Migrate API in Drupal 8
Upgrading from Drupal 6 / 7 to Drupal 8

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Migrate API in Drupal 8

Upgrading from Drupal 6 / 7 to Drupal 8

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About me

- Freelance Drupal developer
- President of Drupal User Group Belgium vzw
- Co-organiser of Drupalcamp Leuven
- Contributor to Migrate in Drupal 8
- https://www.drupal.org/user/35369
- https://twitter.com/sdecabooter

Drupal 8 release party in Ghent

- Thursday 19 November 2015 - Vooruit Gent
- http://www.meetup.com/DUG-BE

Presentation outline

- Getting Migrate in Drupal 8 core
- Drupal 8 Migrate modules
- Drupal 8 Migrate concepts
- Demo migration
- Migrate pipeline
- Advanced topics (time permitting)
- How can you help?
- Resources

Getting Migrate in Drupal 8 core

History of Migrate

- Drupal 7:
  - Migrate & Drupal-to-Drupal data migration (migrate_d2d)
  - contrib modules by Mike Ryan
- Drupal 8:
  - “Migrate in Core” initiative started around Drupalcon Prague
  - Aim: to provide a better upgrade path - rather than upgrade.php
  - Be able to migrate directly from D6 or D7 to D8

Current status

- Migrate & Migrate Drupal modules will be in Drupal 8.0.0
- Contains:
  - API functionality
  - D6 > D8 migration (pretty stable & complete)
  - D7 > D8 migration (users, nodes, terms, comments, blocks and some more)
- Marked as “Experimental”
  - At least until the 8.1.0 release
  - Still needs lots of testing ‘in the wild’

Current status

- Migrate UI & Drush support
  - Currently still in contrib: https://www.drupal.org/project/migrate_upgrade
  - Still unsure when UI will go into Drupal core
  - Drush command will become part of core Drush at some point
- What will be migrated by Drupal Migrate in core?
  - Core content and configuration
  - For modules that ship with Drupal 8
    - also if source in D6 / D7 was contrib, e.g. CCK, ImageCache, Link, ...
    - but still some holes: e.g. Views, i18n content, ... - see https://www.drupal.org/node/2167633
  - Contrib modules will need to provide their own migrations

Drupal 8 Migrate modules

Drupal 8 core

- Migrate module
  - API to migrate content & configuration into Drupal 8
- Migrate Drupal module
  - Functionality to migrate content & configuration from Drupal 6 / 7 to Drupal 8
- Migration plugin classes & migration templates
  - Inside each core module's directory

Drupal 8 contrib

- Drupal Upgrade (https://www.drupal.org/project/migrate_upgrade)
  - UI to upgrade from Drupal 6 or 7 (Batch upgrading at /upgrade)
  - Drush command `drush migrate-upgrade`
- Migrate Plus (https://www.drupal.org/project/migrate_plus)
  - Optional functionality that is not added to Migrate in D8 core
  - e.g. CSV source, additional Drush commands, ...
  - Example migrations

Drupal 8 Migrate concepts

Migration configuration

- A core or contrib module can define migration configuration
- Migrate configuration is stored in configuration entities
- 2 ways to define the configuration entities:
  - As a standard configuration file
    - [module]/config/optional/migrate.migration.[thing].yml
    - recommended for contrib modules & custom migrations
  - In a migration template
    - [module]/migration_templates/d7_[thing].yml
    - recommended for core
    - templates get extra processing before being turned into config entities
- In both cases YAML file with same syntax

www > core > modules > node > migration_templates > d6_node.yml

Project

- node
  - config
  - css
  - migration_templates
    - d6_node.yml
    - d6_node_revision.yml
    - d6_node_setting_promote.yml
    - d6_node_setting_status.yml
    - d6_node_setting_sticky.yml
    - d6_node_settings.yml
    - d6_node_type.yml
    - d6_view_modes.yml
    - d7_node.yml
    - d7_node_revision.yml
    - d7_node_settings.yml
    - d7_node_title_label.yml
    - d7_node_type.yml

d6_node.yml

```yaml
id: d6_node
label: Nodes
migration_tags:
  - Drupal 6
builder:
  plugin: d6_node
source:
  plugin: d6_node
process:
  nid: nid
  vid: vid
  type: type
  langcode:
    plugin: default_value
    source: language
    default_value: "und"
  title: title
  uid: node_uid
  status: status
  created: created
  changed: changed
```

