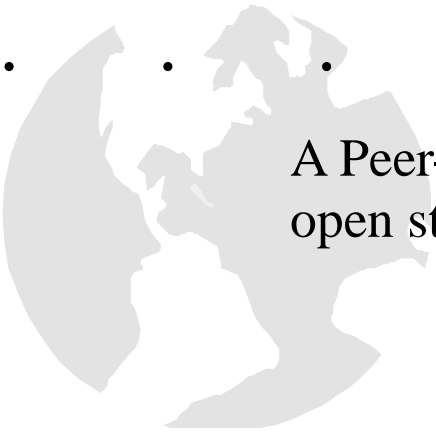




# Sideris



A Peer-to-Peer application based on  
open standards





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## Overview

Sideris is Latin for 'star' or 'constellation.' A constellation is roughly how the Sideris network would look like if you were to visualize the network connections between the nodes in the network.

Sideris is a peer-to-peer file sharing application. Like any other P2P application, Sideris can search and transfer files among nodes. Sideris is set apart from the crowd of P2P applications available today by some features like:

**Open standards.** Sideris uses open standards for communication and data transfer. The advantage here is that clients and servers could be built for any platform, and users are not 'tied-in' to a particular client or server.

**Optimized search.** Searches on the Sideris network do not consume unnecessary network bandwidth. Individual nodes are not contacted when a search is requested.

**Optimal bandwidth usage.** The Sideris network is session-less, which means network connections are only setup and maintained when a search or file transfer is requested.

## Development Platforms and Environment

The development used for developing Sideris is Microsoft.NET Framework 2.0 Beta. Sideris is written entirely in C#. Microsoft provides freely downloadable tools and compilers for this environment:

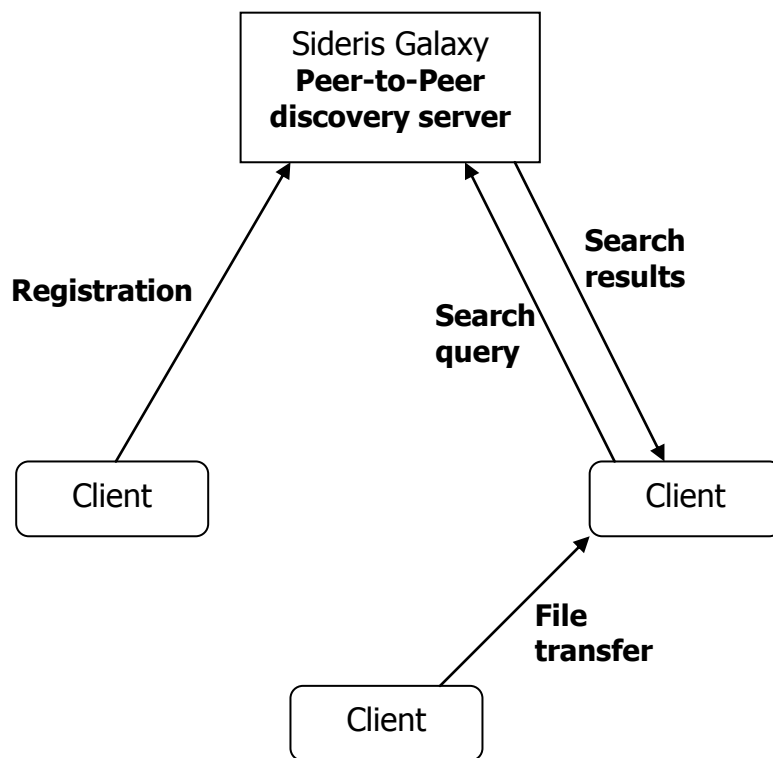
Visual C# 2005 Express Edition Beta

## Visual Web Developer Express Edition Beta

Sideris has the ability to run on Windows 2000, Windows 2000 Server, Windows 2000 Advanced Server, Windows XP Home Edition, Windows XP Professional, and Windows Server 2003. The .NET Framework 2.0 Beta redistributable runtime is required on each of these platforms.

