



# Drupal Europe

## Darmstadt, Germany

Sep 10 - 14, 2018

[www.drupaleurope.org](http://www.drupaleurope.org)



# CONNECTING MEDIA SOLUTIONS BEYOND DRUPAL



**MIRO DIETIKER**

miro\_dietiker

MD Systems - Founder

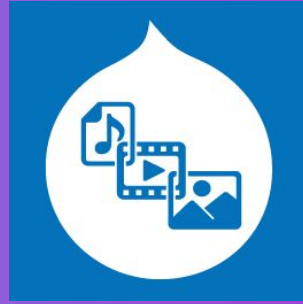
Initiative Leader

Switzerland

## ● CONNECTING MEDIA

- What is Content management?
- Landscape by example
- Media types
- Available solutions
- Digital asset management

Drupal 8 only



# INTRO

## ● INTRO - Evolution

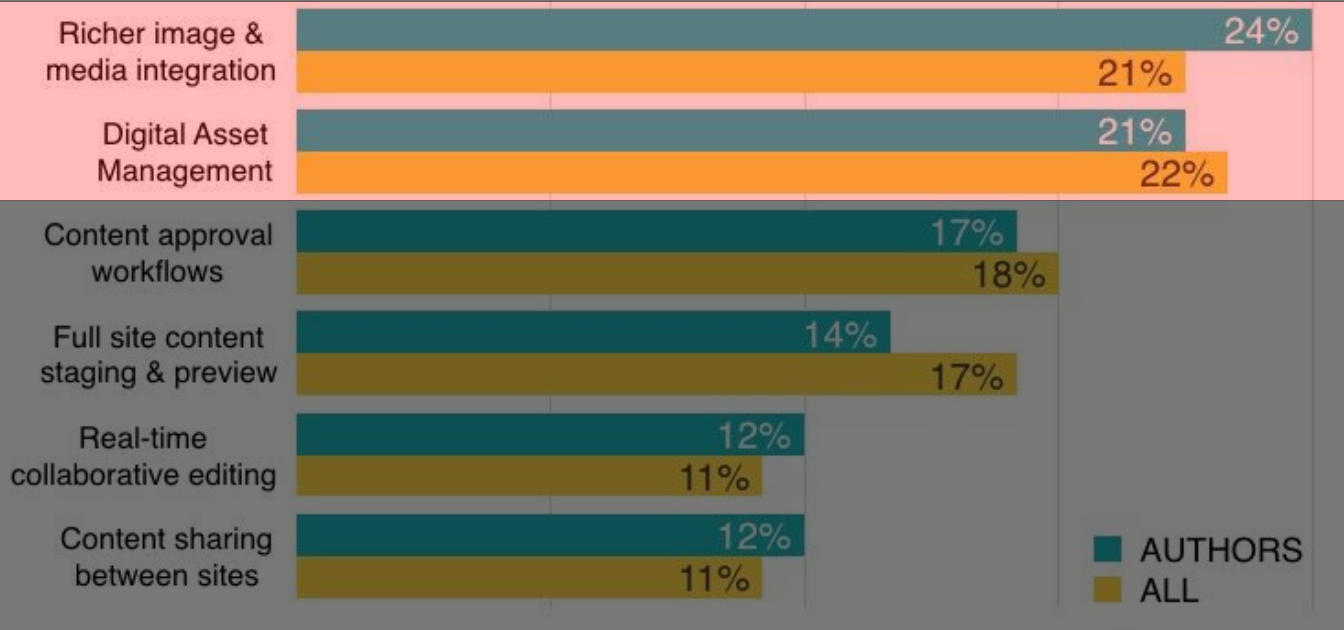
In Drupal 8 we evolved...

- File
- Contrib File Entity
- Contrib Media
- 8.4 Media in Core
- 8.6 Media in Core with Library

<https://dri.es/an-update-on-the-media-initiative-for-drupal-8-4-8-5>



## AREAS TO IMPROVE FOR CONTENT AUTHORS



The results of the State of Drupal 2016 survey show the importance of the Media Initiative for content authors.

<https://dri.es/state-of-drupal-presentation-may-2016>



## Super easy vegetarian pasta bake

A wholesome pasta bake is the ultimate comfort food. This delicious bake is super quick to prepare and an ideal midweek meal for all the family.

Super easy vegetarian pasta bake



## Skip the spirits with delicious mocktails

[VIEW ARTICLE >](#)



Fiery chili sauce



Crema catalana



## ● INTRO - Best practices

Experience from...

