

I(2) DRIVE WEBDAV SERVER

I(2) Drive White Paper
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Introduction

I(2) Drive WebDAV Server is a collaborative authoring and content management server implementing The standard specifications of WebDAV class 1 and class 2 (RFC2518) as set forth by IETF (The Internet Engineering Task Force) WebDAV working group:

<http://www.ietf.org/html.charters/webdav-charter.html>

I(2) Drive WebDAV Server provide namespace management, persistent locking, metadata (properties) management via XML, remote management, and remote authoring of files. Additional functionalities of I(2) Drive WebDAV Server include web-based user interface, administrative tools, file sharing and an account access control. Furthermore, I(2) Drive WebDAV Server support database, file system and other types of store. There are many benefits in using I(2) Drive WebDAV Server over other types of servers. I(2) Drive WebDAV Server is written in Java and can be integrated with other Java-based server and applications, or via Java Connectors to systems that support it. There are many clients that support this standard specification and it makes it ideal for all types of users.

1. Overview

What is WebDAV?

WebDAV (Web-based Distributed Authoring and Versioning) is an extension of HTTP/1.1 a standard specification set by IETF (The Internet Engineering Task Force) WebDAV working group:
<http://www.ietf.org/html.charters/webdav-charter.html>
Enabling remote collaborative authoring of Web resources. It is not limited to web pages alone. In fact all file types can be authored remotely.

WebDAV Protocol

WebDAV is a protocol layered on top of HTTP/1.1. With additional headers: (DAV, If, Depth, Overwrite, Destination, Lock-Token, Timeout, and Status-URI) and new added methods: (COPY, MOVE, MKCOL, PROPPATCH, PROPFIND, LOCK, and UNLOCK). These new methods allow for basic file operations such as copy, move, rename, etc. as well as saving and retrieving of properties that are associated with each file, locking for persistence and overwrite protection, and namespace management. Because of these new additions it makes it more than a file server. I(2) Drive WebDAV Server can replace older protocols such as FTP, and other proprietary protocols that are supported by fewer client software. Here is a short description of each new method.

For more information about WebDAV specification you can check:

<http://www.ietf.org/html.charters/webdav-charter.html>

COPY: To copy a file or folder to a new destination.

MOVE: To move or rename a file or folder.

MKCOL: To create a folder

PROPPATCH: To save one or more file property on the server. Such as author, created date, tile, etc.

PROPFIND: For retrieving properties

LOCK: for locking a resource through authentication, owner information and a Lock-Token. For example, an exclusive write, lock will prevent others from writing to the file.

UNLOCK: Releases the lock on the resource.

PUT and GET methods, which are already part of HTTP protocol, allow reading and writing resources on the server.

There are many client software and operating systems that support this standard. Some of these include MS Windows, Mac OS, Linux, MS Office, Adobe Photoshop, Illustrator, and GoLive, Macromedia Dreamweaver, and others. More information on these clients is provided in section 7.

Software clients supporting WebDAV.

2. Benefits

What are the benefits of using I(2) Drive WebDAV?

For Users

I(2) Drive WebDAV Server allows users to collaboratively edit and manage files remotely. Document metadata such as title, description, author or any other set properties is available to the user and allows for more intelligent directory listings. User can Drag-and-drop files as well as folders, move or copy resources, save files to the server and even edit them right on the server. All these can be done from any WebDAV capable client and most clients support this protocol. There are numerous tools, applications, and operating systems that support WebDAV. The user can also add additional metadata (properties) to each resource, which can then be made available for a more intelligent directory listing. With I(2) Drive WebDAV Server's locking, overwrite of content is protected in a group scenarios where more than one person works on the same file. Microsoft Office product users can open, edit, or create any document on the I(2) Drive WebDAV Server. Adobe and Macromedia product users can checkout files from I(2) Drive WebDAV Server, edit the file and check-in back to the server. From I(2) Drive's web-based user interface, users can access their files from any web browser, share files among co-workers and even public users via a key generated access code.

