

## **CLEARPASS RESTAPI**



# REST API INTRODUCTION



### Cont...

- ClearPass 6.5 introduced a set of REST APIs for use with several Guest related functions.
- In ClearPass 6.6, a large number of Policy Manager APIs had been exposed.
- In ClearPass 6.7, the number of APIs had further been increased to lot of Guest and Policy Manager entities.

# Other Supported HTTP APIs

- **♦ SOAP**
- \* XML-RPC
- \* Tips-Api (basic XML api and can be used only with Policy Manager)

HTTP APIs - Basic work flow.

- API Authentication
- URL Location
- **⋄** HTTP Method
- ❖ API Payload / Content.

# OAuth (Open Standard for Authorization)



### OAuth2

- OAuth is an authorization protocol that deals with the authorization of third-party applications or website to access data from resource provider (ClearPass).
- Works over http(s) and authorizes applications based on Access Token.
- Once an application has an access token, it can access the various APIs serviced by the resource provider.

### OAuth2 - Roles.

- Resource Owner (User/Person)
- Resource Server (ClearPass)
- Client Application
- Authorization Server (ClearPass)

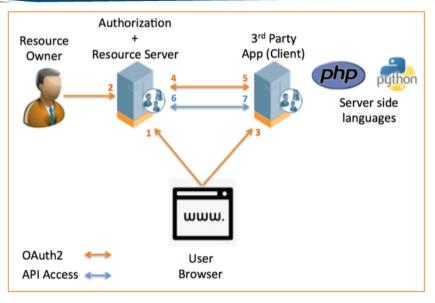
## OAuth2 - Grant Types

- **❖ Authorization Code** − Web application with server side coding.
- ❖ Implicit Client side web and mobile apps.
- \* Password (Resource Owner Password) Official web and mobile apps.
- **❖ Client Credentials** − Meant to be used with application code.

Client ID and Secret.

You will receive a Client ID and Client Secret after registering your App with the resource provider.

#### **Grant - Authorization Code**



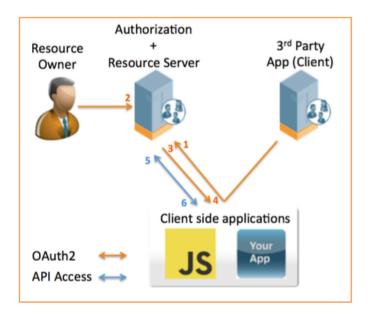
Client ID and Client Secret should be obtained from resource provider (Ex: Facebook/ClearPass)

 $\underline{https://login.fbxxx.com/oauth?response\_type=code\&client\_id=xxx\&redirect\_uri=xxx\&scope=<email>$ 

https://test\_cppm.com/oauth/callback?code=xxx

https://api.fbxxx.com/oauth/token?grant\_type=authorization\_code&code=xxx&client\_id=xxx&client\_secret=xxx&redirect\_uri=xxx

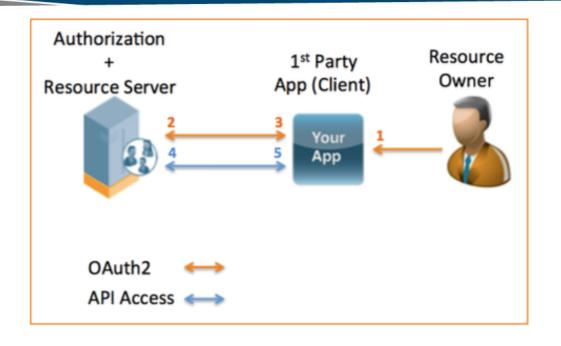
# Grant - Implicit



https://login.xyz.com/oauth?response\_type=token&client\_id=xxx&redirect\_uri=xxx&scope=<email>

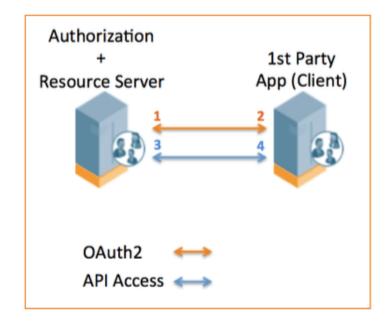
https://test\_cppm.com/oauth/callback?token=xxx

