

Installation Guide

SmartClass+ Lab Management System



2014-11-04

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Guide Revision History	
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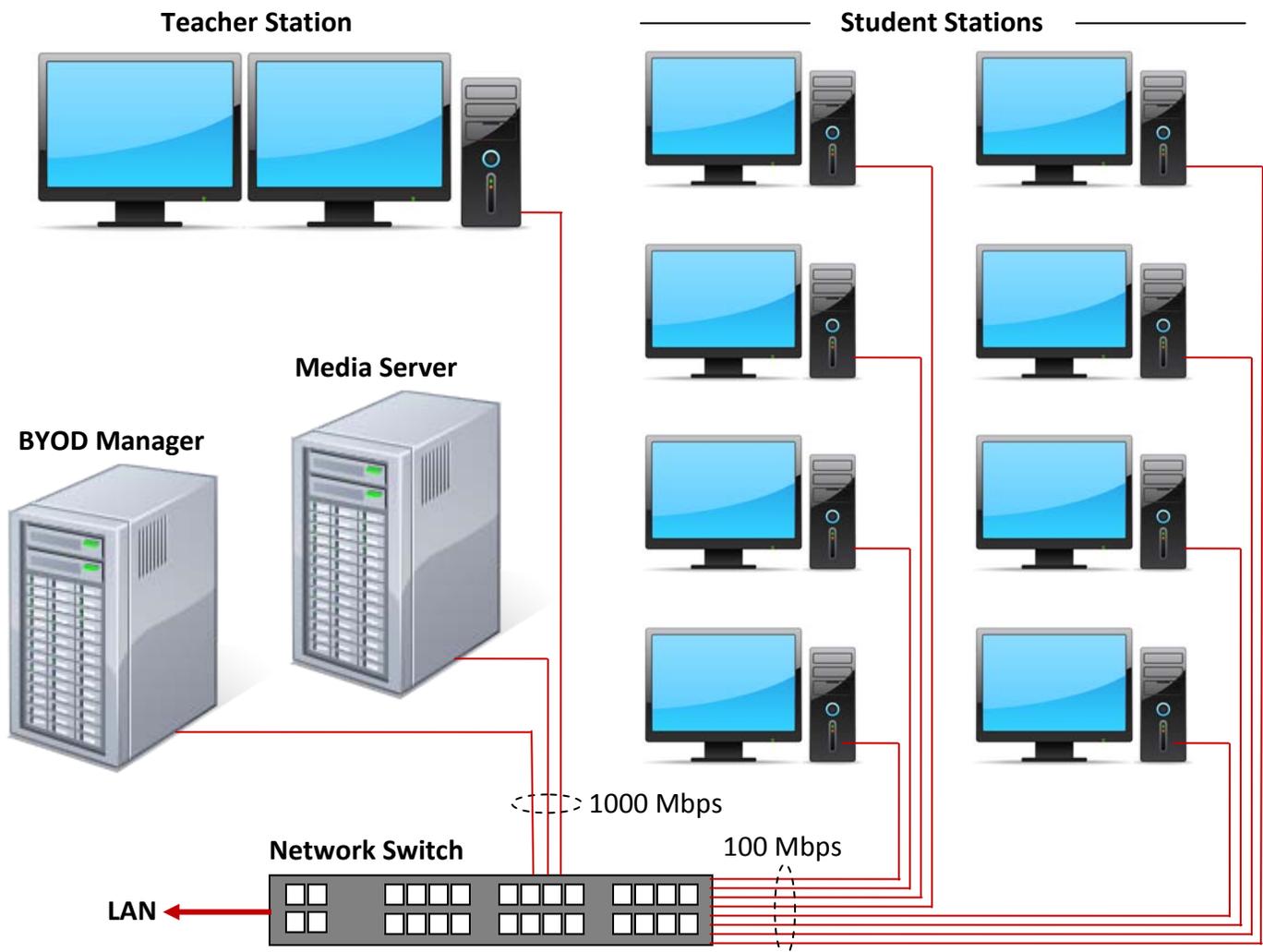
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System Components

Introduction

The block diagram of a typical SmartClass+ based computer lab is shown in the diagram below. There are four main components of this system, the student stations, the teacher station, the SmartClass+ server, and the network switch. The requirements for each of these components are described in this chapter.



Teacher Station

The teacher station must use a computer running the Microsoft Windows® operating system. The minimal requirements for the teacher computer are as follows:

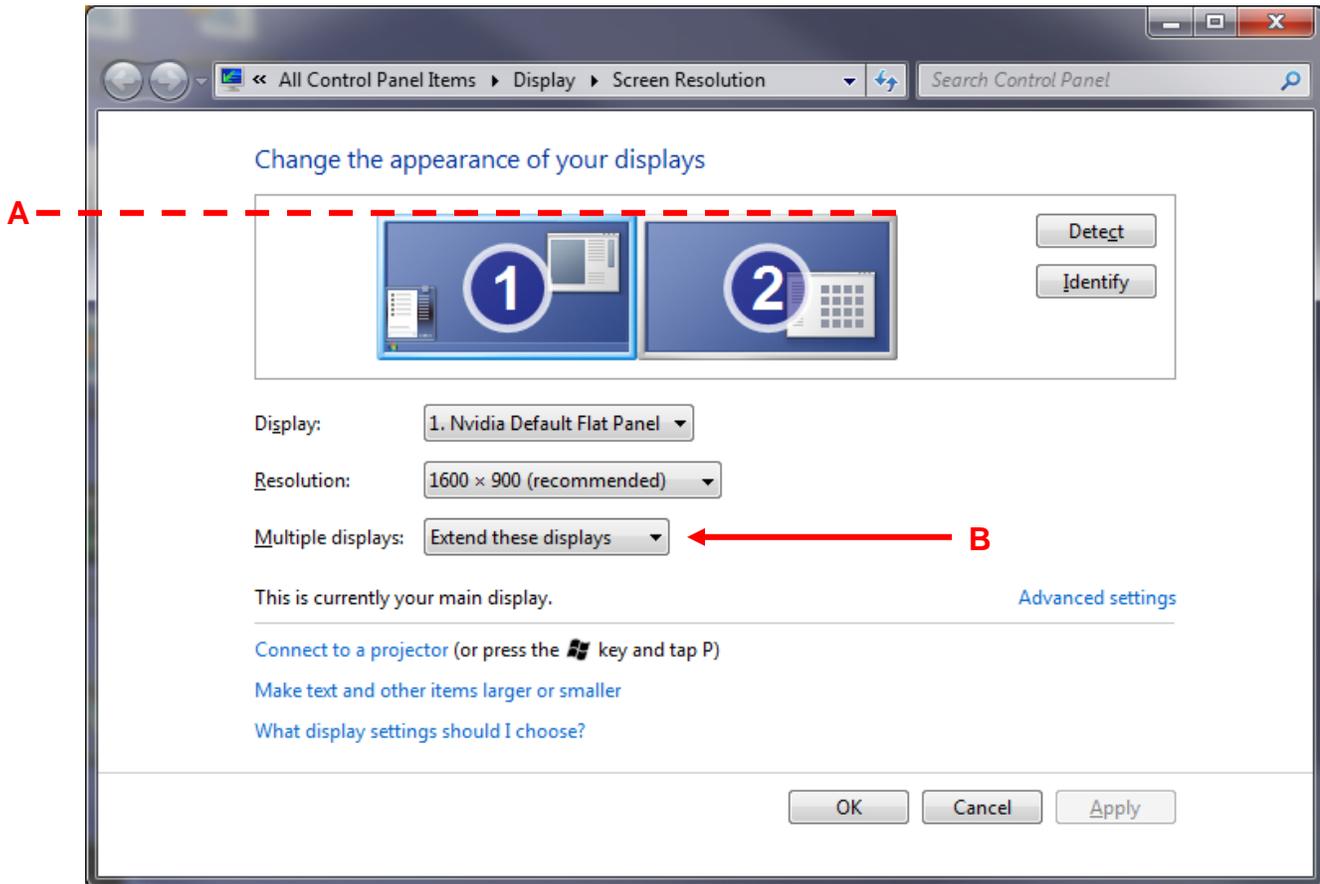
- Intel or AMD 2.5 GHz multicore processor
- 4 GB or more of RAM
- 120 GB hard drive
- 1000 Mb/s NIC (wired) with Wake-On-LAN
- Dual monitor support (teacher & control)
- WXGA Control monitor (1280 x 768 minimum)
- XGA Teacher monitor (1024 x 768 minimum, 1280 x 800 or more recommended)
- Keyboard & mouse
- CD-ROM or DVD drive
- Sound card
- RS-232 port (or USB port with RS-232 adapter) for systems using hardware-based KVM or Intercom modules
- USB 2.0 or IEEE-1394 port (or spare PCI or PCI Express card slot) for optional video capture device
- Windows XP SP3, Windows VISTA, Windows 7 (32 bit or 64 bit), or Windows 8
- Adobe Flash version 10 (10.1.102.64 or newer)

If a hardware KVM module is being used, the teacher station must use the same keyboard and mouse as the student stations, and must use the same keyboard and mouse drivers.

If a software intercom is being used, and the teacher station is using Windows XP, then a software “stereo mix” utility must be purchased and installed on the teacher station. See the section in this chapter on Sound Cards for more details.

Dual-Screen Configuration

Windows allows you to organize two screens in different ways. The image below shows the Windows panel, (from the Windows 7 operating system) that is used to configure the two screens. (Other Windows operating systems have similar displays.)



For SmartClass+ teacher stations, the following two options are very important:

- A. Top Vertical Alignment** – Make sure that the two displays are top aligned. (This impacts the automatic detection of screen resolution.)
- B. Extend the Displays** – Make sure that the Windows desktop is extended onto both screens.

Normally the #1 screen will be used as the teacher’s primary monitor, and the #2 screen will be used as the control screen. The control screen should have a resolution equal to or greater than that of the teacher screen.

Sound Cards

Windows VISTA, Windows 7, & Windows 8

On the sound card, the *microphone* must be selected as the input device.

Adjust recording levels, playback levels, and features such as *microphone boost* according to your preferences.

Make sure that for playback, the microphone is not muted.

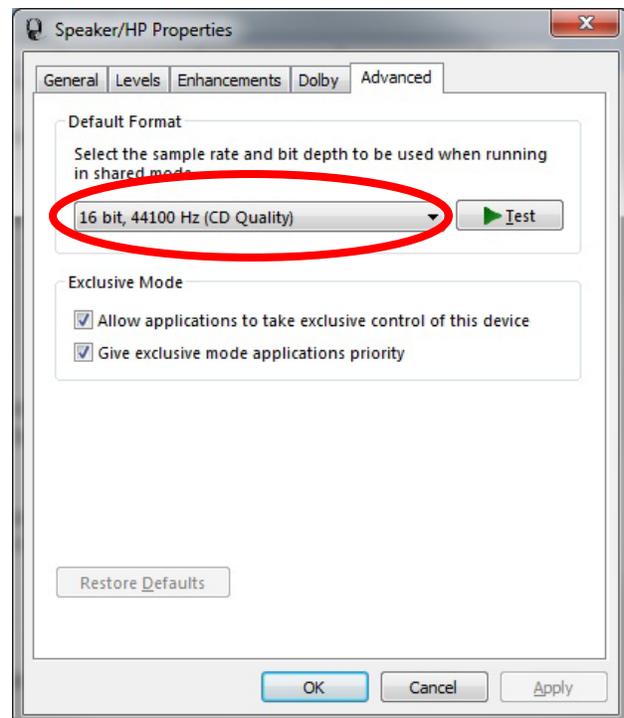
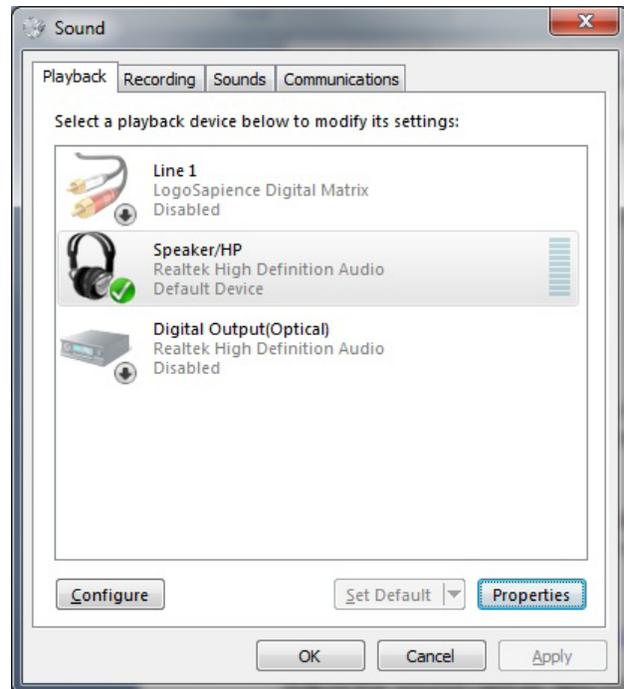
It is critical that the correct default playback CODEC be selected in the sound card settings. Begin by opening the Sound playback tab as shown at right.

From this view, highlight the default playback device, and click on the *Properties* button.

In the Properties window, choose the *Advanced* tab, as shown below right.

Make sure the CODEC **16-bit 44100 Hz** is selected.

(This applies to the teacher station and to all student stations.)



Windows XP

For teacher stations running the Windows XP operating system, a “stereo mix” utility called Virtual Audio Streaming must be installed if using the SmartClass+ software-based intercom option

The Virtual Audio Streaming utility costs \$29.95 US for a non-commercial license and \$69.95 for a commercial license with lifetime updates. It can be purchased on-line from the following organization:

<http://www.virtualaudiostreaming.net/>

Adjust the sound card as described in the previous section (for Windows VISTA et al).

3rd Party Software Applications

Third party software applications like Skype that use the sound card will often modify the sound card settings to support their own needs. You need to be aware that the use of these types of applications can impact the SmartClass+ software-based intercom performance.

Using the Microphone as your default recording device should minimize any interference between applications however, if you require complete independence from 3rd party applications, it is strongly recommended that you purchase the hardware-based intercom option for SmartClass+.

Student Stations

SmartClass+ supports several different devices as student stations, including Windows computers, MAC computers, iPads, iPhones/iPods, Android tablets and phones, and Chromebooks.

Currently, there are two main categories of student station support, a full-featured solution for Windows-based student stations, and an Adobe Air limited-feature solution for MACs, tablets, and Smart phones.

The Adobe Air based solution differs from the Windows solution in two key areas:

1. Students must manually launch the SmartClass+ software to join a live class.
2. The instructor can only remotely view the SmartClass+ application on student stations, and no other sections of the student's screen.
3. Windows utilities like Power-Off, Restart, and Launch Program are not functional with the Adobe Air client.

Station Requirements

For detailed station requirements, consult the appropriate student software guide for the target platform and/or the latest version of the SC+ Pre-requisites document.

BYOD Manager

For small demonstration systems, the BYOD Manager can be installed on the teacher station. As the BYOD manager includes a set of servers for supporting tablets, it is important to ensure that the teacher station is not running the “servers for tablets” option, (now called “Tablets”) as this would conflict with the BYOD Manager if both are installed on the same computer.

Normally, however, the BYOD Manager will run continuously to support 24/7 operation. It should be installed on a school server that is sufficiently robust to support the anticipated traffic.

The BYOD Manager can run on the same server that hosts the SC+ database and/or media server function, or it can run on an independent computer. The BYOD Manager does not require a dedicated server: It can be located on an existing server that supports other applications.

The requirements for the server are nominally as follows:

BYOD Manager Only

- Windows operating system (Win 7 Pro, Win 8 Pro, Windows Server 2000, 2003, 2008)
- Intel or AMD multicore processor
- 3.5 GHz processor (or better)
- 4 GB RAM
- 1000 Mb/s NIC

BYOD Manager with SC+ Database

- Windows Server operating system (2000, 2003, 2008, or newer)
- Intel or AMD multicore processor
- 3.5 GHz processor (or better)
- 4 GB RAM
- 1000 Mb/s NIC
- 500 GB hard drive (RAID array recommended for performance and redundancy)

Media Server

For small demonstration systems having eight or fewer student stations, the teacher station will automatically be configured to work as a default media server.

For larger systems, you must have a separate server or an NAS (Network Attached Storage) device that can be accessed by all users concurrently.

The role of the media server is to store media files and exercises provided by teachers for use in student media activities, to save student responses to exercises, and to store both user and system related data.

(Note that certain SmartClass+ options, such as Stand-Alone MAD support and BYOD support, require an actual server capable of running specified services. These services can be run on the same device that stores the media files and student responses, or they can be run on an independent server.)

The overall performance characteristics and storage requirements for the media server are dictated by factors such as how many concurrent users must access files, how long students record for each class (e.g. 10 minutes per day), and how long student recordings must be saved (e.g. 26 weeks).

That being said, here are some minimum recommendations for the server and some guidelines on how to calculate the required storage capacity.

