Red Hat Mobile Application Platform Hosted 3

Local Development Guide

For Red Hat Mobile Application Platform Hosted 3

Last Updated: 2017-12-21

Red Hat Mobile Application Platform Hosted 3 Local Development Guide

For Red Hat Mobile Application Platform Hosted 3

Legal Notice

Abstract

This document provides guides for using the RHMAP CLI tool and for setting up a local development environment for developing apps in Red Hat Mobile Application Platform Hosted 3.

Table of Contents

CHAPTER 1. SETTING UP FHC

1.1. INSTALLING FHC

Overview

fhc is the Red Hat Mobile Application Platform Hosted (RHMAP) command line interface (CLI) and it is Node.js based. Almost all functionality in the RHMAP Studio is exposed through the RHMAP APIs and is accessed using **fhc**. This allows **fhc** to be included in other Node.js applications thus allowing access to the Platform programmatically. Interaction with the Platform's exposed functionality can be integrated into automated processes such as build systems and continuous integration systems.

Requirements

To use **fhc**, install Node.js and NPM. To install Node.js, see nodejs.org.

Once installed, two new command line applications are available, **node** and **npm**.

1.1.1. Installing FHC

In a terminal/command prompt, run:

```
npm install -g fh-fhc
```

If installing on Linux, you may need to run this command as a sudoer:

```
sudo npm install -g fh-fhc
```

This will install fhc from npm — the central registry of Node.js modules.

The **-g** flag tells npm to install fhc globally so that it will be available from any directory.

Once installation is complete, **fhc** will be available from your command line. If you use ***Z shell (zsh)***, use **hash -r** to reset the hash table for the command to be available.

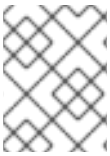
To test FHC is installed correctly, and to show the version you have installed, use:

```
fhc -v
```

1.1.1.1. Command Completion (Linux and Mac only)

The **fhc** bash completion script allows Tab completion of the various **fhc** commands. Install **fhc** bash completion script:

```
fhc completion >> ~/.bashrc
```



NOTE

Append the output of **fhc completion** to a relevant file if you use an alternative shell (not **bash**), for example, **~/.zshrc** for zsh.

1.1.2. Usage

Set the target and login:

```
fhc target https://[your-studio-domain].feedhenry.com
fhc login [email address] [password]
```

To list projects:

```
fhc projects list
```

To list all **fhc** commands:

```
fhc help
```

1.1.2.1. Configuration

fhc is extremely configurable. It reads its configuration options from 5 places.

- Command line switches:
  Set a config with **`--key val`**. All keys take a value, even if they are booleans (the config parser doesn't know what the options are at the time of parsing.) If no value is provided, then the option is set to boolean **`true`**.

- Environment Variables:
  Set any config by prefixing the name in an environment variable with **`fhc_config_`**. For example, **`export fhc_config_key=val`**.

- User Configs:
  The file at $HOME/.fhcrc is an ini-formatted list of configs. If present, it is parsed. If the **`userconfig`** option is set in the cli or env, then that will be used instead.

- Global Configs:
  The file found at **`../etc/fhcrc`** (from the node executable, by default this resolves to **`/usr/local/etc/fhcrc`**) will be parsed if it is found. If the **`globalconfig`** option is set in the cli, env, or user config, then that file is parsed instead.

- Defaults:
  fhc's default configuration options are defined in **`lib/utils/config-defs.js`**. These must not be changed.

Execute **`fhc help config`** for more information. Use **`fhc help`** for a list of all commands, or **`fhc [command] --help`** for help on a specific command.

1.1.3. Next Steps

- Adding an SSH Key via FHC
- Working with Projects & Apps
- Local App Development

CHAPTER 2. SSH KEY SETUP

Overview

Before you can clone a git repo, you must first upload your SSH public key (for more information on Public-key cryptography, check out this Wikipedia article).

This tutorial will show you how to generate a public/private key pair (if required) and upload the SSH Public Key to the Platform via FHC.

Requirements

You should install FHC before completing this tutorial.

2.1. CHECKING FOR AN EXISTING SSH PUBLIC KEY

To check if an SSH public key has been generated, open **`Terminal`** on Linux or Mac, or **`Git Bash`** on Windows.

Run **`ls -la ~/.ssh`**

This will list the files in the .ssh directory. If you see files named either **`id_rsa.pub`** or **`id_dsa.pub`**, then the key has been generated and you can skip to Adding an SSH Public Key to the Platform via FHC. If you do not see either of these files, then proceed to Generating an SSH Public Key, as you must generate an SSH public key manually.

2.2. GENERATING AN SSH PUBLIC KEY

In order to generate a key, we will use a tool called ssh-keygen. Open **`Terminal`** on Linux or Mac, or **`Git Bash`** on Windows.

Enter the following:

```
ssh-keygen -t rsa -C "your_email_address@example.com"
```

After you have entered this command you will be asked where to save the key. Press the enter key to use the default location.

You will then be prompted to enter and confirm a password for the private key. When complete, the public & private key should be written to **`~/.ssh/id_rsa.pub`** & **`~/.ssh/id_rsa`**.

2.3. ADDING AN SSH PUBLIC KEY TO THE PLATFORM VIA FHC

Using FHC, log in to the Platform. When adding a public key, you must specify both a name and a key file. To add a key, enter the following command:

```
fhc keys ssh add <label> <key-file>
```

For example:

```
fhc keys ssh add myKey ~/.ssh/id_rsa.pub
```

You can verify that the key has been added correctly by listing out all ssh keys for the user.

```
fhc keys ssh
```

You should now be able to see your recently added key.

NOTE

If you need to use multiple SSH keys, follow our guide for configuring your local SSH to use multiple keys.

2.4. ADDING AN SSH PUBLIC KEY TO THE PLATFORM VIA STUDIO

Follow these steps to add your public SSH key to the Platform using the Studio:

1. Log into the Studio.
2. Click on the portrait button located on the top right of the screen.
3. Select **`Settings`**.
4. Select **`SSH Key Management`**. A list of previously uploaded SSH Keys will be displayed.
5. Select **`Add New Key`**.
6. Paste your public key into the **`Public Key`** field.
7. Select **`Upload Public Key`**.

