

From:

Matthew Connolly
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Email: <removed>
Phone: <removed>

To:
Telstra Bigpond
Locked Bag 20026
Melbourne VIC 3001

**Subject: Complaint regarding equipment provided for Bigpond
Cable broadband service.**

Dear Manager,

I am writing this letter of complaint after numerous unsuccessful attempts to resolve a problem with my Bigpond cable broadband service.

The problem is that the provided cable modem, a Netgear CGD24N, is not suitable for the purposes for which it has been advertised. I have had a field technician check the line to my premises on three occasions and had the modem replaced twice, with no resolution. I have resolved the problem myself by disabling the cable modems "router" functionality and installing my own wireless router. I demand that the cost of this router be reimbursed to me as a credit on my account. I will then continue to use my cable broadband service under no contract period since Telstra has failed to provide working customer premises equipment and therefore the conditions of the contract have not been met.

I will now go into detail about my experience with Bigpond's support and sales, my efforts to diagnose the problem and communicate that to Telstra Bigpond in order to reach a resolution whereby I can fully utilize the service.

Bigpond Internet Service:

Overall, Bigpond's internet service is excellent. The quality of the physical cable infrastructure and network it attaches to delivers high quality internet to my home. The bandwidth available to me is 6-7 times faster than is achievable via ADSL, which is of great value moving forward as more devices include network functionality and more businesses engage with consumers over the Internet.

However, Telstra's decision to provision the Netgear CGD24N cable modem reduces the functionality of this service to a virtually unusable state for a medium sized house of 3 people.

By means of analogy, upgrading to Bigpond cable has been like upgrading to a car with a bigger engine and more seats, which drives really well, only to find it has a 1 Litre fuel tank and stops very shortly after going somewhere, not able to get you to where you need to go.

My Background:

I have worked in IT for many years, and among my roles, I have configured many network devices, including switches and routers by DLink, Linksys, Cisco and Netgear, for computers running Windows, Mac OS and Unix operating systems. I have a very solid understanding of networking and am very capable of troubleshooting network problems.

My Home Network:

In my home, I have several electronic devices that include network functionality, many of which may access the internet concurrently. I do not believe that my usage would be above that of an average household with 3 people:

- 2 x Laptop computers
- 1 x Desktop computer
- 1 x NAS storage device
- 1 x Network printer
- 1 x Microsoft XBox
- 1 x Apple TV
- 2 x iPhone
- 1 x iPad

My Bigpond Broadband Service:

I signed up for a "Telstra Complete Home Saver 200GB Bundle" service after receiving a telesales call offering a bundle of home phone and cable broadband internet, with a data allowance of 200GB per month, for \$88 per month, including installation and a cable modem with integrated wireless router.

Our Telstra Bigpond service was installed on 2 August 2011. During the next few weeks, I kept our previous ADSL service active until the end of its billing period and was then disconnected.

Immediately after this I noticed problems with our internet access. The symptoms of the problems is as follows:

- One computer (or even a program on the same computer) can access the internet.
- Another computer (or another program on the same computer) goes to start making a request the internet, but times out and cannot connect to the remote server.

This appears similar to a drop-out, but is clearly not a drop-out because the first program continues to work, while the other does not, the computers have no issues connecting to the router, and the modem's line status is fine.

Technical Analysis of the Problem:

Upon investigating this problem, I discovered that there are many users who are experiencing the same problems on the popular whirlpool forum¹. In particular, a search for the term “CGD24N” reveals many discussions where people have problems with the device².

When a computer on the local network sends a request to a server on the internet, the router substitutes the address of the local computer (which is private and cannot be directly accessed from the internet) with the public IP address of the router. When the response from the server is received, the destination address is translated back to the original local address of the computer which originated the request. The main function of the router that achieves this is Network Address Translation (NAT). The NAT part of the router has a lookup table where it records which application of which computer made a request to server so it can correctly translate the response packets back to the originating computer (IP Address) and application (port).