Server

The minimal requirements for the server are as follows:

- Linux or Windows Server 2000, 2003, 2008, (or newer) operating system
- NTFS compatible file system support
- Intel or AMD multicore 3.5 GHz processor
- 4 GB RAM (Windows or Linux)
- 500 GB hard drive (RAID array recommended for performance and redundancy)
- 1000 Mb/s NIC (IEEE 802.3 compliant)
- CD-ROM or DVD drive

NAS Device

The minimal requirements for the NAS device are as follows:

- NTFS compatible file system support
- Intel or AMD multicore 1.2 GHz processor
- 512 MB RAM
- 500 GB hard drive (RAID array recommended for performance and redundancy)
- 1000 Mb/s NIC (IEEE 802.3 compliant)

Estimating Storage Capacity Requirements

SmartClass+ stores all content in an FLV format. When media files having other formats are being imported, they are automatically converted to FLV for storage.

Audio Clips

One minute of SmartClass+ digitized audio for media files requires 1,444 KB of storage space, so we can characterize this as about 1.4 MB per minute. One minute of SmartClass+ digitized audio for student responses requires 2,581 KB of storage space, so we can characterize this as about 2.5 MB per minute.

Video Clips

One minute of SmartClass+ digitized video requires 4,116 KB of storage space, so we can characterize this as about 4.1 MB per minute. (There is actually some variation in space requirements depending on the format of the original video files, but this should average out overall.)

Storage Requirements

For a typical class session, we might assume that the teacher uses 10 minutes of audio-visual content, with 50% being audio and 50% being video. This yields a storage requirement of 35.7 MB per class

Also, for a typical class session, let us assume that students are recording individual responses for about 10 minutes per class, and let us assume that we have 30 students. This yields a storage requirement of 750 MB per class

The aggregate storage requirements for each class session are therefore about 786 MB. We can also express this as 0.79 GB.

If there is one class per week and recordings must be saved for a complete school year, (e.g. 40 class sessions), then each class will require ($40 \times 0.79 = 31.6$ GB), or about 32 GBytes.

If there are 10 different language classes (e.g. English 101A, French 102B, etc.) that run each school term, then the server must provide at least ($10 \times 31.6 = 316$ GBytes) of storage capacity.

Use the guidelines provided in the above example to calculate how much storage space is required on your media server.

Network Switch

SmartClass+ supports both wired and wireless network connections. The teacher station and the media server must always use wired connections, but the student stations can use wired or wireless.

Wired Networks

The preferred wired network configuration is based on the IEEE-802.3 (Ethernet) standard.

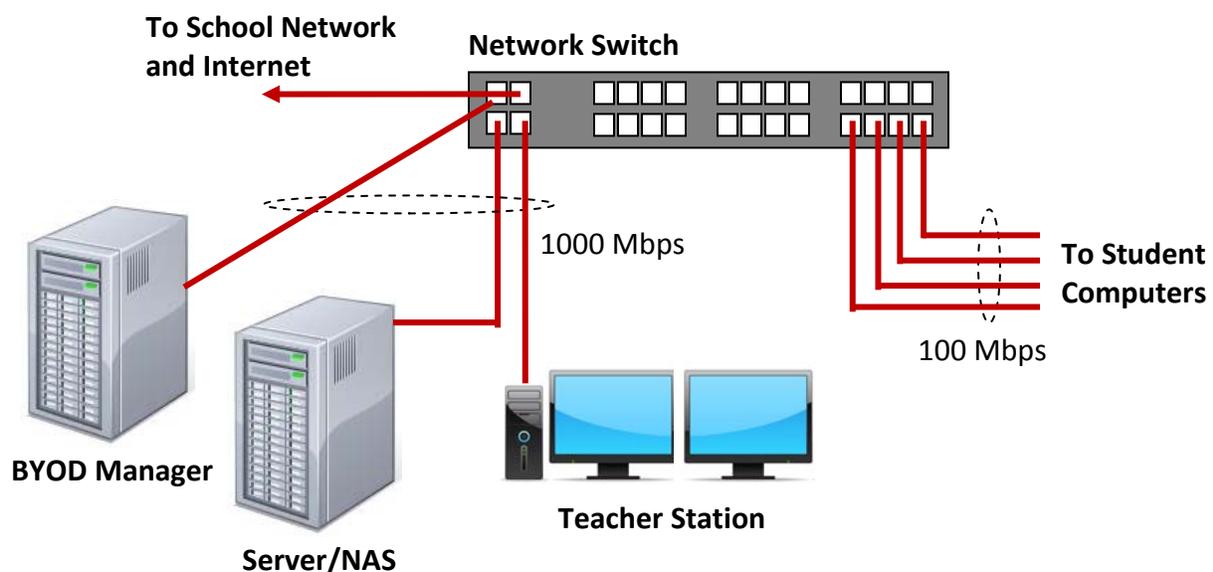
The recommended network configuration is to have a single (or stacked) TCP/IP network switch located in the classroom (or near the classroom in a wiring closet), with all student stations, the teacher station, and the media server all connected to this same switch.

Student stations can be connected to the switch using 100 Mbps links, while the teacher station, the BYOD Manager, and the media server require 1000 Mbps links.

The switch acts as the gateway to the school's LAN (Local Area Network) and any LAN-based resources that provide external access to the Internet.

In situations where a server cannot be dedicated to a single classroom, (e.g. the server is shared by more than one classroom), then the link to the LAN should also use a 1000 Mbps connection.

The BYOD Manager, the Media Server, and the Teacher Computer must use a static IP address. Student stations may use dynamic IP addressing.



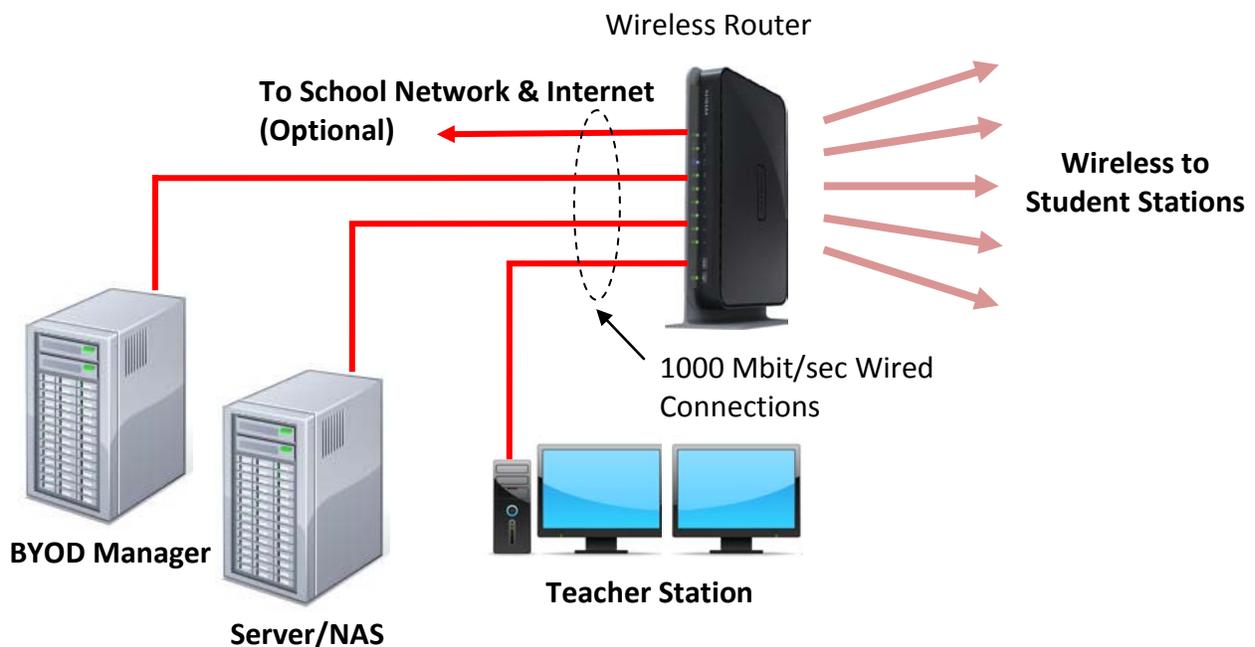
Wireless Networks

The preferred wireless network configuration is based on the IEEE-802.11 standard. As a minimum, all devices must support the “n” version of this standard. At this time, the “ac” version of the standard has not yet been ratified, but this will become the preferred implementation when available.

The specifics of the wireless network implementation are beyond the scope of this document, but the underlying requirement is to deploy sufficient wireless access points (WAPs), such that all students can concurrently connect to the network and work on multimedia assignments.

In general, the rule of thumb we use is that smaller systems (having 15 or fewer students) can usually be supported with a high-performance home-grade router like the NetGear WNDR3700. For larger systems we recommend enterprise-grade WAPs like the Ruckus ZoneFlex 7982. The number of access points will be determined by the number of concurrent users and the physical space that needs to be covered.

As shown in the diagram below, the teacher station and the media server will use wired 1000 Mbit/sec links to the router (or WAP controller), while the students will all connect wirelessly.



Folders & User Permissions

Users

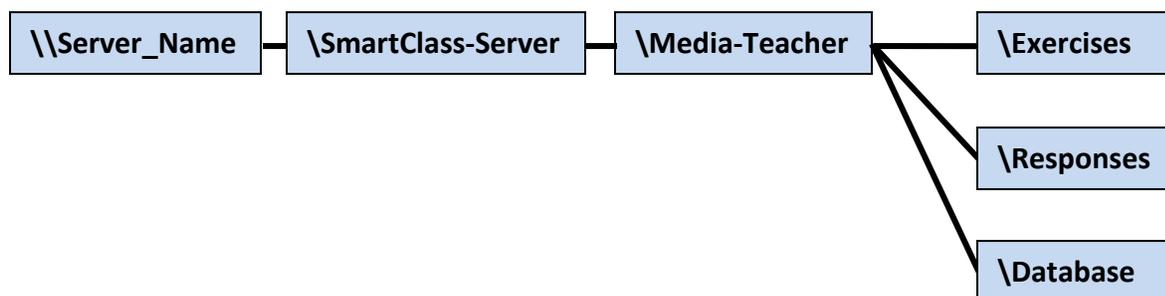
SmartClass+ can be configured to manage users independently within its own database, or it can be configured to dynamically link with a central on-line directory of users through an LDAP (Lightweight Directory Access Protocol) link.

Ideally, this decision should be taken up-front, as changing from LDAP to non-LDAP (or vice-versa) will result in the loss of all student responses.

If working with LDAP, users will be identified by their Login Name, and verification of passwords will be done with the on-line personnel directory. If working independently, users will be identified by their First Name, Last Name, Login Name, and Password, and verification of passwords will be done within the SmartClass+ database.

SmartClass+ Server

Exercise and response materials are organized on the media server as shown in the diagram below:



The “SmartClass-Server” folder must be shared over the network to support network-based communications between the SmartClass-Server application and the client stations (e.g. student and teacher computers).

Materials imported by teachers are stored in the “Exercises” folder, and student responses to exercises are automatically saved in the “Responses” folder.

Note that if using LDAP, there is an extra folder inserted into the hierarchy as shown below:



SmartClass-Server Folder

Teachers must have the following folder access rights:

- Read, write, and modify

Students must have the following folder access rights:

- Read, write, and modify

Teacher Computer

The SmartClass+ system software is installed and runs on the teacher computer. The default configuration is as shown below:



The “SmartClass – Teacher” folder must be shared over the network.

SmartClass-Teacher Folder

The teacher station must have the following folder access rights:

- Read, write, and modify

Student stations must have the following folder access rights:

- Read, write, and modify

Windows Registry

Teacher stations and student stations need have read-only rights to the local Windows Registry for on-going system operation, but require full rights for SmartClass+ installation.

SmartClass+ Executable Files

Teacher Station

The following SmartClass+ executable files will be installed on the teacher computer:

- SmartClass-Server.exe
- SmartClass-Teacher.exe
- SCLASSBQ.exe
- SCLASSCJ.exe
- SAFlashPlayer.exe
- Flash-Teacher.exe
- WASAPL.exe
- Uninstall.exe
- SmartClass-HostGuest.exe
- base64.exe
- ffmpeg.exe
- FFMIC.exe
- FFMIC_MAD.exe
- flashvideomx.exe
- lame.exe
- sc_teacher_server.exe
- SmartClass-WebServer.exe
- xdh_1_xrb_app_01_0.exe
- xdh_1_xrb_app_03_1.exe
- xdh_1_xrb_app_auto.exe
- zvprtcfg.exe
- zvprtcfg_win32.exe

Student Stations

The following SmartClass+ executable files will be installed on student computers:

- SmartClass-Student.exe
- Flash-Student.exe
- SCLASSCJ.exe
- Uninstall.exe
- base64.exe
- ffmpeg.exe
- flashvideomx.exe
- lame.exe
- FFMIC.exe
- FFMIC_MAD.exe
- xdh_1_xrb_app.exe
- xdh_1_xrb_app_02_0.exe
- xdh_1_xrb_app_03_1.exe
- zvprtcfg.exe
- zvprtcfg_win32.exe
- SmartClass_HostGuest.exe
- SmartClass-Student-OLP-02.3xe
- SmartClass-Student-OLP.exe

Network Ports

The SmartClass –Server application uses UDP and TCP ports for communications. The list and description of these ports is shown below:

The Teacher PC accepts TCP connections on ports:

33378
33379
80

With Air clients, the teacher station and student stations also use port:

33389

Beginning with release 3.04, the teacher station also includes an HTML server that is used to communicate with tablet-based student stations. This server requires access to network port 80.

80

To ensure that other applications are not interfering with the port, please consult the Robotel application note titled *Windows 7 Network Settings for the SC+ Teacher Station*.

Student PCs accept TCP connections on ports:

33370

The Server PC (if present) does not use any network ports.

The teacher stations and student stations communicate with the optional BYOD Manager via the following ports:

33359

Installation Pre-requisites

Introduction

These pre-requisites apply to the teacher station and to all student stations. It is critical that these items be addressed to assure proper operation of the SmartClass+ software.

Sound Cards

- Make sure that the latest sound card drivers from the manufacturer have been installed.
- Make sure that the 16 bit, 41000 Hz codec has been selected for playback on all stations (teacher and students).
- For WinXP teacher stations using the SmartClass+ software-based intercom module, the Virtual Audio Streaming utility must be installed.

Dual-Monitor Support for Teacher Station

- The Primary monitor (teacher monitor) must support a minimum resolution of 1024 x 768 pixels, but if the teacher will be running the Media Activities Dashboard on this screen, then the recommended minimum is 1280 x 768 (with taskbar auto-hide) or 1280 x 800 (with the taskbar visible)
- The Primary monitor (teacher monitor) resolution must match that of student workstations.
- The Secondary monitor (control monitor) must support a minimum resolution of 1280 x 768, and the vertical resolution of the Secondary monitor must be at least as great as that of the Primary monitor.
- When running dual monitors on the same computer, make sure that in the Windows screen configuration the icons for the two monitors are top-aligned, as SC+ relies on this for proper positioning of on-screen graphics.
- Make sure that the Windows text/icon size is set to 100% (and no larger) as larger sizes interfere with all Flash based programs – including SC+.

(Note that beginning with release 3.04, it is possible to run the system from a single screen teacher station, but two screens are still recommended.)

General Requirements

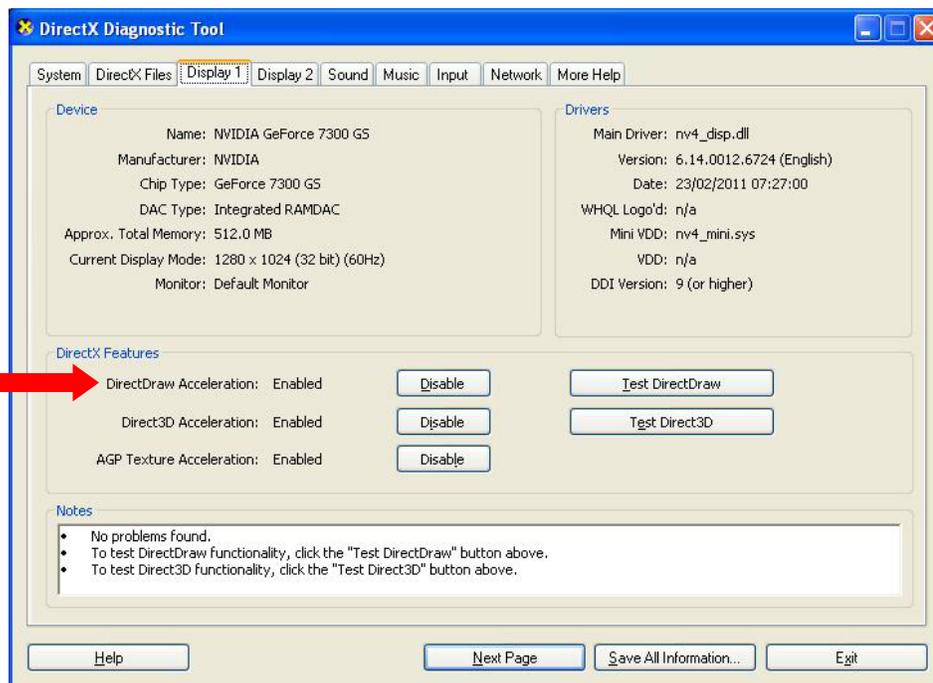
- All stations must be part of the same Workgroup or Domain
- On all stations, local firewalls should be disabled or opened up to the SmartClass+ (and related) applications (network ports 33369, 33370, 33378, 33379, and 80)
- Anti-virus software that conflicts with the operation of SmartClass+ must be disabled.

