UI and applications in Audio-Video systems

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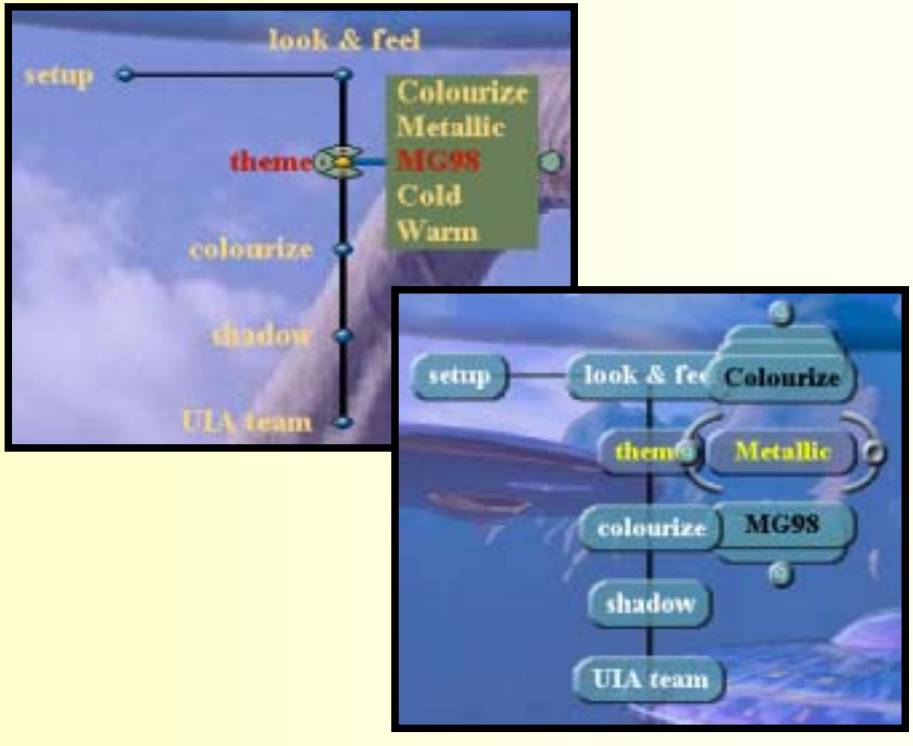
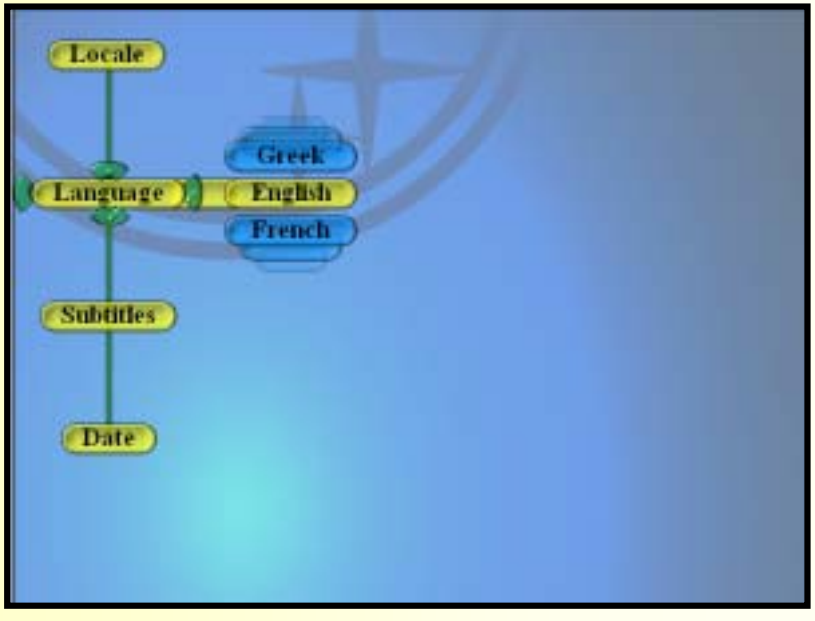
Applications

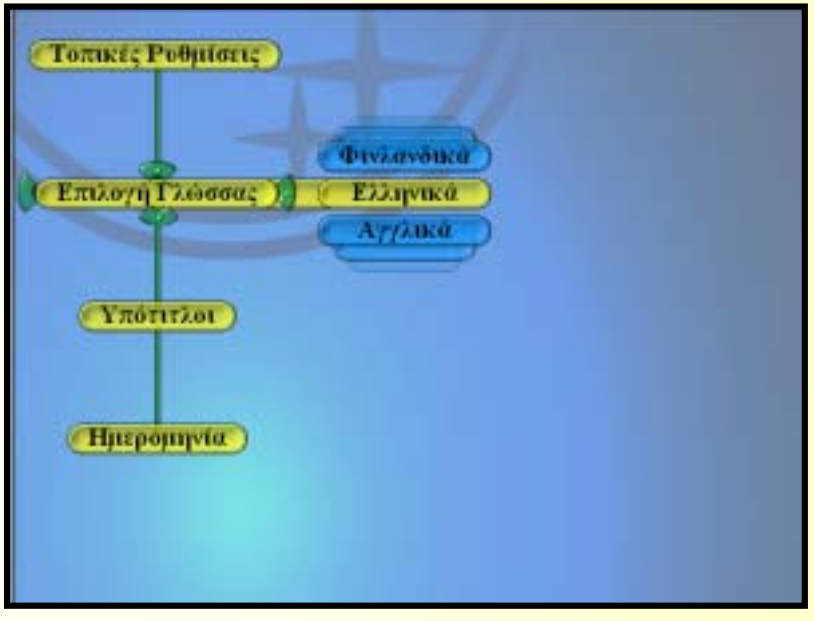
- Basic zapping
- Electronic Programming Guides
- Personal Video Recording
- Install menus
- Teletext

Diversity in UI design



Diversity in language





Diversity in screen size & aspect ratio

	4:3	16:9
PAL		
NTSC		

Diversity in input devices

- Remote control

- Touch / pen-based

Diversity in featuring

				
	21PT1884S	21PT4475	21PT5505	25PT4475
Price level	••	••	•••	••
Colour	Blue Silver	Black	Warm Silver	Black
Tube shape	flat square	flat square	real flat	flat square
Size	••	•••	•••	•••
Width	54.9	59.6	60.0	69.0
Height	46.9	49.3	45.4	54.0
Depth	49.5	48.2	48.7	48.0
Viewing experience	•••	••	••••	••
Screen type	blackline	blackline tc	blackline	blackline tc
Picture format	conventional	conventional	conventional	conventional
Picture processing	50 hz	50 hz	50 hz	50 hz
Extra processing	contrast plus	contrast plus	contrast plus	contrast plus
Sound experience	•	••	••	••
Speakers	1 speaker	2 speakers	2 speakers	2 speakers
Audio system	mono	stereo	incredible surround	stereo
Music power	6.0	6.0	10.0	10.0
Extras	••	••	••	••
Teletext	9 page teletext	10 page smart text	10 page smart text	10 page smart text
Easy features	no extra easy features	no extra easy features	no extra easy features	no extra easy features
Built-in features	tv	tv	tv	tv
Extra features	sleep timer	sleep timer	wake-up clock, sleep timer	sleep timer
Connectivity	••	••	••	••
Connection	1 scart	2 scarts	2 scarts	2 scarts
Audio output	no extra audio outputs	no extra audio outputs	no extra audio outputs	no extra audio outputs
Front connection	front connections	side connections	side connections	side connections

