Using the EPICS ArchiveViewer

Rev 00 11OCT2004 P. Sichta
Rev 01 12JAN2005 P. Sichta

1.0 Introduction

At NSTX EPICS software is used to archive periodically-sampled process points (typically, once per minute), such as machine temperatures. This procedure describes how to install a data-viewing tool (Archive Data Viewer) and some tips to help you to use the tool to retrieve, plot, and export the trended data to your PC. This procedure is written for Windows, Linux, and Mac OS X operating systems.

This document was written using the following software:

- Archive Data Viewer, version XAL 0.3.6.
- Java SDK 1.4.2_06.

2.0 References

1) Channel Archiver Manual, R3.14.4 version, Sept 30,2004 (see EPICS Home Page for link, or try here http://ics-web1.sns.ornl.gov/~kasemir/archiver/).
2) PPPL document NSTX-WBS6-DV-017, Installing the Channel Archiver V2.

3.0 Install Software

The ArchiveViewer uses Sun's Java Web-Start Technology. Using Java web-start (javaw) you download the latest version from the SNS/ORNL website where the software is maintained. This technology works for Linux, WindowsXP, and Macintosh (MacOS X, it should work but I couldn't get it to, will try harder someday).

3.1 Check for Java Software (for Windows)

The viewer uses java web start technology which means you must have the Sun software called Java SDK on your computer. MacOSx and Linux usually have J2SE built-in, for Windows you need to download and install it from Sun Computer's website.

- First check to see if you already have the Java software on your computer:
  - Poke Start→ Control Panel → Add or Remove Programs.
  - Look in the list of programs for 'Java' entries.
  - If you see Java 2 Runtime Environment or Java 2 SDK do not install another version of Java, proceed to section 3.2. Multiple Java versions can cause problems with Java web start.
  - If there are no Java entries, then install the J2SE Java Runtime Environment(JRE) package from Sun's website, currently it is at http://java.sun.com/j2se/1.4.2/download.html , and is shown in Appendix B.
- Choose J2SE v 1.4.2_06 JRE (not J2EE). Poke *Accept*, then *Continue*, then poke ***Windows Installation, Multi-language*** *(j2re-1_4_2_06-windows-i586-p-iftw.exe, 1.35 MB).*
- When the Run-Save-Cancel dialog appears, poke *Run*. The installation will begin. A Windows Security Warning may appear. If you used Sun's website to access the J2SE JRE installation, then poke *Run*. Otherwise choose *Don't Run* and use Sun's website.
- During the installation you will be asked to *Accept* Sun's software licensing terms, and then choose a *Typical* installation.
- After the installation you will have a Java icon on your desktop. The icon can be deleted, it is not necessary.

3.2 Install Archive Viewer (Windows)

- Begin the installation by using your web browser to navigate to http://ics-web1.sns.ornl.gov/archive/viewer/index.html .
- Pick the *Download* link.
- Then poke the *WEB START* link.
- Poke the Launch ArchiveViewer Web Start .
- A Java Security Warning will appear, poke *Start*.
- Answer *Yes* to the Desktop Integration prompt.
- A Windows Security Alert will appear. Poke *Unblock* to allow the Archive Viewer to run.
- The Archive Viewer program should now be running and appear on your screen.

- A desktop icon will have been added for the Archive Viewer.
- The installation is complete, proceed to section 4.0 to connect to the NSTX Data Server.

3.3 Install Archive Viewer (Linux)

(future)

3.4 Install Archive Viewer (Mac OsX)

(future)

4.0 Connect to NSTX Archive Data Server

When you start the program by double-clicking the desktop icon, a URL/connection to the SNS Archive Data Server at ORNL is embedded into the code. This is of no use to NSTX, so the steps below describe how to connect to NSTX data. Once connected and you have selected some channels you can save the configuration and startup will be much easier thereafter.

- Pull down the *File* menu and select *New Connection*.
- Enter the following into the new connection window: http://epicsgate02.pppl.gov/EpicsArchive/ArchiveDataServer.cgi
- You should now be connected to the NSTX Data Archive. Proceed to section 5 to select and view the data.

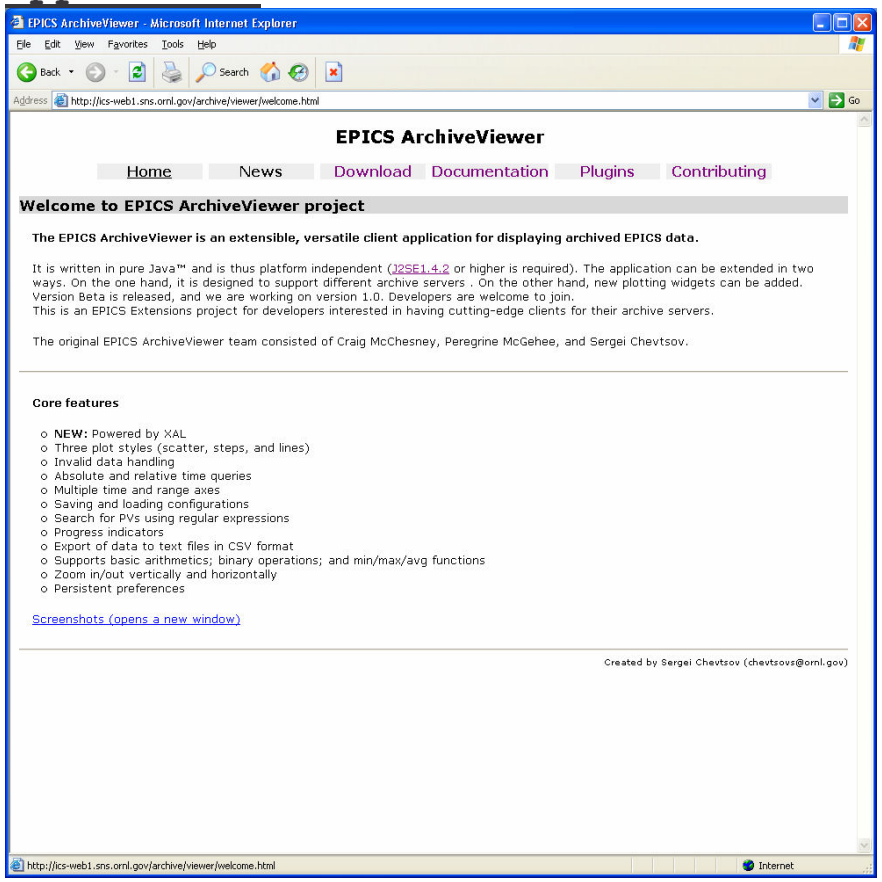
5.0 Use Archive Viewer to Plot Data

- The first step is to select an EPICS process value (PV):
  - Poke the *Search* button which will bring up a 'Search Dialog' window (see Appendix A).
  - Enter an '*' for wildcard *Search* to display all PV in the data archives.
  - Enter tc* to see only thermocouple-related data channels.
  - Select some PV names and hit the Add button.
- Go back to the main window and hit PLOT button to see data on the *Time Plots* tab in the lower portion of the window.
- Try adjusting the *Start* and *End* times.
- Try zooming and panning.
- Try *Export* to a file on your computer, suitable for use in a spreadsheet.
  - Poke the File menu.
  - Select Export.
  - Select your save options and browse to a folder and enter a filename (a .txt extension)
- You can **undock** the chart to make it larger by poking the 'overlaying boxes' icon in the upper-right corner of the *JFreeChart for Time Axis* window.
- Just play around, it is pretty straight forward.
- The Archive Viewer's Home page has link to Documentation, http://ics-web1.sns.ornl.gov/archive/viewer/documentation.html .