This is a critically important function of the router, since without it computers on the local network are unable to establish connections to servers and communicate. This applies equally to web pages and downloads (HTTP), email (POP3/IMAP/SMTP) as well as Skype, Games, Software Updates and many other web services. The fundamental problem with the CGD24N is that this lookup table is very small. When it fills up, other applications (for example: a new tab in a web browser) will not function, while older existing connections will continue to work.

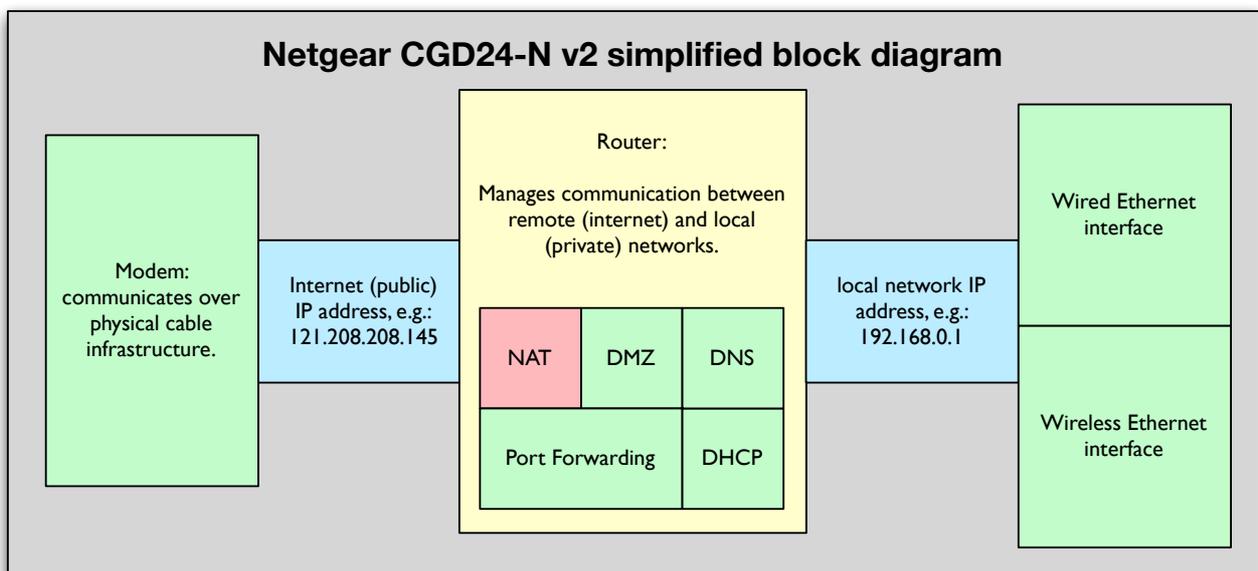


Fig 1. Simplified Block Diagram of Netgear CGD24N cable modem & router.

In particular, my exact problem is caused by a very small Network Address Translation (NAT) table size. According to the whirlpool site (specs are not available on Netgear’s site, nor in the user manual for the CGD24N) the table size is 1024. Similarly, the D-Link DSL-504 which I used nearly ten years ago has a size of 4096.

¹ <http://forums.whirlpool.net.au/>

² http://forums.whirlpool.net.au/forum/?action=threads_search&f=14&fg=1&q=cgd24n

Verizon DSL customers in the United States are issued with routers with larger sizes. Of particular note, is an FAQ page about ActionTec ADSL modems, where customers have reported problems with early routers with a NAT table size of 7500³. Subsequently later revisions have a larger NAT table size to solve the problem.

It may sound as though 1024 is a significantly large number to handle many concurrent network connections, but this is not the case.

A typical web page viewed in a browser such as Safari, Firefox, Chrome or Internet explorer involves making numerous requests to often more than one server. There would be a DNS connection, used to look up the name of the server, typically 5 connections to that server so that multiple resources can be loaded in parallel, and there may be, however, resources loaded from other servers, such as analytics code, tracking cookies, images, advertisements, malware advice, etc.

These connections are typically kept open, because that provides a performance benefit to the user when navigating to multiple pages within the same site because reusing an existing connection is more efficient than establishing a new one.

