

SeedMe: Data sharing building blocks

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Project website: dibbs.seedme.org

Demo website: demo.seedme.org

Trail website: try.seedme.org

SeedMe

aka Stream encode explore and disseminate My experiments

- In production as Platform as a Service (PaaS)
- Based on Drupal 7

SeedMe2

Evolution of the original SeedMe project (Complete rewrite)

- Based on Drupal 8
- Incorporates user feedback from original SeedMe project
- Built for distribution and extension in lieu of PaaS

Presentation Overview

Background & needs

Architecture

SeedMe platform

FolderShare: Virtual file system

- Entity data model & access control
- File management & security
- Views integration
- UI & Command plugins
- File formatters

Small data API

- Visualization

Target users/Use cases

Screen shots

+Demo

Related solutions

Tools

SCP / FTP

Middleware

SCP / FTP

Globus

IRods

NEWT

Software repositories

GitHub

SVN

CVS

File hosting

Cloud drives

WebDAV

Stumbling blocks

Transfer

Storage

Access
control

Collaboration

Automation

Issues due to content dispersion

Data, Description, Discussion (3Ds)

Description in mind

Data in cloud

Discussion on emails

Related solutions

Tools

SCP / FTP

Middleware

SCP / FTP

Globus

IRods

NEWT

Software repositories

GitHub

SVN

CVS

File hosting

Cloud drives

WebDAV

Content management systems

HubZero

FigShare

SeedMe

SeedMe's focus

Enable rapid access to transient and preliminary data

Consumable data

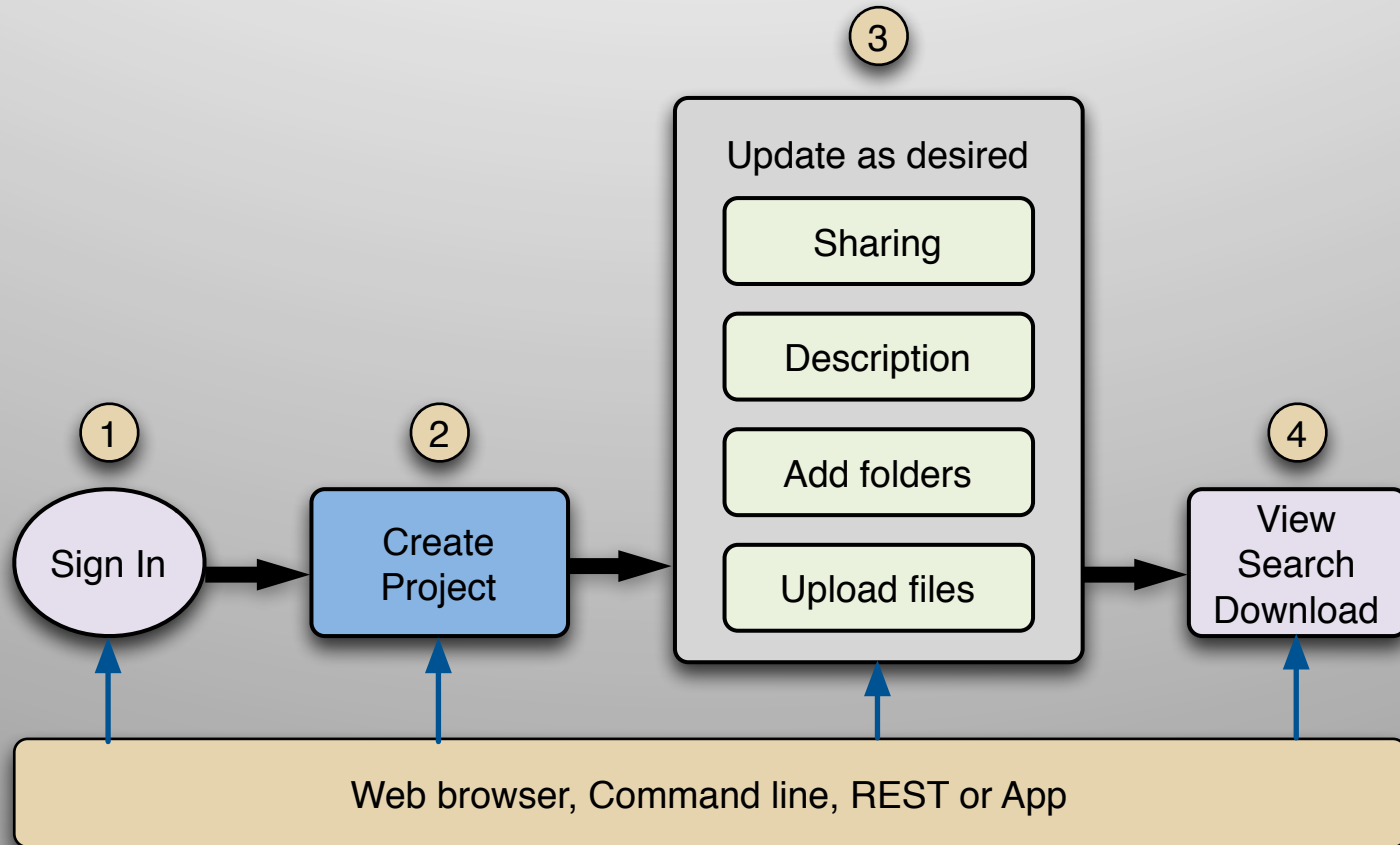
Can be handled by stock web browser
(Upload/Download, < 2GB per file)

