

App Exchange Tutorial

Objectives

- Describe Basecamp's interface to the a Basecamp App Exchange
- Gain familiarity with using Basecamp's app installation features by installing and running the payload manage app, payload simulator app, and payload simulator library.

Notes

1. The Payload Manager example was chosen because most if not all missions need the flight software to interface to a payload
2. For more information on designing mission flight software with a payload manager refer to the following Basecamp project: <https://spacesteps.com/2024/10/12/cfs-payload-manager-app/>
3. Being familiar with the "Build and Run cFS" tutorial is helpful but not required

Lesson 1

Objective

- Describe what a Basecamp App Exchange is
- Show how to install an app from the default cFS App Exchange

Notes

1. This lesson documents how to use an app exchange. In lesson 2 you will use these instructions to actually download and install an app.

Basecamp App Exchange Repositories

- A Basecamp App Exchange is a Github repository that contains libraries and apps that comply with Basecamp's App Spec
- Basecamp's default App Exchange is at <https://github.com/orgs/cfs-apps/repositories>
 - It's is often referred to as the *cFS App Exchange*
- basecamp.ini's **APP_STORE_URL** parameter defines the URL to Github's JSON API file that defines the repositories
 - The JSON file for the default App Exchange is at api.github.com/users/cfs-apps/repos

Basecamp App Exchange Repo Topics

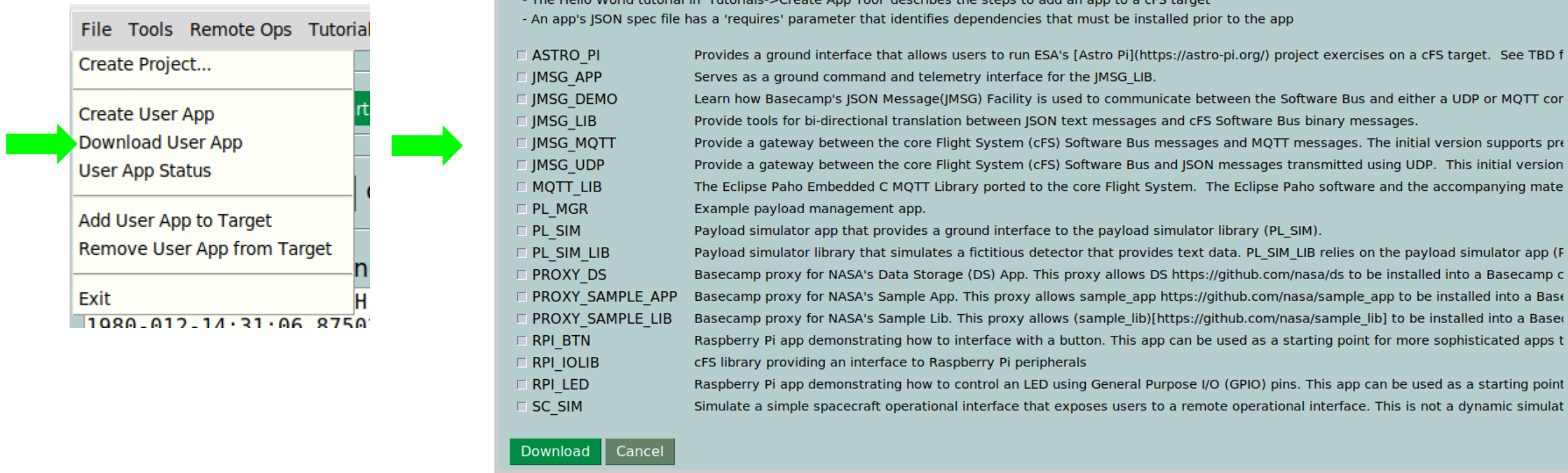
- Github *Topics* are words or phrases that allow users to classify their repositories
- basecamp.ini's *APP_STORE_INCLUDE* and *APP_STORE_EXCLUDE* parameters are lists of topics to include and exclude, respectively from the Download App popup window
- **Basecamp uses the following topics:**
 - cfs-basecamp: Apps developed and maintained by cFS Basecamp
 - cfs-edu: Community apps developed by Open STEMware Foundation partners for cFS education
 - prototype: Apps under development that should not be in the apps listed in the Download App window

