KLASS Installation Guide

KLASS Release Version 2.2.0

HARDWARE CONFIGURATION OVERVIEW

The KLASS software is designed to run with:

- one PC dedicated as a teacher *Modelserver*,

- one or more PCs dedicated as *Student Workstation(s)*, and

- one PC dedicated as a main system *Video Player*.

All of the personal computers (PCs) need to be connected on a TCP/IP network. A simple network configuration can be constructed by connecting all computers to a fast Ethernet network switch. There can be many PCs connected to the network but to run the KLASS simulation, a Modelserver and at least one student workstation are required. The example illustrated below is composed of 6 Student Workstations, each displaying a different Shuttle subsystem, a Video Player Workstation, and a Teacher Workstation.
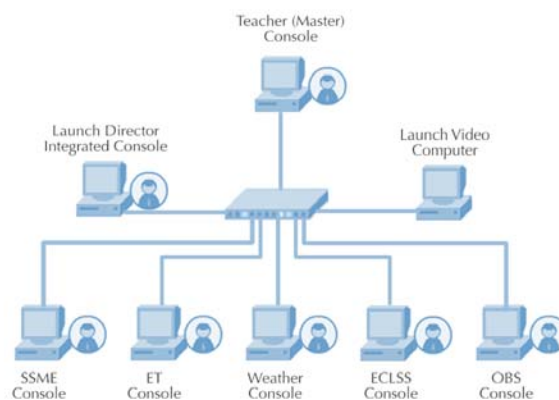
> In an actual Firing Room, these workstations would be equivalent to Firing Room "Consoles."
> Throughout the KLASS curriculum material, Student and Teacher Workstations will often be
> referred to as Consoles.

Networking the Student PCs

Connect each PC to a network switch.

For each PC, a typical configuration will involve connecting one end of your Ethernet cable to a network interface port on a student PC and the other end into an available port on the Ethernet switch.

Assign each PC its own unique IP address.

Each PC on the local network is then assigned its own "static" IP address. To assign an IP address on Windows XP, choose Control Panel from the Start menu, and open Network Connections. Right-click on Local Area Connection and select Properties. In the Properties dialog window under the General tab, select Internet Protocol(TCP/IP).   In the "This connection uses the following items" list, click on the Properties button. At this point you will now need to enter your own network settings in the dialog window that opens. For example, if the Teacher Modelserver address is 192.168.0.10, you could enter the following in the Use the following IP address box:

> IP: `192.168.0.11` (the static IP for this PC)

> Subnet mask: `255.255.255.0`

When assigning IP addresses to Student Workstations, make sure they fall within the subnet designated by the subnet mask. If you are not familiar with how network addressing works, you can use the following address scheme for your network. There are other address ranges you can use. The one provided below is a commonly used.

Workstation/Computer	Address
Teacher Workstation	192.168.0.10
Student Workstations	192.168.0.11 through 192.168.0.199
Video Player PC	192.168.0.200
Subnet Mask: 255.255.255.0	

SOFTWARE INSTALLATION

To set up a complete KLASS simulation, three separate software applications are necessary:

1. Teacher Workstation *Modelserver*,

2. Student Workstation console, and

3. Video Player Workstation

> Note: Although the video player is an optional component it is an integral part of the KLASS total package by design. Using the Video Player during a launch simulation provides an excellent feedback correlation between events occurring "on the ground" and through simulated camera monitoring of the Space Shuttle vehicle at the launch pad.

Teacher Workstation Software Installation

The concept of the Teacher Workstation involves running a part of KLASS on one PC that acts as the *Modelserver*, i.e., the multiple subsystem simulation control point. There are two options for running the Teacher Workstation software: (1) run it directly from the "LiveCD"; or (2) install the KLASS Teacher Workstation software on a dedicated computer.

1. The KLASS LiveCD is a bootable CD with Fedora Core 6 and the KLASS Teacher Workstation preinstalled. To use it, you boot your computer from the LiveCD and start the SMC Interface (Teacher Console) as instructed in the KLASS User Guide. With this option, you do not need to install the Teacher Workstation Software. In fact, any computer can become the Teacher Workstation provided it is compatible with the LiveCD.

2. If you cannot use the LiveCD, then you will need to install the KLASS Teacher Workstation on a computer dedicated for that purpose. Since the Teacher portion of KLASS runs on Linux, you may need to consult with your Network Administrator before proceeding. Refer to the remainder of this section for instructions on installing the Teacher Workstation on a computer running Linux.