Displayable on many devices (Phone to PC)

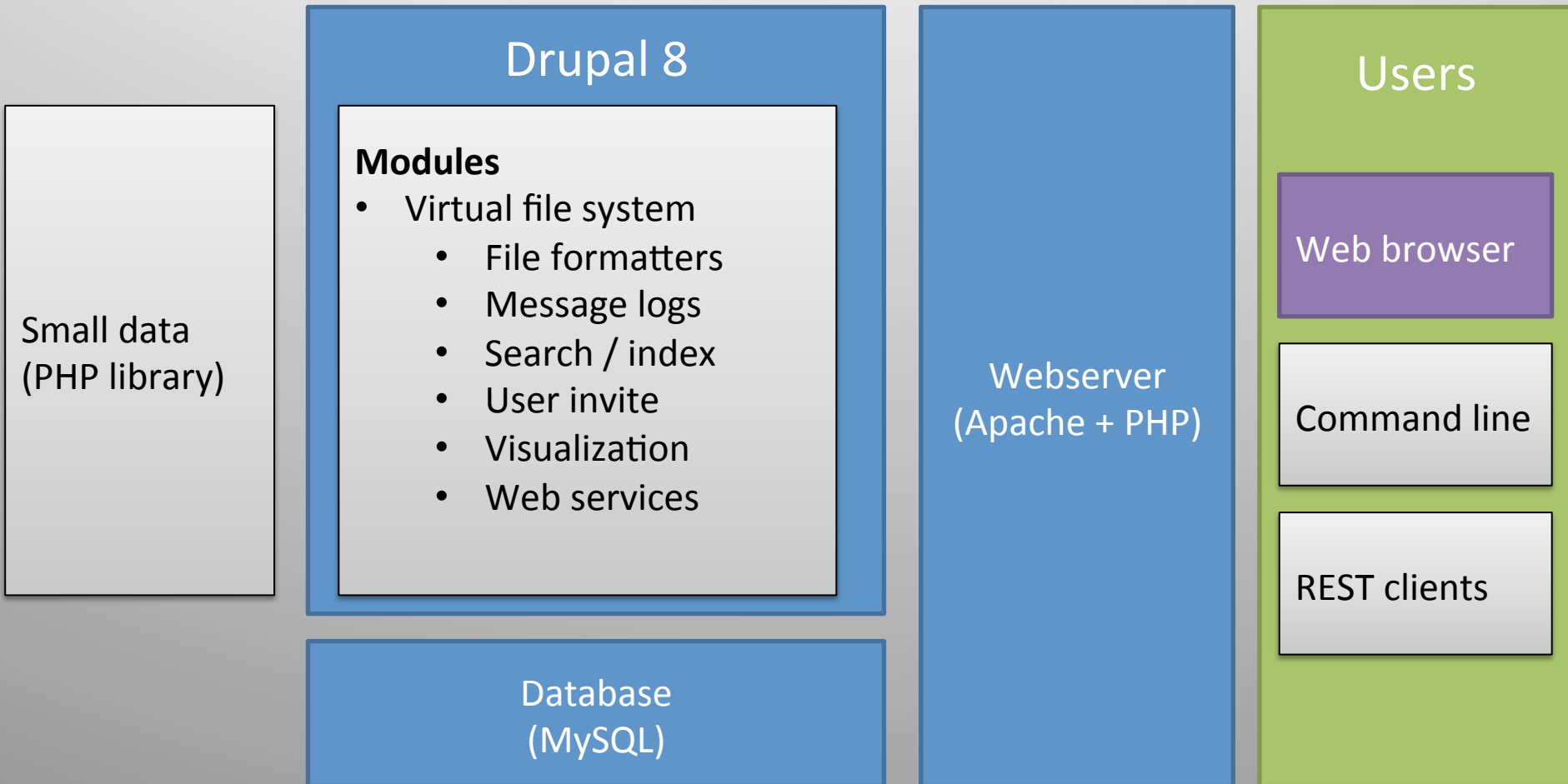
Hot data

High value data at a given time

