

# Cloud Controller API

Using the API, Tracing and GUIDs

# Topics

- **Cloud Controller API calls**
- cf CLI tracing and GUIDs

# Why the Cloud Controller API?

- The Cloud Controller API is used to:
  - obtain information about the platform
  - make changes to the platform
- Calls from clients and scripts, including custom ones, often include Cloud Controller API calls
- Logs often contain results of the API calls and help with troubleshooting



## Cloud Foundry API

### App Routes (Experimental)

- [List routes](#)
- [Map a Route](#)
- [Unmap a Route](#)

### App Usage Events

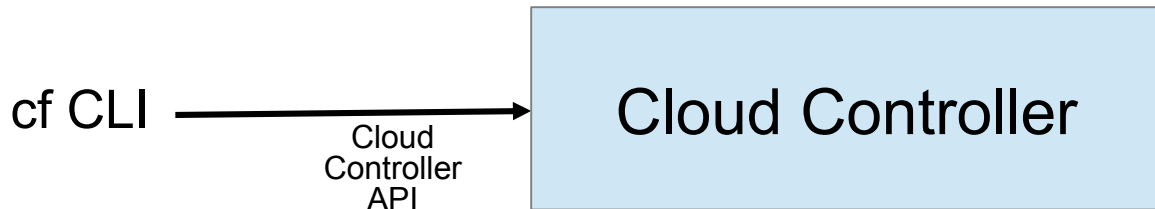
- [List all App Usage Events](#)
- [Purge and reseed App Usage Events](#)
- [Retrieve a Particular App Usage Event](#)

### Apps

- [Associate Route with the App](#)
- [Copy the app bits for an App](#)
- [Creating a Docker App \(experimental\)](#)
- [Creating an App](#)
- [Delete a Particular App](#)
- [Downloads the bits for an App](#)
- [Downloads the staged droplet for an App](#)

# Cloud Controller API

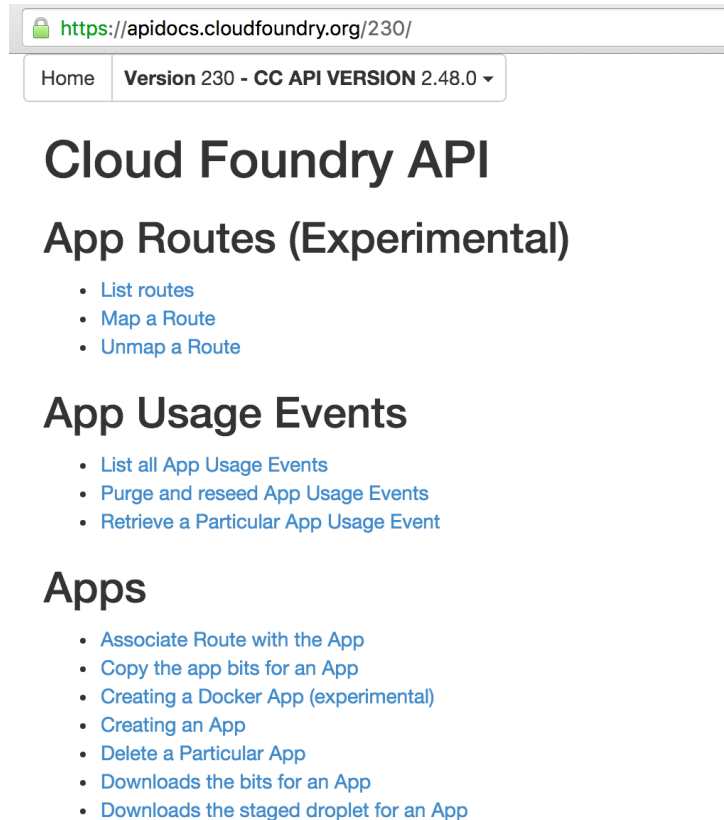
- When you set a target, you are connecting to a component of Cloud Foundry called the Cloud Controller
- The Cloud Controller has a REST API
- The commands of the cf CLI and other clients like Apps Manager directly call this API
- You can also call this API directly



# Cloud Controller API

- View the reference documentation
- This API does the actual work on the platform
  - creates spaces, apps, routes, service instances, etc.

