Jaguar Telecom

BROADBAND - MTU

Introduction

MTU or 'Maximum Transmission Unit' is the largest amount of data your broadband can handle in one chunk or "packet". If the data being sent is larger than this then it is broken down into smaller chunks. You will not see this in action of course. Your router will reassemble the data so everything loads smoothly.

In broad terms MTU determines the 'best' packet size for data transfer across a WAN, wide area network, and thus between you, your ISP and the net in general, depending on your latency.

The MTU runs hand in hand with another system variable called RWIN, the Windows receive page file segment setup configuration. MTU can be fine-tuned, but RWIN cannot be fine-tuned in Vista, it sets it dynamically, but it can be set in XP.

Windows and router manufacturers often by default make any MTU setting the value of 1500.
The BT network runs significantly smoother using an MTU of 1458, rather than 1500 and has long been a BT recommendation for data transfer in the past.

If your MTU is incorrectly configured on your router it can affect the performance of your Broadband connection and can cause issues with:

- Accessing certain websites
- Web pages appear to stop loading
- Web pages loading slowly
- Accessing secure sites such as email accounts, banking and other sites with https in the website address

So, if you're experiencing these problems, it may be worth checking the MTU. The default MTU is 1432. If you are still experiencing issues with the MTU set to the default 1432, then try lowering this to 1400.

ISP MTU Settings

Vodafone	1500
TalkTalk	1430
O2	1526
BT	1500
Cable & Wireless	1500

How do I find my optimum MTU setting?

One of the easy and most accurate ways to test for optimum MTU is to do a simple DOS Ping test. You will send out ping requests and progressively lower your packet size until the packet no longer needs to be fragmented. Although this simple test is accurate for testing end points, users may find that a lower MTU may be better for their particular circumstances.

***Important Notes**:*

- *MTU must be 1492 (or lower) when using PPPoE connectivity.*
- *Due to additional complications, VPNs require a different type of MTU test.*
- *If you have a network with multiple PC's, every computer should be set up with the same MTU. Additionally, some PC's may use several Network Adapters or a VPN client adapter on one PC so you must verify you are changing the Network Adapter associated with your broadband service or VPN client.*
- *The built in PPPoE client for Windows XP uses an MTU that is set to 1480. This only applies if you are running the built in XP PPPoE client!*

Finding the Correct MTU

To find the correct MTU for your configuration you must run a simple DOS Ping test. You will simply send out ping requests and progressively lower your packet size until the packet no longer needs to be fragmented.

The command for this ping test is:

ping www.google.com -f -l xxxx

- There is a single space between each command.
- "-l" is a lower case letter L, not the number one.
- The last four numbers are the test packet size.

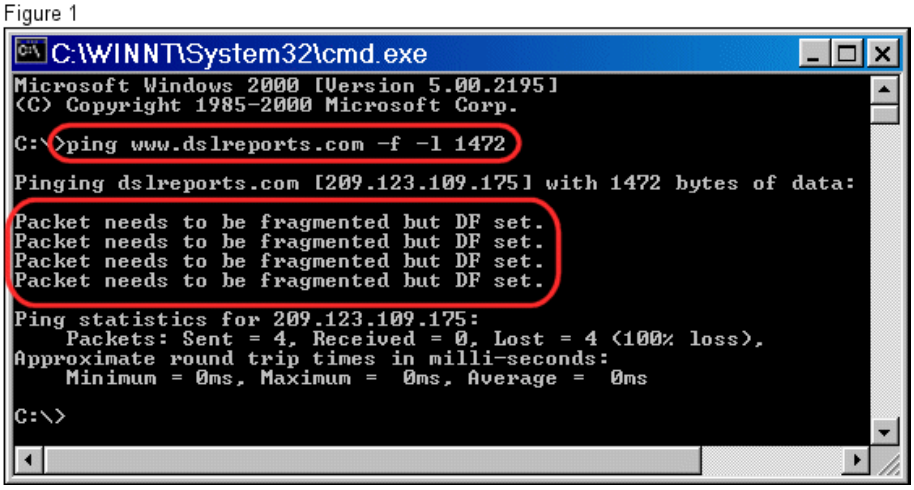
Step 1

Open a DOS prompt

Step 2

At the DOS Prompt type in **ping www.google.com -f -l 1472** and hit Enter.
Notice that the packet needs to be fragmented. *(Figure 1)*

