SCO UnixWare 7 Definitive 2018 - Release Notes Supplement

About this Document

SCO UnixWare™ 7 Definitive 2018 is the latest release of the SCO UnixWare 7 operating system from Xinuos. This *Release Notes Supplement* describe a re-release of the SCO UnixWare™ 7 Definitive 2018 ISO image to enable easy installation on various Linux platforms under the Kernel-based Virtual Machine (KVM) virtualization environment. This new ISO replaces the prior ISO and can be used for installation on all supported platforms, including now running on KVM.

This document supplements and amends (is in addition to, not a replacement of) the original documents provided with SCO UnixWare Definitive 2018:

- *SCO UnixWare 7 Definitive 2018 GETTING STARTED GUIDE (December 2017)*
- *SCO UnixWare 7 Definitive 2018 RELEASE NOTES (December 2017)*

Revision

Revision	Date	Description
00	04/2022	Initial document release - UnixWare Definitive 2018 re-release

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Typographical Conventions

This document follows these conventions:

Convention	Usage	Examples
NOTE:	Important additional information or further explanation of a topic.	**Note:** A weekly backup is recommended.
WARNING!	The task or operation might have serious consequences if conducted incorrectly or without appropriate safeguards.	**WARNING!** Do not change configuration parameters.
Bold	A command or system input that you type, or text or a button you select on a screen.	Click **HELP** for details on disaster recovery.
Italic	Italic font indicates any of the following: *A term with a specific meaning* in the context of this document. *Emphasis* on specific information. *Reference* to another document. *Variables* in a syntax statement for which values are substituted.	Detailed information on *disaster recovery* methods is available in the *Administrator Guide*. **tar** *[*zxvf*] file*.tgz
Courier	System output, file names or path names.	`> Recovery in progress`
	Bold Courier for commands typed by user.	`tar cvf tarfile *.cc`
Angle <> Brackets	A required entry or parameter	installer-<*version#*>. run
Square *[ ]* Brackets	An optional entry or parameter.	tar *[*zxvf*] file*.tgz
Curly { } Brackets	A list of choices separated by a vertical bar | from which one must be selected.	Click { OK | Cancel }.

About SCO UnixWare™ 7 Definitive 2018

The SCO UnixWare 7 Definitive 2018 from Xinuos DVD is being re-released to support installation under Kernel-based Virtual Machine (KVM) on several popular Linux distributions. This is in addition to the features and functionality provided with the original UnixWare 7 Definitive 2018 DVD and documented in:

- SCO UnixWare 7 Definitive 2018 GETTING STARTED GUIDE (December 2017), https://www.xinuos.com/wp-content/uploads/UnixWare7D2M1-GettingStartedGuide-201712.pdf
- SCO UnixWare 7 Definitive 2018 RELEASE NOTES (December 2017), https://www.xinuos.com/wp-content/uploads/UnixWare7D2M1-ReleaseNotes-201712.pdf

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NOTE: This document supplements the above two documents and provides additional information about the changes added in this updated media. If you already installed UnixWare 7 Definitive 2018 with the earlier ISO, then run **patchck** to install the latest UnixWare 7 Definitive 2018 fixes, including the new fixes in this new revised media.

What's New in the UnixWare 7 Definitive 2018 Media

This document describes the revised UnixWare 7 Definitive 2018 media to add Kernel-based Virtual Machine (KVM) support; enhances installation performance on newer hardware; and provides recent fixes.

- If running on KVM, see TA #128041: Which Linux distributions and KVM hypervisors are known to work with UnixWare7 Definitive? for a listing of the supported Linux distributions.
- If running on KVM or Virtual Box, you will need a Xinuos platform license for that platform in addition to the Xinuos UnixWare 2018 Definitive license. See the next section for details.