You should now be able to see your recently added key in the list of keys.

CHAPTER 3. GETTING STARTED WITH FHC

The following information describes how to create a new Project based on a sample template.

fhc is used to clone a Project to a local machine. **npm** is used to install dependencies for local development. **Grunt** is used to start a new Hybrid Client and Node.js Cloud App locally for development within a browser.

Video Tutorial

- RHMAP - Create an App

Prerequisites

- Section 1.1, “Installing FHC”
- Chapter 2, *SSH Key Setup*
- Node.js and Git installed locally

3.1. TARGETING AN RHMAP DOMAIN WITH FHC

First you need to target(connect) your RHMAP domain using **fhc**.

Open a command line application, for example, the Terminal on Linux or MacOS, or a command prompt on Windows.

Target your domain by replacing **<domain-url>** with the URL of your domain:

```
fhc target <domain-url>
```

Next you will be required to enter in your RHMAP credentials. Enter the following command and replace **<email or alias>** with your username or email address.

```
fhc login
Username : <email or alias>
```

Enter your password:

```
Password : <enter password>
```

You are now logged into the RHMAP domain you have targeted.

3.2. CREATING YOUR FIRST PROJECT

The following information describes how to create a new Project based on the **hello_world_project** template.

See the list of available project templates:

```
fhc templates projects
```

Replace the **project name** with the chosen project name and execute:

NOTE

Make sure to pass the name of the template **hello_world_project** as a parameter too.

```
fhc projects create <project name> hello_world_project
```

If successful, a JSON response with all Project information is displayed, for example:

```
{
  "type": "PROJECT",
  "template": null,
  "sysCreated": 1397636395777,
  "guid": "jJHtgZXQPJxXDFJO2pQzMP-d",
  // ...
  "apps": [
    {
      "type": "client_hybrid",
      "description": "",
      "domain": "testing",
      "template": null,
      "email": "joebloggs@feedhenry.com",
      //...
    }
  ],
  "templateId": "default",
  "jsonTemplateId": "hello_world_project"
}
```

IMPORTANT

Note down the **guid**, it is required for the following steps.

To review the project information, enter the following command, replacing **project guid** with the **guid** from the previous step.

```
fhc projects read <project guid>
```

This command returns a JSON object shown in the previous step, containing all project information.

Clone the Project to a local machine. Replace the **project name** with the chosen Project name, and also **project guid** with the **guid** from the JSON object:

```
mkdir <project name> ; cd <project name> ; fhc projects clone <project
guid>
```

Replace the **project name** with your project name to see the MBaaS example or Cloud App:

```
cd <project name>-Hello-World-MBaaS-Instance ; ls -l
```

Install Cloud App dependencies:

```
npm install
```

Install the **grunt CLI** using the **-g** flag to install the grunt globally:

```
[sudo] npm install -g grunt-cli
```

The Cloud App instance is now ready to be deployed to a local machine.

3.3. DEPLOYING A CLOUD APP

To start the cloud server locally:

```
grunt serve
```

The console should output information to indicate that the Cloud App is running on **port 8001** on local machine.

Enter the following curl request on the local machine to test that the Cloud instance is running:

```
curl http://localhost:8001/cloud/hello?hello=world
```

A similar response should be displayed:

```
{
  "msg":"Hello world"
}
```

If you received the above response from this curl attempt, your Cloud App is running locally.

3.4. DEPLOYING A CLIENT APP

Notice the following command is a chained command. The first part navigates up a level in the directory tree. The second part navigates down a level to the client directory.

Enter the following command, replacing **project name** with the name of your project.

```
cd .. ;  cd <project name>-Hello-World-Client ; ls -l
```

Install all dependencies for the Client App:

```
npm install .
```

Run the Client App locally:

```
grunt serve:local
```

If successful, a window opens in your default browser.

3.5. SUMMARY

The Platform hosts all Git repositories. Every app within a project will have its own Git repo. Normal Git procedures and processes are performed by changing directory into either the Client App or Cloud App examples.

You are now setup to develop your RHMAP project locally.

CHAPTER 4. WORKING WITH PROJECTS AND APPS

Overview

In the Platform, a project is used as a container for grouping related apps together and all apps must be created within a project. The following information describes how to create and add projects using **fhc**.

Requirements

You must have completed the following tutorials:

- Installing FHC

4.1. LOG IN TO THE PLATFORM

Enter **fhc targets** in the terminal to display a list of available target domains:

```
fhc targets list
```

Use the **fhc target** command to select a target domain:

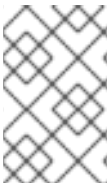
```
fhc target exampleDomain.redhatmobile.com
```

NOTE

The code above selects 'exampleDomain.redhatmobile.com' as the target domain.

The target domain has now being selected. To login, use **fhc login** followed by the username and password:

```
fhc login username@example.com password
```



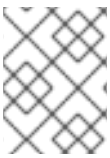
NOTE

Once logged in, access restrictions can apply. Team Permissions determine the level of access a User has within the Platform. See Teams & Collaborations for more information.

4.2. LIST EXISTING PROJECTS

List existing projects:

```
fhc projects list
```



NOTE

To return the project list in raw JSON format, append **--json** to the end of the command, for example, **fhc projects list --json**.

A list of existing projects is displayed (ordered by date lasted modified), for example:

```
------------------------------------------------------------------------
----
| Id                       | Title            | No. Apps | Last Modified
|
------------------------------------------------------------------------
----
| 1234567890abcdefghijklmn | Hello World      | 3        | 3 hours ago
|
------------------------------------------------------------------------
----
| 9876543210zyxwvutsrqpomn | Welcome to RHMAP | 2        | 3 hours ago   |
------------------------------------------------------------------------
----
```

4.3. CREATING A PROJECT

It is possible to create a new project that contains no Client or Cloud Apps however a project **must** have a name. Use **`fhc projects create`** to create a project.

Typically, a new project is created using a pre-defined template. Project templates allow you to bootstrap your development by cloning the project template which typically provides at least one Client App and one Cloud App.

To learn more about Projects, see the Projects Documentation.

In this tutorial, **`hello_world_project`** template is used. This is a basic project with one Client App and one Cloud App, and uses the standard Hello World paradigm to demonstrate basic functionality.