Adobe Flash

- The teacher and student stations should be running the latest version of Adobe Flash, (version 10.1.102.64 or newer).

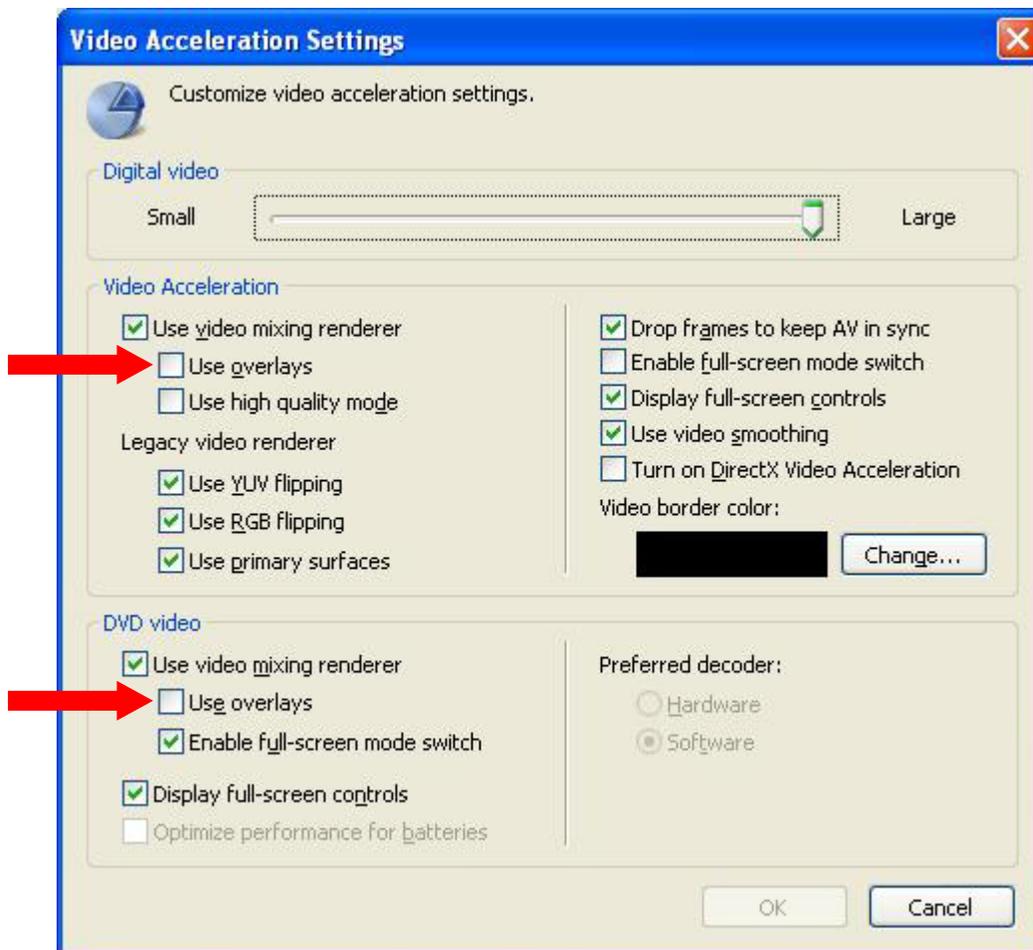
DirectDraw

- DirectDraw support must be enabled (using the Windows *Dxdiag* utility).



Windows Media Player – Overlay (WinXP)

- The *Overlay* feature for Windows Media Player video must be disabled. (This can be accessed from the Windows Media Player *Tools* utility. From the *Tools* menu, choose *Options*, and from the *Options* panel choose *Performance*. In the *Performance* panel choose *Advanced*, and then disable *Overlay* as shown below.)



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SmartClass Server Installation

Introduction

If your installation includes a media server, then the server software should be installed first, before installing SmartClass+ on the teacher and the student stations.

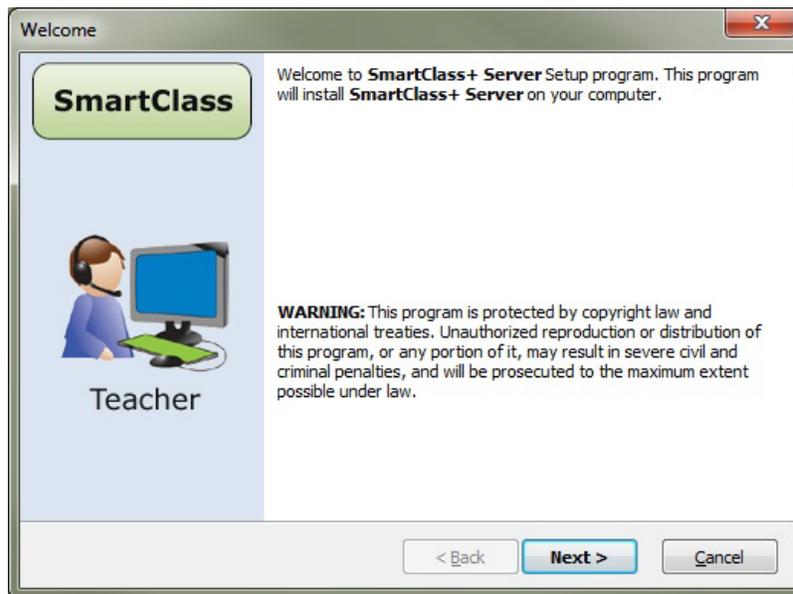
You must have administrative rights for the server in order to install the SmartClass Server software.

Normally, the SmartClass+ software will be installed from CD-ROM, although it is also possible to install from a USB memory stick or from a shared folder on another computer.

We first present how to install the software on an actual server. If you are using an NAS, you can jump ahead to that section.

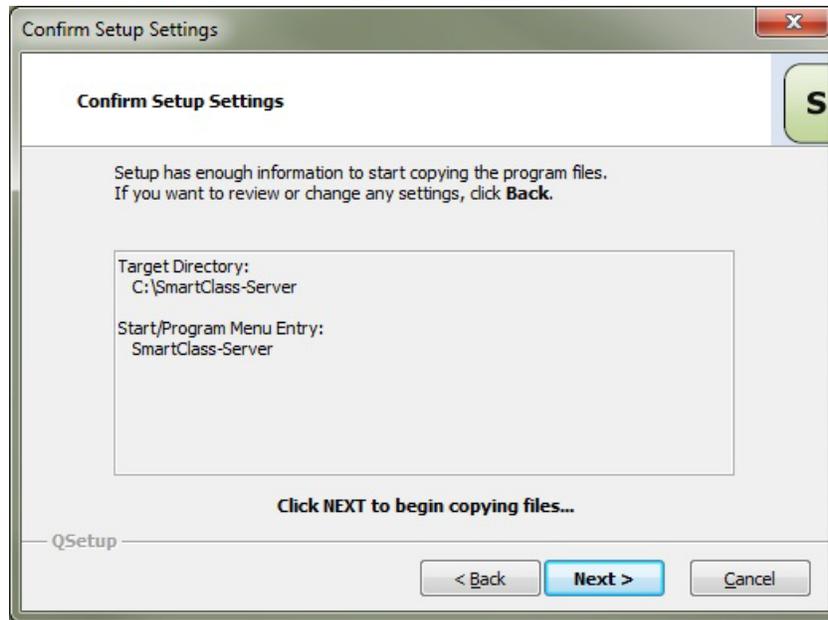
Server Installation

Begin by double-clicking on the file: **SmartClass-ServerSetup-VersionX-XXX.exe**



Click on the *Next* button to proceed.

SmartClass asks you to confirm the Target Directory and Program Menu Entry as shown below. (Currently, you are unable to change these entries.) Click on Next to proceed.

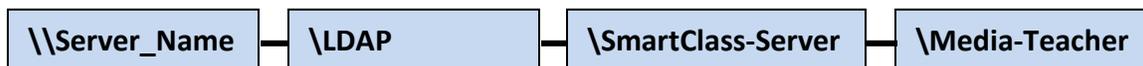


NAS Installation

It is possible to use a Network Attached Storage device to host content normally being installed on a server. In such a situation, you will install the teacher station first, and then you will need to build a directory structure on the NAS similar to that shown below, and then copy the contents of the Media-Teacher folder from the teacher station to the NAS.



If using LDAP, the above structure is modified as shown below:



Folder Sharing

The SmartClass-Server folder must be shared to enable network communications with the client stations (students and teacher).

Teachers and students must have the following folder access rights:

- Read, write, and modify

BYOD Manager Installation

Note that the BYOD Manager installation is addressed in a companion document called the BYOD Manager Installation Guide.

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SmartClass Teacher Installation

Introduction

The SmartClass Teacher station must be installed before the student stations. You must have administrative rights for the teacher computer in order to install the SmartClass Teacher software.

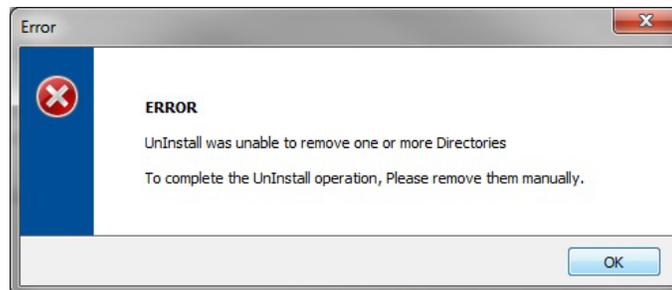
Updating an Older Version

Release 1-220 or Newer – If you are updating a SmartClass+ release 1-220 or newer, you can just install the new release on top of the old. The installer will automatically detect an existing database and prevent it from being overwritten.

PRE-Release 1-220 - In version 1-220 of SmartClass+, the database structure was changed. If you are updating an older release, it is therefore strongly recommended that you remove any previous versions before installing 1-220 or newer. By following this uninstall procedure, you will flush the current database and will have to re-create all user and media records.

To uninstall SmartClass+ from the teacher station, use the following procedure:

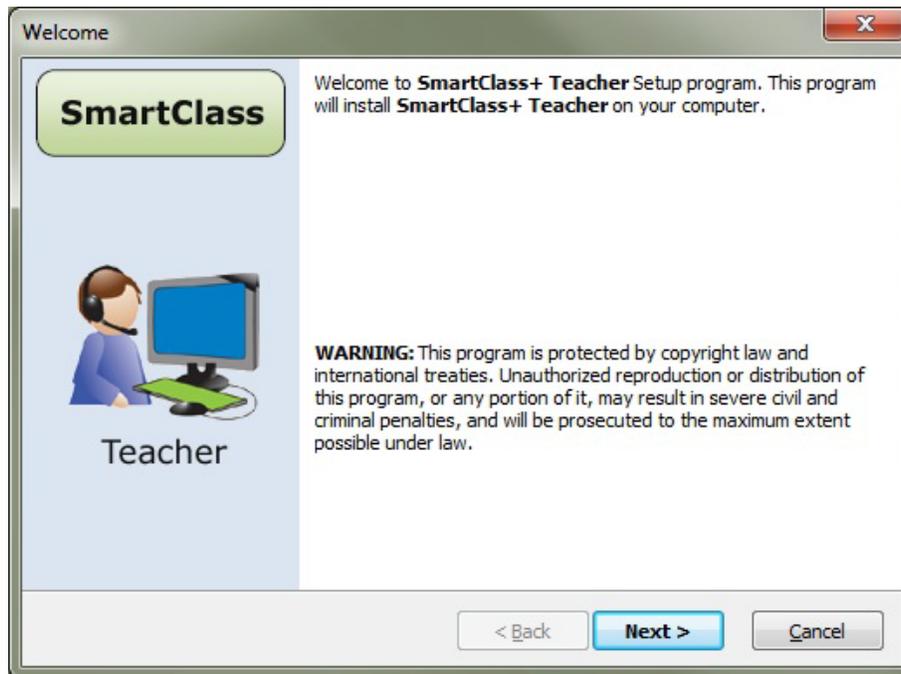
1. Open Windows Explorer and navigate to the SmartClass-Teacher folder.
2. Run the uninstall.exe utility in this folder.
3. Acknowledge all of the pop-up windows, including the error message shown below:



4. Launch the Windows Task Manager and check to see if there is a process called SmartClass – Server.EXE. If so, end this process.
5. From Windows Explorer, delete the SmartClass-Teacher folder.

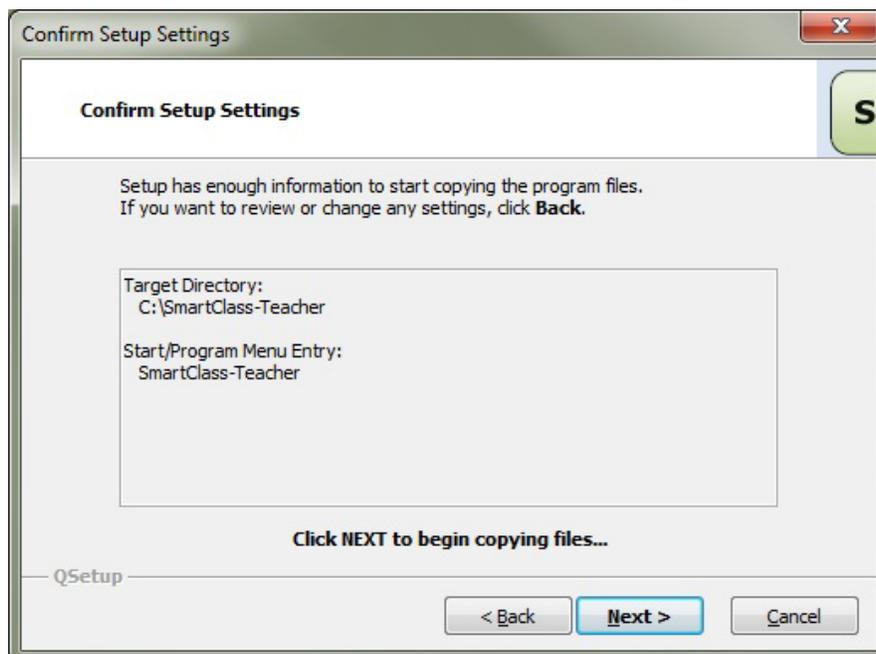
Installation

Begin by double-clicking on the file: **SmartClass-TeacherSetup-VersionX-XXX.exe**

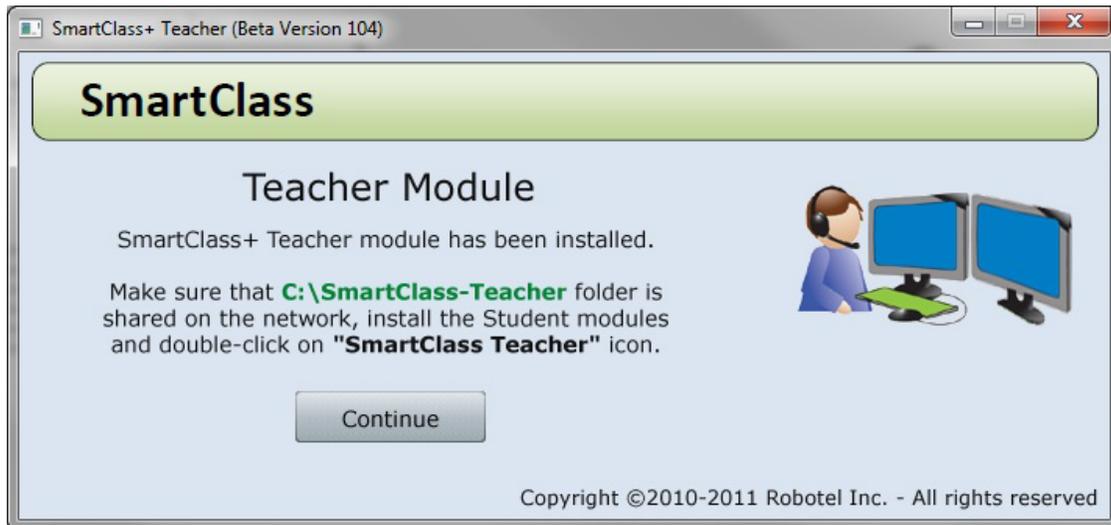


When the Window shown above opens, click on Next to proceed.

SmartClass asks you to confirm the Target Directory and Program Menu Entry as shown below. (Currently, you are unable to change these entries.) Click on Next to proceed.



When the final installation screen (shown below) appears, click on Continue to complete the installation.



