

# SeedMe2: Creating data centric websites for researchers and research projects

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Project website: [dibbs.seedme.org](http://dibbs.seedme.org)

Trial website: [sandbox.seedme.org](http://sandbox.seedme.org)

# SeedMe Projects

## SeedMe 1

a.k.a. Stream encode explore and disseminate My experiments

- Based on Drupal 7
- In production Platform as a Service (PaaS)
- **Video encoding was the main focus**

## SeedMe 2 : Data sharing building blocks

Evolution of the original SeedMe project (Complete rewrite)

- Based on Drupal 8
- Incorporates user feedback from original SeedMe project
- Built for distribution and extension
- **Data sharing and data management is the main focus**

## Data management stumbling blocks

Transfer

Storage

Access  
control

Collaboration

Automation

But what about Presentation and Discovery?

## Data management stumbling blocks

Transfer

Storage

Access  
control

Collaboration

Automation

## Three D's : Data, Description, Discussion

### Issues due to content dispersion

Data in the Cloud

Description in  
someone's mind

Discussion on emails

# Related solutions

## Filesystem based solutions

### Tools

SCP  
FTP

### Middleware

Globus  
IRods  
NEWT

### Software repositories

GitHub  
SVN  
CVS

### File hosting

Cloud drives  
(Dropbox, etc)  
WebDAV

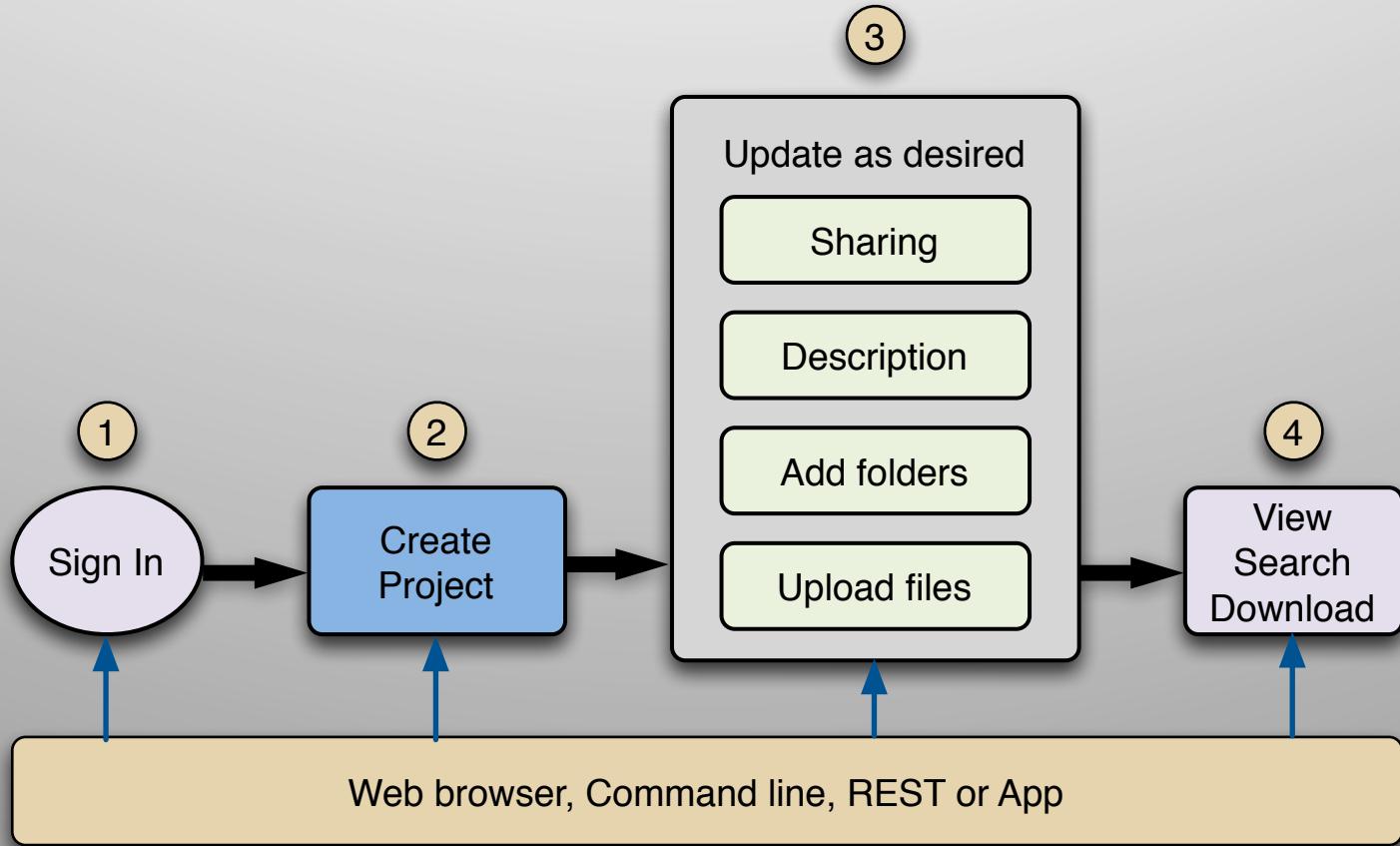
## Content management system based solutions

