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## **Diablo Direct Connect**

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### **1. Playing Diablo using a direct serial connection**

We recommend that you print this document for easy reference.

The direct serial connection code in Diablo utilizes a unique Blizzard technology that allows up to four players to connect and play Diablo using low cost "null modem" serial cables without the need to purchase expensive network hardware. You should be able to purchase an appropriate cable at your local computer store.

In order to play a direct connect game you must have a unused serial port on your PC. Most PCs have two serial ports on the back. You might have a serial mouse (an older style mouse that plugs into your computer's serial port), external modem, or both plugged into your serial ports. If you have both, unplug the modem cable and use that port for your serial cable. If they are both unused, pick either one.

If you wish to play a two player game of Diablo using direct connect, read section 2, "Setting up a two player game". The process is very similar to setting up traditional direct connect games, but should be much easier due to Blizzard's unique auto-sensing technology.

If you want to use direct connect to establish a local gaming "network", read section 3, "Setting up direct connect for three and four player games". Please note that due to the complexity of configuring PC serial ports, setting up a direct connect game for more than two players may require you to be familiar with the Windows device manager. You

should also be comfortable with changing jumpers on your modem or serial hardware if necessary.

## **2. Setting up a two player game**

To play a two player game of Diablo using direct connect and a serial cable:

- Find a unused serial port on both machines
- Connect a serial "null modem" cable

On the machine that will create the game:

- Start Diablo
- Select "Multi Player"
- Create/Select your hero
- Select "Direct Cable Connection"
- Select "Create Game"

On the machine that will join the game:

- Start Diablo
- Select "Multi Player"
- Create/Select your hero
- Select "Direct Cable Connection"

If the game has already been created when the second machine selects "Direct Cable Connection" you will immediately join the game in progress. If the game has not yet been created, select "Retry Connection" after the game has been created.

If you have trouble connecting, please consult the troubleshooting guide at the bottom of this document.

## **3. Setting up a direct connection "network" for three and four player games (propeller heads only!)**

Diablo uses a unique serial packet routing technology to create a gaming network using standard null modem serial cables. Properly configuring your PCs to support direct connection with more than two players may involve changing device settings in the Windows Device Manager, changing hardware jumpers, or other unsavory activities, and Blizzard Entertainment recommends that only advanced users attempt to use this feature of Diablo.

A direct connect network is composed of three or four PCs connected in daisy-chain style by null modem serial cables, as shown below.

## DAISY CHAIN



The PCs that are not on the ends of the chain are "routing" machines, i.e. they relay information to the machine on either side of them. In a two player game there are no routing machines, in a three player game there is one routing machine, and in a full four player game there are two routing machines. A non-routing machine is one that is located at the end of the chain and is directly connected to only one other PC. It is configured just as if it were connected to one PC for a standard two player game.

## ROUTERS



The routing machines must have two serial cables connected, one for the machine on either side. This means that *you must have two unused serial ports* for every machine that will act as a routing machine. Machines that use a serial mouse will probably not be able to act as routing machines, and should be placed at the end of the chain.

Here is where things get sticky. The PC serial communications architecture was designed around the assumption that you would only need to have two serial devices at the same time. The PC can communicate with up to four devices, but it shares two interrupt lines among the four devices. Specifically, COM1 shares an interrupt (or IRQ line) with COM3, and COM2 shares an interrupt with COM4. A COM port is simply a name that your PC gives to a serial device so that the software can communicate with it. In order for direct connect to work properly, you *must* ensure that there are no *active* serial devices using the same IRQ line as a direct connect serial cable. In general, this means that your serial cables must be on COM1 and COM2.

In most cases, the two external serial ports on a PC are assigned to COM1 and COM2 by the BIOS and Windows 95. The most likely reason this would not be the case is if you have installed an internal modem. Many modem vendors ship their modems preconfigured to use COM2. When Windows 95 detects that a modem has been installed in the system, it tries to reassign the serial port that was previously using COM2, and it usually winds up on COM3. This means that it is now sharing an interrupt line with the serial port on COM1, and attempting to use both of these ports for direct connect will fail since they will be active simultaneously.

This is also a problem for a machine that has an internal modem and uses a serial mouse. If the external serial port you are using for direct connect has been reassigned by Windows 95 to use the same IRQ as the mouse, Diablo will not function properly.

If you find yourself in this situation, you need to change the settings for the serial port you wish to use so that it shares an IRQ with a device that you know will not be in use at the same time. Below are some common configurations, and an explanation of the changes necessary to play over direct connect. Remember, the goal is to make sure that no two devices that share an interrupt are in use at the same time!

