﻿Changes in 2.6.8 (May 3, 2015):

- CPU / CPUDB

- Bugfixes for CPU emulation correctness (critical bugfix for x86-64 emulation)

- Memory type calculation support for Bochs debugger and instrumentation,

to enable configure with --enable-memtype option.

- CPUDB: Added Pentium (P54C) configuration to CPUDB

- CPUDB: Added Broadwell ULT configuration to CPUDB

- Updated definition of instrumentation callbacks, see description in

instrumentation.txt / Fixed instrumentation examples

- Configure and compile

- Configure option --enable-fast-function-calls now also used for MSVC nmake.

- Some configure fixes for the GTK debugger support.

- GUI and display libraries

- The VGA update timer mode now can be selected with the 'vga' option.

- Release all pressed keys when the simwindow gets back the keyboard focus.

- Win32 gui: Captured mouse cursor now really trapped in window.

- SDL2: Implemented yes/no dialog (e.g. for VVFAT commit).

- Some fixes for wxWidgets 3.0 and unicode version compatiblity.

- Full save/restore support for enhanced gui debugger settings (window+font).

- Added debugger support for the term gui using a pseudo-terminal.

- I/O Devices

- Hard drive

- Added Oracle(tm) VM VirtualBox image support (VDI version 1.1)

- Re-enable "bulk I/O" repeat speedups extension.

- Some lowlevel cdrom code fixes for Windows and Linux.

- Sound

- SB16: Fixed OPL chip detection by implementing ISA bus delay.

- SB16: Ported OPL3 emulation from DOSBox and partly removed legacy code.

- ES1370: Added MIDI UART output support.

- ES1370: Fixed critical bug that made Win9x drivers crash.

- Major rewrite of the lowlevel sound code.

- Added mixer thread support (required for all modules except 'sdl').

- New mixer and SDL mixer are polling data from the PCM output buffers,

the PC speaker beep generator and the OPL3 FM generator.

- PCM format conversion to 16 bit signed little endian.

- Added sound 'file' module for VOC, WAV, MID and raw data output

and added dual output support (device+file) in midi/wave mode 3.

- Added capability to set up the sound driver per service.

- Floppy

- Fixed "Read ID" command for single-sided media (patch by Ben Lunt).

- ROM BIOS

- Fixed keyboard scancode processing after keyboard intercept.

- Fixed rombios32 code to avoid incorrect ACPI table detection.

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Changes in 2.6.7 (November 2, 2014):

- CPU / CPUDB

- Implemented AVX-512BW/AVX-512DQ/AVX-512VL extensions emulation.

- implemented AVX512-IFMA532 instructions emulation.

- implemented AVX512-VBMI instructions emulation.

- Bugfixes for CPU emulation correctness (critical fixes for AVX-512, CMPXCHG16B and VMX)

- Fixed Bochs segmentation fault crash with Handlers Chaining Speedups enabled when

compiling with gcc, especially with low optimization levels.

- Reverted removal of reporting Architectural Perfmon support in pre-defined CPUID modules.

Windows 8 and Windows 10 require Performance Monitoring to be reported to boot.

To workaround possible Windows 7 64-bit installation issues: use bx\_generic CPUID module,

which doesn't report Performance Monitoring in CPUID.

- GUI and display libraries

- The VGA update timer and the status LED timer now always use the realtime mode

independent from the 'clock' option setting.

- Added native SDL2 GUI support to Bochs. To enable configure with --with-sdl2.

- Added new user shortcut "scrlck" (SDL/SDL2 using "Scroll Lock" for fullscreen toggle).

- Write enhanced gui debugger settings to file on exit and restore on initialization.

- I/O Devices

- USB

- xHCI model now emulates a NEC/Renesas uPD720202 device (patch by Ben Lunt).

- Added USB port specific option 'size' for VVFAT disks (range 128M ... 128G).

If the size is not specified or invalid, it defaults to 504M.

- Hard drive / HD image

- Fixed crash when using a "fixed" type VPC image.

- ROM BIOS

- Fixed int74\_function() for 4-byte (wheel mouse) packets.

- LGPL'd VGABIOS updated from CVS (fixed building VBE modes list)

- Misc

- Visual Studio workspace files updated to VS2013Ex format.

- bximage\_old/bxcommit: removed old obsolete image manipulation tools.

- Documentation fixes and updates.

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Changes in 2.6.6 (June 15, 2014):

- CPU / CPUDB

- allow sandy bridge configuration even when AVX is not compiled in

- Configure and compile

- fixed compilation error when 3dnow support is enabled

- speedup Visual Studio build by almost 20% by adding /Gr compiler option

- Misc

- fixed minimizing win32 gui window and resolution change while minimized

- added compiled SeaBIOS 1.7.5 image into Bochs tree along with Bochs BIOS images

- documentation fixes and updates

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Changes in 2.6.5 (June 1, 2014):

Brief summary :

- CPU: extra 5-10% emulation speedup with new trace linking optimization

- CPU: implemented new instructions (e.g. AVX-512, SHA, XSAVEC)

- CPUDB: added 2 new CPU models

- Bugfixes for CPU emulation correctness (including some critical ones)

- Gui debugger output window now can be used as a log viewer

- Added built-in slirp (user-mode networking) support (ported from Qemu)

- Added global sound config option and volume control support to the devices

- Added new experimental gui 'vncsrv" using the LibVNCServer library

- Rewrite of the bximage utility in C++ for image creation, conversion and resize

Detailed change log :

- CPU

- Bugfixes for CPU emulation correctness (critical fixes for XSAVE, VMX, TBM/BMI and RDRAND instructions)

- Implemented FCS/FDS Deprecation CPU feature

- Implemented SHA instructions emulation

- Implemented XSAVEC instruction emulation and XINUSE optimization in the XSAVEOPT instruction

- Implemented AVX-512 instructions emulation (experimental)

! CPUDB: Added Intel(R) Core(TM) i7-4770 CPU (Haswell) configuration to CPUDB

! CPUDB: Added AMD A8-5600K APU (Trinity) configuration to CPUDB

- Replace 'SSE' and 'AVX' .bochsrc option with single 'SIMD' option which controls presence

of all CPU SIMD extensions from SSE to AVX-512

- Extra 5-10% emulation speedup with new trace linking optimization. The optimization

is enabled by default when configuring with --enable-all-optimizations option,

to disable trace linking optimization configure with --disable-trace-linking.

The optimization require to compile Bochs with at least -O2 optimization level on gcc.

- Bochs Debugger and Instrumentation

- Added disasm for Bochs internal instruction representation, especially useful for instrumentation

- Updated definition of instrumentation callbacks, see description in

instrumentation.txt / Fixed instrumentation examples

- added capability to use the gui debugger output window as a log viewer

- General

- Increased max. device log prefix size to 6 and added / modified prefixes

- plugin version now uses the native DLL handling code for all Windows ports

- critical bugfixes in save/restore functionality

- Configure and compile

- configure and compilation fixes for Cygwin and Visual Studio environment

- configure option --enable-cdrom now only controls the presence of

platform-specific code for device access

- building plugin version with MSVC nmake now supported

- Config interface

- Added global sound control option for the driver and wave input/output

- Added new bochsrc option to control the speaker output mode

- Added support to specify the initial time for 'clock' option in ctime(3) string format

- Added support for the LTDL\_LIBRARY\_PATH variable with MSVC plugins

- All SB16 / ES1370 options are now changeable at runtime

- textconfig: added menu item for saving configuration at runtime

- Added bochsrc option for the Voodoo Graphics emulation (experimental)

- I/O Devices

- Hard drive / CD-ROM

- seek latency implemented for ATA/ATAPI read commands

- portable ISO image file access now available on all platforms

- Networking

- added built-in slirp (user-mode networking) support (ported from Qemu)

- removed the "slirp backend" support (required external slirp binary)

- slirp/vnet: all supported TFTP extension options implemented now

- Sound

- SB16 / ES1370: added volume control support for wave output

- SB16: fixed audio distortion when playing stereo wave files

- ES1370: added 'wavemode' support similar to the SB16

- soundwin: added capability to specify the ID of the MIDI device to use

- Serial

- Serial mouse detection fixes

- Busmouse

- Non-functional device rewritten to make it work in DOS and Win95 guests

(use --enable-busmouse to configure and "mouse: type=bus" at runtime)

- ROM BIOS

- PS/2 mouse function: allow setting mouse packet size to 4 for wheel support

- GUI and display libraries

- Added new experimental gui 'vncsrv" using the LibVNCServer library

- RFB: set maximum resolution to 1280x1024 (same as vncsrv)

- RFB: don't wait for client connection on startup if timeout is set to 0

- Added mouse wheel support to the rfb, vncsrv and wx guis

- wx: added viewer window for the Bochs log output

- win32: fixes and improvements for the fullscreen mode

- Tools

- bximage utility rewritten in C++ for image creation, conversion, resize

and redolog commit. Now vmware4 and vpc images can be created.

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Changes in 2.6.2 (May 26, 2013):

- CPU

- VMX: implemented VMENTER to non-active guest state (HLT, SHUTDOWN, WAIT-FOR-SIPI)

- VMX: fixed write of guest segment access rights VMCS fields (32-bit field

was truncated to 16-bit)

- CPUID: Don't report Architectural Performance Monitoring in CPUID.

Reporting true capabilities without actually supporting them breaks Win7 x64 installation.

- CPUID: Fixed bx\_generic CPUID std leafs (all std leafs > 2 were corrupted)

- CPUID: Enable all supported VMX capabilities for bx\_generic CPUID configuration.

- CPUID: Enable X2APIC support for Ivy Bridge CPUDB configuration.

- Configure and compile

- Enabled VMX compilation by default in shortcut scripts.

- Allow CPU\_LEVEL=5 configurations (pentium\_mmx and amd\_k2\_chomper) even when Bochs was

compiled with CPU\_LEVEL > 5.

- Misc

- Fixes for Bochs port on MorphOS (based on a patch by Thore Sittly):

missing functions, byte-swapping and cdrom support.

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Changes in 2.6.1 (April 7, 2013):

- CPU / CPUDB

- Bochs is fully aligned with rev45 of the of Intel(R) Architecture Manual.

- Implemented Supervisor Mode Access Prevention (SMAP) support

- Implemented VMX APIC Registers Virtualization and VMX Virtual Interrupt Delivery

- Implemented VMCS Shadowing and #VE exception secondary VMEXIT controls emulation

- Implemented RDRAND and RDSEED instructions

! CPUDB: Added AMD FX-4100 (Zambezi) configuration to CPUDB

- Bugfixes for CPU emulation correctness (critical fixes for SVM and AVX2 emulation)

- Bochs Debugger and Instrumentation

- Use Enhanced GUI Debugger instead of old-style wx debugger with wx gui.

The old-style wx debugger support was deprecated and removed from the source code.

- I/O Devices

- Implemented 3dfx Voodoo Graphics card emulation based on DOSBox patch, to enable

configure with --enable-voodoo option.

- Hard drive / HD image

- Added full save restore support for most of the disk image formats

- undoable / volatile mode: added support of other types of r/o base images

- DLL HD support rewritten and enabled for WIN32 host

- PCI chipset

- Implemented i430FX chipset emulation

- USB UHCI always enabled in the i440FX case

- Config interface

- Configure option --enable-misaligned-sse moved to runtime option in .bochsrc. The old

option is deprecated and should not be used anymore.

- moved 'user\_shortcut' bochsrc option to the 'keyboard' option

- save log options per device to bochsrc

- win32: implemented scrollable dialog items for large parameter lists

- GUI and display libraries

- Graphics snapshot feature rewritten to support all kinds of graphics modes

- wx: starting a second simulation without closing Bochs now almost possible

- Tools

- bxcommit: added support for converting flat to growing mode images

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Changes in 2.6 (September 2, 2012):

Brief summary :

- More than 10% CPU emulation speedup !

- Support for AMD's SVM hardware emulation (including extended XAPIC support).

- Implemented support for new x86 ISA extensions.

Bochs is fully aligned with rev043 of Intel(R) Architecture Manual.

- Improved emulation accuracy (critical fixes for APIC, VMX and AVX/XOP emulation).

- Bochs internal debugger: new command to show state of a device from the debugger.

- ROM BIOS: improved PCI boot ROM support (for VGA and other devices)

- Networking:

- Ported Intel(R) 82540EM Gigabit Ethernet adapter emulation from Qemu.

- Added PCI network boot ROM support to all network adapters.

- Added TFTP support to the 'slirp' networking module.

- Harddrive: added support for VirtualPC disk images, fixed sparse disk images.

- Sound:

- implemented PC speaker beep using the lowlevel sound interface.

- SDL audio output support.

- Added ability to set log action per device from .bochsrc.

- Moved disk imaging, networking, sound and USB devices to subdirectories

in the iodev folder.

Detailed change log :

- CPU

- Implemented EPT A/D extensions support.

Bochs is fully aligned with rev043 of the of Intel(R) Architecture Manual.

- Implemented ADX (ADCX/ADOX) instructions support, the feature can

be enabled using .bochsrc CPUID option.

- More than 10% CPU emulation speedup with even more optimal lazy flags

handling, stack access optimizations and cross branch trace linking.

- Support for AMD's SVM hardware emulation in Bochs CPU, to enable

configure with --enable-svm option

- Implemented AMD Extended XAPIC support, to enable set .bochsrc CPU

APIC option to 'xapic\_ext'

! Added Corei5 750 (Lynnfield) configuration to the CPUDB

! Added Turion64 (Tyler) configuration to the CPUDB

! Added AMD Phenom X3 8650 (Toliman) configuration to the CPUDB

! Added Corei7 3770K (Ivy Bridge) configuration to the CPUDB

- Bugfixes for CPU emulation correctness and stability

(critical fixes for APIC/X2APIC, VMX and AVX/XOP emulation)

- Bochs Debugger and Instrumentation

- Implemented new debugger command 'info device [string]' that shows the

state of the device specified in 'string'

- Improved debug dump for ne2k, pci, pic and vga/cirrus devices. Added

debug dump for pci2isa, i/o apic, cmos, pit, floppy and dma devices.

- Added TLB to CPU param tree - now it can be browsed from Bochs internal

debugger and Bochs debugger GUI through param tree interfaces

- Implemented 'writemem' debugger command to dump virtual memory block

starting from selected linear address into a file

- Updated definition of instrumentation callbacks, see description in

instrumentation.txt / Fixed instrumentation examples

- Configure and compile

- Moved disk imaging, networking, sound and USB devices to subdirectories

in the iodev folder.

- pcidev: enable support for Linux kernel 3.x (Debian patch by Guillem Jover)

- debugger: generate parser / lexer files only if all required tools are present

- Config interface

- Added support for direct device plugin loading with bochsrc directive for

devices which have the same name for the plugin and config option.

- The bochsrc option 'plugin\_ctrl' can now be used to load/unload optional

plugins directly when parsing the config file or command line. See the bochsrc

sample for supported devices.

- Moved bochsrc parsing / writing and config parameter handling for networking,

sound and USB devices to the plugin device code. The options are only

available when the corresponding plugin device is loaded.

- Added ability to set log action per device from .bochsrc.

- Added new command line option '-noconsole' to disable the console

window on Windows host.

- Renamed PCI Pseudo NIC option to "pcipnic" (for direct plugin loading)

- Moved several related options to the new "keyboard" bochsrc option.

- Added new parameter 'rtc\_sync' for the 'clock' option. If this option

is enabled together with the realtime synchronization, the RTC runs

at realtime speed.

- Moved MWAIT\_IS\_NOP bochsrc option from CPUID to CPU so it can be set

even if cpu was configured using pre-defined CPUDB profile.

- Allow larger CPU 'quantum' values when emulating SMP systems for speed

(quantum values up to 32 are allowed now).

- I/O Devices

- Networking

- Ported Intel(R) 82540EM Gigabit Ethernet adapter emulation from Qemu,

to enable configure with option --enable-e1000

- Added PCI network boot ROM support to all network adapters

- Added TFTP support to the 'slirp' networking module

- PCI

- added "auto-assign to PCI slot" feature for PCI-only devices

- DMA

- Added the capability to transfer more then one byte / word per ISA DMA cycle

- VGA

- Major rewrite of the vga / cirrus code:

- vgacore (shared standard VGA emulation code)

- vga (Bochs VBE and PCI VGA)

- cirrus (CL-GD 5430 ISA / CL-GD 5446 PCI)

- Added VGA graphics blinking support

- More accurate vertical and horizontal retrace emulation

(based on the DOSBox implementation)

- hard drive / hdimage

- added new disk image mode 'vpc' for VirtualPC images

- undoable mode: added coherency check (flat image size and timestamp)

- sparse mode: fixed read support

- Sound

- implemented PC speaker beep using the lowlevel sound interface

- added SDL audio output support

- ROM BIOS

- improved PCI boot ROM support (for VGA and other devices)

- added MADT entry for Interrupt Source Override to ACPI tables

- GUI and display libraries

- implemented "auto-off" timer for status LEDs indicating a data transfer

- Added support for sending absolute mouse position values from the gui if an

absolute pointing device (USB tablet) is active (rfb, sdl, win32, wx, x).

- Gui debugger now supported when using sdl gui on Windows

- Implemented "hideIPS" option in rfb, sdl, win32 and wx libraries

- wx: fixed random freezes with wxGTK and "show ips" feature enabled

- rfb: the "show ips" feature now works on Windows host

- Tools

- bxcommit: added support for converting growing to flat mode images

- bxcommit: support command line options and non-interactive (quiet) mode

- bximage: increased maximum disk size to 8 TB

- SF patches applied

[3540389] Patch 5 : Change memory reference functions argument order by Yeong-uk Jo

[3539254] Patch 4 : Memory reference optimization 2 by Yeong-uk Jo

[3539251] Patch 3 : Memory reference optimization by Yeong-uk Jo

[3539237] Patch 2 : Some optimization by Yeong-uk Jo

[3539228] Patch 1 : ROM BIOS Compatibility patch by Yeong-uk Jo

[3505209] Fixed combo box size by Konrad Grochowski

[2864391] Gui debugger default regs by Thomas Nilsen

[3486555] Fix critical stack leak in Win32 GUI by Carlo Bramini

- these S.F. bugs were closed/fixed

[625877] wx: power button -> thread deadlock

[3534063] Configure does not check for flex presence

[3555237] NE2000 doesn't compile on OS/X

[3553168] X doesn't build in latest code on OS/X

[3550175] Crash when saving snapshot to directory instead of file

[3548109] VMX State Not Restored After Entering SMM on 32-bit Systems

[3548108] VMEXIT Instruction Length Not Always Getting Updated

[3545941] Typo in preprocessor symbol

[3538731] Missing CR8 register

[3538574] Missing XD flag ( Execute Disable ) when showing PTEs

[3537556] Missing initializations

[3537309] Unable to use the debug GUI with SDL and plugins

[3537473] GUI debugger only shows 32-bit CRx registers in x86-64 mode

[3533426] UHCI PCI interrupts

[3459359] svga cirrus initialization

[3535228] info gdt does not show long mode segments

[3531806] Bochs crashes (SIGSEGV) when starting via ssh console

[3531807] Various missing initialization values reported by Valgrind

[635789] mapping mode 0 not supported

[3307201] BOCHS panics when execute HBIOS.COM

[3528809] IO APIC index register width

[3528516] Missing #if in soundmod.h

[3526069] MADT:Interrupt Source Override missed

[3518753] update dump after manual chages to memory contents

[3516859] bug in svn e1000 module

[3516029] stepping not working in debugger GUI in case of smp vm

[3510403] closing config dialog box closes entire simulator

[3459998] Bochs cannot be compiled outside the source tree

[2905969] can't use --enable-gdb-stub on vs2008

[3294001] Bochs GUI doesn't appear properly for 2nd Bochs copy

[3493315] Changing VGA 9/8 dot mode causes screen corruption

- these S.F. feature requests were closed/implemented

[3540441] automatically enable devices in plugin control

[1251456] command line method to query bochs for features

[3409396] sdl sound

[3519794] debugger's ability to save physical/linear memory dumps

[1429612] Idea how to speedup simulation - stack direct access

[1703452] Other Network Devices?

[2919376] Disable show the console window

[534271] can't set log action by device (bochsrc)

-------------------------------------------------------------------------

Changes in 2.5.1 (January 6, 2012):

- CPU / CPUDB

! Added Athlon64 (Venice) configuration to the CPUDB

- BMI: fixed EFLAGS after BMI instructions

- MSR: access to AMD extended MSR space was impossible due to a bug in RDMSR/WRMSR

- VMX: fixed VMFUNC instruction behavior to align with Intel SDM revision 041

- VMX: fixed Bochs PANIC when doing I/O access crossing VMX I/O permission bitmaps

- VMX: fixed VirtualBox VMX guest Guru Meditation - FS.BASE got corrupted after

saving/restoring unusable FS selector

- VMX: fixed VirtualBox failures with VMX+EPT enabled

- Better report of supported CPUID features when not using pre-defined CPUID profile

- Debugger / Instrumentation

- fixed typo - closing SF bug [3461405] step all command fails in SMP mode

- instrumentation: added special indication for indirect call/jump

- Configure and compile

- fixed compilation err in instrumentation call (tasking.cc)

- fixed compilation err with x86 hw breakpoint enabled and CPU\_LEVEL < 6

- fixed compilation issue under win32 --with-nogui

- added missing dependencies for cdrom\_osx.o

- removed very old deprecated configure options from configure script

- I/O Devices

- fixed possible failures of PCI DMA transfers

- VVFAT: several fixes in the optional write support (passes test with XP)

- USB UHCI: some fixes to make it work in XP guest

- removed devices 'acpi', 'ioapic' and 'pci\_ide' from optional plugin control

to avoid trouble

- Config interface / GUI and display libraries

- added VMX .bochsrc option to control VMX support on runtime

- fix for x86-64 .bochsrc option parsing (patch from @SF)

- fix for @SF bug: Crash on WIN2K - ID: 3454214

- added 'nokeyrepeat' option for the SDL and win32 gui

-------------------------------------------------------------------------

Changes in 2.5 (November 27, 2011):

Bochs repository moved to the SVN version control !

Brief summary :

! Fully configurable CPU to emulate with a single .bochsrc option !

- 10% (ST) to 50% (SMP) CPU emulation speedup !

- Implemented support for new x86 ISA extensions, Bochs is aligned with

latest published Intel Architecture Manual (rev 040, AVX rev 011):

- XSAVEOPT, AVX/AVX2/FMA/F16C, BMI1/BMI2, SMEP, INVPCID, TSC-Deadline

- VMX: VMX Preemption Timer, Pause Loop Exiting and VM Functions

- Implemented support for AMD SSE4A/XOP/FMA4/TBM instruction sets

- Networking: introduced new networking module 'slirp'

- Harddrive: fixed buffer overflow causing Bochs crash in LBA48 mode

- VGA: Added PCI ROM support to cirrus and pcivga and moved ROM loading

for the ISA case to the vga code (SeaBIOS now usable by Bochs)

- Sound: ported ES1370 soundcard emulation from Qemu

- Continuing configure rework, check for more removed configure and .bochsrc

options and their replacements !

- LGPL'd VGABIOS updated to version 0.7a

Detailed change log :

- CPU

- Now you can configure CPU to emulate using a single .bochsrc option !

The option selects CPU configuration to emulate from pre-defined list

of supported configurations. When this option is used, Bochs CPU emulation

engine is automatically configured to emulate a specific real hardware CPU,

including exact CPUID matching reference hardware. Check .bochsrc example

or check user manual for list of supported configurations and more details.

\* It is also possible to choose the CPU to emulate from Bochs command line

using command line interface to .bochsrc: "cpu::model <cpu\_name>"

\* Query for supported CPU models using command line option: -help cpu.

- 10% emulation speedup with handlers chaining optimization implemented. The

feature is enabled by default when configure with --enable-all-optimizations

option, to disable handlers chaining speedups configure with

--disable-handlers-chaining

- New way of CPUs scheduling in SMP mode brings up to 50% speedup to the

SMP emulation. New implementation uses dynamic CPU quantum value and takes

full advantage of the trace cache. Each emulated processor will execute

the whole trace before switching to the next processor.

