



By Saikat Basu

The Things I Do

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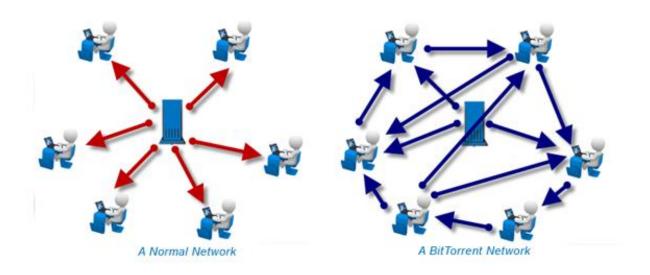
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BitTorrent - It's Just a Simple Way to Share Files

Even God couldn't have done it better. The virtue of sharing with our fellow man has been preached, but perhaps not practiced as often as He would have liked. Thankfully, the World Wide Web came along to change all that. The internet zips and zaps across borders bringing information at our fingertips. From restricted bits of data to a free for all exchange of entire files, the outbreak of file sharing has been as swift as it has been widespread.

Most of us are more familiar with more conventional forms of file sharing such as email and FTP. BitTorrent is just another file sharing protocol (a set of rules on how to do things) we can use. Email and FTP rely on one computer *hosting* the file and transmitting it to another connected computer. BitTorrent introduces a major difference – the hosting and the downloading is spread out over many computers using a technology called *Peer-to-Peer*. We can use BitTorrent to share or download any type of files – .exe, mp3, AVI, Jpeg, and Doc etc.



Hey, stop the muddles before they come on...it's not terribly complicated. Here's a likeness of how BitTorrent works...

There is a book I want to read but I have only one chapter with me. I look around and find a friend who has a few more chapters. It still isn't a complete book, so we search for few more guys around the block who might have the remaining pages. We find a bunch of guys and though nobody has the complete book, we share the chapters amongst each other till all of us get a copy of the complete book one by one.

On the internet the 'book' becomes our file, which is broken up into little pieces or *bits*. Each of us has at least one and we download and share these 'bits' till we have the entire file. Each piece one of us downloads is available to all the others for upload. Thus we all share rather than placing the onus on one computer to host the file and distribute it.

It's pretty simple really. An introduction to a few jargons will take you one step closer to loving BitTorrents.

Let's come to terms with some Torrent lingo

Torrent – At the beginning of all this is the torrent file itself. The .torrent file is not the entire file...it is extremely small and it just contains the information that points to the actual file and the people who are sharing it. It is like a map which is used by the BitTorrent client to assemble all the pieces together.

BitTorrent client – A Bit Torrent client is one of the most important parts of the torrent process. It is a piece of software which takes the .torrent file, reads the information in it and starts the download.

Peer - A peer is any computer participating in the download and upload of a torrent file.

Seeder - A seed (or seeder) is anyone who has a complete copy of the file being shared across the torrent network.

Leecher - A leech (or a leecher) is the person who does not have the complete file yet but has joined the network to download it. A leecher becomes a seeder when he downloads the entire file and then shares it across the network.

Share ratio – The ratio is the amount of data a user has uploaded divided by the amount of data they have downloaded for a particular torrent (UL÷DL). A share ratio of 1+ has a positive effect on the user's reputation because it means that the user has sent more data to other users than he has received. Conversely, share ratios under 1 have a negative effect.

Swarm – The swarm is the sum total of all the leechers and seeders (i.e. all the computers) participating in the torrent process.

Tracker – The tracker is a server which has the information of who has what files and who needs which ones, thus acting as a bridge between seeders and leechers. Some trackers are private requiring a registration where most are public.

Index – An index is, as the name implies, a searchable list of .torrent files, hosted on a website.

