

Configuring Your System for MV3500 Networked Graphics and Simulation

Setting up Java, Netbeans, Git,
Wireshark, and Utility 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
- GIMP, Visio and other tools
- X3D-Edit
- Collaboration and Troubleshooting



Full configuration details
are maintained 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.

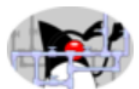


Download and install the latest open-source JDK. Oracle's free, GPL-licensed, production-ready OpenJDK JDK 20 binaries for Linux, macOS, and Windows are [available at `jdk.java.net/20/`](https://jdk.java.net/20/); Oracle's commercially-licensed JDK 20 binaries, based on the same code, are [here](#).



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 the Java that's 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 20 General-Availability Release

This page provides production-ready open-source builds of the Java Development Kit, version 20, an implementation of the Java SE 20 Platform under the GNU General Public License, version 2, with the Classpath Exception.

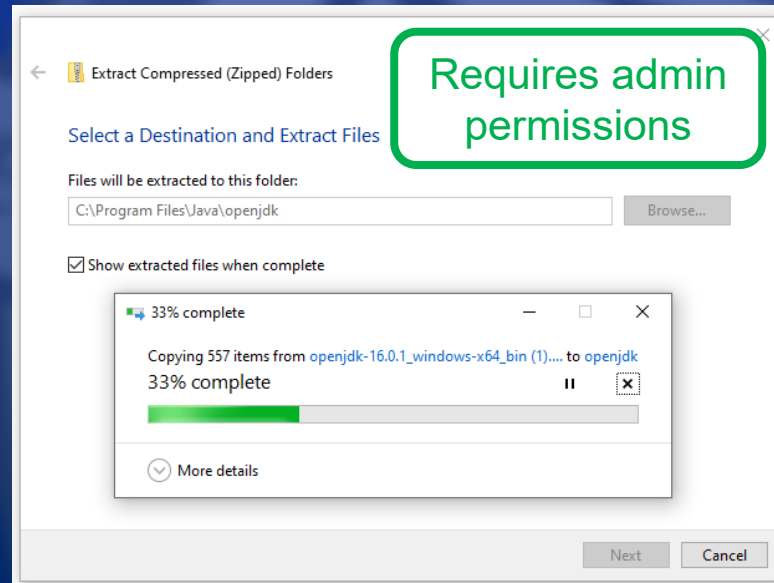
Commercial builds of JDK 20 from Oracle, under a non-open-source license, can be found [here](#).

Documentation

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

Builds

Linux/AArch64	tar.gz (sha256)	195952958 bytes
Linux/x64	tar.gz (sha256)	197562076
macOS/AArch64	tar.gz (sha256)	191881541
macOS/x64	tar.gz (sha256)	194328775
Windows/x64	zip (sha256)	196174504



Javadoc

[JDK 20 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](#)

Latest release

Apache NetBeans 17

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.

Apache Netbeans Installation

Latest release

Apache NetBeans 17

Download

Apache NetBeans Releases

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

Apache NetBeans 17

Latest version of the IDE, released on February 21, 2023.