UI Architectures

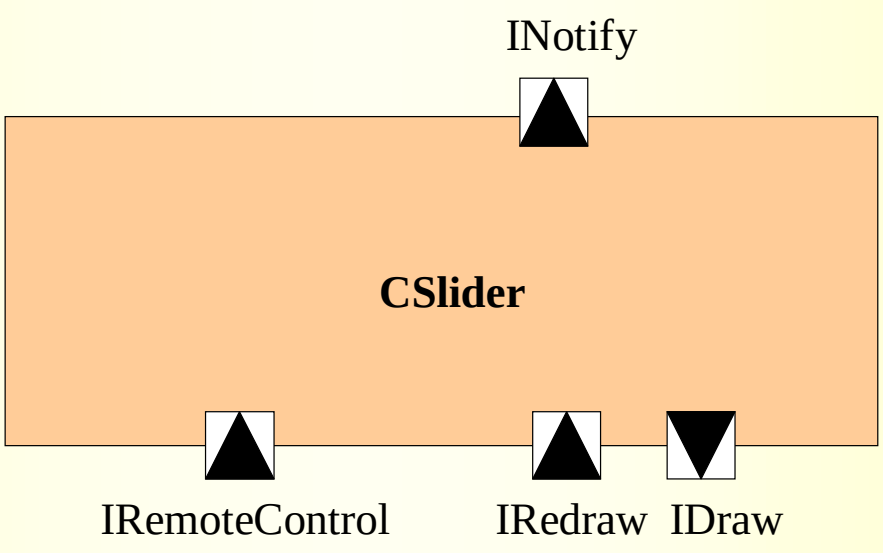
Efficient development
of
UI software
for
resource-constrained platforms

