you have made within MySQL.

Note

The MySQL service will be unavailable until the instance restarts.

This operation returns a 202 Accepted response.

Table 4.8. Restart Instance Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the Restart Instance requests:

Example 4.33. Restart Instance Request: XML

```
POST /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/action HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml

<restart xmlns="http://docs.openstack.org/database/api/v1.0"/>
```

Example 4.34. Restart Instance Request: JSON

```
POST /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/action HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json

{
    "restart": {}
}
```

The following examples show the Restart Instance responses:

Example 4.35. Restart Instance Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: application/xml
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:18 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

Example 4.36. Restart Instance Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:18 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

4.3.2. Resize the Instance

Verb	URI	Description
POST	`/instances/{instanceId}/action`	Resize the memory of the instance.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404), badMediaType (415)

This operation changes the memory size of the instance, assuming a valid flavorRef is provided. Restarts MySQL in the process.

Table 4.9. Resize the Instance Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the Resize Instance requests:

Example 4.37. Resize the Instance Request: XML

```
POST /v1.0/1234/instances/5d891bb6-6c61-4b0a-8b85-26f4ee461c9d/action HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 2eeb3252-0164-40f5-8fb7-85df5faa2698
Accept: application/xml
Content-Type: application/xml

<?xml version="1.0" ?>
<resize xmlns="http://docs.openstack.org/database/api/v1.0">
 <flavorRef>https://openstack.example.com/v1.0/1234/flavors/2</flavorRef>
</resize>
```

Example 4.38. Resize the Instance Request: JSON

```
POST /v1.0/1234/instances/23a3d4fb-3731-497b-afd4-bf25bde2b5fc/action HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 2eeb3252-0164-40f5-8fb7-85df5faa2698
Accept: application/json
Content-Type: application/json

{
    "resize": {
        "flavorRef": "https://openstack.example.com/v1.0/1234/flavors/2"
    }
}
```

The following examples show the Resize Instance responses:

Example 4.39. Resize the Instance Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: text/plain; charset=UTF-8
Content-Length: 58
Date: Mon, 06 Feb 2012 21:28:11 GMT
```

Example 4.40. Resize the Instance Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: text/plain; charset=UTF-8
Content-Length: 58
Date: Mon, 06 Feb 2012 21:28:10 GMT
```

4.3.3. Resize the Instance Volume

Verb	URI	Description
POST	`/instances/{instanceId}/action`	Resize the *volume* attached to the Instance.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404), badMediaType (415)

This operation supports resizing the attached volume for an instance. It supports only increasing the volume size and does not support decreasing the size. The volume size is in gigabytes (GB) and must be an integer.

Note

You cannot increase the volume to a size larger than the API volume size limit specifies.

This operation returns a 202 Accepted response.

Table 4.10. Resize the Instance Volume Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the Resize Instance Volume requests:

Example 4.41. Resize the Instance Volume Request: XML

```
POST /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/action HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml

<resize xmlns="http://docs.openstack.org/database/api/v1.0">
  <volume size="4"/>
</resize>
```

Example 4.42. Resize the Instance Volume Request: JSON

```
POST /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/action HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

