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> Gateways 2017 Ann Arbor, MI | Oct 24, 2017

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**







## **Related solutions**



### **Content management systems**

HubZero FigShare SeedMe

# SeedMe's focus

Enable rapid access to transient and preliminary data

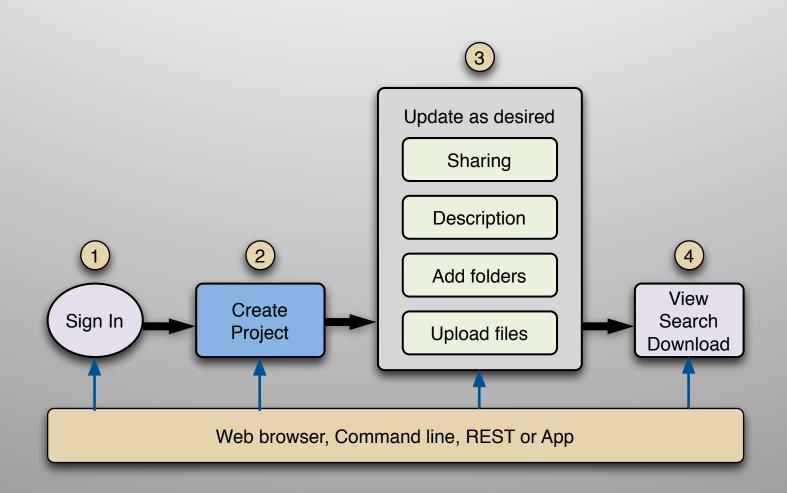
## **Consumable data**

Can be handled by stock web browser (Upload/Download, < 2GB per file) Displayable on many devices (Phone to PC)