Example: Drupal 8 core - node module migration templates

www > modules > migrate_plus > migrate_example > config > install > migrate.migration.beer_comment.yml

Project

- core
- modules
  - custom
  - migrate_plus
    - config
    - migrate_example
      - config
        - install
          - migrate.migration.beer_comment.yml
          - migrate.migration.beer_node.yml
          - migrate.migration.beer_term.yml
          - migrate.migration.beer_user.yml
          - migrate_plus.migration_group.beer.yml

migrate.migration.beer_comment.yml

```yaml
# Migration configuration for beer comments.
id: beer_comment
label: Comments on beers
migration_group: beer
source:
  plugin: beer_comment
destination:
  plugin: entity:comment
process:
  pid:
    plugin: migration
    migration: beer_comment
    source: cid_parent
  entity_id:
    plugin: migration
    migration: beer_node
```

Example: Drupal 8 contrib example migration config

Migration workflow

- Execution of a migration:
  - Load the appropriate Migrate configuration entities
  - Push each data migration through the Migrate pipeline:
    - Source: retrieve the source data
    - Process: prepare the source data for import
    - Destination: save the data to Drupal 8
- More details later in this presentation

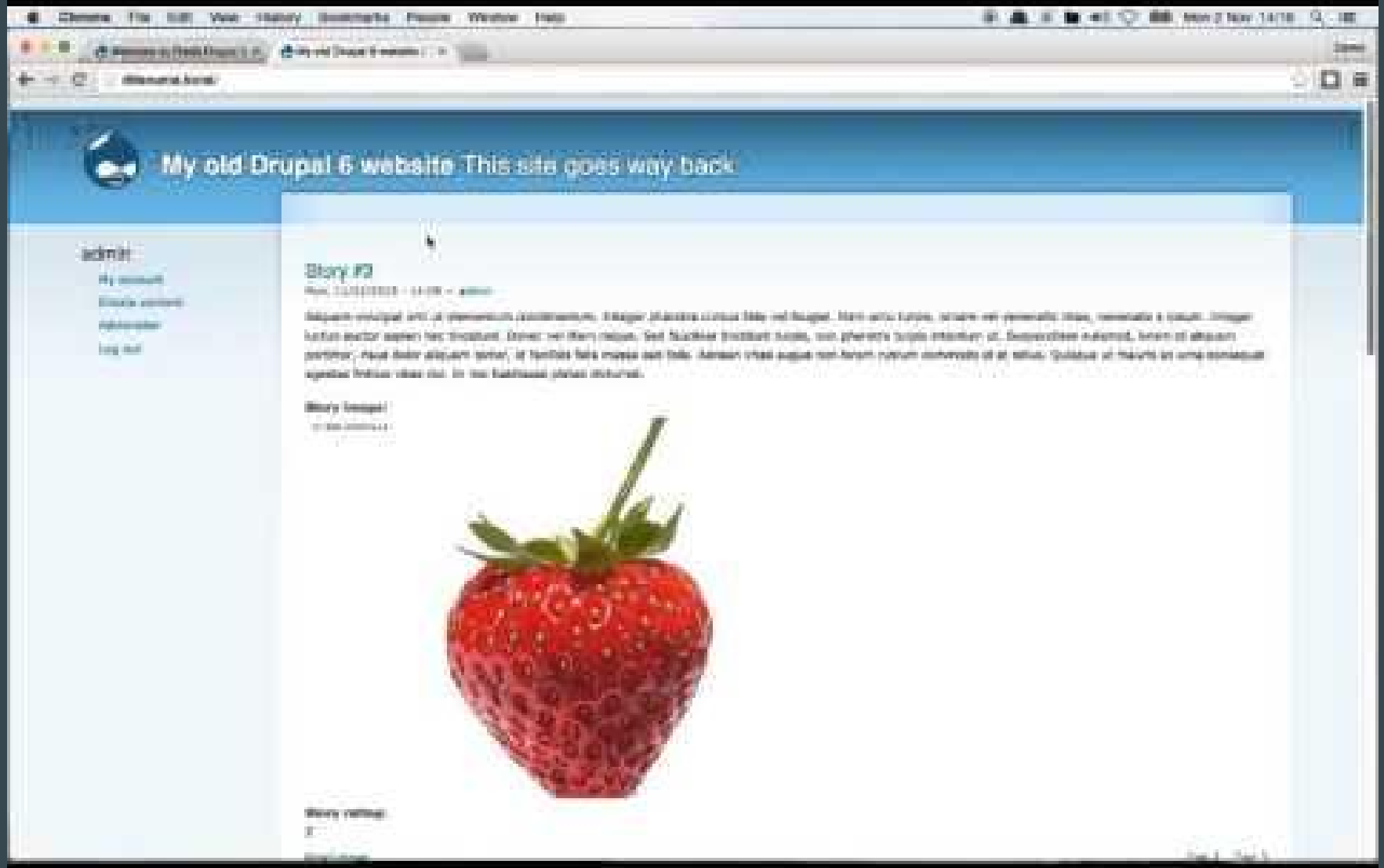
Other Migrate concepts

- Mapping tables keep track of source IDs and linked target ID
  - Migrations can be run multiple times
  - New content will be added
  - Unchanged content will be ignored
  - Updated content will be re-imported
  - Content deleted from source will remain in the destination
- Migration groups (in migrate_plus contrib, not in core)
  - Group migrations together
  - To execute them together
  - To provide shared configuration between migrations in group

Other Migrate concepts

- Stubs
  - Placeholder destination objects
  - Also added to mapping table for consistent IDs
  - To be updated with real data later in the migration process
  - Example:
    - Migration of a child taxonomy term that has a parent.
    - Parent has not yet been migrated: stub taxonomy term entity gets created
    - Stub gets a real ID, but gibberish data (e.g. name)
    - Stub ID gets added to mapping table for later retrieval
    - Later on parent taxonomy term gets migrated with real data into term entity with stub ID

