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Webinar

Zabbix API

all our microphones are muted
ask your questions in Q&A, not in the Chat
use Chat for discussion, networking or applause

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Introduction

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Tasks

- A datacenter was built a month ago and you need to add all new devices to Zabbix.
- In order to increase the availability of business critical systems, you need to integrate Zabbix with an Incident Management System.
- The manager asked to send a report on the availability of key systems every day at 8 am.
- In order to minimize manual work, you decided to create maintenance modes for network hosts automatically.
- You need to compare the Host list in some CMDB and the Host list in Zabbix DB.
- You need to create thousands hosts and items in Zabbix.
- You need to fix $ 1 in all templates.

….. And more.

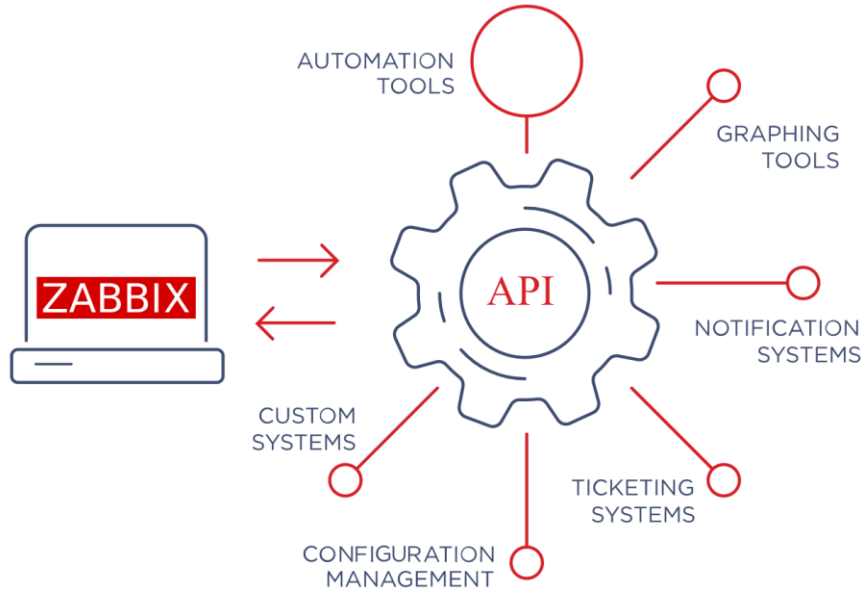
ZABBIX API

Solution

ZABBIX comes with an API that provides access to almost all functions available in Zabbix.

Existence of a Zabbix API opens up a lot of opportunities for even greater efficiency in monitoring:

- easy two-way integration: set up a two-way integration with popular issue-tracking systems;
- third party software: integrate Zabbix with third party software like automation and graphing tools, notification and ticketing systems, configuration management, etc.
- configuration management: integrate configuration management systems with Zabbix API to add, remove or upgrade hardware or software easily;
- data retrieval: re-use information about organization's environment in other applications;
- mobile applications: create new applications to work with Zabbix.



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What is Zabbix API?

ZABBIX API

What is Zabbix API?

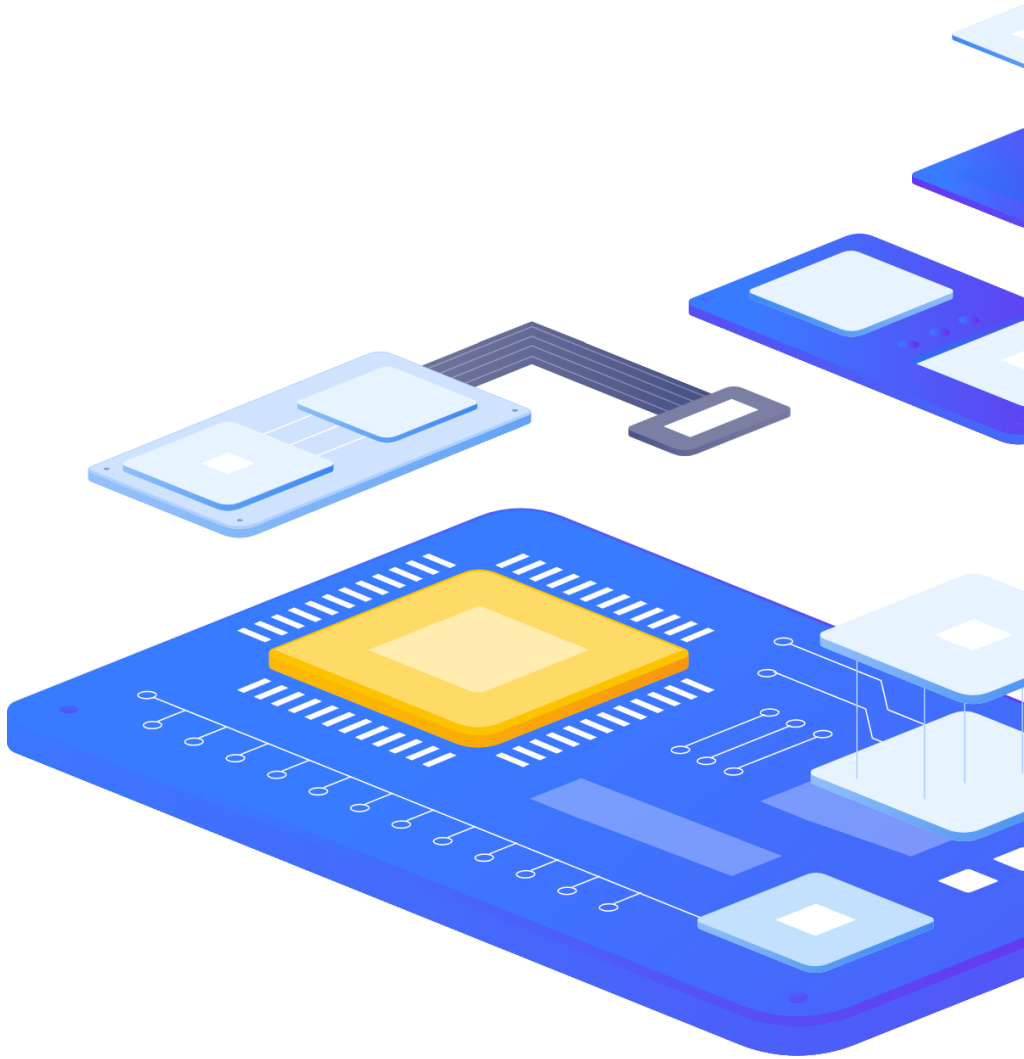
Interface is based on web server

Uses JSON RPC v2.0 specification:

