Light Weight, Low Energy OS, Contemporary Technologies Available for Wearable's.

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***Abstract*—Wearable devices are a new form of mobile computer system that provides exclusive and user-personalized services. Wearable devices bring new issues and challenges to computer science and technology. This report summarizes the development process, current situation and important software research issues of wearable devices related to development of Light Weight and Low Energy Operating Systems.**

I. Introduction

The primary point of this topic is to describe and explain what is light weight operating system?. To know the characteristics, advantages and disadvantages of light weight OS. We mainly concentrated on various kinds of Light weight, Low energy operating systems and their applications that are used in this era.

II. Light Weight Operating System

A lightweight operating system is one used in a large computer with many processor cores, termed as a parallel computer. One major benefit of lightweight os is that they use very minimal system resources. So, on your modern PC with lots of speed and ram, using a lightweight OS which consumes so little of your system resources will reserve more resources for running the main software or apps you intend to. Drawbacks of light weight OS are it comes with very minimal user interface and lags in important features that we may use for some specific tasks.

III. Low Energy Operating System

Day by day number of Operating systems increases proportionally with number users. But nowadays which OS we are using mostly are very power consuming. So we are giving priority to some Low power consuming OS like Gentoo Ubuntu, Lubuntu, Arch Linux, Puppy Linux.

The Internet has penetrated into our daily lives to a large extent.

Today, much of the computation goes online like performing calculations, converting file into different formats, even reading, writing and saving files online is possible by the medium of Google docs. Recently the introduction of Chrome operating system by Google brought the operating system, itself online.

In simpler terms, in near future, neither setup would be required nor would anything be required to be installed in our computers; everything would be online; just an internet browser would be necessary to cater all your computations and system requirements.

We are having a model of future low power OS and the process are

1. Access based file prediction, 2.Local power shutdown, 3. CRAMES (Compressed RAMs for embedded systems) and warp processors, 4. Tick-less Kernel.

IV. Applications of light weight and low energy operating system.

A. Applications of Light Weight Operating System.

Now coming to the applications of light weight and low energy operating systems wearable devices are one of the examples. Every part of our body is having some wearable technology like a smart watch for hand, smart ring for fingers, smart shoes smart socks for foot and smart belts, etc. A wearable device is more convenient for users to use and carry due to its miniaturization, lightweight, and dressing. Their functions, forms, and usages are different from tablet computers and mobile phones. Wearable devices are a new form of mobile computer system that provides exclusive and user-personalized services. Wearable devices bring new issues and challenges to computer science and technology. This report summarizes the development process, current situation and important software research issues of wearable devices. But the main aim to build a light weight and low Power operating system is to use it for light weight devices like wearable devices. The physical form factor of most wearable devices leaves little room for the electronics. A wearable device can pack an amazing array of peripherals for its size but memory capacity is the one area where geometry can't be Sur-passed. Wearable devices are designed to have the same computing abilities as mobile phones and tablet computers. The development of wearable devices is thus bound to encounter various problems such as functional singleness, incompatibility between operating system and software, the convenience of human-computer interaction, data

transmission, confidentiality of the information, energy consumption problems brought by continuous running.
The operating system is the interface of hardware and software. Its function is to manage hardware, software, and data resources, to control program execution, to improve human-computer interaction, to enable users to have a good working environment and to provide services for users and support for other applications.
Developers are facing difficulties to choose which operating system for the device. And the application for one operating system is not suitable for another.
Since the operating system is essential for wearable devices, we should design wearable operating systems by taking the features of wearable devices into account so that we can achieve the following objectives.
1) Convenience. The design of the operating system should be more convenient for users to use wearable devices.
2) Effectiveness. The operating system should be managed more effectively and take advantage of resources like hardware, software, and data of wearable devices.
3) Scalability. The operating system should permit new system functions to be developed, tested, and included.
4) Openness. The operating system should support integrated and collaborative network work of different manufacturers and devices so that it can achieve the portability and interoperability of applications.
5) Multitasking. The operating system should be able to run multiple applications concurrently.

B. Applications of Low Energy Operating System

Energy consumption management is an essential issue for wearable devices.
Because wearable devices can only use battery, rather than stationary power, as their power supply, it is more tedious to charge wearable devices than mobile phones. Frequent charging or replacing battery can inevitably reduce the practicability of devices and the preference and satisfaction of users. In addition, the large amount of energy consumption for devices can produce great heat. If the cooling problem cannot be handled properly, it will damage user experience or even cause low temperature scald. Therefore, the energy consumption of wearable devices is an issue worthy of attention. At present, manufacturers control energy consumption of wearable devices or mobile phones through the design of hardware or operating systems.
In addition to hardware and operating systems, we can also consider improving energy consumption control from a high-level application layer. Particularly, the control of energy consumption can be considered from the following aspects at the application layer.
1) Reduce hardware electricity consumption through reasonable invoke of system APIs. For example, Hao et al. and Li et al. proposed the code-level energy consumption analysis methods on mobile applications. Such methods can be extended to wearable devices to achieve the purpose of reducing energy consumption through invoking less energy-consumption API or arranging reasonable invoking sequence.
2) Create adaptive energy-sensitive applications to adjust automatically energy usage. When the energy is sufficient, high quality services will be provided; otherwise, unimportant applications will be turned off in order to increase the usage time. Mizouni R et al used in such adaptive strategy to reduce the energy consumption of smart phones in mobile applications.
3) Adopt load-balancing method to transfer complex calculation to the mobile terminal via wireless communication network, thus reducing wearable device's own energy consumption. Kwon et al. presented a method to solve the problem. A similar approach can also be introduced into wearable devices through replacing high calculation energy consumption with low communication energy consumption.
• Wearable devices will become the mainstream of the development of mobile smart devices, and dramatically change the modern way of life.
• The only way to boost up the development of wearable devices is to design a full-featured real-time operating system (RTOS).
• This can help get smart wearable products up and running quickly. An RTOS can help minimize memory demands in wearable devices.
• The RTOS itself can have a small footprint and provide a deterministic behavior that keeps code compact.

V. Conclusion

The problem of the light weight, low power operating system rose because in our past we never thought that the problem of weight, power consumption would arise. In near future, most of the applications would go online by using cloud computing. So we would work and focus mainly on optimizing the hardware for light weight and low power of the network applications and system at both the levels: end user and server level, so that history would not repeat itself. The present methods are very much efficient in saving the power of the operating system but still lot of research is going on in this area. There is a great need to address the light weight operating system and its power issues which are going to be raised by the future systems considering the growth in the number of the systems being produced now. Energy would be the key issue tomorrow as per the present conditions of the power resources in developing and underdeveloped countries.

VI. References

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