Demo: Drupal 6 > Drupal 8 Migration


My old Drupal 6 website This site goes way back
admin
Story #2

Migrate pipeline

Migrate configuration files

- Content & configuration migrations are defined in YAML files
- Recap:
  - Normal configuration entity file in config/optional - for most cases
  - Migration template file in migration_templates - for more advanced cases
- Contains:
  - identifying data (id, label, migration tags, migration groups, ...)
  - source, process & destination configuration
  - dependencies (required / optional)

d6_file.yml

```yaml
# Every migration that saves into {file_managed} must have the d6_file
# migration as an optional dependency to ensure d6_file runs first.
id: d6_file
label: Files
migration_tags:
  - Drupal 6
source:
  plugin: d6_file
process:
  fid: fid
  filename: filename
  uri:
    plugin: file_uri
    source:
      - filepath
      - file_directory_path
      - temp_directory_path
      - is_public
  filemime: filemime
  filesize: filesize
  status: status
  changed: timestamp
  uid: uid
destination:
  plugin: entity:file
```

Migrate pipeline

- Source → Process → Destination
- These are all Drupal 8 Plugins
- Source Plugins provide rows of source data (unprocessed)
- Process Plugins prepare & manipulate data for import
- Destination Plugins save data to Drupal 8 targets
  - e.g. content entity, configuration entity, plugin, ...

Source Plugin

- Provides unprocessed rows of source data
- Can be retrieved from different sources:
  - Drupal database (D6 / D7) - use DrupalSqlBase class (D8 core)
  - regular SQL database - use SqlBase class (D8 core)
  - CSV file - use CSV class (D8 Migrate Plus contrib module)
- Iterates over each source row
- Returns the desired fields for each row

Process Plugin

- Describes how to manipulate source data
- Simplest form: copy as-is from source to destination

  `<target property>: <source property>`

```
process:
  name: site_name
  mail: site_mail
  slogan: site_slogan
```

Process Plugin

- One or more process plugins can be executed for each source field
- Key = target property
- Value = (array of) process plugins

```yaml
process:
  d8_target:
    -
      plugin: <first_plugin_name>
      source: d6_source
    -
      plugin: <second_plugin_name>
      some_setting: TRUE
```

