

## **GUID Partition Table (GPT)**

How to install an Operating System (OS) using the GUID Disk Partition Table (GPT) on an Intel<sup>®</sup> Hardware RAID (HWR) Array under uEFI environment.

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#### **Revision History**

Date	Revision Number	Modifications
December 2009	1.0	Initial release.
April 2015	1.1	Updated the OS list, updated the OS install in Windows, and added the Linux OS install.

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## 1. Introduction to GUID Partition Table (GPT)

#### 1.1 What is a GPT disk?

The GUID (Globally Unique Identifier) Partition Table was introduced as a part of the Extensible Firmware Interface (EFI) initiative. GPT provides a more flexible mechanism for partitioning disks than the older Master Boot Record (MBR) partitioning scheme that has been common to PCs.

A partition is a contiguous space of storage on a physical or logical disk that functions as though it were a physically separate disk. Partitions are visible to the system firmware and the installed operating systems. Access to a partition is controlled by the system firmware before the system boots the operating system, and then by the operating system after it starts.

#### 1.2 Why do we need GPT?

MBR Extended Boot Records, the commonly used alternative to GPT, are constrained by supporting only four primary partitions, by temporary schemes such as container partitions, and by allowing volume size less than 2TB only. This inhibits their use in solutions that need more primary partitions or larger volume size.

A superior disk partition format that is well defined and self-identifying would address these constraints while also allowing for greater reliability and better usability.

#### 1.3 What's a GPT Disk benefits?

GPT disks can grow to a very large size. The number of partitions on a GPT disk is not constrained by temporary schemes such as container partitions as defined by the MBR Extended Boot Record (EBR).

The GPT disk partition format is well defined and fully self-identifying. Data critical to platform operation is located in partitions and not in unpartitioned or "hidden" sectors. GPT disks use primary and backup partition tables for redundancy and CRC32 fields for improved partition data structure integrity. The GPT partition format uses version number and size fields for future expansion.

Each GPT partition has a unique identification GUID and a partition content type, so no coordination is necessary to prevent partition identifier collision. Each GPT partition has a 36-character Unicode name, which means that any software can present a human-readable name for the partition without any additional understanding of the partition.

A GPT disk offers these benefits:

- Allows up to 128 primary partitions. (MBR disks can support up to four primary partitions and an infinite number of partitions inside an extended partition.)
- Allows a much larger volume size greater than 2 TB, which is the limit for MBR disks.

- Provides greater reliability due to replication and cyclical redundancy check (CRC) protection of the partition table.
- Can be used as a storage volume on all x64-based platforms.
- Critical GPT data structures are stored twice on the disk: once at the start and again at the end. This behavior improves the odds of successful recovery in case of damage from an accident or a bad sector.
- Whereas MBR provides a 1-byte partition type code, GPT uses a 16-byte GUID (Globally Unique Identifier) value to identify partition types.

#### 1.4 Which OS support GPT?

OS	Support Version	Boot from GPT on EFI
Windowa 2002	Since SP1	No
	64bit only	NO
Windows XP	64bit only	Only 64bit
Windows Vista	Both 32 bit and 64bit	Yes
Windows 2008	Both 32 bit and 64bit	Yes
Windows 2008R2	64bit only	Yes
Windows 7	Both 32 bit and 64bit	Yes
Windows 8 / 8.1	Both 32 bit and 64bit	Yes
Windows 2012 / 2012R2	64bit only	Yes
Solaria	Since Solaris 10	No
Solaris	Both 32 bit and 64 bit	NO
FreePSD	Since 7.0	Xon
FIEEDOD	Both 32 bit and 64 bit	Tes
Mac OS X	Since 10.4.0 (some features Since 10.4.6)	Ves
IVIAC US X	Both 32 bit and 64 bit	165
Linux	Most of the Linux OS	Xoo
	Both 32 bit and 64 bit	
VMware ESXi	Since ESXi 5.0	Yes

## 2. Install an OS into GPT Disk on Intel HWR Array

This document provides a step by step guide to install an OS into GPT Disk on Intel<sup>®</sup> Hardware RAID, under uEFI environment. The BIOS Setup Configuration is done on an Intel<sup>®</sup> Server Board as an example. The OS installation is done with Microsoft Windows 2012\* and RHEL 7.0 as examples.

