

# **ENSC 427**

# **DIGITAL COMMUNICATIONS**

**EXPLORING TRAFFIC FOR P2P FILE  
SHARING PROTOCOL USING OPNET**

**GROUP 01**

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# OVERVIEW

- **Introduction**
- **Implementation**
- **Expected Results**
- **Conclusion**

# INTRODUCTION - PEER 2 PEER

- **P2P file sharing protocol was invented in 1999**
- **Server and Client relationship**
- **Gnutella P2P protocol – Limewire, ShareAza, etc.**
- **BitTorrent P2P protocol – BitTorrent, Vuze, etc.**
- **Project focuses on BitTorrent P2P**

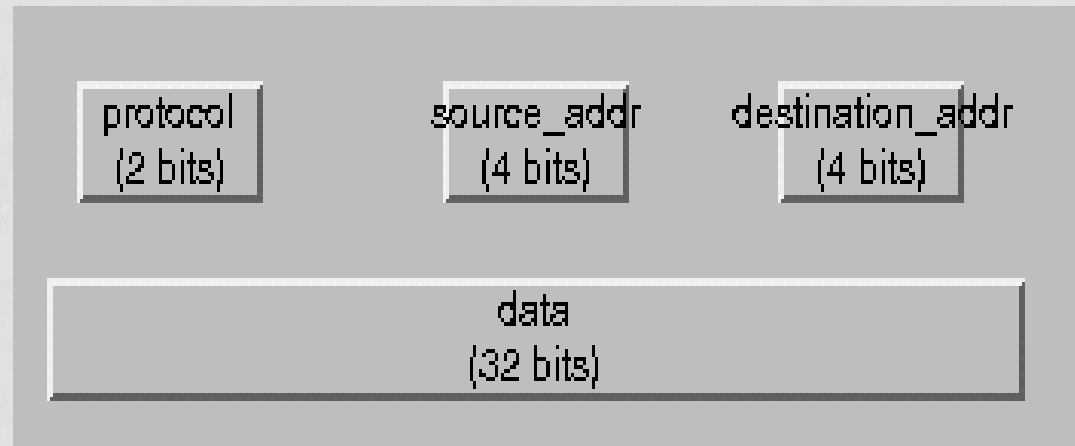
# HOW DOES BIT-TORRENT WORK ?

- **BitTorrent was invented in 2001 by Bram Cohen**
- **Two types of clients – seeds and peers**
- **Peer needs to acquire .torrent file to start downloading**
- **.torrent files contains the Metadata**
- **File transport carried out by modified HTTP protocol**

