The Xen Port of Kexec / Kdump
A short introduction and status report

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Outline

Introduction to Kexec
  What is Kexec?
  Kexec Examples
  Kexec Overview

Introduction to Kdump
  What is Kdump?
  Kdump Kernels
  The Crash Utility

Xen Porting Effort
  Kexec under Xen
  Kdump under Xen
  The Dumpread Tool
  Partial Dumps
  Current Status
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Configuration help text in Linux-2.6.17
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...as long as the new kernel doesn’t depend on the BIOS for setup.
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▶ kexec vmlinux –append="root=/dev/hda3"

Xen

▶ kexec -t multiboot-x86 /xen.gz
  –append="/xen.gz com1=115200,8n1,0x3f8"
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- Linux kernel support available through `CONFIG_KEXEC`.
- `kexec-tools` provides the user space tool `kexec`.
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Development:

- Discussions take place on the fastboot mailing list.
  - [https://lists.osdl.org/mailman/listinfo/fastboot](https://lists.osdl.org/mailman/listinfo/fastboot)
- Many patches available for `kexec-tools`. 
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- The Crash Utility

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- A core dump represents the contents of a process.
  - User space register contents and virtual memory.
- A crash dump represents the contents of the kernel.
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Kdump is used to extract a crash dump from a crashed machine. The crash utility is later on used to analyze the crash dump.
A Kdump enabled setup requires two kernels.

- **Primary kernel:**
  - Regular Linux kernel.
  - Booted with `crashkernel=` to reserve a physical memory window.
  - Configured with `CONFIG_KEXEC=y`.

- **Secondary kernel:**
  - "Crash kernel" which is used to retrieve the crash dump.
  - Started by the primary kernel when a panic occurs.
  - Runs in the reserved physical address window.
  - Configured with `CONFIG_CRASH_DUMP=y`.
  - `CONFIG_PHYSCIAL_START` needs to match crashkernel option.

The file `/proc/vmcore` contains the crash dump.

A patched `kexec-tools` is required to use Kdump.
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Magnus Damm (magnus@valinux.co.jp)

Kexec / Kdump

Xen Summit, September 2006
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The Crash Utility

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- List running processes.
- Backtrace and debug.
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More information about crash can be found at:
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  - This means that the hypervisor and all domains go away.
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The *kexec-tools* used under Xen are the same as for Linux.
Kdump under Xen

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Remember `/proc/vmcore`? It is used in the case of Xen too. The secondary “crash” kernel interface is unchanged. This means that the secondary kernel used as Linux “crash kernel” can be reused under Xen without modification.
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- Extract the hypervisor.

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- Extract the hypervisor.
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Dumpread fully supports i386 and i386/PAE. Basic x86_64 support is in place too.
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The `dumpread` tool extracts information from Xen crash dumps. Supported crash dump operations:

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It is possible to use the `crash` utility directly on Xen crash dumps. Extraction of domU is however not supported by `crash`.
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</tr>
<tr>
<td>i386/PAE</td>
<td>OK</td>
<td>OK</td>
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<tr>
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Kexec / Kdump status: i386, i386/PAE and x86_64 are fully functional.

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Kexec / Kdump status: i386, i386/PAE and x86_64 are fully functional. Dumpread status: x86_64 supports extracting the hypervisor for now.

Our team is currently focusing on ia64 support.

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\(^1\)Xen, x86_64 and vmlinux requires a patched `kexec-tools`.  
\(^2\)Ia64 support not included in mainline Linux yet.
The Xen port of Kexec reboots the *entire* physical machine.
Kdump under Xen triggers a crash dump from Xen *and* dom0.
i386 and x86_64 are ready *now*. ia64 is under development.

Any questions?