SmartClass-Teacher Folder Sharing

The SmartClass-Teacher folder created during the software installation must be shared over the network to enable communication between the server (teacher station) and the clients (student stations).

Everyone should be given full access to this shared folder and be assigned all permissions.

For details concerning the sharing of folders, please consult the application note titled *Windows 7 Network Settings for SC+ Teacher Station*.

SmartClass+ Student Installation

Introduction

You must have administrative rights for all of the student computers in order to install the SmartClass Student software.

Make sure that the Teacher station and Media Server are installed prior to installing the student software.

It is recommended that you start with student station 1 and proceed in sequence until the last student station has been installed.

Determine whether the student stations will be run with or without the associated BYOD Manager.

Updating an Older Version

You can update an older version of the SmartClass Student software simply by installing the new version. There is no need to un-install the previous version nor erase any files or folders.

Installation Details

For detailed information on installing and configuring student stations, please consult the appropriate guide for your device type:

- Student Software for Windows Devices
- Student Software for MAC Computers
- Student Software for iPads, iPods, and iPhones
- Student Software for Android Tablets and Smart Phones
- Student Software for Chromebooks

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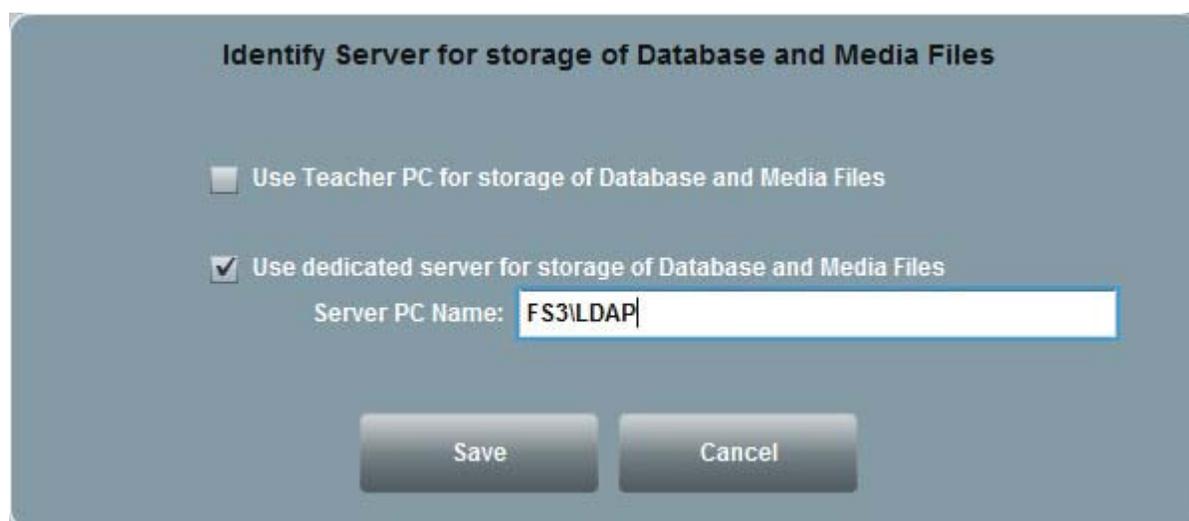
Configuration Management

Server Identification



The first step in configuring an installed system is to identify the network location of the media server at the teacher's station. To do this, you launch the Live Activities Dashboard (LAD) by clicking on the icon shown at left.

The server identification panel will automatically appear when you first launch the Live Activities Dashboard on the teacher station. This panel is shown below:



Identify Server for storage of Database and Media Files

Use Teacher PC for storage of Database and Media Files

Use dedicated server for storage of Database and Media Files

Server PC Name: FS3\LDAP

Save Cancel

If configuring a small system that does not use an external server, check the “Use Teacher PC” option and then click on the *Save* button.

If configuring a system with an external media server, check the “Use dedicated server” option, and enter the path (without the “\\” at the start) to the SmartClass-Server folder in the field titled *Server PC Name*. Click on the *Save* button to save this path.

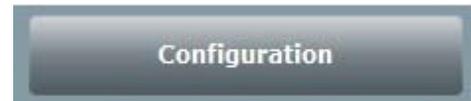
Shared Database for Multiple Systems

If you are deploying multiple SmartClass+ systems on the same Local Area Network, you can create separate databases for each system or you can have all systems share a common server-based database.

This latter approach is recommended to avoid duplication of records. To do so, just make sure that the same server PC path information is entered at the teacher station for each system.

SmartClass+ Configuration

The administrator will configure the SmartClass+ Live Activities Dashboard by clicking on the *Configuration* button shown at right.



Beginning with release 307, the LAD configuration panel is now password protected to prevent inadvertent modification of critical parameters by teachers. The following window will open, and you must enter the password (robotel) to gain access to the panel. (You need not enter this password again to access *Configuration* until the LAD application has been closed.)



This Configuration Panel (shown overleaf) provides access to a number of system configuration parameters, including:

- Detection of connected stations
- Identification of installed hardware switching options for KVM and Intercom
- Identification of KVM hardware addresses for stations (if so equipped)
- Identification of Intercom hardware audio matrix ports for stations (if so equipped)
- Verification of connected station settings
- Layout of station icons on the graphical user interface (Live Activities Dashboard)
- License management (except when used with the BYOD Manager)
- Identification of the SmartClass+ Server
- Enable/disable of AP Testing login
- Enable/disable of SmartClass+ Live mode
- Enable/disable of Tablets servers (when working with student tablet stations)
- Enable/disable of LAD on Tablet support (for Android tablets)
- Enable/disable of BYOD support (if used with the BYOD Manager)

When you click on the Configuration button, the *Configuration of SmartClass+ Stations* panel shown below is displayed on the control screen at the teacher's station, and a local configuration status panel is displayed on the screen of all student stations running the SmartClass-Student software.

Configuration of SmartClass+ Stations

Number	Status	Station PC Name
0	Connected	Gerry-VAIO (Teacher)
1	---	student_137942944001
2	---	student_137942944002
3	---	student_137942944003
4	Connected	student_137942944004
5	---	student_137942944005
6	---	student_137942944006
7	---	student_137942944007
8	Connected	student_137942944008
9	---	student_137942944009
10	---	student_137942944010
11	---	student_137942944011
12	---	student_137942944012
13	---	student_137942944013
14	---	student_137942944014
15	---	student_137942944015
16	---	student_137942944016
17	---	student_137942944017
18	---	student_137942944018

Hardware Only Class
 Symposium Live mode
 AP Testing
 Webinar mode

Student Stations 26

Audio Matrix Stereo Mix
 KVM Switch

Server Identification

Tablets LAD on Tablet BYOD

Generate Site Code

for Class ID: 7AE0F698

Input License Key

7610-2D23-E540-8EC8-7EF9

License administered
by BYOD Manager

Scan for Student Stations
Remove Station
AV Stations

Position Stations
Test Station
Close

Dynamic Optimization of Stereo Mix (or What-U-Hear)

Beginning with SmartClass+ version 1.229.1, the management of Stereo Mix and/or What-U-Hear settings on sound cards is automatically managed for optimal intercom performance.

With a software-based audio intercom, the default sound card settings on teacher and student computers will enable microphone audio to be shared through the network, but audio from other sources (e.g. Windows Media Player) cannot be shared.

When the sound card is equipped with Stereo Mix (or What-U-Hear) capability, the sound card can be configured for either “microphone” or “stereo mix” capability. When stereo mix is enabled, the mix of the local microphone and other sound sources can be shared over the network.

However, if stereo mix is concurrently enabled on two or more endpoints (e.g. teacher and student), intercom performance will be compromised with echo or feedback.

With dynamic optimization of stereo mix, this capability is selectively enabled according to the specific intercom function being used:

1. **Teacher Presentation** – for teacher presentations, stereo mix is enabled only on the teacher station so that the teacher can share any sound source with the students.
2. **Student Monitoring** – when the teacher monitors a student, the stereo mix capability is enabled on the student station so that the teacher can listen to both the student’s microphone and any local sound sources on the student station.
3. **Two-way Intercom** – when the teacher is communicating with a student or when students are part of a pairing or grouping activity, stereo mix must be disabled on all end-points.

Whenever the SmartClass+ system is equipped with an audio intercom, and the hardware intercom option (Audio Matrix) is not selected, dynamic optimization of Stereo Mix is automatically selected (as indicated by the checked box at right).



This capability can be disabled by un-checking the Stereo Mix box.

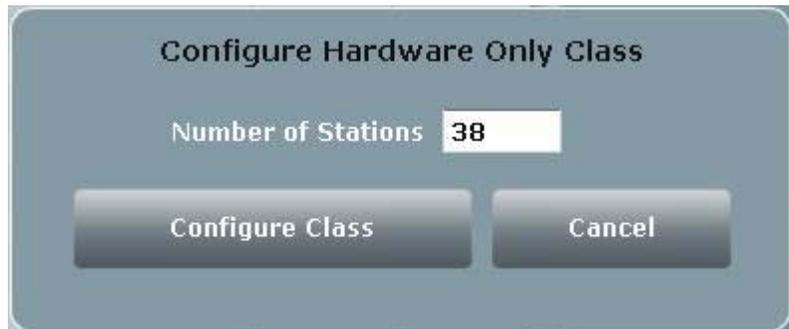
Registering Student Stations (Fixed Classrooms)

Student Stations are not running SmartClass-Student Software

With SmartClass+, it is possible to configure a simple system in which there is no software installed on student stations. This configuration requires that the KVM hardware option (and possibly the Audio Matrix hardware option) be installed. With this configuration, the option box titled *Hardware Only Class* must be checked.



When this box is checked, a pop-up panel will prompt you to enter the number of student stations: This panel is shown at right.



Enter the number of stations and then click on the *Configure Class* button to return to the configuration panel.

Student Stations are running SmartClass-Student Software

When student stations are running the SmartClass-Student software, you do not need to manually enter the stations. Just click on the *Scan for Student Stations* button located directly below the configuration table.



If the SmartClass+ software has not yet been installed on student stations, you can leave the *Configuration of SmartClass+ Stations* panel open while installing the software, and each station will automatically connect when the software install has been completed.

The *Student Stations* field will automatically be updated to reflect the number of stations detected.



Registering Student Stations (BYOD)

In a BYOD environment, student stations are not actually registered with the LAD, as student stations are mobile and can be linked to different teacher stations at different times.

Instead, (as shown below), when a class session is launched, student – taken from the class roster – are automatically assigned to each station number. As students connect via the BYOD Manager, they will be shown as connected in the table shown below.

Configuration of SmartClass+ Stations

Number	Status	Station PC Name
0	Connected	Gerry-VAIO (Teacher)
1	---	student_136121683401
2	---	student_136121683402
3	---	student_136121683403
4	---	student_136121684201
5	---	student_136121684202
6	---	student_136121684203
7	---	student_136121685101
8	---	student_136121685102
9	---	student_136121685103
10	---	student_1366912682
11	---	student_136691301201
12	---	student_136691301202
13	---	student_136691301203
14	---	student_136691301204
15	---	student_136691301205
16	---	student_136691301206
17	---	student_136691301207
18	---	student_136691301208

Hardware Only Class
 Symposium Live mode
 AP Testing
Student Stations 30
 Audio Matrix Stereo Mix
 KVM Switch

Server Identification

 Tablets LAD on Tablet BYOD

Generate Site Code

for Class ID: 7AE0F698

Input License Key

7610-2D23-E540-8EC8-7EF9

License administered by BYOD Manager

Scan for Student Stations

Remove Station

Position Stations

Test Station

Close

Configuration Table

The configuration table (shown below) identifies key system configuration information regarding the system software and hardware components.

Number	Status	Station PC Name	Audio	KVM
0	ON	sf-teacher (Teacher)	1-1A	0
1	ON	sf-student1	1-1B	1
2	ON	sf-student2	1-2A	2
3	ON	sf-student3	1-2B	3
4	ON	sf-student4	1-3A	4

The two right columns, Audio and KVM, will appear only if the option box for the relevant hardware module has been checked (as described later in this section). Note that the values in these two columns will be pre-assigned, but they must be modified to reflect the actual addressing of hardware modules and the wiring of audio matrix ports.

Initially, the table will only show an entry for the teacher station. The student station information will be inserted only when the student stations have been registered. When the stations are not running the SmartClass-Student software, the Station PC Name field will be blank.

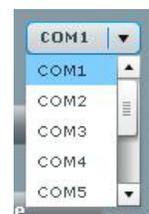
Hardware Switching Options

The SmartClass+ system supports both software-based and hardware-based options for KVM (screen sharing) and INT (audio intercom). By default, it is assumed that the software-based options will be used:

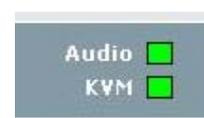
In the upper-right portion of the *Configuration of SmartClass+ Stations* panel, are two checkboxes that serve to indicate the presence of the hardware option for a *KVM Switch* and/or an *Audio Matrix*. Check these boxes as appropriate.



Note that when either of the two hardware options have been selected, a corresponding communications status indicator appears in the utilities bar at the bottom of the Live Activities Dashboard. Also, you must select the appropriate COM port for communication with the hardware (as shown at right).



The indicators (shown at right) are green when proper handshaking between the software and hardware has been established or red when there is a communication problem. The indicators are gray when attempting to establish communications.



Audio Matrix Channels

The hardware audio intercom option uses a module called the Audio Matrix to switch intercom audio connections from each station. Physically, each audio matrix module has 16 ports for CAT-5 cable connections, and each port supports two independent channels. For example, the two channels on the first port would be identified as 1A and 1B.

The system supports up to two audio matrix modules, so for example, channels are identified as 1-1A, where the first “1” is the ID of the audio matrix, the second “1” is the ID of the matrix port, and the “A” is the actual channel within that port.

By default, the system software will sequentially assign audio matrix channels to successive stations. In practice, however, the channel assignments must be modified to reflect the actual cabling that has been installed.

To modify the default settings, click on the corresponding table entry and choose the desired channel from the drop-down list. Make sure that no two entries have the same channel ID!

The configuration table dynamically updates the saved configuration information, so there is no need to explicitly “save” your changes.

KVM Addresses

The hardware KVM option includes a set of central *hubs* and a set of multi-station *interface modules*. Interfaces include a set of address DIPswitches for each workstation port. Station addresses range from 0 to 63.

By default, the system software will sequentially assign KVM addresses to successive stations. Ideally, the installer will set the station addresses so that the address and the Station Number do match. However, in the configuration table, the address values must correspond to those actually programmed on the interface ports.

To modify the default settings, click on the corresponding table entry and choose the desired address from the drop-down list. Make sure that no two entries have the same address!

The configuration table dynamically updates the saved configuration information, so there is no need to explicitly “save” your changes.

Configuration Verification

Test Station

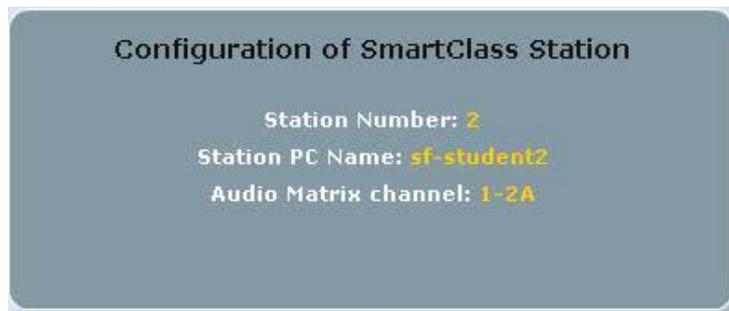


To verify the station address of a student station that is running the SmartClass-Student software, highlight the station in the configuration table, and click on the Test Station button.

The screen from the corresponding station will be displayed on the teacher monitor. If the screen being displayed does not match with the anticipated station, troubleshoot the address problem.

Local Configuration Status Display

It may also be helpful to consult the local configuration status panel being displayed on all of the student stations. An example of this panel is shown below:



AV Stations

SC+ version 314 includes support for the following types of AV stations:

- **Projectors**
- **Document Cameras**
- **Audio Source devices** (e.g. CD player)
- **Classroom Bridges** (special stations used to link two classrooms)

Note that it is not possible to install software on these station types, so these stations are normally used only in systems having the hardware KVM and/or hardware Intercom options.

 To configure AV stations, click on the AV Stations button in the LAD Configuration panel. The panel shown below will open.



To add a device, check the checkbox for that device. Click on the *Close* button to exit this panel.

In the configuration panel, you will need to assign the appropriate KVM address and/or Audio Matrix port information.

Note that AV Stations are automatically excluded from student activities like pairing.

Workstation Layout

This function is used to position station icons on the display and size those icons to best fit the screen. Normally, the icons will be positioned to reflect the actual layout of workstations in the classroom.

To access this function, click on the *Position Stations* button at the bottom of the Configuration of SmartClass+ Stations panel.