List all the project templates:

```
fhc templates projects
```

Create a new project based on the **`hello_world_project`** template:

```
fhc projects create helloWorld hello_world_project
```

Verify successful creation of the project by searching for the new project:

```
fhc projects list
```

Alternatively, you could search for your specific project by piping the output of the **`fhc projects`** command to the **`grep`** command:

```
fhc projects list | grep 'helloWorld'

# Example:

XME5iUr2VoBV3DbXrVF7qApG ┃ helloWorld  ┃ 2  ┃ 3 minutes ago
# ProjectId | Title | Number of apps | Minutes since last update
```

The console output will display the recently created project that contains a Client App and a Cloud App.

To list all apps in a project, select a projectId (also known as a 'guid' (Global Unique IDentifier)) and use

it in conjunction with the **`fhc apps`**:

```
fhc projects # lists all projects. Next, select a projectId

fhc apps <the_selected_project_guid>
```

This will list all the apps for the given projectId:

- Id - The guid of the App.
- Title - The title of the app. This will be used as the app name for Client Apps on mobile devices.
- Description - A description for the application. This will be blank by default.
- Type - The type of the app. Term used by Platform to distinguish between different app types.
- Git - The Git URL of the App. This can be used to clone the app for local development
- Branch - The currently selected branch for editing app code in the platform.

4.4. ADDING APPS TO A PROJECT

A Project can contain many apps however, apps that have no relationship with each other should be housed in separate projects. Apps are normally added to a project using an existing App Template. There are a selection of App Templates available for both Client and Cloud Apps.

List all available App Templates:

```
fhc templates apps
```

To add a Client App, use the following command, specifying the **`<projectId>`**, the name for the **`<appTitle>`**, and the **`<appTemplate>`** to add an app to a project.

```
fhc app create --project=<projectId> --title=<appTitle> --type=<type> --
template=<appTemplate>

 #The following example illustrates the creation of a new project

fhc app create --project=xe2cbz3cky6zfxq2ca66t55u --title='My Native iOS
App' --type=client_native_ios --template=native_ios_swift_blank_app
```

NOTE

If no template is specified, a blank Client App is created.

To verify the successful creation of the app, list all apps in the project.

4.5. NEXT STEPS

- Local App Development
- Building App Binaries

CHAPTER 5. DEVELOPING CODE LOCALLY

Overview

The following tutorial describes how to set up a local environment for developing a mobile application with the Red Hat Mobile Application Platform Hosted (RHMAP).

NOTE

See the Red Hat Mobile Application Platform Supported Configurations page for appropriate versions of software.

Requirements

You must have completed the following tutorials:

- Installing FHC
- SSH Key Setup
- Working with Projects & Apps

5.1. DEVELOPMENT TOOLS

In addition to **fhc**, Node.js and NPM, other development tools are required.

5.1.1. Git

"Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency."

- Download
- Docs
- Getting Started

Install git on a specific operating system:

- RHEL / Fedora: see Git Installation Page
- Debian based distros: `sudo apt-get install git-core`
- Mac OSX: `brew install git` or `sudo port install git-core +doc +bash_completion` or via the graphical git installer
- Windows: see msysgit

NOTE

To install **Homebrew** package manager for Mac OSX, see http://brew.sh/

5.1.2. Grunt

"The JavaScript Task Runner"

- Getting Started
- Plugins

grunt is available from NPM. To install:

```
sudo npm install -g grunt-cli
```

NOTE

All RHMAP Template Apps uses **grunt** as the task runner for local development.

5.2. CLONING THE SOURCE CODE

Create a new directory to house your project development:

```
mkdir helloworld
cd helloworld
```

Clone the source code for all apps in your project using **fhc projects clone <project-guid>**, for example:

```
fhc projects clone XME5iUr2VoBV3DbXrVF7qApG  # <== Replace this projectId
with your projectId
```

An output message is displayed, for example:

```
Cloning into 'helloWorld-Hello-World-Cloud-App'...

Cloning into 'helloWorld-Hello-World-Client'...
```

Once complete, check what new directories were created:

```
ls

helloWorld-Hello-World-Client   helloWorld-Hello-World-Cloud-App
```

5.3. USING CODE FROM ANOTHER GIT REPOSITORY

If you want to use code from a remote repository, for example https://github.com/evanshortiss/rhmap-express-template, complete the following procedure:

1. Create an appropriate blank app, for example, blank_advanced_webapp
2. Clone the repo you want to use into a temporary directory:

   ```
   git clone git@github.com:evanshortiss/rhmap-express-template.git
   temp_express
   ```

3. Delete the **.git** directory:

   ```
   cd temp_express
   ```

```
rm -rf .git
```

4. Copy the contents of the repo to your App repo, for example:

```
cd temp_express
cp -r * <repo-path>
cd <repo-path>
```

You can now develop your app and push the results to RHMAP.

5.4. ACCESSING CLOUD APPS DURING DEVELOPMENT

The two methods for accessing Cloud Apps are:

1. Access the *cloud instance* running in an environment on the Platform
2. Run the Cloud App in a *local instance* of Node.js to access it

5.4.1. Using Cloud Runtime

Client Apps point to **`http://localhost:8001`** by default

Determine the URL that is hosting the Cloud App:

```
fhc app hosts --app=<app-guid> --env=<some-env>
```

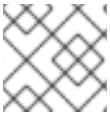
The response is:

```
{
  "url": "https://testing-3utxgzhawprfqot3tya04v5i-example.feedhenry.com"
}
```

Identify the variable **`default_local_server_url`** in the **`Gruntfile.js`** file belonging to the Client App. Set the **`default_local_server_url`** variable to the value returned by the **`fhc app hosts`** command.

The locally running Client App will now route requests to the Cloud App running in the Platform.

5.4.2. Using Local Runtime



NOTE

Your npm version should be at least 1.4.15 to run **`grunt serve`**.