#### 2.1 Preparation

Setup system with Intel<sup>®</sup> Server Board and Intel<sup>®</sup> Hardware RAID and 8 x 300 GB HDDs.

NOTE: At the time this document was written, ESRT2 is not capable of booting up in uEFI mode so, for this kind of controller, GPT is supported just for data drives with no boot.

#### 2.2 RAID and BIOS Configuration

The hardware RAID can be configured from the RAID OpROM from the BIOS Console.

- 1. Press F2 when system POST and enter system BIOS.
- Navigate to the Advanced Boot Options, then enable "EFI Boot mode" and "Use Legacy Video BIOS".

Advanced Boot Options	
System Root Timeout       [2]       Uhen Boot Mode is Legacy, the BIOS only loads modules required for booting Legacy         Boot Option Retry       Chabled>       Operating Systems.         USB Boot Priority       (Enabled>)       When Boot Mode is UEFI, the BIOS only loads modules required for booting         USB Boot Priority       (Enabled>)       UEFI - aware Operating System	15.
F10=Save Changes F9=Reset to Defaults	
TI=Move Highlight <enter>=Select Entry Esc=Exit</enter>	

Figure 1 Advanced Boot Options

NOTE: Windows 2008R2 requires to set Video BIOS to Legacy, other OS's are preferred in UEFI mode.

- 2. Save the new configuration, reboot and enter the system BIOS console again.
- 3. Navigate to Advanced, then PCI configuration, then UEFI Option ROM Control.



Figure 2 UEFI Option ROM Control

4. Select the RAID controller.

	UEFI Option ROM Contro	l
Intel(R) Ethernet Conv 68:05:CA:29:B2:F1 Slot IPv6 Network Confi ULAN Configuration IPv4 Network Confi Intel(R) Ethernet Cont 00:1E:67:94:59:44 IPv6 Network Confi ULAN Configuration IPv4 Network Confi Intel(R) Ethernet Cont 00:1E:67:94:59:45 IPv6 Network Confi ULAN Configuration IPv4 Network Confi iSCSI Configuration Storage Controller Intel(R) Integrated RA - 03.07.12.01 Slot:0x0	erged Network Adapter XL710-Q2 - :0x0201 guration roller 10 Gigabit X540-AT2 - guration guration roller 10 Gigabit X540-AT2 - guration guration LD Module RMS3CC080 Configuration U 211	† Scroll Up Manage RAID Controller Configurations.         tility
AL M	F10=Save Changes	F9=Reset to Defaults
I∔=Move Highlight	<pre></pre>	LSC=LXIT

Figure 3 RAID controller selection for Option ROM control

5. The main menu comes up. Choose the **Configuration management** option.



Figure 4 RAID configuration Main Menu

6. Select the RAID level, and then go to **Select Drives** for this array

	Create Virtual Drive	
<ul> <li>Save Configuration</li> <li>Select RAID Level</li> <li>Protect Virtual Drive</li> <li>Select Drives From</li> <li>Select Drives</li> </ul>	<mark>(RAIDO)</mark> [] (Unconfigured Capacity)	Selects the desired RAID level. The RAID levels that can be configured are 0, 1, 5, 6 (if supported), 10, 50, and 60 (if supported).
CONFIGURE VIRTUAL DRIVE PAD Virtual Drive Name Virtual Drive Size Virtual Drive Size Unit Strip Size Read Policy Write Policy I/O Policy Access Policy Drive Cache Disable Background Initialization Default Initialization > Save Configuration	RAMETERS: [0] <gb> &lt;256 KB&gt; <read ahead=""> <write back=""> <direct> <read write=""> <unchanged> <no> <no></no></no></unchanged></read></direct></write></read></gb>	RAID 0 uses drive striping to provide high data throughput, especially for large files in an environment that requires no data redundancy. RAID 1 uses drive mirroring so that data written to one drive is simultaneously written to another drive. RAID 1 is good for small databases or other applications that Nore (D/d)
†∔=Move Highlight	F10-Save Changes <enter>-Select Entry purgight (c) 2010-2014, Intel Corr</enter>	F9=Reset to Defaults Esc=Exit noration

