

## Troubleshooting Windows 95/98/ME/2000 peer to peer networking problems

Windows 95/98/ME/2000 peer to peer networking is one of the simplest types of networking. As a result, most Windows 95/98/ME/2000 peer to peer networking problems that are not hardware caused are to do with what could be called “setup discipline” rather than anything else. That said, Windows peer to peer networking is definitely “flaky” at best and can throw in its own problems that have nothing to do with the ability of the person setting up the network.

A peer to peer network, as opposed to a server based network, is a network with loose security where all PCs can potentially be servers (ie. their files & printers can be made available to other PCs on the network), whereas a server based network is one where all files are stored on a central server and access to that server via the network, or at the server, is secure and controlled by usernames and passwords, and where you can define network-wide varying levels of access.

In general, the majority of Windows peer to peer networking problems fall into one category : **the inability for one or more PCs to “see” another PC.** This document provides a few troubleshooting tips to address this type of problem.

The various areas we will be looking at in this document are as follows :

- Protocol rationalisation
- Missing bindings
- Workgroup Misspelling
- Computer, Workgroup, and Share Name problems
- No PC defined as Browse Master - force Browse Master.
- File and Printer Sharing needing to be re-installed.
- Network card using IRQ12
- Windows using a different IRQ for the network card from that assigned by the BIOS.
- **Windows 2000** only allows **A-Z, a-z, 0-9, and “-“.**
- **Windows 2000 PC should be made Browse Master.**

Other recommended reading besides this document : [Installing a PC onto a Windows 95/98](#) network in the “Windows 95 & 98” section of the Library of Answers That Work.

### Protocol rationalisation

The multiplicity of unneeded protocols is often the most common cause of an inability to see a specific PC on a network.

- If you are running more than one protocol, e.g. both TCP/IP and IPX/SPX, **pare the protocols down to only one (if you understand TCP/IP, use it in preference to all others)**. Unless you are running specialised software which uses a protocol other than your chosen Windows networking protocol, for a Windows network either TCP/IP or IPX/SPX will do – there is no need to have both, and there is certainly no need to run the antiquated NetBEUI protocol.

Even when the bindings are correct and consistent across all PCs we have seen enough instances of connection problems to be confident in saying that, in our experience, the multiplicity of protocols on PCs connected to a Windows network seems to always throw up a problem on one PC somewhere on the network.
  
- Once you have uninstalled all the unneeded protocols, make sure that you still have **File & Printer Sharing** enabled and that it is bound to the protocol you have decided to keep (To check this, look at the Properties of the protocol you have decided to keep, choose the **“Bindings”** tab, and make sure that it shows File & Printer Sharing as being bound to it).

Here is a reference table on networking protocols :

<b>IPX/SPX</b>	<p>This is the <b>default protocol</b> that gets loaded when you load the <i>“Client for Microsoft Networks”</i>. This protocol was first invented by Novell and Microsoft had to make it its default protocol because of the predominance of Novell at the time that Windows 95 was invented.</p>
<b>TCP/IP</b>	<p>This is the <b>Internet standard</b> protocol and is now also becoming the <u>world standard protocol</u> for all networks – <i>NetWare 5.x and Windows 2000 now use it as their default protocol instead of IPX/SPX which used to be the default protocol pre-NetWare 5 and pre-Windows 2000.</i></p> <p>If you are setting up a complete Windows 95/98 network from scratch, then use <b>TCP/IP</b> in preference to IPX/SPX as it is a much more “robust” protocol than IPX/SPX, particularly in the case of database applications. Note, however, that TCP/IP on a Windows 95/98 network demands proper documentation of the IP addresses, as each PC needs to have a unique IP address and at the same time you cannot, on peer to peer Windows 95/98 networks, have a server process that allocates the IP addresses automatically – you have to set them up manually and document them properly in some HelpDesk document.</p> <p><b>If you are not familiar with IP addresses then use IPX/SPX initially. It is advisable, however, that you learn about IP addresses so that you can later move your Windows 95/98 network to TCP/IP rather than IPX/SPX.</b></p>

**NetBEUI**

This protocol is an old protocol. It is the default networking protocol for **Windows 3.1x** networks (Windows 3.1x networks do not understand IPX/SPX). While it works fine, you should try not to use it for a network of PCs running only Windows 95/98 as it is the slowest protocol. The only time that you will need this protocol is if you need to network a Windows 95/98 PC with a Windows 3.1 PC, or if you have a specific networked application that uses NetBEUI to communicate between PCs running the same networked application, e.g. the SAPS modem sharing software where SAPS on each PC communicates with SAPS on the PC that has the modem, using NetBEUI.