 The screenshot shows a software interface for configuring workstation layouts. On the left, a large light blue grid contains five workstation icons. Each icon depicts a person at a computer workstation. The icons are labeled as follows:

- Top-left: A person with a headset and one monitor, labeled "3 Amy Rox".
- Top-right: A person with a headset and one monitor, labeled "4 Anthony Smith".
- Middle-left: A person with a headset and one monitor, labeled "1 Nick Handson".
- Middle-right: A person with a headset and one monitor, labeled "2 Anita Jane".
- Bottom-center: A person with a headset and two monitors, labeled "Teacher Gerry Sullivan".

 On the right side of the grid, there is a control panel with the following elements:

- Section header: "Position Station Icons on the Screen".
- Instructional text: "Click on the station that you want to position. When the station is highlighted, move it to the desired location and click again to release it."
- Button: "Exit Position Stations".
- Control: "Student size: 100%" with plus and minus buttons.
- Control: "Teacher size: 140%" with plus and minus buttons.
- Button: "Teacher Orientation".

Positioning Station Icons

To position a station icon, first click on the icon; (the icon will be highlighted in a yellow box). Next, drag the icon to the desired position on the screen. Click again to release the icon. Repeat this process for each of the icons.

Sizing Station Icons

In the upper right portion of this screen, are two sets of icon sizing controls; one for all student stations and the other for the teacher station. Use the “+” and “-” buttons to increase or decrease the icon size as desired.

Note also that using a higher-resolution display for the Live Activities Dashboard, will also increase the available area for the workstation layout.

Teacher Station Orientation

The icon for the teacher station can be flipped horizontally by clicking on the *Teacher Orientation* button.

Positioning AV Stations

Currently, it is not possible to manually position AV stations in an absolute sense. Instead, they are automatically positioned relative to the teacher station, as shown in the image below.

Make sure that your teacher station icon is not located too close to the edge of the screen or to student stations, or else the AV station icons may end up off-screen or overlaid on top of a student station.

Note that if you modify the position of the teacher station, this modification will only be applied to the AV Devices the next time the LAD is opened.



Local License Management

Note that if working in a BYOD environment, all license management is handled by the BYOD Manager. If working in a fixed class environment, licenses are managed locally from the teacher station.

If no license key is installed, the Demonstration Version of SmartClass+ will allow you to configure up to 4 student stations with full system functionality and no time limit. It will also allow you to deploy up to 63 student stations with full system functionality for a period of 30 days.

If you wish to support more than 4 student stations, then you must input a License Key within 30 days of the installation.

Ideally, make sure that all student stations have been detected, and then click on the *Generate Site Code* button. This will display the Site Code and the Class ID (as shown above right).

To request a license key, you must submit the complete information identified in the SC+ License Key Request section (shown overleaf). This includes both the Site Code and the Class ID to Robotel. It is strongly suggested that you use a “cut & paste” approach and electronically submit this information via e-mail to our technical support department.

Our tech support department will issue a corresponding License Key and will send this to you via return e-mail. When you have received this Key, copy it into the License Key field and click on the *Input License Key* button.

When a matching license key has been accepted, the text immediately below the License Key field will indicate “Licensed Version” and will show the authorized number of stations as shown in the previous image.



SC+ License Key Request

SmartClass+ license keys will not be issued without the following information:

- Robotel Dealer
 - Organization name
 - Sales representative
 - Installer name
- Site Information
 - Site Code
 - Class ID
 - Number of Student Stations
- Client Organization
 - Organization name
 - Organization address
 - Department
 - Teaching Contact:
 - Name
 - Phone
 - Email
 - Technical Contact
 - Name
 - Phone
 - Email
 - Installation Site (Building, Room)

Enabling Servers for Tablets (Tablets)

If the system is being used with tablet-based student workstations in a non-BYOD environment, then this option must be checked. Note that it only takes effect when the LAD software is closed and re-opened.



Enabling LAD on Tablet

If the system is being used with an external tablet-based second display, then this option must be checked. Note that it only takes effect when the LAD software is closed and re-opened.



Enabling BYOD (LAD)

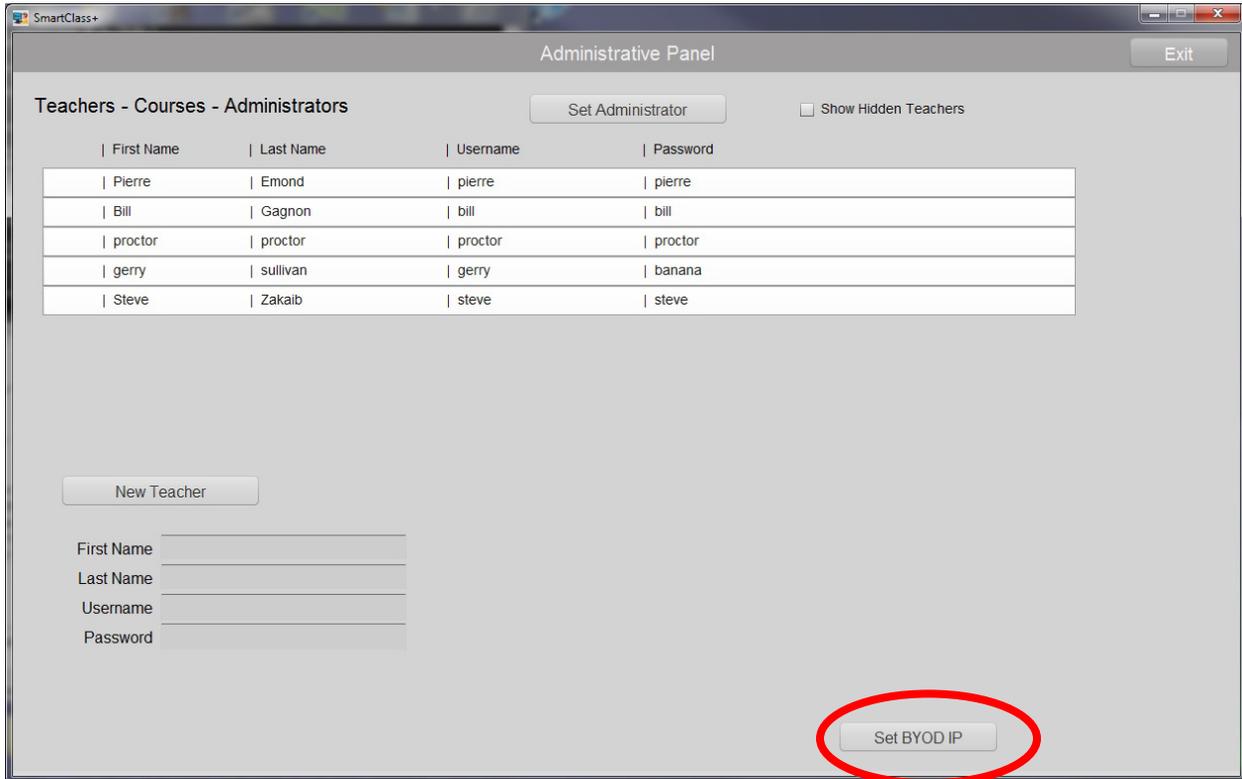
If the system is being used in BYOD environment in conjunction with the BYOD Manager, this option must be checked. This must be done on each teacher station in environments having multiple classrooms. It only takes effect when the LAD software is closed and re-opened.



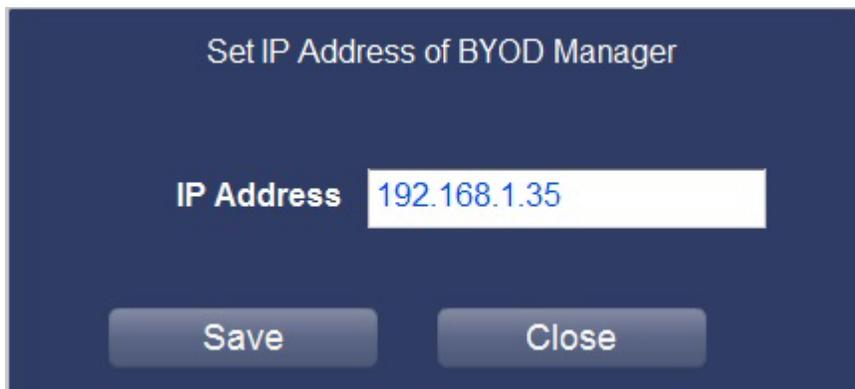
Enabling BYOD (MAD)

There is a second step required to enable BYOD, but this step only needs to be completed from any single teacher station.

You must launch the MAD and login as the administrator:



In the pop-up panel (shown below), enter the IP address of server running the BYOD Manager application.



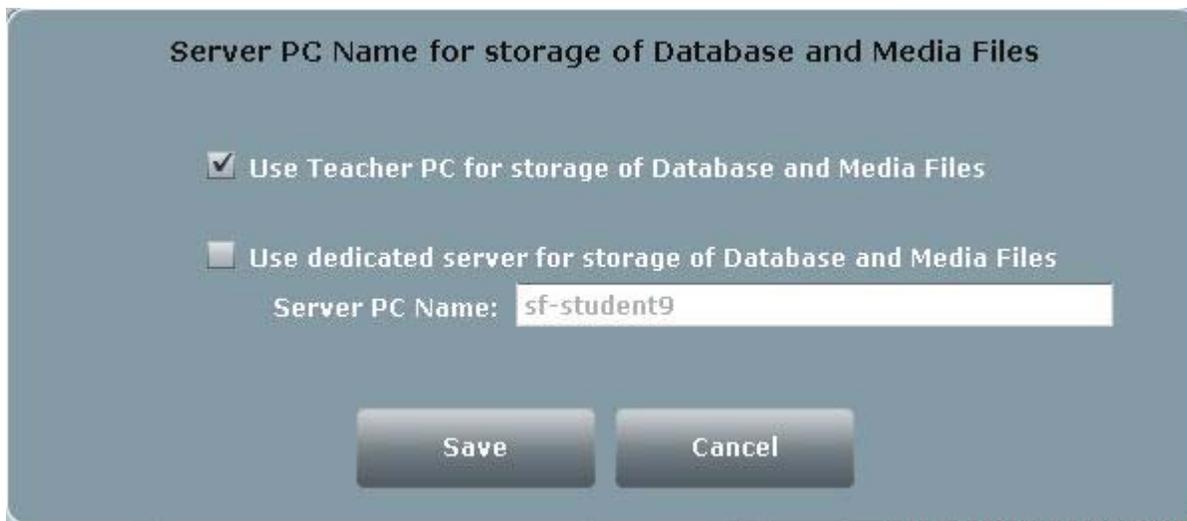
Click on *Close* to save this information.

Editing the Server Identification

To modify the SmartClass+ Server information provided earlier in this chapter, click on the Server PC Name button (as shown at right).



This will re-open the server identification panel shown below



Disabling AP Testing Login

By default, AP Testing login is enabled. If your school does not support AP Testing, then this login can be disabled by un-checking the box shown at right.



Enabling SmartClass+ LIVE Mode

By default, SmartClass+ LIVE Mode is not enabled. When enabled, the system will provide emulation of the legacy Symposium LIVE system.



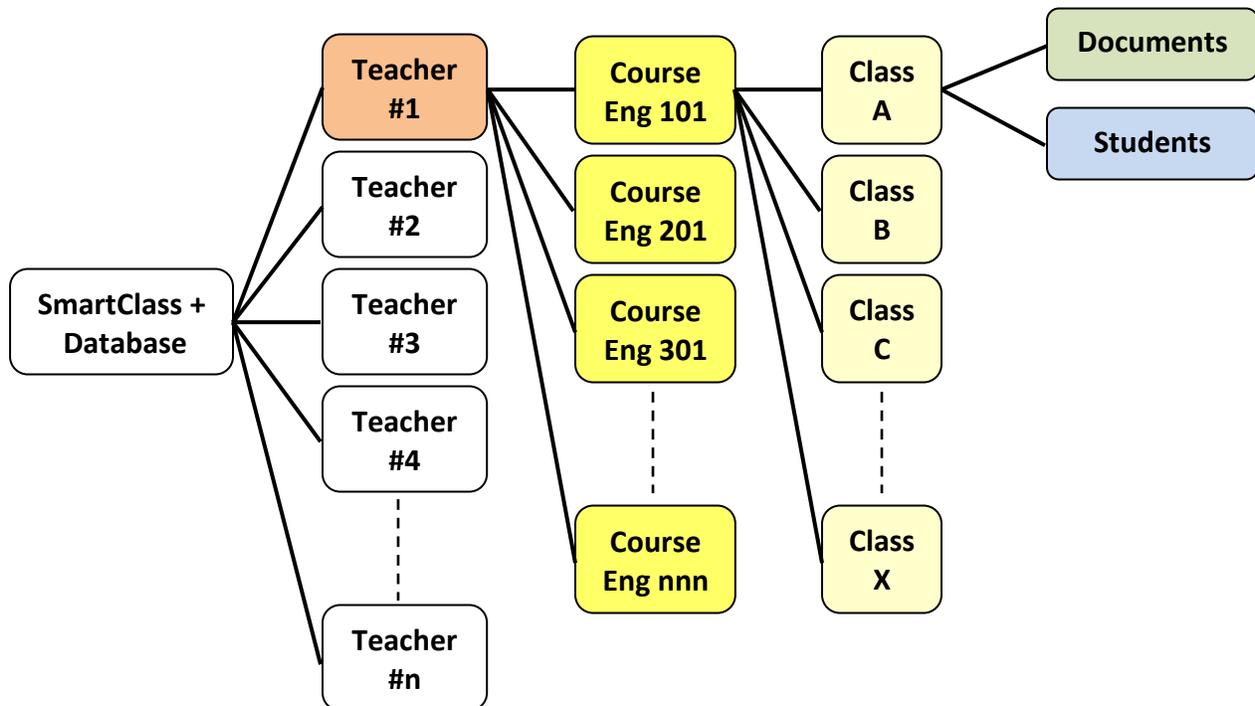
This emulation presumes that students are not equipped with individual computers, and only have access to a hardware-based intercom channel.

The details of the SmartClass+ LIVE solution are beyond the scope of this document. Details will be published in a document titled *SmartClass+ LIVE User Guide*.

Content & Roster Management

Database Structure

The SmartClass+ content management database uses the structure shown below:



- **Teachers** – Information is organized by teacher. The system administrator must create teacher accounts for SmartClass+ before any other data can be added.
- **Courses** – Each teacher will identify the courses, (e.g. English 101), for which he/she is responsible.
- **Classes** – For environments in which an instructor teaches more than one class in the same course, classes, (e.g. section A), are uniquely identified by the teacher.
- **Documents** – When logging in, teachers will always choose a particular class, and will import documents, (e.g. media files), and create exercises for that class. To save time, all documents and exercises imported for one class, (e.g. section A), will automatically be mirrored for the teacher's other classes that are part of the same course, (e.g. sections B, C, D, etc.).
- **Students** – Teachers will identify which students are uniquely registered for each class.

LDAP Configuration Panel



To begin, click on the Media Activities Dashboard icon shown at left.

In systems that have been set-up for non-LDAP operation, the administrator can skip this step and go direct to Administrator Login.

For systems that have been set-up for LDAP operation, the first step is to identify the parameters for the link to the on-line personnel directory. The following LDAP Configuration Panel window will automatically appear:

LDAP Configuration Panel

LDAP Server Access Parameters

Host (URL or IP)

Port

Base DN

User Accounts Access Parameters
(For multiple DN's use separator: ~)

Teachers DN(s)

Students DN(s)

Bind Username

Bind Password

User ID Attribute

User Name Attributes

First Name

Last Name

The system administrator must enter the information in each of the above fields (which are described overleaf).

Click on the *Save LDAP Configuration* button to save this information in the SmartClass+ database.

