Plasma and Netbooks:
A proposal for improving Desktop interfaces on netbooks

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ABSTRACT

This paper provides some ideas behind a desktop shell suitable for devices like netbooks. Usually vendors tend to think that netbook interfaces should look just like a small desktop, but this leads to user frustration.

GENERAL TERMS AND KEYWORDS

Desktop shell, KDE, Netbook, Plasma

INTRODUCTION

Netbooks [8] are low-end devices designed for web browsing, emailing and office tasks like text-editing and presentations. The 'netbook movement' started with the OLPC (One Laptop per Child) [6] project that aimed to create an educational and cheap device. The movement has become stronger in the last few years with many companies selling this kind of device to emerging markets. Despite the fact that this hardware was designed for emerging markets, 70\% of the total sales were in Europe.

The most famous netbook is the EeePc [1], made by Asus. It was the first netbook that was internationally mass-marketed, and the first to ship with a custom Linux version that used a simple user interface. Other brands of netbooks (and later Asus) started selling netbooks with Windows XP [4] pre-installed.

In the last few years, vendors have tried to make netbook devices be just like desktops, but in a smaller form factor. This was easy and also less expensive than developing a custom interface as most of the software was already done. However, it also frustrated most users, as the netbook interface looked the same as in a desktop, but could not perform as well.

Xandros'[9] simple interface for beginners on the EeePc was more like a launcher and not a desktop shell developed to help the user with common tasks. The same problem affects Ubuntu's Netbook Remix [7] interface: it is just a launcher. On the other hand, Ubuntu's interface provides some shortcuts for accessing devices, the user's home folder, and the system settings.

The second version of Moblin [5] brings a lot of new ideas. It has a completely new interface, with animations and concepts that fit well for this kind of device. Some of these concepts are nice while others fail, but it is far ahead of other initiatives in this field.

Despite Moblin's new release, basically all manufacturers put a complete desktop inside these devices, even though this results in problems such as applications needing too much screen space or not having enough memory.

We will enumerate some of the problems that the full desktop approach brings and will present some simple solutions or ideas for them. Please, also note that Ubuntu's Netmix (that uses Gnome) will be often referenced as just "Ubuntu", Moblin 2.0 as just "Moblin", and EeePc's Xandros as "Xandros" only.

Talking About Panels

Panels are important players on almost all desktop shells these days. Since Windows 95 users are used to having a panel at the bottom of the screen and almost all desktop environments follow this trend: Gnome has a panel at the top of the screen and a task bar at the bottom, OSX [3] from Apple has one at the top and KDE [2] has one at the bottom as default but you can add as many panels as you want. Windows XP also support multiple panels but most users do not know how to make it do that.

Usually panels are used to store the system tray, notification area, and widgets that are most commonly used: application launchers (menu), clocks, and taskbar. There are some differences between different desktop shells, for example, OSX also puts an application's menu on the panel, and Gnome puts the taskbar in a different panel.

The bad side of panels is that for devices with smaller screens they tend to waste space. When the user has a lot of space, it is nice to have it always visible so that it is easy to check notifications and an application's status. But if you have a smaller screen, your panel must have an "auto hide" feature, otherwise you throw away space. In KDE for instance, the default panel has a height of 35 pixels and KWin window's decorations have a height of 20 pixels: that is already 55 pixels that are wasted (and most desktop applications also have menus and sometimes toolbars). Windows XP has an even worse scenario as its window decorations have a height of 25 pixels as default (Window's panel has the same height as KDE's one). See Table 1 for how many pixels are "wasted" on KDE and Windows XP.