Run the Cloud Server code locally:

```
cd <PROJECT-DIR>/helloWorld-Hello-World-Cloud-App
```

Install all the dependancies for the Cloud app:

```
npm install
```

Once complete (this may take a number of minutes), start the Node.js server.

```
grunt serve
```

An output message is displayed, for example:

```
Running "env:local" (env) task

Running "concurrent:serve" (concurrent) task
Running "watch" task
Waiting...
Running "nodemon:dev" (nodemon) task
[nodemon] v1.0.20
[nodemon] to restart at any time, enter `rs`
[nodemon] watching: *.*
[nodemon] starting `node application.js`
App started at: Tue Sep 30 2014 15:39:07 GMT+0100 (IST) on port: 8001
```

The Node.js process has a lock on the Terminal Window. The Cloud Server is now running however, to proceed, open another terminal window and verify the Cloud Server is running:

```
curl -X POST http://localhost:8001/hello?hello=world
```

An output message is displayed, for example:

```
{"msg":"Hello world"}
```

Change the input parameter from **`world`** to another value and observe the updated response.

The **`Gruntfile.js`** file contains a number of useful commands such as:

```
grunt serve     # run you server locally with 'live reload'
grunt test      # run your tests locally
grunt coverage  # run your tests with code coverage
```

See the Grunt-ReadMe.md file or run **`grunt --help`** for more information.

5.5. RUNNING THE CLIENT LOCALLY

Run the Client App locally:

```
cd <PROJECT-DIR>/helloWorld-Hello-World-Client
```

Install all the dependancies for the Client App - mainly around grunt:

```
npm install
```

Start up a web browser session:

```
grunt serve:local
```

`grunt serve:local` attempts to contact a local Node.js Cloud App on port 8001 by default. A similar message is displayed:

```
Running "serve:local" (serve) task

Running "clean:server" (clean) task

Running "connect:livereload" (connect) task
Started connect web server on http://localhost:9002

Running "watch" task
Waiting...
```

See the local README.md for the 'Hello World Client' Template App to learn more.

5.6. WORKING WITH MBAAS SERVICES LOCALLY

MBaaS Services are Node.js applications. MBaaS Services can be used by projects to integrate with back-end systems, for example, an Oracle integration service. MBaaS Services are associated with one or more projects and must be made available to apps otherwise an app in a project cannot access the MBaaS Service. For more information on MBaaS Services, see the relevant product documentation.

Services are invoked from a Cloud App via the $fh.service Cloud API call , for example:

```
$fh.service({
  guid: "PFi1ftKRBvlp-qSmgdcOeGe3",
  path: "/hello",
  method: "GET",
  params: {
    "hello": "world"
  }
}, function(err, data) {
  if (err) {
    return console.log(err);
  }
  return console.log(data);
});
```

To interact with an MBaaS Service from a local development environment, a mapping is required between:

1. The service guid (that is, the unique id of the service)
2. The hostname of the running instance of the service, that is being targeted

A new environment variable definition in the Gruntfile.js is required:

```
env : {
  options : {},
  // environment variables - see https://github.com/jsoverson/grunt-env
for more information
  local: {
    FH_USE_LOCAL_DB: true,
    FH_SERVICE_MAP: function() {
      /*
```

```
        * Define the mappings for your services here - for local
development.
        * You must provide a mapping for each service you wish to access
        * This can be a mapping to a locally running instance of the
service (for local development)
        * or a remote instance.
        */
       var serviceMap = {
         'PFi1ftKRBvlp-qSmgdcOeGe3': 'http://127.0.0.1:8010'
       };
       return JSON.stringify(serviceMap);
     }
   }
},
```

In the above example, **FH_SERVICE_MAP** is added to the local environment variable definitions. The new variable is mapped to a function and stores the GUID **PFi1ftKRBvlp-qSmgdcOeGe3** which points to a service running locally on port 8010. To target a hosted instance of the service, use the *Current Host* URL of the service, found on the *Details* page in the Studio. All additional services are added to the **serviceMap** variable.

NOTE

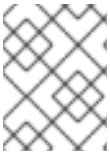
FH_SERVICE_MAP environment variable is defined as a function rather than a simple string.

Users can define the service mappings as a standard JSON object rather than as a stringified JSON object. **FH_SERVICE_MAP** environment variable is set using a standard JSON object in the following example:

```
FH_SERVICE_MAP: '{"PFi1ftKRBvlp-qSmgdcOeGe3":"http://127.0.0.1:8010"}'
```

A working example can be seen here.

5.7. EDITING THE CLOUD CODE



NOTE

When the Node.js Cloud API server is running, **grunt** is monitoring for all changes. **grunt** applies changes in real time.

Navigate to the Cloud App directory and open **./lib/hello.js**.

To add an additional parameter that sets the current time in the response, input a new parameter to both the GET and POST request. Replace both occurrences of:

```
res.json({msg: 'Hello ' + world});
```

with:

```
res.json({msg: 'Hello ' + world, 'timestamp': new Date().getTime() });
```

The will add a timestamp with the current time in milliseconds to the response. The reason there are two occurrences is that we have a route handler for both GET and POST requests.

Your Cloud App should automatically restart as soon as the file is saved. After saving the file, re execute the previous curl command:

```
curl -X POST http://localhost:8001/hello?hello=world
```

The response now includes a timestamp:

```
{"msg":"Hello World","timestamp":1412111429480}
```

5.8. EDITING THE CLIENT CODE

Navigate to your Client App directory and open **./www/index.html**. This is a basic web-page with an input field for a "name" and a button to call the Cloud. There is also a cloudResponse div that is used to populate the response from the Cloud Call.

Directly under the code "cloudResponse":

```
<div id="cloudResponse"></div>
```

Add a timestamp div:

```
<div id="timestamp"></div>
```

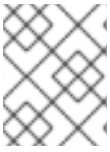
In **./www/hello.js**, a click handler is assigned to the "Say Hello" button. When triggered, the Cloud App's /hello endpoint is called using the $fh.cloud API.

To cater for the timestamp, open **./www/hello.js** and directly under the code:

```
document.getElementById('cloudResponse').innerHTML = "<p>" + res.msg + "
</p>";
```

Add this code:

```
document.getElementById('timestamp').innerHTML = "<p>" + new
Date(res.timestamp) + "</p>";
```



NOTE

A new Date Object is created to accept the timestamp value returned from the cloud for the purposes of displaying the value.

