

Configuring Your System for MV3500 Networked Graphics and Simulation

Setting up Java, Netbeans, Git,
Wireshark, and Software Tools

Configuration Topics

Good collaboration setup is important!

This illustrated slideset covers

- Java OpenJDK and Javadoc
- NetBeans and NetBeans plugins
- Git and gitlab.nps.edu, tokens
- GIMP, Visio and other tools
- X3D-Edit
- Collaboration and Troubleshooting



Full configuration details
are maintained online at
[Savage Developers Guide](#)

Java install

OpenJDK

<https://openjdk.org>

What is this? The place to collaborate on an open-source implementation of the Java Platform, Standard Edition, and related projects.

Download and install the latest open-source JDK. Oracle's free, GPL-licensed, production-ready OpenJDK JDK 22 binaries for Linux, macOS, and Windows are available at jdk.java.net/22; Oracle's commercially-licensed JDK 22 binaries, based on the same code, are here.

Learn about the key active Projects in the Community including [Amber](#) (high-productivity language features), [Loom](#) (lightweight concurrency), [Panama](#) (foreign functions and foreign data), [Valhalla](#) (primitive types and specialized generics), and, of course, the next version of Java and the JDK.

If you want to learn how to use Java features that are available today, head over to [dev.java](#).

Hack on the JDK itself, right here in the OpenJDK Community: [Browse the code](#) on the web, [clone a repository](#) to make a local copy, and [contribute a patch](#) to fix a bug, enhance an existing component, or define a new feature.

OpenJDK JDK 22.0.1 General-Availability Release

This page provides production-ready open-source builds of the Java Development Kit, version 22, an implementation of the Java SE 22 Platform under the GNU General Public License, version 2, with the Classpath Exception.

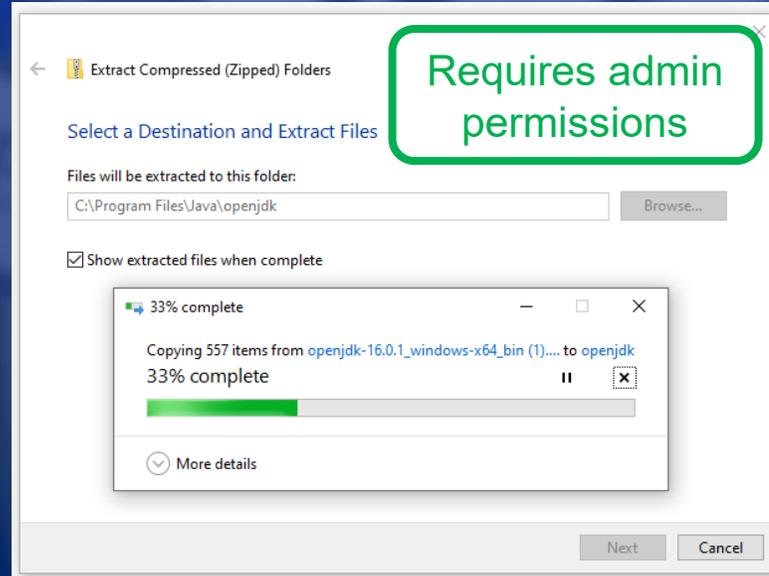
Commercial builds of JDK 22.0.1 from Oracle, under a non-open-source license, can be found [here](#).

Documentation

- [Features](#)
- [Release notes](#)
- [API Javadoc](#)

Builds

Linux/AArch64	tar.gz (sha256)	200176007 bytes
Linux/x64	tar.gz (sha256)	202217886
macOS/AArch64	tar.gz (sha256)	195900042
macOS/x64	tar.gz (sha256)	198190735
Windows/x64	zip (sha256)	200536892



Javadoc

[JDK 22 Javadoc Documentation](#) describes all Java interfaces in full detail. Good to [download local copy](#) with your Java install.

You can go to *build.xml* and run *Javadoc* on your local projects for MV3500 *examples* and MV3500 *assignments*.

Be sure to update or add Javadoc entries in your programs.

Having Javadoc available greatly aids understanding and will often uncover flaws that might otherwise go unnoticed.

Guidance: [How to Write Doc Comments for the Javadoc Tool](#)

Apache NetBeans Search the docs Community Participate Blog Get Help Plugins Download

Latest release
Apache NetBeans 22
 Download



Apache NetBeans

Fits the Pieces Together

Development Environment, Tooling Platform and Application Framework.

Fast & Smart Editing

Apache NetBeans is much more than a text editor. It highlights source code **syntactically and semantically**, lets you easily **refactor code**, with a range of handy and powerful tools.

