Oracle® Communications Platform

TPD Initial Product Manufacture

Software Installation Procedure

Release 8.10.0.0.0

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Oracle® Communications TPD Initial Product Manufacture, 8.10.0.0.0

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Important Notices

CAUTION: Use only the procedure downloaded from Oracle Technology Network (OTN) (http://www.oracle.com/technetwork/indexes/documentation/oracle-comms-tekelec-2136003.html).

Before upgrading your system, access **My Oracle Support** web portal (**https://support.oracle.com**) and review any Alerts that may be related to the System Health Check or the Upgrade.

Before beginning this procedure, contact Oracle Support to inform them of your upgrade plans.

1 Introduction

1.1 Purpose and Scope

This document details the procedure for installing the Operating System on Oracle approved hardware. The intended audiences for this document are the Oracle manufacturing engineers who will work with manufacturing technicians to build the systems. It will also be useful to test and development engineers who need to rebuild systems in the lab. Customer Access Support staff may also benefit from the information contained within this document. The Initial Product Manufacture (IPM) will be used for all Oracle approved hardware at Oracle manufacturing and Lab facilities.

This document applies to various TPD releases, starting with TPD 8.10.0.0.0. Since the output may vary slightly across versions of TPD, the figures should be used as a sample of the output to expect and not as exact text.

The following items are considered out of the scope of this document:

- Application Server unpacking
- Application Server assembly
- Application Server diagnostics and acceptance testing
- Application Server application install/upgrade
- Application Server platform upgrade
- Specific part/configuration information for the terminal device (or equivalent) and null modem serial cable used to initiate and monitor the IPM process
- Use of a VGA monitor and PC keyboard to initiate and monitor the IPM process

1.2 My Oracle Support

Web portal (preferred option): My Oracle Support (MOS) at https://support.oracle.com/

Phone: +1.800.223.1711 (toll-free in the US),

Or retrieve your local hotline from Oracle Support Contacts Global Directory at http://www.oracle.com/support/contact.html

Make the following selections on the Support telephone menu:

Select **2** for New Service Request

Then select **3** for Hardware, Networking, and Solaris Operating System Support

Then either

- select **1** for **Technical Issues**,
  When talking to the agent, please indicate that you are an existing Tekelec customer.

  Note: Oracle support personnel performing installations or upgrades on a customer site must obtain the customer Support Identification (SI) number prior to seeking assistance.
  OR
- select **2** for **Non-Technical Issues**, for example, for My Oracle Support (MOS) registration.
  When talking to the agent, mention that you are a Tekelec Customer new to MOS.

1.3 Glossary

This section lists terms and acronyms specific to this document.

Table 1. Glossary

Acronym/Term	Definition
BIOS	Basic Input Output System
CD	Compact Disk
DIU	Dual Image Upgrade
DVD	Digital Versatile Disc
E5-APP-B	E5 Application Server B
GPT	GUID Partition Table
GRUB	Grand Unified Bootloader
IPM	Initial Product Manufacture – the process of installing TPD on a hardware platform
IPM Media Kit	The IPM media kit is distributed as a DVD or USB. The type of media used depends on the hardware configuration as some configurations do not come with DVD drives.
KVM	Kernel-based Virtual Machine
OS	Operating System (e.g. TPD)
TPD	Tekelec Platform Distribution
USB	Universal Serial Bus
VSP	Virtual Serial Port

2 Pre-Installation Setup

2.1 Installation Prerequisites

The following items are required to IPM a server:

- A properly assembled server.
- Appropriate IPM Media Kit
- A terminal device (or equivalent) and null modem serial cable to initiate and monitor the IPM process.
- TPD can be IPMed from KVM based host
- TPD can be IPMed from E5-APP-B hardware

In general, ANSI standard terminal emulations are supported. As of this writing, the following terminal emulations are known to work: ANSI BBS, VT-52, VT-100, VT-102, VT-220, and VT-320. Console port settings for the E5-App-B is configured as specified below.

System	Baud Rate	Data Bits	Parity	Stop Bits	Flow Control
E5-APP-B	115200	8	None	1	None

Note:

1. Default password(s) will be changed by the manufacturing process –or– will be disclosed to customer with recommendation to change. Standard UNIX commands are used to change user passwords.
2. To login as root, contact Oracle Support.

2.2 System Configuration

Assemble and configure the system as appropriate and documented in the applicable application installation setup guides.