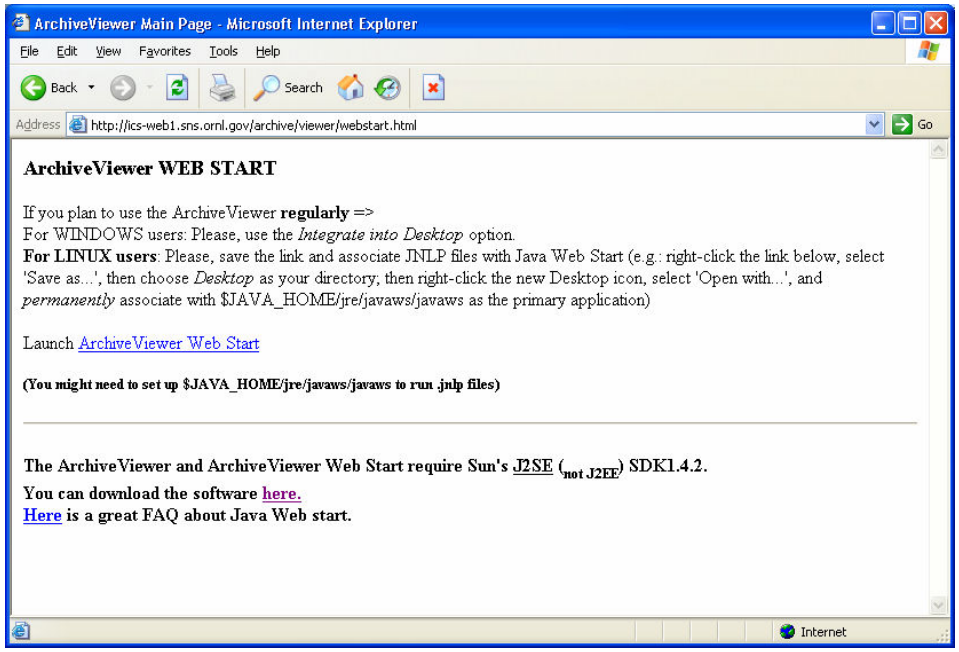
6.0 Hints

- Once you are logged into the NSTX Data Server, you should do a SAVE AS so that startup up will be simpler in the future:
  - Pull down the FILE menu and select SAVE AS.
  - I suggest you save in your Desktop, so you can see the icon.
  - Enter a filename, like NSTX_Archive.xml .
  - Hit the Save button. An icon should appear on your desktop for the filename you used.
  - To use this configuration:
    - Startup the Archive Viewer (use the ArchiveViewer desktop icon if you used Desktop Integration during the installation).
    - Then use the File menue and select OPEN RECENT and you should see the config file you saved.
    - Then, hit he plot button, etc…

