Going Mobile with Next Generation Devices

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Increasingly, executives and staff are mobile, moving from place to place to better serve customers. This has often meant the portage of electronic gadgets or tools to ensure productivity while in hotels, airports, train stations, in taxis and, oh yes, at customer's offices. It is not at all uncommon to see one of these "road warriors" carrying a mobile phone, a PDA, a GPS, a laptop computer and a projector. Each of these devices often has its own charger, power cables and cables allowing each device to connect to all of the others.

This paper will explore the requirements of the road warrior and what Intel and other suppliers are doing to address the problems these highly mobile, disconnected workers face.

ONE'S TOO LITTLE, THE OTHER IS TOO BIG

Much of the time, mobile executives need something more than a PDA or Smartphone but, less than a laptop. This is the reason that both of these devices are in their luggage.

They like the instant-on, put-in-your pocket PDA or Smartphone because they make it possible to retrieve messages and important information; send short messages; and even look up telephone numbers, street addresses or get directions to their customers' offices. The screens, however, are really too small to allow serious data entry, authoring of important documents or access all of the organization's critical applications.

Laptops, on the other hand, offer these travelers all of the tools that they have available at their offices. Full keyboards make data entry, authoring of documents or messaging a breeze. Large, bright screens make it easy for business applications, websites or corporate applications to be easily seen. These machines offer sufficient performance, memory and storage to take on all but the most costly desktop systems. Laptops, however, won't fit in a pocket, take up most of a briefcase and often have a disappointing battery life.

Traveling executives often wish there was something between these two types of devices that would have the utility of either a PDA or Smartphone and the power of a laptop computer. Unfortunately, they're stuck carrying multiple devices, cables and rechargers that contribute to inefficiency.

The requirements for an ideal mobile device differ broadly. Each company has its own set of needs and wants the devices they select to deal with those needs effectively. So, no single device is going to meet the needs of everyone.

Many in the industry have been working on putting together devices that meet the requirements imposed by different communities. Each proposed solution combines a different combination of the capabilities of a PDA, GPS, Smartphone and a laptop computer.

Combining all of these capabilities into one small, battery powered device is not an easy task. Several different factors can stress today's battery technology resulting in an unsatisfactory battery life including the following:

- Putting this much hardware and software into a small device can consume a great deal of power
- Operating systems, in the attempt to support the broadest range of applications, often are large. This software, while necessary, often adds to the memory and storage required. Memory and storage consume even more power.
- Today's graphical, feature rich applications also often require fast processors and large amounts of both memory and storage. As with the other factors, the introduction of these applications can increase levels of power consumption

Keeping things small and power consumption to a minimum is a challenge developers constantly face.

WHERE SHOULD DEVELOPERS LOOK FOR ANSWERS?

Some suppliers have addressed this divergent set of needs by building small general purpose handheld computers. To date, the compromises these suppliers have made to reduce a laptop to that size have resulted in devices having a short battery life, limited keyboard and a memory and storage configuration that is barely able to support small applications. Because these compromises have made the devices acceptable to only a portion of the road warrior audience, they've met with limited market success.

Some in the industry believe that building smaller and smaller general purpose systems is the wrong approach. These people believe that building successful future devices starts with a different perspective, one that says that it would be better to develop custom and selective solutions that address the needs of specific vertical and horizontal market segments, staff functions and workload requirements.

Many of these people believe that it would be best to start with a highly customizable operating system, such as Linux*. These people believe that it would be far easier to create touch-screen devices that provide necessary capabilities, can work with today's devices and can provide needed solutions.

MOBILE LINUX CAN HELP

Since developers of small devices really don't want to invest their limited research and development monies on creating their own custom operating system and development platform, Linux is increasingly being considered as a solution. Linux offers a low cost, open, highly customizable platform that would be ideal for the next generation of mobile devices.

BENEFITS OF LINUX

Linux already provides developers with a large portfolio of development tools, development frameworks, data management tools, networking protocols and of applications that would be beneficial for a mobile device.

Up until now, however, developers have had to choose between purchasing a Linux platform that has been customized to support embedded applications and trying to adapt a general purpose Linux distribution to fit the new device.

CHALLENGES OF TODAY'S EMBEDDED LINUX PRODUCTS

They've discovered that embeddable Linux platforms can be costly although these platforms provide some economies of scale. Many of the capabilities the developer needs were available.

General purpose Linux distributions don't work very well on hardware designed to be embedded in small, responsive devices. While they can be adapted for this

new purpose, the development of device drivers for new devices and overall support can be costly.

MOBILE AND INTERNET LINUX PROJECT

The mobile and internet Linux project (http://www.moblin.org) was started in order to address the requirements of these next generation devices.

Some of the group's initial projects include an image creator for embedded software, a platform-specific kernel, a user interface framework, power management software, network profile manager, a mobile Web browser, a multimedia player, camera software and even chat software.

The goal of this projects is to allow Linux software to be moved onto these future devices in a way that lowers the costs of developing and supporting custom and selective solutions for embedded systems.

SUMMARY

Intel and other suppliers are investing heavily in addressing the needs of a road warrior. The result will be hardware platforms that can address the specific needs of different markets and different staff functions. Mobile Linux is one of the tools that will make this goal achievable.

The mobile and internet Linux project is very likely to become a significant tool for the developers of next generation mobile devices.