Southern Nevada
NeXT Users Group

4220 S.Maryland Parkway
Building B Suite 406
Las Vegas, NV 89119
(702) 792 6799
(702) 792 6794 FAX
nnug@ensuing.com

Using Icon.app with NeXTSTEP 3.0

This paper details how to patch Icon.app so that it can be used on a computer running NeXTSTEP 3.0. Because of the technical nature of this information, and the possibility that great damage can be done if you don't follow it to the letter, I can not and will not be responsible if you trash you system by trying out any of the high jinks detailed within this document.

Note to User Groups and other NeXT organizations: If you would like a RTF or FrameMaker version of this doucument for inclusion in your User Group Newsletter or other publication, please send email to karl@ensuing.com

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What this is all about

Among the many changes between NeXTSTEP 2.1 and NeXTSTEP 3.0, the one that most likely hurt the user community the most, is the inability to use Icon.app. This was best expressed by Gordon Van Huizen, “Just because something is in the demo folder doesn't mean that a community of people won't come to depend on it, especially in light of the lack of commercial alternatives.”

To balance that statement, here’s one from Sam Streeper, “Icon was unmaintainable crap. There was no way it was going to evolve into a stable app. It was an embarrassment, albeit a necessary one at the time, and it probably discouraged the development of decent tools.”

To this end I have created this document which describes how to patch Icon.app so that it can be used under NeXTSTEP 3.0. The main advantages of this patch is that it is quick and simple.

What you will get

After performing this patch, you will be able to use Icon.app while running NeXTSTEP 3.0. However Icon.app will still possess the same bugs that were present under 2.1. This patch may introduce new bugs, but none have been noticed.

What you won't get

Icon.app will run just like a 2.1 application. It will not take advantage of any new 3.0 features or improvements. This means no new color panel, no Pantone colors, no NeXTSTEP 3. 0 features of any kind. It will look exactly as it did under 2.1, but it will run under NeXTSTEP 3.0.

What not to do

A lot of people have given NeXT a lot of flack over the de-bundling of Icon.app. Most of this flack has been completely unfair. Don’t send flack in my direction. It seems the only way people know how to fix problems is whine, complain, write letters, and organize boycotts.

Files and applications you will need.

You will need a copy of NeXTSTEP 2.1 or access to a machine with 2.1 installed. You will need to copy three files from that 2.1 system (I will refer to that copy or machine as the 2.1 system, even though it may only be an optical disk). If you never owned a copy of NeXTSTEP 2.1, nor had a machine with 2.1 installed, then you have no right to the software that was bundled with it. To copy software you don’t have a right to is piracy. Do not post a request to the Internet for someone to mail you the necessary files.

You will need to copy three files from the 2.1 system:

```
/usr/shlib/libNeXT_s.C.shlib
/usr/shlib/libsys_s.B.shlib
/NextDeveloper/Demo/Icon.app
```

You will need a program that will allow you to edit applications. If you want a NeXTSTEP program that does this, I suggest XMon, and the detailed instructions presented in this document are for XMon. If you want to use a command line program, I suggest fm. There is another NeXTSTEP application called HexEditor, but I do not recommend that application. If you don't have any of these, they can be ftp'ed from an archive site. See the end of this document for more info.

You will need root access for the machine you are installing Icon.app. If you are at a site where security is lax you may not need root access.

You may need the NeXTSTEP 3.0 version of otool. This is an optional item that will help you. Otool is part of the NeXTSTEP 3.0 Developers (or Extended) release. If you don't have it, and can't get it from a local NeXT dealer or user group, you can ignore the instructions that refer to it.

How this works

It's optional to read this section, but it will help you understand exactly how this patch works. A good portion of it comes from NeXTAnswers.

A shlib is a shared library. It is a library that contains object code that several executable files may use simultaneously. When a program is linked or compiled with a shared library, the library code that defines the external references are not copied into the object file. Instead it binds the address to a branch table which points to the actual code. (he he he, real complex eh?)

Shared libraries help save disk storage because applications don't contain copies of the appkit, and it also saves memory at runtime because the applications use just one copy of the appkit. It helps to keep all applications up to date, because when a shared library is replaced, all applications will use the new version without needing to be recompiled.