- API consists of a set of separate methods
- requests and responses are encoded using JSON

Examples:

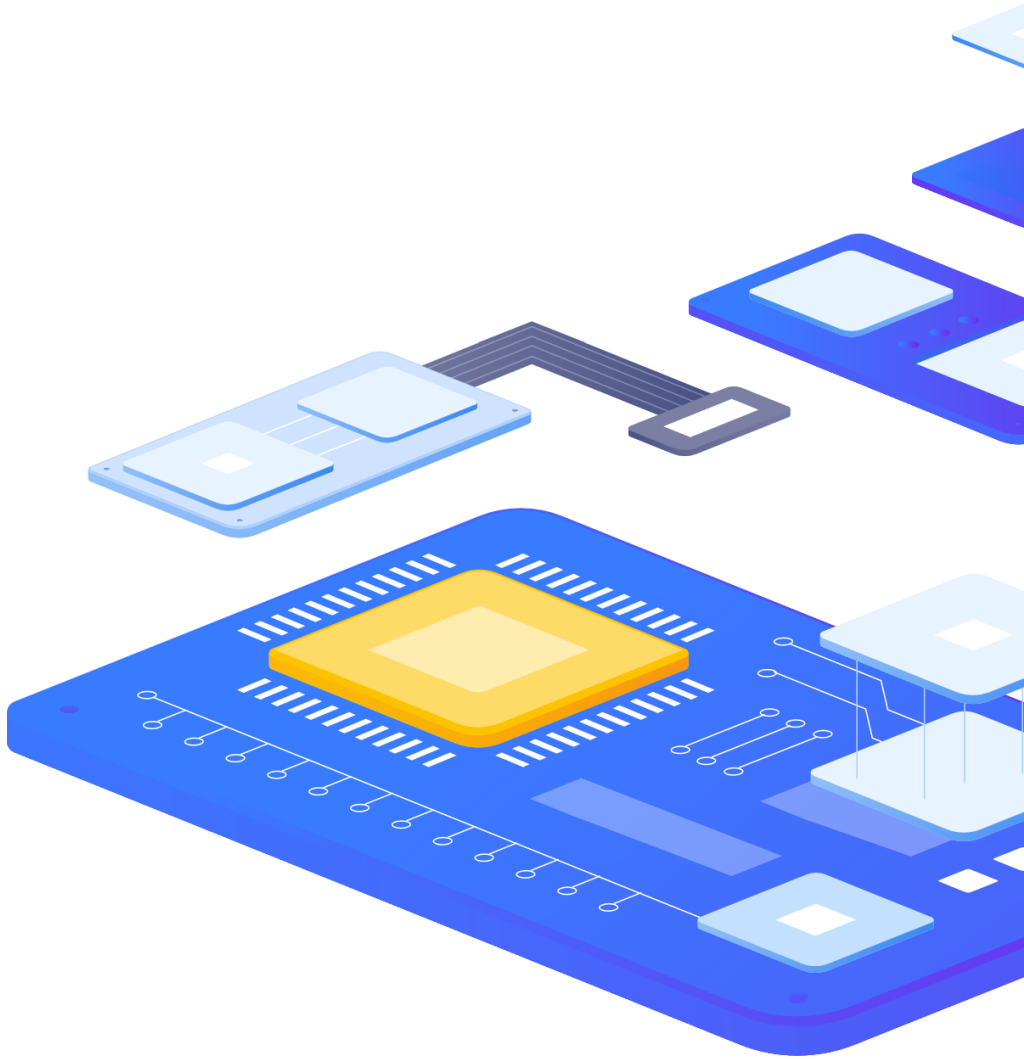
- **host.create** - creates a new host
- **history.get** - retrieves history data
- **item.update** - updates existing items



ZABBIX API

What is Zabbix API?

- More than 230 different methods
- Each of the methods performs one specific task



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Structure of Zabbix API

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Structure of Zabbix API

Zabbix API is made of 3 building blocks: JSON, JSON-RPC and transport (e.g. HTTP)

- JSON is a simple format used to send and receive data
- JSON-RPC is a remote procedure call protocol encoded in JSON. JSON-RPC builds on top of JSON by adding a few standard keys to track requests
- The transport provides a real-time connection to API. The request/response/error is carried in the body of the HTTP message. HTTP is a stateless protocol: not persisting sessions between requests

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Structure of Zabbix API

API request must contain certain properties:

- jsonrpc - version of the JSON-RPC protocol (must be 2.0)
- method - name of the method to be invoked
- params - Object or Array of values to be passed as parameters
- id - value used to match the response with the request that it is replying to (must be a number)
- auth - user authentication token or null

```
{
        "jsonrpc": "2.0",
        "method": "user.login",
        "params": {
                "username": "Admin",
                "password": "zabbix"
        },
        "id": 1,
        "auth": null
}
```

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Structure of Zabbix API

You will get either a response with a result, or an error if the request was unsuccessful

- The response object contains the following properties:
- jsonrpc - version of the JSON-RPC protocol
- result - the data returned by the method
- id - identifier of the corresponding request

```
{
        "jsonrpc":"2.0",
        "result":"2f2ec4720863281c34cdd3c4c8a5de46",
        "id":1
}
```

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Structure of Zabbix API

When rpc call encounters an error, the response contains the following properties:

- code - number that indicates the error type that occurred
- message - string providing a short description of the error
- data - value that contains additional information about the error


```
{
        "jsonrpc":"2.0",
        "error":{
                "code":-32602,
                "message":"Invalid params.",
                "data":"Invalid parameter \"/\": unexpected parameter \"userr\"."
                },
        "id":1
}
```

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Structure of Zabbix API

The rpc call error codes:

- -32700 - invalid JSON. An error occurred on the server while parsing the JSON text (typo, wrong quotes, etc.)
- -32600 - received JSON is not a valid JSON-RPC Request
- -32601 - requested remote-procedure does not exist
- -32602 - invalid method parameters
- -32603 - Internal JSON-RPC error
- -32400 - System error
- -32300 - Transport error
- -32500 - Application error

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How does API work?

