SmartThings API: Taming the OAuth 2.0 Beast

...and how to set up a long-lived token server for Smartthings

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Feb 20, 2025

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The Problem

The change introduced by SmartThings for Personal Access Tokens (PATs) is that **newly generated PATs are only valid for 24 hours from the creation date.** Personal Access Tokens (PATs) provide a way to interact with the SmartThings API for non-SmartApp purposes. These tokens, created and managed on the personal access tokens page, must have explicitly defined permissions and expire within 24 hours unless created before December 30, 2024.
SmartThings recommends using an authorization_code OAuth flow instead of generating new PATs for continuous access.
However, at this time it does not support the client_credentials grant type which precludes usage in non-smartapp or external standalone machine scripts.

A Solution

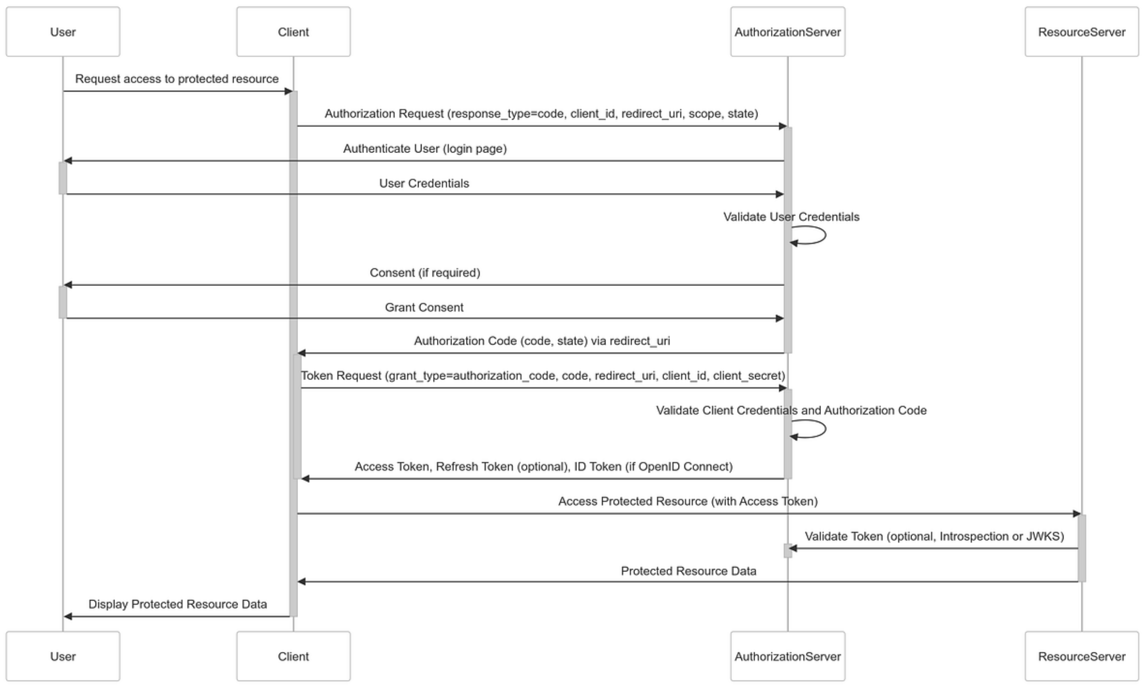
Since the PAT capabilities are now limited, we will need to use Oauth2 here.
The high-level steps for this process are.

1. Create a Smartthings app to obtain the Oauth client_id and client_secret *(One-time setup)*

2. Use the Oauth2 authorization_code flow to get an "Authorization Code" (*One-time setup)*
3. Use this Authorization Code to obtain an access_token and refresh_token (*One-time setup)*
4. Create a simple script in Python to use this generated refresh_token to "seed" the auto-refresh process for the tokens in (potentially) perpetuity.
5. The Python script will spin a server that can used in your applications and scripts as a direct replacement for the previous PA Token.