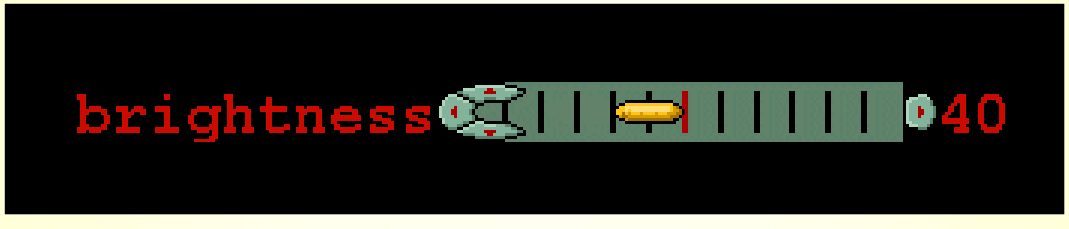
⇓

towards
a reconfigurable UI software stack
for
all pixel-based AV platforms

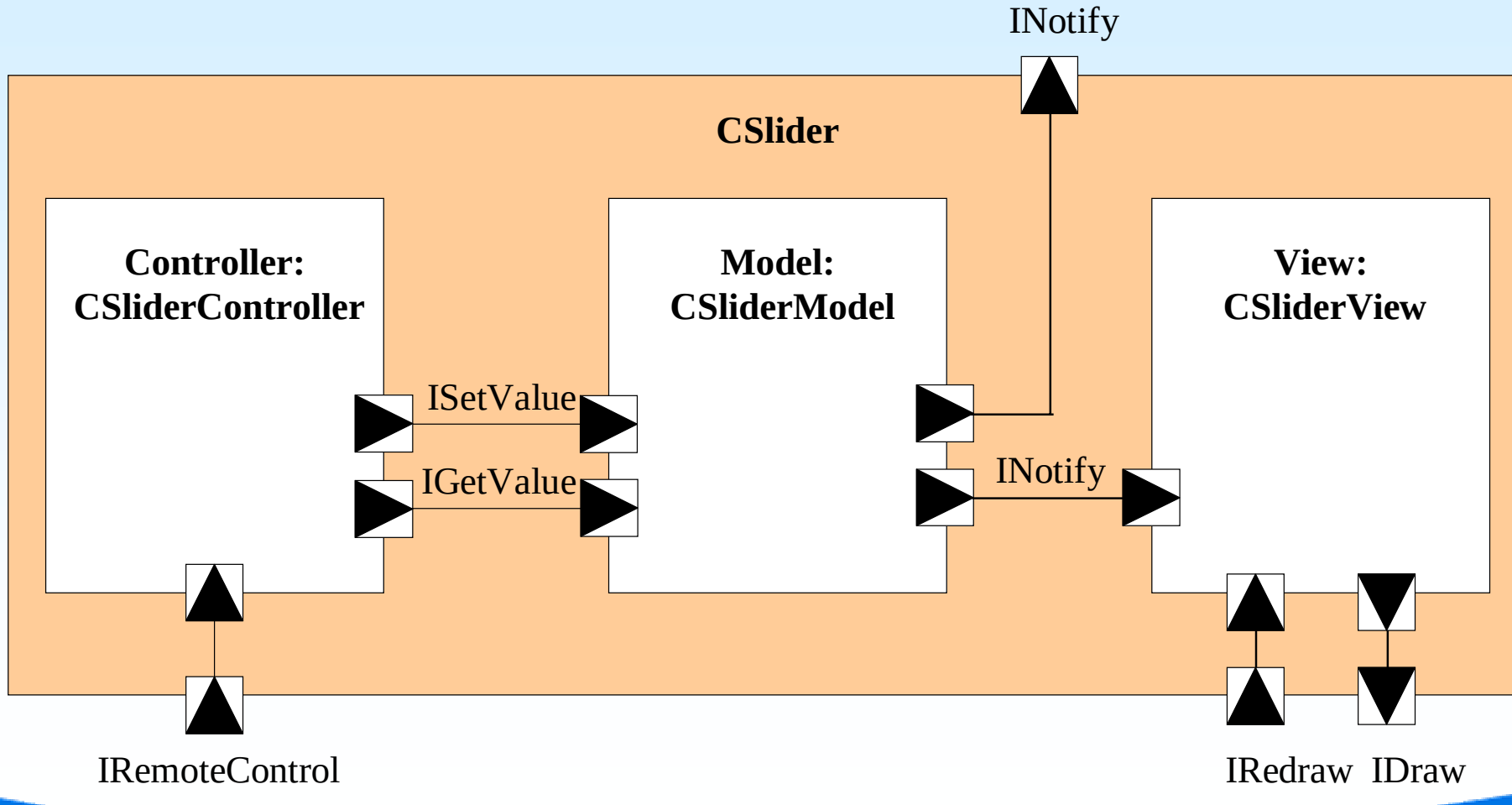
Kangaroo component model

- Components
- Interfaces
  - provides
  - requires

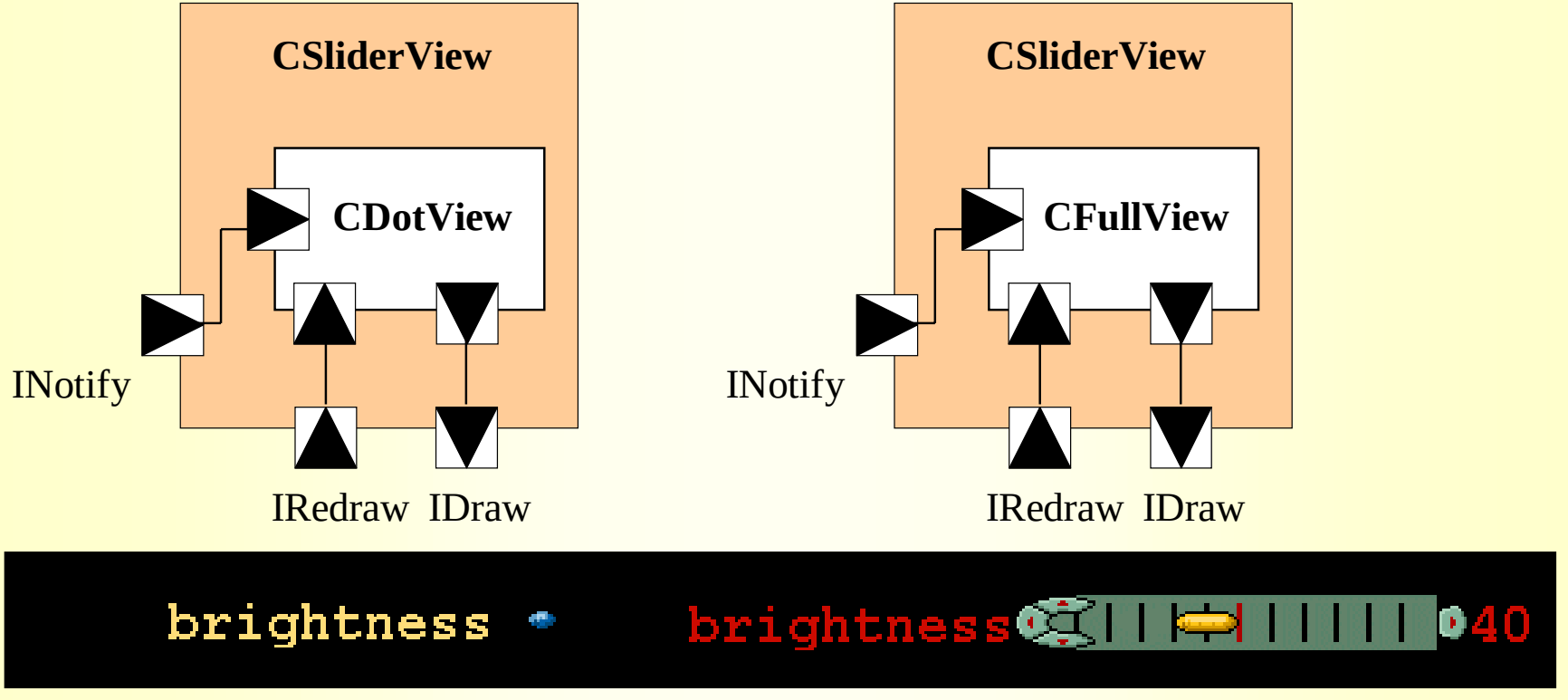




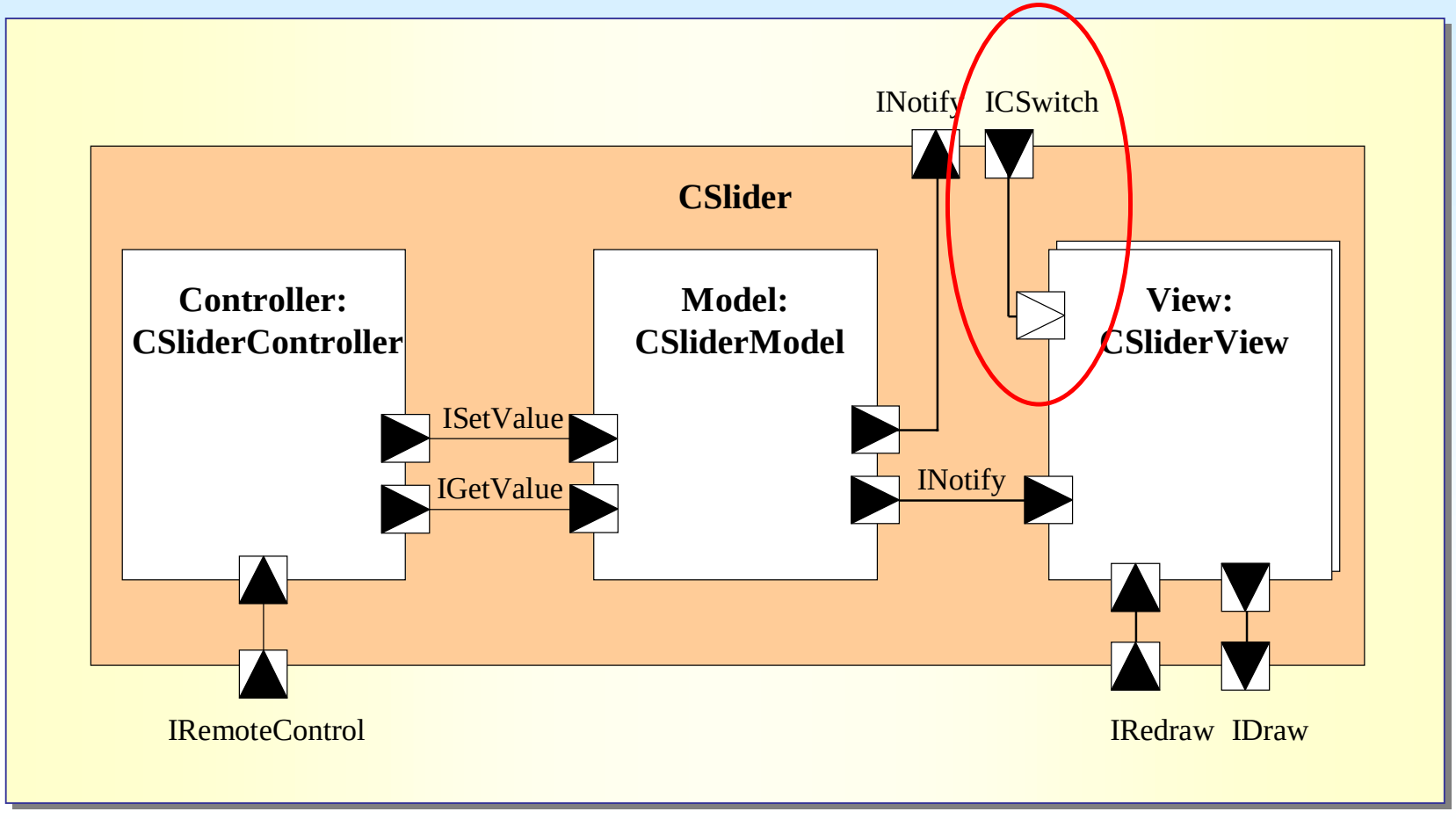
Compound components



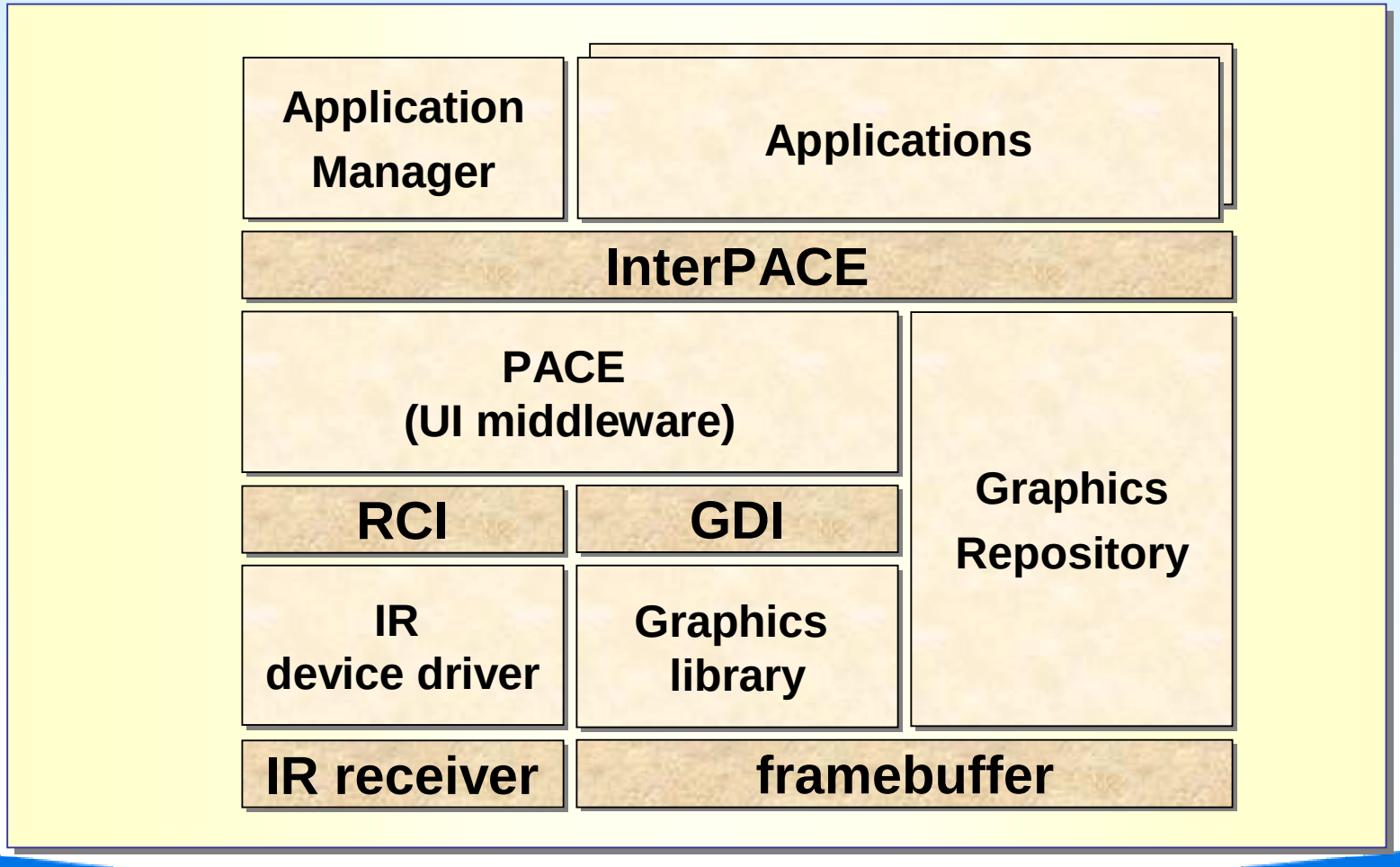