\* It is also safe to use large (up to 16 instructions) quantum values for

the SMP emulation now and improve performance even further.

- Implemented Supervisor Mode Execution Protection (SMEP), the feature can

be enabled using .bochsrc CPUID option.

- Added support for XSAVEOPT instruction, the instruction can be enabled

using .bochsrc CPUID option.

- Added support for AVX and AVX2 instructions emulation, to enable configure

with --enable-avx option. When compiled in, AVX still has to be enabled

using .bochsrc CPUID option.

- Added emulation of AVX float16 convert instructions, the feature can be

enabled using .bochsrc CPUID option.

- Added support for AVX2 FMA instructions emulation. The implementation

was ported (with few bugfixes) from QEMU patch by Peter Maydell.

The FMA instructions support can be enabled using .bochsrc CPUID option.

- Added support for Bit Manipulation Instructions (BMI1/BMI2) emulation.

The BMI instructions support can be enabled using .bochsrc CPUID option.

- Added support for AMD SSE4A/XOP/FMA4/TBM extensions emulation, the

instructions can be enabled using .bochsrc CPUID option.

- Implemented VMX preemption timer VMEXIT control (patch by Jianan Hao)

- Implemented Pause-Loop Exiting Secondary VMEXIT control.

- Implemented VM Functions support and EPTP-Switching VM Function.

- Added INVPCID instruction emulation support.

- Added APIC timer TSC-Deadline mode emulation support.

- Now you could disable x86-64 from .bochsrc so it become possible to

emulate 32-bit CPUs using Bochs binary compiled with x86-64 support.

- Updated/fixed instrumentation callbacks.

- Bugfixes for CPU emulation correctness and stability.

- Bochs Internal Debugger and Debugger GUI

- Bochs disassembler fixes / new instructions support.

- Fixed timer breakpoint handling in Bochs internal debugger.

- Fixed bug in Bochs internal debugger 'show off' command.

- Added Bochs internal debugger command 'vmexitbp' to set breakpoint on

VMX guest VMEXIT (patch by Jianan Hao). Type 'vmexitbp' in debugger

command window to switch it on/off (similar to modebp).

- Fixed linear to physical address translation by Bochs internal debugger

for EPT unrestricted guest (VMX guest with paging disabled under EPT)

- Fixed bug in GUI debugger SSE registers display.

- Correctly display current CPU mode in GUI debugger status bar.

- Turn off the mouse capture when the internal debugger or gdbstub enter

the input loop.

- Memory

- Added new configure option which enables RAM file backing for large guest

memory with a smaller amount host memory, without causing a panic when

host memory is exhausted (patch by Gary Cameron). To enable configure with

--enable-large-ramfile option.

- Configure and compile

- Fixed Bochs manifest for Win64 compilation using Microsoft Visual Studio

command line compiler.

- Added ability to configure CPUID family through .bochsrc.

The default family value determined by configure option --enable-cpu-level.

- Added ability to configure CPUID model through .bochsrc.

The default model value is 3.

- Added ability to configure x2apic support through .bochsrc.

The APIC configuration could be selected using new CPUID .bochsrc APIC option.

Possible configurations are: "legacy", "xapic" and "x2apic".

Configure option --enable-x2apic and Bochs 2.4.6 .bochsrc XAPIC option are

deprecated and should not be used anymore.

- Configure option --enable-vbe is deprecated and should not be used anymore.

The VBE support is always automatically compiled in, in order to enable

VBE support the .bochsrc option "vga: extension=" has to be set to "vbe".

If PCI is present, the "pcivga" device can be assigned to PCI slot.

- Configure option --enable-acpi is deprecated and should not be used anymore.

The ACPI support is always automatically compiled in if PCI is compiled in.

The ACPI still could be disabled using .bochsrc 'plugin\_ctrl' option.

- Removed --enable-trace-cache configure option. The option will be always ON

for any Bochs configuration.

- Compile in MONITOR/MWAIT support by default for all cpu-level=6 configurations.

- added support for MSVC DLL plugins with a separate workspace package.

VS2008Ex can now create a BOCHS.EXE with a set of plugin DLLs.

TODO: nmake still cannot create plugin DLLs.

- removed some outdated / unmaintained parts from the Bochs code: BeOS host

support, plex86 support, networking module 'arpback', text snapshot check

feature.

- I/O Devices

- Networking

- new networking module 'slirp' (user mode networking using Slirp and a

builtin DHCP server)

- Hard drive / cdrom

- fixed buffer overflow causing Bochs crash in LBA48 mode

- implemented ATA commands "READ NATIVE MAX ADDRESS" and

"READ NATIVE MAX ADDRESS EXT"

- Sound

- ported ES1370 soundcard emulation from Qemu, to enable configure with

the option --enable-es1370

- sound input implemented in the sound lowlevel modules for Windows and

Linux (ALSA / OSS)

- PCI

- added framework for PCI ROM support

- new bochsrc option 'pci' replaces the 'i440fxsupport' option. The 'chipset'

parameter for now only accepts the value 'i440fx'.

- VGA

- added PCI ROM support to cirrus and pcivga and moved ROM loading for the ISA

case to the vga code (SeaBIOS now usable by Bochs)

- log prefix now depends on the selected extension (new prefix BXVGA for

Bochs VBE support)

- USB

- experimental USB xHCI support (written by Ben Lunt)

- LGPL'd VGABIOS updated to version 0.7a

- implemented vgabios functions with AX=0x112x (patch by Hugo Mercier)

- fixed DAC palette in 8 bpp VBE and Cirrus modes (using the same palette

as VGA mode 0x13)

- VBE: added HDTV resolutions (patch by Tristan Schmelcher)

- VBE: added PCI ROM signature and data structure

- ROM BIOS

- Report memory above 4GB to BIOS (patch by Sebastian Herbszt)

- added PCI ROM init code for BIOS-bochs-latest

(WARNING: legacy BIOS no longer works with a PCI display adapter)

- GUI and display libraries

- new parameter 'update\_freq' for the 'vga' bochsrc option replaces the

'vga\_update\_interval' option

- vga update frequency now uses host timing if the realtime synchronization

is enabled with the "clock" option (FIXME: it should always be used -

independent from the "clock" setting)

- Implemented graphics mode snapshot for VBE, Cirrus and standard VGA modes.

CGA modes are not supported yet.

- added 'x' display library option 'nokeyrepeat' to turn off keyboard repeat

- Config interface

- win32paramdlg: dialog size now adjusted to support larger label text

- win32paramdlg: added tooltip support using the parameter description

- SF patches applied

[3412431] Enabling raw devices as hdimage by affiss

[3435049] rombios: fix package size in pointing device flags 2 by Sebastian Herbszt

[3426460] [PATCH] PIC: remove never-executed code by Christian Inci

[3370604] Ctrl-Break support for the bochs BIOS by Nikolay Nikolov

[3302668] VMX preemption timer by Jianan Hao

[3327510] Fix wrong address translation in debugger by Jianan Hao

[3323758] Ctrl-Break support for the Win32 gui by Nikolay Nikolov

[3316785] Ctrl-Break support for the X11 gui by Nikolay Nikolov

[3298173] Breakpoint on VMEXIT event by Jianan Hao

[3295737] Fix CopyHost\*WordLittleEndian macros by Heikki Lindholm

[3289448] optimized powerpc byte swapping by Heikki Lindholm

[3292581] Core Audio first aid by Heikki Lindholm

[3205979] Compilation fixes for OpenBSD by Brad Smith

[3290979] acpi/muldiv64 endian bug by Heikki Lindholm

[3289459] Mac OS X audio missing framework dependency by Heikki Lindholm

[3267459] fix xrandr related crash by Heikki Lindholm

[3190995] add eth backend based on Slirp by Heikki Lindholm

- these S.F. bugs were closed/fixed

[3365456] block device dimensions problem

[3441564] interrupts vectors 0x67 should also be NULL ! cf: 2902118

[2829847] Mouse locked during magic-break

[3418621] release mouse when debugger breakpoint was hit

[1947077] sb command bug

[2802677] Unable to install Cirrus SVGA driver in guest Windows ME

[3422638] large ramfile support broken on anything but Linux

[3312237] stepN command might be not working properly

[3392760] Bochs does not compile with linux3.0

[3403746] segfault crash with sparse disk images

[3062054] Problems with BIOS pointing device services (int 15h)

[3277639] incompatible colours in palette

[1788739] Abort on large memory setting

[3012207] Int 13h FN 48h incorrect return values

[3363289] holding shift key causes capslock hang

[1819639] Two incompatible crc32 modules

[3324111] configure for VCPP.NET issues

[3190970] Installing linux causes a crash in pci\_ide

[3077616] Fedora 13 installation fails on Bochs 2.4.5

[3294671] ./configure --enable-pci --disable-cdrom

[3303818] wrong memory size is reported to GRUB (e820 problem?)

[3297475] trace cache disabled mode will miss SMC

[3170157] BIOS32 PCI service wrong length

[3025030] PIT mistakenly connected to IRQ0 IOAPIC instead of IRQ2

[3266738] GUI debugger does not update CPU mode correctly

[3292571] SB16 doesn't reinit correctly

[3175168] Cirrus CL-GD5446 emulation incorrect

[3260134] Failed to compile when trace cache disabled

[3197425] Error compile with vmx in vs2008/2010 and for correct x64

- these S.F. feature requests were closed/implemented

[3424738] Legacy BIOS int13 AL=17/18h diskette issue

[1197067] Screenshot for graphical

[2800839] VMX-preemption timer

[1507519] configurable CPUID

[579002] Allow user to specify architecture

[1228567] CPU option

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Changes in 2.4.6 (February 22, 2011):

Brief summary :

- Support more host OS to run on:

- Include win64 native binary in the release.

- Fixed failures on big endian hosts.

- BIOS: Support for up to 2M ROM BIOS images.

- GUI: select mouse capture toggle method in .bochsrc.

- Ported most of Qemu's 'virtual VFAT' block driver

(except runtime write support, but plus FAT32 support)

- Added write protect option for floppy drives.

- Bugfixes / improved internal debugger + instrumentation.

Detailed change log :

- CPU and internal debugger

- Implemented Process Context ID (PCID) feature

- Implemented FS/GS BASE access instructions support

(according to document from http://software.intel.com/en-us/avx/)

- Rewritten from scratch SMC detection algorithm

- Implemented fine-grained SMC detection (on 128 byte granularity)

- Bugfixes for CPU emulation correctness and stability

- Fixed failures on Big Endian hosts !

- Print detailed page walk information and attributes in

internal debugger 'page' command

- Updated/Fixed instrumentation callbacks

- Configure and compile

- Bochs now can be compiled as native Windows x86-64 application

(tested with Mingw gcc 4.5.1 and Microsoft Visual Studio Express 2010)

- Added ability to configure CPUID stepping through .bochsrc.

The default stepping value is 3.

- Added ability to disable MONITOR/MWAIT support through .bochsrc

CPUID option. The option is available only if compiled with

--enable-monitor-mwait configure option.

- Determine and select max physical address size automatically at

configure time:

- 32-bit physical address for 386/486 guests

- 36-bit physical address for PSE-36 enabled Pentium guest

- 40-bit physical address for PAE enabled P6 or later guests

- Update config.guess/config.sub scripts to May 2010 revisions.

- Update Visual Studio 2008 project files in build/win32/vs2008ex-workspace.zip

- Added Bochs compilation timestamp after Bochs version string.

- GUI and display libraries (Volker)

- Added new .bochsrc option to select mouse capture toggle method.

In addition to the default Bochs method using the CTRL key and the

middle mouse button there are now the choices:

- CTRL+F10 (like DOSBox)

- CTRL+ALT (like QEMU)

- F12 (replaces win32 'legacyF12' option)

- display library 'x' now uses the desktop size for the maximum guest resolution

- ROM BIOS

- Support for up to 2M ROM BIOS images

- I/O Devices

- 3 new 'pseudo device' plugins created by plugin separation (see below)

- Fixes for emulated DHCP in eth\_vnet (patch from @SF tracker)

- Added support for VGA graphics mode with 400 lines (partial fix for SF bug #2948724)

- NE2K: Fixed "send buffer" command issue on big endian hosts

- USB

- converted common USB code plus devices to the new 'usb\_common' plugin

Now the USB device classes no longer exist twice if both HC plugins are loaded.

- added 'pseudo device' in common USB code for the device creation. This makes

the HCs independent from the device specific code.

- USB MSD: added support for disk image modes (like ATA disks)

- USB printer: output file creation failure now causes a disconnect

- re-implemented "options" parameter for additional options of connected

devices (currently only used to set the speed reported by device and to

specify an alternative redolog file of USB MSD disk image modes)

- hard drive

- new disk image mode 'vvfat'

- ported the read-only part of Qemu's 'virtual VFAT' block driver

- additions: configurable disk geometry, FAT32 support, read MBR and/or

boot sector from file, volatile write support using hdimage redolog\_t

class, optional commit support on Bochs exit, save/restore file

attributes, 1.44 MB floppy support, set file modification date/time

- converted the complete hdimage stuff to the new 'hdimage' plugin

- new hdimage method get\_capabilities() that can return special flags

- vmware3, vmware4 and vvfat classes now return HDIMAGE\_HAS\_GEOMETRY flag

- other disk image modes by default return HDIMAGE\_AUTO\_GEOMETRY if

cylinder value is set to 0

- multiple sector read/write support for some image modes

- new log prefix "IMG" for hdimage messages

- floppy

- added write protect option for floppy drives (based on @SF patch by Ben Lunt)

- vvfat support

- bugfix: close images on exit

- SB16

- converted the sound output module stuff to the new 'soundmod' plugin

- SF patches applied

[3164945] hack to compile under WIN64 by Darek Mihocka and Stanislav

[3164073] Fine grain SMC invalidation by Stanislav

[1539417] write protect for floppy drives by Ben Lunt

[2862322] fixes for emulated DHCP in eth\_vnet

- these S.F. bugs were closed/fixed

[2588085] Mouse capture

[3140332] typo in mf3/ps2 mapping of BX\_KEY\_CTRL\_R

[3111577] No "back" option in log settings

[3108422] Timing window in NE2K emulation

[3084390] Bochs won't load floppy plugin right on startup

[3043174] Docbook use of '\_' build failure

[3085140] Ia\_arpl\_Ew\_Rw definition of error

[3078995] ROL/ROR/SHL/SHR modeling wrong when dest reg is 32 bit

[2864794] BX\_INSTR\_OPCODE in "cpu\_loop" causes crash in x86\_64 host

[2884071] [AIX host] prefetch: EIP [00010000] > CS.limit [0000ffff]

[3053542] 64 bit mode: far-jmp instruction is error

[3011112] error compile vs2008/2010 with X2APIC

[3002017] compile error with vs 2010

[3009767] guest RFLAGS.IF blocks externel interrupt in VMX guest mode

[2964655] VMX not enabled in MSR IA32\_FEATURE\_CONTROL

[3005865] IDT show bug

[3001637] CMOS MAP register meaning error

[2994370] Cannot build with 3DNow support

- these S.F. feature requests were closed/implemented

[1510142] Native Windows XP x64 Edition binary

[1062553] select mouse (de)activation in bochsrc

[2930633] legacy mouse capture key : not specific enough

[2930679] Let user change mouse capture control key

[2803538] Show flags for pages when using "info tab"

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Changes in 2.4.5 (April 25, 2010):

Brief summary :

- Major configure/cpu rework allowing to enable/disable CPU options at runtime

through .bochsrc (Stanislav)

- Bugfixes for CPU emulation correctness and stability

- Implemented X2APIC extensions (Stanislav)

- Implemented Intel VMXx2 extensions (Stanislav)

- Extended VMX capability MSRs, APIC Virtualization,

X2APIC Virtualization, Extended Page Tables (EPT),

VPID, Unrestricted Guests, new VMX controls.

- Implemented PCLMULQDQ AES instruction

- Extended Bochs internal debugger functionality

- USB HP DeskJet 920C printer device emulation (Ben Lunt)

Detailed change log :

- Configure rework

- Deprecate --enable-popcnt configure option. POPCNT instruction will be

enabled automatically iff SSE4\_2 is supported (like in hardware).

- Make --ignore-bad-msrs runtime option in .bochsrc. Old --ignore-bad-msrs

configure option is deprecated and should not be used anymore.

- Enable changing part of CPU functionality at runtime through .bochsrc.

- Now you could enable/disable any of SSEx/AES/MOVBE/SYSENTER\_SYSEXIT/XSAVE

instruction sets using new CPUID option in .bochsrc.

- When x86-64 support is compiled in, you could enable/disable long mode

1G pages support without recompile using new CPUID option in .bochsrc.

Configure options:

--enable-mmx, --enable-sse, --enable-movbe, --enable-xsave,

--enable-sep, --enable-aes, --enable-1g-pages

are deprecated and should not be used anymore.

- Local APIC configure option --enable-apic is deprecated and should not

be used anymore. The LAPIC option now automatically determined from

other configure options. XAPIC functionality could be enabled using

new CPUID .bochsrc option.

- Changed default CPU configuration (generated by configure script with

default options) to BX\_CPU\_LEVEL=6 with SSE2 enabled.

- CPU

- Implemented PCLMULQDQ AES instruction

- Implemented X2APIC extensions / enable extended topology CPUID leaf (0xb),

in order to enable X2APIC configure with --enable-x2apic

- Implemented Intel VMXx2 extensions:

- Enabled extended VMX capability MSRs

- Implemented VMX controls for loading/storing of MSR\_PAT and MSR\_EFER

- Enabled/Implemented secondary proc-based vmexec controls:

- Implemented APIC virtualization

- Implemented Extended Page Tables (EPT) mode

- Implemented Descriptor Table Access VMEXIT control

- Implemented RDTSCP VMEXIT control

- Implemented Virtualize X2APIC mode control

- Implemented Virtual Process ID (VPID)

- Implemented WBINVD VMEXIT control

- Implemented Unrestricted Guest mode

In order to enable emulation of VMXx2 extensions configure with

--enable-vmx=2 option (x86-64 must be enabled)

- Bugfixes for CPU emulation correctness

- Fixed Bochs crash when accessing the first byte above emulated memory size

- Internal Debugger

- Introduced range read/write physical watchpoints

- Allow reloading of segment registers from internal debugger

- Improved verbose physical memory access tracing

- BIOS

- Fix MTRR configuration (prevented boot of modern Linux kernels)

- Fix interrupt vectors for INT 60h-66h (reserved for user interrupt) by

setting them to zero

- Fix BIOS INT13 function 08 when the number of cylinders on the disk = 1

- I/O Devices

- USB HP DeskJet 920C printer device emulation (Ben Lunt)

- Misc

- Updated Bochs TESTFORM to version 0.5

- SF patches applied

[2864402] outstanding x2apic patches by Stanislav

[2960379] Fix build with -Wformat -Werror=format-security by Per Oyvind Karlsen

[2938273] allow instrumentation to change execute by Konrad Grochowski

[2926072] Indirection operators in expressions by Derek Peschel

[2914433] makesym.perl misses symbols by John R. Jackson

[2908481] USB Printer by Ben Lunt

- these S.F. bugs were closed/fixed

[2861662] dbg\_xlate\_linear2phy needs to be updated

[2956217] INT13 AH=8 returns wrong values when cylinders=1

[2981161] Allow DMA transfers to continue when CPU is in HALT state

[2795115] NX fault could be missed

[2964824] bad newline sequence in aspi-win32.h

[913419] configure options and build process needs some work

[2938398] gdbstub compile error with x86\_64 enabled

[2734455] shutdown/reset type 05 should reinit the PICs

[1921294] extended memory less than 1M wrong size

[1947249] BX\_USE\_EBDA\_TABLES and MP table placement

[1933859] BX\_USE\_EBDA\_TABLES and memory overlapping

[2923680] "help dregs" is a syntax error

[2919661] CPU may fail to do 16bit near call

[2790768] Memory corruption with SMP > 32, Panic BIOS Keyboard Error

[2902118] interrupts vectors 0x60 to 67 should be NULL !

[2912502] Instruction Pointer behaving erratically

[2901047] Bochs crashed, closed by guest os

[2905385] Bochs crash

[2901481] Instruction SYSRET and SS(PL)

[2900632] Broken long mode RETF to outer priviledge with null SS

[1429011] Use bx\_phyaddr\_t for physaddr vars and bx\_adress for lin adr

- these S.F. feature requests were closed/implemented

[2955911] RPM preuninstall scriptlet removes /core

[2947863] don't abort on unrecognised options

[2878861] numerics in the disassembler output

[2900619] make more CPU state changeable

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Changes in 2.4.2 (November 12, 2009):

- CPU and internal debugger

- VMX: Implemented TPR shadow VMEXIT

- Bugfixes for CPU emulation correctness (mostly for VMX support).

- Bugfixes and updates for Bochs internal debugger

- On SMP system stepN command now affects only current processor

- Memory

- Bugfixes for > 32-bit physical address space.

- Allow to emulate more physical memory than host actually could or would

like to allocate. For more details look for new .bochsrc 'memory' option.

- Cleanup configure options

- All paging related options now will be automatically determined according

to --enable-cpu-level option. Related configure options

--enable-global-pages, --enable-large-pages,

--enable-pae, --enable-mtrr

are deprecated now. Only 1G paging option still remaining unchanged.

- Deprecate --enable-daz configure option. Denormals-are-zeros MXCSR control

will be enabled automatically iff SSE2 is supported (like in hardware).

- Deprecate --enable-vme configure option, now it will be supported iff

CPU\_LEVEL >= 5 (like in hardware).

- I/O Devices

- Bugfixes for 8254 PIT, VGA, Cirrus-Logic SVGA, USB UCHI

- SF patches applied

[2817840] Make old\_callback static by Mark Marshall

[2874004] fix for VMWRITE instruction by Roberto Paleari

[2873999] fix CS segment type during fast syscall invocation by Roberto Paleari

[2864389] Debugger gui maximize on startup by Thomas Nilsen

[2817868] Rework loops in the memory code by Mark Marshall

[2812948] PIT bug by Derek

- these S.F. bugs were closed/fixed

[2833504] GUI debugger bug-about GDT display

[2872244] BIOS writes not allowed value to MTRR MSR causing #GP

[2885383] SDL GUI memory leak

[2872290] compilation in AIX5.3 ML10 failes

[2867904] crash with cirrus bx\_vga\_c::mem\_write

[2851495] BIOS PCI returns with INT flag = 0

[2860333] vista 64 guest STOP 109 (GDT modification)

[2849745] disassembler bug for 3DNow and SSE opcodes

[1066748] Wrong registers values after #RESET, #INIT

[2836893] Regression: Windows XP installer unable to format harddrive

[2812239] VMX: VM-Exit: Incorrect instruction length on software int

[2814130] bx\_debug lex/yacc files incorrectly generated

[2813199] MP Tables Missing From BIOS

[2824093] VMX exception bug

[2811909] VMX : CS Access-rights Type.Accessed stays 0

[2810571] Compile Errors on OSX

[2823749] GCC regression or VM\_EXIT RDMSR/WRMSR bug

[2815929] Vista/XP64 unnecessary panic

[2803519] Wrong example in man page bochsrc

- these S.F. feature requests were closed/implemented

[422766] Large Memory configurations

[1311287] Idea for a better GUI

[455971] USB support

[615363] debugger shortcut for repeat last cmd

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Changes in 2.4.1 (June 7, 2009):

- Fixed bunch of CPUID issues

- Bochs is now able to install and boot 64-bit Windows images!

(special thanks to Mark Ebersole for his patch)

- Several bugfixes in CPU emulation (mostly for x87 instructions)

- Fixed two critical deadlock bugs in the Win32 gui (patches from @SF tracker)

- Fixes related to the 'show ips' feature

- removed conflicting win32-specific alarm() functions ('win32' and 'sdl' gui)

- feature now works in wx on win32

- Added support for gdb stub on big endian machine (patch by Godmar Back)

- Rewritten obsolete hash\_map code in dbg symbols module (patch from @SF)

- BIOS: implemented missing INT 15h/89h (patch by Sebastian Herbszt)

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Changes in 2.4 (May 3, 2009):

Brief summary :

- Added graphical Bochs debugger frontend for most of the supported platforms.

- Thanks for Chourdakis Michael and Bruce Ewing.