### Missing Bindings

Quite often a PC is not being seen on a network because **File & Printer Sharing** is not bound to the protocol that is actually being used by that PC to communicate with the other PCs on the Windows 95 network. Typically this would have happened as a result of a protocol having been installed *after* the installation of File & Printer Sharing.

If you are running more than one protocols on your PC and you *need* to run more than one protocol, then the easiest solution is to go into the properties of each protocol, look at the "Bindings" tab and make sure that **File & Printer Sharing** is bound to each protocol. The reason it is safer to do it that way is that if many PCs on the network run more than one protocol, you will never easily find out which protocol is actually used by Windows on a specific PC. Worse, on one day IPX/SPX may be used, while on another day TCP/IP may be the one that gets chosen.

**Important :** If you have a Dial-Up Adapter configured as well as a network card, make sure you bind File & Printer Sharing only to protocols running on the network card and NOT to protocols running on the Dial-Up Adapter. The reason is that if you bind File & Printer Sharing to a protocol that runs on your Dial-Up Adapter, say TCP/IP running on your Dial-Up Adapter, then, whenever you connect to the Internet, you will effectively be giving any hacker out there on the Internet, access to the files on your PC and, possibly, the rest of your network.

### Workgroup Misspelling

If a PC cannot see **any** of the other PCs on the Windows network, and none of the other PCs can see it either, you may have spelt the workgroup incorrectly. Since on a Windows peer to peer network a PC will immediately recognise PCs in the same workgroup, much faster than it will see PCs in other workgroups (which it does "eventually"), mis-spelling the workgroup will result in your PC not being to **immediately** connect to any of the other PCs in the workgroup you had intended to connect with.

### PC, Workgroup & Share Name Problems

#### **Windows 95a's 8-character undocumented limit**

If one of the PCs on your network is running **Windows 95a**, keep all Computer, Workgroup, and Share names on your Windows network, to **8 characters maximum**. Windows 95a does not handle well any network name that is longer than 8 characters (the old DOS limit), and sometimes just plainly does not handle them at all. It is not always

easily reproducible, but whenever it happens, changing the offending name to 8 characters or less solves the problem.

### **Never have spaces in network names**

Computer and Workgroup names can be up to 15 characters. What is not obvious, *because Windows actually allows you to use them without issuing an error message*, is that you should not use spaces in your **Computer Name**, **Workgroup Name**, or **Share Name**.

Clearly Microsoft should have designed this better and prevented the end-user from actually being able to enter spaces in these various network name fields, but it did not. As a result many people end up fighting for hours baffling and confusing connection problems caused by network names that contain spaces.

Note, by the way, that the **Computer Description** field also has the rather odd restriction that you should not use commas in that field !

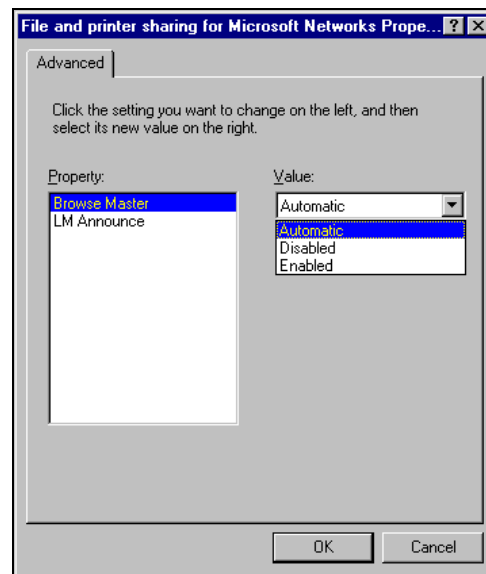
### **No PC defined as "Browse Master"**

On a Windows peer to peer network, there must be at least one PC that is configured as a **Browse Master** PC.