5.9. VIEWING CHANGES IN THE APP STUDIO

Execute the following command in the client directory and also in the cloud directory:

```
git commit -am"Add timestamp parameter"
git push origin master
```

The changes made locally are now visible within the App Studio.

5.10. ADVANCED DEVELOPMENT

For advanced development that makes use of MBaaS APIs, for example, `fh.db()` and `fh.cache()`, additional software is required.

5.10.1. Using fh.cache

To develop locally using fh.cache, install Redis locally:

- RHEL / Fedora: see Redis Download Page
- Debian based distros: `apt-get install redis-server`
- Mac: `brew install redis` or `sudo port install redis`
- Windows: see MSOpenTech Redis

Once installed and running, calls to fh.cache in the Cloud Server will operate in the same manner as the RHMAP Cloud.

IMPORTANT

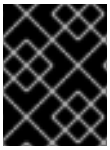
The default Redis port is used therefore there is no need to modify the Redis config file.

5.10.2. Using fh.db

To develop locally using fh.db, install Mongo locally:

- RHEL / Fedora: follow the instructions here
- Debian based distros: follow the instructions here
- Mac: follow the instructions here or `brew install mongodb`
- Windows: follow the instructions here

Once installed and running, calls to fh.db in the Cloud Server will operate in the same manner as the RHMAP Cloud.



IMPORTANT

The default Mongo port is used therefore there is no need to modify the Mongo config file.

5.11. NEXT STEPS

- Building App Binaries
- FHC CLI

CHAPTER 6. WORKING WITH THE PLATFORM USING FHC

6.1. MANAGING API KEYS WITH FHC

When certain FHC commands are executed, it needs to communicate with the platform using the user's identity. This requires the user to login to the platform using the **`fhc login`** command. User API keys provides an alternative way to use FHC. You don't have to run the login command anymore if you have set the user API key in FHC. FHC can use the user's API key to authenticate when communicating with the platform.

6.1.1. Set User API Keys

In FHC, the command related to API keys management is **`fhc keys`**. If you run this command without any additional argument, you will be shown the command help.

To set a user API key for the current FHC target, you should enter the following command:

```
fhc keys user target eb8d9b9ea050b9b23fea59e50ba281c67f3715e5
```

NOTE

This requires you to have previously set the target using **`fhc target`**.

To check which API key is currently used for FHC, you can run this command

```
fhc keys user target
```

After setting a user API key in FHC, you can run other FHC commands as usual.

For example, you can list, create, update and revoke user API keys using FHC.

6.1.2. List User API Keys

If you have logged in or set the user API key using FHC, you can see all the API keys associated with the current user by running this command:

```
fhc keys user list
```

If the output format is set to json in your FHC config, each key object will look like this:

```
{
  "key": "eb8d9b9ea050b9b23fea59e50ba281c67f3715e5",
  "keyReference": "1j6qcwiziRkbYy6sUUHDooAY",
  "keyType": "user",
  "label": "test 1",
  "revoked": "2012-04-20T15:18:17.258Z",
  "revokedBy": "1j6qcwiziRkbYy6sUUHDooAY",
  "revokedEmail": "dev@example.com"
}
```

6.1.3. Create User API Keys

To create a user API key, run this command:

```
fhc keys user create test2
```

You should get a response similar to:

```
{
  "key": "22d0c0ac5990e8fd2c466c26db1a9eff8a171511",
  "keyReference": "1j6qcwiziRkbYy6sUUHDooAY",
  "keyType": "user",
  "label": "test2",
  "revoked": "",
  "revokedBy": "",
  "revokedEmail": ""
}
```

6.1.4. Update User API Keys

To update a user API key using FHC, you can run this command:

```
fhc keys user update 22d0c0ac5990e8fd2c466c26db1a9eff8a171511 test3
```

You should get a response similar to:

```
{
  "key": "22d0c0ac5990e8fd2c466c26db1a9eff8a171511",
  "keyReference": "1j6qcwiziRkbYy6sUUHDooAY",
  "keyType": "user",
  "label": "test3",
  "revoked": "",
  "revokedBy": "",
  "revokedEmail": ""
}
```

6.1.5. Revoke User API Keys

To revoke a user API key using FHC, you can run this command:

```
fhc keys user revoke 22d0c0ac5990e8fd2c466c26db1a9eff8a171511
```

You will be prompted to confirm the revoke action. After confirmation, you should see something similar to:

```
{
  "key": "22d0c0ac5990e8fd2c466c26db1a9eff8a171511",
  "keyReference": "1j6qcwiziRkbYy6sUUHDooAY",
  "keyType": "user",
  "label": "test3",
  "revoked": "2012-04-20T16:14:11.702Z",
  "revokedBy": "1j6qcwiziRkbYy6sUUHDooAY",
  "revokedEmail": "dev@example.com"
}
```

6.2. CREATE A SERVICE USING FHC

Overview

This tutorial shows you how to create a service and associate it with a project. For more information regarding services, and their functionality, see the Cloud Services documentation.

Requirements

The user must be a member of one or more teams with the following permissions:

- Project (View & Edit)
- Service (View & Edit)

For more information on Permissions, see Teams & Collaborations.

6.2.1. Log in to the platform

```
fhc login myUsername myPassword
```

6.2.2. Create a Project

Now that you have successfully logged in to the platform, we will create a project that we will then associate a service with. In order to create the project, enter the following command:

```
fhc projects create serviceProject
```

To verify that the project has successfully been created, enter the following command to search for projects on the domain:

```
fhc projects | grep 'serviceProject'
```

This should return the newly created project. Notice that there are currently two apps in this project. A Client App, and a Cloud App.

6.2.3. Create a Service

Services can be added to a project to allow the Client to access back-end functionality they would otherwise not have access to. Before we create a service, we will view a list of available templates. To view the service templates, enter the following command:

```
fhc templates services
```

This will output a list of all available service templates. We will add the PayPal service to the project. To do this, copy the service id of the PayPal service.

When creating a service, we must also specify a name. Enter the following command:

```
fhc services create paypalService paypal
```

This has successfully created a new service that can be associated with Projects.

