Network Station Manager Version 2

Java Support

Network Station Education
Network Computer Division
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Objectives/Summary

- Overview of the Java support
- Java components in V1R3
- Java Components in V2R1
- Switchable JVMs
- Configuring the Java Plugin
- Configuring Java applets and applications in NSM

Notes

The topic of this presentaion is the Java Support in Network Station Manager Version 2 Release 1 (V2R1).

The objective of this topic is to provide a brief overview of the Java support in Network Station Manager Version 2 Release 1 and highlight the differences with the support available in the previous release.

The areas discussed are:

- An overview of the Java support
- A look back at Java components in V1R3 in order to be able to see the difference with V2R1
- A look at the Java components in V2R1
- Switchable JVMs
- How to configure the Java Plugin
- Simple examples of configuring Java applets and applications using the Network Station Manager configuration panels.

V2R1 Java Support - Overview

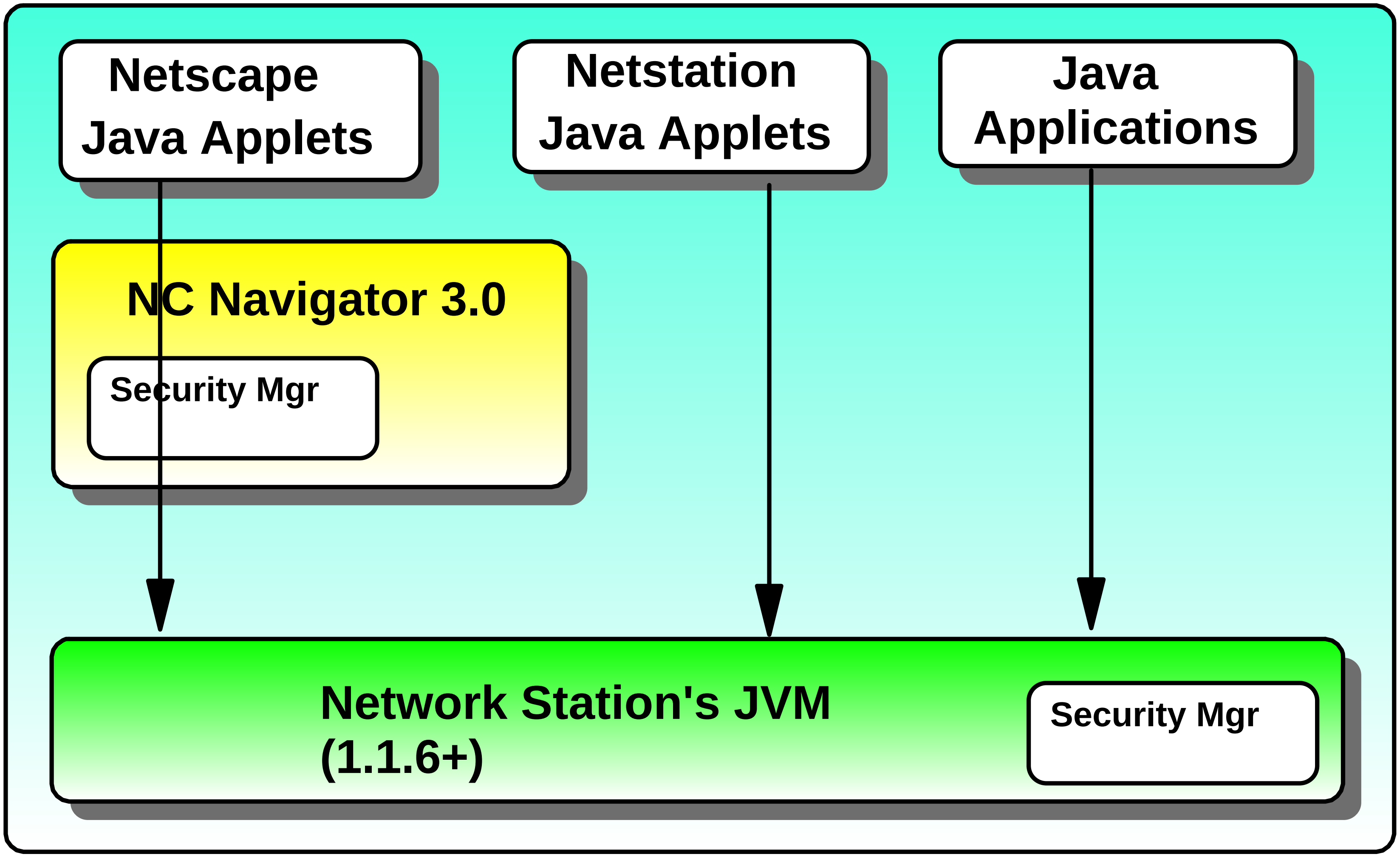
- **V2R1 Enhancements**
  - Multiple concurrent Java applications
  - Provide the Netscape Communicator 4.5 internal JVM
    - Allows to build Java applets for any Netscape platform
  - Higher level of JDK (1.1.8)
  - IBM Enhancements to Sun's JDK 1.1.8
    - Memory management fixes
    - Euro currency support
    - Enhanced security (supports security model of Java 1.1 and 1.2)
    - Integration with the Network Station's Operating System
  - Complete JDK instead of just the Java RUn Time Environment (JRE)
  - Enhanced class library support, Java Extensions (JMF, Swing, javax.comm)
  - Package two (swappable) JVMs in the Network Station
    - Latest JDK for stable and current Java environment
    - Latest JDK beta for development activities
  - Java plug-in to execute applets in a Netscape environment but provide a full function JVM and access to native extensions
  - Support for signed applets and JAR files