Below is a primer diagram on how the authorization_code Oauth grant_type flow works

Press enter or click to view image in full size


User
Client
AuthorizationServer
ResourceServer
Request access to protected resource
Authorization Request (response_type=code, client_id, redirect_uri, scope, state)
Authenticate User (login page)
User Credentials
Validate User Credentials
Consent (if required)
Grant Consent
Authorization Code (code, state) via redirect_uri
Token Request (grant_type=authorization_code, code, redirect_uri, client_id, client_secret)
Validate Client Credentials and Authorization Code
Access Token, Refresh Token (optional), ID Token (if OpenID Connect)
Access Protected Resource (with Access Token)
Validate Token (optional, Introspection or JWKS)
Protected Resource Data
Display Protected Resource Data
User
Client
AuthorizationServer
ResourceServer

STEP 1: Setting up a Smartapp using the SmartThings CLI

To install the SmartThings Command Line Interface (CLI), follow these steps based on your operating system:

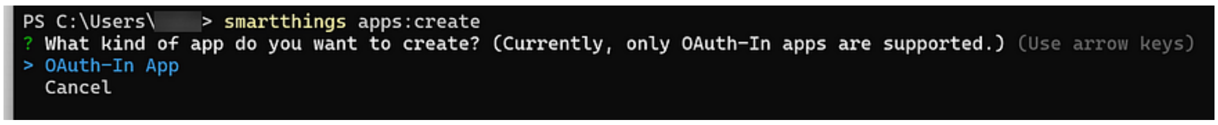
macOS: Use Homebrew by running the command: brew install smartthingscommunity/smartthings/smartthings.

Windows: Download the smartthings.msi installer from the latest release from the link → https://github.com/SmartThingsCommunity/smartthings-cli/releases and run it. If a "Windows protected your PC" warning appears, click "More info" and then "Run anyway" to proceed with the installation.

Linux and other systems: Download the appropriate zipped binary from the latest release, extract it, and install it on your system path. Ensure it is executable, though administrator privileges are not required.

Run smartthings apps:create from the terminal

Press enter or click to view image in full size



```
PS C:\Users\[redacted]> smartthings apps:create
? What kind of app do you want to create? (Currently, only OAuth-In apps are supported.) (Use arrow keys)
> OAuth-In App
  Cancel
```

You will be guided by the app setup instructions.
Note: You can leave the Target URL empty but ensure you enter https://httpbin.org/get for the Redirect URI

Once the app is created, it should look something like the one below.
Make a note of the OAuth Client ID and OAuth Client Secret values. You will need it later.

? Select Scopes. r:devices:*, w:devices:*, x:devices:*
? Add or edit Redirect URIs. Add Redirect URI.
? Redirect URI (? for help) https://httpbin.org/get
? Add or edit Redirect URIs. Finish editing Redirect URIs.
? Choose an action. Finish and create OAuth-In SmartApp.
Basic App Data:

Display Name	my_app
App Id	941a0a50-7aca-47c8-b003-1c6b7731efad
App Name	my_app-61981ee0-096d-35d0-a20a-e557949a03be
Description	app for me
Single Instance	true
Classifications	CONNECTED_SERVICE
App Type	API_ONLY

OAuth Info (you will not be able to see the OAuth info again so please save it now!):

OAuth Client Id	ee4ted7da-ab3a-4576-9f53-c4f772345868
OAuth Client Secret	2att0f69-e260-24b2-93fc-993257fd52br

