TEXAS INSTRUMENTS

TI-*nspire*™

Getting Started with TI-Nspire™ Navigator™ NC Teacher Software IT Administrators

This guidebook applies to TI-Nspire™ software version 3.6. To obtain the latest version of the documentation, go to *education.ti.com/guides*.

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Network Requirements

This document lists the network requirements for installing and using TI-Nspire™ Navigator™ NC Teacher Software.

System Features

The TI-Nspire™ Navigator™ NC Teacher Software classroom learning system provides the software tools you need to set up a wired or wireless classroom network. You can:

- Create and manage classes on the classroom network.
- Transfer files between a teacher computer and a student computer.
- Delete files transferred to students.
- Monitor student work using screen captures, live presentations (Live Presenter), and polling.
- Create, distribute, and analyze educational content.

Network Overview

The software consists of two applications:

- The TI-Nspire™ Navigator™ NC Teacher Software application installed and running on the teacher computer.
- The TI-Nspire™ Student Software application installed and running on each of the student computers.

These components are set up as a network with either a static or dynamic IP address assigned that allows TCP/IP traffic between them. The following diagram shows the TCP/IP traffic flow between the teacher and student.
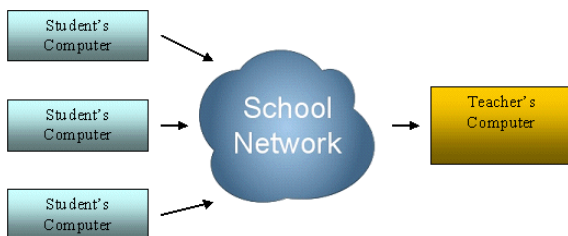
The teacher computer broadcasts the current class name through the network using multicast DNS. This process registers the class as a service on the network.

The student computer uses DNS Service Discovery to connect to the teacher computer and find the class. When the student logs into the class, the application residing on the student computer requests files or sends files for the class.

By default, communication between the teacher application and the student application uses a secure HTTPS connection through port 42124. This port is the application main port and it can be configured.

Basic authentication is performed on all communications such as sending and collecting files. Only Live Presenter communications are not authenticated in the same way. Live Presenter requires a password to authenticate communication.

Live Presenter

Live Presenter is a feature that allows the teacher to select a student computer to become the presenter for the class. Everything the student does is shown to the class through a digital projector connected to the teacher's computer.

A Live Presenter Virtual Network Computing (VNC) application runs on each student computer once the student logs in.

The Live Presenter VNC starts by default through port 42125, the application main port + 1. The teacher computer connects to this application after a Live Presenter action is selected.

When the Live Presenter application starts, the following security actions occur:

• Connection to the student computer is limited to the teacher computer only.

• The system sets the Live Presenter feature password to a unique value known only to the TI-Nspire™ Navigator™ NC Teacher Software and TI-Nspire™ Student Software.

• The password is valid for only the current class session.

The Live Presenter communication stops when one of the following occurs:

• The student logs out.

• The teacher ends the class session.

• The teacher ends the Live Presenter session.

# Network Environment Requirements

The standard requirements and recommendations for running TI-Nspire™ Navigator™ NC Teacher Software are:

- For students that connect through a wireless network, the network should be a one-to-one ready network.

- Communication between the teacher computer to and from the student computer is through a Transmission Control Protocol / Internet Protocol (TCP/IP) connection.

- The TCP application main port default at 42124 and the application main port +1 should not be blocked. The port number for port 42124 can be configured.

Note: If the computers are using a Dynamic Host Configuration Protocol (DHCP) connection, it must be working correctly.

- Routing and traffic policies should allow packets to pass between the teacher and the student.

- Different subnetwork scenarios are supported as long as routing between them is configured.