2.3 Console Connections

A connection to the console is required to initiate and monitor the progress of the IPM installation. The location and type of the connection varies by system:

Table 2: Console port connections

System	Port type	Port location
E5-APP-B	RJ45 – Serial	Back of unit

2.4 Verify System Health before the first IPM

1. Verify the server console port is setup correctly. Refer to Table 2 for the type and location of the console port.
2. Power on the terminal device (if necessary) and establish a connection to the server console port.
3. Power on the server using the following instructions:

Table 3: Power-on instructions

System	Instructions
E5-APP-B	Insert the blade server into a configured and powered EAGLE shelf. Ensure that both hard disk latches and the eject latch are in the locked position (the word LOCKED is shown on the latch).

3 Software Installation and Validation Procedures

3.1 Setting Server's CMOS clock

The date and time in the server's CMOS clock must be set accurately before running the IPM procedure. There are several different ways to set the server's CMOS clock. The following method requires the least number of external resources. See **Error! Reference source not found.** for other alternatives.

3.2 Setting the CMOS clock and other BIOS parameters from the BIOS setup screen

Setting the clock and other BIOS parameters from the BIOS setup screen does not require TPD to be installed.

1. A few seconds after the server is powered on, as soon as you see the first bit of output on the screen, press the respective key three (3) times to access the BIOS setup screen.
   - On E5-App-B servers using the serial console, use the F4 key.

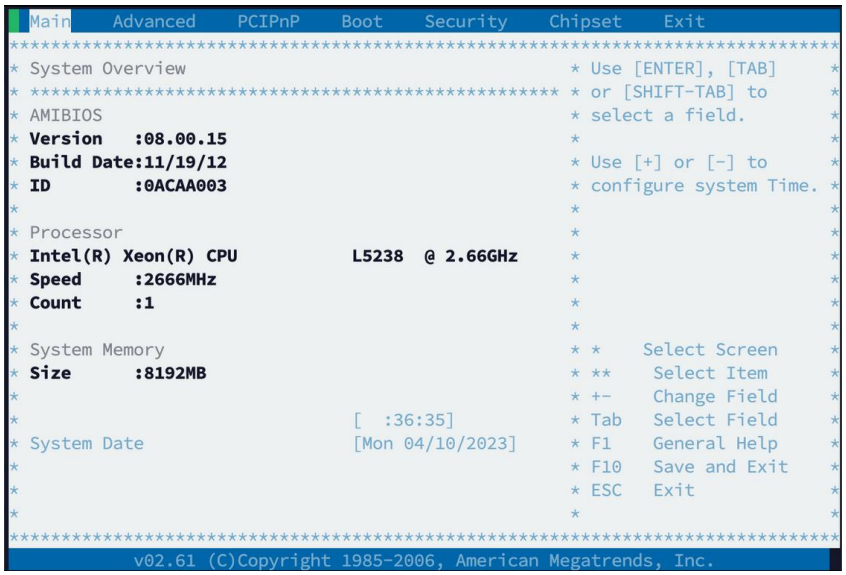

Figure 1: Example Main BIOS Screen

2. Set the server date and time to GMT (Greenwich Mean Time).
3. Check for specific application BIOS settings and apply those. See Appendix C for TPD required settings for your respective server type. If there are no settings listed in the Appendix for your server type, then no changes (from the default) are needed.

   Note: The boot order must be changed on E5-App-B servers as specified in Appendix C.1 to IPM the system!
4. If the server is an Oracle server, scroll to the exit screen using the arrow keys.
5. Exit from the BIOS screen, saving changes.

Figure 2: Example Exit BIOS Screen

3.3 OS IPM Install

The IPM installation media must now be inserted into the system. Installation will then begin by resetting (or power cycling) the system so that the BIOS can find and then boot from the IPM installation media. The reboot steps are different for the different rack mount servers.

Note: Do not remove power from the E5-App-B servers as this will reset the BIOS to factory settings. Follow the steps specified in Appendix E.3 to IPM the system!

3.4 IPM Command line procedures

1.

a. Figure 3: Example boot from media screen, TPD 8.9.0.0.0 is a sample output screen indicating the initial boot from the install media was successful. The information in this screen output is representative of TPD 8.9.0.0.0.

