Network Clipboard

Version 1.1.1
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13 February 2008

Overview

Network Clipboard is a utility that allows you to share a clipboard with everyone on the network, and it's free for anyone to use. I've also included the source code so that potential employers can view my work. **If you would like to modify the code, or include it in your own projects, you must contact me first**, at rbwhitaker83@sisna.com.

Network Clipboard was created because of a significant hole in team software development, but the hole also appears quite commonly elsewhere. In any environment where multiple people are working collaboratively on multiple computers, there is a great need for rapid information exchange. Frequently, this can be done verbally. However, this information exchange often needs to be done (or is just plain easier) via the computer network that is in use.

This is when Network Clipboard can be utilized. Network Clipboard allows you to copy and paste data to a network-shared clipboard, in a way that is familiar and comfortable. The data then appears on others' clipboards across the network, where they can copy and paste it into their work.

To help you see exactly how Network Clipboard can be of use, imaging the following scenario. Your cubicle neighbor, Bob, asks you if you know how to create a multicast UDP socket in Java. Not only do you know how to, but you have the code right in front of you! Rather than trying to explain how to do it, you select the code that does this, shown below:

```java
// Create a new multicast socket on port 3030
MulticastSocket socket = new MulticastSocket(3030);
```

After it is selected, you just copy it, then go over to the Network Clipboard, and paste it there. Now the text appears in Bob's Network Clipboard, where he copies it from the network clipboard and pastes it into his code, so he can continue on with his work. On top of that, Al and Hillary, who overheard this whole conversation, can also take a look at it.

You can see that this is much faster than trying to explain it to Bob, going over to Bob's computer and looking at his code as he writes it, or creating a text file and email it to him. This is the reason why NetworkClipboard was created.

What's New in Version 1.1.1?

Network Clipboard version 1.1 has a number of new and exciting features that make it much easier to use. The biggest addition is the ability to use Drag and Drop. You can now drop text onto the Network Clipboard instead of having to copy it to the system clipboard, as well as dragging items from the Network Clipboard.

There is also a new main menu, as well as a right-click menu, which let you copy and paste to and from the Network Clipboard without having to know the keyboard shortcuts. This reflects the way many people use the computer's copy and paste features.

Also available on the Network Clipboard main menu and right-click menu is an option for clearing out everything on the clipboard.

Also new in version 1.1 are buttons next to each clipboard item which allow you to resend an item across the network, as well as delete an item from the clipboard.
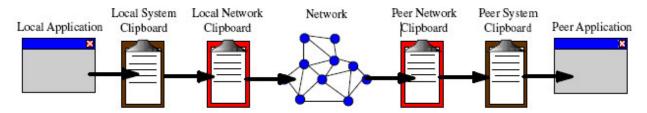
Version 1.1.1 has new and improved graphics that make the program look quite a bit nicer.

How to Open Network Clipboard

Network Clipboard was written in Java, and so it is deployable on any system with a Java Virtual Machine, including computers running Windows, Linux, and Macintosh. Usually, you can just double click NetworkClipboard1-1-1.jar, and the program will start up.
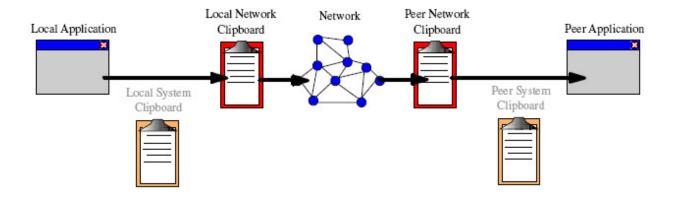
How to Use Network Clipboard

Network Clipboard is very easy to use. Below is a diagram of how the program works.

The first step is to copy the information from your application to the system clipboard, usually by pressing Ctrl-C, or using the copy function in the program. Then in your Network Clipboard application, you can paste the information in a number of ways.

You can select Paste from the Clipboard menu or the right click menu, or by using the keyboard shortcut, Ctrl-V. The data is automatically sent out to everyone else, and will appear in the other Network Clipboards across the network. When it arrives, you can click on the item you want in the network clipboard, and copy it to the system clipboard in any of the following ways: Select Copy from the Clipboard menu, select Copy from the right-click menu, or use the Ctrl-C keyboard shortcut. You can then paste the data into your application, usually by pressing Ctrl-V, or by using the paste function in the program.

