

EXERCISE 5 – ESAPI FOR RESEARCH USERS

Developer Workshop 2.0 – Austin, Texas – July 18th, 2014

Disclaimers

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Sign in to Virtual Eclipse Environment

- Before we start, sign in with your assigned userid/pwd to your assigned Eclipse Client.
- TBD

Exercise 5 Learning Goals

We will:

- 1) Learn how to get started scripting with ESAPI for Research Users.
- 2) Walk through an automated planning script to learn the breadth of features.

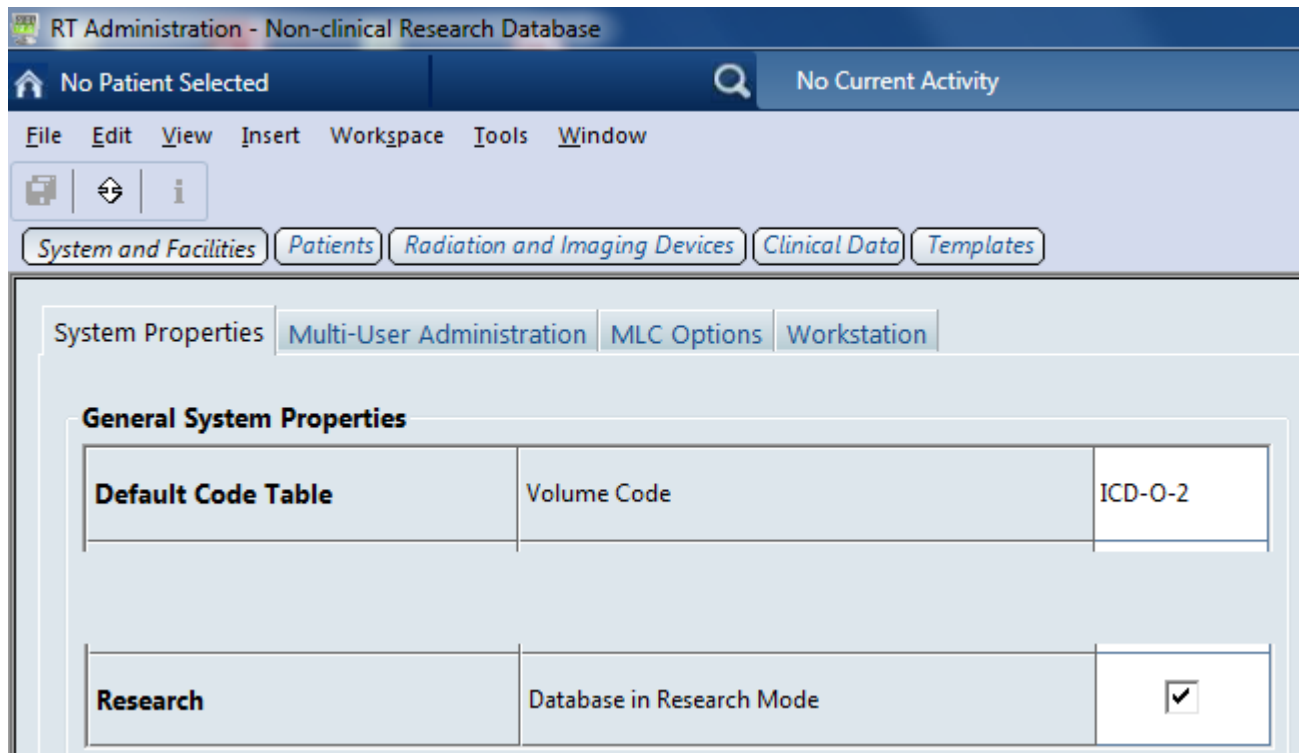
New in v13: ESAPI for Research Users

- New features available for Research Users on Research System.
 - Requires a non-clinical Eclipse Box and special license.
- PdM (me) distributes the Reference Guide and Online Help.

ESAPI for Research : Research System

- New features require separate v13 Aria database installed and configured for non-clinical research use.
 - Database is flagged as 'Research' by Varian service at time of install.
 - Not possible to set plans to "Treatment Approved".
 - Plans get additional 'research' indication when exported via DICOM.

ESAPI for Research : Research System



ESAPI Research Features : Plans

Write access to plans:

- Add/modify courses, plans, beams
- Add/modify optimization objectives and fluences
- Script the optimization engine.
- Execute LMC.
- Start dose calculations.

ESAPI Research Features : Structures

Write access to structures:

- Add structures, modify contours
- Execute boolean operators and margin
 - AND, OR, XOR, NOT
 - Margin (double margin)

What's New in v13.5 – Research?

- Script the New Photon Optimizer.
 - gEUD, mean dose objectives.
 - VMAT optimization now available on ESAPI.
- New method
ExternalPlanSetup.CalculateDVHEstimates

```
public CalculationResult CalculateDVHEstimates(  
    string modelId,  
    Dictionary<string, DoseValue> targetDoseLevels,  
    Dictionary<string, string> structureMatches  
)
```

Exercise 5 – Plugin Script – Step 1

- 1) Navigate to Eclipse External Beam.
- 2) ESAPI for Research Users Help.
- 3) Run Eclipse Script Wizard.
- 4) Create a Single-file plugin script and name it “Superplan”,
- 5) Open project in Visual Studio.
- 6) Open file “Superplan.cs”.

Exercise 5 – Step 2

- 1) Back to Eclipse External Beam.
- 2) Create new patient with last name = **Exercise5**,
First name = your last name (e.g. Keranen)
ID1 = unique so it will not clash with others in room (e.g. wkeranen86).
- 3) Open your new patient in Eclipse.

Exercise 5 – Step 3

- 1) Use DICOM Import Wizard to read in your assigned CT + StructureSet data from

C:\temp\data\exercise5

Exercise 5 – Step 4

- 1) In Visual Studio, select inside code of Execute method, right click to select menu item “Insert Snippet...”, then double click “dw -> exercise5 -> Step 4”.

Exercise 5 – Step 5

- 1) In Eclipse, run the Superplan.cs script.
- 2) Open the plan to view results.
- 3) Calculate Dose.

Exercise 5 – Step 6

- 1) In Visual Studio, select the final } of the Execute method, then:
“Insert Snippet...”, then double click “dw
-> exercise5 -> Step 6”.

Exercise 5 – Step 7

- 1) In Eclipse, run the Superplan.cs script.
- 2) Open the plan to view dose calculation results.

Exercise 5 – Step 8

- 1) In Visual Studio, put cursor above the “`// calculate final dose`” line, then

Right click, “Insert Snippet...”, then double click “dw -> exercise5 -> Step 8”.

Exercise 5 – Step 9

- 1) In Eclipse, run the Superplan.cs script.
- 2) Open the plan to view final results.

Exercise 5 – Step 10

- 1) Use plan evaluation
- 2) compare conformal vs non-conformal.

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