Licensing

This re-release of UnixWare 7 Definitive 2018 uses the same **operating system** licenses as the original media did. The same licenses, both subscription and perpetual use, are valid whether installing from the original UnixWare 7 Definitive 2018 media or the revised media. **You must register your system within fourteen days after applying a non-evaluation UnixWare 7 Definitive 2018 license. Otherwise your system will only operate in single-user mode without networking.**

In addition:

- To run on KVM, you need a platform-specific license for this platform. During ISL installation with the revised media, a thirty-day evaluation license is provided. Post ISL you can install and register your

platform license. **Registration is required.**
- To run on Virtual Box, please contact Xinuos sales or your Xinuos reseller.
- Support for VMware and on bare metal is provided with the UnixWare 7 Definitive 2018 license and a separate platform license is not required.

As a convenience, if you install both the operating system and platform license at the same time, you can register them together with a single registration key. To do so, install both licenses and then proceed to register the **platform** license.

WARNING! Both your Definitive 2018 operating system and, for KVM and Virtual Box, your platform license must be registered within **fourteen** days. System services will cease running after the evaluation license expires, or if you do not register your system. If you do not install a new license prior to when your evaluation license expires, or if you do not register the new license within fourteen days after installing it, then you will need to log into the console and install/register your licenses.

If your licenses expire or are not registered within fourteen days, your system will be in single-user mode and you will not be able to establish a new network connection. To restore full functionality, you will need to log into the console and register both licenses.

Please contact Xinuos sales, or your Xinuos reseller, to purchase licenses or if you have pricing questions.

Fresh Installations and Upgrades

If installing UnixWare 7 Definitive 2018 under KVM on Linux, you need to use the new UnixWare 7 Definitive 2018 media available on the Xinuos public web site at: https://www.xinuos.com/products/unixware-7

For all other platforms, you can either use the original media or the revised media at https://www.xinuos.com/products/unixware-7. In either case, after installation run **patchck** to get the latest fixes and features, including all the features and fixes in the revised UnixWare 7 Definitive 2018 media. Later improvements, when ready, will also be available via **patchck**.

In general, running **patchck** periodically is highly recommended to ensure your system is current.

NOTE: If upgrading on Virtual Box, first obtain and install your Virtual Box platform license from Xinuos or your reseller. Then install this license before running **patchck**. PTF 9150 version H and later will not install on Virtual Box without this license. After installation remember to register your Virtual Box license.

Enhancements and Bug Fixes

This revised UnixWare 7 Definitive 2018 media includes:

- support for the KVM platform under several popular Linux distributions;
- an improved Kernel Memory Debugging Tool (**kmdt**) is now integrated with the kernel;
- all the bug fixes provided by PTF 9150 (version H), the UnixWare 7 Definitive 2018 Supplement;
- the *ahci* device driver (version 2.0b),
- the *vtblk* device driver (version 1.0a),
- an updated version of libc (version 8.0.2i);
- an updated **guest_conf** utility; and
- a new better performance mini-kernel during ISL.

KVM Platform Support

UnixWare 7 Definitive 2018 can now be run as a virtual machine inside the KVM hypervisor running on several popular Linux distribution. See for a listing of supported distributions at: TA #128041: Which Linux distributions and KVM hypervisors are known to work with UnixWare7 Definitive?

Kernel Memory Debugging Tool (kmdt)

The advanced UnixWare 7 Definitive 2018 Kernel Memory Debugging Tool (**kmdt**) is now integrated into the kernel but must be enabled before use. A revised **crash** utility is also provided to utilize the **kmdt** debugging capabilities. These tools are intended for developers to debug kernel performance issues.

The **kmdt** tool supports debugging levels **0** through **6**, as described in the Appendix to this document. As the levels are increased, more compute (physical and virtual memory) resources are consumed. This may change the timing of the application or kernel conditions causing the panic. **0** is the default and means no extra debugging capabilities.

To change the debugging level, set the **KMDT_INSTR_LEVEL** variable in the **/stand/boot** file and reboot. Or reboot, press space at the splash screen, and set the instrumentation level like in this example:

```
[boot] KMDT_INSTR_LEVEL=3
[boot] boot
```

Remember, set to **0** (the default) for no instrumentation.

