

Release Notes for Prism Version 1.4-6

Ira Kalet and Bob Giansiracusa

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These release notes apply to Prism version 1.4-6 as of the date listed above.

1 Changes and additions - Prism

Several minor changes and additions are included in this version.

1. Display Prism version number on Patient Panel: The Prism version number is written out to the terminal window in which Prism was started, and it is also used as the information for the titlebar of the Prism patient frame.
2. Parametrize couch limits: the couch longitudinal and lateral motion limits are specified by global parameters, `*couch-long-lower*`, `*couch-long-upper*`, `*couch-lat-lower*`, `*couch-lat-upper*`, instead of being hard coded.
3. Checkpoint directory selection by menu: instead of a textline in which to fill in the pathname of the checkpoint directory, a menu of available options is provided. There are at least two options, one of which is the user's own checkpoint directory (defined by the global variable `*local-database*`), and the other is a shared checkpoint directory, accessible by all Prism users (defined by the global variable `*shared-database*`). Additional selections can be configured by setting the global variable `*other-databases*` in either `prism.config` or `.prismrc`.
4. Remove IRREG facility.

2 Changes and additions - PDS (Prism DICOM Server)

1. Formerly PDS required images to be labelled as type AXIAL, ORIGINAL, and PRIMARY. Any image labelled with all three of these descriptors is stored without any special logging message; this is the usual type of image we receive.
GE "Scout-view" images are labelled as type LOCALIZER. Reception of a LOCALIZER image is written to the log file but the image itself is not stored.
Formerly, any image labelled with any *other* combination of descriptors was rejected (not stored, but with a message to the log file). In the current version, all such images *are* stored, but the transaction is logged to notify the user that the image may be non-standard.
2. The server maintains (and writes to the log file) both a count of images stored in each individual image set and a cumulative count of images stored in the full association.

3 Changes and additions - PDR (Prism DICOM Client)

1. PDR now supports mixed-energy IMRT beams; that is, the energy to be used for each segment of a multi-segmented beam need not be the same. In the DICOM panel, PDR still checks that all segments of a beam come from the same machine (eg, SL20A) but one segment can use the SL20A at 6MV while another uses it at 18MV. The check for machine identity is via information stored in the machine definition data file for the machine being used. In particular, it is the first element in the list which is the value of the IDENT slot in the MACHINE object). This element is a symbolic generic name for the machine, such as SLA, which does *not* encode the energy.

When adding a new segment, if the energy differs from that used in previous segments, the choice is allowed but an `acknowledge` box warns the user (this is just a warning that a legal but possibly erroneous choice has been made).

2. PDR formerly transmitted MU values to the Elekta server as integers. To obtain greater accuracy, it now transmits them as decimal numbers. As a result, fractional MU values may show up on the Elekta chart printout.

4 Error corrections

1. The beam description text box on the beam panel allowed the user to press ENTER and get more than three lines of text, which caused a misalignment of data in the chart printout. This has been fixed by correcting an error in the coding of the textbox. It is no longer possible to enter more than three lines of text in this location.
2. An error in the handling of data tables in the machine definition files was discovered. If the increment in input data values for the tables was too small, an internal data structure could be generated such that a particular (rare but possible) combination of operating parameters (field sizes and dose point locations) could cause Prism to stop the calculation and abort into the Lisp debugger (error handler). This situation arose several times when testing the new CNTS data. This error has been fixed.
3. An error in the brachytherapy dose display subpanel has been fixed. It was possible to bring up this panel with no brachytherapy sources present, and cause the Prism program to go into a break loop, because the dose display did not check if there were any sources to compute before operating on the (possibly empty) source list. This check has been added, so that the program handles this case by just leaving the display blank and continuing to process user input.

5 Files changed, added or deleted

In addition to the files below, we are now switching to the current version of `defsystem.cl`, and a new version of `config.cl`. The new versions are available for copying in `/radonc/prism/`.

5.1 In systemdefs

5.1.1 Changed files

- `prism.system` - Removed entries for IRREG files.

- `dicom-client.system` - Removed the `di` nickname for the `dicom` package declaration (since it conflicts with a package name in CMU Lisp). All `di:` package prefixes changed to `dicom:` instead.
- `dicom-common.system`

1. A new global configuration variable was added: `*ignorable-groups-list*`. The value is a list (possibly-empty) of number pairs, each representing a range of group numbers to ignore. An empty list means to ignore no ranges; that is, all data types must be defined in the data dictionary (the file `dictionary.cl`) or else a message is printed to the log file and the association will be aborted. If non-empty, each value in the list represents a range to ignore, encoded as a pair of numbers where the first is an inclusive lower bound and the second is an exclusive upper bound. For example, the value

```
(( #x5000 . #x5100 ) ( #x6000 . #x6100 ))
```

means that the 50xx and 60xx group number ranges will be logged but otherwise ignored. More precisely, they will be treated exactly as private elements (decoded as uninterpreted strings by the object parser and dumped when the logging level is sufficiently high but otherwise not passed through for further processing).

