

UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE PATENT TRIAL AND APPEAL BOARD

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MICROSOFT CORPORATION

Petitioners

v.

NONEND INVENTIONS, N.V.

Patent Owner

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CASES: To Be Assigned

Patent Nos. 7,590,752 B2, 7,779,138 B2, 8,099,513 B2

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**DECLARATION OF NATHAN MOINVAZIRI**  
**IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW**  
**OF U.S. PATENT NOS. 7,590,752 B2, 7,779,138 B2, 8,099,513 B2**

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I, Nathan Moinvaziri, declare:

1. I have been asked by Petitioners to provide this Declaration to be used in the Petition for *Inter Partes* Review of U.S. Patent Nos. 7,590,752 B2, 7,779,138 B2, 8,099,513 B2 (“the Patents”).

2. I have been compensated at the rate of \$200 per hour for my time to prepare, review, and sign this Declaration. My compensation is not contingent upon the outcome of any *inter partes* review, district court litigation, or any other proceeding related to the Patents.

**I. BACKGROUND AND EXPERIENCE**

3. I am an experienced software developer, with over 10 years of experience developing freeware and commercial software for a variety of applications.

4. I also maintain a branch of the Minizip contribution in Zlib, a library for compressing and decompressing binary data.

5. I earned an Associate’s Degree in Computer Technology from Rio Salado College, and another Associate’s Degree in General Studies from Mesa Community College.

6. My public LinkedIn profile summarizing my employment and education experience is attached to this Declaration as Attachment A.

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**II. GNUTELLA WEGO WEB SITES**

7. In 2000 I created a page on Gnutella technology and a destination site for the Gnutella network.

8. As of June 2000, the web page was hosted by WeGo, a Redwood City, California based portal platform and services provider, at <http://gnutella.wego.com>.

9. WeGo also provided a portal for developers of Gnutella at <http://gnutelladev.wego.com>.

10. Gnutella is a real-time search, peer-based file sharing client that allows users running Gnutella to search for and download files from other Gnutella users. More generally, Gnutella is a fully distributed information sharing technology.

11. The public web sites <http://gnutella.wego.com> and <http://gnutelladev.wego.com> had information about Gnutella, its technology and software clients, and the protocol used by Gnutella. The web sites were created for the purpose of perpetuating the technology.

12. I have personal knowledge of the <http://gnutella.wego.com> and <http://gnutelladev.wego.com> websites because I was part of the team that developed these web sites in 2000. Specifically, I am the originator of the Gnutella

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page, I made the graphics on the website and designed it. I personally wrote many of the web site pages for <http://gnutella.wego.com>, and updated the web sites with information. Additionally, <http://gnutella.wego.com> was also linked to <http://gnutelladev.wego.com>. Because of my development work I was aware of the contents and descriptions of the pages of contained on the <http://gnutella.wego.com> and <http://gnutelladev.wego.com> websites as they appeared in June 2000.

### **III. GNUTELLA WEGO WEB SITES**

13. Petitioners' have provided me with several web pages for <http://gnutella.wego.com> and <http://gnutelladev.wego.com>, archived on the Internet Archive Wayback Machine on June 19-21, 2000.

14. Attachment B is a true and correct copy of the "Welcome to Gnutella" page on the on the <http://gnutella.wego.com> web site, cached by the Internet Archive on June 20, 2000. I recognize and recall the format and content of the web page in Attachment B as a true and correct copy of "Welcome to Gnutella" page of the GnutellaWeGo website <http://gnutella.wego.com> as it appeared in June 2000. Attachment B is still available on the Internet at the following URL: <https://web.archive.org/web/20000620113133/http://www.gnutella.wego.com/>



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15. Attachment C is a true and correct copy of the “About gnutella.wego.com” page on the on the <http://gnutella.wego.com> web site, cached by the Internet Archive on June 19, 2000. I recognize and recall the format and content of the web page in Attachment C as a true and correct copy of “About gnutella.wego.com” page of the GnutellaWeGo website <http://gnutella.wego.com> as it appeared in June 2000, with the exception of three missing images of the website contributors being replaced by icons. I recognize a brief biographical entry for me on page 1 of Attachment C. Attachment C is still available on the Internet at the following URL:

<https://web.archive.org/web/20000619004605/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=119515&folderId=119437&panelId=119597&action=view>

16. Attachment D is a true and correct copy of the “Support: Main” page on the on the <http://gnutella.wego.com> web site, cached by the Internet Archive on June 20, 2000. I recognize and recall the format and content of the web page in Attachment D as a true and correct copy of “Support: Main” page of the GnutellaWeGo website <http://gnutella.wego.com> as it appeared in June 2000. The “Support: Main” page contained a high-level description of the Gnutella

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technology and its features. Attachment D is still available on the Internet at the following URL:

<https://web.archive.org/web/20000620174435/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=118400&folderId=118398&panelId=119597&action=view>

17. Attachment E is a true and correct copy of the “Support: FAQ” page on the on the <http://gnutella.wego.com> web site, cached by the Internet Archive on June 20, 2000. I recognize and recall the format and content of the web page in Attachment E as a true and correct copy of “Support: FAQ” page of the GnutellaWeGo website <http://gnutella.wego.com> as it appeared in June 2000. The “Support: FAQ” page contained frequently asked questions and answers to those questions. Attachment E is still available on the Internet at the following URL:

<https://web.archive.org/web/20000620201407/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=118401&folderId=118398&panelId=119597&action=view>

18. Attachment F is a true and correct copy of the “Support: Tutorial” page on the on the <http://gnutella.wego.com> web site, cached by the Internet Archive on June 20, 2000. I recognize and recall the format and content of the web page in Attachment F as a true and correct copy of “Support: Tutorial” page



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of the GnutellaWeGo website <http://gnutella.wego.com> as it appeared in June 2000. The “Support: Tutorial” page contained a description of how to access the Gnutella network via the Gnutella client, and a description of how the Gnutella client is used to search for files, download files, make files available for sharing, and launching Winamp from the Gnutella client, to listen to the songs as they are downloaded. Attachment F is still available on the Internet at the following URL: <https://web.archive.org/web/20000620214440/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=119427&folderId=118398&panelId=119597&action=view>

19. Attachment G is a true and correct copy of the “What’s New” page on the on the <http://gnutella.wego.com> web site, cached by the Internet Archive on June 21, 2000. I recognize and recall the format and content of the web page in Attachment G as a true and correct copy of “What’s New” page of the GnutellaWeGo website <http://gnutella.wego.com> as it appeared in June 2000. The “What’s New” page contained descriptions of updates to the <http://gnutella.wego.com> web site and other news about Gnutella. Many of the dated update entries contain the name “Nathan,” because I wrote those entries. This web page also confirms my independent recollection that I created the main graphic for the <http://gnutella.wego.com> web site, and prepared other aspects of the

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presentation of the web page, and made updates to subpages such as frequently asked questions and software downloads. Attachment G is still available on the Internet at the following URL:

<https://web.archive.org/web/20000620144527/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&folderId=168595&panelId=1&pageId=168596&action=view>

20. Attachment H is a true and correct copy of the “Client Software” page on the on the <http://gnutella.wego.com> web site, cached by the Internet Archive on June 21, 2000. I recognize and recall the format and content of the web page in Attachment H as a true and correct copy of “Client Software” page of the GnutellaWeGo website <http://gnutella.wego.com> as it appeared in June 2000. The “Client Software” page contained official releases of Gnutella client software including v. 0.56, and specially modified releases of the Gnutella client software. As I explained in Attachment G, I updated the download page for formatting and to better explain the differences between versions of the software. Attachment H is still available on the Internet at the following URL:

<https://web.archive.org/web/20000620164844/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=117731&folderId=117728&panelId=119597&action=view>



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21. Attachment I is a true and correct copy of the “Developer’s Corner” page on the on the <http://gnutella.wego.com> web site, cached by the Internet Archive on June 20, 2000. I recognize and recall the format and content of the web page in Attachment I as a true and correct copy of “Developer’s Corner” page of the GnutellaWeGo website <http://gnutella.wego.com> as it appeared in June 2000. This page linked users to the <http://gnutelladev.wego.com>, the page for the Gnutella Working Group working on the continued development of Gnutella technology. Attachment I is still available on the Internet at the following URL: <https://web.archive.org/web/20000620154537/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&folderId=116767&pageId=119478>

22. Attachment J is a true and correct copy of the “Gnutella 0.4 protocol” page on the on the <http://gnutelladev.wego.com> web site, cached by the Internet Archive on June 20, 2000. I recognize and recall the format and content of the web page in Attachment J as a true and correct copy of “Gnutella 0.4 protocol” page of the GnutellaDev WeGo website <http://gnutelladev.wego.com> as it appeared in June 2000. The “Gnutella 0.4 protocol” page contained a description of the protocol used to communicate between Gnutella clients/servers. Attachment J is still available on the Internet at the following URL:

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<https://web.archive.org/web/20000620095146/http://gnutelladev.wego.com/go/wego.pages.page?groupId=139406&view=page&folderId=145203&pageId=145249>

23. The web sites <http://gnutella.wego.com> and <http://gnutelladev.wego.com>, including web site pages in Attachments B-J, were accessible to the public and were well known websites in June 2000. For example, Attachments B-I contain a counter in the lower left hand corner of the page counting the number of web site visits between April 10, 2000 and the date the web page was cached in June 2000. The <http://gnutella.wego.com> web site had over one million unique hits before June 2000, which further shows the number of people visiting the Gnutella WeGo web sites in less than two months. This is also shown in Attachment G. This volume of public visits continued through June 2000.

24. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

25. I declare under penalty of perjury that the foregoing is true and correct.

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Executed on 19<sup>th</sup> day of Sept., 2015 in Los Angeles, California.

  
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Nathan Moinvaziri

- Attachment A: Nathan Moinvaziri LinkedIn Profile, *available at*  
<https://www.linkedin.com> (last accessed Sept. 19, 2015)
- Attachment B: Internet Archive Wayback Machine June 20, 2000 capture of  
“Welcome to Gnutella” web page of the GnutellaWeGo  
website, <http://www.gnutella.wego.com/>, *available at:*  
<https://web.archive.org/web/20000620113133/http://www.gnutella.wego.com/> (last accessed Sept. 19, 2015)
- Attachment C: Internet Archive Wayback Machine June 19, 2000 capture of  
“About gnutella.wego.com” web page,  
[http://gnutella.wego.com/go/wego.pages.page?groupId=116705  
&view=page&pageId=119515&folderId=119437&panelId=119597&action=view](http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=119515&folderId=119437&panelId=119597&action=view), *available at:*



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[w](#) (last accessed Sept. 19, 2015)

Attachment D: Internet Archive Wayback Machine June 20, 2000 capture of the “Support: Main” web page of the GnutellaWeGo website, <http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=118400&folderId=118398&panelId=119597&action=view>, *available at:* <https://web.archive.org/web/20000620174435/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=118400&folderId=118398&panelId=119597&action=view>  
[w](#) (last accessed Sept. 19, 2015)

Attachment E: Internet Archive Wayback Machine June 20, 2000 capture of the “Support: FAQ” web page of the GnutellaWeGo website, <http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=118401&folderId=118398&panelId=119597&action=view> *available at:* <https://web.archive.org/web/20000620201407/http://gnutella.w>

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[ego.com/go/wego.pages.page?groupId=116705&view=page&pageId=118401&folderId=118398&panelId=119597&action=view](http://ego.com/go/wego.pages.page?groupId=116705&view=page&pageId=118401&folderId=118398&panelId=119597&action=view)  
[w](#) (last accessed Sept. 19, 2015)

Attachment F: Internet Archive Wayback Machine June 20, 2000 capture of the “Support: Tutorial” web page of the GnutellaWeGo website,

<http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=119427&folderId=118398&panelId=119597&action=view>, available at:  
<https://web.archive.org/web/20000620214440/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=119427&folderId=118398&panelId=119597&action=view>  
[w](#) (last accessed Sept. 19, 2015)

Attachment G: Internet Archive Wayback Machine June 21, 2000 capture of the “What’s New” web page of the GnutellaWeGo website,

<http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&folderId=168595&panelId=1&pageId=168596&action=view>, available at:  
<https://web.archive.org/web/20000620144527/http://gnutella.w>

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[ego.com/go/wego.pages.page?groupId=116705&view=page&f  
olderId=168595&panelId=1&pageId=168596&action=view](http://www.gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&folderId=168595&panelId=1&pageId=168596&action=view)

(last accessed Sept. 19, 2015)

Attachment H: Internet Archive Wayback Machine June 21, 2000 capture of the “Client Software” web page of the GnutellaWeGo website, [http://gnutella.wego.com/go/wego.pages.page?groupId=116705  
&view=page&pageId=117731&folderId=117728&panelId=119  
597&action=view](http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=117731&folderId=117728&panelId=119597&action=view), *available at:* [https://web.archive.org/web/20000620164844/http://gnutella.w  
ego.com/go/wego.pages.page?groupId=116705&view=page&p  
ageId=117731&folderId=117728&panelId=119597&action=vie  
w](https://web.archive.org/web/20000620164844/http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&pageId=117731&folderId=117728&panelId=119597&action=view) (last accessed Sept. 19, 2015)

Attachment I: Internet Archive Wayback Machine June 20, 2000 capture of the “Developer’s Corner” web page of the GnutellaWeGo website, [http://gnutella.wego.com/go/wego.pages.page?groupId=116705  
&view=page&folderId=116767&pageId=119478](http://gnutella.wego.com/go/wego.pages.page?groupId=116705&view=page&folderId=116767&pageId=119478), *available at:* <https://web.archive.org/web/20000620154537/http://gnutella.w>



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[wego.com/go/wego.pages.page?groupId=116705&view=page&folderId=116767&pageId=119478](http://wego.com/go/wego.pages.page?groupId=116705&view=page&folderId=116767&pageId=119478) (last accessed Sept. 19, 2015)

Attachment J: Internet Archive Wayback Machine June 20, 2000 capture of the “Gnutella 0.4 protocol” web page of the GnutellaWeGo website,

<https://web.archive.org/web/20000620095146/http://gnutelladev.wego.com/go/wego.pages.page?groupId=139406&view=page&folderId=145203&pageId=145249> (last accessed Sept. 19, 2015)

# Nathan Moinvaziri

Governor of the Great State of Software Development

nathan@nathanm.com

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## Experience

### **Senior Software Developer at Solid State Networks**

August 2007 - Present (8 years 2 months)

Develop and maintain our flagship digital delivery and deployment software platform called DIRECT. Involved in every aspect of the software development life-cycle taking products from requirements to release. Have worked on projects written in a range of high-level programming languages utilizing both Microsoft and Apple technologies. Lead developer on the Adobe Installation Helper that is used to deliver Flash Player and Reader to millions of users around the world.

### **Freeware Software Developer at WebShot**

2006 - Present (9 years)

Creator of a software utility called WebShot that allows users to capture an image of any webpage given its address. It was a first of its kind by providing a command line version of the application allowing for the automation of batch webpage screenshot generation. It supports both the Internet Explorer trident engine and the Chromium engine through the Chromium Embedded Framework (CEF). It also comes with a DLL component for integration directly into third-party applications. It is written almost entirely in C with Win32 API. For most of its existence it was a paid-for application and has only recently been made free to the masses. <http://www.websitescreenshots.com/>

### **Freeware Software Developer at ExtractNow**

2001 - Present (14 years)

Creator and maintainer of a free software utility called ExtractNow designed to allow users to quickly and easily extract multiple archives. It supports most major archive formats, provides advanced batch extraction features, integrates with Windows Explorer shell using COM, and even works on systems as old as Window 95. Over the past 12 years it has been completely rewritten from scratch at least twice: first from VB to C++ with MFC and then to C with pure Win32 API. It receives over 2,000 downloads per day, has achieved over 2 million downloads from CNET's Download.com alone, and has garnered multiple awards from all over of the Internet. <http://www.extractnow.com/>

### **Software Developer at AXT Media Group**

May 2005 - August 2007 (2 years 4 months)

Maintained an e-commerce shopping cart called Affilicart and an affiliate management system called MerchantZoo. Both web applications were written in ASP.NET powered by SQL databases with the exception of the front-end of Affilicart written in PHP. Responsible for taking feature requests and implementing them including the addition of a guest checkout process, the ability to upsell products after

checkout, and improvements to the reporting and e-mail notification systems. Debugged problems that would arise in both systems and their integration with one another and fixed them. Frequently worked on some of the other e-commerce websites that we hosted and maintained.

### **Technical Support at GoDaddy Software**

October 2004 - May 2005 (8 months)

Worked as a technical support and sales adviser to GoDaddy customers. Daily tasks included showing customers how to manage and configure their products, analyzing and debugging technical issues with products, and meeting a sales quota. Support consisted of products ranging from domain names, to email and hosting accounts, to databases and technologies ranging from DNS, to SMTP, to SQL.

### **Quality Assurance at Aviary Group**

October 2003 - September 2004 (1 year)

Actively worked with developers to ensure that the software they delivered was bug-free. Helped to product launch several ISAPI plug-ins for Microsoft Internet Information Services. Developed and designed the product websites in PHP in-conjunction with an in-house HTML templating system. Wrote all the product marketing, technical documentation, user manuals, faqs. Other projects included the testing of HTML parsing components for a search engine harvester, creation of machine images using Windows XP Embedded for harvesting boxes, and the development of PHP/JS scripts to expose some of the functionality to a site designed to analyze HTML pages on the web.