6.3. BUILDING AN APP BINARY

Overview

This tutorial will cover how to build a mobile app binary using FHC. Building App Binaries with the Red Hat Mobile Application Platform Hosted (RHMAP) makes use of the cloud hosted "Build Farm" which is used to turn source code into mobile apps. If you have local developer tools installed (such as Xcode or ADT), you are free to build app binaries locally yourself. However, using the RHMAP Build Farm allows you to automate the build process, maintain a history of previous builds and build apps for platforms which you may not have developer tools for (for example, building iOS binaries from a Linux OS).

Requirements

Before starting this tutorial, you should have completed the following tutorials:

- Installing FHC
- Working with Projects & Apps

6.3.1. fhc build command

There are a number of parameters that need to be specified to perform a build using fhc. This will vary depending on the type of build, and the platform for which you are building. During the Working with Projects and Apps tutorial, we created a cordova hybrid app as part of the project. We will now use that app to perform a build for Android.

The fhc build command takes the following parameters:

- **`project=<project-id>`** – the guid of the project.
- **`app=<app-id>`** – the guid of the Client App to build app.
- **`cloud_app=<cloud-app-id>`** – the guid of the Cloud App which the Client App should connect to.
- **`tag=<tag>`** – the Semver tag to use for this build. See Connections for more details.
- **`destination=<destination>`** – the type of build – e.g android, iOS, windowsphone.
- **`version=<version>`** – the specific OS version to target for the destination.
- **`config=<config>`** – the type of build to perform – 'debug' (default), 'distribution' or 'release'.
- **`keypass=<private-key-password>`** – the password for the private key used for building (only needed for release builds).
- **`certpass=<certificate-password>`** – the password for the certificate used for building (only needed for release builds).
- **`download=<true|false>`** – whether or not to download the generated binary.
- **`provisioning=<path-to-provisioning-profile>`** – the path to the provisioning profile to be used for the build.
- **`cordova_version=<cordova-version>`** – the version of cordova to use.
- **`environment=<environment>`** – the id of a target environment – e.g dev.

Not all of these parameters are required for all build types. For more information use the **`fhc build --help`** command.

When building an app, we must tell fhc the project the app is in as well as the app id. You must then enter the id of the Cloud App that the Client App speaks to. Client Apps are pointed towards Cloud apps via a connection. Clients can communicate with various Cloud apps via a number of different connections, and so when performing a build you must also specify the connection tag you wish to use.

```
fhc build project=XME5iUr2VoBV3DbXrVF7qApG app=XME5iNsoeRA2xvbmaDYMCdsi
cloud_app=XME5iHzfwW9hcGw6_F7Eiwvf tag=0.0.3 destination=android
config=debug keypass= certpass= download=true
```

When the build has been completed, you will get confirmation output similar to what is displayed below.

```
Download URL: Download URL: https://ngui-
demo.sandbox.feedhenry.com/digman/android-v3/dist/3e0837f2-76b6-4512-881c-
bd3bf427929d/android~4.0~7~HelloWorldClient.apk?digger=diggers.digger206u
```

6.3.1.1. Artefacts

After a build has been successful, a build artefact is added to the build history. These artefacts allow users to re-download an app without having to perform the build again.

To list all artefacts for a given app, you must use the **`fhc artefacts <projectId> <appId>`** command.

```
fhc artefacts XME5iUr2VoBV3DbXrVF7qApG XME5iNsoeRA2xvbmaDYMCdsi
```

A list will be displayed containing all artefacts for the specified app.

6.3.2. Next Steps

- FHC CLI

6.4. VIEWING APP STATS WITH FHC

FHC can be used to access raw, JSON stats data for your apps.

To access your app stats (timers and counters) for a particular app, use the following command:

```
fhc stats <APP_ID> app <NUMBER_OF_RESULTS>
```

Where **`APP_ID`** is the ID of your app as listed in an **`fhc apps`** command, and **`NUMBER_OF_RESULTS`** is the maximum number of results you wish to see returned. See below for a sample Stats response.

```
{
  interval: 10000,
  results: [
    {
      "ts": 1333107734000,
      "numStats": 6,
      "counters": [
```

```
    {
      "key": "DOMAIN_APPID_api_FUNCTIONNAME_active_requests",
      "value": {
        "value": 3,
        "valuePerSecond": 0.3
      }
    },
    {
      "key": "DOMAIN_APPID_api_FUNCTIONNAME2_active_requests",
      "value": {
        "value": 27,
        "valuePerSecond": 2.7
      }
    },
    {
      "key": "DOMAIN_APPID_api_FUNCTIONNAME3_active_requests",
      "value": {
        "value": 456,
        "valuePerSecond": 45.6
      }
    }
  ],
  "timers": [
    {
      "key": "DOMAIN_APPID_api_FUNCTIONNAME_request_times",
      "value": {
        "upper": 86,
        "lower": 63,
        "count": 17,
        "pcts": [
          {
            "pct": "90",
            "value": {
              "mean": 76,
              "upper": 86
            }
          }
        ]
      }
    },
    {
      "key": "DOMAIN_APPID_api_FUNCTIONNAME2_request_times",
      "value": {
        "upper": 99,
        "lower": 82,
        "count": 41,
        "pcts": [
          {
            "pct": "90",
            "value": {
              "mean": 88.66666666666667,
              "upper": 99
            }
          }
        ]
      }
    }
```

```
        },
        {
          "key": "DOMAIN_APPID_api_FUNCTIONNAME3_request_times",
          "value": {
            "upper": 99,
            "lower": 75,
            "count": 2783,
            "pcts": [
              {
                "pct": "90",
                "value": {
                  "mean": 79.1254547827,
                  "upper": 99
                }
              }
            ]
          }
        }
      ]
    }
  ]
}
```

CHAPTER 7. WORKING WITH FORMS USING FHC

7.1. CREATE A FORMS PROJECT USING FHC

Overview

This tutorial will show you how to build an Forms Project using FHC. This project will consist of an Forms Client App, along with a Cloud App.

Requirements

The user must be a member of one or more teams with the following permissions:

- Project (View & Edit)
- Drag & Drop Apps (View & Edit)

For more information on Permissions, see Teams & Collaborations.