Workflow



Architecture

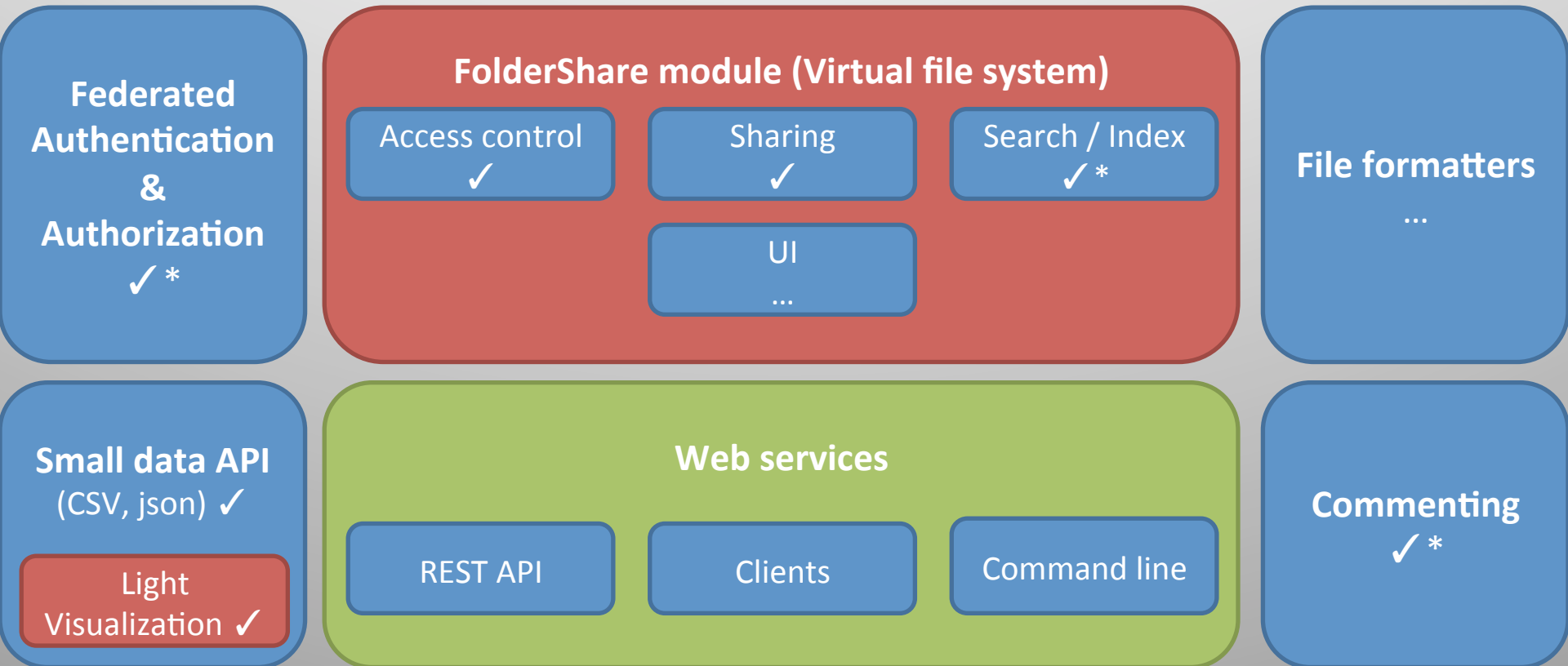


SeedMe Platform

Drupal (Content Management System)