Be savvy about copyright laws

As you scroll deeper, you will see the potpourri that you can lay your hands on using torrents. From a Word file to cheat on your assignment to the entire series of The Simpsons...if it's there, you can get your hands on it. The world of digital distribution can often be seen clashing with copyright laws. Peer to Peer file sharing is completely legal but using it to obtain copyrighted content is not. In some country's it's okay to download (use) material for personal use but distribution makes it a punishable offence. With torrents, the water gets a bit muddied because the protocol makes everyone a downloader as well as a distributor.

There have been numerous cases where torrent trackers which index the torrents available have been shut down for infringing some country's laws. Organizations like the Recording Industry Association of America (RIAA) and the Motion Picture Association of America (MPAA) have become proactive against many of them, because it represents a source of piracy.

Remember, downloader's can be pinpointed by their IP addresses so the cloak of anonymity is not there to hide behind.

The safest course of action is to follow the copyright laws as laid down. Browse to the copyright policy link of the respective tracker website; the better ones have it.

For instance, here is a snapshot of Mininova.com's copyright policy.



- You are, or your company is, the copyright holder of the content in question.
- You provide the exact URLs to the torrents, no complete (sub)categories or search queries.
- You provide the complete name(s) of the content in question.
- You send the removal request using a verifiable email address (e.g. address@yourname/yourcompany.com).

If your request complies with all of these rules, send a mail to copyright@mininova.org. Please keep the correspondence polite.
We remove postings as soon as we can, usually within 48 hours. Keep in mind that we can only handle removal requests that comply with the above rules.

If you are unsure about the rules laid down, look for material which falls under the umbrella of unlicensed content or under a General Public License like Creative Commons.



Getting Started

You have just opened the barn door. Now let's jump in and get our hands a bit dirty. Let's lay our hands on a good torrent client, set it up and download our first file.

Prepping up

Life on the BitTorrent lane gets easier if we have a good client to do the job for us. A good place to get acquainted with the whole shebang is the <u>List of BitTorrent</u> clients on Wikipedia. Or you could directly go for the oft favored ones like <u>uTorrent</u>, <u>Vuze</u> (formerly Azureus) or the <u>BitTorrent</u> client itself. All are free, lightweight and cross platform (for all operating systems).

Make sure you have the latest updated version. For the sake of clarity and convenience, the screenshots here on will depict μ Torrent running on **Windows XP SP3**, although this should be more or less the same on other operation systems.

The download...and the installation

At 266KB, µTorrent downloads in a blink. If you are installing µTorrent for the first time, just follow the screenshots. Installations of the other BitTorrent clients are also similar.

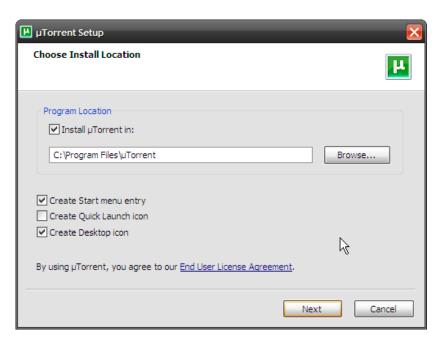
1. When you click on the downloaded installer, your operating system might ask for your permission to install the file. This screen might differ in Vista, Mac OS X or Linux.



2. The second screen recommends downloading the software from the parent site itself to prevent malware.



3. The final screen completes the setup by asking for the location where you want to install the file.



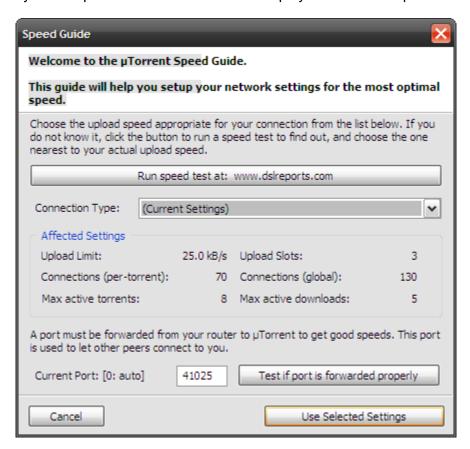
That's it! You have just installed your first BitTorrent client. Now, let's take a peek inside and do some post-installation stuff before we begin our first torrent download.