Java, JavaScript, PHP, HTML5, CSS, and More

Apache NetBeans provides editors, wizards, and templates to help you create applications in **Java, PHP** and many other languages.

Cross Platform

Apache NetBeans can be **installed** on all operating systems that support Java, i.e. Windows, Linux, Mac OSX and BSD. Write Once, Run Anywhere, applies to NetBeans too.

Join us

Subscribe to our **mailing lists**, or follow us in **Twitter, Slack, FaceBook** or **YouTube**.

Participate

See how you can participate by **submitting pull requests**, **filing issues**, or joining the **NetCAT** program.

Learn

We are currently reviewing the tutorials. See how you can **help us** review the **Java** and **PHP** tutorials.

f t y r s g

See this page in GitHub.

Apache NetBeans Search the docs Community Participate Blog Get Help

Latest release
Apache NetBeans 22
 Download

Apache NetBeans Releases

Apache NetBeans is released four times a year. For details, see [full release schedule](#).

Apache NetBeans 22

Latest version of the IDE, released on May 29, 2024.

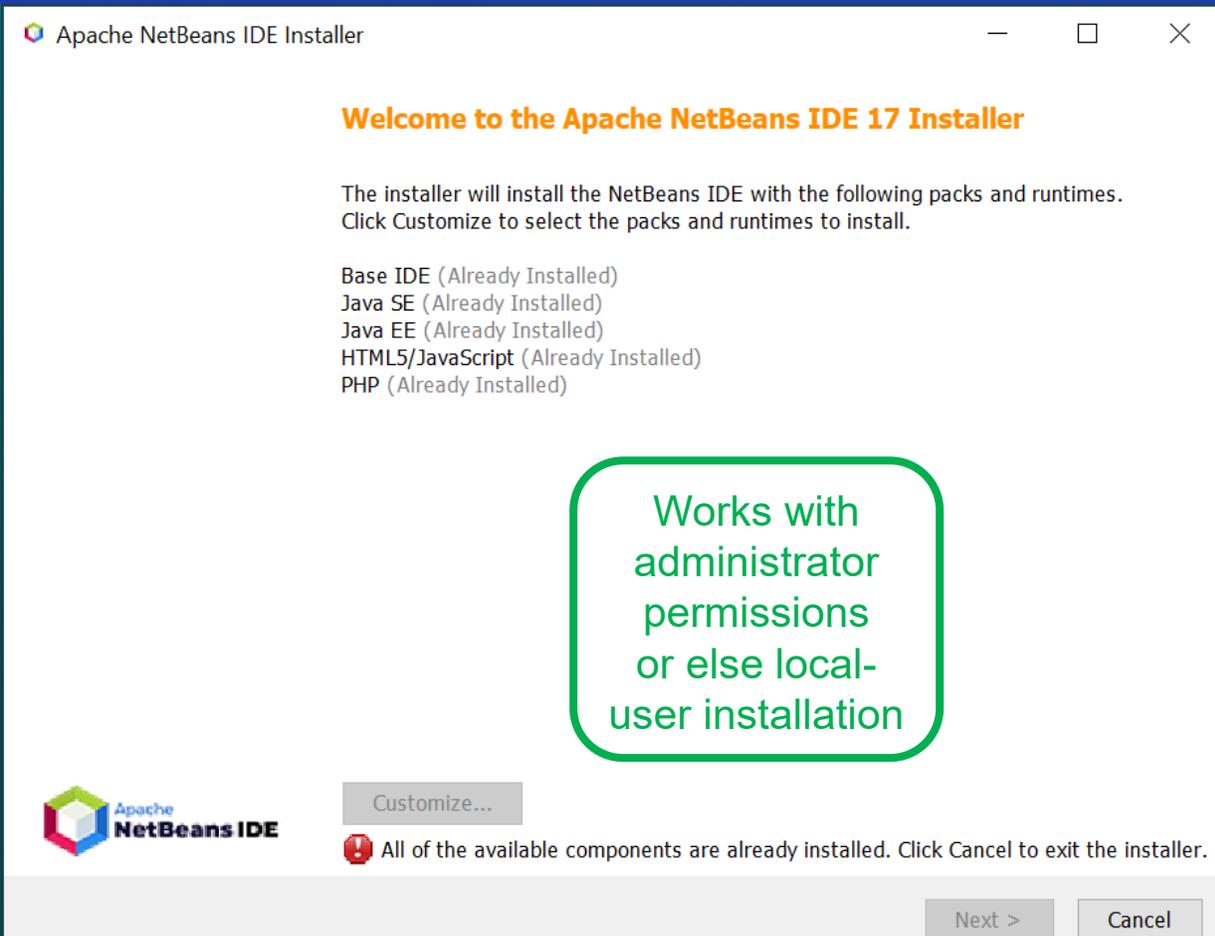
Download

Now using version 22



Apache Netbeans Configuration

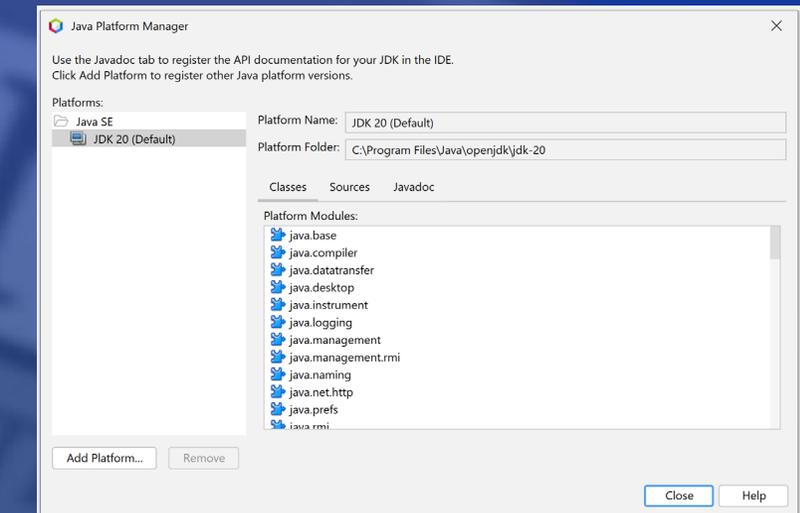
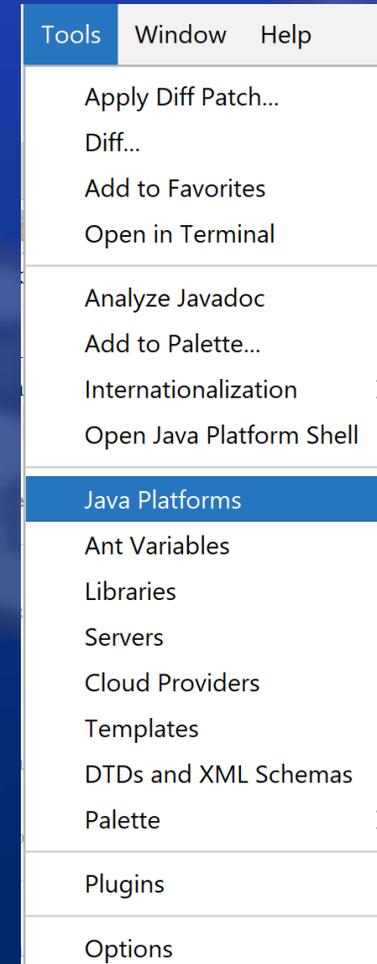
OS-specific installer or extract .zip version



Once running NetBeans, can further adjust

Adjusting Java version:

- *Tools > Java Platforms*





gitlab.nps.edu

NPS GitLab

NPS users

- Sign in using the "NPS account" button below.

External users

- Sign in using your email and password.

Manage Git repositories with fine-grained access controls that keep your code secure. Perform code reviews and enhance collaboration with merge requests. Each project can also have an issue tracker and a wiki.

By logging in, you agree to the terms described within the [DoD Acceptable Use Policy](#).

External users

Username or email

Password

Remember me [Forgot your password?](#)

Sign in