Variants of components



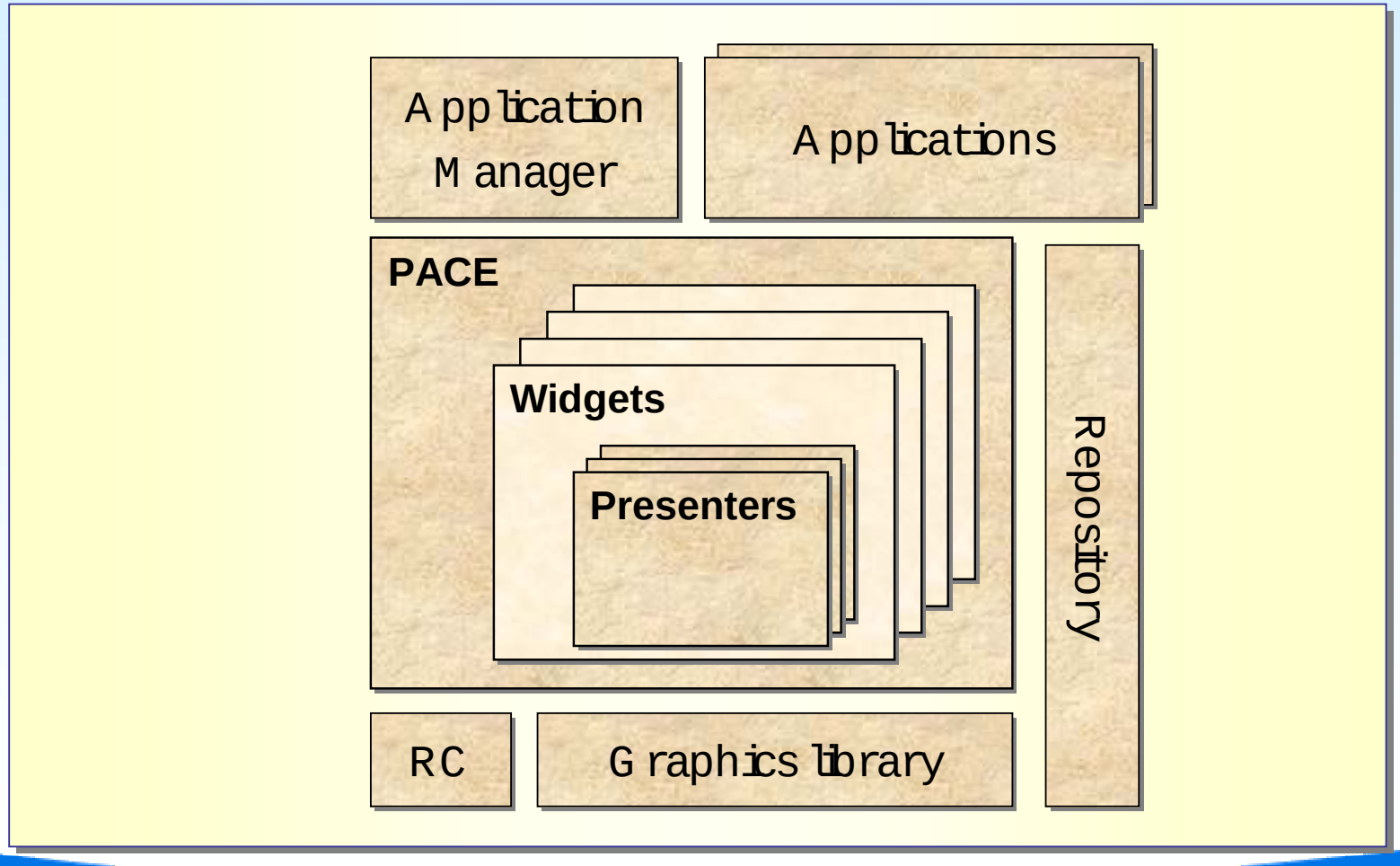
Switching between variants



Global Architecture (1)

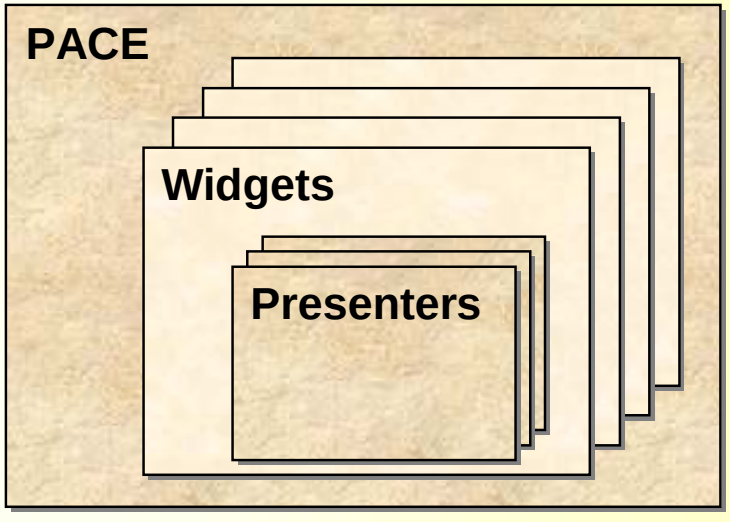


Global architecture (2)



PACE

- Add and remove
  - elementary widgets
    - slider, list, text, ...
  - organizational widgets
    - menu, group, matrix, ...
  - widget presenters
    - UI Puck, Classic, Technic
- without changing anything else!