The following diagram shows two subnetwork scenarios.
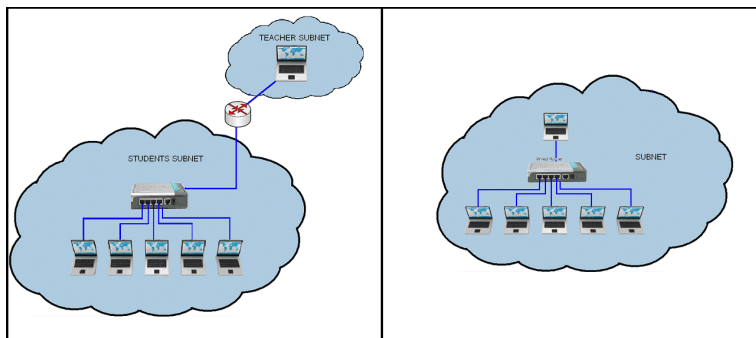
- Software firewalls, hardware firewalls, and other threat protection software should not block the TI-Nspire™ Navigator™ NC Teacher Software application or the application traffic between teacher and student.

- User Data Protocol (UDP) port 5353 should not be blocked. You must enable multicast to broadcast available classes. If multicast DNS cannot be enabled, you can add preferred hosts to a preferences file on student computers.

- Group Policies should be configured to allow continuous traffic between teacher and student.
- A minimum of 100Mbps/1Gbps for wired networks is required. The goal for the IT department is to try to have a minimum data throughput of 10Mbps between the teacher computer and the student.
- A minimum of 802.11g for wireless networks is required.
- In a wireless environment, the access point infrastructure should be robust enough to prevent overloading channels, reduce wireless packet loss, and prevent students from dropping the network.

These additional recommendations can increase system performance.

- Establish a stable and efficient networking system (hardware and software). If your computer classroom already experiences network issues when logging into computers or moving files over the network, please address these issues before using TI-Nspire™ Navigator™ NC Teacher Software.
- Because up to 50 students can connect to a teacher computer, a wired connection to the router is recommended for the teacher computer. This wired connection provides a bigger network pipe to handle multiple requests.
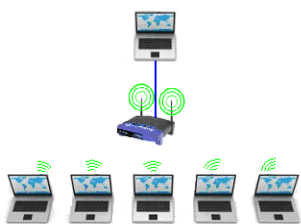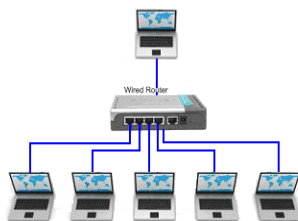
Teacher wired   All wired

Network Recommended Settings

The following network settings are recommended:

- A static Internet Protocol (IP) address for the teacher computer is suggested. If you cannot enable the multicast DNS, a static IP address will

allow easiest class management. You can add the IP address as a preferred host in the preferences file on student computers.

Locating the Properties File

Both TI-Nspire™ Navigator™ NC Teacher Software and TI-Nspire™ Student Software allow you to configure network components based on values defined in a properties file you can create with your specific port settings.

This file is called **imc-network-prefs.properties**. The name of this file must **not** be changed.

Note: If multiple users use the same machine, you may need to copy the properties file into each specific user directory.

Windows® 7 and Windows Vista® Location

For Windows® 7 and Windows Vista® operating systems, you can locate the preferences file here:

C:\Users\<User>\AppData\Roaming\Texas Instruments\<TI-Nspire Navigator Product>\imc-network-prefs.properties

After you create the .properties file you must copy it into the following directory.

C:\Users\<User>\AppData\Roaming\Texas Instruments\<TI-Nspire Navigator Product>\

Windows® XP

For Windows® XP operating systems, you can locate the preferences file here:

C:\Documents and Settings\<Windows Account Name>\Application Data\Texas Instruments\<TI-Nspire Navigator Product>\imc-network-prefs.properties

After you create the .properties file you must copy it into the following directory.

C:\Documents and Settings\<Windows Account Name>\Application Data\Texas Instruments\<TI-Nspire Navigator Product>\

Mac® OS X®

For Mac® OS X® operating systems, you can locate the preferences file here:

/Users/<User Account Name>/Library/Preferences/Texas Instruments/<TI-Nspire Navigator Product>/imc-network-prefs.properties

Teacher Configurable Settings

You can configure the following setting on the teacher computer.

Property name	shinycommproxy.host.port
Description	TI-Nspire™ Navigator™ software uses this port to accept connections from clients. This value is set to the application main port and needs to be unblocked. The application main port + 1 also needs to be unblocked.
Type	int
Default	42124

Editing the Student Preferences File

You can add known hosts in advance in the TI-Nspire™ Student Software. The system uses these hosts to query for available classes when a student attempts to log in to a class. This function is particularly helpful when multicast DNS is disabled and the teacher has a static IP address assigned.