- Module maintenance
- Building distributions
- Site Building
- Custom development
- Operation
- Training, coaching, consulting

## ● INTRO - Core 8.6 Status

### Stable

- **Media**
- Well supported

### Experimental

- **Library**
- minimal
- In transition

### Sources

- File
- Image
- Audio
- Video
- Remote video
  - Youtube
  - Vimeo

## Media library



+ Add media

Published

- Any -

Name

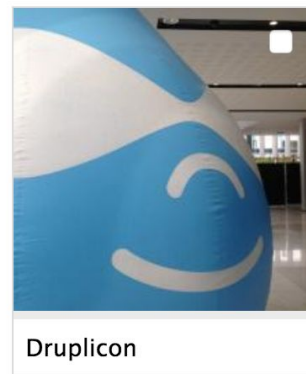
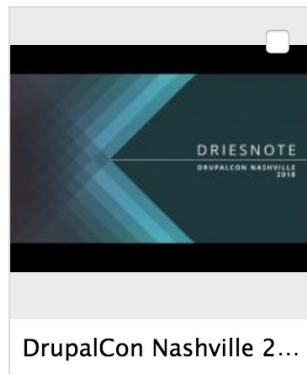
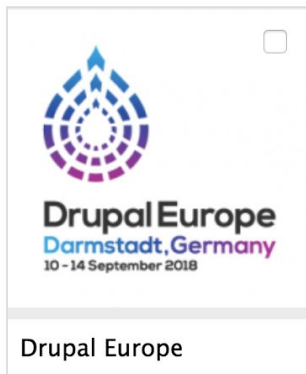
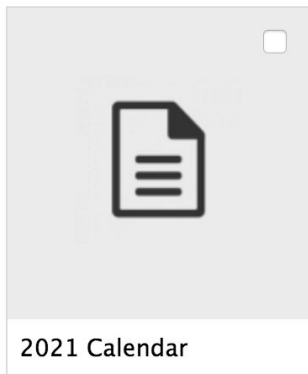
Media type

- Any -

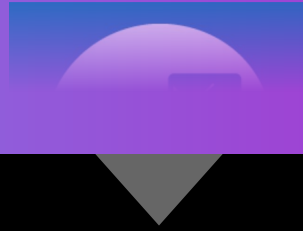
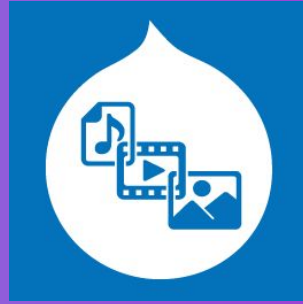
Sort by

Newest first

Apply Filters



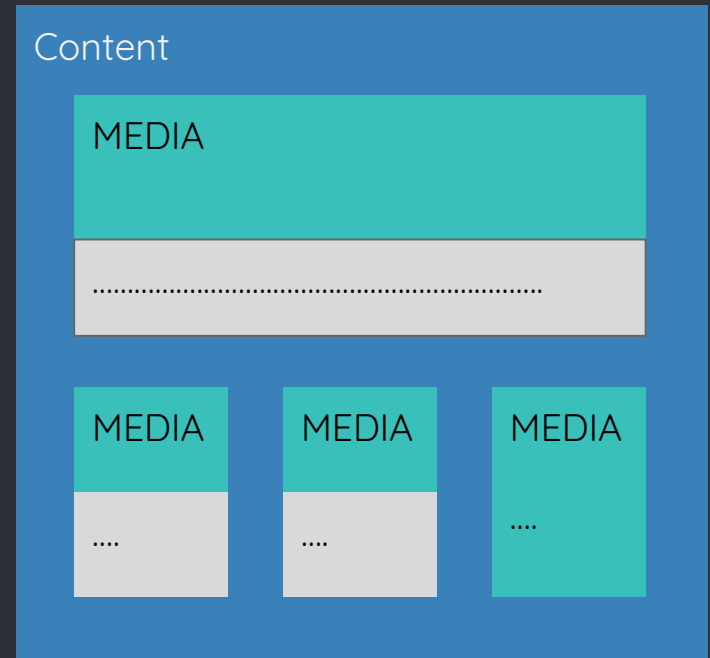
Select media



# BASICS

● BASICS - What is Media?

- Away from Files
- Entity
  - Source (type)
  - Fields
    - File, Filename, ID
    - Entity Reference
    - Remote identifier
- Any type of media “content”



## ● BASICS - Local VS Connected / Remote

### ➤ LOCAL

- Any type of Media inside Drupal

### ➤ CONNECTED / REMOTE

- Benefit from SaaS providers
- Specialized in a specific media type
- Out of the box
- Remotely managed

### ➤ MIXED REALITY



## ● BASICS - Media Lifecycle

- Upload
- Processing
- Storage Original + Metadata
- Placement
- Formatting View modes / Derivatives
- Delivery

## ● BASICS - Implications of Decoupling a provider

- Adds complexity
- Dependency
  - Ownership
  - Lock-in
  - API Changes
- Drupal Expectations
- Provide extra value