	Windows XP	KDE
Window Decorations	25	20
Panel	35	35
Total	**60**	**55**

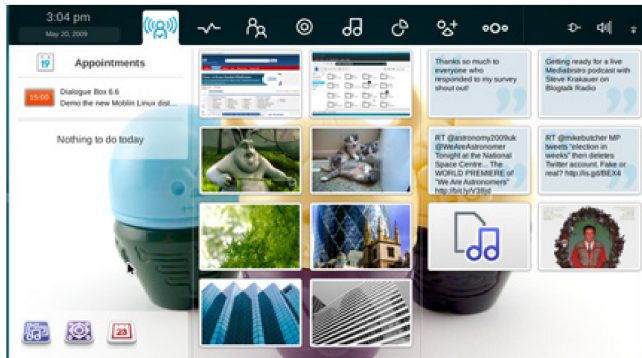**Table 1: Wasted height (pixels)**

Figure 1: Mobilin 2's interface: panel at the top
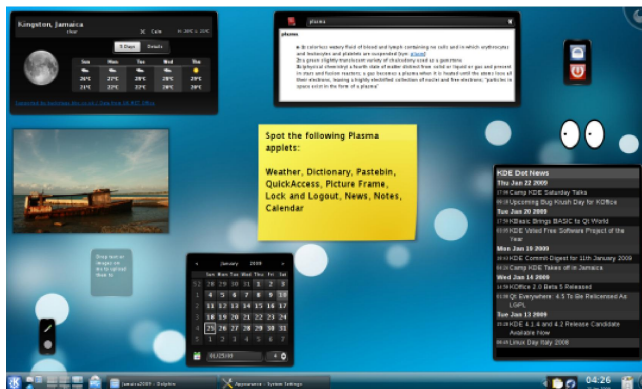

Figure 2: KDE4 Desktop Shell: widgets all around

**Figure 3: Ubuntu Notebook Remix: an approach
without widgets**

Moblin 2 noted these problems and used a panel that automatically hides itself. The main problem with this approach is that it does not work for touchscreen devices, but in this case you can trigger the panel with a hardware key. Unlike internet tablets and pocket computers, netbooks have a keyboard and a mouse, so the problem of not having a hardware key is not important for them. The default look and fell of Moblin 2 can be seen in Figure 1.

Starting from the idea that auto hide panels are best, the best location to put a panel would be on the top of the screen. As already stated, applications usually have menus, toolbars and window decorations. When showing the panel it is better to cover this region with the application, instead of places where it may have content or status messages. So it is a natural choice to put the panel at the top of the screen, avoiding the problem of covering a user's content.

THE DESKTOP

Plasma brought a revolution to user's desktop with KDE4 (See in Figure 2). Usually desktop shells do not take advantage of the desktop and only use it to show a picture (wallpaper). Most of them also works like a file manager, so you can put files on your desktop. Looking at the average user's desktop you can see that he mostly uses the desktop as a launcher for applications, putting shortcuts all around it. The user also store the files in folders, so it is easier to organize everything.

Research with non-geek users showed that most of them used the desktop this way as it was the most obvious way to use the desktop that was presented to them when Windows 95 came to market. OSX created the concept of widgets, but only allowed them on a dashboard and used the desktop the same way as Windows. Plasma completely changed this with the vision that the user should use his desktop just like he uses his real desk, with widgets that are useful for him. Plasma also allows quick access to the desktop using a dashboard, that is a separate layer dedicated purely to widgets and displayed via mouse or keyboard shortcuts.

Xandros and Ubuntu's netbook interface do not have a desktop. Xandros just shows a full screen launcher with categories and Ubuntu shows a wallpaper and in front of it the launcher. Ubuntu's launcher seems to be better from a usability point of view, but it does not allow interaction with the desktop. Moblin has the concept of desktop with a wallpaper and shows it everytime that you are not inside an application but there is no way to interact with that. Figure 3 shows how Ubuntu's netbook interface looks like.

The first tab on Moblin's panel shows a home screen where you can put widgets of all kinds: weather forecast, tweeter feeds, images and even shortcuts to applications. It works like a dashboard and does not have a representation on the desktop. With this approach the desktop is just empty and useless and the user always sees this when closing an application. A better approach would be to at least return to

the first tab (home screen).