HubZero  
FigShare

## Limitations of existing solutions

- Lack extensibility
- Lack support for rich content (description, discussion, etc...)
- Lack independent developer support
- Lack 3 way interaction via web browser & command line & API
- Resource restricted

# Workflow



# Architecture

Small data  
(PHP library)

Drupal 8  
Contributed  
Modules  
e.g.  
Federated  
Authentication  
via OIDC  
module

## Drupal 8

### Modules

- Virtual file system
  - Access control
  - Hierarchical storage
  - Command plugins
  - UI and display
  - Search / index
  - Web services
- File formatters
  - Quick Visualization

Database  
(MySQL)

Webserver  
(Apache + PHP)

## Users

Web browser

Command line

REST clients

# SeedMe Platform Ecosystem

## **Drupal (Content Management System)**

- Widely used in industry, academia and government  
(third most popular CMS on web after Wordpress & Joomla)
- Modular architecture with large ecosystem  
(over 1,000 contributed modules)
- Large developer & support community  
(4,000 contributors to core + thousands more)
- Security advisory and updates for core and stable contributed modules every month
- Versatile deployment options  
(personal hosting, institutional hosting, cloud hosting)

# What is FolderShare?

A Drupal 8 module that enables a website to

- Present data in a more consumable form e.g. with rich description and visualization via companion small data module
- Store, organize and share data
- Annotate any file/folder with description
- Conduct discussion on any file/folder via comments
- Customize site wide virtual file system with additional fields
  - E.g. Keywords, dates, etc
- Manage data (upload, download, etc.) via
  - Web browser
  - REST API
  - Command line

# FolderShare module



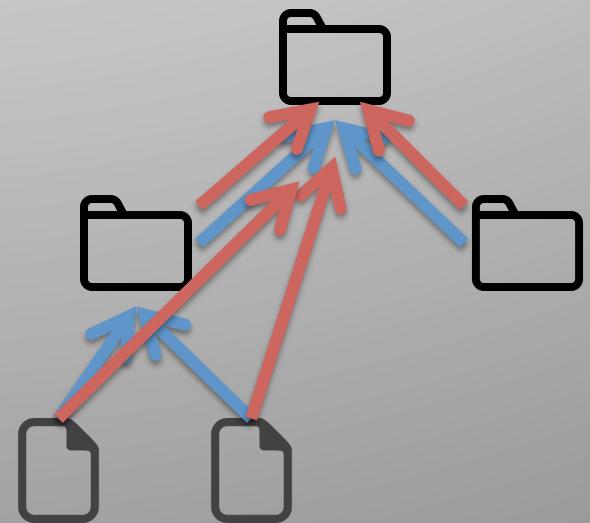
- Virtual file system (fieldable):
  - Entity type & API
  - Access controls
  - Usage tracking
  - Views, displays, breadcrumbs, forms
  - Plugins for field formatters, search, views, actions, and queue workers
- Configurable by sites
  - e.g. Keywords, comments, flags, DOIs
- Extensible by developers

# Files & folders

- Children point to parents
  - Parent IDs enable fast queries for all children of a folder
  - Root IDs enable fast queries for access controls and breadcrumbs

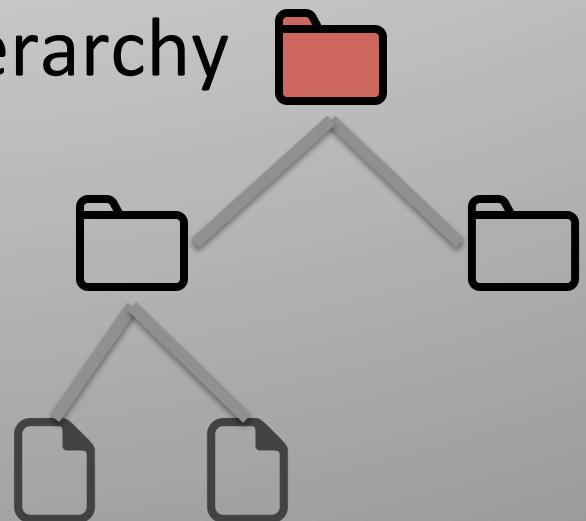
↗ parentid points to immediate parent

↗ rootid points to top folder



# Access controls

- Drupal account-based
- Permissions + access control list on top folders
  - List of users that can view and author
- Top folder controls entire hierarchy
  - Simpler than desktop OSes
  - Similar to file sharing services
  - Fast to check access



# File storage

- Folders only exist in database
- Files described in database & stored on disk
- Disk directory != folder hierarchy
  - Better for security and load balancing
  - Files have generated names
    - Avoids character set and name length limits
  - Files have no extensions
    - Avoids accidental server execution of “.php”, etc.