This means that applications compiled under NeXTSTEP 2.0 use the NeXTSTEP 3.0 appkit, when used under 3.0. This change in *implementation*, the internal detail of the appkit, causes all apps under NeXTSTEP 3.0 to use things like the new color panel. The *interface*, how an application accesses these resources in the appkit always remains the same between releases. The change in color panels was a change in the *implementation* of the appkit.

Because Icon.app was used to help create and design the NeXTSTEP 2.0 color panel, it depended on the internal *implementation* of the appkit, and not just the *interface.* The implementation that it depended on is no longer present in NeXTSTEP 3.0. This is what causes Icon.app to break under 3.0.

The easiest solution to this problem is to have Icon use the old 2.0 versions of the appkit. By using the old appkit we get the old color panel instead of the new color panel, which is what is causing this whole problem.

How to patch Icon.app

When you see text like this **`localhost>ls -al`** that means to type **`ls -al`** in a Terminal window. The word localhost will vary from machine to machine. When you see text like this ***`blah blah blah`*** that means that you can expect output that generally looks similar. Use these to check what you are doing. Please follow the directions exactly. You may be tempted to put files in different location than specified. Don't do it.

All the right files in all the right places.

Copy Icon.app from the 2.1 system to the /LocalApps directory on the destination machine.

From a Terminal window, use otool to find out which shlibs Icon requires.

```
localhost> otool -L /LocalApps/Icon.app/Icon
```

```
/usr/shlib/libNeXT_s.C.shlib (minor version 50)
/usr/shlib/libsys_s.B.shlib (minor version 44)
```

This means that Icon.app requires the libNeXT and libsys shlibs.

Make a new folder in the root directory called "2.1" (without the quotes)

Inside the 2.1 folder make a folder called shlib.

Copy the two shlibs from /usr/shlib on the 2.1 system to /2.1/shlib/ on the target machine. Don't remove them from the 2.1 system, or your 2.1 system will cease to function.

You have now installed Icon.app and the shlibs that it requires to run. Now you must modify Icon.app to use the older shlibs instead of the newer shlibs that come with NeXTSTEP 3.0

Patching Icon.app

Start XMon, or your favorite binary editor.

Using XMon, open the file /LocalApps/Icon.app/Icon.

The top portion of XMon's main window contains two representations of the file being edited. On the left of each line is a set of 16 hexadecimal numbers, that correspond to the 16 characters on the left of the line. The first four hexadecimal numbers should spell "***`FEEDFACE`***".

You now need to search for the embedded string "/usr/shlib". Do this by first clicking on the right side of the representation (the side with the characters).In the lower portion of the window is a text field called "Pattern." In this text field type the word "usr" (without the quotes) Press the Return key.

At the top of the window you will see the text ***/usr/shlib***. Change this to read **/2.1/shlib**. A few lines down you will see another occurrence of ***/usr/shlib***, this time for libsys. Change that occurrence to also be **/2.1/shlib**.

If you accidentally change any other bytes, don't save the changes. Open the file and start over.

Once you have modified the two occurrences of /usr/shlib. Save the changes, and then quit XMon, or whatever editor you are using.

From a Terminal window, use otool to check Icon.app to make sure that the changes have been entered properly.

```
localhost> otool -L /LocalApps/Icon.app/Icon

        /2.1/shlib/libNeXT_s.C.shlib (minor version 50)
        /2.1/shlib/libsys_s.B.shlib (minor version 44)
```

Test the patch

Airbrush Tool

You should now be able to run Icon.app. The easiest way to ensure that the changes worked is to launch Icon.app, and the select the AirBrush tool. An unpatched version of Icon.app will crash immediately.

I hope you enjoy this resuscitated version of Icon.app.

Thanks to:

Keith Ohlfs, the author of Icon and Icon.app
NeXT Computer Inc.
NeXTAnswers (If you don't have a copy, get one!)
ANDI - The Association of NeXTSTEP Developers

Resources:

XMon can also be ftp'ed from sonata.cc.purdue.edu. As of November 9th, 1992, it was still in /pub/next/submissions/Xmon1.0.tar.Z

fm can be ftp'ed from ftp.uu.net, It's full name is /usenet/comp.sources.misc/volume12/fm/part01.Z

otool is part of the NeXTSTEP extended release. If you own a NeXT you are licensed for the extended release, even if you didn't receive it with your machine. Ask your local dealer or NeXT User's Group.