Open STEM ware

cFS

cFS Basecamp
Hello Table Coding Lessons

Version 1.10

December 2023

Tutorial Introduction

- **These slides provide guidance for doing the Hello Table coding tutorial exercises**

- **The "Hello App Designs" section in Basecamp's *Application Developer's Guide* provides design information for all of Hello App coding tutorials**
  - Having all of the design information in one place makes the developer's guide flow better
  - It should be used in conjunction with this guide

- **The Hello Table app template adds an example table to the Hello Object application**
  - The coding exercises introduce developer's to the Basecamp's JSON table design strategy and operations

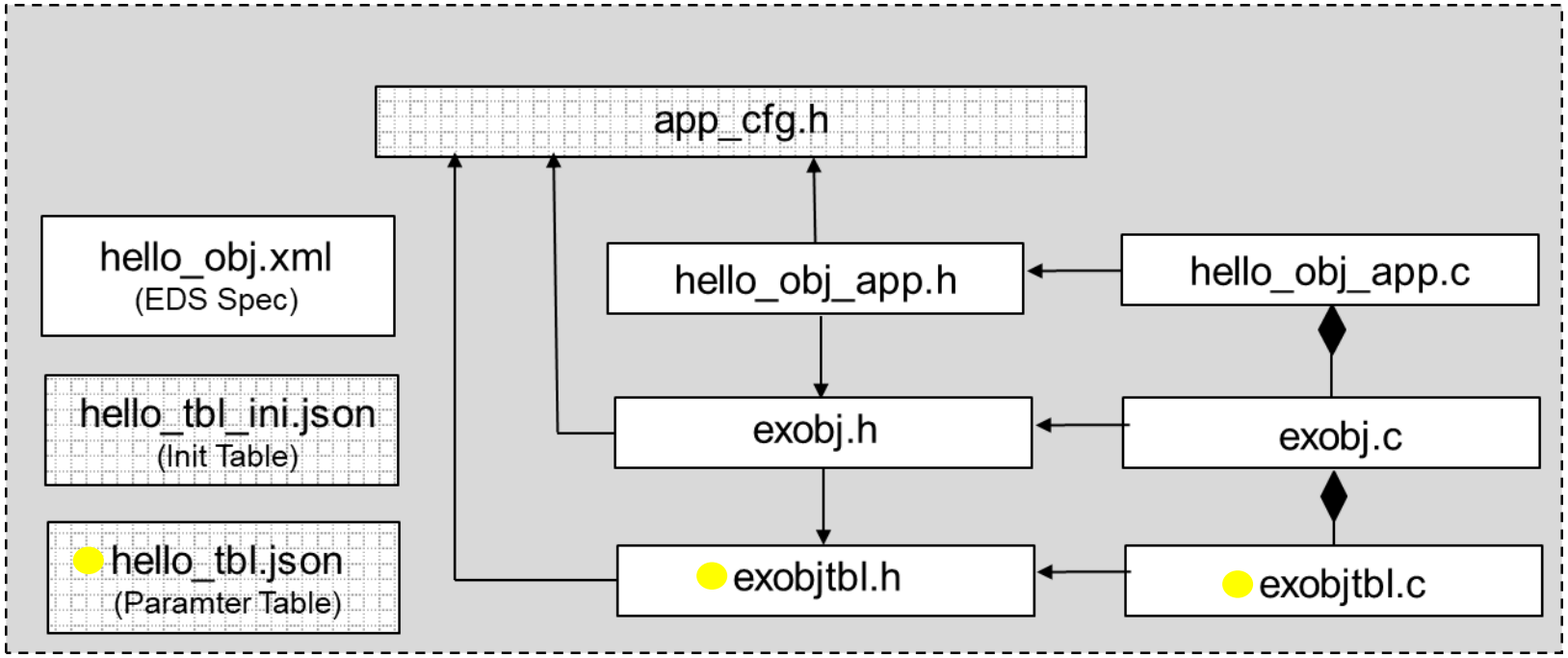
- **Prerequisites**
  - Completed Hello Object coding tutorial and met its prerequisites

Lesson 1 – Add a New Table Parameter (1 of 3)

Objectives

- Learn how a JSON table parameter is stored, parsed during a load command, and written to a dump file

- **The following files are modified in this lesson**
  - Note how object encapsulation limits the change to the table files