Figure 5 Create Virtual drive menu

7. Select the desired drives for the array, apply the changes and confirm when prompted.

	Select Drives	
CHOOSE UNCONFIGURED DRIVES: Drive Port 0 - 3:01:00: SAS, 2786B, Unconfigured Good, (512B) Drive Port 0 - 3:01:01: SAS, 2786B, Unconfigured Good, (512B) Drive Port 0 - 3:01:02: SAS, 2786B, Unconfigured Good, (512B) Drive Port 0 - 3:01:03: SAS, 2786B, Unconfigured Good, (512B) Drive Port 4 - 7:01:04: SAS, 2786B, Unconfigured Good, (512B) Drive Port 4 - 7:01:05: SAS, 2786B, Unconfigured Good, (512B) Drive Port 4 - 7:01:06: SAS, 2786B, Unconfigured Good, (512B) Drive Port 4 - 7:01:07: SAS, 2786B, Unconfigured Good, (512B) Drive Port 4 - 7:01:07: SAS, 2786B, Unconfigured Good, (512B) Drive Port 4 - 1:01:07: SAS, 2786B, Unconfigured Good, (512B) Drive Port 4 - 1:01:07: SAS, 2786B, Unconfigured Good, (512B) Check All Uncheck All	IXI IXI IXI IXI IXI IXI IXI	Scroll Up Submits the changes made to the entire form.
F10 14=Move Highlight <en Copyrigh</en 	)=Save Changes nter>=Select Entry nt (c) 2010-2014, Intel Corpor	F9=Reset to Defaults Esc=Exit ation

#### Look up the GPT Disk Properties

Figure 6 Physical Drive Selection

8. A confirmation notice comes up.

Success	
The operation has been performed successfully. ▶ OK	
F10=Save Changes ↑↓=Move Highlight	F9=Reset to Defaults Esc=Exit
Copyright (c) 2010-2014, Intel Co Figure 7 Successful On	rporation

9. In case all the configurable space has been used you will be notified.



10. Press Esc several times until you exit the System BIOS, pressing F10 to save changes if necessary. Then **reboot** to proceed with the OS installation.

Look up the GPT Disk Properties

#### 2.3 Windows OS Installation.

1. Click Next to confirm language, time, and so on.

🔹 Windows Setup		3
► Windows Server 2012		
Languag <u>e</u> to install: English (United States)		
Time and currency format: English (United States)	•	
Keyboard or input method: US	<b>Y</b>	
Enter your language and other preferences and click "Next" to continue.		
© 2012 Microsoft Corporation. All rights reserved.	Next	

Figure 9 Confirm language, time and keyboard

2. Click Install Now

Wind	ows Setup	
- Win	dows Server 2012	
	Install now	
<u>R</u> epair your computer		
2012 Microsoft Corporation. All rights reserved.		
Figure 10	Install Now	

3. Select standard installation with GUI and click Next.

Windows Server 2012 Standard Evaluation (Server Core Install x64       7/26/2012         Windows Server 2012 Standard Evaluation (Server with a GUI)       x64       7/26/2012         Windows Server 2012 Datacenter Evaluation (Server Core Inst x64       7/26/2012         Windows Server 2012 Datacenter Evaluation (Server with a GUI)       x64       7/26/2012         Windows Server 2012 Datacenter Evaluation (Server with a GUI)       x64       7/26/2012         escription:       nis option is useful when a GUI is required—for example, to provide backward compatibility for an polication that cannot be run on a Server Core installation. All server roles and features are	Operating system	Architecture	Date modified
Windows Server 2012 Standard Evaluation (Server with a GUI)       x64       7/26/2012         Windows Server 2012 Datacenter Evaluation (Server Core Inst x64       7/26/2012         Windows Server 2012 Datacenter Evaluation (Server with a GUI)       x64       7/26/2012         escription:       nis option is useful when a GUI is required—for example, to provide backward compatibility for an uplication that cannot be run on a Server Core installation. All server roles and features are	Windows Server 2012 Standard Evaluation (Server Core Install.	хб4	7/26/2012
Vindows Server 2012 Datacenter Evaluation (Server Core Inst x64 7/26/2012 Vindows Server 2012 Datacenter Evaluation (Server with a GUI) x64 7/26/2012 escription: his option is useful when a GUI is required—for example, to provide backward compatibility for an uplication that cannot be run on a Server Core installation. All server roles and features are	Windows Server 2012 Standard Evaluation (Server with a GUI)	x64	7/26/2012
escription: his option is useful when a GUI is required—for example, to provide backward compatibility for an uplication that cannot be run on a Server Core installation. All server roles and features are	Mindows Server 2012 Datacenter Evaluation (Server Core Inst.	. x64	7/26/2012
innonted you can switch to a different installation option later see. Windows server incrailation	escription: his option is useful when a GUI is required—for example, to p pplication that cannot be run on a Server Core installation. All upnoted Vou can switch to a different installation point.	rovide backward server roles and	compatibility for an features are Server Installation

Figure 11 Select OS Installation.