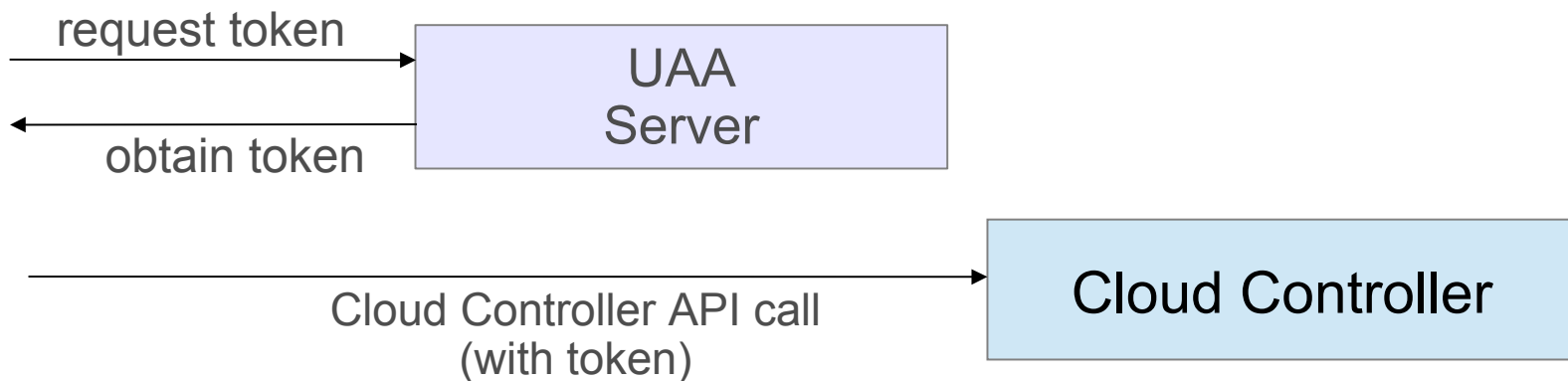
<http://apidocs.cloudfoundry.org>



The screenshot shows the Cloud Foundry API documentation page. At the top, there is a browser address bar with the URL <https://apidocs.cloudfoundry.org/230/>. Below the address bar is a navigation bar with a "Home" link and a dropdown menu labeled "Version 230 - CC API VERSION 2.48.0". The main content area has a heading "Cloud Foundry API" followed by "App Routes (Experimental)". Under "App Routes (Experimental)", there are three links: "List routes", "Map a Route", and "Unmap a Route". Below this is a heading "App Usage Events" with three links: "List all App Usage Events", "Purge and reseed App Usage Events", and "Retrieve a Particular App Usage Event". The final heading is "Apps", which has seven links: "Associate Route with the App", "Copy the app bits for an App", "Creating a Docker App (experimental)", "Creating an App", "Delete a Particular App", "Downloads the bits for an App", and "Downloads the staged droplet for an App".

## But first...

- Before making a Cloud Controller API request, you must get an access token from a component called the User Authentication and Authorization (UAA) server
- Obtain the access token, then pass it with each Cloud Controller API call



# UAA API

- The UAA has an API
- To obtain an access token, use the /oauth/token endpoint

```
curl -k -H 'AUTHORIZATION: Basic Y2Y6'  
-d 'username=[username]&  
password=[password]&grant_type=password'  
https://uaa. [path to system domain] /oauth/token
```

# Example Cloud Controller API- List All Apps

- Lists all apps in the Cloud Foundry foundation

The screenshot shows a web browser window with the URL `apidocs.cloudfoundry.org/215/apps/list_all_apps.html`. The page title is "Apps API" and the sub-header is "List all Apps". Below this, it says "GET /v2/apps". Under the "Request" section, the "Route" is listed as "GET /v2/apps". The "Parameters" section contains a table with the following data:

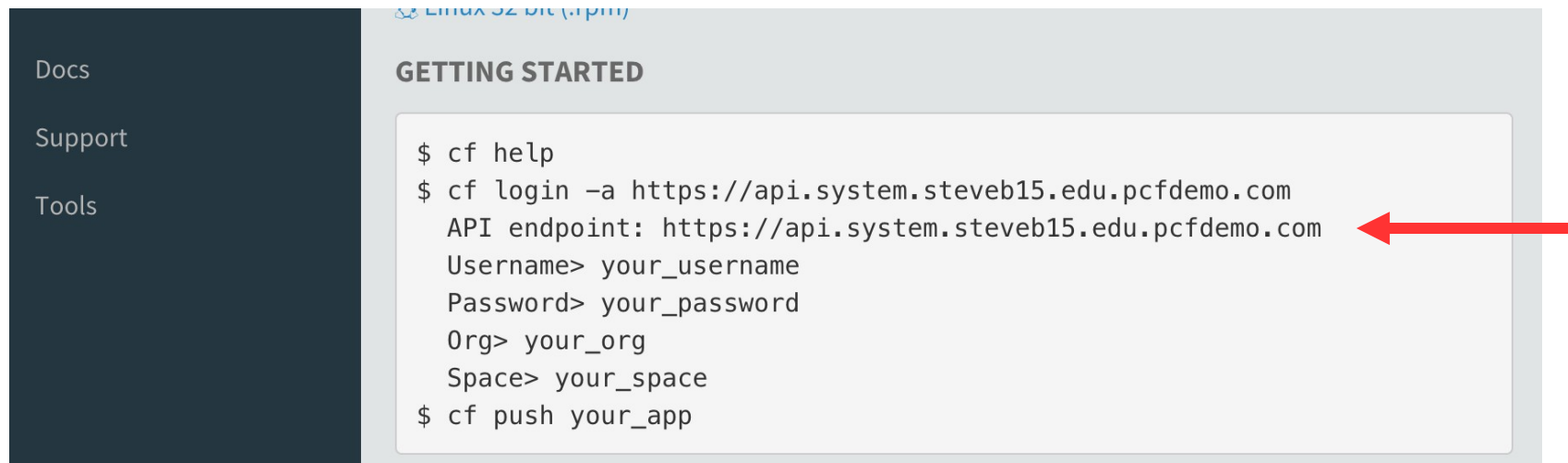
Name	Description	Valid Values	Example Values
q	Parameters used to filter the result set. Format queries as <filter><op><value> Valid ops: : >= <= < > IN Valid filters: name, space_guid, organization_guid, diego, stack_guid		<ul style="list-style-type: none"><li>• q=filter:value</li><li>• q=filter&gt;value</li><li>• q=filter IN a,b,c</li></ul>
page	Page of results to fetch		
results-per-page	Number of results per page		
order-direction	Order of the results: asc (default) or desc		

```
curl "https://api.system.sX.edu.pcfdemo.com/v2/apps" -k  
-X GET -H "Authorization: bearer [access_token]"  
-H "Host: api.system.sX.edu.pcfdemo.com" -H "Cookie: "
```