Notes

The Java environment has been significantly enhanced in V2R1. The enhancements are as follows:

- More than one Java application can now be executed simultaneously
- The browser (Netscape Communicator 4.5) now has an internal JVM and applets built for any Netscape platform can be executed
- Sun Microsystem's JDK 1.1.8 is provided to which IBM has added enhancements such as memory management fixes, euro currency support, enhanced security and integration with the Network Station's operating system.
- The complete JDK is also provided instead of just the Java Run Time environment which means that the Java compiler can be executed on the Network Station itself
- Jave extensions such as JMF, Swing and javax.comm are provided
- Two swappable JVM's are provided so that the latest JDK can be used for development activities. The switch from one to the other is done through the use of an environment variable.
- The Java plug-in is provided to allow applets executed in a Netscape environment to use the full function JVM of the Network Station instead of the Netscape JVM.
- Finally, there is now support for signed applets and JAR files.

Java Components in V1R3



Netscape Java Applets

Netstation Java Applets

Java Applications

NC Navigator 3.0

Security Mgr

Network Station's JVM (1.1.6+)

Security Mgr

Notes

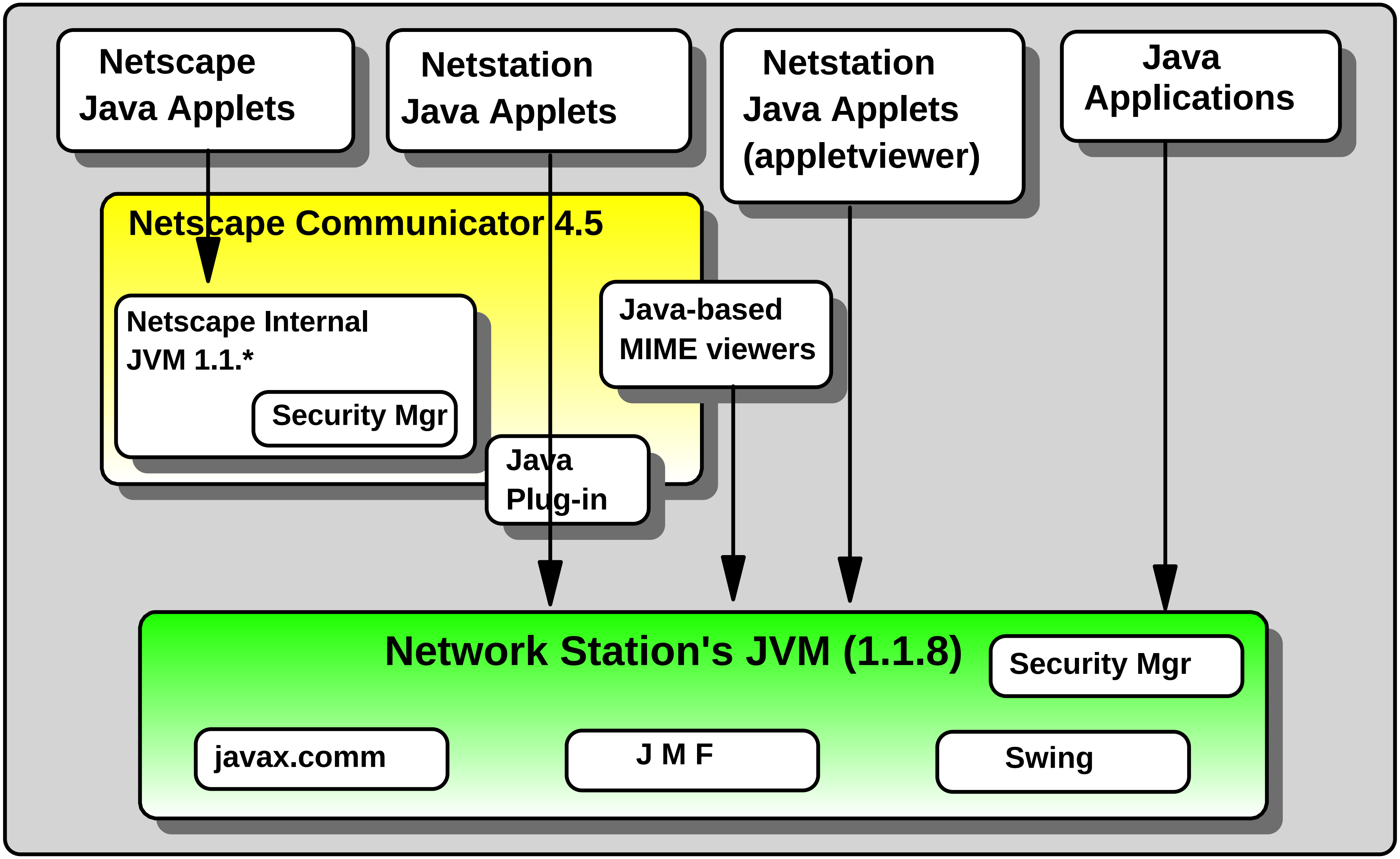
This chart summarizes the Java components used in the NSM V1R3 environment.

