THE NEW THEME LAYER IN DRUPAL 8

Jen Lampton ~ @jenlampton
www.jenlampton.com

WHY?

DRUPAL 7

DRUPAL 7: NEGATIVES

DRUPAL 7: NEGATIVE

- Drupal-specific template conventions

```
?>¬
<div id="node-<?php print $node->nid; ?>" class="<?php print $classes; ?> clearfix"<?php print $attributes; ?>>¬
¬
  <?php print render($title_prefix); ?>¬
  <?php if (!$page): ?>¬
    <h2<?php print $title_attributes; ?>>¬
      <a href="<?php print $node_url; ?>"><?php print $title; ?></a>¬
    </h2>¬
  <?php endif; ?>¬
  <?php print render($title_suffix); ?>¬
¬
  <?php if ($display_submitted): ?>¬
    <div class="meta submitted">¬
      <?php print $user_picture; ?>¬
      <?php print $submitted; ?>¬
    </div>¬
  <?php endif; ?>¬
```

```
<?php if ($page['featured']): ?>¬
  <div id="featured"><div class="section clearfix">¬
    <?php print render($page['featured']); ?>¬
  </div></div> <!-- /.section, /#featured -->¬
<?php endif; ?>¬
```

Drupalism *noun* Something that only exists in Drupal.

DRUPAL 7: NEGATIVE

- Mixed data types (strings, objects & arrays)

```
?>
<div id="node-<?php prin $node->nid; ?>" class="<?php print $classes; ?> clearfix"<?php print $attributes; ?>>

  <?php print render($title_prefix); ?>
  <?php if (!$page): ?>
    <h2<?php print $title_attributes; ?>>
      <a href="<?php print $node_url; ?>"><?php print $title; ?></a>
    </h2>
  <?php endif; ?>
  <?php print render($title_suffix); ?>

  <?php if ($display_submitted): ?>
    <div class="meta submitted">
      <?php print $user_picture; ?>
      <?php print $submitted; ?>
    </div>
  <?php endif; ?>
```

```
<?php i ($page['featured']): ?>
  <div  ="section clearfix">
    <?php print render($page['featured']); ?>
  </div></div> <!-- /.section, /#featured -->
<?php endif; ?>
```

Object or Array?

DRUPAL 7: NEGATIVE

- Different methods of printing

```
?>
<div id="node-<?php print $node->nid; ?>" class="<?ph  print $classes; ?>  clearfix"<?php print $attributes; ?>>

  <?php print render($title_prefix); ?>
  <?php if (!$page): ?>
    <h2<?php print $title_attributes; ?>>
      <a href="<?php print $node_url; ?>"><?php print $title; ?></a>
    </h2>
  <?ph
  <?ph  print render($title_suffix);

  <?php if ($display_submitted): ?>
    <div class="meta submitted">
      <?php print $user_picture; ?>
      <?php print $submitted; ?>
    </div>
  <?php endif; ?>
```

```
<?php if ($page['featured']): ?>
  <div id="featured"><div class="section clearfix">
    <?php print render($page['featured']); ?>
  </div></div> <!-- /.section, /#featured -->
<?php endif; ?>
```

print or print render() ?

DRUPAL 7: NEGATIVE

PHPTemplate is insecure

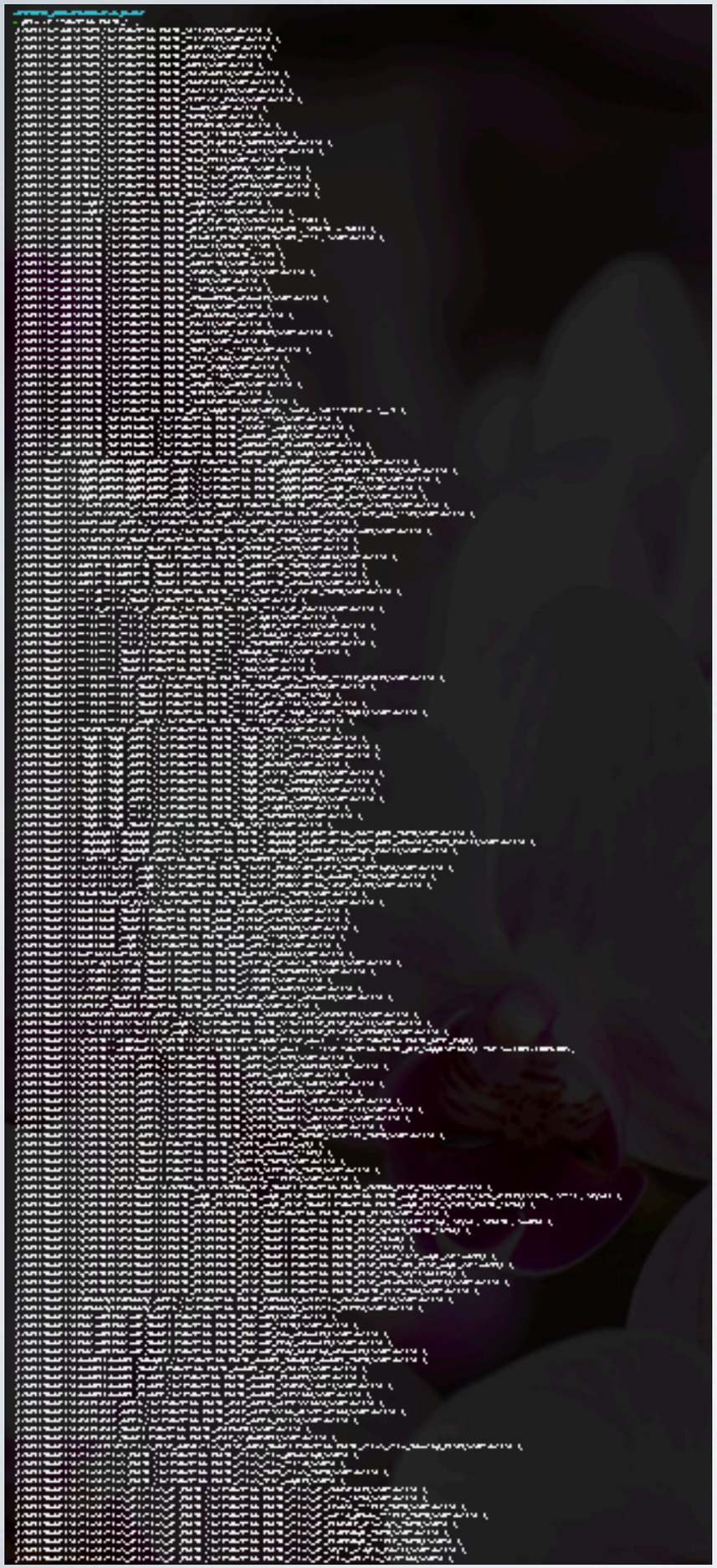
```
<?php db_query("DROP TABLE {node}"); ?>
```

(because PHP is insecure)

```
~/Sites/_drupal/drupal-8.x-dev
> find . -name *.tpl.php
./core/modules/aggregator/templates/aggregator-feed-source.tpl.php
./core/modules/aggregator/templates/aggregator-item.tpl.php
./core/modules/aggregator/templates/aggregator-summary-items.tpl.php
./core/modules/aggregator/templates/aggregator-wrapper.tpl.php
./core/modules/block/templates/block-admin-display-form.tpl.php
./core/modules/block/templates/block.tpl.php
./core/modules/block/tests/themes/block_test_theme/page.tpl.php
./core/modules/book/templates/book-all-books-block.tpl.php
./core/modules/book/templates/book-export-html.tpl.php
./core/modules/book/templates/book-navigation.tpl.php
./core/modules/book/templates/book-node-export-html.tpl.php
./core/modules/comment/templates/comment-wrapper.tpl.php
./core/modules/comment/templates/comment.tpl.php
./core/modules/field/templates/field.tpl.php
./core/modules/forum/templates/forum-icon.tpl.php
./core/modules/forum/templates/forum-list.tpl.php
./core/modules/forum/templates/forum-submitted.tpl.php
./core/modules/forum/templates/forum-topic-list.tpl.php
./core/modules/forum/templates/forums.tpl.php
./core/modules/layout/layouts/static/one-col/one-col.tpl.php
./core/modules/layout/layouts/static/twocol/two-col.tpl.php
./core/modules/layout/tests/layouts/static/one-col/one-col.tpl.php
./core/modules/layout/tests/themes/layout_test_theme/layouts/static/two-col/two-col.tpl.php
./core/modules/node/templates/node-edit-form.tpl.php
./core/modules/node/templates/node.tpl.php
./core/modules/overlay/templates/overlay.tpl.php
./core/modules/search/templates/search-result.tpl.php
./core/modules/search/templates/search-results.tpl.php
./core/modules/system/templates/html.tpl.php
./core/modules/system/templates/maintenance-page.tpl.php
./core/modules/system/templates/page.tpl.php
./core/modules/system/templates/region.tpl.php
./core/modules/system/templates/system-plugin-ui-form.tpl.php
./core/modules/system/tests/modules/theme_test/templates/theme_test.template_test.tpl.php
./core/modules/system/tests/themes/test_theme/node--1.tpl.php
./core/modules/system/tests/themes/test_theme/theme_test.template_test.tpl.php
./core/modules/taxonomy/templates/taxonomy-term.tpl.php
./core/modules/user/templates/user-picture.tpl.php
./core/modules/user/templates/user.tpl.php
./core/modules/views/templates/views-exposed-form.tpl.php
./core/modules/views/templates/views-more.tpl.php
./core/modules/views/templates/views-view-field.tpl.php
./core/modules/views/templates/views-view-fields.tpl.php
./core/modules/views/templates/views-view-grid.tpl.php
./core/modules/views/templates/views-view-grouping.tpl.php
./core/modules/views/templates/views-view-list.tpl.php
./core/modules/views/templates/views-view-row-rss.tpl.php
./core/modules/views/templates/views-view-rss.tpl.php
./core/modules/views/templates/views-view-summary-unformatted.tpl.php
./core/modules/views/templates/views-view-summary.tpl.php
./core/modules/views/templates/views-view-table.tpl.php
./core/modules/views/templates/views-view-unformatted.tpl.php
./core/modules/views/templates/views-view.tpl.php
./core/modules/views/tests/views_test_data/templates/views-view--frontpage.tpl.php
./core/modules/views/views_ui/templates/views-ui-display-tab-bucket.tpl.php
./core/modules/views/views_ui/templates/views-ui-display-tab-setting.tpl.php
./core/themes/bartik/templates/comment-wrapper.tpl.php
./core/themes/bartik/templates/comment.tpl.php
./core/themes/bartik/templates/maintenance-page.tpl.php
./core/themes/bartik/templates/node.tpl.php
./core/themes/bartik/templates/page.tpl.php
./core/themes/seven/templates/maintenance-page.tpl.php
./core/themes/seven/templates/page.tpl.php
```