Those hosts can be added in the property files called settings.properties.

Windows® 7 and Windows Vista® Location

For Windows® 7 and Windows Vista® operating systems, you can locate the preferences file here:

C:\ProgramData\<TI-Nspire SE Product>\res\settings.properties

Windows® XP

For Windows® XP operating systems, you can locate the preferences file here:

C:\Documents and Settings\All Users\Application Data\<TI-Nspire SE Product>\res\settings.properties

Mac® OS X®

For Mac® OS X® operating systems, you can locate the preferences file here:

/Library/Application Support/<TI-Nspire SE Product>/res/settings.properties

Adding the Preferred Host Addresses

To add host addresses:

1.   Open the file for editing.

2.   Add the following line to the end of the file:

prefered.hosts=<Teacher IP Address>:<Application main port>

For example: prefered.hosts=192.168.1.2:42124

If there are multiple hosts, repeat the sequence creating a separated list.

For example: prefered.hosts=192.168.1.2:42124;192.168.1.55:12345

Copy the file to the student computers and save the file in the appropriate location listed under the applicable operating system.

When the student starts the system, the IP address will be checked to determine if a class is available on that computer.

Glossary

Term	Definition
Application main port	The TCP port number used by the TI-Nspire™ Navigator™ NC Teacher Software application starts the server on the teacher computer to receive requests from the student computers.
Student computer	The computer running either a Windows® or Mac® operating system on which the TI-Nspire™ Student Software is installed.
Teacher computer	The computer running either a Windows® or Mac® operating system on which the TI-Nspire™ Navigator™ NC Teacher Software application is installed.

Troubleshooting

This section explains how to troubleshoot some common network connectivity issues.

## Connectivity Errors

Resolving Basic Connectivity Issues

For any network issue, you should first try to resolve the issue by checking that:

- The Ethernet cable is securely connected to both jacks.

- The wireless connection is enabled.

- The network connections are enabled.
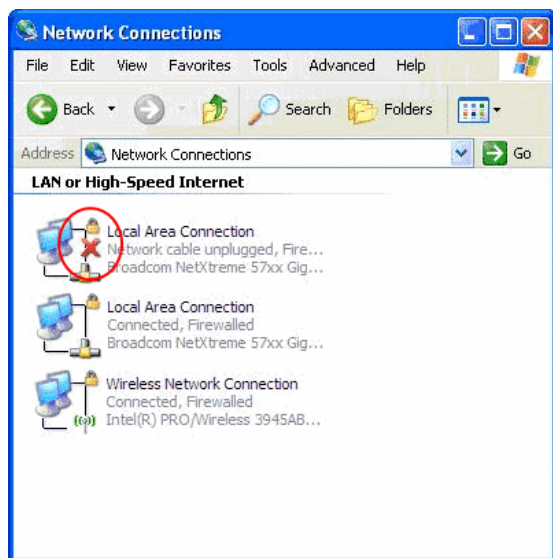
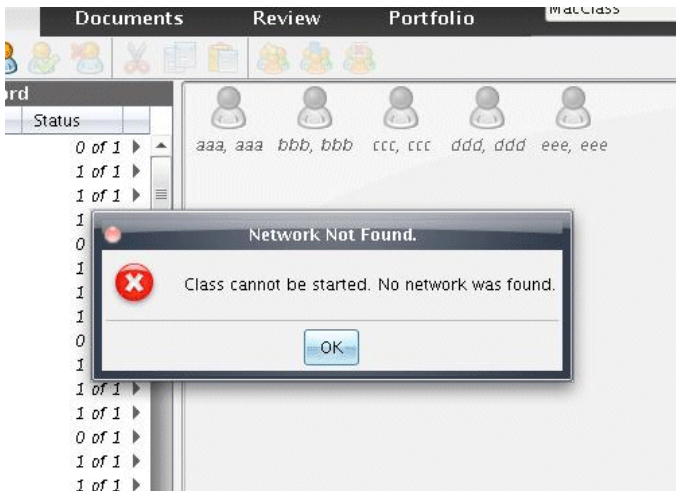The red X indicates that the connection is disabled.