Basecamp App Exchange Organizations

- **Users can configure basecamp.ini's parameters to use their own Github repositories and filter which apps are displayed in the Download App window**
- **We recommend hosting your Github repositories within a Github *Organization***
 - “Organizations are shared accounts where businesses and open-source projects can collaborate across many projects at once, with sophisticated security and administrative features.”
 - <https://docs.github.com/en/organizations/collaborating-with-groups-in-organizations/about-organizations>

App Exchange GUI

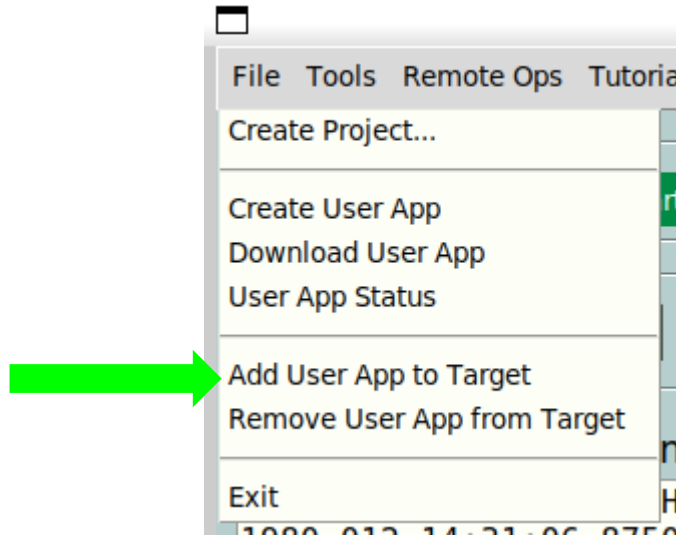
- Select “File->Download User App” to get a list of the libraries and apps that can be installed



- Select the libraries and apps you want and click download to have the components cloned into the cfs-basecamp/usr/apps directory