The Philips look and feel: One OSD

- Basic elements
  - on-screen button
  - bar
  - **value list**
  - toggle
  - check-box list
  - alphanumeric input
- Organizational elements
  - **menus**

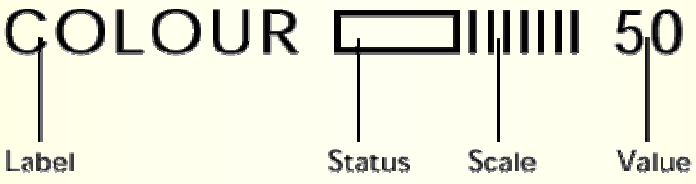
Example: the feel of a Bar/Slider

BAR

Pre	User action	System reaction	Post
Selected bar COLOUR ▭ ||||||| 50	⇧ Navigate	The bar transforms to the unselected version. Move to the item above.	Unselected bar COLOUR ○
	⇨ Control	Increase the current bar-value unless maximum value is reached. Adjust system settings.	Bar is increased COLOUR ▭ ||| 80
	⇩ Navigate	The bar transforms to the unselected version. Move to the item below.	Unselected bar COLOUR ○
	⇦ Control	Decrease the current bar-value unless minimum value is reached. Adjust system settings.	Bar is decreased COLOUR ▭ |||||||||| 20
	OK	No system reaction.	

Example: the look of a Bar/Slider

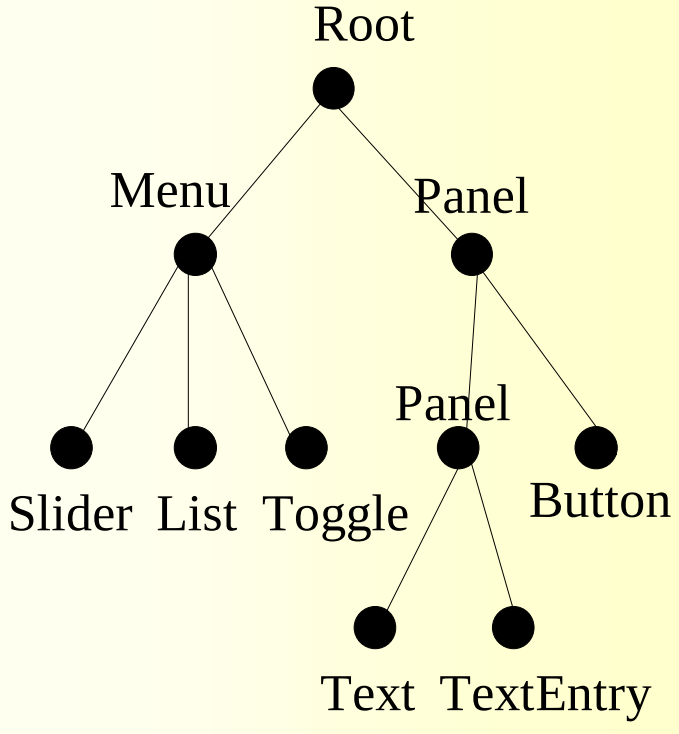
Selected:



Unselected:

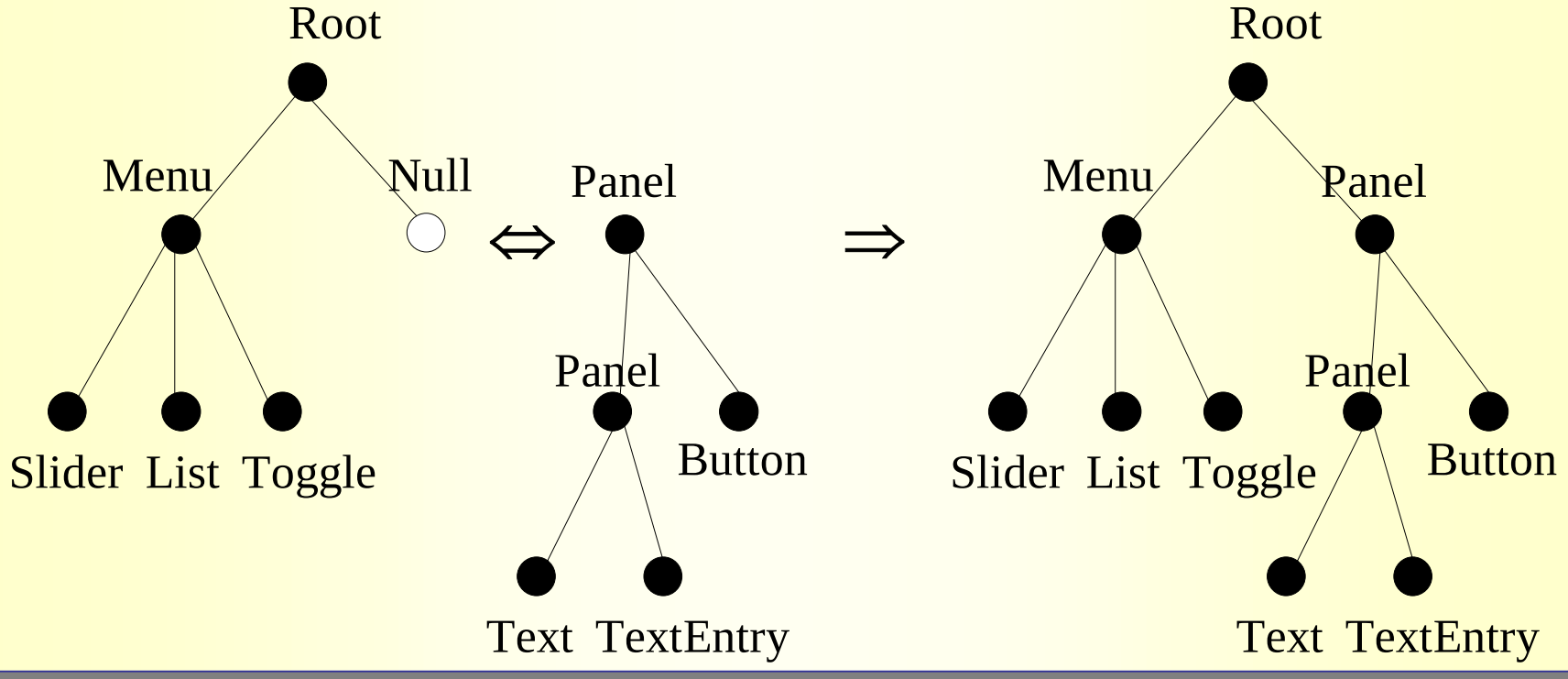
Widget tree

- Basic widgets
  - list
  - slider
  - button
- Organisational widgets
  - panel
  - menu



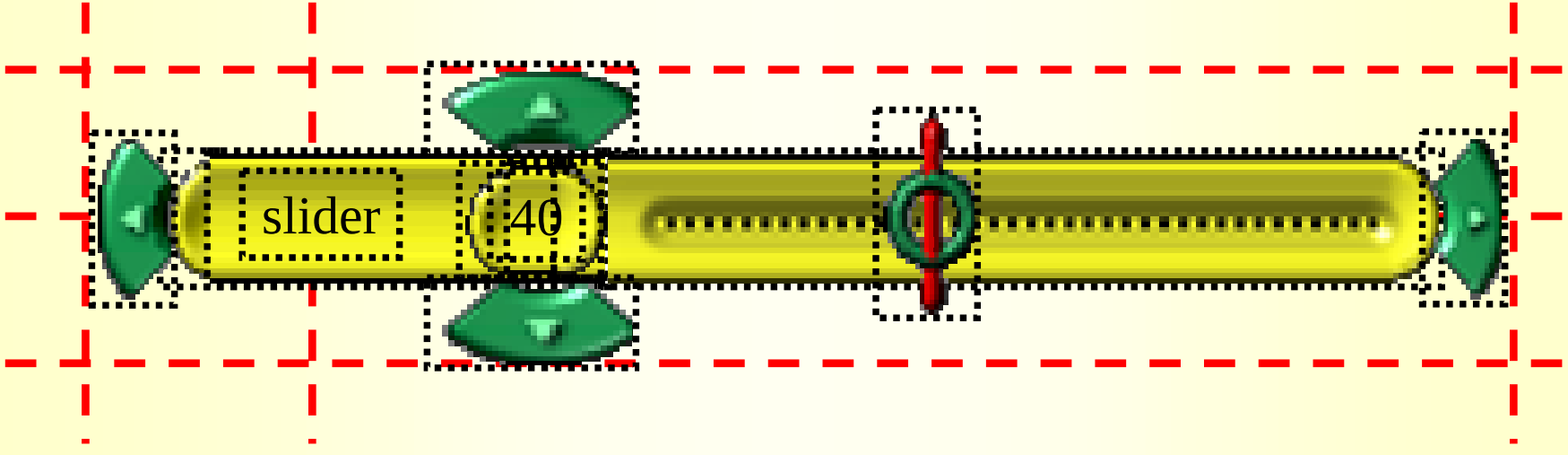
InterPACE

- replaceWidget(WidgetID, WidgetTree)
- replaceAttribute(WidgetID, AttributeID, NewValue)