NEGATIVE

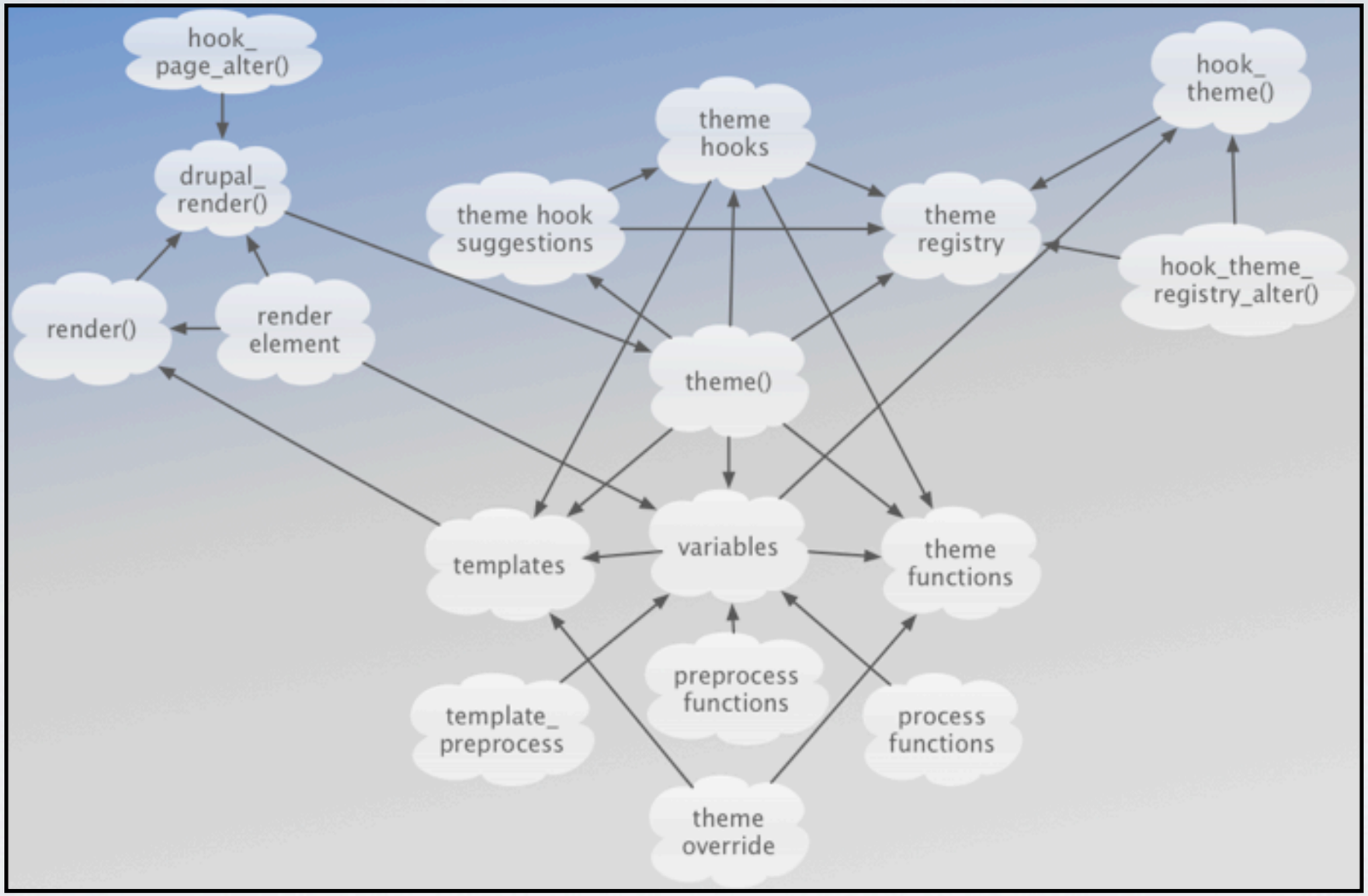
Too many template files



NEGATIVE

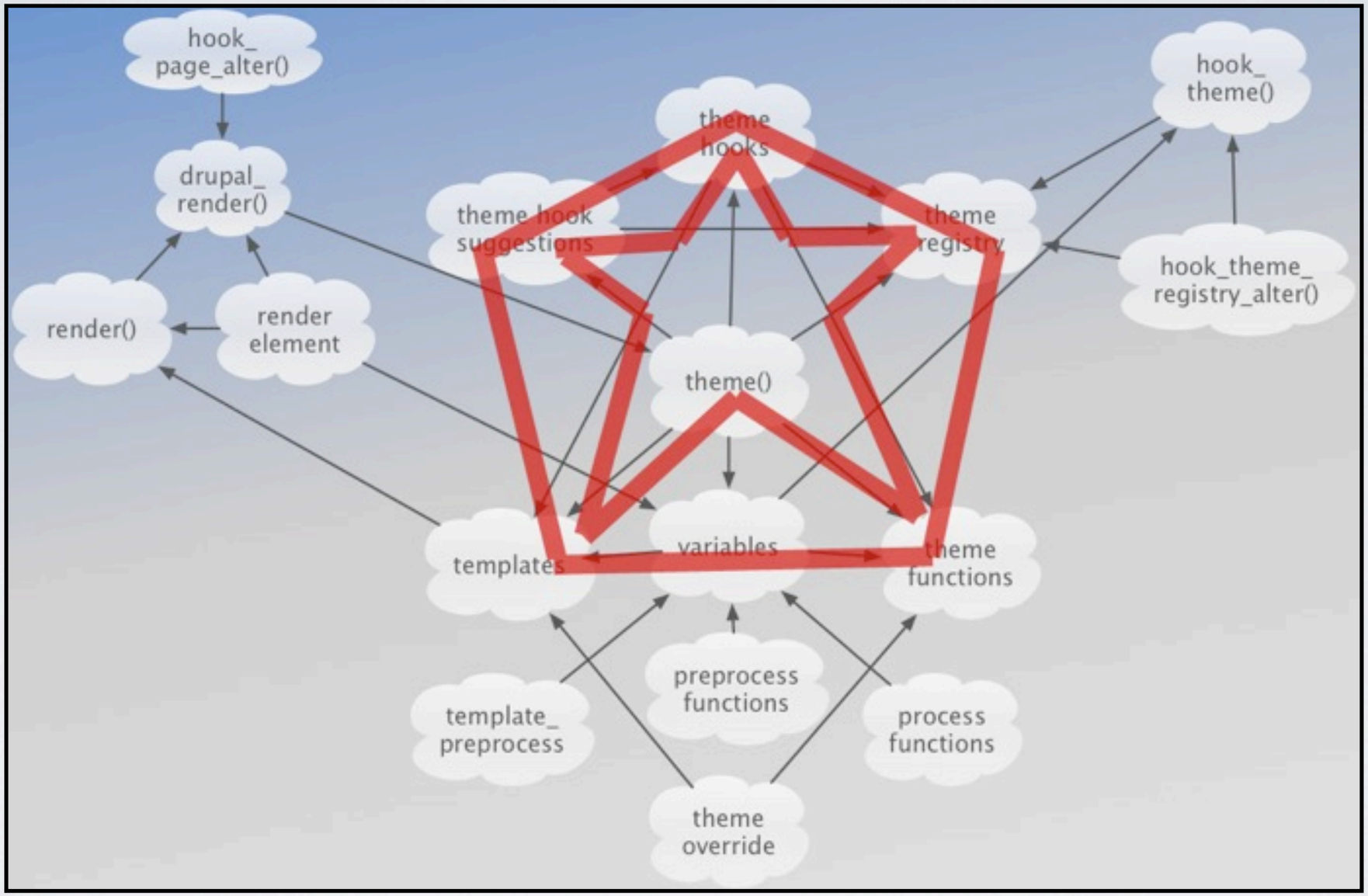
Waaaaaaaaay too many theme functions

DRUPAL 7: NEGATIVE



too many complex of subsystems

DRUPAL 7: NEGATIVE



Satanic?