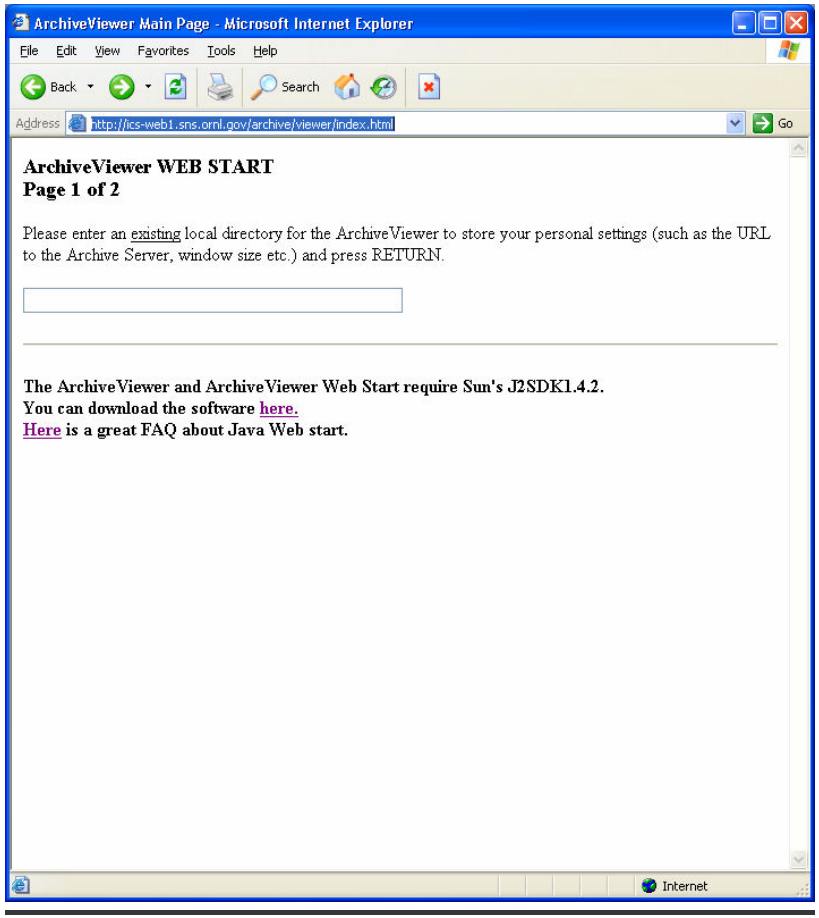
Appendix A

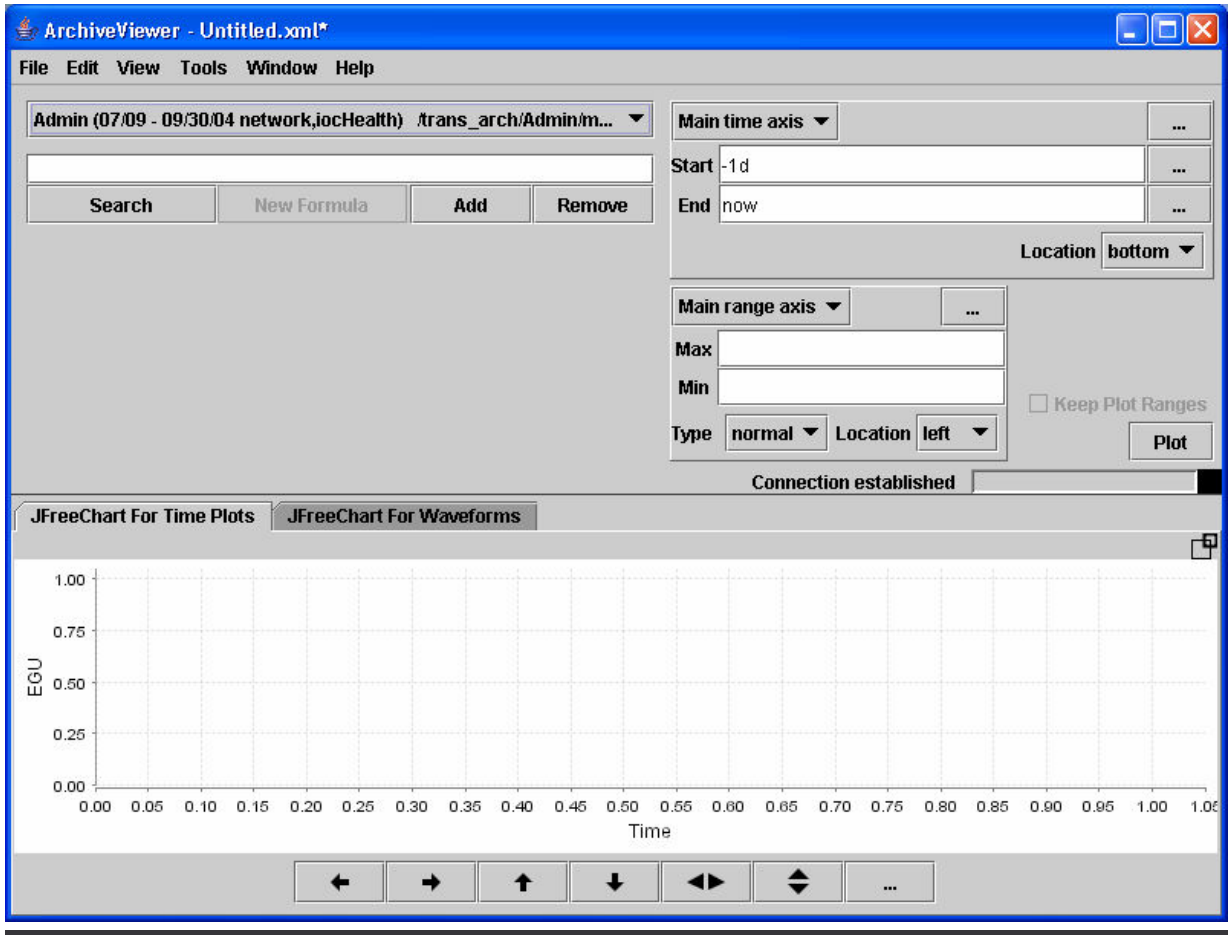

EPICS ArchiveViewer - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search
Address http://ics-web1.sns.ornl.gov/archive/viewer/welcome.html
Go
EPICS ArchiveViewer
Home News Download Documentation Plugins Contributing
Welcome to EPICS ArchiveViewer project
The EPICS ArchiveViewer is an extensible, versatile client application for displaying archived EPICS data.
It is written in pure Java™ and is thus platform independent (J2SE1.4.2 or higher is required). The application can be extended in two ways. On the one hand, it is designed to support different archive servers . On the other hand, new plotting widgets can be added.
Version Beta is released, and we are working on version 1.0. Developers are welcome to join.
This is an EPICS Extensions project for developers interested in having cutting-edge clients for their archive servers.
The original EPICS ArchiveViewer team consisted of Craig McChesney, Peregrine McGehee, and Sergei Chevtsov.
Core features
NEW: Powered by XAL
Three plot styles (scatter, steps, and lines)
Invalid data handling
Absolute and relative time queries
Multiple time and range axes
Saving and loading configurations
Search for PVs using regular expressions
Progress indicators
Export of data to text files in CSV format
Supports basic arithmetics; binary operations; and min/max/avg functions
Zoom in/out vertically and horizontally
Persistent preferences
Screenshots (opens a new window)
Created by Sergei Chevtsov (chevtsovs@ornl.gov)
http://ics-web1.sns.ornl.gov/archive/viewer/welcome.html
Internet

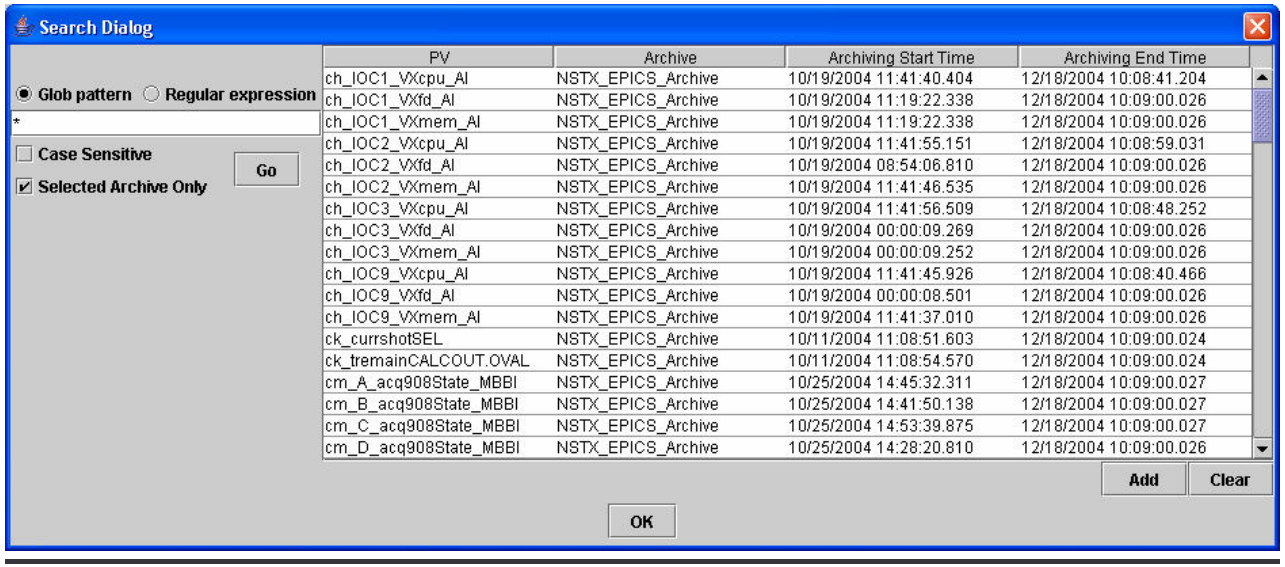
EPICS ArchiveViewer - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search
Address http://ics-web1.sns.ornl.gov/archive/viewer/download.html
Go
EPICS ArchiveViewer
Home News Download Documentation Plugins Contributing
Download page
The EPICS ArchiveViewer is released under an EPICS license. If you find ArchiveViewer useful, or just want to know about future releases, be sure to join the mailing list.
ArchiveViewer requires J2SE 1.4.2 or newer, which is available here.
Please, do not download J2EE!
Following download options are available for different user groups:
WEB START
Advantages:
simplest possible installation
automatic updates
must trust me
Disadvantages:
no source code
impossible to use from command line, shell scripts etc.
must trust me
Recommended for:
casual users
DOWNLOAD JAR FILES
Advantages:
greater control of options, runtime parameters etc.
integration into shell scripts possible
Disadvantages:
manual update checks required
basic knowledge of shells needed
Recommended for:
advanced users with no development desires
DOWNLOAD RAW FILES
Advantages:
source code is available
control over build process
Disadvantages:
no automatic updates
you have to build your tool yourself
Recommended for:
developers
Note:
You will probably want to have ANT to build ArchiveViewer
Internet

