SimCalc MathWorlds® for Computers Technical Guide

Section 1: Information for Teachers

- SimCalc MathWorlds® for Computers can support a classroom of 30 wireless computers using any commercially available wireless router. See Section 9 of the SimCalc MathWorlds® for Computers Reference Guide for instructions on how to conduct a classroom activity.
- If you are using your own wireless router (i.e., you plugged it into the wall yourself) you should be able to connect to it to support 30 computers in your classroom. If you are using the school’s wireless system, consult your school’s IT staff and provide them with a copy of this documentation.
- Computers are sometimes set to go into a “sleep” mode, or a “low power” mode to save electricity. This is especially true for laptops. To prevent the computer from putting the network card to sleep and possibly interrupting the activity, set the computers to not go to sleep during class. See your school’s IT staff for help.

Section 2: Technical Details for School Computer Infrastructure Professionals

SimCalc MathWorlds® for Computers is a Java-implemented technology, which makes use of TCP/IP communications to link the teacher to a classroom of students.

The SimCalc Over TCP/IP (SCOT) protocol used by SimCalc MathWorlds® for Computers is capable of controlling many student machines via one teacher computer. No access to the Internet is necessary; the computers only need to share the same local network.

We tested and found that our protocol is stable for supporting the average-size classroom (30 students) over a “wired” network for an average-length class time (90 minutes, plus). However, our target classroom platform consists of wireless notebooks. Testing has revealed the limitations of some older commercial access points when trying to host an entire classroom (more than 16 computers). With new access points, we have not encountered these problems. However, even with the older commercial access points, these limitations can be circumvented with specific network configurations. See Network Configuration Section below for details.

Installing SimCalc MathWorlds® for Computers

SimCalc MathWorlds® for Computers uses Java technology. On the Windows platform (2000, XP, 7), an installer is provided. The installer contains its own Java Virtual Machine (JVM), which we have included so computers that do not have Java installed will be able to run the software.

Installing SimCalc MathWorlds® on a Windows Platform:
Run the installer on the teacher and student computers. The one installer serves for both the teacher and students versions of the software.

On the MacOS platform (10.4 or greater), SimCalc MathWorlds® does not contain a JVM and relies on the JVM which is included with the MacOS. Please make sure you have the most recent version of Java on the MacOS (usually automatic).

**Installing SimCalc MathWorlds® on a MacOS Platform:**
Open the DMG and copy the SimCalc MathWorlds® application to the Applications folder on the teacher and student computers. The single DMG serves both the teacher and students versions of the software.

**Activation**
The teacher and student computers are distinguished from each other by the use of license keys. Use the “Student” license key for student machines. Use the “Teacher” license key for teacher computers. The “Teacher” Key allows the teacher’s computer to act as a classroom server.

Note: If you use SimCalc MathWorlds® for Computers during the evaluation period—running the software without a license key—the software is fully functional. So, if the evaluation version is installed on student computers, students will have access to “teacher functionality” which may be distracting and possibly disruptive to the class. If you wish to use this software with your students, we urge you to contact the Kaput Center for information on purchasing a license.

**Network Configuration**
For SimCalc MathWorlds® for Computers to support a classroom of students, all computers must be able to find the teacher computer. We recommend that all computers be connected to the same network.

For the teacher’s convenience, a pull-down box in the Classroom Manager window displays the teacher’s IP address (see Section 9 in the SimCalc MathWorlds® for Computers Reference Guide for further information). Student computers need to be in the same network space so that this address is reachable by all student computers.

Using any out-of-the-box wireless access point, even without an Internet connection, teachers can connect to the access point and host a SimCalc MathWorlds® for computers classroom. Testing has yielded a limit to the number of stable connections a commercial access point can handle. While newer access points can handle well over 30 stable connections, we have experienced a limitation with older, commercial access points at a maximum of 16 stable connections.

To circumvent access point limitations, multiple access points should be used. However, they must be configured to the same network so that the teacher and all
students are sharing the same address space. For each access point you have configured to your network, you can host 16 connections. During class time, make sure that no more than 16 students are connected to any one access point. This implies that you must set up your access points with their own SSIDs and different channels. If you have your wireless arrangement set up to “seamlessly” use simultaneous access points on difference channels but the same SSID (in order words, if you use the access points specifically to give you more geographic coverage) then you may come up against the access point connection limitation since you will not be certain how many students are connected to the same access point.

**Exclusive Use**

If an access point is being used for other purposes simultaneous to being used to host a SimCalc MathWorlds® classroom, stability may be degraded. Our testing assumed exclusive use of an access point (or access points) for the duration of class.