DRUPAL 7: NEGATIVE

Drupal 7 is too hard to learn!

THIS IS A LOT OF STUFF

- Drupal-specific template conventions
- Mixed data types (strings, objects & arrays)
  $node->nid vs $content['links']
- Different methods of printing
  print $node->nid vs print render($content['links'])
- PHPTemplate is insecure
- Two ways to override markup
  Templates: *.tpl.php vs functions: theme_foo()
- Many template files, many similar theme functions
- Complex mix of subsystems
- Difficult to learn for newcomers (and D6 veterans)

A NEW THEME LAYER?

Principals to guide us.

BADCamp, 2012.

A NEW THEME LAYER?

Principals to guide us

1. Start with nothing

Core default markup should strive for semantic simplicity, with few HTML elements, added only as needed

A NEW THEME LAYER?

Principals to guide us

1. **Start with nothing**
2. **Build from use cases**

   Don't assume you know what people want or add features based on "What-if?" Think about the 90% of use cases.

A NEW THEME LAYER?

Principals to guide us

1. **Start with nothing**
2. **Build from use cases**
3. **Provide tools**

   Give front-end experts a way to achieve specific goals; goals that apply to the remaining 10% of use cases. Keep in mind that complex problems may require complex solutions.

A NEW THEME LAYER?

Principals to guide us

1. **Start with nothing**
2. **Build from use cases**
3. **Provide tools**
4. **Consolidate**

"Your markup is not special." Don't make something new. Work toward common theme functions that modules leverage (i.e. a Theme Component Library).

A NEW THEME LAYER?

Principals to guide us

1. **Start with nothing**
2. **Build from use cases**
3. **Provide tools**
4. **Consolidate**
5. **Visibility**

   You should be able to see what's going on in a template without reading docs. Twig provides a lot of this by virtue of its syntax (it looks like HTML). Form follows function.

A NEW THEME LAYER?

Principals to guide us

1. **Start with nothing**
2. **Build from use cases**
3. **Provide tools**
4. **Consolidate**
5. **Visibility**
6. **Consistency**

   Do the same things everywhere, follow patterns. Use similar variable names across templates if they represent similar things.

A NEW THEME LAYER?

Principals to guide us

1. **Start with nothing**
2. **Build from use cases**
3. **Provide tools**
4. **Consolidate**
5. **Visibility**
6. **Consistency**
7. **Don't dumb it down**

   Complexity should be reduced but not obscured. Themers *can* understand template logic and loops. When complexity does happen, use comments to explain why.

A NEW THEME LAYER?

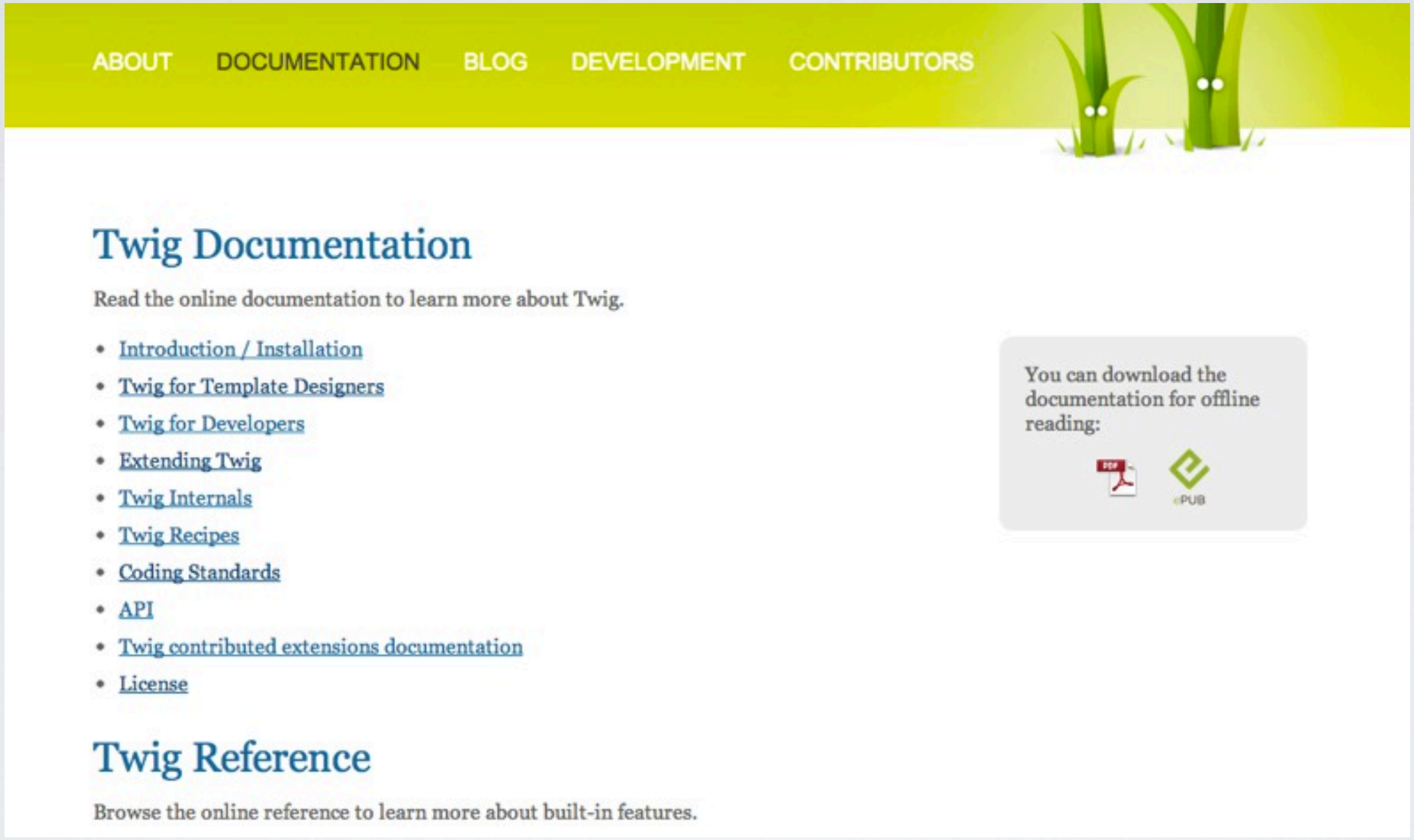
Principals to guide us

1. **Start with nothing**
2. **Build from use cases**
3. **Provide tools**
4. **Consolidate**
5. **Visibility**
6. **Consistency**
7. **Don't dumb it down**
8. **Organization should be driven by meaning and semantics over technical convenience**

   Consider what an element means rather than how it structurally appears. Names and locations of templates should be self-evident. Themers want to see markup in templates, not abstraction.

A NEW THEME LAYER?

TWIG



well documented

TWIG

Extending Twig¶

Twig can be extended in many ways; you can add extra tags, filters, tests, operators, global variables, and functions. You can even extend the parser itself with node visitors.

The first section of this chapter describes how to extend Twig easily. If you want to reuse your changes in different projects or if you want to share them with others, you should then create an extension as described in the following section.

extensible

TWIG

- **Secure**: When it comes to security, Twig has some unique features:
  - *Automatic output escaping*: To be on the safe side, you can enable automatic output escaping globally or for a block of code:

```
{% autoescape true %}
    {% var %}
    {% var|raw %}      {# var won't be escaped #}
    {% var|escape %}   {# var won't be doubled-escaped #}
{% endautoescape %}
```

  - *Sandboxing*: Twig can evaluate any template in a sandbox environment where the user has access to a limited set of tags, filters, and object methods defined by the developer. Sandboxing can be enabled globally or locally for just some templates:

```
{% include "user.html" sandboxed %}
```

secure

TWIG

- **Unit tested**: Twig is fully unit-tested. The library is stable and ready to be used in large projects.

