

TYX Corporation

Productivity Enhancement Systems



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How to remotely control the WRTS

Versions used:

Paws Studio: 1.26.7

Operating System: Windows 2000 SP4

Requirements:

- **Paws developer Studio version 1.10.0 or above.**
- **Operating system supporting DCOM (NT4.0 with Sp3 or later, Win2000 or XP)**
- **The same version of PAWS Studio needs to be installed on both the server computer and the client computer. Only the server computer needs a valid license.**

Introduction:

This document will help configuring the environment in order to use the WRTS from a remote location using the operating system settings.

There are two parts to the settings. You need to configure:

- 1. The server computer where Paws Studio is installed.**
- 2. The client machine where your remote client is installed.**

1 Dcom capability of PAWS RTS (Run Time System):

The WRTS (Windows Run Time System) remote usage is made possible via the **DCOM** (Distributed COM) protocol.

This enables a user to test a program remotely using a client /server and advanced security features of Microsoft DCOM.

Notes:

1. The WRTS is the only component that has a server that can be run remotely by a client.
2. As a default **Distributed COM** is **not** configured on windows systems, so making use of WRTS by a remote client is not possible.

1.1 The server system:

The server system is the computer that has Paws Studio installed on it. This installation includes the WRTS with the WRTS server. The WRTS server is registered upon installation.

You have to:

1. **Configure the Operating System** to allow remote usage of the WRTS server. We will go over those settings later in this documentation.
2. Have a **full installation of PAWS Studio** with a **valid license**.
3. Have a **valid PAWS Studio project** that has been built.

1.2 The client system:

The client system is the computer that has the WRTS client.

You have to:

1. Have a valid **WRTS client**. This client should be configured to be able to launch the WRTS server remotely.
2. **Configure the Operating System** to allow remote usage of the WRTS server. We will go over those settings later in this documentation.

3. Install the **same version of PAWS Studio** that you have on the server computer. However, you do not need to license that version. The reason to install PAWS Studio on this machine is related to registration issues. Those registrations are done during the installation of PAWS Studio.

4. Have a file with the name of the project and the correct extension: **.PAX**, or **.PAW** depending upon your configuration. This project should be located exactly in the same subfolder as it is on the server computer. This is done in order for the client to tell the WRTS server which project to load on the server computer. It is however not necessary to have a complete project. This means that the project on the server computer should be the only one that needs to be built and up to date. The .PAW file on the client does not even need to be a generated by PAWS Studio and can be as simple as an empty text file that has been renamed to **<you project name>.paw**.

It is assumed that you have a functional WRTS client that can launch the server remotely.

1.3 Secure operation of the PAWS RTS Server:

1.3.1 Configuring the Operating System for the server computer:

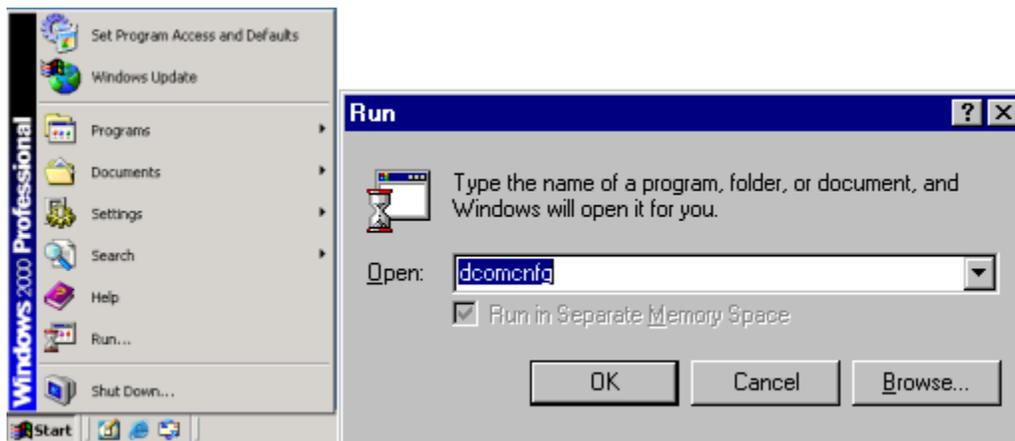
1.3.1.1 Configuring DCOM settings:

The settings addressed below will have to be configured on the machine where the WRTS is installed. On the machine where you want to run the WRTS server, you will need to follow the steps below:

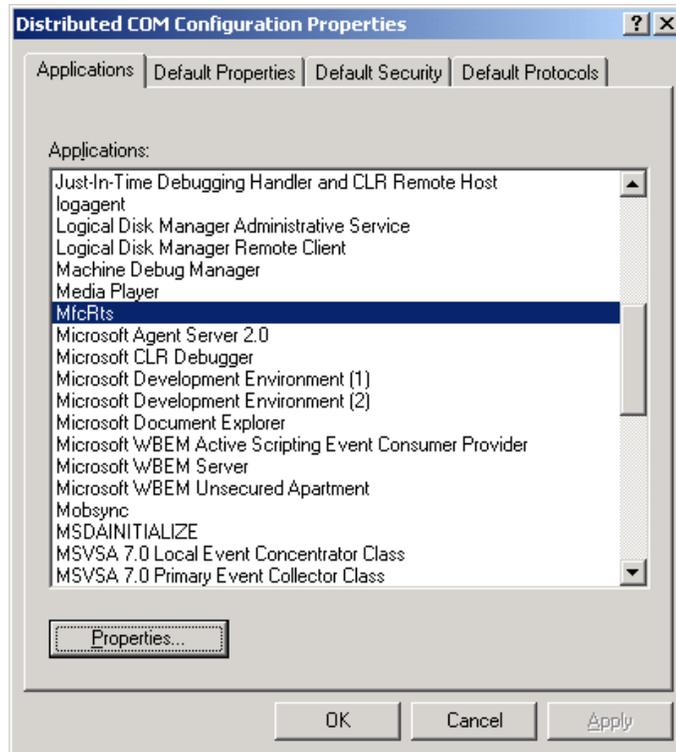
- Install Paws Developer Studio on the Server Machine. This will install the WRTS and the WRTS server.

Note: A user doing this would need administrative privileges on the computer to install the software.

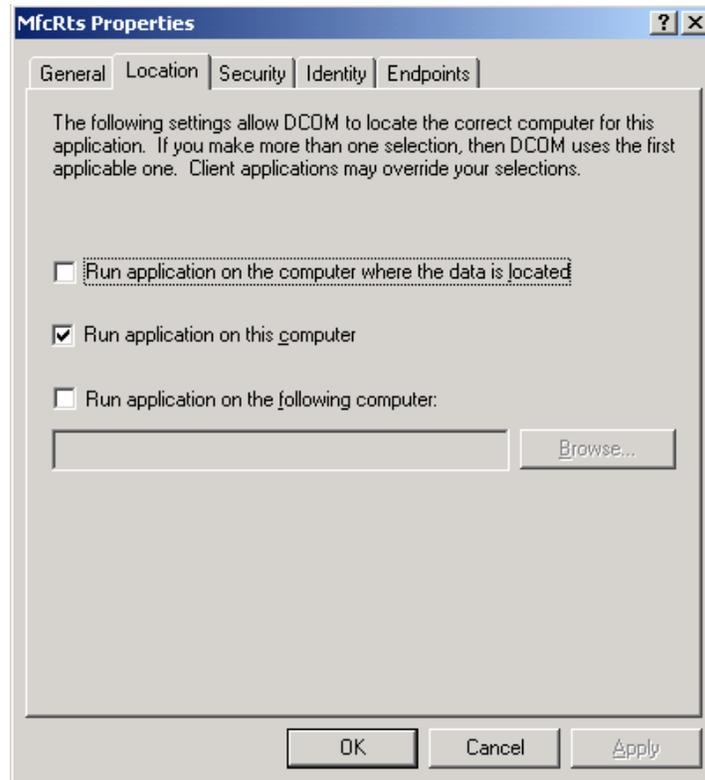
- From the Windows start menu select **Start... Run ...dcomcnfg** :