- The operating system reports a "connected" status.
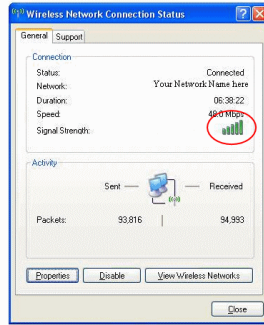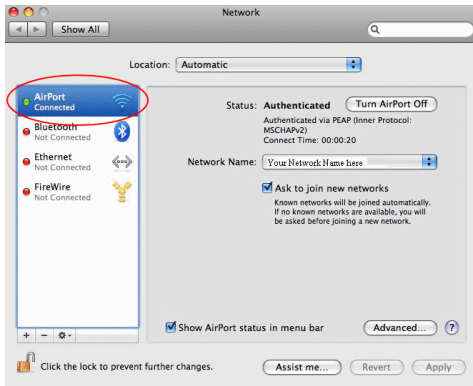
Indicates computer is connected.

Teacher Cannot Start a Class - No Network Found

Problem:

The teacher has created a roster, but cannot start a class because no network was detected.

Solutions:

- Make sure the teacher computer is connected to the network. For more information, see *Resolving Basic Connectivity Issues*.

- Once the teacher computer connects to the network, wait a few seconds before attempting to start class again.
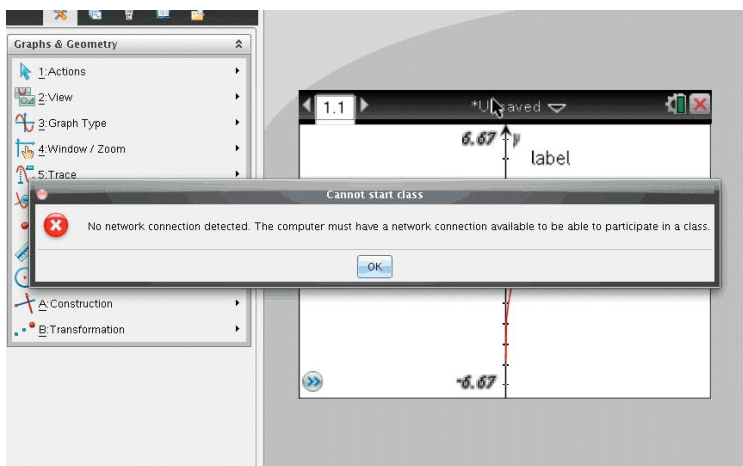
Advanced:

Contact your IT department to verify that:

- The teacher computer has at least one network adapter, and that it is connected to the network.
- A valid IP address is assigned to the teacher computer.
- Traffic between the teacher computer IP address and student computer is allowed.

Student Cannot Log in to Class - No Network Found

Problem:

Student cannot access the login window because no network connection was detected.

Solutions:

- Make sure the teacher computer is connected to the network. For more information, see *Resolving Basic Connectivity Issues*.
- Once the student computer connects to the network, wait a few seconds before attempting to login again.
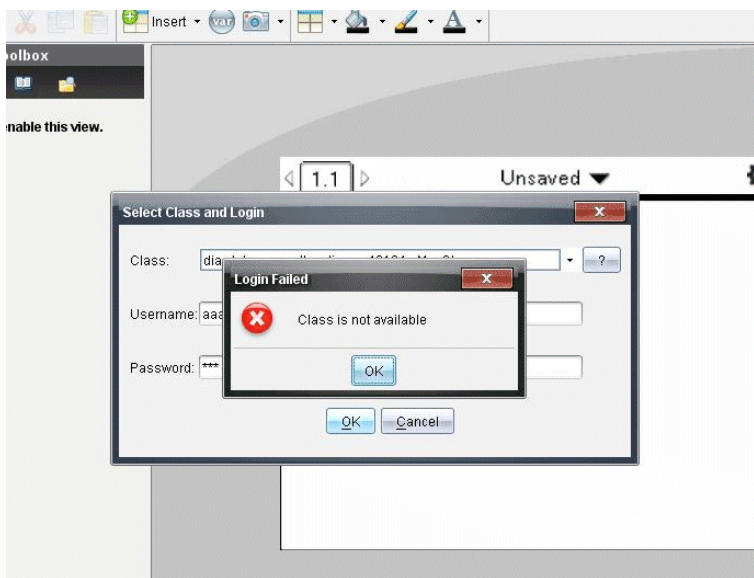
Advanced:

Contact your IT department to verify that:

- The student computer has at least one network adapter, and that it is connected to the network.
- A valid IP is assigned to the student computer.
- Traffic between the teacher computer IP address and student computer is allowed.