There are some independent efforts to create compatibility for the .NET Framework on operating systems other than Windows. For example, Project Mono is one such effort. When these projects are mature enough, Sideris can be run on other platforms such as Linux. However, the current state of these projects is not mature enough to support advanced graphical user interfaces that Sideris requires.

### Architecture of the Sideris Network



This diagram shows the basic elements of the architecture of the Sideris network. It also shows the actions that can take place within this network:



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**New client registration.** A client has to inform the server of its presence and provide a list of files shared by the client. The server keeps this list in an index for searches.

**Searches.** A client sends a search query only to the server. The server looks up the query in its index of files and returns a list of clients that have matching files.

**File transfer.** Files are transferred directly between peers, with no need for the server.

## Features

### General Features

Sideris has all the regular features expected in a peer-to-peer application, like:

**Familiar Microsoft Office 2003-style user interface.**

Microsoft Office always has been the trendsetter in user interface design, with respect to menus and toolbars. Sideris uses components available in the .NET Framework 2.0 to create Office 2003 style menus and toolbars.

**Multiple simultaneous searches.**

The user can search for and see the results of multiple search queries simultaneously. This is beneficial because even though initial search results are available quickly, a search can take a while to complete fully. The section on search optimization explains how this works.

**File integrity verification by using SHA-1 hashes.**

When downloading from multiple sources, files with the same name might actually have differing content. An SHA-1 (Secure Hash Algorithm - 1) hash of the file to be downloaded is used to search for more sources rather than a file name. Two files with the same SHA-1 hash can be assumed to be identical. SHA-1 was originally presented in Federal Information Standards Publication 180-1 (FIPS 180-1) and is available in RFC 3174.

**Download resume support.**

Resuming downloads is an essential feature in any kind of file transfer application today, given the unreliability of network connections and large file sizes that we have come to expect. Sideris can re-start a download from a different peer if the original peer is no longer available on the network.

### **Open standards**

Sideris uses accepted and open standards for communication and data transfer. This ensures that a user is never tied-in to any single client or server application, and porting to other platforms becomes very easy. A summary of the standards and protocols used by Sideris:

**SOAP and Web Services.** The client-server communication is done using SOAP (Simple Object Access Protocol). The server is exposed as a Web Service. Both of these are W3C (World Wide Web Consortium) recommendations.

<http://www.w3.org/TR/soap/>

<http://www.w3.org/2002/ws/>

**HTTP.** Files are transferred among clients using HTTP. This also means you can use any web browser or download manager to transfer files on the network. HTTP 1.1 is defined in RFC 2616.

### **Search Optimization**

A search query is only sent to the server, and not to every client on the network. The server maintains a database of files shared by registered peers. Additionally, duplicated files are easily located because every client also reports the SHA-1 hashes of shared files. Two files are identical if their SHA-1 hashes are identical, with very high probability. This means multiple sources can be located for a single file even if the file names are not identical.

The search is performed in two steps:

1. The text query is sent to the server. The server returns a list of files whose file names match the query.
2. The hashes of the files found are sent as further queries to the server to locate other peers that might have the same file. If a file is found on more than one peer, there is a greater chance of the download completing successfully even if one of the peers has a transient connection to the network.

### **Optimal Bandwidth Use**

Several common P2P networks in wide use today require a client to maintain a connection with servers, other peers, 'supernodes', or 'ultrapeers'. Maintaining TCP connections is a significant network overhead. Some newer networks have come up with connection-less protocols to solve this problem.

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These are generally based on UDP (as opposed to TCP). The disadvantage of UDP based protocols is that they lose out on reliability.

The approach Sideris uses is that connections are not maintained at all. New sessions are started whenever communication is needed on the network. File transfers between peers do not necessitate registration on the network at all.

### Lightweight Discovery Server

The discovery server component of Sideris, Sideris Galaxy, is extremely lightweight and can be run on any regular consumer-grade system, and has no special operating system or server software requirements. The entire server code is less than 200 Kbytes of MSIL and C# code.

## Screenshots

### Sideris Galaxy – Peer Discovery Server



Sideris Galaxy has a very simple interface. All you need to do is select a port on which incoming connections will be accepted, or just use the default. No other configuration or setup is required.

## Sideris - Peer-to-Peer client