- BASICS - Implications - User expectations

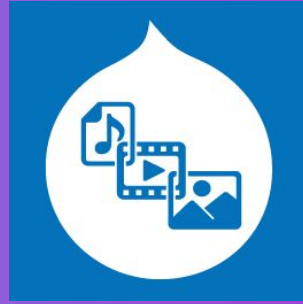
Needs

**truly deep integrations**

- Support expectations
- Through the lifecycle
  
- Or experience limitations

## ● BASICS - Implications - Drupal expectations

- Availability - API
- Speed - Caching
- Accounts
  - Authenticate
  - Permissions
- Entity
  - Types
  - Fields
- Multilingual
- Revisioning
- Views
  - List - Paging
  - Filter
- Placement - Usage
- View modes - formatter
  - Responsive
- Form modes - widgets
- Image Derivatives
- (Personalization)
- (Content Moderation)



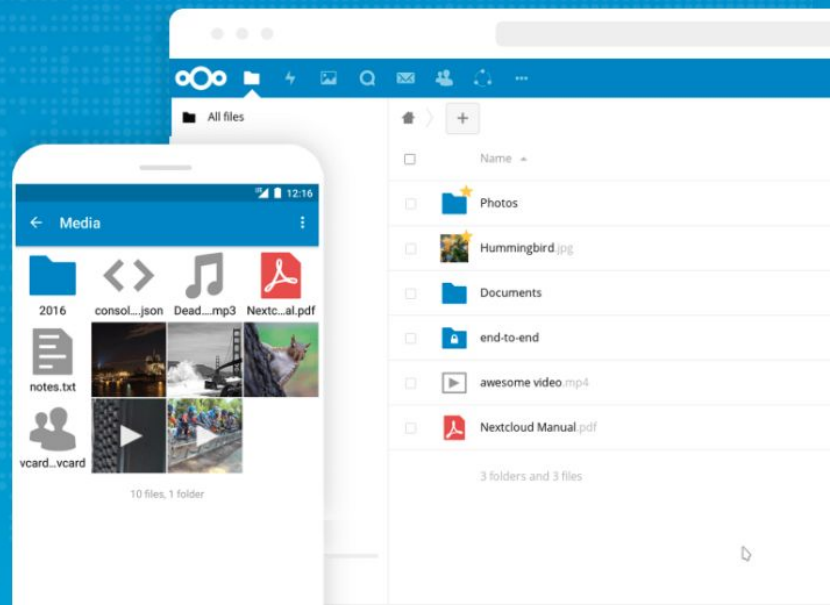
BY EXAMPLE

**NEWS** Nextcloud 14: Video verification, Signal/Telegram 2FA and more! >

# Nextcloud - Protecting your data

Building self-hosted products that allow you  
to be productive without losing control

[Learn more](#) ↓





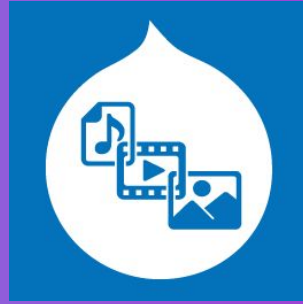
## ● BY EXAMPLE - What if we connect Nextcloud

- Media Licensing
  - Authentication
    - Global key
    - Per-user key
  - Less site building
  - Many Challenges
- Metadata
    - Browser
    - Extraction from assets
    - Thumbnail
    - Predefined metadata structure

## ● BY EXAMPLE - What if we connect Nextcloud

- User specific permissions
- Image derivative mapping
- Cropping
- Usage report
- Metadata updates

Wish it was fully featured AND API first!



# CONCEPTS

## ● CONCEPTS

- Metadata replication
- Usage tracking
- Placement - WYSIWYG
- Browsing
- Expiration

## ● CONCEPTS - Metadata replication

- Fields based
- Mapping configuration
- Replicate on save
  
- Metadata Updates?
  - (delta)
  - Changes?

## ● CONCEPTS - Placement

- WYSIWYG
- Field - Entity Reference Media
- Entity type - Paragraphs



## ● CONCEPTS - Consistency

### ➤ Module: Linkit

<https://www.drupal.org/project/linkit>

- Managed link
  - Stop alias based links that break!
- Matcher / Browser
- Patch: Field support  
[https://www.drupal.org/project/link\\_attributes/issues/2939514](https://www.drupal.org/project/link_attributes/issues/2939514)
- 8.x:**25,095** - August 26, 2018 - 7.x:58,467  
Total: 84,235





# Manage matchers

[Edit](#)[Manage matchers](#)[Translate linkit profile](#)

[Home](#) » [Administration](#) » [Configuration](#) » [Content authoring](#) » [Linkit profiles](#) » [Edit Default profile](#)

Matchers defines how different data can be queried and displayed in the autocomplete suggestion list. Multiple matchers of the same type can be used at the same time to granulate the suggestions. The order of the added matchers defines in which order the suggestions will be presented.