# Views

- List personal, public, and shared files & folders
  - Pages & embedded views in folder pages
- Integrated desktop-like UI
  - Select files and folders
  - Then choose menu command
- Two UI variants:
  - Scripting but no AJAX
  - Scripting with AJAX

# Plugins

- Field formatters
  - Folder names, entity references, MIME-type icons
- Search
  - Index and present results
- Queue worker
  - Update folder hierarchy sizes in background
- Actions & custom commands
  - Menu UI items to add, delete, etc

# Foldershare API Documentation

Home » API reference » foldershare-8.x-1.x

Classes, traits, and interfaces ◉

The screenshot displays the Foldershare API Documentation interface, featuring several interconnected pages:

- Class Page:** Shows the `FolderShare` class with its description: "Manages a hierarchy of folders, subfolders, and files." It also lists common fields for every folder or file item.
- Function Page:** Shows the `hook_foldershare_access` function with its description: "Controls access to a file or folder." It details the access control mechanism and steps.
- Method Page:** Shows the `comment_foldershare_update_index` method.
- Search Bar:** A search bar at the top right allows users to search for functions, files, or topics.
- API Navigation:** A sidebar on the left provides navigation links for various API components like AdminSettings, AdminUsagePage, ArchivItem, ChangeOwnerItem, Constants, CopyItem, DeleteItem, DownloadItem, DuplicateItem, and EditCommand.

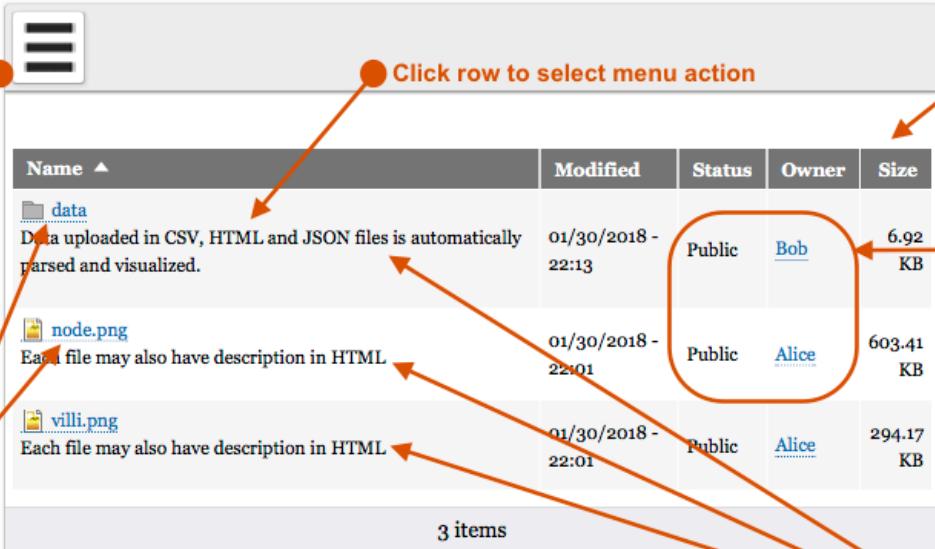
Fixed route - /foldershare

Tools menu > Folders

Add a menu item anywhere pointing to /foldershare

## **FOR USERS**

## Sample project by Alice



**Sortable file and folders listing**

**Click row to select menu action**

**Share folder tree**  
Grant one of the following access  
 a) Public  
 b) View (read only)  
 c) Author (write)

**Each File and folder can add a description**

**Owner:** Alice  
**Modified:** 02/22/2018 - 10:05  
 This top level folder and its child content is public. Bob and Charlie have been granted Author (Read/Write/Edit/Delete) privileges. A rich text description may be added to any file or folder in HTML