### **Internship at Matson, Inc.**

2002 - 2002 (less than a year)

### **Intel ACE Teaching Assistant at Kyrene School District**

1998 - 1998 (less than a year)

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## Certifications

### **MCPS: Microsoft Certified Professional**

Microsoft June 2007

### **MCAD: Microsoft Certified Application Developer**

Microsoft July 2007

### **MCSD1: Microsoft Certified Solutions Developer**

Microsoft August 2007

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## Education

### **Rio Salado College**

Associates in Applied Science, Computer Technology, 2008 - 2009

### **Mesa Community College**

Associates, General Studies, 2001 - 2005

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## Skills & Expertise

**C#**

**Web Applications**

**C**

**C++**

**P2P**

**Desktop Application Development**

**JavaScript**

**Microsoft SQL Server**

**ASP.NET**

**Web Development**

**IIS**

**XML**

**Software Development**

**SQL**

**Databases**

**CSS**

**E-commerce**

**MySQL**

**jQuery**

**Web Services**

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## Projects

**Minizip**

June 2010 to Present

Members:Nathan Moinvaziri

Maintain a branch of the minizip zlib contribution.

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## Languages

**English**

(Native or bilingual proficiency)

# **Nathan Moinvaziri**

Governor of the Great State of Software Development

nathan@nathanm.com

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[Contact Nathan on LinkedIn](#)

INTERNET ARCHIVE  
**WayBackMachine**  
412 captures  
20 Jun 00 - 15 Sep 15

http://www.gnutella.wego.com/

Go

MAY  
**JUN 20**  
1999 2000 21



[Home](#)  
  
What's New  
Developer's Corner  
Help/Support  
**Gnutella?**  
**Tutorial**  
**FAQ**  
Software  
Third-Party  
**Download**  
Press  
Promote Gnutella  
About  
Site Map

 **Community**  
  
Discussion Board

 **Resources**  
  
File Center  
Links

1743392  
Since April 10th, 2000

## Welcome to gnutella

### Gnutella's Home On The Web

Gnutella is a real-time search, peer-based file-sharing client that allows user running Gnutella to search for and download files from other Gnutella users. Gnutella was originally conceived, authored and released by Justin Frankel and Tom Pepper of [Nullsoft](#) in March 2000.

### Net film firm taps Gnutella for video sales

Net film firm taps Gnutella for video sales By Gwendolyn Mariano Staff Writer, CNET News.com June 14, 2000, 5:35 p.m. PT An online movie distributor this week said it will try to sell videos using Gnutella's file-sharing software, issuing a challenge not only for itself, but for the company that has promised to protect files from piracy on the notoriously insecure network: Microsoft. More can be found [Here](#) from Cnet's News.com

### Need a host?

Remove

Add

Host: gnet3.ath.cx

Also check out:  
gnet1.ath.cx  
fileforum.com

This address will send you to one of the host caches, which may not be 100% reliable. This cache listens on ports 23, 80, 6346, 6667, and 8080. The Internet is an unpredictable place, but we try hard to make it work the way it does in movies. If it doesn't work then try again later, or try gnet2.ath.cx! DO NOT E-MAIL US TELLING US IT DOESN'T WORK! Chances are, we already know. Thanks.

[Spread Gnutella!](#)



gnutella  
file sharing and distribution network  
it's all about the gnutelliums



Wego.com, Inc., does not claim ownership of or take responsibility for any content on this site.  
There is no warranty or guarantee on anything downloaded from this site.  
All trademarks are the property of their respective owners.

[Gnutella Website Support](#)



45 captures

19 Jun 00 - 12 Jan 08

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# gnutella

file sharing for a new generation



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**Do not e-mail us asking us how to use Gnutella. If you have any questions on how to use Gnutella please see the FAQ or Tutorial. E-mail [Nathan](#) if your comments are concerning the website.**

#### Ian Hall-Beyer

[homepage](#) | [e-mail](#)

Copy editor/HTML guru/Whipping Boy

Ian, known in online circles as "manuka" since the early cretaceous, is a geek in his late twenties. For the last four years, he has been an IT consultant specializing in Unix systems administration and networking. His clients have included industry heavyweights such [MCI](#), [IBM](#), [GE](#), and [Sun Microsystems](#). His most notable contribution to the Linux community has been an [ipchains firewall](#), which is used by thousands of internet users and several corporations. In what little spare time he has left, he runs [LANgistiX](#) and [nerdherd.net](#). He lives with 3 other geeks, a herd of cats, and an inordinately large number of computers near Boulder, Colorado.



#### Nathan Moinvaziri

[homepage](#) | [e-mail](#)

HTML Stud/Web Stylist

Besides being just Nathan otherwise known as "nouser", he is also only 16. He's the originator of this page and made the graphics on the website and designed it. His cool gnutella icon has been everywhere! Just think, he made the first REAL gnutella page - without him, where would gnutella be? He can also program the best he can in C/C++/VB/HTML/ASM.



#### Gene Kan

[homepage](#) | [e-mail](#)

Network engineer/Unix weenie

In his early twenties, Gene has lived Office Space since graduating UC Berkeley in 1997. At Berkeley has was a member of the [Experimental Computing Facility \(XCF\)](#). Commercially, he's been a Unix network plumber and H.323 gimp at security titan [Check Point Software](#), engineer in charge of Big Brother software at network semantic traffic analysis leader [Narus](#), and Java server guy at [WeGo.COM](#) where he helps to bring you this very page. He recently developed an open-source heavy-lifting MP3 streaming system he calls [Litestream](#) and is responsible for the network end of Unix Gnutella client *Gnubile*. Recently he's been the guy who takes press calls regarding Gnutella, and tries to promote the technology in any way possible. Find him on Efnet IRC as "fd3s".



**Spencer Kimball**[homepage](#) | [e-mail](#)

dot-com Dork/GIMP-Daddy

The halcyon days of youth long past, Spencer wishes he were still at UC Berkeley, coding Open Source full-time. He's since taken employment, including a brief stint in management consulting, a tour of duty in financial analysis, and an ongoing, all-out battle in the seamy underworld of dot-coms. Somewhere along the way, he's found time to slap together a UI for the Unix Gnutella client *Gnubile*.

**Disclaimer:**

The aforementioned crew is not affiliated in any way with America Online, Nullsoft, or any of the original developers of Gnutella. We are an independent group of people doing this to perpetuate the technology.

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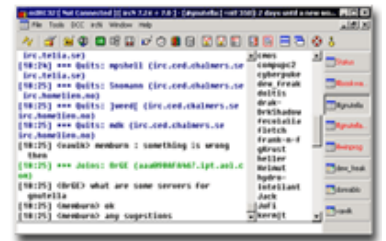
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The best place to get help on Gnutella is on the EFNet IRC network, in the #gnutella channel. That's where everybody hangs out and talks about Gnutella. You can find just about everybody that works on this page there. If you don't have IRC, go to [irchelp.org](http://irchelp.org), where you can find FAQs, clients, and tutorials on IRC

If you're looking for a Gnutella tutorial or FAQ, check out the links above.



Please do not e-mail us with technical support requests for Gnutella, as you will not get a response. Instead, please use the resources provided on this site.

**Support : What Is Gnutella**

Gnutella is a fully-distributed information-sharing technology. Loosely translated, it is what puts the power of information-sharing back into your hands.

When the World Wide Web started, that's how it was. It used to be that I would put up a web page, you would link to it, and I would link to yours. To get around, we would all "surf the links". The web was a web. But shortly after, the likes of Yahoo! and Lycos came on the scene to build search engines, or information portals. You go to one place to find all the information. Ideally that would be true. The problem with portals? They stuff you with ads. They are outdated. They basically control the flow of information. (Proven in a recent IBM/Altavista study of the Internet.)

Now, however, Gnutella puts the personal interaction back into the Internet. When you run a Gnutella software and connect to the Gnutella Network, you bring with you the information you wanted to make public. That could be nothing, it could be one file, a directory, or your entire hard drive (I wouldn't recommend this option).

The power behind this is amazing. That data which you have bothered to keep on your hard disk is what you found to be valuable. So when you share it you are sharing what is most valuable on the entire Internet. And you control its sharing. Decide to stop sharing? Go ahead and take those files offline. Want to share more? Select more files and share them. It's really that easy, and the power of sharing information is just unquantifiable.

Gnutella client software is basically a mini search engine and file serving system in one. When you search for something on the Gnutella Network, that search is transmitted to everyone in your Gnutella Network "horizon". If anyone had anything matching your search, he'll tell you.

So, time to give a brief explanation of the "horizon". When you log onto the Gnutella network, you are sort of wading into a sea of people. People as far as the eye can see. And further, but they disappear over the horizon. So that's the analogy. When you log on, you see the host counter start going crazy. That's because everyone in your horizon is saying "Hello" to you. After a while, it stops counting so rapidly, because you've counted most everyone in your horizon. Over time the people in the horizon change so

Microsoft Exhibit 1052



you'll see the counter move slowly.

If you log in another day, you should see a whole bunch of fresh faces, and maybe you'll have waded into a different part of the network. A different part of the crowd. Different information.

You might say, "Well, what if what I want doesn't exist within my horizon? The horizon never seems to grow beyond 10000 hosts!" True. If the information you want isn't in your horizon, you're out of luck. But hopefully it is. It's a probability game. Fortunately information is duplicated. Everyone's got that joke about the way men choose urinals, for example.

And what of the 10000-user horizon? That's just the network "scaling". The Gnutella Network scales through segmentation. Through this horizoning thing. It wouldn't do to have a million people in the horizon. The network would slow to a crawl. But through evolution, the network sort of organizes itself into little 10000-computer segments. These segments disjoin and rejoin over time. I leave my host on overnight and it will see upwards of 40000 other hosts.