This mechanism was introduced because some clients generate private data using slots with group numbers which are not listed in our data dictionary. Without this mechanism, PDS would abort the association (and enter an error breakloop) on decoding unrecognized slot descriptors.

2. Removed the `di` nickname for the `dicom` package declaration. All `di:` package prefixes are changed to `dicom:` instead.

- `dicom-server.system`

1. Removed the `di` nickname for the `dicom` package declaration. All `di:` package prefixes changed to `dicom:` instead.
2. Added new variables to allow image counts per-image-set and cumulatively over the entire association. The former single `*stored-image-count*` is divided into two new variables, `*stored-image-count-per-set*` and `*stored-image-count-cumulative*`.

5.1.2 New files

None

5.1.3 Deleted files

None

5.2 SLIK subsystem

There was a circular dependency between `gl-support.cl` and `clx-support.cl`, which was resolved by moving the `initialize` function to a separate (new) file. This file depends on `clx-support.cl`, and `gl-support.cl` also depends on `clx-support.cl`, but `clx-support.cl` no longer depends on `gl-support.cl`.

5.2.1 Changed files

- `slik.cl` - Put CLX nickname form from `config.cl` here instead, and added in-package form.
- `clx-support.cl` - moved `initialize` to separate file, along with some functions it calls.
- `gl-support.cl` - moved `load-gl` to new file, `initialize.cl`
- `dialogboxes.cl` - Added a default selection input to `popup-menu`.
- `textboxes.cl` - Corrected an error in coding of `insert-line`.

5.2.2 New files

- `initialize.cl` - contains `initialize` function and its subsidiaries that are only called by it.

5.2.3 Deleted files

None

5.3 Polygons subsystem

5.3.1 Changed files

None

5.3.2 New files

None

5.3.3 Deleted files

None

5.4 DICOM subsystem

5.4.1 Changed files

- `prism-output.cl` - PDS formerly rejected (logged but did not store) all images unless labelled as type `AXIAL`, `ORIGINAL`, and `PRIMARY`. Now PDS rejects only images whose type descriptors (in the DICOM header slot `0008:0008`) include the term `LOCALIZER`. All other combinations of image types *are* stored, but the transaction is logged to notify the user that the image may be non-standard.
- `object-generator.cl` - Rounding of decimal values (which was to 2 decimal places) is now to 4 decimal places.

- `wrapper-server.cl`

1. The server maintains (and writes to the log file) both a per-image-set count of images stored and a cumulative count of images stored over the full association. The former single variable `*stored-image-count*` is now two new ones, `*stored-image-count-per-set*` and `*stored-image-count-cumulative*`.
2. Indentation and column-width changed for improved readability.

5.4.2 New files

None

5.4.3 Deleted files

None

5.5 Prism subsystem

5.5.1 Changed files

- `patient-panels.cl` - Made checkpoint and retrieve from checkpoint directory a popup menu selection instead of a textline and add access to shared checkpoint directory as well as configurable choice of others. Also removed IRREG button and IRREG support.
- `patdb-panels.cl` - Provided for selection of shared checkpoint directory for deletion operations as well as local. Also removed IRREG support.
- `prism-globals.cl` - Add new globals for shared checkpoint directory and list of other checkpoint directories for checkpoint and retrieve.
- `beam-panels.cl` - Using parameters for couch longitudinal limits on slider instead of hard-coded values.
- `charts.cl` - Removed IRREG chart code.
- `prism-db.cl` - Removed IRREG-related code.
- `dicom-panel.cl` - The constraint that machine names must match when adding a segment to an IMRT beam is changed. Formerly, the Prism machine name (ie, `SL20A-6MV-MLC`) was used, which prevented the use of mixed-energy beams (since both `SL20A-6MV-MLC` and `SL20A-18MV-MLC` might be used for different segments in the same Dicom beam). The constraint tested now is the matching of the first element in the list which is the value of the `IDENT` slot in a `MACHINE` object. This element is a symbolic generic name for the machine, such as `SLA`, which does *not* encode the energy. When adding a new segment, if the energy differs from that used in previous segments, an `acknowledge` box warns the user but the choice is allowed.
- `table-lookups.cl`
 1. Clarified array types.