Gearing up the torrent client

A torrent client is no different from any other software. You can take it out 'straight from the box' and run it. Or for better results you could change a thing here and there to give it a smoother run.

Fortunately, µTorrent makes this very easy for the beginner. Here are the basic steps -

1. When you start µTorrent for the first time it helps you out with a Speed Guide.



The speed guide helps you to choose your correct *upload speed*. If you are not aware
of your connection's upload data transfer speed, μTorrent lets you run speed tests
from **DSLReports** website. Connect to the site by pressing the



3. Select a setting close to your obtained upload rate using the *Connection Type* dropdown.

When μ Torrent runs for the first time, a port is automatically selected for you. A port is where your computer receives the communication signals from the outside network. To check whether this port is open to signals, click on the



Note: We'll tell you how to open these ports further on in the guide.



- 4. That's it. Click on the *Use Selected Settings* button and you are ready to begin.
- 5. If you want to recheck your upload speed, you can also run the speed test from the μ Torrent toolbar Options Speed Guide.

The basic configuration done with, it's now time to hit the trail towards out first download.



On the trail of our first torrent download

Downloading a torrent file is not any different from the normal downloading we do daily on the web. Though we can use a search engine like Google and download a torrent file from anywhere, it's better to use a website which acts as a storehouse of torrent files. Such sites have a searchable index of torrents and therefore we call them indexes. These sites are just storehouses for .torrent files and usually don't create any of the content available. Going to a reliable torrent site also lets us avoid the pitfalls of downloading a corrupted file or even worse, a malicious virus. A good torrent website filters out the undesirable and hosts clean .torrents.

The recommended ones are -

<u>PirateBay</u> – By its sheer size it is probably the most popular site in the torrent world with nearly 3.5 million users. The torrents also have little icons labeling them which say whether the torrents are from VIP users or trusted users. This reputation management serves as a mark of quality assurance. In their fight to bring the best they are constantly facing lawsuit threats; check out the <u>Legal Threats</u> link at the footer.

<u>Mininova</u> – It enjoys a very good reputation of filtering out junk torrents. It is also one of the oldest torrent sites out there and definitely one of the cleanest sans any objectionable ads. If you have to restrict yourself to just torrent sites, then these two do the job.

<u>Vertor</u> – In your continuing hunt to find clean, virus free and quality torrents, Vertor is a good place to stop by. Vertor separates itself from the herd by providing snippets of the file you are about to download. This helps to confirm the torrent as safe for download. Vertor by the way is a truncated 'Verified Torrents'.

<u>Demonoid</u> – This site, though amongst the best, has one shortfall – you need to register for a free account. The registrations are only open for some time and you require an invitation to get into Demonoid. If you manage to get an account you will see why this is one of the best. Being a restricted circle, it has a strict usage policy.

Isohunt – Another premier torrent website, but typically caught in a legal wrangle.

If you care for more narrowed down results, here are some more search engines...

<u>Legit Torrents</u> and <u>Legal Torrents</u> list only torrents which are in the public domain and thus 100%legal.

Public Domain Torrents does the same for movies in the public domain.

<u>Etree</u> is a musician's delight with torrents of free, legal concert recordings.

<u>Sugarmegs</u> is another musical stopover if you miss any torrent at Etree.



Meta-search engines

Then there are the torrent meta-search engines, which basically search a bunch of torrent sites in one go and bring together all the results in one page.

<u>Torrentscan</u> – Select a torrent site from a long list and use Torrentscan's webpage to scout out your torrent.

<u>Torrent-Finder</u> – Search 172 torrent sites and trackers with this multi-search engine.

<u>Torrentz</u> – A simple no fuss torrent meta-search engine.

