

CSE 490/590 Computer Architecture, Spring 2024

Appendix 1 – Accessing Xilinx Vivado

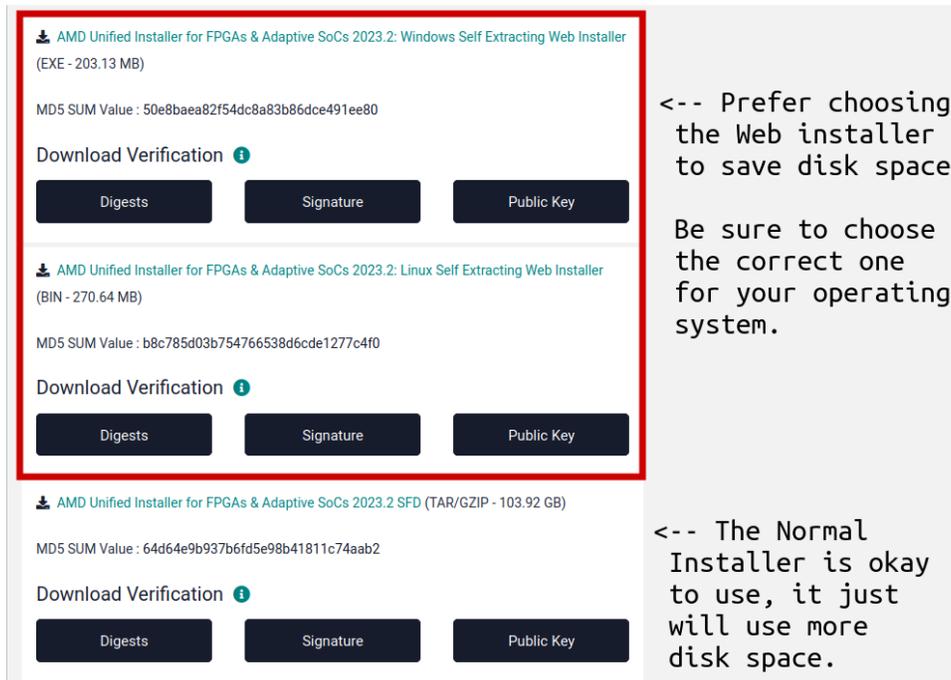
You have two options for accessing and using Vivado: either locally installing Vivado on your computer or remotely accessing Vivado on from the SENS/CSE servers.

1 – Steps for Local Installation

WARNING: Installing the Vivado Design Suite locally onto your personal computer will take several hours for the initial installation to run, and will require about 70 GB of storage to install (less after completing the installation). Having Vivado installed on your own computer will be convenient, but if you do not have enough space available, it is highly recommended to access Vivado remotely instead.

Step 1.1: Download the installer from the website

Goto <https://www.xilinx.com/support/download.html> and download version 2023.2 from the website. Using the web installer is preferred since they will use less disk space.



The screenshot shows three download options for the AMD Unified Installer for FPGAs & Adaptive SoCs 2023.2:

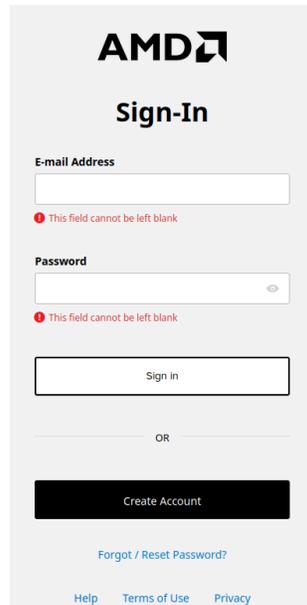
- AMD Unified Installer for FPGAs & Adaptive SoCs 2023.2: Windows Self Extracting Web Installer (EXE - 203.13 MB)**
MD5 SUM Value: 50e8baea82f54dc8a83b86dce491ee80
Download Verification: Digests, Signature, Public Key
- AMD Unified Installer for FPGAs & Adaptive SoCs 2023.2: Linux Self Extracting Web Installer (BIN - 270.64 MB)**
MD5 SUM Value: b8c785d03b754766538d6cde1277c4f0
Download Verification: Digests, Signature, Public Key
- AMD Unified Installer for FPGAs & Adaptive SoCs 2023.2 SFD (TAR/GZIP - 103.92 GB)**
MD5 SUM Value: 64d64e9b937b6fd5e98b41811c74aab2
Download Verification: Digests, Signature, Public Key

