

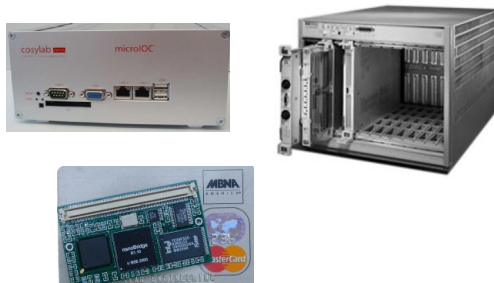
User Interfaces

Kay Kasemir
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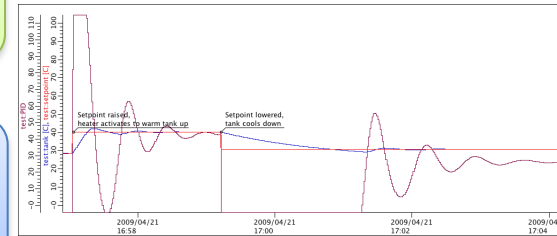
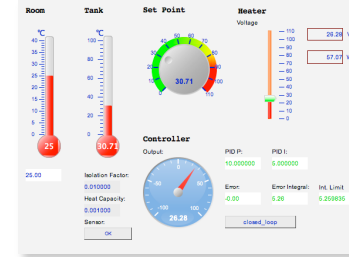
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EPICS: Distributed System

Servers



Clients



“Program”

Tcl/tk, Matlab, Delphy,
Visual Basic, Python/Qt, ...
and CA client library

- You can program sophisticated displays
- Nobody else will understand and maintain your code
- In 5..10 years, you have to re-implement it

vs. “Display Manager”

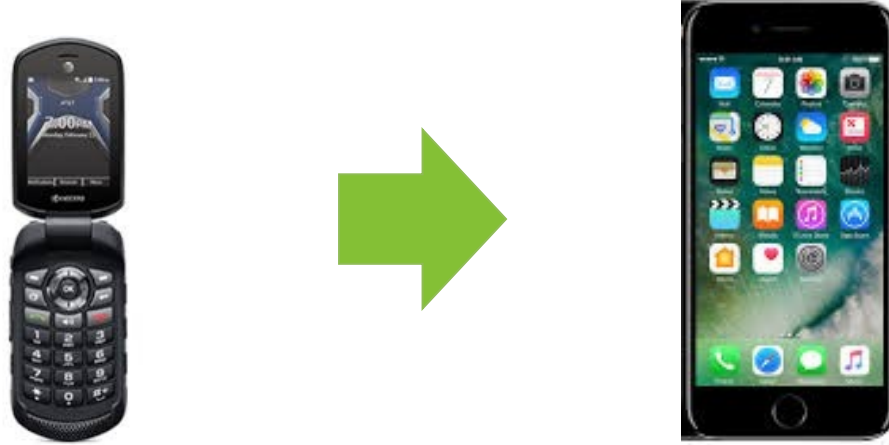
Edd/dm, medm, dm2k,
edm, CS-Studio *.opi, CS-
Studio *.bob

- Use provided Widgets
 - ‘Label’, ‘Text Update’, ...
- Operators can easily tweak your displays or create new ones
- In 5..10 years, there is hope for translating displays to a new tool

Over the years



What changes, what doesn't?



- ✓ Basic dial-by-number
- ✓ Import “Contacts”, Name & Number
- Custom ring tones, icons, .. in “Contacts”
- Speed dial
- Apps

Over the years



Since ~1990:

```
record(ai, "my_record")
{
    field(DTYP, "MyDevice")
    field(INP , "@channel2")
    field(SCAN, "1 second")
    ...
}
```

More supported platforms:
vxWorks, RTEMS, Linux, OS X, Windows, ..
68000, Intel, PPC, Arm, ..

1. edd/dm 198x
2. medm 199x
3. edm 200x
4. CS-Studio 201x
2009: BOY
2017: Display Builder
2019: Web Runtime

Also:
tcl/tk/ca,
python/qt/ca, ..

Limited compatibility.

Limited Compatibility

MEDM

```
Text
{
  object
  {
    x= 265
    y= 440
    width=155
    height=20
  }
  "basic attribute"
  {
    clr=54
  }
  textix="Hello"
}
```

EDM

```
object activeXTextClass
beginObjectProperties
x 265
y 440
w 155
h 20
font "arial-bold-r-10.0"
fgColor index 5
value {
  "Hello"
}
endObjectProperties
```

Qt Designer

```
<widget class="caLabel" name="caLabel_0">
  <property name="foreground">
    <color alpha="255">
      <red>10</red>
      <green>0</green>
      <blue>184</blue>
    </color>
  </property>
  <property name="text">
    <string>Hello</string>
  </property>
  <property name="geometry">
    <rect>
      <x>265</x>
      <y>440</y>
      <width>155</width>
      <height>20</height>
    </rect>
  </property>
</widget>
```

Why not just
<text>Hello?

Dump of tool's in-memory "model".

Simple, General Format

Display Builder

```
<widget type="label">
  <x>268</x>
  <y>440</y>
  <width>155</width>
  <height>20</height>
  <text>Hello<text>
  <foreground_color>
    <color red="0" green="0" blue="0"/>
  </foreground_color>
</widget>
```

- XML
 - Somewhat human-readable
 - Parsers for every programming language
- “label”, “text_update”
 - Not hinting at specific implementation

Example: ORNL/SNS

- Accelerator
 - EDM displays
 - CS-Studio Data Browser
 - CS-Studio Alarms
 - CS-Studio MPS Bypass Table
- Beam Lines
 - CS-Studio Display Builder (Web Runtime for read-only remote access)
 - CS-Studio Data Browser
 - CS-Studio Alarms
 - CS-Studio Scan UI

Possible Approaches

Pick one tool and keep it

- ✓ Stability
- Eventually no updates
- Freeze OS?

Use today's tool to the fullest, then update to next tool

- ✓ All the new features
- Need to re-implement displays

Use today's tool carefully, then upgrade to compatible tool

- ✓ Can use most displays for a long time
- Need to re-implement some
- Miss out on some features