Performance analysis of the full-virtualization environments

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Presentation Outline

Objectives

Analysis of efficiency of virtualization environments.
Analysis of Xen virtualization environment performance.

Hardware

Research equipment specification:

Processor: Intel Core i7 930 - 4 cores, Hyper-Threading, VT-x technology

Network: 1Gbps Realtek RTL-8139

Memory: 12GB RAM

Host System

Virtualization environments specification:

- Xen Cloud Platform 1.6.07, Xen: 4.1.3
- VMWare ESXi 5.1.0, VMKernel release build number: 799733
- Microsoft Windows Server 2012, Hyper-V 2012

Guest System

Guest systems specification:

- Debian 6.0.6 Stable / Debian Testing
- Kernel: 2.6.32-5-amd64 / 3.2.0-4-amd64
- 1 CPU
- 2GB RAM

Performance analysis tools

Phoronix Test Suite:

- Phoronix Test Suite - Memory: 9 tests
- Phoronix Test Suite - Processor: 22 tests

How the experiments were conducted

The efficiency of processor and memory was tested.
The tests were run in parallel for 1 and up to 5 concurrently running guest systems.
The results were averaged and normalized.

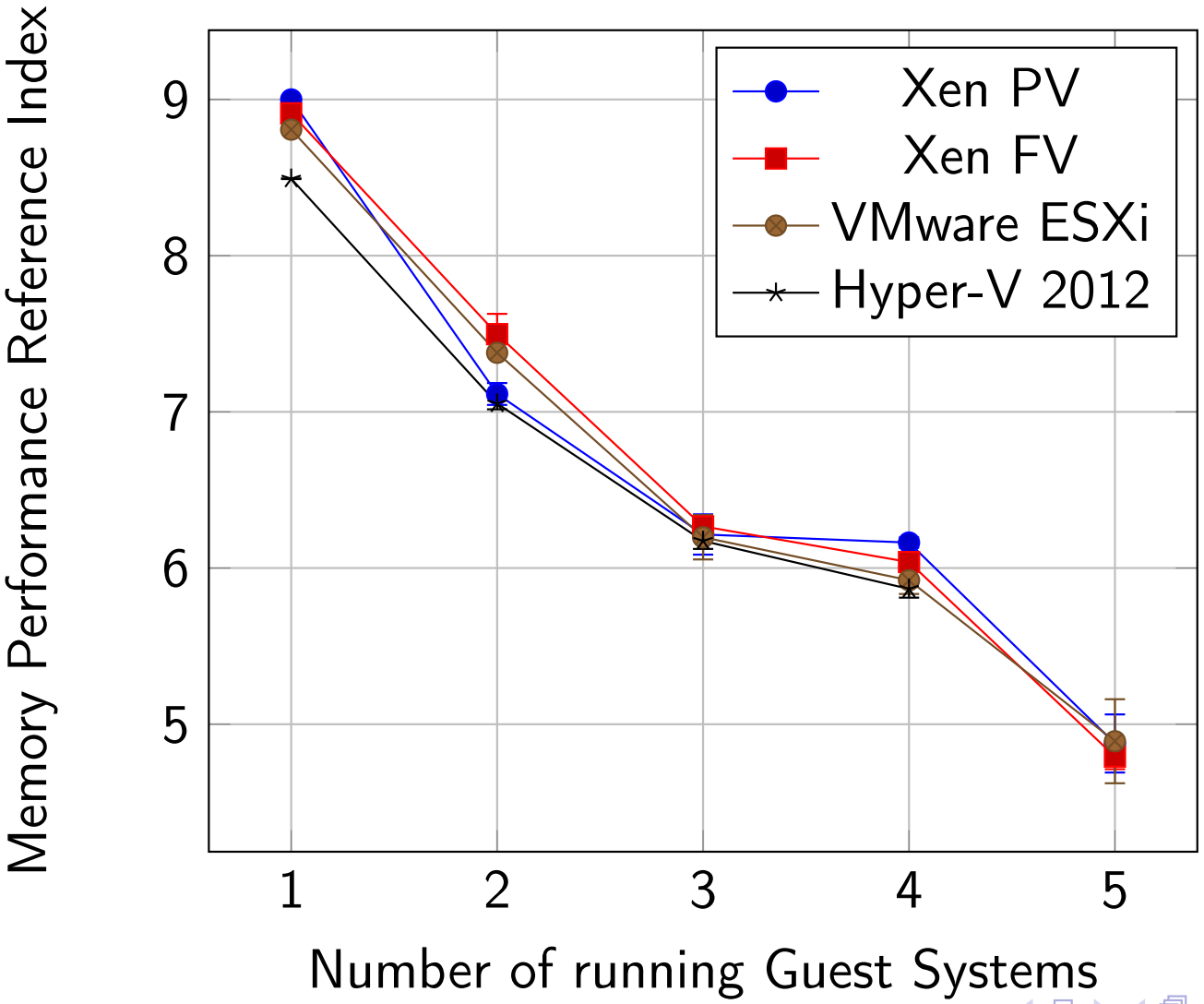
Results normalization

Reference Index (R_I) definition: $R_I = \sum_{n=1}^{N} \frac{T_n^{HIB}}{R_n^{HIB}} + K - \sum_{k=1}^{K} \frac{T_n^{LIB}}{R_n^{LIB}}$

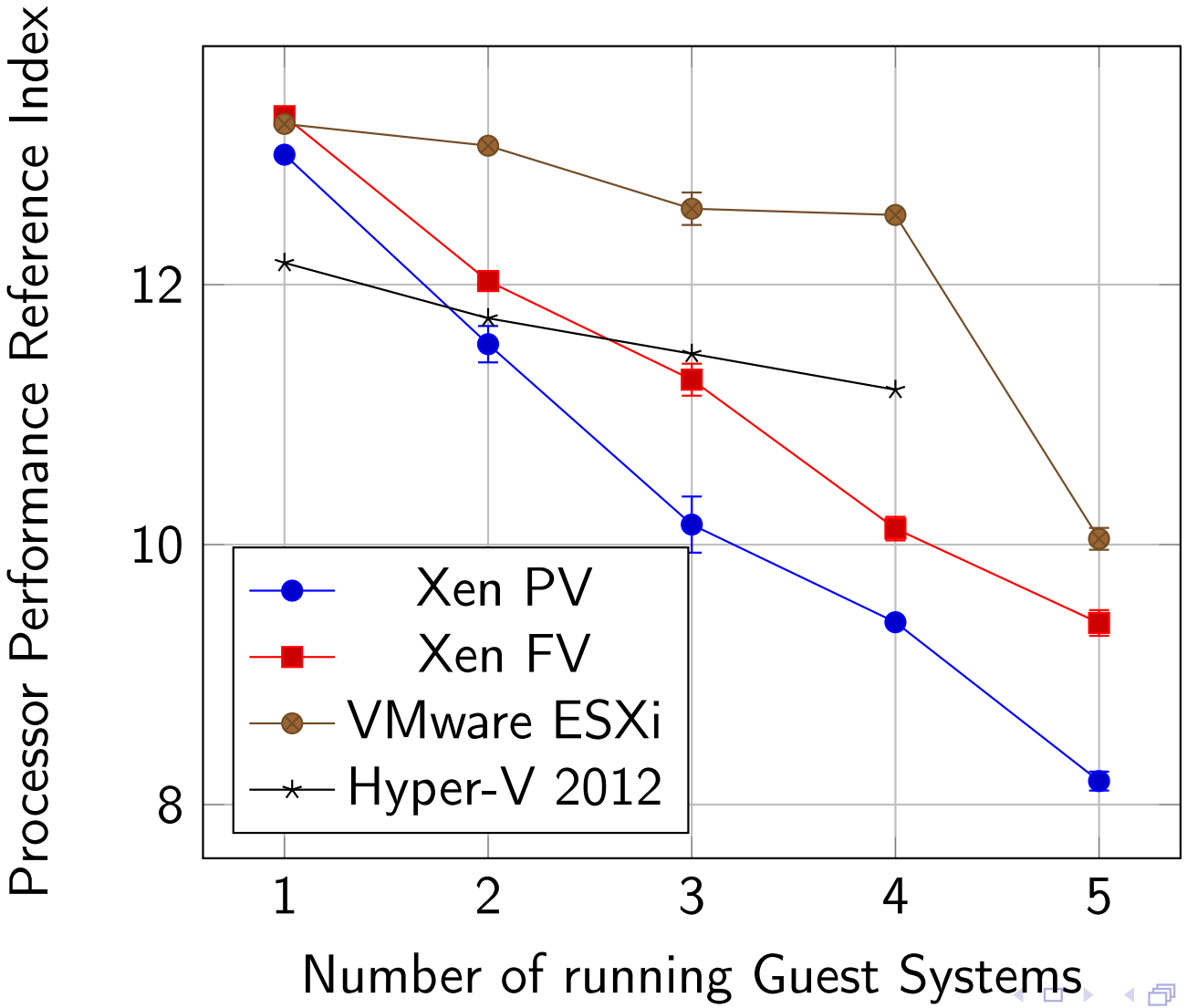
Where:

