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Intel(R) Memory Drive Technology
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DATE : July 11, 2019

TO : Intel(R) Memory Drive Technology customers

SUBJECT : Release notes for latest production version (9.0.3365.62)
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Supported Operating Systems
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(With Compatibility and Stress Testing)

1. Red Hat Enterprise Linux (or CentOS): Ver. .1 to .6
2. SuSE Linux Enterprise Server: ver. 10 to 12 (SLES)

(With Basic installation and compatibility testing)

3. Ubuntu Server: ver. 16.04 to 18.10
4. Open SuSE: ver. 10 to 11 (SUSE10 11).

(With Basic installation only)

5. Fedora Core: ver. 12 to 29
6. Debian: 9.5.0 (DEBIAN)
7. Citrix XenServer: 6.5 (XEN)

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Supported Processors/Platforms
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Intel(R) Xeon(R) E3-1200 v6 or later, Intel(R) Xeon(R) E5-2600 v3 or later, E7-4800 v3 or later
Intel(R) Xeon(R) Scalable processors

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Version 9.0.3365.62
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FIX HCL Devices: Improved support for NVIDIA VGA/GPU devices

FIX Performance: Guest code patching (ultravirt)

FIX Nested VM may free regression: 9.0.3365.01.

FIX Nested VM with host running Linux kernels 4.18.0-1.el7.elrepo.x86_64 (RHEL)

FIX Race during Linux kernel BUG() could cause system crash

CHG Flash: Properly shutdown device during restart to avoid firmware free in next boot

- FIX Flash: Warn if NVMe SSDs are not equally distributed between NUMA nodes
- FIX HCL Boards: Boards with unpopulated PCI slots
- FIX UI and boot: Fix system memory handling (system memory configuration key / F5 system settings)
- CHG Performance: Improve evacuation performance

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Version 9.0.3365. 1
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- FIX HCL Boards: Rare race with Nested VM regression: 9.0.3365.11.
- FIX HCL Boards: UEFI boot with long memory map.
- FIX HCL Devices: ASPEED VGA graphics mode with CentOS .3.
- FIX HCL Devices: Improved support for NVIDIA VGA/GPU devices
- FIX HCL Devices: Several fixes for Microsemi Smart Family SCSI controllers
- FIX HCL Devices: VROC as boot device
- FIX Installer: Avoid using 'strings' command.
- FIX UI and boot: Support for loading the OS from NVMe.
- FIX Nested VM NMI (vnmi) support.
- FIX SPP may lead to error during Linux kernel initialization.
- FIX System reset with Ubuntu 16.0 in legacy mode.
- CHG HCL Boards: Use primary board ACPI SLOT information for guest
- CHG Installer: Allow execution on removable device.
- CHG Performance: More robust Guest code patching (ultravirt).

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Version 9.0.3365.11
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- FIX Installer: Support for quiet installation with " ".
- FIX Installer: Validate user privileges
- FIX vSMP CTL: Warn if user privileges are insufficient to run
- FIX vSMP Foundation Device: Improve partition compatibility
- FIX Offlining CPU may crash the system

- FIX Rare race during memory evacuation
- FIX RHEL6 support
- FIX Theoretical memory corruption when loading OS in UEFI
- CHG Improved Guest OS boot mode automatic detection.
- CHG Installer: Enhanced System info data collection.
- CHG Installer: SLES15 support added.
- NEW HCL Devices: Better support for Microsemi Smart Family SCSI controllers.
- NEW HCL Devices: Improved support for NVIDIA VGA/GPU devices.
- NEW Performance: Nested VM performance improvement.
- NEW Report memory topology in accordance with physical topology when NUMA layout (Guest OS view) set to Expanded (or mem_topology=2).
- NEW Validate Linux kernels .20.13 1.el .elrepo. 6 6 (RHEL) support added
- NEW vSMP CTL: vsmstat correctly reports PTF.