The number of torrent sites reflect the popularity of the protocol. And of course, there are the regular search engines like Google too, where you can search with a "torrent" query.

So let's get down and show you how it all comes together...

Hop over to any of the torrent sites and search for your desired torrent file.
 Remember, a torrent file is nothing but a small 15 – 100Kb sized file which points to the contents of the whole file and the people in the *swarm*. These .torrent files are uploaded by torrent sharers around the web.



2. Click on the desired file (or any download link) to download the file to your computer. The small file sizes will take up just 5-10 seconds of your time.



OpenOffice.org 3.0.1 Win32Intel install en-US exe



3. Browse to your saved .torrent file and double click it to open the file with your torrent client (e.g. µTorrent). You can also use the menu of the software to add the .torrent file for download. Or alternatively, drag and drop the .torrent file into your software window.



- 4. Now, your software begins the download by first connecting to the tracker server to find out who else is downloading the same file and which bits they have.
- 5. The tracker server identifies the users participating in the share and labels them as either seeders or leechers. Look for a torrent with a higher number of seeders. The ratio of seeders to leechers is the share ratio and a higher figure makes for a healthier (and faster) torrent.
- 6. The download begins it starts slowly, don't be alarmed. Gradually the speed picks up as the swarm increases.



The time to complete the download will of course depend on the file size, the speed of your connection and the quality of the swarm. After your download finishes, you may enjoy the file you just got. Now after all that hard work if you are thinking of deleting the leftover .torrent file and closing the client software just pause here. This single selfish act is known as a 'hit and run' in the torrent community and is a cardinal sin of the torrent world.

How to be a good member of the torrent community?

The real world harbors hit and runners. The torrent community calls them leechers. Strictly speaking a leecher is one who does not have a complete copy of a particular file yet. A leecher turns into a seeder only when he starts sharing his copy with the rest of the swarm. Unfortunately, the term has also come to symbolize those users who download without uploading i.e. take but not give back to the swarm. To avoid this name calling follow the cardinal rule –

After your download finishes, leave your Torrent client software running for at least three hours, or until you have uploaded as much as you have downloaded. Sometimes it may not be possible to follow this rule but it is important to get close to it.

Tip: Do your downloading at night so that by the time you wake up you have downloaded your file and you would uploaded your share too.

A little note on torrent safety...

At first you might feel like a kid let loose in a chocolate shop, but beware as there are a many fake torrents out there. Most of them are malicious. Here are three golden rules which have never failed me...

- 1. Make it a habit to scour around for any comments left by earlier downloaders regarding the quality of torrents.
- 2. Download torrents from a reputable website or join a private tracker. Private trackers moderate the quality vigorously but then they are equally rigorous with their rules.
- 3. Try to avoid downloading files which have been split and zipped into mass of kilobyte sized files. Commonly they are fake torrents.
- 4. Always read the rules and the copyright policy of the website you are downloading from.

Read the MakeUseOf.com pointers on some torrenting pitfalls to avoid.



Let's Run With It Now

You started with an idea about torrents, a torrent client and a net connection. With the help of some search engines you got to your first .torrent file and downloaded with success your first file. Now just like a good handyman, you need to assemble some more tools to go from a torrent newbie to a torrent ninja. Chances are that you already have some of them installed on your computer.

Your torrent toolkit

 Dependable Security Software – This software's are not only essential for torrenting but are a must have for the overall safety of your PC. The worthy ones are: <u>Zone</u> <u>Alarm Free Firewall</u>, <u>Comodo Firewall Pro</u>, <u>AVG Anti-Virus</u>, <u>Avira Anti-Virus</u>, <u>Avast...and the list continues</u>.

While on the topic of security, you can hop over and read this post on the <u>Best Programs to Keep Your Computer Secure</u>.

