

Some daemons in OM-2007.2

2008.03.14

What is running when NEO starts

- I use them everyday
 - dropbear, gsmd, Xglamo, ...
- I have heard of them
 - udevd, apmd, phone-kit, dbus-daemon, pulseaudio, neod, ...
- But, there are more
 - avahi-daemon, gconfd-2, mb-applet-startup-monitor, hald, settings-daemon, e-addressbook-factory, notification-daemon, ...

Before X

(skip /etc/init.d/xserver-nodm)

```
$ ps ax
```

```
 351 ?      S<s      0:00 udevd --daemon
1165 ?      Ss       0:00 /sbin/portmap
1205 ?      Ss       0:00 /usr/sbin/dropbear -r /etc/dropbear/dropbear_rsa_host_key -p 22
1215 ?      Ss       0:00 /usr/sbin/apmd -P /etc/apm/apmd_proxy --proxy-timeout 30
1228 ?      Ss       0:00 /usr/bin/dbus-daemon --system
1234 ?      Ss       0:01 /usr/sbin/hald
1235 ?      S        0:00 hald-runner
1242 ?      S        0:00 hald-addon-keyboard: listening on /dev/input/event0
1255 ?      Ss       0:00 /sbin/syslogd -n -C64 -m 20
1257 ?      Ss       0:01 /sbin/klogd -n
1266 ?      Ss       0:00 avahi-daemon: running [fic-gta02.local]
1283 ?      Ss       0:00 /sbin/hcid -s -f /etc/bluetooth/hcid.conf
1286 ?      S        0:00 /usr/lib/bluetooth/bluetoothd-service-input
1304 ?      S        0:00 /usr/sbin/gsmc gsmc -p /dev/ttySAC0 -s 115200 -F
1310 ?      S<sl     0:06 /usr/bin/pulseaudio --no-cpu-limit --resample-method=trivial -D -nF
1322 ttySAC2  Ss+     0:00 /sbin/getty 115200 ttySAC2
1324 tty1    Ss+     0:00 /sbin/getty 38400 tty1
1327 ?      Ss       0:00 /usr/sbin/dropbear -r /etc/dropbear/dropbear_rsa_host_key -p 22
```

After X

(/etc/X11/Xsession.d, /etc/matchbox/session)

\$ ps ax

```
1347 pts/0    S      0:00 xinit /etc/X11/Xsession -- /usr/bin/Xglamo :0 -pn -dpi 285 -screen 4
1352 pts/0    S<     0:05 /usr/bin/Xglamo :0 -pn -dpi 285 -screen 480x640 -hide-cursor -root-p
1357 pts/0    S      0:00 /bin/sh /etc/X11/Xsession
1362 ?        Ss     0:00 /usr/bin/dbus-daemon --fork --print-pid 4 --print-address 6 --sessio
1366 pts/0    S      0:00 run-parts /etc/X11/Xsession.d
1370 pts/0    S      0:00 /usr/libexec/gconfd-2
1374 pts/0    S      0:00 multitap-pad -d
1377 pts/0    S      0:00 mb-applet-startup-monitor
1378 pts/0    Sl     1:15 need
1379 pts/0    S      0:09 openmoko-today
1380 pts/0    Sl     0:03 phone-kit
1381 pts/0    S      0:03 matchbox-window-manager -use_titlebar yes -use_desktop_mode decorate
1382 pts/0    S      0:01 matchbox-panel-2 --start-applets systray,startup --end-applets openm
1383 pts/0    S      0:00 /usr/bin/settings-daemon
1389 ?        S      0:00 /usr/libexec/e-calendar-factory
1391 ?        S      0:00 /usr/libexec/e-addressbook-factory
1399 ?        S      0:01 /usr/libexec/notification-daemon
```

Interested processes

- apmd
- Xglamo
- multimap-pad
- dbus-daemon
- gconfd-2
- neod

apmd

- can log the battery status to syslog every now and take action when the power status changes
 - `APM_SYS_SUSPEND`, `APM_LOW_BATTERY`,
`APM_POWER_STATUS_CHANGE`, ...
- Event device: `/dev/apm_bios`
- Event dispatcher: `/etc/apm/apmd_proxy`
- apm status: `/proc/apm`

/proc/apm

- `cat /proc/apm`

```
driver_version apm_version_major apm_version_minor apm_flags
1.13           1                   2                   0x02
```

```
ac_line_status battery_status battery_flags battery_percentage battery_time units
0x01           0x03           0x08           -1%           -1           ?
```

