

Monitoring of LWA Subsystems using `ms_mb` Ver. 1

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June 1, 2010

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1 Introduction

Beginning in Release 0.5 (LWA Engineering Memo MCS0028), MCS/Scheduler includes a program called “`ms_mb`” which facilitates simple and flexible monitoring of the LWA subsystem MIBs. This memo serves as a tutorial in the use of `ms_mb`, and provides some examples. The intent is to enable and encourage the development of quick, custom engineering interfaces to facilitate subsystem development, commissioning, and certain remote monitoring tasks.

2 Quick Start: Simple Subsystem-Generic Demo

To begin, install Version 0.5 of the MCS/Scheduler and follow the “Quick Start” procedure described in that distribution’s `readme.txt`. This involves running the script “`test1.sh`”, which sets up a generic subsystem (NU1) and creates the corresponding MIB. The MIB file remains after the script terminates. Now enter the following command:

```
$ ./ms_mb NU1 ms_mb_NUx_template.cfg 1 0 ms_mb_NUx_annotate.cfg
```

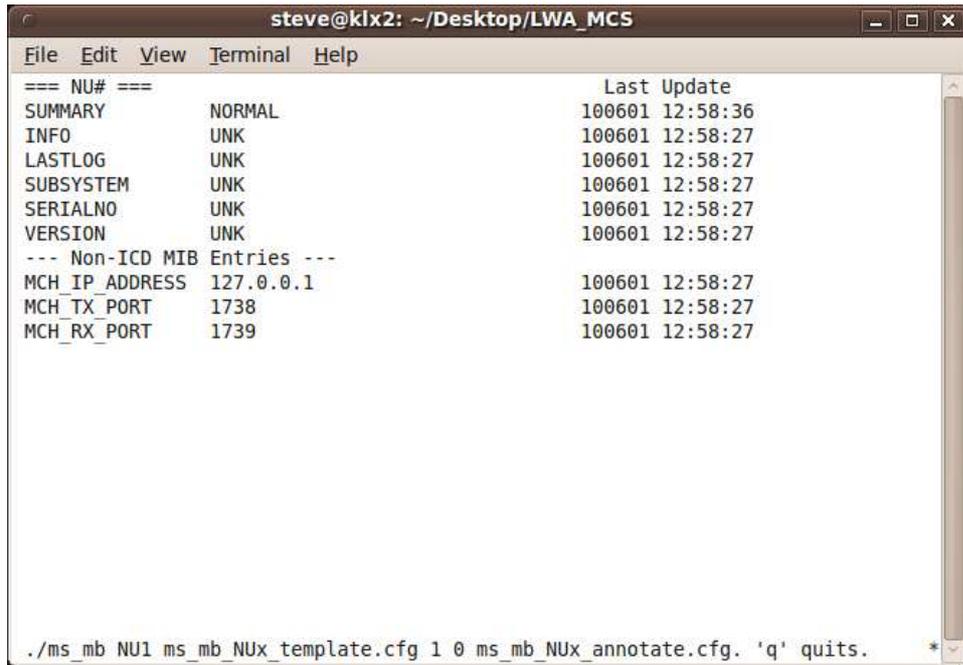
The result is as shown in Figure 1. Note that the display shows MIB labels, their associated values, and the date and time that the values were last updated in the MIB. The bottom line shows the command line that was used to invoke this display. Hit ‘q’ to exit the display.

The command line that invoked this display is explained as follows: The first parameter (“NU1”) identifies the subsystem of interest, using the usual three-letter identifier. The second parameter (“`ms_mb_NUx_template.cfg`”) is the name of a “template” file, which in this case contains the following text:

SUMMARY	1	1	1	17	1	49	1	56	
INFO	1	2	1	2	17	2	49	2	56
LASTLOG	1	3	1	3	17	3	49	3	56
SUBSYSTEM	1	4	1	4	17	4	49	4	56
SERIALNO	1	5	1	5	17	5	49	5	56
VERSION	1	6	1	6	17	6	49	6	56
MCH_IP_ADDRESS	0	8	1	8	17	8	49	8	56
MCH_TX_PORT	0	9	1	9	17	9	49	9	56
MCH_RX_PORT	0	10	1	10	17	10	49	10	56