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Version 9.0.3365.2
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- FIX Diagnostics: Correctly report DHCP IP acquisition error
- FIX Diagnostics: InfiniBand bandwidth test reports inconsistent results
- FIX HCL Boards: Avoid crash due to malformed SMBIOS (DMI).
- FIX HCL Boards: Boot from CDROM/DVDROM
- FIX HCL Boards: InfiniBand ac plane device behind VMD
- FIX HCL Boards: Memory regions below 4GB are missing when OS loads in UEFI.
- FIX HCL Boards: SMBIOS (DMI) info is corrupted
- FIX HCL Boards: System will not boot after BIOS update
- FIX Installer: Some keys are overridden at boot
- FIX Partitioner: Merging two partitions ends with "System Partition Error"
- FIX UI and boot: Fixes to physical memory limit (board memory)
- FIX UI and boot: Loading OS from PXE when booting from UEFI
- FIX UI and boot: OS installs in Legacy although Boot Mode is set to UEFI

FIX UI and boot: Screen will not refresh after UEFI boot file selection

FIX UI and boot: Several improvements to Devices tab

FIX Configuration key board memory gets corrupted.

FIX Improved MWAIT handling.

FIX Intel VMX Preemption Timer virtualization. Prior to this fix it could be missed.

FIX Off line CPU may crash the system

CHG Flash: NVMe to support up to 2 NVMe devices.

CHG Flash: Format NAND to optimal LBAF at boot.

CHG Flash: Skip DSM if unsupported

CHG HCL Base plane: Alert if outdated Mellanox HCA firmware found

CHG HCL Boards: More robust VGA detection for both UEFI and legacy mode even for systems with multiple displays.

CHG HCL Boards: SMBIOS (DMI) socket info use only populated sockets.

CHG HCL Devices: Improve PCI relocation logic to account for multi function devices.

CHG HCL Devices: LSI MegaRAID support 6 bit SGEs

CHG HCL Devices: PMC PCIe switch reset only first function.

CHG Installer: Alert when image creation fails when using 'o'.

CHG Installer: Enhanced System info data collection.

CHG Installer: Image created with 'o p' is designated for a primary board only.

CHG Installer: Specify "recommended" only for question with positive default response

CHG Installer: Validate 'c' and 'l' order for 'up' and 'o'.

CHG Installer: Validate 'in n' when no NVMe device.

CHG Installer: Validate 'si p' arguments.

CHG Installer: Validate file/directory permissions for 'o p' and 'si s'.

CHG Installer: Validate user privileges when needed

CHG Performance: Guest MMU performance (regression since .5.1955.1).

CHG Performance: More robust Guest code patching (ultravirt)

CHG UI and boot: Improved user friendly BSOD messages for common hardware errors.

CHG UI and boot: Update copyright to 2019.

CHG Improved Guest OS boot mode automatic detection

CHG Improved Int13 specification compatibility.

CHG UEFI boot from dedicated partition.

EOL Flash: EOL Xeon Phi 100 virtualization.

EOL HCL Boards: Systems with no Hardware Virtualization (Intel VMX).

NEW HCL Boards: Enable PCID and INVPCID command.

NEW HCL Boards: Improve image layout compatibility with new BIOSes

NEW HCL Boards: vSMP Foundation Device: USB device with Intel Xeon E3 v6 processor family.

NEW HCL Devices: Improved LSI MegaRAID Fusion MPT performance

NEW HCL Devices: Improved support for NVIDIA VGA/GPU devices.

NEW HCL Devices: Validated support for Intel Optane DC Persistent Memory in memory mode

NEW HCL Devices: VMD hot plug support.

NEW Installer: Additional integrated performance tests (Segmented SGEMM).

NEW Installer: Execute integrated performance tests via SSH

NEW Installer: Multiple files to integrated performance tests.

NEW Installer: Warn if partition is mounted as RAID

NEW License: Network license manager updated to 13.0.1.

NEW Performance: Additional frequent pass thru MSR.

NEW Performance: Enhanced Guest code patching (ultravirt).

NEW Performance: Nested VM performance improvement.

NEW Performance: Reduced boot time.

NEW Performance: Significantly improved remote performance of LSI MegaRAID Fusion MPT and LSI Fusion MPT SAS devices when used in IMDT mode

NEW UI and boot: Improve responsiveness of System Settings (F5) and Welcome Screen scroll by automatically turning off serial redirection if unused (no key press). Enabled by default in System Settings (F5) by setting "Console Redirection" to "Auto"

NEW UI and boot: Restart system with CTRL ALT DEL during boot phase.