- Many new CPU features in emulation

- Support for > 32 bit physical address space and configurable MSRs

- VMX, 1G pages in long mode, MOVBE instruction

- Bugfixes for CPU emulation correctness, debugger and CPU instrumentation.

- New config interface 'win32config' with start and runtime menu

- USB: added OHCI support, external hub and cdrom

- Added user plugin interface support.

Detailed change log :

- CPU and internal debugger

- Support for VMX hardware emulation in Bochs CPU, to enable configure with

--enable-vmx option

Nearly complete VMX implementation, with few exceptions:

- Dual-monitor treatment of SMIs and SMM not implemented yet

- NMI virtualization, APIC virtualization not implemented yet

- VMENTER to not-active state not supported yet

- No advanced features like Extended Page Tables or VPID

- Support for configurable MSR registers emulation, to enable configure with

--enable-configurable-msrs option

Look for configuration example in .bochsrc and msrs.def

- Support new Intel Atom(R) MOVBE instruction, to enable configure with

--enable-movbe option

- Support for 1G pages in long mode, to enable configure with

--enable-1g-pages option

- Support for > 32 bit physical address space in CPU. Up to 36 bit could be

seen in legacy mode (PAE) and up to 40 bit in x86-64 mode.

Still support the same amount of the physical memory in the memory object,

so system with > 4Gb of RAM yet cannot be emulated.

To enable configure with --enable-long-phy-address option.

- Implemented modern BIOSes mode limiting max reported CPUID function

to 3 using .bochsrc CPU option. The mode is required in order to

correctly install and boot WinNT.

- Added ability to configure CPUID vendor/brand strings through .bochsrc

(patch from @SF by Doug Reed).

- Many bugfixes for CPU emulation correctness (both x86 and x86-64).

- Updated CPU instrumentation callbacks.

- Fixed Bochs internal debugger breakpoints/watchpoints handling.

- Configure and compile

- Added ability to choose Bochs log file name and Bochs debugger log file

name from Bochs command line (using new -log and -dbglog options)

- Removed Peter Tattam's closed source external debugger interface from

the code.

- Removed --enable-guest2host-tlb configure option. The option is always

enabled for any Bochs configuration.

- Removed --enable-icache configure option. The option is always enabled

for any Bochs configuration. Trace cache support still remains optional

and could be configured off.

- Added configure option to compile in GUI frontend for Bochs debugger,

to enable configure with --enable-debugger-gui option.

The GUI debugger frontend is enabled by default with Bochs debugger.

- Removed --enable-port-e9-hack configure option. The feature now could be

configured at runtime through .bochsrc.

- Added configure option to enable/disable A20 pin support. Disabling the

A20 pin support slightly speeds up the emulation.

- reduced dependencies between source files for faster code generation

- BIOS

- Added S3 (suspend to RAM) ACPI state to BIOS (patch by Gleb Natapov)

- Implemented MTRR support in the bios (patches by Avi Kivity and Alex

Williamsion with additions by Sebastian Herbszt)

- Bug fixes

- I/O Devices

- Added user plugin support

- remaining devices converted to plugins: pit, ioapic, iodebug

- added 'plugin\_ctrl' bochsrc option to control the presence of optional

device plugins without a separate option. By default all plugins are enabled.

- added register mechanism for removable mouse and keyboard devices

- Hard drive / cdrom

- PACKET-DMA feature now supported by all ATAPI commands

- ATAPI command 0x1A added (based on the Qemu implementation)

- sb16

- Added ALSA sound support on Linux (PCM/MIDI output)

- FM synthesizer now usable with MIDI output (simple piano only)

- Fixed OPL frequency to MIDI note translation

- Fixed MIDI output command

- keyboard

- added keyboard controller commands 0xCA and 0xCB

- USB

- USB code reorganized to support more HC types and devices

- added USB OHCI support written by Ben Lunt

- added external USB hub support (initial code ported from Qemu)

- added USB cdrom support (SCSI layer ported from Qemu)

- added status bar indicators to show data transfer

- VGA

- VBE video memory increased to 16 MB

- implemented changeable VBE LFB base address (PCI only, requires latest

BIOS and VGABIOS images)

- I/O APIC

- implemented I/O APIC device hardware reset

- Config interface

- new config interface 'win32config' with start and runtime menu is now

the default on Windows ('textconfig' is still available)

- win32 device config dialogs are now created dynamicly from a parameter list

(works like the wx ParamDialog)

- changes in textcofig and the wx ParamDialog for compatibility with the new

win32 dialog behaviour

- Bochs param tree index keys are case independent now

- some other additions / bugfixes in the simulator interface code

- Misc

- updated LGPL'd VGABIOS to version 0.6c

- Updated Bochs TESTFORM to version 0.4

- SF patches applied

[2784858] IO Handler names are not compared properly

[2712569] Legacy bios serial data buffer timeout bug by grybranix

[2655090] 64 bit BSWAP with REX.W broken by M. Eby

[2645919] CR8 bug when reading by M. Eby

[1895665] kvm: bios: add support to memory above the pci hole by Izik Eidus

[2403372] rombios: check for valid cdrom before using it by Sebastian

[2307269] acpi: handle S3 by Sebastian

[2354134] TAP networking on Solaris/Sparc repaired

[2144692] The scsi device can not complete its writing data command by naiyue

[1827082] [PATCH] Configurable CPU vendor by Marcel Sondaar

[2217229] Panic on EBDA overflow in rombios32 by Sebastian

[2210194] Log pci class code by Sebastian

[1984662] red led for disk write and titlebar mod by ggbsf

[2142955] Fix for monitor/mwait by Doug Gibson

[2137774] Patch to fix bug: cdrom: read\_block: lseek returned error by Gabor Olah

[2134642] Fix scan\_to\_scanascii table for F11 and F12 by Ben Guthro & Steve Ofsthun

[2123036] sdl fullscreen fix by ggbsf

[2073039] Remove CMOS accsess from AML code by Gleb Natapov

[2072168] smbios: add L1-L3 cache handle to processor information by Sebastian

[2055416] bochsrc cpu options for cpuid vendor and brand string by Doug Reed

[2035278] rombios: Fix return from BEV via retf by Sebastian

[2035260] rombios: El Torito load segment fix by Sebastian

[2031978] Fix VMware backdoor command 0Ah by Jamie Lokier

[2015277] Remove obsolete comment about DATA\_SEG\_DEFS\_HERE hack by Sebastian

[2011268] Set new default format and unit only if both are supported by Sebastian

[2001919] gdbstub: fix qSupported reply by Sebastian

[2001912] gdbstub: enclose packet data by apostrophes by Sebastian

[1998071] fix missing SIGHUP and SIGQUIT with term ui on mingw by Sebastian

[1998063] fix wrong colors with term ui by Sebastian

[1995064] Compile fix needed for --enable-debugger and gcc 4.3 by Hans de Goede

[1994564] Fix typo in RDMSR BX\_MSR\_MTRRFIX16K\_A0000 by Sebastian

[1994396] Change hard\_drive\_post #if by Sebastian

[1993235] TESTFORM email address update by Sebastian

[1992322] PATCH: fix compilation of bochs 2.3.7 on bigendian machines by Hans de Goede

[1991280] Shutdown status code 0Ch handler by Sebastian

[1990108] Shutdown status code 0Bh handler by Sebastian

[1988907] Shutdown status code 0Ah handler by Sebastian

[1984467] two typos in a release! (2.3.7)

[1981505] Init PIIX4 PCI to ISA bridge and IDE by Sebastian

- these S.F. bugs were closed/fixed

[2784148] an integer overflow BUG of Bochs-2.3.7 source code

[2695273] MSVC cpu.dsp failure in 2.3.7.zip

[616114] Snapshot/Copy crash on Win2K

[2628318] 'VGABIOS-latest' bug

[1945055] can't 'make install' lastest bochs on loepard

[2031993] Mac OS X Makefile bug

[1843199] install error on mac osx

[2710931] Problem compiling both instrumentation and debugger

[2617003] ExceptionInfo conflicts with OS X api

[2609432] stepping causes segfault (CVS)

[2605861] compile error with --enable-smp

[1757068] current cvs(Jul19, 07) failed to boot smp

[2426271] cannot get correct symbol entry

[2471982] VGA character height glitches

[1659659] wrong behaviour a20 at boot

[1998027] minwg + --with-term + --with-out-win32 = link failure

[1871936] bochs-2.3.6 make fails on wx.cc

[1684666] info idt for long mode

[2105989] could not read() hard drive image file at byte 269824

[1173093] Debugger totally not supports x86-64

[1803018] new win32debug dialog problems

[2141679] windows vcc build broken

[2162824] latest cvs fails to compile

[2164506] latest bochs fails to start

[2129223] MOV reg16, SS not working in real mode due to dead code

[2106514] RIS / startrom.com install ALMOST works

[2123358] SMP (HTT): wbinvd executed by CPU1 crashes CPU0

[2002758] Arch Linux: >>PANIC<< ATAPI command with zero byte count

[2026501] El Torito incorrect boot segment:offset

[2029758] BEV can return via retf instead of int 18h

[2010173] x command breaks after one error about x/s or x/i

[1830665] harddrv PANIC: ATAPI command with zero byte count

[1985387] fail to make using gcc4 with --enable-debugger

[1990187] testform feedback

[1992138] Misspell in cpu/ia\_opcodes.h

- these S.F. feature requests were closed/implemented

[2175153] Update MSVC project files

[658800] front end program and bios

[1883370] Make cd and floppy images more usable

[422783] change floppy size without restarting

[2552685] param tree names should be case insensitive

[1214659] PC Speaker emu turnoff. Plugin Controll.

[1977045] support 40 bit physical address

[1506385] Intel Core Duo VT features

[1429015] Support for user plugins

[1488136] debugger access to floppy controller

[1363136] Full debugger SMP and 64 bit support

[2068304] Support for ACPI

[431032] debugger "x" command

[423420] profiling ideas (SMF)

[445342] Add FM support?

[928439] alsa

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Changes in 2.3.7 (June 3, 2008):

Brief summary :

+ More optimizations in CPU code - Bochs 2.3.7 is more than 2x faster

than Bochs 2.3.5 build !

- Implemented LBA48 support in BIOS

- Added memory access tracing for Bochs internal debugger

- Implemented Intel(R) XSAVE/XRSTOR and AES instruction set extensions

- Many fixes in CPU emulation and internal debugger

- MenuetOS64 floppy images booting perfect again !

- updated LGPL'd VGABIOS to version 0.6b

Detailed change log :

- CPU

- Support of XSAVE/XRSTOR CPU extensions, to enable configure with

--enable-xsave option

- Support of AES CPU extensions, to enable configure with

--enable-aes option

- Fixed Bochs failure on RISC host machines with BxRepeatSpeedups

optimization enabled

- Implemented SYSENTER/SYSEXIT instructions in long mode

- More than 100 bugfixes for CPU emulation correctness (both x86 and x86-64)

- MenuetOS64 floppy images booting perfect again !

- Updated CPU instrumentation callbacks

- Bochs Internal Debugger and Disassembler

- Added memory access tracing for Bochs internal debugger, enable

by typing 'trace-mem on' in debugger command line

- Many bug fixes in Bochs internal debugger and disassembler

- System BIOS (Volker)

- Implemented LBA48 support

- Added generation of SSDT ACPI table that contains definitions

for available processors

- Added RTC device to ACPI DSDT table

- Added implementation of SMBIOS

- I/O devices (Volker)

- VGA

- Implemented screen disable bit in sequencer register #1

- Implemented text mode cursor blinking

- Serial

- new serial modes 'pipe-server' and 'pipe-client' for win32

- new serial mode 'socket-server'

- Configure and compile

- Fixed configure bug with enabling of POPCNT instruction, POPCNT

instruction should be enabled by default when SSE4.2 is enabled.

- Removed --enable-magic-breakpoint configure option. The option is

automatically enabled if Bochs internal debugger is compiled in.

It is still possible to turn on/off the feature through .bochsrc.

- Allow boot from network option in .bochsrc

- Added Bochs version info for Win32

- Display libraries

- implemented text mode character blinking in some guis

- improved 'X' gui runtime dialogs

- SF patches applied

[1980833] Fix shutdown status code 5h handler by Kevin O'Connor

[1928848] "pipe" mode for serial port (win32 only) by Eugene Toder

[1956843] Set the compatible pci interrupt router back to PIIX by Sebastian

[1956366] Do not announce C2 & C3 cpu power state support by Igor Lvovsky

[1921733] support for LBA48 by Robert Millan

[1938185] Fix link problem with --enable-debugger by Sebastian

[1938182] Makefile.in - use @IODEV\_LIB\_VAR@ by Sebastian

[1928945] fix for legacy rombios - e820 map and ACPI\_DATA\_SIZE by Sebastian

[1925578] rombios32.c - fix ram\_size in ram\_probe for low memory setup by Sebastian

[1908921] rombios32.c - move uuid\_probe() call by Sebastian

[1928902] improvements to load-symbols by Eugene Toder

[1925568] PATCH: msvc compilation by Eugene Toder

[1913150] rombios.c - e820 cover full size if memory <= 16 mb by Alexander van Heukelum

[1919804] rombios.c - fix and add #ifdef comments by Sebastian

[1909782] rombios.c - remove segment values from comment by Sebastian

[1908918] SMBIOS - BIOS characteristics fix by Sebastian

[1901027] BIOS boot menu support (take 3)

[1902579] rombios32.c - define pci ids by Sebastian

[1859447] Pass segment:offset to put\_str and introduce %S by Sebastian

[1889057] rombios.c - boot failure message by Sebastian

[1891469] rombios.c - print BEV product string by Sebastian

[1889851] Win32 version information FILEVERSION for bochs.exe by Sebastian

[1889042] rombios.c - fix comment by Sebastian

[1881500] bochsrc, allow boot: network by Sebastian

[1880755] Win32 version information for bochs.exe by Sebastian

[1880471] SMBIOS fix type 0 by Sebastian

[1878558] SMBIOS fixes by Sebastian

[1864692] SMBIOS support by Filip Navara

[1865105] Move bios\_table\_area\_end to 0xcc00 by Sebastian

[1875414] Makefile.in - change make use by Sebastian

[1874276] Added instrumentation for sysenter/sysexit by Lluis

[1873221] TLB page flush: add logical address to instrumentation by Lluis

[1830626] lba32 support by Samuel Thibault

[1861839] Move option rom scan after floppy and hard drive post by Sebastian

[1838283] Early vga bios init by Sebastian

[1838272] rom\_scan range parameter by Sebastian

[1864680] Save CPUID signature by Filip Navara

- these S.F. bugs were closed

[1976171] Keyboard missing break code for enter (0x9C)

[666433] physical read/write breakpoint sometimes fails

[1744820] info gdt and info idt shows the entire tables

[1755652] graphics: MenuetOS64 shows black screen

[1782207] Windows Installer malfunction, Host=Linux, Guest=Win98SE

[1697762] OS/2 Warp Install Failed

[1952548] String to char \* warnings

[1940714] SYSENTER/SYSEXIT doesn't work in long mode

[1422342] SYSRET errors

[1923803] legacy rombios - e820 map and ACPI\_DATA\_SIZE

[1936132] Link problem with --enable-debugger & --enable-disasm

[1934477] Linear address wrap is not working

[1424984] virtual machine freezes in Bochs 2.2.6

[1902928] with debugger cpu\_loop leaves CPU with unstable state

[1898929] Bochs VESA BIOS violates specs (banks == 1)

[1569256] bug in datasegment change in long mode

[1830662] ACPI: no DMI BIOS year, acpi=force is required

[1868806] VGA blink enable & screen disable

[1875721] Bit "Accessed" in LDT/GDT descriptors & #PF

[1874124] bx\_Instruction\_c::ilen() const

[1873488] bochs-2.3.6 make fails on dbg\_main.cc

- these S.F. feature requests were implemented

[1422769] SYSENTER/SYSEXIT support in x86-64 mode

[1847955] Version information for bochs(dbg).exe

[939797] SMBIOS support

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Changes in 2.3.6 (December 24, 2007):

Brief summary :

+ More than 25% emulation speedup vs Bochs 2.3.5 release!

- Thanks to Darek Mihocka (http://www.emulators.com)

for providing patches and ideas that made the

speedup possible!

+ Up to 40% speedup vs Bochs 2.3.5 release with trace cache optimization!

- Lots of bugfixes in CPU emulation

- Bochs benchmarking support

- Added emulation of Intel SSE4.2 instruction set

Detailed change log :

- CPU

- Added emulation of SSE4.2 instruction set, to enable use

--enable-sse=4 --enable-sse-extension configure options

to enable POPCNT instruction only use configure option

--enable-popcnt

- Implemented MTRR emulation, to enable use --enable-mtrr configure

option. MTRRs is enabled by default when cpu-level >= 6.

- Implemented experimental MONITOR/MWAIT support including optimized

MWAIT CPU state and hardware monitoring of physical address range,

to enable use --enable-monitor-mwait configure option.

- Removed hostasm optimizations, after Bochs rebenchmarking it was found

that the feature bringing no speedup or even sometimes slows down

emulation!

- Merged trace cache optimization patch, the trace cache optimization

is enabled by default when configure with --enable-all-optimizations

option, to disable trace cache optimization configure with

--disable-trace-cache

- Many minor bugfixes in CPU emulation (both ia32 and x86-64)

- Updated CPU instrumentation callbacks

- Bochs Internal Debugger and Disassembler

- Many fixes in Bochs internal debugger and disassembler, some debugger

interfaces significantly changed due transition to the param tree

architecture

- Added support for restoring of the CPU state from external file

directly from Bochs debugger

- Configure and compile

- Renamed configure option --enable-4meg-pages to --enable-large-pages.

The option enables page size extensions (PSE) which refers to 2M pages

as well.

- Removed --enable-save-restore configure option, save/restore feature

changed to be one of the basic Bochs features and compiled by default

for all configurations.

- Added new Bochs benchmark mode. To run Bochs in benchmark mode execute

it with new command line option 'bochs -benchmark time'. The emulation

will be automatically stopped after 'time' millions of emulation

cycles executed.

- Another very useful option for benchmarking of Bochs could be enabled

using new 'print\_timestamps' directive from .bochsrc:

print\_timestamps: enable=1

- Added --enable-show-ips option to all configuration scripts used to

build release binaries, so all future releases will enjoy IPS display.

- Enable alignment check in the CPU and #AC exception by default for

--cpu-level >= 4 (like in real hardware)

- SF patches applied

[1491207] Trace Cache Speedup patch by Stanislav

[1857149] Define some IPL values by Sebastian

[1850183] Get memory access mode in BX\_INSTR\_LIN\_READ by Lluis Vilanova

[1841421] pic: keep slave\_pic.INT and master\_pic.IRQ\_in bit 2 in sync by Russ Cox

[1841420] give segment numbers in exception logs by Russ Cox

[1801696] Allow Intel builds on Mac OS X

[1830658] Fix >32GB disk banner by Samuel Thibault

[1813314] Move #define IPL\_\* and typedef ipl\_entry by Sebastian

[1809001] Save PnP Option ROM Product Name string in IPL Boot Table by Sebastian

[1821242] Fix for #1801285, Niclist.exe broken by Sebastian

[1819567] Code warning cleanup

[1816162] Update comment on bios\_printf() by Sebastian

[1811139] Trivial Fix when BX\_PCIBIOS and BX\_ROMBIOS32 not defined by Myles Watson

[1811190] Improve HD recognition and CD boot by Myles Watson

[1811860] Implement %X in bios\_printf by Sebastian

[1809649] printf %lx %ld %lu by Myles Watson

[1809651] move BX\_SUPPORT\_FLOPPY by Myles Watson

[1809652] dpte and Int13DPT fixes by Myles Watson

[1809669] clip cylinders to 16383 in hard drive by Myles Watson

[1799903] Build BIOS on amd64 by Robert Millan

[1799877] Fix for parallel build (make -j2) by Robert Millan

- these S.F. bugs were closed

[1837354] website bug: View the Source link broken

[1801268] Reset from real mode no longer working

[1843250] Using forward slashes gives invalid filename

[1823446] BIOS bug, local APIC #0 not detected

[1801285] Niclist.exe broken

[1364472] breakpoints sometimes don't work

[994451] breakpoint bug

[1801295] NSIS installer vs Windows Notepad

[1715328] Unreal mode quirk

[1503972] debugger doesn't debug first instruction on exception

[1069071] div al, byte ptr [ds:0x7c18] fails to execute

[1800080] Wrong "BX\_MAX\_SMP\_THREADS\_SUPPORTED" assertion

- these S.F. feature requests were implemented

[1662687] Download for Win32-exe with x64 Mode and debugging

[604221] Debugger command: query lin->phys mapping

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Changes in 2.3.5 (September 16, 2007):

Brief summary :

- Critical problems fixed for x86-64 support in CPU and Bochs internal debugger

- ACPI support

- The release compiled with x86-64 and ACPI

- Hard disk emulation supports ATA-6 (LBA48 addressing, UDMA modes)

- Added emulation of Intel SSE4.1 instruction set

Detailed change log :

- CPU

- Fixed critical bug with 0x90 opcode (NOP) handling in x86-64 mode

- implied stack references where the stack address is not in canonical form

should causes a stack exception (#SS)

- Added emulation of SSE4.1 instruction set (Stanislav)

- Do not save and restore XMM8-XMM15 registers when not in x86-64 mode

- Fixed zero upper 32-bit part of GPR in x86-64 mode

- CMOV\_GdEd should zero upper 32-bit part of GPR register even if the

'cmov' condition was false !

- Implemented CLFLUSH instruction, report non-zero cache size in CPUID

- Fixed PUSHA/POPA instructions behavior in real mode

- Fixed detection of inexact result by FPU

- Fixed denormals-are-zero (DAZ) handling by SSE convert instructions

- Implemented Misaligned Exception Mask support for SSE (MXCSR[17])

- Implemented Alignment Check in the CPU and #AC exception, to enable

use --enable-alignment-check configure option

- General

- 2nd simulation support in wxBochs now almost usable (simulation cleanup

code added and memory leaks fixed)

- Configure and compile

- several fixes for MacOSX, OpenBSD and Solaris 10

- enable save/restore feature by default for all configurations

- reorganized SSE configure options to match Intel(R) Programming

Reference Manual, new option introduced for SSE extensions enabling.