On the left, any applet executed in the NC Navigator browser environment was actually executed using the Network Station's native JVM because the NC Navigator browser does not have an internal JVM.

Applets executed through the appletviewer and Java applications were also executed using the Network Station native JVM.

The Network Station's Native JVM was based on Sun Microsystem's 1.1.6 level with some IBM additions

Java Components in V2R1



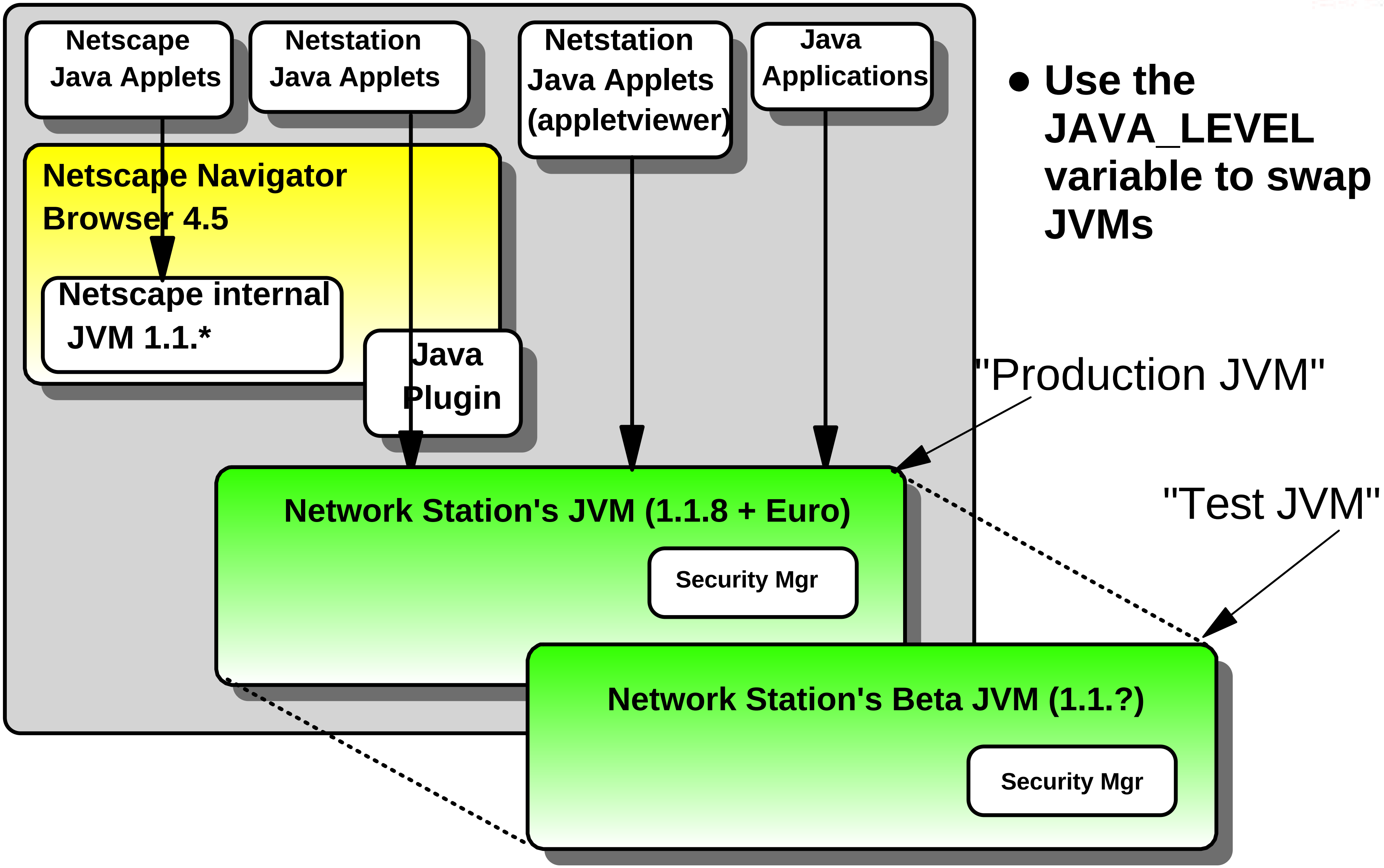
Notes

In NSM V2R1, there are more variations available.

- First, the supplied browser (Netscape Communicator 4.5) does have an internal JVM which is used by default when executing applets in the browser environment.
- However, a Java plugin is available to redirect the applet execution to the Network Station's native JVM, if desired, which is at a higher level than the browser's internal JVM. The use of the Java Plugin is determined by an HTML tag in the applet.
- The browser also has the ability to map MIME types to external browser applications. When these applications are Java-based, they are run in the Network Stations' external JVM and not in the browser JVM.
