Intel® Deployment Assistant v4.0

User Guide

February 2011

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Revision History

Date	Revision Number	Modifications
February, 2011	001	Initial release.
February, 2011	002	Updated with review comments

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1. Introduction

This User Guide describes how to use the Intel® Deployment Assistant (IDA) v4.0 – an easy to use browser based graphical application – to reduce the time associated with setting up Intel® servers. It provides an overview of the features and instructions on how to set up and operate the IDA.

1.1. Target Audience

This guide is intended for system administrators who are responsible for upgrading, troubleshooting, and configuring the Intel® Deployment Assistant. As a system administrator, you can use it to update an Intel® server with the latest system software, configure the most common options of the BIOS and firmware, and configure a RAID volume on attached hard drives and install an operating system.

1.2. Terminology

The following table lists the terminology used in this document and the description:

Table 1: Terminology

Term	Description
IDA	Intel® Deployment Assistant
iBMC	Integrated Baseboard Management Controller
BIOS	Basic input/output system
Firmware	Software embedded in flash memory that controls the BMC, HSC, and LCP
Flash	Non-volatile storage used to store server-resident firmware ,including BIOS
FRU	Field Replaceable Unit
HSC	Hot Swap Controller (Hot Swap Backplane Controller)
RAID	Redundant Array of Independent
SUP	JunturaSystemUpdatePackage(BIOS,firmware,FRU/SDRs)
LCP	LED Local Control Panel
NIC	Network Interface Controller (RJ45 LAN connection)
OFU	One-Boot Flash Update

Term	Description
SDR	Sensor Data Record
SysConfig	System Configuration Utility.This includes BIOS and Firmware configuration
UI	User Interface
XML	Extensible Markup Language
XUL	XML User Interface
CLTT	Closed-loop Thermal Throttling

2. Getting Started

2.1. Product Overview

Intel® Deployment Assistant reduces the complexity and time associated with setting up Intel® servers. Server deployment time is often cut by an hour or more per system, and even more time can be saved when using the cloning feature to deploy identical servers. The wizard automatically locates and retrieves the latest drivers, BIOS, and firmware updates. It guides you through questions to help quickly configure the server via automatic recognition of server hardware, with minimal reboots and an automated unattended OS installation.

Intel® Deployment Assistant helps a system administrator do the following:

- Update an Intel® server with the latest system software. Updates can be got from a set URL (http://www.intel.com/support which can be customized by OEM), a network drive, or removable media. The firmware components that can be updated using Intel® Deployment Assistant are: BIOS, Integrated BMC (iBMC), non expander HSCs, and SDRs.
- Configure the most common options of the BIOS and firmware.
- Configure a RAID volume on attached hard drives
- Install Windows* and Linux* operating systems
- Clone all deployment work from one server to multi server

Note: The installation is fully unattended *except* for a license screen agreement that you can agree to *and* any changing of CDs.

The latest drivers for all the on-board components are added from IDA CD or from other supported locations during the OS installation

Intel® Deployment Assistant is a browser based graphical application that provides an easy to use, wizard style interface to the system administrator for performing all the above tasks. It is packaged onto a single CD which contains its own operating system (Linux*), a GUI, Intel® Deployment Assistant core, and supporting files for setup and deployment. Intel® Deployment Assistant boots automatically from a CD-ROM/USB drive and runs completely in a RAMDISK.

2.2. Supported Platforms

Multi-Core Intel® Xeon® Processor 5500 Sequence-based Servers

- Intel® Server Board S5520UR

- Intel® Server Board S5500BC
- Intel® Server Board S5520HC
- Intel® Server Board S5500HCV
- Intel® WorkStation Board S5520SC
- Intel® Server Board S5500WB

Multi-Core Intel® Xeon® Processor 3400 Sequence-based Servers

- Intel® Server Board S3420GP
- Intel® Server System SR1640TH

Multi-Core Intel® Xeon® Processor E3-1200 Sequence-based Servers

- Intel® Server Board S1200BT

2.3. Hardware Requirements

- **CD-ROM Drive**

A USB, IDE, or SATA CD/DVD-ROM drive is required to be able to boot and run Intel® Deployment Assistant. The CD/DVD-ROM drive is mandatory for OS installation.

1. Mouse

Some functions of the IDA require a standard mouse for navigation.

- **USB Disk on Key device**

Some functions of the IDA require a USB disk on key. Example: Update system firmware from USB key; Save PXE image to USB key.

- **RAM**

IDA requires a minimum of 1GB RAM. If available RAM is less than the minimum recommended value, IDA cannot function properly. To use thermal throttling feature for close loop, CLTT enable DIMMS are required.

- **Network Adapter**

Some optional functions of the IDA require network access. Any single on-board Intel® NIC adapter connection is supported. Example: downloading latest system update packages and OS drivers from support.intel.com.

- **RAID Cards**

RAID Configuration and OS installation are supported on the selected controllers as listed in the PRD under section 3.2.2.

3.Using Intel® Deployment Assistant (IDA)

This section details how to operate the Intel® Deployment Assistant.

IDA is a bootable application that uses an IDA CD to boot Intel® Server System to operate functions such as update server system firmware, setup BIOS, setup BMC and configure RAID logical volume and so on. IDA is designed for one or a series of Intel® Server Systems. (If you use an IDA CD to boot from an unsupported server, IDA will generate an error message).

After IDA booting up, the first interface is the End User License Agreement. You can select **I Accept** and click **Next** button to agree this license, or click **Cancel** button to disagree this license and exit IDA application.

Figure 1: IDA End User License Agreement
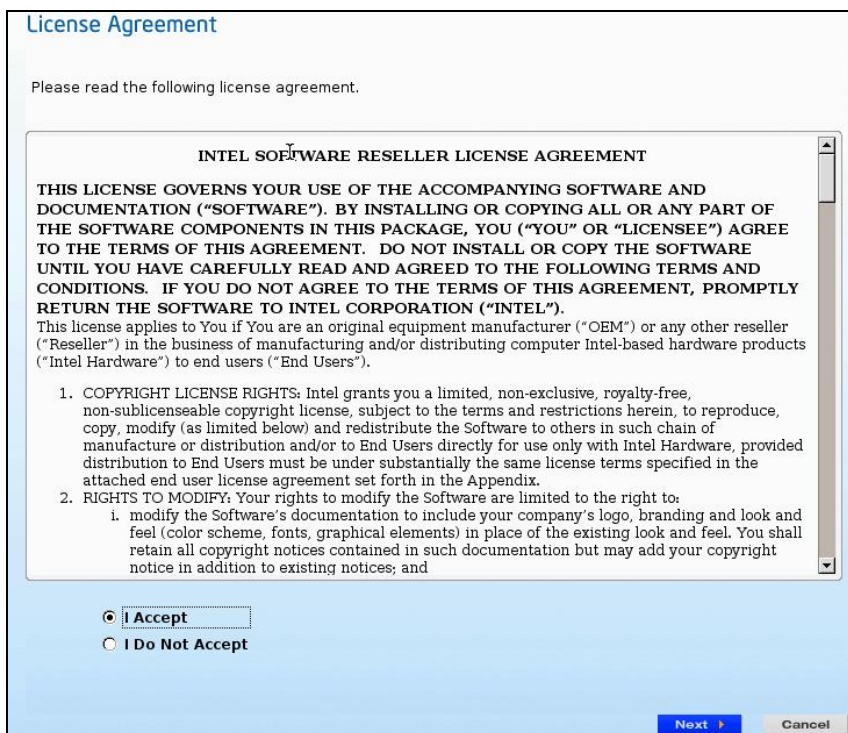
3.1. My Server Page

IDA My Server page is the application homepage that contains main menu and buttons to help you navigate IDA functions.

Figure 2: IDA My Server Page

3.1.1.   Main Menu

This section details the main menu tasks available as shown in Figure 2.3.

Figure 3: IDA Main Menu
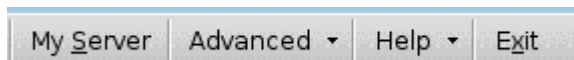
The following table lists the main menu tabs and the corresponding tasks:

Table 2: IDA Main Menu Tabs

Menu Tab	Tasks
My Server (Shortcut: ALT+s)	Enters IDA My Server page

Menu Tab	Tasks
Advanced	Menu **Advanced** contains following submenus: **RAID Web Console 2**. - is used to invoke integrated Linux* version RAID Web Console 2(RWC 2). RWC 2 is professional utility to configure Intel RAID controller. You can refer the RWC 2 online user guide for its details. If the server system doesn't have supported RAID controller, this submenu is disabled.
Help	Menu Help contains following submeanus **Help** - shows a general IDA introduction **About** – shows version and copy right information **Upgrade to New Version** – This submenu is the portal of upgrading IDA to new version with patch file
Exit (Shortcut: ALT+X)	Exits IDA application.

3.1.2. My Server Information Box

The IDA Homepage **My Server** information box detects and displays the server system configuration information as displayed in Figure 2-4.

Figure 4: My Server information box
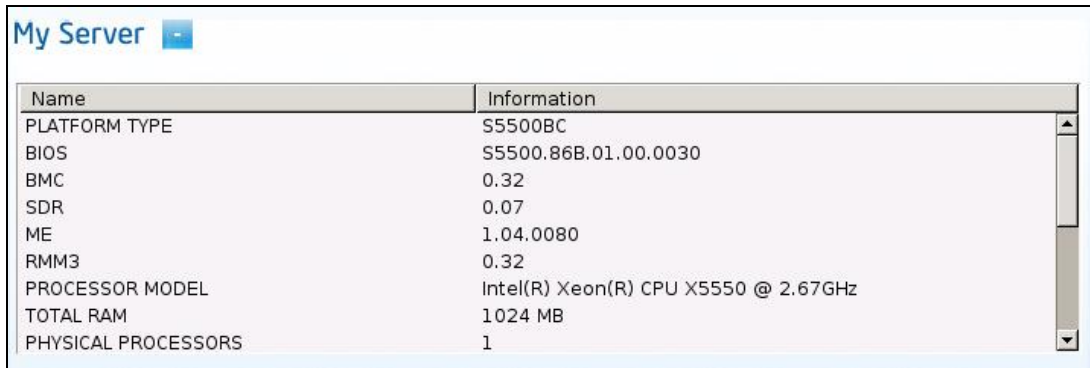
The information displayed as listed in following table depends on your server system hardware configuration. For example, some of the information listed in Table 4 may not be shown if server does not have the related devices.

You have the option to click ➕ button to extend this box and click ➖ to hide it.

Table 3: My Server Information box

Name	Information
Platfrom_Type	Intel® Server System ID name
BIOS	BIOS version
BMC	BMC firmware version

Name	Information
SDR	SDR version
ME	Management Engin version
RMM3	Intel® Remote Management Module 3 firmware version
HSC	HSC backplane firmware version
Intel® RAID Controller XXXXX	Show Intel RAID controller firmware, here XXXX is RAID card name in system
Intel Embedded Server RAID Technology II	Intel onboard embedded RAID type, Show as SATA or SAS
Process Model	Server CPU frequency
Physical Processors	The number of physical CPU on server
Logical Processors	The number of logical CPU on server
Total RAM	Server memory capacity
Asset Tag	Show system asset name if it is set
System Manufacturer Name	Default value is Intel Corporation
System Product Name	Show as Intel® Server Board name
Chassis Manufacturer Name	Default value is Intel Corporation
Chassis Product Name	Default value is Main Server Chassis
Network Adapters	Show the number of onboard network cards

3.1.3.   Primary Function Buttons

There are five primary function buttons in IDA my server page as listed in following table. They are portals to IDA primary functional areas.

Button	Task
Get System Updates	Enters IDA Server System Firmware Update interface.
Configure a Server	Enters the interface to setup the server system information, BIOS, and server management (BMC parameters).

Button	Task
RAID Configuration	This button is used to setup RAID logical volume. If the server system doesn't have RAID card, it is disabled.
OS Installation	Click it to enter OS Unattended Installation interface.
Multi-Server Cloning	Enters IDA Mutli-Server cloning interface.

3.2. Get System Update

If your server has internet connection, IDA can automatically locate and download the latest Intel Server System update packages to upgrade server BIOS, BMC FW, SDR and HSC firmware. To do this, IDA uses the system update package that has been specifically developed for each platform.

You can either click the menu **Get Updates** or click the button **Get System Updates** to enter IDA Server Firmware Update interface. You can manually download this package from Intel Server System page at http://www.intel.com/support/ .
The update package has a .ZIP file extension, and may contain the following components:

- System BIOS
- iBMC （Integrated Baseboard Management） Firmware
- Sensor Data Records (SDRs)
- Hot-swap backplane controller (HSC) firmware update for non-expander types of HSC backplanes

IDA can get system firmware update package from three resources:

- **www.intel.com** - the Intel support website - to get the latest update package.
- **My Network** to browse to a network share containing the update package.
- **USB media** to browse a USB key for the update package.

3.2.1. Scenario 1: Updating Firmware When Server has Internet Connection

If your server has internet connection IDA helps you automatically locate and download the current Intel Server System firmware package from Intel support web site. Following are the steps to operate this function on IDA.

1. Make sure your server system is connected to the network internet connection.
2. Boot server with IDA, and accept IDA end user license.
3. Click IDA menu **Get Update** or button **Get System Updates** at My Server page.
4. Select "**From www.intel.com (recommended)**" at Download Updates page, and click **Next** button.

Figure 5: Update Firmware from support.intel.com
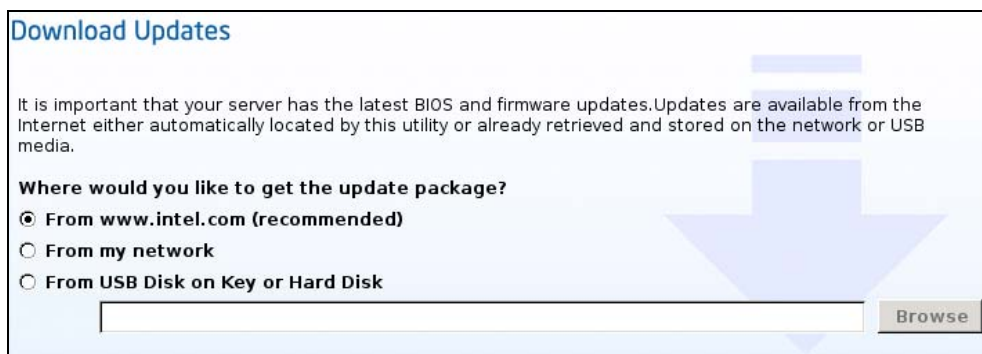
5. Setup your server network parameters to include IP address, subnet Mask, Gateway, DNS and proxy configuration at Network Connection page, and click **Next** button.
   Note: If you are not familiar with your network settings, please check with your IT administrator.

