Configuring Your System for MV3500 Networked Graphics and Simulation

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

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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

SAVAGE

NPS
PRAESTANTIA PER SCIENTIAM

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NAVAL POSTGRADUATE SCHOOL

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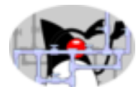
Hack on the JDK itself, right here in the OpenJDK Community: Browse the code on the web, clone a repository to make a local copy, and contribute a patch to fix a bug, enhance an existing component, or define a new feature.

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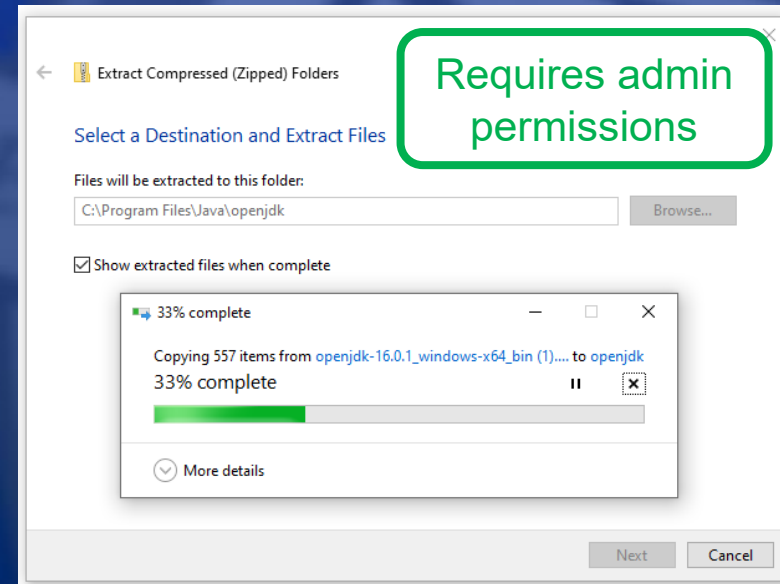
Commercial builds of JDK 22.0.1 from Oracle, under a non-open-source license, can be found here.

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

Requires admin permissions

Extract Compressed (Zipped) Folders

Select a Destination and Extract Files

Files will be extracted to this folder:

C:\Program Files\Java\openjdk   Browse...

☑ Show extracted files when complete

33% complete

Copying 557 items from openjdk-16.0.1_windows-x64_bin (1).... to openjdk
33% complete

More details

Next   Cancel

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SAVAGE

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 Installation

Now using version 22

Apache Netbeans Configuration

OS-specific installer or extract .zip version

Welcome to the Apache NetBeans IDE 17 Installer

The installer will install the NetBeans IDE with the following packs and runtimes.
Click Customize to select the packs and runtimes to install.

Base IDE (Already Installed)
Java SE (Already Installed)
Java EE (Already Installed)
HTML5/JavaScript (Already Installed)
PHP (Already Installed)

Works with administrator permissions or else local-user installation

All of the available components are already installed. Click Cancel to exit the installer.

Once running NetBeans, can further adjust

Tools | Window | Help

Apply Diff Patch…
Diff…
Add to Favorites
Open in Terminal

Analyze Javadoc
Add to Palette…
Internationalization
Open Java Platform Shell

Java Platforms

Ant Variables
Libraries
Servers
Cloud Providers
Templates
DTDs and XML Schemas
Palette

Plugins

Options

Adjusting Java version:

- *Tools > Java Platforms*

Java Platform Manager

Use the Javadoc tab to register the API documentation for your JDK in the IDE.
Click Add Platform to register other Java platform versions.

Platforms:
Java SE
JDK 20 (Default)

Platform Name: JDK 20 (Default)
Platform Folder: C:\Program Files\Java\openjdk\jdk-20

Classes | Sources | Javadoc

Platform Modules:
java.base
java.compiler
java.datatransfer
java.desktop
java.instrument
java.logging
java.management
java.management.rmi
java.naming
java.net.http
java.prefs
java.rmi

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Connecting to gitlab.nps.edu

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

🪟 NPS account

☑ Remember me

🔍 Search GitLab   /   ❓ ⌄   Sign in

📢 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

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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