For Administrators

Configuration, local system layout, and system structure is completely separate from the users conceptual workspace. That means that for namespace management, I(2) Drive WebDAV Server uses database store, or file store while presenting each user with his/her own workspace. Since files have a separate structure, any system design or partitioning scheme can be created. For example one simple sequential file system scheme on any number of mount points will be sufficient for handling hundreds or thousands of users. There is no need to create user home directory or manage users on the system. Backup and restore is also simplified. When a user deletes a file, optionally, I(2) Drive WebDAV Server database store can change the status of that resource from created to deleted status code. This will remove the resource from displaying in the users account. However, neither the actual file nor its reference record in the database is removed. This allows for a simple restore of the file by simply changing the status of the file back. For authentication, you can use HTTP-based authentication instead of system accounts. User accounts are managed by I(2) Drive WebDAV Server and their accounts are maintained in the database. It is also possible for integration with system accounts while authentication of users via HTTP. File locking is identified by the user authentication along with a Lock-Token and owner information. Other information about a lock include: timeouts, ownership and depth. A lock will apply to the whole resource and not just a portion. Locks provide overwrite protection and distinction between the authors. I(2) Drive WebDAV Server allows for basic operations of create, move, copy, and delete of resources and include users ability to edit file on the server itself, instead of downloading and uploading back by the user as in the case of FTP.

3. Use Case

I(2) Drive WebDAV Server can be used as departmental server for web hosting, development teams, remote collaboration and authoring, network file system, unified repository-access, file servers, and offsite access. There are many WebDAV enabled clients that support this standard. Anything that users do with these software tools, they can do it on the server

4. Security

Since I(2) Drive WebDAV Server extends the HTTP/1.1 protocol, you receive all the benefits of HTTP infrastructure such as strong authentication, encryption and proxy/firewall navigation. Namespace is managed by I(2) Drive WebDAV Server which uses database store, or file store while presenting each user with his/her own workspace. This is similar to doing a chroot of a user account. Authentication is done via I(2) Drive Database Realm along with role code permissions. Of course, in this case there is no need to have user accounts on the system. Accounts are maintained in the database and managed by the administration tools of I(2) Drive WebDAV Server. Creating and editing accounts is simple. Another advantage of the permission system is that users are able to share resources (file or folders) among the entire organization, and/or within one or more workgroups, and/or individual users. They can even share with a user that is outside and not part of the system. I(2) Drive WebDAV Server generates an access key for that particular outside user. When sharing is removed, the resource is removed from this account.

5. Development

I(2) Drive WebDAV Server is written in Java. It can run on any Java supported server such as Apache Tomcat, JBoss, Weblogic, etc. You can run it as standalone or layered on an HTTP server such as Apache by using a connector. For example, in the case of Apache and Tomcat combination, use mod_jk or mode_jk2 for redirecting requests to the server.

The store package of I(2) Drive WebDAV Server contains an interface that can be used to implement and extend classes for creating different file system schemes and intergrading with back-end legacy systems. Some implementations are of course included such as database store which is integrated with I(2) Drive's file system and the I(2) Drive web-based user interface.

Furthermore, since you have the advantage of working on a single system that provides each user with their own file system, you can develop applications that can be useful for the users. An example of this is the I(2) Drive Photo Album. It provides managing media and a tool for the user to build presentations. You can build or integrate with any other tools or applications. Some possibilities include providing personal home pages or launching multiple web sites from each accounts' WebDAV file system.

6. Architecture

Architectural design of I(2) Drive WebDAV Server as an integral part of I(2) Drive Server