Figure 3-6: Network Setup for Download Firmware form Internet
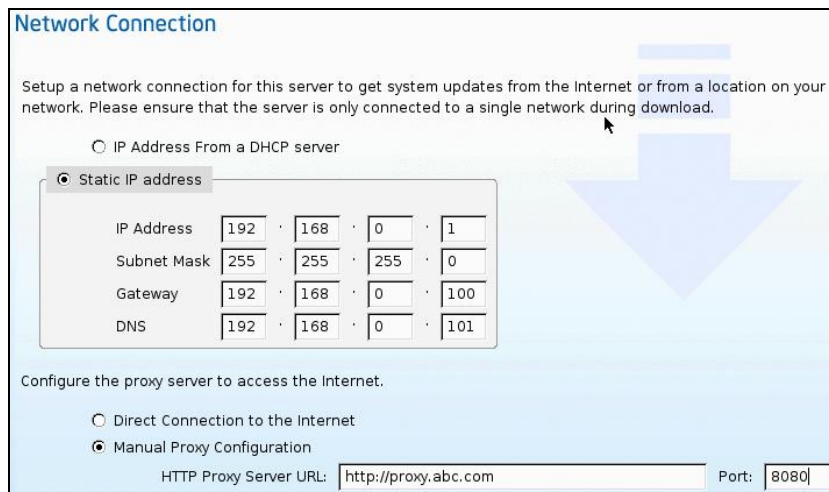
> **NOTE:** IDA can automatically detect all available system firmware update packages. The latest version is recommended.

6. Click **View Contents** button to check the firmware update package version details. Select your update package and click **Download** button...

Figure 7: Available Online SUP

7. After downloading system update package, IDA requests you to select the components in firmware package. Click **Release Notes** button to view system update package release notes that contains server firmware version details, known firmware issues and new features, and click **Apply** button to start selected firmware update.

Figure 8: Select Firmware Components

Figure 9: SUP Release Notes

8. During firmware upgrade, you cannot power off or reboot server.
   After firmware upgrade process is complete, click **Reboot** button to reboot server.

3.2.2.   Scenario 2: Update Firmware from My Network

If your server system cannot access internet, IDA can also download server system firmware update package from a Windows* file server. Following are the steps to update server firmware from local network:

1. Download Intel Server System update package from
   http://www.intel.com/support/
2. Intel Server System update package for IDA is a *.zip file, don't unzip it, copy it to a Windows* file server share folder.
3. Boot server with IDA, and accept IDA end user license
4. Click IDA menu **Get Update** or button **Get System Updates** at My Server page.
5. Select **From my network** at IDA to download Updates page, and click **Next** button.

Figure 10: Download SUP from my network

6. Configure network parameters at IDA Network Connection page. Make sure your server is connected with local network. Else, IDA will generate an error message. Click **Next** button to continue.

Figure 11: Network Setup for Download Firmware form LAN

7. Enter the network user name and password that you use to login the network file server. The network location is the file server name and share folder where the update package is stored. Click **Connect** button and choose the SUP file in a popup window.

Figure 12: Login Window to a File Server

Note: For security reason, the file server administrator cannot be used.
Use a normal account as login user.

8. IDA can display the share folder on file server on a popup window for you to select the update package.

Figure 13: Select a SUP File in File Server
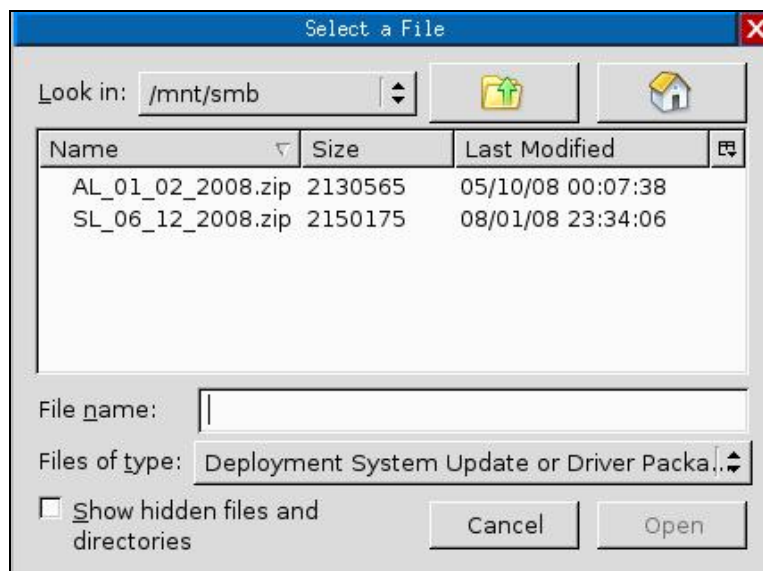
9. IDA shows up the firmware components in package file, for you to select. Click **Release Notes** button to view system update package release notes that contains server firmware version details, known issues, and new features. Click **Apply** button to start selected firmware update
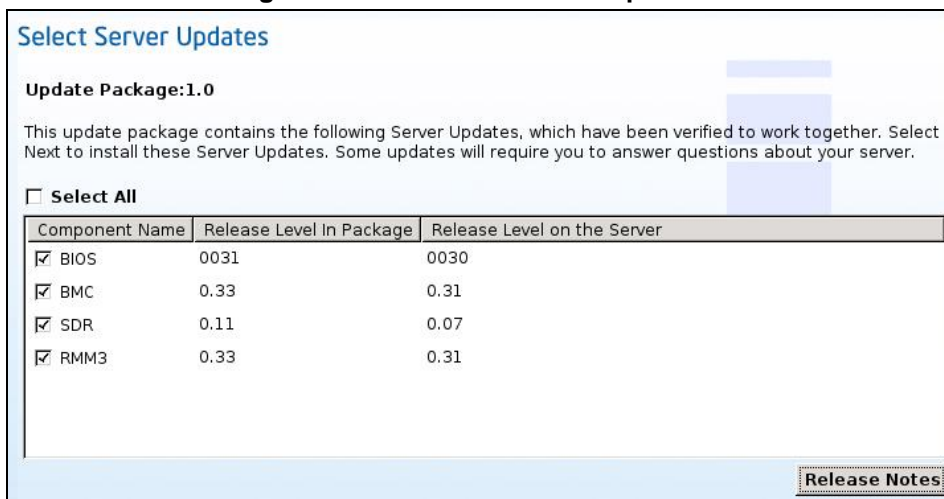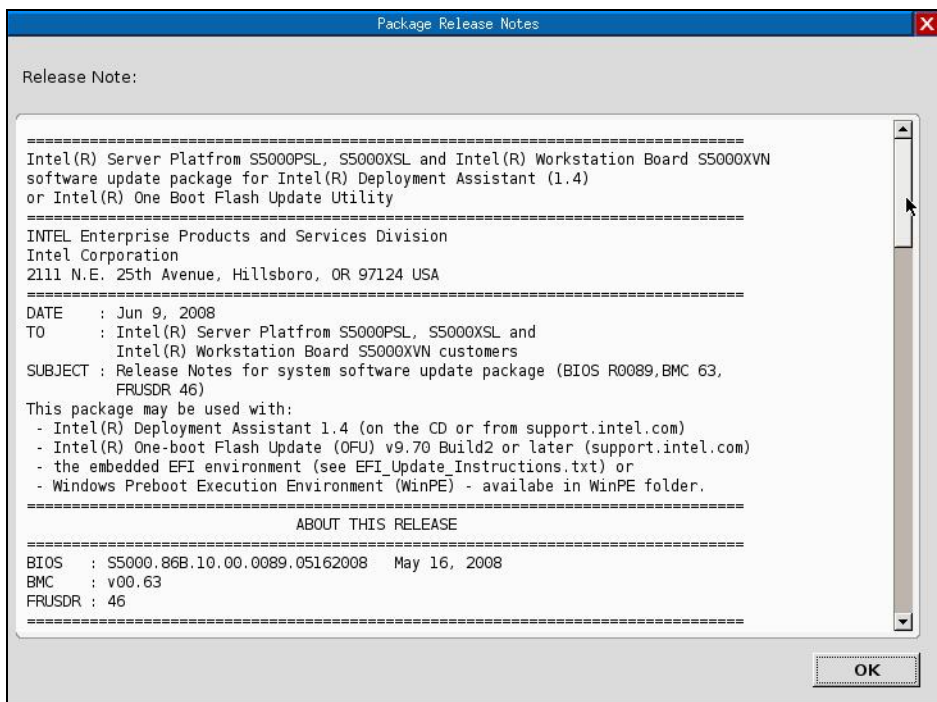10. During firmware upgrade you cannot power off or reboot server. After firmware upgrade process is complete, click **Reboot** button to reboot server.

3.2.3. Scenario 3: Update Firmware from USB key

USB key is other kind of media that can store Intel Server System firmware update package and recognized by IDA. Scenario 3 introduces how to update server firmware from a hot-plug USB key.

1. You need to download Intel Server System update package from http://www.intel.com/support/
2. Intel Server System update package for IDA is a *.zip file, don't unzip it, copy it to USB key.
3. Boot server with IDA, and accept IDA end user license
4. Click IDA menu Get Update or button Get System Updates at My Server page.
5. Insert USB key to server USB port.
6. In the Download Updates page, select **From USB Disk on Key or Hard Disk**

and click **Browse** button.

Note: Only those USB key with FAT partition can be supported by IDA

Figure 14: Download Update Package from USB key

Figure 15: Select SUP File in USB Key Folder
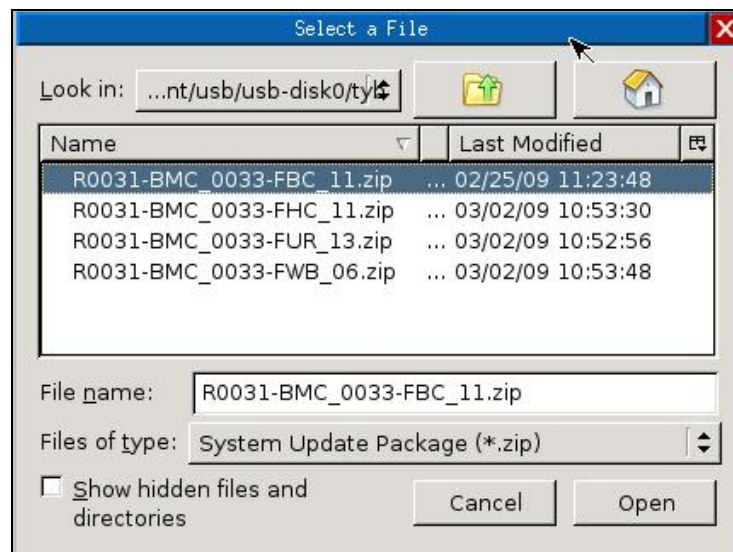
7. Select package file in the popup windows and click **Open** button
8. IDA shows up the firmware components in package file, and asks you to select. Click **Release Notes** button to view system update package release notes that contains server firmware version details, known issues and new features. Click **Apply** button to start selected firmware update
9. During firmware upgrade, you cannot power off or reboot server. After firmware upgrade process is complete, click **reboot** button to reboot server.

3.3. Configure a Server

The IDA **Configuration a Server** function area provides three options – System Information, BIOS Settings, and Server Management Settings. These options allow you to set system asset tag, configure key BIOS settings and configure server management parameters. To enter this function area from the IDA My Server>IDA main menu, click **Configure** tab or click the button **Configure a server**.

Figure 16: Configure a Server Function Area

3.3.1.   System Information

This function area lets you set an asset tag for server system, and also check server system information and chassis information. After setting asset tag and applying, IDA will require a reboot.

Figure 17: System Information
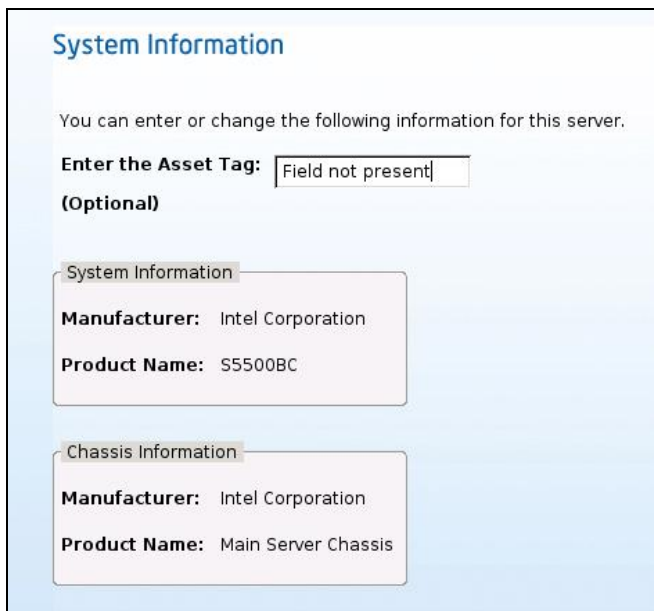
3.3.2.   BIOS Settings

This function area lets you configure server system BIOS settings, including:
-    BIOS Time and Date (This change will take effect later when you choose Apply.)
-    Load Factory Default Settings for the BIOS
-    Hyper Threading Technology
-    Fan Mode and Altitude (These settings are not available on all platforms or configurations. They may not be displayed depending on your hardware, Thermal Throttling mode BIOS setting, and the type of memory installed in your system)
-    Quiet Boot
-    BIOS Administrator and User passwords

- Boot order

Note: Although IDA BIOS settings function provide an alternative to Intel Server System BIOS configuration, some special BIOS settings still needs to be changed via standard BIOS setup interface (to enter it by pressing F2 during server POST)

3.3.2.1. Set System Date and Time

This option lets you update server system BIOS date and time. You can either enter system date or time in the MM/DD/YYYY HH:MM:SS with format, or click icon

 to select date and time at the popup window.