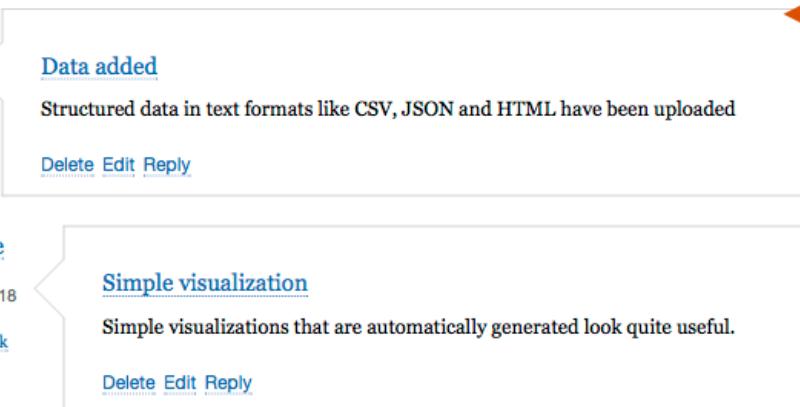
Name	Modified	Status	Owner	Size
 data	01/30/2018 - 22:13	Public	Bob	6.92 KB
 node.png	01/30/2018 - 22:01	Public	Alice	603.41 KB
 villi.png	01/30/2018 - 22:01	Public	Alice	294.17 KB

3 items

**Click link to open file or folder**

**Menu actions**

## FolderShare comments



**Foldershare entity is fieldable**  
e.g. Add comments or other content

**Bob**  
 Wed, 01/31/2018 - 13:13  
[Permalink](#)

**Data added**  
 Structured data in text formats like CSV, JSON and HTML have been uploaded

[Delete](#) [Edit](#) [Reply](#)

**Charlie**  
 Wed, 01/31/2018 - 13:14  
[Permalink](#)

**Simple visualization**  
 Simple visualizations that are automatically generated look quite useful.

[Delete](#) [Edit](#) [Reply](#)

## Sharing form to restrict access

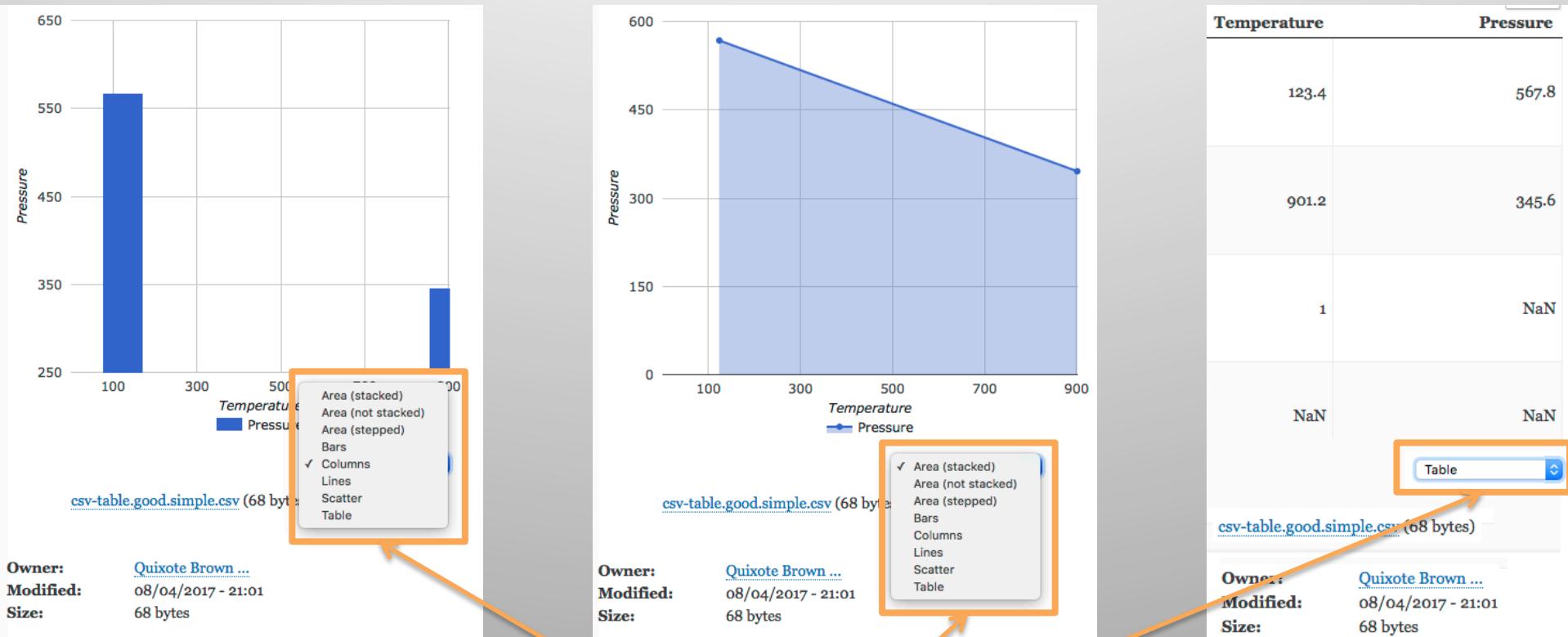
### Share "Project One" Folder Tree

Share all files and folders in this folder tree.