N - number of **higher is better** test results
K - number of **lower is better** test results
T_n^{HIB} - average of **higher is better** n'th test result
R_n^{HIB} - average of reference **higher is better** n'th test result
T_k^{LIB} - average of **lower is better** k'th test result
R_k^{LIB} - average of reference **lower is better** k'th test result

Memory performance analysis



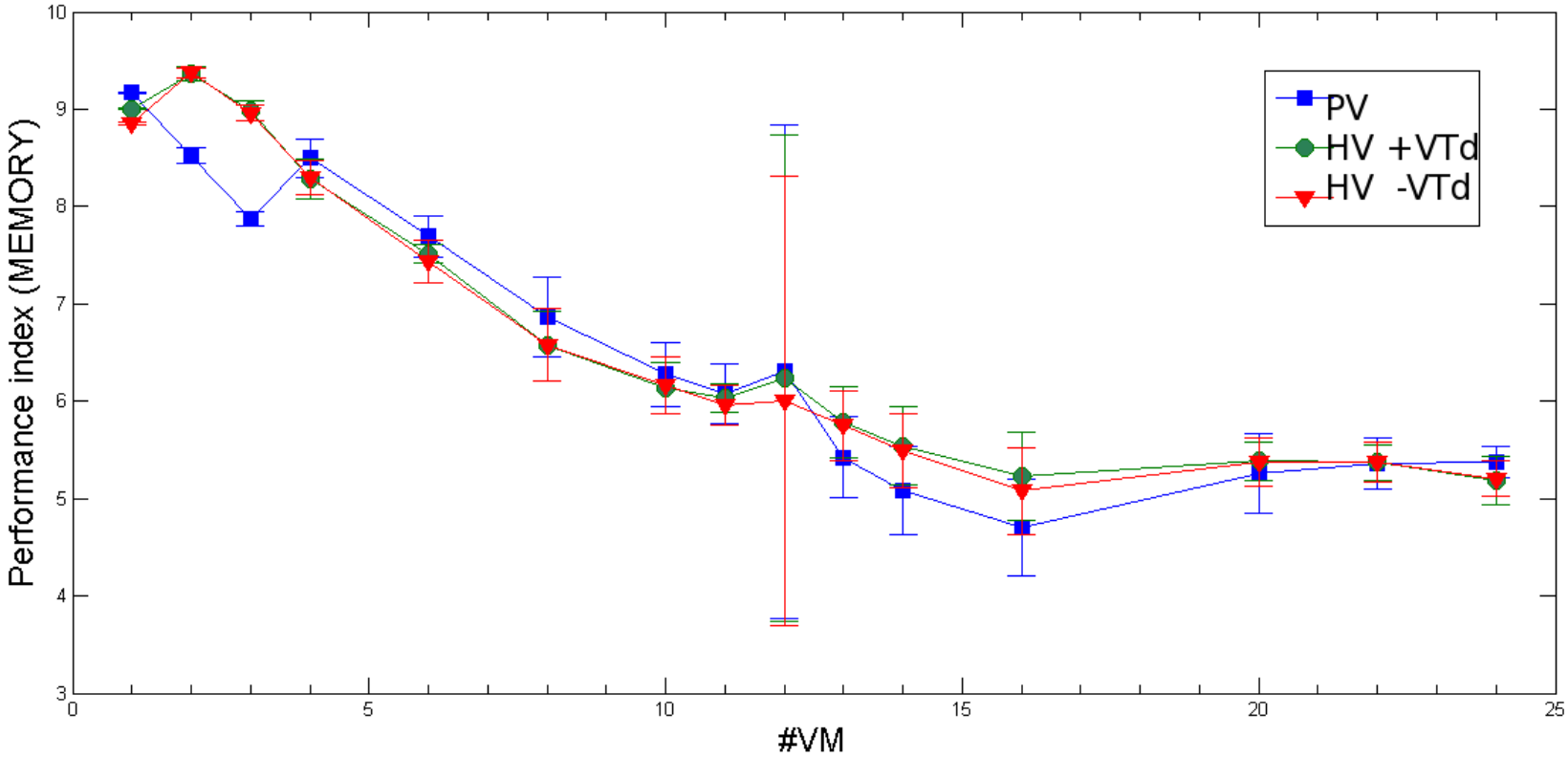
Processor performance analysis



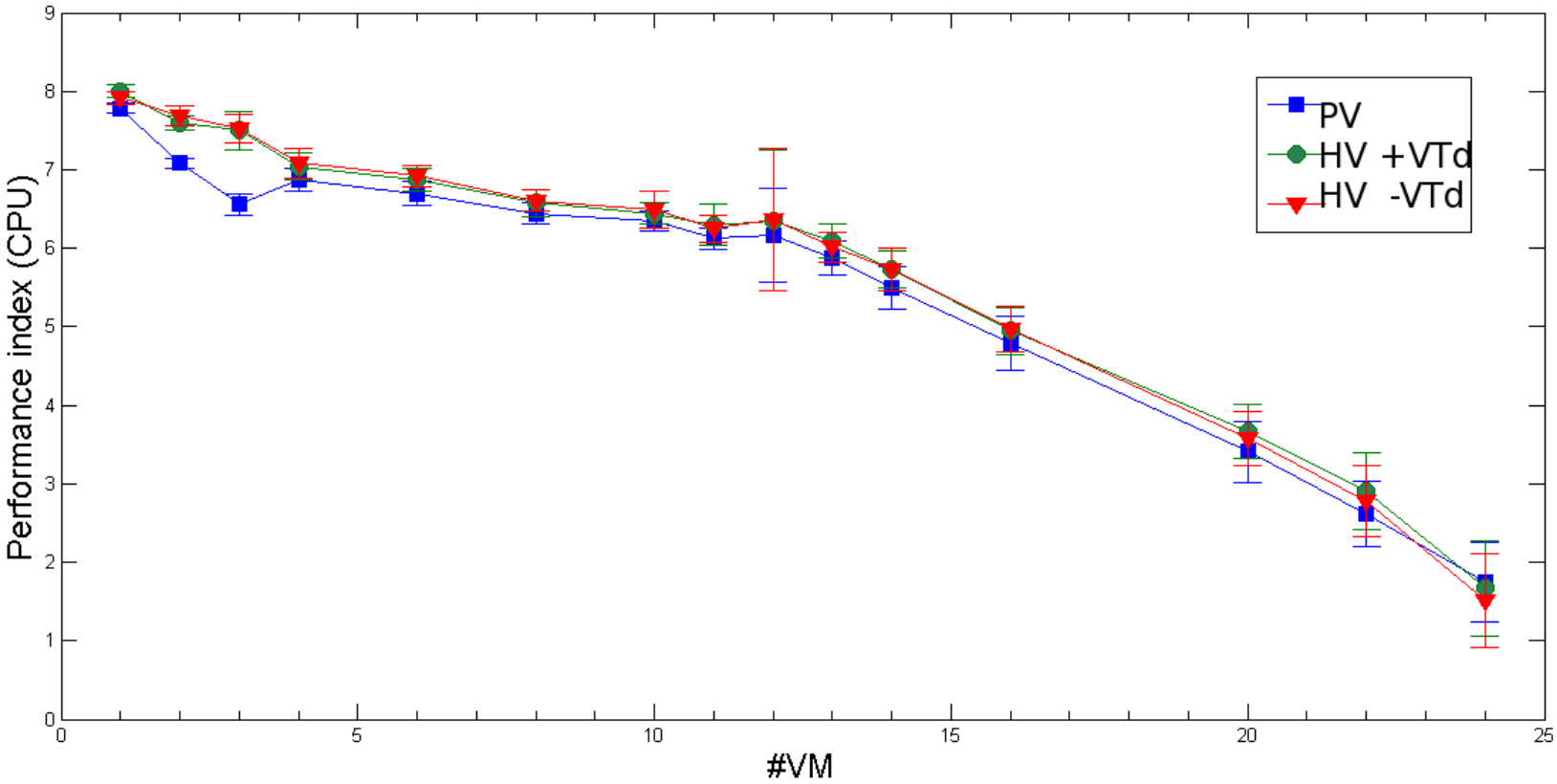
Current work

Focusing on newer versions of virtualization environments running *real* (Xeon-based) server platforms.

Current work



Current work



Questions?

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Thank You for Your Attention!