Figure 18: BIOS Setting – Set System Date and Time
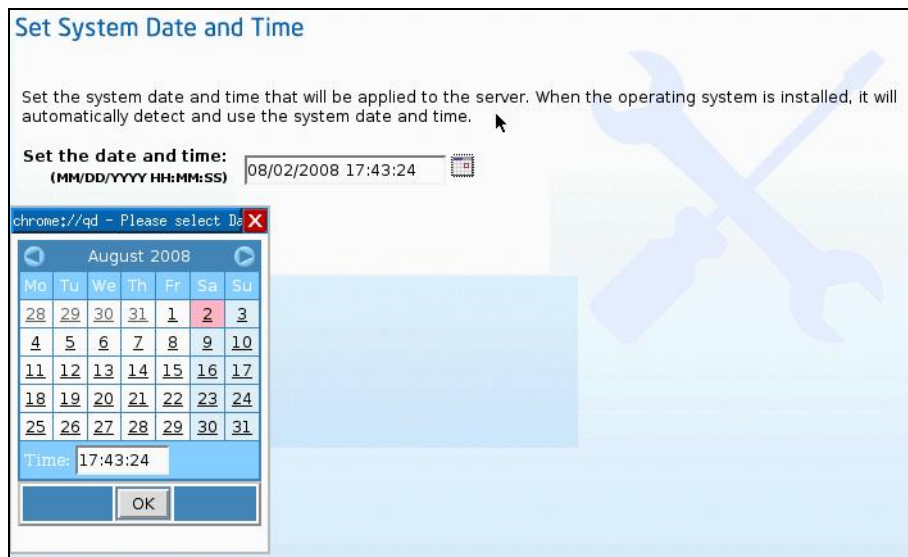
3.3.2.2. Factory Default Settings

Loading factory default settings returns BIOS to its original configuration. This option lets you load factory default BIOS settings. If you select **Load factory default settings** and **Apply**.

To bypass this section, select **Do not load factory default settings**.

Figure 19: BIOS setting – Factory Default Settings
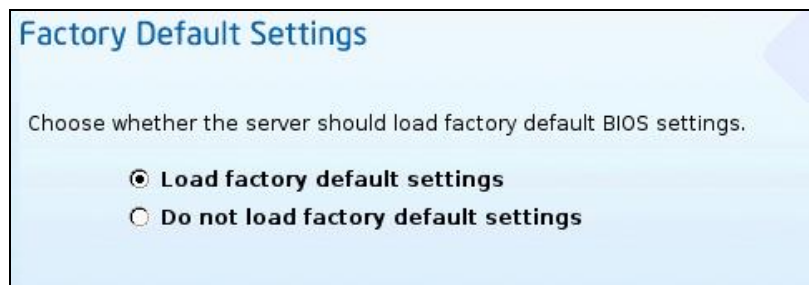
3.3.2.3. Set Hyper Threading

This section allows user enable or disable process hyper-threading function.
- Enable hyper-threading
- Disable hyper-threading

3.3.2.4. Set Quiet Boot

This section lets you enable or disable the quiet boot feature on your server with the following options:
- Enable quiet boot
- Disable quite boot. (If disabled, server POST messages will be displayed while server is booting).

3.3.2.5. Set Pause on Post Error

If server generates an error during POST process, you can use this section to select whether the server should pause and wait for user interaction.

The options include:
- Pause if a POST error occurs
- Do not pause of an error occurs

3.3.2.6. Change BIOS Administrator Password and User Password

You can set BIOS administrator and user password at this section. You need to select option **Change BIOS Administrator Password** and **Change BIOS User Password** to enable corresponding **Enter new password** and **Confirm new password** boxes.

Note: Password length cannot longer than 7 characters

3.3.2.7. Set Fan Mode

Note: This option is only visible if server BIOS **Closed Loop** setting is disabled, or is not supported. **Closed Loop** setting only can be changed via standard BIOS setup interface (to enter it by pressing F2 during server POST)

The **Fan Mode** allows you to select which SDR Fan T-control profile will be active. In the Fan Mode settings, choose the **Acoustic** mode to reduce the fan noise by throttling memory. Choose the **Performance** mode to allow high speed fan operation. It may be noisier, but this configuration results in better processor performance.

If the **Closed Loop** option is set, and server system has the correct type of memory to support this mode, then Acoustic mode is the default option.

Refer to relevant *Intel® Server System User Guide* for more information on BIOS options and supported memory.

3.3.2.8. Set Altitude

You can select an altitude scope according to the position where the server will be resided. This setting will impact server fan speed.

Figure 20: Set Altitude in BIOS Setting
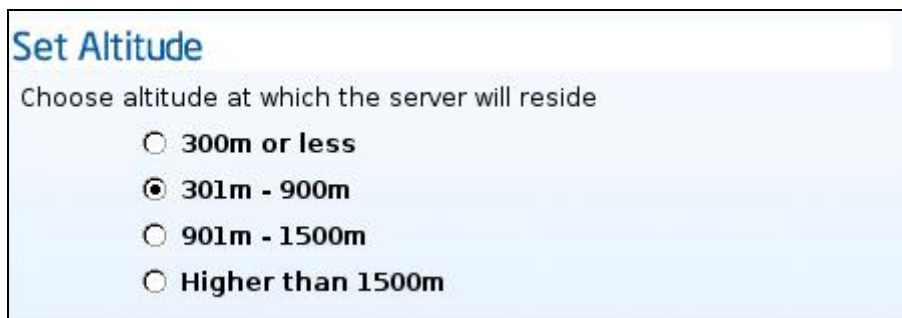
3.3.2.9. Set Boot Order

IDA can show a list of all bootable devices on the server system. You can highlight a device and click button **Move Up** or **Move Down** to arrange the server boot order.

The Boot Order will be saved on this server. The boot device names are determined by your System BIOS. For example, Network boot devices might be listed as "IBA GE Slot..." for the NIC PXE boot capability. Most Intel server boards will also have the list "EFI Shell" for the Extensible Firmware Interface shell that is included in the firmware.

Figure 21: Set Boot Order in BIOS Setting
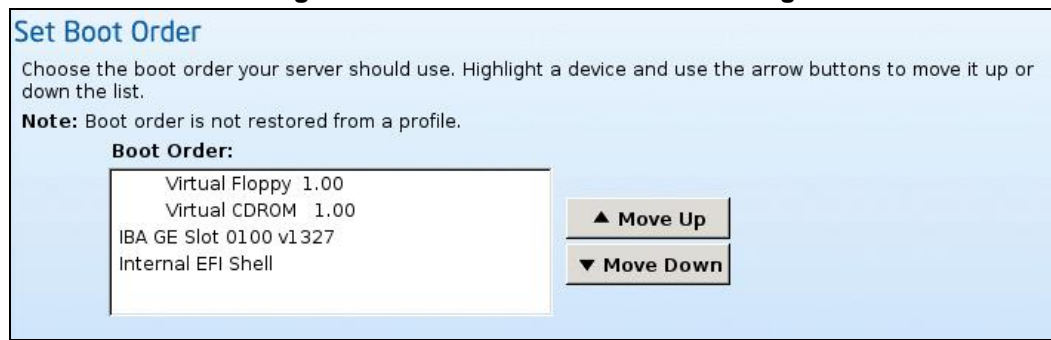
After you set all available BIOS settings, IDA will ask you to apply it and reboot server.

3.3.3. Server Management Settings

This section allows you to configure BMC parameters that include:
- BMC LAN Channel
  - Enable / Disable LAN.
  - Set IP source as static or DHCP configuration)
  - Enable / Disable Serial over LAN.
  - Enable / Disable LAN Alerting
  - LAN alert destination IP addresses.
  - Platform event filter configuration.
  - Enable/disable ARP for LAN channel.
- Set privilege access.
  - Enable / Disable a user.
  - Add or Edit the user name (except anonymous and other non changeable users)
  - Add or Edit the user password.

The BMC LAN channel of Intel® Server Board S5520UR/Intel® Server Board S5520HC/Intel® WorkStation Board S5520SC/Intel® Server Board S5500WB is on board NIC1, the BMC LAN channel of Intel® Server Board S5500BC is on board NIC2

Note: *Server Management Settings is not available if the server system has no BMC.*

3.3.3.1. BMC Communication Options

When you enter IDA server management settings function area, you need to select which channel device needs to be configured at Communication Options page. Select the channel that you want to configure and click the **Next** button to enter the following screens:

Figure 22: iBMC Communication Option
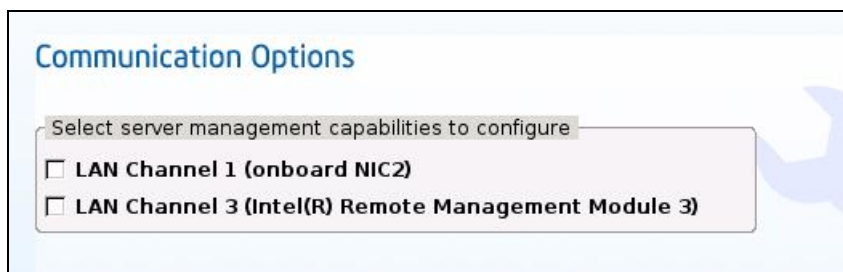
IDA show options include:
- LAN Channel1 (On board NIC1 or NIC2)
- LAN Channel3 (Intel® Remote Management Module 3)

iBMC supports one on-board NIC as LAN channel 1.

Note: Usually NIC1 is the BMC LAN channel 1 but some Intel® server board set NIC2 as BMC LAN channel1, please refer Intel® server board TPS for details.

Intel® Remote Management Module 3(RMM3) is a daughter card on server board, which can provide KVM over IP and media redirection functions. When RMM3 is plug on server board, BMC LAN channel 3 will be enabled.

3.3.3.2. LAN Channel 1

- Enable LAN Channel 1
  Select this option to enable BMC network communication via server onboard NIC 1. IP source can be set to from a DHCP server or static IP address. If you select BMC IP source is from DHCP server, IDA allow user enter hostname for BMC. So user can always find BMC with its hostname and domain name even IP address has been changed. If you select Static IP Address, IDA requests you to enter IP address, subnet mask and gateway.

Figure 23: Enable BMC LAN channel

- Enable Serial Over LAN

  This option allows you enable BMC serial over LAN (SOL). Serial Over LAN provides a mechanism that enables the serial controller of a managed system to be redirected over an IPMI session over IP. This enables remote console applications to provide access to text-based interfaces for BIOS, utilities, operating systems, and applications while simultaneously providing access to IPMI platform management functions. You also need to enable Console Redirection in Intel server BIOS configuration.

- Enable LAN alerting

  When the server system has hardware issues, BMC can generate an alert to the administrator. The type of BMC alert includes SNMP alert message and BMC alert email. After you select this option, IDA will display an extended section as shown in figure 3-24.

Figure 24: BMC Alert

iBMC supports two Alert Destinations. Select **Alert Destination console 1** and enter the SNMP alert receiver IP address in **IP Address** box. Select **Alert Destination console 2** and enter other SNMP alert receiver IP address. IDA set SNMP trap community name as "public" by default. User also can select **Email** option to send alert by email server. The email configuration options include:

- Send Email to:
  Enter email address with to receive BMC alert email.
  Note: This email address should be a real address in email system, or you will not receive email from BMC.

- This Machine Name
  Define a name for current server.

- Mail Server IP:
  Enter SMTP email server IP address

- Email From Address
  Enter email address for the sender

At the section **Select the events that will trigger alerts**, select events that you want BMC to generate alerts for.
Click **Next** button to enter next step.

3.3.3.3. LAN Channel 3 (Intel® Remote Management Module)

In this section, user can setup Intel® Remote Management Module (RMM) network setting. RMM network port is also treated as BMC LAN channel 3.
Select **Enable LAN Channel 3** and select **IP Address from a DHCP server**, RMM will get assigned IP address from user's DHCP server. Or select **Static IP address**, user need to assign IP address, subnet mask and gateway address.

User can enter RMM embedded web site through Internet browser by entering address**.**

User also can setup BMC LAN channel 3 SOL and alerting in this section, the process is the same as BMC LAN channel 1, refer the section 3.3.3.2 for details

Figure 25 LAN Channel 3

3.3.3.4. Setup Users

The BMC user accounts settings include BMC user name, password and its access privilege. Each account has a single privilege level (User or Admin) across all communication channels and BMC features. Accounts with the User privilege level can only read BMC settings. User Accounts with Administrator privilege level have full control of the BMC. IDA can set up 4 accounts for ESB2 BMC, and default BMC account is Anonymous that user name is anonymous and cannot be changed. You can update Anonymous account password and privilege.

Note: When management software access BMC with anonymous account, user name should be blank, not anonymous.

Note: User name "root" is reserved by iBMC, so you can not assign "root" as BMC user account name.

You can update the BMC account user name, password and privilege.
Select one of BMC account in IDA **Set Up Users** page and click the **Edit** button to enable or disable accounts, set the passwords, and set the user privilege level in popup window.

Figure 26: Set Up BMC Account
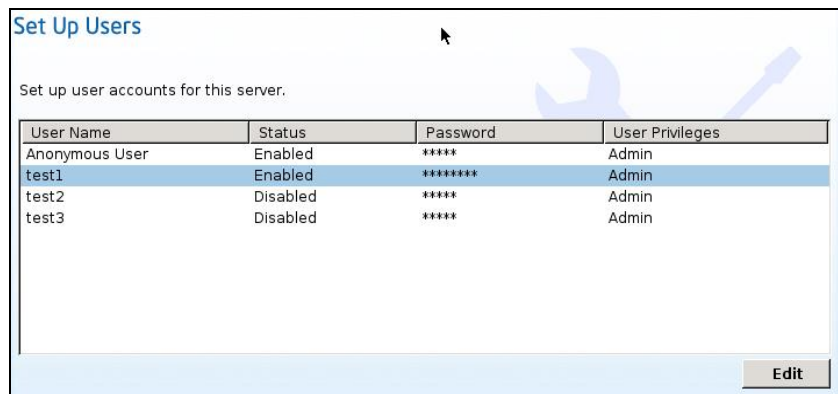
Figure 27: Edit BMC User Information

After completing all selected BMC settings, IDA will request you to apply it and reboot server system.

3.4. RAID Configuration

3.4.1. Supported RAID Devices

IDA provides simplified, common interface and easy to understand user interface for RAID configuration, IDA can support most RAID device on Intel server boards and systems that include:

- SAS ROMB (SROMBSASMR), Embedded RAID level 0. 1, Hardware RAID level 0. 1, 5
- SRCSASBB8I
- SRCSASPH16I
- SRCSAS144E
- RMS2LL040
- RMS2AF080
- RMS2AF040
- RMS2MH080
- RS2WC080
- RS2WC160
- Intel® ICH10, Embedded RAID level 0, 1
- FALSASMP2
- SRCSAS18E
- SRCSAS144E

- SRCSASJV
- SRCSASRB
- SRCSATAWB
- SRCSASPH16I
- SRCSASBB8I
- SRCSASLS4I
- SASMF8I
- SASWT4I
- SASUC8I

For details on Intel RAID cards, please refer Intel Web site:
http://www.intel.com/products/server/raid/

Note: Intel® Matrix RAID is not supported by IDA

In the My Server page you can enter IDA RAID configuration function area by clicking the main menu **RAID Configuration** or **RAID Configuration** button. If multiple RAID controllers are available in the server system, IDA will show a list of all available RAID card at Choose RAID Controllers page.