User	Access
	None   View   Author
Anonymous (any web site visitor) <i>Anonymous users do not have FolderShare module author permission, so they cannot be granted author access.</i>	<input checked="" type="radio"/> <input type="radio"/>
john	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
mary	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>

[Save](#)

# Quick visualization of CSV & JSON files



Visualizations can be switched interactively to different chart types

# SmallData API & Module



SmallData

- Structured data parsers & writers
  - Tables, trees, and graphs
  - JSON, CSV, TSV, TXT, etc.
- Field formatters
  - Light-weight visualization
  - Line plots, bar charts, pie charts, etc.

# Sample commands

```
foldershare --help
```

```
foldershare --host http://demo.seedme.co
```

```
help
```

```
$ foldershare --help
Usage is: foldershare [HOST_OPTIONS] [COMMAND] [OPTIONS]

Create, delete, change, and manage files and folders on a remote web site
that uses the FolderShare module.
```

## Commands

config	Show the host administrator configuration.
cp	Copy files and folders.
get	Download files and folders.
ls	List files and folders.
mkdir	Make new folders.
mv	Move files and folders.
put	Upload files and folders.
rm	Remove files or folders.
rmdir	Remove empty folders.
stat	Show the status of files and folders.
update	Update fields on files and folders.
usage	Show the user's storage use.
version	Show version numbers.

```
Add "--help" after any command to show its description and flags.
```

## Host and account

```
All commands require a remote host and account:
```

--host HOSTNAME	Select the host (and optional port) for the site.
--username NAME	Specify the user login name on the site.
--password PASS	Specify the user password on the site.

## Example:

```
foldershare --host myhost --username me --password pw ls /
```

```
If the username and/or password are omitted, the command will prompt for them.
```

## Additional options

--help	Show this help information.
--verbose	Be verbose while performing the operation.
--version	Show application version numbers.
--format type	Select how information is displayed: auto (default) Use an operation-specific default full Show full-detail nested-array output keyvalue Show a table of key-value pairs linux Show a Linux-style output text Show key-value pairs as text

```
For Linux/macOS/BSD-style commands, the format type defaults to 'linux'
and output is formatted similar to those OS commands.
```

## Example:

```
foldershare --host myhost --format full stat /myfolder
```

# Sample command line interaction

```
foldershare --help
```

```
foldershare --host http://demo.seedme.org --user dave --password 'cliRocks!'
```

```
help
```

```
mkdir --help
```

```
mkdir "/test"
```

```
mkdir "/test/data"
```

```
ls --help
```

```
ls /
```

```
upload --help
```

```
upload "plots/villi.png"      "/test"
```

```
upload "plots/composite.png"  "/test"
```

```
Upload "sample-small-data/OpenGL mesh memory use.csv"          "/test/data"
```

```
Upload "sample-small-data/Image classification breakdown schedule.json"  "/test/data"
```

```
download --help
```

```
download "/test" "/Users/amit/downloads"
```

```
rm --help
```

```
rm -rf "/test"
```

## **FolderShare configuration**

**Admin menu**

Structure > FolderShare

# **FOR ADMINISTRATORS**

# FolderShare configuration

## Fields

### Manage fields, forms & display

Configuration located in admin menu  
Structure > FolderShare

## FolderShare

[Settings](#) [Manage fields](#) [Manage form display](#) [Manage display](#)

FolderShare manages a virtual file system with files, folders, and subfolders. Module settings control how content is stored, presented, searched, and secured. See also [Module help](#) and the module's [Usage report](#).

Fields

Files

Interface

Lists

Search

Security

Web services

#### Manage fields for files and folders.

Files and folders contain fields for names, dates, sizes, descriptions, and more. You may add your own fields and adjust how fields are displayed when viewed and edited.

#### Fields, forms, and displays

Built-in fields for files and folders include a name, description, size, and creation and modification dates. Fields may be adjusted with the optional [Field UI module](#) to add new fields and manage how fields are viewed and edited.

##### [Manage fields](#)

Create, delete, and modify additional fields for files and folders.

##### [Manage form display](#)

Manage forms to edit fields for files and folders.

[Restore original settings](#)

##### [Manage display](#)

Manage how fields are presented on file and folder pages.

[Restore original settings](#)

#### See also

##### [Content Language \(Not enabled\)](#)

Enable users to select a default language for appropriate text fields. ([Core module](#))

##### [Comment types](#)

Configure how comments are created and shown on files and folders. See the [Comments](#) documentation. ([Core module](#))

##### [Dates and times](#)

Configure date and time formats available when creation and modification dates are displayed. See the [Date-Time](#) documentation. ([Core module](#))

##### [Languages \(Not enabled\)](#)

Enable users to provide authored translations of appropriate text fields. ([Core module](#))

##### [Regional](#)

Configure regional formats for the display of dates and times, and select how times are mapped to the current or user time zone. ([Core module](#))

##### [Text Editors](#)

Configure WYSIWYG text editors available on entity edit forms to assist in editing formatted text. See the [Text editor](#) documentation. ([Core module](#))

##### [Text Formats](#)

Configure text formats available on entity edit forms to filter and process formatted text. See the [Filter](#) documentation. ([Core module](#))

##### [Tokens](#)

Manage tokens created by this module and others. ([Third-party module](#))

[Save configuration](#)

# FolderShare configuration

## Files

### Storage location & upload restrictions

#### FolderShare

The file extensions list has been restored to its original values.