Lesson 1 – Add a New Table Parameter (2 of 3)

hello_tbl.json

- Add a new parameter “limit-range-max” to the end of the table

```
"decrement":
{
   "low-limit":  50,
   "high-limit": 99
},
"limit-range-max": 100
```

exobjtbl.h

- Table objects provide local storage that is used during a table load
- After a table is loaded and optionally validated, the data is copied into the storage of the object that owns the table

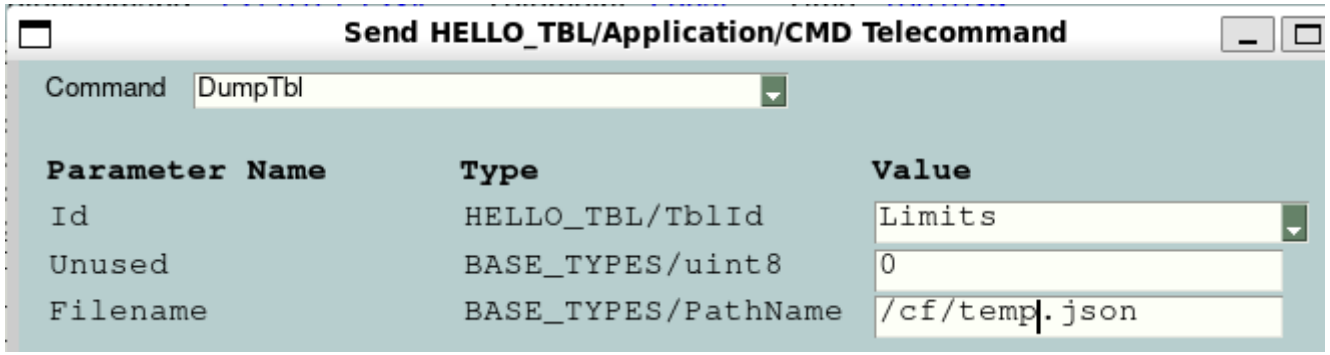
```
typedef struct
{
   EXOBJTBL_Limit_t IncrLimit;
   EXOBJTBL_Limit_t DecrLimit;
   uint16           LimitRangeMax;
} EXOBJTBL_Data_t;
```

exobjtbl.c

- Table file contain the following declaration *static CJSON_Obj_t JsonTblObjs[]* that is used during a table load to instruct the JSON parser how to parse the JSON object and where to store the result
- Table dumps require the developer to hand code print statements to write the JSON objects to a file

Verification

1. Issue a DumpTbl command to a filename other than the default table name



2. You should see an event message indicating the table was written to the commanded filename

```
EVS Port1 66/1/HELLO_TBL 26: Successfully dumped table 0 to file /cf/temp.json
```

3. Transfer the file to the ground and open it with a text editor
   - The values should be identical with the hello_tbl.json values