The list of PCs connected to a specific workgroup on a Windows network is maintained by the main "Browse Master" PC in that workgroup. There is only one main Browse Master for a given workgroup for each protocol used in the workgroup.

Therefore, if you do not have a single Browse Master PC within your WorkGroup, then none of the PCs will be able to see one another through Network Neighborhood. In its default configuration, Windows 95/98 normally has the Browse Master setting set to "Automatic" and PCs usually do a good job at electing a Browse Master between themselves. There are some times, however, specifically when setting up a TCP/IP based Windows 95/98 network (TCP/IP is the most reliable protocol for Windows 95/98/ME/2000 networks, incidentally), where the "election" does not work properly, or is incredibly slow to occur (shades of Bush vs Gore !!). If you feel that this may be the case, set one of the PCs on your network with **Browse Mater** set to **Enabled** and disable Browse Master on all the other PCs, as illustrated below :

- Choose the PC that is the most likely to be "ON" most of the time, rather than a PC that will often be switched off when others need to use the network.
- Go to **Start \ Settings \ Control Panel \ Network**.
- Highlight **File & Printer Sharing** and click on the **Properties** button. You should get the window below :



- Set **Browse Master** to **Enabled** rather than to "Automatic".
- Reboot that PC.
- Next, go through the same procedure on all the other PCs, but on those PCs set **Browse Master** to **"Disabled"**.
- Test.

**File and Printer Sharing needing to be re-installed**

Another problem we have often come across and which had us foxed the first time we came across it, is the need sometimes to simply de-install and re-install **File and Printer Sharing**.

Although we have experienced the problem in other circumstances, this problem happens typically in this type of scenario :

- You previously had your network running on the IPX/SPX or NetBEUI protocol and decided to change it to TCP/IP.
- You add TCP/IP, and get rid of the other protocols.
- You check your TCP/IP protocol bindings and File and Printer Sharing is bound to it.
- You can ping from PC to PC.

- However, when you try to browse the **Network Neighborhood** you cannot see your PC, and other PCs cannot see you. No matter what you try you just cannot get to see yourself in Network Neighborhood and other PCs cannot see you either when they browse Network Neighborhood.

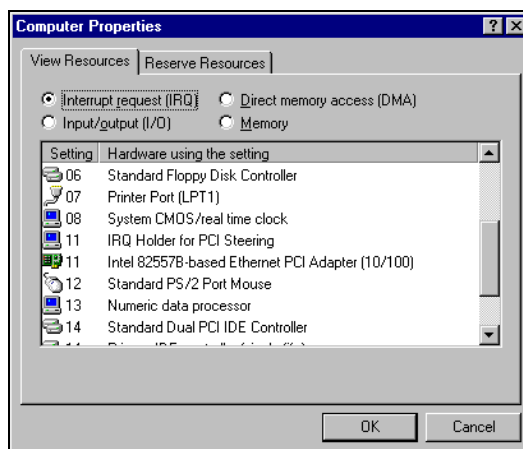
In 80% of cases that we have encountered, this problem after the above scenario, **File and Printer Sharing** simply needs to be de-installed and then re-installed. Do so as follows :

- Remove File and Printer Sharing.
- Reboot.
- Re-install File and Printer Sharing.
- Reboot.
- See if you can see yourself in Network Neighborhood. If you can, others on the network will finally be able to see you.

### Network card uses IRQ12

Your PC runs Windows 95, 98, or 98SE, and you have tried everything and cannot communicate with other PCs using any protocol, whether IPX/SPX, TCP/IP, or NetBEUI. If that is the case check the IRQs used by your PC as follows :

- **Start \ Settings \ Control Panel \ System**
- Click on the **Device Manager** tab.
- Double-click on **Computer** right at the top of the list that is displayed. This brings up the **Computer Properties** window which initially lists devices in "IRQ used" order, as shown below :



In the example above you will see that the Intel network card is using IRQ11, which is fine.