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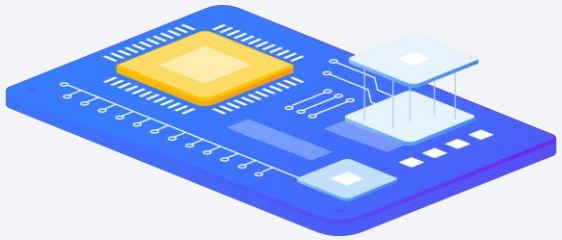
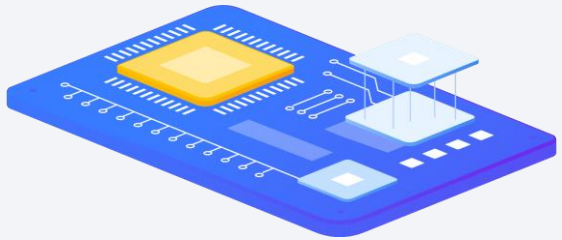
How does API work?



API Client

Authentication



API Server

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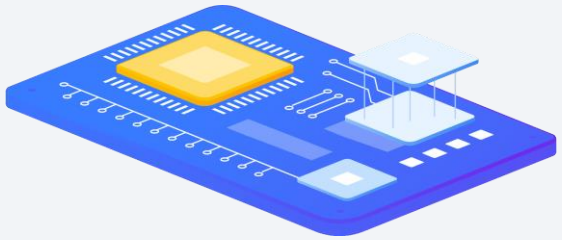
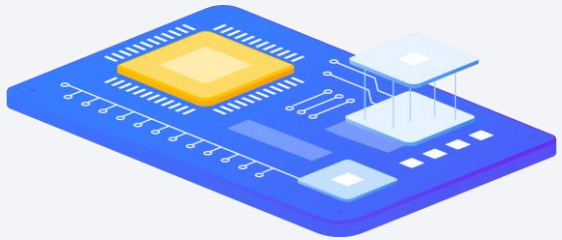
How does API work?



API Client

Authentication

ID sessions



API Server

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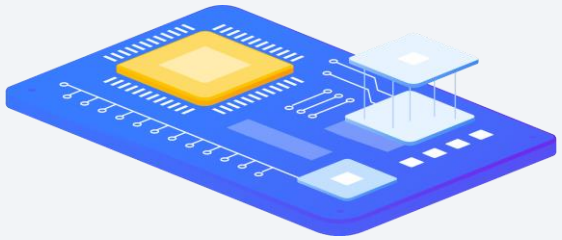
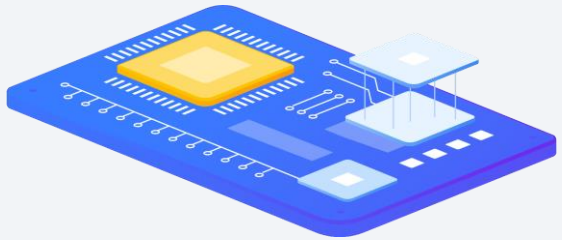


API Client

Authentication

ID sessions

Method A



API Server

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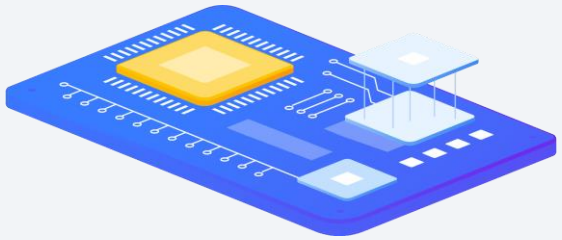
How does API work?



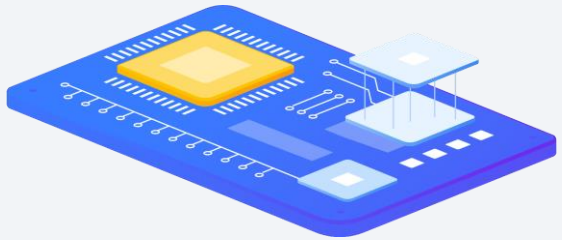
API Client

Authentication

ID sessions

Method A

Result A



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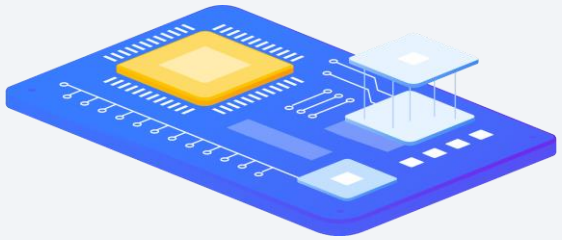