By signing in you accept the [Terms of Use](#) and [acknowledge the Privacy Policy and Cookie Policy](#).

NPS users

Sign in with



Remember me

gitlab.nps.edu/Savage/NetworkedGraphicsMV3500

Connecting to gitlab.nps.edu

Please review any and all PUBLIC repositories, groups, and associated files. These allow anyone on the Internet to access without authentication. Repository and group owners are responsible for their content and permission settings. Go to your project(s), click on Settings > General and expand the "Visibility, project features, permissions" to change this setting.

Savage > NetworkedGraphicsMV3500 > Repository

visio in Teams but not natively on Mac
brutzman authored 5 days ago

742e5e16

master NetworkedGraphicsMV3500 History Find file Clone

Name	Last commit	Last update
archive	archive prior syllabus	1 week ago
assignments	fix javadoc errors, now compiles cleanly,...	1 week ago
conferences	editorial	11 months ago
documentation	Royer - adding twocranesberth with pdus	10 months ago
examples	add convenience link to archive directory	1 month ago
lib	updated SISO-REF-010 enumerations to ...	9 months ago
nbproject	spellchecks	10 months ago
presentations	visio in Teams but not natively on Mac	5 days ago
specifications	updated SISO-REF-010 enumerations to ...	9 months ago

The MV3500 archive is publicly visible

Gitlab user account: Personal Access Tokens

Personal Access Token (PAT) is alternative to password access for git archive operations, avoiding password usage for better security

- https://gitlab.nps.edu/-/user_settings/personal_access_tokens

User Settings / Access Tokens

Search settings

Personal Access Tokens

You can generate a personal access token for each application you use that needs access to the GitLab API. You can also use personal access tokens to authenticate against Git over HTTP. They are the only accepted password when you have Two-Factor Authentication (2FA) enabled.

