MakeSecs

11 January 2006

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1 MAKESECS.L

Serial data captured with the SerialTest Async program has to be "processed" before it is in a format that allows easy understanding of what is there. The flex program MakeSecs is used to do the first step of getting rid of some unused data and converting the time into a total seconds field[3].

1.1 Raw Data Capture File

The SerialTest Async program converts its captured data into an ASCII file. The order and some of the format of the output file is selected via parameters in the "`Export Events`" menu choice. For normal collection of data the following fields were chosen as shown below:

```
DTE 9/27/2005 8:34:55.468656 AM 57
```

1. `DTE␣`: This is the source of the data. It is either `DTE` (Data Terminal Equipment) or `DCE` (Data Communication Equipment). Both of these are old terms and have little to do with collecting data when the data has to be converted from RS-422 levels to RS-232 as the two values may be easily interchanged. It is important to remember that once an assignment is made to not change it for the duration of testing.

[1] `$Header: d:/GeneralInformation/fts/RCS/MakeSecs.tex,v 1.1 2006-01-11 09:27:36-08 Hamilton Exp Hamilton $`

[2] `$Header: d:/GeneralInformation/fts/RCS/MakeSecs.inc,v 1.3 2005-09-29 11:27:20-07 Hamilton Exp Hamilton $`

[3] All the samples/examples used in this document came from testing the TXB-NTCIP when it was installed in a Spectra III SE running rev 1.27 of the software.

2. `9/27/2005␣`: This is the date that the capture was performed on. The date and time are selected as one item, thus it is necessary to get the date if the time field is wanted. This format is variable and has been observed to have the following formats with `M` = Month, `D` = Day and `Y` = Year:

   2.1. `M/D/YYYY`

   2.2. `M/DD/YYYY`

   2.3. `MM/D/YYYY`

   2.4. `MM/DD/YYYY`

3. `8:34:55.468656␣`: This is the time of data capture. It has the following formats with `H` = Hours, `M` = Minutes, `S` = full Seconds and `s` = parts of a second:

   3.1. `H:MM:SS.ssssss`

   3.2. `HH:MM:SS.ssssss`

4. `AM␣`: This indicates which half of the day the data was captured during. It has the following formats:

   4.1. `A`

   4.2. `AM`

   4.3. `P`

   4.4. `PM`

   `57`: This is the hexadecimal value that was captured. Hex bytes are represented by lower case letters.

1.1.1 Sample Raw Data File

```
 1  FTS capture file: E:\Capture\newtest2.cfa (9/27/2005 8:40:01 AM)
 2  Event 1 (9/27/2005 8:33:26.076887 AM) through
 3  Event 1,103 (9/27/2005 8:39:31.531404 AM)
 4
 5  Sd  Timestamp                   Hx
 6  DTE 9/27/2005 8:33:26.076887 AM
 7  DTE 9/27/2005 8:33:26.076901 AM 00
 8  DCE 9/27/2005 8:34:55.452286 AM ff
 9  DCE 9/27/2005 8:34:55.453361 AM 01
10  DCE 9/27/2005 8:34:55.454402 AM 00
11  DCE 9/27/2005 8:34:55.455445 AM 45
12  DCE 9/27/2005 8:34:55.456458 AM 00
13  DCE 9/27/2005 8:34:55.457462 AM 00
14  DCE 9/27/2005 8:34:55.458562 AM 46
15  DTE 9/27/2005 8:34:55.460336 AM ff
16  DTE 9/27/2005 8:34:55.461383 AM 01
17  DTE 9/27/2005 8:34:55.462426 AM 44
18  DTE 9/27/2005 8:34:55.463466 AM 44
19  DTE 9/27/2005 8:34:55.464481 AM 35
20  DTE 9/27/2005 8:34:55.465484 AM 33
21  DTE 9/27/2005 8:34:55.466579 AM 43
22  DTE 9/27/2005 8:34:55.467620 AM 42
23  DTE 9/27/2005 8:34:55.468656 AM 57
24  DTE 9/27/2005 8:34:55.469698 AM 00
25  DTE 9/27/2005 8:34:55.470738 AM 00
26  DTE 9/27/2005 8:34:55.471781 AM 00
27  DTE 9/27/2005 8:34:55.472815 AM 00
28  DTE 9/27/2005 8:34:55.473856 AM 00
29  DTE 9/27/2005 8:34:55.474899 AM 00
30  DTE 9/27/2005 8:34:55.475940 AM 00
31  DTE 9/27/2005 8:34:55.476975 AM 00
32  DTE 9/27/2005 8:34:55.478018 AM 13
33  DCE 9/27/2005 8:34:55.545387 AM ff
34  DCE 9/27/2005 8:34:55.546455 AM 01
35  DCE 9/27/2005 8:34:55.547495 AM 00
36  DCE 9/27/2005 8:34:55.548537 AM 6b
37  DCE 9/27/2005 8:34:55.549579 AM 00
38  DCE 9/27/2005 8:34:55.550620 AM 00
39  DCE 9/27/2005 8:34:55.551669 AM 6c
40  DTE 9/27/2005 8:34:55.553205 AM ff
41  DTE 9/27/2005 8:34:55.554247 AM 01
42  DTE 9/27/2005 8:34:55.555290 AM 00
43  DTE 9/27/2005 8:34:55.556331 AM 6d
44  DTE 9/27/2005 8:34:55.557365 AM 01
45  DTE 9/27/2005 8:34:55.558407 AM 17
46  DTE 9/27/2005 8:34:55.559450 AM 86
47  DCE 9/27/2005 8:34:56.513995 AM ff
48  DCE 9/27/2005 8:34:56.515053 AM 01
49  DCE 9/27/2005 8:34:56.516113 AM 00
50  DCE 9/27/2005 8:34:56.517175 AM 00
51  DCE 9/27/2005 8:34:56.518236 AM 00
52  DCE 9/27/2005 8:34:56.519303 AM 00
53  DCE 9/27/2005 8:34:56.520345 AM 01
54  DTE 9/27/2005 8:34:56.522072 AM ff
55  DTE 9/27/2005 8:34:56.523107 AM 01
56  DTE 9/27/2005 8:34:56.524074 AM 00
57  DTE 9/27/2005 8:34:56.525190 AM 01
```