The format of this file is as follows:

- Column 1 is a MIB label.
- Column 2 is either “0” or “1”. If the label is defined in the subsystem ICD, then this should be “1”, which tells `ms_mb` that it is OK to request this from the subsystem using its RPT command. Otherwise, it should be “0”. “MCH_IP_ADDRESS”, “MCH_TX_PORT”, and “MCH_RX_PORT” are non-ICD MIB entries added to every subsystem MIB by MCS/Scheduler, and so are always indicated with “0”.
- Columns 3 and 4 indicate the line and column at which the first character of the label should appear on the screen. The top left is line 0, column 0; line numbers increase downward and column numbers increase to the right.
- Columns 5 and 6 indicate the line and column at which the first character of the associated value should be appear.
- Columns 7 and 8 indicate the line and column at which the first character of the date of the last MIB update should appear.
- Columns 9 and 10 indicate the line and column at which the first character of the time of the last MIB update should appear.



```

steve@klx2: ~/Desktop/LWA_MCS
File Edit View Terminal Help
=== NU# ===                               Last Update
SUMMARY          NORMAL                    100601 12:58:36
INFO             UNK                      100601 12:58:27
LASTLOG          UNK                      100601 12:58:27
SUBSYSTEM        UNK                      100601 12:58:27
SERIALNO         UNK                      100601 12:58:27
VERSION          UNK                      100601 12:58:27
--- Non-ICD MIB Entries ---
MCH_IP_ADDRESS  127.0.0.1                 100601 12:58:27
MCH_TX_PORT     1738                     100601 12:58:27
MCH_RX_PORT     1739                     100601 12:58:27

./ms_mb NU1 ms_mb_NUx_template.cfg 1 0 ms_mb_NUx_annotate.cfg. 'q' quits.

```

Figure 1: ms_mb display after test1.sh.

The third parameter of the `ms_mb` command line (“1”) indicates the display update period. If this is “0”, the display appears, but never updates. Otherwise, this indicates how long `ms_mb` should wait before re-reading the MIB and refreshing the screen. The value is assumed to be integer seconds. Note that this parameter has nothing to do with MIB updates; rather, this parameter controls how often the MIB is read and the screen is updated.

The fourth parameter of the `ms_mb` command line (“0”) indicates the MIB update period. If this is “0”, then `ms_mb` never initiates MIB updates; however, other things may cause the MIB to update. Otherwise, this parameter indicates how long `ms_mb` should wait before requesting MCS/Scheduler to update the ICD-defined MIB values from the subsystem. This parameter is assumed to be integer seconds. A word of caution here: Every MIB entry that is updated requires MCS/Scheduler to send a separate “RPT” command. A screenful of entries (say, 50 or so) updating once per second with nothing else happening is no problem; however updating 100’s of entries per second simultaneously with other MCS/Scheduler operations may overwhelm MCS/Scheduler, the subsystem, or both.

The fifth parameter of the `ms_mb` command line (“`ms_mb_NUx_annotate.cfg`”) is the name of an “annotation” file, which in this case contains the following text:

```

0 1 === NU# ===
0 49 Last Update
7 1 --- Non-ICD MIB Entries ---

```

The format of this file is as follows:

- Columns 1 and 2 indicate the line and column at which the first character of the annotation should appear.
- The remainder of the line is used as the annotation.

An annotation file is optional. If not specified, no annotations will appear.

```

steve@klx2: ~/Desktop/LWA_MCS
File Edit View Terminal Help
=== NU# ===                               Last Update
SUMMARY      NORMAL                        100601 13:06:48
INFO         This is mock INFO from NU1           100601 13:06:48
LASTLOG      This is mock LASTLOG from NU1        100601 13:06:48
SUBSYSTEM    NU1                                  100601 13:06:48
SERIALNO     NU1-1                                100601 13:06:48
VERSION      mch_minimal_server.py_NU1            100601 13:06:48
--- Non-ICD MIB Entries ---
MCH_IP_ADDRESS 127.0.0.1                          100601 13:06:39
MCH_TX_PORT    1738                                  100601 13:06:39
MCH_RX_PORT    1739                                  100601 13:06:39

./ms_mb NU1 ms_mb_NUx_template.cfg 1 0 ms_mb_NUx_annotate.cfg. 'q' quits.

