Subject: TimerCallBack interval resolution
Posted by deep on Wed, 19 Jan 2022 06:41:00 GMT
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Hi

I am experimenting with TimerCallBack. I want to set callback interval to say 25 ms.
To check this I have done small code sample. It is attached to this message.
I am measuring delay with GetTickCount(). Running this for 10 sec. And counting - Histogram.

My observation shows time aligns to 20 ms

Timer Delay -20
Time Count
20 320
21 160
22 5
23 2
28 1
37 1

Timer Delay -25
Time Count
28 1
30 1
34 1
40 102
41 142

Timer Delay -19
Time Count
19 2
20 331
21 147
22 5
23 1
24 1
31 1
60 1

Timer Delay -22
Time Count
22 3
23 2
24 5

```
40   116
41   113
43   1

Timer Delay -38
Time   Count
40   114
41   131
55   1


#include <CtrlLib/CtrlLib.h>

using namespace Upp;

struct TimerCallBackVariation : TopWindow
{

 Vector<int> interval;
 dword prev, now;

 TimeCallback timer, process;
 int timerDelay, processDelay;
 LineEdit le1;
 String Result;

 void Timer()
 {
  now = GetTickCount();
  interval.Add ( now - prev );
  prev = now ;
 }


 void Process()
 {
  timer.Kill();

  Result << "Count - " << interval.GetCount() << "\n";
  Result << "Interval Vector - " << interval << "\n" ;

  Sort ( interval );

  Result << "Sorted - " << interval << "\n";

  VectorMap<int, int> hist;
  int j, k;
```

```
  for ( int i = 0; i < interval.GetCount(); i++ )
  {
   j = interval[i];
   k = hist.Find ( j );

   if ( k > -1 )
   {
    hist[k] = hist[k] + 1;
   }

   else
   {
    hist.Add ( j, 1 );
   }
  }

  Result << "\nTimer Delay " << timerDelay << "\n";

  Result << "Time  \tCount" "\n";

  for ( int i = 0; i < hist.GetCount(); i++ )
  {
   Result << hist.GetKey ( i ) << "  \t" << hist.GetValues() [i] << "\n";
  }

  this->Title ( "Done" );
  le1.Paste(Result.ToWString());
 }

 TimerCallBackVariation()
 {
  timerDelay = -38;
  processDelay = 10000;
  Title ( "Timer Callback Time Variation" ).Zoomable().Sizeable();
  Add(le1);
  le1.SizePos();
  prev = GetTickCount();
  timer.Set ( timerDelay, [=] {Timer();} );
  process.Set ( processDelay, [=] { Process();} );
 }

};

GUI_APP_MAIN
{
 TimerCallBackVariation app;
 app.Run();
}
```

File Attachments
1) TimerCallCheck.tar.bz2, downloaded 300 times

Subject: Re: TimerCallBack interval resolution
Posted by Tom1 on Wed, 19 Jan 2022 12:19:43 GMT
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Hi Deepak,

Are you running on Windows? If so, you can improve your timing to one millisecond resolution by adding this in your program:

```
#ifdef _WIN32
#include <MMSystem.h>

INITBLOCK{
 timeBeginPeriod(1);
}

EXITBLOCK{
 timeEndPeriod(1);
}
#endif
```

You may also want to use usecs() for measuring time at better than millisecond resolution.

Best regards,

Tom

Subject: Re: TimerCallBack interval resolution
Posted by deep on Wed, 19 Jan 2022 13:27:48 GMT
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Hi Tom

Thanks for reply.

I want this on Linux.

I need consistency in TimerCallback. Actually consistancy is there but with multiple of 20 ms interval.

My observation is I get time resolution of 20 ms.

I need to have say every 30 ms. +/- 2 ms callback. Is it possible with TimerCallback ?

Subject: Re: TimerCallBack interval resolution
Posted by Tom1 on Wed, 19 Jan 2022 13:40:13 GMT
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Hi,

I'm afraid I cannot help you there. You need someone with better Linux timing knowledge...

