RADAR 2.0
A drag and drop, cross platform control system design software

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In the ever-growing control system at CERN, there is a need for having an easy to use, yet fast and flexible tool that interfaces with all the different middleware and communication interfaces in the accelerator, experiments and technical infrastructures.

With RADAR 2.0 we wanted to address this issue, making a LabVIEW based, drag and drop visual tool that hides much of the system complexity from the user and within seconds gives the operator a ready to use, fully functional implementation. With its class based implementation it can easily be extended to other data sources (Files, Databases, middleware) on demand. This paper reports how the control system GUI, RADAR 2.0 interfaces with the CERN Middleware (CMW), the CERN Accelerator and Logging underlying technology and an outlook to other possible applications.

RADAR 2.0 application
- Rapid Application Development Environment in LabVIEW
- Interfaces to any CERN infrastructure
- 2 layer implementation reducing client complexity
- Extends Java, C++ and 3rd party libraries to LabVIEW
- OPC-UA and DIM. With its class based implementation it can easily be extended to other data sources (Files, Databases, middleware)

UNICOS in LabVIEW
- Light alternative to UNICOS
- Connecting to PLCs via OPC-UA
- Schneider and Siemens PLCs
- MongoDB and Oracle Database archiving

Development Architecture
- The RADAR 2.0 development relies heavily on LabVIEW scripting
- Uses pre-defined templates
- Re-uses user defined interfaces
- Standard notions such as save, close, undo, redo, add, copy and duplicate
- Local or database storage of designs
- Realtime backend synchronisation

SOFTWARE ARCHITECTURE

RADAR 2.0
- Made to connect with DASIS
- Extended to any CMW based device
- First version made with LabVIEW 8.0
- Added CMW and DASIS communication to RADAR 2.0

Runtime Architecture
- Cross platform
- Linux from local disk or user database
- Plugin based architecture
- Autor Framework
- Extensible communication classes
- Standard log format (TDMS, HDF)
- Re-use of data and data subscriptions across applications
- Redis

USER INTERFACE

User Databases
- Add CERN Timing support
- Increase catalogue
- Add other communication protocols
- Retrofit user widgets
- Add Alarm and remote error logging
- Set up as a PaaS service
- Support 3D graphs
- Extend to web panels
- Extend to mobile platforms

Scripted Code Generation
Drag and Drop Selection

SUCCESSFULLY DEPLOYED IN THE CERN CONTROL CENTRE
- Drag and drop working in all environments
- 10 minutes to create fully functional data viewer
- Proof of concept done, moving on to field trials
- Support hundreds of simultaneous parallel connections
- Interface with any equipment (which is exposed) in the accelerator domain
- Extendable through plugin based classes
- Compatible with any middleware
- Automatically updated through RAVE installer

and FUTURE

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