# Cloud Controller API Endpoint in Apps Manager

- The Cloud Controller API URL is listed in Apps Manager in the Tools section



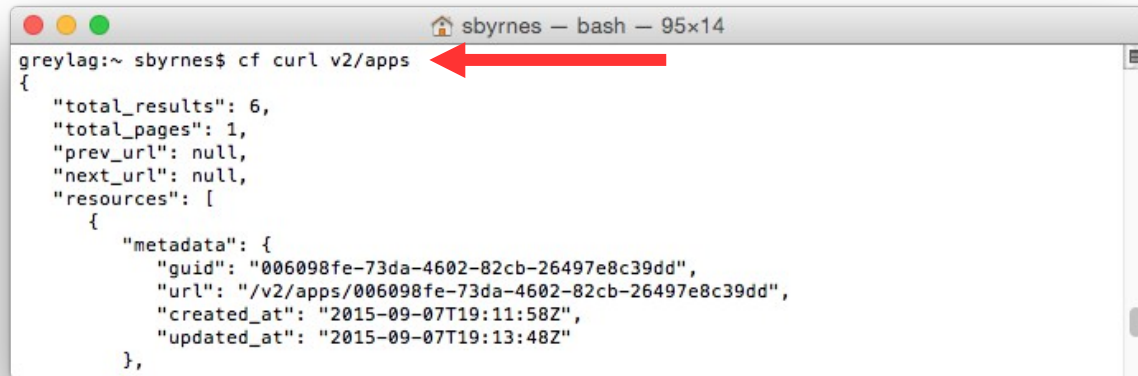
The screenshot shows the Pivotal Cloud Foundry (CF) CLI interface. On the left is a dark sidebar with navigation links: Docs, Support, and Tools. The main content area is titled "GETTING STARTED" and displays the output of the command `$ cf help`. The output lists several commands: `$ cf login -a https://api.system.steveb15.edu.pcfdemo.com`, `API endpoint: https://api.system.steveb15.edu.pcfdemo.com`, `Username> your_username`, `Password> your_password`, `Org> your_org`, `Space> your_space`, and `$ cf push your_app`. A red arrow points to the API endpoint URL in the output.

```
$ cf help
$ cf login -a https://api.system.steveb15.edu.pcfdemo.com
API endpoint: https://api.system.steveb15.edu.pcfdemo.com
Username> your_username
Password> your_password
Org> your_org
Space> your_space
$ cf push your_app
```

# cf curl

- The **cf curl** command simplifies making Cloud Controller API requests
  - The URL is relative
  - The access token is automatically passed
  - Default parameters are passed

with the  
cf CLI



A terminal window titled 'sbyrnes — bash — 95x14' shows the command 'cf curl v2/apps' being executed. A red arrow points to the command. The output is a JSON object representing a list of application resources.

```
greylag:~ sbyrnes$ cf curl v2/apps
{
  "total_results": 6,
  "total_pages": 1,
  "prev_url": null,
  "next_url": null,
  "resources": [
    {
      "metadata": {
        "guid": "006098fe-73da-4602-82cb-26497e8c39dd",
        "url": "/v2/apps/006098fe-73da-4602-82cb-26497e8c39dd",
        "created_at": "2015-09-07T19:11:58Z",
        "updated_at": "2015-09-07T19:13:48Z"
      },

```

without  
the cf CLI

```
curl "https://api.system.sX.edu.pcfdemo.com/v2/apps" -k
-X GET -H "Authorization: bearer [access_token]"
-H "Host: api.system.sX.edu.pcfdemo.com" -H "Cookie: "
```