To enable Intel Core Duo 2 new instructions use

--enable-sse=3 --enable-sse-extension

enabling of SSE4.1 (--enable-sse=4) will enable SSE3 extensions as well

- removed old PIT, always use new PIT written by Greg Alexander,

removed configure option --enable-new-pit

- I/O devices (Volker)

- Floppy

- partial non-DMA mode support (patch by John Comeau)

- Hard drive / cdrom

- hard disk emulation now supports ATA-6 (LBA48 addressing, UDMA modes)

- VMWare version 4 disk image support added (patch by Sharvil Nanavati)

- PCI

- initial support for the PIIX4 ACPI controller

- Serial

- added support for 3-button mouse with Mousesystems protocol

- USB

- experimental USB device change support added

- rewrite of the existing USB devices code

- new USB devices 'disk' and 'tablet' (ported from the Qemu project)

- Bochs internal debugger

- fixed broken debugger "rc file" option (execute debugger command from file)

- implementation of a gui frontend ("windebug") for win32 started

- gdbstub now accepts connection from any host

- several documentation updates

- a lot of disasm and internal debugger x86\_64 support fixes

- Configuration interface

- fixes and improvements to the save state dialog handling

- Display libraries

- text mode color handling improved in some guis

- win32 fullscreen mode (patch by John Comeau)

- System BIOS (Volker)

- 32-bit PM BIOS init code for ACPI, PCI, SMP and SMM (initial patches by

Fabrice Bellard)

- PCI BIOS function "find class code" implemented

- SF patches applied

[1791000] 15h 8600h is reading the wrong stack frame by Sebastian

[1791016] rombios32.c, ram\_probe(), BX\_INFO missing value by Sebastian

[1786429] typo in bochsrc.5 by Sebastian

[1785204] Extend acpi\_build\_table\_header to accept a revision number by Sebastian

[1766536] Partial Patch for Bug Report 1549873 by Ben Lunt

[1763578] ACPI Table Revision 0 -> 1

[1642490] implement alignment check and #AC exception by Stanislav Shwartsman

[1695652] [PATCH] .pcap pktlog and vnet PXE boot by Duane Voth

[1741153] Add expansion-ROM boot support to the ROMBIOS

[1734159] Implemented INT15h, fn 0xC2 (mouse), subfn 3, set resolution

[1712970] bios\_printf %s fix

[1573297] PUSHA/POPA real mode fix by Stanislav Shwartsman

[1641816] partial support for non-DMA access to floppy by John Comeau

[1624032] shows where write outside of memory occurred by John Comeau

[1607793] allow fullscreen when app requests it by John Comeau

[1603013] Bugfix for major NOP problem on x64 by mvysin

[1600178] Make tap and tuntap compile on OpenBSD by Jonathan Gray

[1149659] improve gdbstub network efficiency by Avi Kivity

[1554502] Trivial FPU exception handling fix

- these S.F. bugs were closed

[1316008] Double faults when it shouldn't - gcc 4.0.2

[1787289] broken ABI for redolog class when enable-compressed-hd

[1787500] tftp\_send\_optack not 64bit clean

[1264540] Security issue with Bochs website

[1767217] Debugger Faults including ud2

[1729822] Various security issues in io device emulation

[1675202] mptable hosed (bad entry count in header)

[1197141] 'make install' installs to bad location

[1157623] x86Solaris10 cannot recoginize ACPI RSD PTR

[1768254] large HDD in Bochs/bximage

[1496157] Windows Vista Beta2 dosn't boot

[1755915] Illegal Hard Disk Signature Output

[1717790] info gdt and info idt scrolls away, too long result

[1726640] Debugger displays incorrect segment for mov instruction

[1719156] Typo in misc\_mem.cpp

[1715270] Debugger broken in/beyond 2.3

[1689107] v8086 mode priviledge check failed

[1704484] A few checks when CPU\_LEVEL < 4

[1678395] Problem with zero sector...

[876990] SA-RTL OS fails on PIC configuration

[1673582] save/restore didn't restore simulation correctly

[1586662] EDD int 13h bug, modify eax

[666618] POP\_A Panic in DOS EMU

[1001485] panic: not enough bytes on stack

[1667336] delay times an order of magnitude slow

[1665601] crash disassembling bootcode

[1657065] CVS sources won't compile

[1653805] bochs's gdbstub uses incorrect protocol

[1640737] ASM sti command frezzes guest OS

[1636439] latest CVS sources don't compile under Cygwin

[1634357] disasm incorrect (no sign ext) displacement in 64-bit mode

[1376453] pcidev segfaults bochs

[1180890] IOAPIC in BOCHS - WinXP 64 in MP version

[1597528] 2.3 fails to compile on amd64

[1526255] FLD1 broken when compaling with gcc 4.0.x

[1597451] eth\_fbsd is broken under FreeBSD

[1571949] Bochs will not compile under Solaris

[1500216] Bochs fails to boot BeOs CD

[1458339] bochs-2.2.6 WinXP Binary ACPI error installing FreeBSD 6.0

[1440011] patches needed for FreeBSD 6.0 to compile Bochs

[431674] some devices don't have a prefix

[458150] QNX demo disk crashes with new pit

[818322] Bochs 2.1 cvs: OS/2 - read verify on non disk

[906840] KBD: bogus scan codes generated in set 3

[1005053] No keyboard codes translation

[1109374] Problem with Scancodeset 2

[1572345] Bochs won't continue

[1568153] Bochs looks for (and loads?) unspecified display libraries

[1563462] Errors in /iodev/harddrv.h

[1562172] TLB\_init() fails to initialize priv\_check array if USE\_TLB 0

[1385303] debugger crashes after panic

[1438227] crc.cpp missing in bx\_debug version 2.2.6

[1501825] debugger crashes on to high input

[1420959] Memory leak + buffer overflow in Bochs debugger

[1553289] Error in Dis-assembler

[542464] I cannot use FLAT

[1548270] Bochs won't die with its pseudo terminal

[1545588] roundAndPackFloatx80 does not detect round up correctly

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Changes in 2.3 (August 27, 2006):

Brief summary :

- limited save/restore support added (config + log options, hardware state)

- configuration parameter handling rewritten to a parameter tree

- lots of cpu and internal debugger fixes

- hard disk geometry autodetection now supported by most of the image types

- hard disk emulation now supports ATA-3 (multiple sector transfers)

- VBE memory size increased to 8MB and several VGA/VBE fixes

- updated LGPL'd VGABIOS to version 0.6a

Detailed change log :

- CPU and internal debugger fixes

- Fixed bug in FSTENV instruction (Stanislav Shwartsman)

- Recognize #XF exception (19) when SSE is enabled

- Fixed bug in PSRAW/PSRAD MMX and SSE instructions

- Save and restore RIP/RSP only for FAULT-type exceptions, not for traps

- Correctly decode, disassemble and execute multi-byte NOP '0F F1' opcode

- Raise A20 line after system reset (Stanislav Shwartsman)

- Implemented SMI and NMI delivery (APIC) and handling in CPU (Stanislav)

- Experimental implementation of System Management Mode (Stanislav)

- Added emulation of SSE3E instructions (Stanislav Shwarstman)

- Save and restore FPU opcode, FIP and FDP in FXSAVE/FRSTOR instructions

- Fixed bug in MOVD\_EdVd opcode (always generated #UD exception)

- Fixed critical issue, Bochs was not supporting > 16 bit LDT.LIMIT values

- Many fixes in Bochs internal debugger and disassembler

- CPU x86-64 fixes

- Fixed SYSRET instruction implementation

- Fixed bug in CALL/JMP far through 64-bit callgate in x86-64 mode

- Correctly decode, disassemble and execute 'XCHG R8, rAX' instruction

- Correctly decode and execute 'BSWAP R8-R15' instructions

- Fixed ENTER and LEAVE instructions in x86-64 mode (Stanislav)

- Fixed CR4 exception condition (No Name)

- Fixed x86 debugger to support x86-64 mode (Stanislav)

- APIC and SMP

- Support for Dual Core and Intel(R) HyperThreading Technology. Now you

could choose amount of cores per processor and amount of HT threads per

core from .bochsrc for SMP simulation (Stanislav Shwartsman)

- Allow to control SMP quantum value through .bochsrc CPU

option parameter. Previous Bochs versions used hardcoded quantum=5

value.

- Fixed interrupt priority bug in service\_local\_apic()

- Fixed again reading of APIC IRR/ISR/TMR registers. Finally it becomes

fully correct :-)

- Configure and compile

- Moved configure time --enable-reset-on-triple-fault option to runtime,

the 'cpu' option in .bochsrc is extended and the old configure option

is deprecated (Stanislav Shwartsman)

- Removed --enable-pni configure option, to compile with PNI use

--enable-sse=3 instead (Stanislav Shwartsman)

- enable SEP (SYSENTER/SYSEXIT) support by default for Penitum II+

processor emulation (i.e. if cpu-level >= 6 and MMX is enabled)

- general

- Limited save/restore support added. The state of CPU, memory and all

devices can be saved now (state of harddisk images not handled yet).

- Fixed several memory leaks

- configuration interface

- Configuration parameter handling rewritten to a parameter tree. This is

required for dynamic menus/dialogs, user-defined options and save/restore.

- Support for user-defined bochsrc options added

- help support at the parameter prompt in textconfig added

- I/O devices (Volker)

- Floppy

- partial sector transfers fixed

- Hard drive / cdrom

- several fixes to the IDE register behaviour (e.g. in case of a channel

with only one drive connected)

- fixed data alignment of 'growing' hard drive images (sharing images

between Windows and Linux now possible)

- disk geometry autodetection now supported by most of the image types

(unsupported: external, dll and compressed modes)

- multi sector read/write commands implemented

- hard disk now reporting ATA-3 supported

- ATAPI 'inquiry' now returns a unique device name

- Keyboard

- reset sent to keyboard has no effect on the 8042 (scancode translation)

- PCI

- forward PIRQ register changes to the I/O APIC (if present)

- attempt to fix and update the emulation part of 'pcidev' (untested)

- VGA

- VBE memory size increased to 8MB and several VBE fixes

- VGA memory read access fixed (bit plane access and read mode)

- VGA memory is now a part of the common video memory

- System BIOS (Volker)

- enable interrupts before executing INT 19h

- fixed ATA device detection in case of one drive only connected to controller

- improved INT 15h function AX=E820h

- real mode PCI BIOS now returns IRQ routing information (function 0Eh)

- keyboard LED flags handling fixed and improved

- fixed handling of extended keys in INT 09h

- Updated LGPL'd VGABIOS to version 0.6a

- SF patches applied

[1340111] fixes and updates to usb support by Ben Lunt

[1539420] minor addition to pci\_usb code by Ben Lunt

[1455958] call/jmp through call gate in 64-bit mode

[1433107] PATCH: fix compile with wxwindows 2.6 (unicode / utf8) by jwrdegoede

[1386671] Combined dual core and hyper-threading patch

- these S.F. bugs were closed

[833927] TTD: System Error TNT.40025: Unexpected processor exception

[789230] Sending code that shows lock up when setting idt

[909670] Problems with Symantec Ghost

[1540241] include missing in osdep.cc

[1539373] Incorrect disasm for "mov moffset,bla" in 64bit

[1538419] incorrect disassembly of [rip+disp] with rex.b

[1535432] shift+cursor key maps to a digit

[1504891] Knoopix 5.0.1 error

[1424355] bochs-2.2.6 ata failure in windoze 98se

[1533979] wrong disassembly of IN instruction

[620059] paste won't stop

[1164904] status bar doesn't show num/caps/scroll lock status

[1061720] ATA Support level for HD

[1522196] Broken CHANGES link in main page

[1438415] crash if screen scrolled downwards

[778441] Shouldn't interrupts be enable after BIOS?

[1514949] I got a problem with the 8253 timer

[1513544] disasm of 0xec (in AL,DX) returns ilen of 2 instead of 1

[1508947] APIC interrupt priority checking and interrupt delivery

[766286] Debugger halts after any GPF exception

[639143] va\_list is not a pointer on linuxppc

[1501815] debugger examines memory over page-boundary wrong

[1503978] movsb/w/d doesn't work when direction is stored

[1499405] WinPCap has changed URL hosting

[1498519] APIC IRR bits not set while interrupts disabled

[1498193] Bochs segfaults on LTR instruction

[787140] Guest2HostTLB optimization bug

[1492070] instrument stop

[1487772] No SEP on P4

[1488335] Growing hard disk images severe interoperability errors!

[1076312] Shadow RAM and TLB

[1282249] The real i440FX chipset Award bios hangs

[1479763] mistake "mov ax,[es:di]" for "mov ax,[ds:di]"

[1453575] Misconfigured floppy DMA transfers do not terminate.

[1460068] Incorrect handling for the Options Menu Item

[910203] bochs-2.1.1 wx.lo failed

[1438654] PANIC when trying to run install-amd64-minimal-2005.0.iso

[1458320] compile hdimage.h fails

[1455880] bochs-2.2.6,2: make error on FreeBSD

[696890] Network wouldn't run under W2k hosting MSDOS

[673391] SMP timer problems

[1291059] wxWindows GUI on non-windows/configure issue

[1356450] bochs 2.2.1 errors-omittions

[1178017] Win98 guest cannot receive network packets from host

[1076315] a20\_mask after restarting

[1436323] real hw does not panic when bad Ib in CMPSS\_VssWssIb

[1435269] cdrom\_amigaos is not compilable

[1433314] disasm issues

[1170614] relative jumps/calls wrong in debugger

[758121] user might get confused when interrupt handler invoked

[1170622] You cannot toggle OFF "show" flags

[1406387] JMP instruction should display absolute address

[1428813] PANIC: ROM address space out of range

[1426288] DR-DOSs EMM386 problem

[1412036] Bochs cannot recognize PCI NIC correctly

[435115] dbg: modebp broken and no docs

[1419366] disasm cs:eip does not work anymore

[1419393] SSE's #XF exception -> "exception(19): bad vector"

[1419429] disassembly of "260f6f00" show DS: instead of ES: prefix

[1417583] Interrupt behaviour changed from 2.2.1 to 2.2.5

[1418281] 'push' (6A) incorrectly disassembled

[1417791] FLDENV generating exception when real hw does not.

[1264583] OS/2 1.1 doesn't run

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Changes in 2.2.6 (January 29, 2006):

- First major SMP release !

- several APIC and I/O APIC fixes make SMP Bochs booting Windows NT4.0

or Knoppix 4.0.2 without noapic kernel option in SMP configuration.

- critical APIC timer bug fixed

- obsolete SMP BIOS images removed (MP tables created dynamicaly)

- determine number of processors in SMP configuration through .bochsrc

new .bochsrc option 'CPU' allows to choose number of processors to emulate

- new configure option --enable-smp to configure Bochs for SMP support,

the old --enable-processors=N option is deprecated

- CPU and internal debugger fixes

- enabled #PCE bit in CR4 register, previosly setting of this bit

generated #GP(0) fault

- enabled LAHF/SAHF instructions in x86-64 mode

- fixed bug in PMULUDQ SSE2 instruction

- fixes in Bochs debugger

- Configure and compile

- enable VME (virtual 8086 mode extensions) by default if cpu-level >= 5

- enable Bochs disassembler by default for all configurations

- win32 installer script improvements

- ips parameter moved to new 'CPU' option

- show IPS value in status bar if BX\_SHOW\_IPS is enabled

- Other

- several fixes in the hard drive, keyboard, timer, usb and vga code

- new user button shortcut "bksl" (backslash)

- updated Bochs instrumentation examples

- user and development documentation improved

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Changes in 2.2.5 (December 30, 2005):

Brief summary :

- added virtual 8086 mode extensions (VME) implementation

- several fixes/improvements in x86-64 emulation, debugger and disassembler

- new serial mode 'socket' connects a network socket

- IDE busmaster DMA feature for harddisks and cdroms completed and enabled

- many improvements in Bochs emulated I/O devices (e.g. floppy, cdrom)

- Updated LGPL'd VGABIOS to version 0.5d

Detailed change log :

- CPU

- fixed XMM registers restore in FXRSTOR instruction (Andrej Palkovsky)

- print registers dump to the log if tripple fault occured

- fixed PANIC in LTR instruction (Stanislav)

- added virtual 8086 mode extensions (VME) implementation, to enable

configure with --enable-vme (Stanislav)

- flush caches and TLBs when executing WBINVD and INVD instructions

- do not modify segment limit and AR bytes when modifying segment

register in real mode (support for unreal mode)

- fixed init/reset values for LDTR and TR registers

- reimplemented hardware task switching mechanism (Stanislav)

- generate #GP(0) when fetching instruction cross segment boundary

- CPU (x86-64) (Stanislav Shwartsman)

- implemented call\_far/ret\_far/jmp\_far instructions in long mode

- fixed IRET operation in long mode

- fixed bug prevented setting of NXE/FFXSR bits in MSR.EFER register

- implemented RDTSCP instruction

- do not check CS.limit when prefetching instructions in long mode

- fixed masked write instructions (MASKMOVQ/MASKMOVDQU) in long mode

- fetchdecode fixes for x86-64

- APIC

- Fixed bug in changing local APIC id (Stanislav)

- Fixed reading of IRR/ISR/TMR registers (patch by wmrieker)

- Implemented spurious interrupt register (Stanislav, patch by wmrieker)

- Fixed interrupt delivery bug (anonymous #SF patch)

- Correctly implemented ESR APIC register (Stanislav)

- Bochs debugger

- Fixed bug in bochs debugger caused breakpoints doesn't fire sometimes

(Alexander Krisak)

- watchpoints in device memory fixed (Nickolai Zeldovich)

- new debug interface to access Bochs CPU general purpose registers

with support for x86-64

- Disassembler (Stanislav Shwartsman)

- Fixed disassembly for FCOMI/FUCOMI instructions

- Full x86-64 support in disassembler. The disassembler module extended

to support x86-64 extensions. Still limited by Bochs debugger which

is not supporting x86-64 at all ;(

- I/O devices (Volker)

- general

- memory management prepared for large BIOS images (up to 512k)

- slowdown timer sleep rate fixed (now using 1 msec on all platforms)

- some device specific parameter handlers moved into the device code

- serial

- new serial mode 'socket' connects a network socket (#SF patch by Andrew Backer)

- hard drive / cdrom

- assign a unique serial number to each drive (fixes harddrive detection

problems with Linux kernels 2.6.x: "ignoring undecoded slave")

- geometry autodetection for 'flat' hard disk images added. Works with

images created with bximage (heads = 16, sectors per track = 63)

- ATAPI command 'read cd' implemented, some other commands improved

- cdrom read block function now tries up to 3 times before giving up

- emulation of raw cdrom reads added, some other lowlevel cdrom fixes

- IDE busmaster DMA feature for harddisks and cdroms completed and enabled

- disk image size limit changed from 32 to 127 GB

- split ATA/ATAPI emulation code and image handling code

- floppy

- fixes for OS/2 (patch by Robin Kay)

- disk change line behaviour fixed (initial patch by Ben Lunt)

- end-of-track (EOT) condition handling implemented

- more accurate timing for read/write data and format track commands using

a motor speed of 300 RPM

- timing of recalibrate and seek commands now depends on the step rate,

date rate and the steps to do

- floppy controller type changed to 82077AA

- cmos

- RTC 12-hour and binary mode implemented

- number of CMOS registers changed from 64 to 128

- bochsrc option 'cmosimage' improved

- save cmos image on exit if enabled

- speaker

- simple speaker support for OS X added (patch by brianonn@telus.net)

- pci

- BeOS boot failure fix in the PCI IDE code

- don't register i/o and memory regions during PCI probe

- vga

- memory allocation for vga extensions fixed

- usb

- some bugfixes by Ben Lunt (mouse and keypad are usable now)

- networking modules

- VDE networking module now enabled on Linux

- display libraries

- general

- new syntax for the userbutton shortcut string and more keys supported

- win32

- fixed keycode generation for right alt/ctrl/shift keys

- runtime dialog is now a property sheet

- x11

- simple dialog boxes for the "ask" and "user shortcut" feature implemented

- Slovenian keymap added (contributed by Mitja Ursic)

- configuration interface

- ask dialog is now enabled by default for win32, wx and x display libraries

- bochsrc option floppy\_command\_delay is obsolete now (floppy timing now based

on hardware specs)

- floppy image size detection now available in the whole config interface

- some device specific parameter handlers moved into the device code

- calculate BIOS ROM start address from image if not specified

- System BIOS (Volker)

- PCI i/o and memory base address initialization added

- several keyboard interrupt handler fixes (e.g. patch by japheth)

- several floppy fixes (e.g. OS/2 works with patch by Robin Kay)

- some more APM functions added

- Updated LGPL'd VGABIOS to version 0.5d

- generate SMP specific tables dynamicly by the Bochs memory init code

- SF patches applied

[1389776] Disk sizes over 64 Gbytes by Andrzej Zaborowski

[1359162] disasm support for x86-64 by Stanislav Shwartsman

[857235] task priority and other APIC bugs, etc by wmrieker

[1359011] build breaks for 386 + debugger + disasm by shirokuma

[1352761] Infinite loop when trying to debug a triple exception

[1311170] small APIC bug fix (interrupt sent to the wrong CPU)

[1309763] Watchpoints don't work in device memory by Nickolai Zeldovich

[1294930] change line status on floppy by Ben Lunt

[1282033] SSE FXRESTORE not working correctly by Ondrej Palkovsky

[816979] wget generalizations by Lyndon Nerenberg

[1214886] No more pageWriteStamp / unified icache by H. Johansson

[1107945] com->socket redirection support by Andrew Backer

- these S.F. bugs were closed

[669180] win95 install : unknown SET FEATURES subcommand 0x03

[1346692] bochs 2.2.1 VGA BIOS error

[1354963] floppy in KolibriOS

[1378204] error: bochs-2.2.1, --enable-sb16, --disable-gameport

[1368412] VDE problems in BOCHS

[533446] CPU and APIC devices appear twice

[1000796] bximage fails to create image of specified size

[1170793] Quarterdeck QEMM doesn't work

[923704] Multiple opcode prefixes don't reflect Trap 13

[1166392] DocBook/documentation issues

[1368239] broken grater than 4GB size of sparse type hd image

[1365830] i386 compile breaks on paging

[427550] Incomplete IRETD implementation

[1215081] MSVC workspace STILL not fixed

[736279] Jump to Task

[1356488] FD change fail & occur error

[957615] [CPU ] prefetch: RIP > CS.limit

[1353866] not booting linux-2.6.14

[1351667] load32bitOSImage does not work with --enable-x86-debugger

[1217476] Incorrect (?) handling of segment registers in real mode

[1184711] OS2 DOS crash [2.2.pre2]

[624330] support for disks > 32GiB

[1348368] bochs 2.2.1 bximage error

[1342081] Configuration Menu option failed

[1138616] OS/2 Warp 4 hangs when booting

[1049840] mouse and video conflict

[1164570] Unable to perform Fedora Core 4 test 1 installation

[1183201] Windows 2000 (MSDN build 2150?) does not completely install

[1194284] Can't boot from CD-ROM (Windows NT)

[962969] Windows NT crashes while trying to intall them.

[1054594] WinXP install halts (redo)

[1153107] Windows XP fails with BSOD on 'vga'

[938518] Win XP installation fails

[645420] getHostMemAddr vetoed direct read

[1179985] MS XENIX: >>PANIC<< VGABIOS panic at vgabios.c, line 0

[1329600] WBINVD and INVD should flush caches and TLB

[638924] eliminate BX\_USE\_CONFIG\_INTERFACE

[1048711] Funny behaviour with CTRL

[1288450] keyboard BIOS error

[1310706] Keyboard - about key SHIFT

[1295981] Ubuntu 5.04 Live-CD won't boot in Bochs

[879047] APIC timer behavior different before reset and after

[1188506] I still can't install the german Windows XP!

[1301847] Windows XP dosn't boot - FXRSTOR problem ?

[661259] does not boot QNX under WinX

[924412] Keyboard lock states all whacked

[681127] MIPSpro compiler (IRIX) is allergic to ^M

[1285923] BIOS keyboard handler

[516639] ATA controller revisited...

[657918] does not boot BeOS under WinX

[649245] BeOS CD locks halfway on boot

[1094385] Attachment for bug 1090339 (beos failure)

[1183196] BeOS 4.5 developer CD does not install

[1090339] BeOS fails to boot

[639484] panics when int 13 is called

[711701] divide by zero

[704295] ATAPI/BIOS call missing

[682856] hard drive problems

[627691] Cursor keys problem

[588011] keyboard not working

[542260] os/2 warp crashes with floppy handling

[1273878] SB16 doesn't work in pure DOS

[542254] OS/2 FDC driver dies

[1099610] Windows 98 SE Does not install

[875479] cr3 problem on task switch

[731423] NE2000 causing PANIC on Win2K detection

[1156155] bochs fails to boot plan9 iso

[1251979] --enable-cpu-level=3 should assume --without-fpu

[1257538] Interupt 15h 83h - set wait event interval

[658396] Panic for DR DOS emm386

[679339] /? doesn't divulge Bochs command-line syntax

[1167016] call/jump/return\_protected doesn't support x86-64

[1252432] Mac OS X compile bug

[881442] Bochs 2.1 PANIC when loading DOS Turbo Pascal protected mode

[1249324] Boch2.2.1 Buffer Overfollow in void bx\_local\_apic\_c::init ()

[1197144] 'make install' has dependency on wget

[1079595] LTR:386TSS: loading tr.limit < 103

[1244070] Compilation Error in gui/rfb.cc

[761707] CPU error when trying to start Privateer

[517281] Crash running Privateer in DOS...