Process Plugin: default_value

- Sets a fixed default value
- Also useful to set a default value if a previous process plugin returned no value

```yaml
langcode:
  plugin: default_value
  source: language
  default_value: "und"
```

Process Plugin: static_map

- Provide a map of static "source: destination" values
- Searches map to set destination property based on given source
- "source" can be one field, or array of fields

```yaml
id: d6_view_modes
label: View modes
migration_tags:
  - Drupal 6
source:
  plugin: d6_view_mode
  constants:
    targetEntityType: node
    status: true
process:
  mode:
    plugin: static_map
    source: view_mode
    map:
      0: normal
      1: preview
      2: search_index
      3: search_result
      4: rss
      5: print
      teaser: teaser
      full: full
```

Process Plugin: concat

- Concatenate array of source properties into single destination property

```yaml
id: d7_block
label: Blocks
migration_tags:
  - Drupal 7
source:
  plugin: block
process:
  # Block status is not a thing
  # disabled blocks.
  status:
    plugin: skip_on_empty
    method: row
    source: status
  id:
    -
      plugin: concat
      source:
        - theme
        - module
        - delta
      delimiter: _
```

Process Plugin: migration

- Gets mapped ID from Migrate mapping tables
- Example:
  - D6 site source has “vid” 123
  - d7_taxonomy_vocabulary migration has migrated this to “vid” 456 on D8 site
  - migration plugin returns 456 for given vid 123

d7_taxonomy_term.yml

```yaml
id: d7_taxonomy_term
label: Taxonomy terms
migration_tags:
  - Drupal 7
source:
  plugin: taxonomy_term
process:
  tid: tid
  vid:
    plugin: migration
    migration: d7_taxonomy_vocabulary
    source: vid
  name: name
  description: description
  weight: weight
  parent:
    plugin: migration
    migration: d7_taxonomy_term
    source: parent
  changed: timestamp
destination:
  plugin: entity:taxonomy_term
migration_dependencies:
  required:
    - d7_taxonomy_vocabulary
```

Process Plugins

- More info & additional process plugins: https://www.drupal.org/node/2129651
- Writing your own plugin: see advanced topics

Destination Plugin

- Specify plugin that takes care of saving the destination value
- Can be a Drupal 8 entity

```
destination:
  plugin: entity:user
```

- Or a Drupal 8 config entity

```
destination:
  plugin: config
  config_name: book.settings
```

- Or a custom destination Plugin

Recap

- Core & contrib modules can have Migration configuration files
- They describe:
  - From what source where to get the data
  - How to process the source data
  - How to save the data in your Drupal 8 site
- Use the migrate_upgrade module to run a full migration
  - via Drush: drush migrate-upgrade
  - via UI: http://example.com/upgrade
- You can write your own migration scripts

Advanced topics

Writing your own plugins - Source plugin

- in [modulename]/src/Plugin/migrate/source/[name].php
- Extend existing source base class:
  - \Drupal\migrate\Plugin\migrate\source\SqlBase
  - \Drupal\migrate_drupal\Plugin\migrate\source\DrupalSqlBase
  - \Drupal\migrate_drupal\Plugin\migrate\source\Variable
  - \Drupal\migrate_drupal\Plugin\migrate\source\VariableMultiRow
  - \Drupal\migrate_drupal\Plugin\migrate\source\d7\FieldableEntity

Writing your own plugins - Source plugin

- In case of (Drupal)SqlBase, implement:
  - public function query()
  - public function fields()
  - public function getIds()

File.php ×

\Drupal\file\Plugin\migrate\source\d6\File

```php
<?php

/**
 * @file
 * Contains \Drupal\file\Plugin\migrate\source\d6\File.
 */

namespace Drupal\file\Plugin\migrate\source\d6;

use Drupal\migrate\Row;
use Drupal\migrate_drupal\Plugin\migrate\source\DrupalSqlBase;

/**
 * Drupal 6 file source from database.
 *
 * @MigrateSource(
 *   id = "d6_file"
 * )
 */
class File extends DrupalSqlBase {

  /**
   * {@inheritdoc}
   */
  public function query() {
    return $this->select('files', 'f')
      ->fields('f')
      ->orderBy('timestamp')
      // If two or more files have the same timestamp, they'll end up in a
      // non-deterministic order. Ordering by fid (or any other unique field)
      // will prevent this.
      ->orderBy('fid');
  }
```

