

# ThreadedApp v1.0

Chris Roehrig <croehrig@house.org>

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Writing multi-threaded applications in NEXTSTEP is not as easy as it could be. I wrote ThreadedApp to make it easy to write multi-threaded applications that use the AppKit. In particular, it provides an easy mechanism for threads to use the AppKit features in a safe and robust way.

So now there's no excuse not to use threads! Let's make those Apps RESPONSIVE!

## ThreadedApp

### Support for multi-threaded applications for NEXTSTEP 3.3.

ThreadedApp is a subclass of Application that contains the functionality of the OpenStep NSThread object, but also provides increased support for interaction with the AppKit. The AppKit is not thread-safe and only the main thread can use it. All other threads must message the main thread to perform any functions (drawing, etc) that involve the AppKit. ThreadedApp does this by introducing the notion of *callback* methods. This is a flexible mechanism

whereby a thread can request that the main application thread invoke a method on its behalf. This allows a thread to have virtually full access to the AppKit in a way that is easy to understand and use.

The callback mechanism uses Mach messages to make requests to the main AppKit thread. The main thread only receives the messages when it is in an event loop, so it is crucial that the main thread remains responsive to events. (This is only good user-interface design anyways.)

ThreadedApp provides support for locking shared data or code via the CJRLock and CJRConditionLock classes. These classes allow the main AppKit thread to "block" while waiting to acquire a lock, but still remain responsive to events so that other threads may still perform callbacks.

Send any bug reports, comments, etc. to Chris Roehrig <croehrig@House.ORG> If you find ThreadedApp useful and are using it in an application, send me a note; I'd like to hear about it!

-- Chris

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## ThreadTest Application

ThreadTest is a simple multi-threaded app for NEXTSTEP 3.3 that uses the ThreadedApp object. It lets you start and stop (kill) any number of Counter instances.

## ThreadTest.[hm]

This is the App's controller object. It simply responds to the 2 menu commands New Test, and Kill.

## ThreadTest.nib

The main NIB file for the app. Only contains a main menu.

## Counter.[hm]

This implements the **Counter** object. There are two versions: **SimpleCounter** which is an uncluttered demo to illustrate how to use the **ThreadedApp**'s facilities in a simple way, and **TestCounter** which gives the **ThreadedApp** facilities a real workout. **Counter.[hm]** are symbolic links to the one you want to use.

Experiment with the different ways of incrementing the counter to see the effect it has on windowserver performance.

## Counter.nib

**Counter's** NIB file.

## **ThreadedApp.[hm]**

Multi-threaded application support. See **ThreadedApp.rtf**.

## **CJRLock.[hm]**

A locking facility. See **CJRLock.rtf**.

## **tprintf.[hc]**

A thread-safe version of printf.

## **Documentation**

Documentation for the ThreadedApp and CJRLock classes.

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