- As in the last release, applets and applications can be executed on the native JVM except that in V2R1, the limitation of only one application at a time has been removed so that multiple Java applications can be executed simultaneously. This also means that both Java applications and applets can also run simultaneously.
- The JVM is at the 1.1.8 level with some additional IBM additions and fixes.
- Finally, the diagram shows the Java extensions available, such as the javax.comm package, the Java Media Framework (JMF) package for multimedia applications and the Swing package.

Switchable JVMs

- **Use the JAVA_LEVEL variable to swap JVMs**

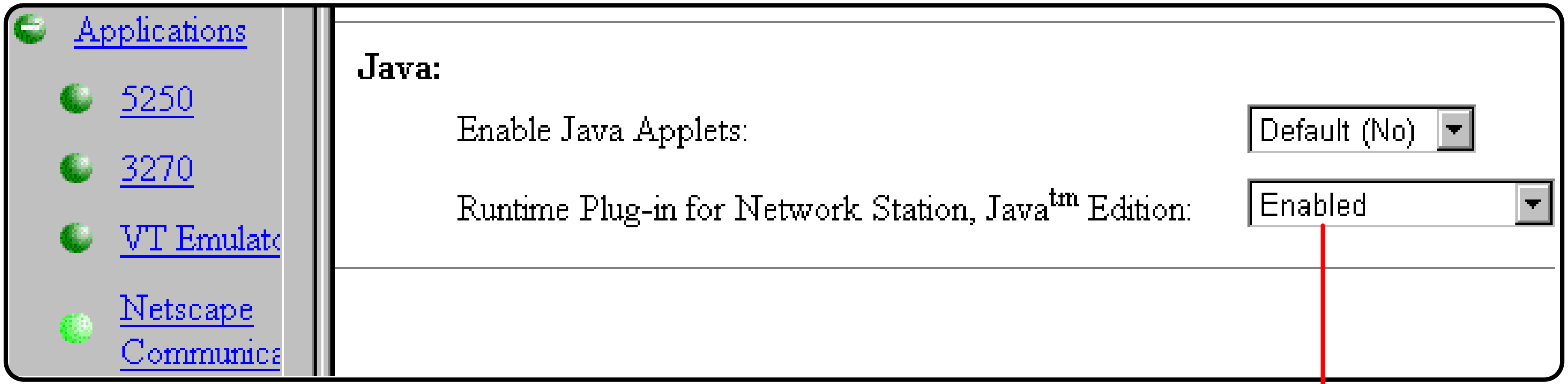

Netscape Java Applets
Netstation Java Applets
Netstation Java Applets (appletviewer)
Java Applications
Netscape Navigator Browser 4.5
Netscape internal JVM 1.1.*
Java Plugin
"Production JVM"
Network Station's JVM (1.1.8 + Euro)
Security Mgr
"Test JVM"
Network Station's Beta JVM (1.1.?)
Security Mgr

Notes

The supplied production JVM is at the 1.1.8+ level, but a test or beta JVM can also be used and swapped in through the setting of the $JAVA_LEVEL environment variable.

This allows an easy transition from one JVM to the other, to be able to run tests for example with a beta JVM and return to a production environment with the normal JVM.