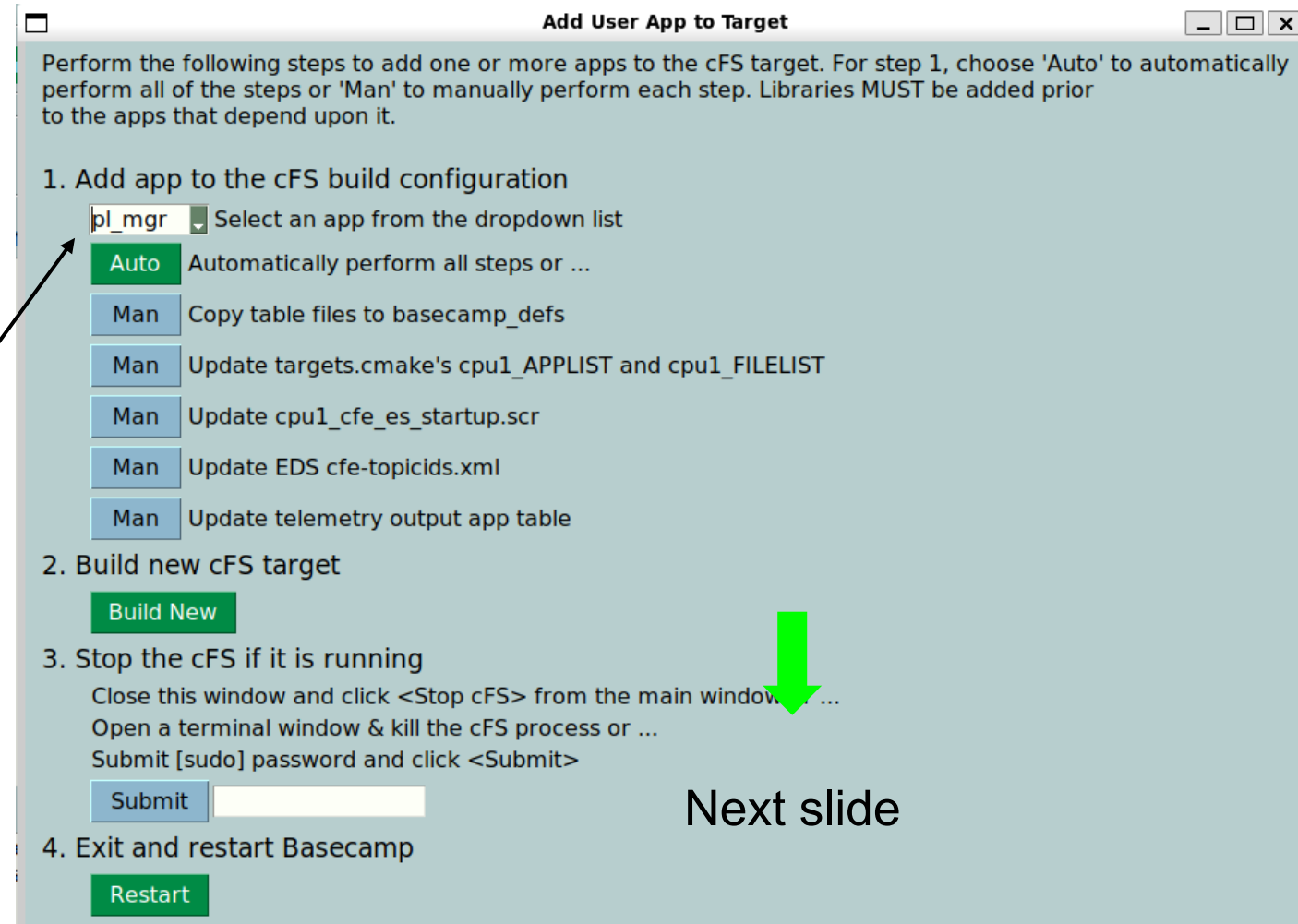
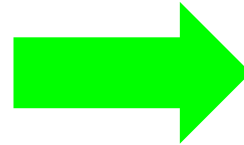
Add New App to Basecamp's cFS Target (1 of 2)

1. Select *File->Add User App to Target*



2. Select the library/app from the dropdown menu you want to add to the build configuration

- a. The autonomous option is recommended for normal user operations. The manual options are for educational situations.



Next slide

Add New App to Basecamp's cFS Target (2 of 2)

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Add User App to Target

Perform the following steps to add one or more apps to the cFS target. For step 1, choose 'Auto' to automatically perform all of the steps or 'Man' to manually perform each step. Libraries MUST be added prior to the apps that depend upon it.

1. Add app to the cFS build configuration

pl_mgr

Select an app from the dropdown list

Auto

Automatically perform all steps or ...

Man

Copy table files to basecamp_defs

Man

Update targets.cmake's cpu1_APPLIST and cpu1_FILELIST

Man

Update cpu1_cfe_es_startup.scr

Man

Update EDS cfe-topicsids.xml

Man

Update telemetry output app table

2. Build new cFS target

Build New

3. Stop the cFS if it is running

Close this window and click <Stop cFS> from the main window or ...
Open a terminal window & kill the cFS process or ...
Submit [sudo] password and click <Submit>

Submit

4. Exit and restart Basecamp

Restart

3. Build the cFS

- This uses the 'make topicids' command option that is described in the 'Build and run cFS' tutorial

4. Stop the cFS if it is running

5. Restart Basecamp's GUI

- This causes Basecamp to use the new python libraries created by the cFS build process