Student Cannot Login to Class - Class Not Available

Problem:

A student can see a class, but upon login the error message "Class is not available" is displayed.

Solution:

Ask the student to manually add the class. For more information, see the section *Student Login* in the *Getting Started with TI-Nspire™ Navigator™ NC Teacher Software* guidebook.

Advanced:

Contact your IT department to add the teacher computer IP address to the student computer preferences file as a preferred host.

No Student Can Connect to Class

Problem:

Students cannot connect to class.

Solution:

Check to see if there is a period in the class name (example: JaneDoe.MathClass). Periods are not allowed in class names. Rename the class without the period in the class name.

Student Does Not See a Class

Problem:

One or more students, but not all, do not see a class that has just been started.

Solutions:

*   Ask the student to close the login window, and then reopen it to connect. Because of network issues, it is possible that the TI-Nspire™ Student Software network component missed the service notification.
*   If the student still does not see the class, the student needs to manually add the class. For more information, see the section *Student Login* in the *Getting Started with TI-Nspire™ Navigator™ NC Teacher Software* guidebook.

Advanced:

Contact your IT department to add the teacher computer IP address to the student computer preferences file as a preferred host.

No Student Can See a Class

Problem:

No student can see a class that has just been started.

Solutions:

*   If all students cannot see the class, ensure the teacher and student computers are connected to the network. For more information, see *Resolving Basic Connectivity Issues*.
*   The student needs to manually add the class for that class to display in the login window. For more information, see the section *Student Login* in the

Getting Started with TI-Nspire™ Navigator™ NC Teacher Software guidebook.
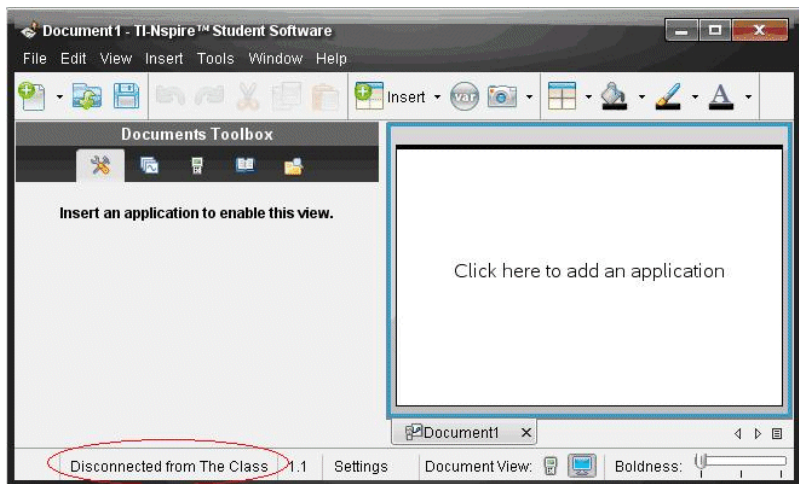
Advanced:

Contact your IT department to verify that:

- Multicast DNS is enabled and traffic between teacher and student computers is allowed.
- Add the teacher computer IP address to the student computers preferences file as a preferred host.

Student Did Not Get a File Transfer

Problem:

The teacher sends a file to students and one or more of them did not receive the file.

Solutions:

- Check to see if the student or teacher computer was dropped from the network.
- The student needs to manually add the class for that class to display in the login window. For more information, see the section *Student Login* in the *Getting Started with TI-Nspire™ Navigator™ NC Teacher Software* guidebook.

Advanced:

Contact your IT department to verify that:

- Connectivity and security credentials between the student computer and teacher computer are correctly configured.
- Student computers and the teacher computer are on the same subnet or routing between subnets is enabled.