### Grant – Password



POST https://test.cppm.com/api/oauth?grant\_type=password&username=xxx&password=xxx&client\_id=xxx

## **Grant – Client Credentials**



POST https://test.cppm.com/api/oauth?grant\_type=client\_credentials&client\_id=xxx&client\_secret=xxx

# REST API HTTP METHODS



### **HTTP Methods**

- \* HTTP GET Get/download a web page form a server.
- \* HTTP POST Fill a form in web page and submit to a server (ClearPass).
- ❖ HTTP PUT Replace an object on the server.
- ❖ HTTP PATCH Update an object on the server.
- \* HTTP DELETE Delete and object on the server.

# HTTP Methods (Cont..)

<b>Guest Users</b>	HTTP Method	Intention
/api/guest	GET	Get a list of guest accounts
/api/guest/{guest_id}	GET	Get a guest account (identified by {guest_id})
/api/guest	POST	Create a new guest account(s)
/api/guest/{guest_id}	PUT	Replace a guest account (identified by {guest_id})
/api/guest/{guest_id}	PATCH	Update some fields of a guest account (identified by {guest_id})
/api/guest/{guest_id}	DELETE	Delete a guest account (identified by {guest_id})

# REST API PAYLOAD/CONTENT



## API Payload/Content

The API content needs to be presented in a format that can be understood by the API server (ClearPass). Some of the more common formats (Content-Type) supported by APIs are:

- JSON (application/json)
- XML (application/xml)
- Form Encoded (application/x-www-form-urlencoded)
- Plain Text (text/plain)

The Content-Type should be included in the HTTP header, so the API server will know what format you are sending in the API payload.

ClearPass REST APIs are designed to accept the JSON Content-Type in the HTTP body to submit API calls.

# JSON (JavaScript Object Notation).

JSON is a minimal readable format for structuring data and used to transmit data between a server and web application.

JSON data is written as key/value pairs.

**Key:** String enclosed in quotation.

**Value:** Value can be a string, integer, Boolean, array or object.

**Key/Value Pair** - follows a syntax with the key followed by a colon followed by the value.

```
Sample Syntax :
1: "Username" : "saran"
2: "attributes": { "Location": "IND", "Username": "saran", "Device Name": "Saran's IOS" }
```

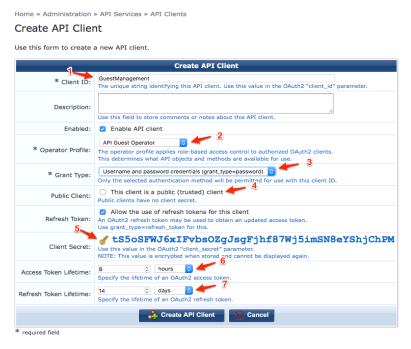
# **CLEARPASS CONFIGURATION**



## STEP 1 - Creating API Client

#### The first step is to create/register a new API client in the ClearPass Server.

Navigation: ClearPass Guest → Administration → API Service → API Clients → Create API Client.



#### Cont..

Home » Administration » API Services » API Clients

#### Create API Client

Use this form to create a new API client.



<sup>\*</sup> required field

#### Cont...

- ❖ Operator Profile Defines the class of user and privileges in ClearPass server.
- ❖ Grant Type Had been discussed previously in OAuth2 overview.
- Public Client App doesn't need to present the client secret in the OAuth2 authorization request.
- Refresh Token Allows an App to recover short lived access token.
- Access Token Lifetime
- Refresh Token Lifetime