[Settings](#) [Manage fields](#) [Manage form display](#) [Manage display](#)

FolderShare manages a virtual file system with files, folders, and subfolders. Module settings control how content is stored, presented, searched, and secured. See also [Module help](#) and the module's [Usage report](#).

Fields

Files

Interface

Lists

Search

Security

Web service

#### Select how files are uploaded and stored.

Files are stored on the site's server and tracked in the site's database. Administrators may restrict uploaded files based upon their size and name extension, and limit the number of files uploaded at once.

##### File system

Select whether the module should use the site's *Public* or *Private* file system to store files. A *Private* file system provides better security.

This setting is disabled because there are already files under management by this module. To change this setting, you must [Delete all](#) files first.

File system: \*

*Default: Public*

##### Storage location

Select the server subfolder in the *Public* or *Private* file system into which the module will save files. This is typically named after the module. The subfolder will be created automatically if necessary.

This setting is disabled because there are already files under management by this module. To change this setting, you must [Delete all](#) files first.

Location: \*

*Default: foldershare*

##### File name extensions

Select whether uploaded files should be restricted to a specific set of allowed file name extensions.

Enable restrictions

##### Allowed file name extensions:

```
1st 3ds a aac accda accdb accde acccdt ade adn adp aiff asc ascii asp aspx au avi bash bat blend bmp  
bz2 c c++ cab cdb cgi cgm cmake config cp cpio cpp cs css csv csx cxx dae daq dat data dmrg doc doob  
doom docx dot dotm dobx dtd dxfs fff fits fits flac gif gz h h5 hdf hdf5 hpp htm html ico inc include info ini  
install iso j2k jar java jpeg jpg jpm jpx json jsp laccdbs ldb less ltx m m3u m4a m4p m4v maf make man  
man maq mar mat mat md mda mde mdf mdn mdt mdw mj2 mkv mlv mn module mogg mov mp3 mp4  
mpeg mpg mpv nc oga ogg p pbm pdf perl pgm phar php pl pm png ppm pot potx ppm ppm pps ppsx  
ppt pptm pptx prl proj ps py pyc python qt r rar ras rdf readme rss rtf sass scss sh shar sit sitx sldm sldx stl
```

Separate extensions with spaces and do not include dots. Changing this list does not affect files that are already on the site.

##### Maximum file upload size

Set the maximum size allowed for each uploaded file. This size is also limited by PHP settings in your server's "php.ini" file and your site's top-level ".htaccess" file. These are currently limiting file sizes to 524288000 bytes.

Size: \*

*Default: 524288000 bytes*

##### Maximum number of files per upload

Set the maximum number of files that may be uploaded in a single pload. This number is also limited by PHP settings in your server's "php.ini" file and your site's top-level ".htaccess" file. These are currently limiting file uploads to 20 files.

# FolderShare configuration

## Interface

### Command plugins

#### FolderShare

[Settings](#) [Manage fields](#) [Manage form display](#) [Manage display](#)

FolderShare manages a virtual file system with files, folders, and subfolders. Module settings control how content is stored, presented, searched, and secured. See also [Module help](#) and the module's [Usage report](#).

Fields

Files

Interface

Lists

Search

Security

Web services

#### Manage the user interface.

File and folder lists include a menu and toolbar for commands to create, upload, edit, and delete items. You may configure select the commands to include.

#### Menus

Commands are plugins provided by this module and others. By default, all available commands are included on menus. You may restrict menus to a specific set of commands.

Enable command menu restrictions

Select the commands to allow:

**Upload Files**

Upload files into a folder. (*foldershare module*)

**Move**

Move files and folders to another folder. (*foldershare module*)

**Duplicate**

Duplicate files and folders, and all of their contents. (*foldershare module*)

**Uncompress**

Uncompress an archive file and add its contents to this folder. (*foldershare module*)

**Change Owner**

Change the owner of files and folders, including the content of subfolders. (*foldershare module*)

**Rename**

Rename an item. (*foldershare module*)

**Delete**

Delete files and folders, and all of their content. (*foldershare module*)

**Download**

Download files and folders, and all of their content. (*foldershare module*)

**Copy**

Copy files and folders to another folder. (*foldershare module*)

**New Folder**

Create a new empty folder with a default name. (*foldershare module*)

**Share Folder Tree**

Share a folder tree and all of its contents with other users. (*foldershare module*)

**Compress**

Compress files and folders, and all of their contents. (*foldershare module*)

**Edit**

Edit the fields of a file or folder. (*foldershare module*)

[Save configuration](#)

# FolderShare configuration

## Lists

### Manage listing of file and folders

#### FolderShare

[Settings](#) [Manage fields](#) [Manage form display](#) [Manage display](#)

FolderShare manages a virtual file system with files, folders, and subfolders. Module settings control how content is stored, presented, searched, and secured. See also [Module help](#) and the module's [Usage report](#).