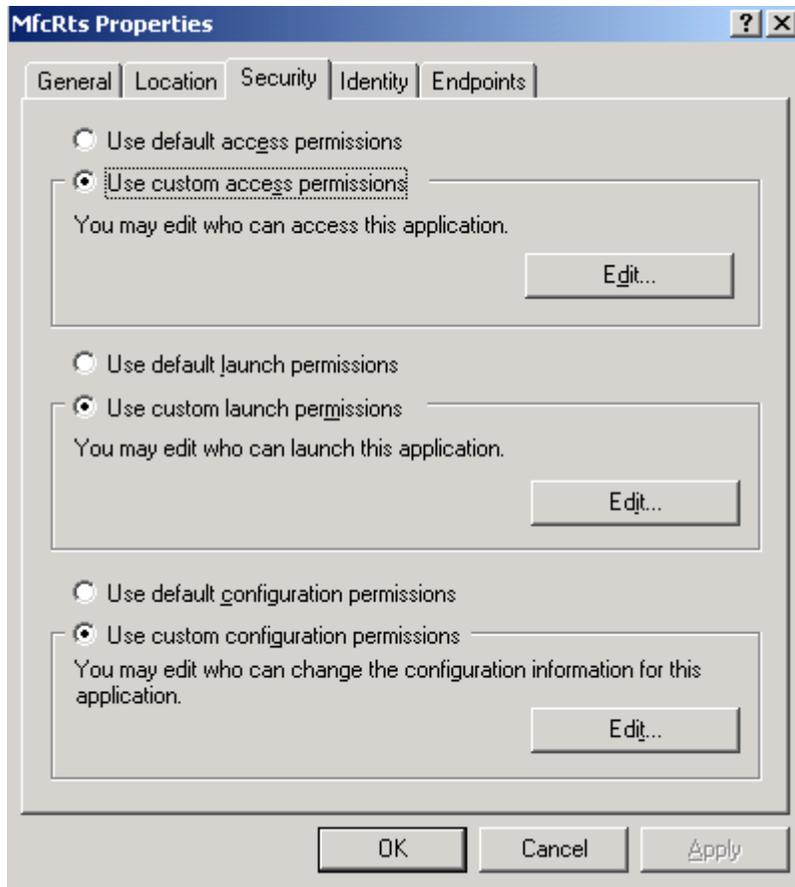
- Select **MfcRts** from the **Applications** tab of **Distributed COM Configuration Properties dialog**
- Click **Properties** on the window below:



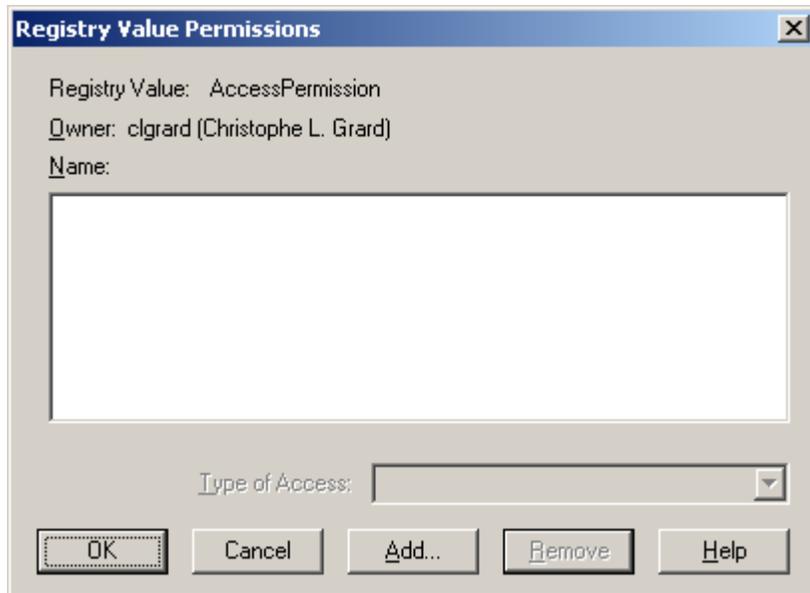
- Select to the **Location** tab in **MfcRts Properties** and you will have the following window:



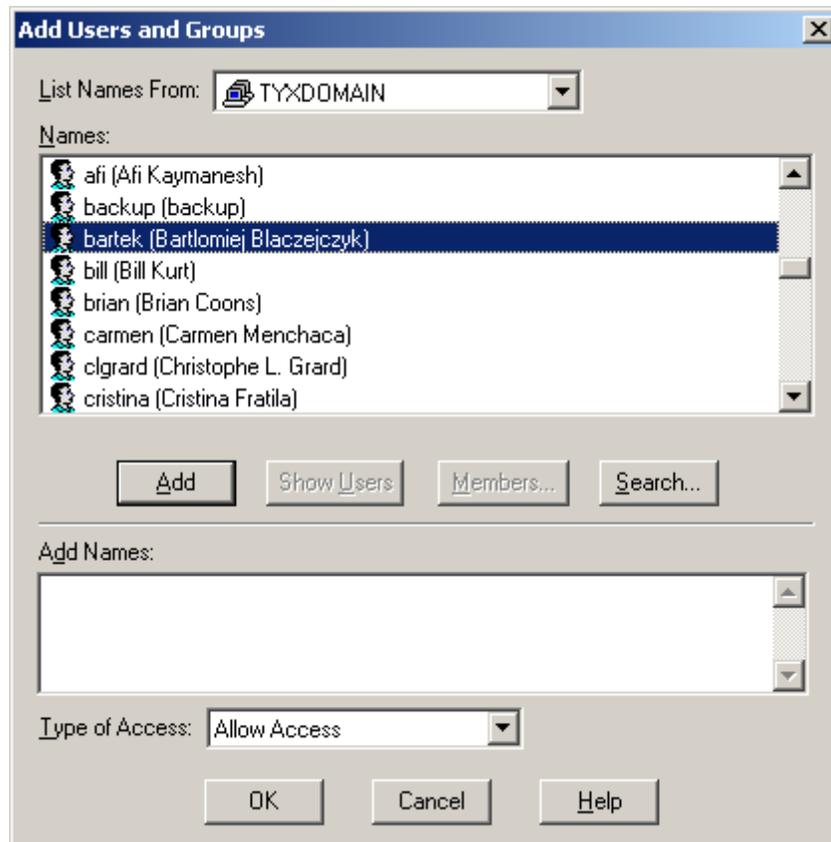
- Verify that **Run application on this computer** is checked.
- Switch to the **Security** tab.
- Select **Use custom access permissions** as shown below:



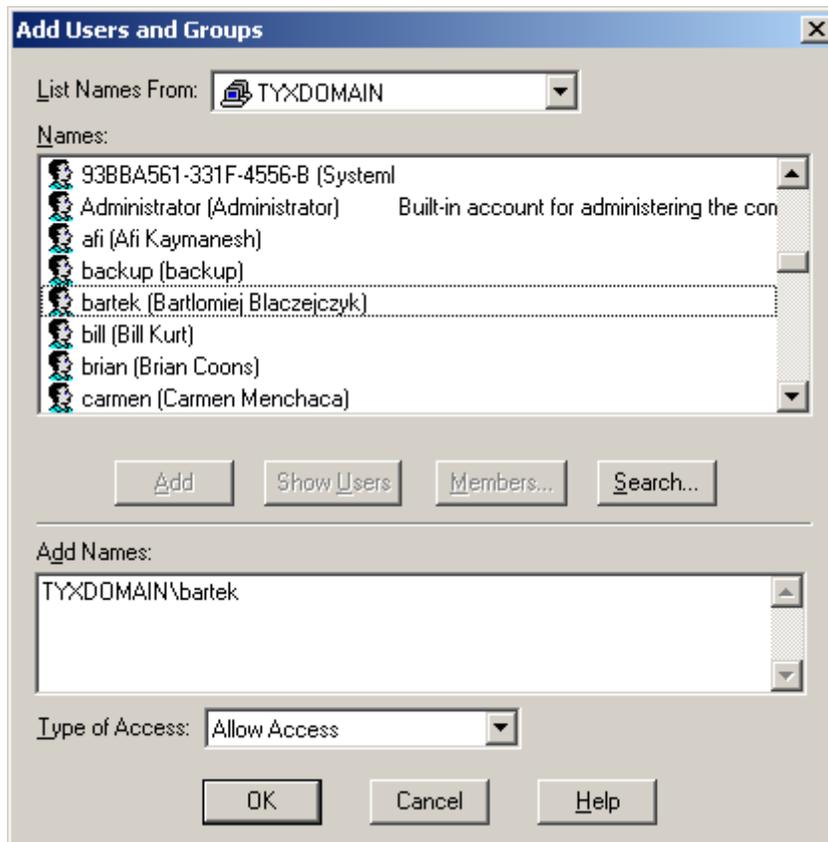
- Select **Edit** within that frame.



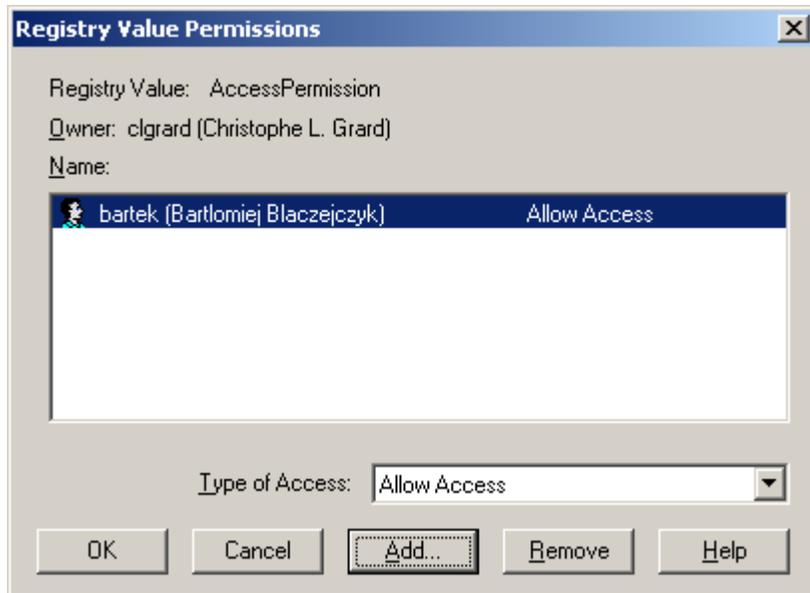
- The name of the Owner displayed above will differ from the one that you will see in your window. It will be a function of the Operating System Login ID.
- In the **Registry Value Permission** window select **Add....**
- In the **Add Users and Groups** dialog select **Show Users** to see all users in your domain.
- In order to add a user to the list of users who is allowed to use this COM component, select the user as shown below. In this case, the user we add to the list is **bartek**:



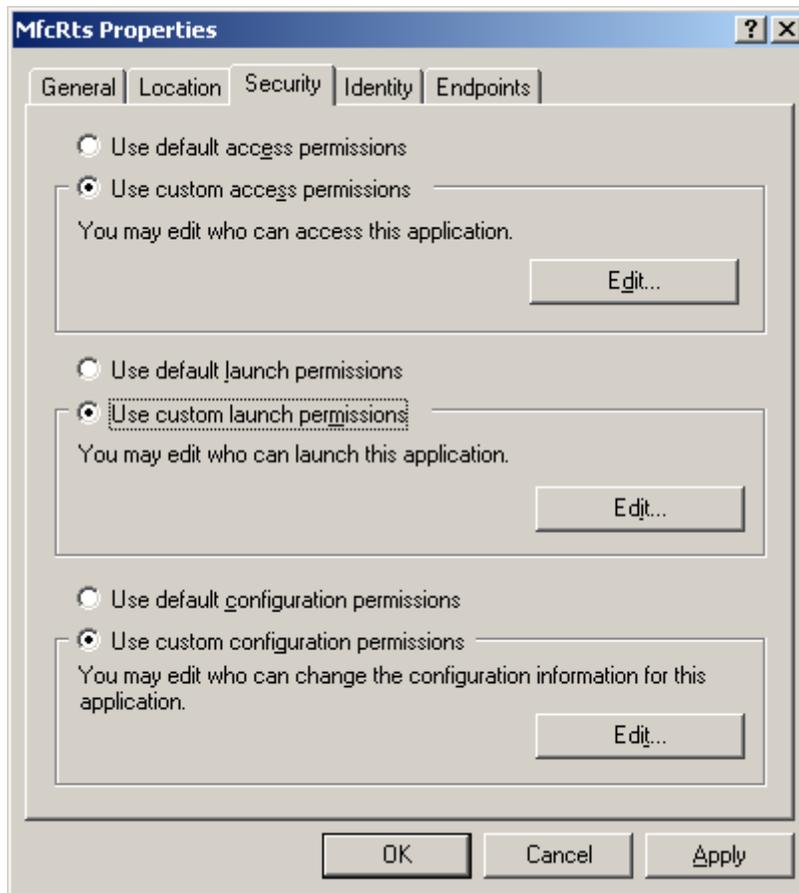
- Press **Add**.



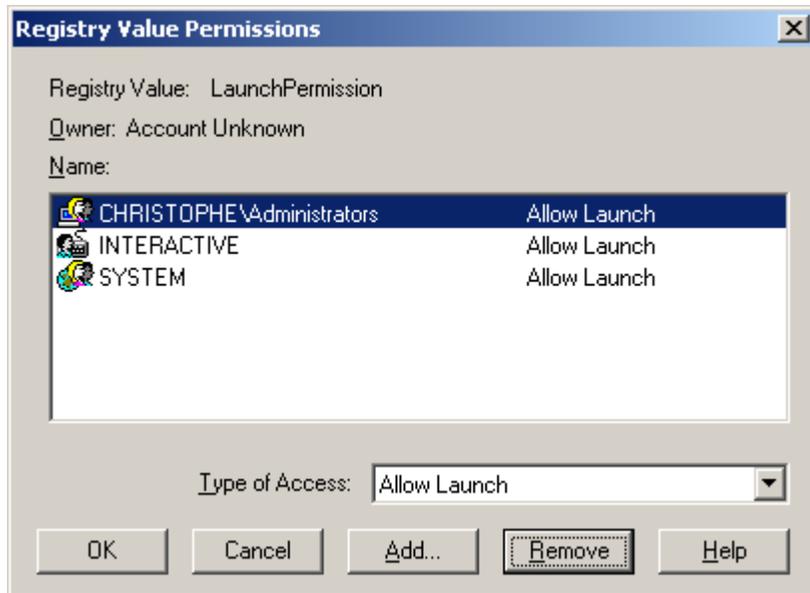
- If you are done with the list of authorized users, you can press **OK** on the **Add Users and Groups** window. You may chose to add more users in your environment, but in our case we will limit ourselves with this one user.



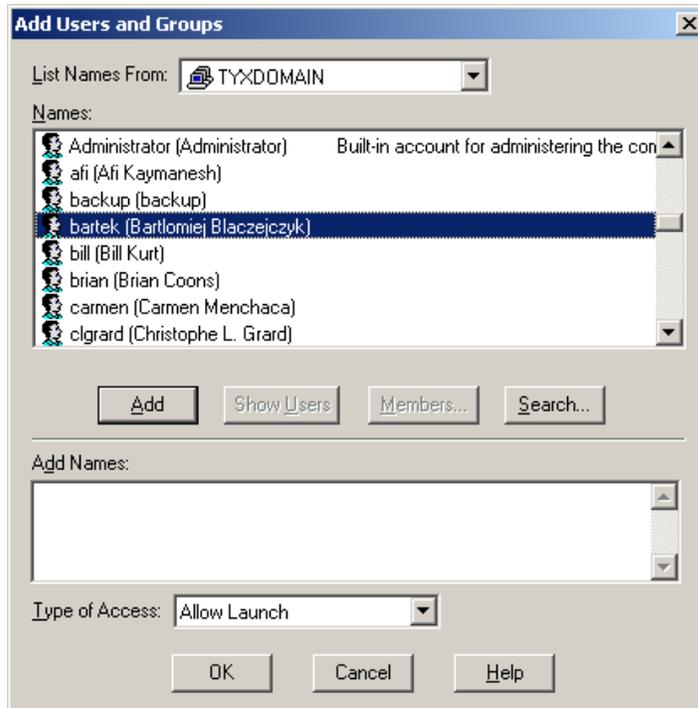
- Press **OK** on the **Registry Value Permissions** window when done.
- In the **Security** tab from the **MfcRts Properties** window, select **Use custom launch permissions**.



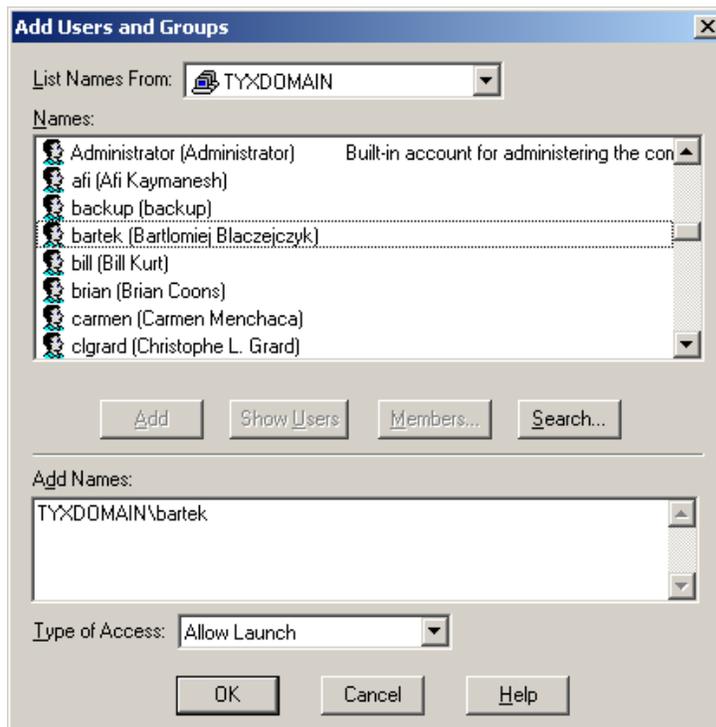
- Select **Edit** within that frame.



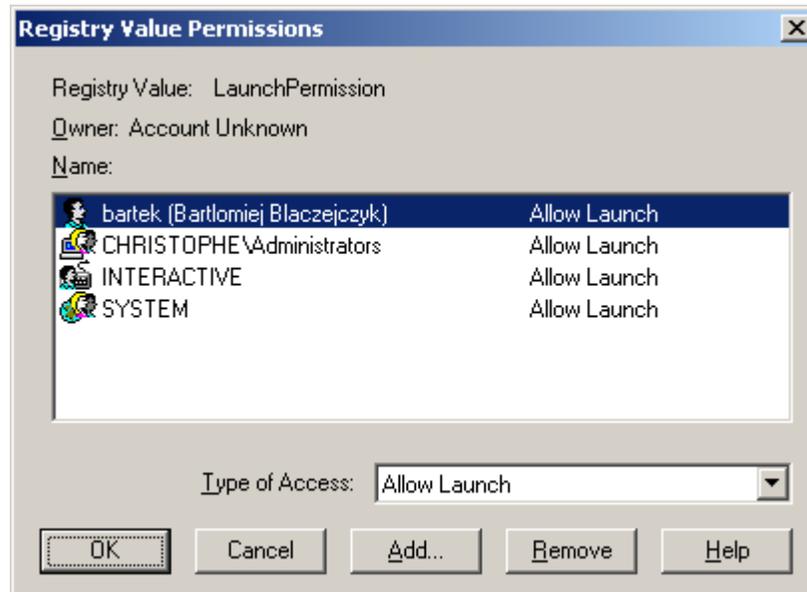
- The list of names in the **Name:** window may be different.
- In the **Registry Value Permission** dialog select **Add**.
- In the **Add Users and Groups** window select **Show Users** to see all users in your domain.
- Then select a user who would use this COM component remotely.