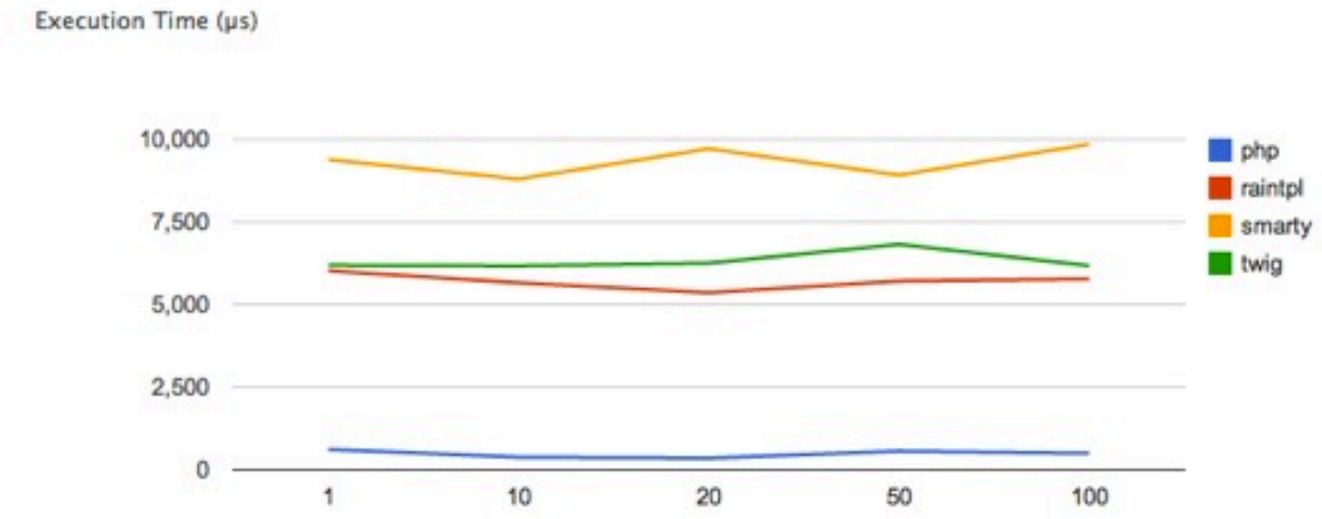
well-tested

TWIG

Summary (assign)

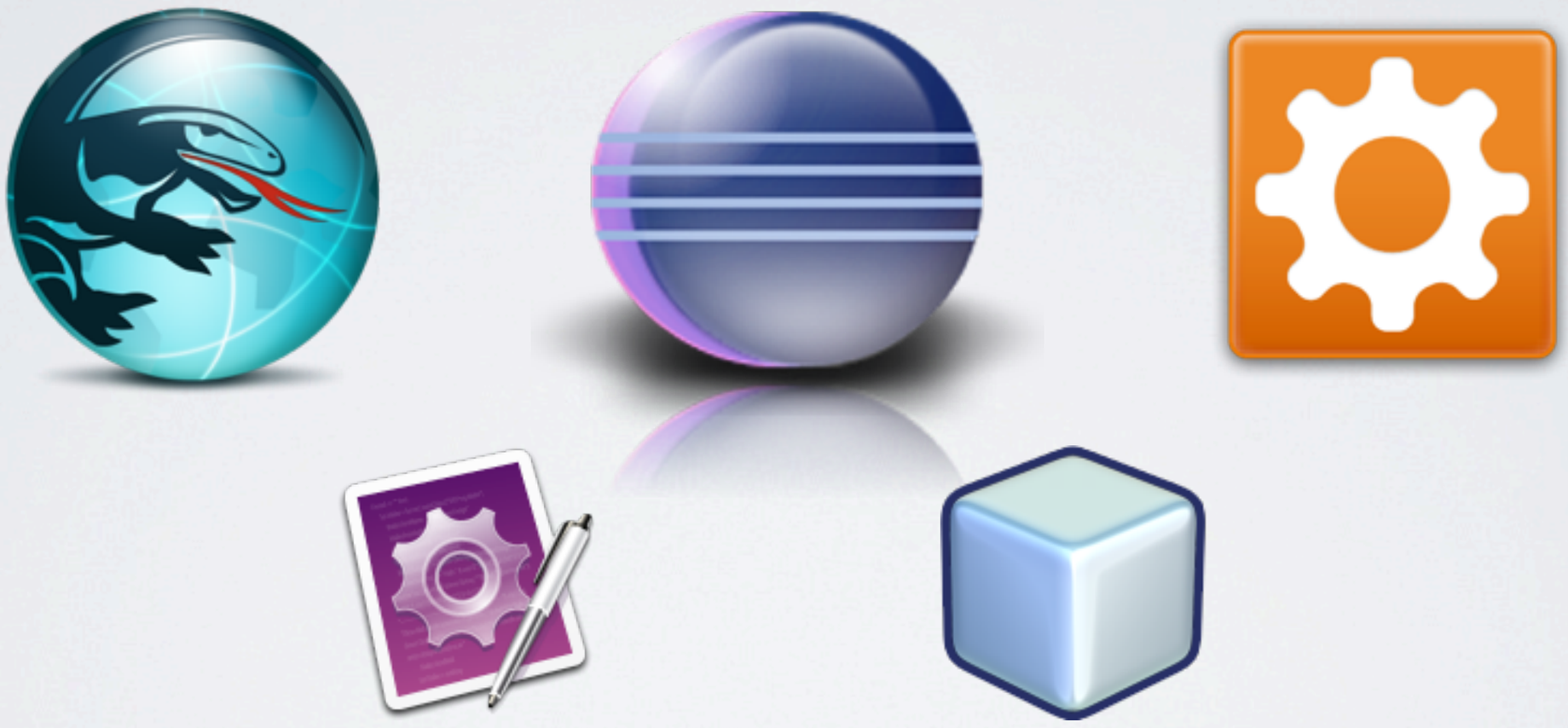
Test	tot. time	tot. memory	package size
php 5.3.3-7+squeeze9	483 µs	11.97 KB	4 KB
raintpl 2.7.0	5707 µs	282.77 KB	37 KB
twig 1.5.1	6323 µs	715.93 KB	647 KB
smarty 3.1.7	9336 µs	1.28 MB	971 KB

Execution Time (assign)



fast

TWIG



IDE integration

TWIG

python

recognizable syntax

TWIG

by Symfony's author, Fabien Potencier

TWIG

what does it look like?

TWIG

what does it look like?

```
{% if items %}
<div class="item-list"> {# @todo remove this div #}
  {% if title %}
    <h3>{{ title }}</h3>
  {% endif %}
  {% if type == 'ol' %}
    <ol class="{{ attributes.class }}"{{ attributes }}>
  {% else %}
    <ul class="{{ attributes.class }}"{{ attributes }}>
  {% endif %}
  {% for item in items %}
    <li{{ item.attributes }}>{{ item.data }}</li>
  {% endfor %}
  {% if type == 'ol' %}
  </ol>
  {% else %}
  </ul>
  {% endif %}
</div> {# @todo remove this div #}
{% endif %}
```

TWIG

print with {{ }}

```
{% if items %}
<div class="item-list"> {# @todo remove this div #}
  {% if title %}
    <h3>{{ title }}</h3>
  {% endif %}
  {% if type == 'ol' %}
    <ol class="{{ attributes.class }}"{{ attributes }}>
  {% else %}
    <ul class="{{ attributes.class }}"{{ attributes }}>
  {% endif %}
  {% for item in items %}
    <li{{ item.attributes }}>{{ item.data }}</li>
  {% endfor %}
  {% if type == 'ol' %}
  </ol>
  {% else %}
  </ul>
  {% endif %}
</div> {# @todo remove this div #}
{% endif %}
```

TWIG

commands with {% %}

```
{% if items %}
<div class="item-list"> {# @todo remove this div #}
  {% if title %}
    <h3>{{ title }}</h3>
  {% endif %}
  {% if type == 'ol' %}
    <ol class="{{ attributes.class }}"{{ attributes }}>
  {% else %}
    <ul class="{{ attributes.class }}"{{ attributes }}>
  {% endif %}
  {% for item in items %}
    <li{{ item.attributes }}>{{ item.data }}</li>
  {% endfor %}
  {% if type == 'ol' %}
  </ol>
  {% else %}
  </ul>
  {% endif %}
</div> {# @todo remove this div #}
{% endif %}
```

TWIG

comments with {# #}

```
{% if items %}
<div class="item-list">{# @todo remove this div #}
  {% if title %}
    <h3>{{ title }}</h3>
  {% endif %}
  {% if type == 'ol' %}
    <ol class="{{ attributes.class }}"{{ attributes }}>
  {% else %}
    <ul class="{{ attributes.class }}"{{ attributes }}>
  {% endif %}
  {% for item in items %}
    <li{{ item.attributes }}>{{ item.data }}</li>
  {% endfor %}
  {% if type == 'ol' %}
  </ol>
  {% else %}
  </ul>
  {% e
</div>{# @todo remove this div #}
{% end
```

TWIG

simple and intuitive

```
{% if items %}
<div class="item-list"> {# @todo remove this div #}
  {% if title %}
    <h3>{{ title }}</h3>
  {% endif %}
  {% if type == 'ol' %}
    <ol class="{{ attributes.class }}"{{ attributes }}>
  {% else %}
    <ul class="{{ attributes.class }}"{{ attributes }}>
  {% endif %}
  {% for item in items %}
    <li{{ item.attributes }}>{{ item.data }}</li>
  {% endfor %}
  {% if type == 'ol' %}
  </ol>
  {% else %}
  </ul>
  {% endif %}
</div> {# @todo remove this div #}
{% endif %}
```

TWIG

A **single way** to override markup!