A. A PC with a PS/2 mouse, two serial ports, and no internal modem or other serial devices.

Since the PS/2 style mouse, which is common on most modern machines, does not plug into a serial port, there are no IRQ conflicts. This machine can be a router.

B. A PC with a PS/2 mouse, two serial ports, and an internal modem.

First, determine which COM port, and therefore IRQ, your internal modem is using. Open the Modems Control Panel, and click the Diagnostics tab. You should see a listing of all the COM ports known to the system, with the device that is assigned to that port. "No Modem Installed" indicates a unused COM port which can be used for direct connect. If the modem is installed on COM2, you will need to change the serial port that is at COM3 to COM4.

This can be done as follows. Open the System Control Panel, and locate the "Ports (COM & LPT)" section. Select the device you wish to change (e.g. COM3). Click Properties to show information about that device. Click the Resources tab. You should see a checkbox labeled "Use automatic settings" that is checked. You will need to clear this checkbox to make the necessary changes. The drop-down menu labeled "Settings based on" has four options: Basic configuration 0000 - Basic configuration 0003. These correspond to COM1 - COM4, i.e. Basic configuration 0000 is COM1, 0001 is COM2, and so on. To change the serial port using COM3 to use COM4, select Basic configuration 0003. Notice that the Interrupt Request setting changes to that of the modem, not the other serial port.

Click OK all the way back to the desktop, and reboot. This machine can be used as a router.

C. A PC with a serial mouse, two serial ports, and no internal modem or other serial devices.

Since your mouse permanently occupies one serial port, this machine must be at one of the ends of the chain to be a member of a direct connect network. Unless your COM ports have been reassigned from previous hardware installations, no changes are necessary. Note that if you previously had an internal serial device that caused Windows 95 to reassign your COM port, simply removing the device will not cause the COM port to return to its original setting. You must either reassign it manually as outlined in section B above or remove it using the device manager and let Windows 95 re-detect the device at the next boot.

This machine cannot be a router.

#### D. A PC with a serial mouse, two serial ports, and an internal modem.

Since your mouse permanently occupies one serial port, this machine must be at one of the ends of the chain to be a member of a direct connect network.

First, determine which COM port, and therefore IRQ, your internal modem is using. Open the Modems Control Panel and click the Diagnostics tab. You should see a listing of all the COM ports known to the system, with the device that is assigned to that port. "No Modem Installed" indicates a unused COM port which can be used for direct connect. If the modem is installed on COM2, you will need to change the serial port that is at COM3 to COM4.

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This machine cannot be a router.

Once you have verified that all machines are properly connected and have no IRQ conflicts, you can setup the game. Pick a machine to be the "host" machine, preferably a router.

On the machine that will create the game:

- Start Diablo
- Select "Multi Player"
- Create/Select your hero
- Select "Direct Cable Connection"
- Select "Create Game"

On each machine that will join the game:

- Start Diablo
- Select "Multi Player"
- Create/Select your hero
- Wait for a neighbor to connect
- Select "Direct Cable Connection"

It is important that each machine wait for its neighbor before attempting to join the game. For example, imagine a direct connect network with four players, numbered left to right 1, 2, 3, and 4. Player 3 is the host, and selects Create Game. As soon as the game is created, players 2 and 4 can select Direct Cable Connection. When player 2 has connected, player 1 can join. Any machine can be the host machine, but a host at the end will involve a slightly longer setup time since one more player will have to wait to join.

If the game has already been created when you select "Direct Cable Connection" you will immediately join the game in progress. If the game has not yet been created, select "Retry Connection" after the game has been created.

Please refer to the troubleshooting guide at the end of this document if you have problems setting up a direct connect game.

### **Troubleshooting**

*Why does my game freeze after a few minutes of play?*

At least one of the machines on your direct connect network has an IRQ conflict. Check the Device Manager tab in your System Control Panel to determine whether you have two active serial devices sharing an interrupt.

*Windows 95 won't let me change my COM port settings!*

You must clear the "Use automatic settings" checkbox in order to manually change your serial device settings.

*Where do I find a "null modem" serial cable?*

Most computer supply stores stock cables appropriate for direct connect use. Ask your salesperson for a "null modem serial cable". Also, there are many cables designed for Microsoft Windows 95 direct cable networking. Any *serial* cable designated for use with Win95 direct cable networking will work with Diablo direct connection games. Parallel cables are *not* compatible.

*I have a serial mouse and an external modem. What can I do?*

You will need to unplug the modem and use that serial port to play direct connect games.

*I am creating a game, but the other player is never able to join it. Why?*

You are using the wrong type of cable, or you have an interrupt conflict with another serial device on one of the computers. Check your Modems and System Control Panels to find the conflicting IRQ.