```
{
    "resize": {
        "volume": {
            "size": 4
        }
    }
}
```

The following examples show the Resize Instance Volume responses:

Example 4.43. Resize the Instance Volume Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: application/xml
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:18 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

Example 4.44. Resize the Instance Volume Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:18 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

4.4. Databases

This section describes the operations that are supported for databases.

Verb	URI	Description
POST	`/instances/{instanceId}/databases`	Creates a new *database* within the specified instance.
GET	`/instances/{instanceId}/databases`	Lists databases for the specified instance.
DELETE	`/instances/{instanceId}/databases/{databaseName}`	Deletes the specified database.

4.4.1. Create Database

Verb	URI	Description
POST	`/instances/{instanceId}/databases`	Creates a new *database* within the specified instance.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation creates a new database within the specified instance.

The `name` of the database is a required attribute.

The following additional attributes can be specified for each database: `collate` and `character_set`.

Table 4.11. Required and Optional Attributes for Create Database

Name	Description	Required
name	Specifies the database name for creating the database. Refer to the request examples for the required xml/json format.	Yes
character_set	Set of symbols and encodings. The default character set is `utf8`.	No
collate	Set of rules for comparing characters in a character set. The default value for collate is `utf8_general_ci`.	No

See the MySQL documentation for information about supported character sets and collations at http://dev.mysql.com/doc/refman/5.1/en/charset-mysql.html.

> **Note**
>
> The following database names are reserved and cannot be used for creating databases: lost+found, information_schema, and mysql.

Refer to the following tables for information about characters that are valid/invalid for creating database names.

Table 4.12. Valid Characters That Can Be Used in a Database Name

Character
Letters (upper and lower cases allowed)
Numbers
'@', '?', '#', and spaces are allowed, but *not* at the beginning and end of the database name
'_' is allowed anywhere in the database name

Table 4.13. Characters That *Cannot* Be Used in a Database Name

Character
Single quotes
Double quotes

Character
Back quotes
Semicolons
Commas
Backslashes
Forwardslashes

Table 4.14. Length Restrictions for Database Name

Restriction	Value
Database-name maximum length	64

Table 4.15. Create Database Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the Create Database requests:

Example 4.45. Create Database Request: XML

```
POST /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/databases HTTP/
1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml

<databases xmlns="http://docs.openstack.org/database/api/v1.0">
  <database collate="utf8_general_ci" name="testingdb" character_set="utf8"/>
  <database name="anotherdb"/>
  <database name="oneMoreDB"/>
</databases>
```

Example 4.46. Create Database Request: JSON

```
POST /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/databases HTTP/
1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json

{
    "databases": [
        {
            "character_set": "utf8",
            "collate": "utf8_general_ci",
            "name": "testingdb"
        },
```

```
        {
            "name": "anotherdb"
        },
        {
            "name": "oneMoreDB"
        }
    ]
}
```

The following examples show the Create Database responses:

Example 4.47. Create Database Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: application/xml
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

Example 4.48. Create Database Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

4.4.2. List Databases for Instance

Verb	URI	Description
GET	`/instances/{instanceId}/databases`	Lists databases for the specified instance.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation lists the databases for the specified instance.

Note

This operation returns only the user-defined databases, not the system databases. The system databases (mysql, information_schema, lost+found) can only be viewed by a database administrator.

Table 4.16. List Databases for Instance Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the List Databases for Instance requests:

Example 4.49. List Databases for Instance Request: XML

```
GET /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/databases HTTP/
1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.50. List Databases for Instance Request: JSON

```
GET /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/databases HTTP/
1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

The following examples show the *paginated* List Databases for Instance requests:

Example 4.51. List Databases for Instance Paged Request: XML

```
GET /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/databases?limit=
2 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.52. List Databases for Instance Paged Request: JSON

```
GET /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/databases?limit=
1 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List Databases for Instance responses:

Example 4.53. List Databases for Instance Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 241
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<databases xmlns="http://docs.openstack.org/database/api/v1.0">
    <database name="anotherdb"/>
    <database name="nextround"/>
    <database name="oneMoreDB"/>
    <database name="sampledb"/>
    <database name="testingdb"/>
</databases>
```

Example 4.54. List Databases for Instance Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 129
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "databases": [
        {
            "name": "anotherdb"
        },
        {
```

```
            "name": "nextround"
        },
        {
            "name": "oneMoreDB"
        },
        {
            "name": "sampledb"
        },
        {
            "name": "testingdb"
        }
    ]
}
```

The following examples show the *paginated* List Databases for Instance responses:

Example 4.55. List Databases for Instance Paged Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 321
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<databases xmlns="http://docs.openstack.org/database/api/v1.0">
    <database name="anotherdb"/>
    <database name="nextround"/>
    <links>
        <link href="https://openstack.example.com/v1.0/1234/instances/
098653ba-218b-47ce-936a-e0b749101f81/databases?marker=nextround&amp;limit=2"
 rel="next"/>
    </links>
</databases>
```