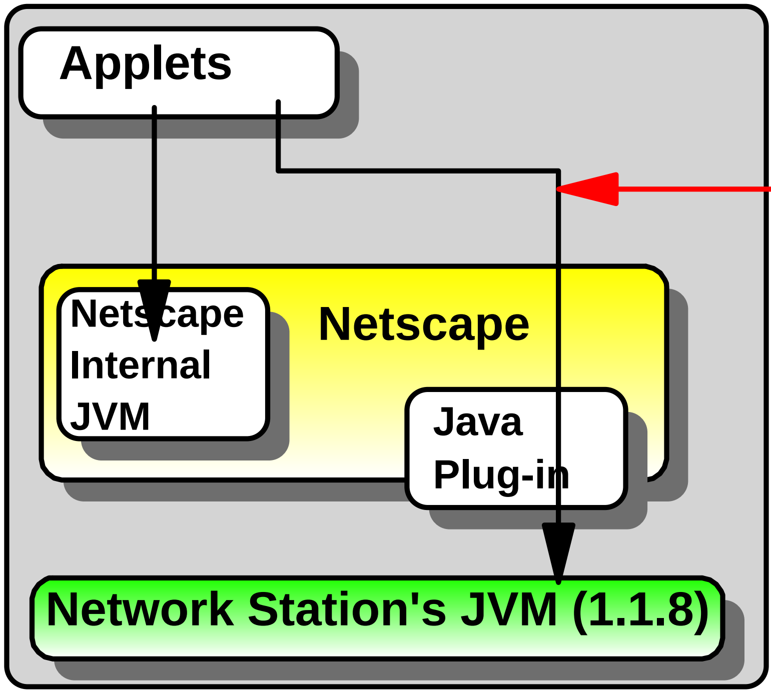
Configuring the Java Plug-in



Java:

Enable Java Applets: Default (No)

Runtime Plug-in for Network Station, Java$^{\text{tm}}$ Edition: Enabled



When Plugin is enabled, all applets go this way

Notes

At the top of this chart is part of an NSM panel for configuring the Netscape Browser.

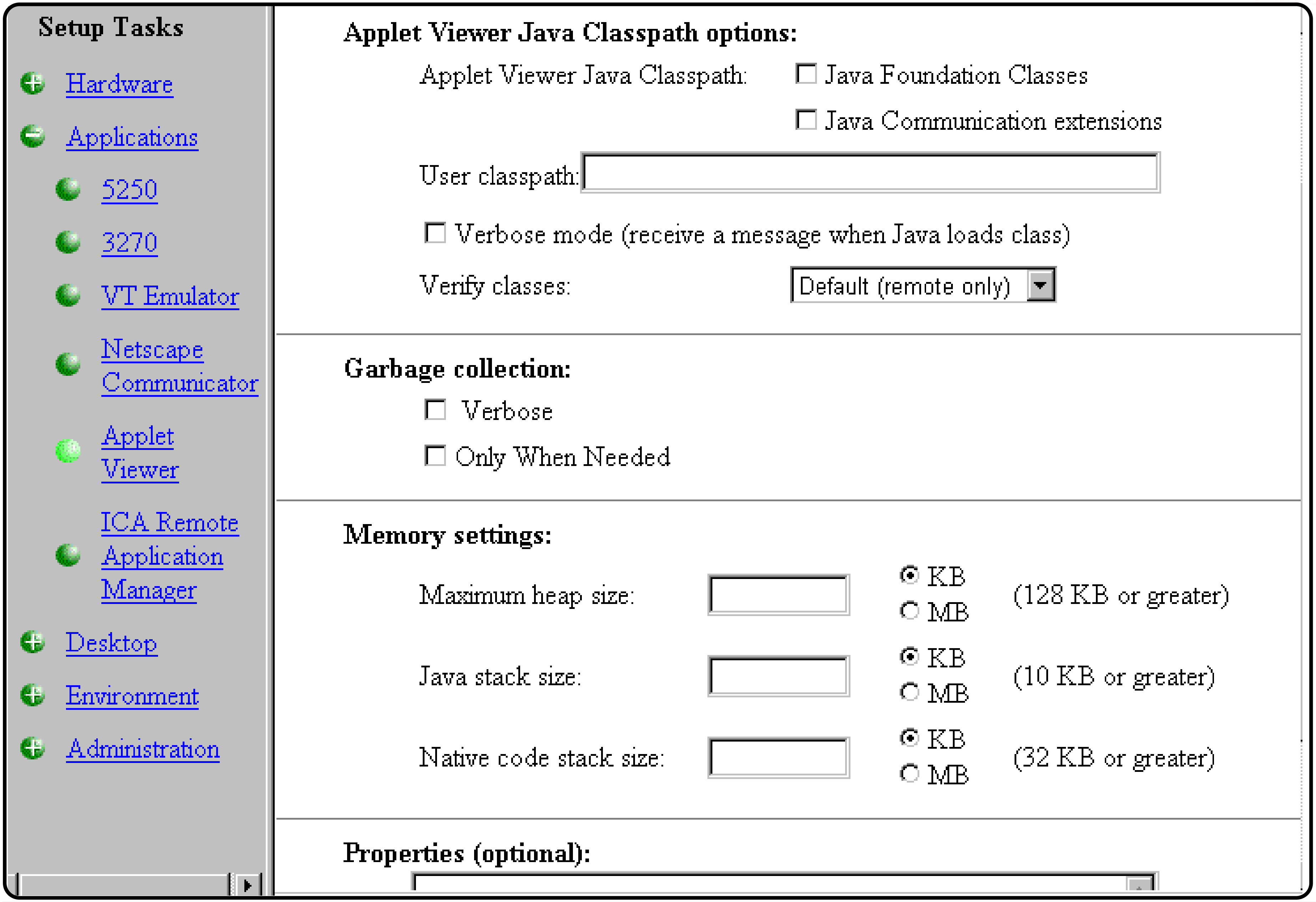
The first entry enables the browser to run applets. If it is set to no, the browser can load HTML pages but not Java applets. When set to yes, this entry allows the browser to execute applets using the browser's internal JVM.