See the Appendix below for more information.

Enhanced libc Support

The UnixWare 7 Definitive 2018 **libc** has been updated as follows:

- The run-time linker now supports **LD_PRELOAD**.
- **libc** now supports **setprogname**/**getprogname**.
- Various header file improvements to maintain compatibility while enabling additional open source ports.

Cloning a UnixWare 7 Definitive 2018 Virtual Machine

The **guest_conf** utility has been improved and updated to prompt for a platform license. The instructions for cloning a UnixWare 7 Definitive 2018 virtual machine are the same as is documented in the **Cloning a SCO UnixWare 7 Definitive 2018 System** section of the *UnixWare 7 Definitive 2018 Getting Started Guide*: https://www.xinuos.com/wp-content/uploads/UnixWare7D2M1-GettingStartedGuide-201712.pdf

Bug Fixes and Other Enhancements

ID	Description
fz536069:4	Fix a bug in the interpretation of ACPI configuration tables.
OSR6-106	Added additional supported AHCI controllers to the AHCI HBA device driver.
OSR6-113	Fix an RD1000 panic. Systems using the AHCI device driver and an attached but empty Dell PowerVault RD1000 Removable Disk Storage device would panic on start up. To fix these panics requires both this escalation patch for the sd01 device driver and to use version 2.0a (or later) of the AHCI device driver. You can separately download that device driver or install it via **patchck**. The revised ISO has an updated version of *ahci* device driver with this fix. The *sd01* portion of the fix is to change a recursive loop to an iterative loop. The *ahci* portion of the fix is to resolve an event registration issue.

ID	Description

OSR6-124	Fix a failure when configuring a Dell PowerVault RD1000 Removable Disk Storage hard disk. This error was encountered:
	
	`ERROR: One or more of the DDB files are not present/corrupt/inaccessible.`
	`UX:ls:ERROR: Cannot access /dev/hba/hba*: no such  file or directory.`
	
	An incorrect data conversion was fixed.

OSR6-172	Provide a new boot parameter, *PANICHALT*. When set to **Y** the system halts on panic and requires hard reboot instead of automatically shutting down or rebooting. The default is **Y**. If set to **N** then the system behaves as per the *PANICBOOT* settings.
UW7-111	Add the **ACPI** reset command to avoid keyboard issues when using **PS2_KEYBOARD=NO** boot parameter. Previously the 8042 keyboard controller reset command was used in this scenario which resulted in a system hang.
UW7-127	Fix for a UnixWare 7 Definitive 2018 NFS bug so that UnixWare now lists directory contents of mounted NFS shares that are larger than two terabytes.
UW7-138	Avoid undefined *WCHAR_MIN* and *WINT_MIN* variables by setting defaults if these variables are not defined elsewhere. Updated the */usr/include/strings.h* file to make visible some declarations that were previously hidden from the Xinuos gcc compiler.
UW7-140	Revise various header files to maintain the same behavior for UDK compiled binaries while supporting definitions required by the new UnixWare 7 Definitive 2018 compiler.
UW7-143	Fixed incorrect **pkgadd** warning messages that were displayed when adding packages that contain linked files. Also did minor source code consolidation to synchronize the UnixWare 7 Definitive and Open Server 6 Definitive packaging tools (**pkg*** commands).
UW7-146	The **getprogname** and **setprogname** functions are now in **libc**. Also cleaned up **typdef** redeclaration error. In addition, added **IF_NAMESIZE** to the **/usr/include/net/if.h** file, per the IEEE Standard 1003.1-2017, https://pubs.opengroup.org/onlinepubs/9699919799/basedefs/net_if.h.html
UW7-148	Add *setenv* and *unsetenv* declarations to *stdlib.h*. While undeclared functions default to *int*, modern compilers complain about the missing declarations.
UW7-155	Update the *mkdev.h* header file to support different definitions for UDK and new development systems.
UW7-156	Add support for installing UnixWare 7 Definitive 2018 under the KVM hypervisor on Linux operating system.
UW7-157	The Initial System Load (ISL) now uses an multi-processor (MP) mini-kernel instead of a uni-processor (UP) mini-kernel. This shortens the time to install the operating system on newer hardware.