[+ Add matcher](#)[Show row weights](#)

MATCHERS		OPERATIONS
 Content	Metadata: by [node:author]   [node:created:medium] Bundle filter: None Group by bundle: No Include unpublished: Yes	<a href="#">Edit</a> 
 Media	Metadata: by [media:author]   [media:created:medium] Bundle filter: Document Group by bundle: No	<a href="#">Edit</a> 

[Save](#)

## ● CONCEPTS - Usage tracking

### ➤ Module: Entity Usage

[https://www.drupal.org/project/entity\\_usage](https://www.drupal.org/project/entity_usage)

- Pluggable tracking
  - Entity References
  - Link field
  - Entity Embed
  - Linkit, ...
- 8.x:**1,429** - August 26, 2018

## Entity usage information for *Nobis Secundum Sino* ☆

[View](#)[Edit](#)[Delete](#)[Usage](#)[Devel](#)[Translate](#)

[Home](#) » [Nobis Secundum Sino](#)

ENTITY	TYPE	LANGUAGE	FIELD NAME	STATUS
<a href="#">Foo bar page</a>	Content	English	Related pages	Published
<a href="#">Sample page created in CATALAN</a>	Content	Catalan	Related pages	Published
<a href="#">Example page created in FRENCH</a>	Content	French	Related pages	Published
<a href="#">Ea Magna Paulatim</a>	Content	English	Related pages	Published
<a href="#">Persto Similis Venio</a>	Content	English	Related pages	Published

## ● CONCEPTS - Selection

- Core 8.6
  - Basic, hardcoded
- Module: Media Entity Browser
  - [https://www.drupal.org/project/media\\_entity\\_browser](https://www.drupal.org/project/media_entity_browser)
  - Highly
    - Extensible
    - Configurable
  - 8.x:**4,852** - August 26, 2018

# Select images



Image library

My images

Upload files

Icon

Media name	Bundle	Status	Folder	Tags	Sort by	Order
<input type="text"/>	- Any -	True	- Any -	<input type="text"/>	Created	Desc

Apply

drupal-8-logo-padding.png



md-systems.svg

**md**SYSTEMS  
19. January 2018, 10:24

User



1. December 2017, 16:35

pencil-square-o



26. June 2017, 18:29

linux



19. January 2018, 10:39

newspaper-o



29. December 2017, 16:56

file-pdf-o



14. August 2017, 17:55

home



26. June 2017, 18:26

drupal



19. January 2018, 10:30

pexels-photo-324658-bw.jpeg



admin

4. December 2017, 17:26

user-times



26. June 2017, 18:43

Layout



21. June 2017, 15:10

Select images

## ● CONCEPTS - Upload

➤ (Core)

➤ Module: DropzoneJS

<https://www.drupal.org/project/dropzonejs>

<https://www.dropzonejs.com/>

- 8.x:**18,219** - August 26, 2018
- Client side image resize

## Select hero image



Image library

My images

Upload files

### File upload \*

Drag and drop images here to upload

or

Select files

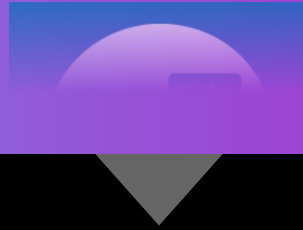


## ● CONCEPTS - Expiration

### ➤ Module: Media Expire

[https://www.drupal.org/project/media\\_expire](https://www.drupal.org/project/media_expire)

- Part of Thunder
- 8.x:**810** - August 26, 2018



# MEDIA TYPE GROUPS

## ● TYPES - Picture

- JPG, PNG, GIF
- Tag `<img src`
- Tag `<figure> <img />`  
`<figcaption />`
- Image styles
  - derivatives
- Responsive img styles
- Lazy Loading
- Image toolkit
  - GD
  - Imagemagick
- Image effect
  - Cropping
  - Other Effects
- Image

## ● TYPES - Picture - Cropping Modules

### ➤ Module: Crop API

<https://www.drupal.org/project/crop>

- 8.x:**28,047** - August 26, 2018

### ➤ Module: Focal Point

[https://www.drupal.org/project/focal\\_point](https://www.drupal.org/project/focal_point)

### ➤ Module: Image Widget Crop

[https://www.drupal.org/project/image\\_widget\\_crop](https://www.drupal.org/project/image_widget_crop)

### ➤ Module: Automated Crop

[https://www.drupal.org/project/automated\\_crop](https://www.drupal.org/project/automated_crop)

## ● TYPE - Picture - Lazyloading Modules

### ➤ Module: Blazy

<https://www.drupal.org/project/blazy>

- Image lazy loading
- 8.x:**17,888** - August 26, 2018

### ➤ Module: Lazyloader

<https://www.drupal.org/project/lazyloader>

- 8.x:**357** - August 26, 2018 - 7.x:3,890  
Total:4,247

- TYPE - Picture - Saas

- DAM - More Later

- Bynder
- Elvis
- ...