If the HTML page contains the HTML tag for the Java Plug-in, the browser directs the applet execution to the external JVM using the Java Plug-in.

However, if the second entry is set to enable, then all applets, no matter what their HTML tags indicate, are automatically directed at the Java Plug-in and the external JVM.

This could be used to cause the browser to use less memory by not loading its internal JVM and always use the Network Station's JVM instead.

Configuring the appletviewer



Setup Tasks

- Hardware
- Applications
  - 5250
  - 3270
  - VT Emulator
  - Netscape Communicator
  - Applet Viewer
  - ICA Remote Application Manager
- Desktop
- Environment
- Administration

Applet Viewer Java Classpath options:

Applet Viewer Java Classpath: □ Java Foundation Classes

□ Java Communication extensions

User classpath:

□ Verbose mode (receive a message when Java loads class)

Verify classes: Default (remote only)

Garbage collection:

□ Verbose

□ Only When Needed

Memory settings:

Maximum heap size: ● KB ○ MB (128 KB or greater)

Java stack size: ● KB ○ MB (10 KB or greater)

Native code stack size: ● KB ○ MB (32 KB or greater)

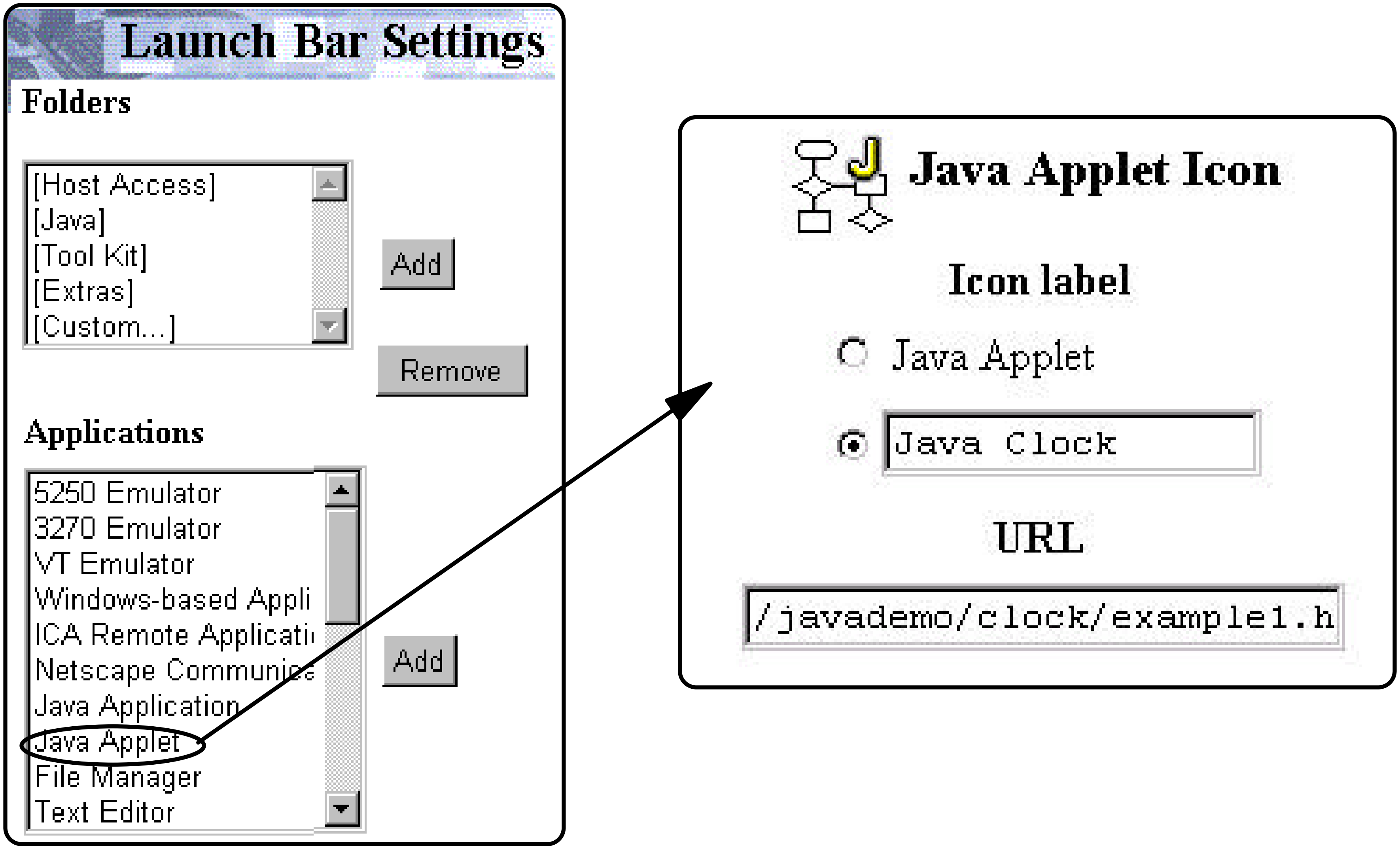
Properties (optional):

