**Software Requirements Specification**

**for**

Vega P2P

**Version 1.0 approved**

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# **Introduction**

## **Purpose**

The purpose of this system is to provide file transfer functionality between computers in a Local Area Network using the peer to peer file transfer technology. The system takes advantage of the decentralized approach for sharing of huge files.

## **Intended Audience and Reading Suggestions**

* Project Mentor
* Developers interested in contributing
* Users

## **Product Scope**

The scope of the system is to enable its users to transfer files taking advantage of decentralized peer to peer technology thus eliminating a single point of failure in the system. The future aim of the system is to implement Gnutella protocol for a complete decentralized file transfer.

This development process also serves as an introductory grounds - for the developing team - to new technologies.

# **Overall Description**

## **Product Perspective**

The current system used in most Networks for file transfer is simple FTP based applications like gFTP. The decentralized file transfer protocol - Gnutella - can greatly improve the file transfer on a wide array of networks. By replacing current file transfer architecture with the new one we can achieve security and create a robust network.

## **User Classes and Characteristics**

* Leecher
  + The user who requests a file from the network and downloads it.
* Seeder
  + The user who provides the file on a network.

## **Operating Environment**

The system operates on any machine capable of connecting to a network and supporting Linux software. For the system to fully function, all the seeder and leecher machines of the network must install the system software.

# **System Features**

## The Node Search

* + 1. The system broadcasts ping message in the network for node discovery.

Input: User activates the system.

Process: The system - on activation - sends pings to the network for identifying available devices in the network.

* + 1. The system replies to ping message with a pong message.

Input: The system receives the ping message from the network.

Process: The system listens for the ping on an open port and replies to that message with a pong message, conveying its own existence in the network.

## The File Query

* + 1. The system accepts file name from the user

Input: User inputs the file name.

* + 1. The system sends a query to available nodes for a particular file

Input: The user inputs the file name.

Process: The system produces a query message with the name of the file the user requested and sends that message to the available nodes in the network.

* + 1. The system sends query hit if the file is available.

Input: The system receives a query message

Process: The system searches for the file mentioned in the query message and if available, send back a query hit message to the file requesting node.

## The File Download

* + 1. The system divides file download between different query hits.

Input: The system receives multiple query-hit messages with some information about the file.

Process: The system divides the file into appropriate parts for efficient file transfer depending on the bandwidths of different nodes who replied with query hit.

* + 1. The system downloads file from multiple nodes.

Input: http request with range headers.

Output: requested chunks of file.

Description: The system uses http protocol and downloads different chunks of the file from different nodes in the network.

* + 1. The system organizes different parts into a single file.

Description: After the completion of the file download, the system merges different parts of the file to construct one single file requested by the user.

Output: The file requested by the user.

# **Other Nonfunctional Requirements**

## **Performance Requirements**

The system must perform the file transfer utilizing all the available peers in an optimized manner to achieve maximum efficiency in the operation.

The system must be optimized in order for it to work in large networks. For example, the ping-pong and the query and query hit’s response time should be reduced for a usable experience.

One computer in a network with a lower bandwidth should not affect all other computers file transfer.

## **Safety Requirements**

The file’s integrity is maintained during the file transfer. There will be corruption detection and prevention when transferring the file.

## Accessibility Requirements

The system should be accessible to users of all background. The system should feature an easy to understand and easy to use user interface so that the core file sharing functionality shall be accessible to users with ease.

## Platform Compatibility

The system should be compatible with the different distro of the Linux operating system and should work in harmony with local area networks and wide area networks alike.

## Stability

The system should be stable. There should not be any error-prone file transfers occurring that might harm all the nodes connected in the network. All exceptions should be handled carefully in order to achieve maximum stability.

## **Security Requirements**

The system must not let users advertise a harmful file as the requested one. The system should be able to recognize and deny bad or error-prone files from being downloaded. The system should not meddle with the private data of the user. There should not be any security breaches that might be taken advantage of by some outside person to break into the computers connected to the networks.