Create and save your own PAT

Save it! If ever lost, just create another

MV3500 repository git clone address or zip download

Savage / NetworkedGraphicsMV3500 · GitLab

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

Savage / NetworkedGraphicsMV3500

NetworkedGraphicsMV3500 🌐

master / NetworkedGraphicsMV3500 / +

History | Find file | Edit | Code

syllabus update
Brutzman, Don authored just now

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

Clone with SSH
git@gitlab.nps.edu:Savage/Networ

Clone with HTTPS
https://gitlab.nps.edu/Savage/Ne

Open in your IDE
Visual Studio Code (SSH)
Visual Studio Code (HTTPS)
IntelliJ IDEA (SSH)
IntelliJ IDEA (HTTPS)

Download source code
zip
tar.gz
tar.bz2
tar

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

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

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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
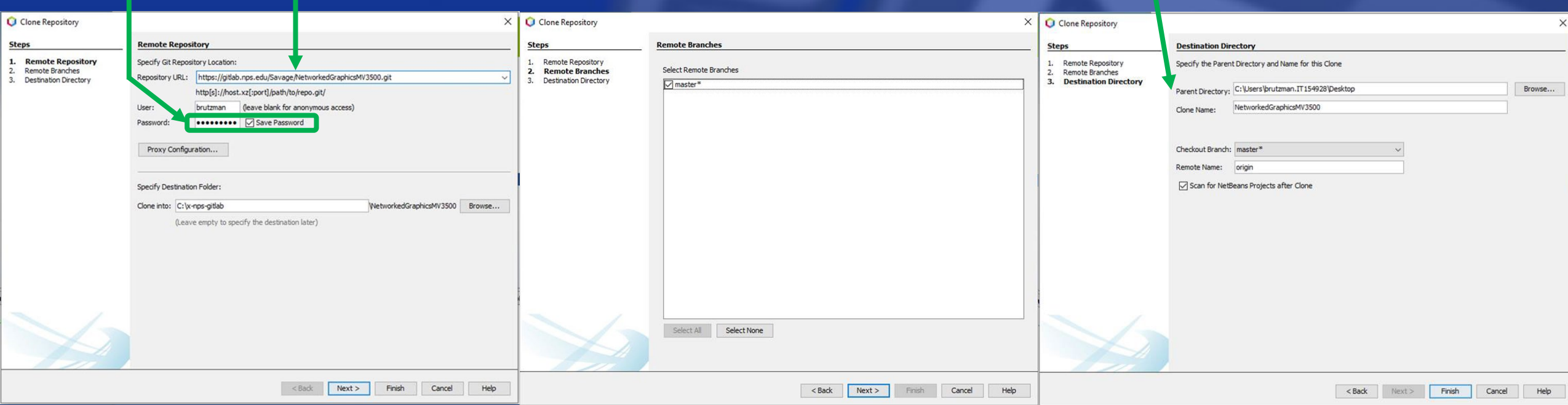
NetBeans timeout problems during initial clone?

