Beamer presentations using the new export engine

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Contents

Introduction

This tutorial covers exporting org documents to LaTeX Beamer slides using the new export engine, `org-elements` and `ox` (short for org-export), written by Nicolas Goaziou.

Note: It will not cover any of the basic features common with the old beamer exporter; it will only focus on the improvements, new additions and backwards incompatibilities. It is also assumed that the reader is already acquainted with GNU Emacs and Org mode itself. Basic understanding of LaTeX and the Beamer package is also assumed.

Initial setup

Unlike the old exporter, requiring the beamer exporter is not enough to export to beamer slides with `ox`. This difference arises from a new feature in `ox-beamer` that allows, in the author's words, a beamer translation of **any** org document. This is extremely useful when creating handouts or article versions of your slides by loading the `beamerarticle` package (see the beamer user guide for specifics).

You can use the following minimal setup to start exporting to the beamer `documentclass`. As of the latest Org mode version (8.0.3), this setup is not necessary anymore. If you want to customise this variable, you should do it before loading `ox-beamer`.

```
(require 'ox-latex)
(add-to-list 'org-latex-classes
             '("beamer"
```

```
"\\documentclass\[presentation\]\{beamer\}"
("\\section\{%s\}" . "\\section*\{%s\}")
("\\subsection\{%s\}" . "\\subsection*\{%s\}")
("\\subsubsection\{%s\}" . "\\subsubsection*\{%s\}")))
```

The first string `beamer` in `org-latex-classes` is by no means unique, it can be substituted for any convenient name you wish. This name however should be the argument to the `LaTeX_CLASS` file header option (or `EXPORT_LaTeX_CLASS` subtree property).

Eric recently updated the old example presentation for beamer export to work with `ox-beamer`. You can take a look at that to get started.

Configuring export options

Apart from the usual export options provided by the `OPTIONS` keyword, you can put additional beamer export options in the file header. For a minimal beamer export, you have to specify the `LaTeX_CLASS` and the `LaTeX_CLASS_OPTIONS` keywords in the header of a file. A preset export template can be inserted by calling the interactive function `org-beamer-insert-options-template`. This can be further modified as per your needs. You can also do a subtree export; in that case you can provide the keywords as subtree `PROPERTIES`. However take note that the keyword names should be prepended with `EXPORT_`. A list of supported keywords are,

Table 1: Export option keywords and corresponding subtree properties.

File header keywords	Subtree properties
OPTIONS	EXPORT_OPTIONS
LaTeX_CLASS	EXPORT_LaTeX_CLASS
LaTeX_CLASS_OPTIONS	EXPORT_LaTeX_CLASS_OPTIONS
LaTeX_HEADER	EXPORT_LaTeX_HEADER
BEAMER_THEME	EXPORT_BEAMER_THEME
BEAMER_COLOR_THEME	EXPORT_BEAMER_COLOR_THEME
BEAMER_FONT_THEME	EXPORT_BEAMER_FONT_THEME
BEAMER_INNER_THEME	EXPORT_BEAMER_INNER_THEME
BEAMER_OUTER_THEME	EXPORT_BEAMER_OUTER_THEME
BEAMER_HEADER	

For a subtree export, a few extra keywords are supported. For example you can specify the exported filename with the `EXPORT_FILE_NAME` property.

Table 2: Properties specific to subtree export

Subtree properties	Functionality
`EXPORT_TITLE`	Export title
`EXPORT_AUTHOR`	Export author
`EXPORT_DATE`	Export date
`EXPORT_FILE_NAME`	Export file name

A simple example

A simple file header might look like the example below.

```
#+LaTeX_CLASS: beamer
#+LaTeX_CLASS_OPTIONS: [presentation,smaller]
#+BEAMER_THEME: default
```

A corresponding subtree export should have properties as shown below.

```
* Exported title
  :PROPERTIES:
  :EXPORT_LaTeX_CLASS: beamer
  :EXPORT_LaTeX_CLASS_OPTIONS: [presentation,smaller]
  :EXPORT_BEAMER_THEME: default
  :EXPORT_FILE_NAME: presentation.pdf
  :END:
```

The export class, as defined in `org-latex-classes`, determines the `documentclass`, and the class options are passed on as optional arguments (note the presence of square brackets).

```
\documentclass[smaller,presentation]{beamer}
```

Configuring frame export level

The new exporter allows the grouping slides into LaTeX sections. The sectioning behaviour is controlled by `org-latex-classes`, where as heading levels to be exported as frames are controlled by the `H:n` option to the `OPTIONS` keyword (`EXPORT_OPTIONS` property for subtree export). The `n` here is the headline level number that you want to export as frames. To elaborate with an example, to export third level headlines as frames, use `#+OPTIONS: H:3` in the file header. This behaviour can be overridden per headline by setting the `BEAMER_env` property to `frame`. You can also provide options to a frame by setting the `BEAMER_opt` property on the headline. This also adds the `fragile` option to the frame.

