# V2616 Series WinXP Embedded User's Manual

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# V2616 Series WinXP Embedded User's Manual

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Thank you for purchasing the Moxa's V2616 x86 ready-to-run embedded computers. This manual introduces the software configuration and management of V2616 computers running the Windows Embedded Standard 2009 operating system. For hardware installation, connector interfaces, setup procedures, and upgrading the BIOS, please refer to the V2616 Hardware User's Manual.

Microsoft Windows Embedded Standard 2009 is a specialized operating system consisting of componentized Windows XP Professional features that allows you to build a wide range of innovative, small footprint devices. Windows developers will find Moxa's V2616 computer plus Windows Embedded Standard 2009 operating system to be the right solution for a wide range of applications.

The following topics are covered in this chapter:

- Overview
- Software Specifications
  - > Application Development Environment
  - > Networking and Communication Capabilities
  - Supporting Services and Daemons
- How to Determine Firmware Build Versions
- Inserting a USB Mass Storage Device into the Computer
- Inserting a CF Card in the Computer
- Inserting SATA hard disks into a V2616 Computer
  - > Two RS-232/422/485 Serial Ports
  - Digital Input/Output Channels

### **Overview**

V2616 embedded computers come with two RS-232/422/485 serial ports, making it ideal for connecting a wide range of serial devices. The dual 10/100/1000 Mbps Ethernet ports offer a reliable solution for network redundancy, delivering continuous operations for data communication and management. As an added convenience, the V2616 computer has six DIs and two DOs for connecting digital input/output devices.

In addition, the CompactFlash and USB sockets provide the V2616 computer with the reliability needed for industrial applications that require data buffering and storage expansion. Most importantly, the V2616 computer comes with 2 removable slots for inserting additional storage media, such as hard disks or SSD drives, and can offer RAID 0 and RAID 1 functions for data reliability.

Pre-installed with Windows Embedded Standard 2009, the V2616 provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.

### **Software Specifications**

The software features of the V2616-XPE embedded computers are listed below:

#### Application Development Environment

The V2616 is fully compatible with the XP Professional Development Environment.

The V2616's use of Windows Embedded Standard 2009 with SP3 provides the following common, popular application development features that make programming convenient and easy.

Every application that runs in Windows XP can be executed in the V2616, so there is no migration cost.

Windows Embedded Standard 2009 is based on the same binary files as Windows XP Professional; Windows Embedded Standard 2009 enables you to rapidly develop reliable and full-featured connected devices.

- Microsoft .Net Framework 3.5—This component includes the common language runtime (CLR) and the .NET Framework class library.
- Active Directory Service Interface (ADSI) Core—Provides the basic functionality for ADSI. This
  component routes any requests to the corresponding provider according to the path it is provided.
- Active Template Library (ATL) Supports ATL applications.
- ASP.NET 2.0—A unified Web application platform that provides the services necessary to build and deploy enterprise-class Web applications.
- Certificate Request Client & Certificate Auto enrollment—This component includes the common language runtime (CLR) and the .NET Framework class library.
- **COM Base**—Component Object Model (COM) includes a programming model and a set of application programming interfaces (APIs), and does not include a dedicated user interface.
- **Common Control Libraries**—(Side by Side) the component provides common user interface (UI) controls.
- Common File Dialogs—Support for common dialog boxes.
- Direct3D—The infrastructure for two-dimensional and three-dimensional graphics.
- **DirectPlay**—Provides a networking API that can enable any application to operate over both a peer-to-peer and client/server topology.
- **DirectShow**—Base filter graph and device enumeration support for all DirectShow applications. This component also provides most DirectShow filters.
- Distributed Transaction Coordinator (MSDTC) A distributed transaction facility for Microsoft Windows systems, which uses transaction-processing technology. MSDTC exploits loosely coupled systems to provide scalable performance.
- Enhanced Write Filter—An upper filter in the storage device driver stack that redirects disk write operations to volatile (RAM) or non-volatile (disk) storage.