ID	Description
UW7-161	Avoid a system hang in version 2.0b of the AHCI device driver when running a virtual machine under KVM.
UW7-162	Improved the hyper-visor detection code and updated the **hw** command to show if the instance is running as a virtual machine.
UW7-164	Avoid null pointers which can otherwise cause hangs during ISL.
UW7-167	Fix *vtblk* installation hang under KVM.
UW7-172	Added the -N option to the **passwd** command. This option disables password login on the account and allows logins via SSH public key(s).
UW7-173	Revisions to header files and libraries to correct some of the **stdio** helper functions. These functions were provided in prior releases to aid in open source porting. These functions were modified: **__ freadable()** **__fwritable()** **__fbufsiz()** should have been **__fbufsize()** **NOTE**: This fix is provided partially by this PTF and partially by an updated **libc** package (version 8.0.2g or later). Note that the **libc** package, once installed, cannot be back revved to an earlier version. Your applications will work correctly with just the new **libc** or just **PTF9150f** (or later). However, the development system will be out of sync.
UW7-178	Modified these utilities to be large-file aware: **awk comm copy cut dd egrep ex** **fgrep fold grep hd head in.tftpd join** **nawk od paste pr sed sort split** **tail tftp uniq wc what** Also modified the **dd** command to accept arguments larger than 2147483647. In addition, modified the **tail** command to handle more than 64K lines.
UW7-179	Fix vi "Internal error: vredraw" on long lines error. Also added vi support for 300 x 300 screens and 32K line lengths.
UW7-183	This PTF should be installed with the latest libc package. libc was updated in parallel with PTF 9150 version G to provide this additional fix: Corrected **LD_PRELOAD** so, when used, loads the libraries set by **LD_PRELOAD** prior to any other libraries, including **libc.so.1**.

ID	Description
UW7-184	Fixed an **/sbin/rc0** typo where the **_AUTOKILL** variable was misspelled as **AUTOKILL**, if this line of the RC script was not already updated. The ptf9150 **postinstall** script checks for three tabs followed by **AUTOKILL=true** and, only if this is found, is this file updated. This typo is not restored upon package removal.
UW7-186	Integrated Kernel Memory Debugging Tool (**kmdt**) and an updated **crash** utility. The **kmdt** is integrated into the kernel but must be enabled before use.
UW7-191	DHCP updates to facilitate DHCP functioning correctly when selected during ISL.
UW7-193	Added the **nologin** command. **nologin** provides a disabled shell security mechanism for UNIX daemon accounts. For more information, after installation run: **man nologin** Also added the **whereis** command for locating binaries and manual pages. For more information, after installation run: **man whereis**
UW7-199	SSH host key fingerprints are now displayed on the console shortly after boot is complete. Run **defadm ssh-host-key-fingerprints** to see the configuration options.
UW7-208	Added missing data types to the **types.h** header file.
UW7-211	Reset these kernel tunables if they were set to a lower value: **MAXLINK** to 32767 and **FLCKREC** to 16000.

Configuration Notes

Installing UnixWare 7 Definitive 2018 for KVM on Linux Under KVM

This section outlines the steps to set-up Linux and KVM, and then to install UnixWare 7 Definitive 2018 under KVM.

1. Configure your Linux system as follows:
    - Use hardware that support KVM virtualization extensions. You can test whether your Linux hardware supports KVM virtualization by entering:

      `grep -E "vmx|svm" /proc/cpuinfo`

      If this command provides any output, then virtualization is supported.

      For more information, see *TA #128002: How to setup a linux system for KVM*
    - When installing a new Linux system partition, your Linux disk for the root */* filesystem should be at least 20 GB. Also, the */var* filesystem should be at least 20 GB plus enough space for your planned virtual disk environment.

    - On an already installed system, make sure you have enough space in the `/var/lib/libvirt/images` directory to store the new UnixWare 7 Definitive 2018 virtual machine(s).

- Optionally, you can make a soft link to another filesystem having more space available for the virtual machine. The virtual machine can then be created there:

  `mv /var/lib/libvirt/images /<mountpoint of filesystem>/images`

  `ln -s /<mountpoint of filesystem>/images /var/lib/libvirt/images`

- Check if your Linux system has an unconfigured network interface. For example, this Linux command will list the unconfigured network interfaces, if any exist: **`nmcli device | grep ethernet | grep disconnected`**

  If any interfaces are listed, one of them can be used as a dedicated interface for your UnixWare 7 Definitive 2018 virtual machines.

  During the VM configuration below, set the VM NIC interface as "**macvtap**" (network source) and set the unconfigured Linux network card as "**VEPA**".

- If no dedicated second network interface is available, then a network "bridge" is needed. Some Linux distributions configure a network bridge as part of the virtualization installation. A network bridge can also be created via Linux administrations tools or a shell script. Here is an example shell script to do so:

```
      #!/bin/sh
      #Find Ethernet device
      DEV=`nmcli device| grep -i ethernet |head -n1| awk '{print $1}'`
      nmcli connection down "$DEV"
      nmcli connection delete "$DEV"
      nmcli connection add type bridge autoconnect yes con-name br0 ifname br0
      nmcli connection modify br0 ipv4.method auto
      nmcli connection add type bridge-slave autoconnect yes con-name $DEV ifname $DEV
 master br0
      nmcli connection up br0
```

2. Install KVM so that it can be used to install UnixWare 7 Definitive 2018 virtual machine:
    - You can test whether your Linux system is configured for KVM by running:

      ```
      grep -E "vmx|svm" /proc/cpuinfo
      ```

      If this command provides any output, then KVM virtualization is enabled.
    - If KVM is not enabled, install the (KVM) "Virtualization Host" software. For example, on Red Hat use **dnf** and on SUSE use **zypper**.
    - Then proceed to the next step to install UnixWare 7 Definitive 2018 virtual machines.
    - More information on configuring KVM is available from the Linux software vendors. For example; https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/html/configuring_and_managing_virtualization/index and https://documentation.suse.com/sles/15/html/SLES-all/book-virt.html
3. Place the **`UnixWare7D2M1b-DVD.iso`** image into the `/var/lib/libvirt/images` directory.

4. Mount the UnixWare 7 Definitive 2018 ISO and install the *osinfo-db* RPM:

   ```
   mount -oloop /var/lib/libvirt/images/UnixWare7D2M1b-DVD.iso /mnt
   rpm -iv /mnt/.venv/osinfo-db-xinuos-20200730-1.noarch.rpm
   ```

5. Start the **virt-manager** GUI and create a new Virtual Machine:
   - Choose "Local Installation Media" and select the **UnixWare7D2M1b-DVD.iso** image. The UnixWare7D2M1 profile will be automatically detected with a sufficient minimum hardware resources set as defaults:
     - 1 GB of RAM,
     - 2 CPUs,
     - 30 GB *vtblk* hard disk,
     - IDE dvd/cdrom, and
     - a *virtio* network card.
   - Change the network selection from NAT to the "**macvtap**" (network source) and"**VEPA**" (source mode) of the additional Linux network card.
   - Check the "**Customize configuration before installation**" box and select "**Finish**".
   - Change the CD device driver: Select **'IDE CDROM**', navigate to '**Advanced options**' and select **Disk-bus:SATA**. Apply to save.
   - Change any other details as desired, then choose "**Begin Installation**"
   - For information on answering the UnixWare 7 Definitive 2018 ISL prompts, see the *UnixWare 7 Definitive 2018 Getting Started Guide*
   - When the cdrom installation is completed, you will be asked to remove the CDROM. Move to the "Hardware details tab' select CDROM and press the cross behind the ISO name to delete the name. Press '**Apply**' to apply the change.
6. Then move to the virt-manager's 'Graphical Console' again and press **<Return>** to shutdown and restart to finish the installation.
7. After installing UnixWare 7 Definitive 2018, log into your virtual machine, start the Software Manager, and apply **both** your operating system (if not applied during ISL) and your platform license. Then register both licenses. After applying both licenses, you can register both licenses at one time by registering the platform license.
8. For more info, please read the following technical article about UnixWare 7 Definitive 2018 on KVM: *TA #128003: How to install UnixWare 7D2018 on linux KVM*