# PACKET FORMATS

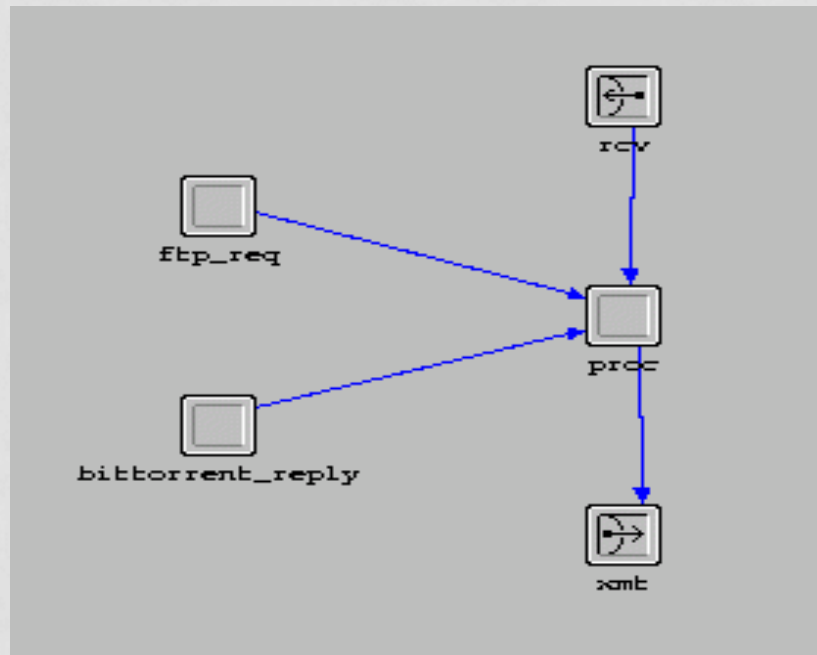


**Request packet  
format**

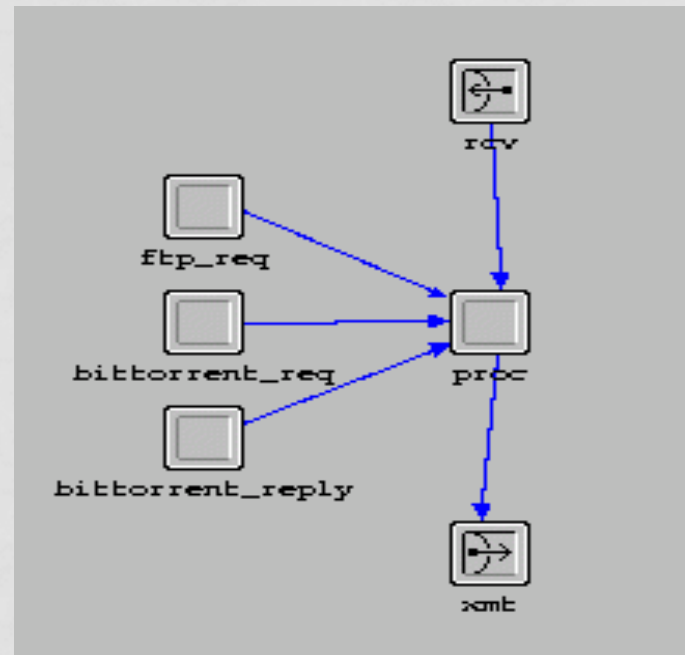


**Reply packet format**

# NODE MODELS

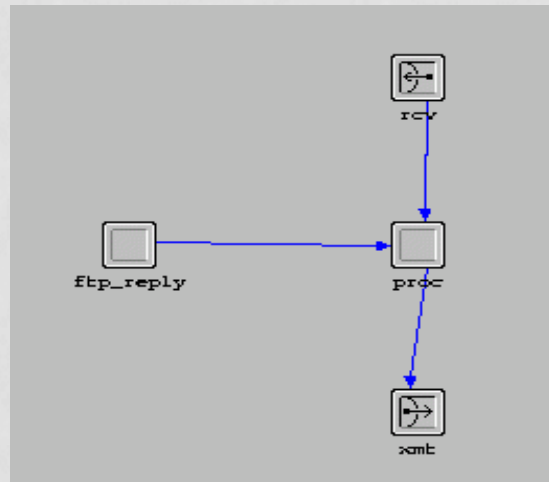


**Seed**

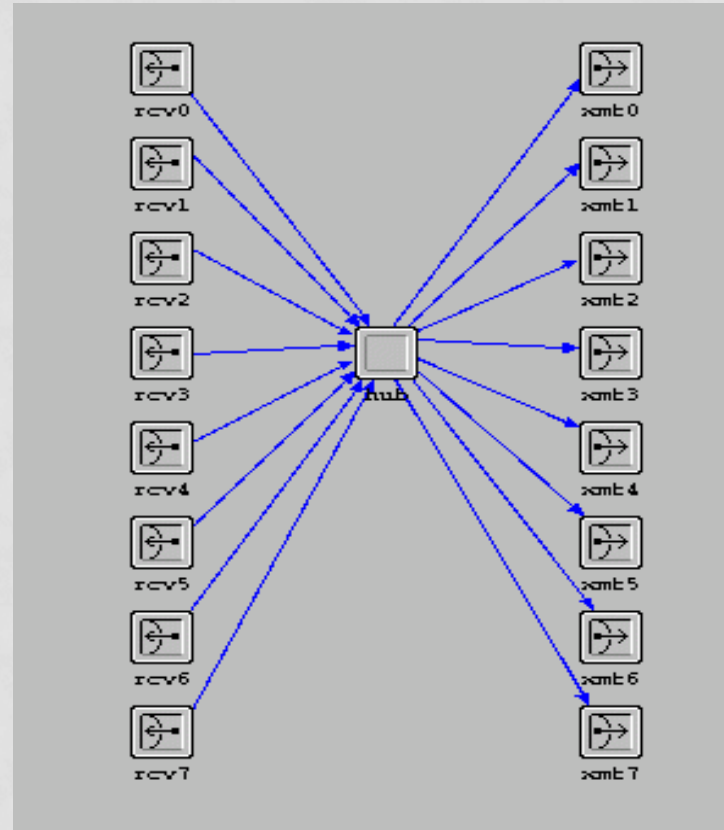


**Peer**

# NODE MODELS CONT'D

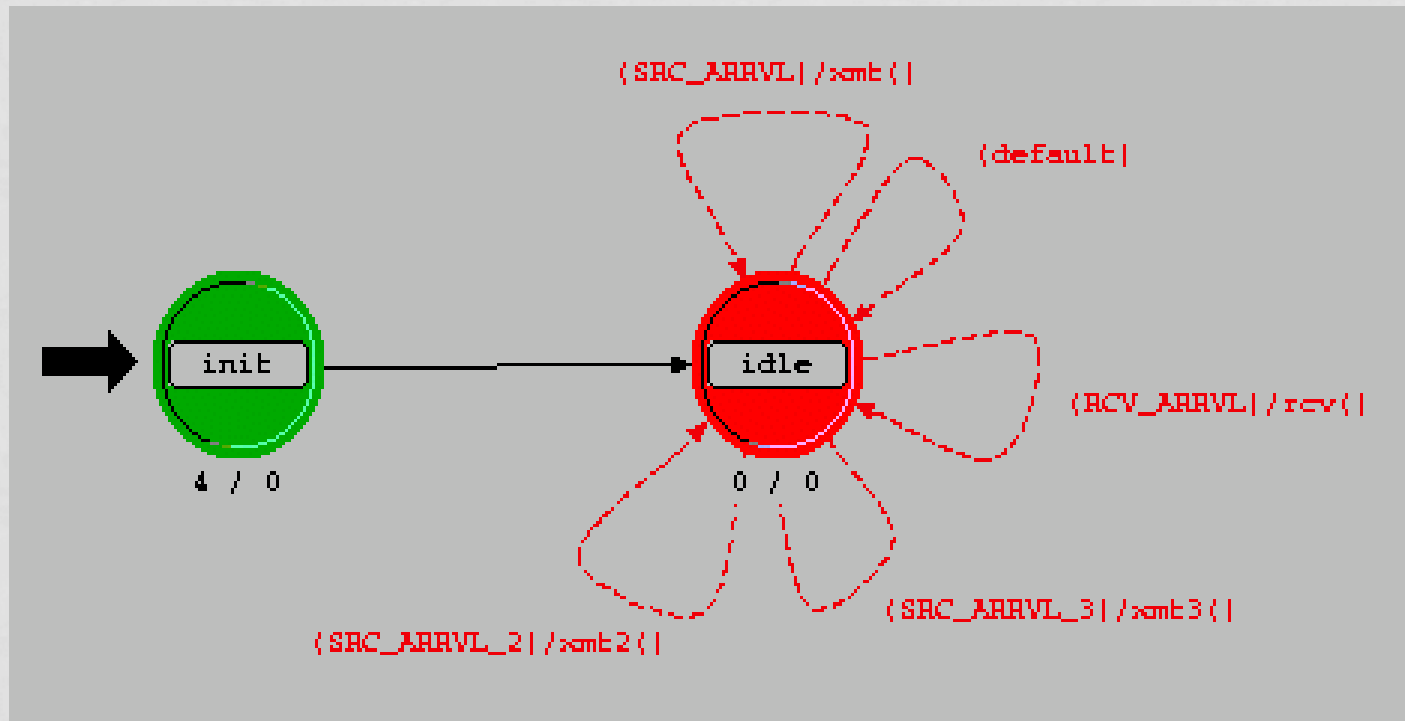


**Server**



**Hub/Router**

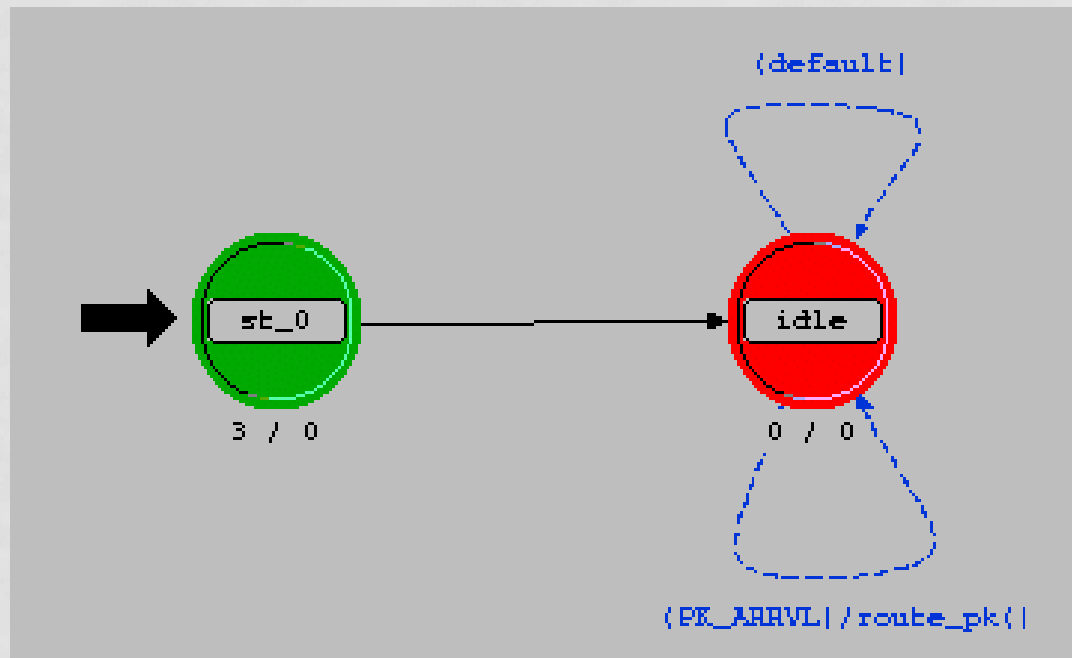
