Activity: Create Apps

Manually create two simple cFS apps with both commands and telemetry. The first application handles IO for a temperature sensor. The second application monitors the readings from the first.

This activity is split into two parts:

1. Creating the applications and verifying basic operations with the cFS Ground System utility.
2. Adding more complex functionality to the apps.

# Create the Shell Apps

|  |  |  |
| --- | --- | --- |
| 1 | Copy a portion of the sample\_app contents to create two new apps. At this point, the new apps will not have a table so the table related files are not yet needed. One of the apps will perform input/output functions to communicate with a thermometer. The other app will monitor the temperature and take action based on the temperature. The app name / directory name should reflect these purposes. There is a configured limit to the length of the app name. Can you find the definition that limits the length of the app name? | debian@beaglebone:~/cFS/apps$ mkdir bcamp\_io\_app  debian@beaglebone:~/cFS/apps$ cp sample\_app/CMakeLists.txt bcamp\_io\_app/.  debian@beaglebone:~/cFS/apps$ cp -r sample\_app/fsw/ bcamp\_io\_app/.  debian@beaglebone:~/cFS/apps$ rm bcamp\_io\_app/fsw/src/sample\_table.\*  debian@beaglebone:~/cFS/apps$  # Do the same for the monitor app |
| 2 | Modify cMakeLists.txt to build the apps. At this point, we won’t be calling a library. So, remove the references to a library along with changing the app name. Do this for both apps. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app$ diff CMakeLists.txt ../sample\_app/CMakeLists.txt  2c2  < project(CFE\_BCAMP\_IO\_APP C)  ---  > project(CFE\_SAMPLE\_APP C)  6a7,10  > # Include the public API from sample\_lib to demonstrate how  > # to call library-provided functions  > include\_directories(${sample\_lib\_MISSION\_DIR}/fsw/public\_inc)  >  10c14,17  < add\_cfe\_app(bcamp\_io\_app ${APP\_SRC\_FILES})  ---  > add\_cfe\_app(sample\_app ${APP\_SRC\_FILES})  >  > # Add table  > add\_cfe\_tables(sampleTable fsw/src/sample\_table.c)  debian@beaglebone:~/cFS/apps/bcamp\_io\_app$ |
| 3 | Modify bcamp\_io\_app\_perfids.h to reflect the new app name. You must choose a performance identifier that is unique across cFS. How do you do this? Do this for both apps. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/mission\_inc$ diff bcamp\_io\_app\_perfids.h ../../../sample\_app/fsw/mission\_inc/sample\_app\_perfids.h  1,2c1,30  < #ifndef \_bcamp\_io\_app\_perfids\_h\_  < #define \_bcamp\_io\_app\_perfids\_h\_  ---  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  > \*\*  > \*\* GSC-18128-1, "Core Flight Executive Version 6.7"  > \*\*  > \*\* Copyright (c) 2006-2019 United States Government as represented by  > \*\* the Administrator of the National Aeronautics and Space Administration.  > \*\* All Rights Reserved.  > \*\*  > \*\* Licensed under the Apache License, Version 2.0 (the "License");  > \*\* you may not use this file except in compliance with the License.  > \*\* You may obtain a copy of the License at  > \*\*  > \*\* http://www.apache.org/licenses/LICENSE-2.0  > \*\*  > \*\* Unless required by applicable law or agreed to in writing, software  > \*\* distributed under the License is distributed on an "AS IS" BASIS,  > \*\* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  > \*\* See the License for the specific language governing permissions and  > \*\* limitations under the License.  > \*\*  > \*\* File: sample\_app\_perfids.h  > \*\*  > \*\* Purpose:  > \*\* Define Sample App Performance IDs  > \*\*  > \*\* Notes:  > \*\*  > \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > #ifndef \_sample\_app\_perfids\_h\_  > #define \_sample\_app\_perfids\_h\_  5c33  < #define BCAMP\_IO\_APP\_PERF\_ID 101  ---  > #define SAMPLE\_APP\_PERF\_ID 91  7c35,39  < #endif /\* \_bcamp\_io\_app\_perfids\_h\_ \*/  ---  > #endif /\* \_sample\_app\_perfids\_h\_ \*/  >  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > /\* End of File Comment \*/  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/mission\_inc$ |
| 4 | Modify bcamp\_io\_app\_msgids.h to reflect the new app name. You must choose message identifiers that are unique across cFS. How do you do this? Do this for both apps. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/platform\_inc$ diff bcamp\_io\_app\_msgids.h ../../../sample\_app/fsw/platform\_inc/sample\_app\_msgids.h  1,2c1,31  < #ifndef \_bcamp\_io\_app\_msgids\_h\_  < #define \_bcamp\_io\_app\_msgids\_h\_  ---  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  > \*\*  > \*\* GSC-18128-1, "Core Flight Executive Version 6.7"  > \*\*  > \*\* Copyright (c) 2006-2019 United States Government as represented by  > \*\* the Administrator of the National Aeronautics and Space Administration.  > \*\* All Rights Reserved.  > \*\*  > \*\* Licensed under the Apache License, Version 2.0 (the "License");  > \*\* you may not use this file except in compliance with the License.  > \*\* You may obtain a copy of the License at  > \*\*  > \*\* http://www.apache.org/licenses/LICENSE-2.0  > \*\*  > \*\* Unless required by applicable law or agreed to in writing, software  > \*\* distributed under the License is distributed on an "AS IS" BASIS,  > \*\* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  > \*\* See the License for the specific language governing permissions and  > \*\* limitations under the License.  > \*\*  > \*\* File: sample\_app\_msgids.h  > \*\*  > \*\* Purpose:  > \*\* Define Sample App Message IDs  > \*\*  > \*\* Notes:  > \*\*  > \*\*  > \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > #ifndef \_sample\_app\_msgids\_h\_  > #define \_sample\_app\_msgids\_h\_  4,6c33,35  < #define BCAMP\_IO\_APP\_CMD\_MID 0x1892  < #define BCAMP\_IO\_APP\_SEND\_HK\_MID 0x1893  < #define BCAMP\_IO\_APP\_HK\_TLM\_MID 0x0893  ---  > #define SAMPLE\_APP\_CMD\_MID 0x1882  > #define SAMPLE\_APP\_SEND\_HK\_MID 0x1883  > #define SAMPLE\_APP\_HK\_TLM\_MID 0x0883  8c37,41  < #endif /\* \_bcamp\_io\_app\_msgids\_h\_ \*/  ---  > #endif /\* \_sample\_app\_msgids\_h\_ \*/  >  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > /\* End of File Comment \*/  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/platform\_inc$ |
| 5 | Modify bcamp\_io\_app.c to reflect the new app name. Search/replace is your friend. Do this for both apps. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ diff bcamp\_io\_app.c ../../../sample\_app/fsw/src/sample\_app.c  0a1,27  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  > \*\*  > \*\* GSC-18128-1, "Core Flight Executive Version 6.7"  > \*\*  > \*\* Copyright (c) 2006-2019 United States Government as represented by  > \*\* the Administrator of the National Aeronautics and Space Administration.  > \*\* All Rights Reserved.  > \*\*  > \*\* Licensed under the Apache License, Version 2.0 (the "License");  > \*\* you may not use this file except in compliance with the License.  > \*\* You may obtain a copy of the License at  > \*\*  > \*\* http://www.apache.org/licenses/LICENSE-2.0  > \*\*  > \*\* Unless required by applicable law or agreed to in writing, software  > \*\* distributed under the License is distributed on an "AS IS" BASIS,  > \*\* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  > \*\* See the License for the specific language governing permissions and  > \*\* limitations under the License.  > \*\*  > \*\* File: sample\_app.c  > \*\*  > \*\* Purpose:  > \*\* This file contains the source code for the Sample App.  > \*\*  > \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  >  4,6c31,37  < #include "bcamp\_io\_app\_events.h"  < #include "bcamp\_io\_app\_version.h"  < #include "bcamp\_io\_app.h"  ---  > #include "sample\_app\_events.h"  > #include "sample\_app\_version.h"  > #include "sample\_app.h"  > #include "sample\_table.h"  >  > /\* The sample\_lib module provides the SAMPLE\_Function() prototype \*/  > #include <sample\_lib.h>  13c44  < Bcamp\_IO\_AppData\_t Bcamp\_IO\_AppData;  ---  > Sample\_AppData\_t Sample\_AppData;  16c47  < /\* BCAMP\_IO\_AppMain() -- Application entry point and main process loop \*/  ---  > /\* SAMPLE\_AppMain() -- Application entry point and main process loop \*/  19c50  < void BCAMP\_IO\_AppMain( void )  ---  > void SAMPLE\_AppMain( void )  31c62  < CFE\_ES\_PerfLogEntry(BCAMP\_IO\_APP\_PERF\_ID);  ---  > CFE\_ES\_PerfLogEntry(SAMPLE\_APP\_PERF\_ID);  38c69  < status = BCAMP\_IO\_AppInit();  ---  > status = SAMPLE\_AppInit();  41c72  < Bcamp\_IO\_AppData.RunStatus = CFE\_ES\_APP\_ERROR;  ---  > Sample\_AppData.RunStatus = CFE\_ES\_APP\_ERROR;  45c76  < \*\* BCAMP\_IO Runloop  ---  > \*\* SAMPLE Runloop  47c78  < while (CFE\_ES\_RunLoop(&Bcamp\_IO\_AppData.RunStatus) == TRUE)  ---  > while (CFE\_ES\_RunLoop(&Sample\_AppData.RunStatus) == TRUE)  52c83  < CFE\_ES\_PerfLogExit(BCAMP\_IO\_APP\_PERF\_ID);  ---  > CFE\_ES\_PerfLogExit(SAMPLE\_APP\_PERF\_ID);  55,56c86,87  < status = CFE\_SB\_RcvMsg(&Bcamp\_IO\_AppData.BCAMP\_IOMsgPtr,  < Bcamp\_IO\_AppData.BCAMP\_IO\_CommandPipe,  ---  > status = CFE\_SB\_RcvMsg(&Sample\_AppData.SAMPLEMsgPtr,  > Sample\_AppData.SAMPLE\_CommandPipe,  62c93  < CFE\_ES\_PerfLogEntry(BCAMP\_IO\_APP\_PERF\_ID);  ---  > CFE\_ES\_PerfLogEntry(SAMPLE\_APP\_PERF\_ID);  66c97  < BCAMP\_IO\_ProcessCommandPacket(Bcamp\_IO\_AppData.BCAMP\_IOMsgPtr);  ---  > SAMPLE\_ProcessCommandPacket(Sample\_AppData.SAMPLEMsgPtr);  70c101  < CFE\_EVS\_SendEvent(BCAMP\_IO\_PIPE\_ERR\_EID,  ---  > CFE\_EVS\_SendEvent(SAMPLE\_PIPE\_ERR\_EID,  72c103  < "BCAMP\_IO APP: SB Pipe Read Error, App Will Exit");  ---  > "SAMPLE APP: SB Pipe Read Error, App Will Exit");  74c105  < Bcamp\_IO\_AppData.RunStatus = CFE\_ES\_APP\_ERROR;  ---  > Sample\_AppData.RunStatus = CFE\_ES\_APP\_ERROR;  82c113  < CFE\_ES\_PerfLogExit(BCAMP\_IO\_APP\_PERF\_ID);  ---  > CFE\_ES\_PerfLogExit(SAMPLE\_APP\_PERF\_ID);  84c115  < CFE\_ES\_ExitApp(Bcamp\_IO\_AppData.RunStatus);  ---  > CFE\_ES\_ExitApp(Sample\_AppData.RunStatus);  86c117  < } /\* End of BCAMP\_IO\_AppMain() \*/  ---  > } /\* End of SAMPLE\_AppMain() \*/  90c121  < /\* BCAMP\_IO\_AppInit() -- initialization \*/  ---  > /\* SAMPLE\_AppInit() -- initialization \*/  93c124  < int32 BCAMP\_IO\_AppInit( void )  ---  > int32 SAMPLE\_AppInit( void )  97c128  < Bcamp\_IO\_AppData.RunStatus = CFE\_ES\_APP\_RUN;  ---  > Sample\_AppData.RunStatus = CFE\_ES\_APP\_RUN;  102,103c133,134  < Bcamp\_IO\_AppData.CmdCounter = 0;  < Bcamp\_IO\_AppData.ErrCounter = 0;  ---  > Sample\_AppData.CmdCounter = 0;  > Sample\_AppData.ErrCounter = 0;  108c139  < Bcamp\_IO\_AppData.PipeDepth = BCAMP\_IO\_PIPE\_DEPTH;  ---  > Sample\_AppData.PipeDepth = SAMPLE\_PIPE\_DEPTH;  110c141  < strcpy(Bcamp\_IO\_AppData.PipeName, "BCAMP\_IO\_CMD\_PIPE");  ---  > strcpy(Sample\_AppData.PipeName, "SAMPLE\_CMD\_PIPE");  115,128c146,159  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[0].EventID = BCAMP\_IO\_STARTUP\_INF\_EID;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[0].Mask = 0x0000;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[1].EventID = BCAMP\_IO\_COMMAND\_ERR\_EID;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[1].Mask = 0x0000;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[2].EventID = BCAMP\_IO\_COMMANDNOP\_INF\_EID;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[2].Mask = 0x0000;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[3].EventID = BCAMP\_IO\_COMMANDRST\_INF\_EID;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[3].Mask = 0x0000;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[4].EventID = BCAMP\_IO\_INVALID\_MSGID\_ERR\_EID;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[4].Mask = 0x0000;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[5].EventID = BCAMP\_IO\_LEN\_ERR\_EID;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[5].Mask = 0x0000;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[6].EventID = BCAMP\_IO\_PIPE\_ERR\_EID;  < Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[6].Mask = 0x0000;  ---  > Sample\_AppData.SAMPLE\_EventFilters[0].EventID = SAMPLE\_STARTUP\_INF\_EID;  > Sample\_AppData.SAMPLE\_EventFilters[0].Mask = 0x0000;  > Sample\_AppData.SAMPLE\_EventFilters[1].EventID = SAMPLE\_COMMAND\_ERR\_EID;  > Sample\_AppData.SAMPLE\_EventFilters[1].Mask = 0x0000;  > Sample\_AppData.SAMPLE\_EventFilters[2].EventID = SAMPLE\_COMMANDNOP\_INF\_EID;  > Sample\_AppData.SAMPLE\_EventFilters[2].Mask = 0x0000;  > Sample\_AppData.SAMPLE\_EventFilters[3].EventID = SAMPLE\_COMMANDRST\_INF\_EID;  > Sample\_AppData.SAMPLE\_EventFilters[3].Mask = 0x0000;  > Sample\_AppData.SAMPLE\_EventFilters[4].EventID = SAMPLE\_INVALID\_MSGID\_ERR\_EID;  > Sample\_AppData.SAMPLE\_EventFilters[4].Mask = 0x0000;  > Sample\_AppData.SAMPLE\_EventFilters[5].EventID = SAMPLE\_LEN\_ERR\_EID;  > Sample\_AppData.SAMPLE\_EventFilters[5].Mask = 0x0000;  > Sample\_AppData.SAMPLE\_EventFilters[6].EventID = SAMPLE\_PIPE\_ERR\_EID;  > Sample\_AppData.SAMPLE\_EventFilters[6].Mask = 0x0000;  133,134c164,165  < status = CFE\_EVS\_Register(Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters,  < BCAMP\_IO\_EVENT\_COUNTS,  ---  > status = CFE\_EVS\_Register(Sample\_AppData.SAMPLE\_EventFilters,  > SAMPLE\_EVENT\_COUNTS,  138c169  < CFE\_ES\_WriteToSysLog("Bcamp\_IO App: Error Registering Events, RC = 0x%08lX\n",  ---  > CFE\_ES\_WriteToSysLog("Sample App: Error Registering Events, RC = 0x%08lX\n",  146,148c177,179  < CFE\_SB\_InitMsg(&Bcamp\_IO\_AppData.BCAMP\_IO\_HkTelemetryPkt,  < BCAMP\_IO\_APP\_HK\_TLM\_MID,  < sizeof(bcamp\_io\_hk\_tlm\_t),  ---  > CFE\_SB\_InitMsg(&Sample\_AppData.SAMPLE\_HkTelemetryPkt,  > SAMPLE\_APP\_HK\_TLM\_MID,  > sizeof(sample\_hk\_tlm\_t),  154,156c185,187  < status = CFE\_SB\_CreatePipe(&Bcamp\_IO\_AppData.BCAMP\_IO\_CommandPipe,  < Bcamp\_IO\_AppData.PipeDepth,  < Bcamp\_IO\_AppData.PipeName);  ---  > status = CFE\_SB\_CreatePipe(&Sample\_AppData.SAMPLE\_CommandPipe,  > Sample\_AppData.PipeDepth,  > Sample\_AppData.PipeName);  159c190  < CFE\_ES\_WriteToSysLog("Bcamp\_IO App: Error creating pipe, RC = 0x%08lX\n",  ---  > CFE\_ES\_WriteToSysLog("Sample App: Error creating pipe, RC = 0x%08lX\n",  167,168c198,199  < status = CFE\_SB\_Subscribe(BCAMP\_IO\_APP\_SEND\_HK\_MID,  < Bcamp\_IO\_AppData.BCAMP\_IO\_CommandPipe);  ---  > status = CFE\_SB\_Subscribe(SAMPLE\_APP\_SEND\_HK\_MID,  > Sample\_AppData.SAMPLE\_CommandPipe);  171c202  < CFE\_ES\_WriteToSysLog("Bcamp\_IO App: Error Subscribing to HK request, RC = 0x%08lX\n",  ---  > CFE\_ES\_WriteToSysLog("Sample App: Error Subscribing to HK request, RC = 0x%08lX\n",  179,180c210,211  < status = CFE\_SB\_Subscribe(BCAMP\_IO\_APP\_CMD\_MID,  < Bcamp\_IO\_AppData.BCAMP\_IO\_CommandPipe);  ---  > status = CFE\_SB\_Subscribe(SAMPLE\_APP\_CMD\_MID,  > Sample\_AppData.SAMPLE\_CommandPipe);  183c214  < CFE\_ES\_WriteToSysLog("Bcamp\_IO App: Error Subscribing to Command, RC = 0x%08lX\n",  ---  > CFE\_ES\_WriteToSysLog("Sample App: Error Subscribing to Command, RC = 0x%08lX\n",  189c220,242  < CFE\_EVS\_SendEvent (BCAMP\_IO\_STARTUP\_INF\_EID,  ---  > /\*  > \*\* Register Table(s)  > \*/  > status = CFE\_TBL\_Register(&Sample\_AppData.TblHandles[0],  > "SampleTable",  > sizeof(SampleTable\_t),  > CFE\_TBL\_OPT\_DEFAULT,  > SAMPLE\_TblValidationFunc);  > if ( status != CFE\_SUCCESS )  > {  > CFE\_ES\_WriteToSysLog("Sample App: Error Registering \  > Table, RC = 0x%08lX\n", (unsigned long)status);  >  > return ( status );  > }  > else  > {  > status = CFE\_TBL\_Load(Sample\_AppData.TblHandles[0],  > CFE\_TBL\_SRC\_FILE,  > SAMPLE\_TABLE\_FILE);  > }  >  > CFE\_EVS\_SendEvent (SAMPLE\_STARTUP\_INF\_EID,  191,195c244,248  < "BCAMP\_IO App Initialized. Version %d.%d.%d.%d",  < BCAMP\_IO\_APP\_MAJOR\_VERSION,  < BCAMP\_IO\_APP\_MINOR\_VERSION,  < BCAMP\_IO\_APP\_REVISION,  < BCAMP\_IO\_APP\_MISSION\_REV);  ---  > "SAMPLE App Initialized. Version %d.%d.%d.%d",  > SAMPLE\_APP\_MAJOR\_VERSION,  > SAMPLE\_APP\_MINOR\_VERSION,  > SAMPLE\_APP\_REVISION,  > SAMPLE\_APP\_MISSION\_REV);  199c252  < } /\* End of BCAMP\_IO\_AppInit() \*/  ---  > } /\* End of SAMPLE\_AppInit() \*/  202c255  < /\* Name: BCAMP\_IO\_ProcessCommandPacket \*/  ---  > /\* Name: SAMPLE\_ProcessCommandPacket \*/  205,206c258,259  < /\* This routine will process any packet that is received on the \*/  < /\* BCAMP\_IO command pipe. \*/  ---  > /\* This routine will process any packet that is received on the SAMPLE \*/  > /\* command pipe. \*/  209c262  < void BCAMP\_IO\_ProcessCommandPacket( CFE\_SB\_MsgPtr\_t Msg )  ---  > void SAMPLE\_ProcessCommandPacket( CFE\_SB\_MsgPtr\_t Msg )  217,218c270,271  < case BCAMP\_IO\_APP\_CMD\_MID:  < BCAMP\_IO\_ProcessGroundCommand(Msg);  ---  > case SAMPLE\_APP\_CMD\_MID:  > SAMPLE\_ProcessGroundCommand(Msg);  221,222c274,275  < case BCAMP\_IO\_APP\_SEND\_HK\_MID:  < BCAMP\_IO\_ReportHousekeeping((CCSDS\_CommandPacket\_t \*)Msg);  ---  > case SAMPLE\_APP\_SEND\_HK\_MID:  > SAMPLE\_ReportHousekeeping((CCSDS\_CommandPacket\_t \*)Msg);  226c279  < CFE\_EVS\_SendEvent(BCAMP\_IO\_INVALID\_MSGID\_ERR\_EID,  ---  > CFE\_EVS\_SendEvent(SAMPLE\_INVALID\_MSGID\_ERR\_EID,  228c281  < "BCAMP\_IO: invalid command packet,MID = 0x%x",  ---  > "SAMPLE: invalid command packet,MID = 0x%x",  235c288  < } /\* End BCAMP\_IO\_ProcessCommandPacket \*/  ---  > } /\* End SAMPLE\_ProcessCommandPacket \*/  239c292  < /\* BCAMP\_IO\_ProcessGroundCommand() -- BCAMP\_IO ground commands \*/  ---  > /\* SAMPLE\_ProcessGroundCommand() -- SAMPLE ground commands \*/  242c295  < void BCAMP\_IO\_ProcessGroundCommand( CFE\_SB\_MsgPtr\_t Msg )  ---  > void SAMPLE\_ProcessGroundCommand( CFE\_SB\_MsgPtr\_t Msg )  249c302  < \*\* Process "known" BCAMP\_IO app ground commands  ---  > \*\* Process "known" SAMPLE app ground commands  253,254c306,307  < case BCAMP\_IO\_APP\_NOOP\_CC:  < if (BCAMP\_IO\_VerifyCmdLength(Msg, sizeof(BCAMP\_IO\_Noop\_t)))  ---  > case SAMPLE\_APP\_NOOP\_CC:  > if (SAMPLE\_VerifyCmdLength(Msg, sizeof(SAMPLE\_Noop\_t)))  256c309  < BCAMP\_IO\_NoopCmd((BCAMP\_IO\_Noop\_t \*)Msg);  ---  > SAMPLE\_NoopCmd((SAMPLE\_Noop\_t \*)Msg);  261,262c314,315  < case BCAMP\_IO\_APP\_RESET\_COUNTERS\_CC:  < if (BCAMP\_IO\_VerifyCmdLength(Msg, sizeof(BCAMP\_IO\_ResetCounters\_t)))  ---  > case SAMPLE\_APP\_RESET\_COUNTERS\_CC:  > if (SAMPLE\_VerifyCmdLength(Msg, sizeof(SAMPLE\_ResetCounters\_t)))  264c317  < BCAMP\_IO\_ResetCounters((BCAMP\_IO\_ResetCounters\_t \*)Msg);  ---  > SAMPLE\_ResetCounters((SAMPLE\_ResetCounters\_t \*)Msg);  269,270c322,323  < case BCAMP\_IO\_APP\_PROCESS\_CC:  < if (BCAMP\_IO\_VerifyCmdLength(Msg, sizeof(BCAMP\_IO\_Process\_t)))  ---  > case SAMPLE\_APP\_PROCESS\_CC:  > if (SAMPLE\_VerifyCmdLength(Msg, sizeof(SAMPLE\_Process\_t)))  272c325  < BCAMP\_IO\_ProcessCC((BCAMP\_IO\_Process\_t \*)Msg);  ---  > SAMPLE\_ProcessCC((SAMPLE\_Process\_t \*)Msg);  279c332  < CFE\_EVS\_SendEvent(BCAMP\_IO\_COMMAND\_ERR\_EID,  ---  > CFE\_EVS\_SendEvent(SAMPLE\_COMMAND\_ERR\_EID,  288c341  < } /\* End of BCAMP\_IO\_ProcessGroundCommand() \*/  ---  > } /\* End of SAMPLE\_ProcessGroundCommand() \*/  291c344  < /\* Name: BCAMP\_IO\_ReportHousekeeping \*/  ---  > /\* Name: SAMPLE\_ReportHousekeeping \*/  299c352  < void BCAMP\_IO\_ReportHousekeeping( const CCSDS\_CommandPacket\_t \*Msg )  ---  > void SAMPLE\_ReportHousekeeping( const CCSDS\_CommandPacket\_t \*Msg )  300a354,355  > int i;  >  304,305c359,360  < Bcamp\_IO\_AppData.BCAMP\_IO\_HkTelemetryPkt.bcamp\_io\_command\_error\_count = Bcamp\_IO\_AppData.ErrCounter;  < Bcamp\_IO\_AppData.BCAMP\_IO\_HkTelemetryPkt.bcamp\_io\_command\_count = Bcamp\_IO\_AppData.CmdCounter;  ---  > Sample\_AppData.SAMPLE\_HkTelemetryPkt.sample\_command\_error\_count = Sample\_AppData.ErrCounter;  > Sample\_AppData.SAMPLE\_HkTelemetryPkt.sample\_command\_count = Sample\_AppData.CmdCounter;  315c370  < Bcamp\_IO\_AppData.BCAMP\_IO\_HkTelemetryPkt.bcamp\_io\_command\_error\_count = Bcamp\_IO\_AppData.ErrCounter;  < Bcamp\_IO\_AppData.BCAMP\_IO\_HkTelemetryPkt.bcamp\_io\_command\_count = Bcamp\_IO\_AppData.CmdCounter;  ---  > Sample\_AppData.SAMPLE\_HkTelemetryPkt.sample\_command\_error\_count = Sample\_AppData.ErrCounter;  > Sample\_AppData.SAMPLE\_HkTelemetryPkt.sample\_command\_count = Sample\_AppData.CmdCounter;  >  > /\*  > \*\* Manage any pending table loads, validations, etc.  > \*/  > for (i=0; i<NUMBER\_OF\_TABLES; i++)  > {  > CFE\_TBL\_Manage(Sample\_AppData.TblHandles[i]);  329c392  < } /\* End of BCAMP\_IO\_ReportHousekeeping() \*/  ---  > } /\* End of SAMPLE\_ReportHousekeeping() \*/  333c396  < /\* BCAMP\_IO\_NoopCmd -- BCAMP\_IO NOOP commands \*/  ---  > /\* SAMPLE\_NoopCmd -- SAMPLE NOOP commands \*/  336c399  < void BCAMP\_IO\_NoopCmd( const BCAMP\_IO\_Noop\_t \*Msg )  ---  > void SAMPLE\_NoopCmd( const SAMPLE\_Noop\_t \*Msg )  339c402  < Bcamp\_IO\_AppData.CmdCounter++;  ---  > Sample\_AppData.CmdCounter++;  341c404  < CFE\_EVS\_SendEvent(BCAMP\_IO\_COMMANDNOP\_INF\_EID,  ---  > CFE\_EVS\_SendEvent(SAMPLE\_COMMANDNOP\_INF\_EID,  343,347c406,410  < "BCAMP\_IO: NOOP command Version %d.%d.%d.%d",  < BCAMP\_IO\_APP\_MAJOR\_VERSION,  < BCAMP\_IO\_APP\_MINOR\_VERSION,  < BCAMP\_IO\_APP\_REVISION,  < BCAMP\_IO\_APP\_MISSION\_REV);  ---  > "SAMPLE: NOOP command Version %d.%d.%d.%d",  > SAMPLE\_APP\_MAJOR\_VERSION,  > SAMPLE\_APP\_MINOR\_VERSION,  > SAMPLE\_APP\_REVISION,  > SAMPLE\_APP\_MISSION\_REV);  351c414  < } /\* End of BCAMP\_IO\_NoopCmd \*/  ---  > } /\* End of SAMPLE\_NoopCmd \*/  354c417  < /\* Name: BCAMP\_IO\_ResetCounters \*/  ---  > /\* Name: SAMPLE\_ResetCounters \*/  361c424  < void BCAMP\_IO\_ResetCounters( const BCAMP\_IO\_ResetCounters\_t \*Msg )  ---  > void SAMPLE\_ResetCounters( const SAMPLE\_ResetCounters\_t \*Msg )  364,365c427,428  < Bcamp\_IO\_AppData.CmdCounter = 0;  < Bcamp\_IO\_AppData.ErrCounter = 0;  ---  > Sample\_AppData.CmdCounter = 0;  > Sample\_AppData.ErrCounter = 0;  367c430  < CFE\_EVS\_SendEvent(BCAMP\_IO\_COMMANDRST\_INF\_EID,  ---  > CFE\_EVS\_SendEvent(SAMPLE\_COMMANDRST\_INF\_EID,  369c432  < "BCAMP\_IO: RESET command");  ---  > "SAMPLE: RESET command");  373c436  < } /\* End of BCAMP\_IO\_ResetCounters() \*/  ---  > } /\* End of SAMPLE\_ResetCounters() \*/  376c439  < /\* Name: BCAMP\_IO\_ProcessCC \*/  ---  > /\* Name: SAMPLE\_ProcessCC \*/  382c445  < void BCAMP\_IO\_ProcessCC( const BCAMP\_IO\_Process\_t \*Msg )  ---  > void SAMPLE\_ProcessCC( const SAMPLE\_Process\_t \*Msg )  383a447,470  > int32 status;  > SampleTable\_t \*TblPtr;  > const char \*TableName = "SAMPLE\_APP.SampleTable";  >  > /\* Sample Use of Table \*/  >  > status = CFE\_TBL\_GetAddress((void \*)&TblPtr,  > Sample\_AppData.TblHandles[0]);  >  > if (status != CFE\_SUCCESS)  > {  > CFE\_ES\_WriteToSysLog("Sample App: Fail to get table address: 0x%08lx",  > (unsigned long)status);  > return;  > }  >  > CFE\_ES\_WriteToSysLog("Sample App: Table Value 1: %d Value 2: %d",  > TblPtr->Int1,  > TblPtr->Int2);  >  > SAMPLE\_GetCrc(TableName);  >  > /\* Invoke a function provided by SAMPLE\_LIB \*/  > SAMPLE\_Function();  387c474  < } /\* End of BCAMP\_IO\_ProcessCC \*/  ---  > } /\* End of SAMPLE\_ProcessCC \*/  391c478  < /\* BCAMP\_IO\_VerifyCmdLength() -- Verify command packet length \*/  ---  > /\* SAMPLE\_VerifyCmdLength() -- Verify command packet length \*/  394c481  < bool BCAMP\_IO\_VerifyCmdLength( CFE\_SB\_MsgPtr\_t Msg, uint16 ExpectedLength )  ---  > bool SAMPLE\_VerifyCmdLength( CFE\_SB\_MsgPtr\_t Msg, uint16 ExpectedLength )  408c495  < CFE\_EVS\_SendEvent(BCAMP\_IO\_LEN\_ERR\_EID,  ---  > CFE\_EVS\_SendEvent(SAMPLE\_LEN\_ERR\_EID,  418c505  < Bcamp\_IO\_AppData.ErrCounter++;  ---  > Sample\_AppData.ErrCounter++;  423c510,534  < } /\* End of BCAMP\_IO\_VerifyCmdLength() \*/  ---  > } /\* End of SAMPLE\_VerifyCmdLength() \*/  >  > /\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*/  > /\* \*/  > /\* SAMPLE\_TblValidationFunc -- Verify contents of First Table \*/  > /\* buffer contents \*/  > /\* \*/  > /\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*/  > int32 SAMPLE\_TblValidationFunc( void \*TblData )  > {  > int32 ReturnCode = CFE\_SUCCESS;  > SampleTable\_t \*TblDataPtr = (SampleTable\_t \*)TblData;  >  > /\*  > \*\* Sample Table Validation  > \*/  > if (TblDataPtr->Int1 > SAMPLE\_TBL\_ELEMENT\_1\_MAX)  > {  > /\* First element is out of range, return an appropriate error code \*/  > ReturnCode = SAMPLE\_TABLE\_OUT\_OF\_RANGE\_ERR\_CODE;  > }  >  > return ReturnCode;  >  > } /\* End of Sample\_TblValidationFunc\*/  427c538  < /\* BCAMP\_IO\_GetCrc -- Output CRC \*/  ---  > /\* SAMPLE\_GetCrc -- Output CRC \*/  431c542  < void BCAMP\_IO\_GetCrc( const char \*TableName )  ---  > void SAMPLE\_GetCrc( const char \*TableName )  440c551  < CFE\_ES\_WriteToSysLog("Bcamp\_IO App: Error Getting Table Info");  ---  > CFE\_ES\_WriteToSysLog("Sample App: Error Getting Table Info");  445c556  < CFE\_ES\_WriteToSysLog("Bcamp\_IO App: CRC: 0x%08lX\n\n", (unsigned long)Crc);  ---  > CFE\_ES\_WriteToSysLog("Sample App: CRC: 0x%08lX\n\n", (unsigned long)Crc);  450c561  < } /\* End of BCAMP\_IO\_GetCrc \*/  ---  > } /\* End of SAMPLE\_GetCrc \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 6 | Modify bcamp\_io\_app\_events.h to reflect the new app name. Search/replace is your friend. Do this for both apps. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ diff bcamp\_io\_app\_events.h ../../../sample\_app/fsw/src/sample\_app\_events.h  1,2c1,30  < #ifndef \_bcamp\_io\_app\_events\_h\_  < #define \_bcamp\_io\_app\_events\_h\_  ---  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  > \*\*  > \*\* GSC-18128-1, "Core Flight Executive Version 6.7"  > \*\*  > \*\* Copyright (c) 2006-2019 United States Government as represented by  > \*\* the Administrator of the National Aeronautics and Space Administration.  > \*\* All Rights Reserved.  > \*\*  > \*\* Licensed under the Apache License, Version 2.0 (the "License");  > \*\* you may not use this file except in compliance with the License.  > \*\* You may obtain a copy of the License at  > \*\*  > \*\* http://www.apache.org/licenses/LICENSE-2.0  > \*\*  > \*\* Unless required by applicable law or agreed to in writing, software  > \*\* distributed under the License is distributed on an "AS IS" BASIS,  > \*\* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  > \*\* See the License for the specific language governing permissions and  > \*\* limitations under the License.  > \*\*  > \*\* File: sample\_app\_events.h  > \*\*  > \*\* Purpose:  > \*\* Define SAMPLE App Events IDs  > \*\*  > \*\* Notes:  > \*\*  > \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > #ifndef \_sample\_app\_events\_h\_  > #define \_sample\_app\_events\_h\_  5,12c33,40  < #define BCAMP\_IO\_RESERVED\_EID 0  < #define BCAMP\_IO\_STARTUP\_INF\_EID 1  < #define BCAMP\_IO\_COMMAND\_ERR\_EID 2  < #define BCAMP\_IO\_COMMANDNOP\_INF\_EID 3  < #define BCAMP\_IO\_COMMANDRST\_INF\_EID 4  < #define BCAMP\_IO\_INVALID\_MSGID\_ERR\_EID 5  < #define BCAMP\_IO\_LEN\_ERR\_EID 6  < #define BCAMP\_IO\_PIPE\_ERR\_EID 7  ---  > #define SAMPLE\_RESERVED\_EID 0  > #define SAMPLE\_STARTUP\_INF\_EID 1  > #define SAMPLE\_COMMAND\_ERR\_EID 2  > #define SAMPLE\_COMMANDNOP\_INF\_EID 3  > #define SAMPLE\_COMMANDRST\_INF\_EID 4  > #define SAMPLE\_INVALID\_MSGID\_ERR\_EID 5  > #define SAMPLE\_LEN\_ERR\_EID 6  > #define SAMPLE\_PIPE\_ERR\_EID 7  14c42  < #define BCAMP\_IO\_EVENT\_COUNTS 7  ---  > #define SAMPLE\_EVENT\_COUNTS 7  16c44,48  < #endif /\* \_bcamp\_io\_app\_events\_h\_ \*/  ---  > #endif /\* \_sample\_app\_events\_h\_ \*/  >  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > /\* End of File Comment \*/  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 7 | Modify bcamp\_io\_app.h to reflect the new app name. Search/replace is your friend. Do this for both apps. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ diff bcamp\_io\_app.h ../../../sample\_app/fsw/src/sample\_app.h  1,2c1,30  < #ifndef \_bcamp\_io\_app\_h\_  < #define \_bcamp\_io\_app\_h\_  ---  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  > \*\*  > \*\* GSC-18128-1, "Core Flight Executive Version 6.7"  > \*\*  > \*\* Copyright (c) 2006-2019 United States Government as represented by  > \*\* the Administrator of the National Aeronautics and Space Administration.  > \*\* All Rights Reserved.  > \*\*  > \*\* Licensed under the Apache License, Version 2.0 (the "License");  > \*\* you may not use this file except in compliance with the License.  > \*\* You may obtain a copy of the License at  > \*\*  > \*\* http://www.apache.org/licenses/LICENSE-2.0  > \*\*  > \*\* Unless required by applicable law or agreed to in writing, software  > \*\* distributed under the License is distributed on an "AS IS" BASIS,  > \*\* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  > \*\* See the License for the specific language governing permissions and  > \*\* limitations under the License.  > \*\*  > \*\* File: sample\_app.h  > \*\*  > \*\* Purpose:  > \*\* This file is main hdr file for the SAMPLE application.  > \*\*  > \*\*  > \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  >  > #ifndef \_sample\_app\_h\_  > #define \_sample\_app\_h\_  13,15c41,43  < #include "bcamp\_io\_app\_perfids.h"  < #include "bcamp\_io\_app\_msgids.h"  < #include "bcamp\_io\_app\_msg.h"  ---  > #include "sample\_app\_perfids.h"  > #include "sample\_app\_msgids.h"  > #include "sample\_app\_msg.h"  18c46,48  < #define BCAMP\_IO\_PIPE\_DEPTH 32 /\* Depth of the Command Pipe for Application \*/  ---  > #define SAMPLE\_PIPE\_DEPTH 32 /\* Depth of the Command Pipe for Application \*/  >  > #define NUMBER\_OF\_TABLES 1 /\* Number of Table(s) \*/  19a50,55  > /\* Define filenames of default data images for tables \*/  > #define SAMPLE\_TABLE\_FILE "/cf/sample\_table.tbl"  >  > #define SAMPLE\_TABLE\_OUT\_OF\_RANGE\_ERR\_CODE -1  >  > #define SAMPLE\_TBL\_ELEMENT\_1\_MAX 10  37c73  < bcamp\_io\_hk\_tlm\_t BCAMP\_IO\_HkTelemetryPkt;  ---  > sample\_hk\_tlm\_t SAMPLE\_HkTelemetryPkt;  47,48c83,84  < CFE\_SB\_PipeId\_t BCAMP\_IO\_CommandPipe;  < CFE\_SB\_MsgPtr\_t BCAMP\_IOMsgPtr;  ---  > CFE\_SB\_PipeId\_t SAMPLE\_CommandPipe;  > CFE\_SB\_MsgPtr\_t SAMPLEMsgPtr;  56c92,93  < CFE\_EVS\_BinFilter\_t BCAMP\_IO\_EventFilters[BCAMP\_IO\_EVENT\_COUNTS];  ---  > CFE\_EVS\_BinFilter\_t SAMPLE\_EventFilters[SAMPLE\_EVENT\_COUNTS];  > CFE\_TBL\_Handle\_t TblHandles[NUMBER\_OF\_TABLES];  58c95  < } Bcamp\_IO\_AppData\_t;  ---  > } Sample\_AppData\_t;  64c101  < \*\* Note: Except for the entry point (BCAMP\_IO\_AppMain), these  ---  > \*\* Note: Except for the entry point (SAMPLE\_AppMain), these  67,75c104,114  < void BCAMP\_IO\_AppMain(void);  < int32 BCAMP\_IO\_AppInit(void);  < void BCAMP\_IO\_ProcessCommandPacket(CFE\_SB\_MsgPtr\_t Msg);  < void BCAMP\_IO\_ProcessGroundCommand(CFE\_SB\_MsgPtr\_t Msg);  < void BCAMP\_IO\_ReportHousekeeping(const CCSDS\_CommandPacket\_t \*Msg);  < void BCAMP\_IO\_ResetCounters(const BCAMP\_IO\_ResetCounters\_t \*Msg);  < void BCAMP\_IO\_ProcessCC(const BCAMP\_IO\_Process\_t \*Msg);  < void BCAMP\_IO\_NoopCmd(const BCAMP\_IO\_Noop\_t \*Msg);  < void BCAMP\_IO\_GetCrc(const char \*TableName);  ---  > void SAMPLE\_AppMain(void);  > int32 SAMPLE\_AppInit(void);  > void SAMPLE\_ProcessCommandPacket(CFE\_SB\_MsgPtr\_t Msg);  > void SAMPLE\_ProcessGroundCommand(CFE\_SB\_MsgPtr\_t Msg);  > void SAMPLE\_ReportHousekeeping(const CCSDS\_CommandPacket\_t \*Msg);  > void SAMPLE\_ResetCounters(const SAMPLE\_ResetCounters\_t \*Msg);  > void SAMPLE\_ProcessCC(const SAMPLE\_Process\_t \*Msg);  > void SAMPLE\_NoopCmd(const SAMPLE\_Noop\_t \*Msg);  > void SAMPLE\_GetCrc(const char \*TableName);  >  > int32 SAMPLE\_TblValidationFunc(void \*TblData);  77c116  < bool BCAMP\_IO\_VerifyCmdLength(CFE\_SB\_MsgPtr\_t Msg, uint16 ExpectedLength);  ---  > bool SAMPLE\_VerifyCmdLength(CFE\_SB\_MsgPtr\_t Msg, uint16 ExpectedLength);  79c118  < #endif /\* \_sample\_io\_app\_h\_ \*/  ---  > #endif /\* \_sample\_app\_h\_ \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 8 | Modify bcamp\_io\_app\_msg.h to reflect the new app name. Search/replace is your friend. Do this for both apps. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ diff bcamp\_io\_app\_msg.h ../../../sample\_app/fsw/src/sample\_app\_msg.h  1,2c1,31  < #ifndef \_bcamp\_io\_app\_msg\_h\_  < #define \_bcamp\_io\_app\_msg\_h\_  ---  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  > \*\*  > \*\* GSC-18128-1, "Core Flight Executive Version 6.7"  > \*\*  > \*\* Copyright (c) 2006-2019 United States Government as represented by  > \*\* the Administrator of the National Aeronautics and Space Administration.  > \*\* All Rights Reserved.  > \*\*  > \*\* Licensed under the Apache License, Version 2.0 (the "License");  > \*\* you may not use this file except in compliance with the License.  > \*\* You may obtain a copy of the License at  > \*\*  > \*\* http://www.apache.org/licenses/LICENSE-2.0  > \*\*  > \*\* Unless required by applicable law or agreed to in writing, software  > \*\* distributed under the License is distributed on an "AS IS" BASIS,  > \*\* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  > \*\* See the License for the specific language governing permissions and  > \*\* limitations under the License.  > \*\*  > \*\* File: sample\_app\_msg.h  > \*\*  > \*\* Purpose:  > \*\* Define SAMPLE App Messages and info  > \*\*  > \*\* Notes:  > \*\*  > \*\*  > \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > #ifndef \_sample\_app\_msg\_h\_  > #define \_sample\_app\_msg\_h\_  5c34  < \*\* BCAMP\_IO App command codes  ---  > \*\* SAMPLE App command codes  7,9c36,38  < #define BCAMP\_IO\_APP\_NOOP\_CC 0  < #define BCAMP\_IO\_APP\_RESET\_COUNTERS\_CC 1  < #define BCAMP\_IO\_APP\_PROCESS\_CC 2  ---  > #define SAMPLE\_APP\_NOOP\_CC 0  > #define SAMPLE\_APP\_RESET\_COUNTERS\_CC 1  > #define SAMPLE\_APP\_PROCESS\_CC 2  20c49  < } BCAMP\_IO\_NoArgsCmd\_t;  ---  > } SAMPLE\_NoArgsCmd\_t;  29,31c58,60  < typedef BCAMP\_IO\_NoArgsCmd\_t BCAMP\_IO\_Noop\_t;  < typedef BCAMP\_IO\_NoArgsCmd\_t BCAMP\_IO\_ResetCounters\_t;  < typedef BCAMP\_IO\_NoArgsCmd\_t BCAMP\_IO\_Process\_t;  ---  > typedef SAMPLE\_NoArgsCmd\_t SAMPLE\_Noop\_t;  > typedef SAMPLE\_NoArgsCmd\_t SAMPLE\_ResetCounters\_t;  > typedef SAMPLE\_NoArgsCmd\_t SAMPLE\_Process\_t;  35c64  < \*\* Type definition (BCAMP\_IO App housekeeping)  ---  > \*\* Type definition (SAMPLE App housekeeping)  40,41c69,70  <typedef union  <{  < uint8 TlmHeader[CFE\_SB\_TLM\_HDR\_SIZE];  < uint32 align;  <} bcamp\_io\_hk\_tlm\_align\_t;  <  <typedef struct  <{  < bcamp\_io\_hk\_tlm\_align\_t align;  < uint8 bcamp\_io\_command\_error\_count;  < uint8 bcamp\_io\_command\_count;  ---  >typedef struct  >{  > uint8 TlmHeader[CFE\_SB\_TLM\_HDR\_SIZE];  > uint8 sample\_command\_error\_count;  > uint8 sample\_command\_count;  44c73,75  < } bcamp\_io\_hk\_tlm\_t;  ---  > } OS\_PACK sample\_hk\_tlm\_t;  >  > #endif /\* \_sample\_app\_msg\_h\_ \*/  46c77,79  < #endif /\* \_bcamp\_io\_app\_msg\_h\_ \*/  ---  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > /\* End of File Comment \*/  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 9 | Modify bcamp\_io\_app\_version.h to reflect the new app name. Search/replace is your friend. Do this for both apps. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ diff bcamp\_io\_app\_version.h ../../../sample\_app/fsw/src/sample\_app\_version.h  1,2c1,31  < #ifndef \_bcamp\_io\_app\_version\_h\_  < #define \_bcamp\_io\_app\_version\_h\_  ---  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  > \*\*  > \*\* GSC-18128-1, "Core Flight Executive Version 6.7"  > \*\*  > \*\* Copyright (c) 2006-2019 United States Government as represented by  > \*\* the Administrator of the National Aeronautics and Space Administration.  > \*\* All Rights Reserved.  > \*\*  > \*\* Licensed under the Apache License, Version 2.0 (the "License");  > \*\* you may not use this file except in compliance with the License.  > \*\* You may obtain a copy of the License at  > \*\*  > \*\* http://www.apache.org/licenses/LICENSE-2.0  > \*\*  > \*\* Unless required by applicable law or agreed to in writing, software  > \*\* distributed under the License is distributed on an "AS IS" BASIS,  > \*\* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  > \*\* See the License for the specific language governing permissions and  > \*\* limitations under the License.  > \*\*  > \*\* File: sample\_app\_version.h  > \*\*  > \*\* Purpose:  > \*\* The Sample Application header file containing version number  > \*\*  > \*\* Notes:  > \*\*  > \*\*  > \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > #ifndef \_sample\_app\_version\_h\_  > #define \_sample\_app\_version\_h\_  5,8c34,37  < #define BCAMP\_IO\_APP\_MAJOR\_VERSION 1  < #define BCAMP\_IO\_APP\_MINOR\_VERSION 0  < #define BCAMP\_IO\_APP\_REVISION 0  < #define BCAMP\_IO\_APP\_MISSION\_REV 0  ---  > #define SAMPLE\_APP\_MAJOR\_VERSION 1  > #define SAMPLE\_APP\_MINOR\_VERSION 1  > #define SAMPLE\_APP\_REVISION 3  > #define SAMPLE\_APP\_MISSION\_REV 0  11c40,44  < #endif /\* \_bcamp\_io\_app\_version\_h\_ \*/  ---  > #endif /\* \_sample\_app\_version\_h\_ \*/  >  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  > /\* End of File Comment \*/  > /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 10 | Modify to\_lab\_sub\_table.h to add the housekeeping telemetry message identifiers to the subscription table. | debian@beaglebone:~/cFS/apps/to\_lab/fsw/platform\_inc$ git diff to\_lab\_sub\_table.h  diff --git a/fsw/platform\_inc/to\_lab\_sub\_table.h b/fsw/platform\_inc/to\_lab\_sub\_table.h  index 7e77eb4..6bdd914 100644  --- a/fsw/platform\_inc/to\_lab\_sub\_table.h  +++ b/fsw/platform\_inc/to\_lab\_sub\_table.h  @@ -39,6 +39,9 @@  #include "sample\_app\_msgids.h"  +#include "bcamp\_io\_app\_msgids.h"  +#include "bcamp\_mn\_app\_msgids.h"  +  #if 0  #include "hs\_msgids.h"  #include "fm\_msgids.h"  @@ -78,6 +81,10 @@ static TO\_subscription\_t TO\_SubTable[] =  {CFE\_ES\_APP\_TLM\_MID, {0,0}, 4},  {CFE\_ES\_MEMSTATS\_TLM\_MID, {0,0}, 4},  + /\* bootcamp application subscriptions \*/  + {BCAMP\_IO\_APP\_HK\_TLM\_MID, {0,0}, 4},  + {BCAMP\_MN\_APP\_HK\_TLM\_MID, {0,0}, 4},  +  {TO\_UNUSED, {0,0}, 0},  {TO\_UNUSED, {0,0}, 0},  {TO\_UNUSED, {0,0}, 0}  debian@beaglebone:~/cFS/apps/to\_lab/fsw/platform\_inc$ |