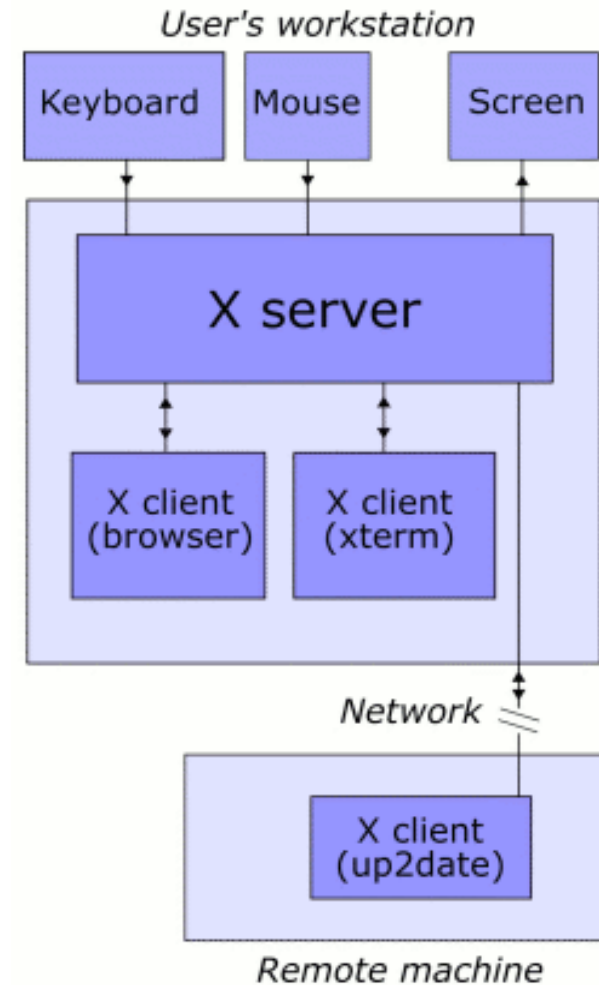
- `openmoko-panel-battery`

- Check `/proc/apm` every 60 seconds

- ```
if (info.battery_percentage < 10)
- icon = PKGDATADIR "/Battery_00.png";
else if (info.battery_percentage < 30)
 icon = PKGDATADIR "/Battery_01.png";
else if (info.battery_percentage < 50)
 icon = PKGDATADIR "/Battery_02.png";
else if (info.battery_percentage < 70)
 icon = PKGDATADIR "/Battery_03.png";
else if (info.battery_percentage < 90)
 icon = PKGDATADIR "/Battery_04.png";
else
 icon = PKGDATADIR "/Battery_05.png";
```

# X overview

- Hardware resources
  - Managed by X server
- Communication
  - X11 protocol





# X server implementation

- Xglamo
- Graphics
  - Direct writing to `/dev/fb0`
  - Hardware acceleration
- Mouse
  - tslib
- (faked) Keyboard
  - libfakekey

# multitap-pad

- UI written in GTK+
- Use libfakekey to send key events
- Invocation
  - Command line (`/usr/bin/multitap-pad`)
  - matchbox applet (`/usr/lib/matchbox-panel/libmultitap-pad.so`)
  - IM module (`/usr/lib/gtk-2.0/2.10.0/immodules/libmtp-im-invoker.so`)



# D-Bus

- an inter-process communication mechanism
- Works in terms of messages
  - METHOD\_CALL, METHOD\_RETURN, ERROR, SIGNAL
- Peer-to-peer
- Buses
  - System bus: /var/run/dbus/system\_bus\_socket
  - Session bus: \${DBUS\_SESSION\_BUS\_ADDRESS}

# D-Bus example

```
$ dbus-send --session --dest=org.openmoko.PhoneKit \
 --type=method_call --print-reply /org/openmoko/PhoneKit/Sms \
 org.freedesktop.DBus.Introspectable.Introspect
```