NEW vSMP CTL: Report CPU and I/O board masks.

NEW IMDT: Revamp package management engine.

NEW Nested VM NMI (vnmi) support.

NEW Support for Citri XenServer .5 is PV mode (HVM/PVH not supported).

NEW Support for Linu crash_ernel

NEW Validate Linu_ernels . .0 116 generic (UBUNTU), . .1 0 9 . 2 default (SLES12SP3), .9.0 amd64 (DEBIAN), .1 .16 300.fc29. 6 6 (FC), .20.12 1.el .elrepo. 6 6 (RHEL) in IMDT mode

NEW Xen and Xen dom0 command line options tuneup_ased on system configuration. All options will_e s_ipped if "vSF_add=no" is added to the command line. Controlled command line options are (in order of appearance):

iommu_ always set to 'off'.

tdt_ always set to 'false'.

dom0_ always set to 'pv'.

watchdog_ if e_ists, set to '0'.

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Version .6.2535.1 2
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FIX HCL Boards: Correctly handle vector shared_etween MSI and IOAPIC interrupts.

FIX HCL Boards: e_20 map handling in some configuration could lead to an early failure.

FIX HCL Boards: Error_ for_boards supporting screen resolution of_00 600 only.

FIX HCL Boards: More ro_ust VGA detection, eliminating error_.

FIX Performance: Guest code patching (ultravirt).

FIX DSDT ACPI ta_ble chec_sum error (since .6.2535.9).

FIX Emulation of INVEPT instruction.

FIX OS load stalls with_ernel 3.10.0 95 .1.3.el . 6 6 and E5 2630 processor.

FIX IMDT may fail to_oot in large configuration (since .6.2535.9).

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Version .6.2535.126
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FIX HCL Boards: Access to addresses well_eyond DRAM address space.

FIX HCL Boards: Avoid crash due to malformed SMBIOS (DMI).

FIX HCL Boards: Correctly align ACPI port allocation.

FIX HCL Devices: Capa_ilities hiding flow.

FIX Performance: Performance: CMR not working with Linux kernel .16 and on.

FIX Performance: Guest code patching (ultravirt): SLES12 SP3 since .6.2535.5 .

FIX UI and boot: Devices table updated.

FIX Stability fixes.

FIX System crash with when using 1GB pages in userspace.

FIX System will not load IMDT from UEFI, error message reported.

FIX UEFI boot file name detection.

CHG Correctly identify GPT boot partition with protective MBR.

NEW Installer: Improved file corruption detection.

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Version .6.2535.113
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FIX HCL Boards: Improved VGA BIOS compatibility.

FIX HCL Boards: System reset after GRUB during switch to legacy VGA mode.

FIX Installer: " o" need writable working directory.

FIX Installer: "in n oard memory=" overridden at boot.

FIX Installer: Cleanup on CTRL C.

FIX Installer: Silence error in Debian 9. environment.

FIX License: Early crash during connection to network license server.

FIX Rare Linux kernel crash case handling.

FIX vsmplog may lead to system freeze.

CHG Record additional system state information at failure.

NEW Validate CentOS kernel 2.6.32 696.1 . .el6. 6 6 .

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Version .6.2535.100
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FIX Cache size too small in System expansion (MEX) mode since .5.1955.1.

FIX HCL Devices: Fix a crash of systems with Broadcom NetXtreme I (1GigE, tg3) devices.

FIX Installer: Multiple UI fixes.

FIX vSMP Foundation Device: Update XHCI devices.

FIX OS loaded in UEFI cannot access ECAM PCI device access.

CHG HCL Boards: Better handle iLo2 and iLo3 systems.

CHG Installer: Enhanced System info data collection.

NEW Installer: Allow selecting devices to install.

NEW Installer: Warn if partition is used as SWAP.

NEW Performance: Improved Linux OS content switch time.

NEW vsmppp: Revamp package management engine.

NEW Debian support added.

NEW Support for Intel Xeon E3 v6 processor family. Maximum memory is limited to 512GB.

