BitTorrent

BitTorrent works as a file sharing network, with each node in the network acting as a server that has the ability to download and upload files or parts of files to other nodes in the system. The advantage of this is that the impact of downloading and uploading from a distributed source like this is less than the impact on a system with a single node to download from, when considering the system as a whole. The distributed nature of this system produces a redundancy when there are several nodes ready to upload a file to the requesting node. The redundancy is good for making sure that all of the file is properly downloaded, especially when the file is being downloaded in multiple pieces from multiple different uploading nodes.

When a node is requesting a file from other nodes, the files on the serving nodes can be broken into pieces, with each node delivering a portion of the file. This decreases bandwidth between any two nodes because now multiple edges can carry a lighter load to serve the full file. Once a file is downloaded to a new node, that node can then act as a seed to upload the same file to other nodes requesting the file. The more nodes that have pieces of a file, the more relief that each other node feels when a new node is requesting to download a file.

BitTorrent is a client that can be installed on a node that facilitates all of this peer to peer file sharing. The BitTorrent client also adds a hash to each piece of the file. This maintains the integrity of the whole file and prevents any unfortunate modifications from being added to the file. BitTorrent uses this hash and can compare it to the original to verify that the file has remained unchanged. The BitTorrent client also facilitates the rearrangement of the pieces of the file being downloaded into the correct order, even when the pieces are downloaded out of order.