1.2 Output from MakeSecs

MakeSecs processes the raw capture file and does the following to it.

1. It inserts a control field for RCS/VisualSourceSafe to use. This is the first line of the output.
2. Then the next three lines are saved. This is the original header that SerialTest Async placed in the file as a very brief overview of what the file is about.
3. The SerialTest Async column header is deleted.
4. Then the captured data is reformatted as follows:

```
␣␣␣␣2,␣␣␣␣␣11:␣␣DTE␣␣␣␣89.391769␣␣␣␣0.001036␣57
```

   4.1. `␣␣␣␣2,`: Indicates that this is the second message group from its source. Source will be either `DTE` or `DCE`.

   4.2. `␣␣␣␣␣11:`: Indicates that this is the 11^{th} overall byte from its source. This field is copied directly from the capture file.

   4.3. `␣␣DTE␣`: Indicates that this message/byte comes from the `DTE` data source. All `␣␣DTE␣` flags are offset by one byte to make them slightly different from the `␣DCE␣␣` flags

   4.4. `␣␣␣89.391769`: Total seconds of the day relative to the start of this data capture. This is converted from hours, minutes, seconds and AM/PM information. However end of day rollover, end of month rollover and end of year rollover are not properly processed. I.e. don't expect good results if the capture is through midnight local time.

   4.5. `␣␣␣␣0.001036`: Time from the preceding byte from this source. In this case `0.001036` is about the "right" time for bytes coming in at a 9,600 baud rate. There is a time quantization, or granularity, problem with the clock and getting the "exact" right time. Inter byte times for various baud rates (all of these end up with repeating 3's or 6's):

      4.5.1. 1200 = .0083333 sec
      4.5.2. 2400 = .0041666 sec
      4.5.3. 4800 = .0020833 sec
      4.5.4. 9600 = .0010416 sec
      4.5.5. 19200 = .00042083 sec

   4.6. `␣57`: The data byte in hexadecimal. This field is copied directly from the capture file.

5. After processing all of the input data some overall statistics are output. These self explanatory statistics message are:

   5.1. `There were a total of 52 bytes transferred`

   5.2. `There were a total of 21 DCE bytes transferred`

5.3. `The first DCE byte came in at 89.375399 seconds from the start of data collection`

5.4. `The last DCE byte was at 90.443458 seconds from the start of data collection`

5.5. `There were a total of 31 DTE bytes transferred`

5.6. `The first DTE byte came in at 0.000000 seconds from the start of data collection`

5.7. `The last DTE byte was at 90.448303 seconds from the start of data collection`