- **Event Log**—A dynamic-link library (DLL) that runs as part of Services.exe. This component stores and retrieves events that can be viewed in the event viewer.
- **Internet Explorer 7**—The Internet Explorer Web browser that allows customers to connect to the Internet or to an intranet (see properties via inetcpl.cpl).
- Mapi32 Libraries—The infrastructure for e-mail support.
- Message Queuing (MSMQ) Core—Message Queuing is a messaging infrastructure and a development tool for creating distributed messaging applications for Microsoft Windows operating systems; it provides guaranteed message delivery, efficient routing, increased security, support for sending messages within transactions, and priority-based messaging.
- **Microsoft Visual C++ Run Time Libraries**—The Microsoft C++ Runtime Library.
- **NTFS**—The NTFS File System driver (NT File System). Use NTFS instead of FAT for optimum file system security.
- **Power Management**—This component includes a dynamic-link library for power management features in the xpepm.dll file, and a command-line tool for using power management on a run-time image in the xpepm.exe file. **Note:** Instead of using this component, Shutdown.exe is the preferred method to shut down the system.
- Registry Editor—The Registry Editor (regedit.exe, regedt32.exe).
- RPC—Facilitates local remote procedure calls (RPCs) using the ncalrpc and ncacn\_np protocol sequences, and provides support for dynamic endpoint resolution. The RPC name service provides remote procedure call (RPC) named services functionality, such as the RPC Locator. The RPC Named Service component exposes all RpcNs\* RPC functions. The RPC server provides a variety of RPC and Component Object Model (COM) services, including RPC Endpoint Mapper, COM Service Control Manager (SCM) and COM Object Resolver.
- Smart Card Cryptographic Service Providers—Supports features such as smart card logon and improved e-mail security. Smart cards must be capable of certain RSA public key cryptographic operations. These functions are exposed by using CryptoAPI and, specifically, through a CSP. Typically, each type of smart card requires a CSP, which is provided by the card vendor.
- **USB 2.0**—The core drivers needed to communicate with an Enhanced Host Controller Interface (EHCI) that is compliant with USB .95 or 1.0.
- Windows API-User-Provides the user-mode component of the Windows operating system API.
- Windows Media Player 11—Playback functionality for digital media that includes videos, CDs, and DVDs for end users and developers.
- **Windows Script Engines**—A complete scripting environment for Windows, including command-line scripting, script languages, and the ability to host script engines within your applications.
- **WMI**—Bundles the features that combine to create the Windows Management Instrumentation (WMI) technologies.

### **Networking and Communication Capabilities**

The V2616-XPE embedded computer provides powerful hardware communication interfaces for network-centric embedded applications, including 2 Ethernet and 2 serial ports, and also support the networking and communications capabilities that are built into Windows Embedded Standard 2009 with SP3 OS. The following features are supported:

- **DHCP Client Service**—Registers and updates Internet Protocol (IP) addresses and Domain Name System (DNS) records for your target system.
- IP Security Services—This component provides IP Security (IPsec) services for all IP traffic.
- **Dial-Up Networking**—Provides the infrastructure necessary to implement a Remote Access Service (RAS) client.
- **Microsoft-Windows-HTTP**—Services that implement the functionality of the HTTP protocol on a server.
- **TCP/IP Networking**—Implements the core TCP/IP protocol stack, which includes the IPv4 version for the following protocols: Transmission Control Protocol (TCP), User Datagram Protocol (UDP), raw, Internet Control Message Protocol (ICMP), Internet Group Membership Protocol (IGMP), and Address Resolution

Protocol (ARP). The component also includes Wshtcpip.dll, which is the Winsock provider for TCP/IP to enable socket-level communication over TCP/IP.

- **TAPI**—A Telephony API (TAPI) Telephony Service Provider (TSP).
- Simple Network Management Protocol (SNMP)—SNMP is an agent service that provides management
  systems with information about activities that occur at the Internet Protocol (IP) network layer. The SNMP
  agent monitors network traffic, and retrieves and updates local management information based on the
  requests from the SNMP manager. The agent also notifies registered managers with traps when significant
  events occur.
- **Time Service Core**—Synchronizes a workstation's clock with other computers using the Network Time Protocol (NTP) version 3. For increased accuracy, this component also incorporates algorithmic enhancements from NTP 4.
- Windows Firewall/Internet Connection Sharing (ICS)—Windows Firewall provides a barrier between your device and network connections to help reduce attacks by hackers, viruses, and worms across networks. Strongly recommended..
- Wireless Zero Configuration—Support for the Windows implementation of the IEEE 802.11 standard. This component performs automatic configuration and authentication for IEEE 802.11 wireless network adaptors.
- Unimodem—Provides the infrastructure necessary for applications to communicate with a modem.