# PROCESS MODELS



**Seed/Peer process model**

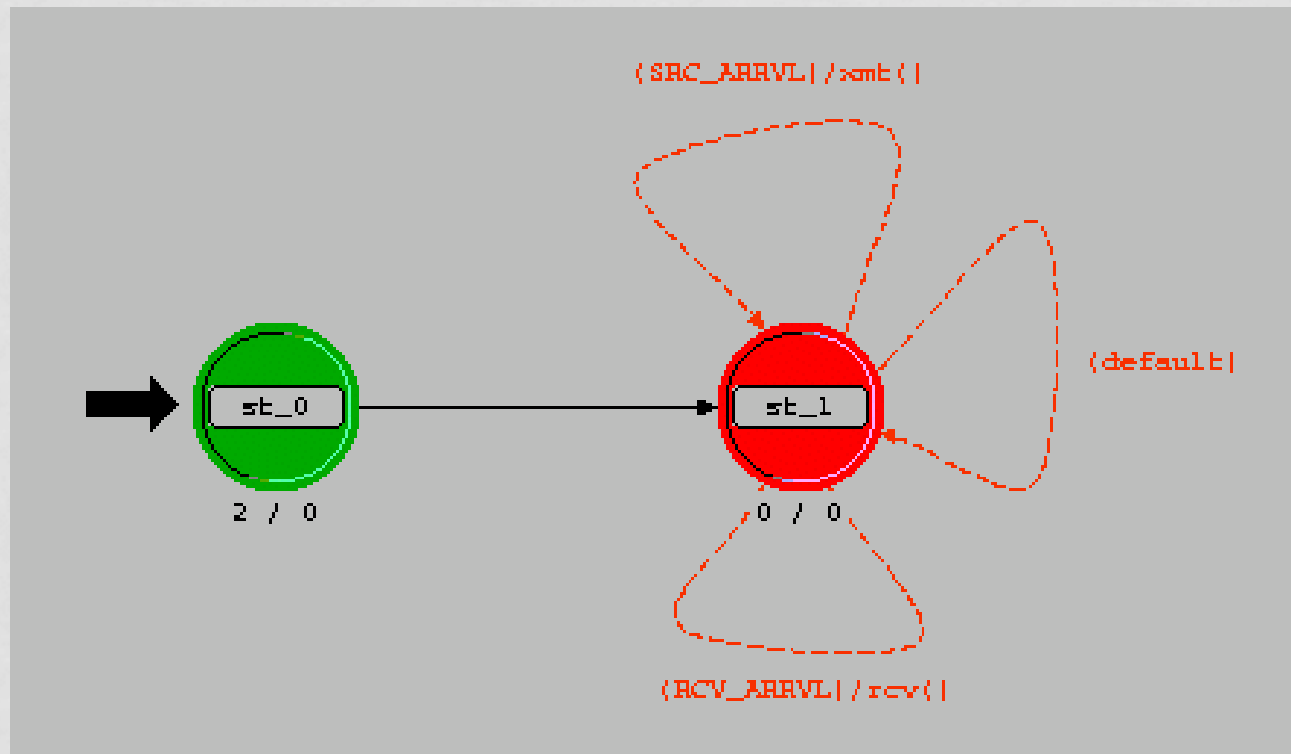


# PROCESS MODELS



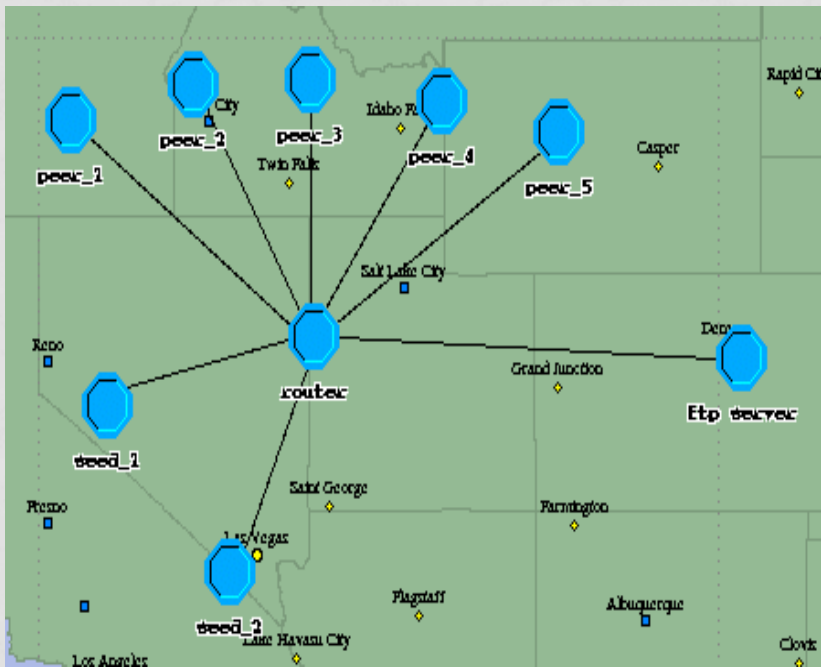
**Router process model**

# PROCESS MODELS

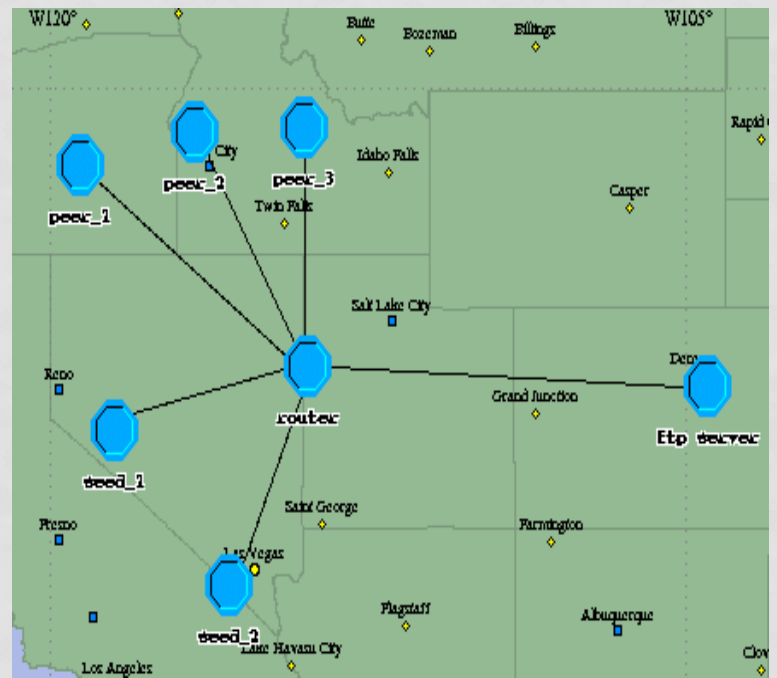


**Server Process Model**

# TOPOLOGIES

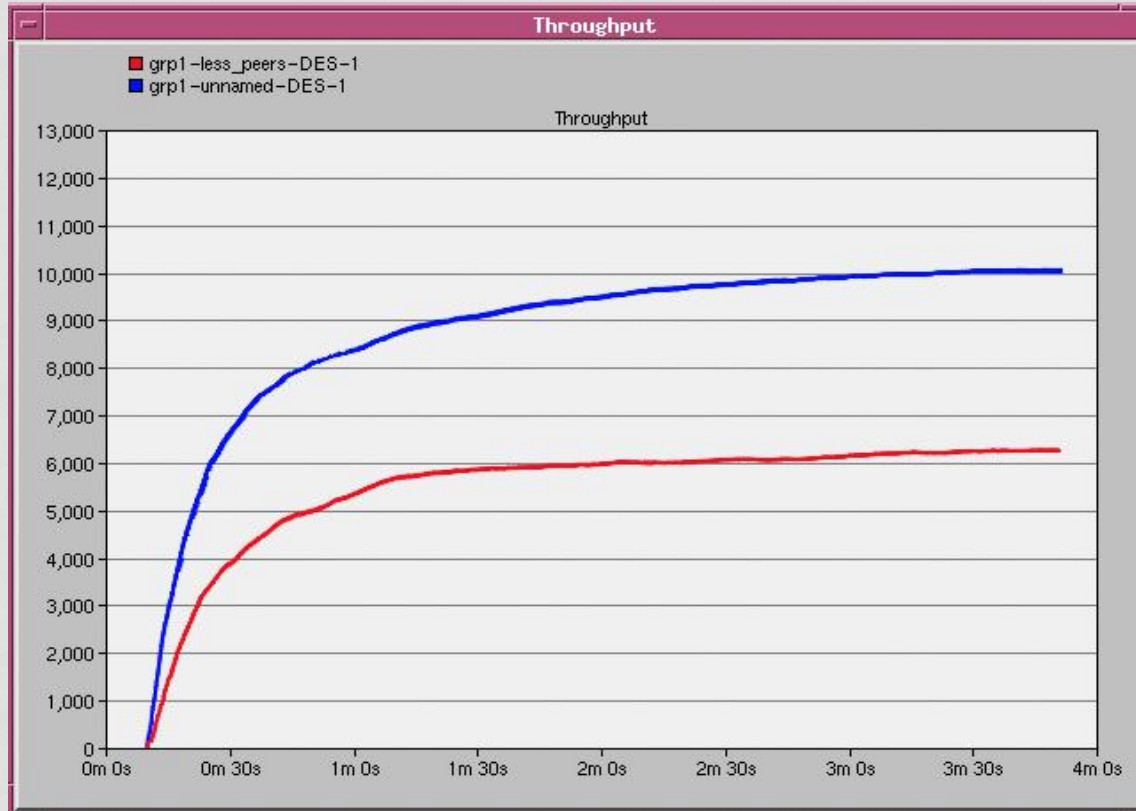


**5 peers & 2 seeds**



**3 peers & 2 seeds**

# OBSERVATION