NEW Validate CentOS .1 .1 1.el .elrepo. 6 6 and .1 .9 1.el .elrepo. 6 6 kernel.

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Version .6.2535.
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FIX HCL Boards: Better handle ACPI S5 sleep state so shutdown now works correctly on additional boards.

FIX HCL Boards: OS may not load on older Intel platforms after update to .6.2535.10 or later.

FIX Installer: "up" command not working.

FIX Installer: Multiple files.

CHG Improve UEFI boot mode automatic detection.

NEW HCL Boards: Support ledctl utility for AHCI devices.

NEW HCL Devices: AnyIO auto enablement for additional NVIDIA GPU and GPGPU devices.

NEW Installer: 'si' run performance tests with 'p'.

NEW Validate CentOS .5 kernel 3.10.0 62.11.6.el . 6 6 when used with SWAP.

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Version .6.2535.51
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FIX HCL Devices: VMD hot replace

FIX Installer: Remove "Supported NVMe SSDs not found. Exiting" if all NVMeS using device license

FIX UI and boot: Alert if DIMM population is unbalanced or suboptimal, when suboptimal NUMA cluster (SNC) is on

FIX UI and boot: Diagnostics device selection in System Settings (F5)

FIX UI and boot: Misaligned print in system message

FIX UI and boot: Several fixes for boot flow.

FIX UI and boot: System stuck with error R062

FIX OS loaded in UEFI may see difference CPU than the one exists.

CHG Installer: Enhanced System info data collection.

NEW HCL Boards: Fix ACS mode setting by the BIOS

NEW HCL Boards: Handle MWAIT disable by BIOS

NEW HCL Boards: Handle SMI decreasing turbo state.

NEW Installer: Improved image installation capability support for configuration setting and file merge with "dev=val" and "config FILE".

NEW Installer: Multiple UI fixes

NEW Installer: Setup image as default boot device in UEFI mode.

NEW Installer: Support for quiet installation with "q".

NEW Linux kernel command line options tuneup

nvidia.NVreg_RegistryDwords="ForceEnableHypervisor=1" expanded NVIDIA GPGPU device identification.

udev.children_max set to 2 number of CPUs on the primary board.

NEW Support for hiding vSMP Foundation SMBIOS identity with uep_smbios=yes configuration

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Version 6.2535.19

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FIX HCL Devices: Several fixes to Intel VMD.

FIX Installer: Change "input FILE" (without "source FILE") to create just primary file.

FIX Installer: Correct "input FILE" operation.

FIX Installer: Usage text.

FIX vSMP CTL: vsmpprof crash Issue fixed.

FIX vSMP Foundation Device: Located behind VMD

FIX Emulation of SSE and AVX instructions.

FIX Fi configuration by cpu boards by when used with multiple boards.

FIX Rare system lock up in System expansion (SYX) mode.

CHG Display full system message for serial crash logs.

CHG Memory footprint reduction.

NEW HCL Devices: Enable Guest OS access to Intel VMD devices with private device behind them.

NEW HCL Devices: Remove hanging PCI to PCI bridges behind Intel VMD due to private device removal.

NEW Installer: " o t" to accept terms and conditions.

NEW Installer: Presents and prompts to accept terms and conditions for boot image manipulation.

NEW License: Enable PXE boot of vSMP Foundation for Flash expansion (FLX) devices.

NEW Performance: Further improve CR3 reloading latency, leading to a shorter OS content switch time.

NEW vSMP CTL: vsmpctl tcs=accept to accept terms and conditions.

FIX Diagnostics: InfiniBand Bandwidth and health test doesn't complete.

FIX Flash: Systems with single NVMe may stuck at boot.

FIX HCL Boards: Boot from CDROM/DVDROM.

FIX HCL Boards: Private device NUMA node is not reported.

FIX HCL Devices: Intel VMD BAR without 256MB alignment.

FIX License: Network license race.

FIX License: NVMe license recovery process change to avoid data loss

FIX vSMP Foundation Device: Located behind VMD.

FIX vSMP Foundation Device: Located on XHCI controller behind USB3 port.

FIX BSOD not showing boot device

FIX Linux kernel command line options tuneup for OS in UEFI boot mode.

FIX Rare system crash (not observed by customer).