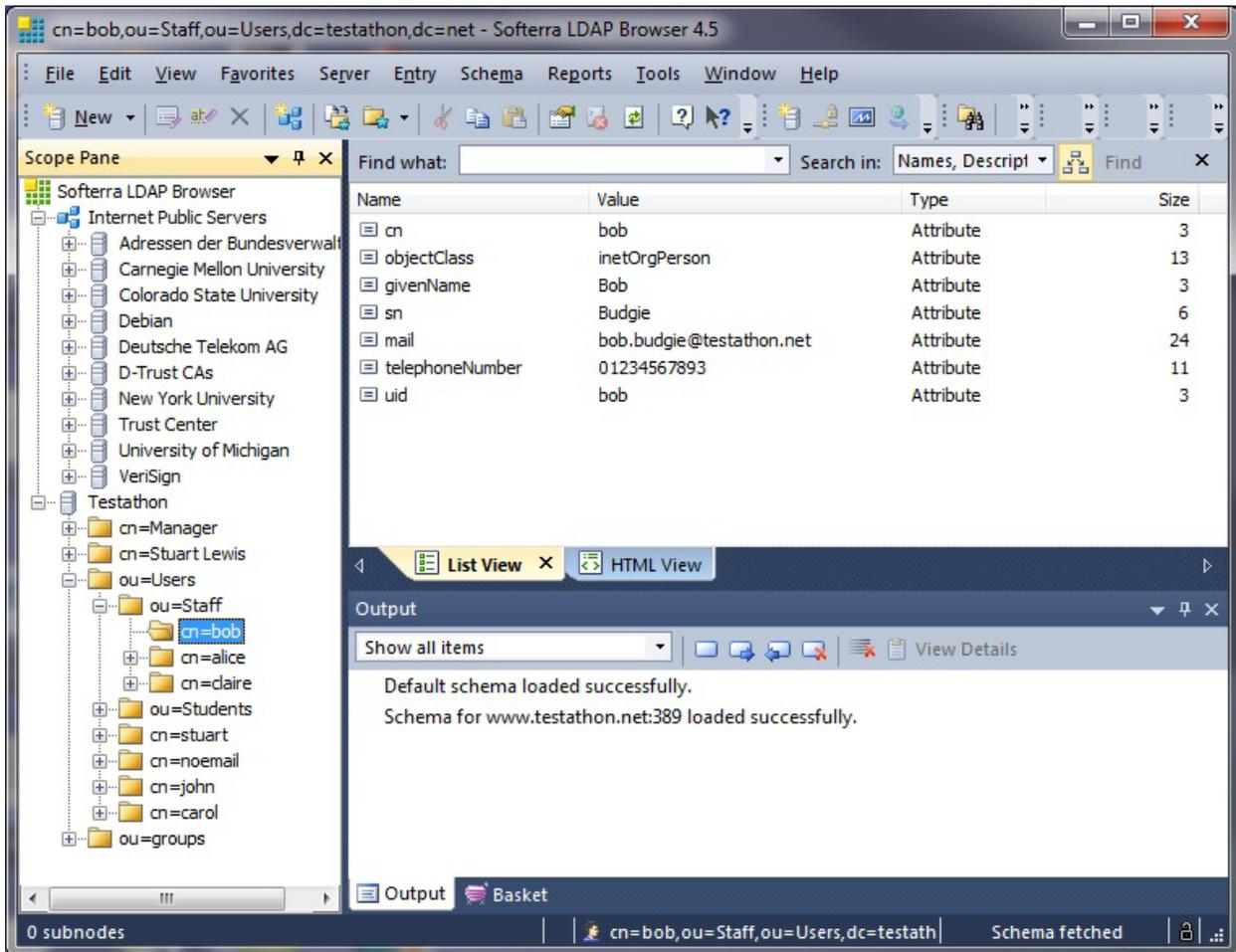
To re-access this panel, login to the MAD as the administrator and click on the LDAP Configuration button in the lower-right corner of the screen (as shown below).



Field	Description
Host (URL or IP)	This field is used to identify the server that hosts the personnel directory. You can use either the server URL or its IP address.
Port	This field identifies the Internet port over which SmartClass+ will communicate with the host. By default this is set to 389.
Base DN	This field identifies the base DN (Distinguished Name) of the directory. The DC values refer to Domain Components.
Teachers DN(s)	This field is not currently used.
Students DN(s)	This field is not currently used
Bind Username	This field identifies the name of a user having system administrator rights. This cannot be a temporary account. This is required to enable SmartClass+ to search the directory for users.
Bind Password	This field identifies the password of the user having system administrator rights named in the previous step.
User ID Attribute	This field identifies the attribute that is used to uniquely identify users. Normally this will be “uid” or “cn” or “SANAaccountName”.
First Name	This field identifies the users’ first name field in the directory.
Last Name	This field identifies the users’ last name field in the directory.

Viewing the LDAP Infrastructure

There is a free LDAP Browser tool available from Softerra, (www.softerra.com). With this tool, you can browse the infrastructure of the LDAP environment to simplify identification of the content required for each of the SmartClass+ LDAP fields.



Administrator Login

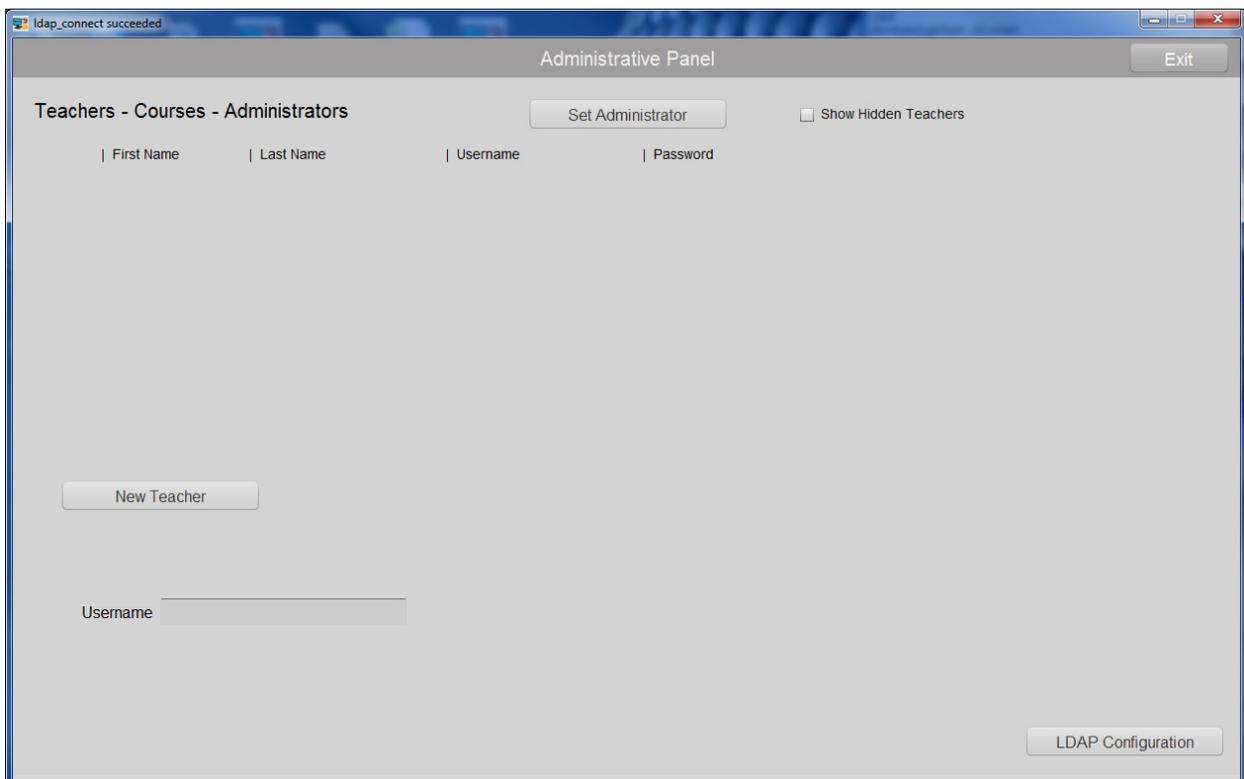


Double-click on the desktop icon for the SmartClass+ Media Activities Dashboard, (as shown at left). When the login window appears, (below right) login as the system administrator:

A login window titled 'ADMINISTRATOR' with fields for 'Username' and 'Password', and a 'Login' button.

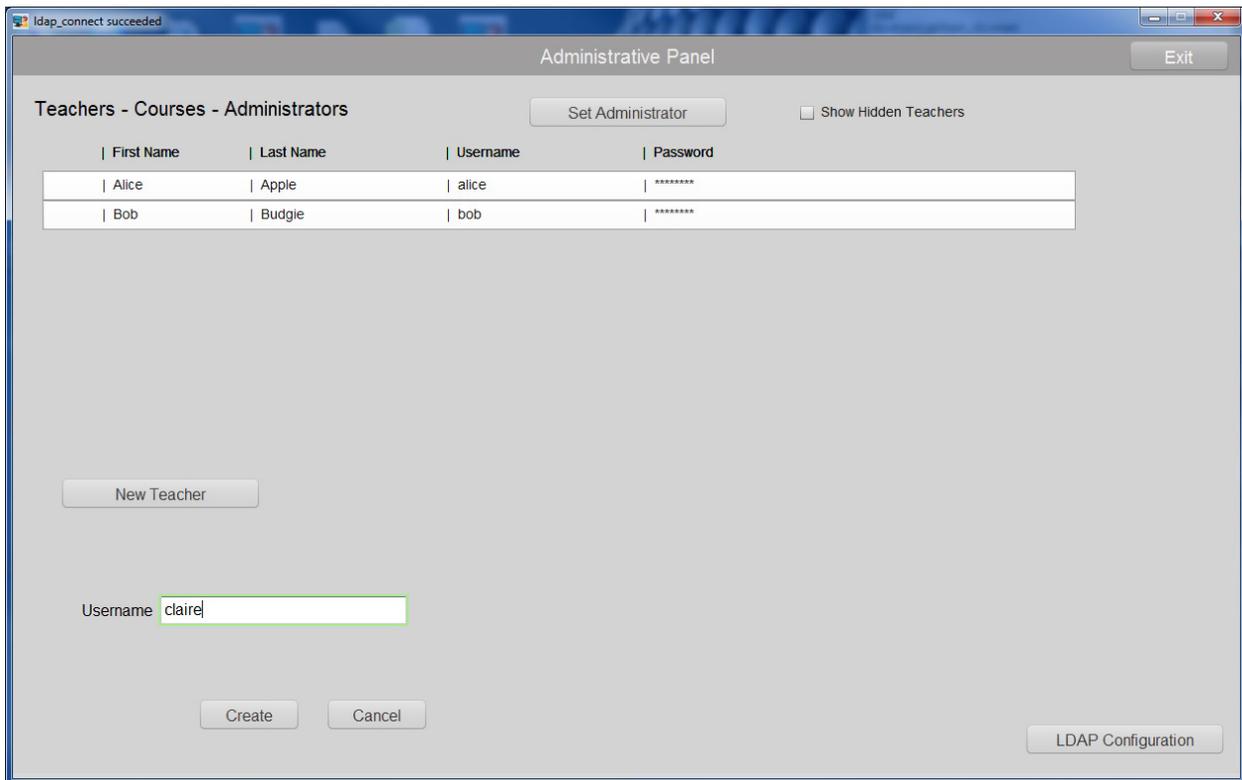
By default, the Username = *administrator* and the Password = *robotel*.

This will open the *Administrative Panel* as shown below:



Creating Teacher Accounts

To begin using SmartClass+ systems equipped with the Content Management Module, the first step is for the system administrator to create a set of teacher accounts.



To add a teacher, just click on the *New Teacher* button.

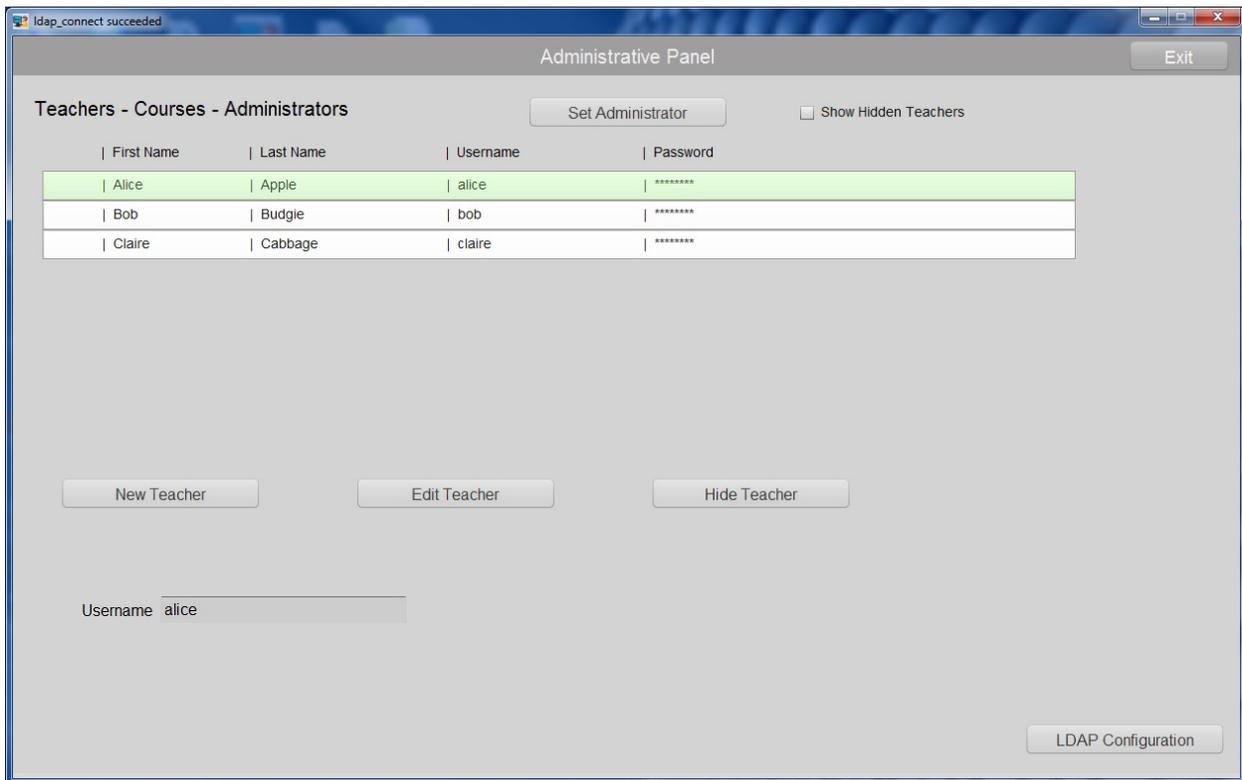
If using LDAP, you just need to fill in the Username field with the teacher’s Login Name, and SmartClass+ will complete the record by consulting the online personnel directory when you click on the *Create* button.

If not using LDAP, you must fill in the four fields shown at right, and complete the operation by clicking on the *Create* button.

A close-up of the "New Teacher" form showing four input fields: First Name, Last Name, Username, and Password.

Editing Teacher Accounts

To modify a teacher account, first select that account in the list of teachers. The parameters will be displayed at the bottom of the screen.



By clicking on the Edit Teacher button, you can modify the teacher's account.

Hiding Teacher Accounts

By clicking on the Hide Teacher button, you can make the account disappear from the list of accounts, but the underlying database structure will be retained.

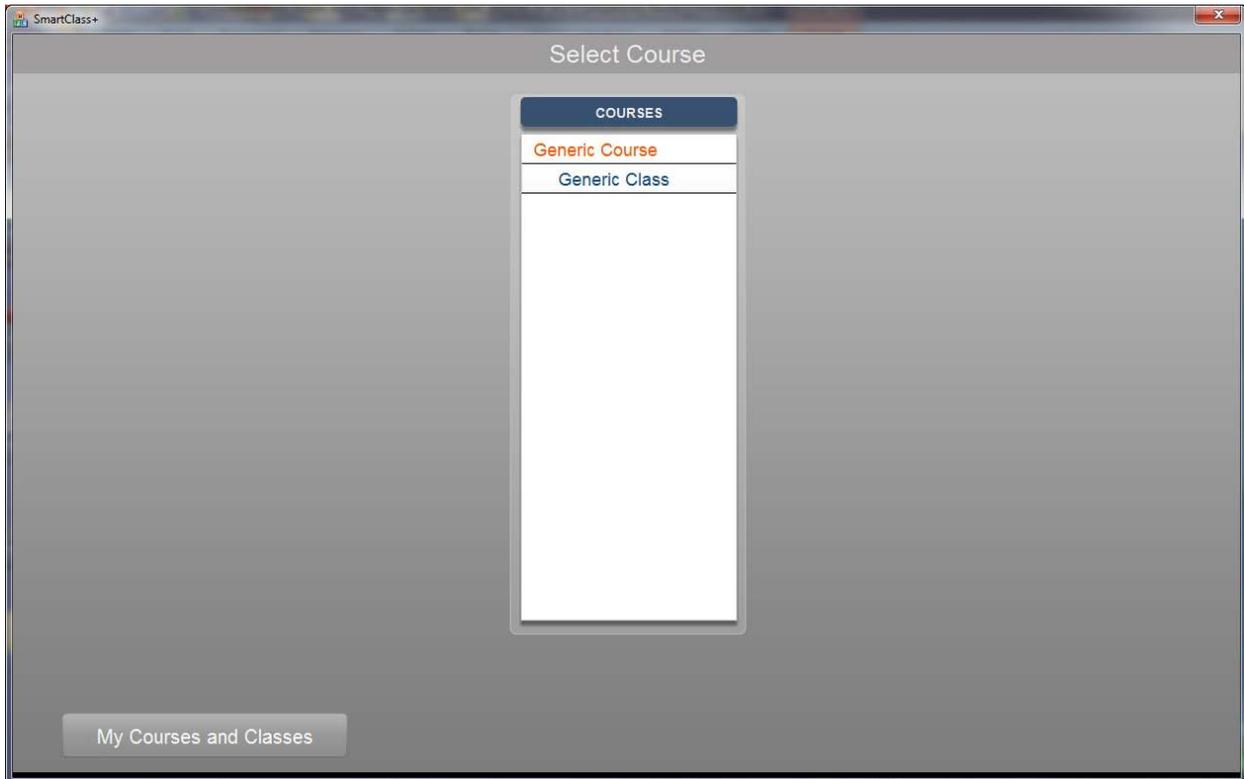
By checking the box for Show Hidden Teachers, the administrator is able to view and/or restore hidden teacher accounts.