Active personal access tokens 1

Token name	Scopes	Created	Last Used	Expires	Action
brutzmanGitlabAccessTokenJuly2024	api, read_api, read_user, create_runner, manage_runner, k8s_proxy, read_repository, write_repository, read_registry, write_registry, ai_features	Jun 29, 2024	33 minutes ago	in 11 months	

[Add new token](#)

Create and save your own PAT

Save it!
If ever lost,
just create another

MV3500 repository **git clone address** or **zip download**

The screenshot shows the GitLab interface for the repository 'NetworkedGraphicsMV3500'. The 'Code' dropdown menu is open, showing options for cloning with SSH and HTTPS, opening in an IDE, and downloading source code as zip, tar.gz, tar.bz2, or tar. The 'zip' option is highlighted. The repository name and a recent commit 'syllabus update' by Brutzman, Don are visible at the top.

Name	Last commit
archive	archive prior simkit example
assignments	updated license year
conferences	Update file README.md
documentation	page title icon
examples	updated build
lib	updated build
nbproject	spell checks
presentations	add some links

<https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500.git>

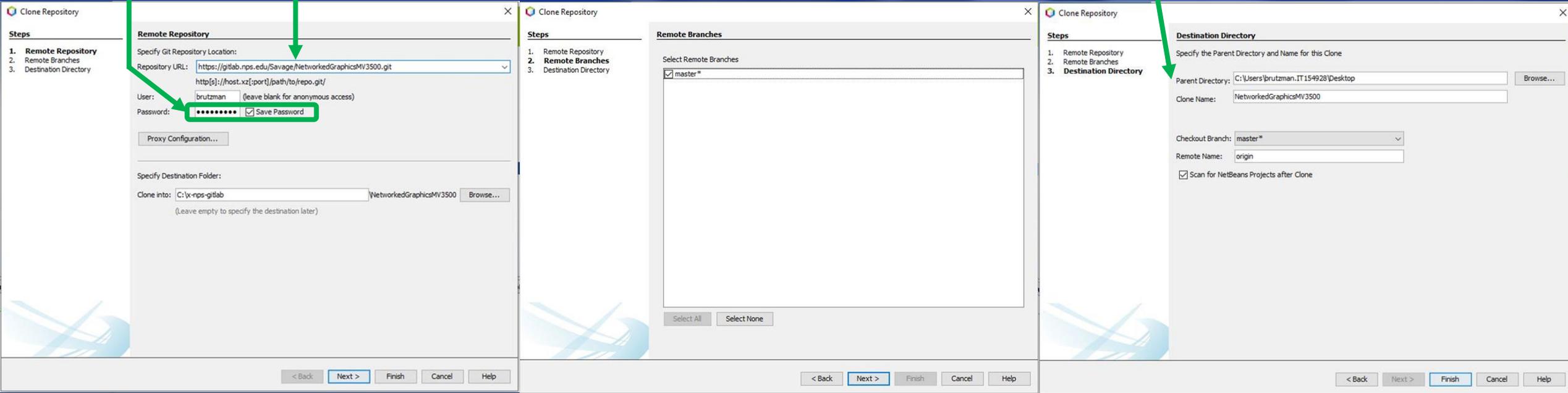
<https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500/-/archive/master/NetworkedGraphicsMV3500-master.zip>

Cloning course projects using NetBeans git

NetBeans can clone copies of git repositories and open projects:

- First select *Projects* tab (rather than *Files* tab), then
- NetBeans menu: *Team > Git > Clone ...*
- Use your **Personal Access Token** in place of actual gitlab password
- Save your cloned repository in a convenient laptop **local directory**