4. Enable Check box to accept license and click Next.



Figure 12 Accept License

Look up the GPT Disk Properties 5. Select Custom installation.

3	💰 Kindows Setup
	Which type of installation do you want?
	Upgrade: Install Windows and keep files, settings, and applications The files, settings, and applications are moved to Windows with this option. This option is only available when a supported version of Windows is already running on the computer.
	<b><u>Custom: Install Windows only (advanced)</u></b> The files, settings, and applications aren't moved to Windows with this option. If you want to make changes to partitions and drives, start the computer using the installation disc. We recommend backing up your files before you continue.
	Help me decide

Figure 13 Select Type of Installation

6. Load the Intel<sup>®</sup> Hardware RAID Driver if necessary.

To install the device driver files, and then	friver for your drive, insert the ins click OK.	tallation media containin	ig the
Note: The installation	media can be a CD, DVD, or USB	flash drive.	
	Browse	OK Ca	ancel

Figure 14 Load Driver

7. Setup a new partition larger than 2 TB.

	Name	Total siz	ze Free s	pace	Туре
S.	Drive 0 Unallocated Space	2791.2 G	6B 2791.	2 GB	
V	Drive 1 Unallocated Space	2791.2 G	iB 2791.	2 GB	
		ß			
† <u>R</u> efi	resh		Drive o	ption	s ( <u>a</u> dvanced)

Figure 15 Create Partition

8. Click **Next** to start installation.



#### Figure 16 Start Installation

NOTE: Disabling "EFI Optimized Boot" in BIOS configuration after installation will cause the operating system to fail boot

#### 2.4 Linux OS Installation.

1. Select Install Red Hat Enterprise Linux 7.0 and press Enter to start installation



Figure 17 Select Linux Installation

- Servedhat RED HAT ENTERPRISE LINUX 7.0 INSTALLATION 🕮 us WELCOME TO RED HAT ENTERPRISE LINUX 7.0. What language would you like to use during the installation process? English (United Stat English (United Kingdom) English (India) Afrikaans Afrikaans **አማር**ኛ Amharic English (Australia) Arabic العربية English (Canada) অসমীয়া Assamese English (Denmark) Asturianu Asturian English (Ireland) English (New Zealand) Беларуская Belarusian English (Nigeria) Български Bulgarian English (Hong Kong SAR China) বাংলা Bengali English (Philippines) Bosanski *Bosnian* English (Singapore) Català Catalan English (South Africa) Čeština Czech English (Zambia) Cymraeg Welsh English (Zimbabwe) Dansk Danish English (Botswana) -63 Quit Continue
- 2. Select language and click on **Continue**

Figure 18 Select Language



3. Confirm date, time, keyboard, etc., then click on Installation Destination

Figure 19 Main Linux Configuration Page

4. Select the 2.28 TB disk and click on Done.



Figure 20 Select Destination Disk

#### Look up the GPT Disk Properties

5.	Click on E	Begin Installation		
INSTALLATION SUMMARY			RED	HAT ENTERPRISE LINUX 7.0 INSTALLATION
	LOCALIZA	TION		
	$\odot$	DATE & TIME Americas/New York timezone		KEYBOARD English (US)
	á	LANGUAGE SUPPORT English (United States)		
	SOFTWAR	E		
	0	INSTALLATION SOURCE		SOFTWARE SELECTION Minimal Install
	SYSTEM			
	2	INSTALLATION DESTINATION Automatic partitioning selected	<b>D</b> 2	NETWORK & HOSTNAME Not connected
			Wew	Quit Begin Installation
		<b>E</b> . <b>64 B</b> • <b>1</b>		

Figure 21 Begin Linux Installation

6. After Installation is done, reboot your system.

NOTE: Disabling "EFI Optimized Boot" in BIOS configuration after installation will cause the operating system to fail boot.