If you find that your network card is using **IRQ12**, then you must try everything to ensure that it is moved to a different IRQ by Windows. The reason is that in Windows 95/98 IRQ12 is reserved for the PS/2 mouse and although Windows will not show you a conflict exclamation mark against the network card if it too is using IRQ12, it will nevertheless not be able to properly communicate with your network card, with the result that you will not be able to communicate with other PCs regardless of the protocol that you use (in effect this could be classed as a Windows 95/98 bug as IRQ12 should simply not be made available if the motherboard supports a PS/2 mouse).

Windows always tries everything that it can before putting any device other than the PS/2 mouse on IRQ12. If it cannot, it is because your PC has quite a few devices and it ran out of IRQs. If that is the case you must free an IRQ - the most common way to do that, normally, is to disable one or both COM ports in the motherboard's BIOS, thus freeing IRQ3 and IRQ4; however, you must also make sure that both IRQ3 and IRQ4 (or just the one you free up) are specified as being "PnP" in the PnP/PCI Configuration section of your motherboard's BIOS (if you do not set them as "PnP", Plug and Play, then your motherboard will not be able to allocate them to your PC's Plug and Play add-on cards. Once you have freed those IRQs in the BIOS, if you are lucky, some of the other devices will take up those freed IRQs and your network card will move off IRQ12. If you are unlucky, the other devices in your PC will be unable to use IRQ3 and IRQ4 (not all devices can) and your only solution will be to find a replacement add-on card (modem, scanner, network, sound, SCSI, whatever it is) that can use IRQ3 or IRQ4.

**Windows uses a different IRQ from that assigned to the network card by the BIOS**

This is the weirdest problem we have ever come across and is a Windows 98 bug in our opinion. We have never seen the problem occur with Windows 95, but two or three times with Windows 98. Also, the problem seems to occur almost exclusively with pre-Year2000 motherboards, and not with any motherboards produced in Year 2000 or later.

The reason we are certain the problem is a Windows 98 bug is that if you load the same PC with Windows 95b/c, the problem is just not there !

Basically, what typically happens is as follows :

- You boot up your PC.
- During the booting up process, your PC displays the **BIOS Summary** Screen which lists your processor, memory, hard disks, CD-ROM drives, parallel ports, serial ports, and ..... the IRQs assigned at boot-up to your AGP and PCI Plug and Play cards.
- Being attentive, you see that your network card has been assigned an IRQ, IRQ11 say.
- However, once into Windows 98, when you go and have a look at the IRQ list you find that your network card has been assigned a different IRQ in Windows, IRQ12 say.

**This is a Windows 98 bug !** The result is that Windows is not communicating properly with your network card and you have absolutely no chance of ever being able to see the other PCs on your network or have the other PCs see your PC.

**There is not fix !!** When you have that problem you only have two choices :

- a) **Load Windows 95b or 95c instead of Windows 98.**
- b) **Or change the motherboard.**

**Windows 2000 only allows A-Z, a-z, 0-9, and “-“**

With the arrival of **Windows 2000** a number of users have been networking, on a peer to peer basis, mixtures of Windows 95/98 PCs with Windows 2000 Professional PCs and finding that, sometimes, they cannot see the Windows 2000 PC or vice versa. In a majority of cases the problem is to do with some of the PCs having a name which contains an **underscore (e.g “Comms\_Server”)**. Underscores are allowed in Windows 95/98 but with Windows 2000 it results either in the Windows 2000 PC not being visible on the peer to peer network (unless the network includes a DNS server), or in the Windows 2000 PC not being able to see PCs that have underscores in their names.

To fix this simply replace the underscore with a hyphen in the names of **all** the PCs on the network, e.g. **“Comms-Server”**.

**Windows 2000 PC should be made  
“Browse Master”**

We are finding increasingly that in a shared Windows 2000 / Windows 95/98 peer to peer network,

ooooooooOooooooooo