Annotations on the right side of the image:

- <-- Prefer choosing the Web installer to save disk space.
- Be sure to choose the correct one for your operating system.
- <-- The Normal Installer is okay to use, it just will use more disk space.

Step 1.2: Create (or login to) an AMD account

After clicking on the download option of your choice, you will be prompted to create/login to an AMD account.

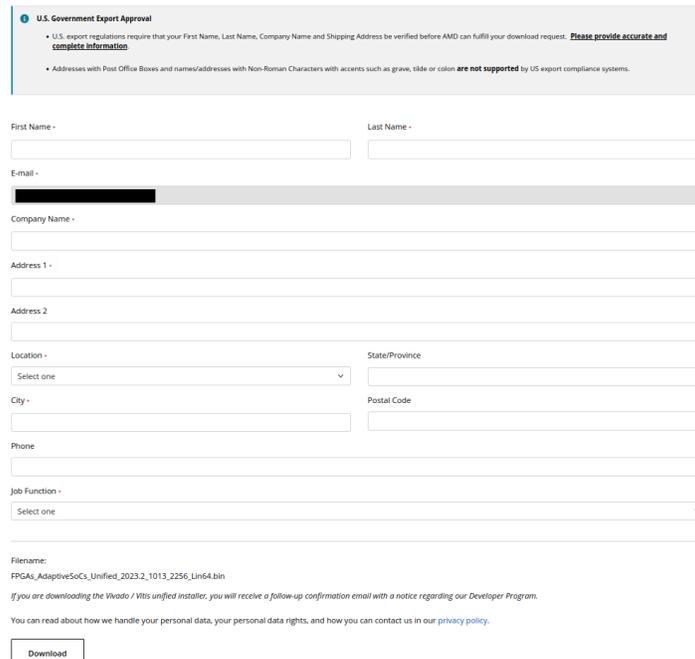


The image shows the AMD Sign-In page. At the top is the AMD logo. Below it is the heading "Sign-In". There are two input fields: "E-mail Address" and "Password". Both fields have a red error message below them that says "This field cannot be left blank". Below the password field is a "Sign in" button. Underneath the "Sign in" button is the text "OR" and a "Create Account" button. At the bottom of the form, there is a link for "Forgot / Reset Password?" and three links: "Help", "Terms of Use", and "Privacy".

Step 1.3: Fill Out United States Export Approval Form

Before you are allowed to download Vivado, you are required to provide some personal information due to U.S. export regulations.

Download Center - Name and Address Verification



The image shows the "Download Center - Name and Address Verification" form. At the top, there is a section titled "U.S. Government Export Approval" with a blue icon. Below this, there are two bullet points: "U.S. export regulations require that your First Name, Last Name, Company Name and Shipping Address be verified before AMD can fulfill your download request. **Please provide accurate and complete information.**" and "Addresses with Post Office Boxes and names/addresses with Non-Roman Characters with accents such as grave, tilde or colon **are not supported** by US export compliance systems." Below this is a form with several fields: "First Name", "Last Name", "E-mail", "Company Name", "Address 1", "Address 2", "Location" (a dropdown menu with "Select one" below it), "State/Province", "City", "Postal Code", "Phone", "Job Function" (a dropdown menu with "Select one" below it). Below the form, there is a "Filename:" label and the text "FPGAs_AdaptiveSoCs_Unified_2023.2_1013_2256_Lin64.bin". Below that, there is a note: "If you are downloading the Vivado / Vitis unified installer, you will receive a follow-up confirmation email with a notice regarding our Developer Program." Below the note, there is a link: "You can read about how we handle your personal data, your personal data rights, and how you can contact us in our [privacy policy](#)." At the bottom of the form, there is a "Download" button.