Example 4.56. List Databases for Instance Paged Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 192
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "databases": [
        {
            "name": "anotherdb"
        }
    ],
    "links": [
        {
            "href": "https://openstack.example.com/v1.0/1234/instances/
44b277eb-39be-4921-be31-3d61b43651d7/databases?marker=anotherdb&limit=1",
            "rel": "next"
        }
    ]
}
```

4.4.3. Delete Database

Verb	URI	Description
DELETE	`/instances/{instanceId}/databases/{databaseName}`	Deletes the specified database.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation deletes the requested database within the specified database instance. Note that all data associated with the database is also deleted.

Table 4.17. Delete Database Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.
`databaseName`	Template	String	The name for the specified database.

The following examples show the Delete Database requests:

Example 4.57. Delete Database Request: XML

```
DELETE /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/databases/
oneMoreDB HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.58. Delete Database Request: JSON

```
DELETE /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/databases/
testingdb HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the Delete Database responses:

Example 4.59. Delete Database Response: XML

```
HTTP/1.1 202 Accepted
```

```
Content-Type: application/xml
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

Example 4.60. Delete Database Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

4.5. Users

This section describes the operations that are supported for managing database users.

In this section, "user has access to a database" means that the user has full create, read, update, and delete access to the given database. In other words, on a cloud database instance, a user named USER and a database named DATABASE exist, and within MySQL, a GRANT ALL ON DATABASE.* TO USER has been issued on the instance.

Warning

There is a bug in a python library that development is using that may cause incorrect user deletions to occur if a period (.) is used in the user name. In this case, the user name is truncated to remove the portion of the name from the period to the end, leaving only the portion from the beginning up to the period. For example, for a user named "my.userA", the bug would truncate the user name to "my", and if the user "my" exists, that user will be incorrectly deleted. To avoid the problem, do not use periods in user names.

Verb	URI	Description
POST	`/instances/{instanceId}/users`	Creates a user for the specified database instance.
GET	`/instances/{instanceId}/users`	Lists the users in the specified database instance.
PUT	`/instances/{instanceId}/users`	Changes the MySQL password of one or more users.
GET	`/instances/{instanceId}/users/{name}`	Lists the specified user's name and a list of databases that the user can access.
DELETE	`/instances/{instanceId}/users/{name}`	Deletes the user identified by {name} for the specified database instance.
GET	`/instances/{instanceId}/users/{name}/databases`	Shows a list of all databases a user has access to.
PUT	`/instances/{instanceId}/users/{name}/databases`	Grant access for the specified user to one or more databases for the specified instance.
DELETE	`/instances/{instanceId}/users/{name}/databases/{databaseName}`	Remove access to the specified database for the specified user.

4.5.1. Create User

Verb	URI	Description
POST	`/instances/{instanceId}/users`	Creates a user for the specified database instance.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation asynchronously provisions a new user for the specified database instance based on the configuration defined in the request object. Once the request is validated and progress has started on the provisioning process, a 202 Accepted response object is returned.
Writer: please add the following note back into the doc once the List User Details call is added back into the API: Using the identifier, the caller can check on the progress of the operation by performing a GET on users/name (for more details on this operation see the "List User Details" section of this document).

If the corresponding request cannot be fulfilled due to insufficient or invalid data, an HTTP 400 "Bad Request" error response is returned with information regarding the nature of the failure. Failures in the validation process are non-recoverable and require the caller to correct the cause of the failure and POST the request again.

The following table lists the required attributes for Create User. Refer to the request examples for the required xml/json format:

Table 4.18. Required Attributes for Create User

Applies To	Name	Description	Required
User	name	Name of the user for the database.	Yes
	password	User password for database access.	Yes
	(database) name	Name of the database that the user can access. One or more database names must be specified.	No

Notes

- A user is granted all privileges on the specified databases.
- The following user name is reserved and cannot be used for creating users: root.

Refer to the following tables for information about characters that are valid/invalid for creating database names, user names, and passwords.

Table 4.19. Valid Characters That Can Be Used in a Database Name, User Name, and Password

Character
Letters (upper and lower cases allowed)

Character
Numbers
'@', '?', '#', and spaces are allowed, but *not* at the beginning and end of the database name, user name, and password
"_" is allowed anywhere in the database name, user name, and password

Table 4.20. Characters That *Cannot* Be Used in a Database Name, User Name, and Password

Character
Single quotes
Double quotes
Back quotes
Semicolons
Commas
Backslashes
Forwardslashes
Spaces at the front or end of the user name or password

Table 4.21. Length Restrictions for Database Name, User Name, and Password

Restriction	Value
Database name maximum length	64
User name maximum length	16
Password maximum length	unlimited (no restrictions)

Table 4.22. Create User Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the Create User requests:

Example 4.61. Create User Request: XML

```
POST /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/users HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml

<users xmlns="http://docs.openstack.org/database/api/v1.0">
  <user password="password" name="dbuser1" database="databaseA"/>
  <user password="password" name="dbuser2">
    <databases>
      <database name="databaseB"/>
      <database name="databaseC"/>
```

```
    </databases>
  </user>
  <user password="password" name="dbuser3" database="databaseD"/>
</users>
```

Example 4.62. Create User Request: JSON

```
POST /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/users HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json

{
    "users": [
        {
            "database": "databaseA",
            "name": "dbuser1",
            "password": "password"
        },
        {
            "databases": [
                {
                    "name": "databaseB"
                },
                {
                    "name": "databaseC"
                }
            ],
            "name": "dbuser2",
            "password": "password"
        },
        {
            "database": "databaseD",
            "name": "dbuser3",
            "password": "password"
        }
    ]
}
```

The following examples show the Create User responses:

Example 4.63. Create User Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: application/xml
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

Example 4.64. Create User Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

4.5.2. List Users in Database Instance

Verb	URI	Description
GET	`/instances/{instanceId}/users`	Lists the users in the specified database instance.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation lists the users in the specified database instance, along with the associated databases for that user.

Note

This operation does not return the system users (database administrators that administer the health of the database). Also, this operation returns the "root" user only if "root" user has been enabled.

The following notes apply to MySQL users:

- User names can be up to 16 characters long.
- When you create accounts with INSERT, you must use FLUSH PRIVILEGES to tell the server to reload the grant tables.
- For additional information, refer to: http://dev.mysql.com/doc/refman/5.1/en/user-account-management.html

Table 4.23. List Users in Database Instance Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the List Users in Database Instance requests:

Example 4.65. List Users in Database Instance Request: XML

```
GET /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/users HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.66. List Users in Database Instance Request: JSON

```
GET /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/users HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
```

```
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

The following examples show the *paginated* List Users in Database Instance requests:

Example 4.67. List Users in Database Instance Paged Request: XML

```
GET /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/users?limit=2
 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.68. List Users in Database Instance Paged Request: JSON

```
GET /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/users?limit=2
 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List Users in Database Instance responses:

Example 4.69. List Users in Database Instance Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 468
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<users xmlns="http://docs.openstack.org/database/api/v1.0">
    <user name="dbuser1">
        <databases/>
    </user>
    <user name="dbuser2">
        <databases>
            <database name="databaseB"/>
            <database name="databaseC"/>
        </databases>
    </user>
    <user name="dbuser3">
        <databases/>
    </user>
    <user name="demouser">
        <databases>
            <database name="sampledb"/>
        </databases>
    </user>
</users>
```

Example 4.70. List Users in Database Instance Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 228
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "users": [
        {
            "databases": [],
            "name": "dbuser1"
        },
        {
            "databases": [
                {
                    "name": "databaseB"
                },
                {
                    "name": "databaseC"
                }
            ],
            "name": "dbuser2"
        },
        {
            "databases": [],
            "name": "dbuser3"
        },
```

```
        {
            "databases": [
                {
                    "name": "sampledb"
                }
            ],
            "name": "demouser"
        }
    ]
}
```

The following examples show the *paginated* List Users in Database Instance responses:

Example 4.71. List Users in Database Instance Paged Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 461
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<users xmlns="http://docs.openstack.org/database/api/v1.0">
    <user name="dbuser1">
        <databases/>
    </user>
    <user name="dbuser2">
        <databases>
            <database name="databaseB"/>
            <database name="databaseC"/>
        </databases>
    </user>
    <links>
        <link href="https://openstack.example.com/v1.0/1234/instances/
098653ba-218b-47ce-936a-e0b749101f81/users?marker=dbuser2&amp;limit=2" rel=
"next"/>
    </links>
</users>
```

Example 4.72. List Users in Database Instance Paged Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 279
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "links": [
        {
            "href": "https://openstack.example.com/v1.0/1234/instances/
44b277eb-39be-4921-be31-3d61b43651d7/users?marker=dbuser2&limit=2",
            "rel": "next"
        }
    ],
    "users": [
        {
            "databases": [],
            "name": "dbuser1"
        },
```

```
        {
            "databases": [
                {
                    "name": "databaseB"
                },
                {
                    "name": "databaseC"
                }
            ],
            "name": "dbuser2"
        }
    ]
}
```

4.5.3. Change User(s) Password

Verb	URI	Description
PUT	`/instances/{instanceId}/users`	Changes the MySQL password of one or more users.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation changes the MySQL password of one or more users.

Note

For information about choosing a valid password, please refer to Section 4.5.1, “Create User” [52] for details.

Table 4.24. Change User(s) Password Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.

The following examples show the Change User(s) Password requests:

Example 4.73. Change User(s) Password Request: XML

```
PUT /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml

<users xmlns="http://docs.openstack.org/database/api/v1.0">
    <user password="5" name="exampleuser"/>
</users>
```

Example 4.74. Change User(s) Password Request: JSON

```
PUT /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json

{
   "users": [
      {
          "name": "dbuser1",
          "password": "newpassword"
      },
```

```
        {
            "name": "dbuser2",
            "password": "anotherpassword"
        }
    ]
}
```

The following examples show the Change User(s) Password responses:

Example 4.75. Change User(s) Password Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: application/xml
Content-Length: 501
Date: Wed, 27 Jun 2012 21:56:06 GMT
```

Example 4.76. Change User(s) Password Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 152
Date: Wed, 21 Mar 2012 17:46:46 GMT
```

4.5.4. List User

Verb	URI	Description
GET	`/instances/{instanceId}/users/{name}`	Lists the specified user's name and a list of databases that the user can access.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation lists the specified user's name and a list of databases that the user can access.

Table 4.25. List User Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.
name	Template	String	The name for the specified user.

The following examples show the List User requests:

Example 4.77. List User Request: XML

```
GET /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users/testuser
 HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.78. List User Request: JSON

```
GET /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users/
exampleuser HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List User responses:

Example 4.79. List User Response: XML

```
HTTP/1.1 200 OK
```

```
Content-Type: application/xml
Content-Length: 0
Date: Wed, 27 Jun 2012 23:11:19 GMT

<user name="testuser" xmlns="http://docs.openstack.org/database/api/v1.0">
    <databases>
        <database name="exampledb"/>
    </databases>
</user>
```

Example 4.80. List User Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 0
Date: Wed, 27 Jun 2012 23:11:19 GMT
{
   "user": {
      "name": "exampleuser",
      "databases": [
         {
            "name": "databaseA"
         },
         {
            "name": "databaseB"
         }
      ]
   }
}
```

4.5.5. Delete User

Verb	URI	Description
DELETE	`/instances/{instanceId}/users/{name}`	Deletes the user identified by {name} for the specified database instance.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation deletes the specified user for the specified database instance.

Warning

There is a bug in a python library that development is using that may cause incorrect user deletions to occur if a period (.) is used in the user name. In this case, the user name is truncated to remove the portion of the name from the period to the end, leaving only the portion from the beginning up to the period. For example, for a user named "my.userA", the bug would truncate the user name to "my", and if the user "my" exists, that user will be incorrectly deleted. To avoid the problem, do not use periods in user names.

Table 4.26. Delete User Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.
`name`	Template	String	The name for the specified user.

The following examples show the Delete User requests:

Example 4.81. Delete User Request: XML

```
DELETE /v1.0/1234/instances/098653ba-218b-47ce-936a-e0b749101f81/users/
testuser HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.82. Delete User Request: JSON

```
DELETE /v1.0/1234/instances/44b277eb-39be-4921-be31-3d61b43651d7/users/
testuser HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
```

```
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the Delete User responses:

Example 4.83. Delete User Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: application/xml
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

Example 4.84. Delete User Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)
```

4.5.6. List User Access

Verb	URI	Description
GET	/instances/{instanceId}/users/{name}/databases	Shows a list of all databases a user has access to.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation shows a list of all databases a user has access to.

Table 4.27. List User Access Request Parameters

Name	Style	Type	Description
tenantId	Template	String	The tenant ID of the owner of the specified instance.
instanceId	Template	String	The instance ID for the specified database instance.
name	Template	String	The name for the specified user.

The following examples show the List User Access requests:

Example 4.85. List User Access Request: XML

```
GET /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users/testuser/
databases HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.86. List User Access Request: JSON

```
GET /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users/
exampleuser/databases HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List User Access responses:

Example 4.87. List User Access Response: XML

```
HTTP/1.1 200 OK
```

```
Content-Type: application/xml
Content-Length: 0
Date: Wed, 27 Jun 2012 23:11:19 GMT

<databases xmlns="http://docs.openstack.org/database/api/v1.0">
    <database name="exampledb"/>
</databases>
```

Example 4.88. List User Access Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 0
Date: Wed, 27 Jun 2012 23:11:19 GMT

{
   "databases": [
      {
         "name": "databaseA"
      },
      {
         "name": "databaseB"
      }
   ]
}
```

4.5.7. Grant User Access

Verb	URI	Description
PUT	/instances/{instanceId}/users/{name}/databases	Grant access for the specified user to one or more databases for the specified instance.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation grants access for the specified user to one or more databases for the specified instance. The user is granted ALL privileges on the database. Refer to the information at the beginning of Section 4.5, "Users" [51] for more details on access.

Table 4.28. Grant User Access Request Parameters

Name	Style	Type	Description
tenantId	Template	String	The tenant ID of the owner of the specified instance.
instanceId	Template	String	The instance ID for the specified database instance.
name	Template	String	The name for the specified user.

The following examples show the Grant User Access requests:

Example 4.89. Grant User Access Request: XML

```
PUT /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users/testuser/
databases HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml

<databases xmlns="http://docs.openstack.org/database/api/v1.0">
    <database name="extradb"/>
</databases>
```

Example 4.90. Grant User Access Request: JSON

```
PUT /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users/
exampleuser/databases HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json

{
   "databases": [
      {
         "name": "databaseC"
      },
```

```
      {
         "name": "databaseD"
      }
   ]
}
```

The following examples show the Grant User Access responses:

Example 4.91. Grant User Access Response: XML

```
HTTP/1.1 202 Accepted
Content-Type: application/xml
Content-Length: 0
Date: Wed, 27 Jun 2012 23:11:19 GMT
```

Example 4.92. Grant User Access Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Wed, 27 Jun 2012 23:11:19 GMT
```

4.5.8. Revoke User Access

Verb	URI	Description
DELETE	`/instances/{instanceId}/users/{name}/databases/{databaseName}`	Remove access to the specified database for the specified user.

Normal Response Code(s): 202

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation removes access to the specified database for the specified user.

Table 4.29. Revoke User Access Request Parameters

Name	Style	Type	Description
`tenantId`	Template	String	The tenant ID of the owner of the specified instance.
`instanceId`	Template	String	The instance ID for the specified database instance.
`name`	Template	String	The name for the specified user.
`databaseName`	Template	String	The name for the specified database.