ACTIVITIES AND VIRTUAL DESKTOPS
The concept of virtual desktops is something that Linux and OSX users are very used to. Windows users do not have this idea and sometimes they do not understand at first how this feature can help but after a while they get used to it and start using it all the time. See Figure 4 for an example of virtual desktops in OSX.

Moblin implemented virtual desktops using the idea of zones: each zone is a virtual desktop and when the user opens an application it automatically goes to a new virtual desktop. Later the user can put applications on the same zone. KDE and Gnome also have the virtual desktop feature but Xandros does not have that with the simple user interface (virtual desktops appear when using advanced mode - KDE 3.5).

Plasma brought to KDE4 the idea of activities that are containers of widgets. This way you can have different groups of widgets for different daily activities like one for work, one for home, another for travel and so on. KDE 4.3 also enabled the user to tie an activity to a virtual desktop.

At first virtual desktops could only handle real applications, but with this feature enabled, now it is possible to also have desktops with different set of widgets for each virtual desktop. You can see how activities looks like on KDE in Figure 5.

A netbook is a product designed for mobility and due to that the user changes the way he organizes the desktop. A user traveling to London would like to see London's forecast and time and another user that has a picture of his family on his desktop may want to hide it while giving a presentation. This is how different activities and virtual desktops can help them with this use case. In the near future Nepomuk will also help warning the desktop shell that the "context" has changed and due to that the desktop can react automatically and change the way it is presented (like putting the netbook in presentation mode and it automatically switches to an activity called "Presentation").

REGULAR APPLICATIONS
When using netbooks, users tend to maximize all applications in order to use better the screen space available. As this is basically a problem that is handled by window managers there is not much that the desktop shell can do.

All netbook interfaces mentioned before let the user maximize his applications or already shows it maximized. But there are some bits that can be polished on the desktop shell that will improve the use of regular applications, like how to present a taskbar or even the use of widgets instead of full applications for some tasks.

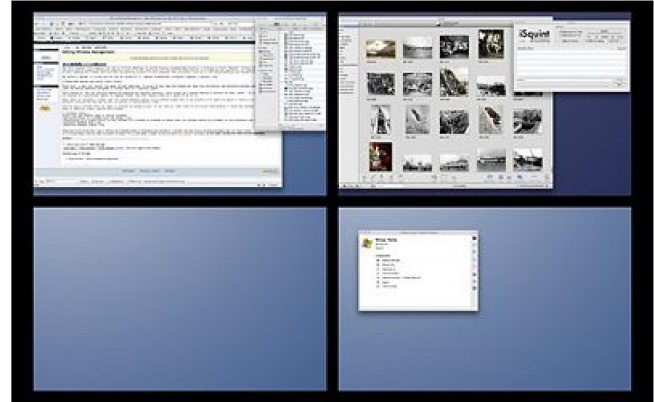Solutions not based on widgets like Ubuntu or Xandros just

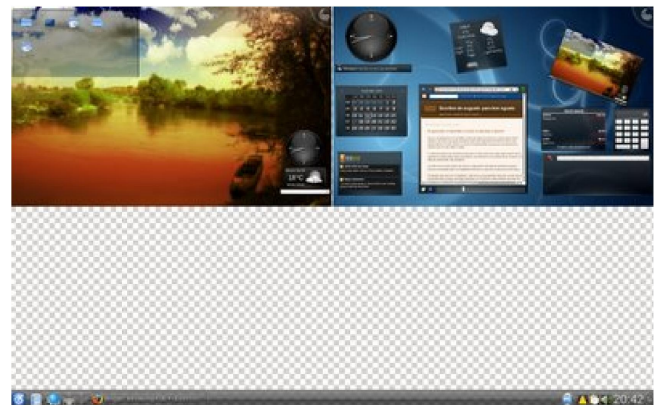**Figure 4: OSX's spaces are virtual desktops**

Figure 5: Activities on Plasma: set of widgets

provide the famous Alt+tab shortcut to change between applications and also the taskbar on the panel to select the application you want to go. Windows also has the same approach but lacks window management power, which means that in Linux's solutions you are able to install a more powerful window manager (Compiz or KWin) that will enable some effects for you. Moblin's approach shows a "preview" of the zone (virtual desktop) and then you change to the new zone using the panel (a kind of taskbar).