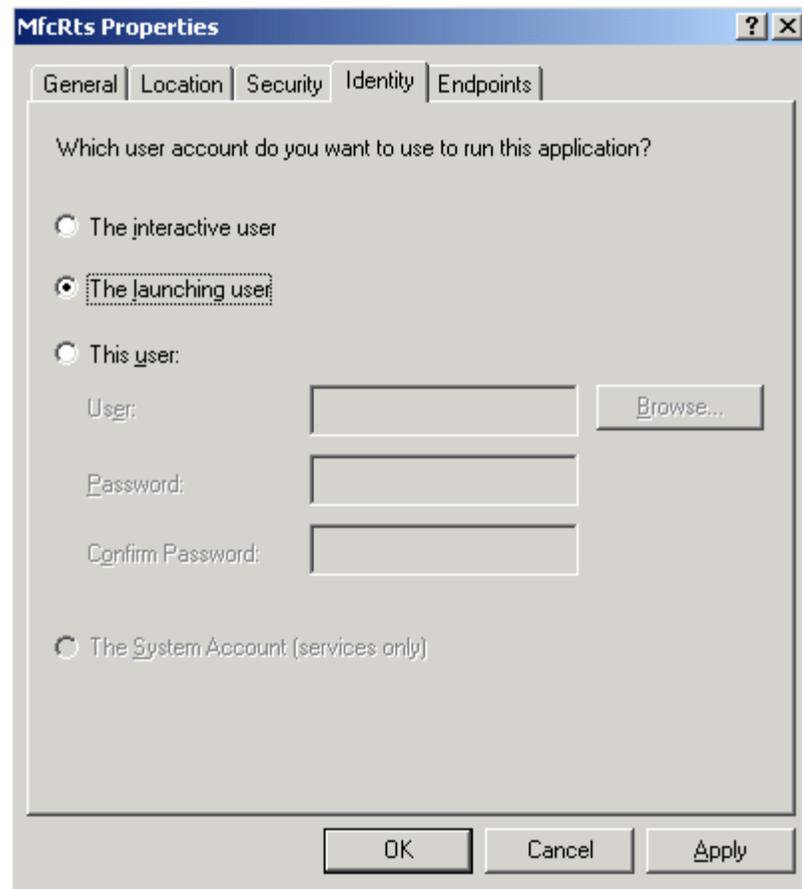
- Press **Add** to add that user in the list for **Add Names**.



- Press **OK** on the **Add Users and Groups** window when done.



- Press **OK** on the **Registry Value Permissions** dialog when done.
- In the **MfcRts Properties** window, switch to the **Identity** tab
- Verify that **The Launching User** is selected.



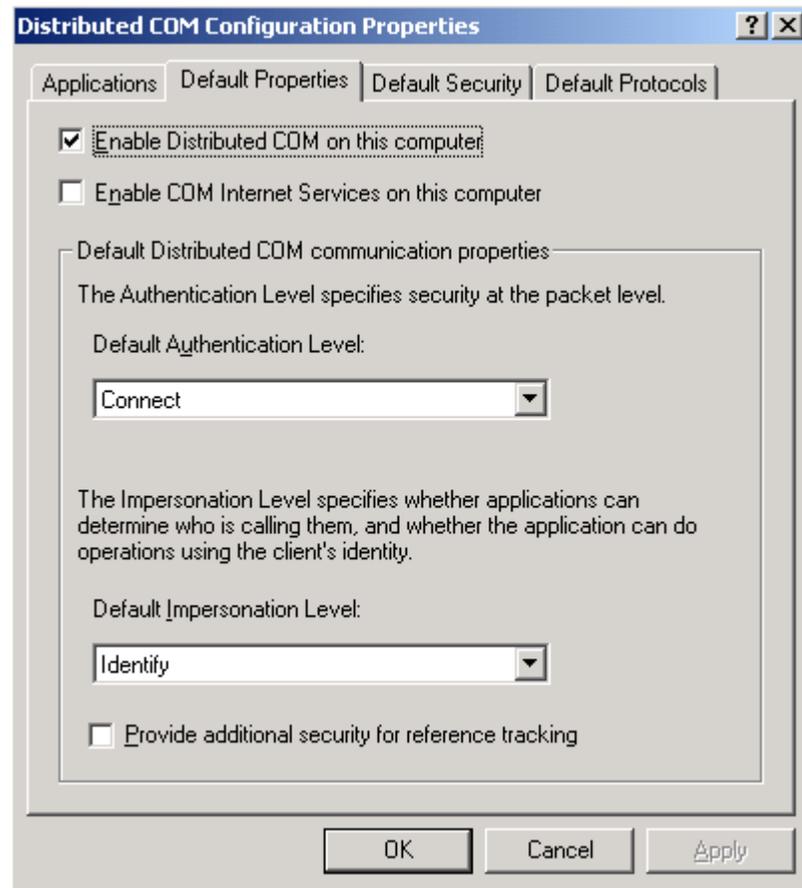
Note: Security concerns could arise with the setting on this page.

- Selecting **interactive user** requires that the logged in user on the server machine have permissions to access the COM component as selected in **Use custom access permissions** on the Security page.
- In the case where **launching user** is selected the COM component can be launched even if nobody is logged in.

More information on this is provided by Microsoft ...look in the Reference section of this document.

- Press **OK** on the **MfcRts Properties** window when done.
- In the **Distributed COM Configuration Properties** window, switch to the **Default Properties** tab.

- Verify that **Enable Distributed COM on this computer** is checked.

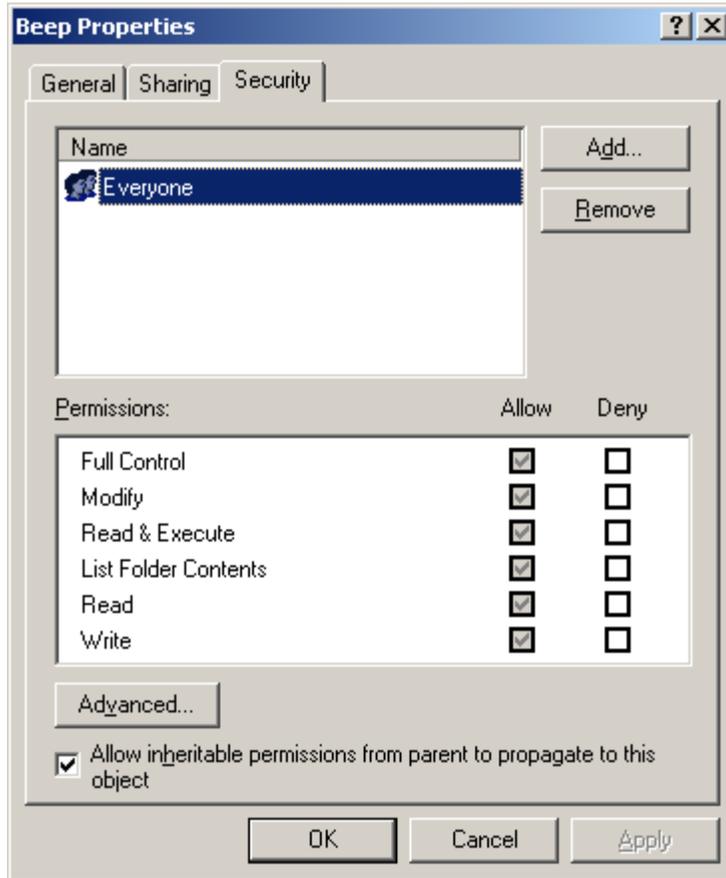


- Press **OK** to save these settings.
- Finally **Reboot** the computer.