#### Supporting Services and Daemons

In addition to development and communication capability, the V2616-XPE embeds the services and daemons shown below. These common and easy-to-use application servers help users migrate industrial communication applications to the V2616-XPE embedded computer very easily and conveniently.

- COM+ Services—The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).
- **Computer Browser Service**—Computer browsing functionality exposed by Windows through Microsoft Networking. It allows a client machine to browse its network neighborhood for available computers, exposing file and print sharing services.
- **Disk Management Services**—Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes (both basic and dynamic). The component also monitors disk arrivals and removals and other changes in the storage subsystem.
- IIS Web Server—Allows you to create and manage Web sites.
- Terminal Server—Microsoft Terminal Server client application (mstsc.exe).
- Remote Registry Service—Enables remote users to modify registry settings on this computer.
- **Telnet Server**—Allows users to connect to Telnet servers from remote computers.

### **How to Determine Firmware Build Versions**

Use the **mxver** command to obtain the firmware version of the V2616-XPE embedded computer. This information is particularly important for identifying which features your embedded computer supports.

• Execute the **mxver.exe** command line utility.

Model Name: V2616-XPE Build Dat: 11071215 Version: V1.0

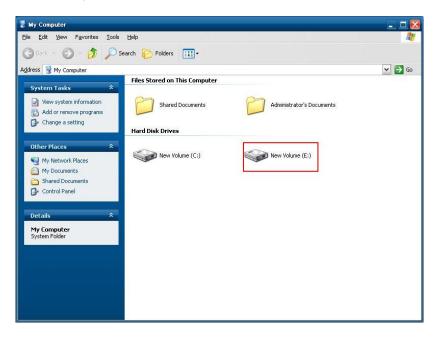
## Inserting a USB Mass Storage Device into the Computer

Inserting a USB mass storage device will generate a new drive on the V2616-XPE. The new drive should be visible in the File Explorer.

💈 My Computer			🛛 🔀
<u>F</u> ile <u>E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools	Help		<b>11</b>
🕝 Back - 🕥 - 🏂 🔎 Se	earch 😥 Folders 🛄 🗸		
Address 😼 My Computer			🗙 🄁 Go
System Tasks 🕆	Files Stored on This Computer		
View system information           Image: Add or remove programs           Image: Change a setting	Shared Documents	Administrator's Documents	
Other Places  My Network Places My Documents Shared Documents	New Volume (C:)		
Control Panel Details	Removable Disk (D:)		
My Computer System Folder			

### Inserting a CF Card in the Computer

Note that the V2616-XPE computer is shipped with a CompactFlash card already inserted and the Windows Embedded Standard 2009 platform installed. However, if you have installed the operating system on the hard disk, the CF card can be used for storage expansion. When inserted, the CF drive will be detected as a new disk in the File Explorer.



The V2616-XPE does not support CF "Plug and Play" and "Hot Swap." Please make sure to turn off the computer before inserting a new CF card.

# Inserting SATA hard disks into a V2616 Computer

The V2616-XPE computer offers two removable disk trays that can be fit two SATA hard disks for storage expansion. Before installing hard disks, make sure that the computer is powered off. Insert the SATA hard disk devices will create new disks in the V2616-XPE. You should see it in the File Explorer.

💈 My Computer			- 🗆 🔀
<u>File E</u> dit <u>Y</u> iew F <u>a</u> vorites <u>T</u> ools	Help		2
🕝 Beck 🔹 🕥 🔹 🏂 🔎 Se	arch 😥 Folders 🛄 🕶		
Address 😼 My Computer			💌 🛃 Go
System Tasks 🏾 🕆	Files Stored on This Computer		
View system information Add or remove programs Change a setting	Shared Documents	Administrator's Documents	
Other Places *	New Volume (C:)	New Volume (D:)	
Control Panel	New Volume (E:)		
My Computer System Folder			

You can also find the hard disks in the computer management screen.