- An archiving utility Downloaded torrent files can be in many forms and you may have to un-zip or un-rar them or convert them to a more usable format. WinZip and WinRar are the most popular programs going around though they are not free. One excellent freeware alternative is 7-Zip. ZipltFree is another freeware WinZip alternative.
- An all-purpose media player The four all purpose video players that should handle
 and play any video file are: Windows Media Player, VLC player, Media Player Classic
 and DivX player. You can download these at their respective websites.
 Tip: you can also check out what is the most popular video player among MakeUseOf
 readers here. It's also likely to be to be the most comprehensive one when it comes
 to playing different video files.

VLC

Windows Media Player

DivX

Media Player Classic

 Codecs to handle all media files - Codecs are little programs used to compress and or decompress large digital media files. They are frequently required in order to be able to play certain video files in your media player. For instance, the K-Lite codec pack is among the most popular downloads (in some cases it comes with the media player itself, like aforementioned Media Player Classic). For Windows Media Player, codecs can be found at the Microsoft website. Some third party web sources for codecs are...

Free-Codecs.com

Fourcc.org

XPCodecpack.com



Tweak under the hood - A fine-tuning tutorial for faster downloads

By now you should be feeling confident about tackling a few settings under the hood. Just a few nips and tucks to the default settings will help boost your torrent download speeds and optimize it for your bandwidth.

1. Your ISP is where it starts

Check the maximum download and upload speeds allowed by your ISP. Most ISP's have specific bandwidths for both uploads and downloads. Obviously your torrent download speed won't cross the cap set by the ISP. Go over to this article on Speed.io on how to check your broadband speed. There are many other bandwidth testers like DSLReports which is the one used by µTorrent.

It is also a good idea to check whether your ISP is restricting your bandwidth. There's a free internet service which can help you out. Read about it here.

MakeuseOf.com has some other <u>helpful hints</u> on ways to increase your connection speed.

2. Choosing the right BitTorrent client

This fundamental step cannot be emphasized enough – it will save you half the bother. The choice of client used should always be updated to the latest version.

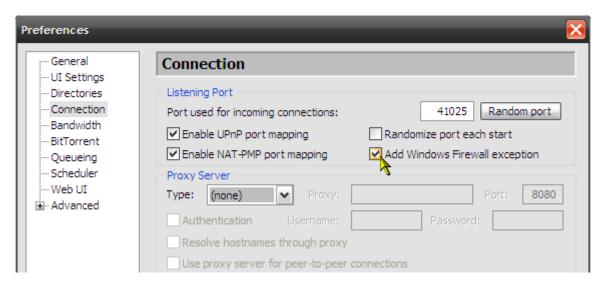
3. Go for healthy seeds and peers

For high torrent speeds, the best bet is in numbers. Greater the number of seeders, healthier is the torrent and *better is the chance* of higher speeds. The rule of thumb says to choose torrent files with a high number of seeders and preferably lesser number of leechers i.e. a higher seed-leecher ratio.

4. Get through the Firewall

Firewalls can block all incoming BitTorrent connections coming through. To ensure otherwise, a firewall should be manually configured to accept the connections and let it through the client. Windows XP has the Windows Firewall. Configure the firewall installed to accept the connections by checking the BitTorrent client on the allowed list i.e. *Options - Preferences – Connection -* check *Add µTorrent to Windows Firewall*. Also, check the Windows Firewall exception (if you keep it enabled) in your client too. Shutting down the firewall is not recommended as it leaves the computer open to attack.





Note: If the home computer is behind a router, it also should be configured through the feature called Port Range Forwarding to enable torrent traffic. The router documentation should have specific information on this.

5. Limit your upload rate

A peer to peer network is all about sharing alike...but an unlimited upload rate hits the download rate too. Using the speed tests, find out your maximum upload speed and then set your client's upload rate (Global Upload Rate in µTorrent) to about 80% of your maximum upload speed. You can try varying your upload speeds – keep it high initially and then gradually bring it down towards the middle of the download. Downloads also tend to go quicker if you seed more.