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

SeedMe : Building blocks



✓ Implemented
✓ * Integrated
... Work in progress

FolderShare module



FolderShare

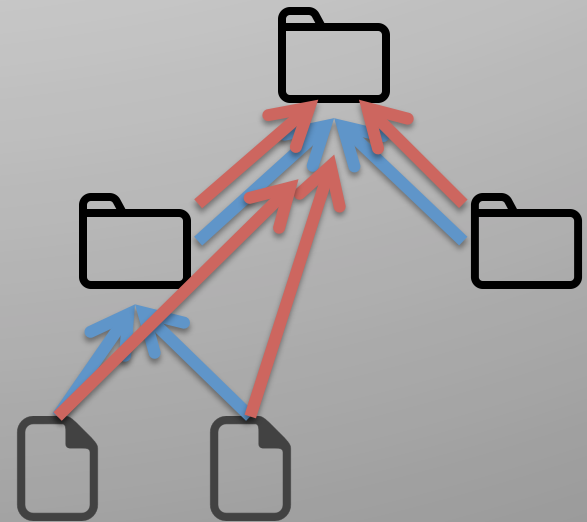
- Virtual file system:
 - Entity type & API
 - Access controls
 - Usage tracking
 - Views, displays, breadcrumbs, forms
 - Plugins for field formatters, search, views, actions, and queue workers
- Configurable by sites
 - e.g. Comments, flags, DOIs
- Extensible by developers

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

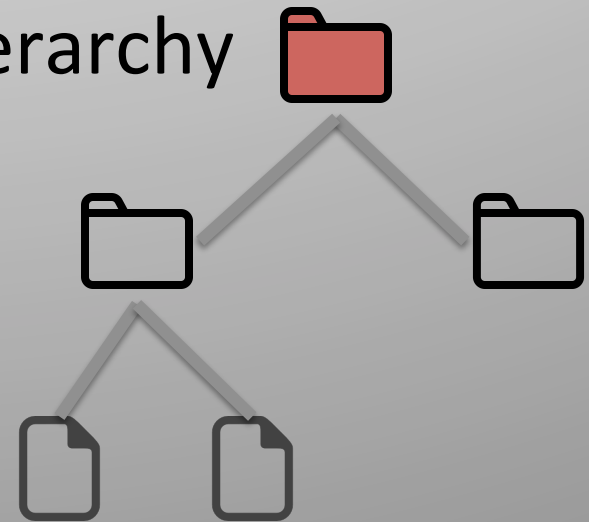


File storage

- Folders only exist in database
- Files described in database & stored on disk
- Disk directory \neq 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.

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



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
- Three UI variants:
 - No scripting
 - 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

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.

Top folders owned by you

Top folders shared with you

Public top folders

These lists display top level folders

Folder management interface showing a list of folders and their details.

Navigation: Home, Folders (selected), Personal, Shared, Public.

Menu: A hamburger menu icon is highlighted, with an arrow pointing to the "Menu" label.

Name ▲	Modified	Status	Owner	Size
Data share This project is publicly viewable. Both Mary and John have Author privileges. Integer posuere erat a ante venenatis dapibus posuere velit aliquet. Aenean...	10/18/2017 - 22:12	Public	demo	191.96 KB
Project One This project may be Authored by Mary, but can only be Viewed by John. Vivamus sagittis lacus vel augue laoreet rutrum faucibus dolor auctor. Curabitur...	10/20/2017 - 03:00	Shared	demo	1.12 MB

2 items

Folders may have a description

Folders

Personal

Shared

Public



Menu options – with no selection

- New Folder
- Upload Files
- Download
- Edit
- Rename
- Delete
- Copy
- Duplicate
- Move
- Share Folder Tree
- Compress
- Uncompress