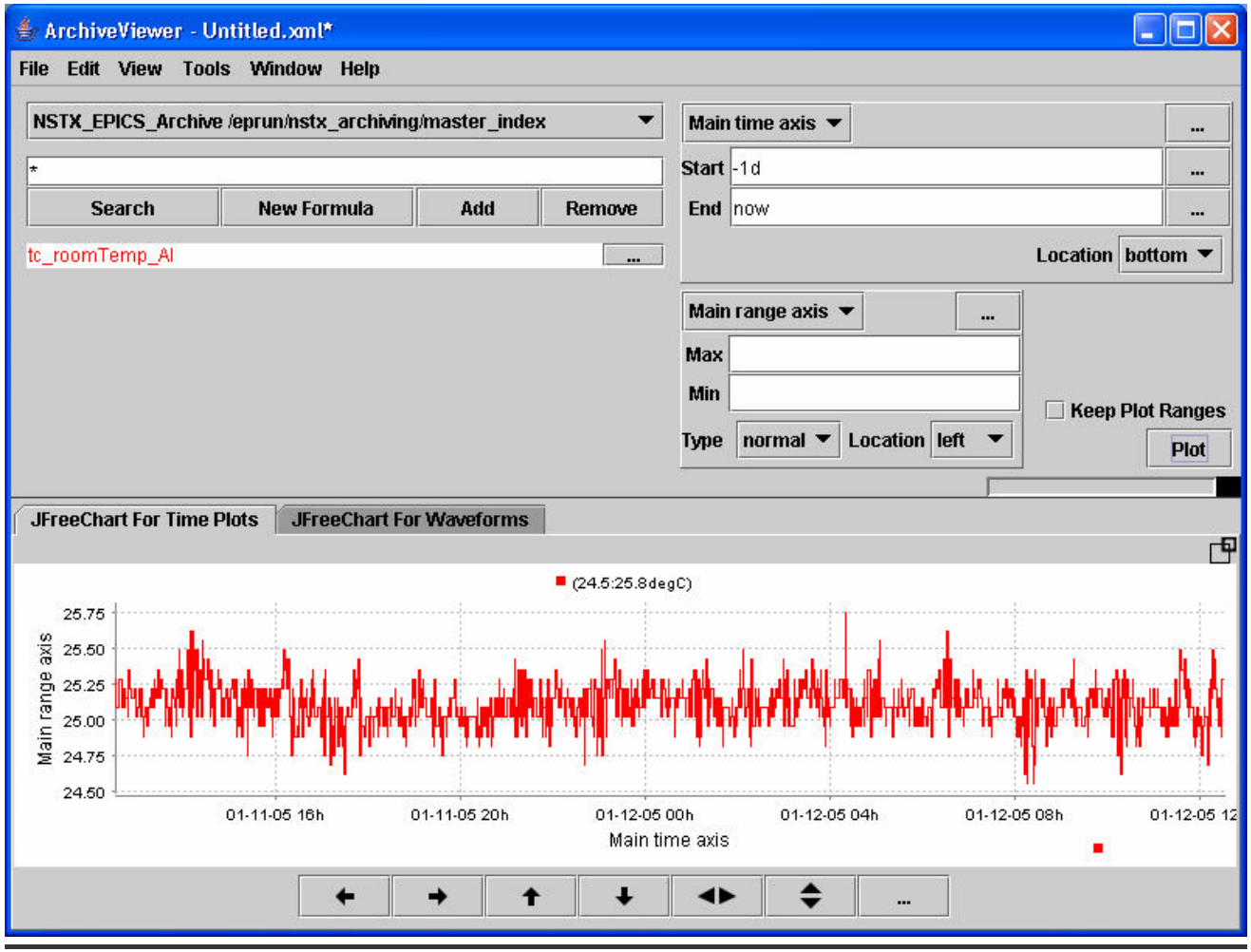


Java Web Start Installation for Java Archive Viewer Client


ArchiveViewer Main Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search
Address http://ics-web1.sns.ornl.gov/archive/viewer/index.html
Go
ArchiveViewer WEB START
Page 1 of 2
Please enter an existing local directory for the ArchiveViewer to store your personal settings (such as the URL to the Archive Server, window size etc.) and press RETURN.
The ArchiveViewer and ArchiveViewer Web Start require Sun's J2SDK1.4.2.
You can download the software here.
Here is a great FAQ about Java Web start.
Internet


ArchiveViewer - Untitled.xml*
File Edit View Tools Window Help
Admin (07/09 - 09/30/04 network,iocHealth) /trans_arch/Admin/m...
Search
New Formula
Add
Remove
Main time axis
Start -1d
End now
Location bottom
Main range axis
Max
Min
Type normal
Location left
Keep Plot Ranges
Plot
Connection established
JFreeChart For Time Plots
JFreeChart For Waveforms
EGU
1.00
0.75
0.50
0.25
0.00
0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00
Time


Search Dialog
Glob pattern
Regular expression
*
Case Sensitive
Selected Archive Only
Go
PV
Archive
Archiving Start Time
Archiving End Time
ch_IOC1_VXcpu_AI NSTX_EPICS_Archive 10/19/2004 11:41:40.404 12/18/2004 10:08:41.204
ch_IOC1_VXfd_AI NSTX_EPICS_Archive 10/19/2004 11:19:22.338 12/18/2004 10:09:00.026
ch_IOC1_VXmem_AI NSTX_EPICS_Archive 10/19/2004 11:19:22.338 12/18/2004 10:09:00.026
ch_IOC2_VXcpu_AI NSTX_EPICS_Archive 10/19/2004 11:41:55.151 12/18/2004 10:08:59.031
ch_IOC2_VXfd_AI NSTX_EPICS_Archive 10/19/2004 08:54:06.810 12/18/2004 10:09:00.026
ch_IOC2_VXmem_AI NSTX_EPICS_Archive 10/19/2004 11:41:46.535 12/18/2004 10:09:00.026
ch_IOC3_VXcpu_AI NSTX_EPICS_Archive 10/19/2004 11:41:56.509 12/18/2004 10:08:48.252
ch_IOC3_VXfd_AI NSTX_EPICS_Archive 10/19/2004 00:00:09.269 12/18/2004 10:09:00.026
ch_IOC3_VXmem_AI NSTX_EPICS_Archive 10/19/2004 00:00:09.252 12/18/2004 10:09:00.026
ch_IOC9_VXcpu_AI NSTX_EPICS_Archive 10/19/2004 11:41:45.926 12/18/2004 10:08:40.466
ch_IOC9_VXfd_AI NSTX_EPICS_Archive 10/19/2004 00:00:08.501 12/18/2004 10:09:00.026
ch_IOC9_VXmem_AI NSTX_EPICS_Archive 10/19/2004 11:41:37.010 12/18/2004 10:09:00.026
ck_currshotSEL NSTX_EPICS_Archive 10/11/2004 11:08:51.603 12/18/2004 10:09:00.024
ck_tremainCALCOUT.OVAL NSTX_EPICS_Archive 10/11/2004 11:08:54.570 12/18/2004 10:09:00.024
cm_A_acq908State_MBBI NSTX_EPICS_Archive 10/25/2004 14:45:32.311 12/18/2004 10:09:00.027
cm_B_acq908State_MBBI NSTX_EPICS_Archive 10/25/2004 14:41:50.138 12/18/2004 10:09:00.027
cm_C_acq908State_MBBI NSTX_EPICS_Archive 10/25/2004 14:53:39.875 12/18/2004 10:09:00.027
cm_D_acq908State_MBBI NSTX_EPICS_Archive 10/25/2004 14:28:20.810 12/18/2004 10:09:00.026
Add
Clear
OK


