

NP Complete Software Solutions

Network Clipboard

Version 1.2.0

User's Manual

RB Whitaker
3/9/2008

Table of Contents

Overview	3
What's New in Version 1.2?	4
How to Use Network Clipboard	4
How to Open Network Clipboard	4
Using the Network Clipboard.....	4
Resending an Item	5
Removing an Item.....	6
Clearing the Clipboard	6
The Future of Network Clipboard	6
Known Issues and Bugs	7
Resolved Issues and Bugs.....	7
Answers to Common Questions	8

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.** Violators will be defenestrated and prosecuted to the full extend applicable under the law.

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 your team's clipboards across the network, where they can copy and paste it into their work.

For instance, let's say that you have some text in one program, like the text below:

*'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe;
All mimsy were the borogoves,
And the mome raths outgrabe.*

*'Beware the Jabberwock, my son!
The jaws that bite, the claws that catch!'*

This particular section of text is from Lewis Carroll's *Through the Looking Glass*. Let's say we want to move this from one program to another. We would simply select the text, tell the program we are using to copy it to the system clipboard, and then go to our other program, where we tell it to paste the information from the clipboard into the second program.

But what if the other program is on another computer? What if your cubicle neighbor reads it and wants it? How do we transfer the information in this case? Perhaps you could copy it into an email and send it to your cubicle neighbor. Or perhaps you could read it off to him or her.

It's situations like these that the Network Clipboard shows how useful it can be. The best solution to our problem is to paste the text into the Network Clipboard. The text immediately appears in your neighbor's Network Clipboard, and he can just pull it out. It is a simple and elegant solution for a very common problem.

What's New in Version 1.2?

Network Clipboard is currently going through some amazing growth that will make the program even more powerful. When you first use Network Clipboard 1.2, you might not notice any significant changes from version 1.1.1. But underneath, an entire plug-in architecture has been added to the program. This will allow development of this program to go forward in a very flexible and powerful way. It allows the possibilities of transferring images, and files, and lots of other improvements. Because of this change, you can expect these capabilities to appear very soon.

Also included with Network Clipboard version 1.2 is a new Network Clipboard Launcher for Windows. The launcher allows users who do not have the Java Development Kit to start up the Network Clipboard in a simple and easy way.

How to Use Network Clipboard

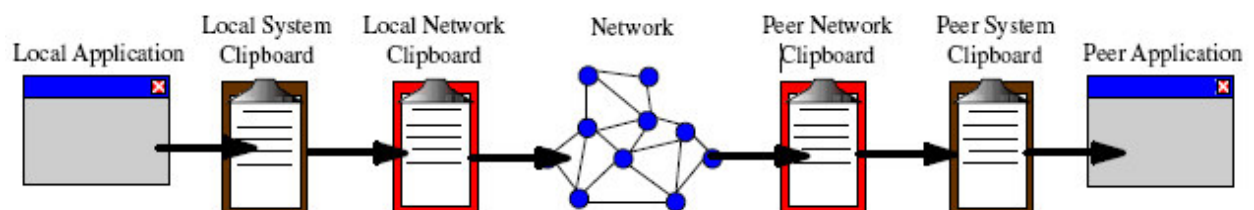
How to Open Network Clipboard

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. If you do not have a Java Virtual Machine, you can download it for free at <http://java.sun.com/>. Most computers will already have a Java Virtual Machine running on it, and so you can just double click NetworkClipboard1-2-0.jar, and the program will start up.

If this does not appear to be working, it may be that you do not have the Java Development Kit (JDK) installed on your system. This can be downloaded as well, from <http://java.sun.com/>. A second option for Windows users is to use the Network Clipboard Launcher that can be downloaded from the web. This version does not require the Java Development Kit, only the Java Runtime Environment (JRE) which comes with Windows.

Using the Network Clipboard

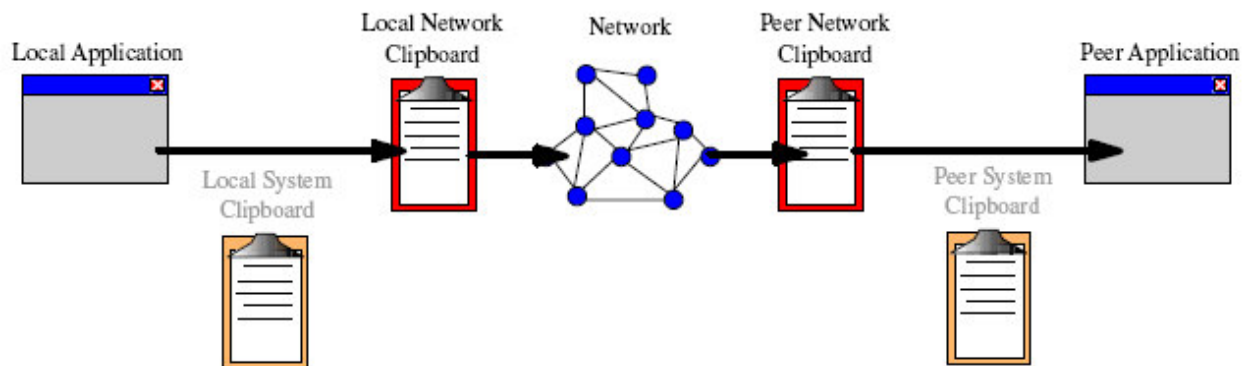
Network Clipboard is very easy to use. Below is a diagram of how the program works.



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.