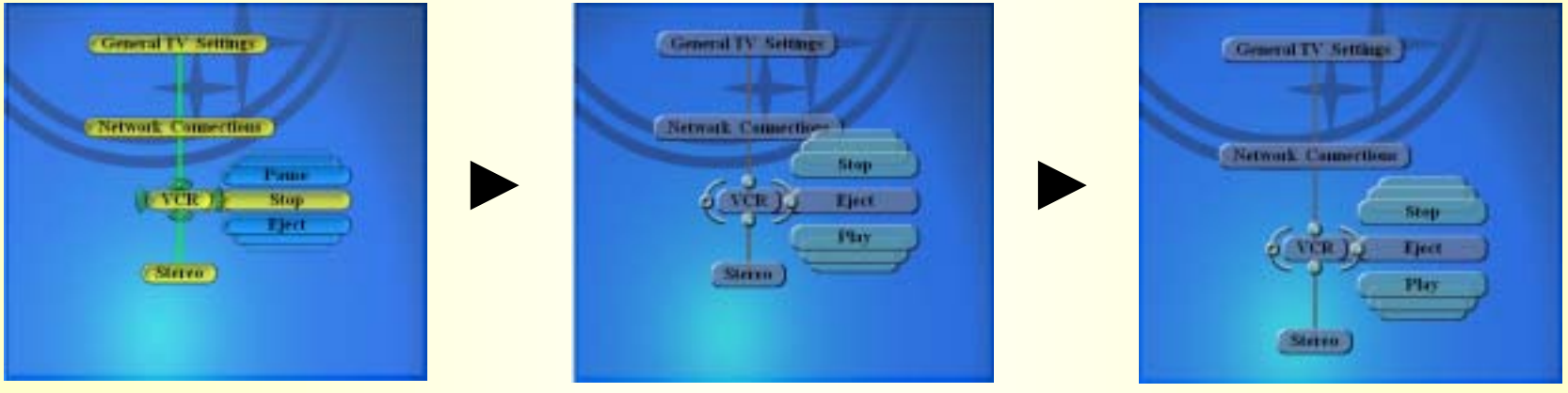


GDI - Graphical Devices Interface

- Basic operations
  - drawBitmap(BitmapID, Position)
  - drawString(StringID, Position)



Layout management

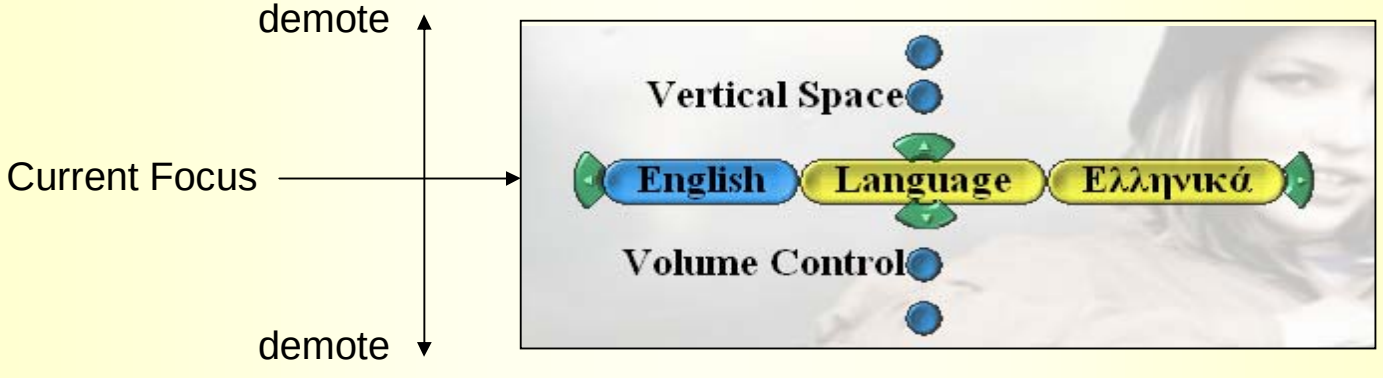


Layout management

- Display states
  - null
  - dot
  - dot+label
  - in focus

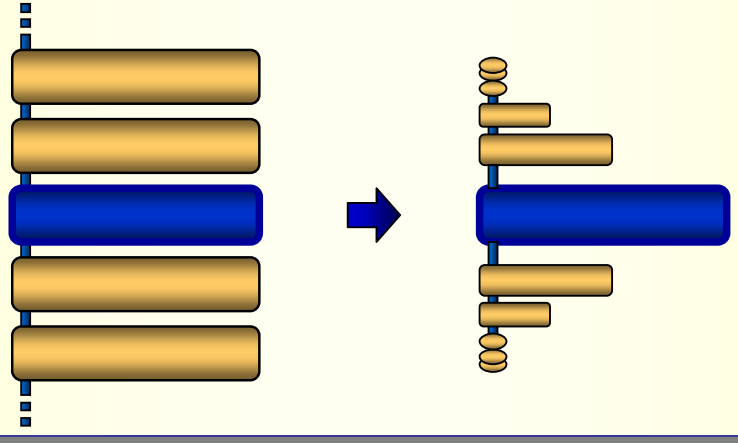
Approach

- ‘Discrete Fish-Eye’ algorithms for PACE
  - Promote / Demote discrete display-states of widgets based on their “distance” from the current focus and available space.