All theme functions become template files!

```
- */
-function theme_
-  $items = $var
-  $title = (str
-  // @todo 'type
-  $type = $varia
-  $list_attribut
-
-  $output = '';
-  if ($items) {
-    $output .=
-
-    $num_items =
-    $i = 0;
-    foreach ($it
-      $i++;
-      $attribute
-      if (is_ar
-        if (isse
-          $attr
-        }
-        $item =
-      }
-      $attribute
-      if ($i ==
-        $attribu
-      }
-      if ($i ==
-        $attribu
-      }
-      $output .=
```

```
--- /dev/null
+++ b/core/themes/stark/templates/system/item-list.twig
@@ -0,0 +1,40 @@
+{#
+/**
+ * @file
+ * Returns HTML for a list or nested list of items.
+ *
+ * Available variables:
+ *
```

TWIG

less code than PHP tempates

TWIG

less code than PHP tempates

D7

```php
function theme_username($variables) {
  if (isset($variables['link_path'])) {
    $output = l($variables['name'] . $variables['extra'], $variables['link_path'], $variables['link_options']);
  }
  else {
    $output = '<span' . drupal_attributes($variables['attributes_array']) . '>' . $variables['name'] . $variables['extra'] . '</span>';
  }
  return $output;
}
```

D8

```twig
{% if link %}
  <a href="{{ link.path }}" {{- link.attributes }}>{{ name }} {{- extra }}</a>
{% else %}
  <span class="{{ attributes.class }}" {{- attributes }}>{{ name }} {{- extra }}</span>
{% endif %}
```

theme_username becomes username.html.twig

TWIG

less code than PHP tempates

D7

```php
function theme_image($variables) {
  $attributes = $variables['attributes'];
  $attributes['src'] = file_create_url($variables['uri']);

  foreach (array('width', 'height', 'alt', 'title') as $key) {
    if (isset($variables[$key])) {
      $attributes[$key] = $variables[$key];
    }
  }

  return '<img' . drupal_attributes($attributes) . ' />';
}
```

D8

```twig
<img src="{{ attributes.src }}" class="{{ attributes.class }}" {{ attributes }} />
```

theme_image becomes image.html.twig

TWIG

less code than PHP tempates

D7

```
function theme_link($variables) {
  return '<a href="' . check_plain(url($variables['path'], $variables['options'])) . '"'
    . drupal_attributes($variables['options']['attributes']) . '>'
    . ($variables['options']['html'] ? $variables['text'] : check_plain($variables['text']))
    . '</a>';
}
```

D8

```
<a href="{{ path }}" {{ attributes }}>{{ text }}</a>
```

theme_link becomes link.html.twig

TWIG

less code than PHP tempates

D7

```php
function theme_item_list($variables) {
  $items = $variables['items'];
  $title = (string) $variables['title'];
  $type = $variables['type'];
  $list_attributes = $variables['attributes'];

  $output = '';
  if (!$items) {
    $output .= '<' . $type . drupal_attributes($list_attributes) . '>';

    $num_items = count($items);
    $i = 0;
    foreach ($items as $key => $item) {
      $i++;
      $attributes = array();

      if (is_array($item)) {
        $value = '';
        if (isset($item['data'])) {
          $value .= $item['data'];
        }
        $attributes = array_diff_key($item, array('data' => 0, 'children' => 0));

        // Append nested child list, if any.
        if (isset($item['children'])) {
          // HTML attributes for the outer list are defined in the 'attributes'
          // theme variable, but not inherited by children. For nested lists,
          // all non-numeric keys in 'children' are used as list attributes.
          $child_list_attributes = array();
          foreach ($item['children'] as $child_key => $child_item) {
            if (is_string($child_key)) {
              $child_list_attributes[$child_key] = $child_item;
              unset($item['children'][$child_key]);
            }
          }
          $value .= theme('item_list', array(
            'items' => $item['children'],
            'type' => $type,
            'attributes' => $child_list_attributes,
          ));
        }
      }
      else {
        $value = $item;
      }

      $attributes['class'][] = ($i % 2 ? 'odd' : 'even');
      if ($i == 1) {
        $attributes['class'][] = 'first';
      }
      if ($i == $num_items) {
        $attributes['class'][] = 'last';
      }

      $output .= '<li' . drupal_attributes($attributes) . '>' . $value . '</li>';
    }
    $output .= "</$type>";
  }

  // Only output the list container and title, if there are any list items.
  // Check to see whether the block title exists before adding a header.
  // Empty headers are not semantic and present accessibility challenges.
  if ($output !== '') {
    if ($title !== '') {
      $title = '<h3>' . $title . '</h3>';
    }
    $output = '<div class="item-list">' . $title . $output . '</div>';
  }

  return $output;
}
```

D8

```twig
{% if items|length > 0 %}
<div class="item-list"> {# @TODO remove this wrapper div #}
  {% if title is defined %}
    <h3>{{ title }}</h3>
  {% endif %}
  <{{ type }} class="{{ attributes.class }}" {{- attributes }}>
  {% for item in items %}
    {% set value = item.data ? item.data : item %}
    <li {{- item.attributes }}>
      {{ value }}
    </li>
  {% endfor %}
  </{{ type }}>
</div> {# @TODO remove this wrapper div #}
{% endif %}
```

theme_item_list beomes item_list.html.twig

REMEMBER DRUPAL 7?

- Drupal-specific template conventions
- Mixed data types (strings, objects & arrays)
  $node->nid vs $content['links']
- Different methods of printing
  print $node->nid vs print render($content['links'])
- PHPTemplate is insecure
- Two ways to override markup
  Templates: *.tpl.php vs functions: theme_foo()
- Many template files, many similar theme functions
- Complex mix of subsystems
- Difficult to learn for newcomers (and D6 veterans)

REMEMBER DRUPAL 7?

- Drupal-specific template conventions

Twig is used elsewhere on the web.

...is syntactically similar to other languages,

...and looks a lot more like HTML.

REMEMBER DRUPAL 7?

- Drupal-specific template conventions **FIXED**
- Mixed data types (strings, objects & arrays)

$node->nid vs $content['links']

All template variables are accessed consistently:

node.nid

content.links

REMEMBER DRUPAL 7?

- Drupal-specific template conventions **FIXED**
- Mixed data types (strings, objects & arrays) **FIXED**

  $node->nid vs $content['links']
- Different methods of printing

  print $node->nid vs print render($content['links'])

We're removed calls to render() from templates:

{{ node.nid }}

{{ content.links }}

REMEMBER DRUPAL 7?

- Drupal-specific template conventions **FIXED**
- Mixed data types (strings, objects & arrays) **FIXED**

  $node->nid vs $content['links']
- Different methods of printing **FIXED**

  print $node->nid vs print render($content['links'])
- PHPTemplate is insecure

All variables will be *automatically* sanitized.

...and most PHP functions cannot be executed in template files.

REMEMBER DRUPAL 7?

- Drupal-specific template conventions **FIXED**
- Mixed data types (strings, objects & arrays) **FIXED**

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- Two ways to override markup

  Templates: *.tpl.php vs functions: theme_foo()

All theme functions are converted to template files

node.tpl.php becomes node.html.twig

theme_table() becomes table.html.twig

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We're working on this right now (Sprints!)

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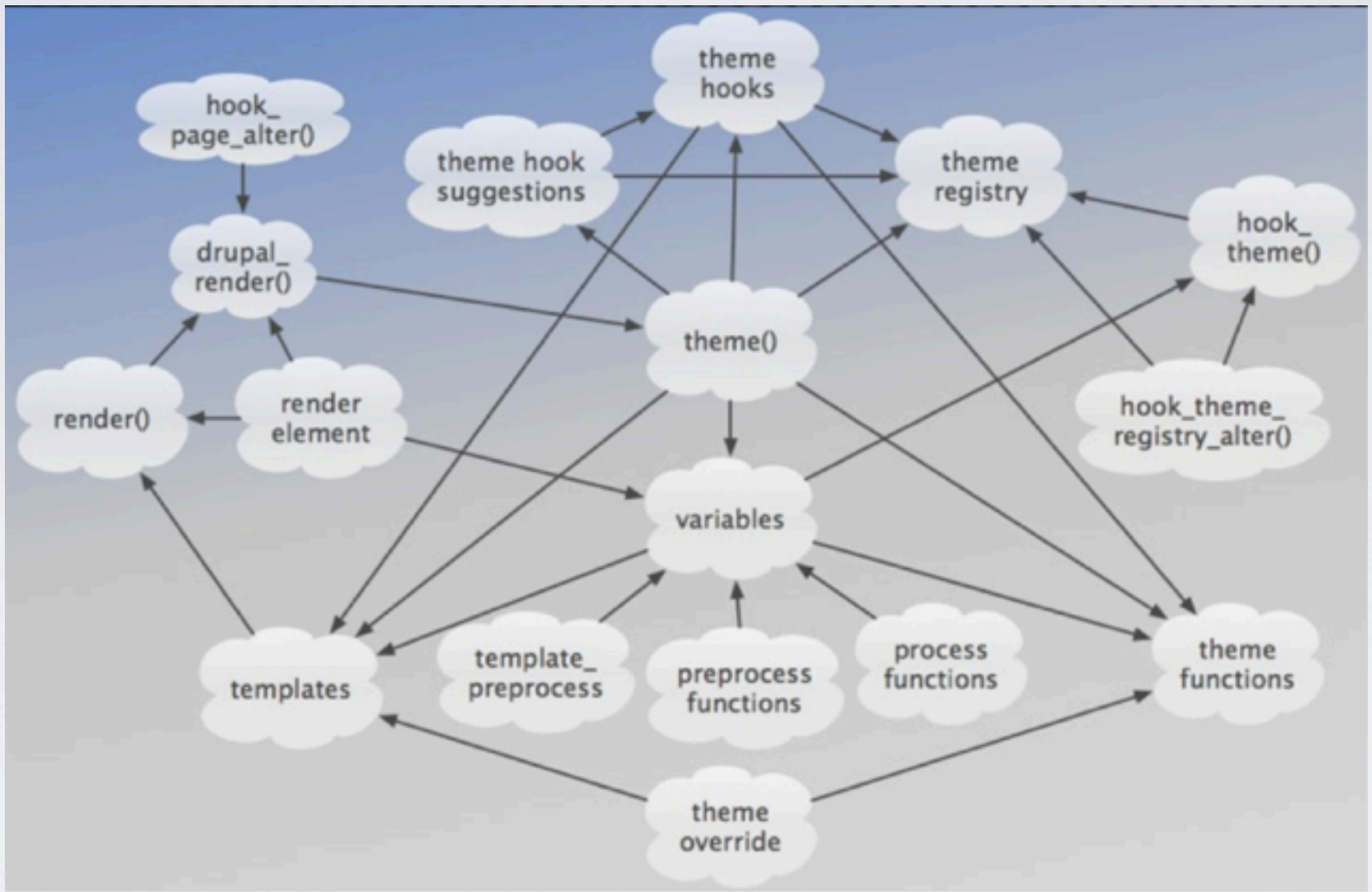
- Many template files, many similar theme functions **@todo**
- Complex mix of subsystems