FIX Several files to ac plane devX key management

FIX System crash upon PCI PIO BAR update.

CHG HCL Boards: Remove VGA BIOS dependency for OS in UEFI boot mode.

CHG HCL Devices: MSI X interrupts for AnyIO devices to total of 61 (was 096).

CHG Performance: More robust Guest code patching (ultravirt).

CHG Support wider range BIOS int calls.

CHG UI and boot: Several fixes for boot flow.

NEW Flash: Expanded Flash expansion (FLX) NVMe support.

NEW Report crash logs to serial.

NEW UI and boot: Support for loading the OS from NVMe.

FIX HCL Boards: Correctly calculate and display minimum memory in System Settings (F5)

FIX Installer: Several fixes on installer screen

FIX Rare system lock up (not observed by customer)

FIX vSMP Foundation Device: Error 50 when booting from USB.

CHG HCL Devices: Extend hardware compatibility list to support complete PCI device classes:

Communication controller: Serial controller (0 0 00).

Display controller (0 03).

Mass storage controller: IDE interface (0 0101).

Mass storage controller: Non Volatile memory controller, NVM

Express (0 010 02).

Mass storage controller: SATA controller (0 0106).

Network controller: Ethernet controller (0 0200) Intel
(0 0 6) only.

CHG HCL Devices: Updated hardware compatibility list.

CHG Installer: Correctly identify target NVMe devices using product branding.

CHG Installer: Improve network license activation speed.

CHG License: NVMe license recovery process change to avoid data loss.

CHG License: Socket based licensing model

CHG Performance: More robust Guest code patching

CHG UI and boot: Additional boot time progress codes.

CHG UI and boot: Several fixes for boot errors

CHG vSMP CTL: Better identification of private device NUMA node (for pinfo).

NEW HCL Devices: Expanded support for LSI MegaRAID Fusion MPT SAS 3.0 devices (SAS300).

NEW HCL Devices: Support Intel VMD. NVMe devices behind each VMD are available either as private device or to the Guest OS (but not for both).

NEW Increase the number of PCI filters from 15 to 2

NEW Installer: 'si' collect system information with 's'.

NEW Installer: 'si' list of supported PCI devices with 'l' / 'la'.

NEW Installer: Be more interactive. Print during preparation phase.

NEW Installer: Handling installation to pre licensed NVMe devices.

NEW Installer: Presents and prompts to accept terms and conditions during install, instead of during system boot.

NEW Installer: Support installation in UEFI OS.

NEW Performance: Additional frequent pass thru MSRs.

NEW Performance: Guest code patching (ultravirt): nested VMs with RHEL . .

NEW Performance: Improved Linux OS content switch time.

NEW Performance: Nested VM performance improvement.

NEW UI and boot: Alert if DIMM population is unbalanced or sub optimal.

NEW UI and boot: Devices table handle larger device list.

NEW UI and boot: Introducing user friendly BSOD messages for common hardware errors.

NEW vSMP CTL: Several fixes to command UI.

NEW vSMP CTL: stats to account for UV time.

NEW vSMP CTL: vsmptcl tcs presents and prompts to accept terms and conditions during install, instead of during system boot.

NEW vSMP CTL: vsmptstat st (system traffic: st) adding level=0 support.

NEW BSOD on system lock up.

NEW Control system boot mode with 'boot mode' configuration key. Possible values: 'legacy' / 'uefi'. If key undefined, legacy will be tried first, then uefi.

NEW Initial support for PCI BAR updates.

NEW Memory footprint reduction grow internal structures at runtime.

NEW SR IOV device capability removal.

NEW Support for PCI extended configuration space access.

NEW Support loading OS in UEFI boot mode.

NEW Validate CentOS kernel 3.10.0 693.21.1.el . 6 6

FIX Installer: correct " o f" operation.

FIX Performance: Several fixes to memory PINNING in System expansion mode (SYX).

FIX Avoid system lock up under high memory pressure

FIX Possible memory corruption on high concurrency access to ECAM range (not seen by a customer)

FIX Rare nested VM memory corruption issue (Issue: 19).

CHG Installer: Themes update.

CHG SSE and AVX instruction emulation robustness.