| 11 | Modify TO’s CMakeLists.txt to add the new app include paths. | debian@beaglebone:~/cFS/apps/to\_lab$ git diff CMakeLists.txt  diff --git a/CMakeLists.txt b/CMakeLists.txt  index 61e67ce..9d50611 100644  --- a/CMakeLists.txt  +++ b/CMakeLists.txt  @@ -5,6 +5,8 @@ include\_directories(fsw/mission\_inc)  include\_directories(fsw/platform\_inc)  include\_directories(${ci\_lab\_MISSION\_DIR}/fsw/platform\_inc)  include\_directories(${sample\_app\_MISSION\_DIR}/fsw/platform\_inc)  +include\_directories(${bcamp\_io\_app\_MISSION\_DIR}/fsw/platform\_inc)  +include\_directories(${bcamp\_mn\_app\_MISSION\_DIR}/fsw/platform\_inc)  aux\_source\_directory(fsw/src APP\_SRC\_FILES)  debian@beaglebone:~/cFS/apps/to\_lab$ |
| 12 | Modify SCH’s sch\_lab\_sched\_tab.h to include the new apps’ header files. | debian@beaglebone:~/cFS/apps/sch\_lab/fsw/platform\_inc$ git diff sch\_lab\_sched\_tab.h  diff --git a/fsw/platform\_inc/sch\_lab\_sched\_tab.h b/fsw/platform\_inc/sch\_lab\_sched\_tab.h  index d6ae31e..a9ffbb8 100644  --- a/fsw/platform\_inc/sch\_lab\_sched\_tab.h  +++ b/fsw/platform\_inc/sch\_lab\_sched\_tab.h  @@ -41,6 +41,9 @@  #include "sample\_app\_msgids.h"  +#include "bcamp\_io\_app\_msgids.h"  +#include "bcamp\_mn\_app\_msgids.h"  +  #if 0  #include "sc\_msgids.h"  #include "hs\_msgids.h"  debian@beaglebone:~/cFS/apps/sch\_lab/fsw/platform\_inc$ |
| 13 | Modify SCH’s table to include the new apps housekeeping telemetry identifiers. | debian@beaglebone:~/cFS/apps/sch\_lab/fsw/src$ git diff sch\_lab\_table.c  diff --git a/fsw/src/sch\_lab\_table.c b/fsw/src/sch\_lab\_table.c  index 42a2039..ae8473b 100644  --- a/fsw/src/sch\_lab\_table.c  +++ b/fsw/src/sch\_lab\_table.c  @@ -46,6 +46,9 @@ SCH\_LAB\_ScheduleTable\_t SCH\_TBL\_Structure =  TO\_LAB\_SEND\_HK\_MID,  SAMPLE\_APP\_SEND\_HK\_MID,  + BCAMP\_IO\_APP\_SEND\_HK\_MID,  + BCAMP\_MN\_APP\_SEND\_HK\_MID,  +  SCH\_LAB\_END\_OF\_TABLE  },  { /\*Packet Rate\*/  @@ -58,6 +61,9 @@ SCH\_LAB\_ScheduleTable\_t SCH\_TBL\_Structure =  4, /\*TO\_LAB\*/  4, /\*SAMPLE\_LAB\*/  + 4, /\*BCAMP\_IO\_APP\*/  + 4, /\*BCAMP\_MN\_APP\*/  +  0 /\*END OF TABLE\*/  },  {/\*Counter\*/  @@ -69,6 +75,9 @@ SCH\_LAB\_ScheduleTable\_t SCH\_TBL\_Structure =  0, /\*CI\_LAB\*/  0, /\*TO\_LAB\*/  0, /\*SAMPLE\_LAB\*/  +  + 0, /\*BCAMP\_IO\_APP\*/  + 0, /\*BCAMP\_MN\_APP\*/  0 /\*END OF TABLE\*/  }  debian@beaglebone:~/cFS/apps/sch\_lab/fsw/src$ |
| 14 | Modify SCH’s CMakeLists.txt to add the new app include paths. | debian@beaglebone:~/cFS/apps/sch\_lab$ git diff CMakeLists.txt  diff --git a/CMakeLists.txt b/CMakeLists.txt  index 25f8ee5..d445bbc 100644  --- a/CMakeLists.txt  +++ b/CMakeLists.txt  @@ -6,9 +6,11 @@ include\_directories(fsw/platform\_inc)  include\_directories(${ci\_lab\_MISSION\_DIR}/fsw/platform\_inc)  include\_directories(${to\_lab\_MISSION\_DIR}/fsw/platform\_inc)  include\_directories(${sample\_app\_MISSION\_DIR}/fsw/platform\_inc)  +include\_directories(${bcamp\_io\_app\_MISSION\_DIR}/fsw/platform\_inc)  +include\_directories(${bcamp\_mn\_app\_MISSION\_DIR}/fsw/platform\_inc)  aux\_source\_directory(fsw/src APP\_SRC\_FILES)  # Create the app module  add\_cfe\_app(sch\_lab ${APP\_SRC\_FILES})  -add\_cfe\_tables(sch\_lab\_table fsw/src/sch\_lab\_table.c)  \ No newline at end of file  +add\_cfe\_tables(sch\_lab\_table fsw/src/sch\_lab\_table.c)  debian@beaglebone:~/cFS/apps/sch\_lab$ |
| 15 | Modify the targets.cmake to build the new apps. | debian@beaglebone:~/cFS/sample\_defs$ cat targets.cmake  <snip>  # Each target board can have its own HW arch selection and set of included apps  SET(TGT1\_NAME cpu1)  SET(TGT1\_APPLIST sample\_app sample\_lib ci\_lab to\_lab sch\_lab bcamp\_io\_app bcamp\_mn\_app)  SET(TGT1\_FILELIST cfe\_es\_startup.scr)  # CPU2/3 are duplicates of CPU1. These are not built by default anymore but are  # commented out to serve as an example of how one would configure multiple cpus.  #SET(TGT2\_NAME cpu2)  #SET(TGT2\_APPLIST sample\_app ci\_lab to\_lab sch\_lab)  #SET(TGT2\_FILELIST cfe\_es\_startup.scr)  #SET(TGT3\_NAME cpu3)  #SET(TGT3\_APPLIST sample\_app ci\_lab to\_lab sch\_lab)  #SET(TGT3\_FILELIST cfe\_es\_startup.scr) |
| 16 | Modify the startup script to load the sample apps. | debian@beaglebone:~/cFS/sample\_defs$ cat cpu1\_cfe\_es\_startup.scr  CFE\_LIB, /cf/sample\_lib.so, SAMPLE\_LibInit, SAMPLE\_LIB, 0, 0, 0x0, 0;  CFE\_APP, /cf/sample\_app.so, SAMPLE\_AppMain, SAMPLE\_APP, 50, 16384, 0x0, 0;  CFE\_APP, /cf/bcamp\_io\_app.so, BCAMP\_IO\_AppMain, BCAMP\_IO\_APP, 50, 16384, 0x0, 0;  CFE\_APP, /cf/bcamp\_mn\_app.so, BCAMP\_MN\_AppMain, BCAMP\_MN\_APP, 50, 16384, 0x0, 0;  CFE\_APP, /cf/ci\_lab.so, CI\_Lab\_AppMain, CI\_LAB\_APP, 60, 16384, 0x0, 0;  CFE\_APP, /cf/to\_lab.so, TO\_Lab\_AppMain, TO\_LAB\_APP, 70, 16384, 0x0, 0;  CFE\_APP, /cf/sch\_lab.so, SCH\_Lab\_AppMain, SCH\_LAB\_APP, 80, 16384, 0x0, 0;  !  ! Startup script fields:  ! 1. Object Type -- CFE\_APP for an Application, or CFE\_LIB for a library.  ! 2. Path/Filename -- This is a cFE Virtual filename, not a vxWorks device/pathname  ! 3. Entry Point -- This is the "main" function for Apps.  ! 4. CFE Name -- The cFE name for the the APP or Library  ! 5. Priority -- This is the Priority of the App, not used for Library  ! 6. Stack Size -- This is the Stack size for the App, not used for the Library  ! 7. Load Address -- This is the Optional Load Address for the App or Library. Currently not implemented  ! so keep it at 0x0.  ! 8. Exception Action -- This is the Action the cFE should take if the App has an exception.  ! 0 = Just restart the Application  ! Non-Zero = Do a cFE Processor Reset  !  ! Other Notes:  ! 1. The software will not try to parse anything after the first '!' character it sees. That  ! is the End of File marker.  ! 2. Common Application file extensions:  ! Linux = .so ( ci.so )  ! OS X = .bundle ( ci.bundle )  ! Cygwin = .dll ( ci.dll )  ! vxWorks = .o ( ci.o )  ! RTEMS with S-record Loader = .s3r ( ci.s3r )  ! RTEMS with CEXP Loader = .o ( ci.o )  debian@beaglebone:~/cFS/sample\_defs$ |
| 17 | Rebuild cFS. | debian@beaglebone:~/cFS$ make distclean  rm -rf "build"  debian@beaglebone:~/cFS$ make prep  mkdir -p "build"  (cd "build/" && cmake -DCMAKE\_INSTALL\_PREFIX=/exe -DCMAKE\_BUILD\_TYPE=debug "/home/debian/cFS/cfe")  <snip>  echo " -DCMAKE\_INSTALL\_PREFIX=/exe -DCMAKE\_BUILD\_TYPE=debug" > "build/.prep"  debian@beaglebone:~/cFS$  debian@beaglebone:~/cFS$ make  make --no-print-directory -C "build" mission-all  Scanning dependencies of target elf2cfetbl  <snip>  [100%] Built target cfe\_ts\_crc  Built target mission-all  debian@beaglebone:~/cFS$  debian@beaglebone:~/cFS$ make install  make --no-print-directory -C "build" DESTDIR="/home/debian/cFS/build" mission-install  <snip>  Built target mission-install  debian@beaglebone:~/cFS$ |
| 18 | Start cFS. Pay special attention to ensure the two new apps started. | debian@beaglebone:~/cFS/build/exe/cpu1$ ./core-cpu1  CFE\_PSP: Default Reset Type = PO  CFE\_PSP: Default Reset SubType = 1  CFE\_PSP: Default CPU ID = 1  CFE\_PSP: Default Spacecraft ID = 42  CFE\_PSP: Default CPU Name: cpu1  CFE\_PSP: Starting the cFE with a POWER ON reset.  CFE\_PSP: Clearing out CFE CDS Shared memory segment.  CFE\_PSP: Clearing out CFE Reset Shared memory segment.  CFE\_PSP: Clearing out CFE User Reserved Shared memory segment.  2030-064-14:23:11.23873 POWER ON RESET due to Power Cycle (Power Cycle).  2030-064-14:23:11.23885 ES Startup: CFE\_ES\_Main in EARLY\_INIT state  CFE\_PSP: CFE\_PSP\_AttachExceptions Called  2030-064-14:23:11.23899 ES Startup: CFE\_ES\_Main entering CORE\_STARTUP state  2030-064-14:23:11.23903 ES Startup: Starting Object Creation calls.  2030-064-14:23:11.23906 ES Startup: Calling CFE\_ES\_CDSEarlyInit  2030-064-14:23:11.23960 ES Startup: Calling CFE\_EVS\_EarlyInit  2030-064-14:23:11.23970 Event Log cleared following power-on reset  2030-064-14:23:11.23973 ES Startup: Calling CFE\_SB\_EarlyInit  2030-064-14:23:11.24042 SB internal message format: CCSDS Space Packet Protocol version 1  2030-064-14:23:11.24053 ES Startup: Calling CFE\_TIME\_EarlyInit  1980-012-14:03:20.00000 ES Startup: Calling CFE\_TBL\_EarlyInit  1980-012-14:03:20.00124 ES Startup: Calling CFE\_FS\_EarlyInit  1980-012-14:03:20.00163 ES Startup: Core App: CFE\_EVS created. App ID: 0  EVS Port1 42/1/CFE\_EVS 1: cFE EVS Initialized. cFE Version 6.7.6.0  EVS Port1 42/1/CFE\_EVS 14: No subscribers for MsgId 0x808,sender CFE\_EVS  1980-012-14:03:20.05209 ES Startup: Core App: CFE\_SB created. App ID: 1  1980-012-14:03:20.05230 SB:Registered 4 events for filtering  EVS Port1 42/1/CFE\_SB 1: cFE SB Initialized  EVS Port1 42/1/CFE\_SB 14: No subscribers for MsgId 0x808,sender CFE\_SB  1980-012-14:03:20.10250 ES Startup: Core App: CFE\_ES created. App ID: 2  EVS Port1 42/1/CFE\_ES 1: cFE ES Initialized  EVS Port1 42/1/CFE\_SB 14: No subscribers for MsgId 0x808,sender CFE\_ES  EVS Port1 42/1/CFE\_ES 2: Versions:cFE 6.7.6.0, OSAL 5.0.6.0, PSP 1.4.4.0, chksm 62084  EVS Port1 42/1/CFE\_SB 14: No subscribers for MsgId 0x808,sender CFE\_ES  EVS Port1 42/1/CFE\_ES 91: Mission 6.7.3-bv-21-ga84a85b.sample, CFE: 6.7.3-bv-46-g681bfc1, OSAL: 5.0.3-bv-33-gcbc43e8  EVS Port1 42/1/CFE\_SB 14: No subscribers for MsgId 0x808,sender CFE\_ES  EVS Port1 42/1/CFE\_ES 92: Build 202003051417 debian@beaglebone  1980-012-14:03:20.15292 ES Startup: Core App: CFE\_TIME created. App ID: 3  EVS Port1 42/1/CFE\_TIME 1: cFE TIME Initialized  1980-012-14:03:20.20337 ES Startup: Core App: CFE\_TBL created. App ID: 4  EVS Port1 42/1/CFE\_TBL 1: cFE TBL Initialized. cFE Version 6.7.6.0  1980-012-14:03:20.25357 ES Startup: Finished ES CreateObject table entries.  1980-012-14:03:20.25362 ES Startup: CFE\_ES\_Main entering CORE\_READY state  1980-012-14:03:20.25420 ES Startup: Opened ES App Startup file: /cf/cfe\_es\_startup.scr  1980-012-14:03:20.25934 ES Startup: Loading shared library: /cf/sample\_lib.so  SAMPLE Lib Initialized. Version 1.1.1.0  1980-012-14:03:20.26394 ES Startup: Loading file: /cf/sample\_app.so, APP: SAMPLE\_APP  1980-012-14:03:20.26680 ES Startup: SAMPLE\_APP loaded and created  EVS Port1 42/1/SAMPLE\_APP 1: SAMPLE App Initialized. Version 1.1.3.0  1980-012-14:03:20.27086 ES Startup: Loading file: /cf/bcamp\_io\_app.so, APP: BCAMP\_IO\_APP  1980-012-14:03:20.27357 ES Startup: BCAMP\_IO\_APP loaded and created  EVS Port1 42/1/BCAMP\_IO\_APP 1: BCAMP\_IO App Initialized. Version 1.0.0.0  1980-012-14:03:20.27986 ES Startup: Loading file: /cf/bcamp\_mn\_app.so, APP: BCAMP\_MN\_APP  1980-012-14:03:20.28140 ES Startup: BCAMP\_MN\_APP loaded and created  EVS Port1 42/1/BCAMP\_MN\_APP 1: BCAMP\_MN App Initialized. Version 1.0.0.0  1980-012-14:03:20.28461 ES Startup: Loading file: /cf/ci\_lab.so, APP: CI\_LAB\_APP  1980-012-14:03:20.28599 ES Startup: CI\_LAB\_APP loaded and created  EVS Port1 42/1/CI\_LAB\_APP 6: CI: RESET command  EVS Port1 42/1/CI\_LAB\_APP 3: CI Lab Initialized. Version 2.3.1.0  1980-012-14:03:20.28915 ES Startup: Loading file: /cf/to\_lab.so, APP: TO\_LAB\_APP  1980-012-14:03:20.29055 ES Startup: TO\_LAB\_APP loaded and created  EVS Port1 42/1/TO\_LAB\_APP 1: TO Lab Initialized. Version 2.3.0.0 Awaiting enable command.  1980-012-14:03:20.29342 ES Startup: Loading file: /cf/sch\_lab.so, APP: SCH\_LAB\_APP  1980-012-14:03:20.29448 ES Startup: SCH\_LAB\_APP loaded and created  SCH Lab Initialized. Version 2.3.3.0  1980-012-14:03:20.34546 ES Startup: CFE\_ES\_Main entering APPS\_INIT state  1980-012-14:03:20.34571 ES Startup: CFE\_ES\_Main entering OPERATIONAL state  EVS Port1 42/1/CFE\_TIME 21: Stop FLYWHEEL |

# Add the Bootcamp Apps to the Ground System

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| --- | --- | --- |
| 1 | Add the bootcamp io app message header to CHeaderParser-hdr-paths.txt. | debian@beaglebone:~/cFS$ cd tools/cFS-GroundSystem/Subsystems/cmdGui/  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ git diff CHeaderParser-hdr-paths.txt  diff --git a/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt b/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  index 85e7e4c..4b15209 100644  --- a/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  +++ b/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  @@ -15,3 +15,4 @@  #  #../../../../../apps/to\_lab/fsw/src/to\_lab\_msg.h  #../../../../../apps/ci\_lab/fsw/src/ci\_lab\_msg.h  +../../../../apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |
| 2 | Generate the ground system file for bootcamp io app commands. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ python CHeaderParser.py  Using header files found in CHeaderParser-hdr-paths.txt  We need to save the command into to a pickle file in 'CommandFile/'.  Please do not use any spaces/quotes in your filename. Ex: my\_app\_cmd\_file  What would you like the command file to be saved as? bcamp\_io\_cmd\_msg  Unused Commands  -----------------------------------------  Command (0 of 2) BCAMP\_IO\_APP\_NOOP\_CC  Command (1 of 2) BCAMP\_IO\_APP\_RESET\_COUNTERS\_CC  Command (2 of 2) BCAMP\_IO\_APP\_PROCESS\_CC  Do any commands in bcamp\_io\_cmd\_msg require parameters? (yes/no): no  You have chosen to exit. Exiting now.  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |
| 3 | Add the bootcamp monitor app message header to CHeaderParser-hdr-paths.txt and comment out the previously added message. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ git diff CHeaderParser-hdr-paths.txt  diff --git a/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt b/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  index 85e7e4c..cad26bf 100644  --- a/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  +++ b/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  @@ -15,3 +15,5 @@  #  #../../../../../apps/to\_lab/fsw/src/to\_lab\_msg.h  #../../../../../apps/ci\_lab/fsw/src/ci\_lab\_msg.h  +#../../../../apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  +../../../../apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |
| 4 | Generate the ground system file for bootcamp monitor app commands. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ python CHeaderParser.py  Using header files found in CHeaderParser-hdr-paths.txt  We need to save the command into to a pickle file in 'CommandFile/'.  Please do not use any spaces/quotes in your filename. Ex: my\_app\_cmd\_file  What would you like the command file to be saved as? bcamp\_mn\_cmd\_msg  Unused Commands  -----------------------------------------  Command (0 of 2) BCAMP\_MN\_APP\_NOOP\_CC  Command (1 of 2) BCAMP\_MN\_APP\_RESET\_COUNTERS\_CC  Command (2 of 2) BCAMP\_MN\_APP\_PROCESS\_CC  Do any commands in bcamp\_mn\_cmd\_msg require parameters? (yes/no): no  You have chosen to exit. Exiting now.  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |
| 5 | Modify the command-pages.txt file to add the new command pages. Where do the 0x1892 and 0x18A2 values come from? | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ git diff command-pages.txt  diff --git a/Subsystems/cmdGui/command-pages.txt b/Subsystems/cmdGui/command-pages.txt  index 2e81320..dcb1d0a 100644  --- a/Subsystems/cmdGui/command-pages.txt  +++ b/Subsystems/cmdGui/command-pages.txt  @@ -29,3 +29,5 @@ Event Services (CPU1), cfe\_\_evs\_\_msg\_8h, 0x1801, LE, UdpCommands.py, 127  Command Ingest LAB, ci\_lab\_msg, 0x1884, LE, UdpCommands.py, 127.0.0.1, 1234  Telemetry Output LAB, to\_lab\_msg, 0x1880, LE, UdpCommands.py, 127.0.0.1, 1234  Sample App (CPU1), sample\_app\_cmd, 0x1882, LE, UdpCommands.py, 127.0.0.1, 1234  +Bootcamp IO App (CPU1), bcamp\_io\_cmd\_msg, 0x1892, LE, UdpCommands.py, 127.0.0.1, 1234  +Bootcamp Mon App (CPU1), bcamp\_mn\_cmd\_msg, 0x18A2, LE, UdpCommands.py, 127.0.0.1, 1234  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |
| 6 | Create description files for the bootcamp io app and bootcamp monitor app telemetry formats. | debian@beaglebone:~/cFS$ cd tools/cFS-GroundSystem/Subsystems/tlmGUI  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/tlmGUI$ cat cfs-bcamp-io-hk-tlm.txt  Error Counter, 12, 1, B, Dec, NULL, NULL, NULL, NULL  Command Counter, 13, 1, B, Dec, NULL, NULL, NULL, NULL  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/tlmGUI$ cat cfs-bcamp-mn-hk-tlm.txt  Error Counter, 12, 1, B, Dec, NULL, NULL, NULL, NULL  Command Counter, 13, 1, B, Dec, NULL, NULL, NULL, NULL  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/tlmGUI$ |
| 7 | Modify telemetry-pages.txt to add the new telemetry pages to the Ground System. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/tlmGUI$ git diff telemetry-pages.txt  diff --git a/Subsystems/tlmGUI/telemetry-pages.txt b/Subsystems/tlmGUI/telemetry-pages.txt  index bcf4307..98a51dd 100644  --- a/Subsystems/tlmGUI/telemetry-pages.txt  +++ b/Subsystems/tlmGUI/telemetry-pages.txt  @@ -13,3 +13,5 @@  Event Messages, EventMessage.py, 0x808, null  Executive Services, GenericTelemetry.py, 0x800, cfe-es-hk-tlm.txt  Table services, GenericTelemetry.py, 0x804, cfe-tbl-hk-tlm.txt  +Bootcamp IO, GenericTelemetry.py, 0x893, cfs-bcamp-io-hk-tlm.txt  +Bootcamp Monitor, GenericTelemetry.py, 0x8A3, cfs-bcamp-mn-hk-tlm.txt  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/tlmGUI$ |
| 8 | If not already started, start the cFS application. | debian@beaglebone:~/cFS/build/exe/cpu1$ ./core-cpu1  CFE\_PSP: Default Reset Type = PO  <snip>  EVS Port1 42/1/CFE\_TIME 21: Stop FLYWHEEL |
| 9 | From an X server window, start the telemetry system. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem$ python3 GroundSystem.py  Attempting to wait for UDP messages |
| 10 | Bring up the Command System by clicking the “Start Command System” button. |  |
| 11 | Bring up both bootcamp command pages by clicking “Display” page for each bootcamp app. |  |
| 12 | Send a NOOP and Reset command to the bootcamp IO app. |  |
| 13 | Observe the output from the Ground System and the cFS application. | Host: 127.0.0.1  Port: 1234  Pkt ID: 0x1892  sending data to '127.0.0.1' (IP : 127.0.0.1); port 1234  Data to send:  0x18 0x92 0xC0 0x00 0x00 0x01 0x00 0x00  Host: 127.0.0.1  Port: 1234  Pkt ID: 0x1892  sending data to '127.0.0.1' (IP : 127.0.0.1); port 1234  Data to send:  0x18 0x92 0xC0 0x00 0x00 0x01 0x00 0x01  ---------------------------------------  EVS Port1 42/1/BCAMP\_IO\_APP 3: BCAMP\_IO: NOOP command Version 1.0.0.0  EVS Port1 42/1/BCAMP\_IO\_APP 4: BCAMP\_IO: RESET command |
| 14 | Send a NOOP and Reset command to the bootcamp monitor app. |  |
| 15 | Observe the output from the Ground System and the cFS application. | Host: 127.0.0.1  Port: 1234  Pkt ID: 0x18a2  sending data to '127.0.0.1' (IP : 127.0.0.1); port 1234  Data to send:  0x18 0xA2 0xC0 0x00 0x00 0x01 0x00 0x00  Host: 127.0.0.1  Port: 1234  Pkt ID: 0x18a2  sending data to '127.0.0.1' (IP : 127.0.0.1); port 1234  Data to send:  0x18 0xA2 0xC0 0x00 0x00 0x01 0x00 0x01  ---------------------------------------  EVS Port1 42/1/BCAMP\_MN\_APP 3: BCAMP\_MN: NOOP command Version 1.0.0.0  EVS Port1 42/1/BCAMP\_MN\_APP 4: BCAMP\_MN: RESET command |
| 16 | Enable telemetry transmission and bring up the telemetry page. |  |
| 17 | Bring up the telemetry pages for the bootcamp io app and bootcamp monitor app. |  |
| 18 | Observe the telemetry pages when sending commands to the bootcamp apps. |  |

# Add Additional Functionality to the Bootcamp IO App

|  |  |  |
| --- | --- | --- |
| 1 | Add additional commands to the bootcamp IO app. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app\_msg.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  index 2aa5ddd..4f0fab8 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  @@ -7,6 +7,8 @@  #define BCAMP\_IO\_APP\_NOOP\_CC 0  #define BCAMP\_IO\_APP\_RESET\_COUNTERS\_CC 1  #define BCAMP\_IO\_APP\_PROCESS\_CC 2  +#define BCAMP\_IO\_APP\_SET\_CURRENT\_TEMP\_CC 3  +#define BCAMP\_IO\_APP\_SET\_DELTA\_VALUE\_CC 4  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 2 | Add a structure and typedefs to carry the command argument for the new commands. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app\_msg.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  index 2aa5ddd..57417b5 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  @@ -19,6 +21,12 @@ typedef struct  } BCAMP\_IO\_NoArgsCmd\_t;  +typedef struct  +{  + uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  + int32 iValue; /\* Command argument of type int32 \*/  +} BCAMP\_IO\_IntArgCmd\_t;  +  /\*  \*\* The following commands all share the "NoArgs" format  \*\*  @@ -30,6 +38,16 @@ typedef BCAMP\_IO\_NoArgsCmd\_t BCAMP\_IO\_Noop\_t;  typedef BCAMP\_IO\_NoArgsCmd\_t BCAMP\_IO\_ResetCounters\_t;  typedef BCAMP\_IO\_NoArgsCmd\_t BCAMP\_IO\_Process\_t;  +/\*  +\*\* The following commands all share the "IntArg" format  +\*\*  +\*\* They are each given their own type name matching the command name, which\_open\_mode  +\*\* allows them to change independently in the future without changing the prototype  +\*\* of the handler function  +\*/  +typedef BCAMP\_IO\_IntArgCmd\_t BCAMP\_IO\_SetCurrentTemp\_t;  +typedef BCAMP\_IO\_IntArgCmd\_t BCAMP\_IO\_SetDeltaValue\_t;  +  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  /\*  \*\* Type definition (BCAMP\_IO App housekeeping)  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 3 | Add variables to the application state structure to hold the simulated temperature and the rate of temperature changes. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  index cd1964f..cc52de3 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  @@ -55,6 +55,11 @@ typedef struct  CFE\_EVS\_BinFilter\_t BCAMP\_IO\_EventFilters[BCAMP\_IO\_EVENT\_COUNTS];  + /\*  + \*\* Variables to hold the simulated temperature  + \*/  + int32 iCurTempVal; /\* Stores current temperature value \*/  + int32 iDeltaVal; /\* Used to compute new temperature value \*/  } Bcamp\_IO\_AppData\_t;  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 4 | Add code to process the new commands. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  index cd1964f..e236430 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  @@ -72,7 +77,8 @@ void BCAMP\_IO\_ReportHousekeeping(const CCSDS\_CommandPacket\_t \*Msg);  void BCAMP\_IO\_ResetCounters(const BCAMP\_IO\_ResetCounters\_t \*Msg);  void BCAMP\_IO\_ProcessCC(const BCAMP\_IO\_Process\_t \*Msg);  void BCAMP\_IO\_NoopCmd(const BCAMP\_IO\_Noop\_t \*Msg);  +void BCAMP\_IO\_SetCurrentTempCC(const BCAMP\_IO\_SetCurrentTemp\_t \*Msg);  +void BCAMP\_IO\_SetDeltaValueCC(const BCAMP\_IO\_SetDeltaValue\_t \*Msg);  bool BCAMP\_IO\_VerifyCmdLength(CFE\_SB\_MsgPtr\_t Msg, uint16 ExpectedLength);  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app\_events.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_events.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_events.h  index 85ced88..bcfcdb0 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_events.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_events.h  @@ -10,7 +10,9 @@  #define BCAMP\_IO\_INVALID\_MSGID\_ERR\_EID 5  #define BCAMP\_IO\_LEN\_ERR\_EID 6  #define BCAMP\_IO\_PIPE\_ERR\_EID 7  +#define BCAMP\_IO\_COMMANDSETTEMP\_INF\_EID 8  +#define BCAMP\_IO\_COMMANDSETDELTA\_INF\_EID 9  -#define BCAMP\_IO\_EVENT\_COUNTS 7  +#define BCAMP\_IO\_EVENT\_COUNTS 9  #endif /\* \_bcamp\_io\_app\_events\_h\_ \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app.c  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  index 9862dcc..0419aaf 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  @@ -126,6 +126,10 @@ int32 BCAMP\_IO\_AppInit( void )  Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[5].Mask = 0x0000;  Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[6].EventID = BCAMP\_IO\_PIPE\_ERR\_EID;  Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[6].Mask = 0x0000;  + Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[7].EventID = BCAMP\_IO\_COMMANDSETTEMP\_INF\_EID;  + Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[7].Mask = 0x0000;  + Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[8].EventID = BCAMP\_IO\_COMMANDSETDELTA\_INF\_EID;  + Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[8].Mask = 0x0000;  /\*  \*\* Register the events  @@ -274,6 +278,22 @@ void BCAMP\_IO\_ProcessGroundCommand( CFE\_SB\_MsgPtr\_t Msg )  break;  + case BCAMP\_IO\_APP\_SET\_CURRENT\_TEMP\_CC:  + if (BCAMP\_IO\_VerifyCmdLength(Msg, sizeof(BCAMP\_IO\_SetCurrentTemp\_t)))  + {  + BCAMP\_IO\_SetCurrentTempCC((BCAMP\_IO\_SetCurrentTemp\_t \*)Msg);  + }  +  + break;  +  + case BCAMP\_IO\_APP\_SET\_DELTA\_VALUE\_CC:  + if (BCAMP\_IO\_VerifyCmdLength(Msg, sizeof(BCAMP\_IO\_SetDeltaValue\_t)))  + {  + BCAMP\_IO\_SetDeltaValueCC((BCAMP\_IO\_SetDeltaValue\_t \*)Msg);  + }  +  + break;  +  /\* default case already found during FC vs length test \*/  default:  CFE\_EVS\_SendEvent(BCAMP\_IO\_COMMAND\_ERR\_EID,  @@ -390,6 +410,34 @@ void BCAMP\_IO\_ProcessCC( const BCAMP\_IO\_Process\_t \*Msg )  } /\* End of BCAMP\_IO\_ProcessCC \*/  +void BCAMP\_IO\_SetCurrentTempCC( const BCAMP\_IO\_SetCurrentTemp\_t \*Msg)  +{  +  + Bcamp\_IO\_AppData.iCurTempVal = Msg->iValue;  + Bcamp\_IO\_AppData.CmdCounter++;  +  + CFE\_EVS\_SendEvent(BCAMP\_IO\_COMMANDSETTEMP\_INF\_EID, CFE\_EVS\_INFORMATION,  + "BCAMP\_IO - Recvd SET\_CURRENT\_TEMP cmd (%d) - %d",  + (int)CFE\_SB\_GetCmdCode((CFE\_SB\_MsgPtr\_t)Msg), (int)Bcamp\_IO\_AppData.iCurTempVal);  +  + return;  +  +} /\* End of BCAMP\_IO\_SetCurrentTempCC() \*/  +  +void BCAMP\_IO\_SetDeltaValueCC( const BCAMP\_IO\_SetDeltaValue\_t \*Msg)  +{  +  + Bcamp\_IO\_AppData.iDeltaVal = Msg->iValue;  + Bcamp\_IO\_AppData.CmdCounter++;  +  + CFE\_EVS\_SendEvent(BCAMP\_IO\_COMMANDSETDELTA\_INF\_EID, CFE\_EVS\_INFORMATION,  + "BCAMP\_IO - Recvd SET\_DELTA\_VALUE cmd (%d) - %d",  + (int)CFE\_SB\_GetCmdCode((CFE\_SB\_MsgPtr\_t)Msg), (int)Bcamp\_IO\_AppData.iDeltaVal);  +  + return;  +  +} /\* End of BCAMP\_IO\_SetDeltaValueCC() \*/  +  /\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*\*/  /\* \*/  /\* BCAMP\_IO\_VerifyCmdLength() -- Verify command packet length \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 5 | Add code to the bootcamp io app to update the temperature. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app\_events.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_events.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_events.h  index 85ced88..dbc8cbb 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_events.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_events.h  @@ -10,7 +10,10 @@  #define BCAMP\_IO\_INVALID\_MSGID\_ERR\_EID 5  #define BCAMP\_IO\_LEN\_ERR\_EID 6  #define BCAMP\_IO\_PIPE\_ERR\_EID 7  +#define BCAMP\_IO\_COMMANDPROC\_INF\_EID 10  -#define BCAMP\_IO\_EVENT\_COUNTS 9  +#define BCAMP\_IO\_EVENT\_COUNTS 10  #endif /\* \_bcamp\_io\_app\_events\_h\_ \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app.c  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  index 9862dcc..5677e9e 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  @@ -97,6 +97,12 @@ int32 BCAMP\_IO\_AppInit( void )  Bcamp\_IO\_AppData.RunStatus = CFE\_ES\_APP\_RUN;  /\*  + \*\* Initialize temperature tracking values  + \*/  + Bcamp\_IO\_AppData.iCurTempVal = 0;  + Bcamp\_IO\_AppData.iDeltaVal = 1;  +  + /\*  \*\* Initialize app command execution counters  \*/  Bcamp\_IO\_AppData.CmdCounter = 0;  @@ -126,6 +132,12 @@ int32 BCAMP\_IO\_AppInit( void )  Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[7].Mask = 0x0000;  Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[8].EventID = BCAMP\_IO\_COMMANDSETDELTA\_INF\_EID;  Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[8].Mask = 0x0000;  + Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[9].EventID = BCAMP\_IO\_COMMANDPROC\_INF\_EID;  + Bcamp\_IO\_AppData.BCAMP\_IO\_EventFilters[9].Mask = 0x0000;  /\*  \*\* Register the events  @@ -386,10 +414,45 @@ void BCAMP\_IO\_ResetCounters( const BCAMP\_IO\_ResetCounters\_t \*Msg )  void BCAMP\_IO\_ProcessCC( const BCAMP\_IO\_Process\_t \*Msg )  {  + Bcamp\_IO\_AppData.iCurTempVal += Bcamp\_IO\_AppData.iDeltaVal;  + Bcamp\_IO\_AppData.CmdCounter++;  +  + CFE\_EVS\_SendEvent(BCAMP\_IO\_COMMANDPROC\_INF\_EID,  + CFE\_EVS\_INFORMATION,  + "BCAMP\_IO: PROCESS command");  +  return;  } /\* End of BCAMP\_IO\_ProcessCC \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 6 | Add code to the bootcamp IO app to publish the updated temperature. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/platform\_inc$ git diff bcamp\_io\_app\_msgids.h  diff --git a/apps/bcamp\_io\_app/fsw/platform\_inc/bcamp\_io\_app\_msgids.h b/apps/bcamp\_io\_app/fsw/platform\_inc/bcamp\_io\_app\_msgids.h  index 6835771..a3dcefe 100644  --- a/apps/bcamp\_io\_app/fsw/platform\_inc/bcamp\_io\_app\_msgids.h  +++ b/apps/bcamp\_io\_app/fsw/platform\_inc/bcamp\_io\_app\_msgids.h  @@ -4,5 +4,6 @@  #define BCAMP\_IO\_APP\_CMD\_MID 0x1892  #define BCAMP\_IO\_APP\_SEND\_HK\_MID 0x1893  #define BCAMP\_IO\_APP\_HK\_TLM\_MID 0x0893  +#define BCAMP\_IO\_APP\_TEMP\_DATA\_MID 0x0894  #endif /\* \_bcamp\_io\_app\_msgids\_h\_ \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/platform\_inc$  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app\_msg.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  index 57417b5..87f43f6 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  @@ -61,4 +61,15 @@ typedef struct  } bcamp\_io\_hk\_tlm\_t;  +/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  +/\*  +\*\* Type definition (BCAMP\_IO App temperature data)  +\*/  +typedef union  +{  + uint8 TlmHeader[CFE\_SB\_TLM\_HDR\_SIZE];  + uint32 align;  +} bcamp\_io\_temp\_data\_align\_t;  +  +typedef struct  +{  + bcamp\_io\_temp\_data\_align\_t align;  + int32 iTempValue;  +  +} bcamp\_io\_temp\_data\_t;  +  + #endif /\* \_bcamp\_io\_app\_msg\_h\_ \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  index e236430..04969bc 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  @@ -37,6 +37,11 @@ typedef struct  bcamp\_io\_hk\_tlm\_t BCAMP\_IO\_HkTelemetryPkt;  /\*  + \*\* Temperature data packet...  + \*/  + bcamp\_io\_temp\_data\_t BCAMP\_IO\_TemperatureDataPkt;  +  + /\*  \*\* Run Status variable used in the main processing loop  \*/  uint32 RunStatus;  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app.c  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  index 5677e9e..fd0aeaf 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.c  @@ -161,6 +161,14 @@ int32 BCAMP\_IO\_AppInit( void )  true);  /\*  + \*\* Initialize temperature data packet (clear user data area).  + \*/  + CFE\_SB\_InitMsg(&Bcamp\_IO\_AppData.BCAMP\_IO\_TemperatureDataPkt,  + BCAMP\_IO\_APP\_TEMP\_DATA\_MID,  + sizeof(bcamp\_io\_temp\_data\_t),  + true);  +  + /\*  \*\* Create Software Bus message pipe.  \*/  status = CFE\_SB\_CreatePipe(&Bcamp\_IO\_AppData.BCAMP\_IO\_CommandPipe,  @@ -417,6 +425,29 @@ void BCAMP\_IO\_ProcessCC( const BCAMP\_IO\_Process\_t \*Msg )  Bcamp\_IO\_AppData.iCurTempVal += Bcamp\_IO\_AppData.iDeltaVal;  Bcamp\_IO\_AppData.CmdCounter++;  + Bcamp\_IO\_AppData.BCAMP\_IO\_TemperatureDataPkt.iTempValue = Bcamp\_IO\_AppData.iCurTempVal;  +  + CFE\_SB\_TimeStampMsg((CFE\_SB\_Msg\_t \*) &Bcamp\_IO\_AppData.BCAMP\_IO\_TemperatureDataPkt);  + CFE\_SB\_SendMsg((CFE\_SB\_Msg\_t \*) &Bcamp\_IO\_AppData.BCAMP\_IO\_TemperatureDataPkt);  +  CFE\_EVS\_SendEvent(BCAMP\_IO\_COMMANDPROC\_INF\_EID,  CFE\_EVS\_INFORMATION,  "BCAMP\_IO: PROCESS command");  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ |
| 7 | To configure the Ground System, first modify CHeaderParser-hdr-paths.txt to process the temperature IO app command structures. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ git diff CHeaderParser-hdr-paths.txt  diff --git a/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt b/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  index 0709da5..51036c8 100644  --- a/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  +++ b/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  @@ -15,5 +15,5 @@  #  #../../../../../apps/to\_lab/fsw/src/to\_lab\_msg.h  #../../../../../apps/ci\_lab/fsw/src/ci\_lab\_msg.h  -#../../../../apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  -../../../../apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  +../../../../apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  +#../../../../apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |
| 8 | Modify the header parser to recognize int32 as a “word”. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ git diff CHeaderParser.py  diff --git a/Subsystems/cmdGui/CHeaderParser.py b/Subsystems/cmdGui/CHeaderParser.py  index 1d8d85d..a86a866 100644  --- a/Subsystems/cmdGui/CHeaderParser.py  +++ b/Subsystems/cmdGui/CHeaderParser.py  @@ -80,6 +80,8 @@ class CHeaderParser():  return '--half'  elif dataTypeOrig == 'uint32':  return '--word'  + elif dataTypeOrig == 'int32':  + return '--word'  elif dataTypeOrig == 'uint64':  return '--double'  else:  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |
| 9 | Generate the screen to send commands to the temperature IO app. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ python CHeaderParser.py  Using header files found in CHeaderParser-hdr-paths.txt  We need to save the command into to a pickle file in 'CommandFile/'.  Please do not use any spaces/quotes in your filename. Ex: my\_app\_cmd\_file  What would you like the command file to be saved as? bcamp\_io\_cmd\_msg  Unused Commands  -----------------------------------------  Command (0 of 4) BCAMP\_IO\_APP\_NOOP\_CC  Command (1 of 4) BCAMP\_IO\_APP\_RESET\_COUNTERS\_CC  Command (2 of 4) BCAMP\_IO\_APP\_PROCESS\_CC  Command (3 of 4) BCAMP\_IO\_APP\_SET\_CURRENT\_TEMP\_CC  Command (4 of 4) BCAMP\_IO\_APP\_SET\_DELTA\_VALUE\_CC  Do any commands in bcamp\_io\_cmd\_msg require parameters? (yes/no): yes  Which command would you like to add parameters to (-1 to exit)? 3  This program will now attempt to find the command structure for BCAMP\_IO\_APP\_SET\_CURRENT\_TEMP\_CC  Showing structure 0 of 3 below.  --------------------------------------------  {  uint8 CmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  } BCAMP\_IO\_NoArgsCmd\_t;  --------------------------------------------  Showing structure 1 of 3 below.  --------------------------------------------  {  uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  int32 iValue; /\* Command argument of type int32 \*/  } BCAMP\_IO\_IntArgCmd\_t;  --------------------------------------------  <snip>  Choose from the list above or choose -1 to exit.  Which of the above structures would you like to use? 1  Line (0) -> {  Line (1) -> uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  Line (2) -> int32 iValue; /\* Command argument of type int32 \*/  Line (3) -> } BCAMP\_IO\_IntArgCmd\_t;  Enter the line of the parameter from the above print-out (-1 to stop): 2  dataTypeOrig: int32  dataTypeNew: --word  paramName: iValue  paramLen:  stringLen:  Added: iValue with type --word  Line (0) -> {  Line (1) -> uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  Line (2) -> } BCAMP\_IO\_IntArgCmd\_t;  Enter the line of the parameter from the above print-out (-1 to stop): -1  You have chosen to stop adding parameters.  Unused Commands  -----------------------------------------  Command (0 of 3) BCAMP\_IO\_APP\_NOOP\_CC  Command (1 of 3) BCAMP\_IO\_APP\_RESET\_COUNTERS\_CC  Command (2 of 3) BCAMP\_IO\_APP\_PROCESS\_CC  Command (3 of 3) BCAMP\_IO\_APP\_SET\_DELTA\_VALUE\_CC  Which command would you like to add parameters to (-1 to exit)? 3  This program will now attempt to find the command structure for BCAMP\_IO\_APP\_SET\_DELTA\_VALUE\_CC  Showing structure 0 of 3 below.  --------------------------------------------  {  uint8 CmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  } BCAMP\_IO\_NoArgsCmd\_t;  --------------------------------------------  Showing structure 1 of 3 below.  --------------------------------------------  {  uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  int32 iValue; /\* Command argument of type int32 \*/  } BCAMP\_IO\_IntArgCmd\_t;  --------------------------------------------  <snip>  --------------------------------------------  Choose from the list above or choose -1 to exit.  Which of the above structures would you like to use? 1  Line (0) -> {  Line (1) -> uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  Line (2) -> int32 iValue; /\* Command argument of type int32 \*/  Line (3) -> } BCAMP\_IO\_IntArgCmd\_t;  Enter the line of the parameter from the above print-out (-1 to stop): 2  dataTypeOrig: int32  dataTypeNew: --word  paramName: iValue  paramLen:  stringLen:  Added: iValue with type --word  Line (0) -> {  Line (1) -> uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  Line (2) -> } BCAMP\_IO\_IntArgCmd\_t;  Enter the line of the parameter from the above print-out (-1 to stop): -1  You have chosen to stop adding parameters.  Unused Commands  -----------------------------------------  Command (0 of 2) BCAMP\_IO\_APP\_NOOP\_CC  Command (1 of 2) BCAMP\_IO\_APP\_RESET\_COUNTERS\_CC  Command (2 of 2) BCAMP\_IO\_APP\_PROCESS\_CC  Which command would you like to add parameters to (-1 to exit)? -1  You have chosen to exit early. Exiting now.  Thank you for using CHeaderParser.  The following commands have been added with parameters:  ['BCAMP\_IO\_APP\_SET\_CURRENT\_TEMP\_CC', 'BCAMP\_IO\_APP\_SET\_DELTA\_VALUE\_CC']  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |

# Add Additional Functionality to the Bootcamp Monitor App

|  |  |  |
| --- | --- | --- |
| 1 | Add additional commands to the bootcamp monitor app.  Add a structure and typedefs to carry the command argument for the new commands.  Add variables to the application state structure to hold the information on the temperature.  Add code to process the new commands.  Add constants to track the state of the temperature.  Add code to initialize the application variable used to track the temperature state.  Add code to subscribe to the temperature messages published by the bootcamp IO app.  Add code to process the messages received from the bootcamp IO app.  Add code to return the temperature data in the telemetry. | debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/platform\_inc$ cat bcamp\_io\_app\_public\_msg.h  #ifndef \_bcamp\_io\_app\_public\_msg\_h\_  #define \_bcamp\_io\_app\_public\_msg\_h\_  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  /\*  \*\* Type definition (BCAMP\_IO App temperature data)  \*/  typedef union  {  uint8 TlmHeader[CFE\_SB\_TLM\_HDR\_SIZE];  uint32 align;  } bcamp\_io\_temp\_data\_align\_t;  typedef struct  {  bcamp\_io\_temp\_data\_align\_t align;  int32 iTempValue;  } bcamp\_io\_temp\_data\_t;  #endif /\* \_bcamp\_io\_app\_public\_msg\_h\_ \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/platform\_inc$  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app\_msg.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  index 87f43f6..57417b5 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  @@ -61,15 +61,4 @@ typedef struct  } bcamp\_io\_hk\_tlm\_t;  -/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  -/\*  -\*\* Type definition (BCAMP\_IO App temperature data)  -\*/  -typedef union  -{  - uint8 TlmHeader[CFE\_SB\_TLM\_HDR\_SIZE];  - uint32 align;  -} bcamp\_io\_temp\_data\_align\_t;  -  -typedef struct  -{  - bcamp\_io\_temp\_data\_align\_t align;  - int32 iTempValue;  -  -} bcamp\_io\_temp\_data\_t;  -  #endif /\* \_bcamp\_io\_app\_msg\_h\_ \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$ git diff bcamp\_io\_app.h  diff --git a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  index 04969bc..cf71262 100644  --- a/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  +++ b/apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app.h  @@ -13,6 +13,7 @@  #include "bcamp\_io\_app\_perfids.h"  #include "bcamp\_io\_app\_msgids.h"  #include "bcamp\_io\_app\_msg.h"  +#include "bcamp\_io\_app\_public\_msg.h"  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  #define BCAMP\_IO\_PIPE\_DEPTH 32 /\* Depth of the Command Pipe for Application \*/  debian@beaglebone:~/cFS/apps/bcamp\_io\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app$ git diff CMakeLists.txt  diff --git a/apps/bcamp\_mn\_app/CMakeLists.txt b/apps/bcamp\_mn\_app/CMakeLists.txt  index 775dc5d..4a62151 100644  --- a/apps/bcamp\_mn\_app/CMakeLists.txt  +++ b/apps/bcamp\_mn\_app/CMakeLists.txt  @@ -3,6 +3,7 @@ project(CFE\_BCAMP\_MN\_APP C)  include\_directories(fsw/mission\_inc)  include\_directories(fsw/platform\_inc)  +include\_directories(${bcamp\_io\_app\_MISSION\_DIR}/fsw/platform\_inc)  aux\_source\_directory(fsw/src APP\_SRC\_FILES)  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app$  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$ git diff bcamp\_mn\_app\_events.h  diff --git a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_events.h b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_events.h  index e3675df..d2541b4 100644  --- a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_events.h  +++ b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_events.h  @@ -10,7 +10,10 @@  #define BCAMP\_MN\_INVALID\_MSGID\_ERR\_EID 5  #define BCAMP\_MN\_LEN\_ERR\_EID 6  #define BCAMP\_MN\_PIPE\_ERR\_EID 7  +#define BCAMP\_MN\_COMMANDSETCOLDLIMIT\_INF\_EID 8  +#define BCAMP\_MN\_COMMANDSETHOTLIMIT\_INF\_EID 9  +#define BCAMP\_MN\_PROCESS\_TEMP\_DATA\_INF\_EID 10  -#define BCAMP\_MN\_EVENT\_COUNTS 7  +#define BCAMP\_MN\_EVENT\_COUNTS 10  #endif /\* \_bcamp\_mn\_app\_events\_h\_ \*/  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$ git diff bcamp\_mn\_app\_msg.h  diff --git a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  index aa915fe..4de6fac 100644  --- a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  +++ b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  @@ -7,6 +7,8 @@  #define BCAMP\_MN\_APP\_NOOP\_CC 0  #define BCAMP\_MN\_APP\_RESET\_COUNTERS\_CC 1  #define BCAMP\_MN\_APP\_PROCESS\_CC 2  +#define BCAMP\_MN\_APP\_SET\_COLD\_LIMIT\_CC 3  +#define BCAMP\_MN\_APP\_SET\_HOT\_LIMIT\_CC 4  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  @@ -19,6 +21,12 @@ typedef struct  } BCAMP\_MN\_NoArgsCmd\_t;  +typedef struct  +{  + uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  + int32 iValue; /\* Command argument of type int32 \*/  +} BCAMP\_MN\_IntArgCmd\_t;  +  /\*  \*\* The following commands all share the "NoArgs" format  \*\*  @@ -30,6 +38,16 @@ typedef BCAMP\_MN\_NoArgsCmd\_t BCAMP\_MN\_Noop\_t;  typedef BCAMP\_MN\_NoArgsCmd\_t BCAMP\_MN\_ResetCounters\_t;  typedef BCAMP\_MN\_NoArgsCmd\_t BCAMP\_MN\_Process\_t;  +/\*  +\*\* The following commands all share the "IntArg" format  +\*\*  +\*\* They are each given their own type name matching the command name, which\_open\_mode  +\*\* allows them to change independently in the future without changing the prototype  +\*\* of the handler function  +\*/  +typedef BCAMP\_MN\_IntArgCmd\_t BCAMP\_MN\_SetColdLimit\_t;  +typedef BCAMP\_MN\_IntArgCmd\_t BCAMP\_MN\_SetHotLimit\_t;  +  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  /\*  \*\* Type definition (BCAMP\_MN App housekeeping)  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$ git diff bcamp\_mn\_app.h  diff --git a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.h b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.h  index 5baec11..4317ce5 100644  --- a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.h  +++ b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.h  @@ -14,6 +14,19 @@  #include "bcamp\_mn\_app\_msgids.h"  #include "bcamp\_mn\_app\_msg.h"  +#include "bcamp\_io\_app\_public\_msg.h"  +  +/\*  +\*\* Constants used for TEMP\_MON data  +\*/  +#define TEMP\_NOCHANGE 0 /\* Temperature direction, 1 of 3 \*/  +#define TEMP\_INCREASING 1 /\* Temperature direction, 2 of 3 \*/  +#define TEMP\_DECREASING 2 /\* Temperature direction, 3 of 3 \*/  +  +#define TEMP\_NOMINAL 0 /\* Temperature range, 1 of 3 \*/  +#define TEMP\_HOT 1 /\* Temperature range, 2 of 3 \*/  +#define TEMP\_COLD 2 /\* Temperature range, 3 of 3 \*/  +  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  #define BCAMP\_MN\_PIPE\_DEPTH 32 /\* Depth of the Command Pipe for Application \*/  @@ -55,6 +68,17 @@ typedef struct  CFE\_EVS\_BinFilter\_t BCAMP\_MN\_EventFilters[BCAMP\_MN\_EVENT\_COUNTS];  + /\*  + \*\* Variables to hold the temperature state  + \*/  + int32 iPrevTempVal; /\* Previous temperature value published by bcamp\_io \*/  + int32 iTempVal; /\* Current temperature value published by bcamp\_io \*/  + int32 iColdLimit; /\* Current threshold for cold temperature range \*/  + int32 iHotLimit; /\* Current threshold for hot temperature range \*/  + int16 sDirection; /\* Current temperature direction:  + TEMP\_NOCHANGE, TEMP\_INCREASING, or TEMP\_DECREASING \*/  + int16 sRange; /\* Current temperature range:  + TEMP\_NOMINAL, TEMP\_HOT, or TEMP\_COLD \*/  } Bcamp\_MN\_AppData\_t;  /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/  @@ -72,8 +96,9 @@ void BCAMP\_MN\_ReportHousekeeping(const CCSDS\_CommandPacket\_t \*Msg);  void BCAMP\_MN\_ResetCounters(const BCAMP\_MN\_ResetCounters\_t \*Msg);  void BCAMP\_MN\_ProcessCC(const BCAMP\_MN\_Process\_t \*Msg);  void BCAMP\_MN\_NoopCmd(const BCAMP\_MN\_Noop\_t \*Msg);  -  -int32 BCAMP\_MN\_TblValidationFunc(void \*TblData);  +void BCAMP\_MN\_SetColdLimitCC(const BCAMP\_MN\_SetColdLimit\_t \*Msg);  +void BCAMP\_MN\_SetHotLimitCC(const BCAMP\_MN\_SetHotLimit\_t \*Msg);  +void BCAMP\_MN\_ProcessTemperatureData(const bcamp\_io\_temp\_data\_t \*Msg);  bool BCAMP\_MN\_VerifyCmdLength(CFE\_SB\_MsgPtr\_t Msg, uint16 ExpectedLength);  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$ git diff bcamp\_mn\_app.c  diff --git a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.c b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.c  index 9dbb2af..f4f0749 100644  --- a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.c  +++ b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.c  @@ -5,6 +5,8 @@  #include "bcamp\_mn\_app\_version.h"  #include "bcamp\_mn\_app.h"  +#include "bcamp\_io\_app\_msgids.h"  +  #include <string.h>  /\*  @@ -94,6 +96,16 @@ int32 BCAMP\_MN\_AppInit( void )  {  int32 status;  + /\*  + \*\* Initialize the temperature state variables  + \*/  + Bcamp\_MN\_AppData.iTempVal = 0;  + Bcamp\_MN\_AppData.iPrevTempVal = 0;  + Bcamp\_MN\_AppData.iColdLimit = 45;  + Bcamp\_MN\_AppData.iHotLimit = 85;  + Bcamp\_MN\_AppData.sDirection = TEMP\_NOCHANGE;  + Bcamp\_MN\_AppData.sRange = TEMP\_NOMINAL;  +  Bcamp\_MN\_AppData.RunStatus = CFE\_ES\_APP\_RUN;  /\*  @@ -126,6 +138,12 @@ int32 BCAMP\_MN\_AppInit( void )  Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[5].Mask = 0x0000;  Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[6].EventID = BCAMP\_MN\_PIPE\_ERR\_EID;  Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[6].Mask = 0x0000;  + Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[7].EventID = BCAMP\_MN\_COMMANDSETCOLDLIMIT\_INF\_EID;  + Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[7].Mask = 0x0000;  + Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[8].EventID = BCAMP\_MN\_COMMANDSETHOTLIMIT\_INF\_EID;  + Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[8].Mask = 0x0000;  + Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[9].EventID = BCAMP\_MN\_PROCESS\_TEMP\_DATA\_INF\_EID;  + Bcamp\_MN\_AppData.BCAMP\_MN\_EventFilters[9].Mask = 0x0000;  /\*  \*\* Register the events  @@ -186,6 +204,19 @@ int32 BCAMP\_MN\_AppInit( void )  return ( status );  }  + /\*  + \*\* Subscribe to bootcamp IO packets  + \*/  + status = CFE\_SB\_Subscribe(BCAMP\_IO\_APP\_TEMP\_DATA\_MID,  + Bcamp\_MN\_AppData.BCAMP\_MN\_CommandPipe);  + if (status != CFE\_SUCCESS )  + {  + CFE\_ES\_WriteToSysLog("Bcamp\_MN App: Error Subscribing to Bootcamp IO, RC = 0x%08lX\n",  + (unsigned long)status);  +  + return ( status );  + }  +  CFE\_EVS\_SendEvent (BCAMP\_MN\_STARTUP\_INF\_EID,  CFE\_EVS\_INFORMATION,  "BCAMP\_MN App Initialized. Version %d.%d.%d.%d",  @@ -222,6 +253,10 @@ void BCAMP\_MN\_ProcessCommandPacket( CFE\_SB\_MsgPtr\_t Msg )  BCAMP\_MN\_ReportHousekeeping((CCSDS\_CommandPacket\_t \*)Msg);  break;  + case BCAMP\_IO\_APP\_TEMP\_DATA\_MID:  + BCAMP\_MN\_ProcessTemperatureData((bcamp\_io\_temp\_data\_t \*)Msg);  + break;  +  default:  CFE\_EVS\_SendEvent(BCAMP\_MN\_INVALID\_MSGID\_ERR\_EID,  CFE\_EVS\_ERROR,  @@ -274,6 +309,23 @@ void BCAMP\_MN\_ProcessGroundCommand( CFE\_SB\_MsgPtr\_t Msg )  break;  + case BCAMP\_MN\_APP\_SET\_COLD\_LIMIT\_CC:  + if (BCAMP\_MN\_VerifyCmdLength(Msg, sizeof(BCAMP\_MN\_SetColdLimit\_t)))  + {  + BCAMP\_MN\_SetColdLimitCC((BCAMP\_MN\_SetColdLimit\_t \*)Msg);  + }  +  + break;  +  + case BCAMP\_MN\_APP\_SET\_HOT\_LIMIT\_CC:  + if (BCAMP\_MN\_VerifyCmdLength(Msg, sizeof(BCAMP\_MN\_SetHotLimit\_t)))  + {  + BCAMP\_MN\_SetHotLimitCC((BCAMP\_MN\_SetHotLimit\_t \*)Msg);  + }  +  + break;  +  +  /\* default case already found during FC vs length test \*/  default:  CFE\_EVS\_SendEvent(BCAMP\_MN\_COMMAND\_ERR\_EID,  @@ -390,6 +442,89 @@ void BCAMP\_MN\_ProcessCC( const BCAMP\_MN\_Process\_t \*Msg )  } /\* End of BCAMP\_MN\_ProcessCC \*/  +void BCAMP\_MN\_SetColdLimitCC( const BCAMP\_MN\_SetColdLimit\_t \*Msg)  +{  +  + Bcamp\_MN\_AppData.iColdLimit = Msg->iValue;  + Bcamp\_MN\_AppData.CmdCounter++;  +  + CFE\_EVS\_SendEvent(BCAMP\_MN\_COMMANDSETCOLDLIMIT\_INF\_EID, CFE\_EVS\_INFORMATION,  + "BCAMP\_MN - Recvd SET\_COLD\_LIMIT cmd (%d) - %d",  + (int)CFE\_SB\_GetCmdCode((CFE\_SB\_MsgPtr\_t)Msg), (int)Bcamp\_MN\_AppData.iColdLimit);  +  + return;  +  +} /\* End of BCAMP\_MN\_SetHotLimitCC() \*/  +  +void BCAMP\_MN\_SetHotLimitCC( const BCAMP\_MN\_SetHotLimit\_t \*Msg)  +{  +  + Bcamp\_MN\_AppData.iHotLimit = Msg->iValue;  + Bcamp\_MN\_AppData.CmdCounter++;  +  + CFE\_EVS\_SendEvent(BCAMP\_MN\_COMMANDSETHOTLIMIT\_INF\_EID, CFE\_EVS\_INFORMATION,  + "BCAMP\_MN - Recvd SET\_HOT\_LIMIT cmd (%d) - %d",  + (int)CFE\_SB\_GetCmdCode((CFE\_SB\_MsgPtr\_t)Msg), (int)Bcamp\_MN\_AppData.iHotLimit);  +  + return;  +  +} /\* End of BCAMP\_MN\_SetHotLimitCC() \*/  +  +  +void BCAMP\_MN\_ProcessTemperatureData(const bcamp\_io\_temp\_data\_t \*Msg)  +{  + /\* Update temperature value \*/  + Bcamp\_MN\_AppData.iPrevTempVal = Bcamp\_MN\_AppData.iTempVal;  + Bcamp\_MN\_AppData.iTempVal = Msg->iTempValue;  +  + /\* Determine if it's increasing, decreasing or no change\*/  + Bcamp\_MN\_AppData.sDirection = TEMP\_NOCHANGE;  + if (Bcamp\_MN\_AppData.iTempVal > Bcamp\_MN\_AppData.iPrevTempVal)  + {  + Bcamp\_MN\_AppData.sDirection = TEMP\_INCREASING;  + }  + else if (Bcamp\_MN\_AppData.iTempVal < Bcamp\_MN\_AppData.iPrevTempVal)  + {  + Bcamp\_MN\_AppData.sDirection = TEMP\_DECREASING;  + }  +  + /\* Determine its range \*/  + Bcamp\_MN\_AppData.sRange = TEMP\_NOMINAL;  + if (Bcamp\_MN\_AppData.iTempVal >= Bcamp\_MN\_AppData.iHotLimit)  + {  + Bcamp\_MN\_AppData.sRange = TEMP\_HOT;  + }  + else if (Bcamp\_MN\_AppData.iTempVal <= Bcamp\_MN\_AppData.iColdLimit)  + {  + Bcamp\_MN\_AppData.sRange = TEMP\_COLD;  + }  +  + CFE\_EVS\_SendEvent(BCAMP\_MN\_PROCESS\_TEMP\_DATA\_INF\_EID, CFE\_EVS\_INFORMATION,  + "BCAMP\_MN - Recvd PROCESS\_TEMPERATURE\_DATA msg (%d) - %d",  + (int)CFE\_SB\_GetCmdCode((CFE\_SB\_MsgPtr\_t)&Msg), (int)Msg->iTempValue);  +  + return;  +}  +  /\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*\*/  /\* \*/  /\* BCAMP\_MN\_VerifyCmdLength() -- Verify command packet length \*/  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$ |
