

RAPTOR System Design Document

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Overview

Each RAPTOR site is associated with one VistA instance and each site has its own base URL. The RAPTOR application is implemented using the Drupal framework and is thus able to run in both Linux and Windows; users interact with it through their browser. A complete RAPTOR setup has all the following parts.

- PHP 5.4
- MySQL 5.6
- DRUPAL 7.x
- RAPTOR Application Software
- VistA Interface (e.g., MDWS or EWD)
- Image viewer handler (e.g., VIX)
- VistA updated with KIDS build

Other Relevant Documents

For additional details on relevant subjects, please review the documents listed in Table 1.

Table 1 – Key RAPTOR Application Configuration Files

| Category | Name | Comment |
|-------------------------------|---|---|
| User Screens | <ul style="list-style-type: none"> • RAPTOR User Manual – Admin.pdf • RAPTOR User Manual – Clinical.pdf | Screenshots of the user interface and how the application is used. |
| RAPTOR VistA RPC Calls | <ul style="list-style-type: none"> • RAPTOR VistA RPC Calls.pdf | Listing of the remote procedure calls that the RAPTOR application makes into VistA using all existing implementations of VistA interaction. <ul style="list-style-type: none"> • MDWS • EWD |
| Database Schema | <ul style="list-style-type: none"> • RAPTOR SQL Schema.pdf | A list of the RAPTOR MySQL database schema at a point in time. |
| SRS to SDD Mapping | <ul style="list-style-type: none"> • RAPTOR SRS to SDD Mapping.pdf | A mapping of the application requirements to the application design. |

Context of RAPTOR

RAPTOR is implemented as Drupal modules with a custom Drupal theme to leverage the extensive content management functionality of the popular open source Drupal framework. The context diagram of Figure 1 illustrates some of the key touch points of RAPTOR.

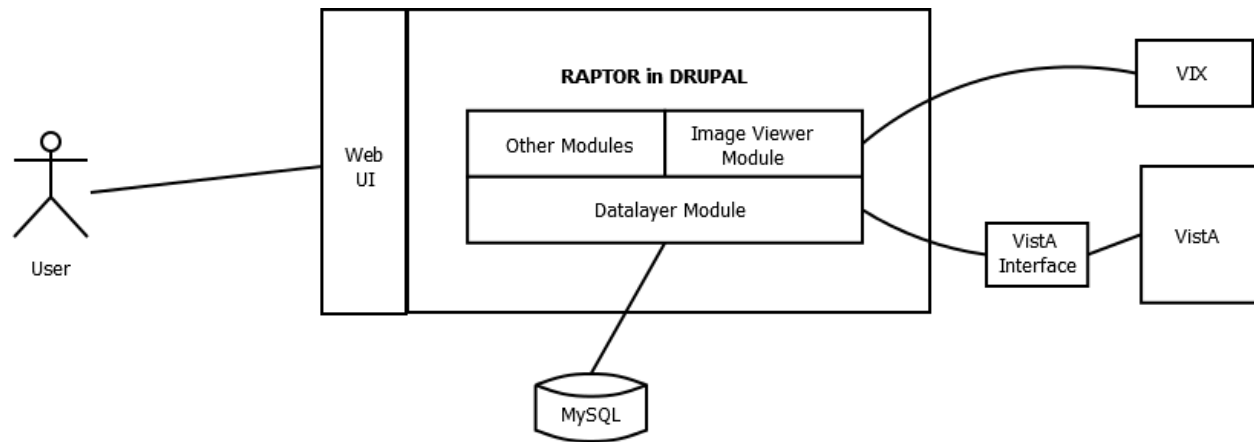


Figure 1 - RAPTOR Context Diagram

The users of RAPTOR interact through a browser interface. The browser interface is served up by Drupal running in either IIS or Apache.

All RAPTOR interactions with VistA are through a RAPTOR datalayer module that can be configured to interface through any number of technologies; currently MDWS, soon also EWD. VistA interfaces, such as MDWS or EWD are separately installed and configured.

Images are served up through an image viewer module that is integrated with the VIX.

A MySQL database is used by the Drupal framework as part of its core runtime operation processes and also for maintenance of the following RAPTOR specific content:

- User account profiles (RAPTOR does NOT store VistA passwords)
- Radiology protocol templates (default protocol details available to users of a site.)
- Contraindication logic
- Workflow content prior to commit into VistA

Electronic Health Record Write-Back

The RAPTOR application, for users with sufficient privilege in VistA, can write back the following information into VistA:

- Write Notes
- Cancel an Order
- Replace an Order

In all cases, VistA controls if a user can or cannot change anything in VistA. RAPTOR does not circumvent those controls.

