Safe and Automatic Live Update

Cristiano Giuffrida

VU University Amsterdam

PhD Dissertation Defense

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A Decade of Modern Software Evolution

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The Halt-Update-Reboot Cycle

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**Restart Required**

In order to complete the update of your system it needs to be restarted.

Until you do so, security updates may not be fully applied, newly inserted or supported hardware may not function and new services may not be available.

Please make sure that you save all of your work before restarting.

[Restart Later] [Restart Now]
The Halt-Update-Reboot Cycle

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Windows Boot Manager

Choose an operating system to start, or press TAB to select a tool:
(Use the arrow keys to highlight your choice, then press ENTER.)

Windows 7
Ubuntu

Tools:

Windows Memory Diagnostic

ENTER=Choose TAB=Menu ESC=Cancel
The Halt-Update-Reboot Cycle

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Massive risk in operating outdated software

Upcoming deadline presents a big opportunity to cybercriminals as they will be able to uncover vulnerabilities without worry of Microsoft providing patches

By Naushad K Cherrayil Staff Reporter
Published: 21:22 April 3, 2014

“The upcoming deadline for Windows XP is something that presents a big opportunity to cybercriminals as they will then be able to uncover vulnerabilities without worry of Microsoft providing patches,” said Ghareeb Saad, senior security researcher, global research and analysis team at Kaspersky Lab.
The SCADA Patch Problem

Industrial control systems vendors are starting to patch security bugs, but actually installing the fixes can invite more trouble

Kelly Jackson Higgins January 15, 2013
First in an occasional series on SCADA security

If you think database patching is onerous and fraught with risk, then try patching a SCADA system that’s running a power plant. With post-Stuxnet paranoia pressuring major SCADA vendors like Siemens to regularly respond to vulnerability finds with software patches, utilities and other organizations running industrial control systems (ICS) face some serious decisions over where and when to patch -- if at all.
No Time for Downtime
Solution: Safe and Automatic Live Update
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The Proteos operating system

Microkernel
The Proteos operating system

Microkernel
Mutable Checkpoint-Restart
Solution

Live update for the entire software stack
Meanwhile, in a Parallel Universe...

“The average user has never experienced
a restart or failed update in her lifetime
and update alerts have passed into history”

The long-term dream