



FUDO

Fudo Enterprise 5.3 - API
documentation

Fudo Security

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About documentation

Conventions and symbols

This section covers conventions used throughout this documentation.

italic

Uster interface elements.

example

Example value of a parameter, API method name or code example.

Note: Additional information closely related with described topic, e.g. suggestion concerning given procedure step; additional conditions which have to be met.

<p>Warning: Essential information concerning system's operation. Not adhering to this information may have irreversible consequences.</p>
--

API v1: Authentication

Accessing Fudo Enterprise data structures over API interface requires a *user* object defined in the local database. The same access rights restrictions apply to the API interface as in case of administration panel access.

Role	Access rights
user	<ul style="list-style-type: none">• Connecting to servers through assigned safes.• Login to the User Portal (requires adding the user to the <code>portal</code> safe).• Fetching servers' passwords (requires additional access right).
service	<ul style="list-style-type: none">• Accessing SNMP information.

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Table 1 – continued from previous page

Role	Access rights
operator	<ul style="list-style-type: none"> • Logging in to the administration panel. • Browsing objects: servers, users, safes, accounts, to which the user has been assigned sufficient access permissions. • Blocking/unblocking objects: servers, users, safes, listeners, accounts, to which the user has been assigned sufficient access permissions. • Generating reports on demand and subscribing to periodic reports. • Managing email notifications. • Viewing live and archived sessions involving objects (user, safe, account, server), to which the user has been assigned sufficient access permissions. • Converting sessions and downloading converted content involving objects (user, safe, account, server), to which the user has been assigned sufficient access permissions. • Available dashboard widgets: concurrent sessions, suspicious sessions, account alerts, active users, cluster status, concurrent sessions chart.
admin	<ul style="list-style-type: none"> • Logging in to the administration panel. • Managing objects: servers, users, safes, listeners, accounts, to which the user has been assigned sufficient access permissions. • Blocking/unblocking objects: servers, users, safes, listeners, accounts, to which the user has been assigned sufficient access permissions. • Generating reports on demand and subscribing to periodic reports. • Activating/deactivating email notifications. • Viewing live and archived sessions involving objects (user, safe, account, server), to which the user has been assigned management privileges. • Converting sessions and downloading converted content involving objects (user, safe, account, server), to which the user has been assigned sufficient access permissions. • Managing policies. • Available dashboard widgets: concurrent sessions, suspicious sessions, account alerts, active users, cluster status, concurrent sessions chart.
Role	Access rights
superadmin	<ul style="list-style-type: none"> • Full access rights to objects management. • Full access rights to system configuration options. • Available dashboard widgets: concurrent sessions, suspicious sessions, account alerts, active users, cluster status, concurrent sessions chart, license, system events log.

Request

Method

POST

Path

`/api/system/login`

Headers

Content-Type: Application/JSON

Body

```
{
  username: username,
  password: password
}
```

Response

Status

200 OK

Headers

Content-Type: Application/JSON

Body

```
{
  sessionid: ygmd2env50zgr2nblypmrfcvarggn0uf
}
```

Response

Status

401 UNAUTHORIZED

Example request

```
curl -k -X POST -H "Accept:application/json" -H "Content-Type:application/json"
https://fudo.whl/api/system/login -d
{"username": "api_user", "password": "api_password"}

Result: {"sessionid": "oz2jfy042kz7d3zc2gos1ahxouxehk3"}
```

After successful authentication, include the key `Authorization` with the received value of the `sessionid` into the Headers of the future requests.

API v1: Password changers

Account defines the privileged account existing on the monitored server. It specifies the actual login credentials, user authentication mode: anonymous (without user authentication), regular (with login credentials substitution) or forward (with login and password forwarding); password changing policy as well as the password changer itself.

3.1 Data structures

Table 1: PasswordChangerModel

Parameter	Type	Description
id	string	Object identifier. Read only.
name	string	Required.
timeout	int	Script's execution time limit expressed in seconds. Required.
transport	string{LDAP, SSH, Telnet, WinRM, plugin}	Transport layer specifier. Required.
changer_type	string{change,verify}	Script type. Required.
variables	VariablesModel	Required.
commands	CommandsModel	Required.

Table 2: VariablesModel

Parameter	Type	Description
id	string	Object identifier.
name	string	Required.
description	string	
encrypt	bool	<ul style="list-style-type: none"> • true - encrypt variable value, • false - store variable value in plain text.
required	bool	<ul style="list-style-type: none"> • true - specifying this value is required, • false - specifying this value is not required.
object_type	string	
object_property	string	

Table 3: CommandsModel

Parameter	Type	Description
id	string	Object identifier. Read only.
command	string	Required if command_type==INPUT.
expected	string	Required if command_type==EXPECTED
delay	int	Delay after running the command before executing the next one. Required if command_type==DELAY
comment	string	Optional commentary.
position	int	required

Table 4: account_password_changer

Parameter	Type	Description
id	string	Object identifier.
position	int	Password changer position in execution queue.
account	string	Account identifier.
password_changer	string	Password changer identifier
timeout	int	Script's execution time limit.
accountvariable_set		

Table 5: accountvariable_set

Parameter	Type	Description
id	string	Object identifier.
password_changer_variable	string	
value	string	Variable value.
account_id	string	Account identifier.
server_id	string	Server identifier.
account_password_changer_id	string	
server_address_id	string	

3.2 Creating a password changer

Request

Method	POST
Path	/api/system/password_changers
Headers	Content-Type: Application/JSON
Body	PasswordChangerModel

Possible Response

Status	201 CREATED
Headers	Content-Type: Application/JSON
Body	PasswordChangerModel
Description	Object successfully created. Resultant object's attributes are included in response body.

Possible Response

Status

400 BAD REQUEST

Headers

Content-Type: Application/JSON

Body

ValidationErrors

Description

Validation didn't pass.

Example: Creating a WinRM password changer

```
{ "name": "test_changer_00567",
"timeout": 300,
"transport": "WinRM",
"changer_type": "change",
"variables": [
  {
    "id": "7394910588142354434",
    "name": "transport_bind_ip",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": "fudo_server",
    "object_property": "bind_ip"
  },
  {
    "id": "7394910588142354435",
    "name": "transport_ca_certificate",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": "fudo_server",
    "object_property": "transport_ca_certificate"
  },
  {
    "id": "7394910588142354436",
    "name": "transport_encoding",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": null,
    "object_property": null
  },
  {
    "id": "7394910588142354437",
    "name": "transport_host",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": "fudo_server",
```

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```
    "object_property": "address"
  },
  {
    "id": "7394910588142354438",
    "name": "transport_login",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": "fudo_account",
    "object_property": "login"
  },
  {
    "id": "7394910588142354439",
    "name": "transport_port",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": "fudo_server",
    "object_property": "port"
  },
  {
    "id": "7394910588142354440",
    "name": "transport_secret",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": "fudo_account",
    "object_property": "secret"
  },
  {
    "id": "7394910588142354441",
    "name": "x",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": null,
    "object_property": null
  }
],
"commands": [
  {
    "id": "7394910588142354434",
    "command": "echo %x%",
    "expected": null,
    "delay": null,
    "comment": null,
    "position": 0
  }
]}
```

3.3 Retrieving password changers list

Request

Method

GET

Path

/api/system/password_changers

Note: Results pagination

Every GET request, which returns a collection of objects can be optionally paginated. To achieve it add a pagination parameter to the request path:

```
/api/system/objects?page=3&page_size=10
```

Table 6: Pagination parameters

page	int
page_size	int

Possible Response

Status

200 OK

Headers

Content-Type: Application/JSON

Body

```
[
  PasswordChangerModel,
  ...
]
```

Example

```
curl -k -X GET
"https://10.0.150.150/api/system/password_changers?sessionid={{sessionid}}"
```

Response

```
[{
  "id": "1",
  "name": "Unix/SSH changer",
  "timeout": 300,
  "transport": "SSH",
  "changer_type": "change",
  "variables": [
    {
      "id": "1",
      "name": "transport_host",
```

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```
"description": null,
"encrypt": false,
"required": true,
"object_type": "fudo_server",
"object_property": "address"
},
{
  "id": "2",
  "name": "transport_bind_ip",
  "description": null,
  "encrypt": false,
  "required": false,
  "object_type": "fudo_server",
  "object_property": "bind_ip"
},
{
  "id": "3",
  "name": "transport_port",
  "description": null,
  "encrypt": false,
  "required": false,
  "object_type": "fudo_server",
  "object_property": "port"
},
{
  "id": "4",
  "name": "transport_login",
  "description": null,
  "encrypt": false,
  "required": true,
  "object_type": "fudo_account",
  "object_property": "login"
},
{
  "id": "5",
  "name": "transport_secret",
  "description": null,
  "encrypt": true,
  "required": true,
  "object_type": "fudo_account",
  "object_property": "secret"
},
{
  "id": "6",
  "name": "transport_method",
  "description": null,
  "encrypt": false,
  "required": true,
  "object_type": "fudo_account",
  "object_property": "method"
},
{
  "id": "7",
  "name": "transport_host_public_key",
  "description": null,
  "encrypt": false,
```

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```
    "required": false,
    "object_type": "fudo_server",
    "object_property": "ssh_public_key"
  },
  {
    "id": "8",
    "name": "transport_password_prompt",
    "description": null,
    "encrypt": false,
    "required": false,
    "object_type": null,
    "object_property": null
  },
  {
    "id": "9",
    "name": "account_login",
    "description": "Login for the account for which password will be changed.",
    "encrypt": false,
    "required": true,
    "object_type": "fudo_account",
    "object_property": "login"
  }
],
"commands": [
  {
    "id": "1",
    "command": null,
    "expected": "Last login:",
    "delay": null,
    "comment": null,
    "position": 1
  },
  {
    "id": "2",
    "command": "passwd %%account_login%",
    "expected": null,
    "delay": null,
    "comment": null,
    "position": 2
  },
  {
    "id": "3",
    "command": null,
    "expected": "[Pp]assword:",
    "delay": null,
    "comment": null,
    "position": 3
  },
  {
    "id": "4",
    "command": "%%account_new_secret%",
    "expected": null,
    "delay": null,
    "comment": null,
    "position": 4
  },
]
```

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```

{
  "id": "5",
  "command": null,
  "expected": "[Pp]assword:",
  "delay": null,
  "comment": null,
  "position": 5
},
{
  "id": "6",
  "command": "%account_new_secret%",
  "expected": null,
  "delay": null,
  "comment": null,
  "position": 6
},
{
  "id": "7",
  "command": null,
  "expected": "successfully",
  "delay": null,
  "comment": null,
  "position": 7
},
{
  "id": "8",
  "command": "logout",
  "expected": null,
  "delay": null,
  "comment": null,
  "position": 8
},
{
  "id": "9",
  "command": null,
  "expected": "closed",
  "delay": null,
  "comment": null,
  "position": 9
}
]]]

```

3.4 Retrieving a password changer

Request

Method

GET

Path

/api/system/password_changers/id

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```

    "encrypt":false,
    "required":false,
    "object_type":"fudo_server_address_property",
    "object_property":"bind_ip"
  }],
"commands":
  [{
    "command":"command 1 %%transport_bind_ip%%",
    "expected": null,
    "position": 1,
    "delay":null,
    "command_type":"INPUT"
  },{
    "command":"command 2 %%transport_port%%",
    "expected": null,
    "position": 2,
    "delay":null,
    "command_type":"INPUT"
  },{
    "command":"command 3 %%transport_host%%",
    "expected":null,
    "position": 3,
    "delay":null,
    "command_type":"INPUT"
  ]}]

```

3.5 Modifying password changers

Request

 Method

PUT

 Path

/api/system/password_changers/id

Possible Response

 Status

200 OK

 Headers

Content-Type: Application/JSON

 Body

PasswordChangerModel

Possible Response

Status

400 BAD REQUEST

Headers

Content-Type: Application/JSON

Body

PasswordChangerModel

Possible Response

Status

404 NOT FOUND

Description

Object not found.

3.6 Deleting a password changer

Request

Method

DELETE

Path

/api/system/password_changers/id

Possible Response

Status

204 NO CONTENT

Possible Response

Status

404 NOT FOUND

Description

Object not found.

Example:

```
curl -k -X DELETE
https://10.0.150.150/api/system/password_changers/68719476746?sessionId={{sessionId}}
```

3.7 Retrieving account-password changers assignments list

Request

Method	GET
Path	/api/system/account_password_changers

Note: Results pagination

Every GET request, which returns a collection of objects can be optionally paginated. To achieve it add a pagination parameter to the request path:

```
/api/system/objects?page=3&page_size=10
```

Table 7: Pagination parameters

page	int
page_size	int

Possible Response

Status	200 OK
Headers	Content-Type: Application/JSON
Body	[AccountSafeAssignmentModel, ...]

Example:

```
curl -k -X GET
"https://10.0.150.150/api/system/account_password_changers?sessionid={{sessionid}}"
```

3.8 Adding a password changer to account

Request

Method

POST

Path

/api/system/account_password_changers

Body

account_password_changer

Possible Response

Status

201 CREATED

Headers

Content-Type: Application/JSON

Body

AccountPasswordChanger

Possible Response

Status

400 BAD REQUEST

Headers

Content-Type: Application/JSON

Body

ValidationErrors

Possible Response

Status

404 NOT FOUND

Example:

```
curl -k -X POST
https://10.0.8.89/api/system/account_password_changers?sessionid={{sessionid}} -d
{
  "account": 1992864825347,
  "accountvariable_set": [
    {
```

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```
"account_id": 1992864825347,
"password_changer_variable": 109,
"server_address_id": null,
"server_id": null,
"value": null
},
{
"account_id": 1992864825347,
"password_changer_variable": 110,
"server_address_id": null,
"server_id": null,
"value": null
},
{
"account_id": null,
"password_changer_variable": 102,
"server_address_id": null,
"server_id": 1992864825347,
"value": null
},
{
"account_id": 1992864825347,
"password_changer_variable": 103,
"server_address_id": null,
"server_id": null,
"value": null
},
{
"account_id": null,
"password_changer_variable": 101,
"server_address_id": 1992864825351,
"server_id": null,
"value": null
},
{
"account_id": 1992864825347,
"password_changer_variable": 106,
"server_address_id": null,
"server_id": null,
"value": null
},
{
"account_id": null,
"password_changer_variable": 107,
"server_address_id": null,
"server_id": 1992864825347,
"value": null
},
{
"account_id": 1992864825347,
"password_changer_variable": 104,
"server_address_id": null,
"server_id": null,
"value": null
},
{

```

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```
        "account_id": null,  
        "password_changer_variable": 105,  
        "server_address_id": null,  
        "server_id": null,  
        "value": "base1"  
    }  
],  
"password_changer": 13,  
"position": 0,  
"timeout": 300  
}
```

3.9 Deleting an account-password changer assignment

Request

Method

DELETE

Path

/api/system/account_password_changers/id

Possible Response

Status

204 NO CONTENT

Possible Response

Status

404 NOT FOUND

Example:

```
curl -k -X DELETE  
https://10.0.150.150/api/system/account_password_changers/68719476738?sessionid={  
↪{sessionid}}
```

API v1: Password changer policy

Password changer policy defines specifics of how frequently the password should be changed and password complexity requirements.

Password changer policy can't be created via API, but can be assigned to a particular Account.

4.1 Adding a password changer policy to account

Request

Method

POST

Path

`/api/system/accounts`

Body

`AccountModel`

Possible Response

Status

200 OK

Headers

Content-Type: Application/JSON

Body

`AccountModel`

Possible Response

Status

400 BAD REQUEST

Headers

Content-Type: Application/JSON

Body

ValidationErrors

Possible Response

Status

404 NOT FOUND

Example:

```
curl -k -X PUT -H "Accept:application/json" -H "Content-Type:application/json"
https://fudo.whl/api/system/accounts/755918023667220708?sessionId={{sessionId}} -
↪ d
{
"credentials": {
  "login": "",
  "method": "password",
  "password_change_policy_id": "75594322023667220482"
},
"server_id": "755918764677220677",
"password_change_request": "0001-01-01T00:00:00",
"type": "regular",
"name": "TestAccount" }
```

Account defines the privileged account existing on the monitored server. It specifies the actual login credentials, user authentication mode: anonymous (without user authentication), regular (with login credentials substitution) or forward (with login and password forwarding); password changing policy as well as the password changer itself.

5.1 Data structures

Table 1: AccountModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
name	string	yes	Unique account's name
description	string	no	Object description
blocked	boolean; default value false	yes	
reason	string	if blocked == true	
type	string {regular, forward, anonymous}	yes	Immutable
hotseat	boolean; default value false	if type == regular	Enable to be informed about existing connections via the Access Gateway. Available for the server with protocol == rdp
login	string; may be empty	if type == regular	

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Table 1 – continued from previous page

Parameter	Type	Required	Description
domain	string	if type == regular forward	
forward_domain	boolean; default value false	if type == forward	
servauth	boolean; default value false	if type == forward	Authentication against server
method	string {account, passvn, password, sshkey}	if type == regular forward	Authentication method
account_id	string	if method == account	
passvn_id	string	if method == passvn	
category	string {nonprivileged, privileged}		
server_id	string	yes	
server_name	string		Read-only; expensive to use
server_address	string		Read-only; expensive to use
server_mask	number		Read-only; expensive to use
server_port	number		Read-only; expensive to use
pool_id	string	yes	
pool_name	string		Read-only; expensive to use
secret	string; may be empty	no	
dump_mode	string {all, none, raw, noraw}; default value noraw	yes	Session recording options
retention_locked	boolean; default value false	yes	
timestamp_enabled	boolean; default value false	yes	
ocr_enabled	boolean; default value false	yes	
ocr_lang	string {eng, pol, deu, hun, nor, rus, ukr}; if more than 1, separated by the + symbol	if ocr_enabled == true	
ssh_agent	boolean; default value false	yes	
retention_remove	number		
retention_external	number		
password_lastupdate	datetime		Read-only

Continued on next page

Table 1 – continued from previous page

Parameter	Type	Required	Description
password_lastcheck	datetime		Read-only
password_change_policy_id	string	if type == regular	
password_checkout_time_limit	datetime (h:m:s)	if password_change_on_checkin == true	
password_change_on_checkin	boolean		If set, password will be changed after last password checkin.
password_change_on_session_end	boolean		If set, password will be changed after session finishes.
password_recovery	boolean		If set and password verification detects unknown password, password changer will try to recover the password to a known value.
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only
last_login	datetime		Read-only; expensive to use
safes	string-array		Read-only; expensive to use
servers	string-array		Read-only; expensive to use

Request for retrieving available attributes of the AccountModel

Method

GET

Path

/api/v2/objspec/account

Table 2: AccountSafeListenerAssignmentModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
account_id	string	yes	Immutable. Expects unique <code>safe_id</code> and <code>listener_id</code>
safe_id	string	yes	Immutable. Expects unique <code>account_id</code> and <code>listener_id</code>
listener_id	string	no	Immutable. Expects unique <code>account_id</code> and <code>safe_id</code>
valid_to	datetime		
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the AccountSafeListenerAssignment-Model

Method

GET

Path

/api/v2/objspec/account_safe_listener

Table 3: AccountGrantAssignmentModel

Parameter	Type	Required	Description
id	string		Read-only, protected object Identifier
to_user_id	string	yes	Immutable. Expects unique <code>for_account_id</code>
for_account_id	string	yes	Immutable. Expects unique <code>to_user_id</code>
to_user_name	string		Read-only, expensive to use
for_account_name	string		Read-only, expensive to use
created_at	string		Read-only
modified_at	string		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the AccountGrantAssignmentModel

Method

GET

Path

/api/v2/objspec/account_grant

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,
 - **lt** - less than,
 - **le** - less or equal,
 - **gt** - greater than,
 - **ge** - greater than or equal
 - **blocked** - filter blocked objects,
 - **!blocked** - filter unblocked objects,
 - **isempty()** - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- **order**,
- **offset**,
- **limit**,
- **debug** - for showing statistics, database errors, etc,
- **total_count**,
- **reveal** - to see objects: **active**, **removed**, or **all** for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: GET `https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the Account objects.

5.2 Creating an account

Request

Method	POST
Path	/api/v2/account
Headers	Content-Type: Application/JSON
Body	AccountModel

Example request

Sending POST `https://10.0.0.0/api/v2/account`

```
{
  "name": "test-account",
  "type": "regular",
  "server_id": "1234567890",
  "method": "password",
  "login": "test-account-login",
  "domain": "my-domain"
}
```

Response

```
{
  "result": "success",
  "account": {
    "id": "1234567890123456"
  }}
}
```


5.3 Retrieving accounts list

Request

Method

GET

Path

/api/v2/account

5.4 Retrieving an account

Request

Method

GET

Path

/api/v2/account/<id>

5.5 Modifying an account

Request

Method

PATCH

Path

/api/v2/account/<id>

Headers

Content-Type: Application/JSON

Body

AccountModel

Example request: Enable OCR with German, English and Polish languages for an account

Sending PATCH <https://10.0.0.0/api/v2/account/1234567890123456>

```
{ "ocr_enabled": true,  
  "ocr_lang": "deu+eng+pol"}
```

Response

```
{"result": "success"}
```

5.6 Granting access for user to account

Request

Method	POST
Path	/api/v2/grant/account
Headers	Content-Type: Application/JSON
Body	<pre>{ to_user_id: 1234567890, for_account_id: 1234567891 }</pre>

5.7 Adding a password changer policy to account

Password changer policy can't be created via API, but can be assigned to a particular Account. It requires a password changer or/and password verifier assigned according to it's enabled options.

By default there is an existing password policy named *Static, without restrictions* with `id = 1`, which has no password change or verification functions assigned.

Request

Method	PATCH
Path	/api/v2/account/<id>
Headers	Content-Type: Application/JSON
Body	AccountModel

Example request

Sending `https://10.0.0.0/api/v2/account/1234567890123456`

```
{"domain":null, "password_change_policy_id":"2345678901234567"}
```

Response

```
{"result": "success"}
```

5.8 Modifying password change parameters for account

Request

Method

PATCH

Path

`/api/v2/account/<id>`

Headers

Content-Type: Application/JSON

Body

AccountModel

Example request

Sending `https://10.0.0.0/api/v2/account/1234567890123456798`

```
{
  "domain":null,
  "password_change_policy_id":"2345678901234567989",
  "password_checkout_time_limit":"06:59:00",
  "password_change_on_session_end":true,
  "password_change_on_checkin":true,
  "password_recovery":true
}
```

Response