Note: Mind the speed units – it may be given in **kilobits** per second (kb/sec) or **kilobytes** per second (kB/sec). 1 kilobyte = 8 kilobit

6. Go to a different port

The default port for the BitTorrent protocol is any between port numbers 6881-6999. ISPs throttle traffic on these ports as BitTorrent sharing involves high bandwidth usage. It's easy to configure a different port in your torrent client. Use some number above 10000 to get around ISPs and also avoid problems with other applications. By default, the µTorrent port is randomized each time it starts. Set a specific port by not enabling the *Randomize Port* setting. Again check if the port is forwarded properly using the button in the Speed Guide.

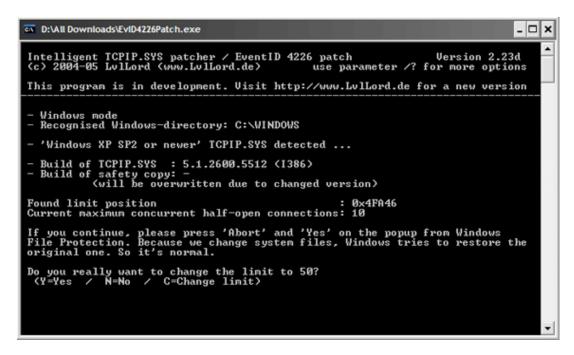
Remember, different types of data, such as web sites, file downloads, and torrents, are each given a specific port. *Port forwarding* is the process that a software (or hardware like routers) uses to screen the right kind of data to the right port. <u>Portforward.com</u> provides step-by-step guides on how to set up this port forwarding.



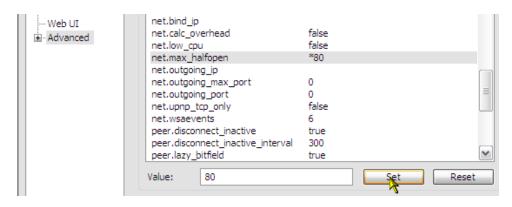
7. Increase the number of Max Half Open TCP connections

This figure specifies how many connections a torrent client should attempt to establish simultaneously at any given time. To make it clearer – it is the number of connection *attempts* in progress and NOT the total number of connections.

Windows XP with Service Pack 2 (SP2) or newer, limits this to a default of 10 as a barrier against virus multiplication. But that's a bummer for torrent speeds as torrents too need a large number of simultaneous connections. A patch has been available for a while from www.LvlLord.de, which modifies the TCPIP.sys file in Windows to allow higher number of TCP connections.



After running the patch, you have to set the number of connections in your torrent client. For example, in µTorrent go to *Options – Preferences – Advanced - net.max_halfopen*. Set any number from 50 to 100. But see that net.max_halfopen is set **lower** than the value set in TCPIP.SYS. Always check if it is still patched because Windows updates sometimes overwrite it.

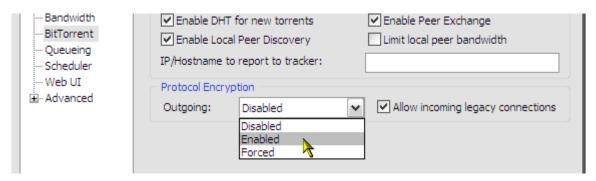


Mac and Linux need not sweat it as this is a Windows Only 'problem'.



8. Experiment with Protocol Encryption

Some ISPs love to act like Big Brothers and constrict bandwidth for P2P protocols. Protocol Encryption in most of the torrent clients helps to over ride this bandwidth shaping. Enable outgoing protocol encryption and put a checkmark on *Allow Incoming Legacy Connections*. With protocol encryption, ISPs find it difficult if not impossible to detect that the traffic is coming from BitTorrent. Experiment with enabled, disabled and forced options because you could be getting better speeds with encryption disabled. Non-encryption makes a torrent connection compatible with someone who is not using encryption but as a minus it makes the torrent detectable but an ISP with a bandwidth restricting policy.