Best regards,

Tom

Subject: Re: TimerCallBack interval resolution
Posted by Didier on Thu, 20 Jan 2022 20:43:52 GMT
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Hello Deep,

You should look at RTIMING.
There is an example : upp/reference/Timing

Works on windows and linux: it should do the job ;)

Subject: Re: TimerCallBack interval resolution
Posted by deep on Fri, 21 Jan 2022 06:39:41 GMT
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Hi Didier,

My issue is not about time profiling.

I am looking at time interval and repeatability of time interval.

When I set TimerCallback time value between -22 to -39 ms. I get interval of 40 ms.
Depending on value of time I set I get time interval in multiple of 20 ms.

If I want 30 ms. time interval for timercallback I am not getting it. I get greater time interval - multiple time interval of 20 ms.

Interval repeatability is 1ms. which is okay for me.

Subject: Re: TimerCallBack interval resolution
Posted by mirek on Sat, 22 Jan 2022 18:32:02 GMT
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deep wrote on Fri, 21 January 2022 07:39Hi Didier,

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Interval repeatability is 1ms. which is okay for me.

It is supposed to be about 20ms by design and it is not even guaranteed. If you need more precise timing, you need to run it in separate thread.

More details: GUI timer is run each time after the set of GUI events is processed and queue becomes empty. Those 20ms actually apply for the case that there are no events - if there are no event for 20 ms, timer is invoked. That also means if the GUI event (e.g. keystroke) takes more than 20ms to process, the interval can be actually much bigger than 20ms.

Subject: Re: TimerCallBack interval resolution
Posted by deep on Mon, 24 Jan 2022 08:56:09 GMT
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Hi Mirek,

Thanks for explanation.

I was under impression that SetTimeCallback/TimeCallback as independent time trigger.

mirek wrote on Sun, 23 January 2022 00:02

It is supposed to be about 20ms by design and it is not even guaranteed. If you need more precise timing, you need to run it in separate thread.

Small code snippet or link will be helpful to setup repeat callback independent of GUI.

Subject: Re: TimerCallBack interval resolution
Posted by mirek on Mon, 24 Jan 2022 09:47:30 GMT
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deep wrote on Mon, 24 January 2022 09:56Hi Mirek,

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Frankly, the only time I did that was in SDL2 based sound synthetiser and there the period is set by SDL2 sound system.

Still, you can check it here:

https://github.com/ultimatepp/ultimatepp/blob/master/example s/Synth/Core.cpp

(or in examples/SDLSoundDemo)

Subject: Re: TimerCallBack interval resolution
Posted by superdev on Wed, 04 Jan 2023 19:19:20 GMT
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mirek wrote on Mon, 24 January 2022 10:47deep wrote on Mon, 24 January 2022 09:56Hi Mirek,

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So how to combine UPP GUI(Ctrl) and SDL2 window (>100 FPS)?
I've tried TopWindow::OpenMain(), then ProcessEvents and render in loop. It works but the loop freezes, for example during TopWindow resizing, dialog showing.

Subject: Re: TimerCallBack interval resolution
Posted by mirek on Thu, 05 Jan 2023 08:29:51 GMT
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superdev wrote on Wed, 04 January 2023 20:19mirek wrote on Mon, 24 January 2022 10:47deep wrote on Mon, 24 January 2022 09:56Hi Mirek,

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If you are doing a game, probably consider using VirtualGui. Otherwise, what about separate thread for SDL?

Subject: Re: TimerCallBack interval resolution
Posted by superdev on Fri, 06 Jan 2023 15:20:11 GMT
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mirek wrote on Thu, 05 January 2023 09:29superdev wrote on Wed, 04 January 2023 20:19...
So how to combine UPP GUI(Ctrl) and SDL2 window (>100 FPS)?
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If you are doing a game, probably consider using VirtualGui. Otherwise, what about separate thread for SDL?