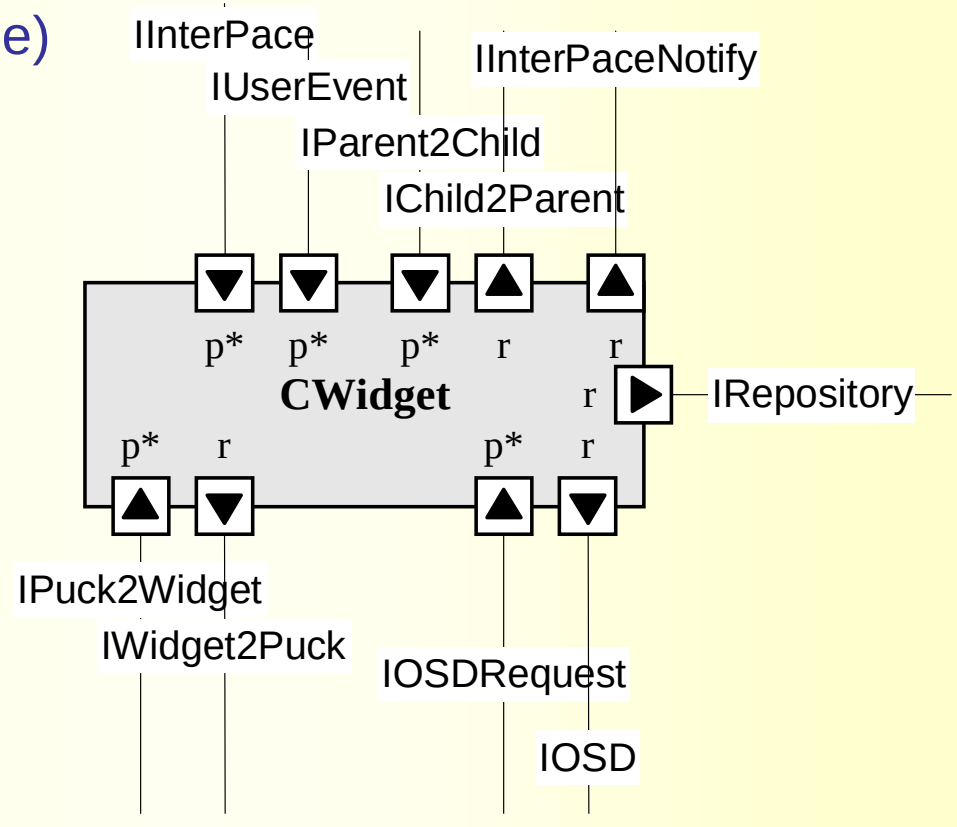
Layout management

- organisational widgets select display state for their children
- based on
  - sizes widget in various display states
  - available screen estate
  - ‘distance’ to focus



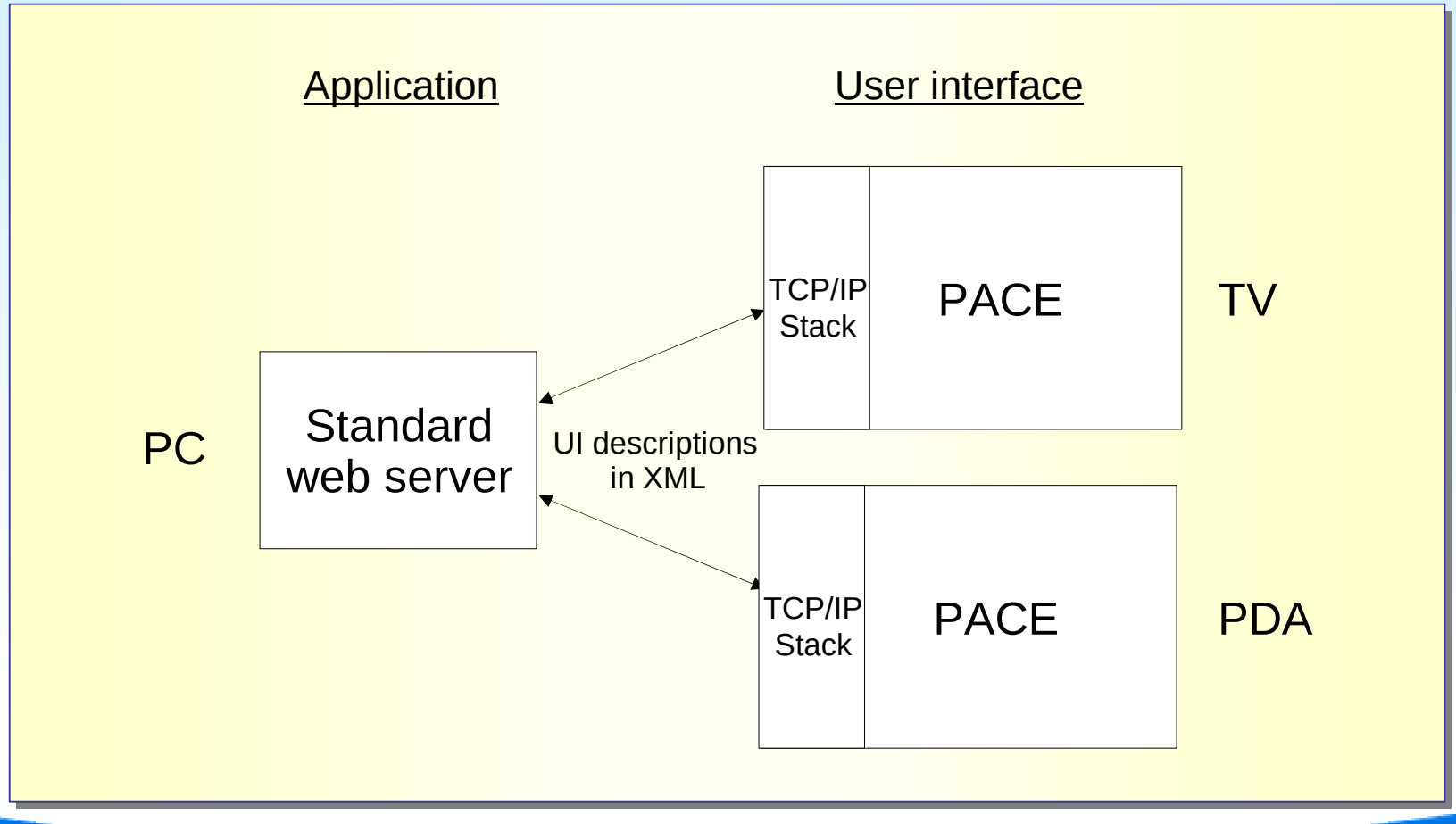
Widget interfaces

- Run-time widget (tree)
  - instantiation
  - modification
  - destruction
- Focus
- Layout
- Rendering
- Animations



Networked user interfaces

Distributed user interfaces and applications



Abstract UI descriptions

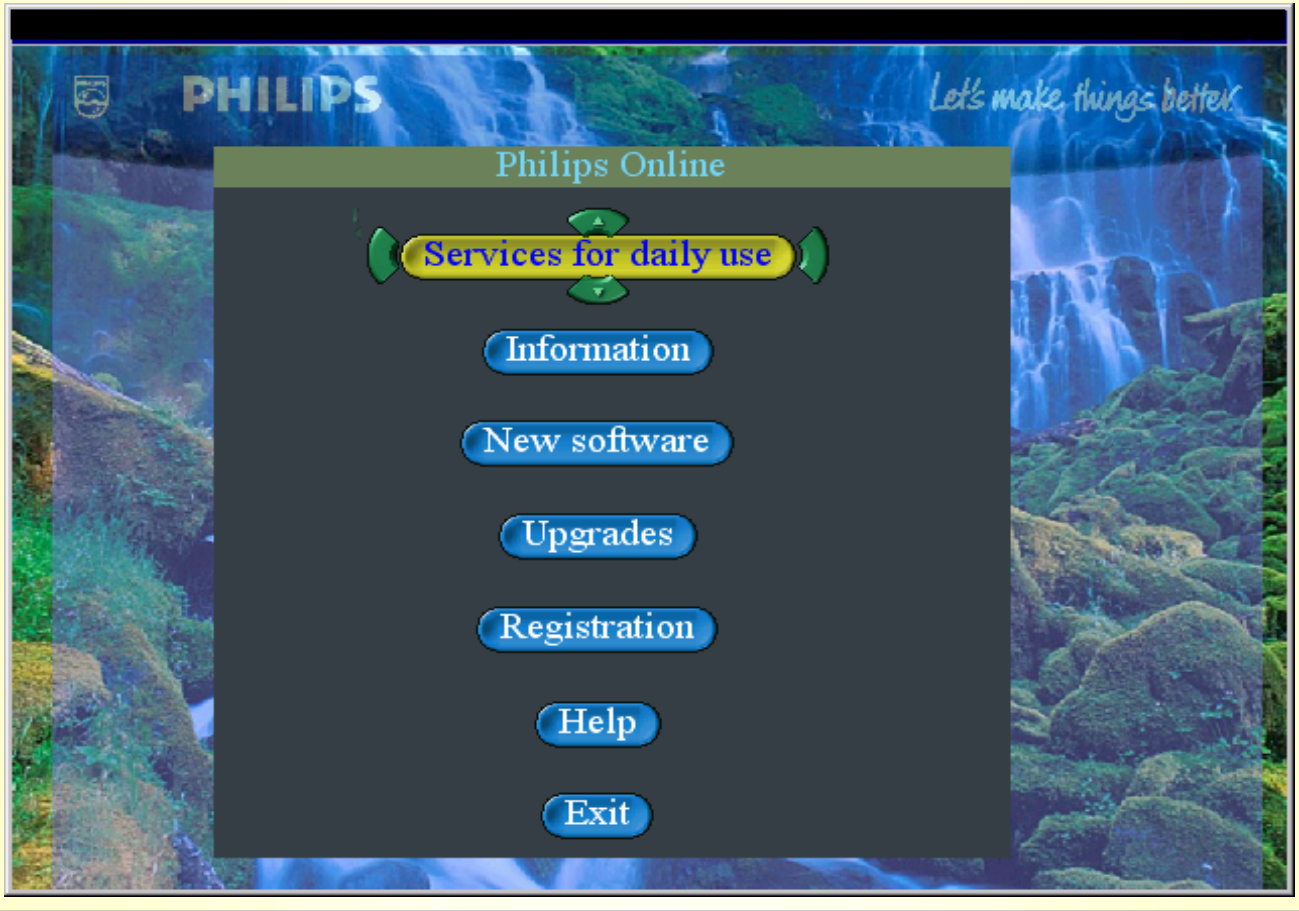
```
<?xml version="1.0"?>
<!DOCTYPE uifragment PUBLIC "-//PHILIPS//DTD AVML FRAGMENTS 0.5//EN"
                    "http://www.philips.com/avml_fragments-0.5.dtd">
<?xml-stylesheet href="stylesheet.uisl"?>
<uifragment>
    <panel id="play" label="Play window">
        <text id="artist"> artist: Celine Dion </text>
        <text id="song">   title:  Regarde-Moi </text>
        <range id="volume" label="Volume" valueset="80"/>
        <button id="play" label="Play"/>
        <button id="prev" label="Prev"/>
        <button id="next" label="Next"/>
        <button id="stop" label="Stop"/>
    </panel>
</uifragment>
```