The following examples show the Revoke User Access requests:

Example 4.93. Revoke User Access Request: XML

```
DELETE /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users/
testuser/databases/extradb HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.94. Revoke User Access Request: JSON

```
DELETE /v1.0/1234/instances/692d8418-7a8f-47f1-8060-59846c6e024f/users/
exampleuser/databases/databaseC HTTP/1.1
User-Agent: python-example-client
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the Revoke User Access responses:

Example 4.95. Revoke User Access Response: XML

```
HTTP/1.1 202 Accepted
```

```
Content-Type: application/xml
Content-Length: 0
Date: Wed, 27 Jun 2012 23:11:19 GMT
```

Example 4.96. Revoke User Access Response: JSON

```
HTTP/1.1 202 Accepted
Content-Type: application/json
Content-Length: 0
Date: Wed, 27 Jun 2012 23:11:19 GMT
```

4.6. Flavors

This section describes the operations that are supported for flavors.

Verb	URI	Description
GET	`/flavors`	Lists information for all available *flavors*.
GET	`/flavors/{flavorId}`	Lists all flavor information about the specified flavor ID.

4.6.1. List Flavors

Verb	URI	Description
GET	/flavors	Lists information for all available *flavors*.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation lists information for all available flavors.

This resource is identical to the flavors found in the OpenStack Nova API, but without the disk property.

Table 4.30. List Flavors Request Parameters

Name	Style	Type	Description
tenantId	Template	String	The tenant ID of the owner of the specified instance.

The following examples show the List Flavors requests:

Example 4.97. List Flavors Request: XML

```
GET /v1.0/1234/flavors HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.98. List Flavors Request: JSON

```
GET /v1.0/1234/flavors HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List Flavors responses:

Example 4.99. List Flavors Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 1600
Date: Mon, 18 Mar 2013 19:09:17 GMT
```

```
Server: Jetty(8.0.y.z-SNAPSHOT)

<flavors xmlns="http://docs.openstack.org/database/api/v1.0">
    <flavor id="1" name="512MB Instance" ram="512">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/flavors/1"
 rel="self"/>
            <link href="https://openstack.example.com/flavors/1" rel=
"bookmark"/>
        </links>
    </flavor>
    <flavor id="2" name="1GB Instance" ram="1024">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/flavors/2"
 rel="self"/>
            <link href="https://openstack.example.com/flavors/2" rel=
"bookmark"/>
        </links>
    </flavor>
    <flavor id="3" name="2GB Instance" ram="2048">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/flavors/3"
 rel="self"/>
            <link href="https://openstack.example.com/flavors/3" rel=
"bookmark"/>
        </links>
    </flavor>
    <flavor id="4" name="4GB Instance" ram="4096">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/flavors/4"
 rel="self"/>
            <link href="https://openstack.example.com/flavors/4" rel=
"bookmark"/>
        </links>
    </flavor>
    <flavor id="5" name="8GB Instance" ram="8192">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/flavors/5"
 rel="self"/>
            <link href="https://openstack.example.com/flavors/5" rel=
"bookmark"/>
        </links>
    </flavor>
    <flavor id="6" name="16GB Instance" ram="16384">
        <links>
            <link href="https://openstack.example.com/v1.0/1234/flavors/6"
 rel="self"/>
            <link href="https://openstack.example.com/flavors/6" rel=
"bookmark"/>
        </links>
    </flavor>
</flavors>
```

Example 4.100. List Flavors Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 1186
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "flavors": [
        {
            "id": 1,
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/flavors/
1",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/flavors/1",
                    "rel": "bookmark"
                }
            ],
            "name": "512MB Instance",
            "ram": 512
        },
        {
            "id": 2,
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/flavors/
2",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/flavors/2",
                    "rel": "bookmark"
                }
            ],
            "name": "1GB Instance",
            "ram": 1024
        },
        {
            "id": 3,
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/flavors/
3",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/flavors/3",
                    "rel": "bookmark"
                }
            ],
            "name": "2GB Instance",
            "ram": 2048
        },
        {
            "id": 4,
```

```
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/flavors/
4",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/flavors/4",
                    "rel": "bookmark"
                }
            ],
            "name": "4GB Instance",
            "ram": 4096
        },
        {
            "id": 5,
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/flavors/
5",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/flavors/5",
                    "rel": "bookmark"
                }
            ],
            "name": "8GB Instance",
            "ram": 8192
        },
        {
            "id": 6,
            "links": [
                {
                    "href": "https://openstack.example.com/v1.0/1234/flavors/
6",
                    "rel": "self"
                },
                {
                    "href": "https://openstack.example.com/flavors/6",
                    "rel": "bookmark"
                }
            ],
            "name": "16GB Instance",
            "ram": 16384
        }
    ]
}
```