STEP 2: Generating the temporary AUTH CODE

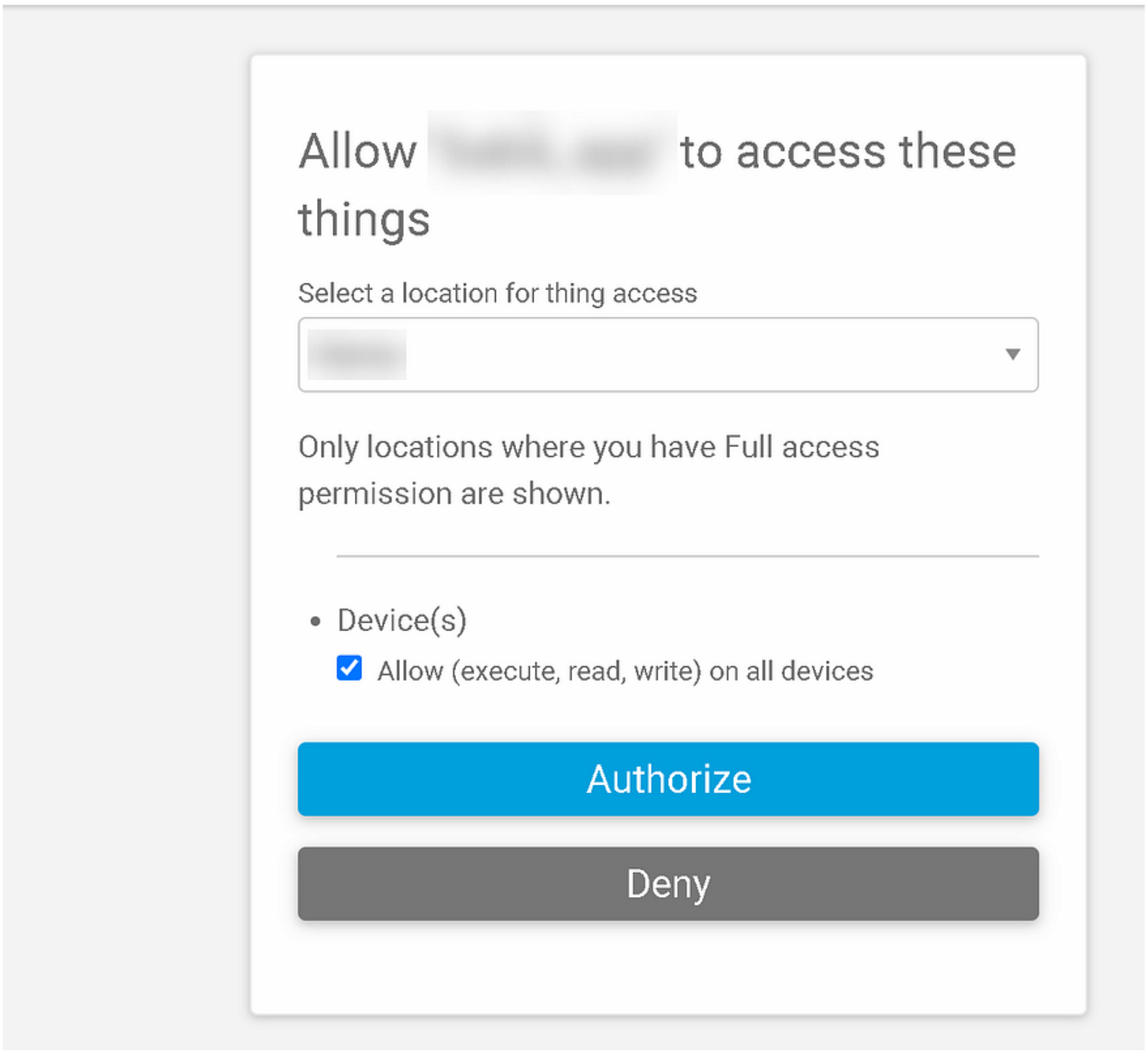
Construct a URL like the below example using the client id and redirect uri that you used in Step 1.
Paste this URL into the browser to get a temporary Authorization Code

Example:-

https://api.smartthings.com/oauth/authorize?client_id=ee4ted7da-ab3a-4576-9f53-c4f772345868&response_type=code&redirect_uri=https://httpbin.org/get&scope=r:devices:*+w:devices:*+x:devices:*

Press enter or click to view image in full size

SmartThings


Allow [redacted] to access these things

Select a location for thing access

[redacted]