### **Gnutella Is Filesharing**

Okay, so you've got Napster, and you've got SpinFrenzy, and you've got CuteMX. And you've got FTP sites, web pages, and all kinds of other stuff. And you still can't find what you want.

Enter Gnutella. Gnutella is the answer to your prayers. Searching for that recipe for strawberry-rhubarb pie? Can't find the latest version of Linux on a T3 or better link? It's probably out there on the GnutellaNet.

What's great about Gnutella is that it isn't focused on trading MPEG music the way the other guys are. There is all kinds of stuff on the GnutellaNet, and when you get a search hit, it's virtually guaranteed to be there. No stale links. No irrelevant hits. And if you don't want to download your recipes from someone in Belize with a 2400 bps link, you just set that in your query.

The other half of Gnutella is giving back. Almost everyone on GnutellaNet *shares* their stuff. Every client on the GnutellaNet is also a server, so you not only can find stuff, but you can also make things available for the benefit of others. So if you've got a good recipe for blueberry cobbler, you could answer someone's prayers by sharing it with the rest of the GnutellaNet!

### **Gnutella Is Anonymous**

One of the problems with Napster and others like it is that they are centralized. A centralized place for government agencies to impinge upon your freedom to search the net. All those commercial realtime search engines probably keep logs so they can target ads at you. At least they keep logs so they know how many searches they get per day so they can tell it to their investors. And they probably run some data mining to figure out how many people searched for MP3's, how many people searched for recipes, etc. All that so they can figure out *exactly* what their customer is like.

Gnutella puts a stop to all those shenanigans. When you send a query to the GnutellaNet, there is not much in it that can link that query to you. I'm not saying it's totally impossible to figure out who's searching for what, but it's pretty unlikely, and each time your query is passed, the possibility of discovering who originated that query is reduced exponentially. More on that in the next section.

In short, there is no safer way to search without being watched.

A big however, however. To speed things up, downloads are not anonymous. Well, we have to make compromises. But again, nobody's keeping logs, and nobody's trying to profile you.

### **Gnutella Is The Game : Telephone**

Remember the game telephone? Yeah, you know...someone whispers something to you, and you're supposed to whisper that to someone else, and so on and so on? And the guy at the end of the chain got a whisper that sounded nothing like the original whisper. Well, Gnutella is similar in many ways.

When you say to GnutellaNet, "Hey, find strawberry-rhubarb pie recipes.", you are actually saying, "Hey, my close friends, could you tell me if you've seen any recipes for strawberry-rhubarb pie? And while you're at it, ask your close friends too. And ask them to ask their friends." It's obvious that after just a few rounds of this, you've got a lot of friends working on finding that recipe! And, it's pretty much impossible for any one person to know who asked the question in the first place. Two beautiful things about Gnutella.

So suppose some guy, 6 degrees from you (your friend's friend's friend's friend's friend's friend), has the world's best recipe for strawberry-rhubarb pies. He tells the guy who asked him. That guy tells the guy who asked him... And ultimately the answer gets back to you. But only one person in the whole world knows that you're the original person who asked. And guess what? In GnutellaNet, we even fix that. The guy you asked originally doesn't even know that you're the person who's really asking the question. Err...searching for that strawberry-rhubarb pie recipe. So you get your answer, and you don't have to admit to anyone that you're a pantywaist.

Could it get any better?

### **Gnutella Is Designed to Survive Nuclear War**

Gnutella is designed to survive nuclear war. It's true. Maybe it's a munition. Who knows. What we do know is that GnutellaNet cannot be defeated by something so lame and simple as an ICMP flood. It's not going to leave you stranded like Yahoo! did when it was pummeled by Smurfs.

The GnutellaNet concept is not to have one massive Gnutella service provider that can go down and bring the whole world to a screeching halt. If, say, New York was hit by Dr. Evil, GnutellaNet probably wouldn't even notice. So you lose your "Gnutella friends" in New York. Big deal. It's unlikely that New York is the only place where people share the recipe for strawberry-rhubarb pie.

You don't have to stand around in your kitchen for the next three hours waiting for some geek to switch the DNS from GlobalCenter to Exodus. You just issue your query, and some guy in Texas jumps up and down and waves his Gnutella hands in the air and says, "Pardner, I've got a recipe for strawberry-rhubarb pie that'll have you salivating like a dog in heat."

### **Gnutella Can Withstand A Band of Hungry Lawyers**

Gnutella can withstand a band of hungry lawyers. How many realtime search technologies can claim that? Not Napster, that's for sure. Just to emphasize how revolutionary this is: hungry lawyers are probably more destructive than nuclear weapons.

There are a few things that will prevent Gnutella from being stopped by lawyers, FBI, etc. First, Gnutella is nothing but a protocol. It's just freely-accessible information. There is no company to sue. No one entity is really responsible for Gnutella.

Second, Gnutella is not there to promote the piracy of music. It's a *technology*, not a music-piracy tool.

The important thing is that Gnutella will be here tomorrow. It's reliable, it's sharing terabytes of data, and it is absolutely unstoppable.



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### **What's this "The RIAA Is Watching You" message about?**

Many people report seeing this message when performing a search. This is clearly the result of some moron who has hacked up one of the clients to return that in response to every search. Don't worry about it, they're just abusing the network. Ditto for any other similar messages.

### **Where Can I Find A Good Server To Connect to?**

Gnutella's peer-to-peer model uses no servers. Each person is an individual node in a network of computers. If you need a server please use the reflectors listed on the [main page](#) or in the topic of the IRC channel. If those don't work, try logging on to IRC and getting someone's IP address via your client's lookup command (usually /dns) – consult your client's documentation on how to do this if you're unsure. Please do not ask the entire channel for somebody that has an IP for Gnutella, as you will likely find yourself out of the channel very rapidly. Many people in #gnutella are running Gnutella or one of the third-party clients. The default port is 6346. Keep trying until you get one. Alternately, try downloading the gnutella.net file from the [File Center](#) and putting it in your gnutella directory, overwriting the existing one. This file is updated fairly regularly. You can also check out my Gnut [hosts list](#), which is relatively current.

### **What's the difference between incoming and outgoing connections?**

The fact that people ask this one mystifies me. The answer is very simple. One is incoming connections, the other is outgoing connections. For those of you still unclear on this concept, an incoming connection is where someone is connected to you. And outgoing one is where you're connected to someone else. Does matter what direction it is, data is passed both ways.

### **Will The Source Code Be Released, and if so, when?**

If all goes well and development of Gnutella continues you should see the source code during the 1.0 release. The source code has not been released yet and we are unsure at



this time if it will ever be released, due to AOL locking it in a closet underneath a large pile of Time Warner's dirty laundry.

**What does the "Speed" number mean?**

Oddly enough, this is asked numerous times a day on IRC. The speed setting reflects, oddly enough, the speed of the line on the remote end that returned the search. This is not automatically determined, and is set in the configuration on the client, and as such is rarely accurate.

**Where Are Settings Saved?**

Settings are saved when you shut down Gnutella and are saved in the GNUTELLA.INI & GNUTELLA.NET files in your Gnutella directory.

**Where Does The Name Gnutella Come From?**

The GNU in Gnutella comes from GNU, which is obvious. The other part, "Nutella", refers to a chocolate and hazelnut spread that is phenomenally popular among Europeans.

<http://www.ferrero.com.ar/productos/nutella/nutella.html>

**What Is Gnutella Written With?**

Microsoft Visual Studio

**Is it available for Linux?**

There are third-party Linux clients already available! Some of the Beta versions of Gnutella for Windows are reported to work with WINE.

**Is it available for Mac?**

There is a Java version that is reported to work nicely under MacOS.

**Do the file transfers go through the GnutellaNet?**

No. The GnutellaNet is used only for exchanging servant messages and performing searches. The actual transfer is done directly between servants via HTTP.

**How did you get the protocol specs?**

Some smart people analyzed the traffic, and reverse engineered most of it. Other parts were obtained from a conversation on IRC.

**I thought AOL pulled the plug at 0.48, so what's with these new versions? Who is producing them? Are they official? Are more coming?**

In the interest of protecting those involved, it can only be said that these versions are being produced by someone with access to the source code. No, of course they're not *official* in the GnuSoft sense, but they do come from a trusted source. I would certainly expect more versions, since we've already seen several materialize.

**What are those three comma-separated numbers in the info field after each connection? (S,R,D)**

Those (at present) represent the number of GnutellaNet messages sent, received, and dropped, to that host.

**How do I know what IP I'm downloading from?**

There is a column in the downloads window immediately to the right of the "Status" column. It is set to zero width by default, but it can be stretched.

**Why Does A Search For \*.mp3 Not Work Correctly?**

The \* is ignored. if you really, really want to search for all mp3's out there (we think you're nuts if you do, however), search for ".mp3". Or whatever extension your little heart desires.