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Changes in 2.2.1 (July 8, 2005):

- Fixed several compilation warnings and errors for different platforms (Volker)

- Fixed FPU tag word restore in FXRSTOR instruction (Stanislav)

- Added missing scancodes for F11 and F12 to BIOS translation table (Volker)

- Bochs disassembler bugfixes (h.johansson)

- About 5% emulation speed improvement (h.johansson)

- Handle writing of zero to APIC timer initial count register (Stanislav)

- Enable Idle-Hack for 'TERM' GUI (h.johansson)

- Reduced overhead of BX\_SHOW\_IPS option to minimum. Now every simulation

could run with --enable-show-ips without significant performance

penalty. (Stanislav)

- Fixed pcipnic register access (Volker)

- Limited write support for TFTP server in 'vnet' networking module added (Volker)

- Changed some timing defaults to more useful values (Volker)

- WinXP/2003 style common controls now supported (Vitaly Vorobyov)

- Updated LGPL'd VGABIOS to version 0.5c (Volker)

- Added new BX\_INSTR\_HLT callback to instrumentation (Stanislav)

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Changes in 2.2 (May 28, 2005):

Brief summary :

- New floating point emulator based on SoftFloat floating point

emulation library.

- improved x86-64 emulation

- Cirrus SVGA card emulation added

- status bar with indicators for keyboard, floppy, cdrom and disk (gui dependant)

- many improvements in Bochs emulated I/O devices (e.g. PCI subsystem)

Detailed change log :

- CPU

- fixes for booting OS/2 by Dmitri Froloff

- fixed v8086 priveleged instruction processing bug (was also reported

by LightCone Aug 7 2003)

- exception process bug (was reported by Diego Henriquez Sat Nov 15

01:16:51 CET 2003)

- segment validation with IRET instruction

- CS segment not present exception processing with IRET

- several fixes by Kevin Lawton

- add MSVC host asm instructions (patch by suzu)

- fixed bug in HADDPD/HSUBPD (SSE3) instructions

- fixed bug in float to integer SSE/SSE2 convert instructions

- fixed BCD instructions implementation

- execution speed improvements (sshwarts and psychosmur)

- fix MSR\_APICBASE base address (Kangmo Kim, Christian Neubert)

- change BX\_PANIC messages to BX\_INFO when behaviour exactly

matches Intel docs

- EIP > CS.limit case should always cause #GP(0), even in real mode.

Fixed all jump, call and ret instructions for 16/32 modes

- fixed using invalid segment register for MOV instruction (h.johansson)

- fixed ET bit mismatch between CR0 and SMSW instruction

- fixed possible simulator #DIVZERO fault when executing IDIV instruction

- fixed undocumented flags handling for BTS, BTR, SHR, SHLD, MUL and IMUL

instructions (Stanislav Shwartsman)

- added missed #GP(0) exception when loading incorrect flags combination

to CR0 (Stanislav Shwartsman)

- in case of --enable-ignore-bad-msr enabled read ignored MSRs as zero

- enabled #DE, #TSD and #MCE bits in CR4 register, previosly setting

of one of these bits generated #GP(0) (Stanislav, Volker Ruppert)

- exceeding the instruction length limit of 15 bytes (this only can

occur when redundant prefixes are placed before an instruction)

generate #GP(0) (Stanislav Shwartsman)

- corrected PAE functionality

- CPU (x86-64)

- fetchdecode fixes for x86-64 and 3DNow! (Stanislav)

- fixed CF flag handling for SHL instruction in x86-64 mode (Stanislav)

- implemented CR8 register (aliased to APIC.TPR[7:4]) (Stanislav)

- implemented NXE bit (No-Execute page protection) support (Stanislav)

- STOSQ instruction emulation fixed (Avi Kivity)

- allow null SS selector for MOV SS, POP SS, and LSS instructions

in long mode (Avi Kivity)

- ignore segment bases for all segments (except FS and GS) in long

mode (Avi Kivity)

- allow SYSENTER/SYSEXIT instructions together with x86-64 (Stanislav)

- canonical address checking for RIP (Stanislav)

- FPU (Stanislav Shwartsman)

- totally rewritten all FPU code based on softfloat library

- significantly improved accuracy of all floating point

instructions.

- implemented all missed P6 and PNI floating point instructions.

- hundreds of bug fixes in FPU code.

TODO:

! Unmasked underflow/overflow should correct the result

by magic number for all operations, including float32

and float64.

- APIC (Zwane Mwaikambo)

- APIC arbitration

- Processor priority

- Various interrupt delivery fixes

- Focus processor checking

- ExtINT delivery

- Disassembler

- fixed MOV opcode 0x88, had exchanged the operands (h.johansson)

- fixed MOV opcode 0xA3, had wrong operand size (h.johansson)

- fixed BOUND opcode 0x62 (Stanislav)

- fixed CALLW opcode 0xFF /3 and JMPW opcode 0xFF /5 (Stanislav)

- fixed INS opcode 0x6D, had wrong operand size (Stanislav)

- fixed disassembly for repeatable instructions (Stanislav)

- fixed sign-extended immediate opcodes (Stanislav)

- fixed MOVSS/MOVSD instructions opcode names (Stanislav)

- fixed NEG instruction opcode name (Stanislav)

- fixed CMPXCHG8B instruction, had wrong operand size (Stanislav)

- fixed floating point instructions operands (Stanislav)

- experimental support of AT&T syntax in disassembler (Stanislav)

- I/O devices

- general

- handle cpu reset through port 0x92

- new memory handler API for PCI i/o and memory handling (Frank Cornelis)

- speaker emulation for Linux (David N. Welton) and Win32 (Volker Ruppert) added

- pci

- PCI slot configuration added for 5 slots (Volker)

- PCI irq routing, irq sharing and level sensitive irq mode implemented

- ne2k device appears as a Realtec 8029 NIC if connected to a PCI slot

- PCI IDE controller dummy device added

- PCI host device mapping for Linux (Frank Cornelis)

- PCI Pseudo-NIC emulation (Michael Brown)

- serial

- multiple serial port support added (4 ports now available)

- partial raw serial support on win32 (transmit data)

- serial port i/o mode option added (modes: null, file, term, raw, mouse)

- parallel

- multiple parallel port support added (2 ports now available)

- mouse

- serial mouse support (Volker)

- PS/2 and serial wheel mouse support (Ben Lunt)

- usb

- USB mouse and keypad support (Ben Lunt)

- config option to specify devices connected to USB ports

- vga

- VBE 8 bit DAC support added

- VBE memory now registered using DEV\_register\_memory\_handlers()

- CL-GD 54xx SVGA emulation added (Makoto Suzuki)

- vga extension option added (choices: vbe, cirrus, none) (Volker)

- floppy

- raw floppy access now works on Win9x host (Ben Lunt)

- sb16

- MacOSX sound support (Brian Huffman)

- networking modules

- new: 'eth\_vnet' simulates ARP, DHCP, ICMP-echo and read-only TFTP

(m\_suzu, easeway)

- new: 'eth\_vde' for Virtual Distributed Ethernet (Renzo Davoli)

- System BIOS

- turn floppy motor off 2 seconds after last read/write/recalibrate command

(Ben Lunt)

- int13\_cdrom / 32 bit register update fixes for FreeBSD cdrom boot

(Fabrice Bellard)

- APM and system shutdown support (Fabrice Bellard)

- checksum calculation for expansion ROMs

- extended floppy parameter table (Mike Nordell, Derek Favcus)

- PCI IRQ initialisation added

- boot sequence with up to 3 boot devices added

- display libraries

- status bar with indicators for cdrom, floppy, harddisk and keyboard added

(done in rfb, sdl, win32, wx and x)

- 3rd (middle) mouse button now supported (rfb, sdl, win32, wx, x)

- mouse wheel support (sdl, win32, x)

- CTRL key + middle mouse button now used to toggle the mouse capture mode

(sdl, win32, wx, x)

- text mode split screen feature added (sdl, win32, wx, x)

- new gui function returns the display library capabilities (xres, yres, bpp)

for the Bochs VBE support

- display library specific options added - currently supported:

rfb: timeout (time to wait for client connection)

sdl: fullscreen (startup in fullscreen mode)

win32: legacyF12 (use F12 to toggle mouse)

- new graphics update API added (used by svga\_cirrus) (Robin Kay)

- configuration interface

- win32: gui runtime dialogs replace textconfig runtime dialogs

- set default IPS to 10000000 in .bochsrc sample

- SB16 options dmatimer and loglevel now available at runtime

- configure script / compile

- --enable-ignore-bad-msr (ignore bad MSR references) option is enabled

by default

- --enable-mmx enabled by default only if cpu-level >= 5

- --enable-4meg-pages will be enabled by default if cpu-level >= 5

- fixes for Solaris SunPro (Robin Kay)

- --enable-pni option added

- --enable-show-ips option added, enable Instruction Per Second counter

in log file

- autodetection for lowlevel sound support added

- documentation

- a bunch of updates in user and documentation docs (Alexander Schuch)

- SF patches applied

[894595] MSR\_APICBASE always returns APIC ADDRESS 0 by Kangmo Kim

[907163] ctrl\_xfer8 clean/speed up

[907161] clean/speed up of io.cc

[899972] data xfer performance patch V 2.0.4

[904549] imul gives incorrect result in long mode

[877510] amd64 fixes...

[903465] SEGV in iodev/ne2k.cc line 1211 on Alpha architecture by Christian Lestrade

[903332] copy the bximage result to clipboard, etc by Lukewarm

[950905] Do not PANIC on rare, bad input from user-mode by h.johansson

[924428] ET bit mismatch between CR0 and MSW

[869822] a real SVGA implementation by m\_suzu

[867045] fix for compiler errors on VC++ by m\_suzu

[838601] support for the over 2GB disk size with MSVC++

[874816] local ARP/ping/DHCP simulator by m\_suzu

[976066] Keyboard: Get controller version by Ben Lunt

[832330] ROMBIOS improvement (reduce stack consumption, etc.)

[977900] READ\_CDROM\_TOC and base address by Ben Lunt

[961665] WinXP patch to read physical CDROM's TOC by Ben Lunt

[978793] CDROM\_SENSE\_MODE medium\_type by Ben Lunt

[615457] gif to png migration

[1021767] Portability in sb16ctrl.c by Robert Millan

[690400] gzip is confused by GZIP variable in Makefile

[567595] guess floppy image size from image file length by Tal Benavidor

[888426] bochsrc to make vnet useful by m\_suzu

[1021758] GNU/k\*BSD host support by Robert Millan

[969967] int 15/ah=87h clearing cr0 by Ben Lunt

[1048327] Russian Keymap by Dmitry Soshnikov

[851332] DESTDIR support for install\_dlx by Ville Skyttä

[970929] gdbstub support for MinGW tool chains by Muranaka Masaki

[1021740] Turn gdb stub into a runtime option by Charles Duffy

[1063329] RFB key press/release bug fix by Remko van der Vossen

[1079240] Wheel Mouse by Ben Lunt

[1087537] Fix for Win9x CD boot by lukewarm

[1083218] Start of wheel for USB #2 by Ben Lunt

[1098480] bochsrc: fixed floppya example by Alexander Schuch (ci-dev)

[1094407] configure.in: changed wxWindows to wxWidgets by Alexander Schuch

[1092058] serial.cc debug output cleanup by Ben Lunt

[1101165] APIC base address by Christian Neubert (flashburn)

[1093796] Fix for bug #1093786 (Nigel Horne)

[1082584] The start of Bus mice and USB mice by Ben Lunt

[1104695] msvc6 compatibility update (Royce Mitchell III)

[1059199] VGA text font bug fix (Anonymous)

[1108001] Null pointer on bx\_atexit() (Ben Lunt)

[1112093] Fixed mouse cursor remain area drawing (Anonymous)

[1114826] Fix PCIBIOS (Destruction prevention of esi and edi)

[1095473] Reading from a CDRW (Fixed) by Ben Lunt

[1123895] x86-64 gdb/debugger fixes by Avi Kivity

[1145423] stosq simulation bugfix by Avi Kivity

[1151012] allow null ss on x86-64 by Avi Kivity

[1153327] ignore segment bases in x86-64 by Avi Kivity

[1153511] Fixed broken screen update (VBE)

[1152808] use 'install' instead of 'cp' during installation by Avi Kivity

[1159626] bugfix [1156776] keyboard scanmode fault by Rene Kootstra

[843328] PATCH: support for Flat-style ToolBar with Win32GUI

[1198308] PATCH: fix incorrect moving mouse cursor when wheel used

[1200515] add TFTP server to vnet & ipv4 bug fix by easeway

[1203305] tuntap incompatibility by Jan Kratochvil

- SF patches partially applied

[896733] Lazy flags, for more instructions, only 1 src op

[1005422] Improve mouse cursol Grub when 2 buttons-mouse use (WIN32)

(TODO: improved japanese keyboard support)

- patches applied

- patch.rombios.markevich (Start/Stop Wait Timer) (Kory Markevich)

- patch.apic-zwane (APIC fixes) (Zwane Mwaikambo)

- patch.v8086-exception.lightcone (LightCone)

- these S.F. bugs were closed

#957660 >>PANIC<< APIC: R(curr timer count): delta < initial

#1192654 60 x 90 text not quite right...

#1189097 "configure --with-sdl --with-rfb" doesn't compile

#1188980 Crash on XP when break into debugger

#1186693 Improving quality of ./configure --help

#1185245 Errors Making Bochs with Mingw32

#1185289 PSE is not enabled by default on Pentium

#1170620 info cpu scrolls away, is too long

#1157998 ips shown even when waiting for input

#663108 APIC Timer Bug

#831750 bochs unlike real PC in paging

#1182698 PAE support doesn't work

#954400 debugger causes segfaults when gcc 3.4.0 is used

#1171312 Possible SMP problem with ICACHE pageWriteStamp

#1179964 PANIC: RIP>CS.limit when jumping to longmode

#1171067 configure fails to add -lpthread

#1171065 Term UI needs -lncurses

#1171061 SDL GUI startup failure

#1022056 win32 error build debug version..c2146

#957190 error while attempting to compile sb16.cc

#804797 Debugger: visualization problem (jmp)

#675523 2.0.1 doesn't run on W2K?

#1167358 When using 5430PCI in DR-DOS Bochs would panic with a PUSHAD

#1164654 Bochs VBE bios causing exception 0B in Windows 95 (SVGA bios)

#1162983 conflicts which configure could detect

#1164536 Windows 95 B crashes during install

#526978 cygwin: in an rxvt, stdout is flaky

#542303 >>PANIC<< call\_protected: CS selector null

#859457 BRICKS game doesn't work

#1159639 text modes on address A0000-BFFFF are not handled properly

#1164225 define BX\_SUPPORT\_X86\_64 0

#1163720 ROL bug

#1156776 keyboard scanmode fault

#1162042 Duke Nukem 3D: >>PANIC<< iret: VM set on stack, CPL!=0

#1161945 ctrl\_xfer32 compile/make error

#1157124 Bochs doesn't run with large amounts of memory in bochsrc

#1154266 weird INT handling in V86 mode

#1157051 default Bochs CVS doesn't work-out-of-the-box

#923954 enter() with level > 0, >>PANIC<< iret: return CS selector

#1098476 Privilege Problem after SYSEXIT

#1121734 Bochs crashes when shutting down Win95

#1099294 VESA for Win98 bogus

#1112836 PGE-Bit crashes Bochs

#947586 The specification difference in x86-64 emulation

#1117145 Push reset Button, APIC0 Error occur

#1123043 fpu stack pointer changed \*despite\* fault occured (e.g. #pf)

#1122066 PANIC: iret: IP > descriptor limit when installing os/2 warp

#809574 rm -f segfaults

#593952 SuSE rm segfaults

#929783 floppy not recogniced since 2.1

#1099298 SB16 for Win98 Bogus

#1079483 Reading from a CDRW

#549793 flaw in interrupt gate handling(exception.cc)

#692055 SMP Error

#805479 Booting from disk causes illegal instruction warnings

#909677 pc-speaker doesn't work

#831751 behaviour unrealistic

#661213 CR4.TSD is broken

#685508 PANIC: prefetch: RIP > CS.limit

#1037923 Non-executable page support missed (NX bit, x86-64)

#1106530 wrong disassemble result

#1105208 drive order for boot gets saved wrong

#661060 Problem with Win98SE

#837377 Norton Ghost don't boot

#876689 Unknown register 0x17 [CPU] / WIN98SE

#947282 Bochs segfault

#963317 Persistent Win98SE

#1101168 APIC base address change

#680737 panic when installing winme

#1097187 Install FC3 on bochs-win failed

#875461 vgabios-lgpl should be default

#594797 Bochs segfaults

#602994 bochs breaks boot kernel

#571539 FreeBSD Install from CD Fails

#774257 Device doesn't work under W98

#759228 Installing Suse 8.2 in Bochs on WinME

#792561 cant boot freebsd 5.1 from cdrom

#804004 Live cd will halt on boot..

#956173 FreeBSD won't boot iso install images in Bochs v2.1 or 2.2.

#864401 >>PANIC<< jmp\_ev: IP out of CS limits!

#853831 Error on int 15h

#1094150 DR-DOS 7.03: panics when using multitasker

#655592 win98 hardwaredetection

#1093786 Solaris 9 installation CD fails

#959585 USB UHCI IO-Device

#963314 Redhat Fedora Installer Kernel Panic and Crash

#1086920 Bochs (cvs) doesn't compile on FreeBSD 5

#879050 Bochs reports enabled APIC without support

#1071199 dBaseII cause prefetch: RIP > CS limit

#1070812 typecast error while compiling wx.cc

#1068786 FSINCOS Cos value wrong at 90 degrees

#675248 Panic: EIP > limit on win98 install

#829793 [CPU ] prefetch: RIP > CS.limit

#1034059 >>PANIC<< prefetch: running in bogus memory

#1067813 pbm fpu\_proto.h:144 ebuild gentoo bochs 2.1.1

#922034 bios not aliased at 0xFFFFF000, registers wrong after reset

#912666 Configure fails on Yellow Dog Linux 3.0.1

#922038 Unexisting memory should read back as 0xFFFFFFFF

#1019723 HD image

#1057814 Shadow RAM not aligned

#1057240 Invalid IRET32 implementation

#809682 >> PANIC << : prefetch: RIP > CS.limit

#618680 memory referencing problems

#724262 A few things (Windows 2.03, Wolfenstein)

#985375 Crash Mandrake 7.1

#913418 compiler errors with --enable-external-debugger option

#708847 CR8 access should not panic X86-64

#1039499 Compile error pcipnic.cc (cygwin)

#978024 compile against wxGTK-2.5.2 fails

#639073 MacOSX: Networking not implemented

#639074 MacOSX: Soundblaster not implemented

#963264 Latest CVS --enable-pcidev fails to configue on YDL Linux

#586282 Mac OS X, will not "make"

#699532 CVS (as of 2003/03/07) cannot read disk images

#639275 wrong more than 2GB size DVD-ROM

#766020 info registers / dump\_cpu get old eflags

#655920 QuickBasic (qbx.exe) panics

#676188 Error BX\_MAX\_DIRTY\_PAGE\_TABLE\_MEGS

#923821 LOCK not generating exceptions properly

#1007747 Wrong configure?

#1022577 show "call" command crashes bochs every time

#681849 SuSE 8.1 Compile problem

#660322 Install bochs 2.0 on SuSe 8,0

#1022587 "Unrecognized args" message wrong after invalid show command

#833118 TUN/TAP interface bug

#1022178 tuntap module mangles incoming broadcast packets

#1028682 Report incorrect disk parameters of floppy

#1026234 make fails on Cygwin because of missing .exe extension

#1026241 --enable-cpp needed for .conf.win32-cygwin

#855323 BIOS Panic at rombios.c, line 1563

#762773 ROM checksum is not checked in rom\_scan\_loop

#657604 concat\_image\_t.lseek to byte -1378816 fa

#800140 No AH=83h INT15h implemented

#831965 Win32.zip BIOSes in wrong directory

#873280 bximage crashes after createing "growing"

#892223 bochsrc-sample.txt/vgaromimage option error

#1014361 Bximage on WinXP won't create image

#651510 bximage won't create larger than 2GB

#759206 bximage fails on Win32 for hd images over 2Gb

#759210 Bochs fails on image files over 2Gb on Win32

#799785 bximage doesn't work

#903345 Problem compiling harddrv.cc

#933303 Bochs cannot lseek() HD images > 2GB on W32 platforms

#888438 bximage crashes...(hacked fix included)

#871720 bximage 2GB file size limit

#930368 Can't create big hard drives (>2 GB)

#912496 IDIV can cause simulator divide error

#522111 Host os SIGILL, booting grub from hd

#1005052 DMA Controller Model Problem

#552939 Bochs window doesn't resize when win311

#989478 I-Cache and undefined Instructions

#661008 make install fails

#845691 Workaround: Ne2k and Windows 2000 not working

#923662 BIOS diskette motor countdown byte broken

#848141 VGA problems running Scitech Display Driver on Win95

#799370 Problem booting ReactOS 0.1.3

#670143 No rule to make config.h

#653444 with vbe/lgpl bios, scrn updates broken

#655696 quickstart broken?

#659350 FDC

#620853 Ne2000 ethernet card \*NOT\* supported

#607611 Numlock

#543476 Sound card does not work in Windows 95

#529554 unsupported VBE features DISPI update

#487316 Access violation on Win32

#576253 RTC too fast

#489748 io read from address 000003c0, len=2

#656861 Gentoo Linux panics in VGA code

#787184 Video BIOS's don't checksum correctly

#988529 textconfig [Save options to] function output obsolete option

#987293 Cannot accesss header/toolbar

#988246 floppy read error

#933199 speedup Bochs compilation 4x -> suggestion

#979106 Incorrect disassembly table entry

#658374 FPU incorrect emulation

#706933 Problem with the F12-Key

#477043 math\_abort panic in RH 7.1

#634371 Floating point problems

#681138 // is not valid in C

#643300 cpuid feature flag 15, cmov and fcmov

#913697 missing division by 0 exeption in fpu emuation

#923682 FSTENV/FINIT problems

#923855 FPTAN doesn't work right with full NPX stack

#924379 ET bit mismatch between CR0 and MSW

#716116 Direct floppy access

#962919 Mac: iodev/cdrom.cc disordered

#954751 Two FPU.CPP in project

#954359 Compile faile is 3dnow support is selected without SSE support

#906412 FreeSCO error

#942060 FDC Controller not conforming to specifications

#938522 Win XP installation fails

#923613 BOUND instruction exception handling is broken

#923223 memtest86 errors

#593342 autoconf script doesn't regenerate clean

#616116 Crash on exit...

#922042 shutdown through port 92 does not work

#891633 02839990390p[CPU0 ] >>PANIC<< RDMSR: Unknown register 0x17

#923653 DAA instruction is broken

#911225 obscure AAA / AAS bugs

#837206 Problems with numerical keys

#658765 BOCHS halts in runtime config

#890734 Bochsrc Parser Bug with commas included in strings

#877285 MSR\_APICBASE zero upon startup

#526984 SDL compiled in cygwin just quits

#886406 I/O permissions bug

#883239 undefined symbols in gui/siminterface.h:1215

#419647 on OSF1, cxx hates C++ inlines

#809790 "No rule to make target `devices.cc?..."

#873654 How compile without plug-in support ?

#837161 Test case for BX\_CPU\_C::IRET32

#888116 mmx.cc compile error

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Changes in 2.1.1 (February 8, 2004):

- fix bug in int15h function 0xe820 (Christian Neubert)

- fix vmware3 disk support on big-endian platforms (Christophe Bothamy)

- fix conditions for NM exception on FWAIT instruction (Christophe)

- fix symbol conflict in rfb and x display libraries (Volker Ruppert)

- allow 16 bit writes to ne2k page 0 (Kenneth Stailey)

- notify display libraries on change of bpp (Volker)

- fix bug in int13h function 0x10 (Volker)

- fix floppy dialog error on win2k (Volker)

- fix adress check in TSS IO permission bitmap (Christophe)

- fix buffer overflow vulnerability pointed out by SeSoX (Christophe)

- updates for MacOS compile (Daniel Gimpelevich)

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Changes in 2.1 (January 9, 2004):

Brief summary :

- New disassembler

- 3DNow!/SSE/SSE2/PNI instruction support

- Vmware3/Sparse/Undoable/Growing harddisk images support

- many VGA emulation improvements (e.g. high/true color VBE modes added)

- No more X11 vga font required

Detailed change log :

- CPU

- added emulation of AMD 3DNow! instructions set. (Stanislav Shwartsman)

Bochs now could decode all AMD 3DNow! instructions.