9. Bandwidth and connections

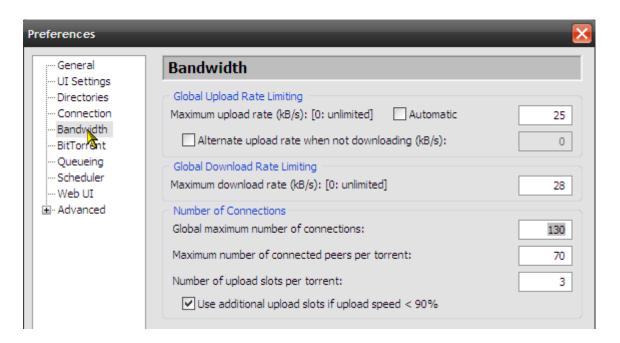
Your BitTorrent client's settings options will let you enter figures for -

Global maximum number of connections gives the maximum number of connections that a BitTorrent client can make for any P2P exchange. Setting this too high DOES not mean higher speeds. Setting it too high would take up useless bandwidth and too low a figure would miss out on peers. For my 256kbps connection, I have a setting of 130

Maximum number of connected peers per torrent gives the maximum number of peers that a BitTorrent client can connect to for any P2P exchange. Experiment by setting this number close to the available peers for a particular torrent. For my 256kbps connection, I have a default setting of 70.

Number of upload slots per torrent gives the maximum number of peers that a BitTorrent client will upload to for any P2P exchange. A low setting may affect downloads. For my 256kbps connection, I have a setting of 3





μTorrent has a *Speed Guide* which handily calculates the optimal figures for a particular connection.

10. Some common sense

Most BitTorrent clients allow us to view the individual files in a download. You can selectively disable the download of files you don't think necessary.

Familiarize yourself with the customization settings of your particular client available in the Help files or at the website FAQs.

Some useful torrent software and FAQs, which are a mine of information and tips.

BitTorrent User Guide

µTorrent FAQ

Vuze FAQ

Optimizing the speed of torrent downloads is a lot of trial and error and a bit of patience.

Share alike - Creating our own Torrent

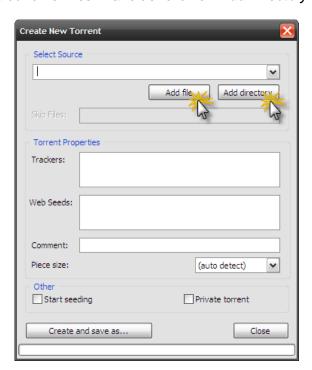
So far we have been preoccupied with downloading features but torrents are not a one way street. The community survives and thrives because somebody out there is taking the pains to create and upload the torrents. Uploading a torrent is not all about being large hearted...though it helps. It is also not about bootlegging illegal content. Creating your own torrents and uploading them for your friends to download is also a cool way to distribute a large digital chunk in one go.

If you are absolutely new to torrents, then take your time...get acquainted with the software and the manner of torrents before you start with your first upload. If you have jumped the gun, then here's how it's done with the help of the torrent clients themselves. Here μ Torrent serves as an example...

1. Open μTorrent. On the menu bar click on the wand button – the *Create New Torrent* icon.

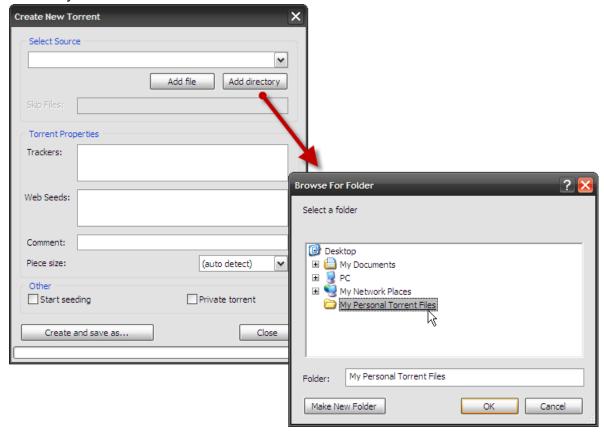


2. The *Create New Torrent* box opens up. For uploading a single file click on *Add File* and for uploading a bunch of files in a folder click on *Add Directory*.