New Reboot Parameter After Panic

The updated UnixWare 7 Definitive 2018 media includes ptf9150h. Starting with ptf9150d:

Xinuos provides a new boot parameter, **PANICHALT**. When set to **Y** the system halts on panic and requires hard reboot instead of automatically shutting down or rebooting. The default is **Y**. If set to **N** in **/stand/boot** then the system behaves as per the **PANICBOOT** settings. If you prefer that the system either shuts down or reboots on panic, set the new **PANICHALT** variable to **N** and set **PANICBOOT** accordingly.

Revised Tuning Parameters During ISL (Not Done For Upgrades)

The revised UnixWare 7 Definitive 2018 ISO sets some parameters to higher, more robust default settings. For those who installed with the original UnixWare 7 Definitive 2018 media, you may want to consider updating your system accordingly. To avoid changing configurations that you may already have optimized for your environment, we do not change these settings on installed systems. Instead, we change these settings only during ISL with the revised UnixWare 7 Definitive 2018 ISO.

Also, you may want to consider updating some **PATH** variables.

If you installed with the prior media, you may want to consider the following changes:

1. Consider updating the tuning parameters:

   NOTE: If you make any of the changes suggested in the following sub-steps then be sure to relink your kernel and reboot per step #2 below.

   - Enable large-file aware capability for each VXFS filesystems:

     ```
     #  Enable large file support for the filesystem
     fsadm -F vxfs -o largefiles filesystem_name

     #  EnsureSFSZLIM and HFSZLIM are set to "infinity"
     cd /etc/conf/bin
     ./idtune SFSZLIM 0x7FFFFFFF
     ./idtune HFSZLIM 0x7FFFFFFF
     ```

     For more information, see: *TA #110169: How to enable large file support?*

   - For developers and high activity systems, you may want to reset these variables:

     ```
     /etc/conf/bin/idtune -m FLCKREC 16000
     /etc/conf/bin/idtune -m MAXLINK 32767
     ```

   - The following parameters were set during ISL of the original (and now revised) UnixWare 7 Definitive 2018 ISL. However, if you installed UnixWare 7 Definitive 2018 by upgrading from a prior UnixWare 7.1.4 or UnixWare 7.1.4+ release, then you may want to confirm that these performance parameters are set to the their maximum values by running the following commands:

     ```
     /etc/conf/bin/idtune -m SDATLIM 0x7FFFFFFF
     /etc/conf/bin/idtune -m HDATLIM 0x7FFFFFFF
     /etc/conf/bin/idtune -m SVMMLIM 0x7FFFFFFF
     /etc/conf/bin/idtune -m HVMMLIM 0x7FFFFFFF
     ```

2. After running the above **idtune** commands in Step #1 above, or any subset thereof, rebuild and reboot:

```
# Rebuild the kernel and reboot your system:
/etc/conf/bin/idbuild -B
init 6
```

3. **patchck** offers you the option to install a new GNU compiler, linker, and debugger for UnixWare 7 Definitive 2018. These tools are only needed to develop **gcc** applications that run on UnixWare 7 Definitive 2018. They are not needed to run these **gcc** applications. To install these development tools, run **patchck -dev**.
4. To use the new Xinuos UnixWare 7 open source ports, path may need to be updated to include: **/opt/xinuos/bin** and **/opt/xinuos/sbin**. The new UnixWare 7 Definitive 2018 media sets paths to include these. To update an upgraded system installed with the prior UnixWare 7 Definitive 2018 ISO image to match the new default paths, run these commands (enter each command on one line):

```
/sbin/defadm login SUPATH=/sbin:/usr/sbin:/opt/xinuos/sbin:/opt/sbin:/usr/bin:
/opt/xinuos/bin:/opt/bin:/etc

/sbin/defadm login PATH=/usr/bin:/opt/xinuos/bin:/opt/bin
```

   Additionally, **/opt/xinuos/man** should be added to **MANPATH** in the **/etc/default/man** file.