Figure 28: choose RAID Controllers
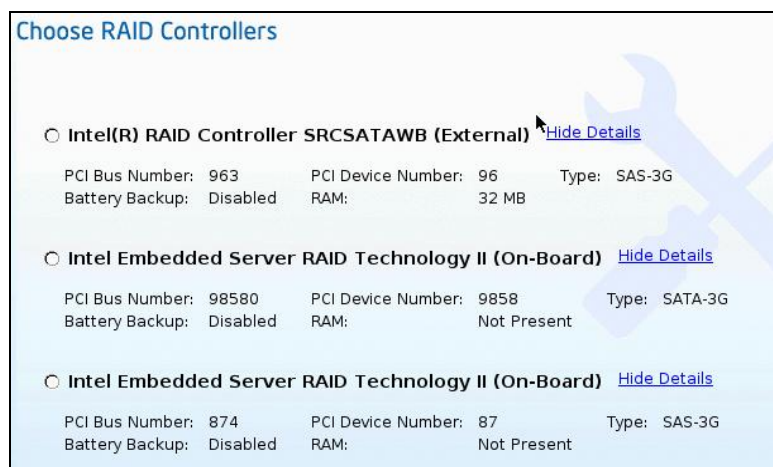
Choose the RAID controller that you want to set up for new RAID array.

Note: The IDA RAID configuration utility detects the physical drivers only once when you enter this function area.
Do not remove or add hard disk drivers while navigating within this function area.

3.4.2.   IDA RAID Configurations

IDA RAID configuration contains three configurations:

- **Automatic Setup with redundancy.**
  Requires at least 2 hardware drives. If your server system has 2 drives, IDA create RAID 1 for you. If more than 2, IDA will recommend to create RAID 5 (if controller doesn't support RAID 5, IDA will Create RAID1).

Figure 29: Automatic Setup RAID with Redundancy

Controller	Intel(R) RAID Controller SRCSATAWB (External)
RAID Level	5
Stripe Size	64k
Read Policy	Read Ahead
Write Policy	Write Through(Recommended)
Cache Policy	Direct IO
Size (GB)	367

Warning: Proceedings with Automatic setup will overwrite any existing RAID arrays.
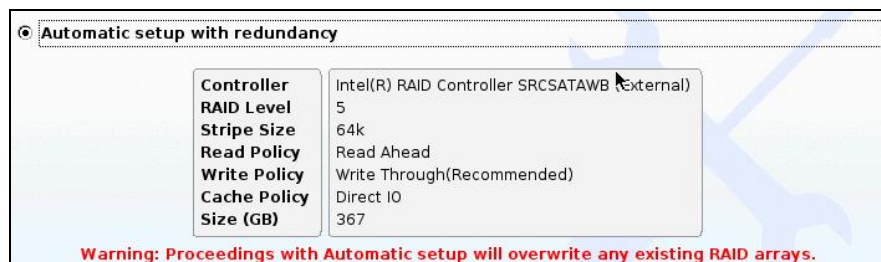
- **Automatic Setup without redundancy**.
  IDA will only use all drives to create a RAID 0 array.

Controller	Intel(R) RAID Controller SRCSATAWB (External)
RAID Level	0
Stripe Size	64k
Read Policy	Read Ahead
Write Policy	Write Through(Recommended)
Cache Policy	Direct IO
Size (GB)	441

Warning: Proceedings with Automatic setup will overwrite any existing RAID arrays.
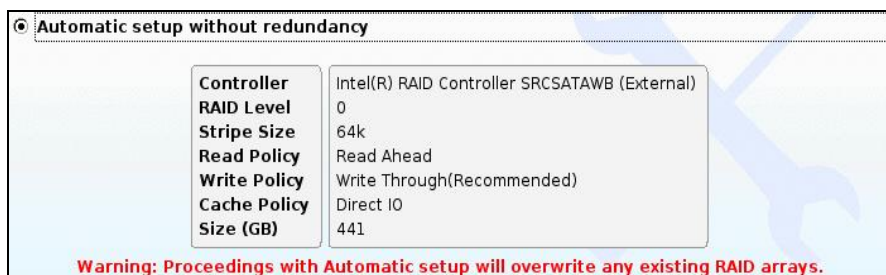
Note: The common parameters except for total size will be the default values for the controller.

- **Custom configuration.**
  When you select option **Create customer or multiple RAID arrays**, IDA shows a window for you to select physical hard disks

Figure 30: Select Drivers for RAID Configuration
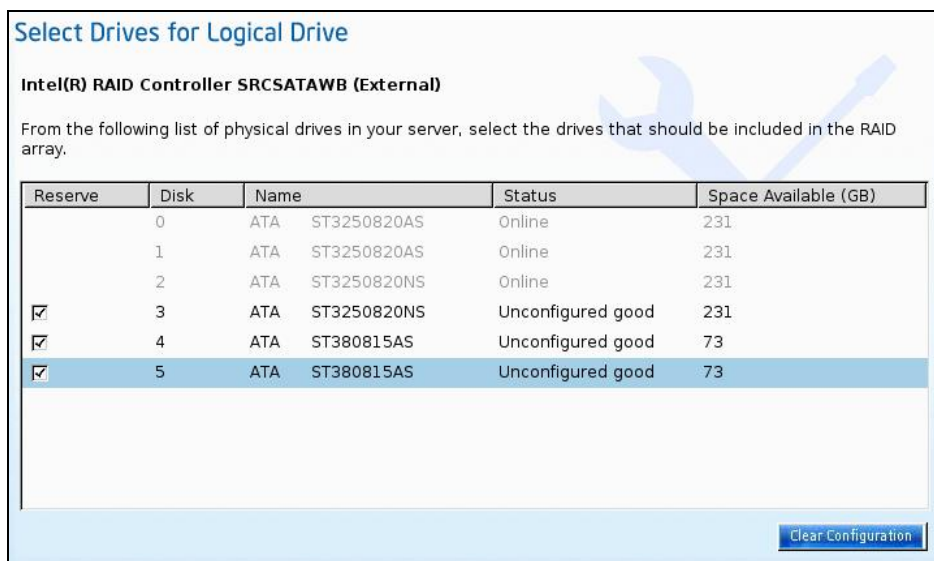
Clear the configuration to make all the disks status is **Unconfigured Good**.

Note: Only the disk which status is **Unconfigured Good** can be used for RAID configuration

To select drives for a new Logical array, do the following:

1. Select the Unconfigured Good physical drives that you want to include in the RAID array.
2. Check the Status column to verify that the drive is Unconfigured Good
3. Choose **Create Arra**y.

The following table lists the status conditions and their explanation:

Table 4: Disk Status Condition and Explanation

Status Condition	Explanation
Online	The drive is already used in another array
Hotspare	the drive will be used to repair any array in the system that had a drive failure if the failed drive is equal to, or smaller than, the hot spare drive
Unconfigured Good	Drive is unused/available
Ready	Drive is online and operating correctly
Offline	Drive is offline or absent. No actions can be performed on the drive until it is back online
Unconfigured Bad	Drive is not operational and need to be replaced. Note: Disks with a status of "Unconfigured bad" cannot be used

Status Condition	Explanation
	for RAID configurations
Foreign	Drive is part of an array created on a different controller or created within one enclosure and moved to another on the same controller. It can be used to create a new array after clearing configuration. You can choose RAID level, LD size, Stripe Size, Read Policy, Write Policy and IO Policy settings, and can allow optional single GLOBAL Hot Spare in page shown in Figure 31: Define RAID Array Attributes

Figure 31: Define RAID Array Attributes
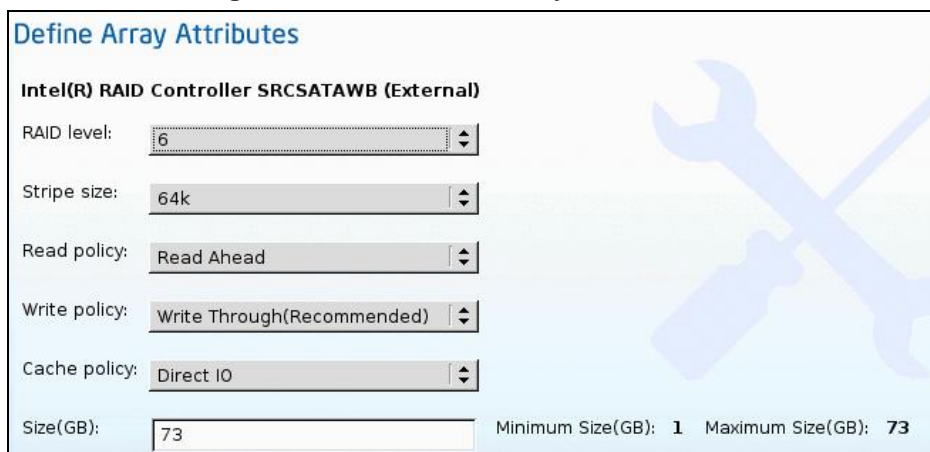
The following table lists the options available and their explanation:

Table 5: RAID Array Attributes and Explanation

Options	Explanation
RAID level	RAID 0 (Data Striping), 1 (Disk Mirroring), 5 (Data Striping with Striped Parity), 6 (Distributed Parity and Disk Striping), 1E (a hybrid of RAID 10 that is available on some platforms)
Stripe size	Size of the data stripe across all disks. Each physical disk has a smaller strip of data. The sum of all the strips equals the stripe size
Read policy	No Read Ahead, Read Ahead, Adaptive. Read Ahead will read additional consecutive stripes. Adaptive will turn on Read Ahead for sequential reads and turn it off for random reads.
Write policy	Write Through or Write Back. With Write Through, I/O completion for write operations is signaled when the data is written to the disk.

Options	Explanation
	With Write Back, I/O completion is signaled when the data is transferred to cache.
Cache policy	Direct I/O or Cached I/O. Choose Direct I/O for uncached read and write operations. Choose Cached I/O to cache all write operations and check the cache first for read operations
Size	Logical drive size. The maximum value depends on the RAID level selected.

3.4.3.   Advanced RAID Configuration

IDA still integrates Intel RAID Web Console 2 (RWC2), the Java* based graphical application that provides full functions for the Intel® RAID configuration. Those functions contain RAID configuration, monitoring and maintenance. For details please refer the *Intel RAID Software User's Guide*

You can enter RWC 2 interface by clicking main menu **Advanced | RAID Web Console 2**.

Figure 32: RAID Web Console 2
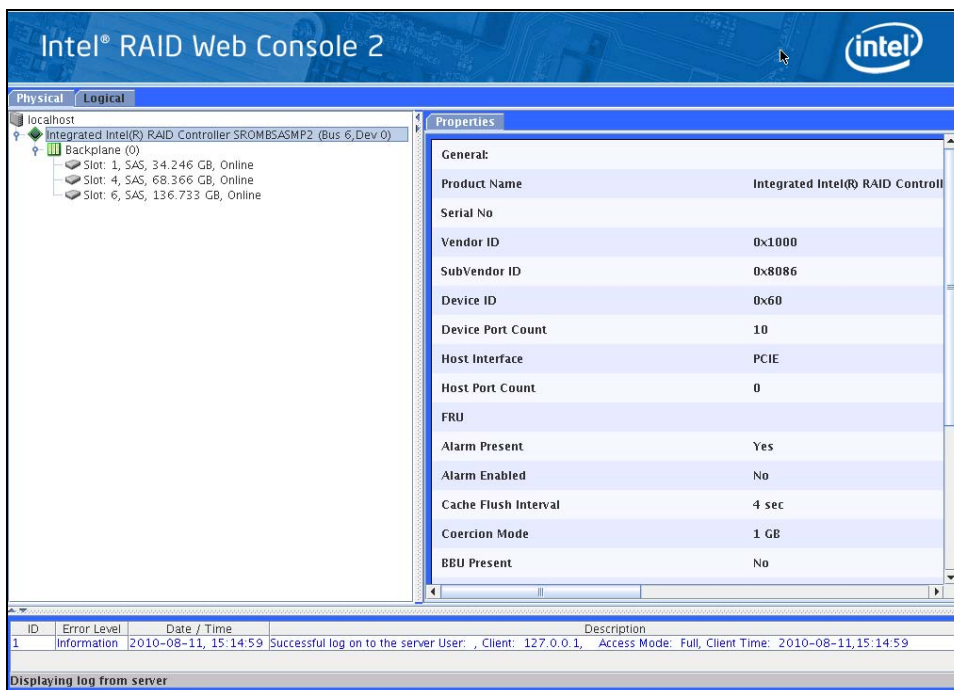
3.5. Unattended OS Installation

3.5.1. Overview

IDA unattended OS installation function provides you additional convenience to install Microsoft Windows*, SuSE* Linux, RedHat* Linux and Vmware* OS families. IDA has integrated Intel server device drivers including most of Intel RAID drivers. IDA can seamlessly install OS on supported RAID logical arrays without additional load driver steps or devices such as USB floppy. The current IDA version supports Windows* Longhorn and Vista*.

1. To enter the IDA unattended OS installation function area,
*   click IDA main menu **OS Installation**
    or
*   click **OS Installation** at IDA My Server page.