## ● TYPE - Graphics

- SVG
  - Tag `<img`
- Inline SVG
  - Tag `<svg`
  - CSS control

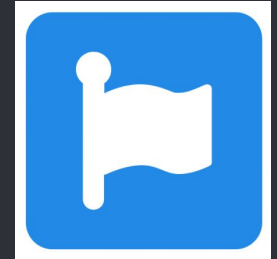


## ● TYPE - Icons

### ➤ Module: Font Awesome Icons

<https://www.drupal.org/project/fontawesome>

- Font | SVG
- Icon Browser
- Best Practice: Media bundle
  - Entity Usage



### ➤ Module: FA Menu Icons

[https://www.drupal.org/project/fontawesome\\_menu\\_icons](https://www.drupal.org/project/fontawesome_menu_icons)



## ● TYPE - Video

- Tag <video
- Core 8.5 Video
  - Local storage
- Core 8.6 Remote video
  - oEmbed based

## ● TYPE - Video - Players

### ➤ Module: Video.js

<https://www.drupal.org/project/videojs>

- HTML5 Video Player
- 8.x:**909** - August 26, 2018 - 7.x:14,283  
Total:15,362

### ➤ Module: JWPlayer

- 8.x:**224** - August 26, 2018 - 7.x:3,856  
Total:4,080

## ● TYPE - Video - Saas

### ➤ Module: Video Embed

- [https://www.drupal.org/project/video\\_embed\\_field](https://www.drupal.org/project/video_embed_field)  
[https://www.drupal.org/project/video\\_embed\\_html5](https://www.drupal.org/project/video_embed_html5)
- Field
- Reference
- Metadata fetch / update
- Youtube, Vimeo, more
- 8.x:**40,715** - August 26, 2018 - 7.x:62,472  
Total:103,187

- TYPE - Video - Saas

- Module: Brightcove

- <https://www.drupal.org/project/brightcove>

- 8.x:**240** - August 26, 2018 - 7.x:2,009  
Total: 2,281

## ● TYPE - Audio

- Core 8.6 local
- Tag <audio
- Local audio
- (Module: Remote audio)

- TYPE - Audio SaaS

- Module: Soundcloud

- <https://www.drupal.org/project/soundcloudfield>

- Feature: Field
    - 8.x:**735** - August 26, 2018 - 7.x:3,678  
Total:4,432



# GALLERY PARADOXON

## ● GALLERY PARADOXON

Select your flavor...

- Multivalue field
- Media type
- Content type
  
- Paragraph
- (Paragraph library)



## ● GALLERY Module Slick

### ➤ Module: Slick

<https://www.drupal.org/project/slick>

- *“the last carousel you’ll ever need”*
- 8.x:**15,204** - August 26, 2018 - 7.x:23,802  
Total 39,006

- GALLERY Module Flex Slider

- Module: Flex Slider

- <https://www.drupal.org/project/flexslider>

- 8.x:**5,785** - August 26, 2018 - 7.x:109,748  
Total 115,533

- TYPE - Social

## Twitter

- Module: Media Entity Twitter

- [https://www.drupal.org/project/media\\_entity\\_twitter](https://www.drupal.org/project/media_entity_twitter)

- Link field
    - Formatter: Twitter embed
    - 8.x:**5,761** - August 26, 2018

- TYPE - Social

## Instagram

- Module: Media Entity Instagram

- [https://www.drupal.org/project/media\\_entity\\_instagram](https://www.drupal.org/project/media_entity_instagram)

- Link field
    - Formatter: Instagram embed
    - 8.x:**5,585** - August 26, 2018

- TYPE - Maps

- Google Maps

- Module: Simple Google Maps

[https://www.drupal.org/project/simple\\_gmap](https://www.drupal.org/project/simple_gmap)

Many more...

## ● TYPE - Polls

- Core Module Poll
- Riddle Marketplace

[https://www.drupal.org/project/riddle\\_marketplace](https://www.drupal.org/project/riddle_marketplace)

<https://www.riddle.com/>

- “Quizzes”
- Part of Thunder

- TYPE - Interaction

- Module: H5P

- <https://www.drupal.org/project/h5p>

- *“Create and Share Rich Content and Applications”*
    - 8.x:**694** - August 26, 2018 - 7.x:3,735  
Total: 4,435



Fill in the correct berries

Strawberries and  berries  
are mixed with  and  
oatmeal  to make this  
delicious smoothie.