For example, a view to “<http://www.telstra.com/>”, comprises 52 individual resources, coming from 5 different servers as identified by their URIs. Each individual resource, however, may then be redirected to a different server according to the specific configuration of the server.

▼ Telstra - mobile phones, prepaid phones, broadband internet, home phones, business phones		50 of 52 items (2 errors)
http://cdn.userservice.com/images/widgets/en/feedback_tab_white.png		
http://cdn.userservice.com/javascripts/widgets/tab.js		
http://info.telstra.com/b/ss/telstraglobalprd,telstratrdetailprd/1...0Plug-in%3BSilverlight%20Plug-in%3BUnity%20Player%3B&AQE=1		43 bytes
http://telstracorporationlt.tt.omtrdc.net/m2/telstracorporationlt...2F%2Fwww.telstra.com.au%2F&mboxReferrer=&mboxVersion=39		1.2 KB
http://ucm.in.telstra.com.au/uberstaging/global/javascript/jquery/plugins/orangebox/orangebox.css		A server with the specified hostname could not be
http://ucm.in.telstra.com.au/uberstaging/global/javascript/jquery/plugins/orangebox/orangebox.min.js		A server with the specified hostname could not be
http://www.telstra.com.au/		39.4 KB
http://www.telstra.com.au/favicon.ico		14.7 KB
http://www.telstra.com.au/global/javascript/adserver-v9.js		
http://www.telstra.com.au/global/javascript/datalicious.js?cb=25:9:2011		6.3 KB
http://www.telstra.com.au/global/javascript/footer.js		8.4 KB
http://www.telstra.com.au/global/javascript/jquery/jquery-core.min.js		76.8 KB
http://www.telstra.com.au/global/javascript/jquery/plugins/labeloverlay/jquery-labeloverlay-0.0.1.min.js		0.9 KB
http://www.telstra.com.au/global/javascript/jquery/plugins/tooltips/jquery-tooltips.js		0.9 KB
http://www.telstra.com.au/global/javascript/mbox.js		
http://www.telstra.com.au/global/javascript/multivariate-testing-v4.js		
http://www.telstra.com.au/global/javascript/scode-v25.js		
http://www.telstra.com.au/global/javascript/swfobject.js		8.2 KB
http://www.telstra.com.au/global/javascript/switchprotocol.js		0.6 KB
http://www.telstra.com.au/global/javascript/userVoiceWidget.js		0.7 KB
http://www.telstra.com.au/global/themes/v9/css/include-main-v9.css		50.2 KB
http://www.telstra.com.au/global/themes/v9/css/main.css		
http://www.telstra.com.au/global/themes/v9/css/print.css		5.8 KB
http://www.telstra.com.au/global/themes/v9/css/screen-ie.css		
http://www.telstra.com.au/global/themes/v9/css/screen.css		71.0 KB
http://www.telstra.com.au/global/themes/v9/images/bg-header-search-ie6.png		0.2 KB

Fig 2. Excerpt from Safari's Activity window when viewing Telstra website.

³ <http://www.dslreports.com/faq/16233>

By means of another example, a web page view to “<http://www.facebook.com/>”, comprises 159 individual resources, coming from 14 different servers as identified by their URIs.

