

Using Views Programmatically

Jason Yee - Aten Design Group
jason@atendesigngroup.com

Session URL: <http://dccco.us/n/42>

Module: http://bit.ly/views_prog

Views

- Most installed module. About 250,000 installs in Drupal 6, and 19,000 in Drupal 7.
- Easily allows you to create lists of information in a friendly interface with Views UI
- But...

Views UI Problems

- Views created in Views UI are stored in the database
- Views trades some functionality in order to achieve its streamlined UI

Problem

Views created through the UI are stored in the Database.

Why should you care?

- Backups - File system backups are easier, faster and can provide better recovery point objectives
- Migration - much easier to update files (patches, version control, etc) than databases
- Version Control - who changed a view and why was it changed?
What was changed and when was it changed?
- Speed - views in code save you a database query.

Solution

Move your views into code

- Views Exporter module Chaos Tools Bulk Exporter module
- Create custom modules without writing any code.
- Views Exporter module - Need to add opening `<?php` tag and, for Drupal 7 update info to core = 7.x

Problem

Views trades some functionality in order to achieve its streamlined UI

Limitations fall into two categories

- Display/format issues
- Data issues

Solution

- Use the Views UI field rewrite functionality
- Use templates to rewrite output

Solution

- Take advantage of Views hooks to manipulate data
- Understanding the life of a view

The Life of a View

views_get_view(\$view_name str)

```
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
    $view->display_handler->build()
      hook_views_pre_build(&$view obj)
      hook_views_query_substitutions()
      arguments, filter, sorting, grouping processed and preliminary query built
      hook_views_query_alter(&$view obj, &$query obj)
      $view->display_handler->attach_displays()
      hook_views_post_build(&$view obj)
    hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

views_get_view(\$view_name str)

\$view->execute_display(\$display str, \$args, arr)

\$view->set_display(\$display str)

\$view->pre_execute(\$args arr)

hook_views_pre_view(&\$view obj, &\$display str, &\$args arr)

arguments added to view object

\$view->display_handler->execute()

\$view->display_handler->build()

hook_views_pre_build(&\$view obj)

hook_views_query_substitutions()

arguments, filter, sorting, grouping processed and preliminary query built

hook_views_query_alter(&\$view obj, &\$query obj)

\$view->display_handler->attach_displays()

hook_views_post_build(&\$view obj)

hook_views_pre_execute(&\$view obj)

\$view->display_handler->query->execute()

hook_query_alter(\$query obj)

hook_query_TAG_alter(\$query obj)

views_query_views_alter()

hook_views_post_execute(&\$view obj)

\$view->render()

hook/theme_views_pre_render(&\$view obj)

hook/theme_views_post_render(&\$view obj, &\$output str, &\$cache obj)

The Life of a View

views_get_view(\$view_name str)

\$view->execute_display(\$display str, \$args, arr)

\$view->set_display(\$display str)

\$view->pre_execute(\$args arr)

hook_views_pre_view(&\$view obj, &\$display str, &\$args arr)

arguments added to view object

\$view->display_handler->execute()

\$view->display_handler->build()

hook_views_pre_build(&\$view obj)

hook_views_query_substitutions()

arguments, filter, sorting, grouping processed and preliminary query built

hook_views_query_alter(&\$view obj, &\$query obj)

\$view->display_handler->attach_displays()

hook_views_post_build(&\$view obj)

hook_views_pre_execute(&\$view obj)

\$view->display_handler->query->execute()

hook_query_alter(\$query obj)

hook_query_TAG_alter(\$query obj)

views_query_views_alter()

hook_views_post_execute(&\$view obj)

\$view->render()

hook/theme_views_pre_render(&\$view obj)

hook/theme_views_post_render(&\$view obj, &\$output str, &\$cache obj)

The Life of a View

views_get_view(\$view_name str)

\$view->execute_display(\$display str, \$args, arr)

\$view->set_display(\$display str)

\$view->pre_execute(\$args arr)

hook_views_pre_view(&\$view obj, &\$display str, &\$args arr)

arguments added to view object

\$view->display_handler->execute()

\$view->display_handler->build()

hook_views_pre_build(&\$view obj)

hook_views_query_substitutions()

arguments, filter, sorting, grouping processed and preliminary query built

hook_views_query_alter(&\$view obj, &\$query obj)

\$view->display_handler->attach_displays()

hook_views_post_build(&\$view obj)

hook_views_pre_execute(&\$view obj)

\$view->display_handler->query->execute()

hook_query_alter(\$query obj)

hook_query_TAG_alter(\$query obj)

views_query_views_alter()

hook_views_post_execute(&\$view obj)

\$view->render()

hook/theme_views_pre_render(&\$view obj)

hook/theme_views_post_render(&\$view obj, &\$output str, &\$cache obj)

The Life of a View