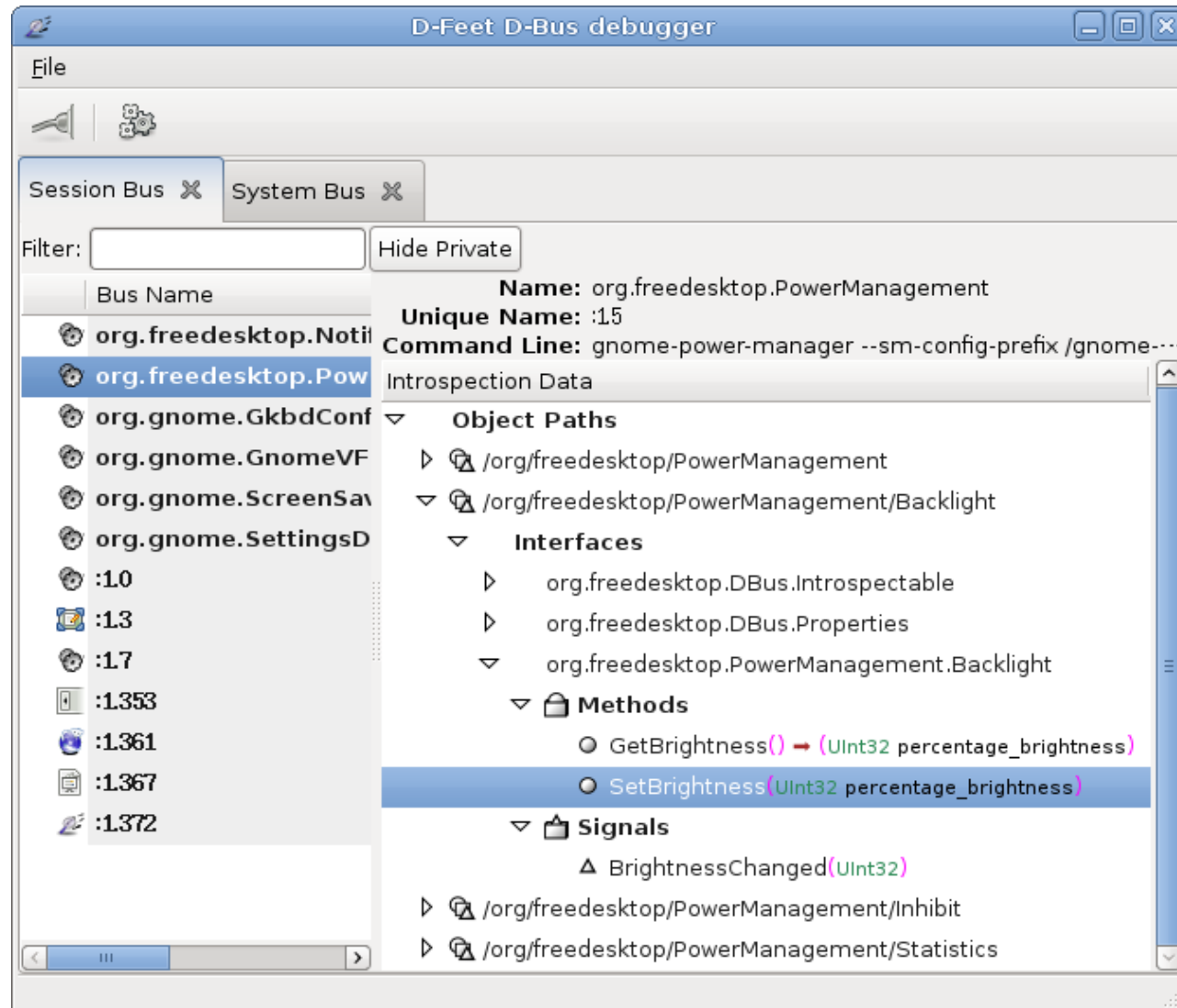
```
<interface name="org.openmoko.PhoneKit.Sms">
 ...
 <method name="Send">
 <arg name="number" type="s" direction="in"/>
 <arg name="message" type="s" direction="in"/>
 <arg name="report" type="b" direction="in"/>
 <arg name="uid" type="s" direction="out"/>
 </method>
 ...
</interface>
```

- *DESTINATION (name): org.openmoko.PhoneKit*
- *PATH: /org/openmoko/PhoneKit/Sms*
- *INTERFACE: org.freedesktop.DBus.Introspectable*
- *MEMBER: Introspect*

