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USER-PRESENCE AWARE SYSTEMS

ABSTRACT

This project proposes to build a user presence aware system which will run from your laptop or desktop. It has its inspiration drawn from a certain project conducted under the Project Oxygen at MIT. We propose to use bluetooth as the basis of "knowing" about the user's presence. Bluetooth is a very commonly available technology now, built into your everyday phones and other computing devices. So it would be befitting to explore the possibility of the usage of bluetooth for our purposes. Once the system "knows" about the presence or perhaps the absence of the user it can switch to the respective mode. The first thing to do when a user leaves the system would be to switch to a lock-screen mode, or if the user wishes to a sleep or suspended mode. If in a lock-screen mode the system may notify the user of any new events like an email or an incoming internet call, thus allowing the user to be on the move. Further extension would be to devise a method to use the users distance from a pc or laptop to transfer running applications to the nearest system. Such an extension is meant for environment where the user may have more than one system in his/her home.

MOTIVATION

It is a very common practice that one puts the computer to sleep (for power saving) or on a lock-screen mode (for security/privacy) when one leaves the computer. Bluetooth is ver commonly available device, integrated with most of our phones. It will be very convenient to do this automatically. In today's scenario it is common to have more than one computer in a home or workplace. It would be very desirable if the applications we are running on one computer could follow us around as we move from one computer to the other. Our project tries to achieve a practical solution to this problem.

ASSUMPTIONS

1. It is assumed that every user has a bluetooth device/bluetooth integrated device.
2. Our solutions would run on a Linux OS environment.
3. It is assumed that the user has administrative rights on the system(s) in question.
4. The computer has integrated bluetooth devices and LAN enabled.
5. It is further assumed that the user will have the personal bluetooth device charged and a discharged condition has been ruled out. Considering that we are targeting phones, it is assumed that the user keeps the phones sufficiently charged.

6. For the notifications regarding emails, it has been assumed that there is access to the mailserver

WORK PLAN

1. Our work begins with *literature survey* about similar work done in the past. We have located certain works done as a part of MIT's Project Oxygen, where a user-presence aware system had been built. We propose to build a system on similar lines but using bluetooth technology.

2. Next step is to get familiar with bluetooth programming. We have begun with reading and understanding the bluetooth specifications and the underlying protocols. We plan to use BlueZ, the bluetooth protocol stack for linux. The working environment would be Linux, and programming in C or Python.

3. The basic blocks of the project would be :

    (i) Device discovery
    (ii) Name-lookup
    (iii) Communication (using RFCOMM / L2CAP)
    (iv) Pairing Devices (identify the user's device by registering it)

    Device discovery is essential part of the process because it makes the system aware of bluetooth devices in the environment. It consists of a scan of the environment and then identify the device using name lookup. Name lookup will map the address to the name of device and hence identify the device in question.

4. Next we build necessary functionalities required for detecting the user's presence absence (based on fading signal strength). Once this has been achieved the machine can be put to sleep or lock-screen mode as user prefers. If in lock-screen mode, the user will be updated about any new emails or notifications from pre-decided applications like mail clients, VOIP clients. These notifications will be put across using SMS services or email if the mobile device is connected to the internet.

5. Next step will building the necessary functionality for the making user-presence aware machines. Transferring application (like music playing) along with the user to the nearest machine available. This will use bluetooth the check for nearest machine and use LAN or WLAN to transfer application data.

The following is the process flow diagram: