

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



SAVAGE

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.

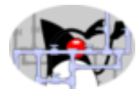


Download and install the latest open-source JDK. Oracle's free, GPL-licensed, production-ready OpenJDK JDK 22 binaries for Linux, macOS, and Windows are available at jdk.java.net/22; Oracle's commercially-licensed JDK 22 binaries, based on the same code, are [here](#).



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.

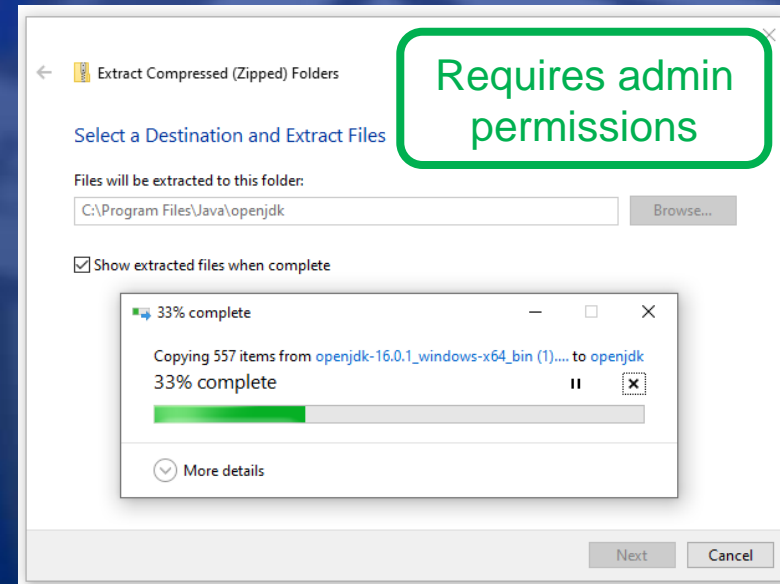
Commercial builds of JDK 22.0.1 from Oracle, under a non-open-source license, can be found [here](#).

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

CommunityParticipateBlogGet HelpPluginsDownload

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.



 See this page in GitHub.

Apache Netbeans Installation

 Apache NetBeans

CommunityParticipateBlogGet Help

Latest release

Apache NetBeans 22

Download

Apache NetBeans Releases

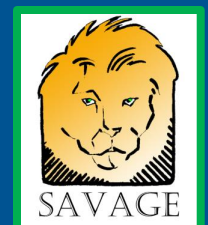
Apache NetBeans is released four times a year. For details, see [full release schedule](#).

Apache NetBeans 22

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

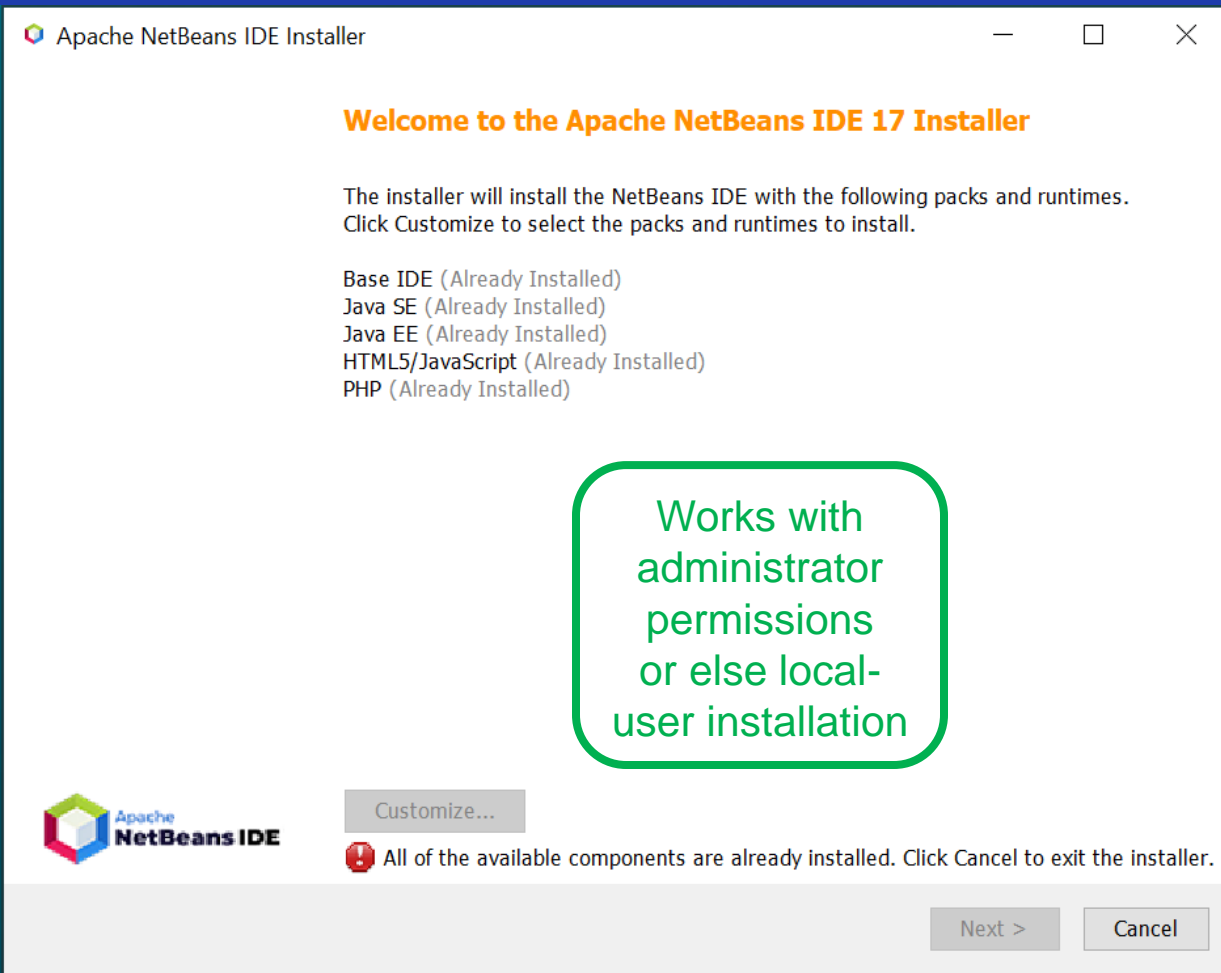
Download

Now using version 22



Apache Netbeans Configuration

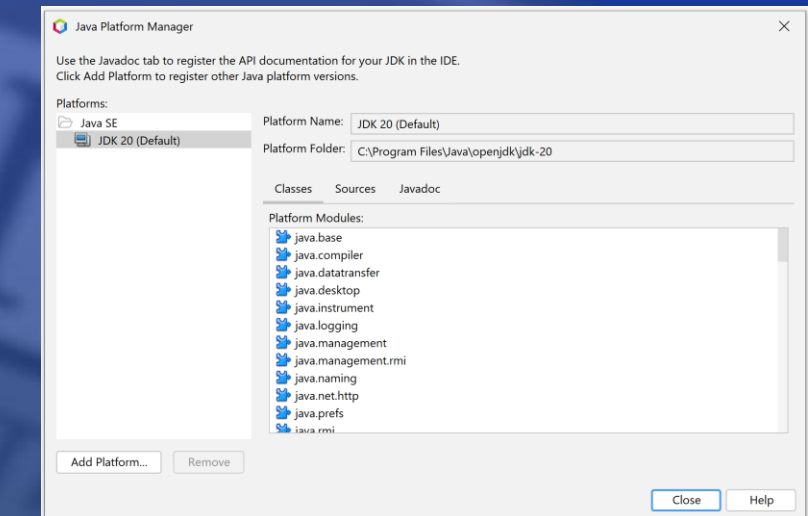
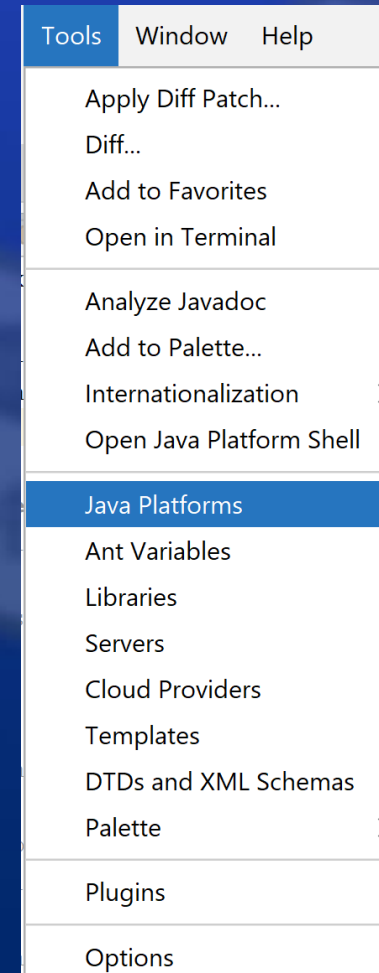
OS-specific installer or extract .zip version



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

The screenshot shows the GitLab web interface. At the top, there's a search bar and a 'Sign in' button. A red banner message 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 main content area shows the repository path: Savage > NetworkedGraphicsMV3500 > Repository. Below this, there's a commit entry for 'visio in Teams but not natively on Mac' by brutzman, authored 5 days ago, with a commit hash of 742e5e16.

Below the commit entry, there's a dropdown menu for 'master' and the repository name 'NetworkedGraphicsMV3500'. To the right are buttons for 'History', 'Find file', a download icon, and a 'Clone' button.

The main part of the page is a table listing 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

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

The screenshot shows the GitLab user settings page for Personal Access Tokens. The browser address bar displays the URL: https://gitlab.nps.edu/-/user_settings/personal_access_tokens. The page header includes the GitLab logo, a search bar, and navigation links for 25 repositories, 10 projects, and 10 issues. The left sidebar contains a 'User settings' menu with options: Profile, Account, Applications, Chat, Access Tokens (selected), Emails, Notifications, and SSH Keys. The main content area is titled 'Personal Access Tokens' and includes a search bar. Below the title, a text block explains that PATs are used for GitLab API access and are the only accepted password when Two-Factor Authentication (2FA) is enabled. A table titled 'Active personal access tokens' shows one token with the name 'brutzmanGitlabAccessTokenJuly2024', scopes including 'api', 'read_api', 'read_user', 'create_runner', 'manage_runner', 'k8s_proxy', 'read_repository', 'write_repository', 'read_registry', 'write_registry', and 'ai_features', created on 'Jun 29, 2024', last used '33 minutes ago', and expiring 'in 11 months'. An 'Add new token' button is highlighted with a green box.

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


Savage / NetworkedGraphicsMV3500 · GitLab

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

Savage / NetworkedGraphicsMV3500

 **NetworkedGraphicsMV3500** 


master ▾ NetworkedGraphicsMV3500 / + ▾

 **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

History Find file Edit ▾ **Code ▾**

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>

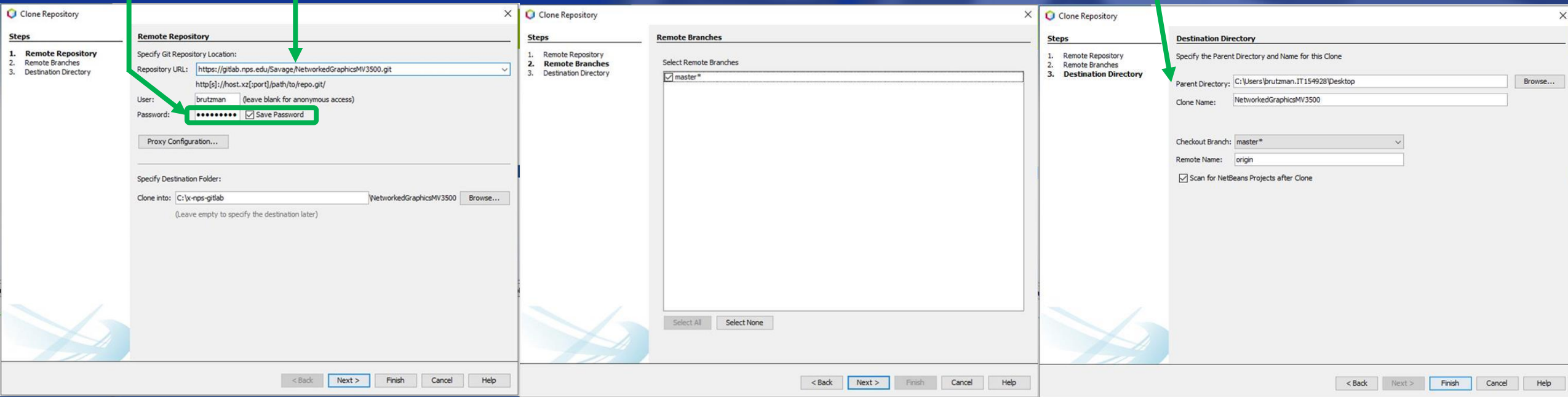
<https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500/-/archive/master/NetworkedGraphicsMV3500-master.zip>

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**

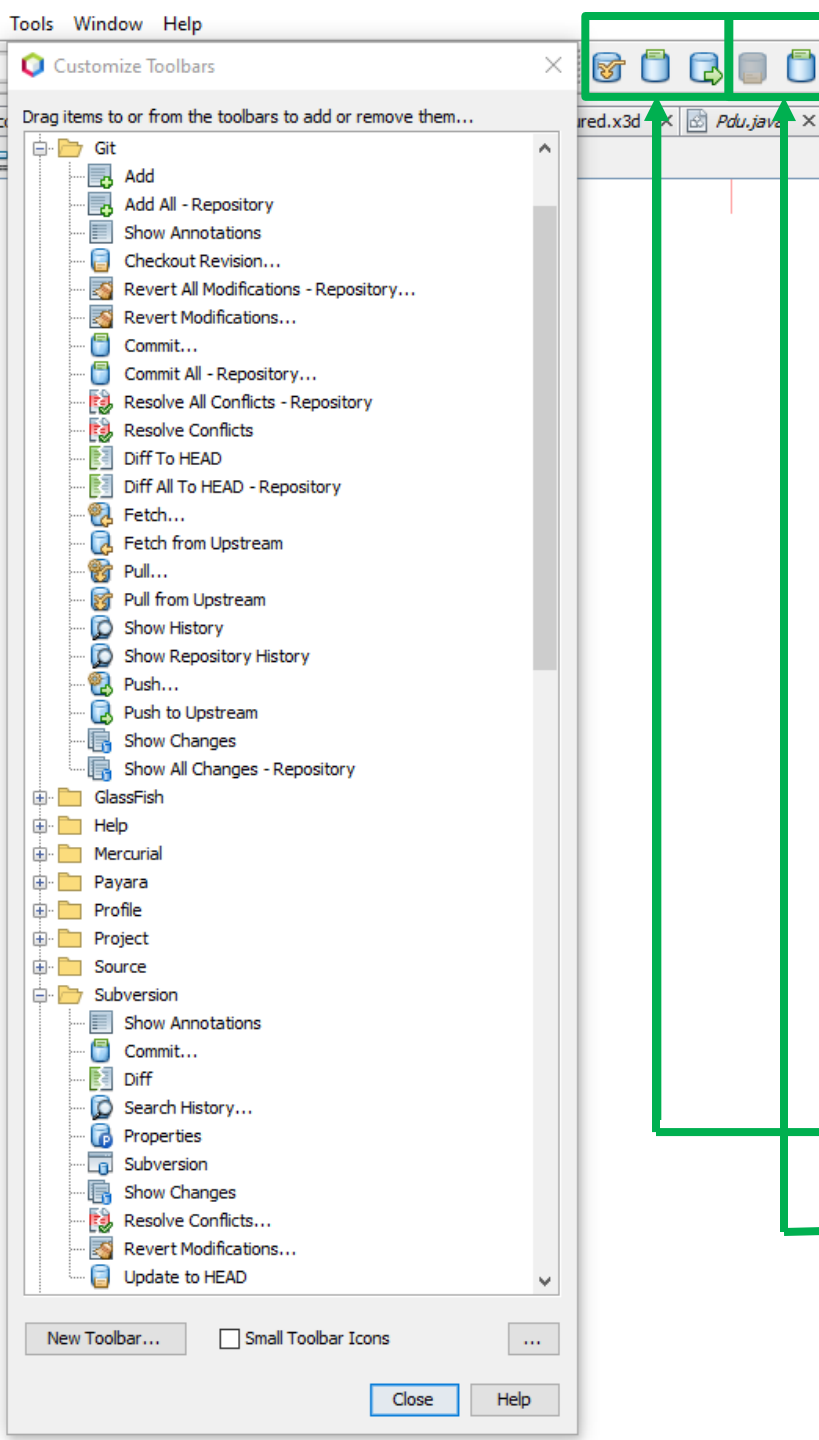
<https://gitlab.nps.edu/Savage/NetworkedGraphicsMV3500.git>