API Client

Authentication

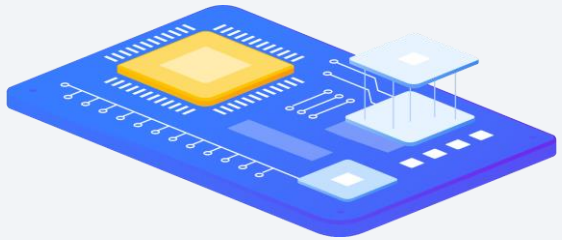
ID sessions

Method A

Result A

Method B

Result B



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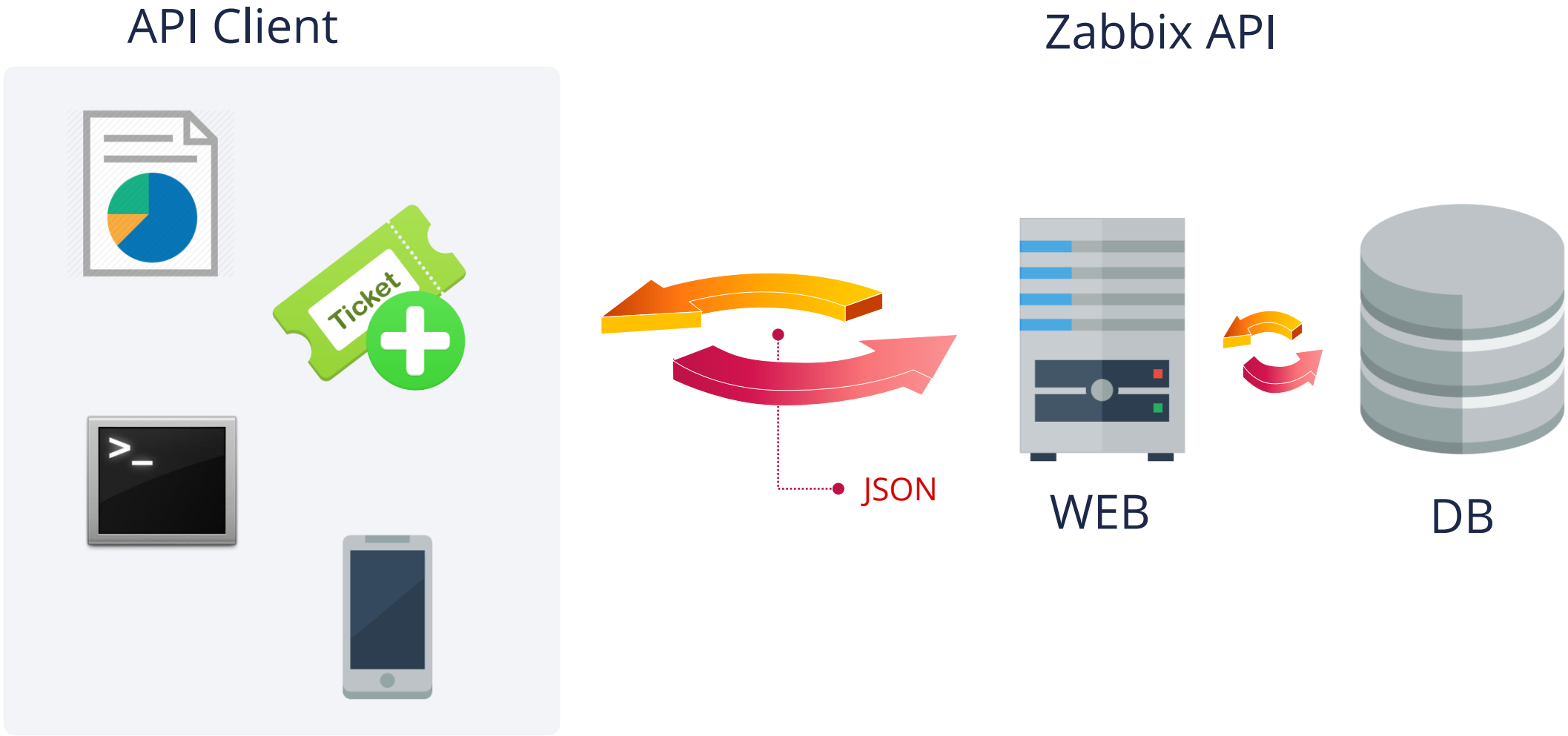
How does API work?