NEW HCL Devices: Alert and halt boot process if Intel VMD enabled in BIOS (Issue: 5).

NEW Several Nested VM performance and stability improvement.

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Version .5.1955.12
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FIX Log and ignore non critical IOMMU errors.

FIX Systems with Reserved Memory Region is used (RMRR).

FIX Critical issue relating to HPSA devices

FIX Performance: .5.1955.3 regression.

FIX vSMP CTL: stats correctness.

FIX .15.12 1.el .elrepo. 6 6 VM may crash.

FIX Fix emulation of CRC32 instructions.

CHG Performance: More robust Guest code patching (ultravirt).

CHG Improved vSMP Foundation heartbeat (keep alive) mechanism.

NEW Intel NVMe SSD latest firmware release.

NEW Installer: Handle process termination during upgrade.

FIX HCL Devices: Broadcom NetXtreme C/E device preventing system boot.

FIX HCL Devices: Critical AHCI issue.

FIX License: Fix license verification error.

FIX License: Fixes to Guest OS (dmesg and console) notification on unlicensed system.

- FIX Performance: Concurrent memory requests (CMR) may be disabled.
- FIX UI and boot: More fixes to physical memory limit (board memory).
- FIX Restore Guest state if log retrieval stopped during operation.
- FIX System crash during parallel memory allocation, or during vsmpprof.
- CHG APIC: Default to APIC physical interrupt delivery mode.
- CHG HCL Boards: Increase UEFI boot error reporting granularity.
- CHG HCL Devices: Updated hardware compatibility list.
- CHG Performance: Faster response to page table updates.
- CHG Performance: Nested VM may crash when launching many nested VMs.
- CHG Performance: Nested VM performance improvement.
- CHG Improved security mitigation support.
- CHG Improved vSMP Foundation heartbeat (keep alive) mechanism.
- NEW APIC: IPI delivery performance improvements.
- NEW Flash: Complete PCIe hierarchy support.
- NEW HCL Devices: Reduce MSI-X interrupt latency.
- NEW Installer: Validate license files.
- NEW Performance: Performance of boards with large core count.
- NEW Validated Linux kernels for:
 - RHEL: 3.10.0-693.11.6.el6_6, 3.10.0-693.1.1.el6_6, .15.12.1.el6.elrepo.6_6
 - SLES: .103.6.3 default
 - Community .15.3

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Version .5.1955.3

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- FIX License: Fixes to Guest OS (dmesg and console) notification on unlicensed system
- FIX License: Server local license expiration.
- FIX UI and boot: Several fixes to physical memory limit (board memory).
- FIX vSMP CTL: imdtstat fix: CPU restart.
- FIX vSMP Foundation Device: Support USB 3.0 (XHCI) boot.

CHG vSMP CTL: prof/stats read speed improvement (up to 300 %).

CHG Improved latest (existing) Linux kernel security fix support.

NEW Linux kernel command line options tuneup added

"transparent hugepage=always" unless

"transparent hugepage=never" is being used.

NEW Set the default NUMA layout (Guest OS view) for Memory expansion (MEX) and Flash expansion (FLX) modes to Expand. Only affects new installations.

NEW Validate CentOS 7 kernel 3.10.0-693.11.6.el7_6.6 in Memory expansion (MEX) mode and Flash expansion (FLX) mode.

NEW Validated Linux kernel 4.14.16 in Memory expansion (MEX) and Flash expansion (FLX) modes.

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Version 5.1955.1
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FIX License: Improved handling of device based license expiration.

FIX License: Secondary nodes handling of server local license

FIX Partitioner: Secondary node stuck after merge

FIX UI and Boot: Several fixes to physical memory limit (board memory)

FIX vSMP CTL: profiling fixes: single board

FIX vSMP Foundation Device: Correctly handle superspeed devices

FIX vSMP Foundation Device: Device access error.

FIX vSMP Foundation Device: Improved update error handling

CHG Installer: Message text.

CHG Performance: Improve idle performance resulting in up to 10% application performance increase.

CHG vSMP Foundation Device: Deprecating vsmpctl 'vfd=on' parameter

NEW Installer: Enforce vsmptools branding.

NEW vSMP CTL: vsmpctl info reports device NUMA node.