	Modified	Status	Owner	Size
...ly viewable. Both Mary and John have Author privileges. Integer posuere erat a ante venenatis dapibus posuere	10/18/2017 - 22:12	Public	demo	191.96 KB
...Authored by Mary, but can only be Viewed by John. Vivamus sagittis lacus vel augue laoreet rutrum faucibus	10/20/2017 - 03:00	Shared	demo	1.12 MB

2 items

Folders

Personal

Shared

Public

Menu options – with selection

- New Folder
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- Download Folder...
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- Rename Folder...
- Delete Folder...
- Copy Folder...
- Duplicate Folder
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2 items

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

Project One

☰				
Name ▲	Modified	Status	Owner	Size
data Certain structured formats such as CSV, JSON and HTML table can be automatically visualized	10/20/2017 - 03:00	Shared	demo	6.92 KB
doc.pdf Every file may have a description.	10/20/2017 - 03:23	Shared	demo	83.86 KB
images Every folder may have a description in rich text.	10/20/2017 - 03:24	Shared	demo	1.03 MB
progressBars.ipynb Every file may have a description in rich text.	10/20/2017 - 03:25	Shared	mary	4.2 KB
4 items				

Owner: demo
Modified: 10/20/2017 - 03:00
Description: This project may be *Authored* by [Mary](#), but can only be *Viewed* by [John](#).

Different users


Vivamus sagittis lacus vel augue laoreet rutrum faucibus dolor auctor. Curabitur blandit tempus porttitor. Donec sed odio dui. Maecenas sed diam eget risus varius blandit sit amet non magna.





- Nullam id dolor id nibh ultricies vehicula ut id elit. Etiam porta sem malesuada magna mollis euismod.
- Cras justo odio, dapibus ac facilisis in, egestas eget quam.
- Praesent commodo cursus magna, vel scelerisque nisl consectetur et.
- Duis mollis, est non commodo luctus, nisi erat porttitor ligula, eget lacinia odio sem nec elit.

Hello	World
Ace	Base
Uno	Dos

Integer posuere erat a ante venenatis dapibus posuere velit aliquet. Donec sed odio dui. Vestibulum id ligula porta felis euismod semper. Maecenas sed diam eget risus varius blandit sit amet non magna. Nullam quis risus eget urna mollis ornare vel eu leo. Vivamus sagittis lacus vel augue laoreet rutrum faucibus dolor auctor.

Project One



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- Nullam id dolor id nibh ultricies vehicula ut id elit. Etiam porta sem malesuada magna mollis euismod.
- Cras justo odio, dapibus ac facilisis in, egestas eget quam.
- Praesent commodo cursus magna, vel scelerisque nisl consectetur et.
- Duis mollis, est non commodo luctus, nisi erat porttitor ligula, eget lacinia odio sem nec elit.

Hello	World
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- Nullam id dolor id nibh ultricies vehicula ut id elit. Etiam porta sem malesuada magna mollis euismod.
- Cras justo odio, dapibus ac facilisis in, egestas eget quam.
- Praesent commodo cursus magna, vel scelerisque nisl consectetur et.
- Duis mollis, est non commodo luctus, nisi erat porttitor ligula, eget lacinia odio sem nec elit.

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Every folder and file may add a description.
(Formatted text field aka Body field in Drupal's Node)

Project One

Name ▲					Modified	Status	Owner	Size
<div><div></div><div>data</div></div>	Certain structured formats such as CSV, JSON and HTML table can be automatically visualized				10/20/2017 - 03:00	Shared	demo	6.92 K
<div><div></div><div>doc.pdf</div></div>	Every file may have a description.				10/20/2017 - 03:23	Shared	demo	83.86 K
<div><div></div><div>images</div></div>	Every folder may have a description in rich text.				10/20/2017 - 03:24	Shared	demo	1.03 M
<div><div></div><div>progress_bars.ipynb</div></div>	Every file may have a description in rich text.				10/20/2017 - 03:25	Shared	mary	4.2 K
4 items								

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Vivamus sagittis lacus vel augue laoreet rutrum faucibus dolor auctor. Curabitur blandit tempus porttitor. Donec sed odio dui. Maecenas sed diam eget risus varius blandit sit amet non magna.