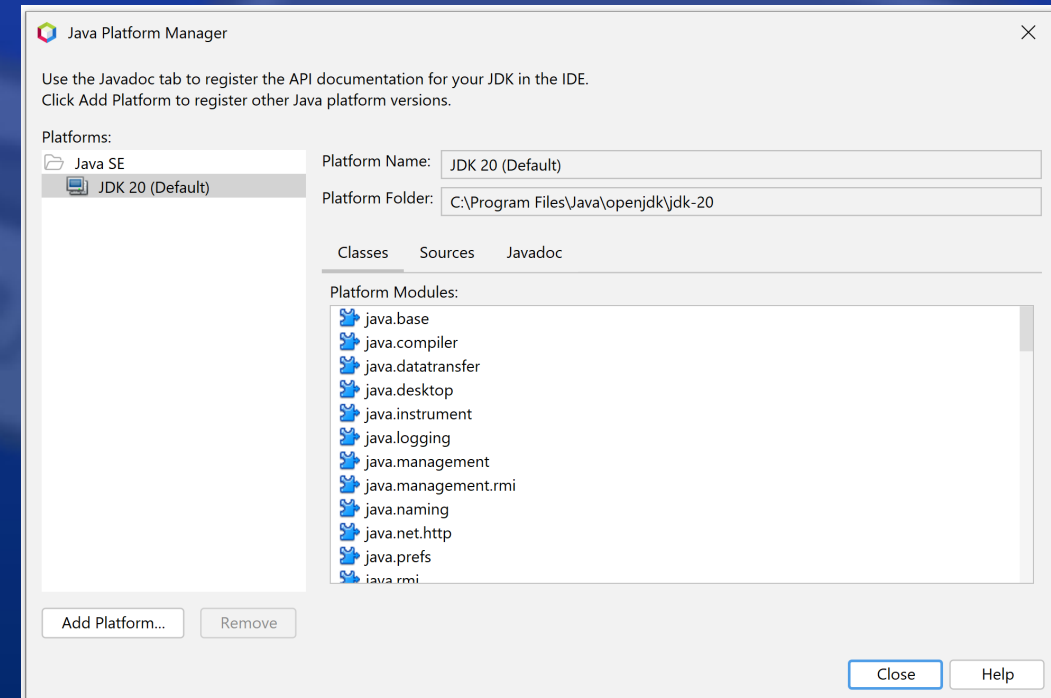
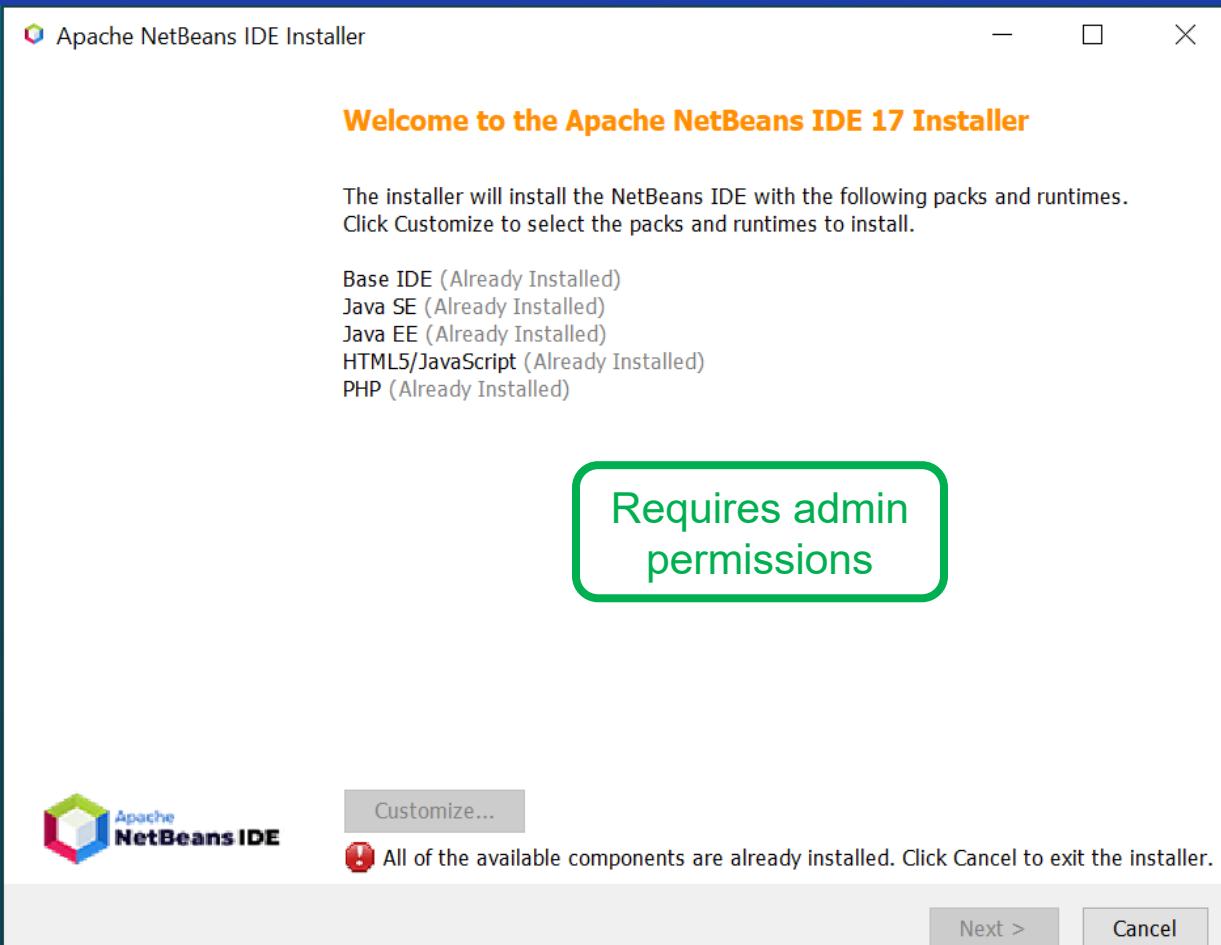
Download