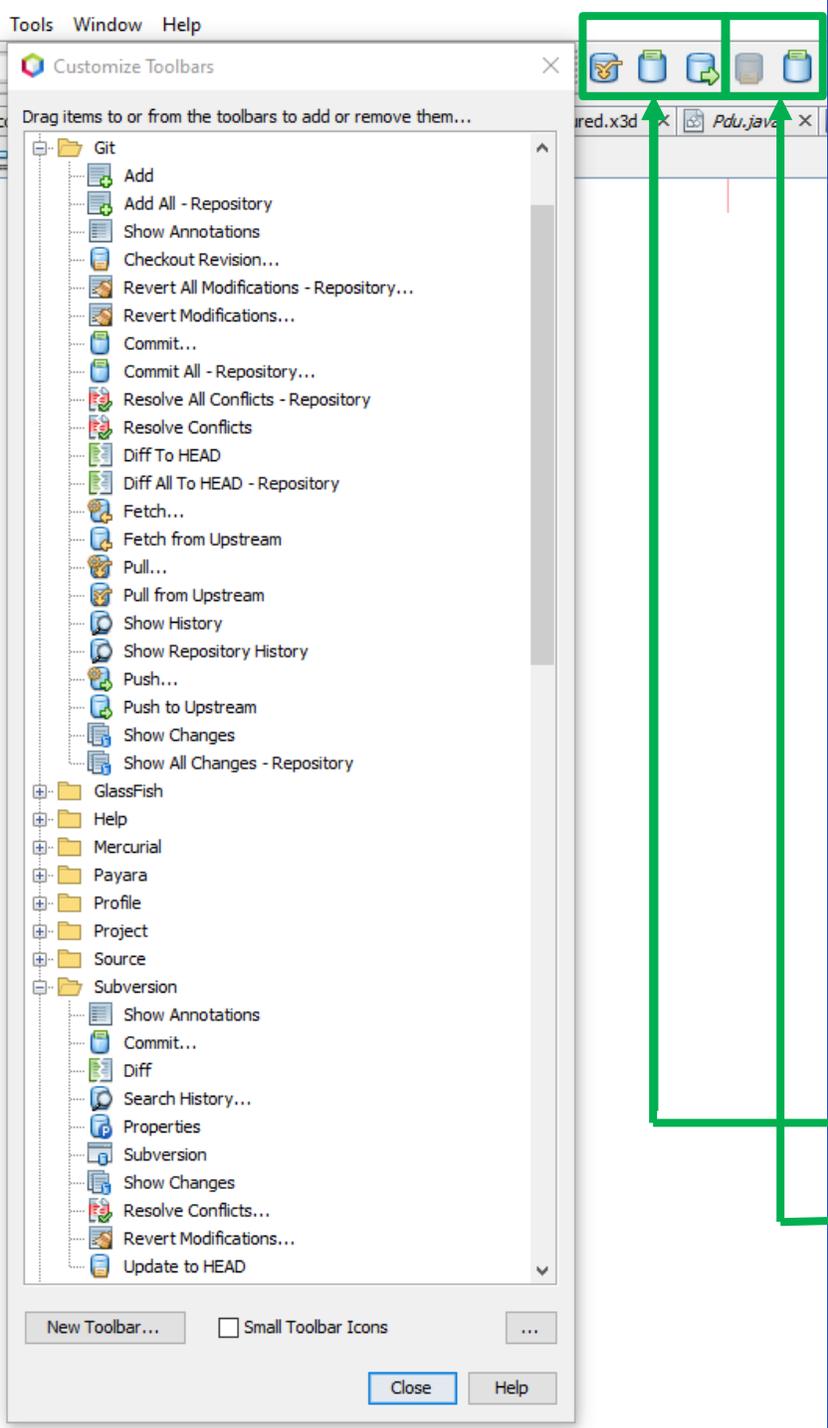
<https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500.git>



NetBeans timeout problems during initial clone?

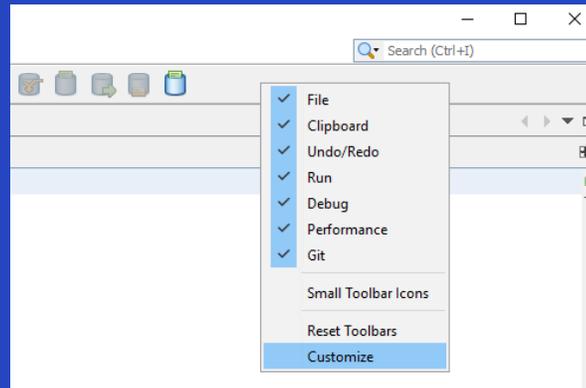
Some NetBeans users might have trouble cloning with git due to [annoying 45-second timeout problem](#) for large repositories

- a. Can perform initial repository clone using alternate git tools
 - Windows: [TortoiseGit](#) shell interface
- b. Can download .zip archive if not committing back to repository



NetBeans toolbar buttons (shortcuts) for git, subversion

NetBeans toolbar > right-click > Customize



Drag suggested buttons on/off the toolbar

- *git*: Pull from Upstream, Commit..., Push to Upstream
- *Subversion*: Update to head, Commit...