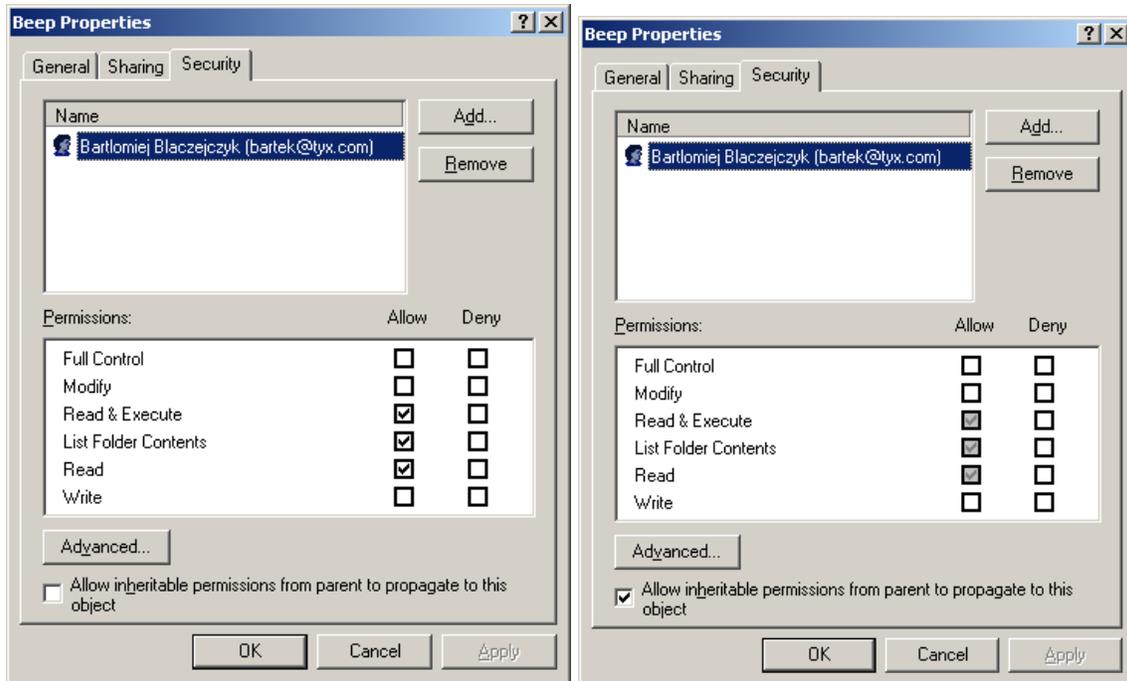
1.3.1.2 Folder security issues:

To ensure proper operation by the user from the client computer, you will need to make sure that the security on the folder should not prevent that user to write into the folder where the .paw project is located on the server computer.

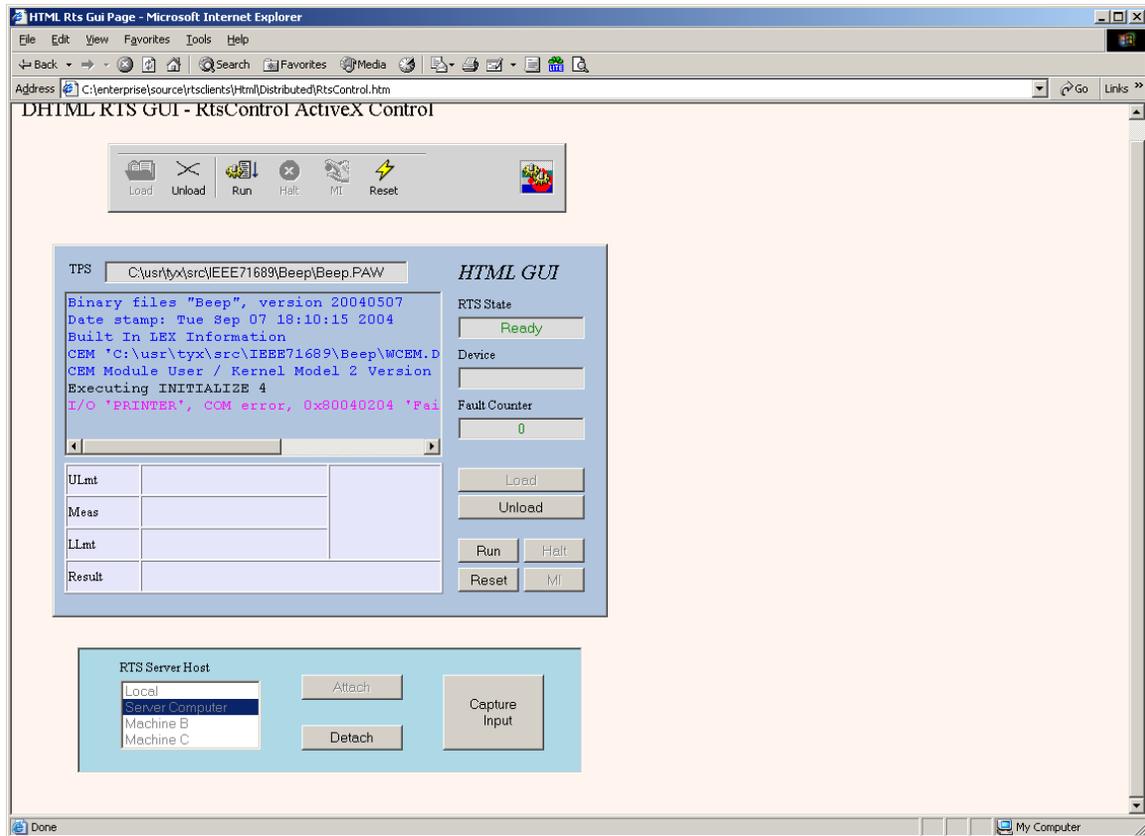
- The following settings are set by default and should allow for that user to have the WRTS server create a file into the folder where the .paw project is located. One of the common files to be written is the PRINTER file that is redirected by default to a FILE.



- In the event that the security settings for that folder are one of the following, the user will have the right to read, but not to write into the .paw project folder:



As a consequence, when running the .paw project from the client, you may have an error that looks like this: **I/O “PRINTER”, COM error, ...**



More errors related to security are possible and it is not possible to cover them all. This section should however allow you to be sensitized to the subject and in the event of a problem, for you to look into the sharing and security issues associated to the folder where the .paw project is located.

1.3.2 Installation of Paws Studio:

- We need to have an installation of the TYX Paws Developer Studio. The version we used for the document is 1.26.7.
- You need to have a valid license for the WRTS.
- After installing all the above, you can verify that:

1. The WRTS can be started.

If you are having problems with the step above, you need to work on those problems before you can proceed with the client computer. Please refer to the proper documentation to troubleshoot those issues.

1.3.3 Presence of Built Paws project:

- You will need to have a valid project that has been built.
- You should verify that:
 1. You can load the project from the WRTS.
 2. Run the project that you want to run from the client computer without unexpected problems.

If you are having problems with either one of the steps above, you need to work on those problems before you can proceed with the client computer. Please refer to the proper documentation to troubleshoot those issues.

1.4 Setting up the CLIENT computer:

1.4.1 WRTS client:

It is assumed that you have a client that can launch the WRTS remotely.

The difference between a client that can launch the WRTS locally and remotely is in the API call **Attach**:

- For a client launching a local WRTS server, the parameter can be empty.

For example, we have the following C/C++ code:

```
// attach tpsserver to wrts  
  
hr = m_pTpsServerEx->Attach();
```

- For a client launching a remote WRTS server, the parameter has to include the IP of the computer that the WRTS server is located on.

For example, we have the following C/C++ code:

```
// attach tpsserver to wrts remotely
```

```
hr = m_pTpsServerEx->Attach(CComVariant("192.168.0.57"));
```

where 192.168.0.57 in this example is the IP of the computer running the WRTS server. You will need to use the IP of your WRTS server computer in the code for your client.

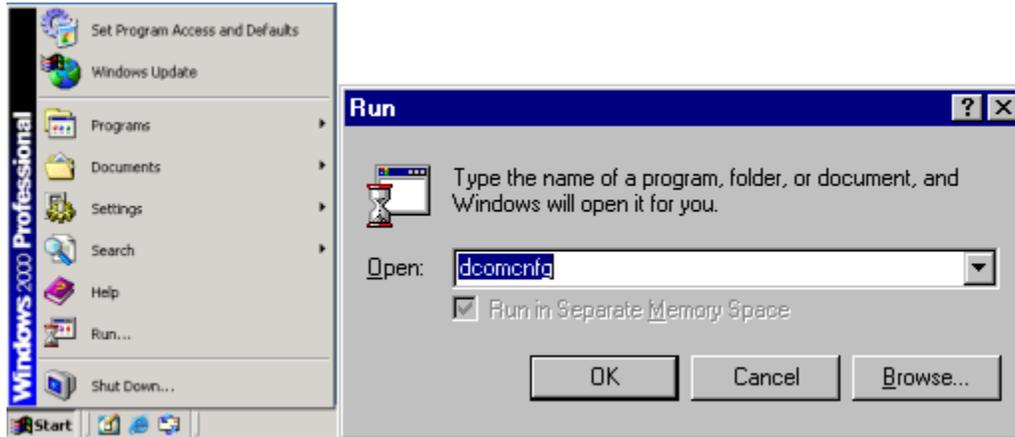
There are tutorials for WRTS clients on the www.tyx.com website.

In those tutorials you will need to make the changes addressed above regarding the Attach API.