Step 1.4: Run the Installer (Web Installer)

Run the installer, you will be asked to enter your email address and password for your AMD account. Select “Download and Install Now”.

AMD Unified Installer for FPGAs & Adaptive SoCs 2023.2 - Select Install Type

Select Install Type

Please select install type and provide your AMD.com E-mail Address and password for authentication.

User Authentication

Please provide your AMD user account credentials to download the required files. If you don't have an account, [please create one](#). If you forgot your password, you can [reset it here](#).

E-mail Address

Password

<-- Enter your credentials for your AMD account

Download and Install Now
Select your desired device and tool installation options and the installer will download and install just what is required.

Download Image (Install Separately)
The installer will download an image containing all devices and tool options for later installation. Use this option if you wish to install a full image on a network drive or allow different users maximum flexibility when installing.

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Select “Vivado” and then “Vivado ML Standard”.

AMD Unified Installer for FPGAs & Adaptive SoCs 2023.2 - Select Product to Install

Select a product to continue installation. You will be able to customize the content in the next page.

Vitis
Installs Vitis Core Development kit for embedded software and application acceleration development on AMD platforms. Vitis installation includes Vivado Design Suite. Users can also install Vitis Model Composer to design for AI Engines and Programmable Logic in MATLAB and Simulink.

Vivado
Includes the full complement of Vivado Design Suite tools for design, including C-based design with Vitis High-Level Synthesis, implementation, verification and device programming. Complete device support, cable driver, and Document Navigator included. Users can also install Vitis Model Composer to design for AI Engines and Programmable Logic in MATLAB and Simulink. Users can select to install the Vitis Embedded Development which is an embedded software development package.

Vitis Embedded Development
The Vitis Embedded Development is a standalone embedded software development package for creating, building, debugging, optimizing, and downloading software applications for AMD FPGA processors. It includes a new Vitis IDE (Preview) with its new backend Vitis Server, as well as the classic command line utilities such as hw_server, bootgen and program_flash.

BootGen
Installs Bootgen for creating bootable images targeting AMD SoCs and FPGAs.

Lab Edition
Installs only the Vivado Lab Edition. This standalone product includes Vivado Design Programmer, Vivado Logic Analyzer and UpdateMEM tools.

Hardware Server
Installs hardware server and JTAG cable drivers for remote debugging.

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AMD Unified Installer for FPGAs & Adaptive SoCs 2023.2 - Select Edition to Install

Select an edition to continue installation. You will be able to customize the content in the next page.

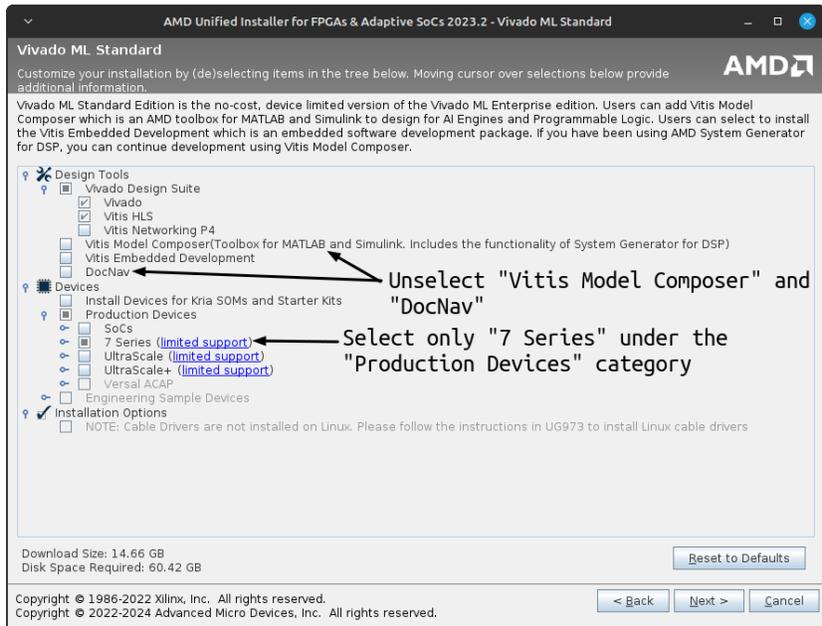
Vivado ML Standard
Vivado ML Standard Edition is the no-cost, device limited version of the Vivado ML Enterprise edition. Users can add Vitis Model Composer which is an AMD toolbox for MATLAB and Simulink to design for AI Engines and Programmable Logic. Users can select to install the Vitis Embedded Development which is an embedded software development package. If you have been using AMD System Generator for DSP, you can continue development using Vitis Model Composer.