    All IDA supported OS are organized into four groups—Windows*, RHEL*, SUSE* and VMware -- that correspond to Windows Server* family, RedHat* Linux OS, SuSE* Linux OS and VMware* ESX/ESXi
2. To choose the OS that you want to install, click the group name and click button **Select Version**

Figure 33: Choose OS
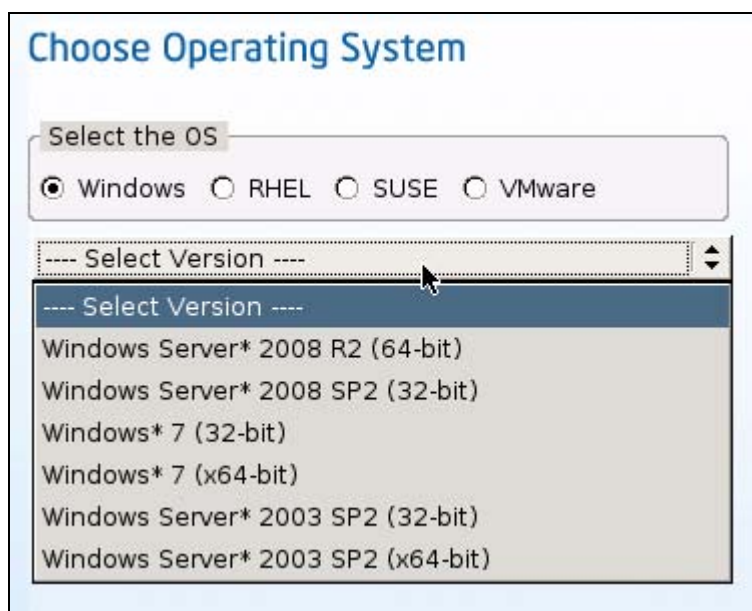
3.5.2.   Supported OS

- Windows Server* family
  - Windows Server 2008 SP2* (32-bit)
  - Windows Server 2008 R2* (64-bit)
  - Windows 7* (32-bit)
  - Windows 7* (64-bit)
  - Windows Server 2003 SP2* (32-bit)
  - Windows Server 2003 SP2* (64-bit)

Note: All Windows Server 2003* editions at here contain corresponding Enterprise and Standard version

- RedHat* Linux
  - Red Hat* Enterprise Linux 4.0 Update 8 (32-bit)
  - Red Hat* Enterprise Linux 4.0 Update 8 (x86-bit)
  - Red Hat* Enterprise Linux 5.0 Update 5 (32-bit)
  - Red Hat* Enterprise Linux 5.0 Update 5 (x86-bit)
  - Red Hat* Enterprise Linux 6.0 (32-bit)
  - Red Hat* Enterprise Linux 6.0 Update 5 (x86-bit)
- SuSE* Linux
  - SUSE* Linux Enterprise Server 10 SP3 (32-bit)
  - SUSE* Linux Enterprise Server 10 SP3 (x86-bit)
  - SUSE* Linux Enterprise Server 11 (32-bit)
  - SUSE* Linux Enterprise Server 11 (x86-bit)
  - SUSE* Linux Enterprise Server 11 SP1 (32-bit)
  - SUSE* Linux Enterprise Server 11 SP1 (x86-bit)
- VMware*
  - VMware* ESX 4.0 Update 1 (X86-64)
  - VMware* ESXi 4.1 (X86-64)

3.5.3.   Installing OS Unattended

Windows Server* Series

1. At Choose Operation System page, select server to install from Windows Server 2003* series.
2. At Set Installation Partition page, create Partition.

Figure 3-34: Set Partition for Windows* Installation
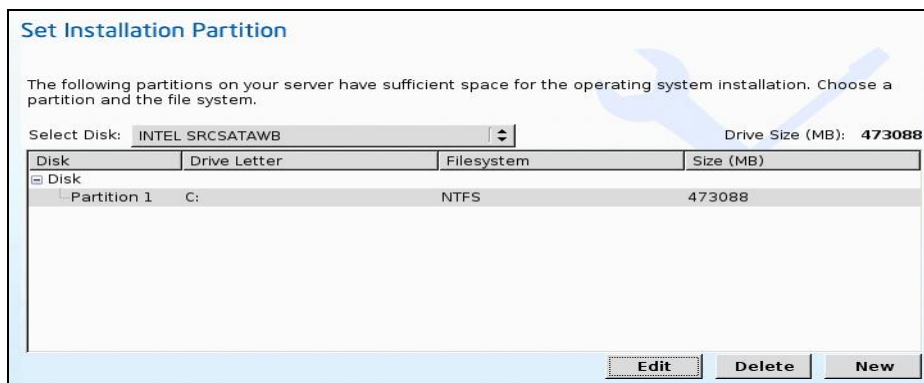
If server system has more disk controller such as SATA, SAS or RAID controller, you can click ⬍ at Select Disk to choose active disk. IDA will switch to corresponding disk that is under the selected disk controller.

- To create new parathion on disk free space, click **New.**
- To remove a partition Button **Delete.**
- To change partition size click **Edit**.

Partition file system can only be formatted as NTFS by IDA for Windows installation for following:

- Region and Location
    - Windows 2003 Server* series
        IDA requests you to select Time Zone, Windows* Language and additional language
    - Windows 2008*
        IDA only requests you to select Time Zone.

- Personalization
    Enter server owner name and organization.

- License Information
    Enter Windows Server* production key.

    Note: Wrong Windows* 2008 and Windows* 7 production key may cause subsequent OS installation stop. User can leave the production key as blank in this IDA page if it is not available or unknown. OS allows user enter production key after installation completed.

- Name and password
    - Windows 2003 Server* series
        You need to set server computer name and administrator password
    - Windows 2008*
        You just need to set server computer name. Because administrator password will be reset when Windows 2008* installation completed, IDA doesn't

request Windows* administrator password.

- Network Settings

    Enter the network configuration settings for the onboard network adapters that
    will be detected by the Operating System during installation.

Figure 35: Network Setting For Windows* Installation
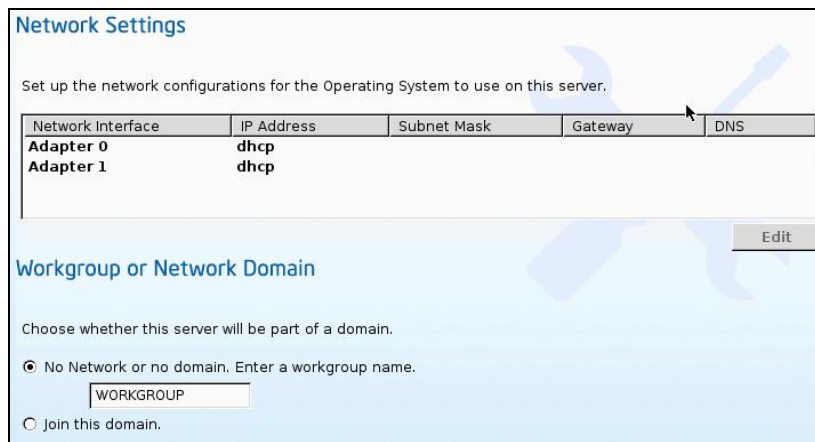
Note: These settings will not affect the network settings for the BMC. Intel
recommends that you set different IP addresses for the Operating System and
BMC.

The "network interface" column lists each network adapter detected by the
Intel Deployment Assistant. Your Operating System may have a different name
after you install the Operating System.

- Get Updated Drivers

    This section allows you to select the source that IDA can download serve
    drivers packages. Those drivers will be automatically installed to OS by IDA.

    Choose one of the following options:

    From www.intel.com
    To get the latest drivers from the Intel support website, select this option.
    Please check that the server is only connected to one network during the
    download.
    You can get the last Intel server drivers but you need to consider that will
    spend a long time if internet speed is low.

    From Intel Deployment Assistant CD
    Directly use the driver packages that store in IDA CD. Although IDA CD may
    not contain the last driver packages, but this option is the fast. IDA selects this
    option as default choice.

From my network

IDA can download a driver package stored on a network share folder. You need to manually download the latest drivers from http://support.intel.com website and copy to your network share.

From USB Disk on Key or Hard Drive

IDA can get the drivers stored on a USB key or USB hard disk drive. You need to manually download the latest drivers from http://support.intel.com website and copy to USB key.

- Choose Drivers to Install

  IDA shows all available drivers downloaded from the driver source.
  Uncheck the drivers that you don't want to install. But if you want to install an OS on a RAID volume, you can deselect the driver for the appropriate RAID controller.

  The path to the selected drivers will be stored and will then be used to download and install the drivers during the Operating System installation.

Figure 36: Choose Drivers for Windows* Installation

  IDA can load third party drivers by selecting the option – **Please select if you want to add Additional Drivers from a different location.**

- Insert OS CD
  - Windows 2003 Server* series
    Insert Windows 2003* OS CD and click **Next** button for IDA to apply all settings. After completing this process, IDA asks to reboot server system. You need to leave the OS CD in the CD-ROM, and system will automatically complete all OS install steps after this reboot.

  - Windows 2008*

Insert Windows 2008* OS DVD and a USB key with at least 10M free space, which IDA can store server driver temporary. Click **Next** button for IDA to apply all settings. After IDA completes this process, click **Restart** button to reboot server.

Figure 37: Screen Indication to Install Windows 2008 Server*
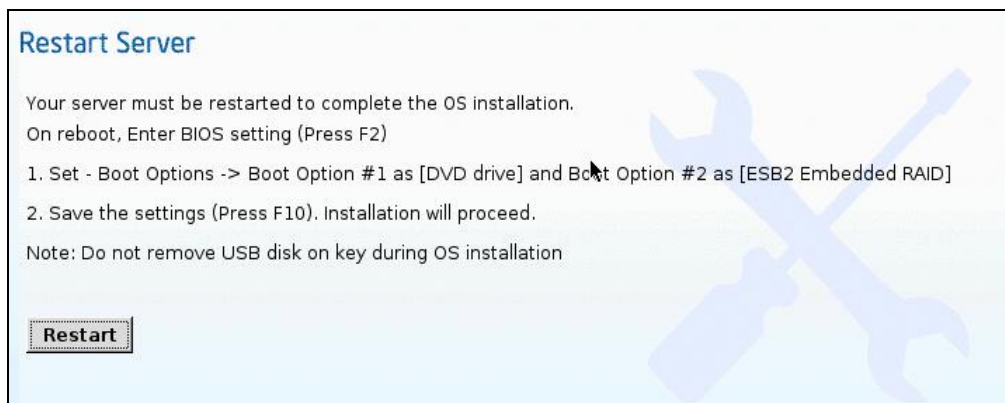
During server POST, press <**F2**> key to enter server BIOS configuration interface. If your server has more than one hard disk device, edit the [**Hard Disk Order**] in BIOS menu [**Boot Options**] to move the disk that are installed Windows 2008 Server* by IDA as the first **Hard Disk #1**. Return back to BIOS [**Boot Option**] page, set **Boot Option #1** to the DVD-ROM that has Windows 2008 Server* DVD, set disk that are installed Windows 2008 Server* as **Boot Option #2**. Press <**F10**> to save BIOS setting and leave.

Server will boot from Windows 2008* DVD. Observe the Windows 2008* start to install automatically. Don't remove USB key on this server during this process.

Linux* Server Series
- Select one of Linux* server from Red Hat* or SuSE* series that you want to install at IDA Choose Operation System page
- Create Partition at Set Instillation Partition page.
  If the server system has more disk controller such as SATA, SAS or RAID controller, you can click ⬍ at **Select Disk** to choose active disk controller. IDA will switch to corresponding disk that is under the selected disk controller and display a recommended default partition.
  Button **New** is used to create new parathion on disk free space. Button **Delete** is for removing a partition and button **Edit** is used to change partition size.
  Partition Root and Swap are necessary. If use misses them, IDA will generate an alert message. IDA gives you a suggested partition solution, accept it if you are not familiar with Linux* partition.

Figure 38: Set Partition for Linux* installation
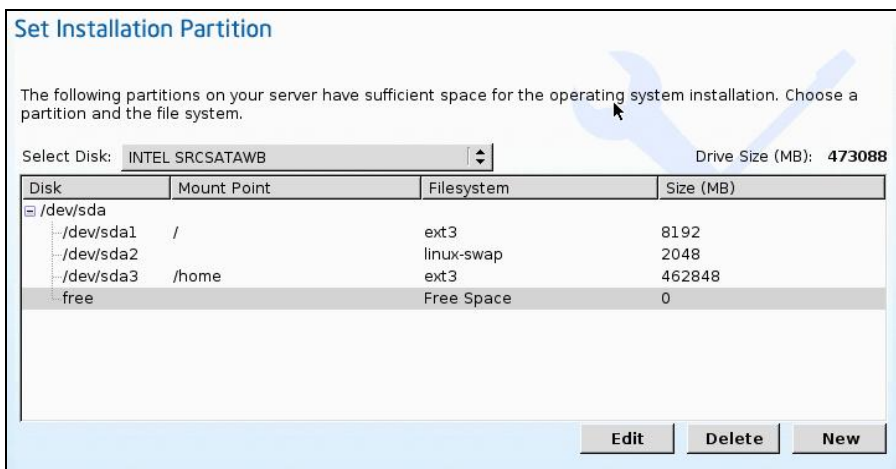
- Basic configuration

    Edit below items at Basic Configuration page.

    - Root Password
    - Default language
    - Keyboard
    - Time Zone
    - Additional Languages

Figure 39: Basic Configuration for Linux* Installation
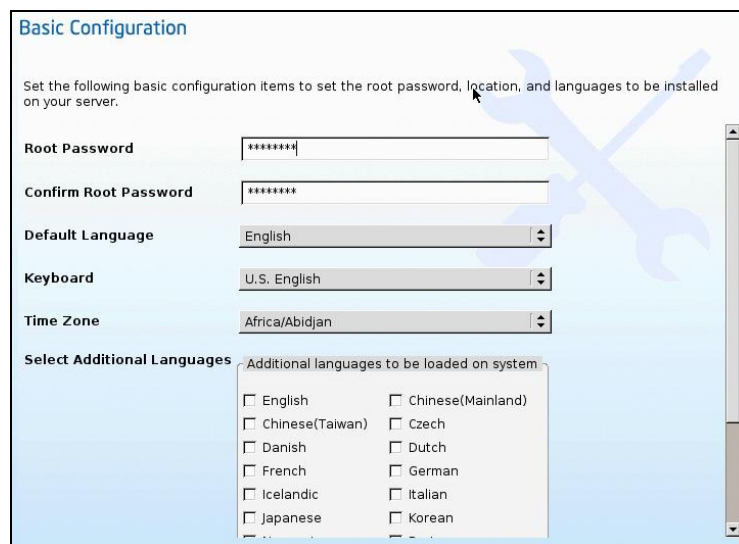
- Package Selection

    Select all Linux* packages that you want to install on server.

- Network Settings

    Enter the network configuration settings for the onboard network adapters that will be detected by the Operating System during installation.

Note: These settings will not affect the network settings for the BMC. Intel recommends that you set different IP addresses for the Operating System and BMC.

The "network interface" column lists each network adapter detected by the Intel Deployment Assistant. Your Operating System may have a different name after you install the Operating System.

- Get Updated Drivers

This section allows you to select the source that IDA can download serve drivers packages. Those drivers will be automatically installed to OS by IDA.