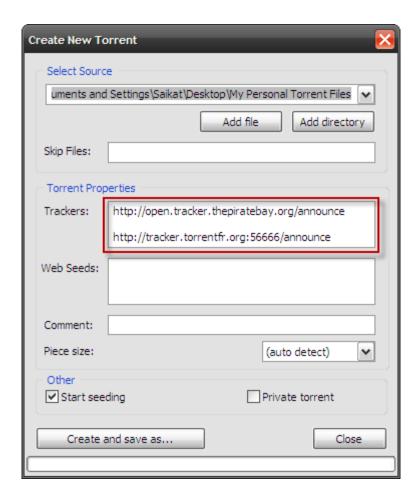


3. Browse to where you have kept the files (or folder) for upload. Click on OK to include these as your source files.



- 4. Filling in the *Trackers* box is an important step towards finishing your torrent upload. Mininova lists a few reliable public tracker URLs. You can use one or many. If you decide to list more than one, put a blank line between each URL by hitting *Enter* twice. Check the *Start seeding box* and click on *Create and save as...* Give your torrent file a nice descriptive name.
 - 4 More Tracker URL Resource Sites for your reference.

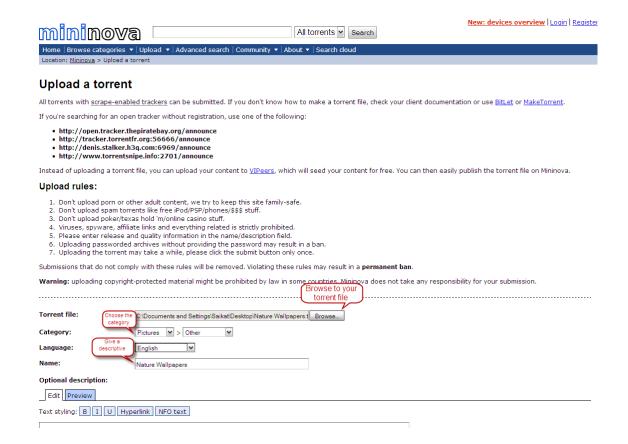
Though some of the trackers might be inactive or dead, the tracker URL lists are quite large and within the haystack you will get the one to do your job.



5. As soon as you save your torrent file, it gets added to your active list in μTorrent, and the status should say 'Seeding' or 'Finished' as shown below.



6. All that is left is to upload the .torrent file to a tracker website like Mininova or Piratebay. All tracker websites have an *Upload* link. Some like PirateBay require a log-in for you to access their upload page. Please read the rules and the copyright policy before you upload your .torrent file.



Enter the details in the form. Click on submit and you are done. Not quite! Now let the torrent seed for a while (*till you've uploaded it at least for 100%*) so others can pick it up.



We come to the end...or is it a beginning?

Surely a beginning, you have just discovered a wonderful way to share and gain. BitTorrent is almost like a Utopian world where the person who shares (or seeds) the most benefits the most. This co-existing network grows without limits as every new player not only takes from the network but also gives. The popularity of BitTorrent has spawned numerous tracker websites and search engines, and of course the huge wealth of digital content. All it takes to find a desired torrent file is a search. But as Peter Parker (a.k.a Spiderman) put it – with great power comes great responsibility – it is up to the swarm to follow the rules of the game.



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- http://feedburner.google.com/fb/a/mailverify?uri=Makeuseof&loc=en_US (subscribe via email)

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