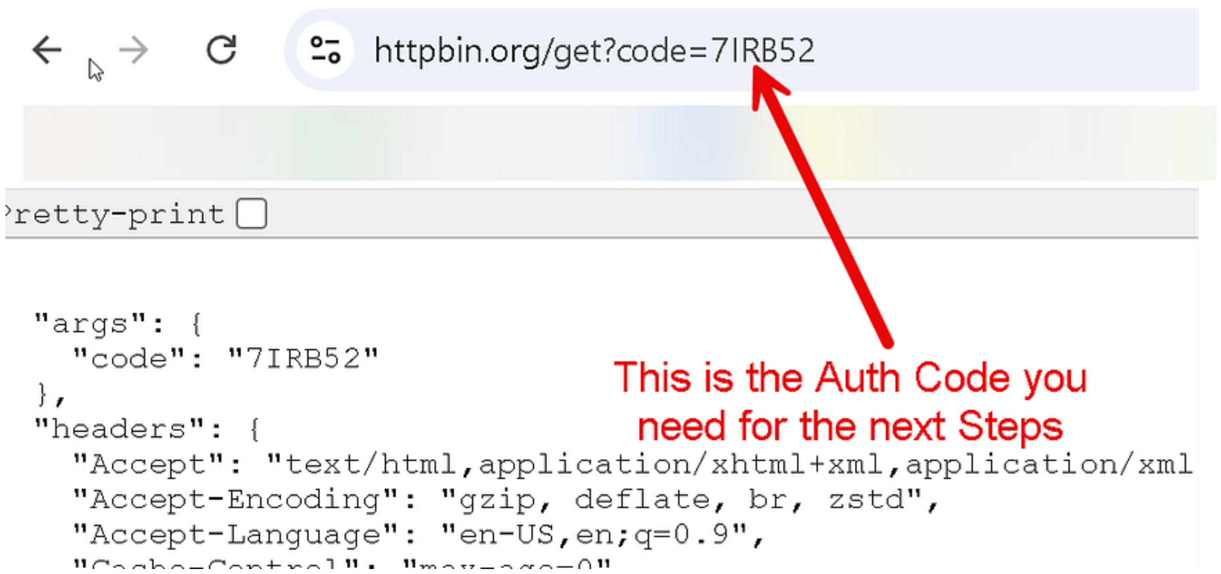
Only locations where you have Full access permission are shown.

- Device(s)

✓ Allow (execute, read, write) on all devices

Login into your Samsung ST Account and click Authorize

Press enter or click to view image in full size



httpbin.org/get?code=7IRB52

```
Pretty-print

  "args": {
    "code": "7IRB52"
  },
  "headers": {
    "Accept": "text/html,application/xhtml+xml,application/xml
    "Accept-Encoding": "gzip, deflate, br, zstd",
    "Accept-Language": "en-US,en;q=0.9",
```

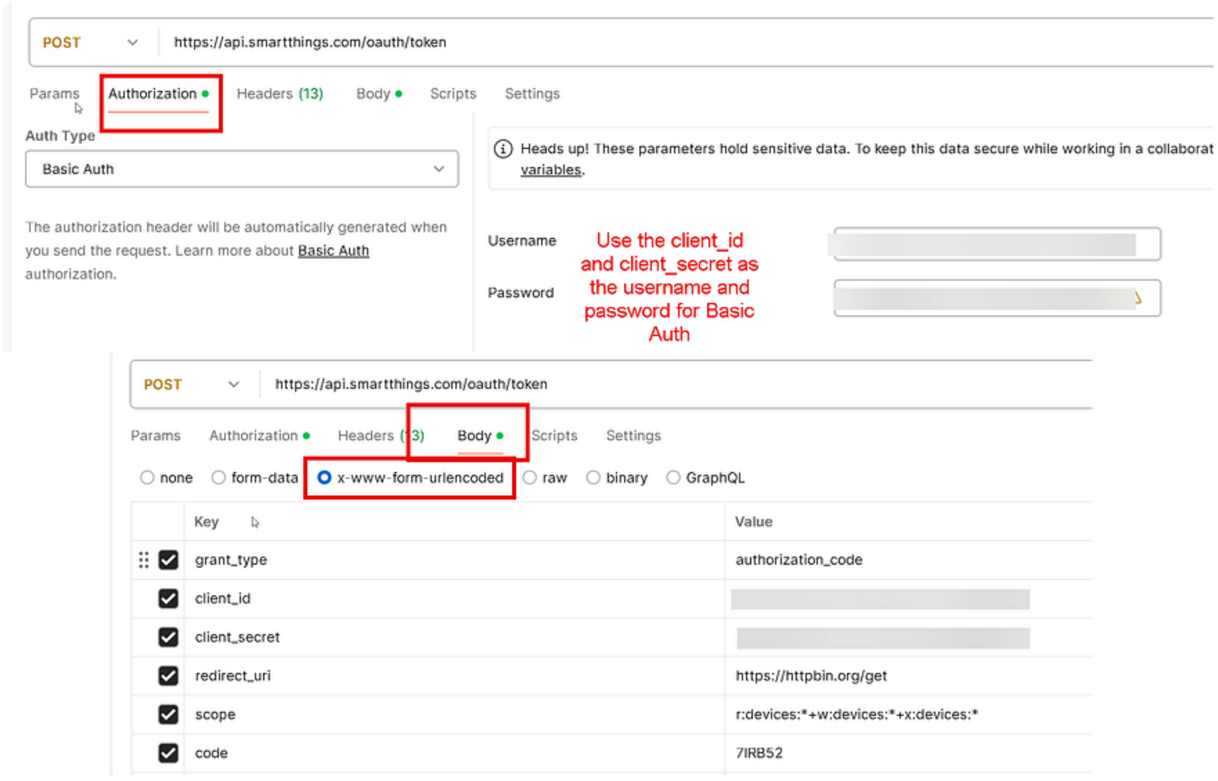
If things go well, you should see the Auth Code in the URL

