

Research Opportunities: Bittorrent

Alex Valentine
alexvalentine@psu.edu



Research Opportunities



- Bittorrent: A look at the possibility of extending the Bittorrent model for academic networks.
- I hope to answer these questions:
 - What is Bittorrent?
 - How is bittorrent different than traditional P2P file sharing?
 - Why is Bittorrent a good match for the academic community?
 - What could a Bittorrent project reuse from the LS infrastructure?



Bittorrent History

- P2P File distribution protocol designed to efficiently distribute large files in high demand.
- New Linux ISO releases were the main inspiration behind the protocol.
- Designed to defeat the “Slashdot effect.”
 - The slashdot effect is when a file is linked from the slashdot website, and the sheer amount of demand kills the target webserver.

Bittorrent Components



- Components
 - Client
 - Small program on an end user's computer that can create or use .torrent files.
 - Torrent
 - A small metadata file which contains:
 - Tracker information
 - File information
 - .torrent files are generally distributed through web servers.
 - Tracker
 - Manages the connection process.



Bittorrent Features

- Small client for downloading and publishing . torrent files
- Swarm Downloading
 - Users can download from hundreds of sources at the same time
 - Partial File sharing
- Website portals used in conjunction with trackers to create an community experience.

The Bittorrent Process



- 1. The publishing user creates a .torrent file with the Bittorrent client
- 2. The publishing user then seeds the .torrent file from a tracker
- 3. A user downloads the .torrent file from a portal and then loads the .torrent file in their client.
- 4. The client then begins download the file pieces from seeders and peers listed on the tracker. Once a piece completes, it starts to share



Bittorrent Demo

- Sit back and enjoy the demo

Bittorrent for Academia



- Why develop a bittorrent like system for academia?
 - Communities of interest can develop around academic bittorrent portals
 - Administration moderated or user submitted content.
 - Replaces or possibly integrates with existing web based learning repositories.
 - Web based portals makes customization and the integration of new features a lot less painful.

Possible Modifications



- The modification of the Bittorrent protocol to make use of the existing LionShare security infrastructure.
- The use of digital signatures to ensure author identity.
- Heavy duty academic metadata support.
- Integration of real collaborative tools.
- Possible integration with existing web based repositories.



In a Nutshell

- Enhance and modify existing open source projects to create an academic Bittorrent tool that utilizes the LionShare infrastructure.
- Possible Project Deliverables
 - Cross Platform bittorrent client based from the Azureus source code.
 - Customized Bittorrent Portal/Tracker developed for the academic community.
 - A hybrid repository with support for traditional/.torrent publishing.