Most of instructions still not implemented, but the basis already presents.

Configure --enable-3dnow to enable 3DNow! support.

Notes :

- These instructions are not implemented yet:

PFPNACC\_PqQq, PF2IW\_PqQq, PFNACC\_PqQq, PFCMPGE\_PqQq, PFMIN\_PqQq,

PFRCP\_PqQq, PFRSQRT\_PqQq, PFSUB\_PqQq, PFADD\_PqQq, PFCMPGT\_PqQq,

PFMAX\_PqQq, PFRCPIT1\_PqQq, PFRSQIT1\_PqQq, PFSUBR\_PqQq, PFACC\_PqQq,

PFCMPEQ\_PqQq, PFMUL\_PqQq, PFRCPIT2\_PqQq

- CPUID does not report 3DNow! instruction set.

- added emulation of SSE/SSE2 floating point instructions. (Stanislav)

All SSE/SSE2 floating point instructions are fully implemented using

free softfloat library (including DAZ support and floating point

exceptions). Correctness of the emulation checked with heavily random

testing.

- added emulation of SSE3 (PNI) instructions (Stanislav)

Currently only 3 PNI opcodes still not implemented:

FISTTP m16int, FISTTP m32int, FISTTP m64int

- added P4 CPU support to CPUID instruction. (Stanislav)

- fixed implementation of FXSAVE/FXRSTOR instructions. (Stanislav)

- bugfix: unallowed lock prefix cases must cause #UD exception. (Stanislav)

- fixed fetchdecode bug caused #UD in SYSENTER/SYSEXIT instructions

in 32bit mode. (Stanislav)

- fixed fetchdecode64 bug caused wrong decoding of opcodes containing

BxImmediate\_IvIw or BxImmediate\_IwIb in x86-64. (Stanislav)

- fixed bug in int01 (opcode 0xF1) emulation. (Vitaly Vorobyov)

- fixed bug in x86 debugger with dr0-dr3 registers (Vitaly)

- fixed bug with mov to/from dr register in v86mode.

(now exception is generated (according to Intel documentation)

instead of panic) (Vitaly)

- fixed stack limit checking, now message is generated as BX\_DEBUG,

rather then BX\_PANIC, and exception code is executed. (Vitaly)

- instrumentation code updated. (Stanislav)

- fix flaw in IO bitmap permission of TSS (Christophe Bothamy)

- cpu resets on triple fault (Christophe)

- remove calculation on cr3 in dtranslate\_linear to increase

emulation speed (Conn Clark)

- numerous x86-64 fixes (Peter Tattam)

- FPU

- hundreds of bugfixes in FPU emulation after checking of the emulation

with testfloat (Scott Duplichan).

- Fixed cases:

- floatx80\_to\_int32, floatx80\_to\_float32

- floatx80\_to\_float64, floatx80\_round\_to\_int

- floatx80\_add, floatx80\_sub,

- floatx80\_mul, floatx80\_div

- implemented FCMOVcc instructions (Stanislav)

- 64-bit addressing support for x86-64 mode (Peter)

- Disassembler

- replaced Bochs disassember. New table-based disassembler fully supports

all IA-32 instruction sets including all FPU/MMX/SSE/SSE2/SSE3 opcodes.

(Stanislav)

- I/O devices

- general

- i/o access mask implemented, unallowed cases are now handled in the devices

code and cause a BX\_ERROR (Volker Ruppert)

- include slowdown timer as a runtime option (Christophe)

- netBSD : fix serial, ethernet, cdrom (fredb, uebayasi and David Laight)

- VGA

- color depth 15, 16, 24 and 32 bpp supported by VBE (Volker and

Christopher Nelson for 32 bpp on win32). Supported by sdl, x, win32 and wx.

- SVGA mode 0x6A (800x600x4bpp) implemented (Volker)

- new CGA graphics modes 640x200x1bpp and 160x100x4bpp (text mode 80x100) (Volker)

- raster operations AND, OR and XOR in write mode 2 (based on SF patch #707931) (Volker)

- 'split screen' in standard VGA graphics mode implemented (Volker)

- 'double scan' and 'double width' now handled in the VGA code (Volker)

- more accurate emulation of the horizontal and vertical retrace (Volker)

- changeable start address and variable line length supported by all

graphics modes (Volker)

- VBE: preserve video memory feature implemented (Volker)

- additional text mode features prepared (handled in the display library

code) (Volker)

- PCI

- add experimental PCI VGA card (Mike Nordell)

- add experimental PCI USB card (Ben Lunt)

- Harddisks

- per device selectable harddisk modes :

- undoable, volatile, growing disks support (Christophe)

- sparse disks support (justinSB)

- vmware3 disks support (Sharvil Nanavati)

- fix non detection of hard drives by minix2 (Christophe)

- implement atapi command 0xA8 read (12) (Christophe)

- mode sense command updated (Hartmut Birr)

- sb16

- opl2 support enhanced (James E. Flemer)

- ne2k

- tap support for FreeBSD (Ronald Klop and Gen Otsuji)

- fix when booting with grub (Keir Fraser)

- cmos

- date/time change support added (Volker)

- UIP bit and divider chain reset implemented (Volker)

- initial time can now be set to local time or utc (Christophe, Daniel Gimpelevich)

- keyboard

- keyboard reset function (0xff) now resets the keyboard (Volker)

- gameport

- new standard PC gameport device (real joystick connected on Linux and

win32 only). Enable it with --enable-gameport or the SB16 emulation (Volker)

- serial

- FIFO emulation (UART type 16550A) implemented (Volker)

- floppies

- 160k,180k,320k floppies support (Ben Lunt)

- display libraries

- X11

- onboard vgacard charmap usage (no need for external X11 vga font any more) (Christophe)

- vgacard charmap change support (Christophe)

- fix black stripes on partial exposes (Dirk Thierbach)

- headerbar redraw optimizations (Dirk Thierbach)

- external font files and their installation mechanism removed (Volker)

- belgian keymap support (Wouter Verhelst, Eric Brasseur)

- win32 + wx + x: new application/window icon (bochs.ico / icon\_bochs.xpm) (Volker)

- sdl + win32 + wx + x: new textmode features: variable line length,

char width switch, horizontal and vertical pel panning (Volker)

- win32 + wxMSW: key event handling rewritten (Volker)

- win32: status bar at the bottom of the simulation window added (Volker)

- wxMSW: resource problems fixed - wx dll plugin works now without errors (Volker)

- term: variable line length and cursor enable/disable feature implemented (Volker)

- rfb

- textmode: charmap change, better cursor emulation, variable line length (Volker)

- headerbar works now (power, reset and user button are okay) (Volker)

- key event handling rewritten (Volker)

- Bochs-RFB waits up to 30 seconds for a client connection. The emulation

starts after connecting the client. (Volker)

- carbon: Alt/Ctrl/Shift key handling rewritten & SysRq/Ctrl-Break key support added

(Daniel)

- configuration interface

- gui dialogs as an extension of the textconfig interface on win32 added (Volker)

\* ask dialog

\* save text snapshot

\* user button shortcut

\* floppy image change

- wxwindows configuration dialogs improved (Volker, Christophe)

- support tools

- bximage : added support for

- growing disks (Christophe)

- sparse disks (justinSB)

- created bxcommit tool for undoable disk images (Christophe)

- System BIOS :

- fixed int15 function e801 (get memory size) (Christophe)

- added int75\_handler for FPU Dos Exceptions (Christophe)

- added int16 function 0a (Get Keyboard ID) (Volker)

- added support for ElTorito Harddisk-on-CD emulation (Christophe)

- fixed ATA/Serial ioport conflict (Daniel)

- VGA BIOS : updated to version 0.4c (Christophe)

- configure script/compile/porting to other OSes/installation

- fixes for compilation with MSVC (Andrew Zabolotny)

- fixes for cross-compilation (Jeroen Janssen)

- win32 nsis installer script updates (Volker)

- small configure fixes for MacOS (Christophe)

- optimizations & compile fixes for MacOS/X (Daniel)

- configuration files. The following options have been deprecated :

diskc, diskd, cdromd, time0, pit, newharddrivesupport.

- documentation

- already ported and obsolete parts of the old documentation removed (Volker)

- user documentation updated and extended :

- improved section "What does Bochs need" (Volker)

- command line arguments (Volker)

- search order for the configuration file (Volker)

- the configuration interface 'textconfig' (Volker)

- FreeDOS Beta 8 installation instructions (Volker)

- disk modes (Christophe)

- LBA translation (Christophe)

- cdboot error codes (Christophe)

- SCO OpenServer install section (Carl Sopchak)

- MacOS-X DMG install guide (Aard Vark)

- update Win98 install guide (Dirk Thierbach)

- SF patches applied

#658950 Bug in FPU (Anonymous)

#678117 build fail due to bad SGML punctuation (Anonymous)

#671873 minimal USB support (UHCI) (Ben Lunt)

#682539 Fix CapsLock and NumLock behavior (rock at gimp.org)

#720776 REX MOVB immediate broken for x86\_64 (Arnd Bergmann)

#729450 new keymap x11-pc-be.map (Wouter Verhelst)

#735990 Limited patches for VC++ (Anonymous)

#742670 fix library dependencies in GUI plugins (Robert Millan)

#742782 LFB bugfix (Jan L. Hauffa)

#748414 load32bitOShack bug (kyriazis at nvidia.com)

#830079 Fix bochs's application error if unsupported key pressed (Anonymous)

#724466 enable building with CC=gcc-3.2 CXX=g++-3.2; dist-clean adds(Leonard Norrgard)

#834962 Fixed drawing graphics is broken (Anonymous)

#838401 Fixed redrawing of ToolBar on Win32GUI (Anonymous)

#850236 Fixed accessing DVD-ROM with direct device access on Win32 (Anonymous)

#847822 Bochs crash when exmining memory that crosses page boundary (ortal at jungo.com)

- SF patches partially applied

#707931 Support EGA/VGA write mode 2 and others (Anonymous)

already applied: disable IME, split screen, write mode 2,

BIOS INT16h/AH=05h

#856506/#856510 Patch to fix compile-time iodev/cd-rom.cc error (alden.dima at nist.gov)

Correct patch provided in SF bug report #843433 (birkhofer at users.sourceforge.net)

- patches applied

- patch.highmem (memory allocation) (Zwane Mwaikambo)

- patch.floppy-160k-180k-320k-benlunt (exotic floppies) (Ben Lunt)

- patch.perf-regparm-cclark (performance) (Conn Clark)

- new patches present in the patches directory :

patch.pipelined-asm-cclark

patch.mingw-resources

patch.v8086-exception.lightcone

patch.pit-vitaly-vorobyov

patch.rombios-vitaly-vorobyov

patch.win32-vitaly-vorobyov

patch.win32-new-files-vitaly-vorobyov.tgz

patch.rombios.markevich

patch.rombios.dirk.thierbach

- these S.F. bugs were closed

#865354 ">>PANIC<< CRA: divider chain control 0x07" in Linux 1.1

#725796 configure script bug

#859768 cpuid

#863964 panic in duron 2000

#843433 cdrom.cc on MacOSX: wrong const names

#818493 EMU][ (DJGPP app running on FreeDOS) broken

#787005 Some MOV instructions are not implemented!!!

#840664 2200136693936p[CPU ] >>PANIC<< prefetch: RIP > CS.limit

#837416 V2 OS not compatible !?

#650917 Serial port broken under win95

#829863 Make bochs 2.0.2 build with gcc3

#816971 main.cc: getcwd() missing argument

#813556 Compile error under gcc 3.3.1

#809758 RIGHT ALT does not function properly

#809695 CVS complains about unknown files after compilation

#628762 Error in Floppy Booting

#474526 Crash under win32 (access violation)

#687619 test case for BX\_CPU\_C::IRET32

#664544 Panic in IRET32 - Reporting test case

#637822 test case for BX\_CPU\_C::IRET32

#603410 BX\_CP U\_C::IRET32

#537047 IRET32 incomplete emulation, panic

#805541 Compile fails on i686, gcc 3.3

#798829 Problem booting from ISO image

#688163 Panic at rombios.c

#688161 rombios.c crashes when boot from a CD.

#796339 int 15h, e801h broken?

#666946 Slowdown Timer should be a module

#783826 the clock is extremely fast

#645609 Real Time Clock is too \*FAST\*

#663320 flaw in IO bitmap permission handling

#764929 Timing is off.

#659510 Bochs timing off by x10

#787138 No ROM BIOS character map

#787134 Config options not saved

#689201 Disassembler bug

#666202 Windows 2000 - random screen blanking with linux DLX demo

#629242 reset during Doom -> BIOS panic

#695434 minix floppies won't boot.

#764473 Freesco Linux crashes on boot

#656026 error when trying to run some stuff

#614202 HD: non-byte IO read to 01f4

#777357 Strange FPU compiler error

#583758 gag bootloader doesn't run

#658639 ne2k panics with MS lanman Client/DOS62

#536711 problem running smart bootmanager

#741433 Disabling all ata# results in HD error.

#753200 lock instruction doesn't do an illegal instruction trap

#679389 libbx\_wx.so.0: undefined symbol

#758936 Problem Installing Bochs

#742580 I configured fants but bochs still give me the same error

#772242 iodev/vga.cc wrong memory access.

#739222 Cannot change resultion

#693344 libwx\_gtk2.3.so.2 RedHat linux 8.0

#639320 sparc: needs -lm to compile

#587422 Windows 95j doesn't boot

#547817 sparc: rfb needs -lsocket

#480963 RFB: option to wait for client

#763893 i've got problems with a "libvga.so.1" and another file

#766490 Documentation mistake

#766481 Bochs 2.0.2 Fails to compile on YDL3.0

#626144 %lld is not portable

#752241 lock prefix erronously allowed for some instructions

#743305 fetchdecode.c probs

#658707 Automatic exit?

#696758 BeOS can't mount image disk, won't complete boot.

#737048 Enabling keyboard resets controllers translation mode

#717713 Bochs panics on startup on RH 9

#741108 VGA PANIC

#730922 seg fault on "bochs boot: cdrom"

#658905 VGA read write error

#564218 Panic on vga\_mem\_write

#614231 X11 doesn't support charmap change

#708311 Missing CGA low-res emulation

#720776 REX MOVB immediate broken for x86\_64

#643296 lock prefix, unallowed cases

#716964 [sb16] OPL.timer\_running not initialized

#662074 little mistake in the default config example

#470701 CD-ROM on Win2K needs FILE\_SHARE\_READ

#706454 bug??

#653861 Win32 build bug

#421155 panic on vga read 0x3c7,0x3cb

#666434 VGA BIOS: Incompatible mode reporting

#681819 Incorrent return value from cdrom reads

#648222 Lotus Agenda futuristic dates off

#657455 doesn't boot plan9

#658938 SGDT in VM8086

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Changes in 2.0.2 (January 21, 2003):

- fix possible segfault in wxWindows (Volker Ruppert)

- fix instrumentation (Stanislav Shwartsman)

- fix cdrom read\_toc() function for \*BSD (Keith Matthew Jones)

- fix NetBSD boot from cdrom (Christophe Bothamy)

- fix cmos checksum (Volker)

- fix "refresh bit" behaviour in pit (Volker)

- fix .bochsrc parsing (Volker)

- fix vga resize/redraw problems (Volker)

- fix compilation issues on Irix and Tru64 (Christophe)

- fix MMX/SSE bugs (Stanislav, Peter Tattam)

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Changes in 2.0.1 (January 4, 2003):

- fix corrupt saved configuration files (Christophe Bothamy)

- fix missing break statements in apic (Shai Fultheim)

- fix compiling sb16 under FreeBSD (Volker Ruppert)

- updates to the documentation (Volker)

- fix text mode colors 8 to 15 (Volker)

- fix FPU integer load bug (Volker)

- stop pasting on hardware reset (Volker)

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Changes in 2.0 (December 21, 2002):

Since the change log is hundreds of lines long, here is a very brief summary.

- 2x emulation speedup!!!

- added plugin devices and guis. Now you can compile with many more

options, and choose between them at runtime.

- added emulation of AMD x86-64, MMX, SSE, SSE2 instructions

- add wxWindows port (a graphical configuration interface and display lib)

and SVGAlib port (full screen display for Linux without X11)

- improvements in many I/O devices: for example up to 8 hard disks/cdroms,

TUN/TAP network interface, 360k floppies,

- improved MacOSX/Carbon interface and updated MacOS9 port

- GDB remote stub, allows symbolic debugging with Bochs simulation.

- support for up to 32gig hard disk images

Detailed change log follows.

- documentation

- manpages updated (Volker, Christophe)

- install HTML rendering of docbook documentation instead of

docs-html (Bryce)

- doc/docbook/Makefile is now generated by configure script.

if configure detects docbook2html on your system, it will turn on

--enable-docbook and run make in the doc/docbook directory. Also

make install will install documentation into $(docdir). You can use

--disable-docbook to turn this off, if necessary. (Bryce)

- add "make bochsdoc.tar.gz" target to create a documentation tarball.

If you do "make webinst" and you have write access on SF shell server,

it updates doc/docbook/\* on the website (Bryce)

- user documentation additions:

- new options (Bryce, Volker, Christophe)

- Bios tips section (Christophe)

- Tuntap section (Christophe)

- Serial Port section (Christophe)

- "Will it Work for Me" / "Is Bochs Right for Me" sections

(N. David Guarneri)

- VESA section (Jeroen Janssen)

- several documents, previously existing as separate html files, have

been included :

- internal debugger section (Christophe)

- gdb stub debugger section (Christophe)

- WinME, WinNT, WinXP, The Hurd, Japanese Win95 install tips (Christophe)

- Win95, Win98 install tips (N. David)

- SB16 section (N. David)

- configure script/compile/porting to other OSes/installation

- added plugin architecture

- plugin code written by Bryce, Christophe, Volker based on

plex86's plugin code by Kevin. Testing help from Psyon and Br'fin.

- Plugins are shared libraries that can be loaded on demand. Example:

the serial device is implemented as a plugin. In UNIX, the

serial plugin is called libbx\_serial.so. When Bochs reads its

configuration file, if the serial device is enabled it loads

libbx\_serial.so.

- all display libraries, most I/O devices are converted to plugins now

- plugins supported on Linux, Solaris, and MacOS X using libtool,

Cygwin using dlltool. On MacOSX, you must have dlcompat installed

and in your include/library paths at configure time. (See .conf.macosx

for an example.)

- we use libtool's LTDL library from libtool 1.4.2, with a number of

critical bug fixes (Bryce Denney)

- the Linux binary RPMs are built with plugin support

- to compile with plugins, configure with --enable-plugins

- the LTDL\_LIBRARY\_PATH variable tells Bochs where its plugins can be

found. Bochs has a compile-time default for this variable which is

correct if you do a make install. You would only need to set the

variable if the default is wrong.

- for win32 plugins we added "BOCHSAPI" in front of many classes

and methods, to aid in building DLLs. This turns into \_\_declspecs

which are used when making an export library for Bochs.

- allow many display libraries to be configured and compiled at

a time. For example --with-win32 --with-sdl --with-rfb.

Also, we added an experimental option --with-all-libs which

tries to detect which --with-\* options will work. If the

autodetection fails, just type the --with-\* options explicitly. (Bryce)

- add #if's around all files which are conditionally compiled such

as cdrom.cc and sb16.cc. This makes it possible to compile every

source file all the time, which has the potential to simplify the

configure script and makefiles. At present we only take advantage

of this capability in the win32 VC++ workspace. (Bryce)

- the MacOS9 port has been updated so that it works again. It had

not been updated in at least 2 years, maybe more. (Christophe Bothamy)

- improve support for FHS standard (Robert Millan, Volker Ruppert)

See patches 551811 and 650066.

- keep separate CFLAGS and CXXFLAGS for Bochs (usually a graphical

program) and console programs such as bximage and niclist. Some

sdl and wx compile flags were making bximage and niclist unusable.(Bryce)

- add concept of cross-configuring in the configure script. If you

use the --target option to generate makefiles to be used on another

machine, some detection of compilers and libraries is disabled. (Bryce)

- fix term compile on Cygwin, but it has to be done without -mno-cygwin,

which means that several win32 features such as networking do not work.

- add "-Wno-multichar" on beos

- test for largefile support, and add required CFLAGS (Bryce)

- add -lm when it's needed, and not when it's not (Bryce)

- add configure support for 8 processors. Bochs can support up to 15

with some work on the BIOS.

- fix nmake makefile generation (Psyon)

- improved pthread detection function from ac-archive project on SF

- add installer package for Windows, using Nullsoft (Michael Rich, Bryce)

- on MacOSX, add startup script that creates a text console and then

runs Bochs. Also add make target to create a DMG disk image (Br'fin)

- do not restart the font server on Unix/X11, if vga.pcf was already

installed. On several modern machines, if you restart the font

server the user has to restart X windows. (Bryce)

- update most .conf.\* files with modern options such as

--enable-all-optimizations. (Bryce)

- The MacosX .conf script adds /sw/include and /sw/lib to the compile/link

path list because it is a common place to put dlcompat. Dlcompat is

required when building with plugins. (Bryce)

- rpms can now be built without root privileges (Bryce)

- command line

- fixed up our command line options (Volker, Bryce, Christophe)

Usage: bochs [flags] [bochsrc options]

-n no configuration file

-f configfile specify configuration file

-q quick start (skip configuration interface)

--help display this help and exit

- configuration file (bochsrc)

- There are several new options. See the documentation for more details.

- config\_interface: select text mode menus or wxWindows for configuration

- display\_library: select which display lib to use

- optromimage: load optional rom images

- ataN (N=0,1,2,3): up to 4 ATA controllers for hard disks, cdroms

- ataN-master, ataN-slave, N=0,1,2,3: defines a hard disk or cdrom.

The "ata\*" options replace diskc, diskd, and cdromd, which are

now deprecated.

- floppy\_bootsig\_check: control the 0xaa55 signature check on boot floppies

- logprefix: lets you change the format of log messages

(patch by Carl Sopchak, help from Christophe)

- debugger\_log: log all output from bochs debugger

- user\_shortcut: allow you to type key combinations like Ctrl-Alt-Del

- pit: control the PIT model, including realtime option to try to

keep in sync with real time.

- Credits: Christophe added optromimage, everything about ATA,

floppy\_bootsig\_check, debugger\_log. Bryce added config\_interface

and display\_library. Volker did the user\_shortcut button.

Greg Alexander wrote the PIT model and added the realtime option.

- since v1.3 we've been able to use environment variables in pathnames

in the bochsrc file. Now, a few variables have default values, set at

compile time, that are used if the user does not set a value. If Bochs

is installed correctly, the defaults will be correct and the user will

not need to override them.

- $LTDL\_LIBRARY\_PATH is the path name where the plugins can be found.

The default value comes from $(plugdir) in the makefile. This is only

important if plugins are enabled. (Bryce)

- $BXSHARE is the path where the BIOSes and keymaps are installed.

The default value comes from $(sharedir) in the makefile. Disk

images on the Bochs website will begin to use BIOS pathnames like

$BXSHARE/BIOS-bios-latest. On win32, the $BXSHARE default is

set by the NSIS installer and read from the registry. On MacoSX,

the $BXSHARE default is set to the path containing bochs.app.

(Bryce, Volker, Br'fin)

- new option in the configuration interface to reset all bochsrc

settings to initial defaults. A reset occurs just before reading

a new configuration file, so that leftover parameters from a

previous configuration do not affect the new configuration. Also,

you can request a reset using the configuration interface. (Volker, Bryce)

- ne2k line can now specify a script to set up the interface (Christophe)

- on Unix, also search /etc/bochsrc (Bernhard Bablok)

- you can use #include in the bochsrc to read configuration from other

files (Volker)

- CPU

- speed optimizations from Kevin Lawton, yielding around 2x speedup

- guest2host\_tlb : for entries in the paging TLB which point to normal

physical memory pages, a pointer to the host address of the emulated

physical memory (from malloc()) page is stored in the TLB entry. In

many cases, this pointer can be used in memory accesses to directly

read/write the guest memory address. In exceptional cases, the physical

memory access routines are used. Turn on with --enable-guest2host-tlb.