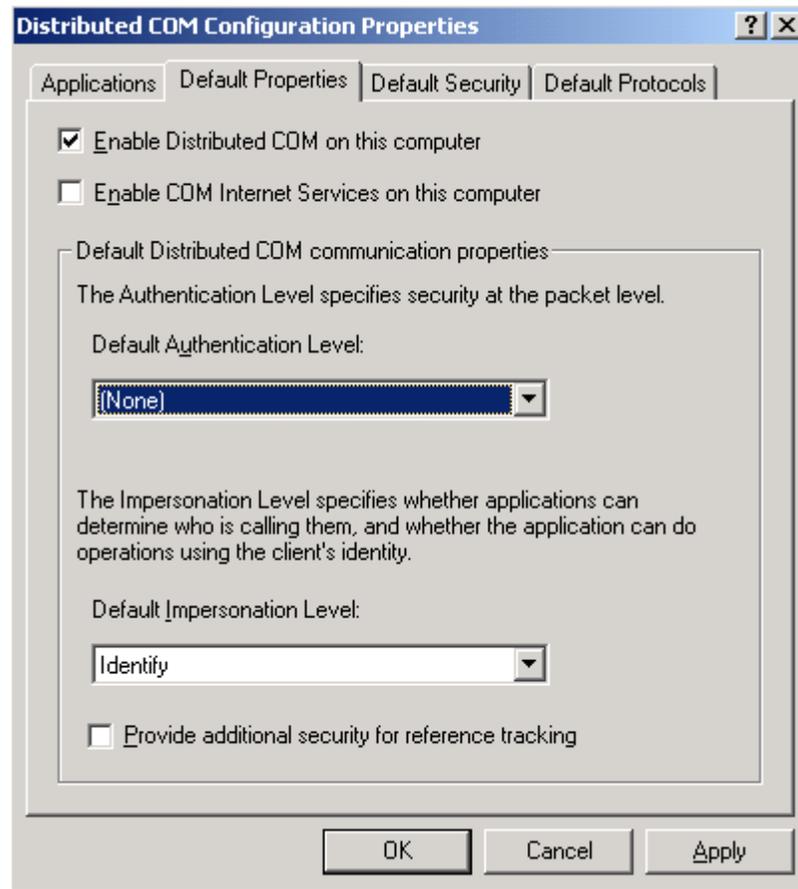
In this documentation, we will be using an HTML client as we'll see later on this documentation.

1.4.2 Configuring the Operating System:

- From the Windows start menu select **Start|Run|dcomcnfg** :



- Switch to the **Default Properties** page of the **Distributed COM Configuration Properties** dialog.
- Verify **Enable Distributed COM on this computer** is checked.
- Switch the **Default Authentication Level** from **Connect** to **None**.
- The window should now look like this:



- Press **OK** to save these settings. You don't need to reboot.

1.4.3 Installation of Paws Studio:

You need to install the **same version** of **PAWS Studio** that was installed on the server computer. A different version may prevent you from being able to run the WRTS server from the client successfully.

The main reason to do this is associated to the files that get registered during the installation of PAWS Studio.

➔ You therefore do not need to have a valid license for this installation, even if having one is not a source of problems.

1.4.4 PAWS file on your client:

You will need two things:

1. A file that has the same name and extension as the one you intend to use on the server computer. If the file on your server computer is a real file generated by Paws Studio such as a **.paw** or a **.pax** file, the one on your client machine can be a file of any type that has been renamed to be the same as the one on your server computer.

For example: if you intend to run a project called **Beep.paw**, you will need a file called **Beep.paw** on your client computer, even if it is an empty text file, such as **untitled.txt**, that you renamed to **Beep.paw**.

This will allow the client to have a file to target when choosing a project to load. You will be *loading* this pretend project file on your client machine and the WRTS server will load the real paws project file on the server machine. You can see that file on the client machine as being some sort of image file.

2. That file has to be located in the same folder on your client computer, as you would expect to find on your server computer.

For example: if the Beep.paw project is located on the server computer under **C:\usr\tyx\src\IEEE71689\Beep**, you will have to have the same path on your client computer and place the “pretend” Beep.paw file in that folder. You will then have the following file on your client computer **C:\usr\tyx\src\IEEE71689\Beep\Beep.paw**. This is all that you will need. You won’t need any other files on your client computer. You will however have a complete project in that location on your server machine that has also been built.

1.5 Running the WRTS from the client:

- We will be running a version of the HTML client that enables the possibility to launch a remote WRTS server. The file we will use is **RtsControl.htm**. Some versions that are part of the PAWS Studio distribution may be different and not offer the ability to connect to a remote WRTS server.
- With the correct version of **RtsControl.htm**, you need to make a few changes in the content of that file. Namely, you need to add the IP address of your server computer in the right place. In the block:

```
<SELECT id=selHost name=selHost size=3  
  
style="HEIGHT: 80px; LEFT: 40px; POSITION: absolute; TOP: 30px; WIDTH: 140px">  
  
<OPTION value="" selected>Local</OPTION>  
  
<OPTION value="MACHINE_A">Machine A</OPTION>  
  
<OPTION value="MACHINE_B">Machine B</OPTION>
```

```
<OPTION value="MACHINE_C">Machine C</OPTION>
```

```
</SELECT>
```

you need to replace “**MACHINE_A**” with the IP address that you want to use associated to the WRTS server machine and **Machine A** with the correct description. You will have the following line instead:

```
<OPTION value="192.168.100.109">Server  
Computer</OPTION>
```

where you will want to adjust the IP address to what is relevant in your case.

Note: Obtaining the Server Machine’s IP Address:

- On the server machine, open a Command Window.
- Execute command **ipconfig /all**

Note the IP Address of the Server Computer.

Example: **IP Address. : 192.168.100.109** as can be seen from the following window:

```
C:\WINDOWS\System32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\dominic>ipconfig /all

Windows IP Configuration

    Host Name . . . . . : dominic-xp
    Primary Dns Suffix . . . . . : tyx.com
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled. . . . . : No
    DNS Suffix Search List. . . . . : tyx.com

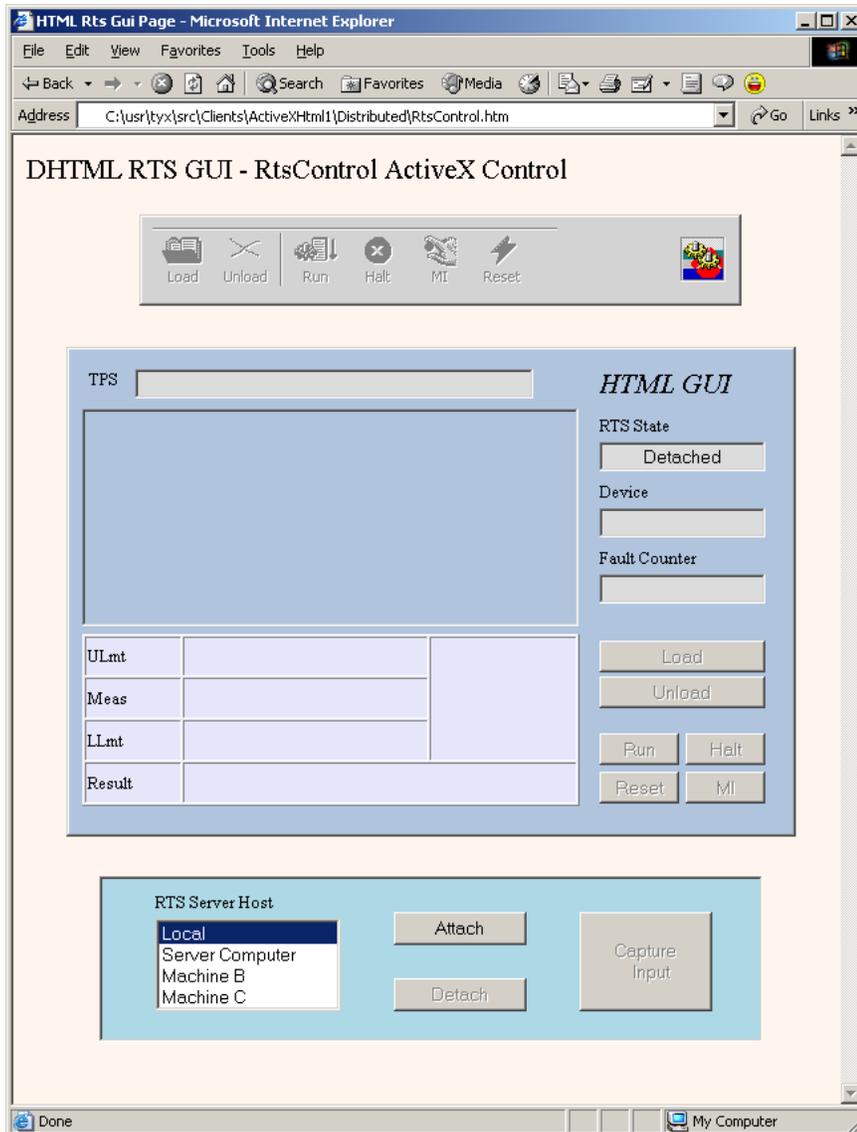
Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . : tyx.com
    Description . . . . . : 3Com EtherLink XL 10/100 PCI For Com
    plete PC Management NIC (3C905C-1X)
    Physical Address. . . . . : 00-01-03-C1-4B-48
    Dhcp Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    IP Address. . . . . : 192.168.100.109
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.100.1
    DHCP Server . . . . . : 192.168.100.126
    DNS Servers . . . . . : 192.168.100.125
                          192.168.100.126
    Primary WINS Server . . . . . : 192.168.100.125
    Lease Obtained. . . . . : Thursday, September 02, 2004 1:51:53
    PM
    Lease Expires . . . . . : Saturday, September 04, 2004 1:51:53
    PM

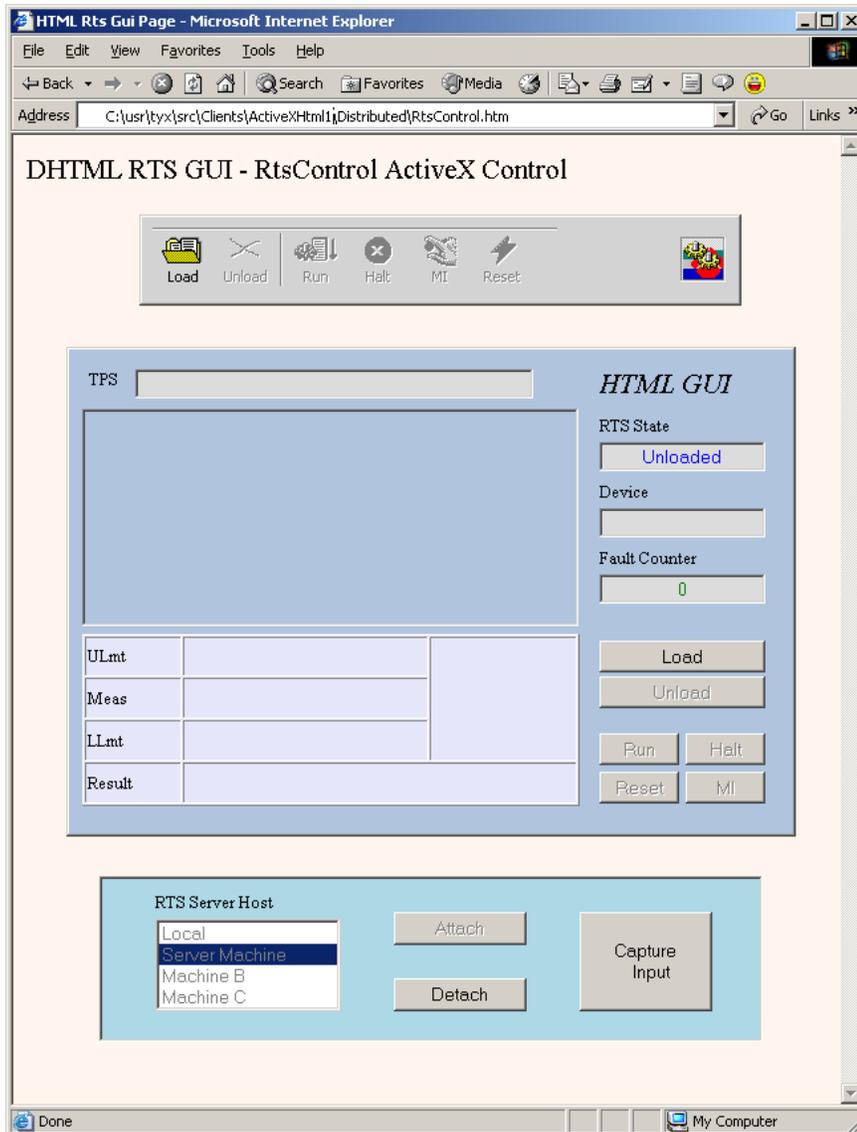
C:\Documents and Settings\dominic>
```