## Cont...

	Operator Pro	file Editor
* Name:	API Guest Operator Enter a name for this operator profile.	
Description:	Operators with this profile can use the API to manage guest accounts.  Comments or descriptive text about the operator profile.	
Access hese options control of	what operators with this profile are permitted to do.	
Enabled:	☑ Allow operator logins If unchecked, operators with this profile will not be able to log in.	
	Operator Privileges  Administrator	No Access 0
	Select operator permissions for system administration and mani Advertising Services Select operator permissions for managing advertising content a	No Access
	AirGroup Services Select operator permissions for access to AirGroup services.	No Access
	API Services  Select operator permissions for API access and management.	Custom
	Allow API Access Operators with this privilege are permitted to make API calls	No Access
	Configure SOAP Web Services (Legacy) Operators with this privilege can change system settings for	○ No Access ③ Read Only ○ Full r SOAP web services.
	△ List SOAP Web Services (Legacy)  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with this privilege can browse the available SOAP  Operators with the soap can be considered to the soap can be	No Access Read Only Full web services and access the service definitions (WSDL).
	Manage API Clients Operators with this privilege may view and manage API clients	No Access Read Only Full ents (OAuth2 authentication).
	SOAP API (Legacy)  Operators with this privilege can use SOAP web services to	○ No Access ○ Read Only ● Full perform system functions. Additional privileges are also required, depending on the Al
	XMLRPC API (Legacy) Operators with this privilege can access system functions the	No Access Allow Access  No MIN Access Allow Access  No Access Allow Access  No Access Allow Access  No Access Allow Access
	Suest Manager	Custom
	Select operator permissions for managing guest users for a net	work.
	△ Active Sessions  Operators with the Active Sessions privilege may disconnect	No Access Read Only Full
	Active Sessions History	No Access

Navigation: ClearPass Guest → Administrator → Operator Logins → Profiles

Home » Administration » Operator Logins » Profiles

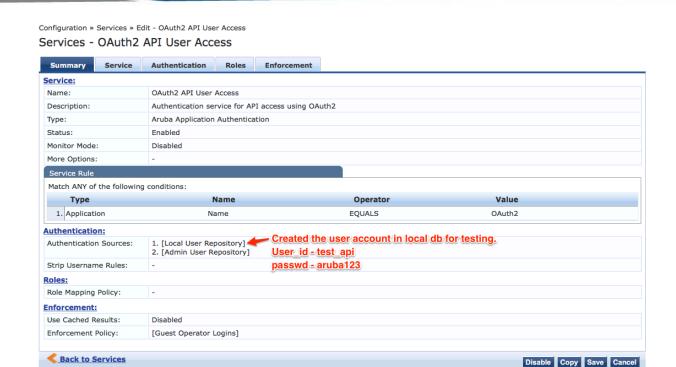
## Step 2 – Verify User Account

Create a new service to authentication the OAuth2 authorization request, as the grant type is "Password".

Use the ClearPass Policy Manager built in wizard to create a new service for API user authentication.

Configuration » Start Here Navigation: Clear To configure a Service and related policies using the full wizard, go here. Aruba Auto Sign-On Service template for accessing SAML based single sign-on enabled applications using network authenticated identity Certificate/Two-factor Authentication for ClearPass Application Login To use certificate or two-factor authentication to allow access to ClearPass applications. ClearPass Admin Access (Active Directory) Service template for access to ClearPass Policy Manager administration console (Active Directory users). ClearPass Admin SSO Login (SAML SP Service) SAML-based Single Sign-On (SSO) access to ClearPass Policy Manager, Insight, Guest and Operator screens via external Identity Provider. ClearPass Identity Provider (SAML IdP Service) Service template to provide a SAML based single sign-on service that can be used by other applications. OAuth2 API User Access < Service template for API clients authenticating with username and password (OAuth2 grant type "password")

#### Cont..



Note: The "OAuth2 API User Access" service is not required for the Grant Type – Client Credentials

