

Tetherless Computing Proposal: VMPod The Wireless Session Synchronization Solution

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1 Introduction

Imagine the following scenario: You finish working at your home computer save everything you were working on to the small wireless VMPod sitting in your pocket. You then arrive at work where you sit down at a computer and the VMPod seamlessly transfers not only your work but the entire operating system environment from home to the computer allowing you to continue work. We propose to develop such a system by exploiting a feature of VMWare which allows the entire state of virtual machine running Windows or Linux to be saved as a *snapshot* and later restored. The system will transfer this snapshot to the VMPod, which for our purposes will simply be a wireless PDA with an iPod attached. The VMPod can be disconnected and transported between locations and the snapshot wirelessly synchronized with other computers running VMWare when the next wireless network is encountered.

2 Challenges

One of the most interesting challenges presented by this problem is how to efficiently transfer the large snapshot files over wireless link. We hope to take advantage of the structure of the files and use differential synchronization and compression to reduce the information being sent. Another challenge is that of allowing the VMPod to trigger the synchronization process as soon as it enters a hotspot. This issue is still the topic of ongoing research and will only be addressed when other challenges have been met. Once in the hotspot, keeping the snapshot on the VMPod constantly in sync while a VMWare session is being used presents another interesting problem which we hope to address. Issues of security become relevant when we extend our system to allow for a user to instantiate a VMWare snapshot on other untrusted machines. Allowing for time we would like to look at providing a layer of security between foreign operating systems and the VMs being run on them.

3 Architecture

The system will consist of a lightweight client application that runs on the VMPod and a server application running on the workstations along with VMWare.

4 Necessary Equipment

- VMWare Licenses
- 2 Windows/Linux machines for development
- iPods or other portable USB external storage
- PDAs with wireless and USB support

5 Timeline

Week 1 - Background research and environment setup

Week 2 & 3 - Implement simple wireless file synchronization between server and VMPod

Week 4 - Implement automated snapshot save and restore with VMWare

Week 5 - Optimize file transfer using general and VMWare-specific techniques

Week 6 - Performance Testing

Week 7 - Analysis and Report

6 Goals

We propose to build a working prototype of the VMPod system and undertake an initial analysis of its capabilities. Our analysis will focus on experiments investigating the time necessary to transfer snapshots to and from the wireless device.