Synoptic GUIs in NSRC SOLARIS for Beamlines and Accelerators Visualization and Control

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SCADA systems play very important role in control systems
What should synoptic do?

- Show control system clearly.
- Be reliable and stable.
- Show exactly what we need to see.
- And it should be intuitive.
- Or even allow to interact with devices and control them in easy way.
First there was a simple panel to control a beamline...

(actually there were few of them for one BL)
...and a simple panel to watch interlocks (with many, many tabs)
Conclusion was simple: we need synoptics
So we tried JDraw
And after some time we got
But then MAX IV came with help
With svgsynoptic we created this:
But that wasn’t enough

• It’s too small.
• Elements are too archaic.
• We need more stuff there (like buttons, indicators etc).
We have improved
And created more of them
It was quite simple
And fast

PHELIX beamline frontend
They have some nice functions

Moving and zooming to sections

Opening Device Widgets (Taurus Device Panels)
They have some nice functions

Hiding some layers
They have some nice functions

Zoom levels
We added more through our common library (some function based on MAX IV code)

Specific commands for classes
We added more through our common library

Opening panels for sets of attributes
We added more through our common library

Run specific command for device
We can also

Open different applications
Unfortunately, it can’t be too easy

• Every scientist wants different functions.
• And different symbols.
• And different colours.
• And panels similar with other applications
Like this
And for the scientists the role model was
MAX IV’s Bloch beamline
We decided with scientists and technical department to set standard for

- colours,
- basic functions,
- mouse actions,
- main panels and view schemes
- similarities between other applications,
- symbols and elements also used in technical drawings.

It’s all for users and scientists, so they can be more familiar, especially if they will work on many beamlines. In addition, it allows technical department to use them easily.
And we end up with this
New beamline in new standard (under construction)
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What are we using?
Tools

- svgsynoptic2,
- Taurus,
- TANGO controls,
- facadedevice (very useful for creating high level devices used for better views),
- some basic javascript,
- Inkscape.
Inkscape workflow (symbols)
Bonus synoptic
What happened to this?
We created this panel (there are only water interlocks)
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We created this panel (there are only water interlocks)
After adding additional elements

Machine interlocks (partial)
We also have this LINAC
And this is our try to replace it
Conclusion

• Now we can quickly create clear synoptics.
• And create more of them.
• Allowing scientists and operators to react quickly.
• And control the accelerators and the beamlines directly.
• It’s very helpful to meet with users and decide on standards and vision we want to follow.
It is still a lot to do
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• We still need to visualize entire system and its subsystems.
• We should allow to directly modify values, not through popup widgets.
• Adding animation would improve visibility.
• Scientists want to have more control and more things on their synoptics.
• Display synoptics in web browser (MAX IV is close)