[Fields](#)

[Files](#)

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[Web services](#)

#### Manage lists of files and folders.

You may configure file and folder lists to adjust which fields are displayed and how their values are presented.

#### Views

The layout and presentation of lists may be controlled using the optional [Views UI module](#).

#### [FolderShare Lists](#)

List files, folders, and subfolders.

[Restore original settings](#)

#### See also

##### [Dates and times](#)

Configure date and time formats available when creation and modification dates are displayed. See the [Date-Time](#) documentation. (*Core module*)

##### [Regional](#)

Configure regional formats for the display of dates and times, and select how times are mapped to the current or user time zone. (*Core module*)

[Save configuration](#)

# FolderShare configuration

## Search (optional)

### FolderShare

[Settings](#) [Manage fields](#) [Manage form display](#) [Manage display](#)

FolderShare manages a virtual file system with files, folders, and subfolders. Module settings control how content is stored, presented, searched, and secured. See also [Module help](#) and the module's [Usage report](#).

[Fields](#)

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#### Manage search indexing and results.

File and folder names, descriptions, and file content is indexed and shown in search results. You may configure when indexing is done, what is included, and how search results are presented.

#### Core search

The optional [Search module](#) provides basic support for searching content. FolderShare provides an optional search plugin to index and present search results for files and folders.

#### Search pages

Configure how search creates indexes of site content and presents search results.

[Restore original settings](#)

#### See also

##### Cron

Configure and run automatic administrative tasks, such as when search indexing is done. See the [System](#) and [Automated Cron](#) documentation. (*Core module*)

[Save configuration](#)

# FolderShare configuration

## Security

### Manage sharing capabilities

#### FolderShare

[Settings](#) [Manage fields](#) [Manage form display](#) [Manage display](#)

FolderShare manages a virtual file system with files, folders, and subfolders. Module settings control how content is stored, presented, searched, and secured. See also [Module help](#) and the module's [Usage report](#).

[Fields](#)

[Files](#)

[Interface](#)

[Lists](#)

[Search](#)

[Security](#)

[Web services](#)

#### Manage how content is secured and shared.

Files and folders may be shared among users and with the public. Content may be accessed using a web browser and using optional services that work with software that runs on personal computers and mobile devices.

#### Sharing

Select whether to enable sharing, and whether users may publish their content for public access by anonymous site visitors. When sharing is disabled, users may only view and edit their own files and folders.

Enable shared access

Enable shared access with anonymous users

#### See also

##### [User permissions](#)

Grant view, author, share, and administer permissions to user roles. See the [User](#) documentation. (Core module)

[Save configuration](#)

[Settings](#) [Manage fields](#) [Manage form display](#) [Manage display](#)

FolderShare manages a virtual file system with files, folders, and subfolders. Module settings control how content is stored, presented, searched, and secured. See also [Module help](#) and the module's [Usage report](#).

[Fields](#)[Files](#)[Interface](#)[Lists](#)[Search](#)[Security](#)[Web services](#)

### Manage REST web services.

Files and folders are always accessible via a web browser, but additional web services may be enabled to allow client applications to access content without a browser. You may configure these services to enable or disable specific types of access.

#### REST web services

The [REST module](#) manages REST (Representational State Transfer) web services, such as those provided by FolderShare. While you can edit YML files to customize a configuration, the optional [REST UI module](#) provides a better user interface. Using the [REST UI module](#) you may enable and disable specific services and adjust their features.

##### [REST module](#)

Provide REST web services for entities and other features at the site.

[Restore original settings](#)

#### See also

##### [REST administration permissions](#)

Grant administrative permissions for REST services. See the [REST](#) documentation. (*Core module*)

##### [REST UI](#)

Manage the REST configuration for the site. (*Third-party module*)

[Save configuration](#)

# FolderShare REST settings

Requires REST UI contributed module

Manage REST operations

## Settings for resource *FolderShare files and folders*

Here you can restrict which HTTP methods should this resource support. And within each method, the available serialization formats and authentication providers.

Granularity Resource 

### Methods

- GET
- POST
- DELETE
- PATCH

### Accepted request formats

- json
- xml

### Authentication providers

- basic\_auth
- cookie

Save configuration

# FolderShare Usage

Admin menu

Reports > FolderShare usage

## FolderShare usage

### Current usage by user

<a href="#">Users</a> ▾	<a href="#">Top-level folders</a>	<a href="#">Folders</a>	<a href="#">Files</a>	<a href="#">Bytes</a>
<a href="#">Anonymous</a>	0	0	0	0 bytes
<a href="#">Dr. Aarush Ahuja</a>	1	2	16	0 bytes
<a href="#">Dr. Buena Bonita</a>	0	1	5	1.27 KB
<a href="#">Dr. Chandler Charles</a>	1	2	20	1.54 KB
<a href="#">Site Administrator</a>	0	0	0	120.68 MB
<a href="#">demo (Data manager)</a>	0	0	0	0 bytes
<b>Total</b>				

# FolderShare permissions

Permission	Anonymous user	Authenticated user	Data manager	Administrator
<b>FolderShare</b>				
Administer files and folders <i>Warning: Give to trusted roles only; this permission has security implications.</i> Administer public, private, and shared files and folders. Create, delete, view, download, edit, and change the ownership of content owned by any user.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Author files and folders Create, delete, view, upload, download, and edit files and folders owned by the user, and by other users that grant author access using folder sharing.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Create and share top-level folders Create and adjust settings for sharable top-level folders that group content that may be made public, kept private, or shared with specific users.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
View files and folders View and download files and folders owned by the user, and by other users that grant view access using folder sharing.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

# What's different

- **Coalesce 3D's**
  - Data, description and discussion in one spot
- **Add custom fields**
  - Tags/Keywords
  - Key-value pairs
  - Etc...
- **Full control on the cyberinfrastructure**
  - Brand your data sharing
    - Your domain
    - Your styling
  - Single sign on from 2,200+ institutions
  - DIY / Hosted by provider
  - Use for data management plan (Combine website and data sharing)

# SeedMe2 – Target users/Use cases

- **Researchers**
  - Collaboration hub or personal dashboard
- **Project repositories**
  - Include project specific customization (e.g. taxonomy, keywords)
- **Developers**
  - Integrate your scientific application
- **Science gateways**
  - Data sharing
  - Data publishing
  - Data escrow service
- **CyberInfrastructure providers**
  - Offer SeedMe platform to your user base/communities

## Coulomb Implosion

# Real usage by physicists

Name	Modified	Status	Owner	Size
EPOCH input deck	03/13/2018 - 18:05	Shared		4.25 KB
n_e	03/13/2018 - 18:07	Shared		6.58 MB
n_i	03/13/2018 - 18:07	Shared		6.33 MB
Total electric field	03/13/2018 - 18:08	Shared		5.65 MB
Total electric field [zoom]	03/13/2018 - 18:10	Shared		1.2 MB

5 items | [Image slideshow](#)

### Owner:

Modified: 03/13/2018 - 17:52

PIC simulations of a rectangular plasma with a cavity irradiated by 4 laser pulses.

$\lambda = 1 \mu\text{m}$  - laser wavelength;

$I = 5 \times 10^{18} \text{ watt/cm}^2$  - peak intensity of each laser pulse;

$n_e = n_i = 30n_{crit}$  - initial electron and ion densities;

$R = 60 \text{ nm}$  - radius of the cavity;

cell size is 2 nm by 2 nm; 20 electron macro-particles and 20 ion macro-particles per cell;

Laser electric field is in the plane of the simulation;

Each pulse is  $\Delta t = 20 \text{ fs}$  long, with the field envelope given by  $(1 - \cos(2\pi t/\Delta t))/2$ .

# Deployment/service options

## **DIY - Run own instance (Your branding + your domain)**

- On your own hardware
- Condo hardware

## **Provider/vendor runs an instance**

- Your institution
- CI centers
- Commercial vendors

## **As a cloud service (Our branding & our domain)**

- [dibbs.seedme.org](http://dibbs.seedme.org)

# Try it yourself!

**Explorers welcome (web browser needed)**

Trial website: [sandbox.seedme.org](https://sandbox.seedme.org)

**Integrators & developers invited**

Download code: <https://dibbs.seedme.org/downloads>



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"Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation."

**Talk to us**  
amit @ sdsc.edu

Project website: [dibbs.seedme.org](http://dibbs.seedme.org)  
Trial website: [sandbox.seedme.org](http://sandbox.seedme.org)

# **DEMO**

## Talk to us

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- **Hiring/Contract: Experienced Drupal 8 PHP programmer for custom module development**
- Keen to learn about potential FolderShare uses cases in your work
- Single sign-on: Checkout <http://www.cilogon.org/drupal>

Project code: drupal.org/projects/foldershare

drupal.org/projects/smalldata

Trial website: sandbox.seedme.org

Project website: dibbs.seedme.org