Apache Netbeans Configuration

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

The screenshot shows the GitLab web interface. At the top, there's a search bar and a 'Sign in' button. A red banner at the top of the repository page states: '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.'

The repository path is 'Savage > NetworkedGraphicsMV3500 > Repository'. The repository name is 'visio in Teams but not natively on Mac' by 'brutzman', authored 5 days ago. The commit hash is '742e5e16'.

Below the repository information, there's a dropdown for 'master' and the repository name 'NetworkedGraphicsMV3500'. There are buttons for 'History', 'Find file', a download icon, and a 'Clone' button.

A table lists the repository's contents:

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

This archive is publicly visible

MV3500 repository [zip download](https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500/-/archive/master/NetworkedGraphicsMV3500-master.zip) or [git clone address](https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500.git)

The screenshot shows the GitLab interface for the repository `NetworkedGraphicsMV3500` under the user `Savage`. A red banner at the top contains a warning about public repositories. The breadcrumb trail is `Savage > NetworkedGraphicsMV3500 > Repository`. The repository name `NetworkedGraphicsMV3500` is displayed next to a dropdown menu currently set to `master`. To the right of the repository name are buttons for `History`, `Find file`, a download icon, and a `Clone` button with a dropdown arrow. A commit hash `742e5e16` is shown with a copy icon. Below the repository name is a table with two columns: `Name` and `Last commit`. The table contains one entry: a folder icon followed by `archive` and the text `archive prior syllabus`. On the right side, a dropdown menu is open, showing options to `Clone with SSH` and `Clone with HTTPS`. The SSH URL is `git@gitlab.nps.edu:Savage/Networ` and the HTTPS URL is `https://gitlab.nps.edu/Savage/N`. Three green annotations are present: a box around the zip download URL `https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500/-/archive/master/NetworkedGraphicsMV3500-master.zip` with an arrow pointing to the download icon; a box around the git clone URL `https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500.git` with an arrow pointing to the clone dropdown; and a box around the `Clone` button with an arrow pointing to the dropdown menu.