Module Architecture of RAPTOR

By logging in as a Drupal administrator you can enable/disable the various RAPTOR modules. The RAPTOR application has been engineered to logically group functionality into separately extensible modules.

| STATUS | NAME | VERSION | DESCRIPTION | ACTIONS |
|--------|-------------------------------------|------------|---|----------------|
| ON | RAPTOR Communications Engine | 7.3-0.96 | A module with the communications engine needed by the RAPTOR application. Required by: RAPTOR Glue (enabled), RAPTOR SSO Integration Layer (enabled), RAPTOR NEWS Integration Layer (enabled). | Help Configure |
| ON | RAPTOR Data Layer | 7.3-0.96 | A module with the data layer integration needed by the RAPTOR application. Required by: RAPTOR Glue (enabled), RAPTOR SSO Integration Layer (enabled), RAPTOR Graph Integration (enabled), RAPTOR NEWS Integration Layer (enabled), RAPTOR Protocol Library Integration (enabled). | Help Configure |
| ON | RAPTOR SSO Integration Layer | 7.3-0.96 | A module that integrates RAPTOR with Vista data sources by utilizing SSO. Requires: RAPTOR Data Layer (enabled), RAPTOR Glue (enabled), RAPTOR CommandEngine Engine (enabled), RAPTOR Image Viewer Integration (enabled), RAPTOR Scheduling Integration (enabled), RAPTOR Workflow (enabled), RAPTOR Formula (enabled). | Help Configure |
| ON | RAPTOR Floating Disk Integration | 7.3-0.1-88 | A module with the floating disk backup logic. | Help |
| ON | RAPTOR Formula | 7.3-0.96 | A module with formulas and inference logic used by the RAPTOR application. Required by: RAPTOR Glue (enabled), RAPTOR SSO Integration Layer (enabled), RAPTOR Graph Integration (enabled), RAPTOR NEWS Integration Layer (enabled). | Help |
| ON | RAPTOR Glue | 7.3-0.96 | Integrates all the other RAPTOR modules into one application. Requires: RAPTOR Communications Engine (enabled), RAPTOR Data Layer (enabled), RAPTOR Image Viewer Integration (enabled), RAPTOR Scheduling Integration (enabled), RAPTOR Workflow (enabled), RAPTOR Formula (enabled). Required by: RAPTOR SSO Integration Layer (enabled), RAPTOR NEWS Integration Layer (enabled). | Help Configure |
| ON | RAPTOR Graph Integration | 7.3-0.96 | A module with the graph integration needed by the RAPTOR application. Requires: RAPTOR Data Layer (enabled), RAPTOR Formula (enabled). | Help |
| ON | RAPTOR Image Viewer Integration | 7.3-0.1-88 | A module with the image viewer integration needed by the RAPTOR application. Required by: RAPTOR Glue (enabled), RAPTOR SSO Integration Layer (enabled), RAPTOR NEWS Integration Layer (enabled). | Help |
| ON | RAPTOR NEWS Integration Layer | 7.3-0.96 | A module that integrates RAPTOR with Vista data sources by utilizing NEWS. Requires: RAPTOR Data Layer (enabled), RAPTOR Formula (enabled), RAPTOR Glue (enabled), RAPTOR Communications Engine (enabled), RAPTOR Image Viewer Integration (enabled), RAPTOR Scheduling Integration (enabled), RAPTOR Workflow (enabled). | Help Configure |
| ON | RAPTOR Protocol Library Integration | 7.3-0.01 | A module with the support for scanned protocol images. Requires: RAPTOR Data Layer (enabled). | Help Configure |
| ON | RAPTOR Reports | 7.3-0.96 | The reports module of the RAPTOR application. | Help |
| ON | RAPTOR Scheduling Integration | 7.3-0.1-88 | A module with the scheduling integration needed by the RAPTOR application. Required by: RAPTOR Glue (enabled), RAPTOR SSO Integration Layer (enabled), RAPTOR NEWS Integration Layer (enabled). | Help |
| ON | RAPTOR Workflow | 7.3-0.96 | A module with the workflow logic needed by the RAPTOR application. Required by: RAPTOR Glue (enabled), RAPTOR SSO Integration Layer (enabled), RAPTOR NEWS Integration Layer (enabled). | Help |

Figure 2 - RAPTOR modules as shown to admin user

The RAPTOR application is highly configurable by a privileged administrator at setup time. The key module for configuration of the RAPTOR application is Raptor Glue. It contains the configuration files described in Table 2.