This panel represents the default or generic settings that you can define for the applet viewer, These settings affect all the applets that are run on the Networpk Station using the appletviewer.

The top part allows you to specify which paths should be added to classpath variable.

The bottom part is for the typical settings for garbage collection and the heap and stack sizes.

Adding a Java Applet in NSM



Launch Bar Settings

Folders

- [Host Access]
- [Java]
- [Tool Kit]
- [Extras]
- [Custom...]

Applications

- 5250 Emulator
- 3270 Emulator
- VT Emulator
- Windows-based Appli
- ICA Remote Applicati
- Netscape Communica
- Java Application
- Java Applet
- File Manager
- Text Editor

Java Applet Icon

Icon label

○ Java Applet

● Java Clock

URL

/javademo/clock/example1.h

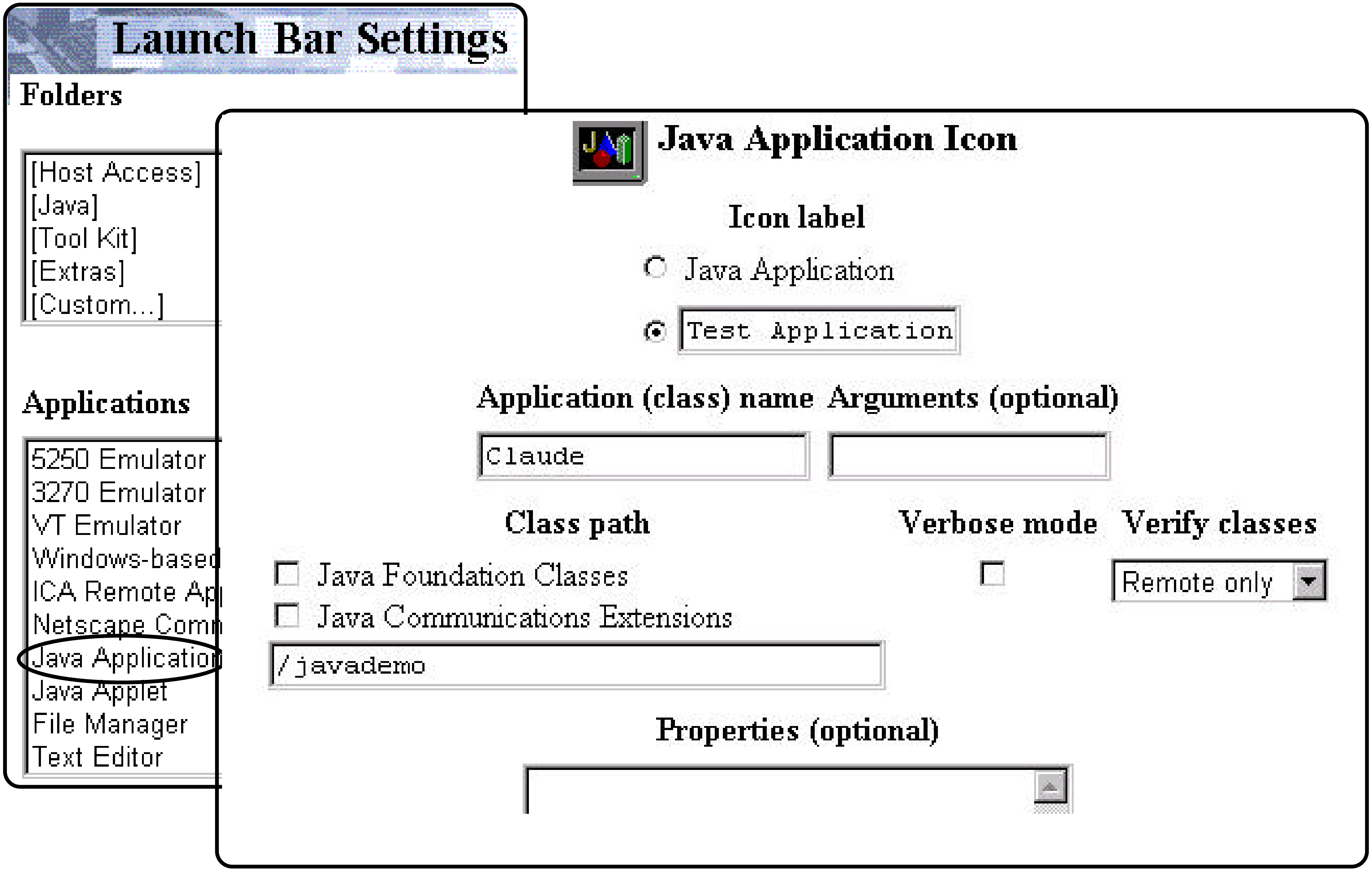
Notes

To add a Java applet definition in NSM, use the Desktop/Launchbar task from the level where you want to make this applet available (system, group or user), and in the Applications list, select the Java Applet entry, click on Add and the configuration panel shown on this chart is displayed.

There are only two choices:

- Use the standard name Java Applet as the label of the icon or specify your own name
- The URL of the applet. In this particular example, we specify a local path on the server where we have added a javademo directory to the root directory of the network station. This could also be specified as an HTTP://server etc. path.

Adding a Java Application in NSM



Launch Bar Settings

Folders

- [Host Access]
- [Java]
- [Tool Kit]
- [Extras]
- [Custom...]

Applications

- 5250 Emulator
- 3270 Emulator
- VT Emulator
- Windows-based
- ICA Remote Ap
- Netscape Comm
- Java Applicatio
- Java Applet
- File Manager
- Text Editor

Java Application Icon

Icon label

○ Java Application

● Test Application

Application (class) name: Claude

Arguments (optional):

Class path

□ Java Foundation Classes

□ Java Communications Extensions

/javademo

Verbose mode □

Verify classes: Remote only

Properties (optional)

Notes

To add a Java application, select Java application instead, click on Add and the panel shown here is displayed. In fact, this is only part of the panel that gets displayed; we selected a smaller portion in order to make it more readable.