- Nullam id dolor id nibh ultricies vehicula ut id elit. Etiam porta sem malesuada magna mollis euismod.
- Cras justo odio, dapibus ac facilisis in, egestas eget quam.
- Praesent commodo cursus magna, vel scelerisque nisl consectetur et.
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Integer posuere erat a ante venenatis dapibus posuere velit aliquet. Donec sed odio dui. Vestibulum id ligula porta felis euismod semper. Maecenas sed diam eget risus varius blandit sit amet non magna. Nullam quis risus eget urna mollis ornare vel eu leo. Vivamus sagittis lacus vel augue laoreet rutrum faucibus dolor auctor.

FolderShare comments

demo

Wed,
10/18/2017
- 05:16

[Permalink](#)

[Duis mollis, est non commodo...](#)

Duis mollis, est non commodo luctus, nisi erat porttitor ligula, eget lacinia odio sem nec elit.

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

mary
Wed,
10/18/2017
- 05:36
[Permalink](#)

[Nullam quis risus eget urna...](#)

Nullam quis risus eget urna mollis ornare vel eu leo. Nulla vitae elit libero, a pharetra augue. Aenean lacinia bibendum nulla sed consectetur. Etiam porta sem malesuada magna mollis euismod. Cras mattis consectetur purus sit amet fermentum.

[Reply](#)

Add new comment

Subject

Comment *

B I [list of icons] Source

[About text formats](#)

Save Preview

The FolderShare entity is fieldable.

Add custom fields such as Comments to FolderShare.

Project One

☰

New Folder

Upload Files

Download Folder...

Edit Folder...

Rename Folder...

Delete Folder...

Copy Folder...

Duplicate Folder

Move Folder...

Share Folder Tree...

Compress Folder

Uncompress

Menu options change on selection

	Modified	Status	Owner	Size
	10/20/2017 - 03:00	Shared	demo	6.92 KB
	10/20/2017 - 03:23	Shared	demo	83.86 KB
	10/20/2017 - 03:24	Shared	demo	1.03 MB
	10/20/2017 - 03:25	Shared	mary	4.2 KB

4 items

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- Nullam id dolor id nibh ultricies vehicula ut id elit. Etiam porta sem malesuada magna mollis euismod.
- Cras justo odio, dapibus ac facilisis in, egestas eget quam.
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data

Name ▲	Modified	Status	Owner	Size
 Apple assets, 2008-2009.htm Every file may have a description in rich text.	10/20/2017 - 03:25	Shared	demo	1.04 KB
 Benchmark of original Matlab image preprocessing times.json Every file may have a description in rich text.	10/20/2017 - 03:26	Shared	demo	1.82 KB
 Benchmark of revised image preprocessing times.json Every file may have a description in rich text.	10/20/2017 - 03:26	Shared	demo	795 bytes
 Cost breakdown of Google Nexus 7.json Every file may have a description in rich text.	10/20/2017 - 03:26	Shared	demo	798 bytes
 csv-table.good.simple.csv Every file may have a description in rich text.	10/20/2017 - 03:26	Shared	demo	68 bytes
 Image classification work breakdown schedule.json Every file may have a description in rich text.	10/20/2017 - 03:26	Shared	demo	1.18 KB
 OpenGL mesh memory use.csv Every file may have a description in rich text.	10/20/2017 - 03:27	Shared	demo	1.27 KB
7 items				

Owner: demo**Modified:** 10/20/2017 - 03:00**Description:** Certain structured formats such as CSV, JSON and HTML table can be automatically visualized