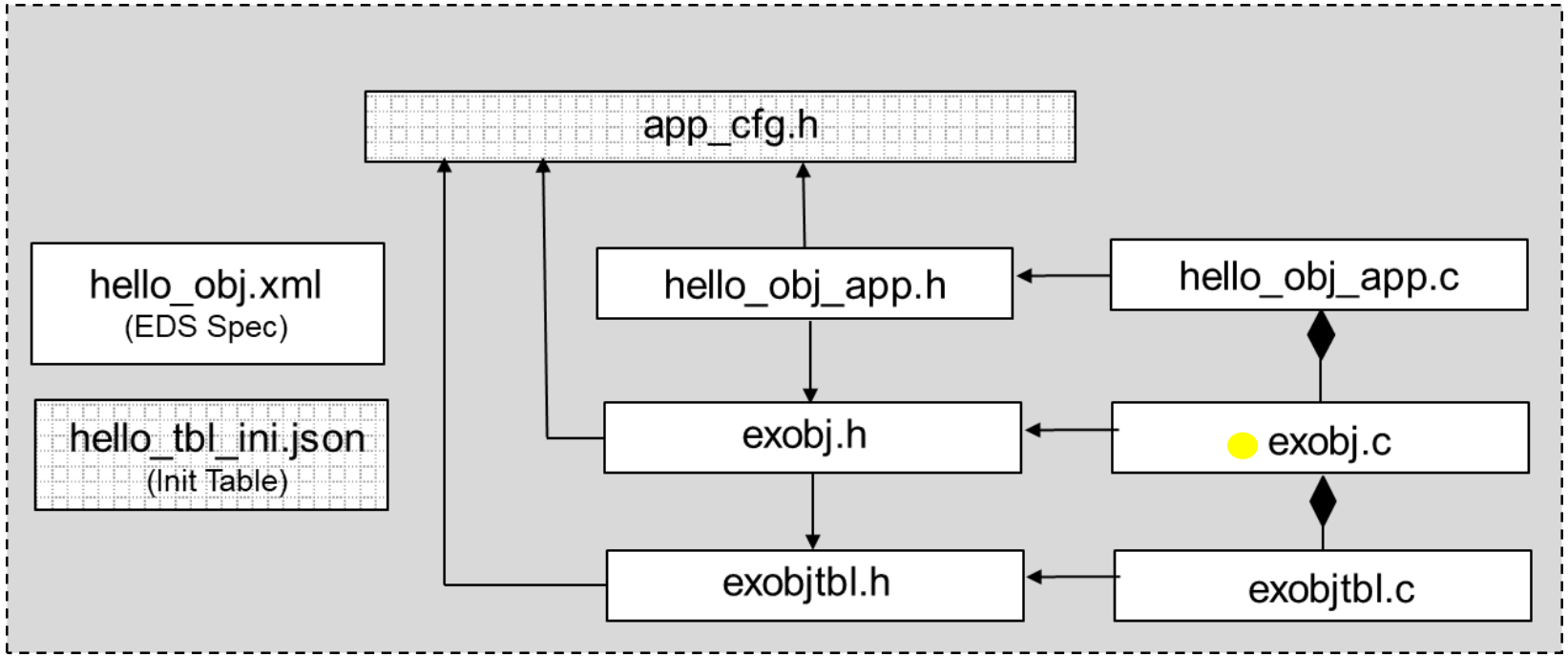
```
"decrement":
{
   "low-limit":  50,
   "high-limit": 99
},
"limit-range-max": 100
```

Lesson 2 – Add Table Load Acceptance Check (1 of 3)

Objectives

- Learn how to supply a table load validation function

- **The following files are modified in this lesson**
  - Note only exobj needs to change because it has the contextual knowledge of how the table parameters are used



Lesson 2 – Add Table Load Acceptance Check (2 of 3)

exobj.c

- A pointer to the table validation function is passed to the EXOBJTBL's constructor
  - EXOBJTBL_Constructor(&ExObj->Tbl, IniTbl, AcceptNewTable);
  - This function is called as part of the table load command

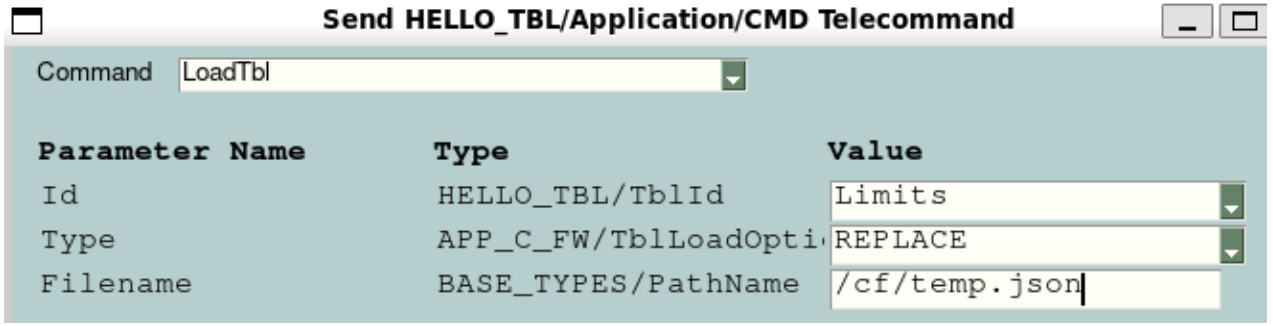
- The new validation logic ensures a the table range limits are within the maximum allowed

Verification

1. Edit the temp.json dump file created in lesson one with an invalid range such as this one

```
"decrement":
{
   "low-limit": 50,
   "high-limit": 199
},
"limit-range-max": 100
```

2. Issue a LoadTbl command



3. You should see an error event message stating the table load failed
   - Note the TBLMGR service incorrectly reports the last table load was valid. This bug is captured in issue #59

```
EVS Port1 66/1/HELLO_TBL 122: Table rejected. Maximum range 100 exceeded. Increment: Low 0, High 49, Decrement: Low 50, High 199
```