Remote Laboratories

Configuring a Remote Laboratory Session
A Short Manual

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This Remote Lab Configuration Manual aims to facilitate in successfully setting up a remote lab session.

1.0 Introduction

This short manual has been written to help to facilitate in successfully setting up a remote laboratory session. A remote laboratory session will allow people to access a computer remotely which has the remote lab software successfully set up. The first part, section 2.0, of the installation instruction is about installing the VNC software. This is the software which will allow people control of the computer remotely. Section 3.0 provides instructions and information regarding the remote lab software installation and setup. This will ensure that the remote lab setting can be configured to suit the laboratory that will be run (correct ports, lab title, lab duration, audio settings and video settings). Section 4.0 allows you to chose whether the laboratory operations will be an application or service. Section 5.0 explains how to change laboratory configurations if any settings need to be altered. Section 6.0 explains how to setup your firewall to allow Electromeet to operate successfully. Section 7.0 is the troubleshooting section which provides contact details on who to contact if any problems are encountered.

2.0 Installing VNC

In order to establish a remote laboratory session you must install the Remote Lab software in conjunction with an installed VNC server.

Firstly, a VNC server should be installed. This can be installed by accessing the following link. http://www.uvnc.com/downloads/ultravnc/95-downlaod-10961.html

The remote VNC software can we strongly recommend is version 1.0.9.6.1 for the best compatibility with the remote lab software.

3.0 Installing Remote Lab Software

Once the VNC server is installed to be able to use the remote lab, you must have the installation package of Remote lab software. The remote lab software can be obtained from the following link: http://www.electromeet.com/download/Default.aspx

You will need to download LabServiceSetup-v1.2.5940.

After installing the package, run the configuration of the Remote Lab Service.

The main panel contains list of available configurations or remote laboratory session.
When you start it for the first time, the list will be empty. This is because no configurations or remote lab session have been configured.

The fastest and easiest way to configure it for the first time will be to run the wizard. This is simply done by clicking on the ‘Start Wizard’ icon.

### 3.1 Step 1

![Step 1 dialog](image)

The first dialog of the wizard contains the most basic information for the remote laboratory configurations.

**Host name:** This is the name of the login server to which the Lab service will advertise its self.
**Session name:** is the name that the session will have in the configuration list. It is also the name of the session after the registration is complete.

**Session key:** This is a key, generated to identify the Lab sever. This will allow the remote labs to connect to the Lab server.

**Listen port:** This is the port used by the Lab server, to listen at for incoming connections.

### 3.2 Step 2

This step contains the title of the laboratory sessions.

**The Title of Application:** This is the name given to the laboratory session.

**Length of the lab in minutes:** This allows for control and limitations to be placed on how long students will be able to work in the lab. Students can only access a remote laboratory one at a time. Once the time, which has been defined in the ‘Length of the lab in minutes’ box expires, students will be logged out from the Remote Laboratory session. Immediately after the student has been logged out from the laboratory session, the next student in line will be allowed to access the remote labs.

![Step 2 window](image)

**Web site of the lab details:** This references students to a website. This website will contain additional information about the laboratory session the students will be undertaking.

**Select Lab Documentation:** This feature gives you the opportunity to add a document containing a description of the lab. These documents will provide full information regarding the laboratories. The information will include purpose, procedure and any extra information required by the students. The additional information may include further instructions on gaining access to the remote laboratory sessions. The documentations should include all necessary information required by the students.

### 3.3 Step 3

The third step of the wizard allows you to select web cameras, through which, the students will be able to observe the result if their actions in the remote lab. This feature of the remote labs is
critical for it adds an element of realism. It separates a remote lab session from a virtual simulation since it provides real observable behavior.

You can select some, or all, of the available cameras, and also select the size of the cameras. The size of the image display has only two options; big or small.

3.4 Step 4

The 4th step will let you select folders that you will share with the students. This allows students to download or upload files at the lab server.

The transfer port is the port number through which files will be transferred. This port number will allow you to exchange files with the lab server.
4.0 Remote Lab Service

After you have configured some labs, you can change the way it will run. The lab can run as either an application or a service.

After saving the configuration, you will be able to use one of the labs by selecting it in the lab list. The name you gave the remote lab session in the configuration will display in the list. After selecting the lab, you can choose whether you want to run the remote lab as either application more or service mode.

Selecting application mode, allows you to will be able to start it or stop the lab it running it like an application.

Selecting Service mode, allows you to run in the session in the background of the computer, referenceing to the login server and making it available to the remote users of the remote laboratory sessions.
The “Install Service with current config” button, will install a service in your computer to use the selected configuration. Once installed, the other icons will activate allowing you to start, stop, install or uninstall services. If you have already used the lab, you will most probably have configured labs in the list.
5.0 Remote Lab Server Configuration

Using the “Configure” button will let you change the configuration of any listed labs in your computer. The options here are similar to the items in the remote lab configuration wizard. The only new thing here is VNC section. This section will let you configure VNC service that you have already installed alongside with the remote lab software. You can configure VNC port for incoming connections and passwords for the remote laboratory sessions.

There is also a button that will open dialog of the VNC configuration to set up the more advanced options.
The Video and audio tab, will let you select audio devices, and stream audio along with the video streams to the students. The advantage of this feature is to add sound to the observations gained through the video feature. Audio will make the remote laboratory session, in conjunction with the video streaming feature, as realistic as possible. This makes the remote laboratory session more realistic and less like a virtual simulation.

6.0 Opening the Firewall

Remote Lab uses by default few ports to accept connections.

1. The main default port is 5900. This port is used by the VNC server. This is the port which is used to share the lab server’s desktop with users. It can be changed from the configuration program of the lab service, or from the configuration of the VNC server itself.

2. TCP port 1144 is used for file transfer between the lab server and clients. If the remote lab is a public IP address, there is probably no need to configure the router. Usually it will have a private IP address in the form 10.xx.xx.xx or 192.168.xx.xx. This will mean that the lab server is behind some router or firewall hardware, which is doing NAT (Network Address Translation). If the remote lab server is behind a firewall or router, you need to make sure that the default ports Electromeet operates from are accessible from outside. This procedure depends on the specific hardware, and there is no universal recipe to do it, but most often it is called Destination NAT, Virtual server, or in the home routers, there is an option called DMZ (demilitarized zone) which will forward the incoming connection from Internet to a specific IP address behind firewall on your internal network. In most cases you will need to read the router’s manual pages, and find the exact commands to configure it. A summary of the methodology is as follows: You need to forward incoming connections to ports 5900, 1144 to the IP address of the lab computer.

If any problems are encountered when trying to allow the Electromeet default ports through the firewall please contact Kim Li. Contact details are provided below:

Email: Kim.Li@idc-online.com

Contact Number: +61 893 211 70

7.0 Troubleshooting

If any problems are encountered during the installation and setup of the remote lab service please contact Kim Li. Contact details are provided below:

Email: Kim.Li@idc-online.com

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