**Is this program designed for exchanging copyrighted files?**

Gnutella is a tool for general peer-to-peer file sharing. It can be used to share spreadsheets, source code, design documents, really any file on your computer. Yes, it is possible to exchange illegal files. This is entirely the choice of the people sharing them. That is, after all, the beauty of freedom of choice. We do not condone or endorse the exchange and transfer of such files, and would like to point out that doing so is entirely at your own risk. The files you can find out on the GnutellaNet include recipes from Usenet's rec.food.recipes group, as well as files from the [Gutenberg Project](#).

**I'd like to run a Gnutella server. Who do I ask?**

There are no servers. This is a decentralized system that does not rely on central servers that can be shut down on a whim. If you want to be part of the network, download the Gnutella application, and fire away.

**I'm behind a firewall. Can I still use Gnutella?**

Certainly. If you're exchanging files with people outside your firewall, the other end of the transaction can't be firewalled. But you can also set up your own GnutellaNet within your firewall, simply by having others connect to each other. Please see the [firewalling document](#) for details on Gnutella and firewalls.

**How come when I try to download songs from Gnutella nothing happens?**

Usually if nothing happens, it's because the person who is hosting the files has recently renamed the files they are sharing and has forgotten to rescan the folders in which they are sharing the files, or is behind a firewall.

**I'm a parent concerned about pornography. Is this a haven for perverts?**

Given that gnutella is designed to share any type of files, it's quite likely that there are people sharing adult material. There is really nothing that can be done to stop this. However, the proportion of searches for adult material on gnutella is not significantly different from what you will find on the web at large. There are several people on the network actively trying to reduce the amount of "objectionable" material flowing across their systems.

**Doesn't gnutella expose me to virus attacks?**

No more so than downloading files from the Internet through any other means such as FTP, the Web, IRC, or Usenet. Use common sense and scan executable file using a current virus scanner with a recent list.

**What are dropped packets?**

A packet is "dropped" when the client at the other end of the connection is unable to keep up with the rate at which the data wants to flow. It's trying to drink from a fire hose. If you find that a particular client connection has a lot of dropped packets and that number doesn't stop growing, then you should close that client's connection because it's wasting your time and dragging the entire network down. That system isn't receiving much of the data it is supposed to, so it really doesn't need to be connected to you. Aggressively closing connections to clients which are dropping an unreasonably high number of packets benefits the performance of the network at large. To reduce the number of dropped packets that you receive check all the hosts you are connected to for dropped packets and remove any where the number is increasing rapidly.

**Does Gnutella automatically resume interrupted downloads?**

Whenever you close Gnutella and you have a file that was still downloading, it will resume where it left off upon restarting Gnutella. This doesn't always work, as the system you were downloading from may no longer be on the network.

**Does a search normally take a long time?**

The amount of time it takes for a search to complete depends on your speed and the speed of the others you are connected to. It takes time to traverse the GnutellaNet made up of many high and low speed connections. Give the search at least a few minutes.

**Why doesn't my search for <file> come up with anything?**

The most likely cause is that you searched for something nobody has shared out at the moment. But just to be sure, make sure you have at least one connection to the GnutellaNet, and that you can see more than one host.

**Since my IP address isn't sent along with my search, how do other Gnutella clients find out where to send the search results?**

Gnutella keeps track of all the IP addresses on the network along with each client's TTL and hops. Gnutella then matches up the TTL and hops from the search with the ones it has from all of its pings and sends it to the IP address it found.

**Is there anyway to stop or cancel a search?**

Since there is no point that can define the "end" of a search, it will keep accepting results until you start another.

**What's the best client to use?**

I have no idea what your needs are, and neither does anyone else. The best client is whatever works for you and meets your individual needs. Why don't you try one?

**Does anyone have <file> for me to download?**

Gnutella is a file search tool, so why don't you go search for what you're looking for with Gnutella? We're not your personal locator service, but if you still insist on having us find stuff for you, I'm sure we can accommodate you for a reasonable fee, just provide us with your billing information and credit card number, and we'll be glad to help.

**How many hosts should I connect to?**

If you're using a dialup connection, no more than two. Bear in mind that each connection uses up between 500 and 1000 bytes/second of bandwidth. If you're on a faster connection, four is a good number.

**Why are my downloads so slow With Gnutella?**

The speed of your file transfers has nothing to do with Gnutella itself, but rather the network connection between the two systems. The actual file download is a direct HTTP connection and would be no faster than if you used a web browser to the same system. Bear in mind you're quite likely not the only person downloading files from the system on the other end. If they're on a dialup, transfers will be slow.

**Should I be worried about the potential hazards of giving anyone access to my computer?**

The only files people can see are the ones you allow them to see. If you have important information in any of the folders that you are sharing then it would be best to move them to another folder. Gnutella only shares the folders which you specify - this can be changed in the configuration area of Gnutella.

**Gnutella Sucks! You're all a bunch of lamers!**

Nobody said you had to use Gnutella. Use whatever you like. We really don't give a damn about your holy war and aren't going to play your silly troll games.

**Will people only have access to my files when Gnutella is running or every time I am on the Internet?**

Whenever you have Gnutella open and you are connected to the internet and connected to some body on Gnutella then the people who you are connected have access to the files you are sharing on the network. You have to be connected to the internet and to a Gnutella host in order to share files with your neighbors.

**If people are downloading from me will this slow down anything else I'm doing on the Internet?**

Whether or not you have a fast enough connection will determine if anything else is slowed down because of Gnutella. In fact, Gnutella does take up quite a lot of bandwidth and if you have a slow connection the most likely your other connections to the internet (whether it be via WWW,FTP, ect..) will suffer.

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Please read the section of the site about what exactly Gnutella is.

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Ok, so maybe you've already downloaded Gnutella and maybe you're not quite sure how to use it. I don't blame you. At first glance, yeah, it might seem like something for the techie but once you learn how to use it'll be a tool you'll use everyday.

**How To Download**

Click on the Download section after you've gone to <http://gnutella.wego.com/>. Download the latest version, which should be listed first.

- Hit that link and choose to **Save File**.
- Once you have downloaded it double-click on the file and install it using the install program, which should take you step by step through the installation process. See: [How To Install](#).

**How To Install**

If you are prompted with the install program leave the type of install as normal and hit next. At this point you will be asked to choose a directory to install the program in. The default is "c:\Program Files\gnutella". This screen will also tell you if you have enough room to install Gnutella, after you have specified a directory hit next and the files will be installed. After you have installed Gnutella you will have shortcuts on the desktop, and the start menu. Hit one of these shortcuts and Gnutella will be launched.

**How To Uninstall**

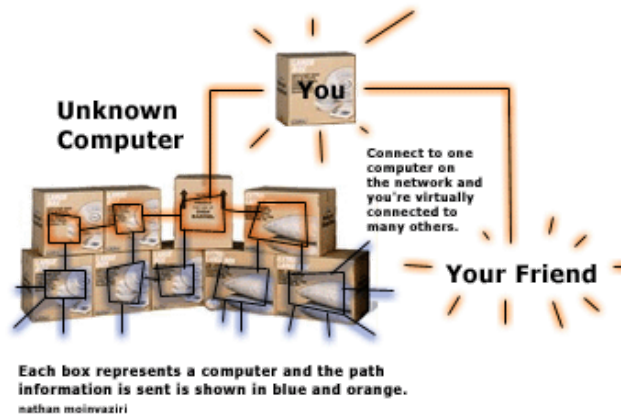
There is no uninstall program for Gnutella, which means that you'll have to delete

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Gnutella manually. Gnutella saves none of its settings in the registry so there should be no problem there. All you need to do is delete the folder where you installed Gnutella. For most people they would goto My Computer, then to Program Files and delete the Gnutella folder they see. If you didn't install it in the default directory, you're not going to find it here.

## How Gnutella Works

Before we start, we need to get some things clear. For one, Gnutella doesn't use servers to connect to like Napster or CuteMX. You connect to one person on the network, by entering their IP in the IP text box and that connects you directly to that one person on the network. When you search, though, it will do a recursive search throughout the network starting with that one person you are connected to.



As you can see the box that says, "You" connects to another box or computer. "You" is directly connected to that box and indirectly connected to all of the other boxes. When a search is done, "You" send the search to the box it is directly connected to, and that box sends the search to all the boxes it is connected and so on and so forth.