- repeat IO/string : for some variants of repeatable IO and string

instructions, the segmentation and paging checks are done in batch along

with the data transfers, constrained within page boundaries and the

segment limits. Turn on with --enable-repeat-speedups.

- icache : The structure holding instruction decode information was

reduced to 32 bytes. 24 bytes for the actual decode data, and 4 each

for pointers to the address resolution routine (not always needed) and

the instruction emulation routine. With a reasonably small

per-instruction decode size, an instruction cache (iCache) was created,

which is simply a hash table. The main cpu loop looks in the table

first; if the instruction has already been decoded, execution can begin

immediately without decoding. Turn on with --enable-icache.

- host specific asm : when compiling on an x86 platform, use of

x86-specific asms can be enabled to accelerate several facets of

emulating instructions. For example, the EFLAGS values are much more

efficient to calculate when the actual x86 instructions are used to

generate the EFLAGS values. Turn on with --enable-host-specific-asms.

(Kevin, with help from Jas Sandys-Lumsdaine)

- if you want to enable all the speed optimizations that we believe

to be stable, use --enable-all-optimizations. The release binaries

are built with this option.

- add support for AMD's x86-64 instruction set. To enable, configure with

--enable-x86-64. The AMD x86-64 support is about 90% complete and is

still experimental. We've implemented the core x86-64 instruction set and

the changes to the rest of Bochs necessary to operate in long mode, but

we've still to implement checking for canonical 64 bit addresses. The code

has been tested on a limited number of test programs. It has been able to

successfully boot a x86-64 Linux kernel and run a 64 bit userland

application. It has also successfully run a DOS based 64 bit protected

mode test application. (Peter Tattam, with merge/bugfix help from Kevin

Lawton and Bryce Denney)

- add MMX support. To enable, configure with --enable-mmx.

(Stanislav Shwartsman)

- add SSE and SSE2 support. To enable, configure with --enable-sse=1

or --enable-sse=2. (Stanislav)

- fixed the behaviour of the bcd instructions AAM, AAD and DAA based on

SF patch #537146 (Volker)

- stop printing an error for VERR/VERW. According to the i386 opcode

description there is no error present. (Volker)

- fix bug [ 625878 ] reset doesn't reset something(?). Fix cpu reset

when executing a rep instruction (Christophe)

- use accessors methods for CFLAGS and several other registers, so that

the implementation can be changed transparently later (Bryce, Stanislav)

- add support for page size extensions, also known as 4meg pages.

Turn on with --enable-4meg-pages. (Kevin Lawton)

- add support for page global extensions. Turn on with

--enable-global-pages. (Kevin)

- add support for physical address extensions. Turn on with --enable-pae.

(Peter Tattam)

- implement RDMSR and WRMSR. not all MSRs are supported (Zwane Mwaikambo)

- new configure option --enable-ignore-bad-msr, which makes unrecognized

MSR reads and writes into just a warning

- fix PIC/APIC interrupt problem that caused Linux 2.4.19 to hang

during boot (Peter)

- CMPXCHG8B patch (Michael Hohmuth)

- EFLAGS are now stored in the same form as the native EFLAGS on an x86,

so that we can use native machine instructions in some cases (Kevin)

- instrumentation code updated (Stanislav)

- FPU

- fixed bug [ 452275 ] fprem emulation bug (Volker)

- fixed bug [ 648579 ] Mac OSX >>PANIC<< FPU\_printall. There was an

endianness issue with the fpu (Christophe)

- I/O devices

- rewrote pc\_system timers (Kevin)

- biosdev

- this new device handles the panic/error/info/debug messages sent

by the Bios and VGABios. It was previously done in the unmapped device.

- cdrom

- implementation of the function READ TOC for cdrom image files. (Volker)

- function capacity() for win32 fixed. Now it returns the number of blocks

instead of bytes. (Volker)

- added multiple cdrom support for win32 (NT/2000 version untested). The

ASPI version uses the cdrom drives in the system's order. Drive letters

are not used by ASPI. (Volker)

- fix configure script's cdrom detection on BeOS (Bryce)

- fix physical CD change at runtime (Bryce)

- cmos

- fix panic when WinXP read port 70h (Christophe)

- add ps/2 style century at index 37 to allow WinXP to boot. (Bryce)

- dma

- DMA register and unregister functions for DMA channels added and macros

for DMA functions defined. The changes are based on the Plex86 functions.

(Volker)

- implementation of the DMA controller reset (Volker)

- the value of the command register must be always 0x00 (BX\_ERROR fixed)

- floppy (Volker)

- implemented Tape Drive Register (Dave Poirier)

- added support for 360k floppy images

- the skip flag (SK) in command 'read sector' is ignored now

- floppy read and write function do not set the 'seek end' bit in status

register 0 (fixes SF bug #553377)

- the status of the 'disk changed' line depends on the selected drive.

The digital input register is now an array (DIR[4]).

- apply patch [ 635021 ] floppy cleanup by Alex Thiel

- distinguish between floppy drive type and media type

- hard drive

- add largefiles support, to allow disk images larger than 2gig.

(Stu Grossman)

- missing conditions for lower\_irq() added (Volker)

- several noncritical panics replaced with BX\_ERRORS and the controller

returns an error code until we implement the features (Volker)

- applied patch from Carl Sopchak for booting sco openserver

- allow disk block access only if concatenated images are not used

(Christophe)

- fix bug [ 419415 ] netbsd 1.5 rescue disk won't boot (Volker)

- multiple drq atapi data transfers corruption fixed (Christophe)

- added some commands to the unsupported "Set Feature" commands (Christophe)

- speedups in repeated IO transfers (Kevin)

- support for Peter Tattam's external disk simulator (Bryce)

- 4 channels / 8 devices support (Christophe)

- "inquiry" atapi command results corrected (Volker)

- check for incomplete devices configuration before starting the

simulation (Bryce)

- implemented the different bios disk translation schemes (Christophe)

- keyboard and mouse

- add commands 0xd2, 0xdd and 0xdf (Dave)

- fix bug [ 613975 ] wxWindows: params redefined on restart (Bryce)

- in function mouse\_motion(): added parentheses to fix compilation problems

with MSVC. See SF bug #575301. (Volker)

- added missing register\_irq() for the PS/2 mouse IRQ12 (Volker)

- fix "AltGr" key on European keyboards wxWindows/win32, SDL (Volker)

- NE2000

- function reset() clears the IRQ line (Volker)

- added TUN/TAP interface (Renzo Davoli, Christophe)

- fix DOS based packet drivers that use an odd count for the NE2000 DMA (Peter)

- changed "TCR write, reserved bits set" panic into an error, fixes

networking with debian image (Bryce)

- parallel

- parport1 enable/disable support added (Volker)

- PCI (Volker)

- implementation of the PCI device register mechanism

- PCI memory handling moved to the memory code

- replaced memcpy() in pci\_read() by a more portable code. Problems with

PCI on big-endian machines are fixed now (SF bug #638481).

- implementation of the PCI-to-ISA bridge started (still incomplete)

- PIC

- fixed detection of single mode and level senistive mode in ICW1 (Volker)

- fixed handling of rotate\_on\_autoeoi for master PIC (Volker)

- irq mask is now cleared on initialization (Dave)

- fixed lockup during mouse movements during win98 install. (patch from

Wilfried Weissmann)

- PIT

- Added realtime PIT support (Greg)

- Sound Blaster 16

- it used to enable itself all the time; now only when you ask

- fix memory leaks (Bryce)

- serial

- don't cause problems when serial device is disabled (Volker)

- unmapped

- add programmatic shutdown feature at port 0x8900 (Christophe)

- vga

- VBE fixes (Jeroen, Volker)

- CRTC fixes (Volker)

- sequencer reset with bits 'reset1' and 'reset2' implemented (Volker)

- add charmap change support (used by SDL, win32 and wxWindows gui) (Volker)

- screen dimensions / updates for some graphics and text modes fixed (Volker)

- use the start address when calculating the byte offset for standard

EGA/VGA modes (Volker)

- byte offset for modeX fixed (use value of CRT register 0x13) (Volker)

- text mode memory mappings 0 and 1 support (Christophe)

- fix bug [ 612741 ] VBE mem conflicts w/ local APIC address (Jeroen)

- fix bug #635223: VGA tiles array access out of bounds (Bryce)

- ROM BIOS

- improve compile process. Now bioses for 1, 2, 4 and 8 processors

are built at the same time (Bryce)

- fixes to be able to compile the bios with gcc2 or gcc3 (Jeroen and

Christophe)

- changes on boot signature check (Christophe):

- never done for cdroms

- always done for hard-disks

- conditional for floppies

- add keyboard int16 functions 0x09 (get keyboard functionality) and

0x0a (get keyboard id) (Christophe)

- fix bug [ 629810 ] int 16/ah=01 broken? Enable interrupt on entering

int16 handler (Christophe)

- new keyboard init in POST (patch from Adam Sulmicki)

- flush input and output keyboard buffer before keyboard self test

(Volker and Christophe)

- fix bug [ 547603 ] kbd up/down arrows in dos install (Christophe)

- fix bug [ 549815 ] bios wrongly loads CS,ES. CS and ES are set to 0

before the bootloader code is called. (Christophe)

- PCI functions support (Volker) :

- BIOS32 service directory

- real mode PCI int1a functions

- protected mode PCI int1a functions

- fix reset for MS-DOS and Win95 (Volker)

- 360K floppy support (Volker)

- enhanced ata/atapi support (Christophe) :

- 4 channels / 8 devices

- device auto detection (with help from Adam Sulmicki)

- EDD3.0

- 32bits device access

- optional disk translation "large", "r-echs" or "lba" (up to 8.4GiB)

- re-enable harddisk controller interrupt after reads/writes.

Win95 can now use native access to harddisks and cdroms. (Volker)

- shutdown status handling (cmos index 0x0f) (Christophe) :

- fix bug [ 601166 ] CMOS Problem @ "0x0F Index 0x05 data". After reset

execution will resume by a jump to [0x40:0x67] if the shutdown status

is 5

- the bios don't panic any more if the shutdown status is 9

- two parallel ports detection in POST (Volker)

- two serial ports detection in POST (Volker)

- add int15 extended memory function 0xe820 (patch from osmaker) and

0xe801 (patch from Hartmut Birr)

- fix return values on some int15 functions (Bryce)

- fix int70 handler overlapping int08 handler (Christophe)

- simplify 8 processors BIOS for operating systems which don't do

paranoia/sanity checks (Zwane)

- configuration interface

- wxWindows config interface now allows you to change every bochsrc

option using menus and dialog boxes. There is also the beginning of

a wxWindows graphical debugger, but it needs a lot of work before it

will be useful.

- renamed control.cc to textconfig.cc. Now we're calling it a

text configuration interface, instead of a control panel.

- display libraries

- Even though we've had them for years, the term "display library" is new in

release 2.0. In the gui directory, Bochs has a number of different C++

files which you can select to display the text and graphics on the

simulated monitor. Each of these is a display library. The display

libraries are:

x use X windows interface, cross platform

win32 use native win32 libraries

carbon use Carbon library (for MacOS X)

beos use native BeOS libraries

macintosh use MacOS pre-10

amigaos use native AmigaOS libraries

sdl use SDL library, cross platform

svga use SVGALIB library for Linux, allows graphics without X

term text only, uses curses/ncurses library, cross platform

rfb provides an interface to AT&T's VNC viewer, cross platform

wx use wxWindows library, cross platform

nogui no display at all

- it is now possible to compile Bochs with support for many different

display libraries and select the one to use at runtime (even without

plugins). See the display\_library directive in .bochsrc.

- add new svgalib display library by Igor Popik

- fix bug [ 614724 ] SDL can get stuck in full screen mode

display libraries such as SDL which have a full screen mode can be

dangerous, if Bochs does not switch back to normal display mode at

the right time. This is fixed for SDL and the new svga.

- keymap support added in SDL interface (Bryce, Volker)

- new keymap files: SDL keymaps for US and DE keyboards, X11 keymap

for Danish keyboard.

- use keyboard mapping for keyup messages too

- renamed almost all references to data type "Boolean" to "bx\_bool".

The Boolean data type was defined in Carbon.h headers, and conflicted

with Bochs's definition. See bug [ 618388 ] Unable to boot under MacOS X

Exceptions: When talking to the Carbon library, you must use Boolean.

Also, siminterface.h uses standard "bool" instead of bx\_bool.

- "User" button added in toolbar. It can send keyboard shortcuts to

the guest OS. (Volker)

- snapshot improvement and memory leak fixed (Volker)

- testing framework, based on comparing screen content, added (Greg)

- term display library:

- support for color terminal, function keys, clear screen (Volker)

- solaris compilation problem (bug #613393) fixed (Bryce)

- win32 display library:

- use native win32 toolbar for headerbar, use system palette (Volker)

- many Carbon interface improvements:

- patch [ 549248 ] Fix Carbon key & menu handling (Chris Thomas)

- partial keymap support, copy&paste, menu items fixed, new toolbar

behavior, dialog box display for panics (Br'fin)

- sdl display library:

- keyboard fixes and key mapping added (Bryce)

- when captured, the mouse is forced to stay in the window. fix bug

[ 619283 ] SDL: os mouse pointer leaves the window (Bryce)

- x display library:

- bug [ #537593 ] vga font not being found fixed. If vga font not

found, search for a font called "-\*-vga-\*" (Bryce)

- keyboard problems fixed (Bryce, Christophe)

- beos platform, any display library: add a nice icon to the executable

(Bernd Korz)

- wxWindows

- wxWindows is a cross-platform C++ user interface library which you can

download for free at http://wxwindows.org. wxWindows provides C++

classes for all sorts of GUI controls (buttons, menubars, etc.) and

implements all of them using the native controls on the platform.

- The new wxWindows port of Bochs provides both a graphical configuration

interface (for editing bochsrc options) and a display. It was

written by Bryce Denney, Don Becker, Dave Poirier, and Volker Ruppert.

- In release 2.0, we concentrated on making the wxWindows port as stable

and functional as the other interfaces. wxWindows provides a great

toolbox that we can use to make Bochs easier to learn and use.

- wxWindows supports charmap changes, keyboard mapping, cut and paste,

text and graphics modes, text mode cursor size, and mouse (Volker, Bryce)

- To compile Bochs with wxWindows, you should install wxWindows 2.3.3

or later. Then configure Bochs with --with-wx.

- if you have multiple versions of wxWindows installed (e.g. a debug

and a release version), you can set $WX\_CONFIG before configuring

to select between them. (Bryce)

- Bochs debugger

- [ 609616 ] remote GDB stub

add GDB Stub support from Johan Rydberg, with bug fixes by Stu Grossman

- add hooks for external debugger for win32. The external debugger

that connects to Bochs is distributed in

build/win32/tattam-external-debugger.zip in binary form. Turn on

with --enable-external-debugger. (Peter)

- add "debugger\_log" option to bochsrc, which logs all debug output

into a file. feature [ 629068 ] (Christophe)

- debugger is now usable in fullscreen SDL and SVGA guis. It will

switch back to text mode for each debug prompt (Bryce)

- disassembly output cleaned up and improved

(Kernel Panic, Peter Tattam, Jonathan Shapiro, Luiz Henrique Shigunov)

- fix [ 628806 ] debug: x/c prints unprintable chars (Bryce)

- add the beginnings of a wxWindows debugger. Not ready for mainstream use

yet. CPU register display is implemented, and you can type any debugger

command you want into the Debug Console window. (Bryce)

- add help command (Alexander Krisak)

- symbol table lookups cleaned up a bit (Bryce)

- displays the address of the caught watchpoint, feature #435271 (Dave)

- remove obsolete "loader"

- utilities

- fixed bug [ 487758 ] bximage fails on file creation >2048meg

Bximage should now work up to 32gig. (Bryce)

- on win32, both bximage and niclist now ask the user to press

return before exiting, so that you have time to read the results

before the window disappears. (Bryce)

-------------------------------------------------------------------------

Changes in 1.4.1 (June 22, 2002):

- now cdrom is enabled in configure, unless you specifically disable

it with --disable-cdrom. (Christophe)

- fix compile error in main.cc when SMP or APIC is enabled (Dave)

- the runtime menu now displays 11 (continue) by default (Bryce)

- initialize DMA controller before floppy and SB16

- fix DMA panic when installing win95 (Volker)

- first character of the vga bitmap is blank on win32 (Volker)

Before, it was incorrectly coded as a '@'.

- AltGr key on European keyboards works now on win32 (Volker)

- fix problem with console/serial port on Bochs exit (Volker)

- enable serial port for GNU and GNU/Linux (Volker)

- small documentation fixes (Volker)

- remove unnecessary include statements for X11 (Volker)

- italian keymap added (Emanuele Goldoni)

- fix win32 ethernet frames error. It will no longer reject packets

that are less than 60 bytes long. (Peter Tattam)

- BIOS fixes :

- win2k cd-boot (Christophe)

- emm386 crash (Dave)

- cs=0 at boot time (Christophe)

- keyboard failure in scandisk (Dave)

- fix bug in forming the 64-bit APIC base address from two 32-bit registers.

A compiler warning in cpu/proc\_ctrl.cc pointed this out.

- fix default choice in the runtime options menu

-------------------------------------------------------------------------

Changes in 1.4 (March 27, 2002):

- ROM BIOS

- Boot from CDROM! Christophe Bothamy added partial El Torito support in

rombios.c, which allows Bochs to boot cdroms. Booting from win2k or winXP

cdrom is not supported yet. The default BIOS includes El Torito functions.

the boot line must say "cdrom".

Example:

boot: cdrom

- implementation of int13 diskette function 5 (format track) (Volker)

- initialisation of PIC and DMA-2 added to POST code (Volker)

- configure script (Bryce Denney)

- the configure script now detects your platform and provides a default

GUI and the required compiler flags. All supported platforms should

compile with simply "configure" and "make".

- default guis by platform:

- win32/windows/cygwin: win32 gui

- MacOS X: carbon gui

- MacOS 9 or earlier: macos gui

- BeOS: beos gui

- AmigaOS: amigaos gui

- all other platforms: X windows gui

- compile arguments supplied by configure script

- win32: too many to list here; see documentation

- cygwin: -mno-cygwin -DWIN32

- MacOS X: -fpascal-strings -fno-common -arch ppc -Wno-four-char-constants

-Wno-unknown-pragmas -Dmacintosh

- the --with-GUINAME configure option is only needed if you want to override

the default GUI. This is the only way to use the Term, RFB, and SDL

GUIs.

- VGA

- added VESA BIOS Extensions code by Jeroen Janssen (banked mode only, LFB

support in patches)

- vga memory read/write functions in text mode fixed

- implementation of CGA mode 320\*200\*4 (patch from Sebastien Bechet)

- VGA BIOS

- updated Christophe Bothamy's LGPL VGA BIOS to version 0.3a. This consists

of a bug fix for function ah=13 and VBE support by Jeroen Janssen.

- networking

- chipmem read/write limit fixed (Mike Lerwill)

- writing a byte in 16-bit mode now possible (Mike Lerwill)

- new ethertap interface for Linux, which allows Bochs to talk to

the local machine and the internet (Bryce Denney)

- NE2000 is now enabled by default on Win32, Cygwin, and Linux compiles

in the .conf.\* scripts and release binaries.

- fix check for auto transmit disable, which was checking the wrong bit

(Peter Tattam)

- Win32 only

- niclist.exe has been revised to work on more Windows versions, and it

suggests a usable ne2k line (Dean Payne)

- fix timeout setting so that ne2000 does not slow down the whole

simulation (Don Becker)

- bug fix: be able to handle multiple packets that arrive at once

(Mike Lerwill)

- GUI changes

- cdrom button: click this to notify Bochs when you changed the CDROM (Volker)

- snapshot button: saves the text on the Bochs screen into a file called

snapshot.txt (Volker)

- copy button: on Win32 and X windows, copy the text on the Bochs screen

to the clipboard (Volker)

- paste button: on Win32 and X windows, paste the characters on the

clipboard into the Bochs window. This requires keyboard\_mapping to

be enabled. (Bryce Denney)

- improved text mode cursor for Win32, X11, and SDL (Volker)

- new SDL interface (Dave Poirier, debugging by Christophe, Volker, Bryce)

SDL is a graphics library that has works on many platforms. This interface

is experimental, and is missing a few features of the standard Bochs

interfaces: extended keys (arrows, keypad).

- MacOS X: add MacOS X carbonized event handlers by Jeremy Parsons

- X windows: when not enough colors can be allocated, force use of

private colormap (Bryce Denney)

- bug #490570 fixed: OUTB set and command 0xaa encountered (Dave Poirier)

- keyboard

- completed keyboard emulation with the implementation of the three scancodes

sets (mf1, mf2, mf3) with or without translation. This is based on Ludovic

Lange's plex86 keyboard patch. (Christophe Bothamy)

- added a "keyboard\_type" option, that defines the answer to an "identify

keybord" request to the keyboard controller. The available values are

"xt","at","mf". (Christophe Bothamy)

- added an optional keyboard\_mapping option that enables to use your

country specific keyboard with Bochs. If enabled, the keymap file must be

specified in bochsrc. The available keymaps are US, German, Spanish and

French for PCs running X11. Contributions are welcomed. (Christophe

Bothamy)

- added Windows(tm) key definitions (Volker Ruppert)

- added paste button, which causes the emulated keyboard to type characters

from the system clipboard. This only works when keyboard\_mapping is

enabled. (Bryce Denney)

- cdrom

- bug fix: win32 could not read a cdrom image file

- eject cd support for linux (patch from Petr Stehlik)

- BeOS fixes

- changing cdrom media is possible now with CDROM button

- sound blaster(tm) emulation (Volker)

- you can use --enable-sb16=freebsd now

- 16-bit DMA controller added

- 16-bit mode of the SB16 implemented (output to file works)

- floppy drive (Volker Ruppert)

- implementation of the floppy command 'format track'

- implementation of read / write operations with MT=0

- behaviour of a few floppy commands fixed

- floppy reset behaviour fixed

- lots of other fixes

- fixed bug [ #468340 ] pic:slave: OCW3 not implemented. Now the slave PIC

supports all the modes that the master PIC does, and nobody will see this

message again.

- serial port (by Volker Ruppert unless noted)

- improved IRQ handling

- now Windows 95 serial driver works correctly

- fixed the return value of the MCR (loopback bit)

- interrupt reasons LSR change and MSR change implemented

- the number of data bits is considered when sending data

- all serial port changes are tested in loopback mode only

- serial port emulation fixed for FreeBSD and OpenBSD (Stu Grossman)

- fix receiver poll frequency so that it doesn't slow emulation (Stu Grossman)

- Bochs debugger

- when tracing, print the instruction just before it is executed, instead

of just after (Greg Alexander)

- after a triple-fault panic, you can now return to the debugger

- symmetric multiprocessor (SMP) simulation

- no more panic if you read the EOI register

- fixed default destination format in local APIC

- fix SMP instruction tracing in bochs debugger

- fix deadlock when debugger enabled and all processors HLT

- MSR support added by Zwane Mwaikambo

- simulation of interrupts is more accurate (Volker)

- implemented edge triggered interrupt mode

- added functions raise\_irq() and lower\_irq()

- programmable interrupt timer (Greg Alexander)

- fixed the PIT gate and improved the PIT printing options

- experimental real-time PIT

- parallel port improvements (Volker Ruppert)

- bug fix: hard disk errors caused by overflowing imul in the BIOS code.

Sebastian Bechet and Peter Tattam tracked it down and fixed it.

- fix some memory leaks (patch from Darko Tominac)

- Double-Word IO is supported for ATA devices

- fix bash-specific syntax in install-x11-fonts script

- print stack\_return\_from\_v86 error only the first 100 times

-------------------------------------------------------------------------

Changes in 1.3 (December 10, 2001):

- networking works on Windows and Linux platforms

- emulated cdrom can now read from ISO image files, on any platform.

- new PIT model by Greg Alexander which is much more complete than the

old one. The new PIT is used by default, but you can switch back to

the old one if you configure with --disable-new-pit.

(PIT = 8254 programmable interrupt timer)

- new configuration menus by Bryce Denney, which allow you to change any

bochsrc option using text menus, then save the configuration into

a new bochsrc file for later use. You can disable the new code using

configure --disable-control-panel. Also you can use the command

line arguments -nocp or -nocontrolpanel. Also, there is a new

"Config" button on the GUI that allows limited changes to the

configuration at runtime, such as changing the floppy disk.