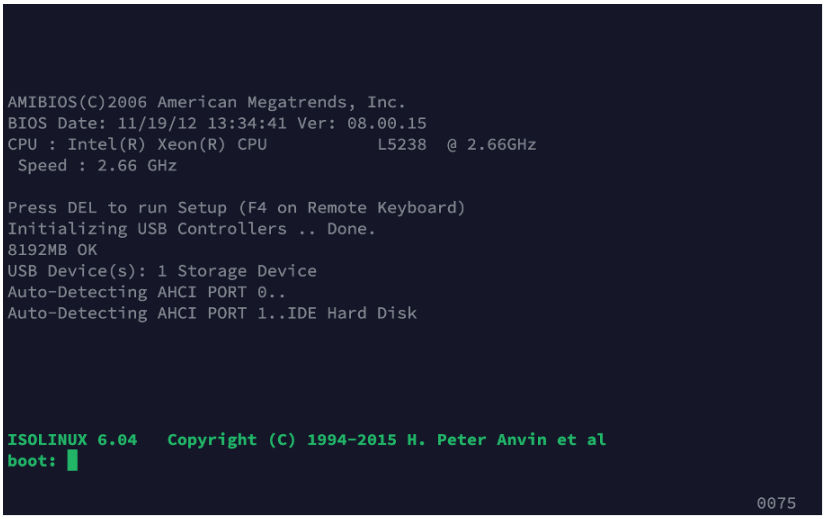

Figure 3: Example boot from media screen, TPD 8.9.0.0.0

2. The command to start the installation is dependent upon several factors, including the type of system, knowledge of whether an application has previously been installed or a prior IPM install failed, and what application will be installed.

   Note: Text case is important, and the entries must be typed exactly as listed.

3. If installing on a server that has never had an application installed (a "fresh install"), start the IPM process by entering the **TPD** command at the boot prompt. There are other boot targets and options available as well. The following is a description of the alternative boot targets:

   - TPD – To install with software RAID. The number of software RAID enabled partitions will vary depending on the TPD release.
   - TPDnoraid – To install on first device found. Creates a /boot partition and five logical volumes. Very useful for machines that do not require software RAID because they already include hardware RAID. This target is appropriate for servers using hardware RAID setup instead of software.
   - TPDlvm – To install with logical volumes on top of a software RAID. This is like the TPD option but instead of partitions, logical volumes are used like in the TPDnoraid setup. This is useful for machines that do not have a hardware RAID but want to have the benefit of having OS filesystems on logical volumes for use of features such as LVM backouts, snapshots, etc. This option was added in TPD 7.0.2.0.0-86.28.
   - TPDcompact – To install using the minimum disk space. Create a boot partition and a / (root) partition. This target is not intended for production use.
   - rescue – To enable rescue mode.
   - HDD – This option allows you to boot to the default hard drive after booting from IPM media. This is used when the server has been rebooted while IPM media was left in the DVD/CD-ROM drive.
   - TPDibi – To install TPD DIU iso. Creates a /boot partition and five logical volumes. Very useful for machines that do not require software RAID because they already include hardware RAID. It is similar to TPDnoraid but instead of TPD IPM iso, TPD DIU iso is used for installation.

   If the server has had an application installed (and is not a "fresh install"), if its state is not known, or if recovering from a failed installation, start the IPM process by including the **scrub** option with your IPM command. Warning: Make sure you understand the behavior of the "scrub" option (as described in paragraph B.3 on page 19) before using it.

   Some applications require disk space to be set aside for use other than being part of the vgroot LVM volume group. See the installation documentation for the application to determine if this is needed and if so, how much space needs to be reserved. The **reserved** option provides this ability to set aside one or more partitions. For more information on the option, see Section B.1.

   When installing to a server with more than one drive, it may be desired to limit the TPD installation to a subset of the drives. For example, it may be desired to perform a **TPDnoraid** installation to a drive other than the first. If this special handling is desired, use the **drives** option to specify the device names to which TPD should be installed. In this configuration one will most likely need to specify the parameter(s) to the **drives** option as the specific logical drive(s) for the internal RAID. For more information on the option, see Section B.2.

   TPD supports automatically reconfiguring the disk drives so the TPD installation can use hardware mirroring (RAID 1). This command will reconfigure the onboard RAID controller to support hardware mirroring if passed with the **force** option. Any data on any disk drive managed by the onboard RAID controller may be lost during this reconfiguration, however, no data will be lost if the disks are already in the desired configuration.

When IPMing supported hardware, the correct **diskconfig** option is appended to the IPM command, without the **force** option, if no **diskconfig** or drives option is passed. This option will verify the disk configuration is correct before proceeding with the install. If the configuration is not correct, it will stop the installation without changing the disk configuration so you can reboot and start over manually passing the diskconfig option you want with the force option. If you want to install TPD on a system with a non-standard configuration, you should manually configure the disks and use the **drives=<device>** option to IPM onto a specific device. To force the reconfiguration of the disks for all supported servers you would pass **diskconfig=HWRAID, force.**

Refer to **Appendix B IPM command options** for all TPD IPM command options.

How long the IPM process will take will be determined by the size and speed of the disk drives installed in the server. See **Error! Reference source not found.** for time estimates. No status is printed to the screen for several hours as the scrub option is run. If one or more disk drives in the server have any hardware errors, the time required to run a scrub will rise dramatically.