```
{"result": "success"}
```

5.9 Creating an account-safe-listener assignments

Request

Method

POST

Path

/api/v2/account/safe/listener

Headers

Content-Type: Application/JSON

Body

AccountSafeListenerAssignmentModel

Example request

Sending POST <https://10.0.0.0/api/v2/account/safe/listener>

```
{ "account_id": 1232678819172646919,  
  "safe_id": 1232678819172646913,  
  "listener_id": 1232678819172646914 }
```

Response

```
{ "result": "success",  
  "account_safe_listener": {} }
```

5.10 Deleting an account-safe-listener assignment

Request

Method

DELETE

Path

/api/v2/account/<account_id>/safe/<safe_id>/listener/<listener_id>

5.11 Deleting an account

Request

Method

DELETE

Path

/api/v2/account/<id>

User defines a subject entitled to connect to servers within monitored IT infrastructure. Detailed object definition (i.e. unique login and domain combination, full name, email address etc.) enables precise accountability of user actions when login and password are substituted with a shared account login credentials.

6.1 Data structures

Table 1: UserModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
name	string	yes	Unique user's name
blocked	boolean; default value false	yes	
reason	string	if blocked == true	
domain	string	no	User's domain
role	string {admin, operator, service, superadmin, user}	yes	
full_name	string	no	User's full name
email	string	no	User's email address
organization	string	no	User's organization name
phone	string	no	User's phone number
ad_domain	string	no	User's AD domain
ldap_base	string	no	User's LDAP base
language	string {en, pl, ru, ua, kk}; default value en	yes	Interface language

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Table 1 – continued from previous page

Parameter	Type	Required	Description
previous_success	datetime		Read-only
last_success	datetime		Read-only
last_failure	datetime		Read-only
failures	number; default value 0	yes	Number of authentication failures
password_complexity	boolean; default value false	yes	Enable password complexity settings
external_sync	boolean; default value false	yes	
valid_since	datetime (h:m:s); default value -infinity	yes	Beginning access time
valid_to	datetime (h:m:s); default value infinity	yes	Ending access time
ldap_server_id	string	no	Id of the user's LDAP server
source_ip	string	no	
snmp_enabled	boolean; default value false	if role == service	
snmp_authentication		if role == service & snmp_enabled == true	
snmp_encryption		if role == service & snmp_enabled == true	
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the UserModel

Method	GET
Path	/api/v2/objspec/user

Table 2: UserSafeAssignmentModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
user_id	string	yes	Immutable. Expects unique safe_id
safe_id	string	yes	Immutable. Expects unique user_id

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Table 2 – continued from previous page

Parameter	Type	Required	Description
blocked	boolean; default value false	yes	
position	number	yes	
password_visible	boolean; default value false	yes	Allow a user to use Secret Checkout feature and view passwords in the Access Gateway.
use_time_policy	boolean; default value false	yes	
valid_since	datetime (h:m:s); default value -infinity	yes	Beginning access time
valid_to	datetime (h:m:s); default value infinity	yes	Ending access time
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the UserSafeAssignmentModel

Method

GET

Path

/api/v2/objspec/user_safe

Table 3: UserSafeTimePolicyAssignmentModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
user_safe_id	string		Read-only object Identifier
user_id	string	yes	Immutable
safe_id	string	yes	Immutable
day_of_week	number	yes	Value range from 1 to 7
valid_from	datetime (h:m:s)	yes	Beginning access time
valid_to	datetime (h:m:s)	yes	Ending access time
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the UserSafeTimePolicyAssignment-Model

Method

GET

Path

/api/v2/objspec/user_safe_time_policy

Table 4: UserGrantAssignmentModel

Parameter	Type	Required	Description
id	string		Read-only, protected object Identifier
to_user_id	string	yes	Immutable. Expects unique for_safe_id
for_user_id	string	yes	Immutable. Expects unique to_safe_id
to_user_name	string		Read-only, expensive to use
for_user_name	string		Read-only, expensive to use
created_at	string		Read-only
modified_at	string		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the UserGrantAssignmentModel

Method	GET
Path	/api/v2/objspec/user_grant

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,
 - **lt** - less than,
 - **le** - less or equal,
 - **gt** - greater than,
 - **ge** - greater than or equal

- `blocked` - filter blocked objects,
- `!blocked` - filter unblocked objects,
- `isempty()` - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- `order`,
- `offset`,
- `limit`,
- `debug` - for showing statistics, database errors, etc,
- `total_count`,
- `reveal` - to see objects: `active`, `removed`, or `all` for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: GET `https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the User objects.

6.2 Creating a user

Request

Method	POST
Path	<code>/api/v2/user</code>
Headers	Content-Type: Application/JSON
Body	UserModel

Example request

Sending POST `https://10.0.0.0/api/v2/user`

```
{
  "role": "user",
  "name": "test-user",
  "language": "en"
}
```

Response

```
{
  "result": "success",
  "user": {
    "id": "12345678901234567890"
  }}
}
```

6.3 Retrieving users list

Request

Method

GET

Path

`/api/v2/user`

Example request

Sending GET `https://10.0.0.0/api/v2/user`

Response

```
{
  "result": "success",
  "user": [
    {
      "id": "1234567891012345",
      "name": "tet",
      "blocked": false,
      "role": "user",
      "full_name": "",
      "email": "",
      "phone": "",
      "ad_domain": "",
      "ldap_base": "",
      "language": "en",
      "failures": 0,
      "password_complexity": false,
      "external_sync": false,
      "valid_since": "-infinity",
      "valid_to": "infinity",
    }
  ]
}
```

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```
    "created_at": "2022-10-20 02:09:49.818029-07",
    "modified_at": "2022-10-20 02:09:49.818029-07"
  },
  {
    "id": "12345678910123456",
    "name": "admin",
    "blocked": false,
    "role": "superadmin",
    "language": "en",
    "previous_success": "2022-10-25 05:33:19.377878-07",
    "last_success": "2022-10-25 06:03:39.084783-07",
    "last_failure": "2022-10-24 04:19:35.204557-07",
    "failures": -1,
    "password_complexity": false,
    "external_sync": false,
    "valid_since": "-infinity",
    "valid_to": "infinity",
    "created_at": "2022-10-20 02:01:32.093269-07",
    "modified_at": "2022-10-25 06:03:39.085472-07"
  }
]}
```

6.4 Retrieving a user

Request

Method

GET

Path

/api/v2/user/<id>

6.5 Modifying a user

Request

Method

PATCH

Path

/api/v2/user/<id>

Headers

Content-Type: Application/JSON

Body

UserModel

Example request: Changing user login

Sending PATCH https://10.0.0.0/api/v2/user/12345678901234567890

```
{  
  "name": "new-user"  
}
```

Response

```
{ "result": "success" }
```

Example request: Blocking a user

Sending PATCH https://10.0.0.0/api/v2/user/12345678901234567890

```
{"blocked": true,  
  "reason": "lost rights"}
```

Response

```
{ "result": "success" }
```

6.6 Retrieving user's management privileges

Request

Method

GET

Path

/api/v2/grant/<to_user_id>/user/<for_user_id>
/api/v2/grant/<to_user_id>/server/<for_server_id>
/api/v2/grant/<to_user_id>/safe/<for_safe_id>
/api/v2/grant/<to_user_id>/pool/<for_pool_id>
/api/v2/grant/<to_user_id>/listener/<for_listener_id>
/api/v2/grant/<to_user_id>/account/<for_account_id>

6.7 Revoking user's management privileges

Request

Method

DELETE

Path

```
/api/v2/grant/<to_user_id>/user/<for_user_id>
/api/v2/grant/<to_user_id>/server/<for_server_id>
/api/v2/grant/<to_user_id>/safe/<for_safe_id>
/api/v2/grant/<to_user_id>/pool/<for_pool_id>
/api/v2/grant/<to_user_id>/listener/<for_listener_id>
/api/v2/grant/<to_user_id>/account/<for_account_id>
```

6.8 Granting access for user to another user

Request

Method

POST

Path

```
/api/v2/grant/user
```

Headers

Content-Type: Application/JSON

Body

```
{
  to_user_id: 1234567890,
  for_user_id: 1234567891
}
```

6.9 Retrieving user-safe assignments list

Request

Method

GET

Path

```
/api/v2/user/safe
```

6.10 Creating a user-safe assignment

Request

Method	POST
Path	/api/v2/user/safe
Body	UserSafeAssignment

Example request

Sending PATCH <https://10.0.0.0/api/v2/user/safe>

```
{ "user_id": "1232678819172646915",  
  "safe_id": "1232678819172646913" }
```

Response

```
{ "result": "success",  
  "user_safe": {} }
```

6.11 Retrieving users' time policy settings within safes

Request

Method	GET
Path	/api/v2/user/safe/time_policy

Example request

Sending GET https://10.0.0.0/api/v2/user/safe/time_policy

Response (User's time policy is declared separately for each day)

```
{  
  "result": "success",  
  "user_safe_time_policy": [  
    {  
      "id": "4602678819172646913",  
      "safe_id": "4602678819172646913",  
      "user_id": "4602678819172646914",
```

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```

    "day_of_week": 2, <--- A user has access to the safe on Tuesday
    "valid_from": "09:00:00", <--- User's access starts at 9:00
    "valid_to": "14:00:00", <--- and ends at 14:00
    "created_at": "2022-10-26 02:25:19.155648-07",
    "modified_at": "2022-10-26 02:30:40.677788-07"
  },
  {
    "id": "4602678819172646914",
    "safe_id": "4602678819172646913",
    "user_id": "4602678819172646914",
    "day_of_week": 3, <--- A user has access to the safe on Wednesday
    "valid_from": "09:15:00", <--- User's access starts at 9:15
    "valid_to": "14:15:00", <--- and ends at 14:15
    "created_at": "2022-10-26 02:32:11.781045-07",
    "modified_at": "2022-10-26 02:32:11.781045-07"
  ]}]

```

6.12 Modifying user's time policy settings within a safe

Request

 Method

PATCH

 Path

/api/v2/user/safe/time_policy/<id>

 Body

UserSafeTimePolicyAssignment

Example request: Changing the day of user's access to Monday

 Sending PATCH https://10.0.0.0/api/v2/user/safe/time_policy/1232678819172646913

```
{ "day_of_week": 1 }
```

Response

```
{ "result": "success" }
```

6.13 Creating user's time policy settings within a safe

Request

Method

POST

Path

/api/v2/user/safe/time_policy

Body

UserSafeTimePolicyAssignment

Example request: Creating user's access to the the safe for Thursday from 16:00 till 23:00

Sending POST https://10.0.0.0/api/v2/user/safe/time_policy

```
{ "user_id": "1232678819172646915",
  "safe_id": "1232678819172646913",
  "day_of_week": 4,
  "valid_from": "16:00:00",
  "valid_to": "23:00:00"
}
```

Response