```
views_get_view($view_name str)
```

```
$view->execute_display($display str, $args, arr)
```

```
  $view->set_display($display str)
```

```
  $view->pre_execute($args arr)
```

```
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
```

```
  arguments added to view object
```

```
$view->display_handler->execute()
```

```
  $view->display_handler->build()
```

```
    hook_views_pre_build(&$view obj)
```

```
    hook_views_query_substitutions()
```

```
    arguments, filter, sorting, grouping processed and preliminary query built
```

```
    hook_views_query_alter(&$view obj, &$query obj)
```

```
  $view->display_handler->attach_displays()
```

```
    hook_views_post_build(&$view obj)
```

```
  hook_views_pre_execute(&$view obj)
```

```
  $view->display_handler->query->execute()
```

```
    hook_query_alter($query obj)
```

```
    hook_query_TAG_alter($query obj)
```

```
      views_query_views_alter()
```

```
  hook_views_post_execute(&$view obj)
```

```
$view->render()
```

```
  hook/theme_views_pre_render(&$view obj)
```

```
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
```

arguments added to view object

```
$view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
    hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
```

\$view->display_handler->execute()

```
$view->display_handler->build()
  hook_views_pre_build(&$view obj)
  hook_views_query_substitutions()
  arguments, filter, sorting, grouping processed and preliminary query built
  hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
hook_views_pre_execute(&$view obj)
$view->display_handler->query->execute()
  hook_query_alter($query obj)
  hook_query_TAG_alter($query obj)
  views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
    $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
    $view->display_handler->attach_displays()
    hook_views_post_build(&$view obj)
    hook_views_pre_execute(&$view obj)
    $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
    hook_views_post_execute(&$view obj)
  $view->render()
    hook/theme_views_pre_render(&$view obj)
    hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```


The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
    $view->display_handler->attach_displays()
    hook_views_post_build(&$view obj)
    hook_views_pre_execute(&$view obj)
    $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
    hook_views_post_execute(&$view obj)
  $view->render()
    hook/theme_views_pre_render(&$view obj)
    hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
      hook_views_query_substitutions()
      arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
    $view->display_handler->attach_displays()
    hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed
    and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

hook_views_query_alter()

- Views' \$query object is similar to Drupal's \$query object
- Lots of methods, see module to dpm a list or look in `views/plugins/views_plugin_query_default.inc`

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
    $view->display_handler->attach_displays()
    hook_views_post_build(&$view obj)
    hook_views_pre_execute(&$view obj)
    $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
    hook_views_post_execute(&$view obj)
  $view->render()
    hook/theme_views_pre_render(&$view obj)
    hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
    hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```


The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
  hook_query_alter($query obj)
  hook_query_TAG_alter($query obj)
  views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
      hook_query_TAG_alter($query obj)
        views_query_views_alter()
    hook_views_post_execute(&$view obj)
  $view->render()
    hook/theme_views_pre_render(&$view obj)
    hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
```

\$view->render()

```
hook/theme_views_pre_render(&$view obj)
hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str, &$cache obj)
```

The Life of a View

```
views_get_view($view_name str)
$view->execute_display($display str, $args, arr)
  $view->set_display($display str)
  $view->pre_execute($args arr)
    hook_views_pre_view(&$view obj, &$display str, &$args arr)
    arguments added to view object
  $view->display_handler->execute()
  $view->display_handler->build()
    hook_views_pre_build(&$view obj)
    hook_views_query_substitutions()
    arguments, filter, sorting, grouping processed and preliminary query built
    hook_views_query_alter(&$view obj, &$query obj)
  $view->display_handler->attach_displays()
  hook_views_post_build(&$view obj)
  hook_views_pre_execute(&$view obj)
  $view->display_handler->query->execute()
    hook_query_alter($query obj)
    hook_query_TAG_alter($query obj)
    views_query_views_alter()
  hook_views_post_execute(&$view obj)
$view->render()
  hook/theme_views_pre_render(&$view obj)
  hook/theme_views_post_render(&$view obj, &$output str,
&$cache obj)
```


hook_views_post_render()

Questions?

Using Views Programmatically

Jason Yee - Aten Design Group
jason@atendesigngroup.com

Session URL: <http://dccco.us/n/42>

Module: http://bit.ly/views_prog