Changing the Administrator

In the Administrative Panel, there is a button at the top called *Set Administrator*. If you wish to change the default administrator, you can select any person from the list of teachers and click on this button.

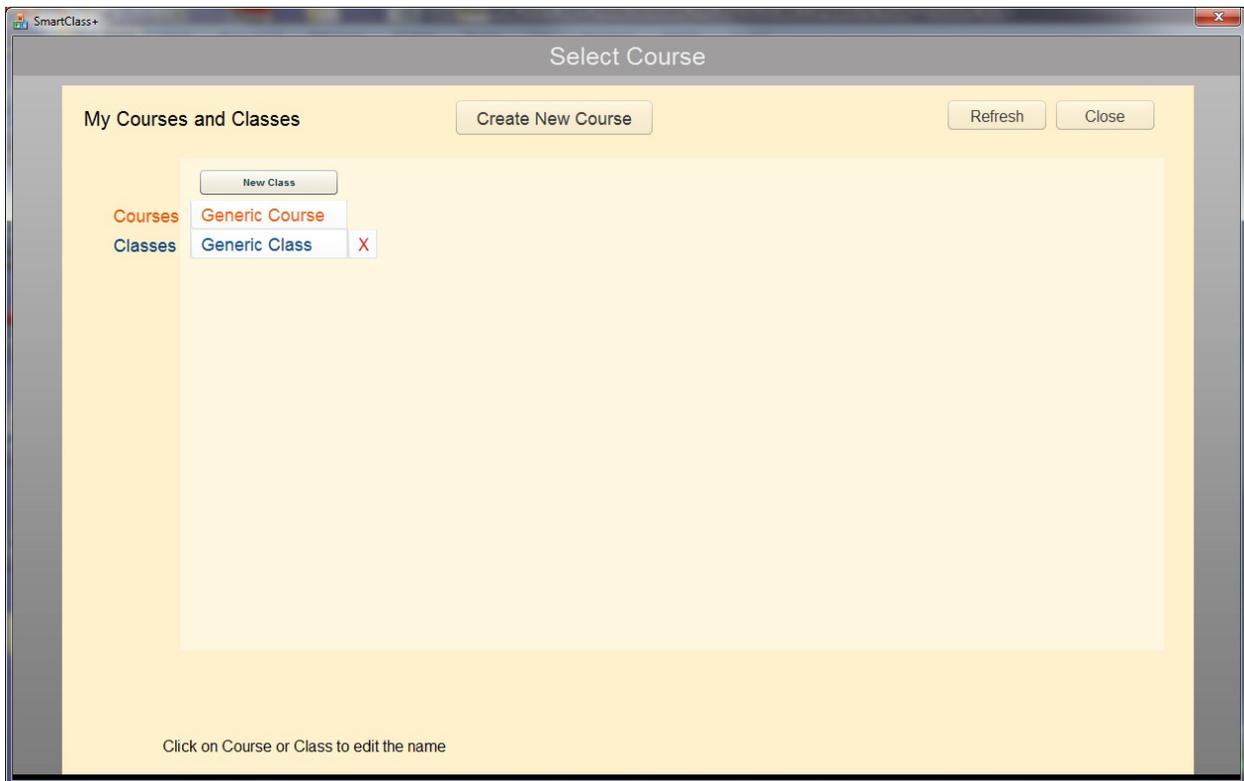
Creating Courses & Classes

When a teacher first logs in to the SmartClass+ Media Activities Dashboard, he/she will land on the screen shown below:



The list of available courses & classes is initially blank (except for the Generic Class, which can be used by teachers to experiment with using the system).

To fill in this information, the teacher will click on the *My Courses and Classes* button at the bottom of the screen. This opens the *My Courses and Classes* panel (shown overleaf).



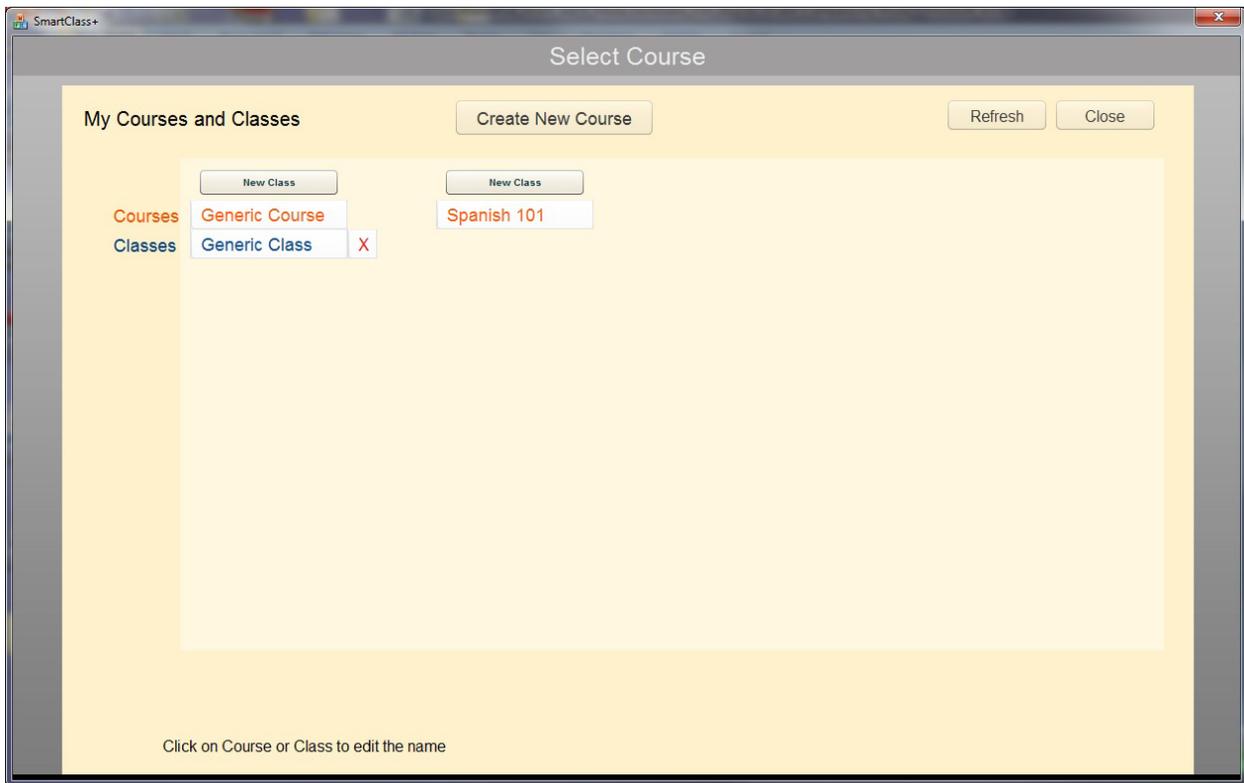
Create New Course

Click on the *Create New Course* button at the top to create a new course. You are prompted with the pop-up window shown at right.

Fill in desired *Course Name* field, and then click on the *Create* button to create the new course.

This will return you to the now-modified *My Courses and Classes* panel (shown overleaf).





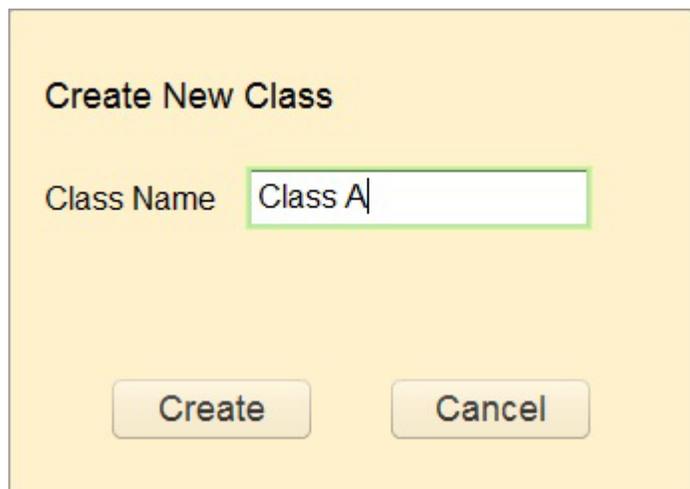
Create New Class

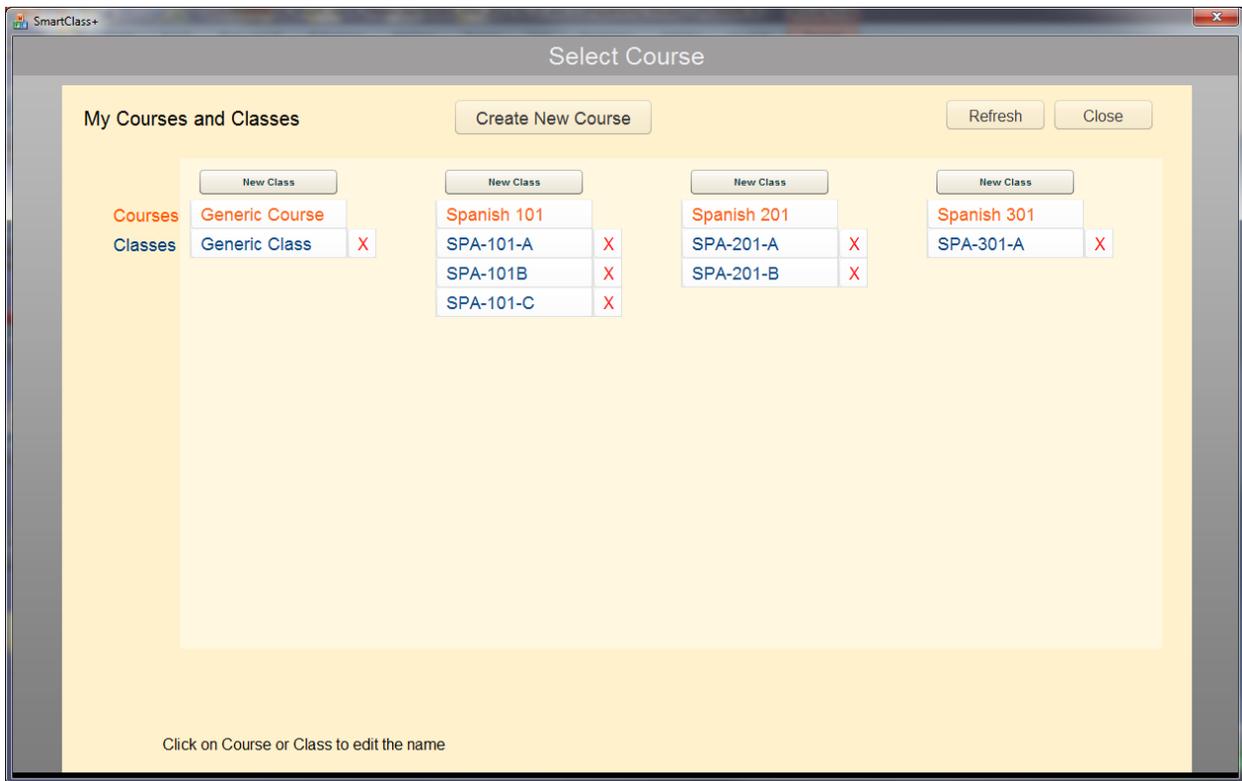
The *My Courses and Classes* panel now shows the course that was just created. To add a class to this course, click on the *New Class* button (immediately above the course name).

You are prompted with the pop-up window shown at right.

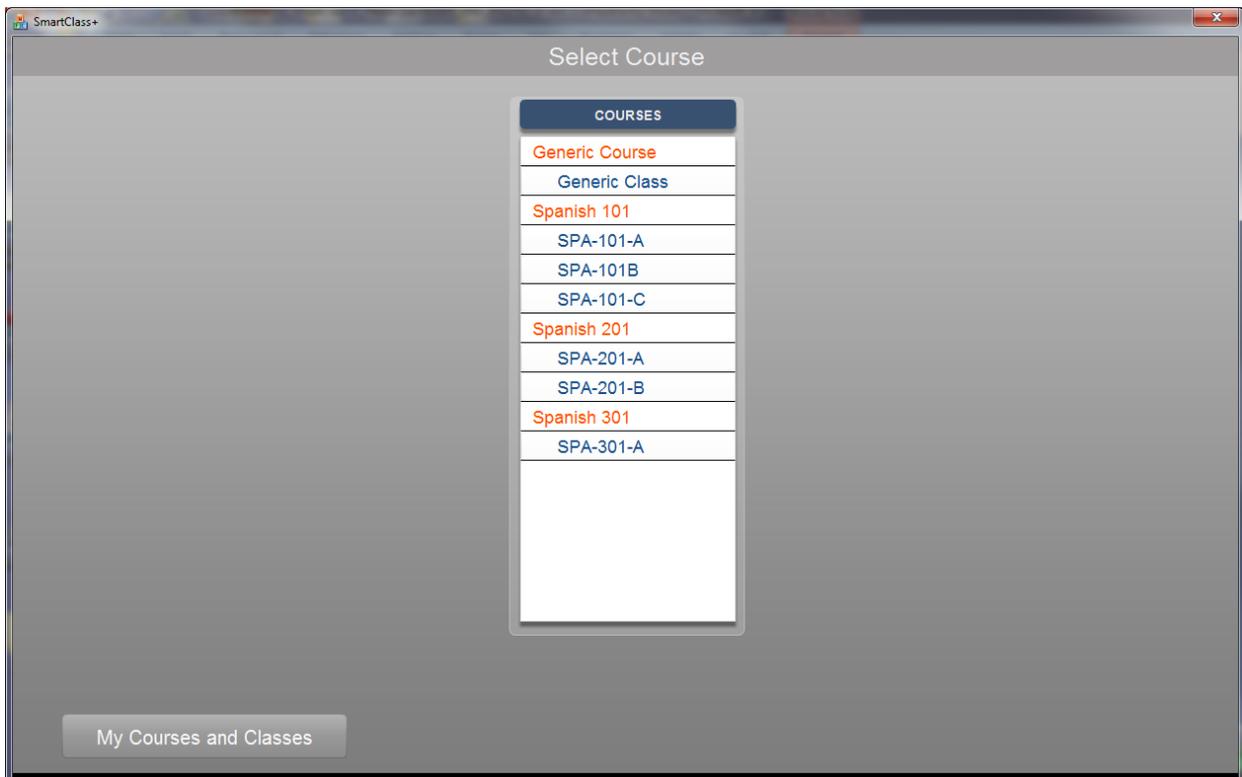
Fill in desired *Class Name* field, and then click on the *Create* button to create the new class.

When you have completed entering all courses and classes, the *My Courses and Classes* panel will appear as shown overleaf.



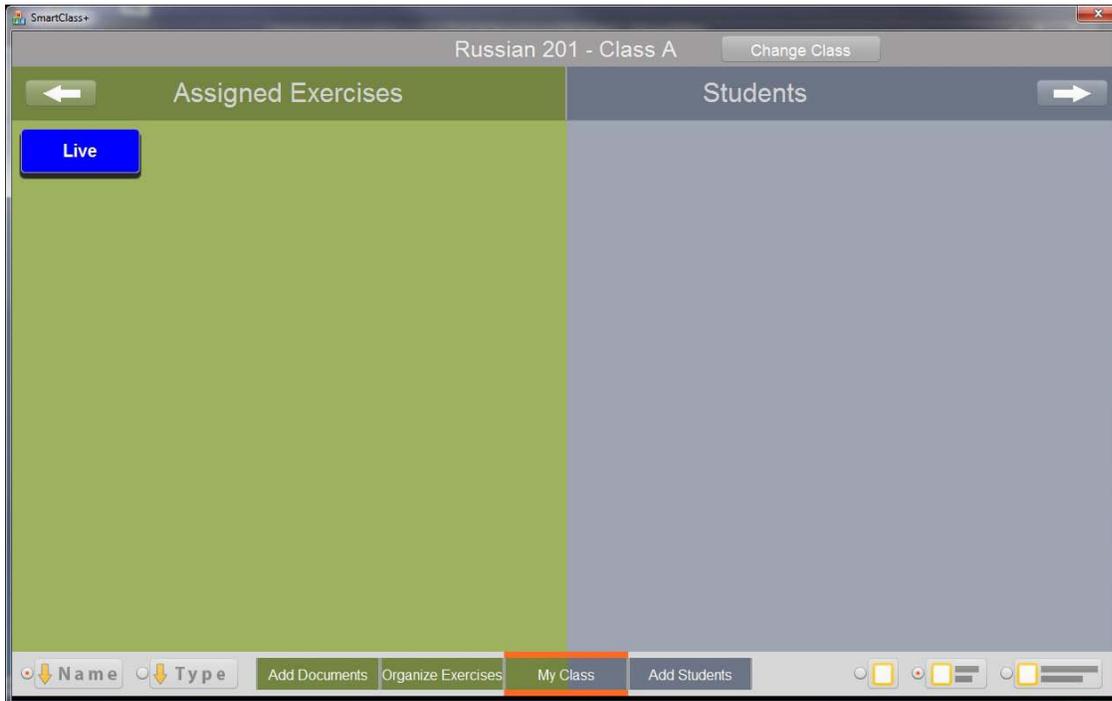


Click on the *Close* button at the top to exit this panel and return to the *My Courses and Classes* panel. You now have access to your classes in the *Select Course* window as shown below:



Adding Students to Classes

When you select a new class for the first time, you will land on the blank *My Class* panel as shown below. Note that there are no students in the right hand panel.