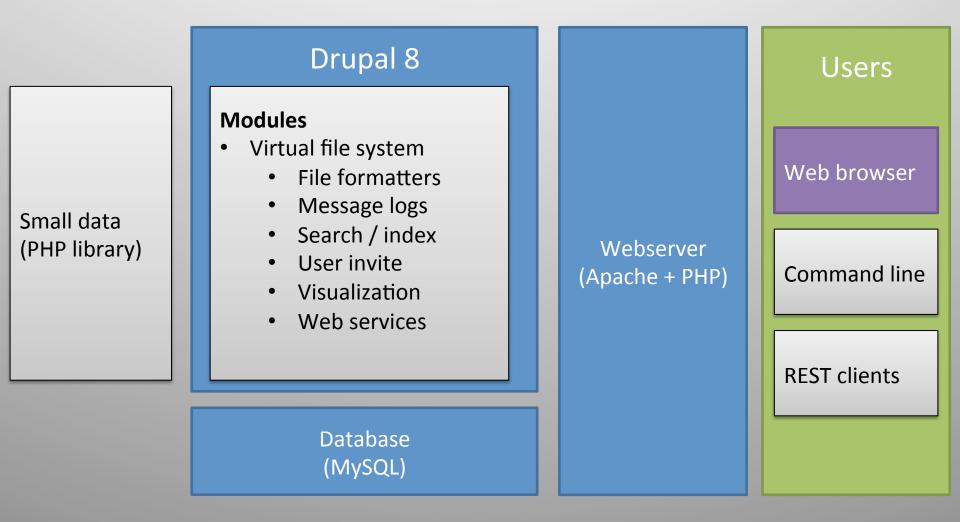
## Hot data

High value data at a given time

# Workflow



# Architecture

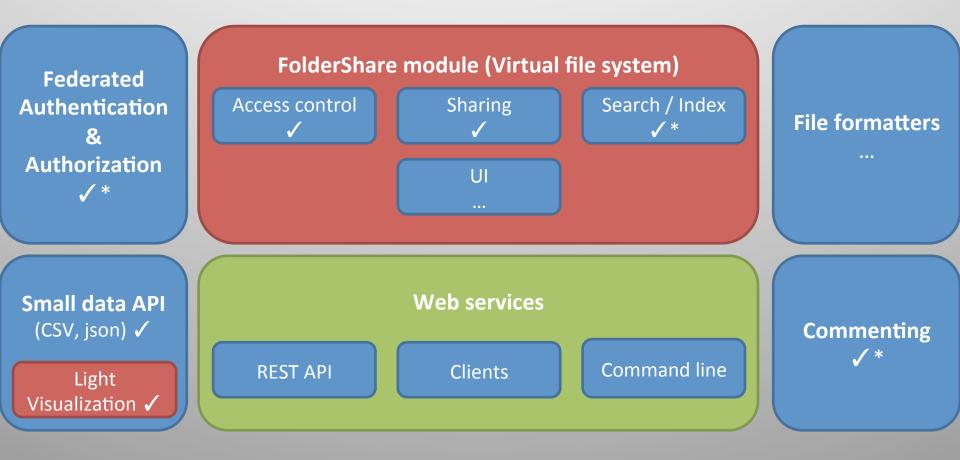


# SeedMe Platform

## **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

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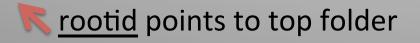
FolderShare

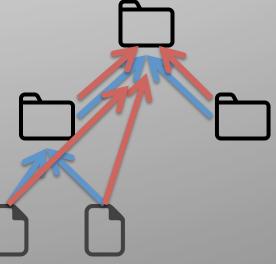
- Virtual file system:
  - Entity type & API
  - Access controls
  - Usage tracking
  - Views, displays, breadcrumbs, forms
  - Plugins for field formatters, search, views, actions, and queue workers
- Configurable by sites
  - e.g. Comments, flags, DOIs
- Extensible by developers

# 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

Reprint the point of the parent parent is a parent pare





# 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.

## 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

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- 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 These	ists display	top lev	el fol	ders
Public top folders				
Folders				
Home				
Folders Personal Shared Public				
Personal Shared Public Menu				
Name 🔺	Modified	Status	Owner	Size
This project is publicly viewable. Both Mary and John have Author privileges. Integer posuere erat a ante venenatis dapibus posuvelit aliquet. Aenean	10/18/2017 - 22:12	Public	demo	191.96 KB
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2 items				

Folders may have a description

#### Folders

#### Home

### Folders

Personal Shar	Public				
	Menu options – with no selection				
New Folder Upload Files		Modified	Status	Owner	Size
Download					
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Move	2 items				
Share Folder Tree					
Compress Uncompress					
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#### Folders

#### Home

### Folders

Personal Share	Public					
	Menu options – with selection					
New Folder Upload Files		Modified	Status	Owner	Size	
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Move Folder	2 items					
Share Folder Tree						
Compress						
Uncompress						

### 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) Anonymous users do not have FolderShare module author permission, so they cannot be granted author access.	0	$\bigcirc$			
john	$\bigcirc$	0	$\bigcirc$		
mary	$\bigcirc$	$\bigcirc$	0		
Save					

### **Project One**

Name 🔺			Modified	Status	Owner	Size
Certain structured formats such as CSV, JSON and HTML table can be automatically visualized		10/20/2017 - 03:00	Shared	demo	6.92 KB	
<b>doc.pdf</b> Every file may hav	re a description.	Sortable listing of files	10/20/2017 - 03:23	Shared	demo	83.86 KB
<b>Every folder may </b>	nave a description in rich text.	and folders.	10/20/2017 - 03:24	Shared	demo	1.03 MB
<b>progress_bars</b> Every file may hav	.ipynb re 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		Different users			
<b>Description:</b>	<b>Description:</b> This project may be <i>Authored</i> by <b>Mary</b> , 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.

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

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### **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
<b>images</b> Every folder may have a description in rich text.	10/20/2017 - 03:24	Shared	demo	1.03 MB
<b>progress_bars.ipynb</b> Every file may have a description in rich text.	10/20/2017 - 03:25	Shared	mary	4.2 KB
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### Owner: demo Modified: 10/20/2017 - 03:00

**Description:** This project may be *Authored* by **Mary**, but can only be Viewed by John

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

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### **Project One**

Name 🔺		Modified	Status	Owner	Size	
Image: Certain structured formats such as CSV, JSON and HTML table can be automatically visualized       10/20/2017 - 03:00       Shared       6.92 KB						
Image: doc.pdf10/20/2017 - 03:23Shareddemo83.86 KBEvery file may have a description.						
Every folder may have a description in rich text. Shared demo 1.03 MB						
progress_bars.ipynb10/20/2017 - 03:25Sharedmary4.2 KBEvery file may have a description in rich text.						
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- Duis mollis, est non commodo luctus, nisi erat porttitor ligula, eget lacinia odio sem nec elit.4