After subscription

Server returns to client:

```
<?xml version="1.0"?>
<uifragment>
   <container id="p1" label="Philips Online">
      <button id="b1" label="Services for daily use" up="b7"/>
      <button id="b2" label="Information"/>
      <button id="b3" label="New Software"/>
      <button id="b4" label="Upgrades"/>
      <button id="b5" label="Registration"/>
      <button id="b6" label="Help"/>
      <button id="b7" label="Exit"/>
   </container>
</uifragment>
```

Rendering

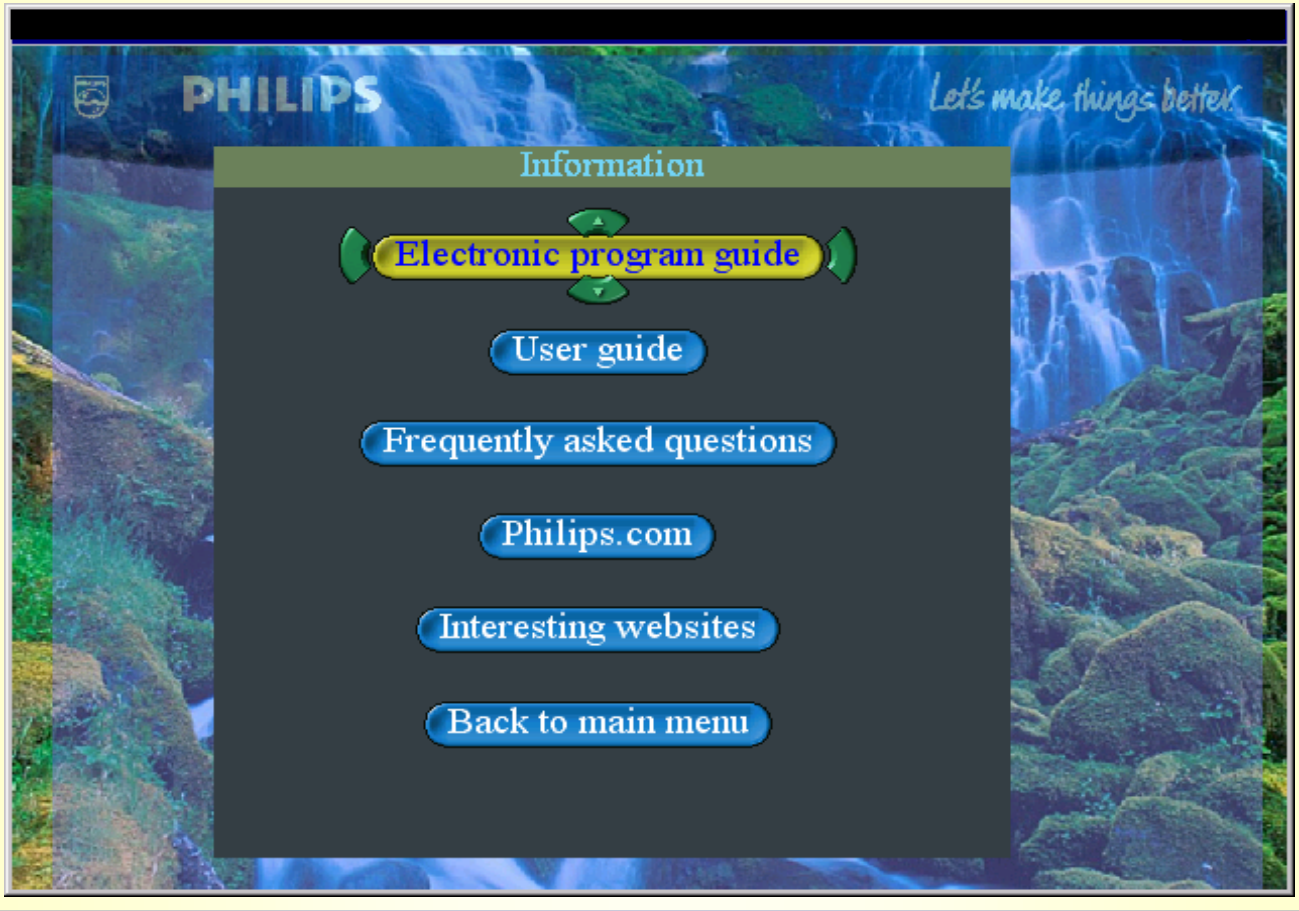

PHILIPS
Let's make things better.
Philips Online
Services for daily use
Information
New software
Upgrades
Registration
Help
Exit

Click ‘Information’ button

- **Client to server:**
  http://appserver.philips.com/servlets/philips-online?element=b2
- **Server returns:**

```
<uifragment>
   <replace element=”p1">
      <container id="p3" label="Information" showparent="false">
         <button id="b31" label="Electronic program guide" up="b36"/>
         <button id="b32" label="User guide"/>
            . . .
         <button id="b36" label="Back to main menu" down="b31"/>
      </container>
   </replace>
</uifragment>
```

Rendering

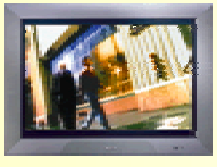

PHILIPS
Let's make things better.
Information
Electronic program guide
User guide
Frequently asked questions
Philips.com
Interesting websites
Back to main menu

Networked user interface

- Re-use of PACE
  - it is already in for resident applications
- Re-use of InterPACE
  - XML based (over HTTP or SOAP)
- Issues
  - response time
  - bandwidth
  - flexibility in load balance between server and client

UI Architectures

- Efficient development
  of
  UI software
  for
  resource-constrained platforms



- UI software
  for
  networked applications