Vivado ML Enterprise
Vivado ML Enterprise Edition includes the full complement of Vivado Design Suite tools for design, including C-based design with Vitis HLS, implementation, verification, and device programming. Complete device support, cable drivers, and documentation Navigator are included. Users can add Vitis Model Composer which is an AMD toolbox for MATLAB and Simulink to design for AI Engines and Programmable Logic. Users can select to install the Vitis Embedded Development which is an embedded software development package. If you have been using AMD System Generator for DSP, you can continue development using Vitis Model Composer.

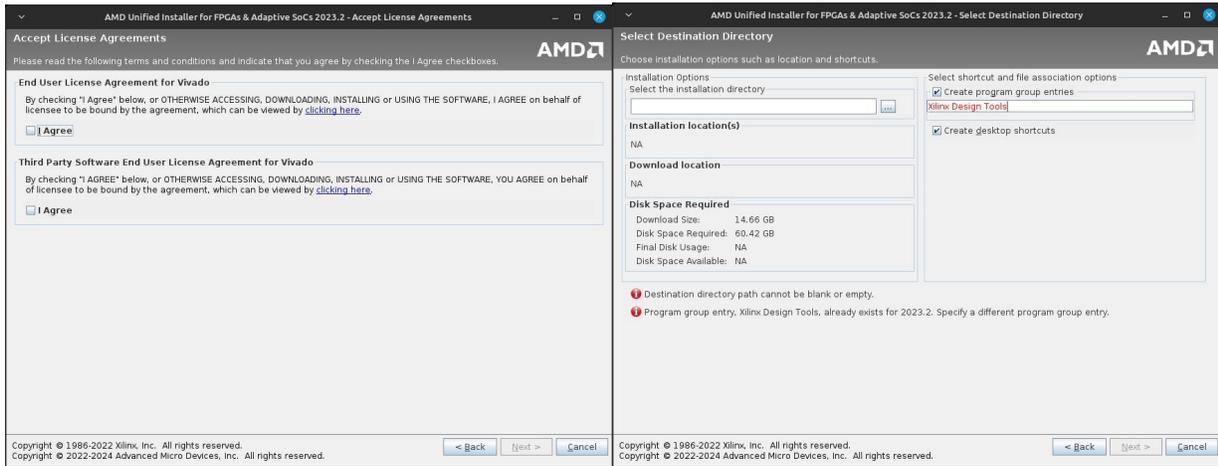
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Next unselect all options except “Vivado”, “Vitis HLS”, and “7 Series”.



Finally, agree to the License Agreements and set options for your installation.



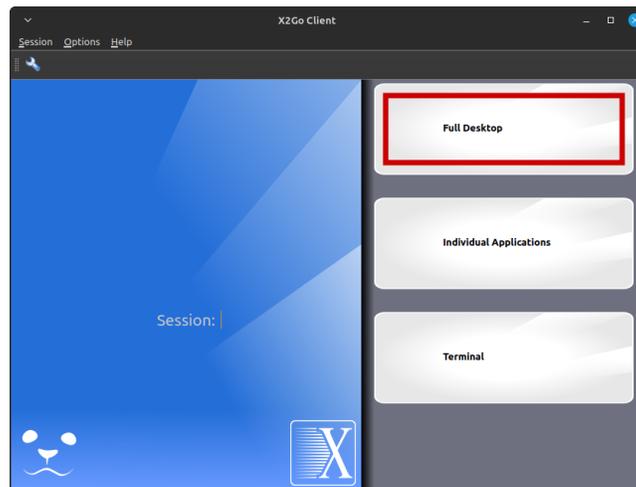
2 – Steps for Remote Access from SENS/CSE Servers