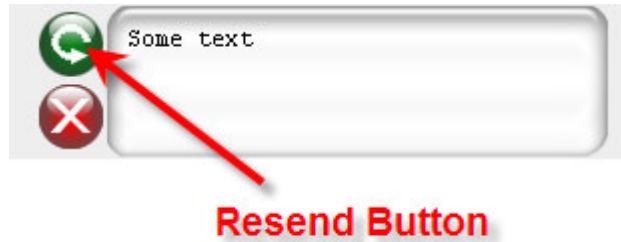
Version 1.1 also supports the ability to Drag and Drop text to and from the Network Clipboard. Data transfer with Drag and Drop works much like data transfer before, except that the system clipboard is not used, as shown below.



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 sent 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.

Resending an Item

By default, when an item is placed on the Network Clipboard, it is immediately sent out to the network. But what happens if some people didn't get the item? Each clipboard item has a button to resend an item across the network. The button is the green button with a circular arrow on it, located on the top left side of each clipboard item. Pressing this button will cause the item to be resent to everyone on the network.



Removing an Item

When you are finished using an item on the clipboard, you can remove it. To remove an item, click on the red colored button marked with an 'X' next to the item, as shown in the image below.



Clearing the Clipboard

If you have multiple items on the clipboard, and you wish to remove them all, there is a way to clear the clipboard, rather than removing them all individually. To do this, you can either select **Clear** from the **Clipboard** menu, or right click and select **Clear**.

The Future of Network Clipboard

The Network Clipboard will have many substantial improvements over the next few versions. The new plugin architecture that was made for version 1.2 enables a vast number of improvements to be done easily. The next step in the development of Network Clipboard is to include a system for transferring large segments of data. This will be completed for Network Clipboard version 1.3. After this, a series of plug-ins is planned. The following plugins are going to be made over the next few versions:

- Help and About sections
- Transferring images
- Transferring files
- Auto-propagation of data to and from the system's clipboard
- Running in the system tray

The following improvements will also be included before the Network Clipboard reaches version 2.0:

- Specifying an IP address and port to use

- Ignoring duplicates
- Scrolling to the newest item when it arrives

The following options are being considered for future releases:

- Saving and loading the contents of the clipboard to a file
- Support for web links, allowing you to simply click on the link in the Network Clipboard and having the page displayed automatically.
- Configuration of groups
- Encryption for security purposes
- Support for MIME types
- A Cut command that removes the contents of the clipboard as they are transferred.
- Look and feel variations

The Network Clipboard will probably also be packaged as part of NP Complete Software's *Community Workspace* environment within a few months. The stand-alone version will still be available. Also, future versions of the Network Clipboard may have a different name.

If you have any suggestions for future improvements, please email them to rbwhitaker83@sisna.com.

Known Issues and Bugs

1. Not all programs accept drops from the Network Clipboard. These programs however, all accept copying and then pasting the data. In addition, drags *from* these programs to the Network Clipboard still work. The list of all known programs that do not accept drops is below:

- Microsoft XNA Game Studio Express
- Microsoft C# Express Edition 2005
- Microsoft Visual Studio 2005
- Notepad

Please report additional bugs so that they can be fixed.

Resolved Issues and Bugs

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. *The new Network Clipboard Launcher deals with this issue. With the Launcher, you can run the program without the JDK. The JRE is still required to run the program.*

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.*

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. *Version 1.1.2 fixes this problem by having the OS look it up.*

Answers to Common Questions

What port is Network Clipboard running on?

Port 5565

What UDP group address does Network Clipboard use?

224.1.1.6

What programming language was used?

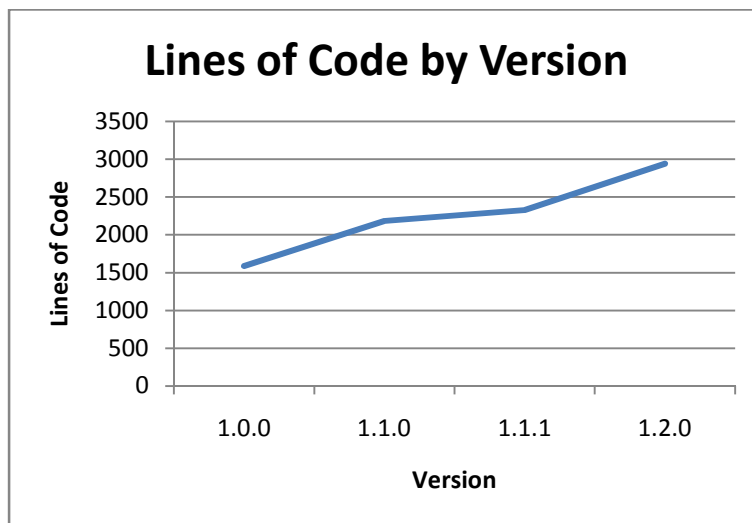
Java

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?

2940. (615 more than version 1.1.1, 759 more than version 1.1.0, and 1356 more than version 1.0.)



Is version 1.2 compatible with earlier versions?

Yes. In all of the released versions, the network protocol has remained the same, and so the four versions are all completely compatible with each other.

Is it worth upgrading to version 1.2 from 1.1.x?

The improvements to version 1.2 are not noticeable to users. If you have already downloaded version

1.1.x, you would be just fine staying with it. If you are just now discovering Network Clipboard for the first time, why not get version 1.2? Also, if you are running on Windows, the Network Clipboard Launcher may be useful if you do not have the Java Development Kit (JDK) installed.

When will version 1.3 be released?

Since the development of this program is being counted for a homework project, you can expect more releases in the near future. You should probably expect at least one more update to this program by 15 March 2008. The program will be in active development until at least the end of the semester, which will be in May 2008.