URI	Size
http://0.146.channel.facebook.com/iframe/11?r=http%3A%2F%2...tatic.ak.fbcdn.net%2Fsrc.php%2Fv1%2Fyf%2Fr%2FgTITHkFAXa.js	156 items
http://a1.sphotos.ak.fbcdn.net/hphotos-ak-snc7/s320x320/298267_10150384581001563_724766562_9874482_709968358_n.jpg	6 of 8 items (1 error) 16.1 KB
http://a3.sphotos.ak.fbcdn.net/hphotos-ak-ash4/s320x320/29...50302240687544_120904727543_7863933_1822092342_n.jpg	17.8 KB
http://a3.sphotos.ak.fbcdn.net/hphotos-ak-ash4/s320x320/320231_10150384580871563_724766562_9874481_1025613341_n.jpg	13.9 KB
http://a3.sphotos.ak.fbcdn.net/hphotos-ak-snc7/s320x320/314895_10150402808662577_548497576_10099002_1164723280_n.jpg	13.2 KB
http://a5.sphotos.ak.fbcdn.net/hphotos-ak-ash4/s320x320/320020_10150384580731563_724766562_9874480_425691871_n.jpg	17.6 KB
http://a5.sphotos.ak.fbcdn.net/hphotos-ak-snc7/s320x320/312204_10150402808667577_548497576_10099003_921255276_n.jpg	15.5 KB
http://a8.sphotos.ak.fbcdn.net/hphotos-ak-ash4/s320x320/293405_10150402808677577_548497576_10099004_596903857_n.jpg	15.3 KB
http://external.ak.fbcdn.net/safe_image.php?d=AQARqCTjwcrIR...w.469underworld.com%2FDownloads%2FBakedNotFriedCover.jpg	4.0 KB
http://photos-e.ak.fbcdn.net/photos-ak-snc1/v43/135/48119224995/app_2_48119224995_4168.gif	0.6 KB
http://photos-g.ak.fbcdn.net/hphotos-ak-snc6/196876_10150132087458850_621103849_6514160_1373398_s.jpg	6.2 KB
http://photos-h.ak.fbcdn.net/hphotos-ak-snc6/247832_10150672624520111_656040110_19087380_6024101_s.jpg	7.1 KB
http://pixel.facebook.com/ajax/log_ticker_render.php?sidebar..._id=43a5c9e43a52ad239e34e26f0887ef8b&_user=606441735	67 bytes
http://platform.ak.fbcdn.net/www/app_full_proxy.php?app=481...30.media.tumblr.com%2Ftumblr_ls2vb58LRq1qzwr4ro4_250.jpg	5.2 KB
http://platform.ak.fbcdn.net/www/app_full_proxy.php?app=481...26.media.tumblr.com%2Ftumblr_ls2vb58LRq1qzwr4ro2_250.jpg	6.0 KB
http://platform.ak.fbcdn.net/www/app_full_proxy.php?app=481...27.media.tumblr.com%2Ftumblr_ls2vb58LRq1qzwr4ro1_250.jpg	4.5 KB
http://platform.ak.fbcdn.net/www/app_full_proxy.php?app=481...28.media.tumblr.com%2Ftumblr_ls2vb58LRq1qzwr4ro3_250.jpg	5.8 KB
http://profile.ak.fbcdn.net/hprofile-ak-ash2/173394_578732867_8036947_q.jpg	2.8 KB
http://profile.ak.fbcdn.net/hprofile-ak-ash2/186961_100002357555860_171476_q.jpg	2.4 KB
http://profile.ak.fbcdn.net/hprofile-ak-ash2/260927_660823997_8068454_q.jpg	2.0 KB
http://profile.ak.fbcdn.net/hprofile-ak-ash2/273527_613221421_608686388_q.jpg	2.6 KB

Fig 3. Excerpt from Safari’s Activity window when view Facebook website.

At the time of writing this letter, for example, my laptop computer has 112 active connections.

Because Network Address Translation is a “Network Layer” function (Layer 3 of the OSI model⁴), it is not able to determine how long a connection will be open and the table periodically fills up as new connections are established. Eventually, older connections are released as they become unused and time out. The size of the Network Address Translation table and the timeouts are typically not configurable in domestic equipment such as the Netgear CGD24N.

When the NAT table is full, the computer is unable to make a connection with the server. The application (for example a web browser or email client) continues to wait for a response and eventually times out.