| 2 | Generate the screen to send commands to the temperature monitor app. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ git diff CHeaderParser-hdr-paths.txt  diff --git a/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt b/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  index 51036c8..0709da5 100644  --- a/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  +++ b/Subsystems/cmdGui/CHeaderParser-hdr-paths.txt  @@ -15,5 +15,5 @@  #  #../../../../../apps/to\_lab/fsw/src/to\_lab\_msg.h  #../../../../../apps/ci\_lab/fsw/src/ci\_lab\_msg.h  -../../../../apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  -#../../../../apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  +#../../../../apps/bcamp\_io\_app/fsw/src/bcamp\_io\_app\_msg.h  +../../../../apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ python CHeaderParser.py  Using header files found in CHeaderParser-hdr-paths.txt  We need to save the command into to a pickle file in 'CommandFile/'.  Please do not use any spaces/quotes in your filename. Ex: my\_app\_cmd\_file  What would you like the command file to be saved as? bcamp\_mn\_cmd\_msg  Unused Commands  -----------------------------------------  Command (0 of 4) BCAMP\_MN\_APP\_NOOP\_CC  Command (1 of 4) BCAMP\_MN\_APP\_RESET\_COUNTERS\_CC  Command (2 of 4) BCAMP\_MN\_APP\_PROCESS\_CC  Command (3 of 4) BCAMP\_MN\_APP\_SET\_COLD\_LIMIT\_CC  Command (4 of 4) BCAMP\_MN\_APP\_SET\_HOT\_LIMIT\_CC  Do any commands in bcamp\_mn\_cmd\_msg require parameters? (yes/no): yes  Which command would you like to add parameters to (-1 to exit)? 3  This program will now attempt to find the command structure for BCAMP\_MN\_APP\_SET\_COLD\_LIMIT\_CC  Showing structure 0 of 3 below.  --------------------------------------------  {  uint8 CmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  } BCAMP\_MN\_NoArgsCmd\_t;  --------------------------------------------  Showing structure 1 of 3 below.  --------------------------------------------  {  uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  int32 iValue; /\* Command argument of type int32 \*/  } BCAMP\_MN\_IntArgCmd\_t;  --------------------------------------------  Showing structure 2 of 3 below.  --------------------------------------------  {  uint8 TlmHeader[CFE\_SB\_TLM\_HDR\_SIZE];  uint32 align;  } bcamp\_mn\_hk\_tlm\_align\_t;  --------------------------------------------  Showing structure 3 of 3 below.  --------------------------------------------  {  bcamp\_mn\_hk\_tlm\_align\_t align;  uint8 bcamp\_mn\_command\_error\_count;  uint8 bcamp\_mn\_command\_count;  uint8 spare[2];  int32 iTempValue;  int16 sTempDirection;  int16 sTempRange;  } bcamp\_mn\_hk\_tlm\_t;  --------------------------------------------  Choose from the list above or choose -1 to exit.  Which of the above structures would you like to use? 1  Line (0) -> {  Line (1) -> uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  Line (2) -> int32 iValue; /\* Command argument of type int32 \*/  Line (3) -> } BCAMP\_MN\_IntArgCmd\_t;  Enter the line of the parameter from the above print-out (-1 to stop): 2  dataTypeOrig: int32  dataTypeNew: --word  paramName: iValue  paramLen:  stringLen:  Added: iValue with type --word  Line (0) -> {  Line (1) -> uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  Line (2) -> } BCAMP\_MN\_IntArgCmd\_t;  Enter the line of the parameter from the above print-out (-1 to stop): -1  You have chosen to stop adding parameters.  Unused Commands  -----------------------------------------  Command (0 of 3) BCAMP\_MN\_APP\_NOOP\_CC  Command (1 of 3) BCAMP\_MN\_APP\_RESET\_COUNTERS\_CC  Command (2 of 3) BCAMP\_MN\_APP\_PROCESS\_CC  Command (3 of 3) BCAMP\_MN\_APP\_SET\_HOT\_LIMIT\_CC  Which command would you like to add parameters to (-1 to exit)? 3  This program will now attempt to find the command structure for BCAMP\_MN\_APP\_SET\_HOT\_LIMIT\_CC  Showing structure 0 of 3 below.  --------------------------------------------  {  uint8 CmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  } BCAMP\_MN\_NoArgsCmd\_t;  --------------------------------------------  Showing structure 1 of 3 below.  --------------------------------------------  {  uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  int32 iValue; /\* Command argument of type int32 \*/  } BCAMP\_MN\_IntArgCmd\_t;  --------------------------------------------  Showing structure 2 of 3 below.  --------------------------------------------  {  uint8 TlmHeader[CFE\_SB\_TLM\_HDR\_SIZE];  uint32 align;  } bcamp\_mn\_hk\_tlm\_align\_t;  --------------------------------------------  Showing structure 3 of 3 below.  --------------------------------------------  {  bcamp\_mn\_hk\_tlm\_align\_t align;  uint8 bcamp\_mn\_command\_error\_count;  uint8 bcamp\_mn\_command\_count;  uint8 spare[2];  int32 iTempValue;  int16 sTempDirection;  int16 sTempRange;  } bcamp\_mn\_hk\_tlm\_t;  --------------------------------------------  Choose from the list above or choose -1 to exit.  Which of the above structures would you like to use? 1  Line (0) -> {  Line (1) -> uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  Line (2) -> int32 iValue; /\* Command argument of type int32 \*/  Line (3) -> } BCAMP\_MN\_IntArgCmd\_t;  Enter the line of the parameter from the above print-out (-1 to stop): 2  dataTypeOrig: int32  dataTypeNew: --word  paramName: iValue  paramLen:  stringLen:  Added: iValue with type --word  Line (0) -> {  Line (1) -> uint8 ucCmdHeader[CFE\_SB\_CMD\_HDR\_SIZE];  Line (2) -> } BCAMP\_MN\_IntArgCmd\_t;  Enter the line of the parameter from the above print-out (-1 to stop): -1  You have chosen to stop adding parameters.  Unused Commands  -----------------------------------------  Command (0 of 2) BCAMP\_MN\_APP\_NOOP\_CC  Command (1 of 2) BCAMP\_MN\_APP\_RESET\_COUNTERS\_CC  Command (2 of 2) BCAMP\_MN\_APP\_PROCESS\_CC  Which command would you like to add parameters to (-1 to exit)? -1  You have chosen to exit early. Exiting now.  Thank you for using CHeaderParser.  The following commands have been added with parameters:  ['BCAMP\_MN\_APP\_SET\_COLD\_LIMIT\_CC', 'BCAMP\_MN\_APP\_SET\_HOT\_LIMIT\_CC']  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/cmdGui$ |
| 3 | Add code to return the temperature information in the telemetry. | debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$ git diff bcamp\_mn\_app\_msg.h  diff --git a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  index 4de6fac..f8feafe 100644  --- a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  +++ b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app\_msg.h  @@ -57,7 +57,10 @@ typedef struct  bcamp\_mn\_hk\_tlm\_align\_t align;  uint8 bcamp\_mn\_command\_error\_count;  uint8 bcamp\_mn\_command\_count;  + uint8 spare[2];  +  + int32 iTempValue;  + int16 sTempDirection;  + int16 sTempRange;  } bcamp\_mn\_hk\_tlm\_t;  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$ git diff bcamp\_mn\_app.c  diff --git a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.c b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.c  index f4f0749..44eb840 100644  --- a/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.c  +++ b/apps/bcamp\_mn\_app/fsw/src/bcamp\_mn\_app.c  @@ -355,6 +355,9 @@ void BCAMP\_MN\_ReportHousekeeping( const CCSDS\_CommandPacket\_t \*Msg )  \*/  Bcamp\_MN\_AppData.BCAMP\_MN\_HkTelemetryPkt.bcamp\_mn\_command\_error\_count = Bcamp\_MN\_AppData.ErrCounter;  Bcamp\_MN\_AppData.BCAMP\_MN\_HkTelemetryPkt.bcamp\_mn\_command\_count = Bcamp\_MN\_AppData.CmdCounter;  + Bcamp\_MN\_AppData.BCAMP\_MN\_HkTelemetryPkt.iTempValue = Bcamp\_MN\_AppData.iTempVal;  + Bcamp\_MN\_AppData.BCAMP\_MN\_HkTelemetryPkt.sTempDirection = Bcamp\_MN\_AppData.sDirection;  + Bcamp\_MN\_AppData.BCAMP\_MN\_HkTelemetryPkt.sTempRange = Bcamp\_MN\_AppData.sRange;  /\*  \*\* Send housekeeping telemetry packet...  debian@beaglebone:~/cFS/apps/bcamp\_mn\_app/fsw/src$ |
| 4 | Add the new telemetry fields to the Ground System. | debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/tlmGUI$ git diff cfs-bcamp-mn-hk-tlm.txt  diff --git a/Subsystems/tlmGUI/cfs-bcamp-mn-hk-tlm.txt b/Subsystems/tlmGUI/cfs-bcamp-mn-hk-tlm.txt  index 8797201..a1ee0c6 100644  --- a/Subsystems/tlmGUI/cfs-bcamp-mn-hk-tlm.txt  +++ b/Subsystems/tlmGUI/cfs-bcamp-mn-hk-tlm.txt  @@ -1,2 +1,5 @@  Error Counter, 12, 1, B, Dec, NULL, NULL, NULL, NULL  Command Counter, 13, 1, B, Dec, NULL, NULL, NULL, NULL  +Temp Value, 16, 4, i, Dec, NULL, NULL, NULL, NULL  +Temp Direction, 20, 2, h, Enm, NoChange, Increasing, Decreasing, NULL  +Temp Range, 22, 2, h, Enm, Nominal, Hot, Cold, NULL  debian@beaglebone:~/cFS/tools/cFS-GroundSystem/Subsystems/tlmGUI$ |

# Exercise the New Commands and Telemetry in the Ground System

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| --- | --- | --- |
| 1 | Start the cFS application.  Start the Ground System.  Enable telemetry.  Display the Bootcamp Monitor telemetry.  Set the temperature to 40 and process the change.  Set the temperature to 60 and process the change.  Set the temperature to 100 and process the change.  Set the delta to -10 and process the change.  Set the delta to 5 and process the change.  Set the delta to 0 and process the change.  Observe the Ground System pages and the output from cFS. | EVS Port1 42/1/TO\_LAB\_APP 3: TO telemetry output enabled for IP 127.0.0.1  EVS Port1 42/1/BCAMP\_IO\_APP 8: BCAMP\_IO - Recvd SET\_CURRENT\_TEMP cmd (3) - 40  EVS Port1 42/1/BCAMP\_IO\_APP 10: BCAMP\_IO: PROCESS command  EVS Port1 42/1/BCAMP\_MN\_APP 10: BCAMP\_MN - Recvd PROCESS\_TEMPERATURE\_DATA msg (0) - 41  EVS Port1 42/1/BCAMP\_IO\_APP 8: BCAMP\_IO - Recvd SET\_CURRENT\_TEMP cmd (3) - 60  EVS Port1 42/1/BCAMP\_IO\_APP 10: BCAMP\_IO: PROCESS command  EVS Port1 42/1/BCAMP\_MN\_APP 10: BCAMP\_MN - Recvd PROCESS\_TEMPERATURE\_DATA msg (0) - 61  EVS Port1 42/1/BCAMP\_IO\_APP 8: BCAMP\_IO - Recvd SET\_CURRENT\_TEMP cmd (3) - 100  EVS Port1 42/1/BCAMP\_IO\_APP 10: BCAMP\_IO: PROCESS command  EVS Port1 42/1/BCAMP\_MN\_APP 10: BCAMP\_MN - Recvd PROCESS\_TEMPERATURE\_DATA msg (0) - 101  EVS Port1 42/1/CFE\_SB 25: Pipe Overflow,MsgId 0x808,pipe TO\_LAB\_TLM\_PIPE,sender BCAMP\_MN\_APP  EVS Port1 42/1/BCAMP\_IO\_APP 9: BCAMP\_IO - Recvd SET\_DELTA\_VALUE cmd (4) - -10  EVS Port1 42/1/BCAMP\_IO\_APP 10: BCAMP\_IO: PROCESS command  EVS Port1 42/1/BCAMP\_MN\_APP 10: BCAMP\_MN - Recvd PROCESS\_TEMPERATURE\_DATA msg (0) - 91  EVS Port1 42/1/BCAMP\_IO\_APP 9: BCAMP\_IO - Recvd SET\_DELTA\_VALUE cmd (4) - 5  EVS Port1 42/1/BCAMP\_IO\_APP 10: BCAMP\_IO: PROCESS command  EVS Port1 42/1/BCAMP\_MN\_APP 10: BCAMP\_MN - Recvd PROCESS\_TEMPERATURE\_DATA msg (0) - 96  EVS Port1 42/1/BCAMP\_IO\_APP 9: BCAMP\_IO - Recvd SET\_DELTA\_VALUE cmd (4) - 0  EVS Port1 42/1/BCAMP\_IO\_APP 10: BCAMP\_IO: PROCESS command  EVS Port1 42/1/BCAMP\_MN\_APP 10: BCAMP\_MN - Recvd PROCESS\_TEMPERATURE\_DATA msg (0) - 96 |

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