ArchiveViewer - Untitled.xml*
File Edit View Tools Window Help
NSTX_EPICS_Archive /eprun/nstx_archiving/master_index
*
Search
New Formula
Add
Remove
tc_roomTemp_AI
Main time axis
Start -1d
End now
Location bottom
Main range axis
Max
Min
Type normal
Location left
Keep Plot Ranges
Plot
JFreeChart For Time Plots
JFreeChart For Waveforms
(24.5:25.8degC)
25.75
25.50
25.25
25.00
24.75
24.50
Main range axis
01-11-05 16h
01-11-05 20h
01-12-05 00h
01-12-05 04h
01-12-05 08h
Main time axis

testfile.txt - Notepad

File Edit Format View Help

```
# tc_roomTemp_AI
# NSTX_EPICS_Archive
# type: double□# disp_low: 0.0□# disp_high: 400.0□# alarm_low: 5.0□# alarm_high: 50.0□# warn_low: 10.0□#
warn_high: 40.0□# precision: 1□# units: degC□#
# tc_spp_u_4_AI
# NSTX_EPICS_Archive
# type: double□# disp_low: 0.0□# disp_high: 400.0□# alarm_low: 10.0□# alarm_high: 500.0□# warn_low: 12.0□#
warn_high: 450.0□# precision: 0□# units: degC□#
#Timestamp      tc_roomTemp_AI  tc_spp_u_4_AI
12:42:18        24.4    0
12:43:18        24.7    0
12:43:30        24.7    18
12:44:18        24.5    18
12:44:30        24.5    18
12:45:18        24.4    18
12:45:30        24.4    18
12:46:18        24.3    18
12:46:30        24.3    18
12:47:18        24.5    18
12:47:30        24.5    18
12:48:30        24.5    18
12:49:30        24.5    18
12:50:30        24.5    18
12:51:30        24.5    18
12:52:30        24.5    18
12:53:30        24.4    18
12:54:30        24.4    18
12:55:30        24.5    18
12:56:30        24.7    18
12:57:30        24.6    18
12:58:30        24.5    18
12:59:30        24.4    18
01:00:30        24.5    18
01:01:30        24.4    18
01:02:30        24.6    18
01:03:30        24.8    18
01:04:30        24.8    18
01:05:30        24.7    18
01:06:30        24.7    18
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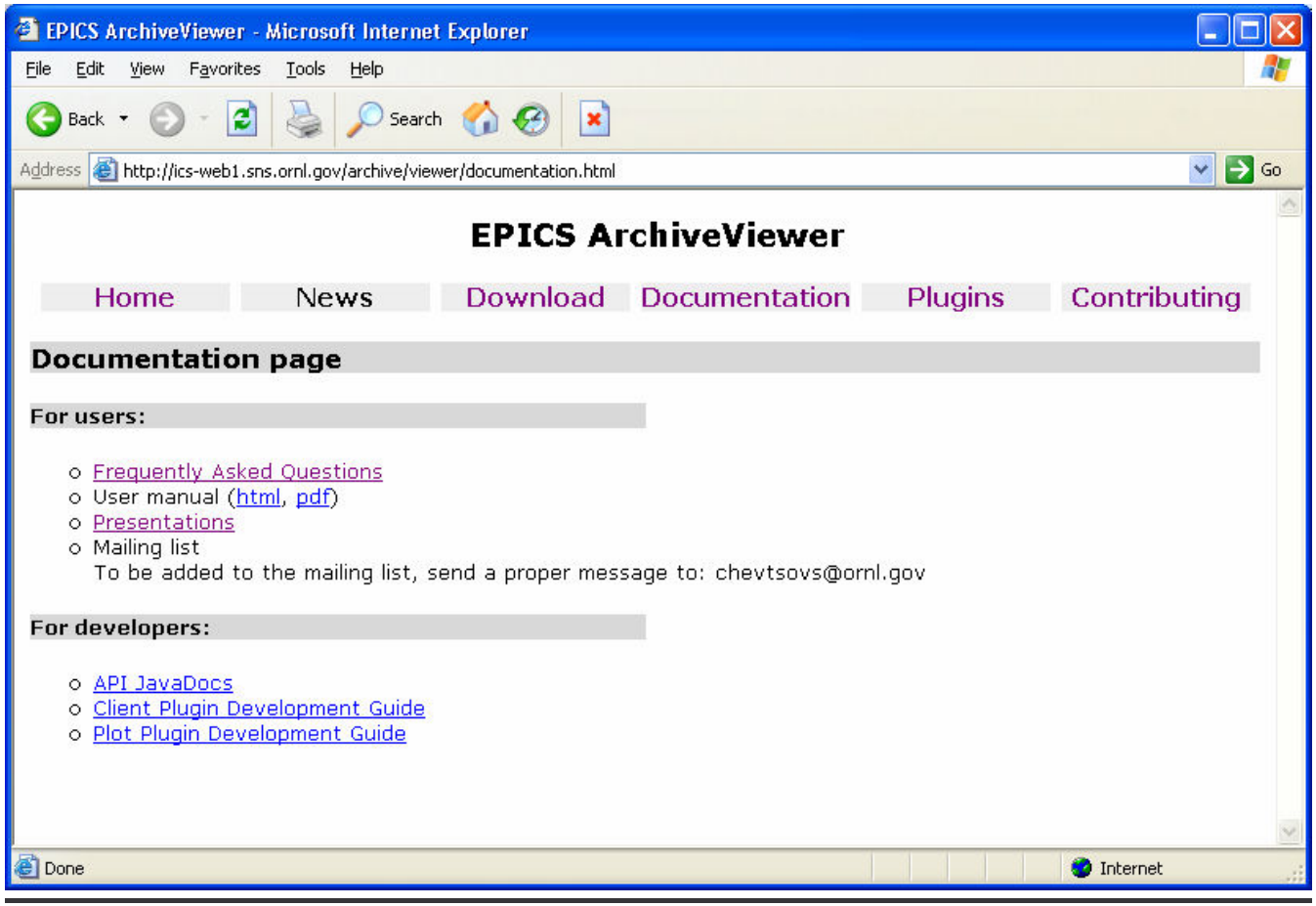
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Back Search
Address http://ics-web1.sns.ornl.gov/archive/viewer/documentation.html
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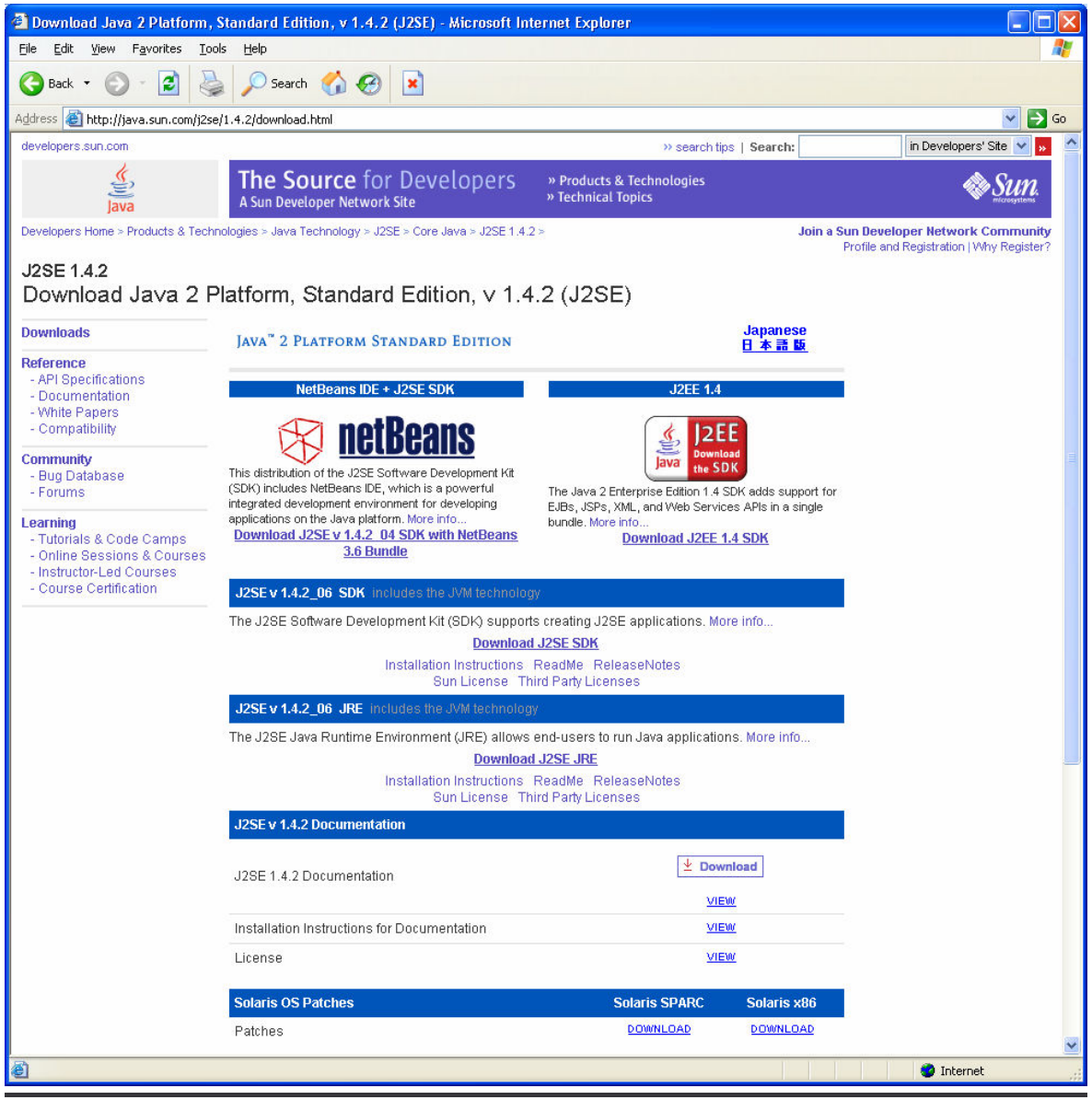
Documentation page
For users:
Frequently Asked Questions
User manual (html, pdf)
Presentations
Mailing list
To be added to the mailing list, send a proper message to: chevtsovs@ornl.gov
For developers:
API JavaDocs
Client Plugin Development Guide
Plot Plugin Development Guide
Done
Internet

Appendix B – Java SDK Installation Support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- Online Sessions & Courses
- Instructor-Led Courses
- Course Certification
JAVA™ 2 PLATFORM STANDARD EDITION
Japanese
日本語版
NetBeans IDE + J2SE SDK
netBeans
This distribution of the J2SE Software Development Kit (SDK) includes NetBeans IDE, which is a powerful integrated development environment for developing applications on the Java platform. More info...