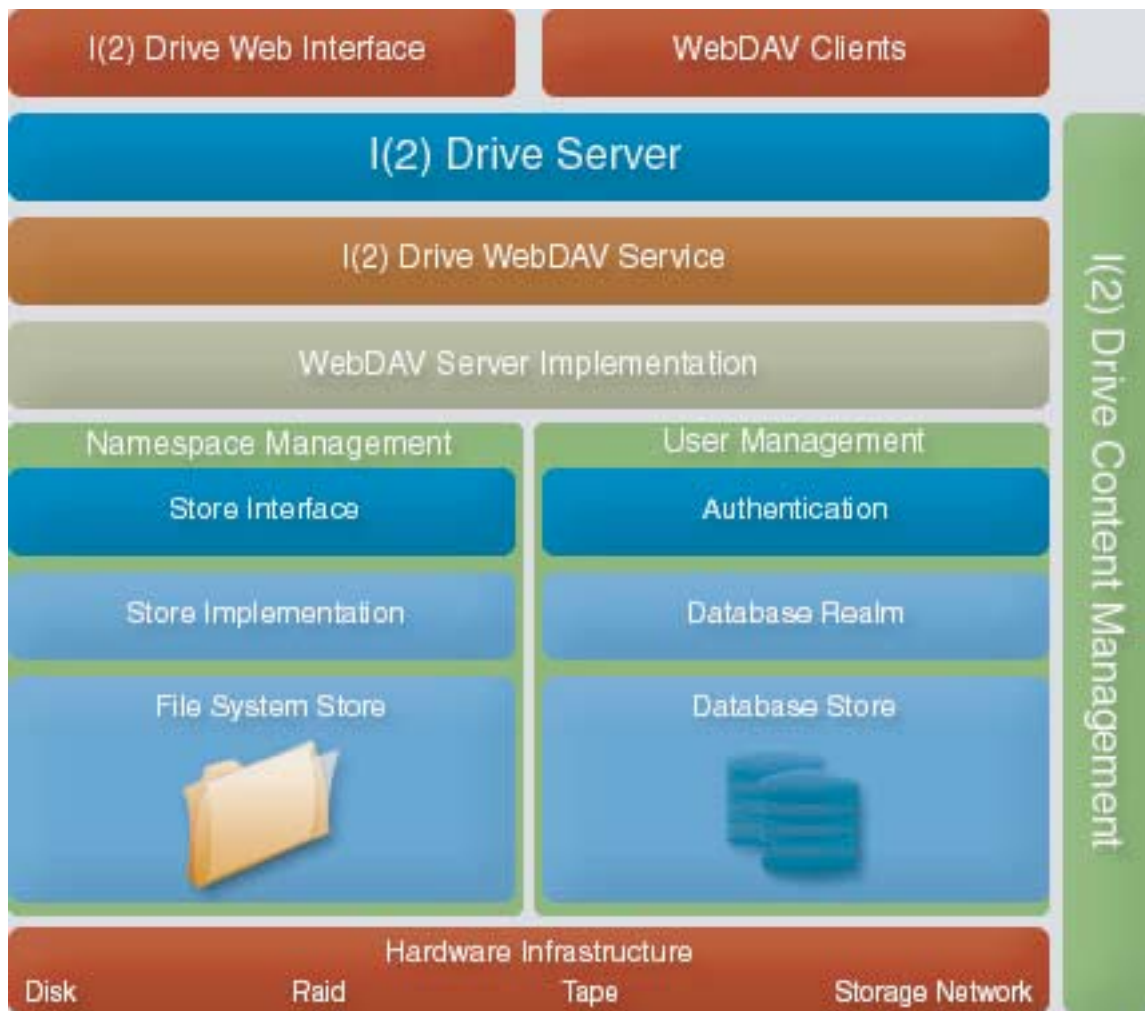


Figure 1. Abstract structure of I(2) Drive Server.

7. Clients Supporting WebDAV

There are many WebDAV compliant clients. Here is a list of the most commonly used tool. Microsoft Windows 98/2000/XP Explorer: Provides access via "Web Folders" by mapping to I(2) Drive WebDAV Server. Allows drag and drop of files and standard move/copy/delete/rename of files or folders. Mac OS X: from "Finder", you can connect to I(2) Drive WebDAV Server. This will mount I(2) Drive on the desktop. You can do anything you would normally do with any other drives. Mac OS 9: For Mac OS 9 you can use a freely available tool called Goliath, to connect to I(2) Drive WebDAV Server. Linux: For Linux you can use DAVFS2 to mount I(2) Drive WebDAV Server as a file system. gnome-vfs: Creates a Virtual File System. KDE is also DAV-enabled. Microsoft Office 2000/2003: Word, Excel, etc are DAV-enabled.

You can open/save files directly from/to I(2) Drive WebDAV server. Office uses lock request for overwrite protection. Adobe Photoshop and Adobe Illustrator: With its workgroup server connection option, lets you connect to I(2) Drive WebDAV Server, Check-in/check-out files. Optionally maintains synchronized copy of the files locally. Adobe GoLive: It is used as a site management and page design/authoring tool. Uses Locks for team authoring and overwrite protection. Macromedia Contribute: Can be used to manage WebDAV enabled sites. Macromedia Dreamweaver: Can checkout and check-in files on I(2) Drive WebDAV Server with choice of having local copies of the workspace or editing files on the server.



FOR MORE INFORMATION

To learn more about I(2) Drive WebDAV, please visit:

www.i2drive.com/webdav

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WEB-DAV Linux File System (DAVFS2) is written by Sung Kim <http://dav.sourceforge.net/> Linux (GNU/Linux) is an open source operating system of GNU Operating System - Free Software Foundation <http://www.gnu.org>