**Technical White Paper**

# Understanding Network Protocols

A protocol is a standard by which communication takes place between network devices. The following white paper attempts to explain in the simplest terms the protocols used by your Iomega network device.

**iomega**®
an EMC company

**March 19, 2009**

# Introduction

A protocol is a standard by which communication takes place between network devices. The following white paper attempts to explain in the simplest terms the protocols used by your Iomega network device.

## TCP/IP

Transmission Control Protocol/Internet Protocol. TCP/IP is one of the core network protocols on top of which most other protocols are built. TCP watches network traffic to detect problems and ensure that data is safely transfered between network devices.

## UDP

User Datagram Protocol (also Universal Datagram Protocol). Controls traffic between network devices, but does not attempt any error correction. It is used for protocols where speed is more important than accuracy or error correction is handled by the client software.

## SMB/CIFS

Server Message Block/Common Internet File System. SMB is the File transfer protocol commonly used by Windows computers. Mac OS X and Linux/UNIX now commonly include an implementation of SMB known as Samba. This protocol uses TCP port 445.

## AFP

Apple Filing Protocol. AFP is the file transfer protocol commonly used by Macintosh computers. This protocol is preferred for Mac transfers since it supports Unicode file names, resource forks, and other Mac OS specific attributes. This protocol uses TCP ports 548 and/or 427.

## NFS

Network File System. NFS is the file transfer protocol commonly used by UNIX/Linux computers. Due to its UNIX roots, Mac OS X also supports NFS. This protocol uses TCP port 1025.

## HTTPS

Hypertext Transfer Protocol Secure. This protocol is most commonly used for websites and combines HTTP (see below) transfers with SSL or TLS encryption. Iomega's remote access features relies on HTTPS to transfer file lists, downloads, and uploads securely accross the Internet. The StorCenter ix-Series will also use HTTPS for its web-base configuration if security is enabled. HTTPS requires a certificate that verifies that the server operator is who they claim to be. Most web browsers will issue a warning if the HTTPS server's certificate cannot be verified. Remote Access users can receive a HTTPS certificate for a nominal fee. HTTPS (Iomega Remote Access) typically uses TCP port 443.

**iomega**
an EMC company

## FTP

File Transfer Protocol. FTP is a common Internet protocol used for file transfers. Although FTP is a very common protocol, it still may require special client software in some situations. For example, the Mac OS X finder supports FTP, but is Read-Only—You will need special software to use FTP to upload files. This protocol uses TCP port 21.

## BitTorrent

BitTorrent is a common peer-to-peer (P2P) file sharing protocol used on the Internet. Torrents require special software clients such as the software built-in to the StorCenter ix-Series. This file sharing method requires .torrent files that are downloaded from a torrent tracker — a special server that tracks which peers are sharing a file. The torrent tracker does not actually host a copy of the files that are being shared. Each peer shares portions of the torrent once it has been downloaded. File transfer rates increase as more peers participate in the download. This protocol uses TCP ports 6881-6999; however, many Internet Service Providers (ISPs) throttle traffic on these ports. Some torrent trackers require that you use a port in the 49152-65535 (unassigned) range.

## HTTP

Hypertext Transfer Protocol. This is the protocol used for most web traffic. Your iomega network device uses either this protocol or HTTPS (see above) to host the configuration interface. It will not allow you to host other websites on the device. This protocol usually uses TCP port 80, but may use 8008, 8080, 16080, etc.

## Bluetooth

Bluetooth is a wireless transfer protocol that is used to transfer small files such as calendars, photos, and contacts over short distances (using OBEX or Object Exchange Protocol). It is also used to control devices such as mice wirelessly.

## NTP

Network Time Protocol. NTP synchronizes the time between a client and a time server. This protocol uses UDP port 123.

## SMTP

Simple Mail Transfer Protocol. SMTP is a simple email protocol. SMTP is usually only used for outbound emails such as email notifications sent by your iomega network device. By default, this protocol uses UDP port 123.

## UPnP

Universal Plug-and-Play. UPnP is a set of peer-to-peer network protocols that assist with the discovery and control of network devices. Iomega network devices use UPnP to automatically configure network routers for port forwarding and serve multimedia files. DLNA and Microsoft Rally (see below) are both based on UPnP.

## DLNA

Digital Living Network Alliance. DLNA is not technically a protocol, but is a series of guidelines that define protocols, etc. necessary for network devices to seamlessly share media files, such as movies, photos, and music. Your Iomega network device uses DLNA for its media server. DLNA is based on UPnP (see above).

## DAAP/iTunes

Digital Audio Access Protocol. DAAP is a media sharing protocol developed by Apple for its iTunes software. DAAP uses Bonjour (see below) to announce and discover media files. This protocol uses TCP port 3689 by default.

## Bonjour

Bonjour (formerly known as Rendezvous) is Apple's implementation of Zeroconf which is used to discover network resources. Bonjour announces your Iomega network device's abilities as a file server, iTunes media server, and print server to client computers. This protocol uses UDP port 5353.

## Windows Rally

Rally is used to discover network resources. Rally announces your Iomega network device's abilities as a file server, media server, and print server to client computers. Rally is based on UPnP.

## SNMP

Simple Network Management Protocol. SNMP is used to manage diverse network resources using a single interface. StorCenter ix-Series servers can be configured using SNMP client software. This protocol uses UDP port 161.