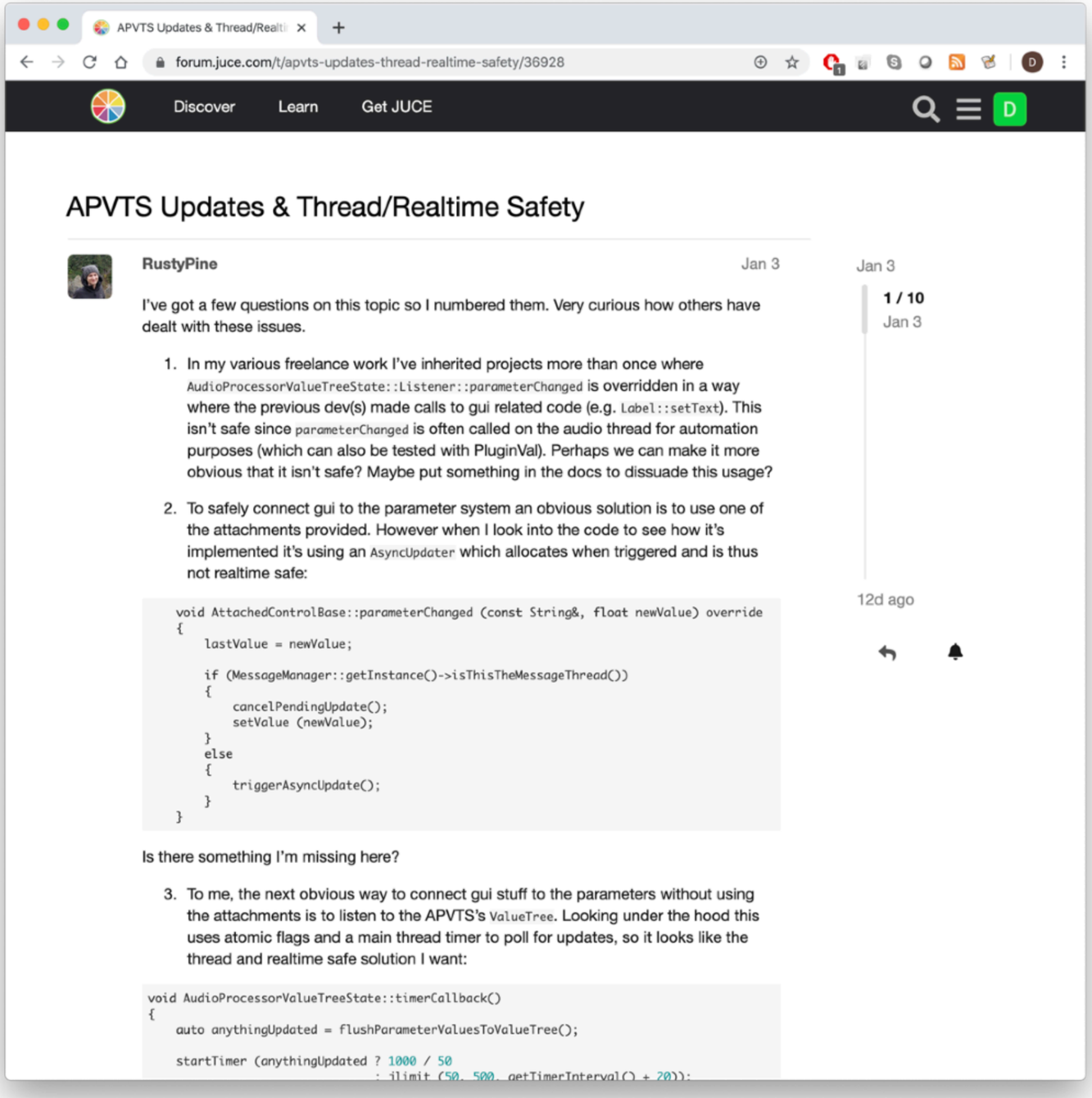
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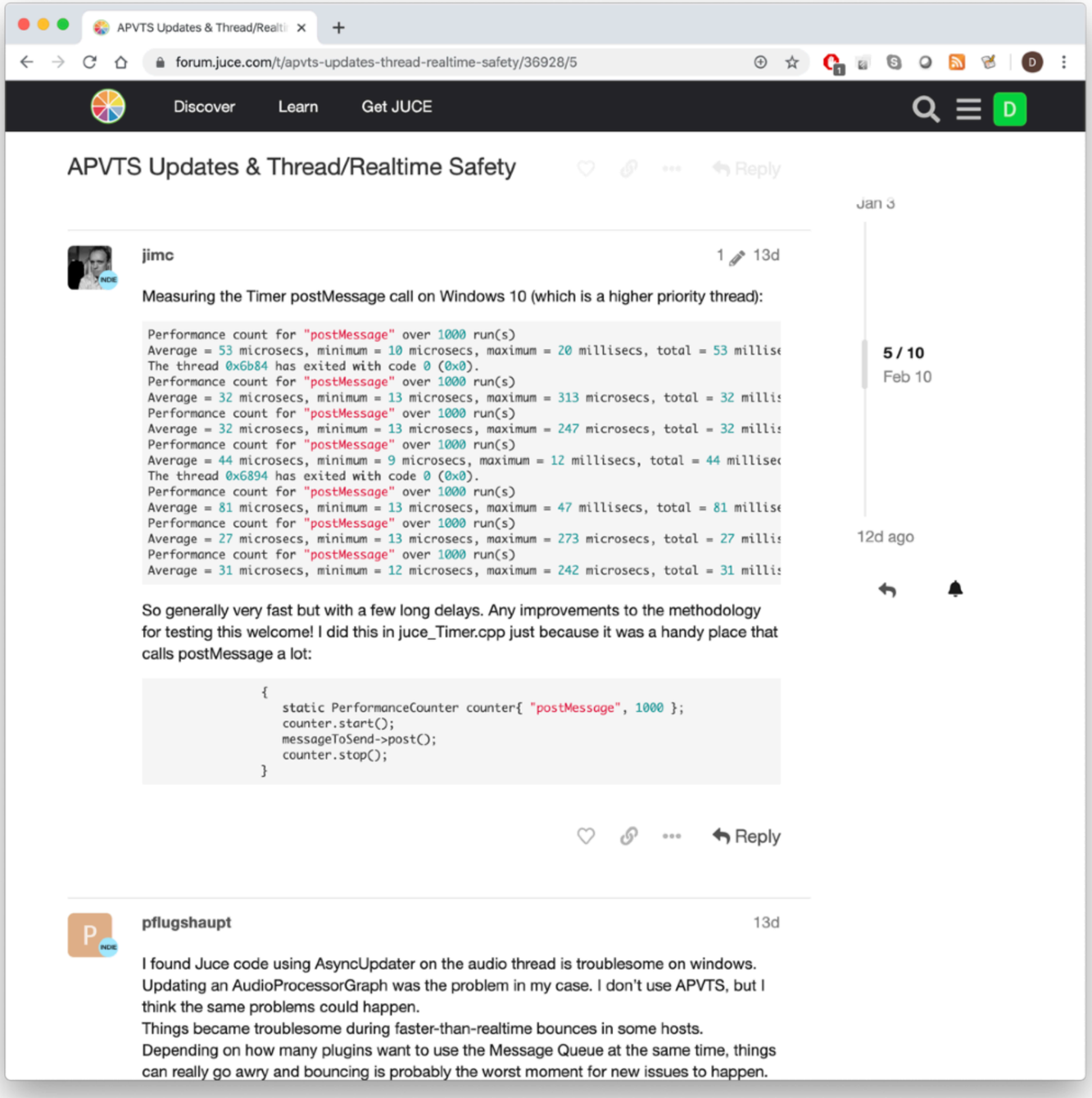
APVTS Updates & Thread/Realtime Safety
RustyPine
Jan 3
I've got a few questions on this topic so I numbered them. Very curious how others have dealt with these issues.
1. In my various freelance work I've inherited projects more than once where AudioProcessorValueTreeState::Listener::parameterChanged is overridden in a way where the previous dev(s) made calls to gui related code (e.g. Label::setText). This isn't safe since parameterChanged is often called on the audio thread for automation purposes (which can also be tested with PluginVal). Perhaps we can make it more obvious that it isn't safe? Maybe put something in the docs to dissuade this usage?
2. To safely connect gui to the parameter system an obvious solution is to use one of the attachments provided. However when I look into the code to see how it's implemented it's using an AsyncUpdater which allocates when triggered and is thus not realtime safe:
void AttachedControlBase::parameterChanged (const String&, float newValue) override
{
lastValue = newValue;
if (MessageManager::getInstance()->isThisTheMessageThread())
{
cancelPendingUpdate();
setValue (newValue);
}
else
{
triggerAsyncUpdate();
}
}
Is there something I'm missing here?
3. To me, the next obvious way to connect gui stuff to the parameters without using the attachments is to listen to the APVTS's ValueTree. Looking under the hood this uses atomic flags and a main thread timer to poll for updates, so it looks like the thread and realtime safe solution I want:
void AudioProcessorValueTreeState::timerCallback()
{
auto anythingUpdated = flushParameterValuesToValueTree();
startTimer (anythingUpdated ? 1000 / 50
Jan 3
1 / 10
Jan 3
12d ago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Jan 3
jimc
1
13d
Measuring the Timer postMessage call on Windows 10 (which is a higher priority thread):