More Information

If you have questions regarding this supplement, or the product on which it is installed, contact your software supplier or support representative.

Known Problems

KVM Tools Are Not Available for UnixWare 7 Definitive 2018

(ID: UW7-160)

UnixWare 7 Definitive 2018 is currently missing the utilities which support interactions between the Linux KVM host operating system and the KVM virtual machine. For Linux VMs, these features are provided by the *libvirt-client* package. There is no equivalent package for UnixWare 7 Definitive VMs. As a result, the shutdown and restart options in *KVM/QEMU*, *Virt-Manager* and *virsh*, do not work.

For more information, please see this related technical article *TA #128004: Using virt-manager to shutdown my KVM virtual machine does not work.*

KVM UnixWare 7 Definitive 2018 Virtual Machine Configured With an IDE CD-ROM May Hang

(ID: UW7-164)

Some KVM VMs configured with an IDE CD-ROM device driver may hang sometime after accessing the CD-ROM. Configuring the VM to use a SATA CD-ROM avoids this problem.

For more information, please see related technical article *TA #128005: How can I change my UnixWare7 Definitive 2018 KVM Virtual Machine to use a SATA CD-ROM device instead of the IDE CD-ROM to prevent system hangs?*

SATA CD-ROM Is Not Detected by UnixWare 7 Definitive 2018 Under KVM on CentOS 7 and Red Hat Enterprise Linux 7

(ID: UW7-165)

Installing UnixWare 7 Definitive 2018 under KVM on Centos 7 or Red Hat Enterprise Linux 7 is **not** supported. We strongly recommend that you upgrade to Centos 8 or Red Hat Enterprise Linux 8. Please seeTA #128041: Which Linux distributions and KVM hypervisors are known to work with UnixWare7 Definitive? for a listing of the supported Linux distributions.

Installation with an IDE CD-ROM can workaround this issue, however, further use of the IDE CD-ROM could result in the issue described by UW7-164 (previous section), where the system hangs after accessing the CD-ROM. Using a SATA CD-ROM as a workaround to UW7-164 will not work on CentOS 7 or Red Hat Enterprise Linux 7.

"WARNING: Cannot Find IRQ Routing Info on CG 0" Is Displayed During ISL

(ID: UW7-166)

This message can be displayed if the PCI device driver issues a 32-bit BIOS call; these are disabled by default. Although the system will boot, you can avoid this message by setting the boot parameter:

```
ENABLE_PCI32=Y
```

Appendix: kmdt Instrumentation Levels

This appendix explains the **kmdt** parameter settings when debugging kernel memory issues. In general the default value of **0** should be used. The higher values are used when investigating issues where more debugging information is needed.

To use the **kmdt** set the **KMDT_INSTR_LEVEL** in **/stand/boot**, or at the start-up `[boot]` prompt , as described earlier. The following describes the different settings available:

1. The **kma** device driver provides the new **kmdt** and supports the following levels of instrumentation (debugging levels):

Level	Instrumentation
0	Default (no instrumentation)
1	KMDT_STATS
2	KMDT_HIST|KMDT_STATS
3	KMDT_PARANOID|KMDT_HIST|KMDT_STATS
4	KMDT_POISON|KMDT_PARANOID|KMDT_HIST|KMDT_STATS
5	KMDT_EXTREME_PARANOID|KMDT_HIST|KMDT_STATS
6	KMDT_EXTREME_PARANOID|KMDT_POISON|KMDT_HIST|KMDT_STATS