Now you need to save the changes and you are ready to use the HTML client.

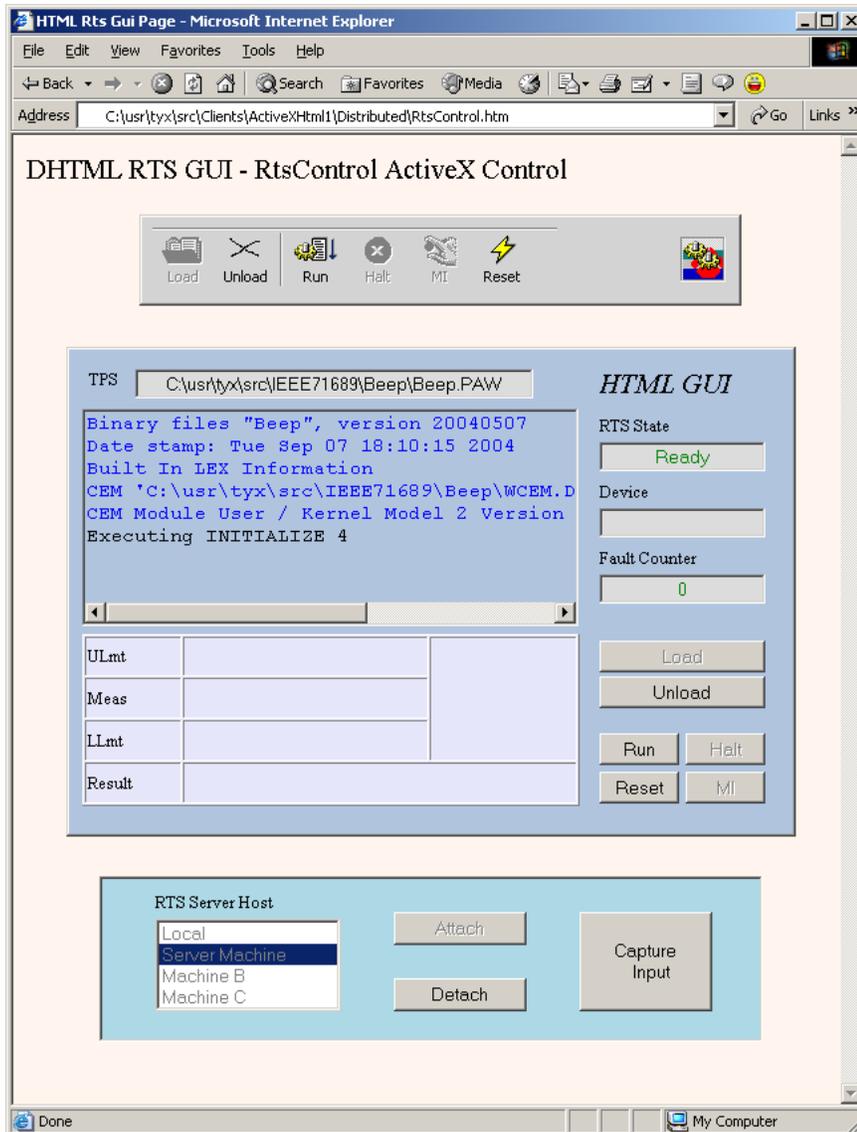
- To use the client, we need to drag the **RtsControl.htm** file into Microsoft Internet Explorer. This HTML client does not work with Netscape. You will see something like this:



- In the **RTS Server Host** window, select **Server Computer**.
- Press **ATTACH**.



- If all goes well, you should see the **LOAD** button become active. If not, you will need to go over the steps above again and verify that your client is suited to run a remote WRTS server.
- At this point, you need to press **LOAD** and select the pretend .paw file that is located exactly in the same folder on your client computer as it is on your server computer. In our case, we will load **C:\usr\tyx\src\IEEE71689\Beep\Beep.paw**.



- We are now ready to run the project.
- If you press **Run**, the project will be running on the server machine.

HTML Rts Gui Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail News RSS

Address C:\usr\tyx\src\Clients\ActiveX\Html1\Distributed\RtsControl.htm Go Links >>

DHTML RTS GUI - RtsControl ActiveX Control

Load Unload Run Halt MI Reset

TPS C:\usr\tyx\src\EEE71689\Beep\Beep.PAW *HTML GUI*

```

DMM Setup
DMM Fetch
DMM Reset
DCP Reset
DCP Reset
DMM Reset
Executing RESETALL
    
```