```
{ "result": "success",
  "user_safe_time_policy": {
    "id": "1232678819172646915" }}
```

6.14 Deleting a user-safe assignment

Request

Method

DELETE

Path

/api/v2/user/<user_id>/safe/<safe_id>

6.15 Deleting a user

Request

Method

DELETE

Path

`/api/v2/user/<id>`

API v2: User authentication methods management

Table 1: UserAuthenticationMethodModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
type	string {certificate, duo, extauth, oath, password, sms, sshkey}	yes	Immutable
user_id	string	yes	Immutable. Expects unique position
position	number	yes	Expects unique user_id
external_sync	boolean; default value false	yes	
secret	string	if type == duo oath password sms sshkey token	
needs_change	boolean; default value false	yes	
external_authentication_id	string	if type == duo extauth oath sms	
certificate_subject	string	if type == certificate	
duo_user_id	string	if type == duo	
duo_username	string	if type == duo	

Table 2: OATHAuthenticationMethodModel

Parameter	Type	Required	Description
oath_type	string {HOTP, TOTP}	yes	Immutable
oath_initialized	boolean; value false	default yes	
oath_secret	string	yes	Protected
oath_tokenlen	number	yes	Immutable; value range: [4, 16]
oath_timestep	number {30, 45, 60, 90, 120, 180, 300}	If oath_type == TOTP	
oath_counter	number; value 0	default yes	Read-only
oath_timeshift	number; value 0	default If oath_type == TOTP	Read-only
oath_url	null		Read-only
oath_qrcode	null		Read-only

Request for retrieving available attributes of the UserAuthenticationMethodModel

Method

GET

Path

/api/v2/objspec/user_authentication_method

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,

- `lt` - less than,
- `le` - less or equal,
- `gt` - greater than,
- `ge` - greater than or equal
- `blocked` - filter blocked objects,
- `!blocked` - filter unblocked objects,
- `isempty()` - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- `order`,
- `offset`,
- `limit`,
- `debug` - for showing statistics, database errors, etc,
- `total_count`,
- `reveal` - to see objects: `active`, `removed`, or `all` for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: `GET https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the User objects.

7.1 Listing user's authentication methods

Request

Method	GET
Path	<code>/api/v2/user/<user_id>/authentication</code>

Example request

Sending GET <https://10.0.0.0/api/v2/user/12345678901234567890/authentication>

Response

```

{
  "result": "success",
  "user_authentication_method": [
    {
      "id": "12345612345123",
      "user_id": "12345678901234567890",
      "type": "password",
      "needs_change": false,
      "position": 0,
      "external_sync": false,
      "created_at": "2022-10-25 06:35:12.95741-07",
      "modified_at": "2022-10-25 06:35:12.95741-07",
      "user_name": "test-user"
    },
    {
      "id": "1234561234512357466",
      "user_id": "12345678901234567890",
      "type": "sshkey",
      "needs_change": false,
      "position": 1,
      "external_sync": false,
      "sshkey_user_presence_required": true,
      "sshkey_verification_required": false,
      "sshkey_counter": 0,
      "created_at": "2022-10-25 06:37:54.913056-07",
      "modified_at": "2022-10-25 06:37:54.913056-07",
      "user_name": "test-user"
    }
  ]
}

```

7.2 Creating user authentication method

Request

Method	POST
Path	/api/v2/user/<user_id>/authentication
Headers	Content-Type: Application/JSON
Body	UserAuthenticationMethodModel

Example request: Setting user authentication method - static password

Sending POST <https://10.0.0.0/api/v2/user/12345678901234567890/authentication>

```
{
  "type": "password",
  "secret": "test-password",
  "position": 0
}
```

Response

```
{
  "result": "success",
  "user_authentication_method": {
    "id": "12345612345123"
  }
}
```

7.3 Modifying user authentication method

Request

Method

PATCH

Path

/api/v2/user/<user_id>/authentication/<id>

Headers

Content-Type: Application/JSON

Body

UserAuthenticationMethodModel

Example request

Request

Sending PATCH <https://10.0.0.0/api/v2/user/12345678901234567890/authentication/12345612345123>

```
{
  "position": 1
}
```

Response

```
{
  "result": "success"
}
```

7.4 Deleting user authentication method

Request

Method

DELETE

Path

/api/v2/user/<user_id>/authentication/<id>

Example request

Sending DELETE <https://10.0.0.0/api/v2/user/12345678901234567890/authentication/1234561234512357466>

Response

```
{  
  "result": "success"}  
}
```

API v2: External authentication

8.1 Data structures

Table 1: ExternalAuthenticationModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
type	string {cerb, radius, ldap, ad}	yes	Immutable
address	string	yes	
port	number {from 1 to 65535}	yes	
bindto	string	no	Bind address. Include labels like 'fudo:label:test' or ip address
cerb	ExternalAuthentication-CerbModel	If <code>type == cerb</code>	Cerb object definition
radius	ExternalAuthentication-RadiusModel	If <code>type == radius</code>	Radius object definition
ldap	ExternalAuthentication-LdapModel	If <code>type == ldap</code>	LDAP object definition
ad	ExternalAuthentication-AdModel	If <code>type == ad</code>	Active Directory object definition
tls_enabled	boolean	no	Enable TLS protocol
tls_certificate	string	If <code>tls_enabled == true</code>	
second_factor_type	string {duo, oath, sms}	no	
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Table 2: ExternalAuthenticationCerbModel

Parameter	Type	Description
secret	string	Password to cerb provider; required; write-only
radius_nasid	string	Correct value of NAS id of Cerb provider

Table 3: ExternalAuthenticationRadiusModel

Parameter	Type	Description
secret	string	Password to cerb provider; required; write-only
radius_nasid	string	Correct value of NAS id of Radius provider

Table 4: ExternalAuthenticationLdapModel

Parameter	Type	Description
ldap_binddn	string	Bind domain to LDAP provider; required

Table 5: ExternalAuthenticationAdModel

Parameter	Type	Description
login	string	
secret	string	Password to cerb provider; required; write-only
ad_domain	string	Bind domain to AD provider; required

Request for retrieving available attributes of the ExternalAuthenticationModel

Method	GET
Path	/api/v2/objspec/external_authentication

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,

- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,
 - **lt** - less than,
 - **le** - less or equal,
 - **gt** - greater than,
 - **ge** - greater than or equal
 - **blocked** - filter blocked objects,
 - **!blocked** - filter unblocked objects,
 - **isempty()** - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- **order**,
- **offset**,
- **limit**,
- **debug** - for showing statistics, database errors, etc,
- **total_count**,
- **reveal** - to see objects: **active**, **removed**, or **all** for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: `GET https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the External Authentication objects.

8.2 Retrieving external authentication methods list

Request

Method	GET
Path	/api/v2/external_authentication

Example request

Sending GET https://10.0.0.0/api/v2/external_authentication

Response

```
{
  "result": "success",
  "external_authentication": [
    {
      "id": "1234538875067072557",
      "type": "ad",
      "port": 636,
      "ad_domain": "jdoe.local",
      "created_at": "2021-08-09 19:40:05.171853+02",
      "modified_at": "2021-08-09 19:40:05.171853+02",
      "address": "10.0.139.100",
      "tls_enabled": true,
      "tls_certificate": "-----BEGIN CERTIFICATE-----\r\nMIIFrTCCBJWgAwIBAg...
↵ic=\r\n-----END CERTIFICATE-----\r\n",
    },
    {
      "id": "12345138875067072517",
      "type": "ldap",
      "port": 389,
      "ldap_binddn": "dc=qa-ldap,dc=null",
      "created_at": "2021-03-03 14:11:52.245683+01",
      "modified_at": "2021-03-03 14:14:46.052855+01",
      "address": "10.0.235.1",
      "tls_enabled": false,
      "tls_certificate": ""
    },
    {
      "id": "12345067072573",
      "type": "cerb",
      "port": 1812,
      "created_at": "2022-10-19 10:23:11.29545+02",
      "modified_at": "2022-10-19 10:58:12.325396+02",
      "address": "10.0.234.21",
      "radius_nasid": "",
      "tls_enabled": false,
      "tls_certificate": ""
    },
  ]
}
```

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```

    "id": "3234566775067072572",
    "type": "radius",
    "port": 1812,
    "created_at": "2022-10-19 10:08:23.160433+02",
    "modified_at": "2022-10-19 10:19:50.525671+02",
    "second_factor_type": "oath",
    "address": "10.0.0.1",
    "radius_nasid": "abcdeg",
    "tls_enabled": true,
    "tls_certificate": "-----BEGIN CERTIFICATE-----\r\nMIIG5jC...
↪2MOXV1x+eQAm0Vy\r\n-----END CERTIFICATE-----\r\n"
  }]}

```

8.3 Modifying external authentication method

Request

Method	PATCH
Path	/api/v2/external_authentication/<id>
Headers	Content-Type: Application/JSON
Body	ExternalAuthenticationModel

Example request: Adding SMS authentication for second factor to AD authentication

Sending PATCH https://10.0.0.0/api/v2/external_authentication/1234538875067072557

```
{"second_factor_type": "sms"}
```

Response

```
{ "result": "success"}
```

8.4 Creating an external authentication method

Request

Method

POST

Path

/api/v2/external_authentication

Headers

Content-Type: Application/JSON

Body

ExternalAuthenticationModel

Example request: Creating Cerb definition with second factor OATH authentication

Sending POST https://10.0.0.0/api/v2/external_authentication

```
{ "type": "cerb",
  "port": 1812,
  "address": "10.0.234.21",
  "radius_nasid": "abcde",
  "secret": "my-password",
  "tls_enabled": false,
  "second_factor_type": "oath" }
```

Response

```
{ "result": "success",
  "external_authentication": {
    "id": "123456819172646913" }}
```

8.5 Deleting an external authentication method

Request

Method

DELETE

Path

/api/v2/external_authentication/<id>

Server is a definition of the IT infrastructure resource, which can be accessed over one of the specified protocols.

9.1 Data structures

Table 1: `ServerModel`

Parameter	Type	Required	Description
<code>id</code>	string	yes	Unique, read-only object Identifier
<code>name</code>	string	yes	Unique server's name
<code>description</code>	string	no	Object description
<code>blocked</code>	boolean; default value <code>false</code>	yes	
<code>reason</code>	string	if <code>blocked == true</code>	
<code>bind_ip</code>	string		
<code>address</code>	string	yes	IP address; expects unique <code>mask</code> and <code>port</code>
<code>mask</code>	number {from 0 to 128}	no	Expects unique <code>address</code> and <code>port</code>
<code>port</code>	number {from 1 to 65535}	yes	Expects unique <code>address</code> and <code>mask</code>
<code>legacy_crypto</code>	boolean; default value <code>false</code>	If <code>protocol == rdp ssh http telnet tn3270 tn5250 & tls_enabled == true</code>	Enabling legacy cryptographic protocols and settings

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Table 1 – continued from previous page

Parameter	Type	Required	Description
protocol	string{http, modbus, mysql, rdp, ssh, system, tcp, tds, telnet, tn3270, tn5250, vnc}	yes	Immutable
http	HTTPServerAttributes	If protocol == http	HTTP protocol properties
rdp	RDPServerAttributes	If protocol == rdp	RDP protocol properties
tls	TLSServerAttributes	If tls_enabled == true	TLS protocol properties
ssh_public_key	string	If protocol == ssh	SSH public key
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only
last_login	datetime		Read-only; expensive to use
pools	string-array		Read-only; expensive to use

Table 2: HTTPServerAttributes

Parameter	Type	Required	Description
http_host	string	yes	HTTP host header value
http_timeout	number {seconds}	yes	Period of inactivity, after which the user will have to authenticate again
http_authentication	boolean; default value false	no	
http_authentication_method	string {Asana, Azure, Facebook, HPE BladeSystem, HPE iLO, HTTP Authentication, LinkedIn, Salesforce, Twitter}; default value null	If <code>http_authentication == true</code>	
http_username_element	string	If <code>http_authentication == true</code> & <code>http_authentication_method == null</code>	Custom login page details
http_press_enter	boolean; default value false	If <code>http_authentication == true</code> & <code>http_authentication_method == null</code>	The <i>Press the enter key prior to password</i> option
http_password_element	string	If <code>http_authentication == true</code> & <code>http_authentication_method == null</code>	Custom login page details
http_signon_realm	string	If <code>http_authentication == true</code> & <code>http_authentication_method == null</code>	Custom login page details