## Step 3 – Test API Authorization.

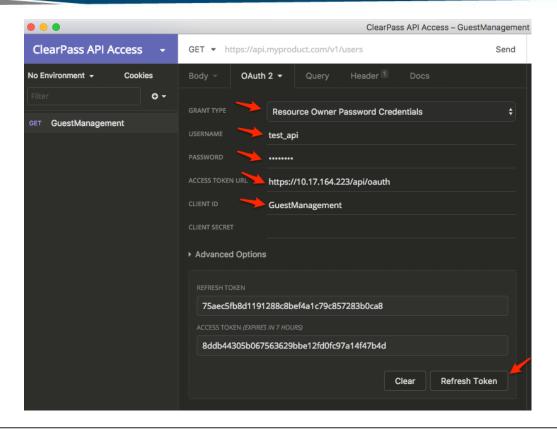
#### **URL Location - /api/oauth/**

#### Ex: https://<ClearPass\_ip/hostname>/api/oauth/

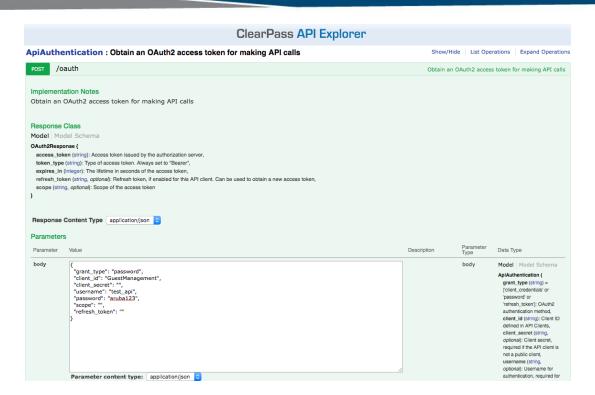
```
curl -X POST "https://10.17.164.223/api/oauth"; \
-H "Content-Type: application/json" \
-d $'{"grant_type": "password", "username": "test_api", "password": "aruba123", "client_id":
"GuestManagement"}' \
-m 30 \
-v \
-k

{"access_token":"1dad233e63c29d7e203e0207f51d1cbe76e205c3","expires_in":28800,"token_type":"Bearer","scope":null,"refresh_token":"454b169e2d43d1640fcc4ce4c4cde00e58254701"}
```

## Cont...



#### Cont..

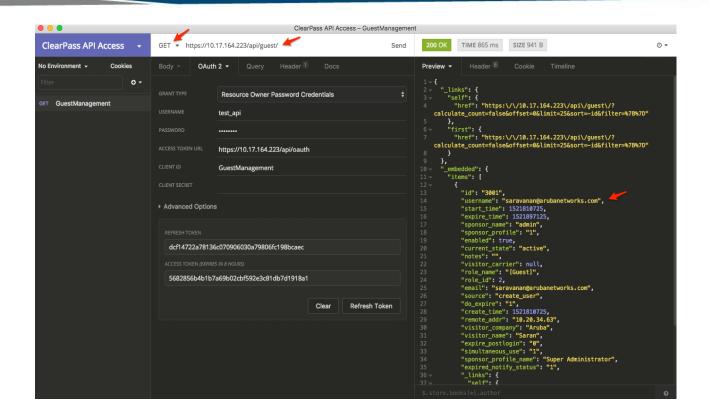




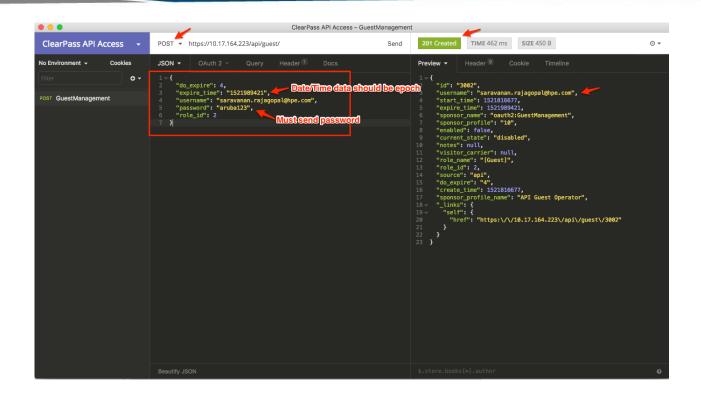
# GUEST ACCOUNT GET AND POST SAMPLES



#### **GET**



#### **POST**



#### **HTTP Status Codes**

#### **Common Error/Status Codes (HTTP)**

- 201 Created
- 401 Unauthorized
- 403 Forbidden
- **406** Not Acceptable
- ❖ 415 Unsupported Media Type
- **422** Unprocessable Entity