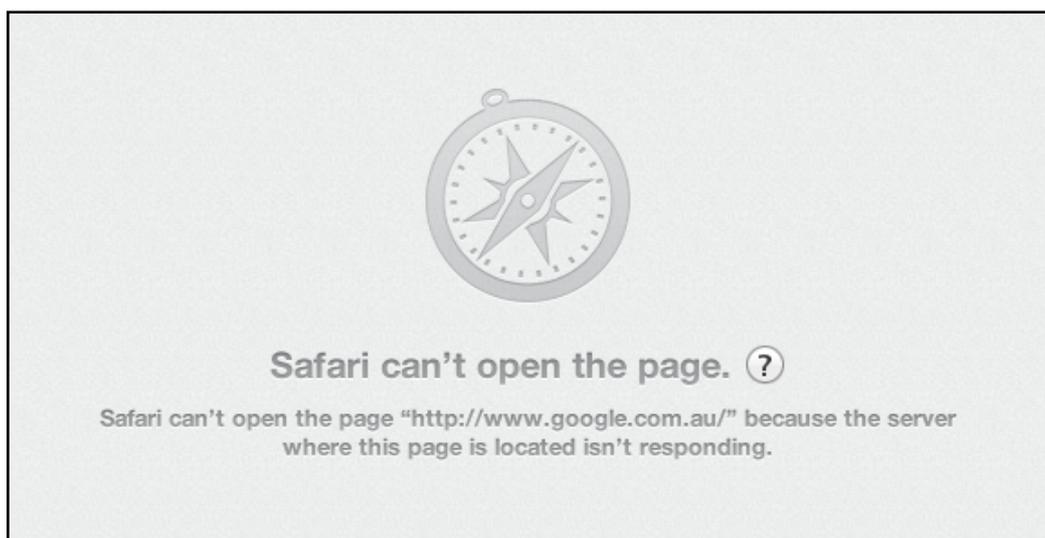


Fig 4. Example timeout message in Safari.

In most computer operating systems, there is a tool called “netstat” which provides information about the state of the computers current network connections.

⁴ <http://www.itu.int/rec/T-REC-X.224-199511-I/en/>

When these timeouts occur, many connections can be seen in the “netstat” output as being in a state “SYN_SENT”. To quote the TCP specification⁵, this state:

*represents waiting for a matching connection request
after having sent a connection request*

That is, the application on the computer has sent a request to the service to establish a connection for communicating data (for example, to retrieve a web page), but is unable to proceed because no response from the server has been received; a connection has not yet been established.

Because the NAT table is full, the router is unable to translate the server’s response back to the application which originated the request and the connection is never established.

When this problem happens, I have seen many hundreds of connections stuck in the SYN_SENT state as applications timeout and retry to connect to internet servers.

I have tested my laptop computer on various other networks, and have not ever experienced any timeouts nor netstat showing connections stuck in the “SYN_SENT” state. Some of these networks are:

- * Office network, with business ISP, Spiderbox,
- * Telstra Next G network, with laptop tethered to my iPhone,
- * My brother’s home network, with Optus via ADSL,
- * Another family friend’s network, with Optus via Cable.

In an additional step to prove the fault lies within the Netgear CGD24N, I managed to establish an SSH connection to a server in my office and run a SOCKS proxy over that connection. I then configured my computer to make all further internet connections with the SOCKS proxy, which tunneled them all over a single established connection without requiring any further NAT processing from my home router. Immediately, web pages started loading and email clients connected. Another computer without the SOCKS proxy, continued to timeout. This clearly proves that the router is incapable of establishing new connections despite having a perfectly good cable connection that is more than capable of carrying data.

Permanently running a SOCKS proxy is unacceptable for several reasons:

- * Not all devices are capable of being configured to use a SOCKS proxy (iPhones, for example).
- * Using the SOCKS proxy requires that all data be tunneled through a server at my office, which actually requires double the bandwidth usage for my business. (ie: Downloading a 1MB file requires that the office server download that 1MB file and then upload the 1MB file through the tunnel to my home computer).

⁵ <http://www.ietf.org/rfc/rfc793.txt>

Bigpond Technical Support correspondence:

Following is a schedule of occasions where I communicated with Bigpond via phone or email, and what outcomes came from each call.