Table 3: RDPServerAttributes

Parameter	Type	Required	Description
rdp_hotseat	boolean; default value <code>false</code>	yes	The option to have the users informed that other users are connected to the server, they are trying to connect to
rdp_nla_enabled	boolean; default value <code>true</code>	If <code>protocol == rdp & tls_enabled == true</code>	
rdp_public_key	string	If <code>protocol == rdp & tls_enabled == false</code>	RDP public key

Table 4: TLSServerAttributes

Parameter	Type	Required	Description
tls_enabled	boolean; default value <code>true</code>	If <code>protocol == rdp http telnet tn3270 tn5250</code>	Enabling the TLS protocol
tls_certificate	string	If <code>protocol == rdp http telnet tn3270 tn5250 & tls_enabled == true</code>	TLS certificate
tls_use_ca_store	boolean; default value <code>false</code>	If <code>protocol == rdp http telnet tn3270 tn5250 & tls_enabled == true</code>	Enable using CA store for server verification

Request for retrieving available attributes of the ServerModel

Method	GET
Path	<code>/api/v2/objspec/server</code>

Table 5: ServerPoolModel

Parameter	Type	Required	Description
id	number	yes	Read-only object Identifier
pool_id	number	yes	Immutable. Expects unique <code>server_id</code>
server_id	number	yes	Immutable. Expects unique <code>pool_id</code>
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the ServerPoolModel

Method

GET

Path

/api/v2/objspec/pool_server

Table 6: ServerGrantAssignmentModel

Parameter	Type	Required	Description
id	string		Read-only, protected object Identifier
to_user_id	string	yes	Immutable. Expects unique for_server_id
for_server_id	string	yes	Immutable. Expects unique to_user_id
to_user_name	string		Read-only, expensive to use
for_server_name	string		Read-only, expensive to use
created_at	string		Read-only
modified_at	string		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the ServerGrantAssignmentModel

Method

GET

Path

/api/v2/objspec/server_grant

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,

- `eq` - equal,
- `ne` - not equal,
- `lt` - less than,
- `le` - less or equal,
- `gt` - greater than,
- `ge` - greater than or equal
- `blocked` - filter blocked objects,
- `!blocked` - filter unblocked objects,
- `isempty()` - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- `order`,
- `offset`,
- `limit`,
- `debug` - for showing statistics, database errors, etc,
- `total_count`,
- `reveal` - to see objects: `active`, `removed`, or `all` for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: `GET https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the Server objects.

9.2 Creating a server

Request

Method

POST

Path

/api/v2/server

Headers

Content-Type: Application/JSON

Body

ServerModel

Example request

Sending POST <https://10.0.0.0/api/v2/server>

```
{
  "name": "my-1st-rdp-server",
  "protocol": "rdp",
  "address": "10.0.2.0",
  "port": 3389,
  "legacy_crypto": false
}
```

Response

```
{ "result": "success",
  "server": {
    "id": "41234678819172646916" }}
```

9.3 Retrieving servers list

Request

Method

GET

Path

/api/v2/server

9.4 Retrieving a server

Request

Method

GET

Path

/api/v2/server/<id>

Example request

Sending GET <https://10.0.0.0/api/v2/server/41234678819172646916>

```

{
  "result": "success",
  "server": {
    "id": "4602678819172646916",
    "name": "my-1st-rdp-server",
    "blocked": false,
    "address": "10.0.2.0",
    "mask": 32,
    "port": 3389,
    "protocol": "rdp",
    "legacy_crypto": false,
    "rdp_hotseat": false,
    "rdp_nla_enabled": true,
    "tls_enabled": true,
    "tls_use_ca_store": false,
    "created_at": "2022-10-27 01:43:39.688273-07",
    "modified_at": "2022-10-27 01:43:39.688273-07",
    "last_login": "-infinity"
  }
}

```

9.5 Modifying a server

Request

Method

PATCH

Path

/api/v2/server/<id>

Headers

Content-Type: Application/JSON

Body

ServerModel

Example request: Enable using CA store for server verification

Sending PATCH <https://10.0.0.0/api/v2/server/41234678819172646916>

```
{"tls_use_ca_store": true}
```

Response

```
{ "result": "success" }
```

9.6 Adding a server to the pool

Request

Method

POST

Path

/api/v2/pool/server

Headers

Content-Type: Application/JSON

Body

ServerPoolModel

Example request

Sending POST <https://10.0.0.0/api/v2/pool/server>

```
{ "pool_id": "122678819172646916",  
  "server_id": "123402678819172646914" }
```

Response

```
{ "result": "success",  
  "pool_server": {} }
```

9.7 Deleting a server from a pool

Request

Method

DELETE

Path

/api/v2/pool/<pool_id>/server/<server_id>

9.8 Retrieving users allowed to manage servers

Request

Method

GET

Path

/api/v2/grant/server

Example request

Sending GET https://10.0.0.0/api/v2/grant/server

Response

```
{ "result": "success",
"server_grant": [
  {
    "for_server_id": "4602678819172646916",
    "to_user_id": "4602678819172646914",
    "created_at": "2022-10-27 01:51:15.839452-07",
    "modified_at": "2022-10-27 01:51:15.839452-07" } ] }
```

9.9 Granting management privileges

Request

Method

POST

Path

/api/v2/grant/server

Body

```
{
  to_user_id: 1234567890,
  for_server_id: 1234567891
}
```

9.10 Deleting a server

Request

Method

DELETE

Path

/api/v2/server/<id>

Pools serve grouping purposes for the server objects based on the same protocol to be managed within other objects (for example, accounts) as one server.

10.1 Data structures

Table 1: PoolModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
name	string	yes	Unique pool's name
description	string	no	
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only
servers	string-array		Read-only

Request for retrieving available attributes of the PoolModel

Method

GET

Path

/api/v2/objspec/pool

Table 2: ServerPoolModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
pool_id	string	yes	Immutable. Expects unique <code>server_id</code>
server_id	string	yes	Immutable. Expects unique <code>pool_id</code>
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the ServerPoolModel

Method	GET
Path	<code>/api/v2/objspec/pool_server</code>

Table 3: PoolGrantAssignmentModel

Parameter	Type	Required	Description
id	string		Read-only, protected object Identifier
to_user_id	string	yes	Immutable. Expects unique <code>for_pool_id</code>
for_pool_id	string	yes	Immutable. Expects unique <code>to_user_id</code>
to_user_name	string		Read-only, expensive to use
for_pool_name	string		Read-only, expensive to use
created_at	string		Read-only
modified_at	string		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the PoolGrantAssignmentModel

Method	GET
Path	<code>/api/v2/objspec/pool_grant</code>

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,
 - **lt** - less than,
 - **le** - less or equal,
 - **gt** - greater than,
 - **ge** - greater than or equal
 - **blocked** - filter blocked objects,
 - **!blocked** - filter unblocked objects,
 - **isempty()** - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- **order**,
- **offset**,
- **limit**,
- **debug** - for showing statistics, database errors, etc,
- **total_count**,
- **reveal** - to see objects: **active**, **removed**, or **all** for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: GET `https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the Pool objects.

10.2 Retrieving pools list

Request

Method	GET
Path	/api/v2/pool

Example request

Sending GET `https://10.0.0.0/api/v2/pool`

Response

```
{
  "result": "success",
  "pool": [
    {
      "id": "1232678819172646913",
      "name": "Linux servers",
      "description": "Example Linux pool",
      "created_at": "2022-10-20 02:01:38.373501-07",
      "modified_at": "2022-10-20 02:01:38.373501-07",
      "servers": [
        "1202678819172646913"
      ]
    },
    {
      "id": "41232678819172646914",
      "name": "Windows servers",
      "description": "Example Windows pool",
      "created_at": "2022-10-20 02:01:38.376251-07",
      "modified_at": "2022-10-20 02:01:38.376251-07",
      "servers": [
        "1202678819172646914"
      ]
    }
  ]
}
```

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```
{
  "id": "1232678819172646915",
  "name": "test-pool",
  "created_at": "2022-10-24 06:34:53.510281-07",
  "modified_at": "2022-10-24 06:34:53.510281-07",
  "servers": [
    "1202678819172646913"
  ]}]}
```

10.3 Retrieving a pool

Request

Method

GET

Path

/api/v2/pool/<id>

Example request

Sending GET <https://10.0.0.0/api/v2/pool/1232678819172646915>

Response

```
{
"result": "success",
"pool": {
  "id": "1232678819172646915",
  "name": "test-pool",
  "created_at": "2022-10-24 06:34:53.510281-07",
  "modified_at": "2022-10-24 06:34:53.510281-07",
  "servers": [
    "1202678819172646913"
  ]}]}
```

10.4 Creating a pool

Request

Method

POST

Path

/api/v2/pool

Headers

Content-Type: Application/JSON

Body

PoolModel

Example request

Sending POST <https://10.0.0.0/api/v2/pool>

```
{"name": "my-2nd-pool"}
```

Response

```
{ "result": "success",  
  "pool": {  
    "id": "1202678819172646916"  }}
```

10.5 Modifying a pool

Request

Method

PATCH

Path

/api/v2/pool/<id>

Headers

Content-Type: Application/JSON

Body

PoolModel

Example request

Sending PATCH <https://10.0.0.0/api/v2/pool/1202678819172646916>

```
{"name": "my-cool-pool"}
```

Response

```
{ "result": "success" }
```

10.6 Retrieving server pools

Request

Method

GET

Path

/api/v2/pool/server

Example request

Sending GET <https://10.0.0.0/api/v2/pool/server>

Response

```
{
  "result": "success",
  "pool_server": [
    {
      "pool_id": "1232678819172646913",
      "server_id": "1232678819172646913",
      "created_at": "2022-10-20 02:01:38.374809-07",
      "modified_at": "2022-10-20 02:01:38.374809-07"
    },
    {
      "pool_id": "1232678819172646914",
      "server_id": "1232678819172646914",
      "created_at": "2022-10-20 02:01:38.376536-07",
      "modified_at": "2022-10-20 02:01:38.376536-07"
    },
    {
      "pool_id": "1232678819172646915",
      "server_id": "1232678819172646913",
      "created_at": "2022-10-24 06:51:46.780733-07",
      "modified_at": "2022-10-24 06:51:46.780733-07"
    }
  ]
}
```

10.7 Adding a server to the pool

Request

Method

POST

Path

/api/v2/pool/server

Headers

Content-Type: Application/JSON

Body

ServerPoolModel

Example request

Sending POST <https://10.0.0.0/api/v2/pool/server>

```
{ "pool_id": "4602678819172646916",  
  "server_id": "4602678819172646914"}
```

Response

```
{ "result": "success",  
  "pool_server": {} }
```

10.8 Deleting a server from a pool

Request

Method

DELETE

Path

/api/v2/pool/<pool_id>/server/<server_id>

10.9 Retrieving users allowed to manage pools

Request

Method

GET

Path

/api/v2/grant/pool

Example request

Sending GET <https://10.0.0.0/api/v2/grant/pool>

Response