```

Figure 2: ms_mb display after test2.sh.

In this example, ms_mb was invoked with a request to update the screen once per second. To test this, leave the above example running, and open a new xterm. In the new xterm, try running the test script test2.sh, which updates all the MIB entries. The result should appear as shown in Figure 2.

3 Examples for SHL, ASP, and DP

MCS/Scheduler Ver. 0.5 includes template and annotation files to demonstrate ms_mb with SHL, ASP, and DP.

The SHL demonstration proceeds as follows: First, run the test script test5.sh, which creates the MIB and uses an emulator to get some values. Now enter the command:

```
$ ./ms_mb SHL ms_mb_SHL_template0.cfg 1 0 ms_mb_SHL_annotate0.cfg
```

The result is as shown in Figure 3. Refer to the associated template and annotation files to see how this display was specified.

Continuing with the SHL demo, switch to a different xterm and enter the command:

```
$ ./ms_mb SHL ms_mb_SHL_template1.cfg 1 0 ms_mb_SHL_annotate1.cfg
```

The result is as shown in Figure 4. (If the result looks weird, try pulling the right side of the xterm out so that the display is wider.) Here, different template and annotation files have been used to generate a second display for SHL showing the status of 50 power ports. In this example, the date fields appear to be excluded, but in fact are simply “buried” under the line 0 annotation. Now, just for fun, switch to a third xterm, and run test5.sh again. The two ms_mb displays should change as the MIB is first re-initialized by MCS/Scheduler, and then updated by test5.sh.

```

steve@klx2: ~/Desktop/LWA_MCS
File Edit View Terminal Help
=== SHL Status ===
SUMMARY          NORMAL          Last Update
INFO             This is INFO    100601 13:16:36
LASTLOG          This is LASTLOG 100601 13:16:36
PORTS-AVAILABLE-R1 50             100601 13:16:36
PORTS-AVAILABLE-R2 0              100601 13:16:36
PORTS-AVAILABLE-R3 0              100601 13:16:36
PORTS-AVAILABLE-R4 0              100601 13:16:36
PORTS-AVAILABLE-R5 0              100601 13:16:36
PORTS-AVAILABLE-R6 0              100601 13:16:36
CURRENT-R1       UNK           [A]          100601 13:16:22
CURRENT-R2       UNK           [A]          100601 13:16:22
CURRENT-R3       UNK           [A]          100601 13:16:22
CURRENT-R4       UNK           [A]          100601 13:16:22
CURRENT-R5       UNK           [A]          100601 13:16:22
CURRENT-R6       UNK           [A]          100601 13:16:22
SET-POINT        00091        [degF]      100601 13:16:36
DIFFERENTIAL     1.5          [degF]      100601 13:16:36
TEMPERATURE      UNK           [degF]      100601 13:16:22
MCH_IP_ADDRESS   127.0.0.1    100601 13:16:22
MCH_TX_PORT      1738         100601 13:16:22
MCH_RX_PORT      1739         100601 13:16:22
SUBSYSTEM        SHL          100601 13:16:36
./ms_mb SHL ms_mb_SHL_template0.cfg 1 0 ms_mb_SHL_annotate0.cfg. 'q' quits.