# Topics

- Cloud Controller API calls
- **cf CLI tracing and GUIDs**

# cf CLI Tracing

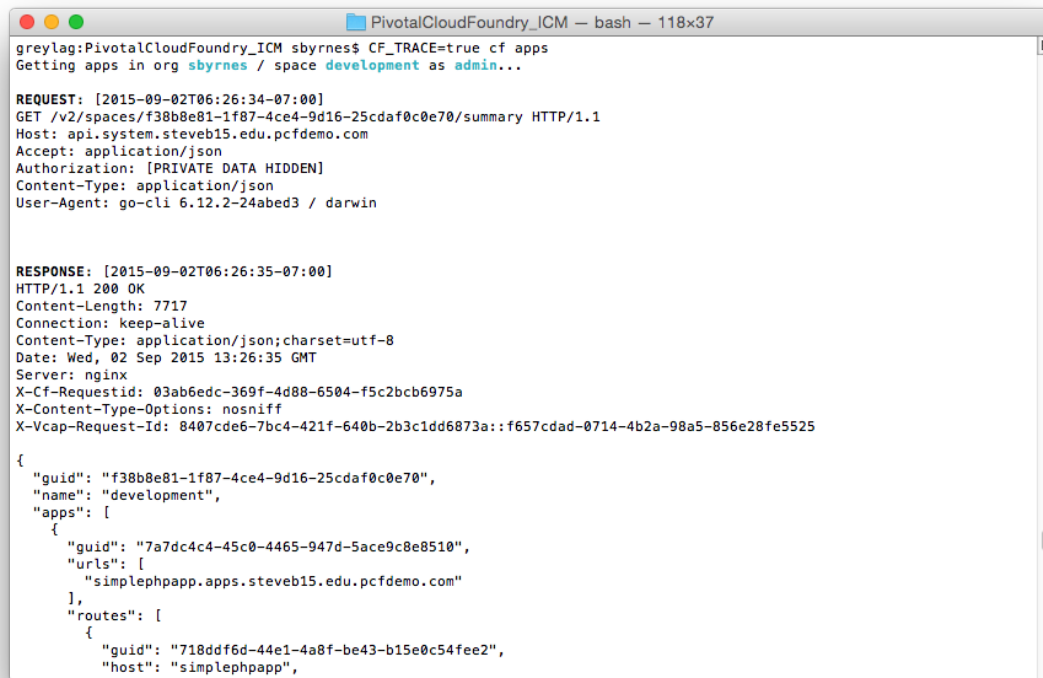
- The cf CLI makes Cloud Controller API requests behind the scenes
- CF\_TRACE is an environment variable
- To see the Cloud Controller API requests and responses, turn on CF\_TRACE
  - Set to **true** to log to console
  - Set to path and filename to log to a file

To turn on tracing for **cf apps**:

```
CF_TRACE=true cf apps
```

# CF\_TRACE Output

- View details of HTTP REQUESTs and RESPONSEs



```
PivotalCloudFoundry_ICM — bash — 118x37
greytag:PivotalCloudFoundry_ICM sbyrnes$ CF_TRACE=true cf apps
Getting apps in org sbyrnes / space development as admin...

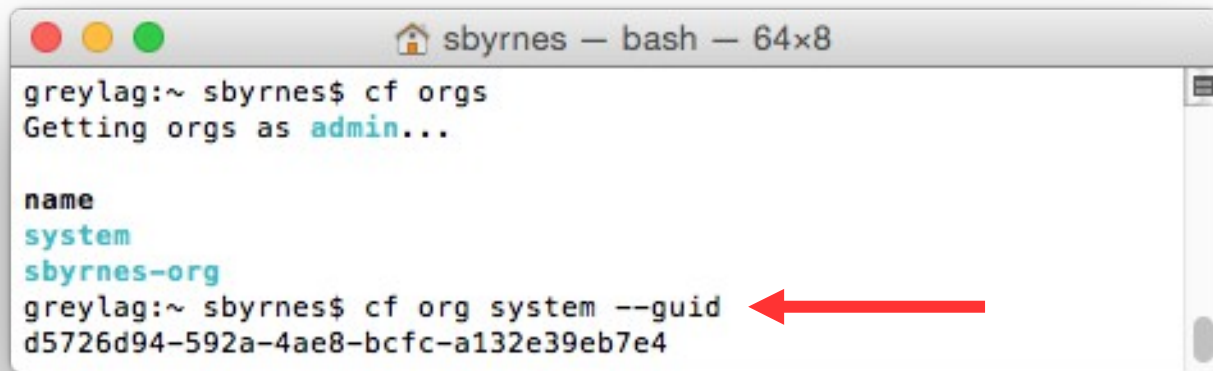
REQUEST: [2015-09-02T06:26:34-07:00]
GET /v2/spaces/f38b8e81-1f87-4ce4-9d16-25cdfaf0c0e70/summary HTTP/1.1
Host: api.system.steveb15.edu.pcfdemo.com
Accept: application/json
Authorization: [PRIVATE DATA HIDDEN]
Content-Type: application/json
User-Agent: go-cli 6.12.2-24abed3 / darwin

RESPONSE: [2015-09-02T06:26:35-07:00]
HTTP/1.1 200 OK
Content-Length: 7717
Connection: keep-alive
Content-Type: application/json;charset=utf-8
Date: Wed, 02 Sep 2015 13:26:35 GMT
Server: nginx
X-Cf-Requestid: 03ab6edc-369f-4d88-6504-f5c2bcb6975a
X-Content-Type-Options: nosniff
X-Vcap-Request-Id: 8407cde6-7bc4-421f-640b-2b3c1dd6873a::f657cdad-0714-4b2a-98a5-856e28fe5525

{
  "guid": "f38b8e81-1f87-4ce4-9d16-25cdfaf0c0e70",
  "name": "development",
  "apps": [
    {
      "guid": "7a7dc4c4-45c0-4465-947d-5ace9c8e8510",
      "urls": [
        "simplephpapp.apps.steveb15.edu.pcfdemo.com"
      ],
      "routes": [
        {
          "guid": "718ddf6d-44e1-4a8f-be43-b15e0c54fee2",
          "host": "simplephpapp",
```