```
{
  "result": "success",
  "pool_grant": [
    {
      "for_pool_id": "1232678819172646916",
      "to_user_id": "1232678819172646915",
      "created_at": "2022-10-26 04:08:38.907148-07",
      "modified_at": "2022-10-26 04:08:38.907148-07"
    }
  ]
}
```

10.10 Granting access for user to a pool

Request

Method	POST
Path	/api/v2/grant/pool
Headers	Content-Type: Application/JSON
Body	<pre>{ to_user_id: 1234567890, for_pool_id: 1234567891 }</pre>

10.11 Deleting a pool

Request

Method	DELETE
Path	/api/v2/pool/<id>

Safe directly regulates user access to monitored servers. It specifies available protocols' features, policies and other details concerning users and servers relations.

11.1 Data structures

Table 1: SafeModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
name	string	yes	Unique safe's name
blocked	boolean; false	default value yes	
reason	string	if blocked == true	
login_reason	boolean; false	default value yes	Enable sending login reason for connection
use_ticketing_system	boolean; false	default value yes	
require_confirmation	boolean; false	default value yes	Enable confirmation of each connection
otp_in_access_gateway	boolean; true	default value yes	Enable generating OTP in the Access Gateway
webclient	boolean; true	default value yes	Enable connecting to the session in browser

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Table 1 – continued from previous page

Parameter	Type	Required	Description
confirmation_timeout	number; default value 5	yes	
inactivity_limit	number; default value 0	yes	
time_limit	number; default value 0	yes	
note_access	string {none, read, write}; default value none	Access level to the notes	
required_votes	number; default value 0	yes	How many voters will be voting for the access request
backup_id	string	no	Target destination ID for storing ses- sion data
rdp	SafeRDPAttributes	If protocol == rdp	
ssh	SafeSSHAttributes	If protocol == ssh	
vnc	SafeVNCAAttributes	If protocol == vnc	
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only
last_login	datetime		Read-only
accounts	string-array		Read-only; expen- sive to use

Table 2: SafeRDPAttributes

Parameter	Type	Required	Description
rdp_audin	boolean; default value true	yes	Audio input redirection
rdp_cliprdr	boolean; default value true	yes	Clipboard redirection
rdp_depth	number	no	Max. color depth
rdp_rdpdr	boolean; default value true	yes	
rdp_rdpwnd	boolean; default value true	yes	Sound redirection
rdp_rdrynvc	boolean; default value true	yes	
rdp_resolution	string	no	Max. resolution
rdp_suspend	boolean; default value true	yes	Enable content to not be avail- able for viewing when the user minimizes its client application
rdp_tsmf	boolean; default value true	yes	

Table 3: SafeSSHAttributes

Parameter	Type	Required
ssh_agent	boolean; default value <code>true</code>	yes
ssh_environment	boolean; default value <code>true</code>	yes
ssh_exec	boolean; default value <code>true</code>	yes
ssh_port_forwarding	boolean; default value <code>true</code>	yes
ssh_scp	boolean; default value <code>true</code>	yes
ssh_session	boolean; default value <code>true</code>	yes
ssh_shell	boolean; default value <code>true</code>	yes
ssh_sftp	boolean; default value <code>true</code>	yes
ssh_terminal	boolean; default value <code>true</code>	yes
ssh_x11	boolean; default value <code>true</code>	yes

Table 4: SafeVNCAttributes

Parameter	Type	Required	Description
vnc_clipcli	boolean; default value <code>true</code>	yes	Enable a user to be allowed to paste text into the VNC server computer
vnc_clipsrv	boolean; default value <code>true</code>	yes	Enable a user to be allowed to copy and paste text from the VNC server computer into the user's computer

Request for retrieving available attributes of the SafeModel

Method	GET
Path	<code>/api/v2/objspec/safe</code>

Table 5: UserSafeAssignmentModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
user_id	string	yes	Immutable. Expects unique <code>safe_id</code>
safe_id	string	yes	Immutable. Expects unique <code>user_id</code>
blocked	boolean; default value <code>false</code>	yes	
position	number	yes	
password_visible	boolean; default value <code>false</code>	yes	Allow a user to use Secret Checkout feature and view passwords in the Access Gateway.
use_time_policy	boolean; default value <code>false</code>	yes	
valid_since	datetime (h:m:s); default value <code>-infinity</code>	yes	Beginning access time

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Table 5 – continued from previous page

Parameter	Type	Required	Description
valid_to	datetime (h:m:s); default value infinity	yes	Ending access time
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the UserSafeAssignmentModel

Method

GET

Path

/api/v2/objspec/user_safe

Table 6: UserSafeTimePolicyAssignmentModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
user_safe_id	string		Read-only object Identifier
user_id	string	yes	Immutable
safe_id	string	yes	Immutable
day_of_week	number	yes	Value range from 1 to 7
valid_from	datetime (h:m:s)	yes	Beginning access time
valid_to	datetime (h:m:s)	yes	Ending access time
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the UserSafeTimePolicyAssignment-Model

Method

GET

Path

/api/v2/objspec/user_safe_time_policy

Table 7: AccountSafeListenerAssignmentModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
account_id	string	yes	Immutable. Expects unique <code>safe_id</code> and <code>listener_id</code>
safe_id	string	yes	Immutable. Expects unique <code>account_id</code> and <code>listener_id</code>
listener_id	string	no	Immutable. Expects unique <code>account_id</code> and <code>safe_id</code>
valid_to	datetime		
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the AccountSafeListenerAssignment-Model

Method

GET

Path

/api/v2/objspec/account_safe_listener

Table 8: SafeGrantAssignmentModel

Parameter	Type	Required	Description
id	string		Read-only, protected object Identifier
to_user_id	string	yes	Immutable. Expects unique <code>for_safe_id</code>
for_safe_id	string	yes	Immutable. Expects unique <code>to_user_id</code>
to_user_name	string		Read-only, expensive to use
for_safe_name	string		Read-only, expensive to use
created_at	string		Read-only
modified_at	string		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the SafeGrantAssignmentModel

Method

GET

Path

/api/v2/objspec/safe_grant

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,
 - **lt** - less than,
 - **le** - less or equal,
 - **gt** - greater than,
 - **ge** - greater than or equal
 - **blocked** - filter blocked objects,
 - **!blocked** - filter unblocked objects,
 - **isempty()** - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- **order**,
- **offset**,
- **limit**,
- **debug** - for showing statistics, database errors, etc,
- **total_count**,
- **reveal** - to see objects: **active**, **removed**, or **all** for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: GET `https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the Safe objects.

11.2 Retrieving safes list

Request

Method	GET
Path	/api/v2/safe

Example request

Sending GET `https://10.0.0.0/api/v2/safe`

Response

```
{ "result": "success",
"safe": [
  {
    "id": "123678819172646913",
    "name": "main",
    "blocked": false,
    "login_reason": false,
    "use_ticketing_system": false,
    "require_confirmation": false,
    "otp_in_access_gateway": true,
    "webclient": true,
    "confirmation_timeout": 5,
    "inactivity_limit": 0,
    "time_limit": 0,
    "note_access": "none",
    "required_votes": 0,
    "rdp_audin": true,
    "rdp_cliprdr": true,
    "rdp_rdpdr": true,
    "rdp_rdpsnd": true,
    "rdp_rdrynvc": true,
    "rdp_suspend": true,
    "rdp_tsmf": true,
```

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```

"ssh_agent": true,
"ssh_environment": true,
"ssh_exec": true,
"ssh_port_forwarding": true,
"ssh_scp": true,
"ssh_session": true,
"ssh_shell": true,
"ssh_sftp": true,
"ssh_terminal": true,
"ssh_x11": true,
"vnc_clipcli": true,
"vnc_clipsrv": true,
"created_at": "2022-10-20 02:01:38.366865-07",
"modified_at": "2022-10-26 03:26:45.530129-07",
"last_login": "-infinity",
"accounts": [
  "122678819172646913",
  "1232678819172646914",
  "1232678819172646919"
]]}

```

11.3 Creating a safe

Request

Method	POST
Path	/api/v2/safe
Headers	Content-Type: Application/JSON
Body	SafeModel

Example request

Sending POST <https://10.0.0.0/api/v2/safe>

```
{ "name": "my-1st-safe" }
```

Response

```

{ "result": "success",
"safe": {
  "id": "1232678819172646915" }}

```

11.4 Retrieving a safe

Request

Method	GET
Path	/api/v2/safe/<id>

Example request

Sending GET <https://10.0.0.0/api/v2/safe/1232678819172646915>

Response

```
{ "result": "success",
"safe": {
  "id": "1232678819172646915",
  "name": "my-1st-safe",
  "blocked": false,
  "login_reason": false,
  "use_ticketing_system": false,
  "require_confirmation": false,
  "otp_in_access_gateway": true,
  "webclient": true,
  "confirmation_timeout": 5,
  "inactivity_limit": 0,
  "time_limit": 0,
  "note_access": "none",
  "required_votes": 0,
  "rdp_audin": true,
  "rdp_cliprdr": true,
  "rdp_rdpdr": true,
  "rdp_rdpsnd": true,
  "rdp_rdrynvc": true,
  "rdp_suspend": true,
  "rdp_tsmf": true,
  "ssh_agent": true,
  "ssh_environment": true,
  "ssh_exec": true,
  "ssh_port_forwarding": true,
  "ssh_scp": true,
  "ssh_session": true,
  "ssh_shell": true,
  "ssh_sftp": true,
  "ssh_terminal": true,
  "ssh_x11": true,
  "vnc_clipcli": true,
  "vnc_clipsrv": true,
  "created_at": "2022-10-27 02:26:22.951762-07",
  "modified_at": "2022-10-27 02:26:22.951762-07",
  "last_login": "-infinity" }}
```

11.5 Modifying a safe

Request

Method	PATCH
Path	/api/v2/safe/<id>
Headers	Content-Type: Application/JSON
Body	SafeModel

Example request: Enabling the Just-in-Time feature for a safe that would wait for 5 authorized users to vote for access

Sending PATCH <https://10.0.0.0/api/v2/safe/1232678819172646915>

```
{ "required_votes": 5 }
```

Response

```
{ "result": "success" }
```

11.6 Retrieving users' time policy settings within safes

Request

Method	GET
Path	/api/v2/user/safe/time_policy

Example request

Sending GET https://10.0.0.0/api/v2/user/safe/time_policy

Response (User's time policy is declared separately for each day)

```
{
  "result": "success",
  "user_safe_time_policy": [
    {
      "id": "4602678819172646913",
```

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```

"safe_id": "4602678819172646913",
"user_id": "1232678819172646915",
"day_of_week": 2, <--- A user has access to the safe on Tuesday
"valid_from": "09:00:00", <--- User's access starts at 9:00
"valid_to": "14:00:00", <--- and ends at 14:00
"created_at": "2022-10-26 02:25:19.155648-07",
"modified_at": "2022-10-26 02:30:40.677788-07"
},
{
  "id": "4602678819172646914",
  "safe_id": "4602678819172646913",
  "user_id": "1232678819172646915",
  "day_of_week": 3, <--- A user has access to the safe on Wednesday
  "valid_from": "09:15:00", <--- User's access starts at 9:15
  "valid_to": "14:15:00", <--- and ends at 14:15
  "created_at": "2022-10-26 02:32:11.781045-07",
  "modified_at": "2022-10-26 02:32:11.781045-07"
}]]}

```

11.7 Modifying a user's time policy settings within a safe

Request

Method	PATCH
Path	/api/v2/user/safe/time_policy/<id>
Body	UserSafeTimePolicyAssignment

Example request: Changing the day of user's access to Monday

Sending PATCH https://10.0.0.0/api/v2/user/safe/time_policy/1232678819172646913