File.php

```php
  /**
   * {@inheritdoc}
   */
  public function fields() {
    return array(
      'fid' => $this->t('File ID'),
      'uid' => $this->t('The {users}.uid who added the file. If set to 0, this file was added by an anonymous user.'),
      'filename' => $this->t('File name'),
      'filepath' => $this->t('File path'),
      'filemime' => $this->t('File Mime Type'),
      'status' => $this->t('The published status of a file.'),
      'timestamp' => $this->t('The time that the file was added.'),
      'file_directory_path' => $this->t('The Drupal files path.'),
      'is_public' => $this->t('TRUE if the files directory is public otherwise FALSE.'),
    );
  }
  /**
   * {@inheritdoc}
   */
  public function getIds() {
    $ids['fid']['type'] = 'integer';
    return $ids;
  }

}
```

Writing your own plugins - Process plugin

- in [modulename]/src/Plugin/migrate/process/[name].php
- Extend ProcessPluginBase
- Override public function transform()

```php
namespace Drupal\image\Plugin\migrate\process\d6;

use ...

/**
 * @MigrateProcessPlugin(
 *   id = "d6_imagecache_actions"
 * )
 */
class ImageCacheActions extends ProcessPluginBase {

  /**
   * {@inheritdoc}
   */
  public function transform($value, MigrateExecutableInterface $migrate_executable, Row $row, $destination_property) {
    $effects = [];

    foreach($row->getSourceProperty('actions') as $action) {
      $id = preg_replace('/^imagecache/', 'image', $action['action']);

      if ($id === 'image_crop') {
        $action['data']['anchor'] = $action['data']['xoffset'] . '-' . $action['data']['yoffset'];

        if (!preg_match('/^[a-z]*\-[a-z]*/', $action['data']['anchor'])) {
          $migrate_executable->message->display(
            'The Drupal 8 image crop effect does not support numeric values for x and y offsets. Use keywords to set crop
            'error'
          );
        }

        unset($action['data']['xoffset']);
        unset($action['data']['yoffset']);
      }

      $effects[] = [
        'id'     => $id,
        'weight' => $action['weight'],
        'data'   => $action['data'],
      ];
    }

    return $effects;
  }
```

Writing your own plugins - Destination plugin

- in [modulename]/src/Plugin/migrate/destination/[name].php
- Extend DestinationBase
- to create Drupal entities:
  - extend EntityContentBase or EntityConfigBase
- Implement public function import()

Config entity files vs migration_templates

- Recap:
  - Config entity: [module]/config/optional/migrate.migration.[stuff].yml
  - Template: [module]/migration_templates/[stuff].yml
- Migration templates pass through extra layer - builder system before being turned into config entities
- Migration config entity definitions get created as-is

Config entity files vs migration_templates

- Migration templates
  - Used for “dynamic” migrations
    - where migration config entities need to be created on the fly
  - Workflow:
    - Builder Plugin parses template
    - Applies dynamic processing
    - Returns derived migration entities

How can you help?

Getting involved

- Test the upgrade path with your site(s) and report issues:
  - https://www.drupal.org/node/2257723 (documentation)
  - Report in https://www.drupal.org/project/issues/drupal (select “migration system” component)
- Help improve D6 / D7 core migrations
- Help get the Upgrade UI in core (frontend / UX)
- Add migrations to contrib D8 modules
- IRC: #drupal-migrate

Resources

Resources

- Upgrading from D6/D7 to D8 - docs:
  - https://www.drupal.org/upgrade/migrate
- D8 Migrate API docs:
  - https://www.drupal.org/node/2127611
- Migrate Example module in Migrate Plus
  - https://www.drupal.org/project/migrate_plus
- Blogposts:
  - https://www.advomatic.com/blog/drupal-8-migrate-from-drupal-6-with-a-custom-process-plugin
  - http://mikeryan.name/blog/mikeryan/update-on-migration-in-drupal-8

Questions?

Get in touch

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