User Interfaces in the Octopus

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Roadmap

• Problems
• Ideas
• Examples
• Status and Issues
Problems

Distributed User Interfaces

- Combining old and new devices
- Without carrying hardware
- Persistent sessions
- Generic tools for UI elements
- Giving control to users
Target environment

Many machines per user
Hardware cheap, available everywhere
Just look around...
Organization
A omero screen

[Image of a computer screen with code snippets and a directory structure]

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UI elements as files

col:menu/

ctl data button:Col/ button:Sel/ button:Arg/ button:Del/

ctl data ctl data ctl data ctl data
Users move and copy controls
Programs move and copy controls

% cd /mnt/ui

% mkdir appl/text:xample

% cp /NOTICE appl/text:xample/data

% mkdir screen

% echo copyto /screen/row:wins/col:1 > appl/text:xample/ctl

% echo moveto /screen/row:wins/col:2 > screen/row:wins/col:1
More things can be done:

- search for buttons:
  \[\text{du -a /mnt/ui | grep 'button:'}\]
- press a button:
  \[\text{echo press >/.../button:Play/ctl}\]
- Change its label:
  \[\text{echo Pause >/.../button:Play/data}\]
Omero (Plan B)
O/mero and O/live (Octopus)
# Events (O/mero – Appl.)

<table>
<thead>
<tr>
<th>Event</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Look</td>
<td>look for something in the file system</td>
</tr>
<tr>
<td>Exec</td>
<td>execute a command</td>
</tr>
<tr>
<td>Apply</td>
<td>apply a command to the selection</td>
</tr>
<tr>
<td>Close</td>
<td>last replica for the panel is closed</td>
</tr>
<tr>
<td>Click</td>
<td>mouse event (only sent when requested)</td>
</tr>
<tr>
<td>Keys</td>
<td>keyboard event (only sent when requested)</td>
</tr>
<tr>
<td>Interrupt</td>
<td>user wants to interrupt the application</td>
</tr>
<tr>
<td>Clean</td>
<td>the panel is clean (no edits by the user)</td>
</tr>
<tr>
<td>Dirty</td>
<td>the panel is dirty (user made edits)</td>
</tr>
</tbody>
</table>
# Events (O/mero – O/live)

<table>
<thead>
<tr>
<th>Event</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update</td>
<td>update the view for a subtree</td>
</tr>
<tr>
<td>Top</td>
<td>view the subtree rooted here</td>
</tr>
<tr>
<td>Insert</td>
<td>text was inserted in a text panel</td>
</tr>
<tr>
<td>Delete</td>
<td>Text was deleted from a text panel</td>
</tr>
</tbody>
</table>
API

panels->init();

ui := Panel.init("xample");

text := ui.new("text:xample", 1);

sfd := open("/NOTICE", OREAD);

dfd := open(text.path+"/data", OWRITE|OTRUNC);

panels->copy(dfd, sfd);
API (cntd)

\[
\begin{align*}
\text{scr} & := \text{hd panels}\rightarrow\text{screens}(); \\
\text{col} & := \text{hd panels}\rightarrow\text{cols}(\text{scr}); \\
\text{text.ctl}(\text{sprint}("\text{copyto %s\n", \text{col});}
\end{align*}
\]
API (cntd)

c := ui.eventc();

for(;;){
    ev := <-evc;
    if (ev == nil) break;
    print("path %s id %s ev %s\n", hd ev, hd tl ev, hd tl tl ev);
}

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Complexity

- O/mero: 2785 lines of Limbo
- O/live: 6749 lines of Limbo
- O/x: 4294 lines of Limbo
- panel module: 295 lines of Limbo
Issues

Latency when in production.

- Command language to handle panels.
- UI automations
- O/live for non programers
- O/mero for native appls.
More info

http://lsub.org