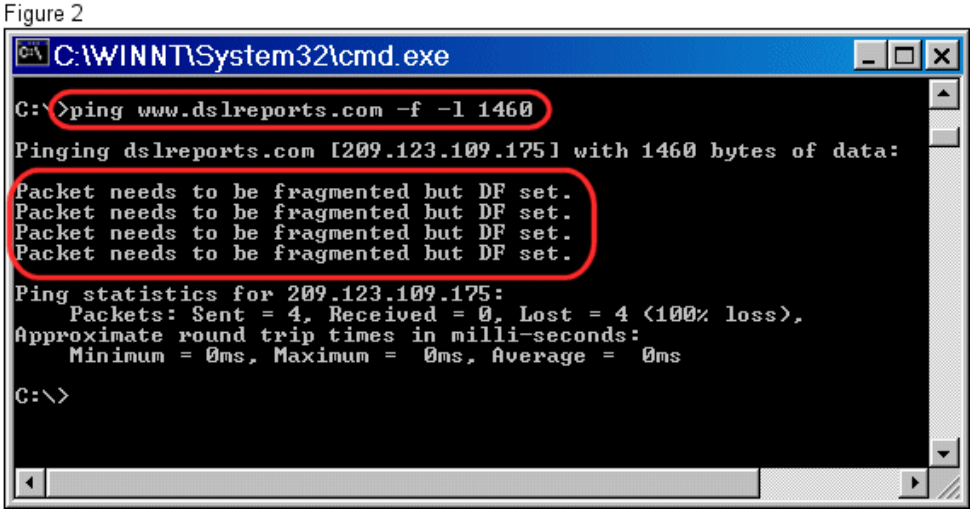
Figure 1



Step 3

Drop the test packet size down (10 or 12 bytes) and test again. Notice that the packet still needs to be fragmented. *(Figure 2)*

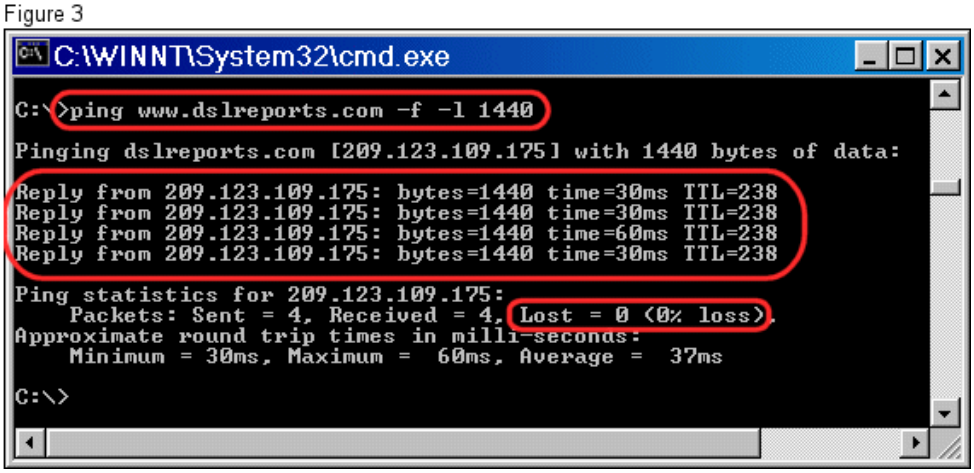
Figure 2



Step 4

Drop the test packet size down more and test again until your reach a packet size that does not fragment. *(Figure 3)*

Figure 3



Step 5

Once you have a test packet that is not fragmented increase your packet size in small increments and retest until you find the largest possible packet that doesn't fragment.

Step 6

Take the maximum packet size from the ping test and add **28**. You add 28 bytes because 20 bytes are reserved for the IP header and 8 bytes must be allocated for the ICMP Echo Request header.

Remember:

You must add 28 to your results from the ping test !

An example:

1440 Max packet size from Ping Test
+ 28 IP and ICMP headers
1468 Your optimum MTU Setting

Additional Important Information

There may be more than one network adapter showing in the pull down menu for your PC. You must make sure you change the MTU on the correct network adapter associated with your broadband connection or VPN client.

You must also reboot your computer in order for the new settings to take place.

Additionally, if you have a network with more than one computer, all NICs and router(s) should have the same MTU setting.

How to change MTU in Windows 7

Some routers require you to change the MTU value *(maximum transmission unit)* in Windows 7. This setting can also be used to speed up your internet connection.

```
C:\Windows\system32>netsh interface ipv4 set subinterface
" mtu=1492 store=persistent_
```

I can't reach website xyz.com, what should I do?