 Show solutions

Interactive Video Editor

Upload video

Add interactions

Summary task

Click and drag to place image



Insert the missing words in this text about berries found in Norwegian forests and mountainous regions.


Billberries (*Vaccinium myrtillus*), also known as  berries are edible, nearly black berries found in nutrient-poor soils.

**Cloud**berries (*Rubus chamaemorus*) are edible orange berries similar to raspberries or blackberries found in alpine and arctic tundra.

Redcurrant (*Ribes rubrum*) are red translucent berries with a diameter of 8–10 mm, and are closely related to its black colored relative  currant.



You got 2 of 3 blanks correct.

 Try again



## ● TYPE - Generic widgets

### oEmbed

#### ➤ Module: Simple oEmbed

<https://www.drupal.org/project/soembed>

<https://oembed.com>

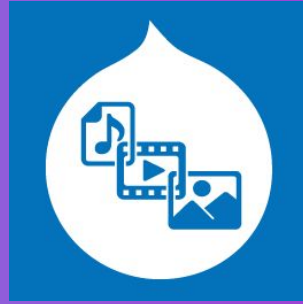
- 8.x:**25** - August 26, 2018 - 7.x:332  
Total:357

#### ➤ (Core - only base class)

#### ➤ Others?

## ● TYPE - HTML

- Tag <iframe, <script
- Text field
  - Text format “code” without WYSIWYG
- Any widget provider
- Example: Typeform
  - <https://www.typeform.com/>
  - “Turning data collection into an experience”



STACK

## ● CONCEPTS

- Storage
- Asset separation
- Infrastructure

## ● STACK - Storage - Module: Flysystem

<https://www.drupal.org/project/flysystem>

- 8.x:**683** - August 26, 2018
- “Local”
- Stream wrapper
  - path based magic

### FEATURES

- Ftp (Requires ftp extension)
- Sftp
- Dropbox
- Zip (through ZipArchive)
- Rackspace Cloud Files
- Amazon Web Services - S3
- Openstack Swift

Example path: 'local-example://path/to/folder'

## ● STACK - Storage

### ➤ Module: S3 File System

<https://www.drupal.org/project/s3fs>

- 8.x:**1,592** - August 26, 2018 - 7.x:3,285

### ➤ Module: Remote stream wrapper

[https://www.drupal.org/project/remote\\_stream\\_wrapper\\_widget](https://www.drupal.org/project/remote_stream_wrapper_widget)

- 8.x:**126** - August 26, 2018

- STACK - Asset separation

- Module: CDN

- <https://www.drupal.org/project/cdn>

- Asset domain

- “Origin Pull” CDNs = transparent

## ● STACK - Infrastructure

### ➤ DNS

- Https termination / certificate
- Example: CloudFlare
  - Image optimization
  - No bandwidth cost
- Can be used with a subdomain
  - CDN

### ➤ Mount driver





# DIGITAL ASSET MANAGEMENT

## ● DAM - Elvis

### ➤ Module: Media Elvis

[https://www.drupal.org/project/media\\_elvis](https://www.drupal.org/project/media_elvis)

- Woodwing Elvis

<https://www.woodwing.com/en/digital-asset-management-system>

### ➤ Basic integration

- Local delivery
- Media contrib
- Images only
- Full text search
- Paging
- Folder filter
- Metadata mapping
- Thunder integration





# Elvis DAM

Unleash the power of your digital assets.

[Overview](#)

[Features](#)

[Integrations](#)

[Technical](#)

[What is DAM?](#)

[Contact](#)

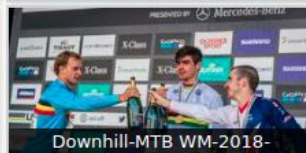
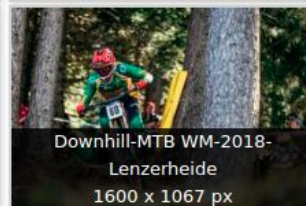
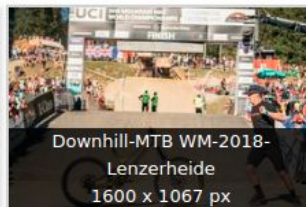
## Digital Asset Management

In today's publishing and digital marketing world you need to create the right visuals fast. And whether it's a unique editorial image, a banner ad for a new campaign or the latest product shots, it needs to be beautiful, on-brand and useable for any channel.

Elvis DAM helps you to create incredible assets, and enables creatives to collaborate more effectively. All files are stored in a single location, giving you maximum control over when and where assets are used. Being an open platform with unlimited scalability, Elvis DAM is an

[Elvis Media](#)[Select existing](#)[Import image](#)[Embed video](#)**SEARCH****Keyword**

A single word such as "hello" or a group of words surrounded by double quotes such as "hello world".