NetBeans timeout problems during initial clone?

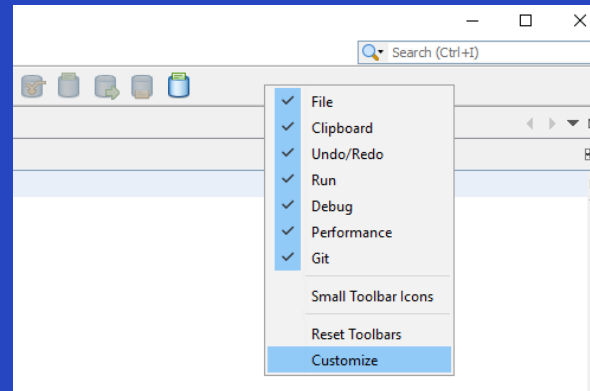
Some NetBeans users might have trouble cloning with git due to [annoying 45-second timeout problem](#) for large repositories

- a. Try again, with higher bandwidth perhaps!
- b. Can perform initial repository clone using alternate git tools
 - Windows: [TortoiseGit](#) shell interface
- c. Can download .zip archive if not committing back to repository
- d. Ask us! We will help you.



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=MbwH0w6JXI8>

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.

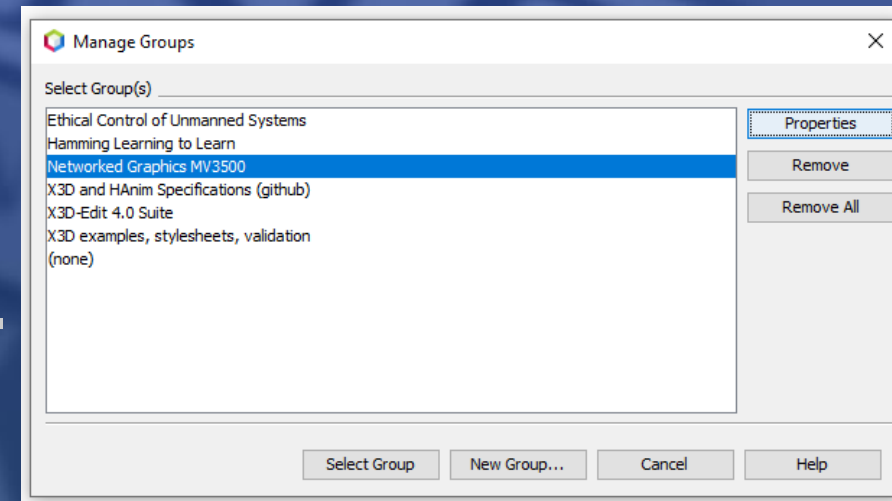
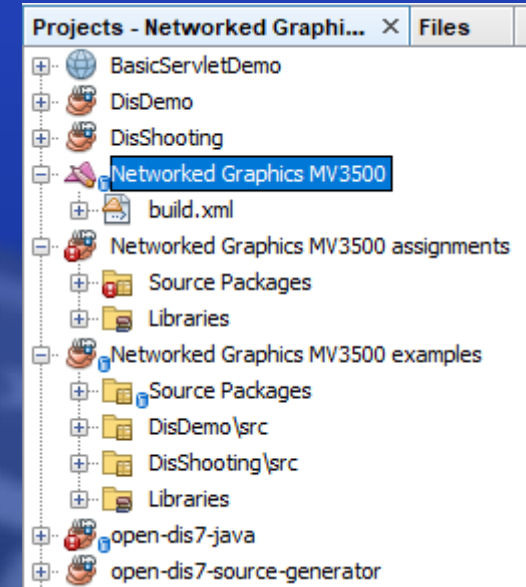
Alternative manual method:

- 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>

NetBeans
Debugger
Demos by
Brandon Jones

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>



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

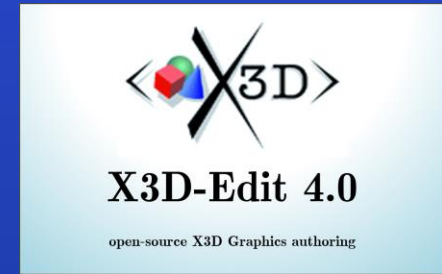
SharkFest Sponsors

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>

The screenshot shows the 'X3D-Edit 4.0 Module' page in the NetBeans Plugin Portal. The page is divided into several sections: 'Updates', 'Available Plugins (16)', 'Downloaded', 'Installed (120)', and 'Settings'. The 'X3D-Edit 4.0 Module' is listed in the 'Available Plugins' section with a status of 'Active'. The 'Plugin Description' section states that 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. It 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>.

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	●

The screenshot shows the X3D-Edit 3.2 application interface. The main window displays a 3D scene with a yellow cube and a red arrow. The interface includes a menu bar (File, Edit, View, Window, X3D, Versioning, Tools, Help), a toolbar, and several panels. The 'DIS Player Recorder Window' shows a list of entities. The 'DIS ESPOU Test Panel' shows various settings for translation, rotation, and DIS settings. The 'DIS ESPOU Test Panel' also includes a 'Dead Reckoning Parameters' section and an 'Entity Marking' section.

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

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE X3D PUBLIC "ISO//Web3D//DTD X3D 3.2//EN" "http://www.web3d.org/specifications/x3d-3.2.dtd">
<X3D profile="Immersive" version="3.2" xmlns:xsd="http://www.w3.org/2001/XMLSchema-instance" xsd:noNamespaceSchemaLocation="http://www.web3d.org/x3d/content/examples/Basic/course/CoordinateAxes.x3d" >
  <head>
    <component level="1" name="DIS"/>
    <meta content="BoxTestEspduTransform.x3d" name="title"/>
    <meta content="Don Brutzman, Don McGregor" name="creator"/>
    <meta content="1 January 2007" name="created"/>
    <meta content="13 November 2008" name="modified"/>
    <meta content="Leonard Daly and Don Brutzman" name="creator"/>
    <meta content="A simple EspduTransform test to move a Box." name="description"/>
    <meta content="http://www.web3d.org/x3d/content/examples/Basic/DistributedInteractiveSimulation/BoxTestEspduTransform.x3d" name="generator"/>
    <meta content="X3D-Edit 3.2, https://savage.nps.edu/X3D-Edit" name="generator"/>
    <meta content="http://www.web3d.org/x3d/content/examples/Basic/course/CoordinateAxes.x3d" name="license"/>
  </head>
  <Scene>
    <Viewpoint description="EspduTransform moves Box" position="0 0 25"/>
    <Background skyColor="0.5 0.6 0.8"/>
    <EspduTransform address="239.1.2.3" applicationID="1" entityID="2" marking="TestBox"
      networkMode="networkReader" port="62040" siteID="0">
      <Shape>
        <Box size="2 4 6"/>
        <Appearance>
          <Material diffuseColor="0.748014 0.62085 0" shininess="0.93" specularColor="0.860606 0.860606 0.860599"/>
        </Appearance>
      </Shape>
    </EspduTransform>
    <Transform scale="5 5 5">
      <Inline url="http://www.web3d.org/x3d/content/examples/Basic/course/CoordinateAxes.x3d"/>
    </Transform>
  </Scene>
</X3D>
```

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