Use of filters to customise export

`ox` also gives you access to all `org-element` entities in the exported text for customisation with user filters. Filters are essentially simple lisp functions that reformat the exported elements. As a simple example; the `ox-beamer` translates **bold text** as `\alert{bold text}`. To revert this back to the old behaviour, you can you a filter like this:

```
(defun my-beamer-bold (contents backend info)
  (when (eq backend 'beamer)
    (replace-regexp-in-string "\\‘\\\\[A-Za-z0-9]+" "\\\\textbf" contents)))

(add-to-list 'org-export-filter-bold-functions 'my-beamer-bold)
```

Another example would be to translate ~~strike through text~~ to `\structure{strike through text}` with the following filter.

```
(defun my-beamer-structure (contents backend info)
  (when (eq backend 'beamer)
    (replace-regexp-in-string "\\‘\\\\[A-Za-z0-9]+" "\\\\structure" contents)))

(add-to-list 'org-export-filter-strike-through-functions 'my-beamer-structure)
```

Structure editing, environments and markup

All the usual Org mode structure editing commands work. The minor mode `org-beamer-mode` is also provided to make it convenient to insert Beamer specific environments in an org-mode buffer.

A notable change in `ox-beamer` with regards to markup is, **bold text** is translated as `\alert{bold text}` by default.

Block environments and overlay specifications

All headlines below the `org-beamer-frame-level` (i.e. below `H` value in `OPTIONS`), are exported as blocks with `ox-beamer`. You can choose special block environments by setting the `BEAMER_env` property on the headline. Supported blocks are listed in `org-beamer-environments-default`. To specify an overlay specification for a frame or block environment, set the `BEAMER_act` property. If the value is enclosed in square brackets, it is interpreted as a default overlay specification.

```
* A theorem block
  :PROPERTIES:
  :BEAMER_env: theorem
  :BEAMER_act: <2->
  :END:

The =BEAMER_act= property says to overlay this environment from the
second frame onwards.
```

You can add your own environments by customising the `org-beamer-environments-extra` variable. For example the snippet below adds support for `only` environment and associates to the letter `O`.

```
(add-to-list 'org-beamer-environments-extra
             '("onlyenv" "O" "\\begin{onlyenv}%a" "\\end{onlyenv}"))
```

Special enviroments

Environments can be put in a column by setting the `BEAMER_col` property on a headline. It accepts decimal point numbers which is interpreted as a fraction of the text width. If the beadline does not have an enviroment the headline text is ignored and all the contents are put inside the column environment.

```
* A block in a column
  :PROPERTIES:
  :BEAMER_env: block
  :BEAMER_col: 0.5
  :END:

* Just a column with contents
  :PROPERTIES:
  :BEAMER_col: 0.5
  :END:
Some text, the headline above is ignored
```

You can start an appendix by setting the `BEAMER_env` property to `appendix` on a headline. Similarly you can insert notes by setting the property to `note` (use `noteNH` to exclude the headline from the note). You can also use Beamer's `againframe` command by setting the same property. The frame being refered to by `againframe` is specified by the `BEAMER_ref` property. You can also ignore a headline by using `ignoreheading`. This can also be used to close a `column` environment.

All contiguous environments are automatically wrapped in a `columns` environment, although it can be forced at any point by setting the `BEAMER_env` property to `columns`. This might be handy if you want to pass special options.

New features available with the new exporter

TODO Beamer article

Discuss that `EXPORT_LaTeX_CLASS` need not be beamer. Useful to export `beamerarticle` document for slides.

Email from Nicolas Goaziou discussing this feature: `http://mid.gmane.org/87hapz3na9.fsf@gmail.com`

TODO Overlays

- Overlay specifications for frames and blocks

TODO Snippet translation

TODO Ordered and unordered lists

TODO Images

TODO Tables

TODO Source blocks

DONE Environments

TODO Examples

1. ☐ Sectioning and TOC (progress state between sections)
2. ☐ Overlays
3. ☐ Blocks
   (a) ☐ Normal blocks
   (b) ☐ Verbatim blocks
   (c) ☐ Source blocks
4. ☒ Columns

5. ☐ Text / LaTeX commands in between frames
6. ☐ Images
    - Centering
    - Captions
7. ☐ Footnotes and references
8. ☒ Backup slides with `\appendix`
9. ☐ Caveats about using alternate TeX binaries

TODO Migrating from the old to the new exporter

- Backwards incompatible changes in the new exporter
- Configuration:
    1. variable name changes,
    2. filters instead of hooks (except for two)