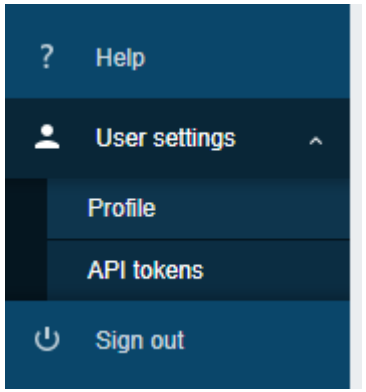


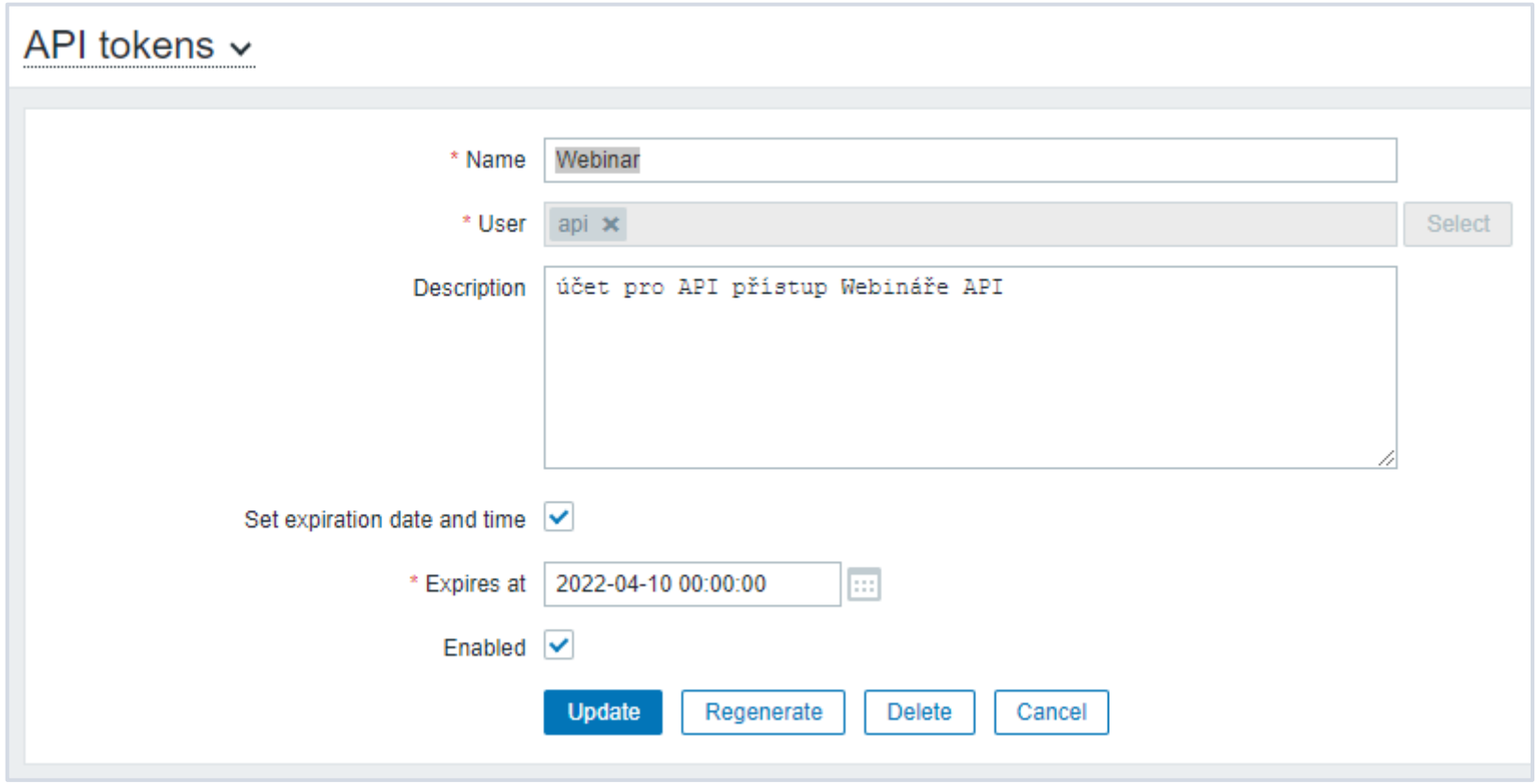
INTRODUCTION

API Tokens

User based API Tokens

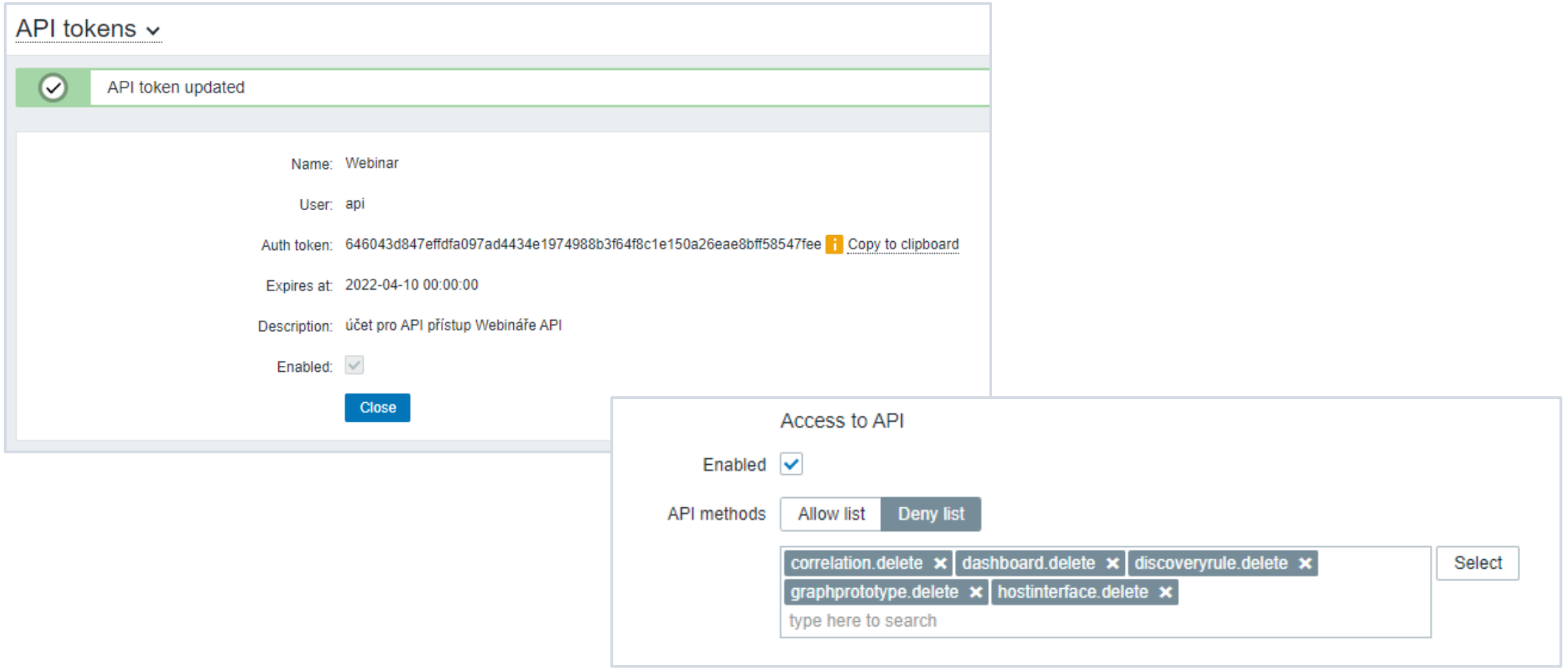
- Expiration Time
- User and Global managed
- Available from 5.4 version





INTRODUCTION

API Tokens and User Role Restrictions



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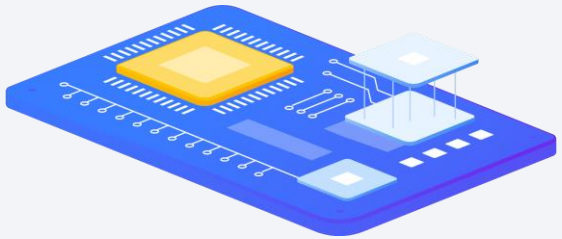
How does API work?