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J2EE Download the SDK
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J2SE v 1.4.2_06 SDK includes the JVM technology
The J2SE Software Development Kit (SDK) supports creating J2SE applications. More info...
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J2SE v 1.4.2_06 JRE includes the JVM technology
The J2SE Java Runtime Environment (JRE) allows end-users to run Java applications. More info...
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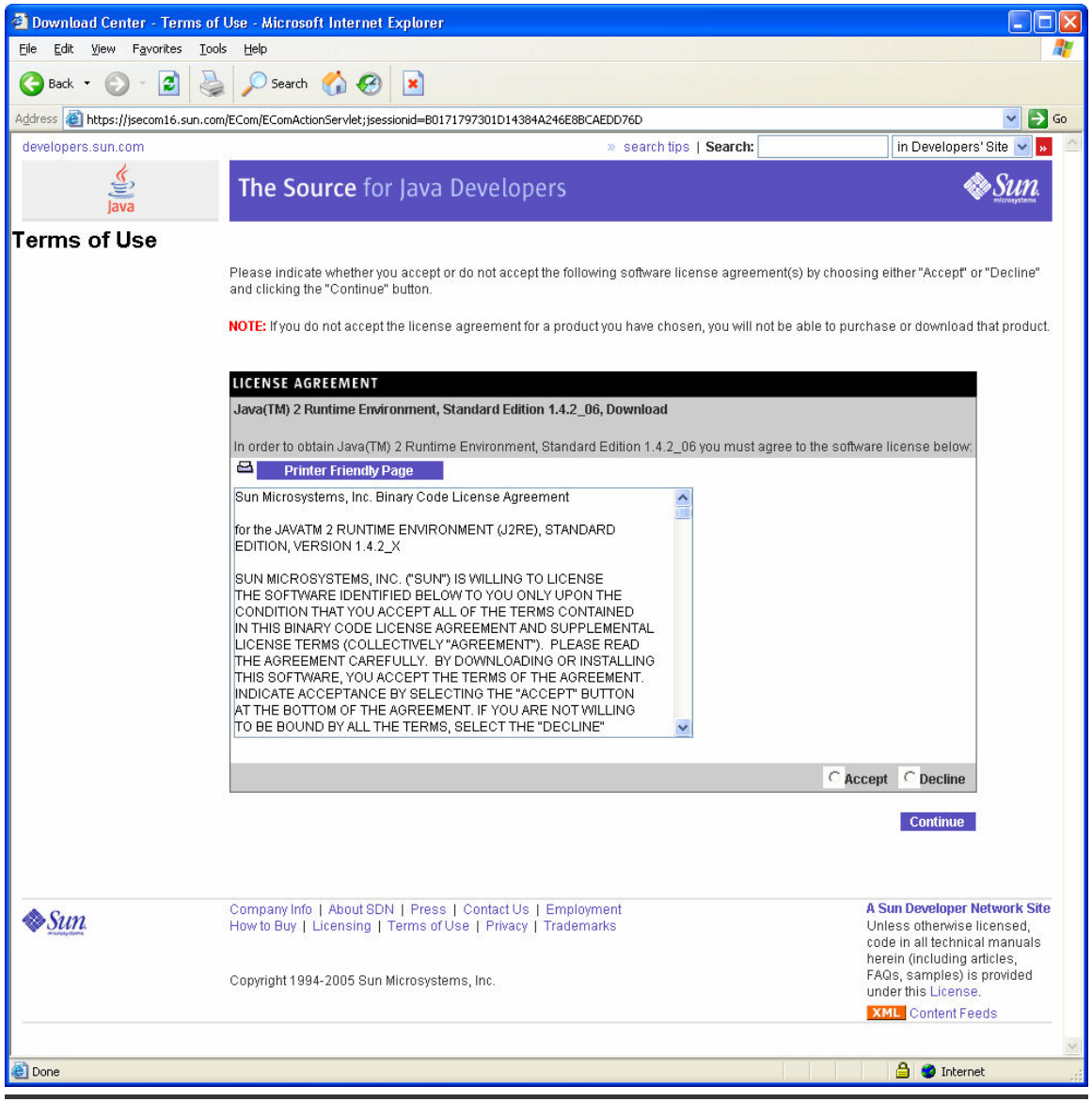
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File Edit View Favorites Tools Help
Back Search
Address https://jsecom16.sun.com/ECom/EComActionServlet;jsessionid=B0171797301D14384A246E8BCAEDD76D
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developers.sun.com
» search tips | Search: in Developers' Site
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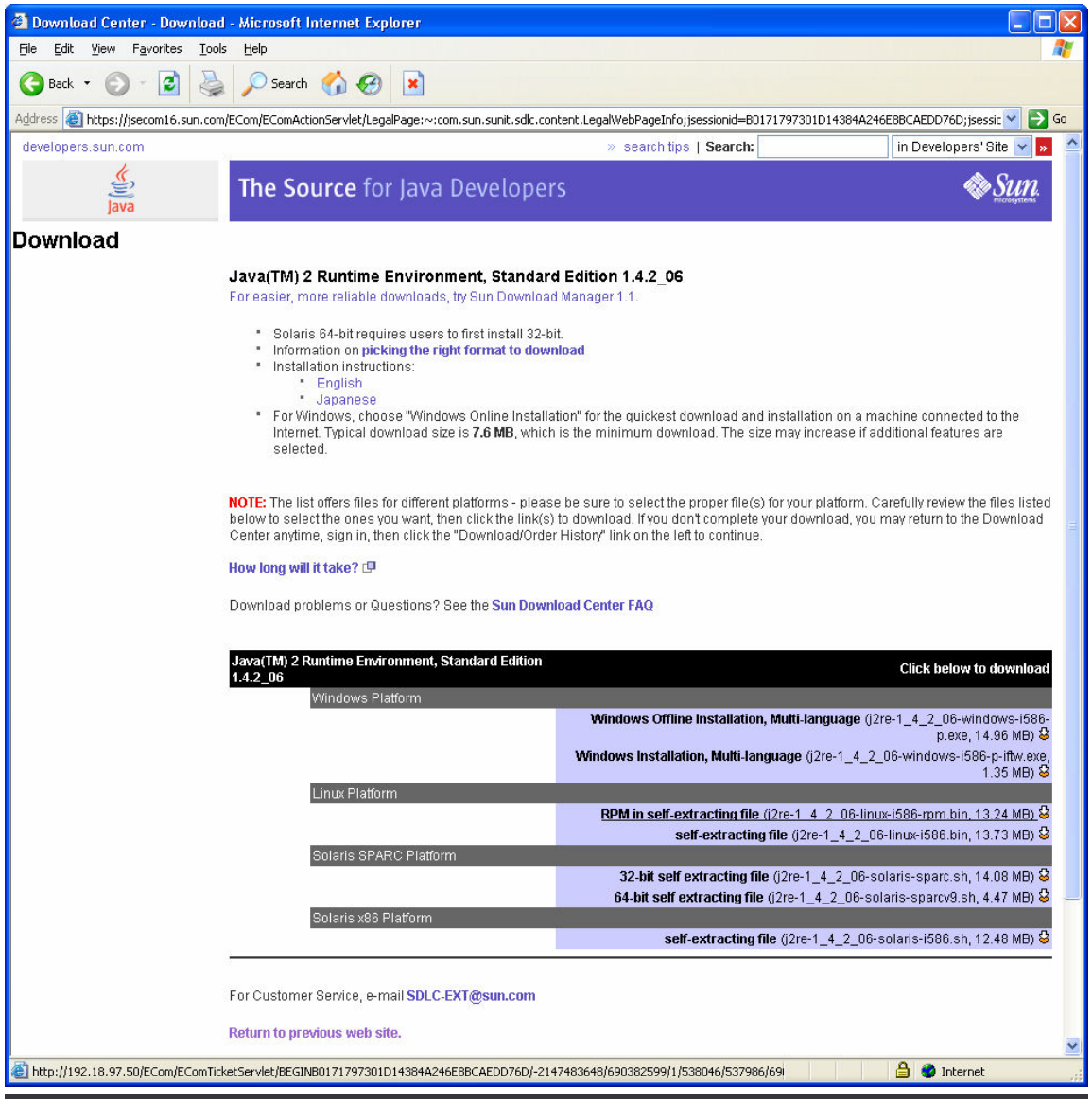
XML Content Feeds
Done
Internet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Back Search
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Go
developers.sun.com
search tips | Search: in Developers' Site
Java
The Source for Java Developers
Sun microsystems
Download
Java(TM) 2 Runtime Environment, Standard Edition 1.4.2_06
For easier, more reliable downloads, try Sun Download Manager 1.1.
Solaris 64-bit requires users to first install 32-bit.
Information on picking the right format to download
Installation instructions:
English
Japanese
For Windows, choose "Windows Online Installation" for the quickest download and installation on a machine connected to the Internet. Typical download size is 7.6 MB, which is the minimum download. The size may increase if additional features are selected.
NOTE: The list offers files for different platforms - please be sure to select the proper file(s) for your platform. Carefully review the files listed below to select the ones you want, then click the link(s) to download. If you don't complete your download, you may return to the Download Center anytime, sign in, then click the "Download/Order History" link on the left to continue.
How long will it take?
Download problems or Questions? See the Sun Download Center FAQ
Java(TM) 2 Runtime Environment, Standard Edition 1.4.2_06
Click below to download
Windows Platform
Windows Offline Installation, Multi-language (j2re-1_4_2_06-windows-i586-p.exe, 14.96 MB)
Windows Installation, Multi-language (j2re-1_4_2_06-windows-i586-p-iftw.exe, 1.35 MB)
Linux Platform
RPM in self-extracting file (j2re-1_4_2_06-linux-i586-rpm.bin, 13.24 MB)
self-extracting file (j2re-1_4_2_06-linux-i586.bin, 13.73 MB)
Solaris SPARC Platform