If you can't reach a certain websites, but the same site is working for others, you should consider changing the MTU value as well. If the MTU value is set too high you will not be able to successfully ping the site and is then unreachable.

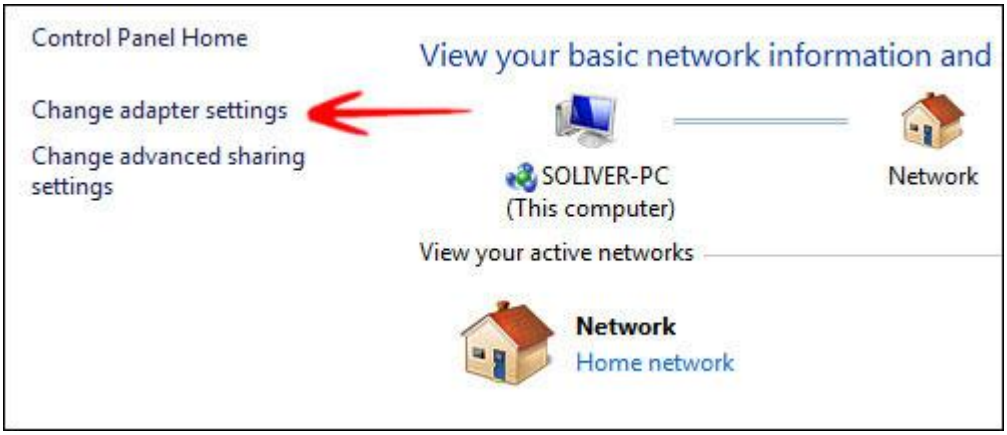
Change MTU Manually

Tip: If you don't have any problems with loading websites, you should properly not mess around with the MTU value or you might not be able to reach some websites. If you decide to change the MTU value anyway, keep this in mind so that you will know the reason why a certain website might be unreachable.

Let's do it the good old-fashioned way!

1. Here's how:

Control Panel / Network and Internet / Network and Sharing Centre.
In the sidebar click on Change adapter settings



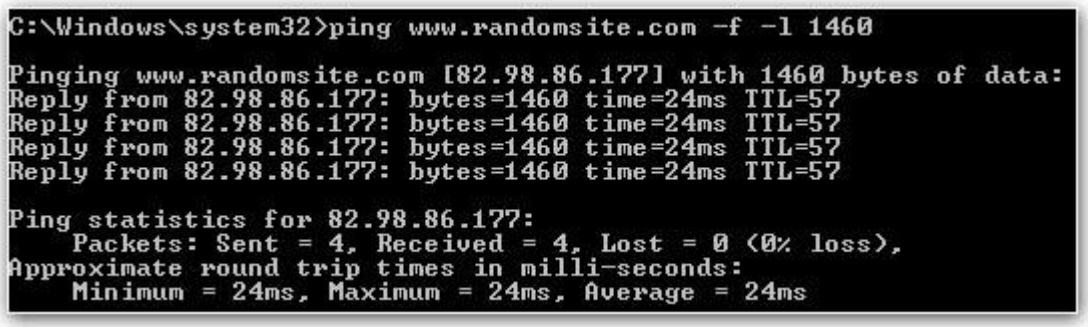
2. Write down the name of your main adapter or remember it. E.g. Local Area Connection

3. Open up an elevated CMD. exe command prompt

4. Enter **ping www.thisdoesnotexist234.com -f -l 1460** … where 1460 is the number of bytes of the package that we are sending out to ping the site. Make sure the site thisdoesnotexist234.com is actually a site that you can't reach, because your MTU is too high.

Finding the Optimal MTU Value

1. Now, what we do next is to find out the best MTU value for your setup. We have to increase or lower the value 1460 until we find the correct value. **The correct value is the highest number that still gets a successful ping Reply.**



Do this:
If you get the first one 'fragmented' then lower the number 1460 until you get a reply from it. If you get the second one 'reply' then increase the number 1460 until you get a fragmented packet. The highest package size that is not fragmented and gets a successful reply is the best MTU value. Found the package size? Mine is 1464 bytes.

2. Add 28 to the package size *(for the header that we send together with the package)*. 1464 + 28 = 1492 bytes

3. The optimal MTU value for my setup is 1492 bytes

4. Enter:
netsh interface ipv4 set subinterface "Local Area Connection" mtu=1492 store=persistent
and replace Local Area Connection with the network from step 1-2.

5. You have successfully change the MTU in Windows 7!
It's now the optimal MTU value for your setup and all websites should be reachable.

6. Reboot