📙 Computer Management						-	
🗐 File Action <u>V</u> iew <u>W</u> indow <u>H</u>	elp						-B×
🗢 → 🖻 🖬 😫 🗙 🗙	e 🖻 🖉 🗟						
Computer Management (Local)  Computer Management (Local)  Computer Viewer  Computer Viewer	Volume Volume (C:) New Volume (D:) New Volume (E:)		File System NTFS NTFS NTFS	Status Healthy (System) Healthy Healthy	Capacity 1.95 GB 14.91 GB 14.91 GB		% Free 17 % 90 % 84 %
E Services and Applications	Cisk 0 Basic 14.91 GB Online	<b>New Volume (C</b> 14.91 GB NTFS Healthy	p:)				*
	Cisk 1 Basic 14.91 GB Online	New Volume (E 14.91 GB NTFS Healthy	:)				~
<	Unallocated 📕 F	Primary partition		1			

The disks can also be found in **Control Panel/Device Manager**.

음 Device Manager	2
<u>File Action View H</u> elp	

In addition, the V2616 computer comes with an internal storage tray that allows users to install one 2.5-inch SATA hard disk or SSD. If this storage device has been installed, an additional hard disk will be visible in Device Manager.

NOTE: The V2616 embedded computer supplies only 5V DC power for 2.5 inch SATA hard disks. If you want to use a 3.5 inch hard disk, you will need to use an external power supply for your SATA hard disk.

#### Two RS-232/422/485 Serial Ports

The serial ports of the V2616-XPE computer from bottom to top are named **COM1** and **COM2**. Both are RS-232/422/485 serial ports. Each of these ports supports baudrate settings of up to 921.6 Kbps.

### **Digital Input/Output Channels**

The V2616 provides six digital input and two digital output channels. You can set the operation mode by programming; the example "DIO" can be found under **\examples\C++\** of the Software DVD.

# **Software Configuration**

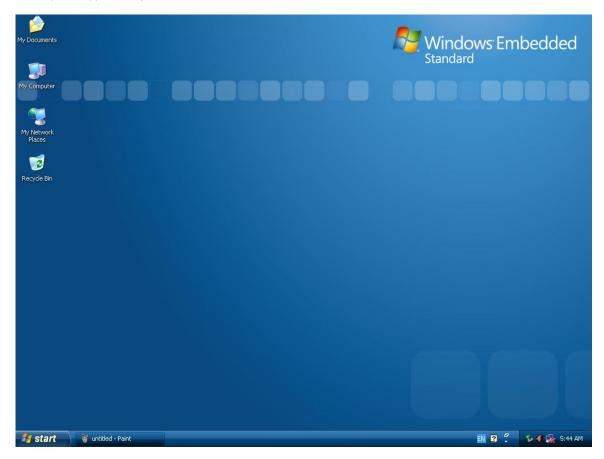
In this chapter, we explain how to operate a V2616-XPE computer directly or from a PC. Instructions are given on how to adjust the system time, troubleshoot network connectivity, and manage other functions. Some of these operations can be done with system commands after gaining access to the computer, and others can be done from the "Control Panel," which is described in a later chapter.

The following topics are covered in this chapter:

- **Starting Your V2616-XPE Computer**
- **Resetting Your V2616-XPE Computer**
- Configuring the Display Settings
- Changing the Network Settings
- Operating Your V2616-XPE Computer with a Telnet Client
- Adjusting the System Time
- Starting and Stopping Services
- Simple Network Management Protocol (SNMP)
- Remote Desktop (RDP)
- Serial Ports
- Enhanced Write Filter
- File Based Write Filter

## Starting Your V2616-XPE Computer

Connect the CRT monitor or LCD monitor to the target computer, and then power it up by connecting it to the power adaptor. It takes about 30 to 40 seconds for the system to boot up. Once the system is ready, the Desktop will appear on your monitor.



## **Resetting Your V2616-XPE Computer**

Reset Button

A Reset button is located on the front panel of V2616-XPE. Press the reset button to shut down your computer, just as you would do with a standard PC.

Software Shutdown / Reboot
 Click Start → Turn Off Computer to reboot or shutdown the V2616-XPE computer.