The minimum requirements needed for the Teacher Workstation installation include a Pentium 3 or better PC with Red Hat Fedora Core Linux loaded (version 3, 4, 5 or 6), A DVD drive and at least 200 MB hard of drive space.

Fedora Linux offers two choices for a user interface: GNOME and KDE. For purpose of installation, you should choose the GNOME interface since installation will require fewer steps. You can still install using the KDE interface but it takes a bit more technical skill and offers no advantage. In either case, you will need to know the user ID and Password for the "root" user for your system.

To begin the installation, insert the KLASS distribution disk into the DVD drive and select the GNOME interface on your Linux system, then login as the "root" user.

> IMPORTANT: It is necessary that the "Login Shell" for the root user be set to "/bin/bash". This is required since the installation software can only run in the bash shell environment. Unless you have made a change to the root user's Login Shell, you should not have to worry about this technical requirement. However, if you find that the installation program is failing to run, you may need to check to ensure that the root user's Login Shell is set to /bin/bash.

Installing Under GNOME

If you are installing under the GNOME interface, follow these instructions:

On the GNOME desktop, double-click on the "Computer" icon. This will open a window showing the devices on your computer. Double-click on the DVD icon to open another window showing the contents of the KLASS distribution disk and you should see the KLASS_2.2.0_DISTRO folder. Double click on the KLASS_2.2.0_DISTRO folder and you should see the "InstallModelServer.sh" file. Double-click on the "InstallModelServer.sh" icon to start the installation. (If you are then asked if you want to "Run" or "Display" be sure to select "Run".) Follow the instructions that appear on the screen to complete the installation. Once the installation has completed, don't forget to follow the final instructions displayed by the installation program to get your Model Server running.

Installing Under KDE

If you must install using the KDE interface, follow these instructions:

You must first determine the "name" that the KDE interface has given to the DVD drive in your computer. You can do this by opening the "K Menu" (click on the "f" icon, probably in the lower left corner of the window) and selecting "Find Files/Folders". Then push the Browse button. Now search the list that appears for a "Media" folder and under that folder you should see an entry for something like "CD-DVD". Single click on that entry and at the bottom of the window you will see the name that the KDE interface has given to the DVD drive in your computer. It will probably look something like "/media/CD-DVD". Carefully write down the name that is displayed paying attention to upper and lower case, slashes and dashes. Close the Find Files/Folders windows until you return to the desktop. Now open a console window. For example, when using the KDE interface under Fedora Core 6, right click on the desktop and select "Konsole" to open a console window. In the console window, type the following two commands to start the installation. For example, if you found that the name of your DVD drive is "/media/CD-DVD" you would type the following commands:

```
cd  /media/CD-DVD/KLASS_2.2.0_DISTRO
./InstallModelServer.sh
```

Note that the first command starts with "cd" and then a space and a forward slash. Also note that the second command starts with a "dot" followed by a forward slash but there is no space. In both commands you must pay attention to the exact upper and lower case shown above. As another example, if you found that the name of your DVD drive is, say, "/media/hdc" then the commands you enter would look like:

```
cd  /media/hdc/KLASS_2.2.0_DISTRO
./InstallModelServer.sh
```
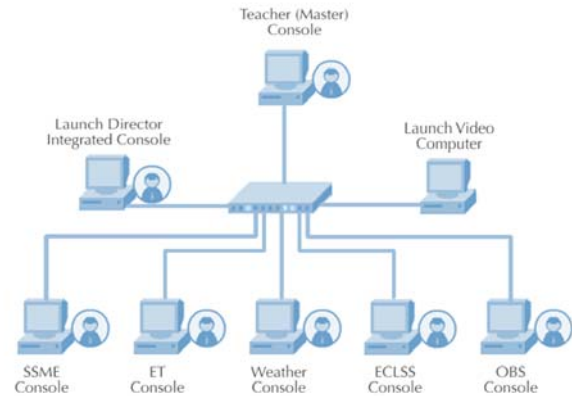
Once the installation starts, follow the instructions that appear on the screen to complete the installation. Once the installation is complete, enter "Exit" in the console window to close that window. Don't forget to now follow the final instructions displayed by the installation program to get your Model Server running.

This completes the Simulation Modelserver and Models installation on the Teacher Workstation.