API Client

with API Token:

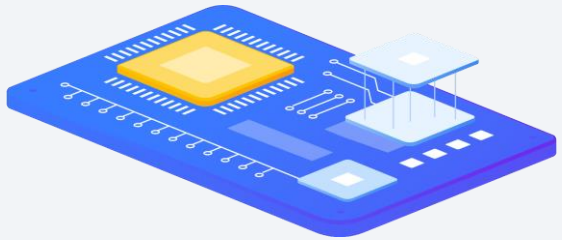
7ecc990488f71a5a48eeeb14b7b281f7c4b1738e2169d411efe

Method A

Result A

Method B

Result B



API Server

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API connection examples

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Zabbix API

Various programming or scripting languages :

- Use programming language you are familiar with
- Control workflow using built-in operands
- Some programming languages have Zabbix API plugins – community based, not supported by Zabbix

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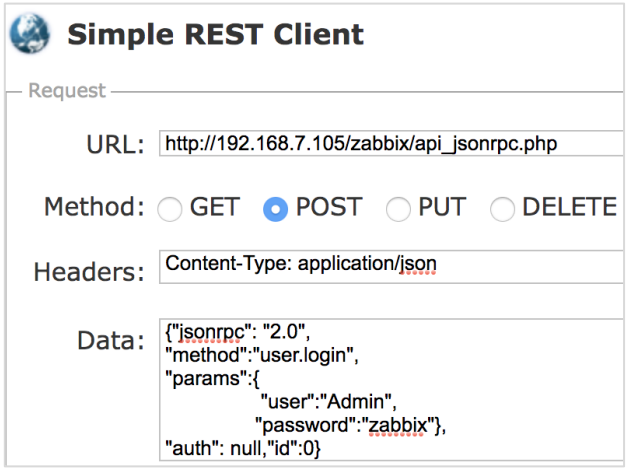
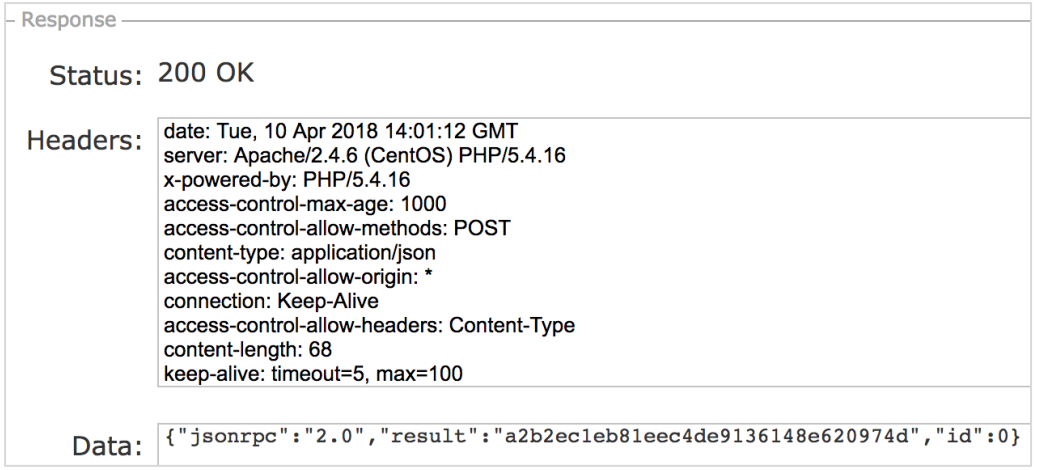
Zabbix API - Option 1. By using a client

Simple REST Client:



Response:



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Zabbix API - Option 2. From command line

Request via curl:

```
$ curl -i -X POST -H 'Content-
Type:application/json' -d'
{"jsonrpc": "2.0",
"method":"user.login",
"params":{
                "user":"Admin",
          "password":"zabbix"},
"auth": null,"id":0}
' http://127.0.0.1/zabbix/api_jsonrpc.php
```

Authentication

Credentials

URL including host, port and API path

Response:

```
HTTP/1.1 200 OK
Date: Wed, 11 Nov 2015 09:32:41 GMT
Server: Apache/2.2.15 (CentOS)
X-Powered-By: PHP/5.3.3
Access-Control-Allow-Origin: *
Access-Control-Allow-Headers: Content-Type
Access-Control-Allow-Methods: POST
Access-Control-Max-Age: 1000
Content-Length: 68
Connection: close
Content-Type: application/json

{"jsonrpc":"2.0",
"result":"2f2ec4720863281c34cdd3c4c8a5de46","id":
0}
```

Response including session ID

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Zabbix API - Option 2. From command line

Request via curl:

```
$ curl -i -X POST -H 'Content-Type:
application/json' -d '
{"jsonrpc":"2.0",
   "method":"host.get",
   "params":{
      "filter":{
         "host":"Zabbix server"
      }
   },

"auth":"2f2ec4720863281c34cdd3c4c8a5de46",
   "id":1}
' http://127.0.0.1/zabbix/api_jsonrpc.php
```

Response:

```
{
   "jsonrpc":"2.0",
   "result":[
      {
         "hostid":"10126",
         "proxy_hostid":"0",
         "host":"Zabbix server",
         "status":"0",
         "disable_until":"0",
         ...
         "name":"Zabbix server",
         "flags":"0",
         "templateid":"0",
         "description":""
      }
   ],
   "id":1
}
```

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Filtering - Option 2. From command line

Use "filter" to return only those results that exactly match the given filter

Use "output" parameter to query specific object property:

Request via curl:

```
$ curl -X POST -H 'Content-Type:
application/json' -d'
{"jsonrpc":"2.0",
  "method":"host.get",
  "params":{
      "filter":{
         "host":"Zabbix server"
      },
      "output": "hostid"
  },
  "auth":"2f2ec4720863281c34cdd3c4c8a5de46",
  "id":1}
' http://192.168.7.105/zabbix/api_jsonrpc.php
```