7.1.1. Create a Forms project

First we must create an App Forms Project. This can be done by specifying which template to use when creating a project. This will create a project containing a Hybrid Forms App.

```
fhc projects create FormsProject appforms_project
```

7.1.2. Add a form

Now that the Project containing the Forms App has been created, the next step is to associate a form with that App. We will do this by specifying the path to the form file we wish to use.

`fhc forms create <form.json>`

For example:

```
fhc forms create ~/Desktop/forms/smallForm.json
```

7.1.3. Associate a form with a project

Now that a form has been created on the Platform, we must now associate it with the app inside our project.

`fhc forms apps update <project-id> <form-id>`

For example:

```
fhc forms apps update 534572a3fb19a3983fd92c15 5579624572fb19ajsfig398c
```

Your App now has a form associated with it. Use the **`fhc preview`** command to view the current state of your form.

`fhc preview <app-id>`

This will load a preview of your app in the browser. You can see that the form has been successfully associated with the app, however it appears rather bare, as no theme has yet been assigned to make the form more visually appealing.

7.1.4. Create a theme

A theme is created in a similar way to that of a form. You create the theme.json file and then specify the path to that file using the **`fhc themes create`** command.

`fhc themes create <theme.json>`

For example:

```
fhc themes create ~/Desktop/themes/CustomTheme.json
```

7.1.5. Associate the theme with the app

Now that the theme has been added to the Platform, you must apply it to the project you created.

NOTE

Themes are associated with Projects, not individual Apps.

`fhc themes app set <project-id> <theme-id>`

For example:

```
fhc themes app set HQgUjokQi7jizH8T-7TD4SQQ 534578160663a687117a4bd1
```

At this stage you have a functioning Forms Project that contains a Client Forms App, and an Cloud App. The Client App has a form and a theme associated with it. Once again, you can preview using **`fhc preview <app-id>`**. You will notice that the form is a lot more visually appealing now that a theme has been associated with the project.

7.1.6. Add another Forms App

If you wanted to add a forms based app to a project, you would do as follows:

`fhc apps create <project-id> <app-title> [<app-template-id>]`

For the template-id you specify the 'appforms_client' template. This creates a Hybrid Forms App.

NOTE

To view all available App Templates, use the 'fhc templates apps' command.

So to add the Forms App to the project, enter the following into the terminal:

```
fhc apps create HQgUjokQi7jizH8T-7TD4SQQ Second_Form_App appforms_client
```

This has now successfully created another Form based App within your project. You can associate a form and theme with your app exactly as you did before.

7.2. CREATE A FORM USING FHC

Overview

This tutorial explains how to create a form for use with an App Forms apps.

Requirements

The user must be a member of one or more teams with the following permissions:

- Domain — Drag & Drop Apps
- Form (View & Edit)

For more information on Permissions, see Teams & Collaborations.

7.2.1. List available forms

Target the Platform domain using **`fhc target`**.

```
fhc target exampleDomain.feedhenry.com
```

Then log in using the **`fhc login`** command.

```
fhc login testUser@example.com password
```

To list all forms on a domain, use the **`fhc forms`** command.

```
fhc forms
```

This command will list all forms that you have access to based on the Permissions assigned to the logged-in User.

7.2.2. Create a form

In order to create a form, you need to pass in a **`form.json`** object. Create a **`form.json`** object and take note of its path. The example **`form.json`** file used in this tutorial can be seen below.

```
{
   "description":"This is a test form",
   "name":"Test Form",
   "updatedBy":"testing-admin@example.com",
   "pageRules":[

   ],
   "fieldRules":[

   ],
   "pages":[
      {
         "name":"Page 1",
         "fields":[
            {
               "fieldOptions":{
```

```
                "definition":{
                   "defaultValue":""
                }
             },
             "required":false,
             "type":"text",
             "name":"Text",
             "helpText":"Text",
             "repeating":false
          },
          {
             "required":false,
             "type":"file",
             "name":"File",
             "helpText":"File",
             "repeating":false
          }
       ]
    },
    {
       "name":"Page 2",
       "fields":[
          {
             "required":false,
             "type":"text",
             "name":"Page 2 Text",
             "helpText":"Page 2 Text",
             "repeating":false
          }
       ]
    }
 ],
 "lastUpdated":"2014-01-22T16:51:53.725Z",
 "dateCreated":"2014-01-22T14:43:21.806Z",
 "pageRef":{
    "52dfd909a926eb2e3f000001":0,
    "52dff729e02b762d3f000004":1
 },
 "fieldRef":{
    "52dfd93ee02b762d3f000001":{
       "page":0,
       "field":0
    },
    "52dfd93ee02b762d3f000002":{
       "page":0,
       "field":1
    },
    "52dff729e02b762d3f000003":{
       "page":1,
       "field":0
    }
 },
 "lastUpdatedTimestamp":1390409513725,
 "appsUsingForm":123,
```

```
    "submissionsToday":1234,
    "submissionsTotal":124125
}
```

To create the form above using fhc, we use the **`fhc forms create`** command. The command operates as follows:

`fhc forms create <form-file.json>`

A JSON form object needs to be passed as a parameter for the command. The path of the file is to be specified.

```
fhc forms create ~/Desktop/forms/form.js
```

This will recreate the given form on the Platform. After the form has been created, use the **`fhc forms get`** command to display the form. Then copy and paste the code into your desired directory in case you want to edit the form in future. Alternatively, you could print the result of the **`fhc forms get`** command to file by issuing the following command:

```
fhc forms get <app-id> > ~/Desktop/formFile.txt
```

7.2.3. Update form

At some stage during development, you may want to update a form. To do this, edit whatever content you like in the file where you saved your form earlier. For example, you may wish to add another text field, or apply a rule to a page. You can then use the **`fhc forms update`** command to update an existing form.

`fhc forms update <path_to_form>`

For example:

```
fhc forms update ~/Desktop/formFiles/form
```

NOTE

If you pass in the path to the form file you used to create the form initially, the update command will actually duplicate the form, as that file has no id assigned to it. This means that instead of updating the form, a new instance will be created, and a new id will be assigned.

The new changes will now have taken effect.

To learn how to associate a form with a project, see the Associate a form with a project section of the Create an App Forms project tutorial.

7.3. CREATE A FORM SUBMISSION USING FHC

Overview

This tutorial will inform you of how to list, retrieve, and generate form submissions.