Choose one of the following options:

From support.intel.com
To get the latest drivers from the Intel support website by select this option. Please check that the server is only connected to one network during the download.
You can get the last Intel server drivers but you need to consider that will spend a long time if internet speed is low.

From Intel Deployment Assistant CD
Directly use the driver packages that store in IDA CD. Although IDA CD probably didn't contain the last driver packages, this option is the fastest. IDA selects this option as default choice.

From my network
IDA can download a driver package stored on a network share folder. You need to manually download the latest drivers from http://support.intel.com website and copy it to your network share.

From USB Disk on Key or Hard Drive
IDA can get the drivers stored on a USB key or USB hard disk drive. You need to manually download the latest drivers from http://support.intel.com website and copy to USB key.

- Choose Drivers to Install

IDA shows all available drivers that downloaded form the driver source.
Uncheck the drivers that you don't want to install. But if you want to install an OS on a RAID volume, you can deselect the driver for the appropriate RAID controller.

The path to the selected drivers will be stored and will then be used to download and install the drivers during the Operating System installation.

Figure 40: Choose Drivers for Linux* Installation
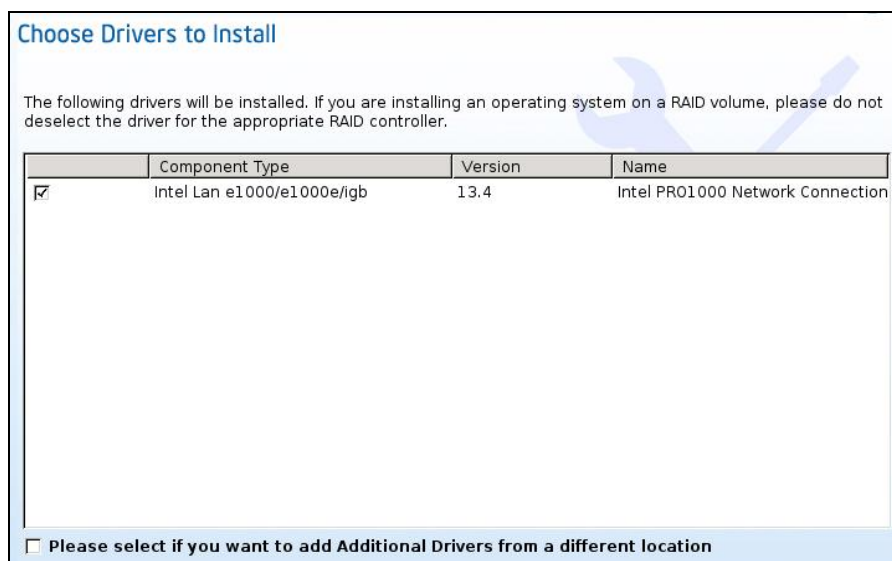
- Insert OS CD
  You need to insert Linux* Server OS CD 1 and click **Next** button, IDA will start to apply all settings. After completed this process, IDA will inform you to reboot the server system. You should leave the OS CD in the CD-ROM, system will automatically complete all OS install steps after this reboot.

VMware* ESX/ESXi Server Series
- Select VMware* ESX 4.0 Update1 or WMware* ESXi4.1 from VMware* series that you want to install at IDA Choose Operation System page.
- Create Partition at Set Service Console Partition page
  If the server system has more disk controller such as SATA, SAS or RAID controller, you can click ⬍ at **Select Disk** to choose active disk controller. IDA will switch to corresponding disk that is under the selected disk controller and display a recommended default partition.
  Button **New** is used to create new partition on this page. Button **Delete** is for removing a partition and button **Edit** is used to change partition size.
- Partition Root and Swap are necessary. If user misses them, IDA will generate an alert message. IDA gives you a suggested partition solution, accept it if you are not familiar with VMware* ESX partition.

Figure 41: VMware* Set Service Partition Page

- Basic configuration

    Edit below items at Basic Configuration page.

  - Root Password
  - Keyboard
  - Time Zone (Optional)

- Network Settings

  Enter the network configuration settings for the onboard network adapters that will be detected by the Operating System during installation.

  Note: These settings will not affect the network settings for the BMC. Intel recommends that you set different IP addresses for the Operating System and BMC.

  The "network interface" column lists each network adapter detected by the Intel Deployment Assistant. Your Operating System may have a different name after you install the Operating System.

- License Information

  Enter the product key at this section

- Insert OS CD

  You need to insert VMware* Server OS CD and click **Next** button, IDA will start to apply all settings. After completed this process, IDA will inform you to reboot the server system. Follow the guide on screen to reset the server boot order if it is needed. You should leave the OS CD in the CD-ROM, system will automatically complete all OS install steps after this reboot.

3.5.4. Package Third Party Driver

3.5.4.1. Overview

IDA unattended OS installation allows you to load third party device drivers if your server has hardware device which driver didn't contain IDA driver list.

Any customer's driver to be slipstreamed into an OS using the Intel Deployment Assistant must be packaged in the format described as below:

- All driver files for the hardware component should be packaged into a single zip file.
- The zip package cannot contain zip files inside. It can contain tar.gz and .img files.
- The zip file should contain a properly formatted osd.xml file in the root of the zip file.

3.5.4.2. osd.xml

The file osd.xml is an xml file providing information required for slipstream installation.
 - Driver zip file name.
 - Hardware device category name and device name,
 - Location of the inf file of the drivers included in the package,
 - A tag for any installation script included for Linux*

The basic xml file structure is shown below and can be used as a template. Replace all sections shown as () with specific information for this pack.

> *<?xml version="1.0" encoding="utf-8"?>*
> *<osi-meta>*
> *<jdp pid=?platform IDs, separated by comma)?>*
> *<jdrivers os_type=?OSs supported by the pack)?>*
> *<osi_driver name="(hardware)" devname=(device name) inf_loc="(inf location)" ver="(driver version)"/>*
> *</jdrivers>*
> *</jdp>*
> *</osi-meta>*

Note: Do NOT include any spaces between commas when listing multiple options.

(platform IDs), use a Comma to separate list.
For example:
S5000PAL,S5000XAL,S5000PSL,S5000XSL,S5000XVN,SC5400RA,

S5000VSA,S5000VCL,S3000AHX, S3000AHV, S3000AH

Note: Please refer Intel® Server TPS for your platform ID name

(OSs supported by the pack), use a Comma to separate list. For example:
w2k,wsbs,w2k3,w2k3x64,wxp,wxpx64
rhel4x86,rhel4x64,rhel4u2x64,rhel4u2x86,rhel4u3x64,rhel4u3x86,rhel5x86,rhel5x64,
sles9x86,sles9x64,sles9sp1x86,sles9sp1x64,sles9sp2x86,sles9sp2x64,sles9sp3x86,sles9sp3x64,sles10x86,sles10x64

(hardware)
For example:
BackPlane, Intel PRO1000 Network Connection, chipset, HW/External RAID, RAID SAS,

(device name)
For example:
Intel® Lan e1000, SRCSAS144E,SRCSAS18E,SROMBSAS18E

(inf location)
Replace with relative path to the info file.
Each different location should be specified using a separate xml node with os_type attribute value. For Linux*, the inf location can be an empty string or an img file name. Sample ".\."

(release script Only used for Linux* driver package).
put bash scripts to untar and compile the source or empty script for a precompile .img file.

Steps to create osd.xml file and ZIP driver pack.
- Copy the above template or a real osd.xml from a driver pack to a file
- Replace the () sections if using the template.
- Save the file as osd.xml
- Extract the driver files to a folder
- Put the newly created osd.xml in the folder
- Zip the folder into a single file.

3.5.4.3. Sample osd.xml Files

- Sample 1 windows osd.xml

  <?xml version="1.0" encoding="utf-8"?>

```
<osi-meta>
    <jdp pid="S5000PAL,S5000XAL,S5000PSL,S5000XVN" >
    <jdrivers os_type=w2k,w2k3,wsbs,wxp?
    <osi_driver name="RAID SAS" devname=
    "Intel SRCSAS144E/SRCSAS18E" inf_loc=".\." ver="1.18.0.32"/>
     </jdrivers>
     </jdp>
</osi-meta>
```

- Sample 2 Linux osd.xml - package contains source and script

```
<?xml version="1.0" encoding="utf-8"?>
<osi-meta>
 <jdp
 pid="S5000PAL,S5000XAL,S5000PSL,SC5400RA,S5000XSL,S5000XVN,S5000
  VSA,S5000VCL,S3000AHX,S3000AHV,S3000AH">
 <jdrivers
os_type="rhel4u2x86,rhel4u2x64,rhel4u3x86,rhel4u3x64,sles9sp2x86,sles9sp
2x64,sles9sp3x86,sles9sp3x64">
<osi_driver name="Intel PRO1000 Network Connection" devname="Intel Lan
e1000" inf_loc="" ver="12"/>
 </jdrivers>
 </jdp>

 <script><![CDATA[#!/bin/sh
 # script to install Intel e1000 LAN driver
 MAIN_DRIVER_FILE=intel-lan_linux_v11.1.tar.gz
 DVER=7.2.7
 SUB_DRIVER_FILE=e1000-$DVER.tar.gz
 if [ ! -f $MAIN_DRIVER_FILE ];then
     echo "Main Driver not found!"
     exit
 fi

 tar zxvf $MAIN_DRIVER_FILE|| {
     echo "Unable to extract main driver !"
     exit
 }

 cd drivers/
 if [ ! -f $SUB_DRIVER_FILE ];then
     echo "Sub Driver not found!"
     exit
 fi
 tar zxvf $SUB_DRIVER_FILE|| {
```

```
        echo "Unable to extract sub driver !"
        exit
}


tar zxvf e1000-$DVER.tar.gz
rmmod e1000
cd e1000-$DVER
cd src/
make && make install && depmod
modprobe e1000


cd ../../../
RH_NW_SETUP=rhel_nwsetup.sh
SL_NW_SETUP=sles_nwsetup.sh


if [ -f /etc/redhat-release ];then
    chmod +x $RH_NW_SETUP
    ./rhel_nwsetup.sh
fi
if [ -f /etc/SuSE-release ];then
    chmod +x $SL_NW_SETUP
    ./sles_nwsetup.sh
fi


cd /]]></script>
</osi-meta>
```

- Sample 3 Linux osd.xml with .img

```
<osi-meta>
    <jdp
pid="S5000XSL,S5000PSL,S5000PAL,S5000XAL,S5000VSA,SC5400RA,S5000XVN,
X5000VCL,S3000AH,S3000AHV,S3000AHX">
        <jdrivers os_type="rhel4u2x86,rhel4u3x86,rhel4u2x64,rhel4u3x64">
            <osi_driver name="HW/External RAID" devname="SRCSAS18E SAS-
3G,SRCSAS144E SAS-3G,SROMBSAS18E SAS-3G"
                inf_loc="ir3_sas-v00.00.03.03-1-rhel40-all.img"
                ver="00.00.03.03-1"/>
        </jdrivers>
    </jdp>


    <script><![CDATA[#!/bin/sh
echo no script for DuDs
]]></script>
</osi-meta>
```

3.6. Multi-Server Cloning

The IDA multi-server cloning feature is designed for users who need to repeat the same deployment work on more than one server which have the same hardware configuration. This feature deployment can improve server efficiency and save user's human resource via copying all deployment work on first server to other servers automatically.

Uses of this feature include:
* In mass deployment environments by placing on a PXE or WDS server
* Build templates for future deployments on similar systems
* Help user quickly recover server configure for crashed systems or replacements
* Supply to technicians for quick fix of systems without the need for Internet access. All the parts can be included with the image.

IDA can record users operations, including system firmware update, server asset, BIOS and BMC configuration, RAID configuration and OS unattended installation on first server, and create a self contained bootable image. The image is called the IDA multi-server cloning image.

There are two methods to deliver the IDA multi-server cloning image to other servers
* IDA can save the image to a USB key and make the USB key bootable. User can then boot the other servers with this USB key and the image can copy all deployment work to the target server.
* IDA image can be delivered to other servers over network by a PXE server. The image boots the target servers and copies all deployment work to them.

Some parameters within the IDA multi-server cloning image can be modified during cloning phase, such as BMC IP address, OS host name, etc, so that user can avoid conflicts between the first server and other servers. Multi-server cloning image reads the file – config.ini, which contains the settings to those parameters. Parameters for each target server are organized in one section and start with the server onboard NIC1 MAC address that is used to recognize different target servers by the image. Refer to section 3.6.3 for config.ini format.

The first server and other servers should have similar hardware configuration. However, depending on what is being cloned, they don't necessarily have to have the exact same configuration. The following are the different requirements for configurations based on what is being cloned.
* Cloning asset, BIOS and BMC configuration, the server board should be the same.

- Cloning the system firmware update includes BIOS, BMC and FRUSDR, the server board and chassis should be the same.
- Cloning the RAID configuration, the RAID card and hard disks should be the same.
- Cloning the OS installation, the server board and storage sub system(RAID or SAS/SATA) should be the same.

3.6.1. Multi-Server Cloning Options

After clicking the **Multi-Server Cloning** button on the IDA home page**,** IDA enters the page of **Multi-Server Cloning Options.** IDA provides four options that are allowed to copy to multiple servers,
- Get System Update
- Configure a Server
- RAID Configuration
- OS installation
User can select all options or any options at one time.

Figure 42: Multi-Server Cloning Options
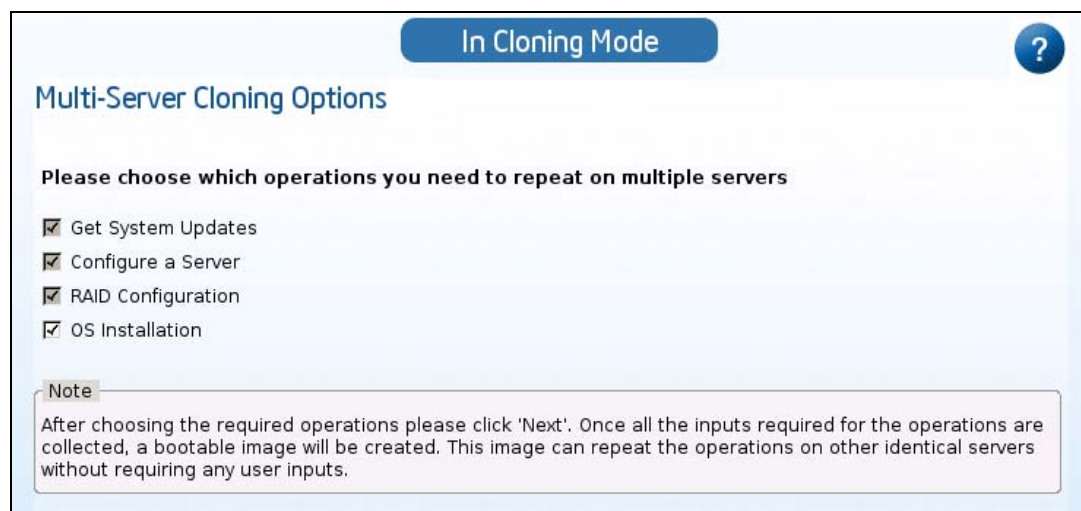
The operations for those four options in Cloning Mode are the same as the IDA normal mode. Refer to section 3.2 for detailed operations of "Get System Updates", section 3.3 for detailed operations of "Configure a Server", section 3.4 for detailed operations of "RAID Configuration" and section 3.5 for detailed operations of "OS installation".