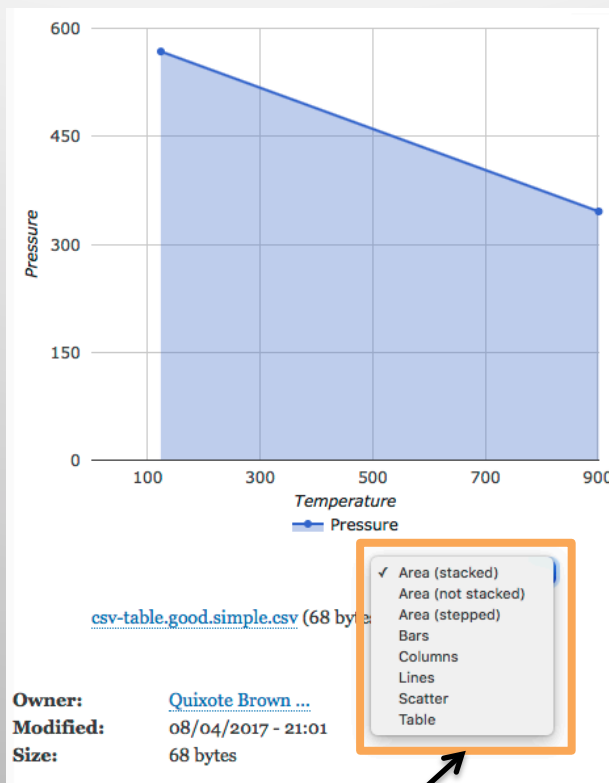
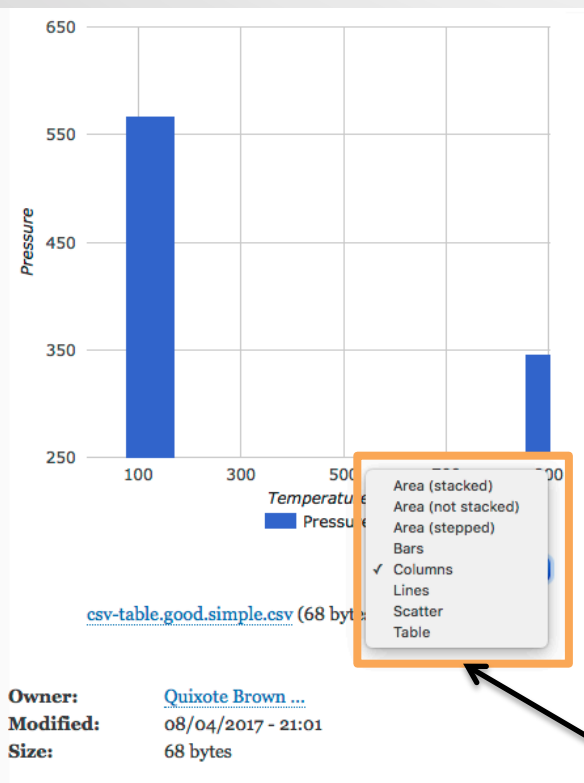
FolderShare comments

demo

Wed,
10/18/2017
- 22:50[Permalink](#)[Donec id elit non mi porta...](#)

Donec id elit non mi porta gravida at eget metus. Donec sed odio dui.

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



Temperature	Pressure
123.4	567.8
901.2	345.6
1	NaN
NaN	NaN

csv-table.good.simple.csv (68 bytes)

Owner: Quixote Brown ...
Modified: 08/04/2017 - 21:01
Size: 68 bytes

Table

Visualizations can be switched interactively to different chart types

SeedMe – Target users/Use cases

- **Researchers**
 - Collaboration hub or personal dashboard
- **Project repositories**
 - Project specific customization
- **Developers**
 - Integrate scientific application
- **Science gateways**
 - Data sharing
 - Data publishing
 - Data escrow service
- **CyberInfrastructure providers**
 - Offer SeedMe platform to your user base/communities

Deployment options

As a cloud service (Our branding)

- demo.seedme.org
- www.seedme.org

DIY - Run own instance (Your branding)

- On your own hardware
- Condo hardware

Provider runs an instance (Your/Their branding)

- Your institution
- CI centers
- Commercial vendors

Ongoing work

Extend core features

- User interface
- Web services
 - Clients in C, Python & JAVA
 - Command line
- Access control: Support group & role based
- Message logs
- Search

Policy

- Storage quota
- User invite
- Content expiration

Track progress

<https://dibbs.seedme.org>

Demonstration/Trial

Demo website: demo.seedme.org

Explorers welcome (webbrowser required)

Trail website: try.seedme.org



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San Diego Supercomputer Center | University of California San Diego

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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

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