Response:

```
{
   "jsonrpc":"2.0",
   "result":[
         {"hostid":"10084"}
   ],
   "id":1
}
```

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Filtering - Option 2. From command line

- **Parameters accept arrays (begins with [and ends with]):**

```
$ curl -X POST -H 'Content-Type: application/json' -d'
{"jsonrpc":"2.0",
  "method":"host.get",
  "params":{
      "filter":{
         "host": [
              "Zabbix server",
              "MySQL 01"
          ]
      },
      "output": [
              "hostid",
              "status"
      ]
  },
  "auth":"2f2ec4720863281c34cdd3c4c8a5de46",
  "id":1}
' http://192.168.7.105/zabbix/api_jsonrpc.php
```

Response:

```
{
   "jsonrpc":"2.0",
   "result":[

{"hostid":"10084","status":"0"},

{"hostid":"10627","status":"1"}
   ],
   "id":1
}
```

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Zabbix API – Option 3. From Python

```
Install PyZabbix Python library using pip:
# yum install python-pip
# pip install pyzabbix
```

```
Get auth & host via custom script:
#!/usr/bin/env python
from pyzabbix import ZabbixAPI

zapi = ZabbixAPI("http://127.0.0.1/zabbix")
zapi.login(”Admin", "z@hg*1aD")

result = zapi.host.get(filter={"host" : "Zabbix
server"})
for h in result:
        for key in sorted(h):
                print "%s: %s " % (key, h[key])
```

```
$ ./host_get.py
available: 1
description:
disable_until: 0
error:
errors_from: 0
flags: 0
host: Zabbix server
hostid: 10126
...
snmp_available: 0
snmp_disable_until: 0
snmp_error:
snmp_errors_from: 0
status: 0
templateid: 0
```

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Zabbix API – Option 4. From Powershell

```
For ($i=1; $i -le 1000; $i++) {
    $host_str = "TEST_API_" + $i;
    $item = "Test_item." + $i;
    $JsonItem ='{"jsonrpc": "2.0",
        "method": "host.create",
        "params": { "host": "' + $host_str +'",
                "groups": [ { "groupid": "19" } ] },
        "auth": "' + $auth + '",
        "id": 1}'

Invoke-RestMethod $ZabbixServer -ContentType "application/json-rpc; charset=utf-8" -Method Post
-Body ([System.Text.Encoding]::UTF8.GetBytes($jsonItem))
```

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Zabbix API – Option 5. From Javascript

```
var request = new HttpRequest(),
auth = "",
params = JSON.parse(value),
fields = {};
//Parse input params
apiToken = params.apiToken;
hostName = params.hostName;
Zabbix_URL = params.URL + "/api_jsonrpc.php";
hostID = params.ID;
json_request = '{ "jsonrpc": "2.0", "method": "hostinterface.get", \
          "params": { "hostids":"' + hostId + '", "output": "extend", \
          "filter" :{ "main":"1","type":"1"}\
        }, "auth": "' + apiToken +'", "id": 1 }';
iface_result =  request.post(Zabbix_URL,json_request);

return iface_Result;
```

Zabbix API

Response:


```
{
   "jsonrpc":"2.0",
   "result":[
      {
         "hostid":"10084",
         "proxy_hostid":"0",
         "host":"Zabbix server",
         "status":"0",
         "available":"1",
         ...
         "name":"Zabbix server",
         "flags":"0",
         "templateid":"0",
         "description":""
      }
   ],
   "id":1
}
```


What does "status: 0" or "available: 1" mean?

Use API Documentation:

status	integer	Status and function of the host. Possible values are: 0 - *(default)* monitored host; 1 - unmonitored host.

available	integer	*(readonly)* Availability of Zabbix agent. Possible values are: 0 - *(default)* unknown; 1 - available; 2 - unavailable.

5

API features

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API vs DATABASE

Getting host from a database.

- In SQL, it would look like this:
- SELECT * FROM hosts WHERE host = 'Zabbix server'\G

Great, but what should I use? API!

```
hostid: 10084
proxy_hostid: NULL
host: Zabbix server
status: 0
disable_until: 0
error:
available: 1
errors_from: 0
lastaccess: 0
ipmi_authtype: -1
ipmi_privilege: 2
ipmi_username:
jmx_disable_until: 0
jmx_available: 0
jmx_errors_from: 0
jmx_error:
…
name: Zabbix server
proxy_address:
```