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
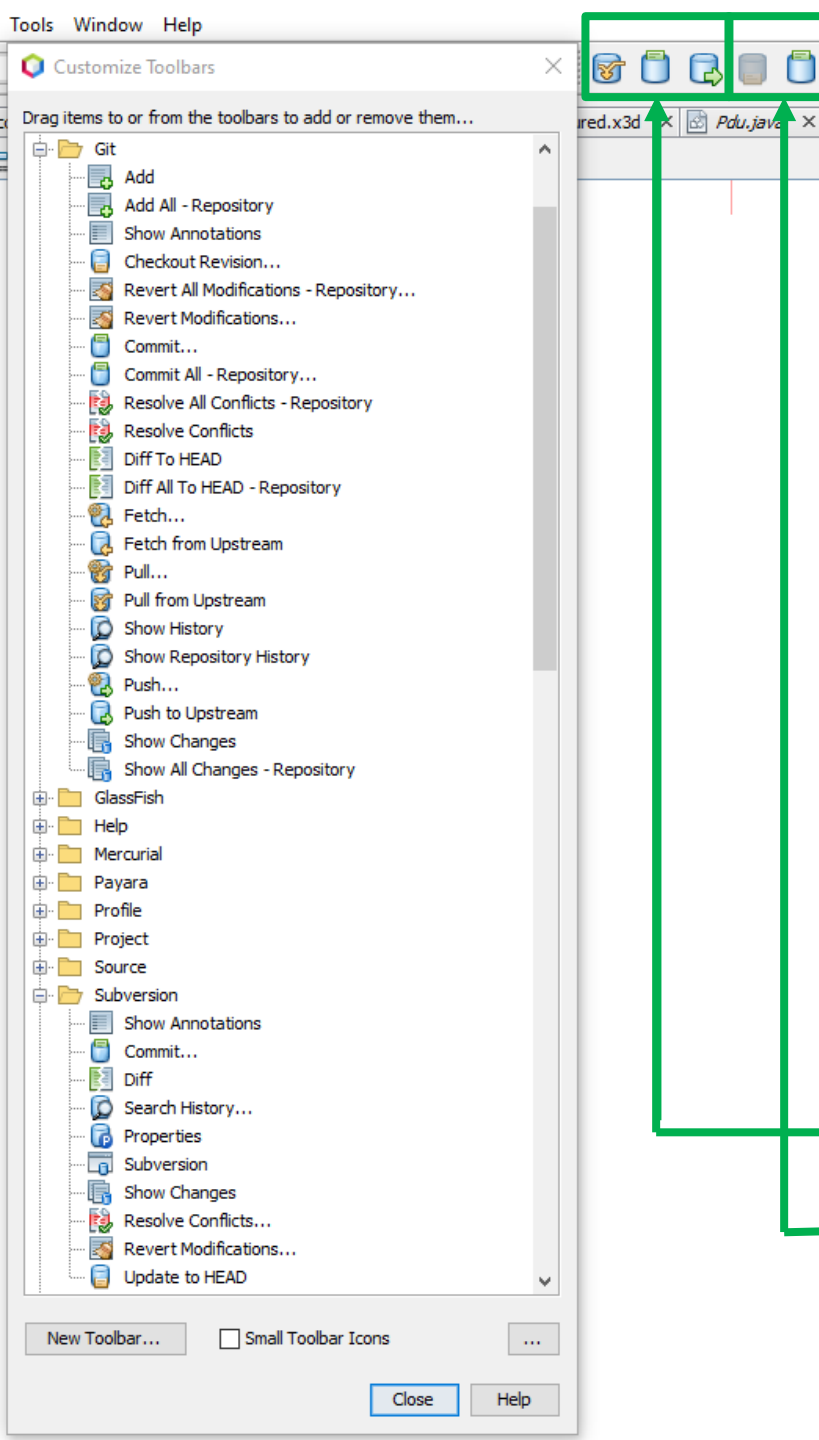
NetBeans toolbar buttons (shortcuts) for git, subversion

NetBeans toolbar > right-click > Customize
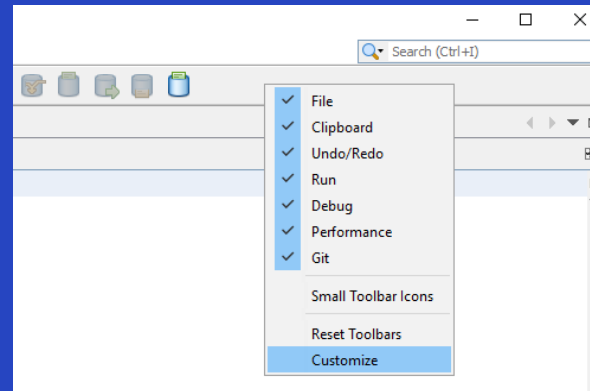
Drag suggested buttons on/off the toolbar

- *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=mX7lKoabmDw

GitLab Beginner Tutorial 1 | Introduction and Getting Started

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

NetBeans: Open Projects

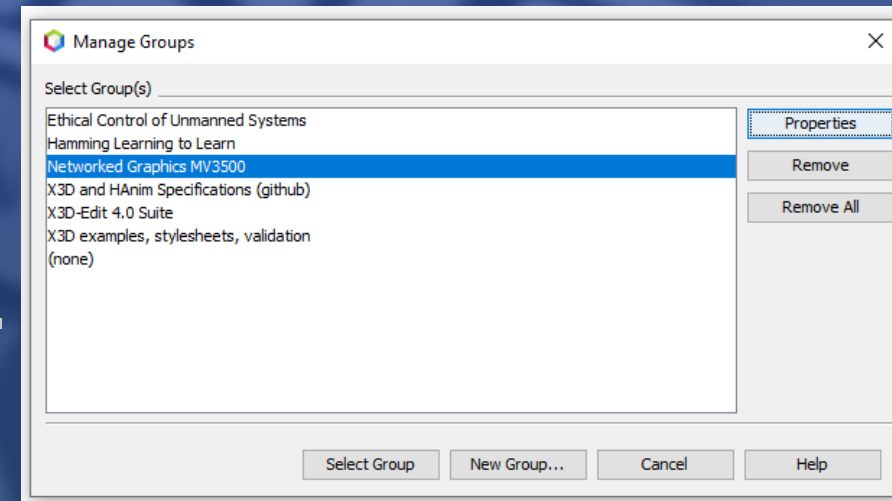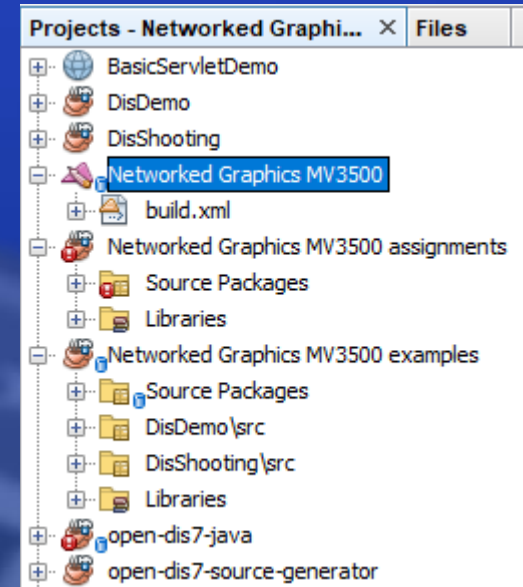Netbeans offers to open projects after git cloning.

Alternative manual method:

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

Need to also select subprojects

- (so that 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

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)](#) is an excellent open-source image editor for scaling, resizing, clipping, reformatting, applying special effects, etc.

- https://gimp.org

Currently 2.10.38

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

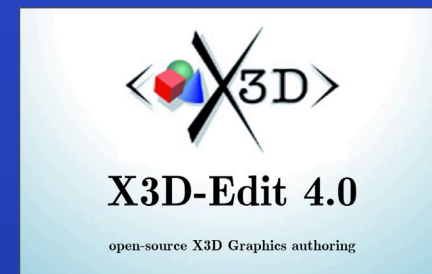| About | Awards and Accolades | Authors | SharkFest | SharkFest Sponsors |

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.

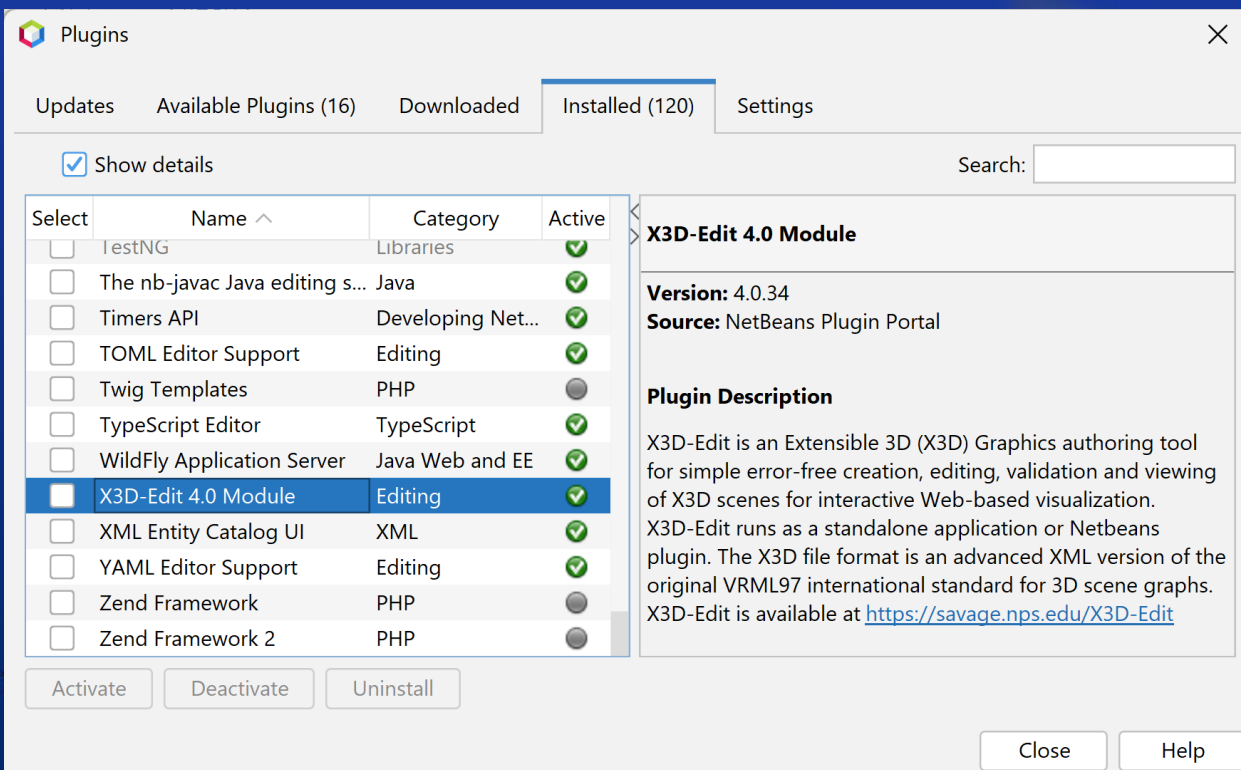**Wireshark** has a rich feature set which includes the following:

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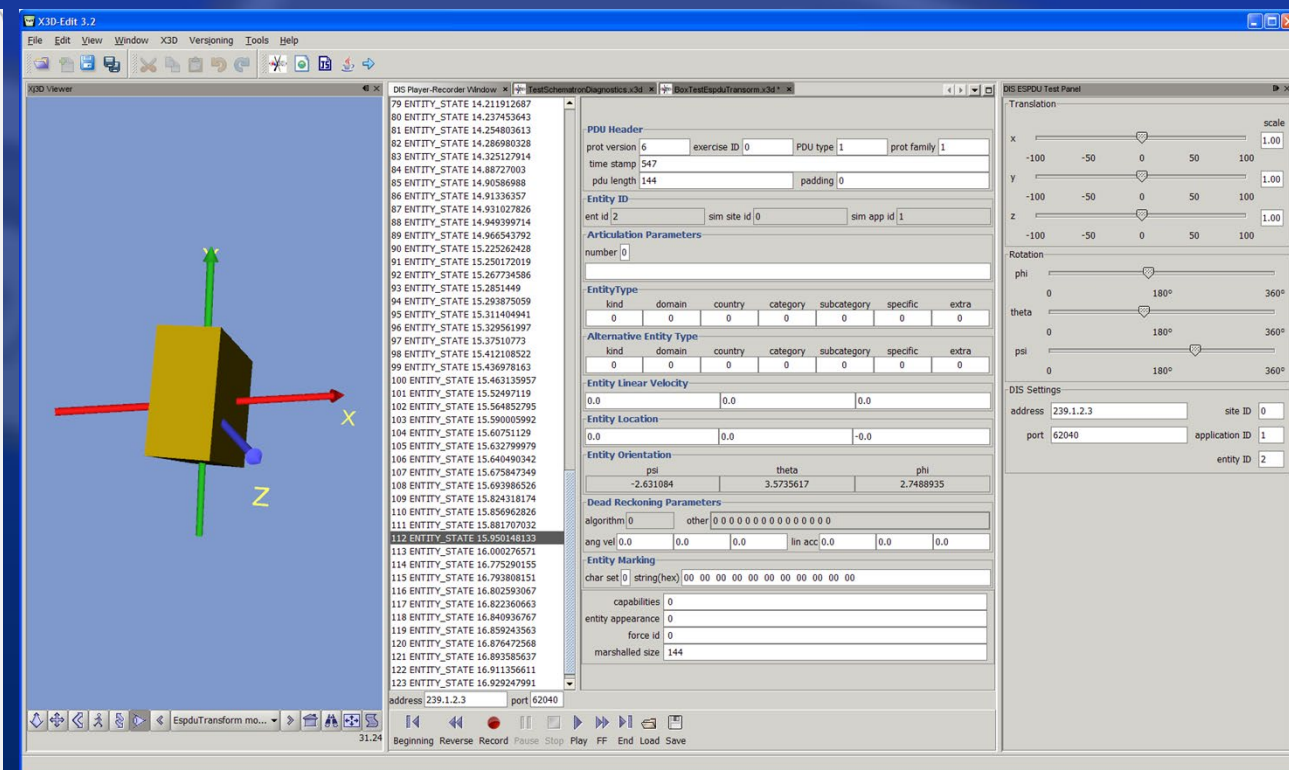
Distributed Interactive Simulation (DIS)
Entity State Protocol Data Unit (ESPDU)
Test Panel

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

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