NEW Most recent Linux kernel security fix support

NEW Validated Linux kernel 3.10.13 in Memory expansion (MEX) and Flash expansion (FLX) modes.

NEW Validated RHEL6.9 and RHEL 7 latest kernels.

FIX Flash: Expired licenses may corrupt data if the device with the expired license is used in the very next boot.

FIX HCL Boards: Handling of 'cpus per socket' key

FIX HCL Boards: Systems with Reserved Memory Region is used (RMRR) may crash

FIX HCL Devices: Correctly handle PCI BAR restore

FIX HCL Devices: Critical issue with AHCI devices that could lead to system crash

FIX HCL Devices: Support for Intel Storage Controller Unit (SCU) with Linux kernel 3.10 or later

FIX Partitioner: Cancelling merge leads to system crash

FIX Partitioner: Correctly handle partition lock /unlock after changing expansion mode

FIX UI and boot: Fix system memory handling (system memory configuration key / F5 system settings). Previously, in some cases the value ignored

FIX UI and boot: Improve boot stability.

FIX IMDT CTL: profiling files: full profiling accounts for post system event, correctly report group members, correctly report flags.

FIX IMDT CTL: imdtstat files: idle accounting, others.

FIX IMDT Foundation Device: Log device must be created specifically for that purpose (using 'in' options).

FIX Correctly handle VMCALL and VMPTRST instructions.

FIX Correctly handle XSAVES and XRSTORS instructions.

FIX Do not crash on unsupported PIC OCW2 operations.

FIX Fix emulation of SHIFT instructions.

FIX No crash logs for systems with HT disabled.

FIX Rare system lock up immediately after OS load.

FIX ssh terminates under load

FIX System crash when turning off concurrent memory requests (CMR) for systems with HT disabled

CHG Diagnostics: Improve the process of saving diagnostics to USB.

CHG HCL Boards: Disable PCID.

CHG HCL Devices: Mellanox InfiniBand support for guest is permitted for one board only

CHG Installer: Message text.

CHG Performance: Improve batched operations.

CHG Performance: Improve idle performance (HLT/MONITOR/MWAIT).

CHG Performance: Improved concurrent memory requests (CMR) learn and forget algorithm.

CHG Performance: More robust Guest code patching (ultravirt).

CHG Performance: Nested VM performance improvement.

CHG UI and boot: Update copyright to 2018.

EOL HCL Back plane: EOL Intel True Scale HCAs.

NEW Flash: Improved Flash expansion (FLX) performance for NVMe devices.

NEW Flash: Intel NVMe SSD experimental mode.

NEW HCL Back plane: Support for Mellanox ConnectX 5 EDR HCAs.

NEW HCL Boards: Support for TSC DEADLINE in Memory expansion (MEX) and Flash expansion (FLX) modes.

NEW HCL Boards: Support for UEFI boot without any legacy BIOS (including legacy VGA) support (and removal of error 1311).

NEW HCL Devices: Better handling of PCI to PCI bridges.

NEW HCL Devices: Handle FLR.

NEW Installer: 'o' supports section removal with 'c'/'w'/' ' pointing to /dev/null.

NEW Installer: 'in' supports introduce server based licensing with 'd', replacing ' ' in some cases.

- NEW Installer: 'in' supports installation to file with ' n' / ' ' / ' d'.
- NEW Installer: Better handling of non supported NVMe SSDs.
- NEW Installer: Change license agent default installation directory to /usr/local/ in.
- NEW Installer: Product branding controls the installation of network license agent.
- NEW Installer: Product branding sets the first letters for imdttools (imdtctl, imdtlog, imdtprof, imdtstat, imdtversion) as well as license agent and server executable name. Previous instance of imdttools (non branded) will be removed.
- NEW Installer: SUID is set based on user decision.
- NEW Installer: Warn and exit if running in Cygwin.
- NEW License: Introduce server local license for Memory expansion (MEX) systems.
- NEW Performance: Further improve CR3 reloading latency, leading to a shorter OS context switch time.
- NEW Performance: More efficient cache management up to 15% improved performance.
- NEW Performance: Single process memory initialization speed.
- NEW UI and boot: Control the amount of physical memory used on primary board via System Settings (F5) or using board memory configuration parameter.
- NEW UI and boot: Devices table allows "Reset to Defaults" with F9.
- NEW UI and boot: Graphical mode compatibility improvement for both UEFI and legacy BIOS modes
- NEW IMDT CTL: Add IMDT Foundation Device info SMBIOS (DMI) information changes to Type 11 (OEM Strings) structure.
- NEW IMDT CTL: imdtctl info reports current SMART info (and not cached one).
- NEW IMDT CTL: imdtversion flags changes:
 - full will be deprecated.