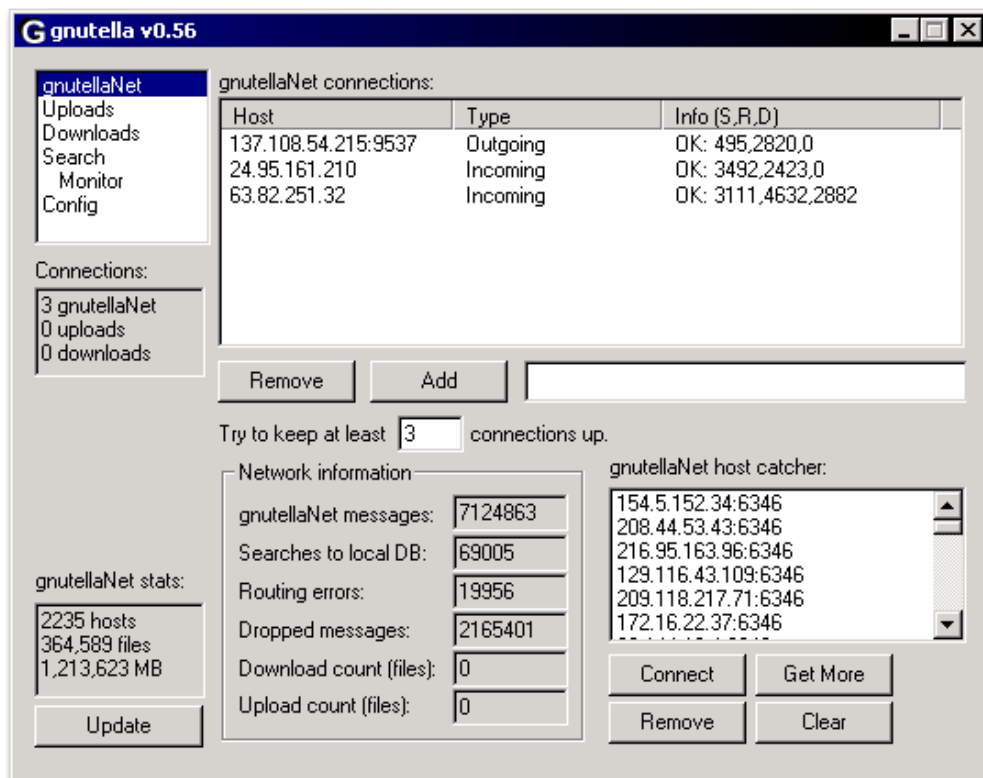
### *For Techies*

Gnutella is a peer-to-per network. Each person on the network is considered a hub.

In other terms, everybody on the network is a client and a server.

## Let's Get Started

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### Just Tell Me How To Get Connected!

When you first load up Gnutella, it doesn't automatically connect to any servers or anything which is why you have to find somebody to connect to before you can start search for files and downloading them.

First thing you need to do is find one of the computers on the network. You need to at least have the [IP](#) of the computer that is on the network.

You would enter IP address in the format as shown below:

*IP : Port*

findshit.gnutella.com:8015 and 24.15.16.29 are examples.

If you are connecting to somebody on the default port (6346) then you don't need to add ':6346'

The IP addresses listed in this tutorial page probably won't work for you. [To get an IP](#) on the network you might want to check out this page. You can download the gnutella.net file listed there and put it in your Gnutella directory. IP addresses are also often up at the main gnutella page, <http://gnutella.wego.com/>. Don't give up on the first IP address that you try, it may take several tries before you actually get connected to any part of the network. If you can't seem to find any IP addresses there you might want to check out the channel topic on #gnutella on the EFnet IRC network (use [mIRC](#) if you don't have a windows IRC client).

### Interface Rundown

When you first look at Gnutella for Windows it may appear not appear to be the powerful program that it is, but Gnutella covers a good range of functionality. The upper left-hand corner contains the tabs GnutellaNet, Uploads, Download, Search, Monitor, and Config.

Feature	Function
<b>GnutellaNet</b>	The main screen it shows your connected hosts, network information, host catcher, and a text box to add servers

<b>Uploads</b>	Shows what people are downloading from you and their download progress
<b>Downloads</b>	Shows you are downloading and your download progress
<b>Search</b>	Where you search for files to download. You must be connected to somebody in order to download or even search for files to download
<b>Search Monitor</b>	In this screen you can see what people are searching for. <u>NOTE: THE SEARCH MONITOR IS NOT FOR CHATTING.</u>
<b>Config</b>	Where you can change the options relating to the way that your Gnutella client functions

### Techie Explanation Of The Interface

Next lets start by going over the picture above and what it means to you.

List	Definition of Contents
<b>Connection List</b>	This is the list of people you are directly connected to
Header	Definition of Contents Under The Header
<u>Host</u>	IP of computer you are connected to
<u>Type</u>	Type of connection. If you add an IP to your connection list the type is considered outgoing and the other way around is an incoming connection.
<u>Info</u>	Packets <b>S</b> ent, Packets <b>R</b> eceived, Lost/ <b>D</b> ropped Packets

List	Definition of Contents
<b>Connection Stats</b>	This is the list of people you are directly connected to
Header	Definition of Contents Under The Header
<u>gnutellaNet</u>	Number of direct connections you have open
<u>Uploads</u>	Number of uploads in progress
<u>Downloads</u>	Number of downloads in progress

List	Definition of Contents
<b>GnutellaNet Stats</b>	Contains information on network you and your connections make
Header	Definition of Contents Under The Header
<u>Hosts</u>	Number of direct connections and the number of the direct connections' connections. This makes up your network.
<u>Files</u>	Number of files in the network
<u>MB</u>	Size of files in the network
<u>Ms Avg. Ping</u>	Average ping time in milliseconds to all the Hosts in the network

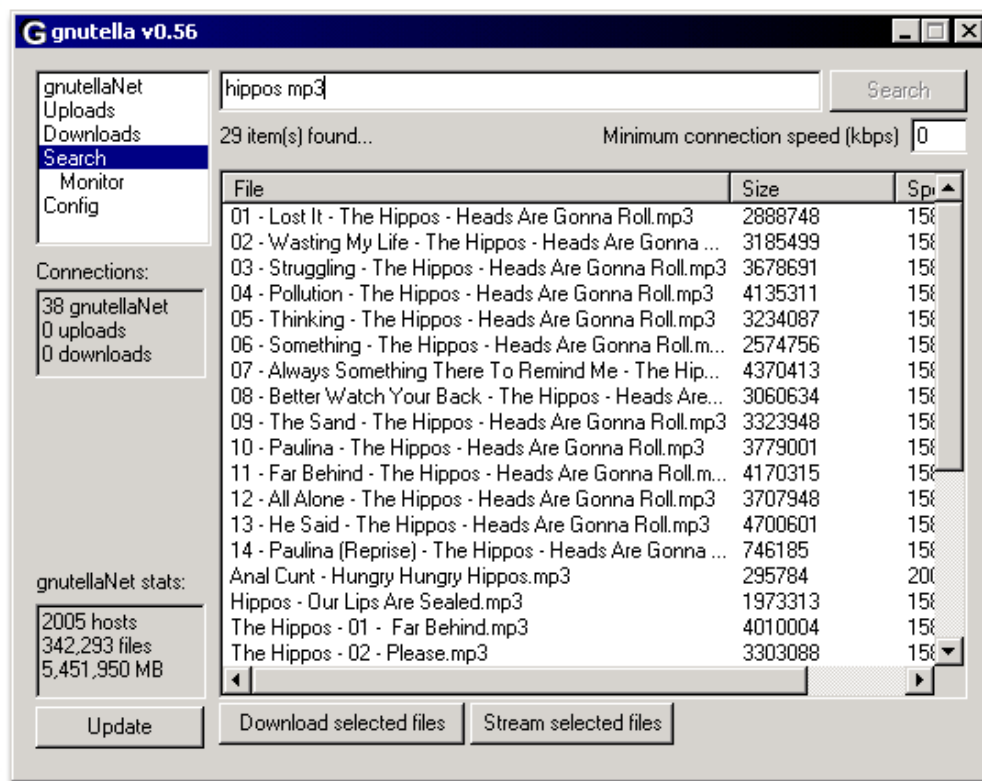
Feature	Function
<b>Add/Remove Button</b>	Adds or removes an IP from your connections list.



<b>Keep # Connections Up</b>	How many connections to other computers Gnutella should try to keep open. If this number is lower than the number of connections Gnutella has open then Gnutella adds hosts from the <i>Host Catcher</i> list and tries to connect to them.
<b>Host Catcher</b>	When your stats are updated or information is sent from one computer to another in which an IP is required to send the data, the IP is added to this list. When Gnutella is then in need of hosts to connect to it uses the IP addresses in this list.

## How To Search

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Again, you have to be connected to somebody for searching to work. (See [Just Get Me Connected!](#))

To search for anything on the network just enter what you are search for in the search text box and press the 'Search' button.

The search button works like the button on an elevator. No matter how many times you search for the same thing over and over, it will not make the searching go any faster than it is.

If you are not getting as many search results as you would like, try connecting to another computer on the network which will allow you to connect to even more computers on the network. Dialup users shouldn't connect to more than 1 or 2 other peers, and high-bandwidth users should limit themselves to 10 connections. Too many connections will consume all your available bandwidth (each one uses 500-1000 bytes/second) and cause dropped packets due to redundancy on the network. Also make sure you have more than 1 host in the Gnutella stats on the side screen. You need to press 'update' to manually check how many people you are direct and indirectly connected to.

### Searching Tips

Most of the time if you want to search for file types other than mp3's then you'll need to specify the file type as shown above.

- Periods and wild cards and Regular Expressions are not supported
- Search terms also look in a file's pathname
- Errors on uploads/downloads either because of firewall/proxy or routing to other system
- \*.AVI is the same as AVI
- Search terms are separated by spaces and wild cards and periods are converted to spaces on the remote computer when searching

When you do a search using Gnutella, it searches the files of everybody you have in your list and searches each one of their lists as well for what you're looking for. This is what you call the hosts.