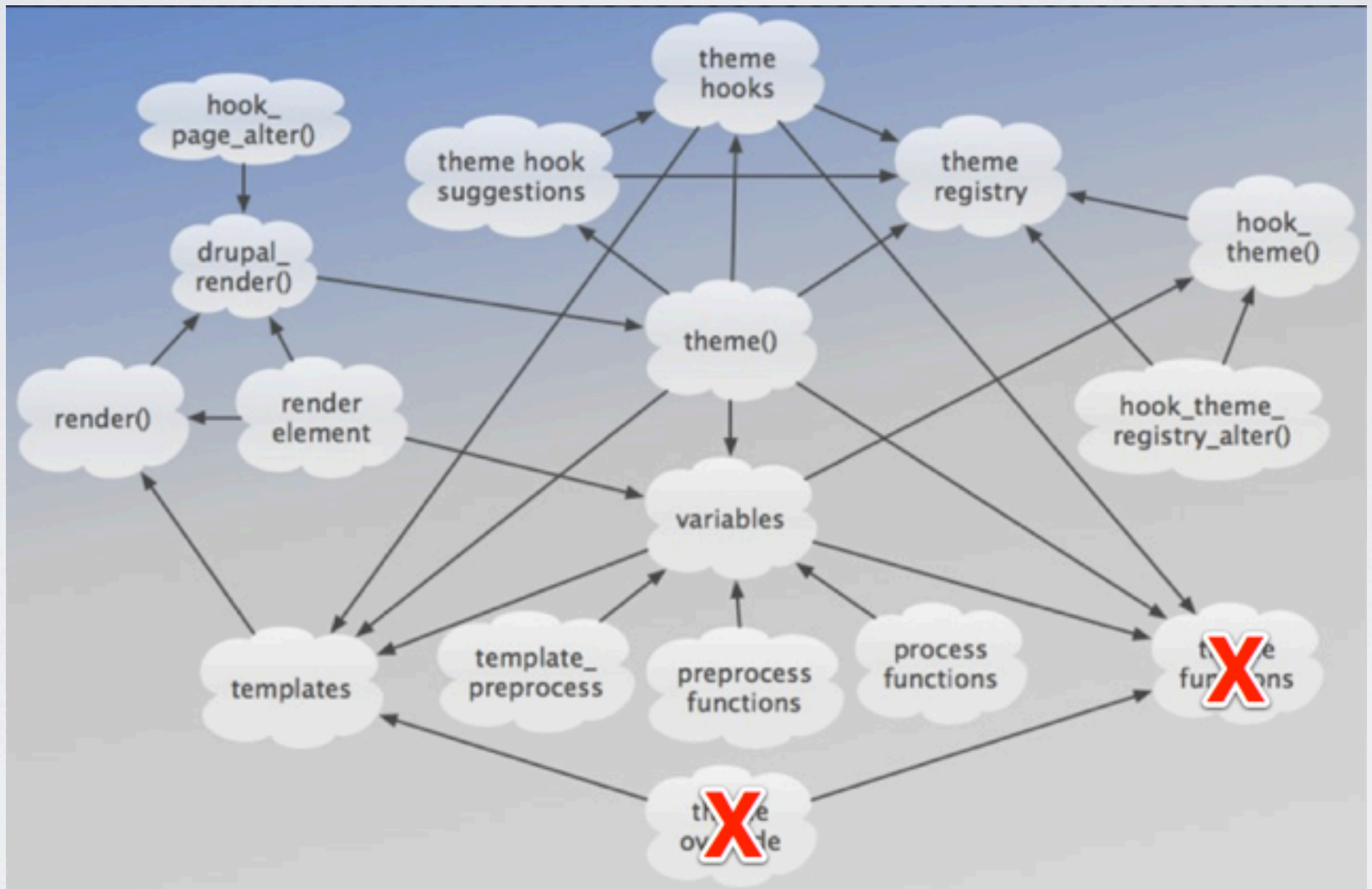
We can remove all theme functions, and potentially render, process & (maybe) preprocess.

REMEMBER DRUPAL 7?



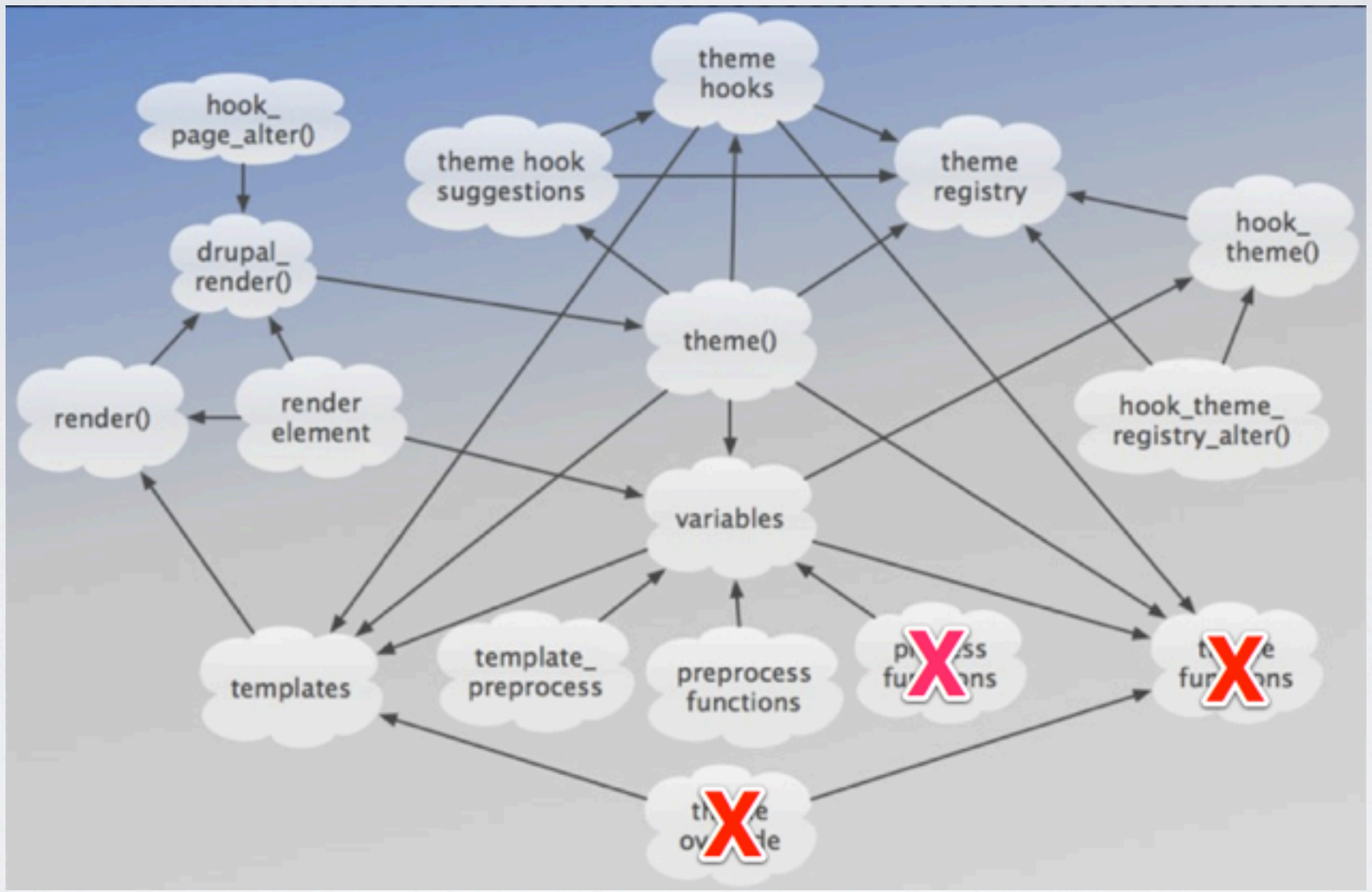
remember the complexity of Drupal 7?