32-bit self extracting file (j2re-1_4_2_06-solaris-sparc.sh, 14.08 MB)
64-bit self extracting file (j2re-1_4_2_06-solaris-sparcv9.sh, 4.47 MB)
Solaris x86 Platform
self-extracting file (j2re-1_4_2_06-solaris-i586.sh, 12.48 MB)
For Customer Service, e-mail SDLC-EXT@sun.com
Return to previous web site.
http://192.18.97.50/ECom/EComTicketServlet/BEGINB0171797301D14384A246E8BCAEDD76D/-2147483648/690382599/1/538046/537986/69
Internet

I) WindowsXP Java SDK Installation Support

See http://java.sun.com/j2se/1.4.2/install-windows.html for full text.

1.0 Installation Notes
Java 2 SDK, Standard Edition
Version 1.4.2
Microsoft Windows

Installation Instructions
In this procedure, you will run the self-installing executable to unpack and install the Java 2 SDK software bundle. As part of the Java 2 SDK, this installation includes the Java Plug-in and Java Web Start, as well as an option to include the public Java 2 Runtime Environment. (The Java 2 SDK also contains a private J2RE for use only by its tools.)

1. Check the download file size (Optional)

If you save the self-installing executable to disk without running it from the download page at the web site, notice that its byte size is provided on the download page. Once the download has completed, check that you have downloaded the full, uncorrupted software file.
2. If 1.4.2 Beta is installed, uninstall it.
Use the Microsoft Windows Add/Remove Programs utility, accessible from the Control Panel (Start -> Settings -> Control Panel).

3. Run the Java 2 SDK installer
Note - you must have administrative permissions in order to install the Java 2 SDK on Microsoft Windows 2000 and XP.
The file j2sdk-1_4_2_<version>-windows-i586-i.exe is the Java 2 SDK installer. If you downloaded it instead of running it directly from the web site, double-click on the installer's icon. Then follow the instructions the installer provides. The installer may ask you to reboot your computer. When done with the installation, you can delete the download file to recover disk space.
4. If you want to run Netscape 7.x/Mozilla 1.x with Java Plug-in, do this:

Exit the Netscape 7.x/Mozilla 1.x browser and all Netscape 7.x/Mozilla 1.x "objects" (Messenger, Composer ...);
If the Quick Launch feature is enabled, disable it;
Then restart Netscape 7.x/Mozilla 1.x.

5. Update the PATH variable (Optional)

You can run the Java 2 SDK without setting the PATH variable, or you can optionally set it as a convenience.
Should I set the PATH variable?
Set the PATH variable if you want to be able to conveniently run the Java 2 SDK executables (javac.exe, java.exe, javadoc.exe, etc.) from any directory without having to type the full path of the command. If you don't set the PATH variable, you need to specify the full path to the executable every time you run it, such as:

```
C:> \j2sdk1.4.2_<version>\bin\javac MyClass.java
```

It's useful to set the PATH permanently so it will persist after rebooting.
How do I set the PATH permanently?
To set the PATH permanently, add the full path of the j2sdk1.4.2_<version>\bin directory to the PATH variable. Typically this full path looks something like C:\j2sdk1.4.2_<version>\bin. Set the PATH as follows, according to whether you are on Microsoft Windows NT or 98/2000/ME.

Microsoft Windows NT, 2000, and XP - To set the PATH permanently:

Choose Start, Settings, Control Panel, and double-click System. On Microsoft Windows NT, select the Environment tab; on Microsoft Windows 2000 select the Advanced tab and then Environment Variables. Look for "Path" in the User Variables and System Variables. If you're not sure where to add the path, add it to the right end of the "Path" in the User Variables. A typical value for PATH is:

```
C:\j2sdk1.4.2_<version>\bin
```

Capitalization doesn't matter. Click "Set", "OK" or "Apply".
The PATH can be a series of directories separated by semi-colons (;). Microsoft Windows looks for programs in the PATH directories in order, from left to right. You should only have one bin directory for a Java SDK in the path at a time (those following the first are ignored), so if one is already present, you can update it to j2sdk1.4.2_<version>\bin.

The new path takes effect in each new Command Prompt window you open after setting the PATH variable.

II) Linux Java SDK Installation Support

SUN's instructions to install SDK RPM:

Installation of RPM File

Use these instructions if you want to install Java 2 SDK in the form of RPM packages. If you want to use the self-extracting binary file instead, see Installation of Self-Extracting Binary.

1. Download and check the file size.

You can download to any directory you choose.
Before you download the file, notice its byte size provided on the download page on the web site. Once the download has completed, compare that file size to the size of the downloaded file to make sure they are equal.

2. Extract the contents of the downloaded file.

Change directory to where the downloaded file is located and run these commands to first set the executable permissions and then run the binary to extract the RPM file:
chmod a+x j2sdk-1_4_2_<version>-linux-i586-rpm.bin

./j2sdk-1_4_2_<version>-linux-i586-rpm.bin
Note that the initial "`./`" is required if you do not have "`.`" in your PATH environment variable.

The script displays a binary license agreement, which you are asked to agree to before installation can proceed. Once you have agreed to the license, the install script creates the file `j2sdk-1_4_2_<version>-linux-i586.rpm` in the current directory.

3. Become root by running the `su` command and entering the super-user password.

4. Run the `rpm` command to install the packages that comprise the Java 2 SDK:

rpm -iv j2sdk-1_4_2_<version>-linux-i586.rpm
5. Delete the `bin` and `rpm` file if you want to save disk space.
6. Exit the root shell.

Notes on Java http://www.cs.brandeis.edu/~guru/java-notes.html

If you are having trouble with java, for example getting the following error message:

```
libgcj-java-placeholder.sh

This script is a placeholder for the /usr/bin/java and /usr/bin/javac
master links required by jpackage.org conventions. libgcj's
rmiregistry, rmic and jar tools are now slave symlinks to these
masters, and are managed by the alternatives(8) system.

This change was necessary because the rmiregistry, rmic and jar tools
installed by previous versions of libgcj conflicted with symlinks
installed by jpackage.org JVM packages.
```

Then read on:

```
Java *should* be installed at /usr/java/j2sdk1.4.2_05/ (if it isn't, please send an email to guru at cs dot
brandeis dot edu telling us which machine you were working on)

In order to add java to your path, first determine your shell:
echo $SHELL

If it returns /bin/bash you need to edit your ~/.bashrc file:
echo 'export PATH="/usr/java/j2sdk1.4.2_05/bin/:${PATH}"' >> ~/.bashrc

If it returns /bin/tcsh you need to edit your ~/.cshrc file:
echo 'setenv PATH "/usr/java/j2sdk1.4.2_05/bin/:\${PATH}"' >> ~/.cshrc

(If it returns anything else, you ought to be able to deal with this on your own.)

At this point you can log out and log back in again and java should work as you expect.  To make sure, you
can run:
which java
and it should return /usr/java/j2sdk1.4.2_05/bin/java.  If it doesn't, you might run into problems.
```