2. Each level above is a combination of a particular **KMDT** functionality to debug a certain type of memory related issues. Each increasing level is going to stress the system more in terms of physical and virtual memory resources. This may change the timing of the application or kernel conditions causing the panic.
3. The KMDT functionality values in #1 are defined as follows:

Instrumentation	Definition
KMEM_STATS	KMA statistical information is organized into two tables. The SIZES table holds the number of bytes "owned" (allocated but not freed) for each size. The INVOCATIONS table holds the number of invocations of **kma_alloc** or **kma_free** for each size and for each invocation point, where an invocation point is a return address from where **kma_alloc** or **kma_free** is called. Each entry in the SIZES table is linked to the chain of corresponding INVOCATIONS entries.

Instrumentation	Definition
KMEM_STATS	KMA statistical information is organized into two tables. The SIZES table holds the number of bytes "owned" (allocated but not freed) for each size. The INVOCATIONS table holds the number of invocations of **kma_alloc** or **kma_free** for each size and for each invocation point, where an invocation point is a return address from where **kma_alloc** or **kma_free** is called. Each entry in the SIZES table is linked to the chain of corresponding INVOCATIONS entries.
KMEM_HIST	KMA history information is gathered primarily for the purpose of finding undisciplined users of **kmem_alloc**/**kmem_free**. The last KMA_HIST_MAX calls to **kmem_alloc**/**kmem_zalloc**, and **kmem_free** are recorded in the **kma_hist_buffer**.
KMDT_PARANOID	This is the basic functionality to catch memory corruption. This writes **MAGIC** at the beginning of the freed memory and **TMAGIC** to the tail of allocated memory and checks if the same has been corrupted at time of free or re-allocation.
KMA_EXTREME_PARANOID, **kma_xminbufsz**, **kma_xmaxbufsz**	The **kma_xminbufsz** controls the minimum (or start) buffer size and **kma_xmaxbufsz** controls the maximum (or end) buffer size to be tracked for memory corruption. Any buffer size requested within the range is allocated in unit of a page. The page is freed when the buffer is released. This enables us to track memory corruption within a buffer after it is released. If a fixed size buffer needs to be tracked, set **kma_xminbufsz** to **kma_xmaxbufsz**. The **kma_xminbufsz** and **kma_xmaxbufsz** should not be greater than **MAXBUFSZ** ; that is, **8192** bytes. Please note that the default value of **kma_xminbufsz** and **kma_xmaxbufsz** are 0 which means **KMA_EXTREME_PARANOID** has no effect. So, if you want to enable **KMA_EXTREME_PARANOID** via level 5 or 6, then we need to set these two values.

Instrumentation	Definition
KMA_POISON	As you can see from above instrumentation levels in #1, **KMA_POISON** is only enabled with either **KMA_PARANOID** or **KMA_EXTREME_PARANOID**. With **KMA_PARANOID**, this **KMA_POISON** write **MAGIC** and **TMAGIC** to all memory except of few bytes, as in case if only **KMA_PARANOID** is enabled. At the time of allocation or **free**, the unused buffer space is checked for the MAGIC string. This considerably slows down memory allocations and frees and may disrupt timing of the problem being investigated. With **KMA_EXTREME_PARANOID**, an extra virtual page is allocated to track out-of-bound memory access.

4. An enhanced **crash** utility to utilize the **kmdt** functionality is also provided. Useful **crash** commands include **kmastat** and **kmahist**.
5. There are three new tuneables are defined in **/etc/conf/pack.d/kma/space.c**:
    - **kma_sizes**
    - **kma_hist_max**
    - **kma_invocs**

    Please note that the default values for these tuneables in **space.c** is **0** because the **kma** device driver code during initialization will allocate a certain amount of memory for each of the tables/buffer. If you need to overwrite, then please update these variables, rebuild the kernel, and reboot.

    The default sizes are:

    - **14983** entries for the size table;
    - **29989** entries for the invocation table; and
    - **100000** entries for the history log buffer.

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