Student Workstation Software Installation

The concept of the Student Workstation involves running a part of KLASS on separate PCs to simulate a Shuttle Launch Control Room environment. Each PC will be used to represent one of 8 Space Shuttle subsystems:

- SSME1 (Space Shuttle Main Engine 1)
- SSME2 (Space Shuttle Main Engine 2)
- SSME3 (Space Shuttle Main Engine 3)
- External Tank
- Weather
- Operational Bioinstrumentation System (BIOSYS or OBS)
- Environmental Life Support System (ECLSS)
- Master (Integration)

System Requirements

Component	Required	Recommended
Processor	Pentium 3 processor	A 1-gigahertz (GHz) processor or faster.
Monitor	One of the following*: ▪ SVGA (800 x 600) resolution ▪ XGA (1024 x 768) resolution ▪ SXGA (1280 x 1024) resolution	SXGA (1280 x 1024)
Video card	Video card with 128K of RAM capable of running OpenGL	Video card with 256 MB of RAM or higher
Optical drive	DVD drive	Same as required configuration
Free hard disk space	200 MB	Same as required configuration
Operating system	One of the following: ▪ Microsoft Windows XP ▪ Microsoft Windows 2000	Same as required configuration

* Attempting to run KLASS in any other resolution will cause the application to abort and shutdown on startup. Since the Student Workstation is designed to run in 1280 × 1024 resolution, choosing this resolution will ensure that all readouts and controls are visible for each subsystem. Other resolutions may crop the display for some subsystems.

When selecting computers to use as Student Workstations, keep in mind that some subsystem displays work best a certain resolutions. Although you can display any subsystem on a Student Workstation, consider the following recommendations.

Subsystem	1280 x 1024	1024 x 768	800 x 600
SSME	❂	❂	◉
ET	❂		
Weather	❂		
OBS	❂		
ECLSS	❂	❂	◉
Integration	❂	❂	◉

❂ Resolution is fully supported.

◉ Some text labels may be obscured or may overlap.

Installation

For each Windows PC that you will use, perform the following steps to install the Student Workstation software:

1. Insert the KLASS Software Disk.

2. Open Windows Explorer and navigate to the StudentWorkstation folder.

3. In the StudentWorkstation folder double-click on the self-extracting .exe file (`KLASS_2.2.0_`) to start installation.

4. When installation completes, KLASS will be available as a program from the Start Menu.

5. Finally, you will need to edit the Modelserver (Teacher Workstation) IP address to which the Student Workstation will connect.

    a. Using the Windows Explorer, navigate to the installation directory. (If you accepted the default location during installation, this directory will be `C:\Program Files\KLASS_2.2.0`).

    b. Open the `modelserveraddress` file in a text editor like Wordpad.

    c. There is one line in this file showing a default IP address (128.217.80.102) of the Teacher Workstation Modelserver. Change this IP address to the address of the Teacher Workstation that you will be using and save the file. Be sure to save this file as a Text Document; otherwise, the software will not be able to read the IP address you entered. For some text editors and word processors, you may have to use the "Save As ..." option when saving the `modelserver` file. Also, make sure not to append an extension to the file name.

Video Player Installation (Optional)

The Video Player provides real time feedback of launch conditions as they might appear in a real launch countdown. This feedback guides students in ways that an instructor cannot by letting the student see on-the-ground conditions. While the Video Player is optional, it is recommended.

Before installing the Video Player, select a separate PC on which to install it, i.e., not on a computer running the Student Workstation, and perform the following:

1. ***Set the display resolution***. Configure this dedicated Windows based computer to a screen resolution of 640 x 480 using the Control Panel.

2. Connect and configure the overhead video projector and sound system if used (the PC screen can also be used if a projector is not available).

3. ***Install the Video Player software***. Insert the KLASS Software DVD and copy the `KLASSVideoPlayer` folder to the `C:\Program Files` folder on your computer.

4. ***Create a Desktop shortcut***. On your Windows desktop, find the `KlassVideoPlayer.exe` within the folder you just copied. Right-click and select Create Shortcut. Now, drag the shortcut onto your desktop.

5. ***Set the Modelserver address***. Open the file `modelserveraddress` in a text editor and enter the IP address of the Teacher Workstation.

6. ***Enable closed-captioning (optional)***. To display the Launch Video with closed captions, right-click on the KlassVideoPlayer desktop shortcut you created and select Properties. Under the Shortcut tab, enter the following in the Target box:

   ```
   C:\Program Files\KLASSVideoPlayer\KlassVideoPlayer.exe –fc
   ```

   (assuming you copied the KLASSVideoPlayer folder to `C:\Program Files`). Click the Apply button then OK.

For instructions on running the Video Player with the simulation, see the KLASS User Guide.