STEP 3: Generating the Seed Access and Refresh Tokens

Now that we have an Auth Code, we can use POSTMAN or any HTTP client like Curl to generate the Access and Refresh tokens which will be used as seed values in our Script.

A POST request to https://api.smartthings.com/oauth/token

Press enter or click to view image in full size



POST https://api.smartthings.com/oauth/token

Params | Authorization ● | Headers (13) | Body ● | Scripts | Settings

Auth Type: Basic Auth

The authorization header will be automatically generated when you send the request. Learn more about Basic Auth authorization.

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborat variables.

Username
Password

Use the client_id and client_secret as the username and password for Basic Auth

POST https://api.smartthings.com/oauth/token

Params | Authorization ● | Headers (13) | Body ● | Scripts | Settings

none | form-data | x-www-form-urlencoded (selected) | raw | binary | GraphQL

Key	Value
grant_type	authorization_code
client_id	
client_secret	
redirect_uri	https://httpbin.org/get
scope	r:devices:*+w:devices:*+x:devices:*
code	7IRB52

# cURL version

```
curl --location 'https://api.smartthings.com/oauth/token' \
--header 'Content-Type: application/x-www-form-urlencoded' \
--header 'Authorization: Basic ••••••' \
--data-urlencode 'grant_type=authorization_code' \
--data-urlencode 'client_id=ee4ted7da-ab3a-4576-9f53-c4f772345868' \
--data-urlencode 'client_secret=2att0f69-e260-24b2-93fc-993257fd52br' \
--data-urlencode 'redirect_uri=https://httpbin.org/get' \
--data-urlencode 'scope=r:devices:*+w:devices:*+x:devices:*' \
--data-urlencode 'code=7IRB52'
```

The response should have the required access and refresh tokens

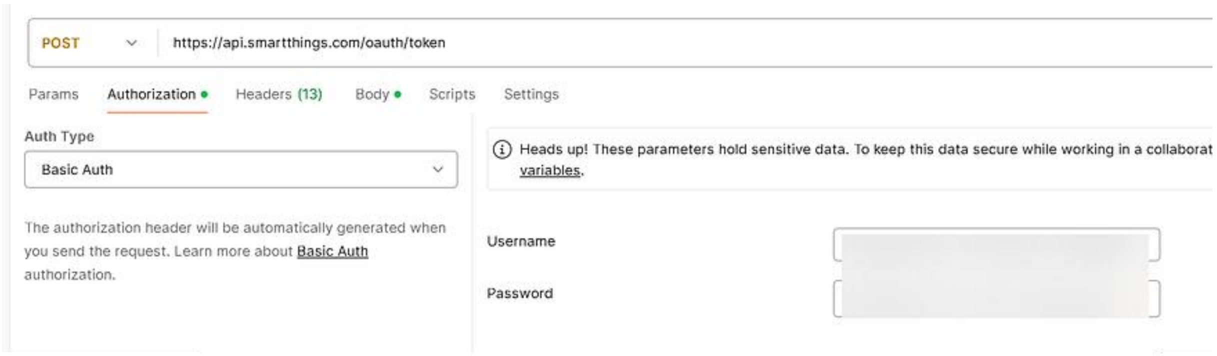
```
{
  "access_token": "07961fa6-73a5-408e-85db-6c93f7e9eaf1",
  "token_type": "bearer",
  "refresh_token": "25b90b60-1b57-4e14-92k3-7b8ey8er9d8f",
  "expires_in": 85025,
  "scope": "x:devices:* r:devices:* w:devices:*",
  "access_tier": 0,
  "installed_app_id": "341a0a50-7aca-47c8-b003-1c6b7731efad"
}
```

The access_token is valid for 24 hours
The refresh_token is valid for 30 Days
The refresh token can be renewed for another 30 Days using the Refresh Token grant type which is used in Step 4 below.
We will use the refresh_token above as the "seed" token in Step 4 below.