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ZABBIX API security

SSL

Password authentication, API Keys

Respects permissions

Audit

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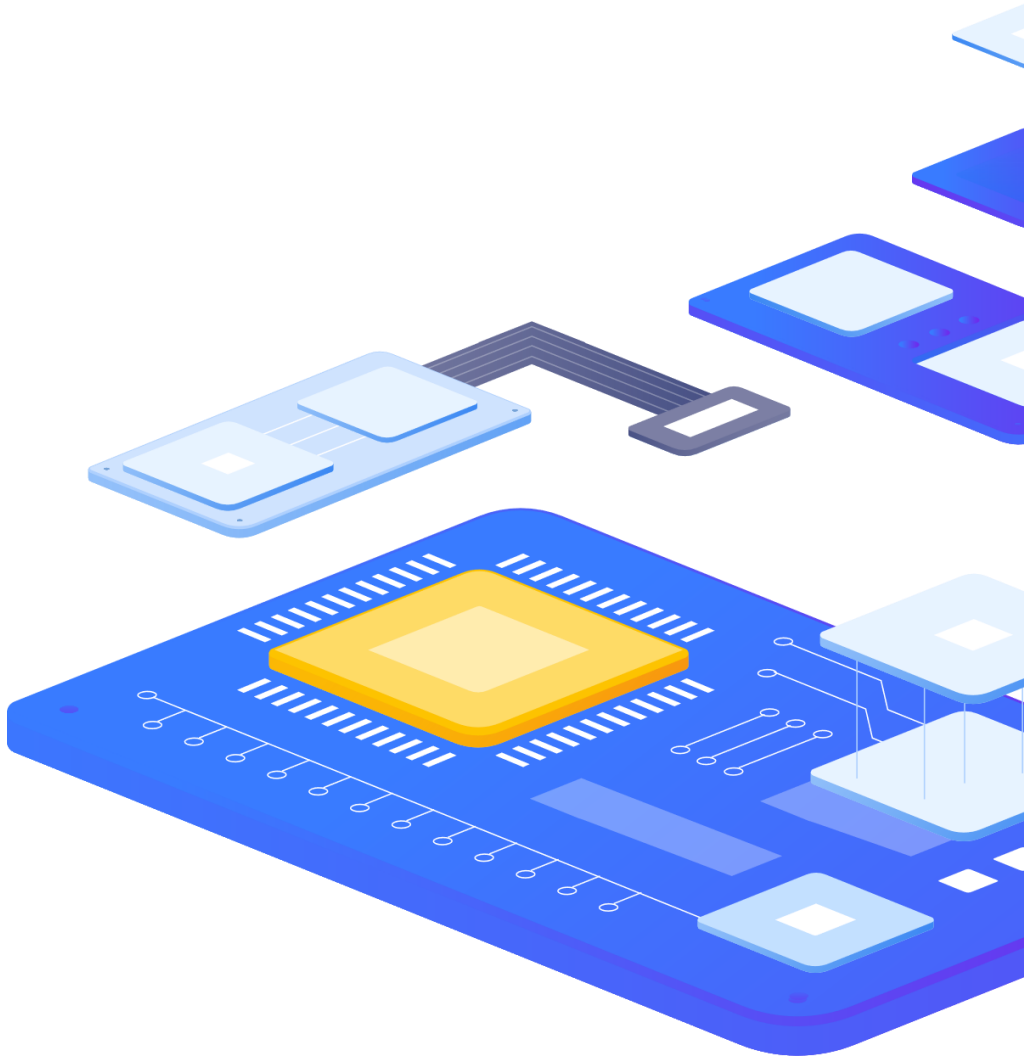
Zabbix API security

- Backward compatibility
- Rollback operation in case of an error



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WHY UPGRADE

ZABBIX API Performance

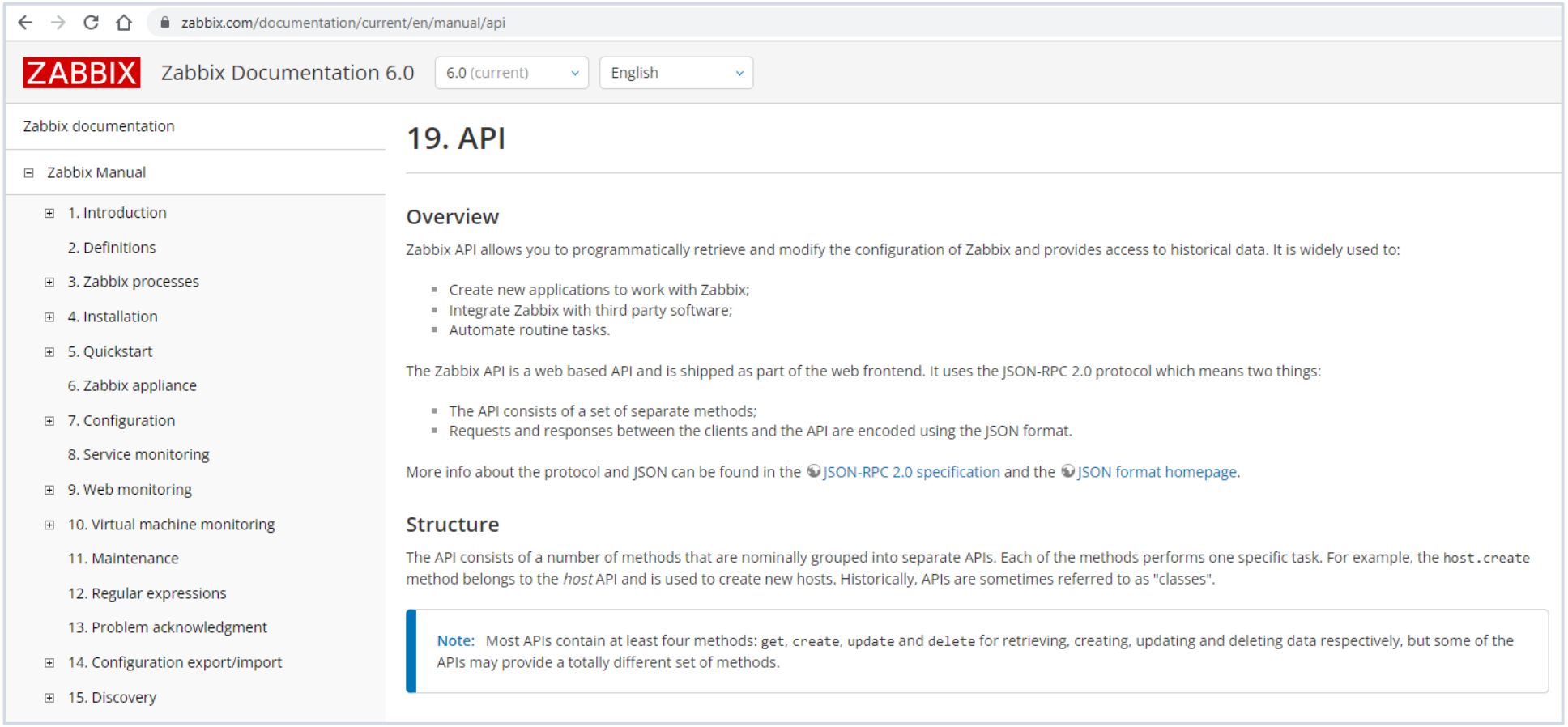
- DB performance issues
- Heavy requests / huge number of objects
- Old Zabbix version

ZABBIX API

Documentation

https://www.zabbix.com/manuals

Full list of API methods is available in ZABBIX documentation



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Questions?

ZABBIX API

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