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

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

742e5e16

master NetworkedGraphicsMV3500

History Find file

Clone

Name	Last commit
archive	archive prior syllabus

Clone with SSH

`git@gitlab.nps.edu:Savage/Networ`

Clone with HTTPS

`https://gitlab.nps.edu/Savage/N`

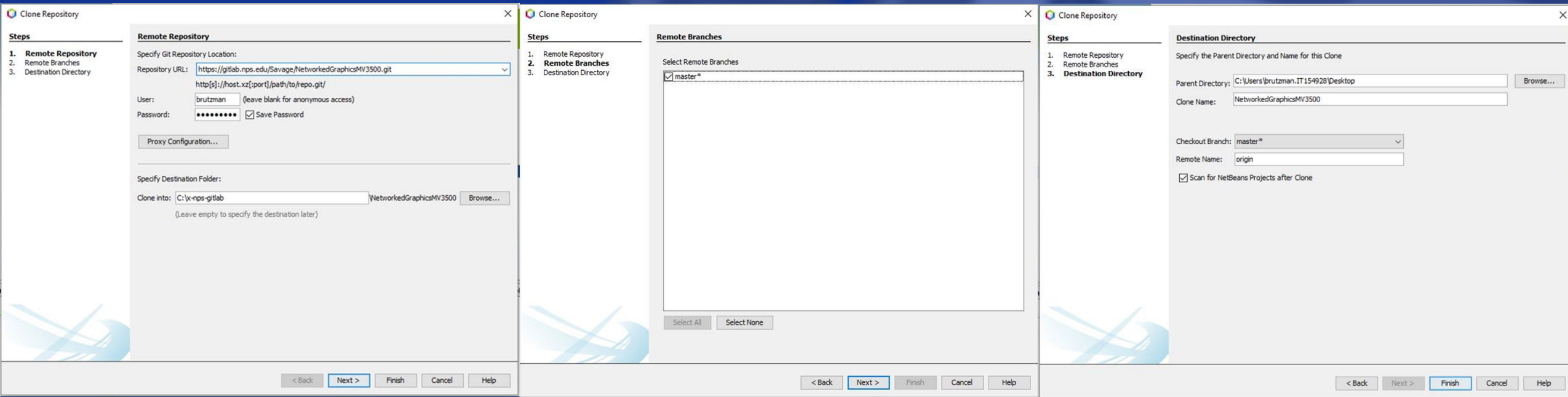
`https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500.git`

Cloning course projects using NetBeans git

Netbeans can clone copies of git repositories and open projects:

- Netbeans menu: *Team > Git > Clone ...*

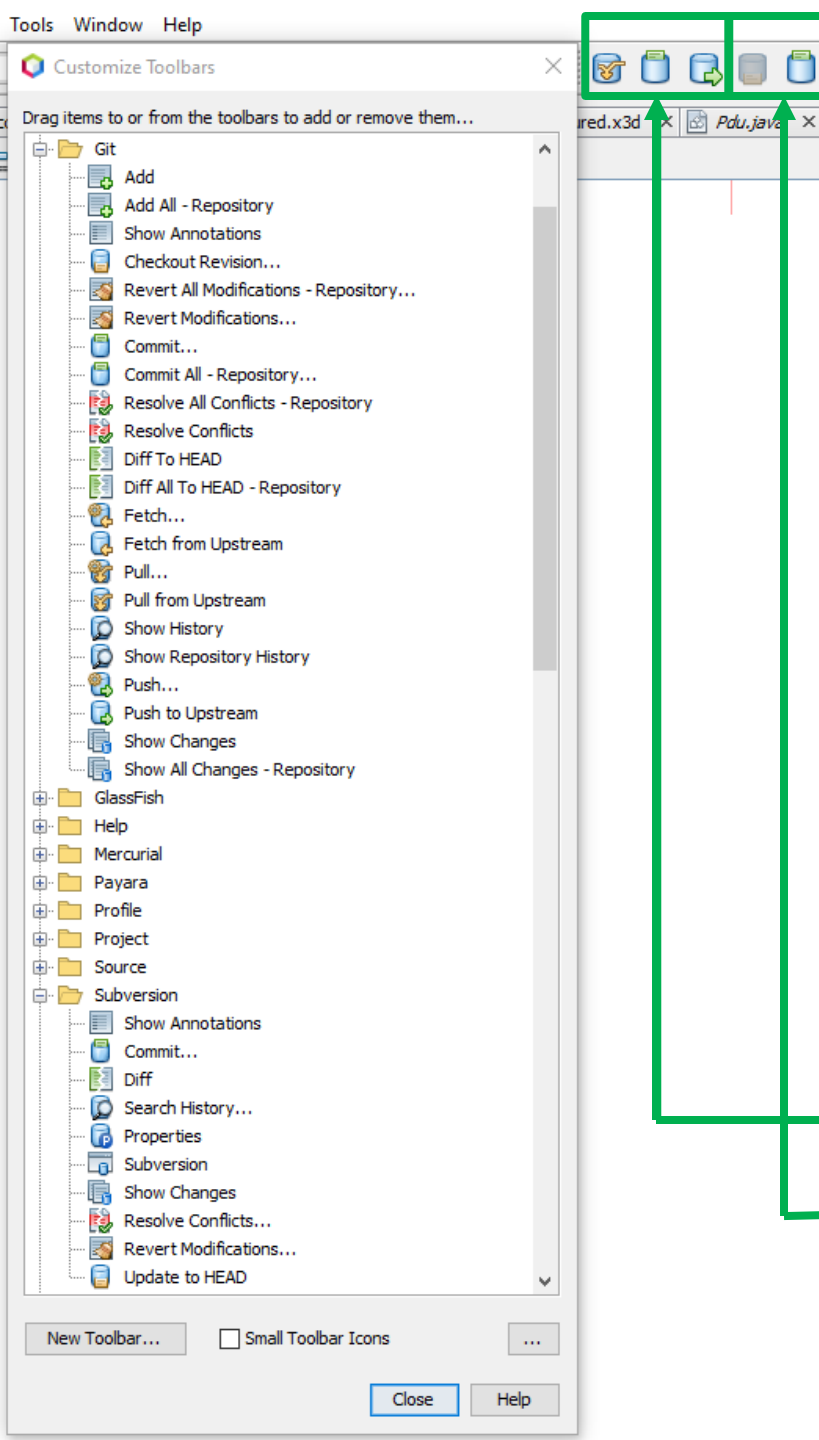
<https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500.git>



NetBeans timeout problems

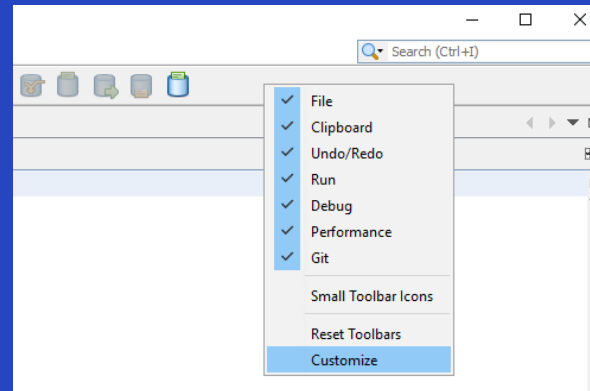
Some NetBeans users might have trouble cloning with git due to [annoying 45-second timeout problem](#) for large repositories

- a. Can use .zip archive if not committing back to the repository
- b. Windows users can perform initial repository clone using
 - [Git for Windows](#)
 - [TortoiseGit](#) shell interface



NetBeans toolbar buttons (shortcuts) for subversion, git

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/kb/docs/ide/git.html>

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=mX7lKoabmDw>

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.