**Throughput (central router)**

# CONCLUSION

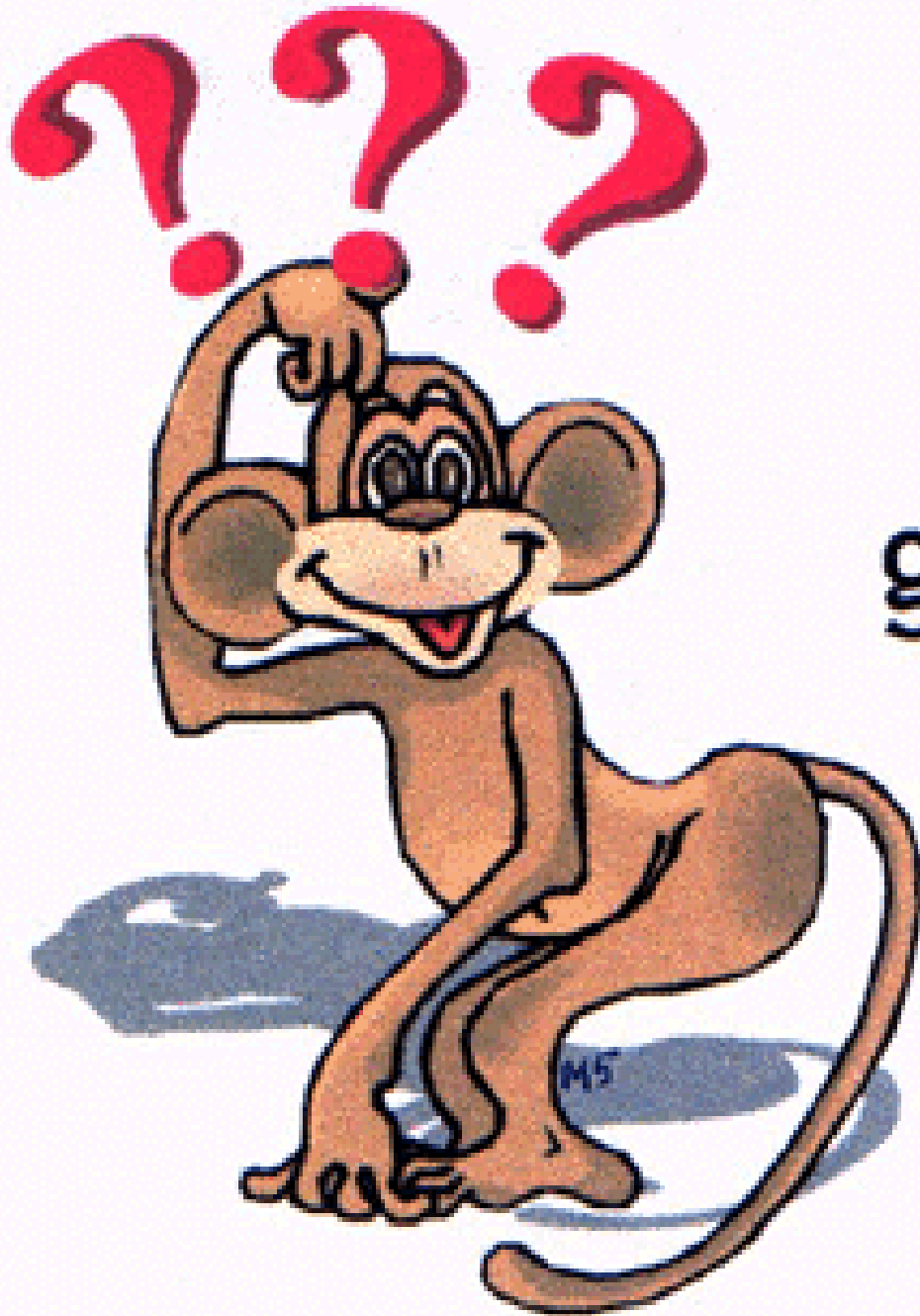
- **Difficulties faced**
  - Ports were not available
  - Sink.c process model
  - Out of range errors / warnings in packet transfers
- **Improvements implemented**
  - Logged in remotely to tackle the unavailable ports
  - We built our own process models with guidance from the tutorials