Additional git Tutorial References

Using Git in Apache NetBeans

- <https://netbeans.apache.org/tutorial/main/kb/docs/ide/git>

How to Use Git and GitHub from NetBeans

- <https://www.youtube.com/watch?v=MbwHOw6JXI8>

GitLab Tutorial For Beginners | What Is GitLab And How To Use It?

- <https://www.youtube.com/watch?v=mX7IKoabmDw>

GitLab Beginner Tutorial 1 | Introduction and Getting Started

- <https://www.youtube.com/watch?v=Jt4Z1vwtXT0>

NetBeans: Open Projects

Netbeans offers to open projects after git cloning.

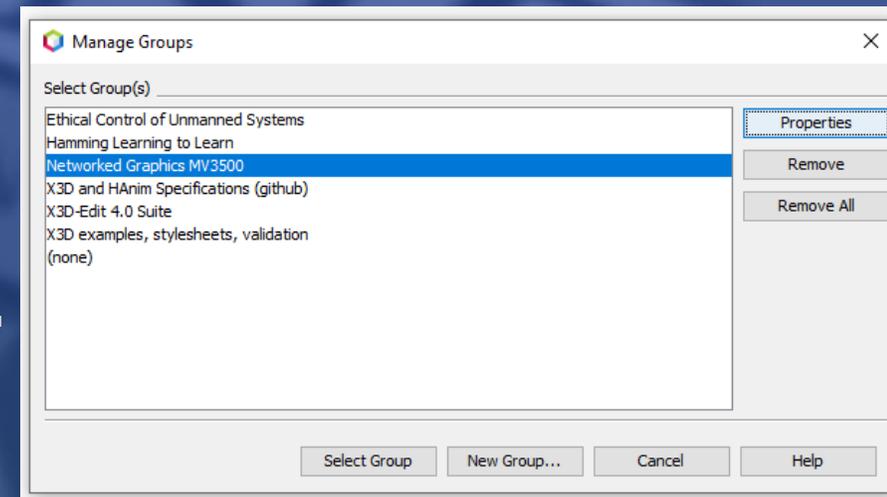
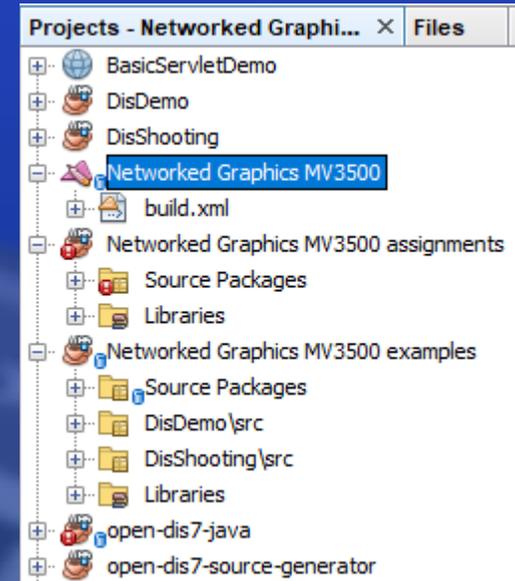
Alternative manual method:

- Netbeans menu: *File > Open Project*
- Select directory for project you have cloned

Need to also select subprojects

- (so that project build.xml files work)

You can also create a *Project Group* for convenience when handling many projects.



NetBeans Debugger

Critical skill for you to test, understand, and improve source code

Using the Visual Debugger in NetBeans IDE

- <https://netbeans.apache.org/tutorial/main/kb/docs/java/debug-visual>

How to Use the NetBeans Debugger for Java

- <https://www.youtube.com/watch?v=2Z9B8wYhKWw>

NetBeans - Debugging Project

- <https://www.youtube.com/watch?v=-ioCLAGrWGs>

Cygwin Unix Tools on Windows

Cygwin

Get that *Linux* feeling - on Windows

Utility tools in the [Cygwin distribution](#) provide a full repertoire of Unix command-line functionality for Windows systems.

- These Unix tools are already present on MacOS or Linux systems

Optional, can help NetBeans Windows users run `terminal` window

Administrator permissions required for installation, setting `PATH`.

Helps project development across multiple operating systems.

- [Savage Developers Guide: Cygwin](#)
- <https://savage.nps.edu/Savage/developers.html#Cygwin>



GIMP image editor

[GNU Image Manipulation Program \(GIMP\)](https://gimp.org) is an excellent open-source image editor for scaling, resizing, clipping, reformatting, applying special effects, etc.

