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Subject: How do I create a loop for a window to react to volatile changes to a global variable?

Posted by [slashupp](#) on Mon, 11 Mar 2019 08:49:09 GMT

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The problem:

I have some global variables get&set by detached threads, using mutexes when getting and setting them.

I have a window that need to update it's display based on changes in the variables, also using the mutexes to get & set the values.

The changes are volatile/random/unpredictable ...

What I tried:

I passed a pointer to the window to the threads when I create them, and use the pointer to call methods

in the window to do the updates

Result: the app crashes with:

"... Using GUI in non-main thread without GuiLock"

I added "GuiLock \_\_\_;" in the methods but then get:

"Assertion failed in ....\CtrlCore/GtkCapture.cpp, line 41 IsMainThread()"

(I know that this same code did work with an older release of Upp, but is now broken)

Any ideas on how I can fix this would be much appreciated.

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Subject: Re: How do I create a loop for a window to react to volatile changes to a global variable?

Posted by [Oblivion](#) on Mon, 11 Mar 2019 11:44:22 GMT

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Hello slashupp,

If you are calling a method of the main window (main thread), then add a GuiLock "in" that method, it is better that way.

E.g.:

```
#include <CtrlLib/CtrlLib.h>
```

```
using namespace Upp;
```

```
class ThreadTest : public TopWindow {
    Button  start;
    ArrayCtrl array;
public:
    ThreadTest()
    {
```

```

SetRect(0, 0, 800, 600);
CenterScreen();
array.AddColumn("Number");
Add(array.HSizePos().VSizePos(0, 30));
Add(start.SetLabel("Start Thread").RightPos(2, 120).BottomPos(2, 26));

start << [=] { RunThread(); };
}
void RunThread()
{
    Thread t;
    t.Run([=]{
        for(int i = 1; i < 30000; i++) {
            // GuiLock __;
            SetArray(i);
        }
    });
    t.Detach();
}
void SetArray(int n)
{
    GuiLock __;
    array.Add(n);
    if(n == 10) { // Resize window from within thread...
        SetRect(0, 0, 640, 480);
    }
}

};

GUI_APP_MAIN
{
    ThreadTest().Run();
}

```

Also,

Quote:

I added "GuiLock \_\_;" in the methods but then get:

"Assertion failed in ....\CtrlCore\GtkCapture.cpp, line 41 IsMainThread()"

AFAIK, this means that, that specific method -or other methods called within it- can only be called from the main thread.

In some cases you may want to create a customized event loop in the main thread.

E.g:

```
void Run()
{
    OpenMain();
    while(IsOpen()) {
        ProcessEvents();
        GuiSleep(10);
        ProcessMyThreadsEvents(); // It's up to you how to precess your threads' events.
    }
}
```

Best regards,  
Oblivion

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Subject: Re: How do I create a loop for a window to react to volatile changes to a global variable?

Posted by [slashupp](#) on Mon, 11 Mar 2019 12:29:26 GMT

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Hi Oblivion

What I do is more like this:

```
#include <CtrlLib/CtrlLib.h>
```

```
using namespace Upp;
```

```
class ThreadTest;
void RunThread(ThreadTest *pTT);
```

```
class ThreadTest : public TopWindow
{
    Button  start;
    ArrayCtrl array;
public:
    ThreadTest()
    {
        SetRect(0, 0, 800, 600);
        CenterScreen();
        array.AddColumn("Number");
        Add(array.HSizePos().VSizePos(0, 30));
        Add(start.SetLabel("Start Thread").RightPos(2, 120).BottomPos(2, 26));

        start << [=] { RunThread(this); };
    }
    void SetArray(int n)
```

```

{
    GuiLock __;
    array.Add(n);
    if(n == 10) { // Resize window from within thread...
        SetRect(0, 0, 640, 480);
    }
}
};

```

```

void RunThread(ThreadTest *pTT)
{
    Thread t;
    ThreadTest *ptt=pTT;
    t.Run([=]
    {
        for(int i = 1; i < 10; i++)
        {
            // GuiLock __;
            ptt->SetArray(i);
        }
    });
    t.Detach();
}

```

```

GUI_APP_MAIN
{
    ThreadTest().Run();
}

```

Where the thread-func is global. This still works, and the only real difference between my app and this is that I use `std::thread` ... maybe I shouldn't I'll change my code to use `Upp::Thread` (and if you don't hear from me again, it worked)

thx

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Subject: Re: How do I create a loop for a window to react to volatile changes to a global variable?

Posted by [Didier](#) on Thu, 14 Mar 2019 21:11:52 GMT

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Hello Slashupp,

Maybe you should try using 'PostCallback()'

1 - Use PostCallback( UpdateCB ) in the thread modifying the variables

2 - In the GUI thread, UpdateCB() will get called and will do the update work

Note : a mutex is still needed to protect the variable UNLESS these variables can be set/read atomically

Didier

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Subject: Re: How do I create a loop for a window to react to volatile changes to a global variable?

Posted by [JeyCi](#) on Thu, 10 Sep 2020 17:13:58 GMT

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Oblivion wrote on Mon, 11 March 2019 12:44In some cases you may want to create a customized event loop in the main thread.

Yes it helps - thank you for the example.

But first example in your message also works U++ 13664 IN WIN32-MINGW\_9.3-compiled - only if using

```
void SetArray(int n)
{
    PostCallback([=]() {
        array.Add(n);
        if(n == 10) { // Resize window from within thread...
            SetRect(50, 50, 640, 480);
        }
    });
}
```

otherwise, I suppose, I'm getting into deadlock (with GuiLock & even with Call)app don't show changes to arrayCtrl & crashes... I think, that compiler matters!.. MSVC probably could compile ok MT app with GuiLock, or perhaps OS matters (probably Linux can have ok with GuiLock)...

But now with your example I see some possible changes to do to my own code :blush: - I could'n even assume, that answer is so easy - I thought (in my own code) that I made some mistakes in the code itself... of course will check again... but I agree with your proposal concerning MainThread... thank you for useful advice!

In any case, it seems, that compiler matters for Upp::Thread dealing with??... 8o therefore your suggestion seems suitable... thanks

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Subject: Re: How do I create a loop for a window to react to volatile changes to a global variable?

Posted by [JeyCi](#) on Thu, 10 Sep 2020 17:17:47 GMT

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P.S.

slashupp wrote on Mon, 11 March 2019 13:29

Where the thread-func is global.

global functions as I remember can have problems being compiled with MSVC... if I'm wrong?

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