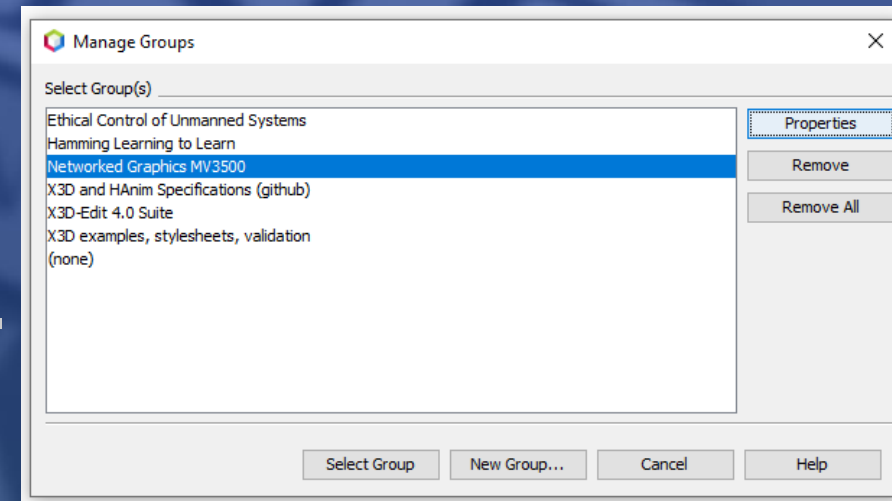
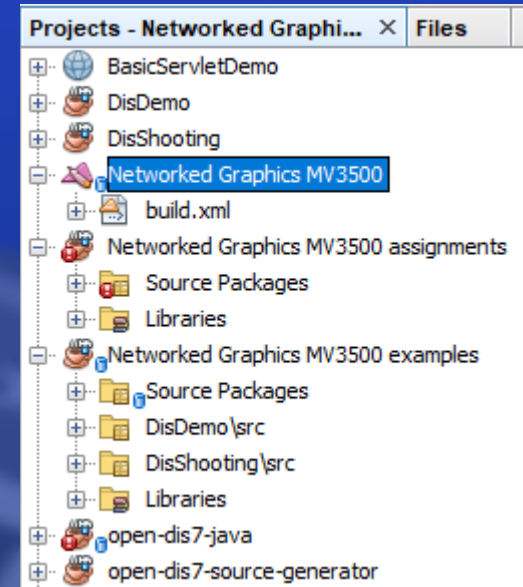
Alternative manual method:

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

Need to also select subprojects

- (so that build.xml files work)

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



Netbeans Debugger

Critical feature for testing, understanding and improving code

Using the Visual Debugger in NetBeans IDE

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

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



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

Needed for NetBeans Windows users to 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) is an excellent open-source image editor for scaling, resizing, clipping, reformatting, applying special effects, etc.