To save space on the panel and enable an easy way to switch between applications we can just drop the taskbar and use the window manager features. Current netbook's hardware have a good support for composite (rendering of windows to an off-screen buffer) and effects like the Show Present Windows can solve all the issues as it shows all applications opened or just the applications opened on the current virtual desktop in an elegant way.

Some small applications can also be transformed into desktop widgets like news reader, microblogging, weather forecast, calendar, and others. This way the user saves interactions and if he needs something more advanced than a widget, the real application can be started with user interaction on the applet.
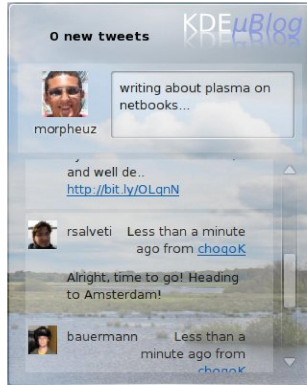
Figure 6: Microblogging Widget: web 2.0 world in the desktop

Figure 7: KDE4 Desktop Netbook Shell: newspaper containment

CONCLUSIONS

Almost all vendors started selling their hardware without putting the software in good shape and this brought some frustration to users. After a while they noted this problem and now they are looking desperately for solutions. A lot of vendors are just dropping the Linux support and choosing Windows as most users are already used to it.

Now KDE will try to fill this gap, delivering to users a desktop shell well suited for their use cases and that fits nicely in their hardware. It is all about custom experience instead of replicating the experience of a different world (regular desktops). To achieve this, basic components already available in KDE, like it's powerful window manager (KWin) and innovative desktop shell (Plasma), will be used and customized.

A nice panel that can show notifications, messages and easily trigger some components, the use of window manager's effects, all Plasma's widgets and desktop features, art work and the experience from the Open Source community can deliver a good product to be used by vendors. Later vendors can customize the interface to match their brands and users will be able to get the most of their netbooks.

A desktop shell that fits nicely on a netbook is currently being developed by KDE community. It uses all the concepts that we can find in Plasma but also has some new ideas like the new default activities: *Newspaper* and *Search and Launch*. The new shell is also simpler than the regular one and due to that consumes less resources.

The *Newspaper* activity is where the user will put all his widgets and the layout of this activity will be just like in a newspaper (2 columns). The other activity (*Search and Launch*) uses KRunner to enable the query of different content (applications, documents, contacts, conversions, etc..) and have a strip to save the user's favourites actions. Later other kind of activities may be added in order to fulfill user's requirements like a media based activity [10] for media consumption or a personal information manager

activity.

Widgets that already exists will be used like the *Weather* widget, *RSS Reader*, *Microblogging* (featuring twitter and identi.ca as can be seen in Figure 6) and *Picture Frame*. Others are still under development but are very important to the project like *Lionmail* (for user's e-mail) and *OpenDesktop* that provides social interaction between different users. New features like network transparency [11] in Plasma will also improve relation between the user's netbook and other Plasma enabled devices.

As proposed before, the panel is placed at the top of the screen and is used to close applications, switch between them with a button that triggers the Show Windows effect, switch between the containments and has some widgets like clock and systemtray. Figure 7 shows the very first version of this UI.

Advanced users will also be happy because they can go back to the regular desktop shell (plasma-desktop) easily as the new shell uses all the infrastructure already present on KDE.

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