# GUIDs- In the cf CLI

- Most resources in Cloud Foundry have a globally unique ID (GUID) associated with them
- The **cf app**, **cf org**, **cf space** and **cf service** commands have a **--guid** flag



```
sbyrnes — bash — 64x8
greylag:~ sbyrnes$ cf orgs
Getting orgs as admin...

name
system
sbyrnes-org
greylag:~ sbyrnes$ cf org system --guid
d5726d94-592a-4ae8-bcfc-a132e39eb7e4
```

# GUIDs- In the Cloud Controller API

- You can also see GUIDs in the Cloud Controller API requests and responses

```
"apps": [  
  {  
    "guid": "7a7dc4c4-45c0-4465-947d-5ace9c8e8510",  
    "urls": [  
      "simplephpapp.apps.steveb15.edu.pcfdemo.com"  
    ],  
    "routes": [  
      {  
        "guid": "718ddf6d-44e1-4a8f-be43-b15e0c54fee2",  
        "host": "simplephpapp",
```

# GUIDs- Calling the Cloud Controller API

- You can use the GUID to make Cloud Controller API calls directly
- Example: Deleting an application
  1. Use the --guid flag to get the application GUID:

```
$ cf app my-php-app --guid  
995c0b08-3ca8-404f-a49a-3ca991cde304
```

2. Use cf curl to make the API call to delete the app:

```
$ cf curl -X DELETE /v2/apps/995c0b08-3ca8-404f-a49a-  
3ca991cde304
```



# GUIDs- In the Logs

- GUIDs are very common in logs
- For example, an application has a GUID, and you can search for that GUID in the logs when troubleshooting

RECENT LOGS 

[</> Tail Logs](#)

```
2015-09-02T05:35:10.000+00:00 [RTR] OUT my-php-app89.apps.steveb15.edu.pcfdemo.com - [02/09/2015:05:35:10 +0000] "GET / HTTP/1.1" 200 290 "https://apps.system.steveb15.edu.pcfdemo.com/organizations/88da014c-6f6a-47ee-9f08-e3dd5779899d/spaces/f38b8e81-1f87-4ce4-9d16-25cdf0c0e70" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/44.0.2403.157 Safari/537.36" 10.0.0.65:27319 x_forwarded_for:"99.117.101.147" vcap_request_id:6429dd52-5254-480b-6b7d-07102bbe3c6f response_time:0.003051879 app_id:4632dbb1-3513-403f-b3aa-217cc78fc32f
```

# Lab

Use the following:

- cf curl
- Cloud Controller API
- cf CLI tracing
- Globally unique identifiers (GUIDs)