- <https://gimp.org>



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

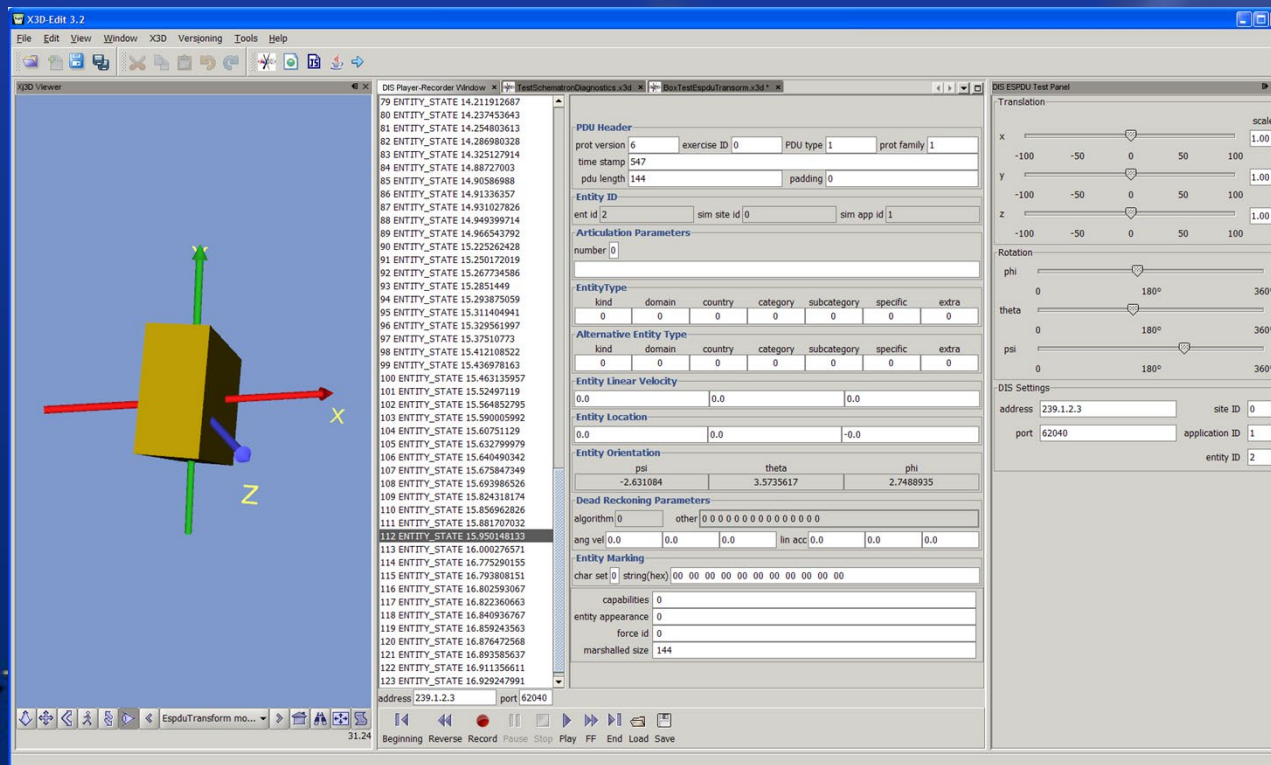


X3D-Edit 4.0

open-source X3D Graphics authoring

To support recording, inspection and playback of DIS PDUs

- <https://savage.nps.edu/X3D-Edit>



X3D-Edit 3.2

File Edit View Window X3D Versioning Tools Help

X3D Viewer

DIS Player-Recorder Window

TestSchematronDiagnostics.x3d

BoxTestEspduTransform.x3d

DIS ESPDU Test Panel

Translation

scale

x -100 -50 0 50 100 1.00

y -100 -50 0 50 100 1.00

z -100 -50 0 50 100 1.00

Rotation

phi 0 180° 360°

theta 0 180° 360°

psi 0 180° 360°

DIS Settings

address 239.1.2.3 site ID 0

port 62040 application ID 1

entity ID 2

Palette

- X3D Metadata and Structure
- Geometry: Primitives
- Grouping
- Viewing and Navigation
- Appearance, Material and Textures
- Geometry: Points, Lines and Polygons
- Event Animation and Interpolation
- User Interactivity
- Event Utilities and Scripting
- Geometry: 2D
- Lighting and Environment
- Environment Sensor and Sound
- Geometry: Triangles and Quadrilaterals
- Prototypes
- Computer Aided Design (CAD)
- Distributed Interactive Simulation (DIS)
 - DISEntityManager
 - DISEntityTypeMapping
 - EspduTransform
 - ReceiverPdu
 - SignalPdu
 - TransmitterPdu
- Geospatial
- Humanoid Animation

BoxTestEspduTransform.x3d - Navigator

- version="1.0" encoding="UTF-8"
- PUBLIC "ISO//Web3D//DTD X3D 3...."
- X3D xmlns:xsd="http://www.w3.org/2/..."
 - head
 - Scene
 - Viewpoint position="0 0 25", description...
 - Background skyColor="0.5 0.6 0.8"
 - EspduTransform port="62040", siteID="0", addr...
 - Shape
 - Box size="2 4 6"
 - Appearance
 - Material diffuseColor="0.748014 0.62085 0"
 - Transform scale="5 5 5"
 - Inline url="http://www.web3d.org/x3d/content/examples/Basic/course/CoordinateAxes.x3d"

Filters: []

30:20 INS

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 are using Microsoft Teams for local/remote participation.

Computers must be able to access the same local-area network (LAN) in order to share packets.

Later in the course we will look at special VPNs and bridging.

Troubleshooting Techniques

Troubleshooting code can be difficult. We overcome that.

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.

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