Hello	World
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Uno	Dos

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

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#### Home » Folders

#### **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 KE		
images Every folder may have a description in rich text.	10/20/2017 - 03:24	Shared	demo	1.03 ME		
progress_bars.ipynb Every file may have a description in rich text.	10/20/2017 - 03:25	Shared	mary	4.2 KI		
4 items						

#### Owner: demo

Modified: 10/20/2017 - 03:00

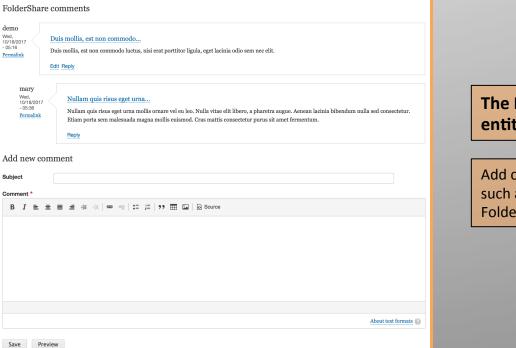
Description: This project may be Authored by Mary, but can only be Viewed by John.

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.

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## The FolderShare entity is fieldable.

Add customs fields such as Comments to FolderShare.

### **Project One**

	Menu options change on selection				
New Folder Upload Files		Modified	Status	Owner	Size
Download Folder					
Edit Folder Rename Folder	nats such as CSV, JSON and HTML table can be automatically visualized	10/20/2017 - 03:00	Shared	demo	6.92 KB
Delete Folder	escription.	10/20/2017 - 03:23	Shared	demo	83.86 KB
Copy Folder Duplicate Folder Move Folder	a description in rich text.	10/20/2017 - 03:24	Shared	demo	1.03 MB
Share Folder Tree	b escription in rich text.	10/20/2017 - 03:25	Shared	mary	4.2 KB
Compress Folder Uncompress	4 items				

<b>Owner:</b>	demo
Modified:	10/20/2017 - 03:00
<b>Description:</b>	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 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.
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- 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
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### data

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

#### FolderShare comments

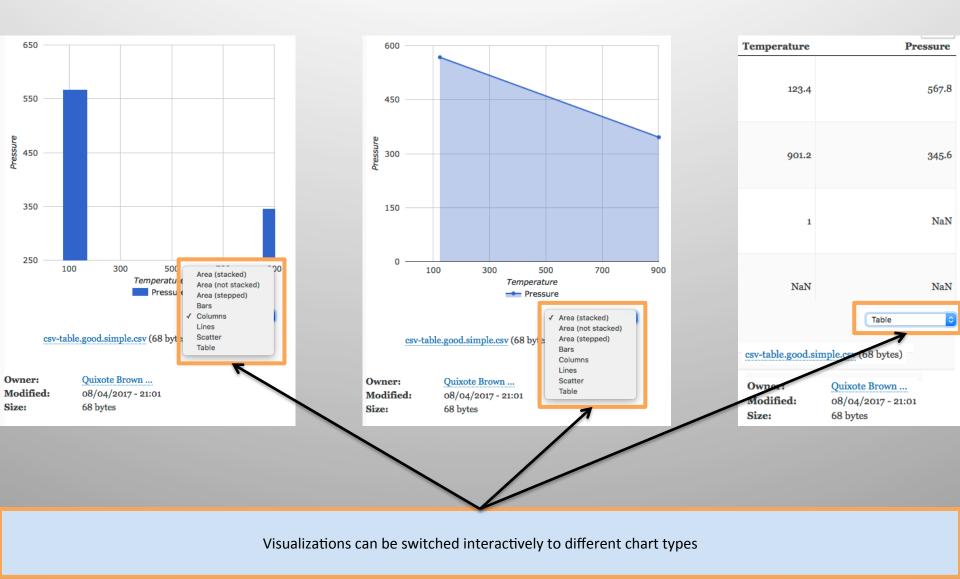
#### demo

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



# 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
- Cl 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



## Amit Chourasia, David Nadeau, Dmitry Mishin & Michael Norman 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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