# D-Bus example cont.

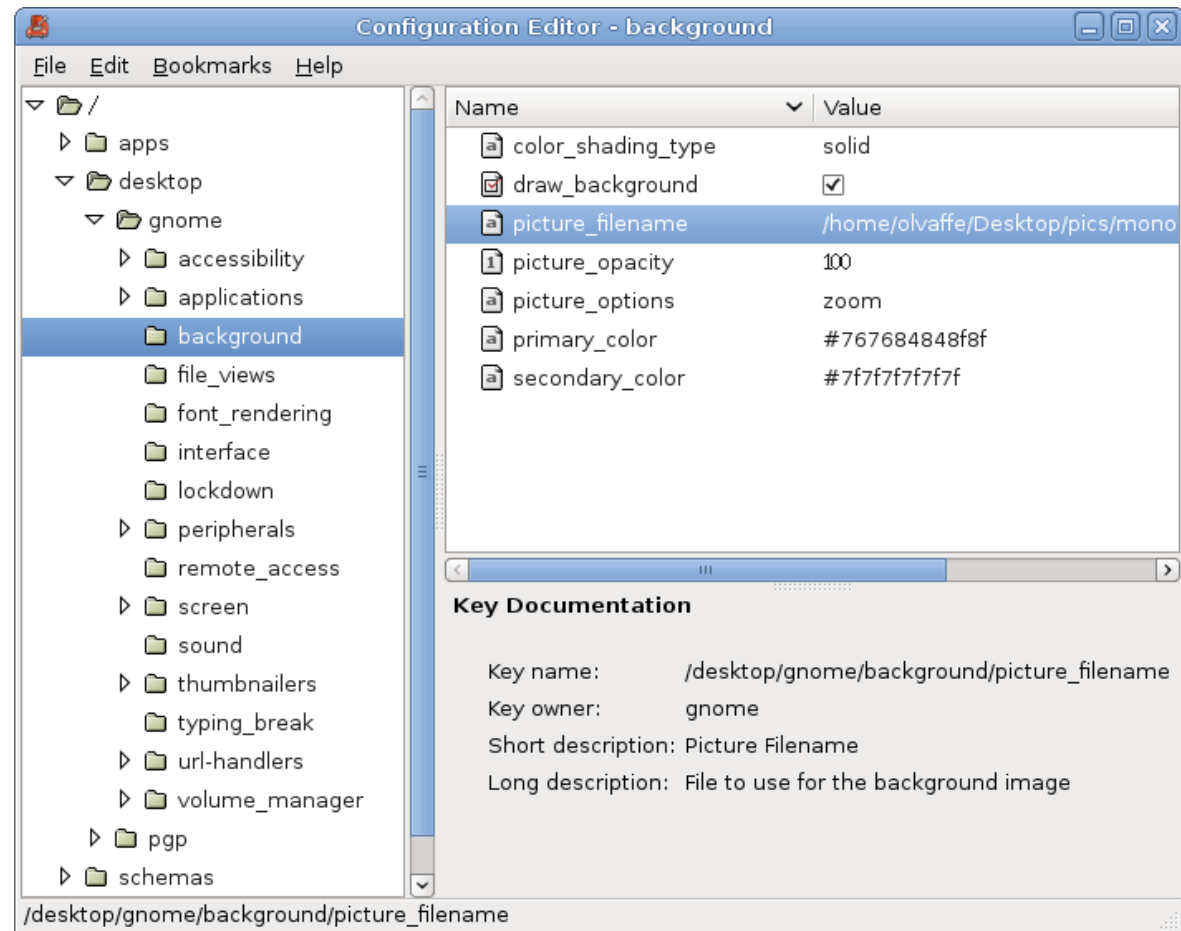
```
$ dbus-send --session --dest=org.openmoko.PhoneKit \
--type=method_call --print-reply /org/openmoko/PhoneKit/Sms \
org.freedesktop.DBus.PhoneKit.Sms.Send string:09xxxxxxx \
string:hello boolean:false
```

# d-feet



# gconfd-2

- a system for storing application preferences
- Value types
  - Int
  - Bool
  - Float
  - String
  - List
  - pair



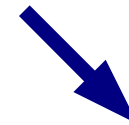
## gconfd-2 cont.

- process transparent
  - change a setting from one application, all other applications interested in that setting is updated



# gconfd-2 example

```
$ gconftool-2 --type bool --set /desktop/poky/interface/digital_clock false
```



# neod

- neod\_buttonactions\_input\_dispatch
  - Power and Aux menu
  - Touch sound
  - Aux key switches window
  - Power key closes window
  - USB insertion (dbus)
  - Headphone insertion (amixer)

neod cont.

- Power management
  - Dim screen
  - Blank screen
  - Suspend (apm)
  - Power on/off GSM, GPS, Bluetooth
- Startup sound
- ... and everything in power and aux menus

# USB insertion

- openmoko-panel-usb

```
if (dbus_message_is_signal(msg, CHARGER_DBUS_INTERFACE,
 "ChargerConnected"))
{
 g_debug("-- charger connected");
 usb_applet_update_status(applet, TRUE);
 return DBUS_HANDLER_RESULT_NOT_YET_HANDLED;
}
else if (dbus_message_is_signal(msg, CHARGER_DBUS_INTERFACE,
 "ChargerDisconnected"))
{
 g_debug("-- charger disconnected");
 usb_applet_update_status(applet, FALSE);
 return DBUS_HANDLER_RESULT_NOT_YET_HANDLED;
}
```

- openmoko-panel-battery does the same

# More daemons

- udevd — populate /dev, hotplug
- pulseaudio — sound mixer
- mb-applet-startup-monitor — !!
- hald — hardware abstraction, hotplug over dbus
- avahi-daemon — service discovery
- settings-daemon — XSETTINGS over gconf
- e-addressbook-factory — contacts
- notification-daemon — easy user notification
- ...