- <https://gimp.org>



The screenshot shows the GIMP website homepage. At the top left, there is a navigation bar with links for GIMP, DOWNLOAD, NEWS, ABOUT, DOCS, PARTICIPATE, TUTORIALS, and DONATE. The main content area features a large banner with the GIMP logo (a cartoon cat head holding a paintbrush) and the text "GIMP GNU IMAGE MANIPULATION PROGRAM". Below the logo, there is a red button labeled "DOWNLOAD 2.10.24" and a dark blue button labeled "RELEASE NOTES". At the bottom right of the banner, it says "Currently 2.10.38". A diagonal banner on the left side of the page reads "Celebrating 25 YEARS!". The background of the banner is a landscape with a field and trees under a blue sky.

Visio drawing tool

Microsoft Visio is diagram editing software, usable standalone or as part of Microsoft Office suite. Licensed for use by NPS personnel.

- Directly in Teams, or else
- NPS Intranet > Technology > Software Downloads
- <https://nps.edu/group/technology/software-download>
- <https://nps.edu/web/technology/-/visio-pro-2019-project-pro-2019>
- Use UML styles to create sequence diagram (aka timing diagram)
- Viewing (but not editing) on MacOS, unless using a Windows VM

Wireshark



Wireshark lets you monitor traffic and inspect packet contents.

- <https://www.wireshark.org>
- “**Wireshark** is the world’s foremost and widely-used network protocol analyzer. It lets you see what’s happening on your network at a microscopic level and is the de facto (and often de jure) standard across many commercial and non-profit enterprises, government agencies, and educational institutions. Wireshark development thrives thanks to the volunteer contributions of networking experts around the globe and is the continuation of a project started by Gerald Combs in 1998.”

Installation, configuration, references, and video links found at

- [NetworkedGraphicsMV3500 > documentation > Wireshark > README](#)
- <https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500/-/blob/master/documentation/Wireshark/README.md>



About Wireshark



About

[Awards and Accolades](#)

[Authors](#)

[SharkFest](#)

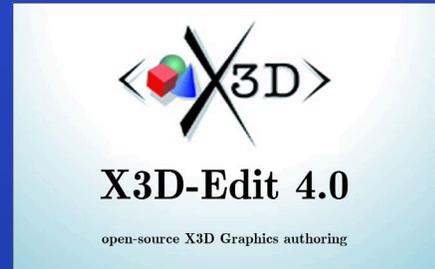
[SharkFest Sponsors](#)

Wireshark is the world's foremost and widely-used network protocol analyzer. It lets you see what's happening on your network at a microscopic level and is the de facto (and often de jure) standard across many commercial and non-profit enterprises, government agencies, and educational institutions. Wireshark development thrives thanks to the volunteer contributions of networking experts around the globe and is the continuation of a project started by Gerald Combs in 1998.

Wireshark has a rich feature set which includes the following:

- Deep inspection of hundreds of protocols, with more being added all the time
- Live capture and offline analysis
- Standard three-pane packet browser
- Multi-platform: Runs on Windows, Linux, macOS, Solaris, FreeBSD, NetBSD, and many others
- Captured network data can be browsed via a GUI, or via the TTY-mode TShark utility
- The most powerful display filters in the industry
- Rich VoIP analysis
- Read/write many different capture file formats: tcpdump (libpcap), Pcap NG, Catapult DCT2000, Cisco Secure IDS iplog, Microsoft Network Monitor, Network General Sniffer® (compressed and uncompressed), Sniffer® Pro, and NetXray®, Network Instruments Observer, NetScreen snoop, Novell LANalyzer, RADCOM WAN/LAN Analyzer, Shomiti/Finisar Surveyor, Tektronix K12xx, Visual Networks Visual UpTime, WildPackets EtherPeek/TokenPeek/AiroPeek, and many others
- Capture files compressed with gzip can be decompressed on the fly
- Live data can be read from Ethernet, IEEE 802.11, PPP/HDLC, ATM, Bluetooth, USB, Token Ring, Frame Relay, FDDI, and others (depending on your platform)
- Decryption support for many protocols, including IPsec, ISAKMP, Kerberos, SNMPv3, SSL/TLS, WEP, and WPA/WPA2
- Coloring rules can be applied to the packet list for quick, intuitive analysis
- Output can be exported to XML, PostScript®, CSV, or plain text

X3D-Edit 4.0 Authoring Tool for Extensible 3D (X3D) Graphics



To support recording, inspection and playback of DIS PDUs

- Produced by NPS MOVES! <https://savage.nps.edu/X3D-Edit>

A screenshot of the NetBeans 'Plugins' window. The 'Installed (120)' tab is active. A search bar is present. A table lists various plugins, with 'X3D-Edit 4.0 Module' selected and highlighted in blue. The details for this plugin are shown on the right.

