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# **Autosave and Concurrent Editing (Conflict Resolution)**

## **Drupal 8**

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Hristo Chonov  
Senior Software Engineer

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# Hristo Chonov

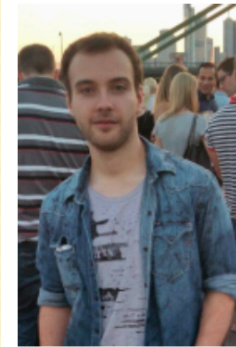
## Senior Software Engineer

- Official Drupal 8 Core Entity API Maintainer

Author and/or main maintainer/developer:

- Autosave Form
- Conflict (8.x-2.x)
- Prefetch Cache
- Widget on Demand
- Entity Reference Inline
- Entity Reference Revisions Inline

## Hristo Chonov (hchonov)



[Twitter](#)



**Current Role(s):**  
Senior Software Developer



### Personal Info

**Primary language:** Bulgarian

**Languages spoken:** Bulgarian  
English  
German

### Bio:

Entity API (ORM) Maintainer for Drupal 8 Core

### History

On Drupal.org for 5 years 2 months

Over 5 edits to documentation

### Drupal events:

DrupalCon Amsterdam 2014  
DrupalCon Barcelona 2015  
DrupalCon Dublin 2016  
DrupalCon Vienna 2017  
Drupal Europe 2018

### Credited on 44 issues fixed in the past 1 year

- [Drupal core](#), 18 issues
- [Conflict](#), 6 issues
- [Search API Solr](#), 1 issue
- [Autosave Form](#), 11 issues
- [Language Negotiator Content Entity \(All Routes\)](#), 2 issues
- [Prefetch Cache](#), 2 issues
- [Drupal.org customizations](#), 2 issues
- [JSON:API](#), 1 issue
- [Search API](#), 1 issue

[View all issue credits](#)

### Projects

[Autosave Form](#) (44 commits)  
[Prefetch Cache](#) (26 commits)  
[Widget On Demand](#) (19 commits)  
[Conflict](#) (12 commits)  
[Language Negotiator Content Entity \(All Routes\)](#) (11 commits)  
[Relation](#) (7 commits)  
[HTML Diff](#) (4 commits)  
[Ajax Confirm](#) (4 commits)  
[Jira REST](#) (3 commits)  
[Entity Reference Revisions Inline](#) (2 commits)  
[Diff](#) (2 commits)  
[RedirectLess](#) (2 commits)  
[Entity Reference Inline](#) (2 commits)  
[Search API Solr](#) (1 commit)  
[Field Group](#) (1 commit)  
[Entity Reference Revisions](#) (1 commit)  
[Content locking \(anti-concurrent editing\)](#) (1 commit)  
[Search API](#) (1 commit)  
Total: 143 commits



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#### Drupal facts

- #18 in Drupal Marketplace (02/08/2019) [1]
- #18 in Dropsolid Contrib Dashboards (02/08/2019) [2]
- one of the two end-users in the top 30 corporate sponsors according to "Who sponsors Drupal development? (2016-2017 edition)" by Dries Buytaert [3]
- one of the three end-users in the top 30 corporate sponsors according to "Who sponsors Drupal development? (2017-2018 edition)" by Dries Buytaert [4]

