

```
1 /*+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
2
3 Copyright (c) 2001 BeComm Corporation
4
5 Filename:
6
7     clocksync.c
8
9 Group Name:
10
11     todo
12
13 Group Overview:
14
15     Used in conjunction with timesync.
16
17     Used to propogate a master/render clock pair over
18     a network link.
19
20     Passes the following elements:
21     - epoch from the master clock.
22     - frequency/divisor from the render clock. (NO LONGER REQUIRED, REMOVED)
23
24     This is enough to manage timed delivery of video.
25
26     NOTE: Transports only in forward direction (currently) - updates to the
27     render clock are not propogated backwards.
28
29 Owner:
30
31     Guy Carpenter (guyc) 16-Aug-2001
32
33 -----
34 #define SOS_DEBUG_ZONE "/beads/clocksync"
35 #include <sosstrings.h>
36 #include <sosmultimedia.h>
37 #include "timesync.h"
38
39 SOS_SOURCE_VERSION("$Id: clocksync.c,v 1.12 2001/11/09 02:46:36 guyc Exp $");
40
41 /*+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
42 Named Constants
43 -----
44
45 /
```

```
46  * Name of bead
47  */
48  static
49  const char BEAD_NAME[] = "clocksync";
50  const char LOOPBACK_CONTENTTYPE[] = "clocksync/loopback";
51
52  #define TIMER_INTERVAL      4000
53  #define TIMER_INITIAL_DELAY 200
54
55  /*+++++
56  Masks
57  -----
58
59  /*
60  * Order here is important: we use the bit
61  * positions to efficiently compute the length.
62  */
63  #define FLAG_MASTERSHIFT    16
64  #define FLAG_RENDERSHIFT   18
65  #define MASK_SIZE          3
66  #define MASK_LENGTH        0xFFFF
67  #define FLAG_MASTEREPOCH   1<<(FLAG_MASTERSHIFT)
68  #define FLAG_MASTERFREQ    1<<(FLAG_MASTERSHIFT+1)
69  #define FLAG_RENDEREPOCH   1<<(FLAG_RENDERSHIFT)
70  #define FLAG_RENDERFREQ    1<<(FLAG_RENDERSHIFT+1)
71  #define FLAG_LOOPBACKREQ   1<<20
72  #define FLAG_DONTFORWARD   1<<21
73  #define FLAG_UNCONDITIONAL_MASK (FLAG_LOOPBACKREQ | FLAG_DONTFORWARD)
74  #define CONSTANT_LENGTH    2 /* hostid and length+flags in 2x32 bits */
75  #define MAX_VARIABLE_LENGTH 6 /* up to 6 other 32-bit values */
76
77  /*+++++
78  Structs
79  -----
80
81  typedef struct STREAM_CONTEXT {
82      SOS_UINT32      HostId;
83      SOS_CLOCK_TICK  StartTime;
84      SOS_ISAMPLECLOCK * IMasterClock;
85      SOS_ISAMPLECLOCK * IRenderClock;
86      SOS_TIMER_ID    TimerId;
87      SOS_BOOLEAN     RenderUpdate;
88      SOS_PATH *      ReturnPath;
89  } STREAM_CONTEXT;
```

```
91 /*+++++
92 Context create and destory
93 -----
94
95 /*++
96 Routine Name:
97
98     ClockSync_ContextCreate
99
100 Routine Description:
101
102     Attempt to allocate a ClockSync session and all the resources it requires
103
104 Parameters:
105
106     None.
107
108 Return Value:
109
110     UPDATE_CONTEXT * -
111         A valid pointer to a session context on success.
112
113         A NULL pointer if an error ocured.
114
115 --*/
116 static
117 STREAM_CONTEXT *
118 ClockSync_ContextCreate(
119     void
120 )
121 {
122     STREAM_CONTEXT *context;
123
124     SOS_DEBUGOUT_FUNC_TRACE("ClockSync_ContextCreate called\n");
125
126     context = SOS_Mem_Alloc(sizeof(*context));
127     if (context) {
128         SOS_memset(context, 0, sizeof(*context));
129         TimeSync_HostIdGet(&context->HostId);
130         context->StartTime = SOS_Clock_TickGet();
131         //     context->RenderUpdate = SOS_True; // REVISIT - set via configurati
132
133     }
134
135     return context;
```

```
136 }
137
138 void
139 ClockSync_ContextDestroy(
140     STREAM_CONTEXT * Context
141 )
142 {
143     if (Context) {
144         SOS_Interface_Release(Context->IMasterClock);
145         SOS_Interface_Release(Context->IRenderClock);
146
147         SOS_Mem_Free(Context);
148     }
149 }
150
151 /*+++++
152 Edge Handlers
153 -----
154
155 /*++
156 Routine Name:
157
158     ClockSync_KeyCreate
159
160 Routine Description:
161
162     Creates a new key for each session.
163
164 Parameters:
165
166     SOS_PATH *Path - [in]
167         The new Path to create a Key for
168
169     SOS_MESSAGE *Message - [in]
170
171 Return Value:
172
173     SOS_STATUS -
174         SOS_PathBuild_Stop on success.
175
176         SOS_Error if something goes wrong.
177 --*/
178 static
179 SOS_STATUS
180 ClockSync_KeyCreate(
```

```
181     SOS_PATH      *Path,  
182     SOS_MESSAGE  *Message  
183 )  
184 {  
185     static SOS_UINT32 s_UniqueId = 0;  
186     SOS_REGOBJECT*  uniqueSessionKey;  
187  
188     uniqueSessionKey = SOS_UInt32_Create(s_UniqueId++);  
189     SOS_Path_SessionKeySet(Path, uniqueSessionKey);  
190     SOS_RegObject_Release(uniqueSessionKey);  
191  
192     return SOS_PathBuild_Stop;  
193 }  
194  
195 static  
196 SOS_ISAMPLECLOCK *  
197 FindClock(  
198     SOS_PATH * Path,  
199     const char * Name  
200 )  
201 {  
202     SOS_REGOBJECT *clock;  
203     SOS_ISAMPLECLOCK *iSampleClock = NULL;  
204  
205     if (SOS_SUCCEEDED(  
206         SOS_Path_AttributeGet(  
207             Path,  
208             Name,  
209             &clock))) {  
210         SOS_RegObject_InterfaceGet(  
211             clock,  
212             SOS_ISAMPLECLOCK_ID,  
213             (void**)&iSampleClock  
214             );  
215         SOS_RegObject_Release(clock);  
216     }  
217     return iSampleClock;  
218 }  
219  
220  
221 static  
222 SOS_UINT32  
223 ClockSync_LengthCompute(  
224     SOS_UINT32      Flags  
225 )
```

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