Table 2 – Key RAPTOR Application Configuration Files

| Category | Name | Comment |
|-----------------------------------|-------------------|--|
| Main Configuration File | config.php | This is the main configuration file for RAPTOR which in turn loads all other configuration files needed. |
| | | Edit this file to load your site specific RSite*.inc file. |
| Server Instance Specific Settings | RSite*.inc | Contains site specific settings unique to the hardware and software configuration of the box on which it is running. If such a file does not already exist for your Vista site, copy the file for RSite500 and give it a name using your Vista site ID. Edit the contents of the file to fit your server configuration details and then update config.php to load it. |
| General Settings | GeneralDefs.inc | General values for site customization. |
| Workflow Settings | WorkflowDefs.inc | Customize workflow behavior of RAPTOR for a site |
| Vista Settings | VistaDefs.inc | Key connection details between RAPTOR and Vista |
| Time Settings | TimeDefs.inc | Contains settings for timeouts |
| Measurements | UOMDefs.inc | Declares default units of measure for the site. |
| Internal | InternalDefs.inc | These application settings should not be edited and customized. |
| Errors | ErrorCodeDefs.inc | Declaration of some key error codes. In general, do not edit this file. |

| Category | Name | Comment |
|----------|------------------------------|--|
| User QA | QualityAssuranceD efs.inc | Declaration of quality assurance labels for reports and user interfaces. |

Theme Architecture of RAPTOR

The Drupal best practice is to encode user interface elements into a theme rather than directly into the modules. For RAPTOR, we have sub-classed the popular Omega theme to create the RAPTOR Omega theme.

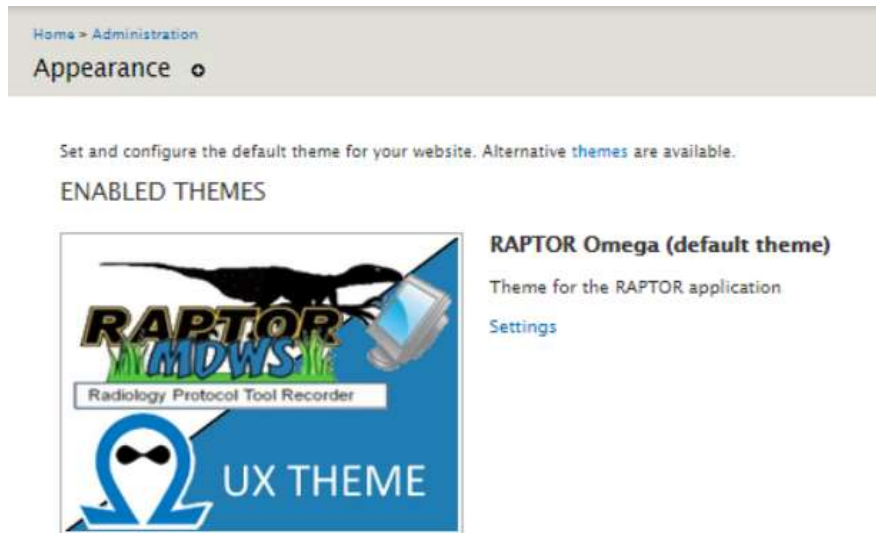


Figure 3 - RAPTOR theme as shown to admin user

RAPTOR Database

The RAPTOR database is the same database used by your Drupal site. When you install the RAPTOR modules into your Drupal site, the RAPTOR tables will be created and initialized with demo data. All the RAPTOR specific tables follow the naming convention of **raptor_***.

A default raptor site includes an administrator account with the following credentials:

- Login name: *admin*
- Default password: *apass*

User Account Management Scheme

RAPTOR site administration accounts, such as the demo “admin” account, do NOT have any Vista privileges. They do however have Drupal administration privileges and can thus be used to tune the Drupal configuration and perform Drupal administrative functions in addition to RAPTOR specific administrator functions. RAPTOR specific administration functions include adding/deleting users from the RAPTOR system.

A VistA privileged account is created in RAPTOR such that the username in raptor for that account matches the VistA access name for the account. The VistA password IS NEVER stored in the RAPTOR user profile.

NOTE: All interactions with VistA are done by the user using their VistA credentials; not a RAPTOR application credential.

The RAPTOR user profiles are stored in the MySQL database.

Table 3 – Key Accounts for Operation

| Context | Description |
|------------------------------|---|
| OS Privileged Account | You will need a “sudo” account to if installing into Linux or an “Administrator” account if installation into Windows. |
| RAPTOR site admin | This account is a Drupal administrator and has no access to VistA. The default demo admin account is called “admin”. This is NOT a VistA account. |
| RAPTOR user | You will need a standard user account to test the installation. This account must have the same name as a valid VistA access string. The verify code is NOT stored in RAPTOR. |
| MySQL root | This account has root access to the MySQL database server |
| MySQL RAPTOR user | This account only has RAPTOR database access. |

Revision History

| When | Who | What |
|-----------------|------------|---|
| 20150817 | Frank Font | Updated for upload to repository |
| 20150917 | Frank Font | Updates with VA during collaboration session. |
| 20150928 | Frank Font | Filename update |