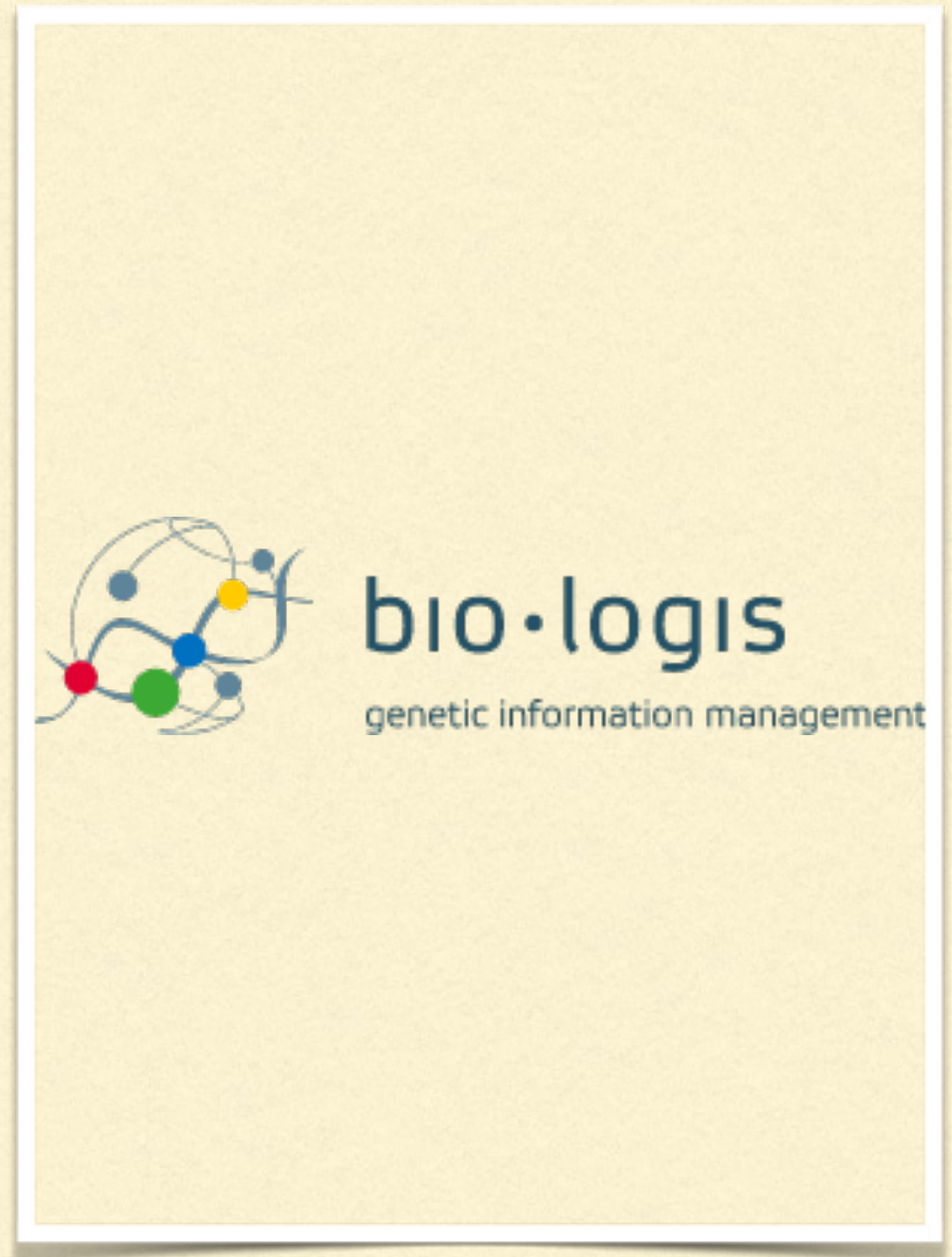
[1] Drupal Marketplace - <https://www.drupal.org/drupal-services>

[2] Dropsolid Contrib Dashboards - <http://drupalcontributions.org>

[3] Who sponsors Drupal development? (2016-2017 edition) - <https://dri.es/who-sponsors-drupal-development-2017>

[4] Who sponsors Drupal development? (2017-2018 edition) - <https://dri.es/who-sponsors-drupal-development-2018>

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# AUTOSAVE FORM

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# AUTOSAVE FORM MODULE

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- continuous autosaving of the form
    - user input
    - form state
  - configuration options
    - autosave interval (default - 60 seconds)
    - enable only for specific entity types & bundles (default - all)
  - currently supported forms
    - content entity forms (default - all)
    - config entity forms support will be added on request
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# AUTOSAVE FORM INTERNALS

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- Decorates the core form builder for autosave submissions
    - speeds up autosave submissions
    - prevents form & entity validation
    - prevents hook invocations
    - prevents altering the user input and form state
    - prevents updating the form build ID
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# AUTOSAVE FORM STATES