```

Figure 3: SHL Demonstration: ms_mb display after test5.sh.

```

steve@klx2: ~/Desktop/LWA_MCS
File Edit View Terminal Help
=== SHL Rack 1 Power Status ===
PWR-R1-1 OFF 13:16:22 PWR-R1-21 OFF 13:16:22 PWR-R1-41 OFF 13:16:22
PWR-R1-2 OFF 13:16:22 PWR-R1-22 OFF 13:16:22 PWR-R1-42 OFF 13:16:22
PWR-R1-3 OFF 13:16:22 PWR-R1-23 OFF 13:16:22 PWR-R1-43 OFF 13:16:22
PWR-R1-4 ON 13:16:36 PWR-R1-24 OFF 13:16:22 PWR-R1-44 OFF 13:16:22
PWR-R1-5 OFF 13:16:22 PWR-R1-25 OFF 13:16:22 PWR-R1-45 OFF 13:16:22
PWR-R1-6 OFF 13:16:22 PWR-R1-26 OFF 13:16:22 PWR-R1-46 OFF 13:16:22
PWR-R1-7 OFF 13:16:22 PWR-R1-27 OFF 13:16:22 PWR-R1-47 OFF 13:16:22
PWR-R1-8 OFF 13:16:22 PWR-R1-28 OFF 13:16:22 PWR-R1-48 OFF 13:16:22
PWR-R1-9 OFF 13:16:22 PWR-R1-29 OFF 13:16:22 PWR-R1-49 OFF 13:16:22
PWR-R1-10 OFF 13:16:22 PWR-R1-30 OFF 13:16:22 PWR-R1-50 OFF 13:16:22

PWR-R1-11 OFF 13:16:22 PWR-R1-31 OFF 13:16:22 Notes:
PWR-R1-12 OFF 13:16:22 PWR-R1-32 OFF 13:16:22 Rack 1 is ASP
PWR-R1-13 OFF 13:16:22 PWR-R1-33 OFF 13:16:22 Rack 2 is DP
PWR-R1-14 OFF 13:16:22 PWR-R1-34 OFF 13:16:22
PWR-R1-15 OFF 13:16:22 PWR-R1-35 OFF 13:16:22 If the display looks weird, try
PWR-R1-16 OFF 13:16:22 PWR-R1-36 OFF 13:16:22 dragging the window side(s) to
PWR-R1-17 OFF 13:16:22 PWR-R1-37 OFF 13:16:22 make it larger.
PWR-R1-18 OFF 13:16:22 PWR-R1-38 OFF 13:16:22
PWR-R1-19 OFF 13:16:22 PWR-R1-39 OFF 13:16:22
PWR-R1-20 OFF 13:16:22 PWR-R1-40 OFF 13:16:22
./ms_mb SHL ms_mb_SHL_template1.cfg 1 0 ms_mb_SHL_annotate1.cfg. 'q' quits.

```

Figure 4: SHL Demonstration (continued): ms_mb display after test5.sh, using different template and annotation files.

```

steve@kix2: ~/Desktop/LWA_MCS
File Edit View Terminal Help
=== ASP Status (DEMO) ===
SUMMARY          NORMAL          100601 13:22:47
INFO             This is mock INFO from ASP 100601 13:22:47
LASTLOG          This is mock LASTLOG from ASP 100601 13:22:47
ARXSUPPLY        UNK             100601 13:22:37
ARXCURR          0000000 [mA]   100601 13:22:37
FEESUPPLY        UNK             100601 13:22:37
FEECURR          0000000 [mA]   100601 13:22:37
TEMP-STATUS      UNK             100601 13:22:37

FILTER_1         3 (0=Spl,1=Full,2=Red,3=Off) 100601 13:22:37
AT1_1           00 [2dB]       100601 13:22:37
AT2_1           00 [2dB]       100601 13:22:37
ATSPLIT_1       00 [2dB]       100601 13:22:37

FEEPOL1PWR_1    UNK             100601 13:22:37
FEEPOL2PWR_2    UNK             100601 13:22:37

MCH_IP_ADDRESS  127.0.0.1      100601 13:22:37
MCH_TX_PORT     1738           100601 13:22:37
MCH_RX_PORT     1739           100601 13:22:37
SUBSYSTEM       ASP (...says subsystem) 100601 13:22:47

./ms_mb ASP ms_mb_ASP_template0.cfg 1 0 ms_mb_ASP_annotate0.cfg. 'q' quits. *

```

Figure 5: ASP Demonstration: ms_mb display after test6.sh.

The ASP demonstration proceeds as follows: First, run the test script `test6.sh`, which creates an ASP MIB and uses an emulator to get some values. Now enter the command:

```
$ ./ms_mb ASP ms_mb_ASP_template0.cfg 1 0 ms_mb_ASP_annotate0.cfg
```

The result is as shown in Figure 5. (Refer to the associated template and annotation files to see how this display was specified.)