```
{ "day_of_week": 1 }
```

Response

```
{ "result": "success" }
```

11.8 Retrieving user's settings within a safe

Request

Method

GET

Path

/api/v2/user/<user_id>/safe/<safe_id>

11.9 Modifying a user within a safe

Request

Method

PATCH

Path

/api/v2/user/<user_id>/safe/<safe_id>

Body

UserSafeAssignment

Example request: Allow a user to use Secret Checkout feature and view passwords in the Access Gateway

Sending PATCH https://10.0.0.0/api/v2/user/1232678819172646914/safe/12302678819172646913

```
{"password_visible": true}
```

Response

```
{ "result": "success" }
```

11.10 Deleting a user from a safe

Request

Method

DELETE

Path

/api/v2/user/<user_id>/safe/<safe_id>

11.11 Retrieving users allowed to manage selected safe

Request

Method

GET

Path

`/api/v2/user/safe`

11.12 Granting management privileges

Request

Method

POST

Path

`/api/v2/grant/safe`

Body

```
{  
  to_user_id: 1234567890,  
  for_safe_id: 1234567891  
}
```

11.13 Retrieving account-safe-listener assignments list

Request

Method

GET

Path

`/api/v2/account/safe/listener`

11.14 Creating an account-safe-listener assignments

Request

Method

POST

Path

/api/v2/account/safe/listener

Headers

Content-Type: Application/JSON

Body

AccountSafeListenerAssignmentModel

Example request

Sending POST <https://10.0.0.0/api/v2/account/safe/listener>

```
{ "account_id": 1232678819172646919,  
  "safe_id": 1232678819172646913,  
  "listener_id": 1232678819172646914 }
```

Response

```
{ "result": "success",  
  "account_safe_listener": {} }
```

11.15 Deleting an account-safe-listener assignment

Request

Method

DELETE

Path

/api/v2/account/<account_id>/safe/<safe_id>/listener/<listener_id>

11.16 Deleting a safe

Request

Method

DELETE

Path

/api/v2/safe/<id>

Fudo Enterprise enables direct connection over the RDP protocol to a remote application using Remote Applications feature.

12.1 Data structures

Table 1: RemoteApplicationsModel

Parameter	Type	Required	Description
id	string		Read-only unique object Identifier
name	string	yes	Unique, case insensitive application name
path	string	yes	Path to application executable file
arguments	string		Definitions of which object and what property of object to use
created_at	string		Read-only
modified_at	string		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the RemoteApplicationsModel

Method

GET

Path

/api/v2/objspec/remote_app

The next chapter describes procedures for creating separate requests.

12.2 Retrieving remote applications definitions list

Request

Method

GET

Path

/api/v2/remote_app

Example request

Sending GET https://10.0.0.0/api/v2/remote_app

```
"result": "success",
"remote_app": [
  {
    "id": "1936547839769313283",
    "name": "RemoteApp1",
    "path": "/foldername/application1_executable_file",
    "created_at": "2022-12-13 02:53:32.427697-08",
    "modified_at": "2022-12-13 02:53:32.427697-08"
  },
  {
    "id": "1936547839769313284",
    "name": "RemoteApp2",
    "path": "/foldername/application2_executable_file",
    "created_at": "2022-12-13 02:53:44.722701-08",
    "modified_at": "2022-12-13 02:53:44.722701-08" }]
```

12.3 Deleting a remote application definition

Request

Method

DELETE

Path

/api/v2/remote_app/<id>

13.1 Data structures

Note: The following data structure contains **read-only** fields for retrieving session data.

Table 1: SessionsModel

Parameter	Type	Description
id	string	Object Identifier
leader_session_id	string	Object Identifier
account_id	string	Account's Identifier, which was used for connection
listener_id	string	Listener's Identifier, which was used for connection
safe_id	string	Safe's Identifier, which was used for connection
server_id	string	Server's Identifier, which was used for connection
user_id	string	User's Identifier, which was used for connection
started_at	string	Datetime of the session's start
finished_at	string	Datetime of the session's end
handled_by	string	Object Identifier
-marked_safe_by	string	
terminate_at	string	Datetime of the session's termination
dump_mode	string {all, none, raw, noraw}	Session recording options

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Table 1 – continued from previous page

Parameter	Type	Description
protocol	string{http, modbus, mysql, rdp, ssh, system, tcp, tds, telnet, tn3270, tn5250, vnc}	Used protocol for connection
source_ip	string	Source IP address
source_port	number	Port of the source IP address
destination_ip	string	Destination IP address
destination_port	number	Port of the destination IP address
paused	boolean	
retention_locked	boolean	
indexed	number	
-trusted_timestamp	string	
size	number	
reason	string	Reason of the session's termination or rejection
status	string {approved, disconnected, expired, rejected, terminated, waiting}	
active_time	number	
ml (Machine Learning)	SessionsMLModel	
pending_delete	boolean	
password_change	boolean	
checkout_forced	boolean	
created_at	string	Datetime of the record creation
modified_at	string	Datetime of the record modification
removed	boolean	
login_reason	string	Reason for user's connection
bits_per_pixel	string	Resolution options
height	string	Resolution options
width	string	Resolution options
command	string	Given command during a session
type	string	Session's type
subsystem	string	For example, <code>sftp</code>

Table 2: SessionsMLModel

Parameter	Type	Description
ml_threat_level	number	Detected threat level
ml_threat_level_min	number	Min threat level value
ml_threat_level_max	number	Max threat level value
ml_converted_at	string	Datetime of the session's processing
ml_finished_at	string	End datetime of the session's processing

Request for retrieving available attributes of the SessionsModel

Method

GET

Path

/api/v2/objspec/session

Table 3: SessionBackupAssignmentModel

Parameter	Type	Description
session_id	string	ID of the session to backup. Requires <code>backup_id": {}</code> or <code>backup_name": {}</code> .
session_ids	string-array	IDs of the sessions to backup. Requires <code>backup_id": {}</code> or <code>backup_name": {}</code> .
backup_id	string	ID of the backup target. Requires <code>session_id": {}</code> or <code>session_ids": {}</code> .
backup_name	string	Name of the backup target. Requires <code>session_id": {}</code> or <code>session_ids": {}</code> .

Request for retrieving available attributes of the SessionBackupAssignmentModel

Method

GET

Path

/api/v2/objspec/session_backup

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,

- `lt` - less than,
- `le` - less or equal,
- `gt` - greater than,
- `ge` - greater than or equal
- `blocked` - filter blocked objects,
- `!blocked` - filter unblocked objects,
- `isempty()` - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- `order`,
- `offset`,
- `limit`,
- `debug` - for showing statistics, database errors, etc,
- `total_count`,
- `reveal` - to see objects: `active`, `removed`, or `all` for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: `GET https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the Sessions objects.

13.2 Retrieving sessions list

Request

Method	GET
Path	<code>/api/v2/session</code>

13.3 Retrieving a session

Request

Method

GET

Path

/api/v2/session/<id>

Example request

Sending GET <https://10.0.0.0/api/v2/session/41234678819172646916>

```
{
  "result": "success",
  "session": {
    "id": "3927138875067084301",
    "leader_session_id": "3927138875067084301",
    "listener_id": "3927138875067073099",
    "user_id": "3927138875067072685",
    "safe_id": "3927138875067072584",
    "account_id": "3927138875067088645",
    "server_id": "3927138875067072586",
    "started_at": "2022-04-05 16:06:07.313862+02",
    "finished_at": "2022-04-05 16:07:58.65701+02",
    "dump_mode": "all",
    "protocol": "vnc",
    "source_ip": "10.2.0.0",
    "source_port": 65331,
    "destination_ip": "10.0.0.1",
    "destination_port": 5900,
    "paused": false,
    "retention_locked": false,
    "indexed": 2,
    "size": 371712,
    "status": "approved",
    "active_time": 60,
    "password_change": false,
    "checkout_forced": false,
    "created_at": "2022-04-05 16:06:07.316523+02",
    "modified_at": "2022-04-08 08:16:02.009606+02",
    "height": "768",
    "width": "1024"
  }
}
```

13.4 Modifying a session

Request

Method

PATCH

Path

/api/v2/session/<id>

13.5 Mark existing session for back up

Request

Method

POST

Path

/api/v2/session/<session_id>/backup/<backup_id>

Example request

Sending POST https://10.0.0.0/api/v2/session/2345678901234567890/backup/12345617890123456789

Request

Method

POST

Path

/api/v2/session_backup

Headers

Content-Type: Application/JSON

Body

SessionBackupAssignmentModel

Example request

Sending POST https://10.0.0.0/api/v2/session_backup

```
{
  "backup_name": "Backup_Target_Name",
  "session_ids": [
    "2345678901234567890",
    "2345678901234567891"
  ]
}
```

Response