2. Moved function `build-mapper` from `table-lookups.cl` to `therapy-machines.cl` (to simplify dependencies), and changed its name from `build-mapper` to the more descriptive `interpolate-mapper`.
3. Removed obsolete version number in change log header.

- `therapy-machines.cl`

1. Removed all IRREG-related slots, including `psf-table-vector`, `psf-radius-mapper`, `psf-radii`, `psf-table`, `oaf-table-vector`, `oaf-radius-mapper`, `oaf-radii`, and `oaf-table`.
2. Fixed fencepost error in `interpolate-mapper` function. On resizing a too-large-array, a rare boundary condition could result in a narrow data bin being overwritten by the adjacent data bin. The fix was to remove the resizing operation and to let bin size be determined solely by the data being mapped.
3. Also in the function `interpolate-mapper`, the scale-factor for rounding was changed from $1.0e4$ to $1.0e3$. Too large a value causes over-large array allocation. The value $1.0e3$ still allows the mapper to work with tables measured to 1/1000 of a centimeter (or 1/100 of a millimeter).
4. Removed obsolete version number in change log header.

- `dicom-rtplan.cl`

1. The “Beam Energy” parameter is transmitted at all control points so that it can vary from segment to segment. Repeating a data value is legal according to the DICOM standard (it is *optional* if the value remains fixed but is *required* if the value varies from segment to segment).
2. To improve the accuracy of MU and dose-monitoring-point dose values (to obtain a better match between the values transmitted from Prism and those recorded by the Elekta server and displayed on its printed chart), several changes were made:
 - (a) Added a slot 300A:00B3 to Beams Module (“Primary Dosimeter Unit”, with value “MU”).
 - (b) Converted slot 300A:0086 “Beam Meterset” value from integer to decimal (allowing fractional values to 4 places).
 - (c) Converted slot 300A:010E “Final Cumulative Meterset Weight” value from integer to decimal (allowing fractional values to 4 places).
 - (d) Converted slot 300A:0134 “Cumulative Meterset Weight” value from integer to decimal (allowing fractional values to 4 places).
3. Removed the `di` nickname for the `dicom` package. All `di:` package prefixes changed to `dicom:` instead.
4. The function `send-dicom` prints `mach-name`, `mach-id`, and `mach-ident` to the background window with double-quotes around strings so that they are more easily readable.

- `dose-info.cl`

1. Removed all IRREG-related slots in `photon-dose-info` object definition. These include:
 - `source-diameter`,
 - `collimator-constant`,
 - `collimator-transmission`,

- source-tray-distance,
 - psf-table-vector,
 - psf-radius-mapper,
 - psf-radii,
 - psf-table,
 - oaf-table-vector,
 - oaf-radius-mapper,
 - oaf-radii, and
 - oaf-table.
- 2. Removed obsolete version number in change log header.
- output-factors.cl
 1. Added more explicit declarations.
 2. Removed obsolete version number in change log header.
- imrt-segments.cl - Clarified comments about constraints on segment parameters.
- dose-grids.cl - Removed obsolete version number in change log header.
- file-functions.cl
 1. Indentation and column-width changed for improved readability.
 2. Removed obsolete version number in change log header.
- import-structure-sets.cl - Added more explicit declarations.
- room-view-graphics.cl - in function make-top-and-bottom added declaration to ignore unused variable tobj.
- beam-dose.cl
 1. Added more explicit declarations.
 2. Removed obsolete version number in change log header.
- clipper.cl
 1. Added more explicit declarations.
 2. Removed obsolete version number in change log header.
- dosecomp.cl - Removed obsolete version number in change log header.
- pathlength.cl
 1. Added more explicit declarations.
 2. Removed obsolete version number in change log header.
- quadtree.cl
 1. Added more explicit declarations.
 2. Removed obsolete version number in change log header.
- brachy-dose-panels.cl - check for empty source list in brachy-dose-refresh function.

5.5.2 New files

None

5.5.3 Deleted files

Removed all support for IRREG

- `irreg.cl`
- `irreg-dose.cl`
- `irreg-panels.cl`
- `irreg-point-panels.cl`

5.6 Configuration files

5.6.1 Changed files

- `prism.config` - Removed the `di` nickname for the `dicom` package. All `di:` package prefixes are changed to `dicom:` instead.

5.6.2 New files

None

5.6.3 Deleted files

None