6. From time to time various changes in the exact format will be made at the whim of the person using the program.

1.2.1 Raw output of the MakeSecs program

```
 1  $Header: d:/GeneralInformation/fts/RCS/Start1.dat,v 1.1 2006-01-11 09:28:42-08 Hamilton Exp Hamilton $
 2  FTS capture file: E:\Capture\newtest2.cfa (9/27/2005 8:40:01 AM)
 3  Event 1 (9/27/2005 8:33:26.076887 AM) through
 4  Event 1,103 (9/27/2005 8:39:31.531404 AM)
 5
 6
 7      1,      1:  DTE     0.000000    0.000000
 8      1,      2:  DTE     0.000014    0.000014 00
 9
10      2,      1: DCE     89.375399   89.375385 ff
11      2,      2: DCE     89.376474    0.001075 01
12      2,      3: DCE     89.377515    0.001041 00
13      2,      4: DCE     89.378558    0.001043 45
14      2,      5: DCE     89.379571    0.001013 00
15      2,      6: DCE     89.380575    0.001004 00
16      2,      7: DCE     89.381675    0.001100 46
17
18      2,      3:  DTE    89.383449    0.001100 ff
19      2,      4:  DTE    89.384496    0.001047 01
20      2,      5:  DTE    89.385539    0.001043 44
21      2,      6:  DTE    89.386579    0.001040 44
22      2,      7:  DTE    89.387594    0.001015 35
23      2,      8:  DTE    89.388597    0.001003 33
24      2,      9:  DTE    89.389692    0.001095 43
25      2,     10:  DTE    89.390733    0.001041 42
26      2,     11:  DTE    89.391769    0.001036 57
27      2,     12:  DTE    89.392811    0.001042 00
28      2,     13:  DTE    89.393851    0.001040 00
29      2,     14:  DTE    89.394894    0.001043 00
30      2,     15:  DTE    89.395928    0.001034 00
31      2,     16:  DTE    89.396969    0.001041 00
32      2,     17:  DTE    89.398012    0.001043 00
33      2,     18:  DTE    89.399053    0.001041 00
34      2,     19:  DTE    89.400088    0.001035 00
35      2,     20:  DTE    89.401131    0.001043 13
36
37      3,      8: DCE     89.468500    0.067369 ff
38      3,      9: DCE     89.469568    0.001068 01
```

```
39      3,     10: DCE     89.470608    0.001040 00
40      3,     11: DCE     89.471650    0.001042 6b
41      3,     12: DCE     89.472692    0.001042 00
42      3,     13: DCE     89.473733    0.001041 00
43      3,     14: DCE     89.474782    0.001049 6c
44
45      3,     21:  DTE    89.476318    0.001049 ff
46      3,     22:  DTE    89.477360    0.001042 01
47      3,     23:  DTE    89.478403    0.001043 00
48      3,     24:  DTE    89.479444    0.001041 6d
49      3,     25:  DTE    89.480478    0.001034 01
50      3,     26:  DTE    89.481520    0.001042 17
51      3,     27:  DTE    89.482563    0.001043 86
52
53      4,     15: DCE     90.437108    0.954545 ff
54      4,     16: DCE     90.438166    0.001058 01
55      4,     17: DCE     90.439226    0.001060 00
56      4,     18: DCE     90.440288    0.001062 00
57      4,     19: DCE     90.441349    0.001061 00
58      4,     20: DCE     90.442416    0.001067 00
59      4,     21: DCE     90.443458    0.001042 01
60
61      4,     28:  DTE    90.445185    0.001042 ff
62      4,     29:  DTE    90.446220    0.001035 01
63      4,     30:  DTE    90.447187    0.000967 00
64      4,     31:  DTE    90.448303    0.001116 01
65
66  There were a total of      52 bytes transferred
67
68  There were a total of      21 DCE bytes transferred
69  The first DCE byte came in at 89.375399 seconds from the start of data collection
70  The last DCE byte was at 90.443458 seconds from the start of data collection
71
72  There were a total of      31 DTE bytes transferred
73  The first DTE byte came in at 0.000000 seconds from the start of data collection
74  The last DTE byte was at 90.448303 seconds from the start of data collection
75
```

1.3 Final Processing of the MakeSecs Processed Capture File

The output of MakeSecs is then taken, and using an editor, has each message formatted to fit on one line and then that line usually has a textual description of what it is appended.

```
 1  $Header: d:/GeneralInformation/fts/RCS/Start2.dat,v 1.1 2006-01-11 09:28:44-08 Hamilton Exp Hamilton $
 2  FTS capture file: E:\Capture\newtest2.cfa (9/27/2005 8:40:01 AM)
 3  Event 1 (9/27/2005 8:33:26.076887 AM) through
 4  Event 1,103 (9/27/2005 8:39:31.531404 AM)
 5
 6
 7      1,      1:  DTE     0.000000    0.000000                    Noise
 8      1,      2:  DTE     0.000014    0.000014 00                 Noise
 9      2,      1: DCE     89.375399   89.375385 ff 01 00 45 00 00 46 Query
10      2,      3:  DTE    89.383449    0.001100 ff 01 44 44 35 33 43 42 57 00 00 00 00 00 00 00 00 13 Query
Reply
11      3,      8: DCE     89.468500    0.067369 ff 01 00 6b 00 00 6c Query Device Type
12      3,     21:  DTE    89.476318    0.001049 ff 01 00 6d 01 17 86 Device Type Response
13      4,     15: DCE     90.437108    0.954545 ff 01 00 00 00 00 01 Stop
14      4,     28:  DTE    90.445185    0.001042 ff 01 00 01          Response
15
16  There were a total of      52 bytes transferred
17
18  There were a total of      21 DCE bytes transferred
19  The first DCE byte came in at 89.375399 seconds from the start of data collection
20  The last DCE byte was at 90.443458 seconds from the start of data collection
21
22  There were a total of      31 DTE bytes transferred
23  The first DTE byte came in at 0.000000 seconds from the start of data collection
24  The last DTE byte was at 90.448303 seconds from the start of data collection
25
```

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