REMEMBER DRUPAL 7?



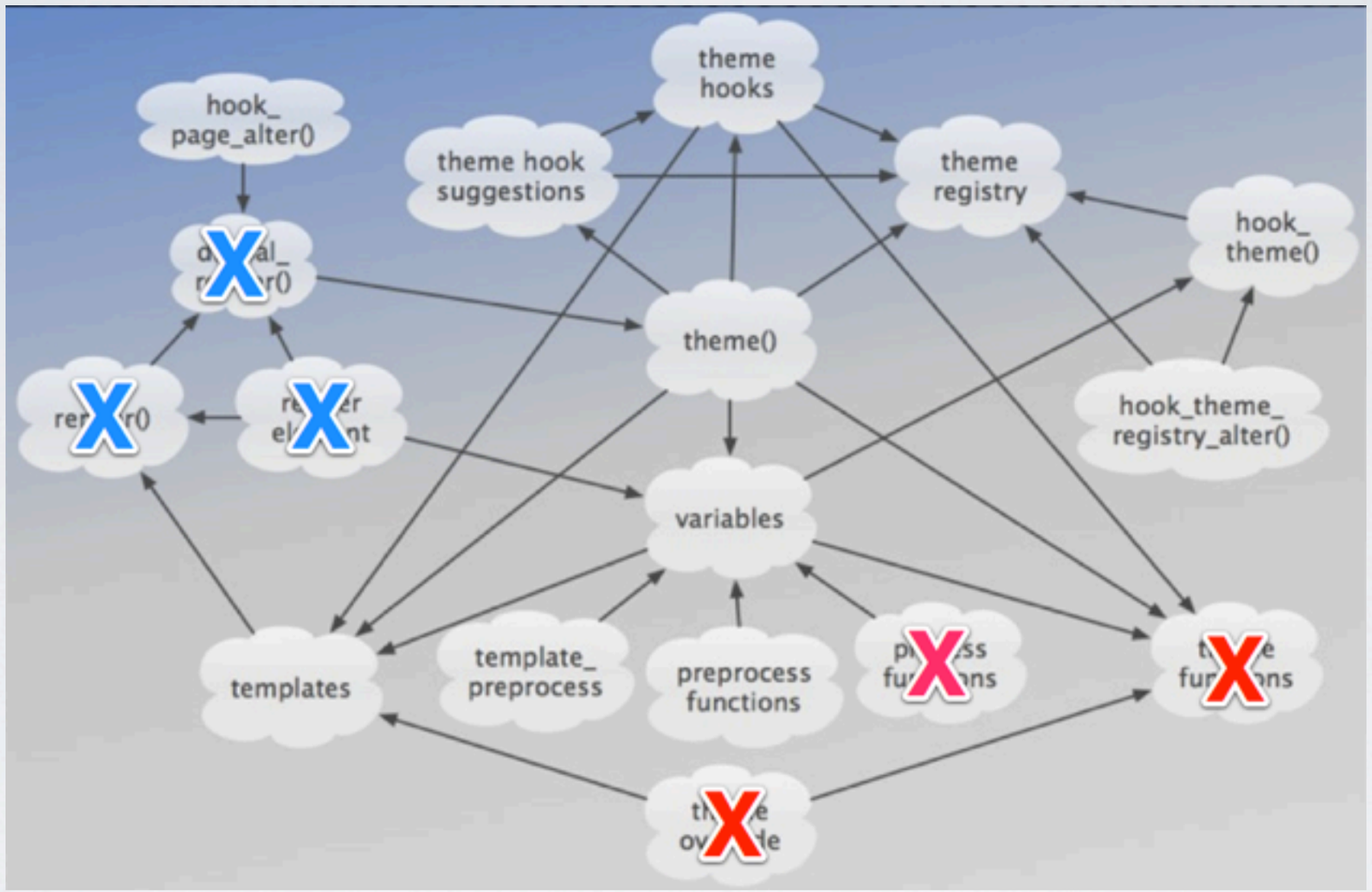
remove theme functions (and overrides) entirely.

REMEMBER DRUPAL 7?



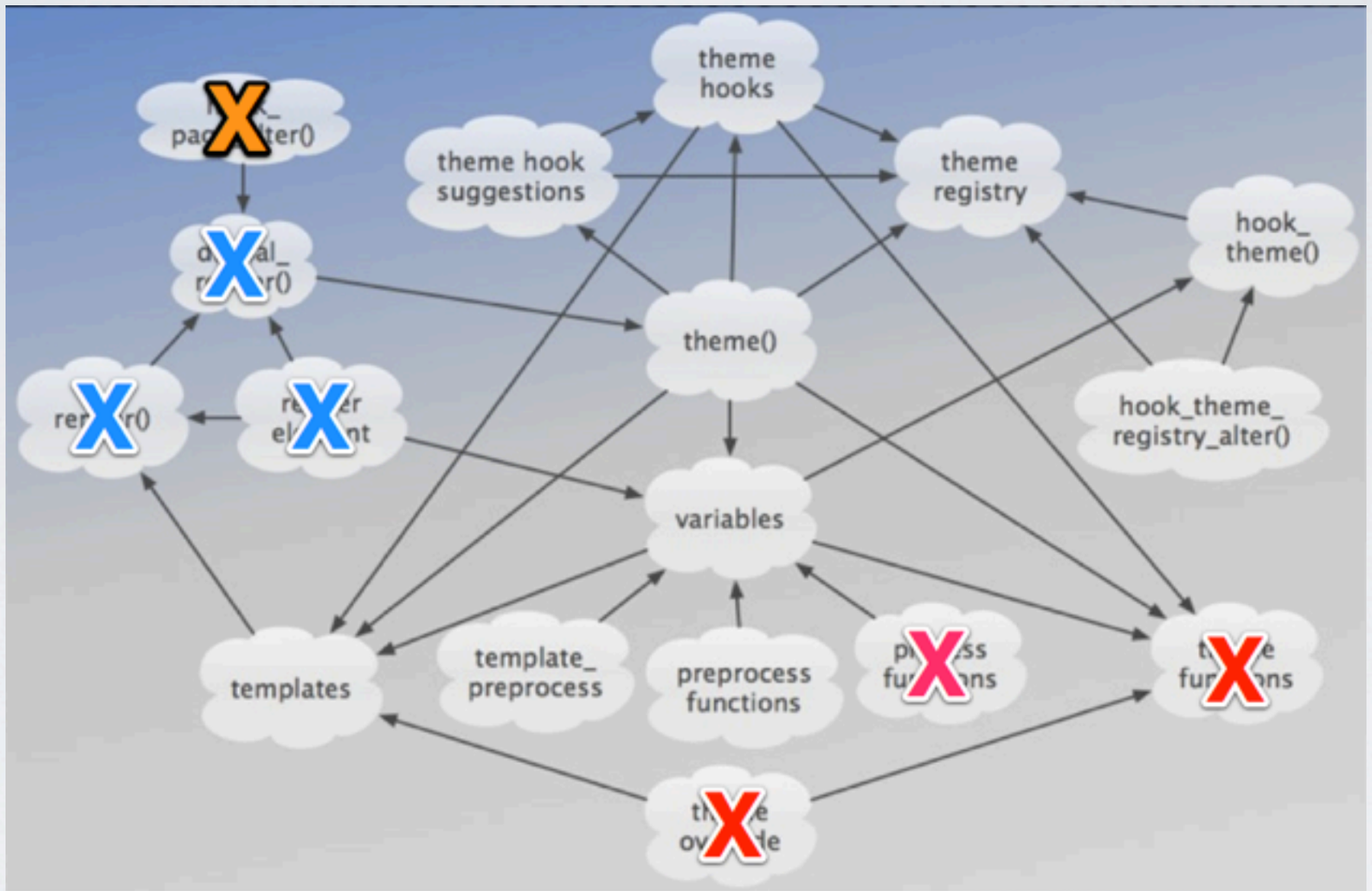
remove process.

REMEMBER DRUPAL 7?