- Again, the icon label can be changed from the default Java Application to your own words
- Then specify the application class name only and any arguments, if applicable
- Then specify the classpath (/javademo in this example) where the class is located
- If the class needs to use Java Foundations classes or Java Communications Extensions classes, a click on these checkboxes will automatically add the required path to the classpath.
- Finally specify Properties if the class needs properties to be specified and the verbose mode and verification of classes if required.
- The part of the panel that is not displayed here lets the user configure the heap sizes and stack sizes.

Testing Java applets and Applications

- **The Advanced Diagnostic window can be used to test applets and applications**
  - It avoids a more rapid change of parameters
  - Avoids having to make changes in NSM and then logoff/logon
- **Use the Java and appletviewer command as on any platform**
- **Examples:**
  - appletviewer http://nsedv2r1/v2/javademo/clock/example1.html
  - appletviewer /tmp/javademo/clcok/example1.html
  - Java -classpath /javademo/ Claude

Notes

Testing Java applets and applications on the Network Station can also be done using the command line of the Advanced Diagnostics window.

The benefit is that it can be much faster to test this way because it avoids having to make changes in NSM and then log the user off and on again for these changes to take effect.

Use the command as you would normally on any platforms, as shown here through a few examples.

- the fist one uses the appletviewer command followed by the normal http URL
- the second one uses also the appletviewer command but uses a local file specification instead of a URL
- the third example executes a Java class using the normal Java command, with a classpath that points to the local filesystem and finally the name of the class to execute

Where to find more information

- SG24-5844 - IBM Network Station Manager V2R1 Guide
- http://java.sun.com/products/plugin
- http://java.sun.com/products/javacomm
- http://java.sun.com/products/jfc
- http://java.sun.com/products/java-media/jmf

Notes

More information and examples are provided in the draft redbook on V2R1 that you can find on this CD.

You can also find information on Java at the URLs listed here.