### Limiting Searches

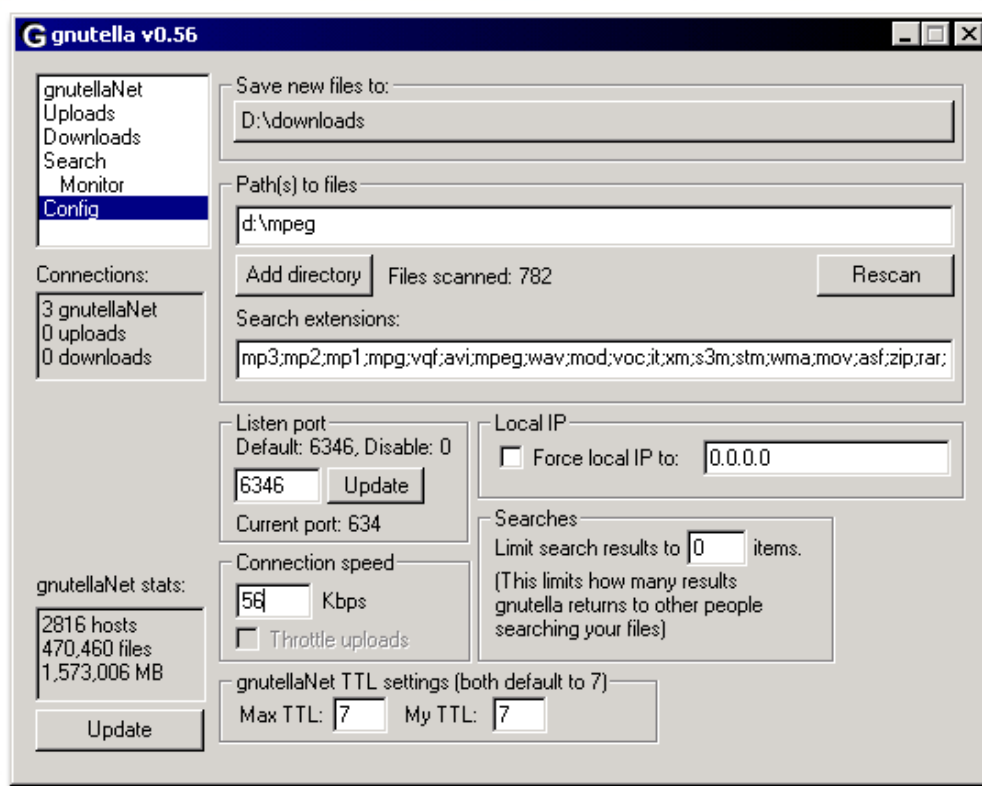
There are a few ways to limit searches. One way is by using the Minimum Connection Speed (kbps) as shown in the graphic above. The Minimum Connection Speed will only search people who are higher than the speed that you've specified.

### Techie Explanation Of The Interface

Feature	Function
<b>Stream Selected Files</b>	This only works for MP3 files and you must have WinAMP to begin with. All this does is put the MP3 file name in your WinAMP playlist so that you can list to the song as it downloads.
<b>Download Selected Files</b>	Downloads the selected files. You can see the progress of all downloads in the Download screen

### Client Configuration

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Feature	Function
<b>Save New Files To</b>	AKA <i>Your Download Directory</i> . Specifies the directory in which all files that are downloaded will be placed. Click on the button to change the directory.
<b>Add Directory</b>	Adds a directory to the list of shared folders. You have to press

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<b>Button</b>	'Rescan' before files in any new directories are shared.
<b>Rescan Button</b>	Sets the Files Scanned property at 0 and starts to scanning each one of the shared folders for files of all types. When it is done Files Scanned will show how many files you are sharing in the directories scanned.
<b>Path(s) To Files</b>	AKA <i>Your Shared Folders</i> Specifies the folders that are scanned and then shared to the outside world! Each directory path is separated by a semi-colon.
<b>Search Extensions</b>	When you do search for something, only files with the file types specified here, will be shown. Notice that each file type does not include a period at the beginning, and that each one is separated by a semi-colon.
<b>Searches (Limit search results to...)</b>	This does not limit the number of results you get when you search for something, but only limits the number of results Gnutella returns when other people are searching through your files.
Word	Definition
<b>Listen Port</b>	Port in which people connect to you.
<b>Time To Live</b>	Number of computers a single packet goes through before it is stopped
<b>Connection Speed</b>	Your connection speed in KBPS
<b>Files Scanned</b>	Number of files you are sharing

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[Gnutella Website Support](#)



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file sharing for a new generation



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Since April 10th, 2000

## View What's New Pages

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### WHAT'S NEW What's new with Gnutella

#### What's New

#### June 11, 2000

Nathan - Changed the picture up top on the webpage along with the color of the webpage. Also added a few more pictures to the [Promote Gnutella](#) section on the page.

#### June 7, 2000

Nathan - Added a new client called Gnewtella to the [Third-Party](#) section of the website. I've gotten tons of pictures for the Promote Gnutella section of the website. I get like 2 a day. I'm thinking as what I should do now, cause It will take a while to get all the pictures up.

#### June 1, 2000

Cody - Hello All, not a whole lot going on in the world of Gnutella right now. We are working hard on the next release of our own little client for Unix GnuBile. Looks for a new UI and many bug fix's soon.

#### June 1, 2000

Nathan - I'm in Seattle, Washington now. I haven't had time to make the much needed changes to the website. There has been a Macintosh gnutella clone added to the third-party section. This is the first Macintosh client/clone that does not require the Java runtime files I believe. In the coming weeks I hope to get the site to the point where we don't get anymore annoying e-mails of people asking us, "How do I download?", which means revisions of the Tutorial. If you have information that you think needs to be added please [e-mail](#) me.

#### May 25, 2000

We hit the 1,000,000 mark for unquie hits on our website. Took us 45 days or 1 & 1/2 months to achieve this mark.

#### May 24, 2000

Nathan - Added a new client/clone to the [Third-Party](#) area, which is our first BeOS clone.

#### May 23, 2000

Nathan - Changed some of the wording on the side bar to make it more specific as to what everything was. Changed the [FAQ](#) page so that you can find answers to your questions on certain topics more easily. Changed some of the font and layout of some of the dev pages to match with the rest of the site. Added two new clients to the [Third-Party](#) area. Updated the [Download](#) page so it has those cool 3d tables and made it so it is easier to find which version YOU should download. Also, added two new images to the [Promote Gnutella](#) section of the website!

#### May 21, 2000

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Gnutella was featured on [ABC World News Weekend](#) today. Congratulations to all the developers and users who have taken Gnutella this far!

**May 19, 2000**

Nathan - Changed the main graphic for the top of the page. E-mail [me](#) and tell me what you think of the new graphic. Also switched the graphical buttons on the side back to their original yellow color. The buttons got messed up during a server move or something or rather. Also changed the color of everything to a little funkier blue.

**May 18, 2000**

Added a graphic to the [Promote Gnutella](#) section.

**May 17, 2000**

Nothing major to report, really. Gnutella is growing every day, and the network just gets better and more usable. Client software is improving, and we get client software submissions almost daily. Thanks to all of you for sticking through the thick and thin.

**Older stuff**

Got this from Kurt Nimmo. Totally funny [Flash animation about Metallica vs. Napster](#).

Got this from [Slashdot](#). Looks like the FTC has found that you and I have overpaid \$480 million for CD's.

Not much here yet, but we'll fill this page with the new day-to-day.

Just added: [mailing lists for all Gnutella client software](#). Tell the authors what you think of their software. Contribute to its development. And learn from others.

[FRiEDCAT](#) has released 1.1b of his great-looking software [N-Tella](#). Sources close to FRiEDCAT tell us he is working hard on getting the bugs out of N-Tella, so we should soon see a functional and beautiful piece of software. We've got 1.1b [mirrored here](#).

And, we're keeping Gnutella in the news! Check out the [press room](#).

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Client Software : Gnutella

**Official Releases**

Name	D/L	Version	Comments
Gnutella		0.56	97KB TTL issue resolved
Gnutella		0.50c	101KB 100% CPU Usage At Times Memory Leak? Download Problems Incorrect Search Result # Found?
Gnutella		0.49	100KB GPF Errors When Certain Packets Sent
Gnutella		0.45	100KB

**Specially Modified**

Name	D/L	Version	Comments
Gnutella Brokkolo		0.56	93KB Modified by <a href="mailto:brokkolo@operamail.com">brokkolo@operamail.com</a> for improved aesthetics.
Gnutella BR2		0.56	53KB In Brazilian-Portuguese. Modified to have a bigger window. Updated 18 May 2000.
Gnutella France		0.56	128KB Now in French. Take a look at the <a href="#">website</a> , also in French.
Gnutella Wieman		0.56	104KB Modified to have a bigger window. ONLY WORKS CORRECTLY AT 1024x768 RESOLUTION.