Note: Those operations will really be performed on your server, original configuration or partition will be changed.
Note: IDA cannot clone Windows 2008* and Windows 7* unattended OS installation at this time.

3.6.2.   Creating IDA Multi-Server Clone Image

After IDA collected all inputs on the first server, multi-server clone image can be created as bootable image on USB key or packaged as PXE image file to save to a USB key at the IDA **Create Clone Image** page.

3.6.2.1 USB Bootable Option

Select the option **USB bootable** and insert a USB key (free space must be larger than 512MB), then click **Refresh** button, and after IDA recognizes the USB key click **Next** button to create the bootable image to USB key.

Note: The USB key will be formatted and all original data will be erased.
Note: If the cloning image contains Windows* 2003 installation, the USB key space should be more than 2GB

Figure 43: Make Bootable USB key
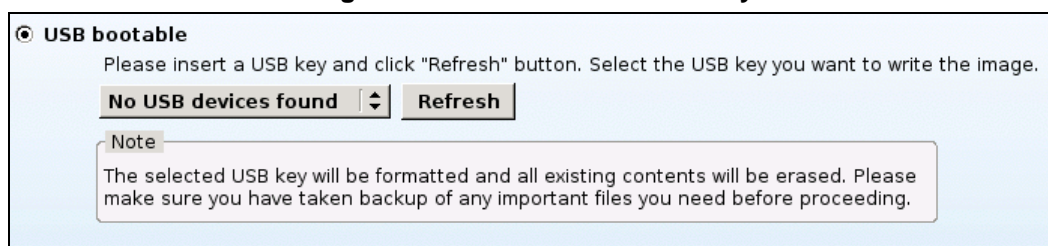
Creating bootable USB key takes about 5 minutes. IDA will copy the multi-server clone image to USB key and make it bootable. The bootable USB key contains a Linux* ext3 format partition and a FAT format partition. User can edit file config.ini and save it to the FAT partition (Refer to the section 3.6.3 for details of config.ini). After all processes are completed, user can boot other servers with this USB key and start the server cloning.

Note: Additional network file server is needed if multi-server cloning contains OS installation. Refer to **Appendix B** for an example of cloning Linux* OS installation with multi-server cloning image on USB key.

3.6.2.2 PXE Image Option

Select the option PXE Image and insert a USB key (free space must be larger than 512MB), after around 5 seconds and click Browser button. If the USB key can be recognized, IDA will pop up a window that will allow you define a file name for the PXE image package.

Figure 44: Save PXE Image
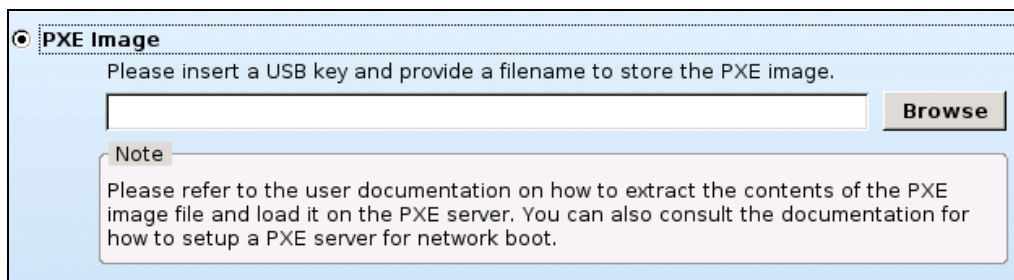
After clicking the **Next** button, IDA will automatically save PXE image package as a ZIP format file, which usually contains the following files and folder.

- vmlinuz
- initrd.gz
- drivers.zip
- update_package.zip
- conflig_template.ini
- stage2.tar.gz

File "drivers.zip" and "update_package.zip" will not be included in PXE image package except user selects OS installation and firmware upgrade cloning.

Note: Refer **Appendix C** for how to integrate IDA multi-server cloning PXE image with Linux* version PXE server.

3.6.2.3 Create more multi-server cloning images

IDA allow user select an option of repeat the cloning process to create more bootable USB key or PXE bootable image.

Figure 45: Option of repeat the cloning process
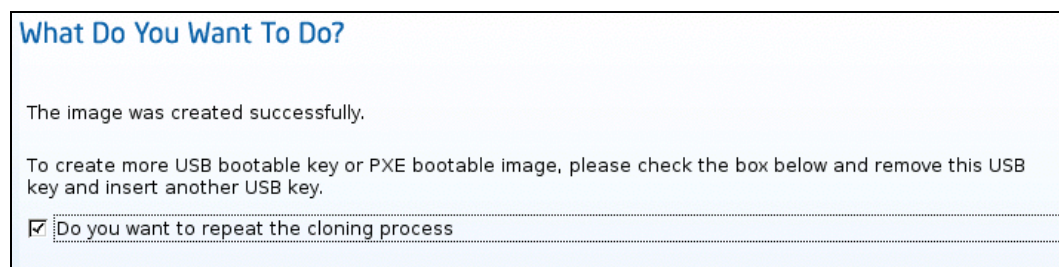
3.6.3. Config.ini

IDA multi-server cloning image supports the ability to change parameters of target servers according to the config.ini, which includes:
- BMC channel 1 IP address
- BMC channel 3 IP address (RMM module IP address)
- BMC DHCP_HOSTNAME
- Machine Name for Email Alerting
- From Email Address for Email Alerting
- LICENSE for OS installation
- Computer Name for OS installation
- Admin Password for OS installation

Those parameters for each target server are organized in one section and start with the onboard NIC1 MAC address that is used to recognize different target servers by the image.

Config.ini content:

[GENERAL]
mode =
Comments: mode has three options "nfs", "network_share" , "cdrom" and "usb"
- "nfs" is for Linux* OS installation. NFS file server should be prepared by user. All content of Linux* OS CD/DVD should be copy to a share folder of NFS server.
- "network_share" is for Windows* OS installation. Windows* uses Server Message Block protocol to share files over network. All content of Windows* OS CD/DVD should be copy to a Windows* share folder or a share folder of Samba service on a Linux* server.
- "cdrom" is for scenario that target server has local CDROM/DVDROM, server can be installed from local media. This option supports Linux* and Windows* OS.
- "usb" is for Windows* OS installation with USB key. User can create bootable USB key with IDA, and extract all the contents of Windows* 2003 CD to the first partition of this USB key. Boot up other homogeneous server with this USB key, the deployment of Windows * 2003 installation can be cloned.

Note: If USB mode is selected, minimum 2 GB pen drive is required.
- The option can be blank if multi-server cloning image doesn't include OS installation.

server =
Comments: enter file server IP address "XXXX.XXXX.XXXX.XXXX" at here.

dir =
Comments: enter share folder name at here. Such as "/nfs1/RHEL5U4/"

username =
Comments: enter user name to access the file server. Such as "root" "administrator".

password =
Comments: enter user password to access the file server.

workgroup =
Comments: This option is for Windows* file server, enter workgroup or domain name if that is needed to access file server.

Note: All above options can be blank if IDA multi-server cloning image doesn't include OS installation.

[Server onboard NIC1-MAC-ADDRESS]
Comments: Enter onboard NIC1 MAC address of target server at here. Example: [00:15:17:8B:4E:12]*.*
Note: The MAC address at here is case sensitive, only capital can be accepted.
Note: onboard NIC1 MAC address usually can be found as a label on server board or chassis. User also can find this address at BIOS configuration interface. Refer server technical specification or user guide about onboard NIC MAC address.

lan1_ip =
Comments: Enter BMC LAN channel 1 IP address.

lan1_netmask =
Comments: Enter subnet mask for BMC LAN channel 1

lan1_gateway =
Comments: Enter BMC LAN channel 1 gateway address of BMC LAN channel 1

lan3_ip =
Comments: Enter BMC LAN channel 3 (RMM) IP address.

lan3_netmask =
Comments: Enter subnet mask of BMC LAN channel 3 (RMM)

lan3_gateway =
Comments: Enter Gateway address of BMC LAN channel 3 (RMM)

dhcp_host_name =

Comments: Enter BMC host name if BMC IP address is assigned by DHCP server

from_addr =
Comments: Enter sender's email address of BMC Lan channel 1 alert email.

from_addr_lan3 =
Comments: Enter sender's email address of BMC Lan channel 3 alert email.

machine_name =
Comments: Enter machine name of BMC Lan channel 1 alert email.

machine_name =
Comments: Enter machine name of BMC Lan channel 3 alert email.

os_computer_name =
Comments: Enter server host name for OS install

os_password =
Comments: Enter OS root or administrator Password for OS install

os_license =
Comments: Enter OS License key for OS install

Note: Refer to **Appendix A** for config.ini templates

3.7. Online Patch Update

IDA Online patch update provides user a quick path to get new IDA features or fix critical issues. IDA can search support.intel.com and automatically find the online patch files that match with the user server system. User can save patch files to a USB key, and IDA can load it from USB key next time and don't need to download patch file again.

Click IDA menu **Help** and select **Upgrade to New Version** to enter the page of Upgrade Intel® Deployment Assistant.

3.8. OS-HTML

OSHTML is a set of HTML pages contains links to download drivers, utilities and latest IDA ISO image. The HTML pages are located in CD and can automatically run when the CD is put in a machine running Windows*/Linux* operating systems. This HTML pages gets executed in a default browser which could be an internet explorer or Mozilla Firefox* browser.

You can get below information when OS-html automatically loads by browser

1. Home page
    Introduce the Intel Server System hardware features

2. Drivers and Utilities
    In this page, you can download server hardware drivers and utilities that organized in different OS sub-page. For example, you click Microsoft Windows* to enter a sub-page that contains all available drivers and utilities in IDA CD.

3. Documents
    You can find current Intel Server System and devices user guide or spec documents at this page.

4. Customer Support
    This page contains Intel Server System technical support information

5. Update
    At this page, you can download new IDA version. IDA has ability to detect the newer IDA version on Intel support web site. This page has a tab "Upgrade to new version". Clicking on it causes IDA to query http://support.intel.com for new updates. IDA reports whether there is an available version of IDA that is newer than the current ones. If there is a new IDA image available, you can select to download it.

Appendix A: config.ini template

Description:

============

Sample config file for providing system specific settings during server cloning

with Intel(R) Deployment Assistant.

##

This file helps in customizing system specific settings during server cloning.

##

Notes:

======

1. Any line starting with the symbol '#' is a comment, and hence ignored.

2. For use with USB key based cloning, the filename has to be renamed to 'config.ini'

3. This file is just an example, please modify the values as required.

##

Tip:

====

The configuration parameters are commented out below, starting with a single '#'.

They can to be uncommented (by removing the leading '#') and proper values need to

be entered.

##===

=============

The GENERAL section contains settings that are common to all servers during PXE-based

deployment

[GENERAL]

#mode = "network_share"   # Possible values are: network_share (Windows*), nfs

(RHEL* and SUSE*), cdrom (common for all OS), usb(Windows*)

```
                                # ** NOTE ** The parameter "mode" with value "usb" is applicable only

for USB based cloning

#dir = "share"              # ** IMPORTANT ** The directory/folder name that is being shared,

                            # it should _NOT_ be a sub-directory within a shared folder.

                            # For # Windows(R) installations, this directory should contain

                            # the 'i386' folder


#username = "user"          # Username for the Windows(R) share or NFS


#password = "password"          # Password


#workgroup="WGROUP"          # Only required for Windows(R) share


## Any setting that is specific to a server needs to be grouped under a section with the
## MAC address of the first NIC


# [ 00:15:17:8B:4E:12 ]          ## Server Specific setting ##
##-- Basic LAN Configuration –

#lan1_ip = "xxx.xxx.xxx.xxx"      # IP address of BMC LAN channel 1

#lan1_netmask = "xxx.xxx.xxx.xxx"    # Netmask for BMC LAN channel 1

#lan1_gateway = "xxx.xxx.xxx.xxx"      # Gateway address of BMC LAN channel 1

#lan3_ip = "xxx.xxx.xxx.xxx"        # IP address of LAN3

#lan3_netmask = "xxx.xxx.xxx.xxx"       # Netmask of LAN3

#lan3_gateway = "xxx.xxx.xxx.xxx"     # Gateway address of LAN3
```

##-- Email alert settings --

#from_addr = "some_user@domain.com"   # Sender email address for LAN channel 1

#machine_name = "mc_name"   # Sender machine name for LAN channel 1

#from_addr_lan3 = "some_user@domain.com"# Sender email address for LAN channel 3

#machine_name_lan3 = "mc_name"   # Sender machine name for LAN channel 3

#dhcp_host_name = "hostname"   # DHCP hostname

##-- For OS Installation --

#os_computer_name = "computer"   # Computer name. Only applicable for Windows*
installations

#os_password = "password"   # Administrator/root password for the OS

#os_license = "XXXX-XXXX-XXXX-XXXX"# License key. Only applicable for Windows* and
RedHat* Linux

Appendix B: An example of cloning Linux* OS installation with multi-server cloning image on bootable USB key

1. Create multi-server image that contains Linux* RHEL* 5 Update 5 installation with IDA and make a bootable USB key.
2. Create config.ini and save to the FAT partition of that bootable USB key. The following is an example of config.ini. The mode option could be "nfs", "share_server" and "cdrom". "nfs" is for Linux* OS installation, "network_share" is for Windows* OS installation, and "cdrom" is for scenario that target server has local CDROM/DVDROM, server can be installed from local media.

```
[ GENERAL ]
mode = "cdrom"
server =
dir =
username =
password =
workgroup =

[ 00:15:17:DE:D9:84 ]
os_computer_name = "test1"
os_password = "123456"

[ 00:15:17:DE:84:08 ]
os_computer_name = "test2"
os_password = "password"
```

3. Insert Linux* RHEL* 5 update 5 OS installation DVD to DVD-ROM of target server.
4. Boot the target server with the USB key and start to run multi-server cloning image, reboot server when the process is completed.