ULmt	5.2	v
Meas	5.15	
LLmt	4.8	
Result	Pass	

RTS State
Finish

Device
DCP

Fault Counter
0

Load
Unload
Run Halt
Reset MI

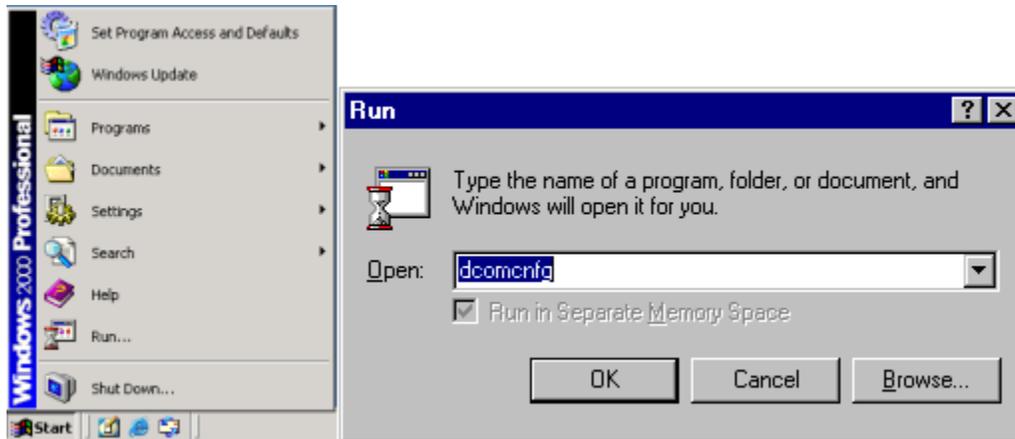
RTS Server Host

Local Server Machine Machine B Machine C	Attach	Capture Input
	Detach	

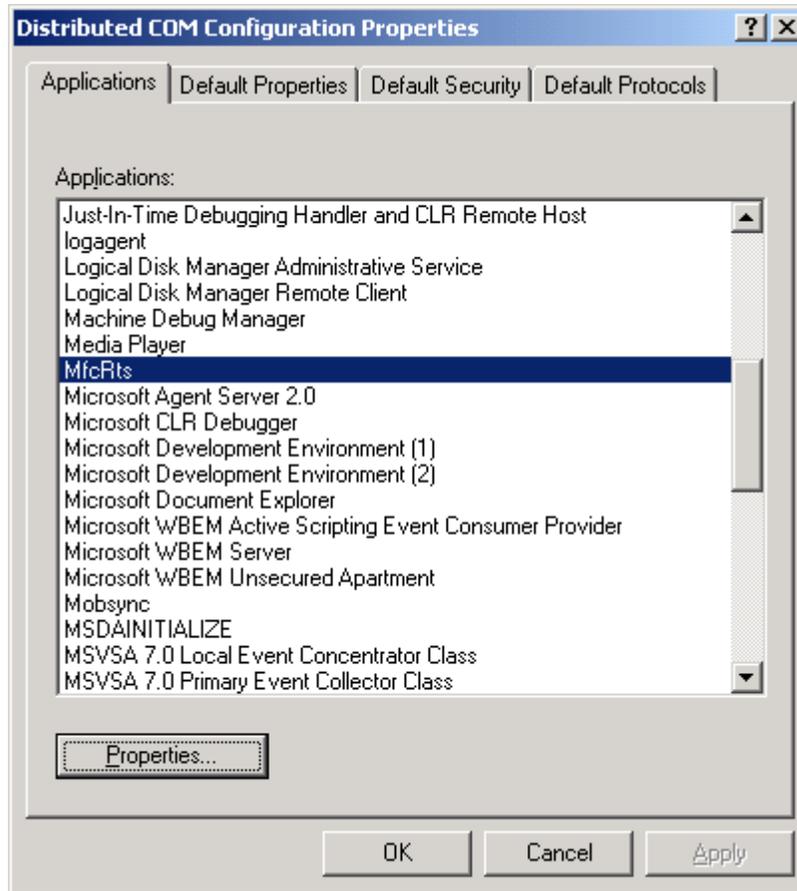
Done My Computer

2 Appendix: Steps to ensure that remote access of WRTS Server is turned off:

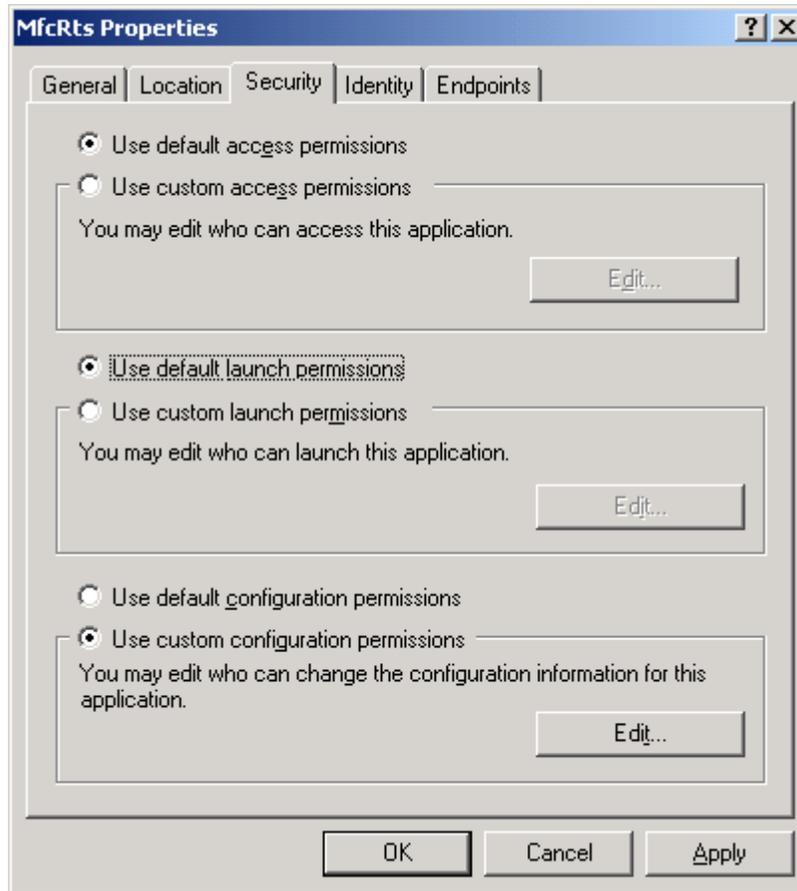
- From the Windows start menu select **Start|Run|dcomcnfg**:



- Switch to the **Default Properties** page of the **Distributed COM Configuration Properties** dialog.
- Select **MfcRts** from the **Applications** tab of **Distributed COM Configuration Properties** dialog and click on **Properties**.



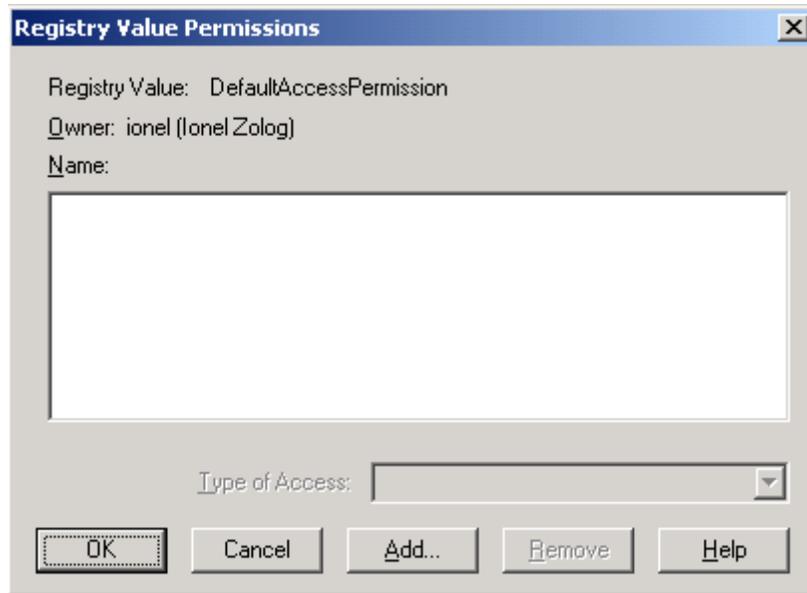
- Switch to the **Security** tab.
- Verify that **Use Default access permissions** is selected.
- Verify that **Use Default launch permissions** is selected.



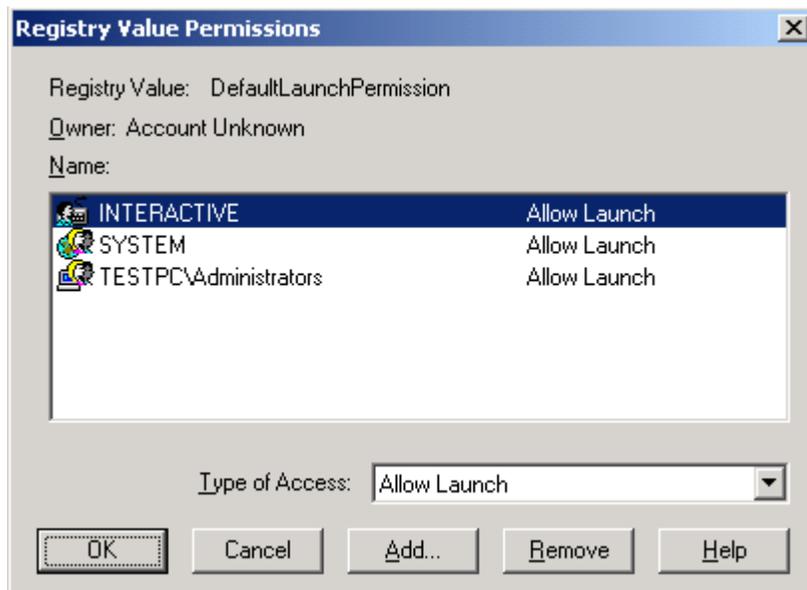
- Press **OK**.
- Then on the **Distributed COM Configuration Properties** switch to the **Default Security** tab.



- Within the **Default Access Permissions** frame, click on **Edit Default**.



- Verify that only intended users are given default access permissions.
 - If unintended users exist, select them and click **Remove** to restrict access.
- Press **OK** to save these settings.
- Within the **Default Launch Permissions** frame, click on **Edit Default**.



- Verify that only intended users are given default access permissions.

- If unintended users exist, select them and click **Remove** to restrict access.

Note: It is ok to allow **INTERACTIVE**, **SYSTEM** and **Administrators** to have access and launch permissions.

- Press **OK** to save these settings.
- Press **OK** on the **Distributed COM Configuration Properties** dialog to save all settings.

- Finally **Reboot** the Client Computer.
- You can then verify that your WRTS client on the client machine cannot launch the WRTS server on the server machine.

3 References:

Using DCOM Config (DCOMCNFG.EXE) on Windows NT & Windows 2000 Systems.

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;176799>