```
{
  "result": "success",
  "session_ids": [
    "2345678901234567890",
    "2345678901234567891"
  ]
}
```


Listener determines server connection mode (proxy, gateway, transparent, bastion) as well as its specifics.

14.1 Data structures

Table 1: ListenerModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
name	string	yes	Unique listener's name
blocked	boolean; default value false	yes	
reason	string	if <code>blocked == true</code>	
announcement	string	no	
protocol	string {http, modbus, mysql, rdp, ssh, system, tcp, tds, telnet, tn3270, tn5250, vnc}	yes	Immutable
ignore_case	boolean; default value false	If <code>protocol == vnc ssh</code>	
legacy_crypto	boolean; default value false	If <code>protocol == ssh http rdp & tls_enabled == true</code>	Enabling legacy cryptographic protocols and settings
mode	string {bastion, gateway, proxy, transparent}	yes	

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Table 1 – continued from previous page

Parameter	Type	Required	Description
listen_interface	string	If mode == gateway transparent	Network interface for user connections
listen_ip	string; default value 0.0.0.0	If mode == bastion proxy	IP address for user connections
listen_port	number; value range from 1 to 60000	If mode == bastion proxy	Port number for user connections
external_address	string	with external_port	Listener address to present in Access Gateway
external_port	number; value range from 1 to 65535	with external_address	Listener port to present in Access Gateway
http_render	boolean; default value true	If protocol == http	Is graphical representation for HTTP(S) sessions enabled?
rdp	ListenerRDPAttributes	If protocol == rdp	RDP protocol properties
ssh	ListenerSSHAttributes	If protocol == ssh	SSH protocol properties
tls	ListenerTLSAttributes	If protocol == http rdp	TLS protocol properties
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Table 2: ListenerRDPAttributes

Parameter	Type	Required	Description
rdp_private_key	string	If protocol == rdp & tls_enabled == false	RDP private key
rdp_public_key	string	If protocol == rdp & tls_enabled == false	RDP public key

Table 3: ListenerSSHAttributes

Parameter	Type	Required	Description
ssh_private_key	string	yes	SSH private key
ssh_proxyjump	boolean; default value false	yes	Is SSH ProxyJump function enabled?
ssh_public_key	string	yes	Read-only SSH public key

Table 4: ListenerTLSAttributes

Parameter	Type	Required	Description
tls_enabled	boolean; default value <code>true</code>	If <code>protocol == http rdp</code>	Enabling the TLS protocol
tls_private_key	string	If <code>protocol == http rdp & tls_enabled == true</code>	TLS private key
tls_certificate	string	If <code>protocol == http rdp & tls_enabled == true</code>	TLS certificate

Request for retrieving available attributes of the ListenerModel

Method	GET
Path	<code>/api/v2/objspec/listener</code>

Table 5: AccountSafeListenerAssignmentModel

Parameter	Type	Required	Description
id	string	yes	Read-only object Identifier
account_id	string	yes	Immutable. Expects unique <code>safe_id</code> and <code>listener_id</code>
safe_id	string	yes	Immutable. Expects unique <code>account_id</code> and <code>listener_id</code>
listener_id	string	no	Immutable. Expects unique <code>account_id</code> and <code>safe_id</code>
valid_to	datetime		
created_at	datetime		Read-only
modified_at	datetime		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the AccountSafeListenerAssignment-Model

Method	GET
Path	<code>/api/v2/objspec/account_safe_listener</code>

Table 6: ListenerGrantAssignmentModel

Parameter	Type	Required	Description
id	string		Read-only, protected object Identifier
to_user_id	string	yes	Immutable. Expects unique for_listener_id
for_listener_id	string	yes	Immutable. Expects unique to_user_id
to_user_name	string		Read-only, expensive to use
for_listener_name	string		Read-only, expensive to use
created_at	string		Read-only
modified_at	string		Read-only
removed	boolean		Read-only

Request for retrieving available attributes of the ListenerGrantAssignmentModel

Method	GET
Path	/api/v2/objspec/listener_grant

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,
 - **lt** - less than,
 - **le** - less or equal,
 - **gt** - greater than,
 - **ge** - greater than or equal

- `blocked` - filter blocked objects,
- `!blocked` - filter unblocked objects,
- `isempty()` - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- `order`,
- `offset`,
- `limit`,
- `debug` - for showing statistics, database errors, etc,
- `total_count`,
- `reveal` - to see objects: `active`, `removed`, or `all` for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: GET `https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

The next chapter describes procedures for creating separate requests.

Refer to the *Batch operations* topic to create nested requests for operating on the Listener objects.

14.2 Retrieving listeners list

Request

Method	GET
Path	<code>/api/v2/listener</code>

Example request

Sending GET `https://10.0.0.0/api/v2/listener`

```

"result": "success",
"listener": [
  {
    "id": "1234138875067073217",
    "name": "rdp_list_fd_10647",
    "protocol": "rdp",
    "mode": "bastion",
    "listen_ip": "0.0.0.0",
    "listen_port": 3388,
    "blocked": false,
    "created_at": "2022-10-15 14:52:30.980597+02",
    "modified_at": "2022-10-15 14:52:30.980597+02",
    "legacy_crypto": false,
    "tls_enabled": true,
    "tls_certificate": "-----BEGIN CERTIFICATE-----\nMIIEODCCArigAwIBAgIU5GWB/C..
↵.Ow/BXGR\n-----END CERTIFICATE-----"
  },
  {
    "id": "1234138875067073219",
    "name": "telnet_proxy_3",
    "protocol": "telnet",
    "mode": "proxy",
    "listen_ip": "0.0.0.0",
    "listen_port": 2236,
    "blocked": false,
    "created_at": "2022-10-17 09:34:32.582169+02",
    "modified_at": "2022-10-17 09:34:32.582169+02"
  },
  {
    "id": "12348875067073220",
    "name": "mssql_proxy",
    "protocol": "tds",
    "mode": "proxy",
    "listen_ip": "0.0.0.0",
    "listen_port": 8874,
    "blocked": false,
    "created_at": "2022-10-17 10:50:53.209773+02",
    "modified_at": "2022-10-17 10:50:53.209773+02" }]

```

14.3 Creating a listener

Request

Method

POST

Path

/api/v2/listener

Headers

Content-Type: Application/JSON

Body

ListenerModel

14.4 Retrieving a listener

Request

Method

GET

Path

/api/v2/listener/<id>

14.5 Modifying a listener

Request

Method

PATCH

Path

/api/v2/listener/<id>

Headers

Content-Type: Application/JSON

Body

ListenerModel

Example request: Changing the listener's address

Sending PATCH <https://10.0.0.0/api/v2/listener/12345678819172646915>

```
{ "listen_ip": "10.0.2.0" }
```

Response

```
{ "result": "success" }
```

14.6 Retrieving users allowed to manage given listener

Request

Method

GET

Path

/api/v2/grant/listener

14.7 Granting management privileges

Request

Method

POST

Path

/api/v2/grant/listener

Body

```
{  
  to_user_id: 1234567890,  
  for_listener_id: 1234567891  
}
```

14.8 Creating an account-safe-listener assignments

Request

Method

POST

Path

/api/v2/account/safe/listener

Headers

Content-Type: Application/JSON

Body

AccountSafeListenerAssignmentModel

Example request

Sending POST <https://10.0.0.0/api/v2/account/safe/listener>

```
{ "account_id": 1232678819172646919,  
  "safe_id": 1232678819172646913,  
  "listener_id": 1232678819172646914 }
```

Response

```
{ "result": "success",  
  "account_safe_listener": {} }
```

14.9 Deleting an account-safe-listener assignment

Request

Method

DELETE

Path

/api/v2/account/<account_id>/safe/<safe_id>/listener/<listener_id>

14.10 Deleting a listener

Request

Method

DELETE

Path

/api/v2/listener/<id>

API v2: Batch requests

Fudo Enterprise allows using its API for sending a batch request by which an administrator can perform nested operations with different methods. Creating an account and assigning an authentication method to it or defining 100 servers in one request is possible with an endpoint `/batch`.

Note: The `/batch` endpoint is available to use on objects of API v2 only.

15.1 Data structures

Table 1: BatchModel

requests:	
id	Give your request an ID
method	Use one of the available methods per request
endpoint	Use one of the available endpoints per request
params	Include optional URL parameters
data	Include optional variables for the future responses of the previous requests

The `/batch` endpoint contains a *variables* object, which serves definition purposes for the future references for the responses.

Example (use horizontal scroll to see full comments):

```
{
  "variables": {
    "username": "jdoe",
  },
  "requests": [
```

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```

{
  "id": "123",
  "method": "POST",
  "endpoint": "/user",
  "data": {
    "name": "{username}" <---- Reference to the "username" variable
  }
},
{
  "method": "POST",
  "endpoint": "/user/{123.user.id}/authentication", <--- Reference to the response_
↳ to the previous request with an "id": "123" {<response-id>.user.id}.
  "data": {
    "type": "password",
    "position": 0,
    "secret": "test123"
  }
}
]}

```

Whereas, the response to the previous request is the following:

```

{
  "id": "123",
  "result": "success",
  "status": 200,
  "user": {
    "id": "12345678901234567",
    "name": "test"
  }
}

```

Allowed methods

GET	for reading data of an existing object; no request body is required
POST	for creating an object; requires a request body, specified in JSON format, that contains the values for properties of the object that is about to be created
PATCH	for modifying an existing object; requires a request body, specified in JSON format, that contains the values for properties of the object
DELETE	for removing an existing object; no request body is required

There is a list of **URL parameters** available for a specific method to be included within a path:

- **fields** - for including the object fields in the query,
- **filter** - narrows out the result with available additions:
 - **in** - include possible field values (separated with comma),
 - **match** - include a sequence of characters to be searched in field values,
 - **eq** - equal,
 - **ne** - not equal,
 - **lt** - less than,

- `le` - less or equal,
 - `gt` - greater than,
 - `ge` - greater than or equal
 - `blocked` - filter blocked objects,
 - `!blocked` - filter unblocked objects,
 - `isempty()` - filter objects with empty values in specified fields, only applies to arrays (e.g., `server.isnull()`),
- `order`,
 - `offset`,
 - `limit`,
 - `debug` - for showing statistics, database errors, etc,
 - `total_count`,
 - `reveal` - to see objects: `active`, `removed`, or `all` for both removed and un-removed.

An example of the request that shows a list of 10 users that have a role *user* with their *id* and *name* specified, sorted alphabetically by their names and shows a total count of users that match the given criteria: `GET https://<fudo_address>/api/v2/user?fields=id,name&filter=role.eq(user)&order=name&limit=10&total_count`

Possible responses

Code	Status	
200	success	OK
201	success	CREATED
400	failure	BAD REQUEST; message examples: Unrecognized endpoint, Request body is not allowed for this endpoint
401	failure	UNAUTHORIZED
404	failure	BAD REQUEST; message example: Object not found

15.2 Creating a batch operation

Request

Method	POST
Path	/api/v2/batch
Headers	Content-Type: Application/JSON
Body	BatchModel

Example of a batch operation that contains 4 requests:

- **request0** returns a list of users' IDs and names, where the user's **name** == **test**,
- **request1** deletes the first user that was on the list of the **request0**'s response,
- **request2** creates a new user with **name** of the first user from the **request0**'s response and assigns a role **user** to it,
- **request3** assigns **password** as an authentication method for the user that was created in the **request2**

Example request

```
{
  "requests": [
    {
      "id": "request0",
      "method": "GET",
      "endpoint": "/user",
      "params": {
        "filter": "name.eq(test)",
        "fields": "id,name"
      }
    },
    {
      "id": "request1",
      "method": "DELETE",
      "endpoint": "/user/{request0.user[0].id}",
      "params": {
        "fields": "name"
      }
    },
    {
      "id": "request2",
      "method": "POST",
      "endpoint": "/user",
      "data": {
        "name": "{request0.user[0].name}",
        "role": "user"
      }
    }
  ],
}
```

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```
{
  "id": "request3",
  "method": "POST",
  "endpoint": "/user/{request2.user.id}/authentication",
  "params": {
    "fields": "user_id"
  },
  "data": {
    "type": "password",
    "position": 0,
    "secret": "abcd.8"
  }
}
]]
```

Response

```
{
  "result": "success",
  "responses": [
    {
      "id": "request0",
      "result": "success",
      "status": 200,
      "user": [
        {
          "id": "2179742219647320079",
          "name": "test"
        }
      ]
    },
    {
      "id": "request1",
      "result": "success",
      "status": 200
    },
    {
      "id": "request2",
      "result": "success",
      "status": 201,
      "user": {
        "id": "2179742219647320080"
      }
    },
    {
      "id": "request3",
      "result": "success",
      "status": 201,
      "user_authentication_method": {
        "user_id": "2179742219647320080"
      }
    }
  ]
}
]]
```

Fudo Enterprise allows retrieving network settings within its API.

Note: Network settings are accessible for the users with `superadmin` privileges.

16.1 Data structures

Table 1: NetworkModel

Parameter	Type	Description
hostname	string	
dns	address	DNS address(es)
management	address	Admin Panel's address
access_gateway	address	Access Gateway's address
labels	string	Global configuration parameters
interfaces		Network interfaces configuration
	name	
	ether	
	active {true, false}	
	use_dhcp {true, false}	
	routing_table	
	inet	
routing		Routing configuration
	tables_max_count	Max number of the routing tables is 8
	tables {table[id]}	ID of the routing table
	routes {network, gateway}	Network and gateway addresses

16.2 Retrieving network settings

Request

Method

GET

Path

`/api/v2/network`

CHAPTER 17

API usage examples

Refer to the particular object page to see actual examples.
Inform us if more examples is needed.