Video player.
What widgets can i use with VirtualGui? Sorry but its description is poor and i can't test it yet.
SDL2Uword (built with fresh 16660, 32 or 64 bit) causes "exception c0000005 at 0".
"SDL render functions must be called from the main thread". I tried separate thread and it was glitchy.

Subject: Re: TimerCallBack interval resolution
Posted by mirek on Sat, 07 Jan 2023 08:10:22 GMT
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superdev wrote on Fri, 06 January 2023 16:20mirek wrote on Thu, 05 January 2023 09:29superdev wrote on Wed, 04 January 2023 20:19...
So how to combine UPP GUI(Ctrl) and SDL2 window (>100 FPS)?
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Video player.
What widgets can i use with VirtualGui?

All of them. The major disadvantage is that VirtualGui takes over window management, so that means it cannot really be used e.g. for normal applications.

What kind of application are you trying to develop?

Subject: Re: TimerCallBack interval resolution
Posted by superdev on Sat, 07 Jan 2023 10:05:52 GMT
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mirek wrote on Sat, 07 January 2023 09:10superdev wrote on Fri, 06 January 2023 16:20...
Video player.
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All of them. The major disadvantage is that VirtualGui takes over window management, so that means it cannot really be used e.g. for normal applications.

What kind of application are you trying to develop?

Video player.

Subject: Re: TimerCallBack interval resolution
Posted by mirek on Sat, 07 Jan 2023 12:15:09 GMT
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superdev wrote on Sat, 07 January 2023 11:05mirek wrote on Sat, 07 January 2023 09:10superdev wrote on Fri, 06 January 2023 16:20...
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What kind of application are you trying to develop?

Video player.

Interesting!

So that would imply that you need one window area capable of updating much faster than 40ms, while you want to keep GUI.

I guess you will need to go a bit deeper for this one. Probably the part handling videooutput running in separate thread, then you have to connect with it through low-level stuff, like HWND in Windows (and that part will be host specific).

Subject: Re: TimerCallBack interval resolution
Posted by superdev on Sun, 08 Jan 2023 05:38:19 GMT
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mirek wrote on Sat, 07 January 2023 13:15superdev wrote on Sat, 07 January 2023 11:05...
Video player.

Interesting!

So that would imply that you need one window area capable of updating much faster than 40ms, while you want to keep GUI.

I guess you will need to go a bit deeper for this one. Probably the part handling videooutput running in separate thread, then you have to connect with it through low-level stuff, like HWND in Windows (and that part will be host specific).

No, i simply use SDL window for video and TopWindow for GUI

Subject: Re: TimerCallBack interval resolution
Posted by superdev on Tue, 10 Jan 2023 18:12:16 GMT
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mirek wrote on Sat, 07 January 2023 09:10superdev wrote on Fri, 06 January 2023 16:20..
Video player.
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All of them. The major disadvantage is that VirtualGui takes over window management, so that means it cannot really be used e.g. for normal applications.

So what things cannot be done with VirtualGui?

Subject: Re: TimerCallBack interval resolution

Posted by mirek on Wed, 11 Jan 2023 09:36:23 GMT
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superdev wrote on Tue, 10 January 2023 19:12mirek wrote on Sat, 07 January 2023 09:10superdev wrote on Fri, 06 January 2023 16:20..
Video player.
What widgets can i use with VirtualGui?

All of them. The major disadvantage is that VirtualGui takes over window management, so that means it cannot really be used e.g. for normal applications.

So what things cannot be done with VirtualGui?

Management of normal windows.

Drag&Drop between VirtualGui app and host GUI.

Ditto clipboard.

Basically, it runs as separate GUI system, not integrated with rest of OS. OK for games / special uses. Bad for applications.

Subject: Re: TimerCallBack interval resolution
Posted by superdev on Wed, 11 Jan 2023 17:17:33 GMT
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mirek wrote on Wed, 11 January 2023 10:36...
Thanks for the explanation.
Pardon my offtop.