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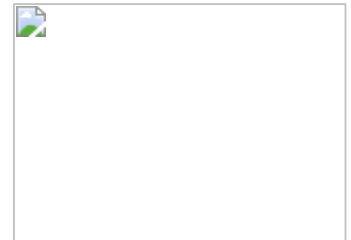
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GUEST : [LOG IN](#) | [JOIN GROUP](#)[Back to all pages](#)**DEVELOPERS' CORNER**[Index](#) | [Scaling GnutellaNet](#) | [Windows GUID and PUSH](#) | [Protocol](#) | [The Daily Spam](#)**Development : Index**

Chat with the people who make Gnutella happen in the #gnutella and #gnutelladev channels on [Efnet IRC](#). The Gnutella Working Group is open at <http://gnutelladev.wego.com>. All developers should join and participate so we can all know what we all need to do to make GnutellaNet continue to thrive. And, if you're interested in working on the Next Generation Gnutella Protocol, join the GnutellaNG Working Group at <http://gnutellang.wego.com>.

Sign up for the [Gnutella Developers Mailing List](#)

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# GnutellaDev

*It's all about the Gnutelliums*

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PROTOCOL  
Gnutella/0.4 protocol

# The Gnutella protocol

Last update: 15 April 2000

Updated PUSH request routing instructions. Please comment. [gene@wego.com](mailto:gene@wego.com)

## Notes

Everything is in network byte order unless otherwise noted. Byte order of the GUID is not important.

Apparently, there is some confusion as to what "\r" and "\n" are. Well, \r is carriage return, or 0x0d, and \n is newline, or 0x0a. This is standard ASCII, but there it is, from "man ascii".

Keep in mind that every message you send can be replied by multiple hosts. Hence, Ping is used to discover hosts, as the Pong (Ping reply) contains host information.

Throughout this document, the term server and client is interchangeable. Gnutella clients are Gnutella servers.

Thanks to capnbry for his efforts in decoding the protocol and posting it.

## How GnutellaNet works

### General description

GnutellaNet works by "viral propagation". I send a message to you, and you send it to all clients connected to you. That way, I only need to know about you to know about the entire rest of the network.

A simple glance at this message delivery mechanism will tell you that it generates inordinate amounts of traffic. Take for example the defaults for Gnutella 0.54. It defaults to maintaining 25 active connections with a TTL (TTL means Time To Live, or the number of times a message can be passed on before it "dies"). In the worst of worlds, this means  $25^7$ , or 6103515625 (6 billion) messages resulting from just one message!

Well, okay. In truth it isn't that bad. In reality, there are less than two thousand Gnutella clients on the GnutellaNet at any one time. That means that long before the TTL expires on our hypothetical message, every client on the GnutellaNet will have seen our message.

Obviously, once a client sees a message, it's unnecessary for it to process the message again. The original Gnutella designers, in recognition of this,

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engineered each message to contain a GUID (Globally Unique Identifier) which allows Gnutella clients to uniquely identify each message on the network.

So how do Gnutella clients take advantage of the GUID? Each Gnutella client maintains a short memory of the GUIDs it has seen. For example, I will remember each message I have received. I forward each message I receive as appropriate, unless I have already seen the message. If I have seen the message, that means I have already forwarded it, so everyone I forwarded it to has already seen it, and so on. So I just forget about the duplicate and save everyone the trouble.

## Topology

The GnutellaNet has no hierarchy. Every server is equal. Every server is also a client. So everyone contributes. Well, as in all egalitarian systems, some servers are more equal than others. Servers running on fast connections can support more traffic. They become a hub for others, and therefore get their requests answered much more quickly. Servers on slow connections are relegated to the backwaters of the GnutellaNet, and get search results much more slowly. And if they pretend to be fast, they get flooded to death.

But there's more to it than that.

Each Gnutella server only knows about the servers that it is directly connected to. All other servers are invisible, unless they announce themselves by answering to a PING or by replying to a QUERY. This provides amazing anonymity.

Unfortunately, the combination of having no hierarchy and the lack of a definitive source for a server list means that the network is not easily described. It is not a tree (since there is no hierarchy) and it is cyclic. Being cyclic means there is a lot of needless network traffic. Clients today do not do much to reduce the traffic, but for the GnutellaNet to scale, developers will need to start thinking about that.

## Connecting to a server

After making the initial connection to the server, you must handshake. Currently, the handshake is very simple. The connecting client says:

```
GNUTELLA CONNECT/0.4\n\n
```

The accepting server responds:

```
GNUTELLA OK\n\n
```

After that, it's all data.

## Downloading from a server

Downloading files from a server is extremely easy. It's HTTP. The downloading client requests the file in the normal way:

```
GET /get/1234/strawberry-rhubarb-pies.rcp HTTP/1.0\r\n
Connection: Keep-Alive\r\n
Range: bytes=0-\r\n
\r\n
```

As you can see, Gnutella supports the range parameter for resuming partial downloads. The 1234 is the file index (see HITS section, below), and "strawberry-rhubarb-pies.rcp" is the filename.

The server will respond with normal HTTP headers. For example:

```
HTTP 200 OK\r\n
Server: Gnutella\r\n
```

```
Content-type:application/binary\r\n
Content-length: 948\r\n
\r\n
```

The important bit is the "Content-Length" header. That tells you how much data to expect. After you get your fill, close the socket.

#### Header

bytes	summary	description	
0-15	Message identifier	This is a Windows GUID. I'm not really sure how globally-unique this has to be. It is used to determine if a particular message has already been seen.	
16	Payload descriptor (function identifier)	<b>Value</b>	<b>Function</b>
		0x00	Ping
		0x01	Pong (Ping reply)
		0x40	Push request
		0x80	Query
		0x81	Query hits (Query reply)
17	TTL	Time to live. Each time a message is forwarded its TTL is decremented by one. If a message is received with TTL less than one (1), it should not be forwarded.	
18	Hops	Number of times this message has been forwarded.	
19-22	Payload length	The length of the ensuing payload.	

#### Payload: ping (function 0x00)

##### No payload

#### Routing instructions

Forward PING packets to all connected clients. Most other documents state that you should not forward packets to their originators. I think that's a good optimization, but not a real requirement. A server should be smart enough to know not to forward a packet that it originated.

A cursory analysis of GnutellaNet traffic shows that PING comprises roughly 50% of the network traffic. Clearly, this needs to be optimized. One of the problems with clients today is that they seem to PING the network periodically. That is indeed necessary, but the frequency of these "update" PINGs can be drastically reduced. Simply watching the PONG messages that your client routes is enough to capture lots of hosts.

One possible way to really reduce the number of PINGs is to alter the protocol to support PING messages which includes PONG data. That way you need only wait for hosts to announce themselves, rather than discovering them yourself.

#### Payload: pong (query reply) (function 0x01)

bytes	summary	description
0-1	Port	IPv4 port number.
2-5	IP address	IPv4 address. <b>x86 byte order! Little endian!</b>
6-9	Number of files	Number of files the host is sharing.
10-13	Number of kilobytes	Number of kilobytes the host is sharing.



**Routing instructions**

Like all replies, PONG packets are "routed". In other words, you need to forward this packet only back down the path its PING came from. If you didn't see its PING, then you have an interesting situation that should never arise. Why? If you didn't see the PING that corresponds with this PONG, then the server sending this PONG routed it incorrectly.

**Payload: query (function 0x80)**

bytes	summary	description
0-1	Minimum speed	The minimum speed, in kilobytes/sec, of hosts which should reply to this request.
2+	Search criteria	Search keywords or other criteria. NULL terminated.

**Routing instructions**

Forward QUERY messages to all connected servers.

**Payload: query hits (query reply) (function 0x81)**

bytes	summary	description												
0	Number of hits (N)	The number of hits in this set. See "Result set" below.												
1-2	Port	IPv4 port number.												
3-6	IP address	IPv4 address. <b>x86 byte order! Little endian!</b>												
7-10	Speed	Speed, in kilobits/sec, of the responding host.												
11+	Result set	There are N of these (see "Number of hits" above). <table><tr><th>bytes</th><th>summary</th><th>description</th></tr><tr><td>0-3</td><td>Index</td><td>Index number of file.</td></tr><tr><td>4-7</td><td>Size</td><td>Size of file in bytes.</td></tr><tr><td>8+</td><td>File name</td><td>Name of file. Terminated by double-NULL.</td></tr></table>	bytes	summary	description	0-3	Index	Index number of file.	4-7	Size	Size of file in bytes.	8+	File name	Name of file. Terminated by double-NULL.
bytes	summary	description												
0-3	Index	Index number of file.												
4-7	Size	Size of file in bytes.												
8+	File name	Name of file. Terminated by double-NULL.												
Last 16 bytes	Client identifier	GUID of the responding host. Used in PUSH.												

**Routing instructions**

HITS are routed. Send these messages back on their inbound path.

**Payload: push request (function 0x40)**

bytes	summary	description
0-15	Client identifier	GUID of the host which should push.
16-19	Index	Index number of file (given in query hit).
20-23	IP address	IPv4 address to push to.
24-25	Port	IPv4 port number to push to.

**Routing instructions**

Forward PUSH messages only along the path on which the query hit was

delivered. If you missed the query hit then drop the packet, since you are not instrumental in the delivery of the PUSH request.

**Need some feedback on this one.**