STEP 4: Python Script to Auto Refresh and Serve Tokens

Here is the quick POSTMAN and cURL checks for this refresh_token grant type.

Press enter or click to view image in full size



POST https://api.smartthings.com/oauth/token

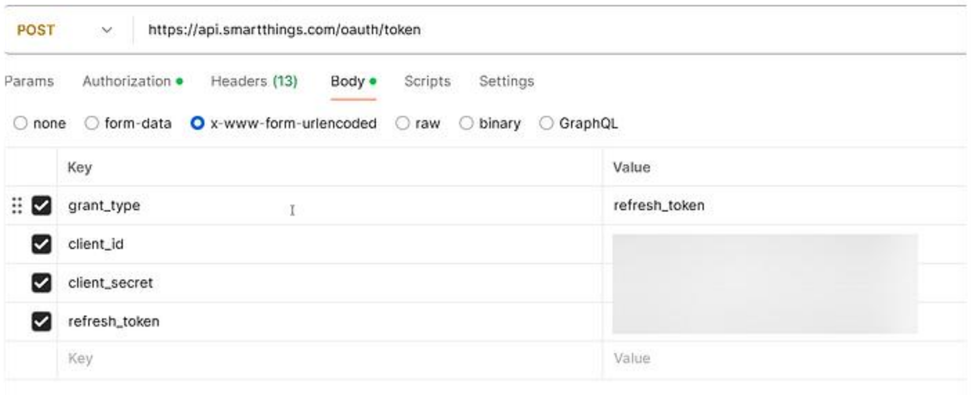
Params | Authorization ● | Headers (13) | Body ● | Scripts | Settings

Auth Type: Basic Auth

The authorization header will be automatically generated when you send the request. Learn more about Basic Auth authorization.

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborat variables.

Username	[redacted]
Password	[redacted]



POST https://api.smartthings.com/oauth/token

Params | Authorization ● | Headers (13) | Body ● | Scripts | Settings

none | form-data | x-www-form-urlencoded | raw | binary | GraphQL

	Key	Value
✓	grant_type	refresh_token
✓	client_id	[redacted]
✓	client_secret	[redacted]
✓	refresh_token	[redacted]
	Key	Value

# curl version

```
curl --location 'https://api.smartthings.com/oauth/token' \
--header 'Content-Type: application/x-www-form-urlencoded' \
--header 'Authorization: Basic ••••••' \
--data-urlencode 'grant_type=refresh_token' \
--data-urlencode 'client_id=ee4ted7da-ab3a-4576-9f53-c4f772345868' \
--data-urlencode 'client_secret=2att0f69-e260-24b2-93fc-993257fd52br' \
--data-urlencode 'refresh_token=af8ce0b4-572c-2fbe-9d1f-b3e035efd568'
```

I wrote a simple Python script below to set up the Auto Refresh of the access and refresh and also spin up a simple HTTP server.
Any client can now connect to the HTTP endpoint and *always* get a valid token.

The script will serve the tokens at the below endpoint

http(s)://<server_host>:<server_port>/token_info.json

This script is self-contained and to have it constantly running 24x7, you could use multiple options. For example: The script can be used inside a Docker container or on Kubernetes.
Hint:- Use any official Python Docker image from the docker hub and override the start CMD like