# 3. Adding a GPT disk to an existing OS installation.

#### 3.1 Windows OS

1. From **Disk Manager**, locate the new disk, a rescan might be needed in case the new disk doesn't show up.



Figure 22 Create new Windows GPT Volume

Ł	Co	omputer Ma	nagemei	nt	×	
File Action View Help	r 😼					
🞥 Computer Management (Local)	Volume Layout	Actions				
▲ <sup>1</sup> System Tools ► Task Scheduler	Simple	e Basic Hea Basic Hea		ealthy (Recovery Partition)	Disk Ma	
Event Viewer     Shared Folders     Mere Local Users and Groups     Mere Performance	(C:) Simple	Basic NTFS	He	althy (Boot, Page File, Crash Dump,	F More I	
<ul> <li>Device Manager</li> <li>Storage</li> <li>Windows Server Backup</li> <li>Disk Management</li> <li>Services and Applications</li> </ul>	Disk 0 Basic 2791.05 GB Online	300 MB Healthy (R	99 MB Healthy	<b>(C.)</b> 2790.66 GB NTFS Healthy (Boot, Page File, Crash D		
	Cipisk 1 Unknown 2791.17 Not Ini	ialize Disk				
	Offi	line				
	Pro	perties				
	Hel	р				
	Unallocated	Primary partit	ion		1	

2. Right click on the new disk (Disk 1 in this case) and select Initialize Disk

Figure 23 Initialize new Windows GPT Volume

Look up the GPT Disk Properties

*	Computer Management		_ 🗆 X					
File Action View Help								
Computer Management (L	ocal) Volume Lavout Type File System Status	n	Actions					
⊿ System Tools	トイ Initialize Disk		Disk Ma 🔺					
<ul> <li>Fask Scheduler</li> <li>Event Viewer</li> <li>Shared Folders</li> </ul>								
<ul> <li>▷ Decal Users and Ge</li> <li>▷ ○ Performance</li> <li>Device Manager</li> <li>∠ Storage</li> <li>▷ Windows Server B</li> </ul>	Crash D							
<ul> <li>Disk Management</li> <li>Services and Applicati</li> </ul>	MBR (Master Boot Record) OFT (GUID Partition Table) Note: The GPT partition style is not recognized by all previous versions of Windows. OK Cancel							
	Unallocated Primary partition							

Figure 24 Select GPT Type Partition

4. Once the disk is initialized, proceed to create a new volume. Right click on the shaded area and select **New Simple Volume**.



Figure 25 Create new Windows Volume

5. Once the new volume is created, click Finish.

<b>*</b>		Con	nput	er Manage	ment	-		x
File Action View Help	7 😼							_
Computer Management (Local)  Computer Management (Local)  System Tools  Computer Viewer  Sector Viewer	Volume	Layout 1 Simple E	Гуре Basic	File System	Status Healthy (Recovery Partition) New Simple Volume Wizard		tions	
<ul> <li>Shared Folders</li> <li>Local Users and Groups</li> <li>Performance</li> <li>Device Manager</li> <li>Storage</li> <li>Windows Server Backup</li> <li>Disk Management</li> <li>Services and Applications</li> </ul>	<ul> <li>Control (Control (Contro) (Contro) (Contro) (Contro) (Contro) (Contro)</li></ul>				Completing the New Volume Wizard You have successfully completed th Wizard. You we type: Simple Volume Disk selected: Disk 1 Volume size: 2858030 MB Drive letter or path: D: File system: NTFS Allocation unit size: Default Volume label: New Volume Chink format: Yee To close this wizard, click Finish.	Simple ne New Simp	le Volur	ne E
	Unal				< Back	Finish		Cancel

Figure 26 Complete new Windows Volume

6. Confirm the new volume is created and greater than 2 TB.

Computer Management					
File Action View Help	f 19				
<ul> <li>Computer Management (Local)</li> <li>System Tools</li> <li>Task Scheduler</li> <li>Event Viewer</li> <li>Shared Folders</li> <li>Local Users and Groups</li> <li>Performance</li> </ul>	Volume         Layout         Type         File System           Simple         Basic         Simple         Basic           Simple         Basic         NFS         Ne         Simple         Basic         NTFS           Ne         Simple         Basic         NTFS         III         III			atus ealthy (Recovery Partition) ealthy (EFI System Partition) ealthy (Boot, Page File, Crash Dump, ealthy (Primary Partition)	Actions Disk Ma A More >
<ul> <li>△ Device Manager</li> <li>✓ Storage</li> <li>▷ Windows Server Backup</li> <li>☑ Disk Management</li> <li>▷ Services and Applications</li> </ul>	Basic 2791.05 GB Online	300 MB Healthy (R Healthy Healthy (Boot, Page File, Crash I			
	<b>☐Disk 1</b> Basic 2791.05 GB Online	New Volum 2791.04 GB   Healthy (Pri	ne (D:) NTFS mary Parti	tion)	
	Unallocated	Primary parti	tion		