After entering the command to start the installation, the Linux kernel will load, as in the following screenshot for non-UEFI systems:

Figure 4: Example boot from media screen, TPD 8.9.0.0.0

4. After a few seconds, additional messages will begin scrolling by on the screen as the Linux kernel boots, and then the drive formatting and file system creation steps will begin and the following screen will appear indicating that the package installation step is about to begin:

Figure 5: Installation process beginning screen

Once the screen shown in Figure 5: Installation process beginning screen appears, it may take several minutes before the installation process starts. However, after a few minutes, you will see a screen like Figure 6: Example package installation screen showing the status of the package installation step.

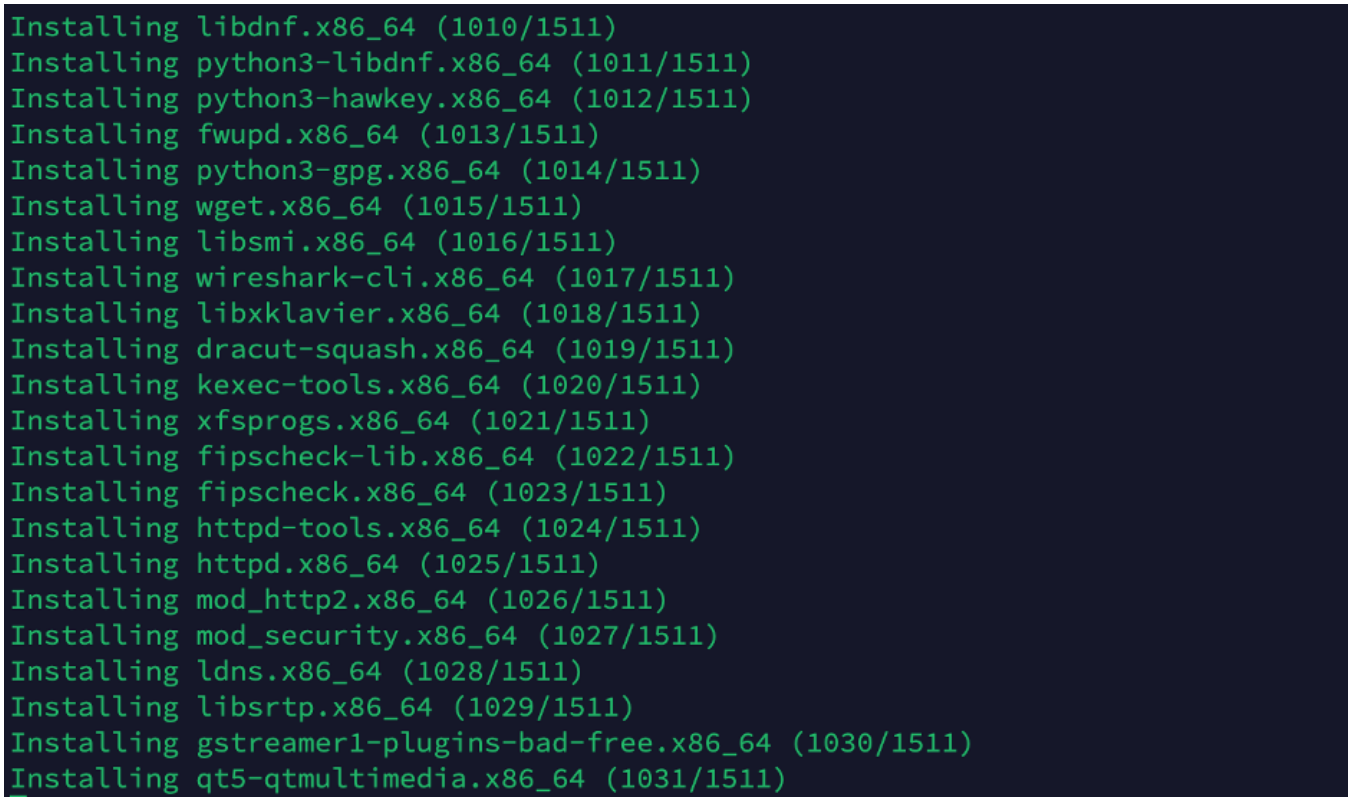

Figure 6: Example package installation screen

5. Once all the packages have been successfully installed, Figure 7: Example installation complete screen will appear, letting you know the installation process is complete. Remove the installation media and then press <ENTER> to reboot the system.

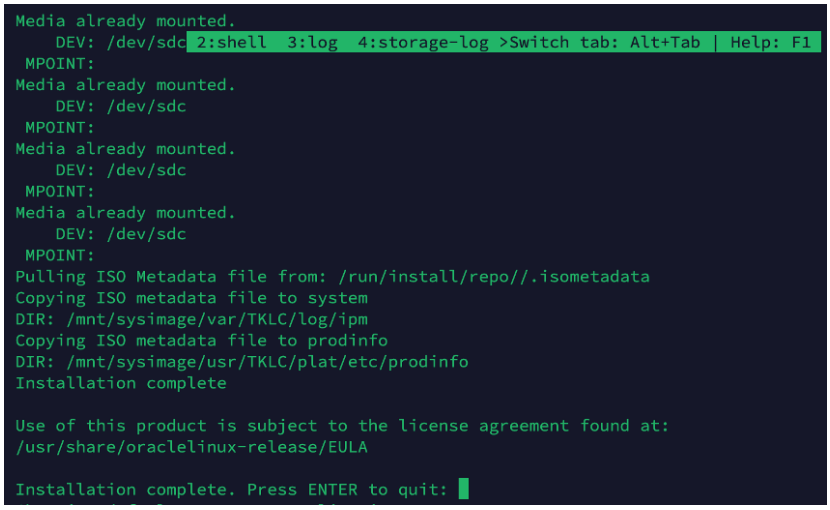

Figure 7: Example installation complete screen

6. After a few minutes, the BIOS screen will appear again, followed by several messages about each of the Ethernet ports in the system, and finally followed by the following message printed by the boot loader, indicating that it is booting the new IPM load.

Note: It is possible that the system will reboot several times during the IPM process. No user input is required if this occurs.

7. A successful IPM platform installation process will result in a user login prompt.

3.5 Post-Install Processing

Log in as user syscheck, and the system health check will run automatically. This will check the health of the server, and print out an "OK" if the tests passed or a descriptive error of the problem if anything failed. The screenshot in Figure 8: Example successful syscheck output shows a successful run of syscheck, where all tests pass, indicating the server is healthy.