All Students are Disconnected from the Class

Problem:

All students are showing the message "Disconnected from <The Class>" in the status bar even though the class is still running.

Solutions:

- Make sure the teacher computer is connected to the network. For more information, see *Resolving Basic Connectivity Issues*.
- Check connections and power to any networking equipment.

Advanced:

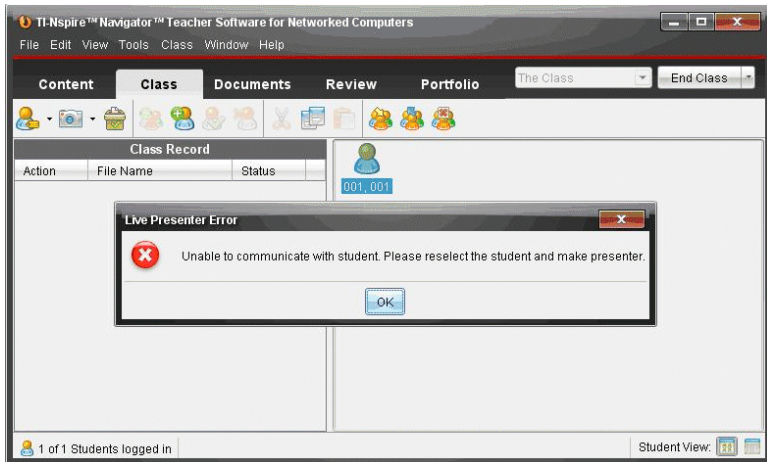Contact your IT department to verify that:

- There are not any network outages. You may need to wait until the network is restored before attempting to log on again.
- The teacher IP address did not change in the middle of the class because of short lease times. A static IP address is preferred.

Live Presenter Errors

Cannot Display Student Screen

Problem:

The teacher cannot select a student in Live Presenter mode.

Solution:

- Make sure the student computer is connected to the network. For more information, see *Resolving Basic Connectivity Issues*.

Advanced:

Contact your IT department to verify that:

- Port Application main port + 1 (default 42125) is not blocked.
- The VNCServer is not blocked by firewalls, routers, or security features.
- There is a VNCServer process running that is the child of the TI-Nspire™ Student Software process. It is created when the student logs in.

Application Runs Slow During Screen Capture

Problem:

Screen Capture processes a lot of data when storing screen shots. Running auto refresh at the same time you are capturing screens causes the application to slow down for several seconds while images are refreshed. If you close the Screen Capture window when downloading new screens (either manually or using auto refresh), the application freezes for several seconds.
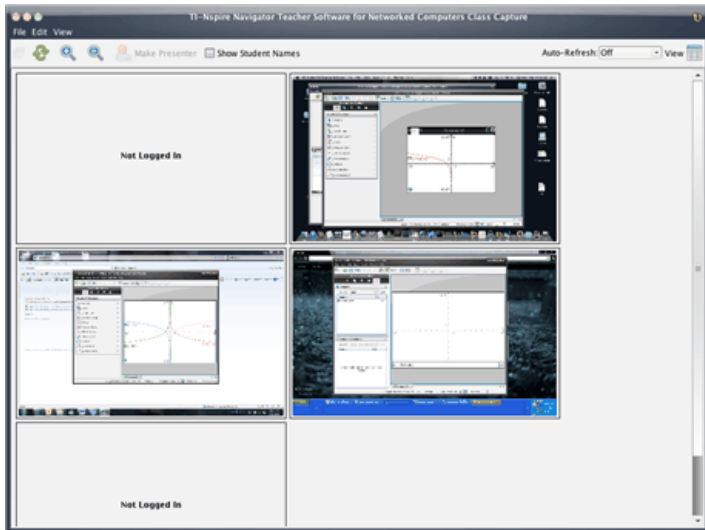
Solution:

Before closing the Screen Capture window:

• If auto refresh is on, turn it off.

• Wait for all the screens to be updated in case auto refresh or a manual refresh has been triggered.

Note: Screens appear opaque when you capture new ones.

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Texas Instruments Support and Service

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Knowledge Base and support by e-mail:	education.ti.com/support or ti-cares@ti.com
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