Figure 27 Windows GPT partition and Volume

#### 3.2 Linux OS

In order to add a new GPT disk to an existing Linux installation, several steps are needed:

- a) Create a GPT partition
- b) Create a file system
- c) Format and label the file system
- d) Create a mount point
- e) Mount the new file system
- f) Update the /etc/fstab file in order to automatically mount the FS at boot time.

There are several ways and tools for this, in this example Parted will be used, an Ext4 file system will be created and it will be mounted on /work mount point.

- 1. Logged on as root, run **Parted /dev/sda** (this command invokes Parted in interactive mode and uses /dev/sda as the target disk, in this case /dev/sdb is the OS disk and /dev/sda is the new disk.
- 2. From Parted, run Mklabel gpt (this labels the new disk as GPT).
- 3. From Parted, run **Mkpart Data Ext4 0% 100%** (This creates a new partition named Data, from the beginning to the end of the disk, also creates a single Ext4 type file system that will be referred to as /dev/sda1)
- 4. From Parted, run **Print** (prints the disk and partition information to the console, this is just for confirmation)



#### Figure 28 Parted output

- 5. Run mkfs -t ext4 /dev/sda1 (this command formats the Ext4 file system /dev/sda1)
- 6. Run e2label /dev/sda1 /workdidsk (this command labels the file system as workdisk)
- 7. Run mkdir /work (this command creates the mount point /work)
- 8. Run **mount LABEL=/workdisk /work** (this command mounts the FS labeled /workdisk on the mount point /work
- 9. Edit the /etc/fstab file and add this new FS and mount point in order to automatically mount the FS every time the system boots up.

## 4. Look up the GPT Disk Properties

#### 4.1 Windows OS

Go to **Disk Management** > Right click on **Disk 0** > **Properties** > **Volumes** Tab. It displays Disk 0 with capacity larger than 2 TB and the GPT partition style.



Figure 29 GPT Disk Properties in Windows

#### 4.2 Linux OS

You can check your disk's properties with the **fdisk** command, option - I.

[root@localhost ~	´l# fdisk	-1 /dev/sda		
Disk /dev/sda 23 Units = sectors o Sector size (logi I/O size (minimum Disk label type:	392.0 GB, of 1 × 512 ical∕physi n⁄optimal) dos	239199479398 = 512 bytes cal): 512 by : 512 bytes	4 bytes, 4671 tes / 512 byt / 512 bytes	864832 sectors es
Disk identifier:	0×0000000	0		
Device Boot Zdevzsda1	Start 1	End 4294967295	Blocks 2147483647+	Id System

Figure 30 GPT Disk Properties in Linux

### 5. Backup

If you cannot install successfully with the above steps, try the following steps before RAID and BIOS configuration. These steps will change your entire BIOS configuration to the default configuration.

- 1. Press F2 when system POST to enter system BIOS
- 2. Press F9 or switch to Exit tab and select Load Default Values.
- 3. Click **Yes** when the screen displays:

"Load Optimized Defaults?"

Aptio Setup Utility - Copyright (C) 2009 American ∢ Error Manager Exit	Megatrends, Inc.
Save Changes and Exit Discard Changes Discard Changes Load Default Values Save as User Default Values Load User Default Values Load Optimized Defaults? Ves No	Load factory default values for all BIOS Setup Utility options. The IF91 key can also be used. ++ Select Screen 14 Select Item +/- Change Value Enter Select Field F1 General Help F9 Optimized Defaults F10 Save and Exit ESC Exit
Version 1.23.1114. Copyright (C) 2009 American M	egatrends, Inc.

Figure 31 Load Optimized Defaults

 Press F10 to save and exit. Click Yes when the screen displays: "Save Configuration and Reset?"