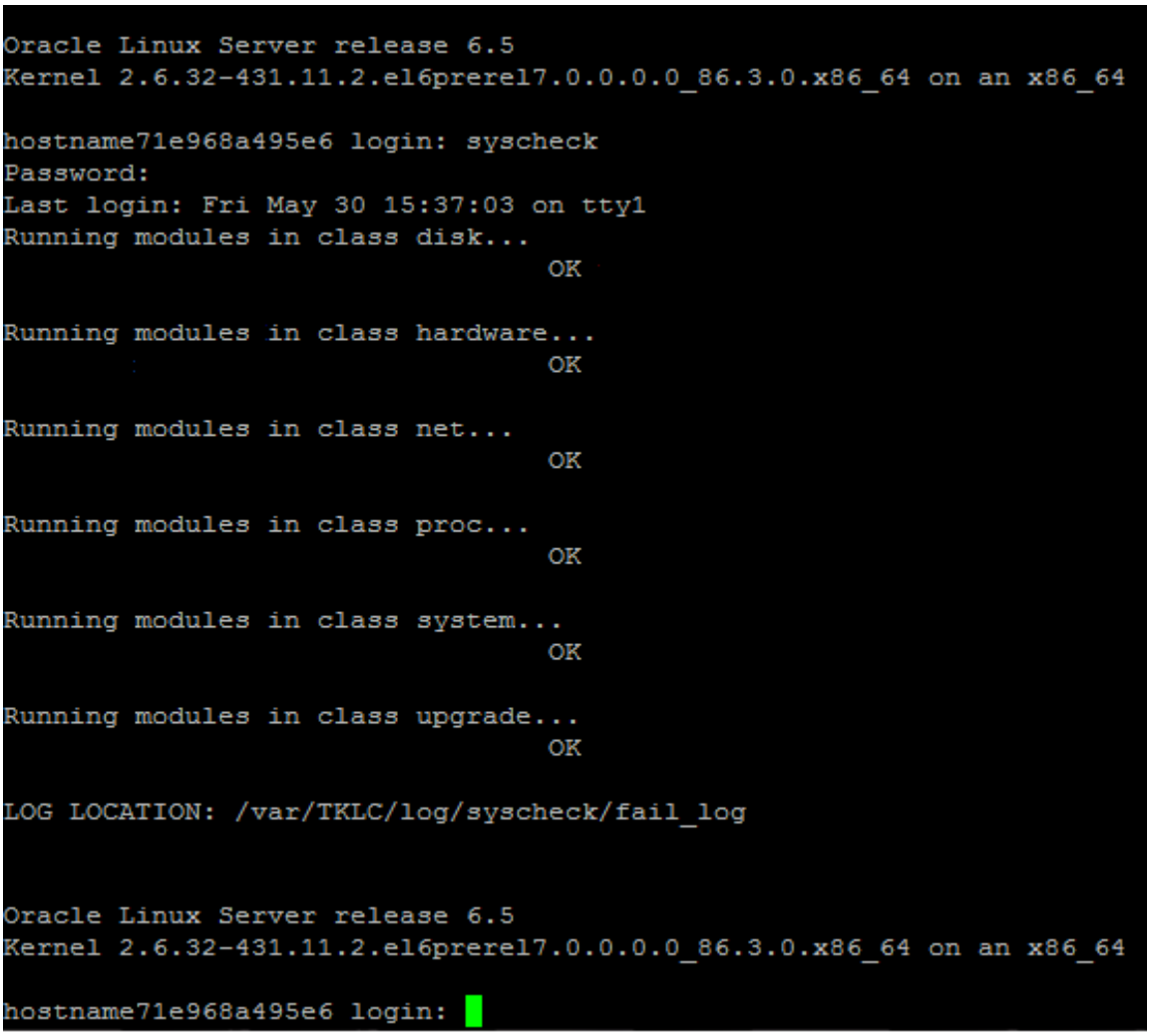

Figure 8: Example successful syscheck output

Verify that the IPM competed successfully by logging in as root and running verifyIPM. Contact Oracle Support if any output is printed by the verifyIPM command.

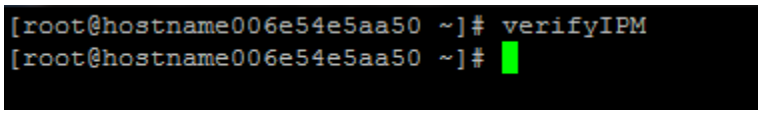

Figure 9: Example verifyIPM output

Congratulations!
Application Server IPM Process is complete and Post-install checks have passed
You have successfully completed this procedure
Refer to sales order to load appropriate application

Appendix A. Possible Errors During IPM Installation Processing

A.1 IPM Errors

1. During the IPM installation, if failures occur, or if the IPM process stops and requests user input, the installation process is suspended and manual intervention is required.
2. If media check was not performed in section 3.4, step 2, and then stop and refer to **Error! Reference source not found.**, "Media Check" to run that now.
3. If media check fails, do not continue, and contact Oracle Support to report the error condition.

A.2 Post Installation syscheck errors

If the syscheck command continues to fail in the post-installation step, execute the following steps to isolate the problem

1. Log in as root
2. Run: syscheck -v -k meta disk
3. If the output looks like the screenshot below, then execute all the steps in 3.4 again, but at step 3, append the "scrub" option to the installation start command. **Warning:** Make sure you understand the behavior of the "scrub" option (as described in Section B.3) before using it. Refer to the text for step 3 to determine the proper installation start command for your hardware.

```
Oracle Linux Server release 6.5
Kernel 2.6.32-431.11.2.el6prerel7.0.0.0.0_86.3.0.x86_64 on an x86_64

athens login: root
Password:
Last login: Tue Jun  3 13:42:00 on tty1
[root@athens ~]# syscheck -v -k meta disk
Running modules in class disk...
        meta: Checking md status on system.
        meta: md Status OK, with 7 active volumes.
        meta: Checking md configuration on system.
        meta: md3 is configured, but is not currently active.
*        meta: FAILURE:: MAJOR::3000000000000002 -- Server Internal Disk Error
*        meta: FAILURE:: md configuration check failed.
Active md config doesn't match /etc/raidtab.
One or more module in class "disk" FAILED

LOG LOCATION: /var/TKLC/log/syscheck/fail_log
[root@athens ~]#
```

Figure 10: Example syscheck failure output

Appendix B. IPM command options

There are multiple options that can be specified on the boot line that affect how the system is manufactured. Multiple options can be specified on a single command.

B.1 reserved

The **reserved** option provides the capability to create one or more extra partitions that are not made part of the vgroot LVM volume group.

The sizes of the partition(s) are indicated after "**reserved=**" and are separated by commas without any whitespace if there are more than one. The sizes use a suffix to indicate whether the value is in units of megabytes ('**M**') or gigabytes ('**G**'). In this context, a megabyte is 1024^2 and a gigabyte is 1024^3.

In the case of a software RAID-1 configuration, such as **TPD** (but not **TPDnoraid**), a single value will cause the creation of a partition on 2 drives and a metadevice (md) that incorporates the two partitions.

Examples:

1. **TPD reserved=2G** – This will create a reserved partition on sda and sdb of 2 GB, and a RAID-1 metadevice using those reserved partitions.
2. **TPDnoraid reserved=512M** – On a HP server, this will create a reserved partition on sda of 0.5 GB.
3. **TPDnoraid reserved=4G,128M** – On a HP server, this will create two reserved partitions of 4 GB and of 128 MB.