- add docbook documentation directory in the sources under doc/docbook.

The transition from HTML to docbook documentation is still in progress.

- Add new log action "ask", as shown in these example bochsrc lines:

panic: action=ask

error: action=ask

When an event occurs which is set to "ask", you get a beep and message

on the text terminal that asks what you want to do. Choices are: continue,

continue and disable future messages from this device, quit immediately,

or segfault (where abort() function is available). If compiled with

--enable-debugger, you can also choose to enter the debugger.

- Parallel port emulation cleaned up by Volker Ruppert. See .bochsrc for

syntax of new parport1 line in bochsrc.

- PCI support improved by Volker Ruppert, including BIOS changes. Still

not complete.

- floppy controller returns a proper error response if you try to write

a read-only disk image. For systems such as DOS that actually use the BIOS

services, it was also necessary to add code in int13\_diskette\_function to

recognize a write-protected error and return the correct error status code

(AH=3, Carry Set).

- the ROM BIOS now prints panic messages to the console. Thanks to Cliff

Hones for his console display code.

- the ROM BIOS detects nonbootable disks (Barry Allard), and prints a message

on the console. Barry Allard's patch who helped with checking the boot

signature.

- LBA support added for hard disks. (Not tested very much.)

- add dependencies to makefiles

- logging code moved into a separate file, logio.cc

- new option --enable-slowdown-timer, by Greg Alexander, which kicks in if

Bochs simulation time starts to run faster than real time. This helps to

keep the Bochs clock in sync with the real clock when the CPU is mostly

idle.

- new option --enable-iodebug, by Dave Poirier, which creates an I/O

interface to the debugger. This lets you write software to be emulated

in Bochs which can turn on instruction, register, or memory tracing

using I/O accesses.

- improved detection of readline in configure script

- configure substitutes the version number into many files, instead of

using sed in the makefile. There are still a few uses of sed remaining.

- you can now use environment variables in bochsrc values. For example,

diskd: file="$BOCHS\_IMG/diskd.img", cyl=615, heads=6, spt=17

- configure with --prefix=PATH works now

- running configure from a different directory works now, thanks to

a patch from Edouard G. Parmelan

- fix [ #433759 ] virtual address checks can overflow.

> Bochs has been crashing in some cases when you try to access data which

> overlaps the segment limit, when the segment limit is near the 32-bit

> boundary. The example that came up a few times is reading/writing 4 bytes

> starting at 0xffffffff when the segment limit was 0xffffffff. The

> condition used to compare offset+length-1 with the limit, but

> offset+length-1 was overflowing so the comparison went wrong.

- cmpxchg8b patch from Michael Hohmuth <hohmuth@innocent.com>

- apply patch from Thomas Fitzsimmons <fitzsim@cygnus.com> to fix compile

problems when BX\_SUPPORT\_PAGING and BX\_USE\_TLB are turned off

- fix bug introduced in 1.2.1 which caused spurious exceptions.

See patch #439314, Exception 1 (debug) on HALT, from

thomas.petazzoni@meridon.com.

- add panic in ctrl\_xfer32.cc where the IRET32 implementation is broken.

This only happens if you are NOT in vm8086 mode or protected mode.

The intent is to warn people when they are getting bad emulation, and

encourage people to report how they got to that point.

- apply patch from Santiago Bazerque. See this bug report:

[ #463018 ] retf not removing parameters sometimes

- fix bug [ #461730 ] IRETD causes problems if NT-flag is set

reported by Peter Lammich.

- apply patch [ #455014 ] CR0 bug in 80486, described as:

> In the register CR0, when the bit PM is enabled, the bit 4 is 0

> when should be 1.

- apply patch from Mike Rieker <mrieker@o3one.org> associated with this bug

report: [ #480422 ] gdt 'accessed' bit

- in task\_switch when it tried to ensure that the old TSS was paged in,

it actually used the new TSS address, fixed.

- updated the instrumentation code, and added a working example. To try

it, configure --enable-instrumentation=instrument/example1. Then when

you run bochs, you will get one line for each instruction PC and for

each I/O access in a new file called bxevent.txt.

- set a bit in the CMOS that says the processor has an FPU. This is

from patch [ #455006 ] Device byte is not initialized aptly.

Author did not leave their name.

- add logging code to the "null ethernet" which does not require host OS

support. All this does is print the outgoing packets from the guest OS.

- cleanup of log functions (Todd Fries)

- add BX\_ERROR for every command in ATAPI-6 that bochs does not support.

I still need to do add some commands from older specs that are obsolete

(and not listed) in ATAPI-6. Commands that aren't in the spec will still

panic.

- only put 0xf into the 2nd hard disk field when the cdrom is not present.

This is a patch from Volker Ruppert <Volker.Ruppert@t-online.de>, who

comments: "The fdisk command reports an unusable second harddisk if the cdrom

is enabled. This patch helps, but I don't know if it is the right way."

- make hard disk code return error codes when data is not available instead

of just panicing. In particular, if the logical sector is out of bounds

or the disk image cannot be read/written at the desired offset, we now

abort the ATA command and return an error code. Many of the old BX\_PANIC

messages are turned to BX\_ERROR, so they will still appear in the

log, but now the device model will try to communicate this fact to

the OS instead of simply giving up.

- don't blindly reject odd length atapi commands. There are cases when

it's really ok according to ATA-4.

- for big endian machines, reversed the bit fields in interrupt\_reason.

This was pointed out by Nicholai Benalal.

- extended keyboard improvements by Dave Poirier

- major mouse patch from Dave Spring, that implements several missing

mouse modes.

- commit keyboard patch from David Haslam <dch@sirius.clara.co.uk>

posted to mailing list, that addresses the problem of each key press

printing ^@. See cvs log for details.

- mouse performance fixes by Greg Alexander and Robb Main

- NE2000 fixes by Frode Vatvedt Fjeld, ecelca@yahoo.com, Greg Alexander,

and angelos@openbsd.org.

- fix bug [ #468340 ] pic:slave: OCW3 not implemented. Some event handling

code appeared in the master pic but not the slave pic.

- fix compile problems in SB16 code, related to fpos\_t being treated as

an integer.

- patch from Volker Ruppert <Volker.Ruppert@t-online.de> to fix

midi output file so that winamp can play it.

- some cleanup of serial code by Todd Fries and Volker Ruppert, but it

doesn't work yet.

X Windows specific:

- commit patch from David Haslam <dch@sirius.clara.co.uk>

[ #455763 ] Cursor trail with DOS Edit/Minix vi

- error for missing fonts now points to the documentation

- new option --enable-idle-hack, by Roland Mainz, which makes Bochs more

friendly toward other processes when its CPU is idle. Presently,

this option is specific to X windows.

Win32 specific:

- now Windows 95/98/ME can read the physical cdrom (Don Becker)

- The default configuration for Win32 VC++, given in .conf.win32-vcpp,

now enables the NE2000 and renames all .cc files to .cpp. This keeps VC++

happy but may make it hard to use CVS.

- The default configuration for Cygwin, given in .conf.win32-cygwin, now

enables cdrom and SB16.

- See "new docs" on the web site for compile instructions for VC++ and Cygwin.

- The sources include a VC++ workspace, in addition to the old "nmake"

makefile.

- ethernet support (emulated NE2000 card), coded by Don Becker. This

implementation requires a library called WinPCap, which you can

download from http://netgroup-serv.polito.it/winpcap.

- new utility called niclist.exe which lists the ID number of all your network

cards (well probably you just have one). The ID be used when setting up your

.bochsrc.

- patch [ #466403 ] make text colors more accurate. The author did not leave

his/her name.

- fix GUI bug [ #452159 ] win32: mouse stuck if bochs win partly off screen

Now we center the mouse periodically, whether or not the mouse has

wandered outside of the window or not.

- event handler recognizes the extended keycode flag

- fixes for raw floppy and floppy disk images (Don Becker)

Linux specific:

- Ethernet (emulated NE2000 card) now works in Linux! Contributed by

splite@purdue.edu. This has been tested using host OS kernel 2.2.14, and

works with telnet, ftp, irc, lynx, etc. Because it is a packet filter

solution, you aren't able to talk to the host machine, only to other

machines on the network.

- The default configuration for Linux, given in .conf.linux, now enables

the NE2000 model.

- RPM build process configures with --prefix=/usr so that everything is

installed in /usr/bochs instead of /usr/local/bochs.

- DLX Linux disk image is now installed so that only root can write it, to

avoid security problems. When you run the bochs-dlx script, it creates a

local copy in your home directory and then runs it.

- code that determines the capacity of a cdrom now works for both ATAPI

and SCSI drives (splite@purdue.edu)

- applied patch from bochs@sigint.cs.purdue.edu. The comments are:

> The Linux 2.4.5 CD-ROM driver sends a READ\_DISC\_INFO command which caused

> an "unrecognized ATAPI command" panic. Looks like READ\_DISC\_INFO is only

> recognized by CD-R and CD-RW drives, so I ignore it for now.

Amiga MorphOS specific:

- Bochs now compiles and works on Amiga MorphOS. Configure with

--with-amigaos. For AmigaOS only, see .bochsrc for use of fullscreeen and

screenmode options. The Amiga MorphsOS is written and maintained by

Nicholai Benalal <nicholai@chello.se>.

- raw cdrom supported if you configure with --enable-cdrom

BeOS specific:

- Bochs compiles and works on BeOS. Configure with --with-beos.

Bernd Thorsten Korz <bernd.korz@insidebeos.de> maintains the BeOS port.

- raw cdrom supported if you configure with --enable-cdrom

MacOS X specific:

- Bochs now compiles and works on MacOS X. Configure with --with-carbon.

Emmanuel Mailliard <e.rsz@libertysurf.fr> ported the Macintosh code to the

Carbon API.

- The MacOS X application is built using (gasp) mkdir, copy, and rez.

Surely this is not the right way, but it works.

- raw cdrom supported if you configure with --enable-cdrom

RFB mode:

- apply patch.rfb-mouse by MURANAKA Masaki (monaka@users.sf.net)

see this source forge bug [ #457968 ] Strange mouse motion on RFB

- add a retry loop in RFB code, so that if port 5900 is not available

it can try 5901, etc.

Bochs Debugger:

- do a vga update whenever you print a debugger prompt.

- added debugger command "info fpu" that prints the FPU registers. If you

do "info all" you get cpu and fpu registers.

- added debugger command "info ne2k" which prints all the registers

of the NE2000 model

- add ability to do register tracing and flag tracing (Dave Poirier).

Try the trace-reg-on and trace-reg-off commands.

- instruction trace now includes time ticks

- fixed problems in which bochs compiled with debugger measured time

differently from bochs compiled without debugger. Also when instruction

trace was enabled, breakpoints and control-C did not work. Also,

breakpoints at the beginning of an interrupt handler did not work.

-------------------------------------------------------------------------

Changes in 1.2.1 (June 12, 2001):

- more work on makefile for building RPMs

- [ #432382 ] build debian packages patch

add build/debian directory from Rob Lemley <rjlemley@calypsoblue.org>

which allows us to make Debian packages!

- optimize for speed when simulating one processor. Now 1-processor

performance should be equivalent to 1.1.2.

- [ #425640 ] sb16 assumes fpos\_t is long int

This fixes compiles of iodev/sb16.cc on linux systems with newer libraries

in which fpos\_t is not an integer.

- [ #432488 ] SMP:assert "n\_logfn < MAX\_LOGFNS" fails

increase MAX\_LOGFNS since we ran out of them on an SMP simulation with

4 processors

- changes to compile clean on cygwin:

- don't use the WIN32 snprintf define for cygwin

- add ssize\_t definition for cygwin

- only compile "struct timeval tval" if select is available

on that platform.

- [ #432491 ] SMP: CPUID says no APIC feature

clean up inconsistent use of BX\_SUPPORT\_APIC and BX\_APIC\_SUPPORT, which

caused the CPUID to report no APIC was present

- [ #431025 ] --enable-external-device-models broken

removed configure options for external-device-models and

external-cpu-memory. These don't work and aren't going to be fixed.

- [ #429448 ] configure: -lreadline when not there

Now configure allows you to choose not to use readline, even if it's found

on your system.

- [ #428915 ] apply extended keyboard patch

extended keyboard patch by Dave Poirier <eks@void-core.2y.net>

- [ #428626 ] if no X11 found, configure&make fails

Now configure halts if X windows is selected but no X libraries are found.

- updated rombios to version 1.13. This fixes several problems:

- [ #430472 ] DOS HIMEM "A20 line" error

This problem was apparantly caused when Bryce added a function that prints

the BIOS version, and he called it too early in the boot process. Now the

same function is called later, and it doesn't break the A20.

- [ #431010 ] SMP structure overwritten in v1.2

SMP structures were getting overwritten by BCC-generated data,

preventing SMP operating systems from detecting that other processors

were available.

- [ #431016 ] bios: SMP struct has wrong entry count

SMP structure had the wrong entry counts

- very minor doc updates (typos, replace broken link to mtools info)

- quit when the user clicks the power button, even if they have disabled

panics.

- win32 now defaults to having mouse capture mode turned off. For new users,

it would be distressing for their mouse cursor to disappear until they

pressed F12.

- [ #428222 ] vga font not installed

added script called "install-x11-fonts" which should help people install

the VGA font on X windows systems, if it isn't already there.

-------------------------------------------------------------------------

Changes in 1.2 (June 3, 2001):

- [ #427259 ] rombios HALT calls don't print

Fixed bios/rombios.c HALT macro so that it writes the line number of the

panic to the PANIC\_PORT (port 0x400) and then does NOT do a halt

instruction. Also changed iodev/unmapped.cc so that the line number written

to PANIC\_PORT is displayed as a BX\_PANIC message. Because the HALT

macro now triggers the normal panic behavior, it can be controlled by

the bochsrc.

- [ #429016 ] crash if no hard drive

rombios used to call HALT macro if no hard drive was found. Now it only

calls HALT if a hard drive has an illegal geometry.

- [ #425388 ] include source for simple disk img tool

[ #428478 ] mkimg tool creates image 1 byte too big

Added bximage tool, which makes empty floppy and hard disk images.

It is now included in the top level Makefile, so it will get built

by default on all platforms.

- [ #426036 ] eth\_fbsd.cc compile problem on solaris26

added configure test so that "configure --enable-ne2000" only

includes the Berkeley Packet Filter code (eth\_fbsd) if the header

file <net/bpf.h> can be found. If you don't have BPF the ne2000

will not actually move packets, but at least it will compile clean now.

- [ #428214 ] 1.2.pre1 need documentation for binaries

Write windows and linux specific documentation to be installed in

binary releases.

- [ #429258 ] disable RESET for version 1.2

Since soft reset was not completely working, I reverted the reset patch.

Now it does panics on reset instead of trying to reboot, as the old

bochs versions did.

- [ #428222 ] Should the linux RPM install vga font?

now font/vga.pcf will be installed in the RPM package

- [ #429020 ] stop renaming the BIOS!!!

new BIOS changes are now in BIOS-bochs-latest, instead of a BIOS

whose name changes every time we change anything! To help distinguish

different BIOS versions, the BIOS now prints its RCS Id into the

log file.

- [ #428625 ] compile problem if SHOW\_IPS is on

removed extra paren that broke SHOW\_IPS

- [ #428219 ] PCI doesn't compile with SMF=1

- [ #429375 ] pthreads detection broken

- [ #429073 ] configure: if no X11, makes bad config

- [ #429229 ] install current .bochsrc in binary rels

- install Tim's man pages on linux RPM

- BIOS prints messages in log in case of boot failure

- rewrote instructions for compiling in win32 (win32.txt)

- fixed link in HTML changelog.html to point to the real sources on SF.

- added missing LOG\_THIS definition to gui/nogui.cc and gui/rfb.cc

- added additional check for null pointer in debugger exit routine

- added diskd to .bochsrc

-------------------------------------------------------------------------

Changes in version 1.2-pre1 (May 25, 2001):

- major cleanup of .bochsrc

- major cleanup of stderr output: prints bochs version information when

starting, and at the end it tries to print the message that caused

bochs to quit.

- two hard disk support (diskd). At present, you cannot have two

hard drives and a cdrom at the same time, because there is only

one IDE controller with two channels.

- split hard disk support allows different partitions to be stored in

different image files

- two new GUI choices: term mode and RFB mode. Term is a text-only

interface, and RFB creates a server that can be accessed using

the AT&T VNC viewer.

- now Bochs can simulate an SMP machine, if you configure with

--enable-processors=N. Configuring more than one processor has

a major performance impact, so the default is 1 processor.

See SMP documentation for more details.

- to make SMP work, bx\_mem and bx\_cpu have been replaced with

bx\_mem\_array[] and bx\_cpu\_array[]. The cpus are referenced through

the BX\_CPU(n) macro and memories through the BX\_MEM(n). Normal

mode has one cpu and one memory, SMP mode has multiple cpu's and

one memory, cosimulation mode has multiple cpus and multiple memories.

- use --enable-cpu-level=6 to make Bochs claim to be a Pentium Pro.

The only feature that requires CPU level 6 is apic support.

- new logging system by Todd Fries, which has 4 levels of event

severity (panic, error, info, debug). There are new .bochsrc

options that control what action to take when a

panic/error/info/debug event occurs.

- now searches for .bochsrc, bochsrc, bochsrc.txt, and (on unix only)

$HOME/.bochsrc.

- use GNU readline library if --enable-debugger is on, as long as readline

can be found on the machine

- configure checks for existence strtoull and strtouq. if neither exists,

Bochs uses its own implementation

- applied patches from Cliff Hones <cliff@aonix.co.uk> to fix up the

rombios. This includes many improvements, which you can list by

doing "cvs log -r 1.6 bios/rombios.c" or looking at cvsweb.

- added suggested geometries of larger disks to the documentation

- this is the first release to have official binary packages for win32

and Linux. There is a new "make rpm" in the top-level Makefile which

will create an RPM of the current bochs directory. To use this,

become root and type "configure; make rpm".

- applied some FreeBSD patches from Maxim Sobolev (cdrom and serial).

-------------------------------------------------------------------------

Changes in version 1.1.2 (bugfix3, May 16, 2001):

- updated Elpin VGA BIOS to version 2.40, and changed pointer in .bochsrc

- fixed .conf.x86 script so that it uses c++ instead of egcs for C++ files

- now Makefile targets that recurse into subdirectories use double colons,

so that it will always recurse into subdirectories. Now a single make

command should notice a modified source file in a subdir.

- fixed bug in bx\_panic. If BX\_PANIC\_IS\_FATAL==0 and a (non-fatal) panic

occurs, it used to call bx\_atexit() and then return. It should never

call bx\_atexit, which starts to shut down the simulator, unless it's

really going to quit!

- support 2.88 MB floppy disks

- since dataseghack is checked in as non-executable, invoke it with

"csh dataseghack"

- double fault patch from Thomas Petazzoni <thomas.petazzoni@ifrance.com>,

sourceforge patch #423726.

- removed -fno-builtin from fpu makefiles

- redefine u\_char, u\_short, etc. in order to not conflict with system

definitions of these same types.

- in cdrom.cc, remove the extern "C" { } structure around some of the

header files. This is no longer necessary.

- do not panic on hard disk command 0x1f2 (read sector count)

- in keyboard.cc:

- apply Todd Fries' reset patch

- recognize most of the "Grey" insert/delete/home/end/etc. keys the

same as keypad keys.

- removed panic on "kbd\_ctrl\_to\_kbd(): got value of 0x??"

- implement mouse command 0xf6 (set defaults)

- apply Suboner@aol.com's Xwindows timing patch from

http://sourceforge.net/tracker/index.php?func=detail&aid=418730&group\_id=12580&atid=312580

- remove all patches from patches subdir which have already been applied.

The remaining ones are under consideration but not applied.

-------------------------------------------------------------------------

Changes in version 1.1.1 (bugfix2, April 9, 2001):

- in soundwin.cc, arg 3 should be typecast to LPWAVEFORMATEX

- in fpu\_entry.c, Bryce mistyped his own initials!

- in configure.in and configure, define good defaults for VC++

#define BX\_64BIT\_CONSTANTS\_USE\_LL 0

#define inline \_\_inline

#define BX\_NO\_EMPTY\_STRUCTS 1

#define BX\_NO\_ATTRIBUTES 1

#define BX\_HAVE\_HASH\_MAP 0

- in config.h.in, fixed typo in #error message

-------------------------------------------------------------------------

Changes in version 1.1 (bugfix1, April 6, 2001):

(FIXED, patch #414360: update copyrights)

update headers. Change copyright to 2001, replace config.h.in header with

the standard mandrake header that every other file uses.

(FIXED, patch #414356: inlines)

make macro to replace inline and static/extern keywords. Then make

define the macro appropriately based on configure.

(FIXED: patch #414234: macos-no-strdup)

--with-macos should force HAVE\_STRDUP=0.

(FIXED, patch #403027: Fix mouse bugs in Linux and BSD)

Linux and BSD (maybe others) cause panic in mouse code.

(FIXED, patch #413851: const64bit patch)

VC++ does not allow "LL" after 64-bit constant.

(FIXED, patch #413859: fabs symbol conflict)

fpu code contains fabs, which conflicts with math library fabs.

(FIXED, patch #403004: Implement aborts on a few SET FEATURE commands...)

Implement aborts on a few SET FEATURE commands for ATA.

(FIXED, patch #402991: Update to iodev/vga.cc to add 3c3h read support)

Implement VGA enable register, at 0x3c3.

(FIXED, patch #403027: Fix mouse bugs in Linux and BSD)

Mouse panic in linux/BSD:

KBD: io write 0x64: command = 0xD3(write mouse outb)

(FIXED, patch #414229: panic-is-fatal)

Allow user to decide if panic is fatal, or just a warning

(FIXED, patch #414230: sun-cdrom)

Support Sun CDROM

(FIXED, patch #413574: portable1)

there are cases where a pointer is cast to a 32-bit int,

then later cast to a pointer and dereferenced, which crashes any 64-bit

machine.

(FIXED, patch #413574: portable1)

some machines have no snprintf or strtoull. include a replacement function

when needed.

(FIXED, patch #413574: portable1)

Some compilers don't allow "typedef struct { } foo;"

(FIXED, patch #413574: portable1)

Some people don't have hash\_map.h, used in dbg\_main.cc. Disable this code

if hash\_map.h not found.

(FIXED, patch #413574: portable1)

Some compilers can't handle labels at the end of a block, as in

void main () { /\*code\*/ label: }

(FIXED, patch #413574: portable1)

Most compilers can't handle \_\_attribute\_\_. Use macro to define it away.

(FIXED, patch #413574: portable1)

if --enable-debugger, turn on --enable-disasm too.

(FIXED, patch #413574: portable1)

ome compilers can't handle any chars after an #endif

(FIXED, patch #413574: portable1)

wrong type arg1 of bx\_dbg\_watch and bx\_dbg\_unwatch. The code in

lexer.l was calling it with integers (not booleans)

(FIXED, patch #413574: portable1)

in fpu code, "setcc" macro was implemented with braces inside parens,

which some compilers don't understand.

(FIXED, patch #413574: portable1)

in fpu\_entry.c, FPU\_load\_int32 was consistently called with arg1 of

type (s32 \*), but should be (u32 \*)

(FIXED, patch #413574: portable1)

comment out sigcontext structure in fpu/stubs/asm/sigcontext.h because

it conflicted with sigcontext of other machines. This struct was never

used by bochs anyway.

(FIXED, patch #414046: portable2)

move definition of missing library functions into osdep.h and osdep.cc,

include contents of macutils\*.

(FIXED, patch #414061: win32-rawcd)

CDROM drive letter for WIN32 should not be hardcoded.

(FIXED, patch #414060: win32-rawfloppy)

Bypass fstat when opening WIN32 raw floppy disk.

(FIXED, patch #414226: pit-panic)

WinME install dies with panic:

bochs: panic, pit: outp(43h): comm Bh, mode 00, bcd 00 unhandled

I think I had a similar problem. All three timers should support modes

0, 2, and 3. Other modes really aren't implemented.