Select	Name ^	Category	Active
<input type="checkbox"/>	TestNG	Libraries	✓
<input type="checkbox"/>	The nb-javac Java editing s...	Java	✓
<input type="checkbox"/>	Timers API	Developing Net...	✓
<input type="checkbox"/>	TOML Editor Support	Editing	✓
<input type="checkbox"/>	Twig Templates	PHP	●
<input type="checkbox"/>	TypeScript Editor	TypeScript	✓
<input type="checkbox"/>	WildFly Application Server	Java Web and EE	✓
<input checked="" type="checkbox"/>	X3D-Edit 4.0 Module	Editing	✓
<input type="checkbox"/>	XML Entity Catalog UI	XML	✓
<input type="checkbox"/>	YAML Editor Support	Editing	✓
<input type="checkbox"/>	Zend Framework	PHP	●
<input type="checkbox"/>	Zend Framework 2	PHP	●

X3D-Edit 4.0 Module

Version: 4.0.34
Source: NetBeans Plugin Portal

Plugin Description

X3D-Edit is an Extensible 3D (X3D) Graphics authoring tool for simple error-free creation, editing, validation and viewing of X3D scenes for interactive Web-based visualization. X3D-Edit runs as a standalone application or Netbeans plugin. The X3D file format is an advanced XML version of the original VRML97 international standard for 3D scene graphs. X3D-Edit is available at <https://savage.nps.edu/X3D-Edit>

Buttons: Activate, Deactivate, Uninstall, Close, Help

A screenshot of the X3D-Edit 3.2 application interface. The main window shows a 3D scene with a yellow cube and a red arrow pointing along the X-axis. The interface includes a menu bar (File, Edit, View, Window, X3D, Versioning, Tools, Help), a toolbar, and several panels:

- Entity List:** A list of entity states (e.g., ENTITY_STATE 14.211912687, 80 ENTITY_STATE 14.237453643, etc.)
- PDU Header:** Fields for prot version (6), exercise ID, PDU type (1), and prot family (1).
- Entity ID:** Fields for ent id 2, sim site id (0), and sim app id (1).
- Articulation Parameters:** A table with columns for kind, domain, country, category, subcategory, specific, and extra.
- Entity Linear Velocity:** Fields for velocity components.
- Entity Location:** Fields for location coordinates.
- Entity Orientation:** Fields for orientation angles (psi, theta, phi).
- Dead Reckoning Parameters:** Fields for algorithm and other parameters.
- Entity Marking:** Fields for char set and string(hex).
- Entity Capabilities:** Fields for capabilities, enty appearance, force id, and marshalled size.
- DIS ESPDU Test Panel:** Controls for Translation (x, y, z) and Rotation (phi, theta, psi) with sliders and input fields.
- DIS Settings:** Fields for address (239.1.2.3), port (62040), site ID, application ID, and entity ID.

**Distributed Interactive Simulation (DIS)
Entity State Protocol Data Unit (ESPDU)
Test Panel**

Translation along x-axis by -20m, to left
Rotation about y-axis by +20° counter-clockwise

The screenshot displays the X3D-Edit 3.2 interface. On the left is the 3D Viewer showing a yellow box in a coordinate system. The center pane contains XML code for an ESPDU Test Panel. The right pane shows the DIS ESPDU Test Panel controls, including Translation (x, y, z) and Rotation (phi, theta, psi) sliders. A red box highlights the XML code, and red arrows point from this box to the 3D viewer and the rotation controls.

**Distributed Interactive Simulation (DIS)
Entity State Protocol Data Unit (ESPDU)
Test Panel**

Translation along x-axis by -20m, to left
Rotation about y-axis by +20° counter-clockwise

Effective Collaboration

We use Microsoft Teams for local/remote class participation.

Computers must access the same local-area network (LAN) in order to share packets, or else have a network bridge that passes packets back and forth - without infinite loops!

Later in this course and the follow-on LVC practicum, we will look at special VPNs and bridging.

Troubleshooting Techniques



Troubleshooting code can be difficult. We overcome that. No really!

We will pursue a number of challenges, big and small, to help you build a personal repertoire of techniques for solving problems.

These skills not only aid you in your own work, but also give you useful expectations and leadership skills when leading effective programming teams in the future.

Contact

Don Brutzman

brutzman@nps.edu
<http://faculty.nps.edu/brutzman>

Code USW/Br, Naval Postgraduate School
Monterey California 93943-5000 USA
1.831.656.2149 work