Performance count for "postMessage" over 1000 run(s)
Average = 53 microsecs, minimum = 10 microsecs, maximum = 20 millisecs, total = 53 millise
The thread 0x6b84 has exited with code 0 (0x0).
Performance count for "postMessage" over 1000 run(s)
Average = 32 microsecs, minimum = 13 microsecs, maximum = 313 microsecs, total = 32 millis
Performance count for "postMessage" over 1000 run(s)
Average = 32 microsecs, minimum = 13 microsecs, maximum = 247 microsecs, total = 32 millis
Performance count for "postMessage" over 1000 run(s)
Average = 44 microsecs, minimum = 9 microsecs, maximum = 12 millisecs, total = 44 millisec
The thread 0x6894 has exited with code 0 (0x0).
Performance count for "postMessage" over 1000 run(s)
Average = 81 microsecs, minimum = 13 microsecs, maximum = 47 millisecs, total = 81 millise
Performance count for "postMessage" over 1000 run(s)
Average = 27 microsecs, minimum = 13 microsecs, maximum = 273 microsecs, total = 27 millis
Performance count for "postMessage" over 1000 run(s)
Average = 31 microsecs, minimum = 12 microsecs, maximum = 242 microsecs, total = 31 millis
5 / 10
Feb 10
12d ago
So generally very fast but with a few long delays. Any improvements to the methodology for testing this welcome! I did this in juce_Timer.cpp just because it was a handy place that calls postMessage a lot:
{
static PerformanceCounter counter{ "postMessage", 1000 };
counter.start();
messageToSend->post();
counter.stop();
}
Reply
pflugshaupt
13d
I found Juce code using AsyncUpdater on the audio thread is troublesome on windows. Updating an AudioProcessorGraph was the problem in my case. I don't use APVTS, but I think the same problems could happen.
Things became troublesome during faster-than-realtime bounces in some hosts.
Depending on how many plugins want to use the Message Queue at the same time, things can really go awry and bouncing is probably the worst moment for new issues to happen.