Requirements

The user must be a member of one or more teams with the following permissions:

- Domain — Drag & Drop Apps
- Form (View & Edit) — Submission (View & Edit)

For more information on Permissions, see Teams & Collaborations.

In order to complete this tutorial, you will have to already have created a form. See Form Creatation for a guide to creating a new form.

7.3.1. Listing submissions

In order to list submissions for a form, you can use either the **`fhc submissions`** or the **`fhc submissions list`** command.

```
fhc submissions list
```

This will return a list of all submissions for all forms you have access to.

7.3.2. Return a specific submission

The **`fhc submissions get`** command can be used to return a specific submission based on its id.

`fhc submissions get <submission-id>`

This will return that specific submission. You can also save the submission in .pdf form simply by appending a filename with the **`.pdf`** suffix.

`fhc submissions get <submission-id> <filename>.pdf`

For example:

```
fhc submissions get 534cf14de078a2c47291e5b3 savedSubmission.pdf
```

7.3.3. Submission status

You can check the status of a submission by using the **`fhc submissions status`** command in conjunction with a specific submission id.

```
fhc submissions status 5335bc00d4598fdb5cae04f7
```

7.3.4. Submitting a Submission

You can submit data for a submission by passing a submission.json file into the **`fhc submissions submitdata`** command.

`fhc submissons submitdata <submission.json>`

For example:

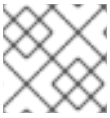
```
fhc submissions submitdata ~/Desktop/templateForSubmission.json
```

You can complete a submission by using the **`fhc submissions complete <submission-id>`** command to push mark the submission as finished.

```
fhc complete submissions complete 5335bc00d4598fdb5cae04f7
```

Just as you can save submissions as PDF's, you can also save submissions as zip files. This can be useful if a particular project has a number of submissions.

`fhc submissions export file=<zip-file> app=<project-id> || form=<form-id>`



NOTE

The project parameter is passed into the app field **`app=<project-id>`**.

```
fhc submissions export file=submissions.zip app=H_DNbFNJWS9uZIt7LJOkut20
```

7.4. CREATE A FORM THEME USING FHC

Overview

This tutorial will teach you how to create a theme for a form using FHC.

Requirements

The user must be a member of one or more teams with the following permissions:

- Domain — Drag & Drop Apps
- Theme (View & Edit)

For more information on Permissions, see Teams & Collaborations.

7.4.1. List all themes

Target your domain using the **`fhc target`** command, and log in using **`fhc login`**.

To list all themes on a domain, you can use the **`fhc themes`** command.

7.4.2. Create a theme

To create a theme, you must use the **`fhc themes create`** command. This command requires you to pass a json file as a paramter.

`fhc themes create <theme-file.json>`

For example:

```
fhc themes create ~/Desktop/themes/theme.json
```

This will create the specified theme on the Platform. It will also assign an id to the theme.

When the theme is successfully created, it will be output to the console.

Save the output to a file and take note of its path. This will be used to update a theme. To save the output to file

7.4.3. Associating a theme with an app

Before adding a theme to an app, you must have an app associated with a project. If you do not know how to add an app to a project, please refer to guide Working with Projects and Apps.

Themes are associated with apps using the **`fhc themes app set`** command.

`fhc themes app set <app-id> <theme-id>`

For example:

```
fhc themes app set x5KmSy0gXPZOvpD_hHqCOwZe zRdUezAD3l11huedCk-WJswZ
```

7.4.4. Updating a theme

If you want to update a theme at any stage, you can do so via the **`fhc themes update`** command. Navigate to where you saved the theme after you created it. Make whatever changes you wish, and then save the file. You can now update the theme.

```
fhc themes update ~/Desktop/themes/theme.json
```

This will load in the changes you have made. The newly updated theme will once again be output to the console.

APPENDIX A. USING MULTIPLE SSH KEYS FOR DIFFERENT DOMAINS/PROJECTS

If you need to access multiple domains in the Red Hat Mobile Application Platform Hosted (RHMAP) as different users you need to use seperate SSH keys when accessing the Git repositories, since each SSH key can only be associated with a single user. You need to tell Git/SSH which key you want to apply to each host. Typically, you set this up using an SSH config file.

SSH normally attempts to use all the identity files available to it, and if several of your ssh keys are valid in the cluster, it may use one that is valid for the cluster but which does not have access to the project that you are trying to clone.

You can update your local SSH config file, normally **`~/.ssh/config`**, to list the identities to use for a particular host, but you must also add an **`IdentitiesOnly yes`** clause, to tell SSH to only use the specified identity file for a particular host, rather than all the identity files.

For example, if you want to access App repositories as two different users, create SSH keys for each of the users, upload each SSH key to the corresponding user's account.

In the example below, the SSH key file **`/Users/jbloggs/.ssh/key_for_domain1_id_rsa`** has been uploaded to the user in **`domain1.redhatmobile.com`**, and **`/Users/jbloggs/.ssh/key_for_domain2_id_rsa`** has been uploaded to the user in **`domain2.redhatmobile.com`**

To allow access to the App repositories:

```
git@domain1.redhatmobile.com:domain1/jbAdvTest-mmCord1.git
git@domain2.redhatmobile.com:domain2/jbAdvTest-mmCord2.git
```

Your ssh config file is similar to the following:

```
Host domain1.redhatmobile.com
HostName domain1.redhatmobile.com
IdentitiesOnly yes
IdentityFile /Users/jbloggs/.ssh/key_for_domain1_id_rsa
Host domain2.redhatmobile.com
HostName domain2.redhatmobile.com
IdentitiesOnly yes
IdentityFile /Users/jbloggs/.ssh/key_for_domain2_id_rsa
```

You can then clone the repos using the git commands:

```
git clone git@domain1.redhatmobile.com:domain1/jbAdvTest-mmCord1.git
git clone git@domain2.redhatmobile.com:domain2/jbAdvTest-mmCord2.git
```

Because of the ssh config file, the appropriate SSH key is used for each domain. For more information on the configuration of ssh, check the documentation for your local installation of SSH. Depending on your Operating System, it may be available from the command line **`man ssh_config`**.

NOTE

The configurations and domain names above are examples only and do not refer to actual domains.