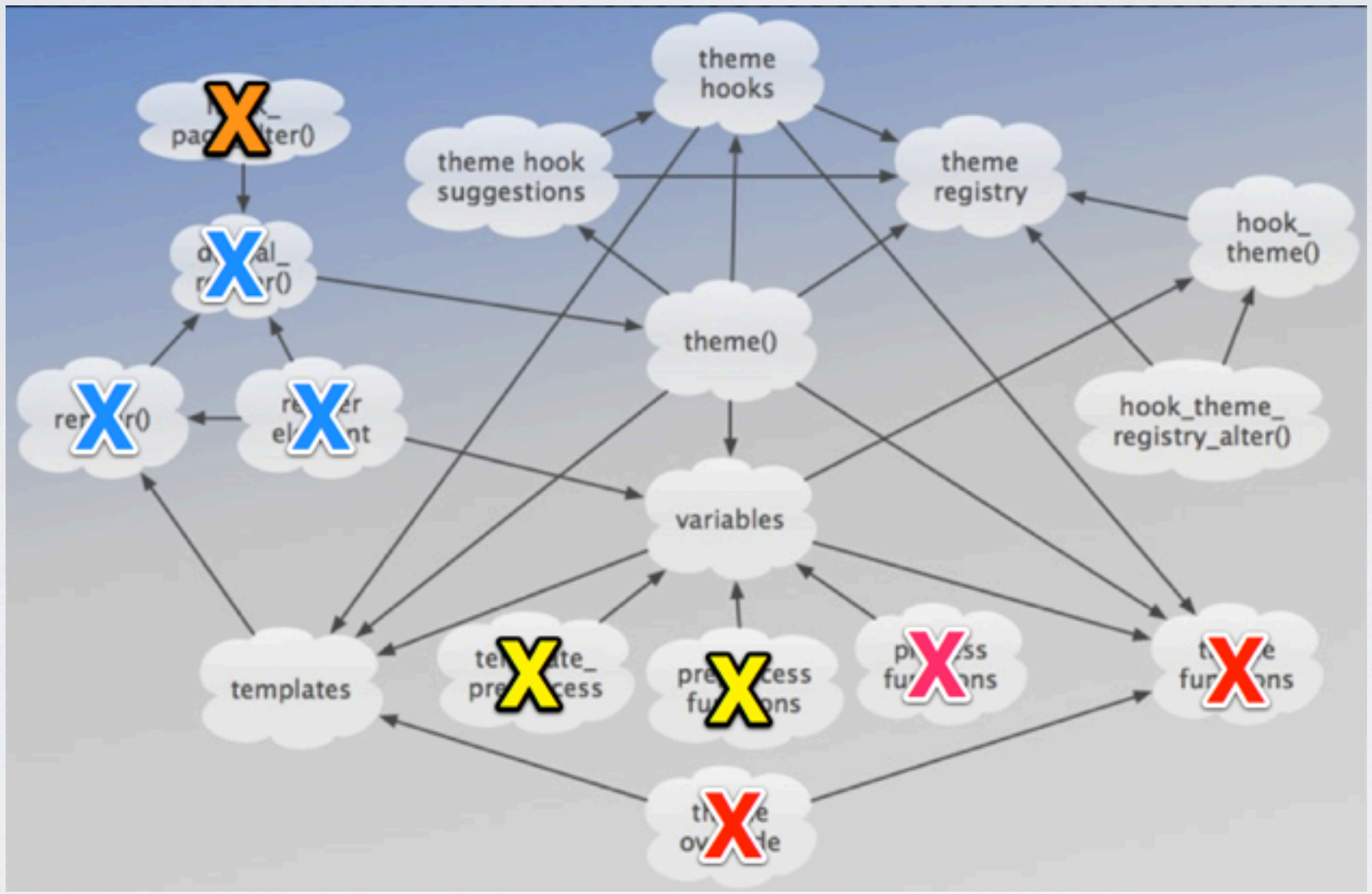
remove render.

REMEMBER DRUPAL 7?



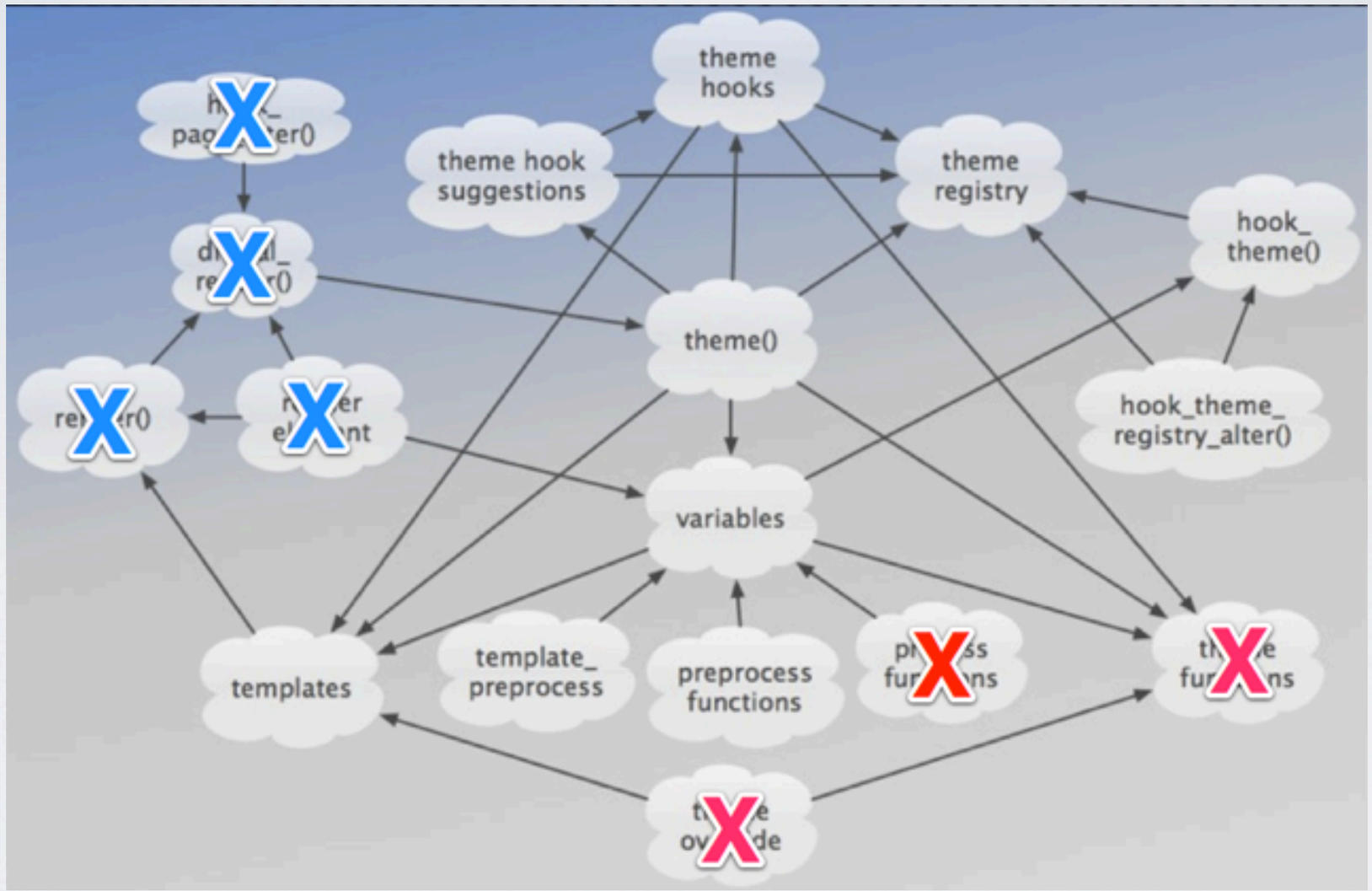
remove page alter?

REMEMBER DRUPAL 7?



remove preprocess?

REMEMBER DRUPAL 7?



look what would happen in Drupal 8.

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Consistency FTW

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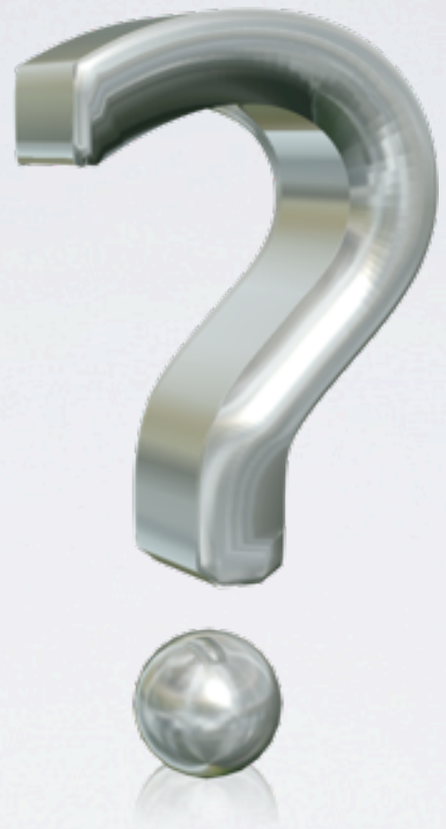
- Awesome variable inspection: Twig's dpm()
- Templates are safe enough for in-browser editing
- Possible performance gains: (much TBD) faster than render()?
- 2-way communication between UI and code: The UI can understand what variables exist (or not) in a template file



QUESTIONS?

HOW CAN I HELP?

NEXT TASKS

- ~~Finish converting all existing core *.tpl.php files to Twig templates (sandbox)~~ **DONE~ISH**
- ~~Finish converting all existing core theme functions to~~ Twig templates (sandbox) **DONE~ISH**
- Create & test patches for each module (core) **HELP!**
- Help clean up markup in core (sandbox/core) **HELP!**
- Consolidate similar templates (core) **HELP!**
- Identify & enable template suggestions (core) **HELP!**
- Rethink preprocess / __to_string() methods (maybe D9?)
- Convert renderable arrays into Twig objects (maybe D9?)

- More TBD

JUST DO IT!

- Create & test patches for each module

live demo?

A NEW THEME LAYER FOR DRUPAL 8

photo credits:

lolcat-flexible
http://cheezburger.com/2679924736

anything is possible pebbles
http://www.invergordontours.com/aip.html

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http://2teachers1classroom.blogspot.com/2009_02_01_archive.html

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http://icsigns.org/press/2010/03/23/consistency-staying-on-the-mark/

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