# CONCLUSION - CONTD.

- **Future Goals**
  - Web Seeding
  - Throttling and encryption
  - Multi-tracking
- **Usefulness of this project**
  - Exciting experience since we are frequent torrent users
  - Useful in future jobs related to networking

# REFERENCES

- **[1] "BitTorrent Inc. Open Sources New P2P Protocol - The H Open Source: News and Features."** The H: Security News and Open Source Developments. Web. 13 Feb. 2011. <<http://www.h-online.com/open/news/item/BitTorrent-Inc-open-sources-new-P2P-protocol-1007814.html>>.
- **[2] "BitTorrent Protocol Encryption."** Wikipedia, the Free Encyclopedia. Web. 13 Feb. 2011. <[http://en.wikipedia.org/wiki/BitTorrent\\_protocol\\_encryption](http://en.wikipedia.org/wiki/BitTorrent_protocol_encryption)>.
- **[3] Katzela, Irene. Modeling and Simulating Communication Networks: a Hands-on Approach Using OPNET.** Upper Saddle River, NJ: Prentice Hall, 1999. Print.
- **[4] Leuf, Bo. Peer to Peer: Collaboration and Sharing over the Internet.** Boston: Addison-Wesley, 2002. Print.
- **[5] "Peer-to-peer."** Wikipedia, the Free Encyclopedia. Web. 13 Feb. 2011. <<http://en.wikipedia.org/wiki/Peer-to-peer>>.



Questions  
are  
guaranteed in  
life;  
Answers  
aren't.