**FOLDERS**

## Manage fields

- Edit
- Manage fields
- Manage form display
- Manage display

Home » Administration » Structure » Media bundles » Edit *Elvis media image*

+ Add field

LABEL	MACHINE NAME	FIELD TYPE	OPERATIONS
Copyright	field_copyright	Text (plain)	Edit
Description	field_description	Text (formatted, long)	Edit
Elvis remote id	field_elvis_remote_id	Text (plain)	Edit
Image	field_image	Image	Edit
Tags	field_tags	Entity reference	Edit

## Edit *Elvis media image* media bundle

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

[Home](#) » [Administration](#) » [Structure](#) » [Media bundles](#)

### Label \*

Machine name: elvis\_media\_image

The human-readable name of this media bundle.

### Description

Describe this media bundle. The text will be displayed on the *Add new media* page.

### Type provider

Media type provider plugin that is responsible for additional logic related to this media.

#### TYPE PROVIDER CONFIGURATION

##### Field with source information

Field on media entity that stores Image file. You can create a bundle without selecting a value for this dropdown initially. This dropdown can be populated after adding fields to the bundle.

#### FIELD MAPPING

##### Description

##### Remote ID

##### Title

##### Name

##### Filename

##### Asset path

##### Tags

##### Copyright owner

##### Width

##### Height

# Edit *Elvis media image* ATHERTON Rachel\_Downhill\_Elite\_Woman\_WM\_by\_Piotr\_Staron IMG\_6830.jpg

[View](#)[Edit](#)[Delete](#)

[Home](#) » [ATHERTON Rachel\\_Downhill\\_Elite\\_Woman\\_WM\\_by\\_Piotr\\_Staron IMG\\_6830.jpg](#)

## Media name \*

The name of this media.

## Copyright

## Image

[Preview](#)

## Alternative text

This text will be used by screen readers, search engines, or when the image cannot be loaded.

## Title

The title is used as a tool tip when the user hovers the mouse over the image.



 [ATHERTON%2520Rachel\\_Downhill\\_Elite\\_Woman\\_WM\\_by\\_Piotr\\_Staron%2520IMG\\_6830\\_preview.jpg](#) (134.78 KB)

[Remove](#)

## Tags

- Bike
- Bike World Championships
- Events
- Familie
- Langlauf
- Planoiras
- Sommer
- Wandern
- Winter

## Description

**B** **I**        

UCI Mountain Bike World Championships, 5.-9. September 2018, Lenzerheide, Downhill



- DAM - Bynder

- Module: Bynder

<https://www.drupal.org/project/bynder>

- Unique features





## ● DAM - Bynder - Unique features

- Remote delivery
- Per-user
  - Authentication
  - Search facets
  - Access
- Usage restrictions
  - Indication
  - Review tab
  - License info
- Bynder formatter
- Image, Video, Documents
- Derivatives mapping
- API Caching - speed
- Direct Upload
  - Batch processing
- Updates (Cron)
- Demo module
- Lightning integration

## FIELD MAPPING

### Description

Description ▼

### Name

Media name ▼

### Tags

- Skip field - ▼

### Type

Type ▼

### Video preview urls

- Skip field - ▼

### Thumbnail urls

- Skip field - ▼

### Width

- Skip field - ▼

### Height

- Skip field - ▼

### Date created

- Skip field - ▼

### Data modified

- Skip field - ▼

## ▼ MEDIA



**Bynder**

▶ Bynder digital asset management system integration.



**Bynder demo**

▶ Demonstration of the Bynder integration.

## API CONNECTION TEST

The API connection was established successfully.

**Test connection**



Test connection before saving

Uncheck to allow saving credentials even if connection to Bynder can't be established.

## BYNDER IMAGE DERIVATIVES

- mini
- webimage
- thul

**Reload derivatives info**

Bynder provides "mini", "webimage" and "thul" image sizes by default. Custom derivatives can be configured to better suit specific use-cases. Reload of derivatives can be triggered if any derivatives are missing from the list.

## USAGE RESTRICTION METADATA

Usage restrictions ▼

Select metaproperty which is responsible for usage restriction. This is used to limit what assets can be used. If the information is not provided we assume royalty free.

### Royalty free restriction level \*

Royalty free ▼

Select metaproperty option for assets that can be used everywhere.

### Web license restriction level \*

Web only ▼

Select metaproperty option for the assets that may be used only online.

### Print license restriction level \*

Print only ▼

Select metaproperty option for the assets that may be used only for print.