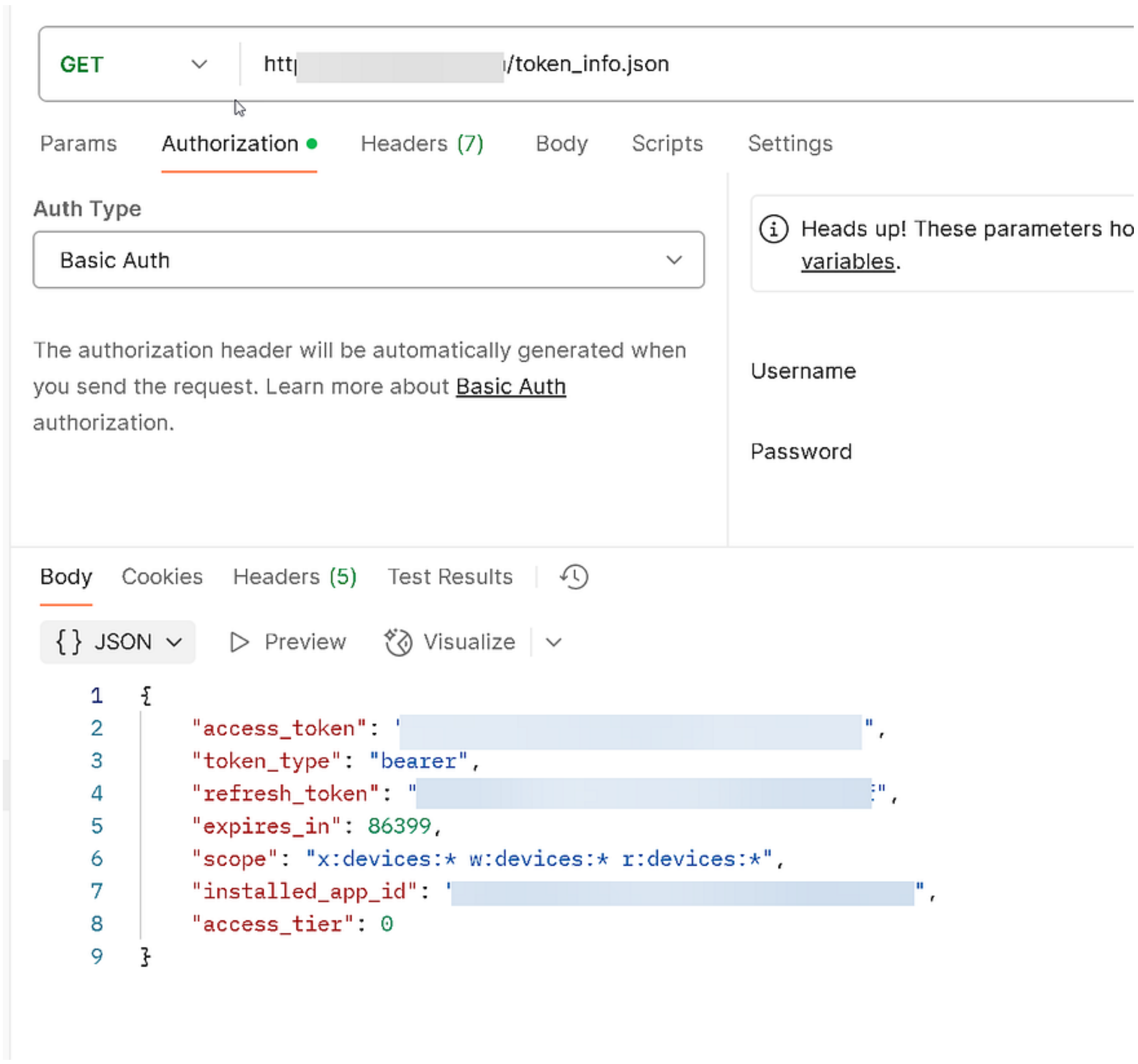
```
python -u smartthings_token_server.py
```

You could also add features like Authentication to the standard Python server or use Ingresses to control Authentication if using Kubernetes.

STEP 5: Using this Token Server

Here is an example of a POSTMAN client call to fetch a fresh access_token from our running server/script.

Press enter or click to view image in full size



GET htt[redacted]/token_info.json

Auth Type

Basic Auth

The authorization header will be automatically generated when you send the request. Learn more about Basic Auth authorization.

Heads up! These parameters ho
variables.

Username

Password

```
{
    "access_token": "[redacted]",
    "token_type": "bearer",
    "refresh_token": "[redacted]",
    "expires_in": 86399,
    "scope": "x:devices:* w:devices:* r:devices:*",
    "installed_app_id": "[redacted]",
    "access_tier": 0
}
```

CONCLUSION
With this approach, we can continue to get the same flexibility as PATs in standalone / non-smart app integrations using Oauth2.