long version with no system topology details. v
version with some system topology details. Multiple v can be added to
increase system topology detail level.

NEW IMDT CTL: Write protection for read only PCI BARs.

NEW IMDT Foundation Device: Do not filter USB 2. (EHCI) devices that has
USB 1.0 device.

NEW IMDT Foundation Device: Support USB 3. (XHCI) root.

NEW Validated Linux kernel .11.12, .12.9 and .1 .6

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Version .2.1 55.10
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FIX Flash: NVMe SSD to soc let assignment fix .

FIX UI and root: Fix system memory handling (system memory configuration
key / F5 system settings). Previously, in some cases the value ignored.

FIX vSMP CTL: stats to correctly account for concurrent memory requests (CMR).

FIX vSMP CTL: stats to correctly handle system with HT disabled

FIX Boot warning on Linux kernel . . .

FIX Fix emulation of REP instruction.

FIX Rare race leading to memory corruption

FIX Rare race leading to system crash

CHG Guest code patching (ultravirt) improvements.

CHG HCL Boards: Increase number of supported IOAPICs per board to 20
(Dell R9 0 requires 1).

CHG Performance: Critical improvement for idle performance in
System expansion (SYX) mode (HLT/MONITOR/MWAIT).

CHG UI and root: Several fixes for Devices table .

NEW HCL Devices: Support for LSI Fusion MPT SAS 3.0 and LSI MegaRAID Fusion MPT
SAS 3.0 devices.

NEW Installer: Improve compatibility.

NEW Installer: UEFI support

NEW Installer: Warn if running in EFI

NEW Several Nested VM performance and stability improvement. Certain VM VMs operations measured to run 100% faster

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Version 2.1.55.
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FIX HCL Boards: Boards with 5 TB will fail to boot.

FIX Performance: Several fixes to memory PINNING in System Expansion mode (SYX)

FIX Cache size too large on systems with memory less processors.

FIX Rare system crash (not seen by a customer)

FIX RHEL 8.2 VM may crash

FIX RHEL 8.3 VM will not start in some memory layouts

CHG HCL Devices: Set USB 1.0 (UHCI) devices to AnyIO mode if not used for vSMP Foundation Device.

CHG Performance: Improve idle performance (HLT/MONITOR/MWAIT).

CHG Improve internal log of failed NVMe commands.

NEW Performance: NNA defaults to on if system NUMA layout (Guest OS view) set to Expand (or mem_topologies=2).

NEW Support for RHEL 9.

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Version 2.1.55.56
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CHG Installer: sync after tools installation to avoid binary corruption due to uncleaned shutdown.

CHG Linux kernel command line options tuneup always add "intel_iommu=off".

NEW Flash: Support for systems with memory less processors.

NEW HCL Boards: Intel(R) Xeon(R) Scalable processors based platform

System expansion (SYX) mode validation.

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Version 2.1 55.29
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FIX HCL Boards: Crash when Reserved Memory Region is used (RMRR).

FIX vSMP CTL: vsmptest file descriptor runoff.

FIX Guest OS might crash with NULL pointer dereference during boot in
System expansion mode.

FIX Performance: Guest code patching (ultravirt): avoid code collisions.

FIX System may freeze at boot.

CHG Installer: Tools installation and update UI.

CHG vSMP CTL: Improved vsmptest periodic time slice measurement.

CHG vSMP CTL: vsmptest exit code change in bad termination (0 1).

NEW Performance: Improved 32-bit Guest page table management.

NEW vSMP Foundation Device: Support USB 3.0 (XHCI) boot in Flash expansion
(FLX) mode.
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