Step 2.1: Connect to SENS servers using X2go

1. Read the instructions from the [SENS X2go information page](#) and follow the instructions for installing X2go on your personal machine.
2. Make sure that you are connected to UB's Local Network by either connecting to UB's WiFi or ethernet while on campus, OR connecting to UB's VPN (<https://www.buffalo.edu/ubit/service-guides/connecting/vpn.html>) when off campus.
3. Under the "Connecting" section of the [SENS X2go information page](#) follow the directions for your specific operating system for connecting to the SENS servers.
4. Enter your UBIT name and password.



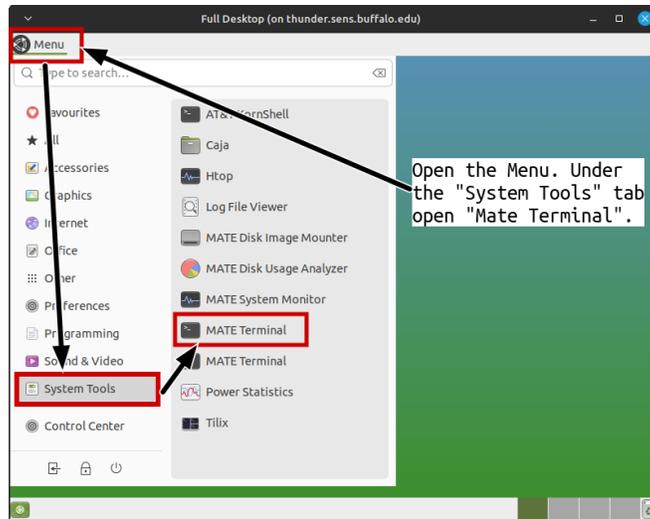
5. Once connected, select the "Full Desktop" option.



Step 2.2: Connect to CSE's "metallica" server

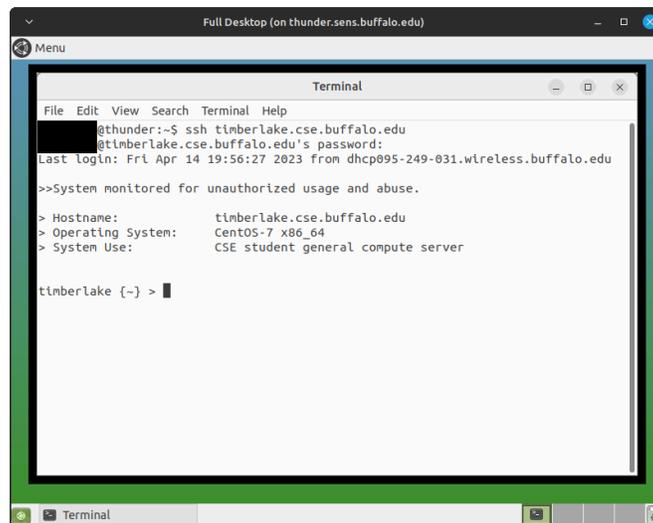
Perform the following **INSIDE** the virtual SENS desktop:

1. Open a terminal (inside the virtual SENS desktop, NOT directly on your personal computer).



2. Login to CSE's "metallica" server using the following command:

```
ssh metallica.cse.buffalo.edu
```



Step 2.3: Run Vivado Remotely on **metallica**

Inside the virtual SENS desktop, inside the terminal connected to **metallica** run the following commands to run Vivado:

```
source /util/Xilinx/Vivado/2021.2/settings64.csh
```

```
vivado &
```