4.6.2. List Flavor By ID

Verb	URI	Description
GET	/flavors/{flavorId}	Lists all flavor information about the specified flavor ID.

Normal Response Code(s): 200

Error Response Code(s): badRequest (400), unauthorized (401), forbidden (403), badMethod (405), overLimit (413), unprocessableEntity (422), instanceFault (500), notImplemented (501), serviceUnavailable (503), itemNotFound (404)

This operation lists all information for the specified flavor ID with details of the RAM.

This resource is identical to the flavors found in the OpenStack Nova API, but without the disk property.

Note

The flavorId parameter should be an integer. If a floating point value is used for the flavorId parameter, the decimal portion is truncated and the integer portion is used as the value of the flavorId.

Reviewer / Writer: need to confirm that this behavior is not changed in subsequent releases, and if it is prevented, remove the Note above.

Table 4.31. List Flavor By ID Request Parameters

Name	Style	Type	Description
tenantId	Template	String	The tenant ID of the owner of the specified instance.
flavorId	Template	String	The flavor ID for the specified flavor.

The following examples show the List Flavor By ID requests:

Example 4.101. List Flavor By ID Request: XML

```
GET /v1.0/1234/flavors/1 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/xml
Content-Type: application/xml
```

Example 4.102. List Flavor By ID Request: JSON

```
GET /v1.0/1234/flavors/1 HTTP/1.1
User-Agent: python-reddwarfclient
Host: openstack.example.com
X-Auth-Token: 87c6033c-9ff6-405f-943e-2deb73f278b7
Accept: application/json
Content-Type: application/json
```

This operation does not require a request body.

The following examples show the List Flavor By ID responses:

Example 4.103. List Flavor By ID Response: XML

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: 283
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

<flavor id="1" name="512MB Instance" ram="512" xmlns="http://docs.openstack.
org/database/api/v1.0">
    <links>
        <link href="https://openstack.example.com/v1.0/1234/flavors/1" rel=
"self"/>
        <link href="https://openstack.example.com/flavors/1" rel="bookmark"/>
    </links>
</flavor>
```

Example 4.104. List Flavor By ID Response: JSON

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 206
Date: Mon, 18 Mar 2013 19:09:17 GMT
Server: Jetty(8.0.y.z-SNAPSHOT)

{
    "flavor": {
        "id": 1,
        "links": [
            {
                "href": "https://openstack.example.com/v1.0/1234/flavors/1",
                "rel": "self"
            },
            {
                "href": "https://openstack.example.com/flavors/1",
                "rel": "bookmark"
            }
        ],
        "name": "512MB Instance",
        "ram": 512
    }
}
```

Glossary

database
: A MySQL database within a database instance.

database instance
: A database instance is an isolated MySQL instance in a single tenant environment on a shared physical host machine. Also referred to as instance.

flavor
: A flavor is an available hardware configuration for a database instance. Each flavor has a unique combination of memory capacity and priority for CPU time.

volume
: A volume is user-specified storage that contains the MySQL data directory. Volumes are automatically provisioned on shared Internet Small Computer System Interface (iSCSI) storage area networks (SAN) that provide for increased performance, scalability, availability and manageability. Applications with high I/O demands are performance optimized and data is protected through both local and network RAID-10. Additionally, network RAID provides synchronous replication of volumes with automatic failover and load balancing across available storage clusters.