The DP demonstration proceeds as follows: First, run the test script `test7.sh`, which creates a DP MIB and uses an emulator to get some values. Now enter the command:

```
$ ./ms_mb DP_ ms_mb_DP_template0.cfg 1 0 ms_mb_DP_annotate0.cfg
```

The result is as shown in Figure 6. (Since the available emulator does not respond to DP-specific MIB entries or commands, the result is not very exciting in this case...) Refer to the associated template and annotation files to see how this display was specified.

Continuing with the DP demo, switch to a different xterm and enter the command:

```
$ ./ms_mb DP_ ms_mb_DP_template1.cfg 1 0 ms_mb_DP_annotate1.cfg
```

The result is as shown in Figure 7. Here, different template and annotation files have been used to generate a second display for DP showing the detailed status of TBN and TBW. As in the SHL example, it is OK to run both displays concurrently (that is, in separate xterms).

```

steve@klx2: ~/Desktop/LWA_MCS
File Edit View Terminal Help
=== DP Status (DEMO) ===                               = Last Update =
SUMMARY          NORMAL                               100601 13:25:14
INFO             This is mock INFO from DP_          100601 13:25:14
LASTLOG          This is mock LASTLOG from DP_       100601 13:25:14
CLK_VAL          0          [MPM]                    100601 13:25:05
NUM_STANDS       0                               100601 13:25:05
NUM_BOARDS       0                               100601 13:25:05
NUM_DRX_TUNINGS  0                               100601 13:25:05
NUM_BEAMS        0                               100601 13:25:05
BEAM_FIR_COEFFS  0                               100601 13:25:05

ANT1_RMS         0.000000                          100601 13:25:05
ANT1_DCOFFSET    0.000000                          100601 13:25:05
ANT1_SAT         0                               100601 13:25:05
ANT1_RMS         0.000000                          100601 13:25:05
ANT1_DCOFFSET    0.000000                          100601 13:25:05
ANT1_SAT         0                               100601 13:25:05
STAT_SAMP_SIZE   0                               100601 13:25:05

MCH_IP_ADDRESS   127.0.0.1                            100601 13:25:05
MCH_TX_PORT      1738                            100601 13:25:05
MCH_RX_PORT      1739                            100601 13:25:05
SUBSYSTEM        DP          (...says subsystem)     100601 13:25:14
./ms_mb_DP_ms_mb_DP_template0.cfg 1 0 ms_mb_DP_annotate0.cfg. 'q' quits.

```

Figure 6: DP Demonstration: ms_mb display after test7.sh.

```

steve@klx2: ~/Desktop/LWA_MCS
File Edit View Terminal Help
=== DP TBW/TBN Monitor (DEMO) ===                       = Last Update =
--- TBW Status ---
TBW_STATUS       0 (see [1])                          100601 13:25:05
TBW_BITS         0 (0 = 12, 1 = 4)                    100601 13:25:05
TBW_TRIG_TIME    0          [sample period]             100601 13:25:05
TBW_SAMPLES      0                               100601 13:25:05
TBW_REFERENCE    0                               100601 13:25:05
TBW_CMD_SENT_MPM 0                               100601 13:25:05

--- TBN Status ---
TBN_FREQ         0.000          [Hz]                  100601 13:25:05
TBN_BW           0 (see [2])                          100601 13:25:05
TBN_GAIN         0 (0-15)                             100601 13:25:05
TBN_SUB_SLOT     0                               100601 13:25:05
TBN_REFERENCE    0                               100601 13:25:05
TBN_CMD_SENT_MPM 0                               100601 13:25:05
NUM_TBN_BITS     0                               100601 13:25:05

[1] 0=idle, 2=queued, 4=recording, 8=reading out (add vals)
[2] 1=1, 2=3.125, 3=6.25, 4=12.5, 5=25, 6=50, 7=100 [kS/s]
NOTE: All but TBW_STATUS and NUM_TBN_BITS are non-ICD
./ms_mb_DP_ms_mb_DP_template1.cfg 1 0 ms_mb_DP_annotat1.cfg. 'q' quits.

```

Figure 7: DP Demonstration (continued): ms_mb display after test7.sh, showing detailed status of TBN and TBW.

4 Document History

- Version 1 (June 1, 2010): First version.