The partition(s) or metadevice(s) can be used by storageMgr to create a DRBD device or LVM physical volume. However, to do so, one will need to know the partition number or metadevice number.

Numbering of partitions is performed by anaconda and is controlled by anaconda. Therefore, to get the partition number, a developer would need to examine the partition table after an IPM to determine the number. Also, this number may change due to changes in anaconda in future releases of TPD.

B.2 drives

The **drives** option provides the capability to limit the installation of TPD to certain drives by specifying the device names separately by commas after "**drives=**".

Example:

TPD drives=sda,sdb – May be useful on a system with more than 2 drives where the additional drives are not intended to be used for the root (TPD) install.
TPDnoraid drives= sdb – May be useful on rack mount servers where the logical drive for the internal RAID is not the first device in the system.

Note: If the drives specified do not include the first device in the system, care must be made to set the BIOS to treat one of the drives specified as the first boot disk/controller before starting the IPM. For example, #2 to work, the internal RAID controller should be configured as the boot controller.

Note: The order in which the drives are specified in the drives parameter determines the boot drive order sent to anaconda for use. The order in which the drives are specified must correspond to the order in which the drives are specified in the BIOS.

B.3 scrub

This option is typically used as part of the IPM process on machines that have had TPD loaded in the past. The usage of the "scrub" option is used to ensure that the disk and logical volume partitioning that occurs during the early phase of IPM operates correctly.

It is extremely important to understand that the "scrub" option will remove all data from ALL attached disk devices to the machine being IPM'ed. Note that this includes disk drives that are not mentioned in the "drives" parameter. Therefore, whenever the "scrub" option is used, all disk drives attached to the machine being IPM'ed, including those not mentioned in the "drives" parameter, will lose all their data. Technically, this is accomplished by writing zeroes to the entire disk of each attached disk drive.

B.4 clear

This option is used to erase the Master Boot Record (MBR) of all the attached disk drives. Note that this option will operate against all attached disk drives of the machine being IPM'ed. Clearing the MBR also removes each disk drive's partition table, effectively causing the loss of all data on the disk.

It is extremely important to understand that the "clear" option will remove all MBR's from all the attached devices to the machine being IPM'ed. Note that this includes disk drives that are not mentioned in the "drives" parameter. Therefore, whenever the "clear" option is used, all disk drives attached to the machine being IPM'ed, including those not mentioned in the "drives" parameter, will lose all their data. Technically, this is accomplished by writing zeroes to the 512 Kbytes of each attached disk drive.

Note: The MBR of any USB drives attached will remain intact since USB devices are ignored.

B.5 diskconfig

This option is intended to direct the IPM process to configure the disks in different ways. At this time diskconfig supports the following options:

- HWRAID - This option detects which disk controller, either HP or LSI, is present and configures the hardware RAID1 appropriately. This is the default if no diskconfig or drives option is passed.
- SWRAID - This option detects which disk controller, either HP or LSI, is present and configures the software RAID appropriately. **Note:** This mode is intended for use during development and testing and is not supported on fielded systems.
- force – specify that if the current disk configuration does not match the desired configuration, that the desired configuration should be forcibly installed. Loss of data on any disk on the same RAID disk controller may result.

B.6 lab

Note: Intended for development use only
This is a debug mode which will provide an interactive shell on failure rather than exiting the IPM process. If this mode is selected and the kickstart file is coming from an http server, the kickstart file will attempt to download the files normally included in the initrd from the http server where the kickstart file is located.

B.7 test

Note: Intended for development use only
This is a debug mode which will cause the IPM process to stop at multiple locations and prompt the user. This mode is useful to check status of scripts used during the IPM process.

B.8 tklcuserdata

This option has been deprecated. It has been replaced by IPMUUID.

B.9 IPMUUID

This value is provided by PM&C to uniquely identify each IPM. All SNMP informs sent will include the IPMUUID if it is provided.

B.10 tklcserverdata

This option has been deprecated. It has been replaced by IPMtrapHosts.

B.11 IPMtrapHosts

This is a colon separated list of IP addresses normally provided by PM&C. The SNMP informs sent during IPM will be sent to this/these address[es].

B.12 ForceFail

This value provides a way to force IPM failures for testing purposes. Three options are available:

- ipmfailed – send "ipmfailed" inform at end of IPM rather than normal "tpdinstalled" trap.
- installfailed – send "install failed" as part of the tpdstate inform on first reboot after IPM.
- ipmabort – Do not put the expected final entry in the kickstart log file. This will cause an "install failed" as part of the tpdstate inform on first reboot after IPM.