Version 1.1 also supports the ability to Drag and Drop text to and from the Network Clipboard. Data transfer with Drag and Drop works much like data transfer before, except that the system clipboard is not used, as shown below.

To perform a Drag and Drop operation, your application must first support dragging. Select the text that you want and then drag it to the Network Clipboard application. Release the mouse button to drop the text. Be aware of the fact that most applications *move* text in Drag and Drop operations by default, rather than copy. You may need to press the Control key when you are ready to drop the text in order to ensure that the text is copied rather than moved to the clipboard. At this point, the data is send out across the network as before, and arrives at the peer Network Clipboard for use. To drag from the Network Clipboard, select an item and begin dragging it. Drop it into the destination application. Network Clipboard does not *cut* the item, so the item will remain in the Network Clipboard.

The Future of Network Clipboard
There have been a lot of good comments about the Network Clipboard utility, so there are future versions in the works. Version 1.2 of Network Clipboard will likely contain smaller updates than version 1.1 did. The following features will likely make it into version 1.2:
- Specify an IP Address and port on the command line
- Auto propagation from system to network clipboard and back if it is configured to do so
- Help/About sections
- Ignoring duplicates
- Scrolling to the newest item when it arrives

The following features are being considered for version 1.2:
- Saving/Loading the contents of the clipboard to a file
- A Cut option to allow you to remove from the clipboard, but place in the system clipboard
- Support for URLs, allowing you to simply click on the URL in the network clipboard and having the URL displayed automatically.

Other features are also in the works, but will probably not be included in version 1.2. These features include:
- Support for non-text data types (files, images, MIME types)
- Configuring your port and IP address in the GUI
- Ability to be in multiple groups
- Encrypted data transfer for security purposes
Also, future versions of the Network Clipboard utility may have a different name.

Known Issues and Bugs
1. The version accessible on the internet requires the JDK of Java (as opposed to the JRE) because it requires the **jar** utility. As a temporary workaround, you can download the JDK from Sun's website. Starting with Network Clipboard 1.2, it will also be deployed in a way that does not require the **jar** utility.

2. Not all programs accept drops from the Network Clipboard. The list of all known programs that do not accept drops is below:
- Microsoft XNA Game Studio Express

3. As of version 1.1.1, if you rename the file from NetworkClipboard1-1-1.jar to anything else, the images won't load correctly.

Resolved Issues and Bugs

1. The Linux JVM does its drawing in a slightly different manner than the Windows JVM. As a result, the 'resend' button does not look quite like it should. This does not affect the performance of Network Clipboard, only the appearance. *This was fixed by replacing the drawing with icon images.*

Answers to Common Questions

What port is Network Clipboard running on?
Port 5565

What UDP group address does NetworkClipboard use?
224.1.1.6

What programming language was used?
Java

Why was Java used?
Three reasons: it is platform independent, it is powerful enough to do everything needed, and it was easy enough to do the development rapidly.

How many lines of code were there?
2325. (144 more than version 1.1 and 741 more than version 1.0)

Is version 1.1.1 compatible with earlier versions?
Yes. In all three of the released versions, the network protocol has remained the same, and so the three versions are all completely compatible with each other.

Is it worth upgrading to version 1.1.1 from 1.1?
It is really the same thing, other than a few cosmetic changes. Upgrading is probably not going to be all that useful. But if you are downloading Network Clipboard every time that you use it, then it is probably a great idea to use 1.1.1 instead.

Is it worth upgrading to version 1.1 from 1.0?
Considering that it is free, and considering all of the new features, it would be well worth it to upgrade to version 1.1, if you have been using version 1.0.

When will version 1.2 be released?
Earlier, I had said that version 1.2 would be released in November of 2007, and that obviously didn't happen. I won't make any promises about when it will be released, because I've been really busy, but there is a decent possibility that I will be able to count this project as a homework project, in which case I'm sure I'll find time for it soon. Whatever the case may be,

you can still consider the Network Clipboard utility to be in active development unless there are no further updates before the middle of May 2008.