{"type":"http://www.w3.org/Protocols/rfc2616/rfc2616- sec10.html","title":"invalid\_client","status":400,"detail":"This client is invalid or must authenticate using a client secret"}

{"type":"http://www.w3.org/Protocols/rfc2616/rfc2616- sec10.html","title":"Forbidden","status":403,"detail":"Client does not have \u2018Allow API Access\u2019 privilege"}

{"type":"http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html", "title":"Not Acceptable", "status":406, "detail":"Cannot honor Accept type specified"}

# LIVE DEMO AND DEBUGGING



# API Explorer – Testing and Debugging

#### Please make use of built-in API explorer in ClearPass for testing and debugging.

Navigation: ClearPass Guest → Administration → API Services → API Clients → API Explorer.

or ClearPass Guest → Administration → API Services → API Explorer.

ClearPass API Explorer				
API	Services	Version		
ApiFramework	ApiAuthentication, ApiClient	v1		
Authentication	AuthMethod	v1		
Certificates	CertSignRequest, CertTrustList, CertTrustListDetails, SelfSignedCert, ServerCert, ServiceCert	v1		
Dictionaries	Attribute, ContextServerAction, Fingerprint	v1		
DigitalPass	DigitalPass	v1		
Events	LoginAudit, SystemEvents	v1		
Extension	Instance, InstanceConfig, InstanceLog, InstanceReinstall, InstanceRestart, InstanceStart, InstanceStop, Store	v1		
ExternalServers	EndpointContextServer, FileBackupServer, SyslogExportFilter, SyslogTarget	v1		
GuestManager	ActiveSession, ActiveSessionDisconnect, ActiveSessionReauthorize, Configuration, Device, Guest, GuestDigitalPass, GuestReceipt, GuestSponsor, PrintTemplate, RandomPassword, SMSReceipt, SMTPReceipt, WebLogin			
Identity	Endpoint, LocalUser, LocalUserPasswordPolicy, Role, StaticHostList			
Insight	Endpoint	v1		
MessagingServices	EmailSend, MessagingSetup	v1		
Network	NetworkDevice, NetworkDeviceGroup, ProxyTarget	v1		
Onboard	Certificate, CertificateChain, CertificateExport, CertificateImport, CertificateNew, CertificateReject, CertificateRequest, CertificateRevoke, CertificateSign, Device, User			
OnGuard	GlobalSettings, Settings	v1		

## Debugging ClearPass API Framework

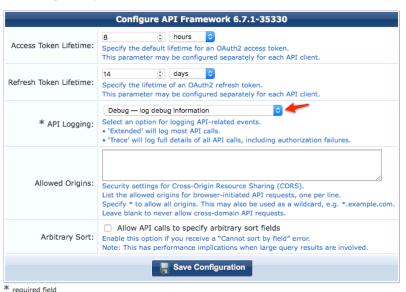
Enable debug under ClearPass Guest → Administration → Plugin Manager → API Framework → Configuration.

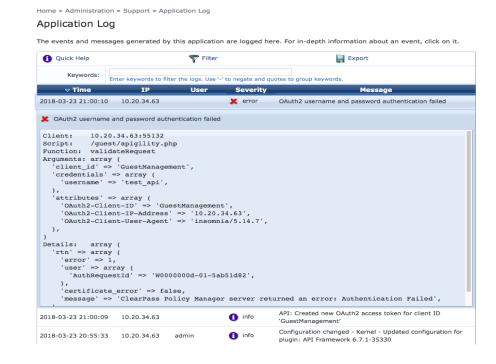
Navigate to ClearPass Guest → Administration → Support → Application Log, to view the logs.

Home » Administration » Plugin Manager

API Framework 6.7.1-35330 Configuration

Set the configuration options for API Framework 6.7.1-35330.





# **THANK YOU!**