5. After server reboot, additional OS installation process will be started automatically.

Appendix C: Setting up a Linux* PXE server and integrating IDA multi-server cloning image HOWTO

Overview

This appendix describes how to set up a Pre-boot eXecution Environment (PXE) server on Red Hat* Linux 5.4 and how to integrate Intel® Deployment Assistant (IDA) multi-server cloning bootable image with the PXE server

Setting up a Linux* PXE server requires an Intel® Xeon® based server and two key software components that provides PXE functionality: 1> the DHCP server; 2> the TFTP server.

The PXE portion will be handled by the syslinux package. The Syslinux 3.11 package included in Red Hat* Linux 5.4

Notes: Refer to the section 3.6 for how to create IDA multi-server cloning bootable image.
Refer to Intel® server TPS for how to enable PXE client on PXE-enabled network interface controller (NIC) on Intel® server board or system

Pxelinux functionality

The pxelinux functionality occurs in this order:
- The client machine (the server that needs to be cloned) boots from PXE client which requests a DHCP address.
- The DHCP server responds with an IP address for the client machine along with the address of a TFTP server and filename to load "pxelinux.0" from that server
- The client machine downloads "pxelinux.0" from the TFTP server and executes it
- "pxelinux.0" then searches the "pxelinux.cfg" directory on the PXE server for a configuration file that matches the IP address of the machine. If no matches are found, it will attempt to load a file called "default"
- The configuration file loaded by "pxelinux.0" will have instruction on what to do next. Some of the choices include boot to local hard drive, boot to an image file, or load vmlinuz and initrd.img

Setting up the PXE server

1. Install Red Hat* Linux 5.4 on a suitable Intel® Xeon® based server as PXE server.

2. Install the following packages:

   - dhcp-3.0.5-21

   - tftp-server-0.49-2

If multi-server cloning image contains OS installation, it also needs network file server to access the OS installation content. Network file server includes NFS for Linux* OS installation, CIFS (SMB) for Windows* OS installation. The file server could be a standalone server in network or NFS and samba service on the same server with PXE service.

Additional NFS and samba services may need to be installed.

   - nfs-utils-1.0.9-42

   - nfs-utils-lib-1.0.8-7.6.el5

   - portmap-4.0-65.2.2.1

   - samba-common-3.0.33-3.14

   - samba-client-3.0.33-3.14

   - samba-3.0.33-3.14

3. Setup static IP and hostname for PXE server, for example: IP=192.168.5.1, hostname =pxeserver.pxe.com

4. Setup DHCP service

   - Run the following command to ensure that DHCP server can be started at each boot

     chkconfig --level 345 dhcpd on

   - A sample DHCP server configuration file "dhcpd.conf" is located at

   /usr/share/doc/dhcp-3.0.5/dhcpd.conf.sample. Copy this sample to /etc/dhcpd.conf.

   - Edit /etc/dhcpd.conf . The following is an example for dhcpd.conf, and item "next-server 192.168.5.1" defines the tftp server address, item "filename "pxelinux.0" " indicates the first file that PXE client download from tftp server.

```
ddns-update-style interim;
#ignore client-updates
subnet 192.168.5.0 netmask 255.255.255.0 {
range 192.168.5.100 192.168.5.150;
default-lease-time 86400;
max-lease-time 86400;
option ip-forwarding off;
option broadcast-address 192.168.5.255;
option subnet-mask 255.255.255.0;
option ntp-servers 192.168.5.100;
option domain-name-servers 192.168.5.100;
option netbios-name-servers 192.168.5.100;

next-server 192.168.5.1;
filename "pxelinux.0";
}
```

- After modifying /etc/dhcpd.conf, notify the dhcpd server of the changes by using the following command:

  ```
  service dhcpd restart
  ```

Note: Do not run a new DHCP server on a network with an existing one unless you have configured the network for multiple DHCP servers. Running two or more DHCP servers on the same network without taking special precautions causes conflicts.

5. Configure TFTP service

    - TFTP service is started and stopped by demon "xinetd", using the following command to ensure xinetd can be started at each boot

      ```
      chkconfig --level 345 xinetd on
      ```

    - Notify xinetd that the TFTP service has been enabled with the following command:

      ```
      service xinetd restart
      ```

    - Install pxelinux.0 and memdisk into the /tftpboot directory with following commands:

      ```
      mkdir -p /tftpboot/pxelinux.cfg
      ```

      ```
      cp -a /usr/lib/syslinux/pxelinux.0   /tftpboot/
      ```

6. Enable NFS on the server

- Enable the NFS server by using following commands

```
chkconfig  --level  345  portmap  on

chkconfig  --level  345  nfslock  on

chkconfig  --level  345  nfs  on
```

- Edit /etc/exports. The following is an example that allow access NFS share folder "/nfs1" with anonymous user. Access NFS help for more information of NFS setting.

```
/nfs1                                    *(ro,
sync,all_squash,anonuid=40,anongid=40)
```

- Start or restart NFS service by using the following commands

```
service  portmap  restart

service  nfslock  restart

service  nfs  restart
```

7. Enable samba service
   - Enable samba service by following command

```
Chkconfig –level 345 smb on
```

   - Edit /etc/samba/smb.conf. The following is an example that allows to access the samba share folder "/share/win2003r2" with anonymous user. Access samba help for more information of samba setting.

```
[global]
workgroup = mygroup
server string = Samba
security = share
wins support = no
guest ok = yes
netbios name = myserver
[win2003r2]
path = /share/win2003r2
guest ok = yes
available = yes
public = yes
```

   - Test "smb.conf" by following command

```
testparm
```

- Start or restart samba service by using the following command

```
service  smb  restart
```

- Linux* may prevent samba search the share folder, such as "/share", alter file context by using the following commands

```
chcon -R -t samba_share_t  './share'
```

Steps to integrate IDA multi-server cloning image with Linux* PXE server

1. Unzip IDA multi-server cloning image to Linux TFTP root folder "/tftpboot". IDA multi-server cloning image is a zip file, it usually contains:

```
Input zip contains:
-  vmlinuz
-  initrd.gz
-  drivers.zip
-  update_package.zip
-  conflig_template.ini
-  stage2.tar.gz
```

2. Create file "config.ini" at folder "/tftpboot/", you can find a config.ini template in the package of IDA multi-server cloning image.

Note: refer to the user guide section 3.6.3 for detailed config.ini definition

3. We have created the directory "/tftpboot/pxelinux.cfg". The pxelinux.0 configuration files will be stored in this directory. Because more than one system may be booted from the same server, the configuration file name depends on the IP address of the booting machine. PXELINUX will search for its configuration file on the boot server in the following way:

- First, it will search for the configuration file using the hardware type (using its ARP type code) and address, all in lower case hexadecimal with dash separators; for example, for an Ethernet (ARP type 1) with address 88:99:AA:BB:CC:DD it would search for the filename 01-88-99-aa-bb-cc-dd.

- Next, it will search for the configuration file using its own IP address in upper case hexadecimal, e.g. 192.0.2.91 -> C000025B (192->C0, 0->00, 2->02, 91->5B). If that file is not found, it will remove one hex digit and

try again. Ultimately, it will try looking for a file named "default" (in lower case). As an example, if the boot file name is /mybootdir/pxelinux.0, the Ethernet MAC address is `88:99:AA:BB:CC:DD` and the IP address 192.0.2.91, it will try following files (in that order):

```
/mybootdir/pxelinux.cfg/01-88-99-aa-bb-cc-dd
 /mybootdir/pxelinux.cfg/C000025B
 /mybootdir/pxelinux.cfg/C000025
 /mybootdir/pxelinux.cfg/C00002
 /mybootdir/pxelinux.cfg/C0000
 /mybootdir/pxelinux.cfg/C000
 /mybootdir/pxelinux.cfg/C00
 /mybootdir/pxelinux.cfg/C0
 /mybootdir/pxelinux.cfg/C
 /mybootdir/pxelinux.cfg/default
```

- Example of "default" file:

```
DEFAULT Example
prompt  0

label  Example
kernel vmlinuz
append initrd=initrd.gz  server_ip=192.168.5.1
       stage2_path= quiet
```

- "vmlinuz" and "initrd.gz" are files from the IDA multi-server cloning image zip package.

- "server_ip" is PXE server IP address

- "stage2_path" is the sub-folder name that contains file "stage2.zip". The sub-folder means the sub-folder under TFTP root folder "tftpboot". At this example, the value of "stage2_path" is blank, as "stage2.zip" is at TFTP root folder "tftpboot".

4. Multi-server cloning image also can be integrated to a sub-folder under TFTP root folder. PXE server supports boot menu function, so user can arrange several multi-server cloning images on one PXE server, and can select them by boot menu.

- Copy file "menu.c32" from syslinux package to TFTP root folder "tftpboot"

- Create folder "test1" under "tftpboot", unzip multi-server cloning image to folder "/tftpboot/test1"

- Create file "config.ini" at folder "/tftpboot/test1", you can find a config.ini template file at multi-server cloning image

Note: refer to the user guide section 3.6.3 for detailed config.ini definition

- Edit "/tftpboot/pxelinux.cfg/default" as following

-

```
default menu.c32
PROMPT   0
TIMEOUT 300
MENU TITLE PXE Boot Menu

label SR1625 MPHW RAID 15G Windows2003
MENU DEFAULT
kernel test1/vmlinuz
append initrd=test1/initrd.gz server_ip=192.168.7.1
        stage2_path=test1 quiet

label SR1625 FW update
kernel test2/vmlinuz
append initrd=test2/initrd.gz server_ip=192.168.7.1
        stage2_path=test2 quiet
```

5. Copy content of OS installation CD or DVD to file server

If multi-server cloning image contains OS installation, it needs to access the content of OS installation CD/DVD from local CDROM of target server or network file server.

In this example, we copy all content of RHEL* Linux 5 U5 DVD to folder "/nfs1", and copy all content of Windows* 2003 R2 to folder "/share/win2003r2"

6. Example of deploying firmware update multi-server cloning with PXE server
    - Create multi-server image that contains firmware update and server management configuration with IDA and save PXE image to a USB key
    - Unzip the image to "/tftpboot/test2"
    - Check "/tftpboot/pxelinux.cfg/default", it should follow step 4
    - Create "/tftpboot/test2/config.ini". The following is an example of config.ini. After system firmware updated, BMC DHCP hostname will be updated with different name.
      Note: If multi-server cloning image only contains firmware update operation, config.ini is not needed.

```
[ GENERAL ]
mode =
server =
dir =
username =
password =
workgroup =

[ 00:15:17:DE:D9:84 ]
dhcp_host_name = "BMC001"

[ 00:15:17:DE:84:08 ]
dhcp_host_name = "BMC002"
```
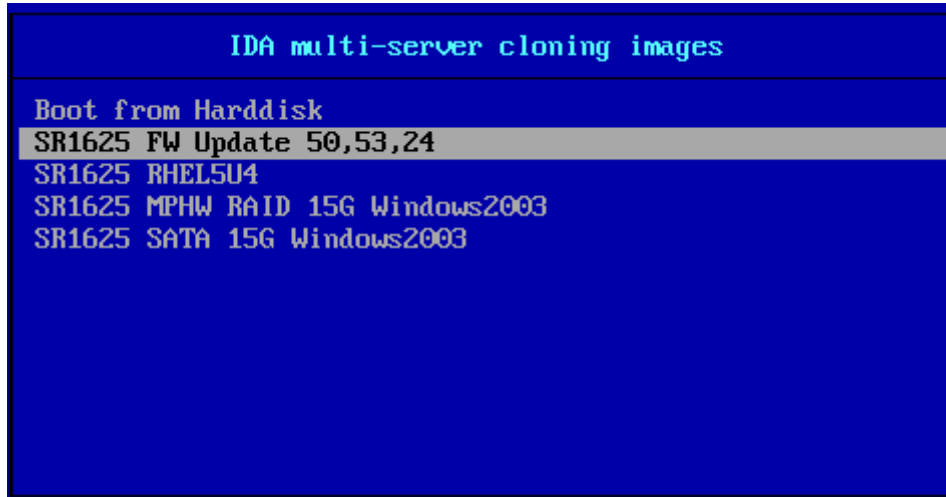
- Start other servers and enter "F12" key to boot from PXE client.

- Select update FW menu from PXE menu in this example

`

- Multi-server cloning image start to update server firmware, reboot server when the process completed.

```
        Intel(R) Deployment Assistant 4.0 (0120)
        ========================================


Starting automatic configuration (cloning)

Downloading the config file                            [  OK  ]
Downloading the system update file                     [  OK  ]
Downloading the drivers                                [  OK  ]
Detecting system components                            [  OK  ]
Updating system software                               [  OK  ]
==================================================
Cloning completed                                      [  OK  ]

The following operations were completed successfully:
    * System Updates


The system has been cloned successfully.
Please remove the USB key, if any, and press 'Enter' to restart the system
```

Notes:

▪ Server onboard NIC1 is usually recommended to connect to network. If other onboard NIC are not connected to server, multi-server cloning image may report those unconnected NIC fail to get IP address from DHCP server. This is working as design and will not impact the deployment cloning.

▪ When multi-server cloning image is updating server firmware, do not power off server. Otherwise system firmware may be damaged. If server lost power due to an accident during FW updating, multi-server cloning image will fail to run on this server again. User need to force update system BIOS, BMC and FRUSDR to recover it. Refer to the server system TPS for how to force update system firmware.

7. Example of deploying Windows 2003* installation multi-server cloning with PXE server

- Create multi-server image that contains Windows 2003* installation with IDA and save PXE image to a USB key
- Unzip the image to "/tftpboot/test1", Check "/tftpboot/pxelinux.cfg/default", it should follow step 4
- Create "/tftpboot/test1/config.ini". The following is an example of config.ini.

```
[ GENERAL ]
mode = "network_share"
server = "192.168.7.1"
dir =  "win2003r2"
username = "root"
password =  "password"
workgroup ="mygroup"


[ 00:15:17:DE:D9:84 ]
os_computer_name = "test1"
os_password = "123456"


[ 00:15:17:DE:84:08 ]
os_computer_name = "test2"
os_password = "123456"
```

- Start other servers and enter "F12" key to boot from PXE client.
- Select *SR1625 MPHW RAID 15G Windows2003* menu in this example
- Multi-server cloning image start to OS installation, reboot server when the process completed. After server reboot, additional OS installation process will be started automatically.