Select assets



Bynder

Upload

Search keyword

Option

Option 3

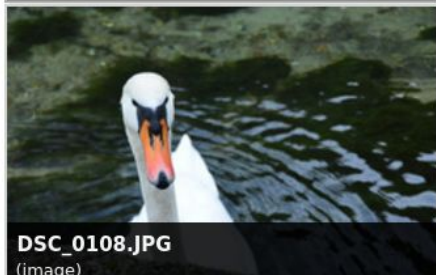
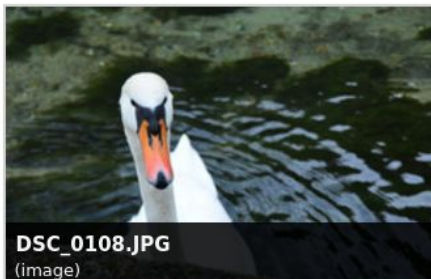
Option 4

- None -

- None -

- None -

Search



## Select assets



Bynder

Upload

### File upload

Drop files here to upload them

### Description

Description text that should be added to assets.

Upload assets

# Bynder usage

View

Edit

Delete

Bynder media usage

Name	Type	Usage Restriction	Action
DSC_0054.JPG	image	Royalty free	<p>Edit</p> <p>Edit on Bynder</p> <p>Edit</p>
bitcoin_on_keyboard-100572325--primary.idge_.jpg	image	N/A	



Usage info is not available yet. Usage restriction level: Royalty free





- Content
- Structure
- Appearance
- Content
- Configuration
- People
- Security
- Help

## Edit Bynder example What is bitcoin?

View Edit Delete Revisions Bynder media usage

Home » What is Bitcoin?

### Title \*

What is bitcoin?

### Body (Edit summary)

**B** *I* U ~~ABC~~        Print Source

Bitcoin is a [digital currency](#) and an electronic payment system invented by an unidentified programmer, or group of programmers, under the name of [Satoshi Nakamoto](#). [Nakamoto](#) introduced bitcoin on 31 October 2008 in a cryptography mailing list, and released an open-source software in 2009. The system is peer-to-peer, and transactions take place between users directly, without an intermediary. These transactions are verified by network nodes and recorded in a public distributed ledger called the [blockchain](#), which uses bitcoin as its unit of account. Since the system works without a central repository or single administrator, bitcoin is called the first decentralized digital currency. Bitcoin is the largest of its kind in terms of total market value.

More on Wikipedia

Text format Basic HTML

[About text formats](#)

### MEDIA ASSETS

Select assets



Remove



Remove



Remove



### Published

Last saved: 05/02/2017 - 11:52

Author: admin

[Create new revision](#)

### Revision log message

Briefly describe the changes you have made.

### URL PATH SETTINGS

### AUTHORING INFORMATION

### PROMOTION OPTIONS

- Content
- Structure
- Appearance
- Extend
- Configuration
- People
- Reports
- Help

## Edit Bynder example What is bitcoin?

View Edit Delete Revisions Bynder media usage

Home » What is bitcoin?

### Title \*

What is bitcoin?

### Body (Edit summary)

Rich text editor toolbar with options like Bold, Italic, Underline, Bulleted list, Numbered list, Indent, Outdent, Undo, Redo, and Source.

Bitcoin is a [cryptocurrency](#) and an electronic payment system invented by an unidentified programmer, or group of programmers, under the name of [Satoshi Nakamoto](#). Nakamoto introduced bitcoin on 11 October 2008 to a cryptography mailing list, and released an open-source software in 2009. The system is pure to-peer, and transactions take place between users directly, without an intermediary. These transactions are verified by network nodes and recorded in a public distributed ledger called the [blockchain](#), which uses bitcoin as its unit of account. Since the system works without a central repository or single administrator, bitcoin is called the first decentralized digital currency. Bitcoin is the largest of its kind in terms of total market value.

More on [Wikipedia](#).

Text format Basic HTML

About text formats

### MEDIA ASSETS

Select assets

Save and keep published Preview Delete

### Published

Last saved: 05/02/2017 - 10:47

Author: admin

Create new revision

### Revision log message

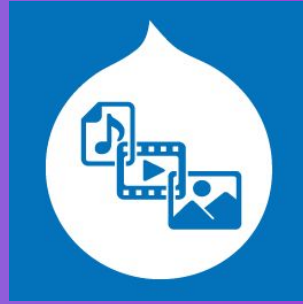
Briefly describe the changes you have made.

### URL PATH SETTINGS

### AUTHORING INFORMATION

### PROMOTION OPTIONS





CONTENT

## ● CONTENT - Repository

- When all content becomes “media”

### Modules

- Contentpool
- Drupal Content Sync
- Deploy
- Contenta CMS

### Presentations

- TUE 11:30 3.03
- THU 14:10 2.07



**Thanks!**

**ANY QUESTIONS?**