If the ForceFail argument is provided with any of the supported options, it will cause the verifyIPM command to fail.

B.13 rdate

This optional argument should be set to the IP address of a server on the local network segment that is running the "time" service. The "time" service is not the same as NTP. If this value is set, the clock on the server will be set using rdate to the provided IP address before the installation of packages begins. If this option is provided, no other setting of the server clock will be required. If the rdate argument is provided, the IP address will be configured as an NTP server when the IPM is completed unless the ntphost option is provided, in which case the IP address provided with the ntphost argument will be used.

B.14 ntphost

This optional argument can be set to the IP address of an NTP server. If this value is provided, TPD will be configured to use this NTP server when the IPM is completed. This option does NOT set the clock of the server before the packages are installed, so it is important the server CMOS clock is set either manually (see Setting Server's CMOS clock or **Error! Reference source not found.**) or using the "rdate" option (see B.13).

B.15 primaryConsole

The argument provided to this option will be set as the primary console device for TPD. This means that all init and kernel messages will be sent to this device while the server is running and during startup and shutdown. Additionally, a login prompt will display itself on this console after the system startup. The argument must be a valid console device such as "tty0", "ttyS1,115200", or "ttyS0,9600n8r".

B.16 diskpart

This optional argument is used to override the disk partition template used for TVOE installation. By default, the "TVOE" disk partition template will be used when TVOE is installed. The "TVOE" partition scheme assumes hardware

RAID is used and the first disk should have TVOE installed on it. However, it is possible to install TVOE using the default TPD disk partition by passing "diskpart=TPD" on the TPD command line. This might be useful when installing TVOE on platforms that do not have hardware disk mirroring.

B.17 console

The default console is serial console but sometimes it is useful to be able to use another device like a VGA monitor. An example for using a VGA monitor would be to use **`console=tty0`**.

B.18 guestArchive

This optional argument is used to start the system in guest archive creation state. This state is used to IPM a guest system that can be used as a base to create a TVOE guest archive.

B.19 ctrlslot

This optional argument is used to select a different controller slot than the default. By default, controller slot 0 is used on TPD systems. This optional argument might be useful when installing TPD on lab or custom customer configurations.

B.20 control_if

This optional argument is used to configure alternate interfaces on the system as "onboot=yes" and "dhcpd=yes" during IPM. This optional argument might be useful when installing TPD or TVOE with alternate NIC or network configurations to ensure select interfaces are configured to come up DHCP on every boot, including the first boot.

The format of the option is:

control_if=<if1>[,<if2>]

To maintain consistency with the default behavior, TPD and TVOE on blades will still require two active interfaces to be given. The given interfaces will maintain configuration together as bond0. If 3 or more interfaces are given an error will be generated and the IPM stopped. TPD on an RMS will only require one interface. If multiple interfaces are given, an error will be generated and the IPM stopped. To maintain consistency with other options, if the **control_if** option is passed with no options, it will be ignored. TVOE on an RMS will have the same interface requirements as TVOE on a blade.

Appendix C. BIOS Configuration

Run the appropriate subsection below based on your hardware platform. If your server type is not listed, then no changes from the default configuration are needed.

C.1 E5-App-B BIOS configuration

To IPM TPD on the E5-App-B, the boot order must be updated to attempt to boot from the USB key first. Before this setting can be applied, the USB key must be inserted in the system.

1. Connect to the system using the serial console.
2. Reboot/reset the system.
3. A few seconds after the server is powered on, as soon as you see the first bit of output on the screen, press the F4 key three (3) times to access the BIOS setup screen.
4. Enter the Boot screen using the right arrow key.
5. From the Boot screen, select Hard Disk Drives menu, and select 1st Drive.
6. Select the USB drive from the popup menu using the down arrow key.
7. Go to the Exit screen using the right arrow key.
8. Select "Save Changes and Exit".

Note: There is no need to revert the BIOS settings to boot from the Hard Disk if the USB key is removed as directed by Step 5 in Section 3.4.

Appendix D. Locate Product Documentation on the Oracle Technology Network Site

Oracle customer documentation is available on the web at the Oracle Technology Network (OTN) site, ***http://docs.oracle.com***. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at ***www.adobe.com***.

Log into the Oracle Customer Support site at ***http://docs.oracle.com***.

1. Under **Applications**, click the link for **Communications.**
2. The *Oracle Communications Documentation* window opens with Tekelec shown near the top.
3. Click **Oracle Communications Documentation for Tekelec Products**.
4. Navigate to your Product and then the Release Number, and click the **View** link (the Download link will retrieve the entire documentation set).