Date & Reference	Details	Resolution
24/8/2011 Reference: 110814-007129	Email to technical support, including attachments showing netstat output and details of troubleshooting performed to identify the problem.	I was asked to do further troubleshooting, which I supplied, then no response.
30/8/2011	Phone call to support, spoke with Gim. Booked a Field technician for 31/8/2011. Booking ID: 6000105921	Field technician came to check the line and replaced the modem with another CGD24N. Same problem.
10/9/2011	Email to technical support.	No response
11/9/2011 Ticket issue number: 1-74308862353	Phone call to support, spoke with Marie. Existing reference 110814-007129. Booked field technician for Monday morning 8-12noon, 12/9/2011 Booking ID: 6000109707	Field technician did not show up.
13/9/2011 Ticket issue number: 1-74550155747	Phone call to support, spoke with Janine; asked for escalation, and spoke with Ed. Booked a field technician again, explaining that it could only be escalated further after three unsuccessful attempts to solve the problem.	Field technician came to check the line, no line problems, Replaced connectors on pole to ensure good line signal quality. Still same problem.
16/9/2011		Another field technician came, but did not understand any problems with the router - he was only qualified to check the line status, which, again was fine. Still same problem.
20/9/2011	Phone call to support, spoke with Josh.	Forwarded to Sales
20/9/2011	Phone call to sales, making complaint about support's inability to resolve the issue, and enquiring about replacing the Netgear with a different model that would perform correctly.	Sales ensured they would send me a Thomson modem in the mail, I received another Netgear CGD42N. Still same problem.

My Solution - Supplying another Wireless Router:

On Saturday 24/9/2011 I purchased a Linksys E2000 wireless router and set it up at home. I disabled the NAT function in the Netgear CGD24N, which effectively turns the device into a Cable Modem only, disabling all of its router and wireless capabilities. I connected the Linksys router to the Netgear and have since had perfect internet access.

I have stress tested our network by getting every computer to open as many web browser windows as possible, and have not had a single timeout nor connection stuck in the "SYN_SENT" state. This proves again, that all of my internet problems were caused by the Netgear CGD24N's router being unable to perform correctly.

Consumer Rights - Faulty Products:

According to the ACCC (under the *Competition and Consumer Act 2010*), if a product is faulty and does not perform its advertised function, the consumer has the right to have the product replaced, or returned and its cost refunded.

In the case of all my previous ADSL internet services, I have had the option to provide my own ADSL modem. If a product was faulty, I could return it to the place of purchase for a replacement. If a product did not perform its advertised function, I could return it to the place of purchase for a refund, and buy a different product.

Neither of these options are available with a cable modem provisioned by Bigpond. This is a significant problem with the Cable modem ecosystem, causing undue burden on technical support lines and field technicians whose time is wasted chasing line faults where there are none; and undue stress for the consumer whose time is wasted and service is under-delivered due to support's inability to replace the modem with a better model that performs the required functionality.

Conclusion and Demand:

I have provided enough technical analysis of the problem to unequivocally identify that the Netgear CGD24N cable modem is incapable of performing the required functionality for the "Telstra Complete Home Saver 200GB Bundle" service.

I have given Telstra Bigpond a fair opportunity to resolve the issue and it has not been resolved.

I have taken further steps and resolved the issue myself by disabling a significant portion of the Netgear CGD24N's functionality and installing an additional wireless router (Linksys model E2000) at my own expense.

I therefore make the following demands:

1. I demand that the cost of this Linksys E2000 router (\$115.00) be reimbursed to me as a credit to my Bigpond account. (Original invoice attached.)
2. I demand acknowledgement from Telstra that no suitable customer premises equipment has been delivered and subsequently the conditions for the contract for service have not been met. I will then continue to use Bigpond as my Internet service provider just as if a contract period had expired naturally, subject to no cancellation clauses, and continuing on a rolling monthly basis.
3. I demand a written response to this complaint with 14 days.

Should Telstra Bigpond fail to meet these demands, or respond in a timely manner, I will proceed with escalating this complaint to both the Telecommunications Industry Ombudsman (TIO) and Australian Competition and Consumer Commission (ACCC) for further investigation. I will additionally pursue claiming compensation for consequential loss due to the amount of time I have spent on this issue and work time that I have lost waiting for field technicians at my home.

I am happy to be contacted directly by mobile phone on <removed> should you require clarification on any of the information I have provided.

Yours sincerely,

Matthew Connolly
Encl.

<address removed>

Phone: <removed>

Email: <removed>

Attached:

1. Copy of Tax Invoice for Linksys E2000 wireless router.