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- Autosave states
    - autosave states are per user i.e. represent drafts per user
    - new state only when the form has actually changed (after previous autosave)
    - allows for implementing an undo and redo functionality on top
  - On entity form save
    - with conflict module enabled - only the autosave states of the current form session are deleted
    - without conflict module - all autosave states for the entity being edited are deleted
      - if there are other active autosave sessions then they will be stopped and their users will be notified through a pop-up dialog
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# AUTOSAVE FORM

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DEMO

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# AUTOSAVE FORM LIMITATIONS

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- Out of the box support for entity form routes defined through
    - `_entity_form`
    - `_controller` and `_form` aren't supported
      - but could be enabled through custom code
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# AUTOSAVE FORM FUTURE

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- Use the browser local storage
    - no active internet connection required
    - conserves bandwidth and server processing time
  - Save autosave states as forward revisions in a revision branch
    - Technical limitations
      - DB Not Null Constraints
      - New inline entities
      - non-revisionable entity types
  - Core inclusion? - Implement Autosave [\[#3029488\]](#)
  - Your ideas and requests ...
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# CONFLICT

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8.x-2.x

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# CONFLICT MODULE FOR CONCURRENT EDITING

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- makes concurrent editing of entities possible
  - content entity types
    - revisionable and non-revisionable entity types supported
  - config entity types
    - not supported yet
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# CONFLICT INTERNALS

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- main functionality implemented as an entity builder with an event system for conflict discovery and resolution
  - on entity build a three way comparison for each entity field **part of the form display** is performed using
    - the initially used entity to build the form
    - the current entity built from the form values
    - the entity from the storage (possibly a newer one)
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# CONFLICT DISCOVERY & RESOLUTION

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- EntityConflictDiscoveryEvent
    - left, right and base entities
    - context as parameter bag (form, form state, revision branch metadata)
    - => building a list of conflicting properties (fields)
  - EntityConflictResolutionEvent
    - + result entity
    - + conflicts list
    - => resolves automatically conflicts and removes them from the list
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# CONFLICT INTERNALS

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- Merge mechanisms
    - auto-merge
      - fields not enabled in the currently used entity form display
      - fields the current user has no access to
      - translatable fields from other entity translations
      - entity metadata - changed timestamp, revision metadata
      - fields changed only in the current form or in the newest storage version
    - conflict - fields changed both in the current form and in the newest storage version
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# CONFLICT ENTITY HANDLER

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- Default conflict entity handler - ContentEntityConflictHandler
- for customizations extend from it and register the handler on the desired entity type - “conflict.resolution\_handler”
  - directly on the entity type annotation
  - in hook\_entity\_type\_alter()

```
$entity_type->setHandlerClass( handler_type: 'conflict.resolution_handler', value: ContentEntityConflictHandler::class);
```

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# CONFLICT - MANUAL RESOLUTION

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- Still in progress ... but some basic functionality:
    - Dialog Based
      - main target - nested inline entity forms
        - integration tested with the module Entity Reference Inline
    - Inline Based
      - main target - regular entity forms
    - a mix of both?
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# CONFLICT

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DEMO

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# CONFLICT COMING SOON

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- Auto merge of text fields with diff highlighting
  - <https://xiphe.net/jQuery-Merge-for-php-diff/>



# CONFLICT COMING SOON

## Old Version

```
1 <html>
2   <head>
3     <meta http-equiv="Content-type" content="text/html; charset=utf-8"/>
4     <title>Hello World!</title>
5   </head>
6   <body>
7     <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea
commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla
pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est
laborum.</p>
8
9     <h2>A heading we'll be removing</h2>
10
11    <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea
commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla
pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est
laborum.</p>
12  </body>
13 </html>
```



# CONFLICT COMING SOON

## New Version

```
1 <html>
2   <head>
3     <meta http-equiv="Content-type" content="text/html; charset=utf-8"/>
4     <title>Goodbye Cruel World!</title>
5   </head>
6   <body>
7     <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea
commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla
pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est
laborum.</p>
8
9
10    <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea
commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla
pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est
laborum.</p>
11
12    <p>Just a small amount of new text...</p>
13  </body>
14</html>
```



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# CONFLICT COMING SOON

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- Core inclusion?  
WI: Phase H: Conflict management and local workspace merging support [#2867707]



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# Q&A

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**THANK YOU!**

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