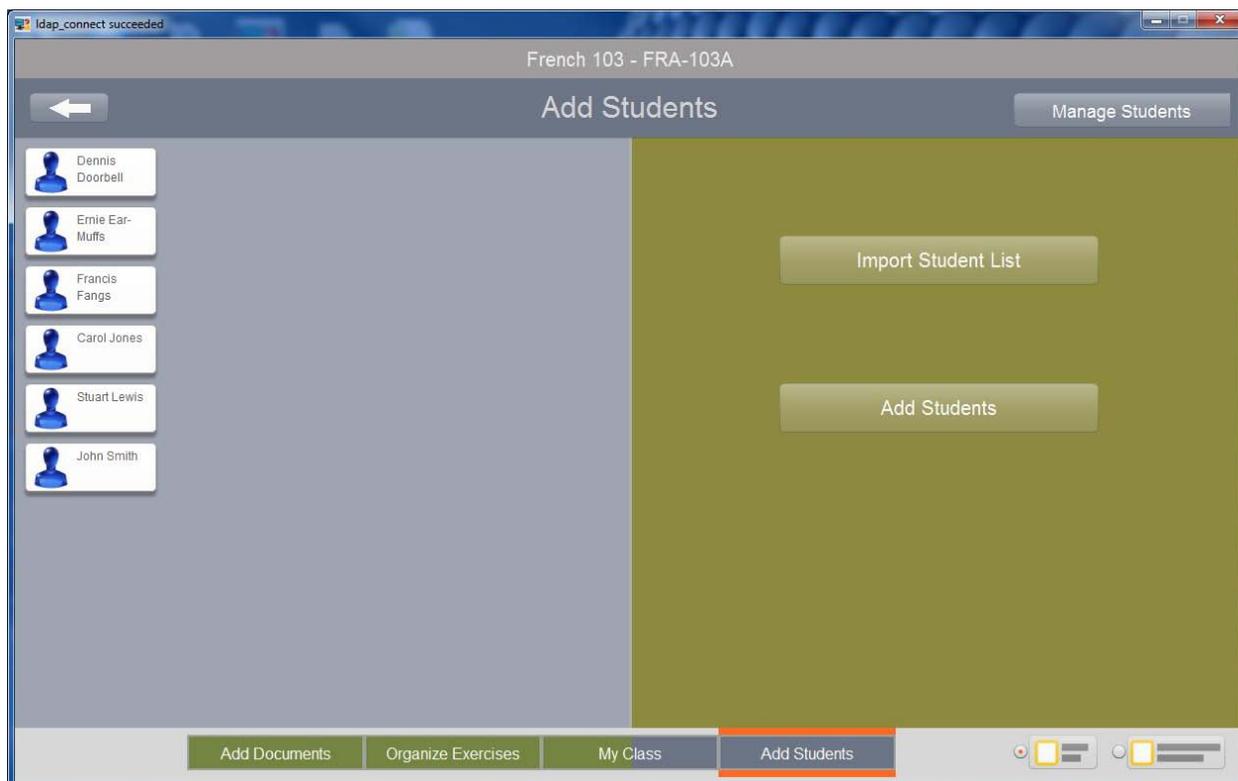


There are three different ways to add students:

1. You can enter students manually one-by-one
2. You can import a CSV list of students for the class
3. You can leave the list of students blank and use the Populate Class option within the Live Activities Dashboard (LAD) to have students login and create their own records. (This can only be done if there are no students currently listed in the class.)

Add Students

To add students, first click on the arrow at the upper right of the Students panel. This will move you to the *Add Students* panel (shown below). In the example below, note that there are already six students in the class.



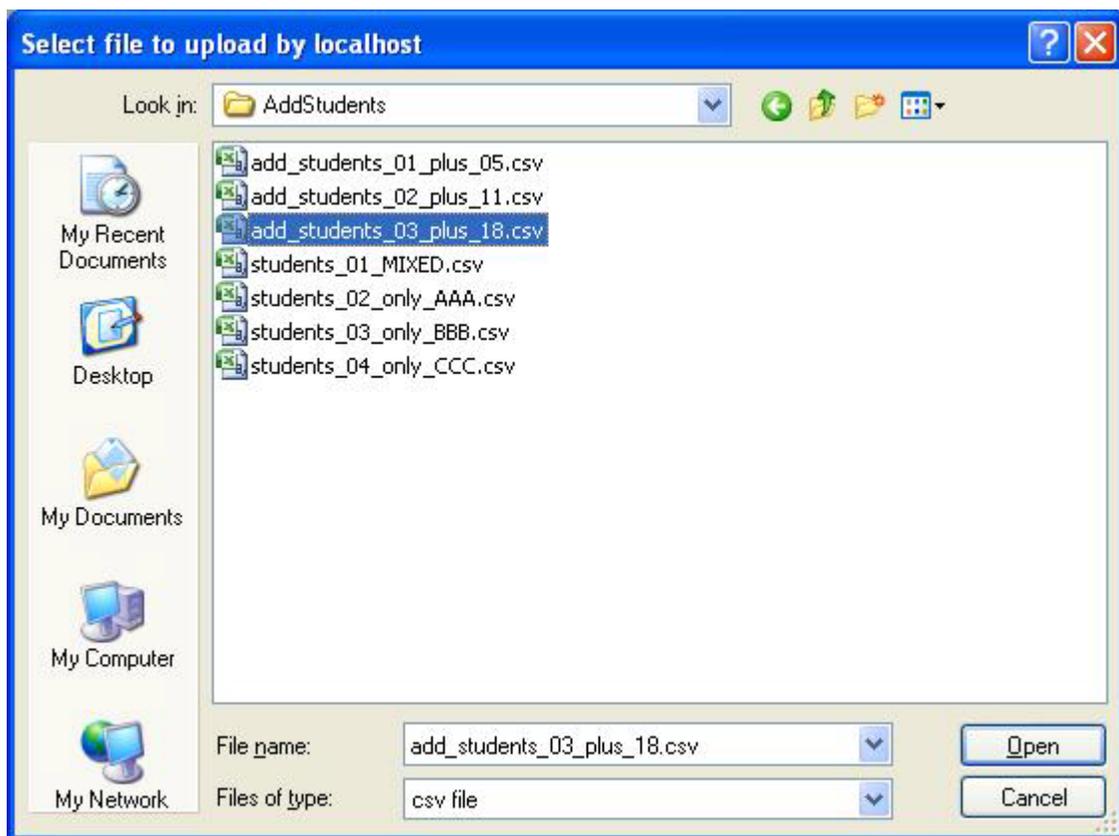
From this panel, you have two options: Importing a student list, or Adding students one-by-one. The *Add Students* option is useful for adding new students who join a class later in the term, but normally you will use the *Import Student List* option when setting up classes.

Import Student List

When you click on this button, you see the panel shown at right. Click on the *Select CSV File* button to begin browsing for the student list file.

Important!

To use this capability, all teachers must be provided with a set of CSV (Comma Separated Values) files containing the lists of students registered for each of their classes.



Choose the target list of students and click on the *Open* button.

CSV File Format

SmartClass+ uses the following four-field student record format:

First name, Last name, User name, Password

For non-LDAP configurations, your CSV files must have these four fields in this order. Beginning with version 1.229.1, SmartClass accepts either a comma or a semi-colon as the field delimiter.

For LDAP configurations, your CSV files need only have the *User name* field.

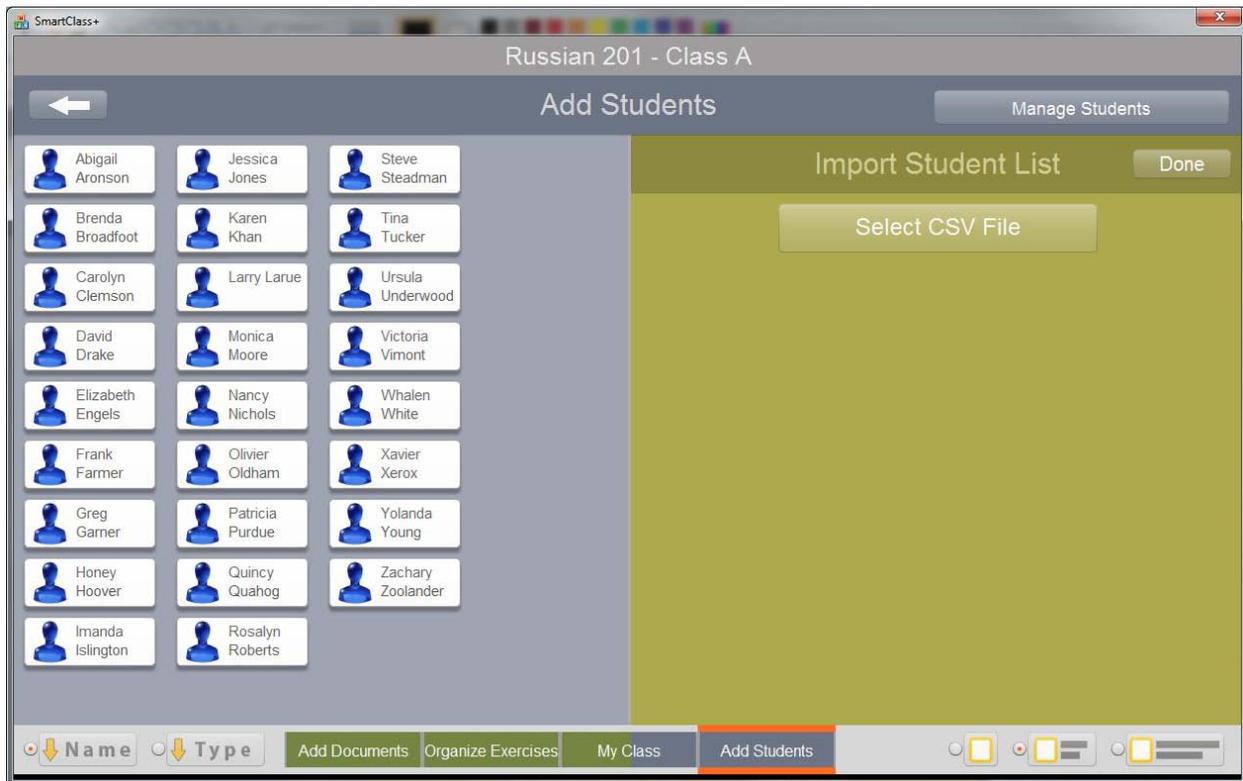
When you select the CSV file, a preview of the records to be imported will be displayed as shown in the image below.



Click on the *Add Students* button to import this list of students into the class, or click on the *Cancel* button to abort the import.

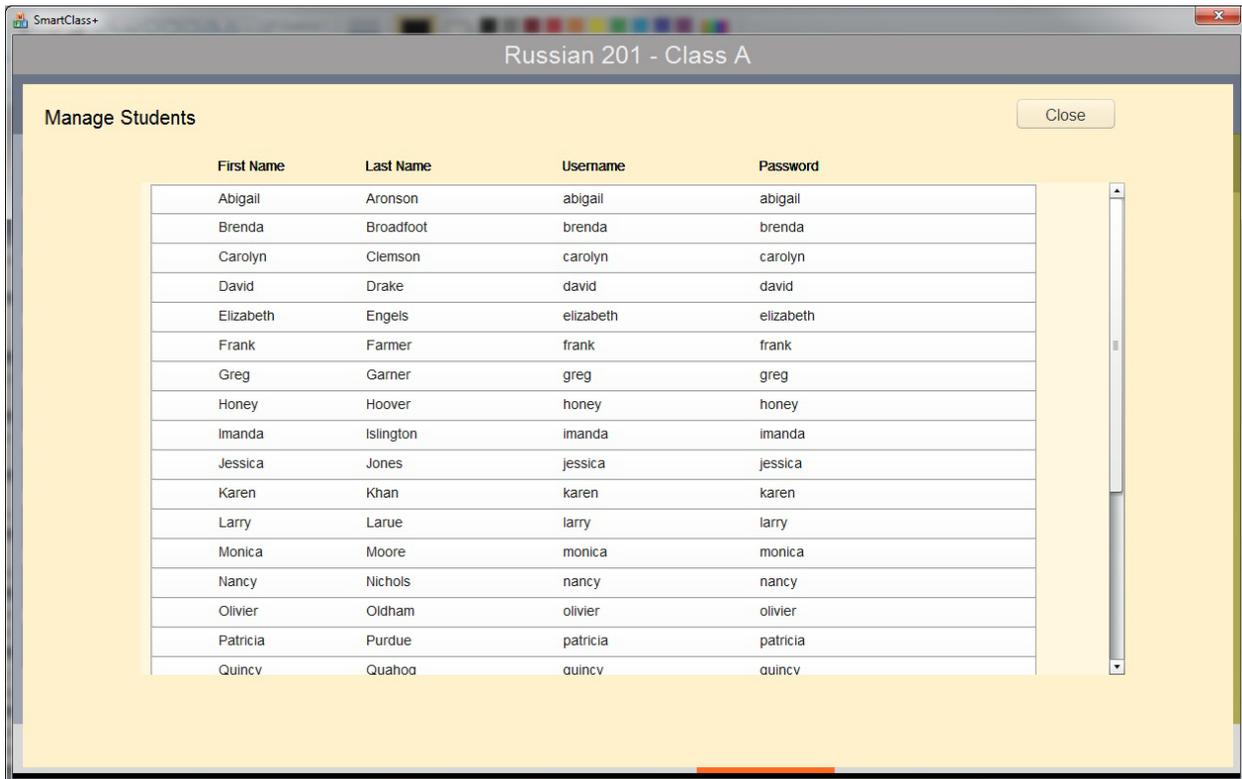
Verify Student List in the Students Panel

Once the student list has been imported, there should be a token displayed in the Students panel for each of the students in the class. Verify that this list is correct.



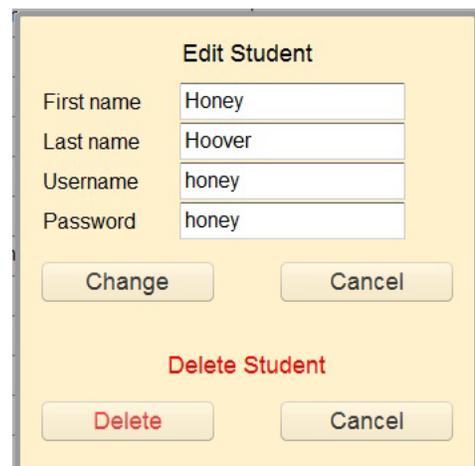
Managing Students

Teachers are able to edit or delete the student accounts associated with their classes. This process begins by clicking on the *Manage Students* button located in the upper-right portion of the Add Students view.



To select a student record, click anywhere on the row for that student: The panel (shown at right) will appear.

You can edit any of the four fields for the selected record, and then click on the *Change* button, or you can delete the entire student record by clicking on the *Delete* button.



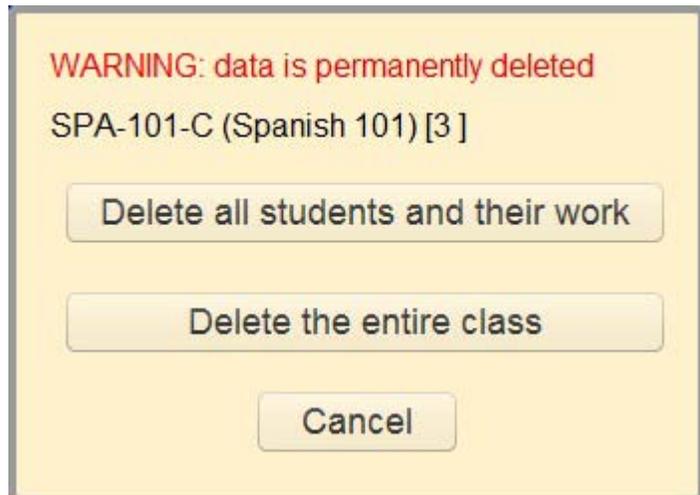
Deleting Classes & Students

Beginning with release 1.228, teachers have the ability to delete classes that are no longer needed. To do this, the teacher clicks on the red X to the right of the course (as shown at right).

When you do this, the box shown below right will appear.

To remove the entire class, click on the *Delete the entire class* button, but note that this permanently erases all student records and responses for that class and all media files and exercises for that class.

There is also a second button called, *Delete all students and their work*. This button permanently removes all students and their responses for that class, but leaves all class related media files and exercises intact. This latter option might be selected at the end of a school term, when the teacher is planning to give the same class to a new group of students.



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