

SCALING OF EPICS EDM DISPLAY PAGES AT ISAC

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Abstract

The EPICS-based control system of the ISAC facility at TRIUMF uses the edm display editor / display manager to create and render the Operator interface displays. edm displays are expressed in pixel coordinates and edm does not scale the display page when a window is re-sized. A simple scheme was implemented to allow operators to switch page magnifications using a set of pre-selected scaling factors. Possible extensions of the scheme and its limitations will be discussed.

INTRODUCTION

The control system for the ISAC radioactive beam facility at TRIUMF is based on the EPICS toolkit. The operator displays were initially (1996) designed and rendered using the edd/dm display editor / manager combination. In 2005, all operator displays were converted [1][2] to use the extensible display editor / manager edm [3], both because edd/dm was not maintained any more and because edm provides superior functionality. Both edd/dm and edm store display information in "display list" files, in binary format for edd/dm and ASCII format for edm.

The conversion was performed by using the edd/dm export facility to generate ASCII meta-files which were then translated to edm-compatible format using a basic Perl translator script and a set of Perl filter scripts for incremental clean-up.

THE PROBLEM

One shortcoming of edm compared to edd/dm is the fact that re-sizing a display window does not scale window content, i.e. the pixel sizes of the graphics widgets remain constant. Over the years this caused increasing problems when the ISAC control room

consoles switched from the original CRT monitors to larger flat panel displays. Although the flat panels are larger in size than the CRT monitors, the pixel size is smaller due to the higher screen resolution. The difference is not big but noticeable and the controls group started to receive complaints about some screens being difficult to view.

THE SOLUTION

A simple solution was implemented to allow operators to view display pages with different magnifications.

Scaling the Display

A Perl tool edlMagnify was developed which creates scaled versions of the original edm display list (edl) file. The file name of the scaled file includes the scale factor for identification purposes. Scaling of the location, with and height of widgets is straightforward.

For all related display call-up widgets and embedded display widgets the target file names are modified to use the edl file versions with the same scale factor as the calling display.

A fixed set of scale factors is defined by the script. After some experimentation the scale factors 100%, 115%, 130%, 150% were chosen for the production system.

Magnification Button

Selected display pages - essentially the the main menu screen and all "top-level" displays of the display hierarchy which follow a certain naming convention - allow switching to a different scale factor. In the top left corner of these display pages edlMagnify inserts a "magnification button", which allows starting any of the scaled versions of this display page (see Fig. 1). This button exploits an edm feature which allows closing of the current page when a related display is called up.

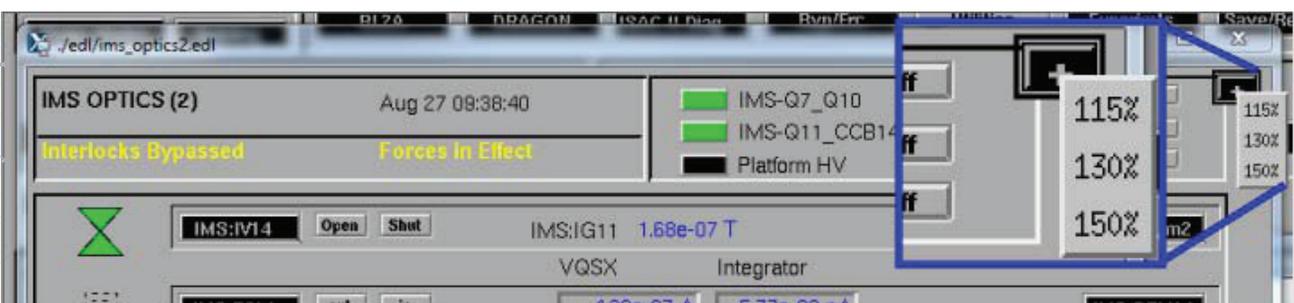


Figure 1: The magnification button on a top-level page.

This means when a new scale factor is chosen, the currently displayed page closes and its scaled copy opens. Any other display pages on the operator screen are not affected by this scale change.

Deployment

At ISAC display page files are - like any other control system files - moved from the development environment to the production environment by a tool which keeps a record of the move in a relational database for quality management purposes. This tool was enhanced to automatically invoke the edlMagnify tool before edl files are moved.

Problems and Limitations

The only problem encountered is caused by the fact that edm does not allow user-selectable fonts for the drop down menus on related display and script callup widgets. As a consequence, these drop-down menus do not follow the scaling scheme. This was deemed to be no problem by the operations group.

The addition of several scaled copies per display page increases, of course, the disk space requirements of the control system. Presently the edl pages use less than 1 GB of disk space and can be easily managed.

In principle it should be possible to use the edm filter mechanism to generate scaled displays "on-the-fly" without using extra disk space. This option has not yet been pursued because of resource limitations.

For the display page designer the scaling scheme demands an extra level of diligence as minor flaws on a page get much more visible when magnified.

SUMMARY

The magnification scheme has been enthusiastically embraced by the ISAC operators. It has been in production for more than seven months.

REFERENCES

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- [3] J. Sinclair, <http://ics-web.sns.ornl.gov/edm/>