## **Configuring the Display Settings**

The V2616-XPE computer offers dual displays which allow users to connect the displays in VGA or DVI-D interfaces. The default setting will allow one display only. If you would like to use dual displays, Use the following steps to adjust display settings.

1. Double-click the display icon at the bottom right of the screen.

-

2. Select **Display Devices** and choose the operation mode.

Single Display: This option allows one display to be used.

**Dual Display Clone:** This mode allows you to use two displays at the same time.

**Extended Desktop:** This mode allows you to use extended desktop function. You may use two displays to extend your desktop.

Intel® Graphics Media Accelerator Driver for mobile	🧐 Monitor			
Display Devices	Operating Mode			
Display Settings	Single Display Single Display			
Color Correction	Intel(R) Dual Display Clone Extended Desktop	evice		
Hot Keys	Monitor		•	
(intel)				
		_		
3D Settings		ОК	Cancel	Apply
	6			

3. Select **Display Settings**, you may configure **Color Quality**, **Screen Resolution**, and **Refresh Rate** compatible with your displays. You may also select the **Enable Rotation** checkbox if you need rotation function.

Intel® Graphics Media Accelerator Driver for mobile	💆 Monitor	🧖 Digital Display		
Display Devices	Color Quality	32 Bit 💌	Rotation	
Display Settings	Screen Resolution	1280 x 1024 💌	Enable Rotation • 0	
Color Correction	Refresh Rate	60 Hertz 💌	90 C 🔽 C 270	)
Hot Keys	Display Expansio		C 180	
(intel)			Advanced Settings	]
3D Settings		ОК	Cancel Ap	ply
Scheme Option	s			

4. Select **Color Correction**, you can adjust the color settings for your display.

Graphics Media Accelerator Driver for mobile	👮 Monitor	🧖 Digital Display	
Display Devices Display Settings	Color: • All	<ul> <li>⊂ Red</li> <li>⊂ Green</li> <li>⊂ Blue</li> </ul>	
Color Correction Hot Keys	Gamma : 1.0 Brightness : 0	1.0 0	5.0
(intel)	Contrast : 50	40 —0————	100 Restore Defaults
3D Settings		ок	Cancel Apply
3D Settings Scheme Option	s		

5. You can also use hot keys to change your display settings. When finished, click **Apply** and then **OK**.

Graphics Media Accelerator Driver for mobile	Hot Keys		
Display Devices	Enable Hot Keys		
	Action	Hot Keys	^
Display Settings	Enable Monitor	<ctrl><alt>F1</alt></ctrl>	
	Enable Digital Display	<ctrl><alt>F4</alt></ctrl>	
01 0 C	Enable/Disable Panel Fitting	<ctrl><alt>F11</alt></ctrl>	
Color Correction	Open Graphics Properties Application	<ctrl><alt>F12</alt></ctrl>	
	Rotate to Normal	<ctrl><alt>Up</alt></ctrl>	
Hot Keys	Rotate 90 Degrees	<ctrl><alt>Left</alt></ctrl>	
not rejs	Rotate 180 Degrees	<ctrl><alt>Down</alt></ctrl>	~
3D Settings		Restore Def       OK     Cancel	aults Apply
Scheme Options			

## **Changing the Network Settings**

The V2616-XPE computer comes with two network interfaces. Both of the default IP addresses are DHCP. Choose **Start → Control panel → Network Connections** to enter the network settings page. Select the connection and choose **Properties** on the pop-up menu by right-clicking. You can specify the IP address manually or by DHCP. In addition, you can disable or enable either one or both connections with the pop-up menu.

- Local Area Connection Properties ?	Internet Protocol (TCP/IP) Properties	
General Advanced	General Alternate Configuration	
Connect using: B Realtek RTL81688/81118 Family PC Configure	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.	
This connection uses the following items:	<ul> <li>Obtain an IP address automatically</li> </ul>	
	Use the following IP address:	
Install Uninstall Properties	Default gateway:	
Description	Obtain DNS server address automatically	
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.	Use the following DNS server addresses: Preferred DNS server:	
Show icon in notification area when connected Notify me when this connection has limited or no connectivity	Alternate DNS server:	
OK Cance	Cancel	

# **Operating Your V2616-XPE Computer with a Telnet Client**

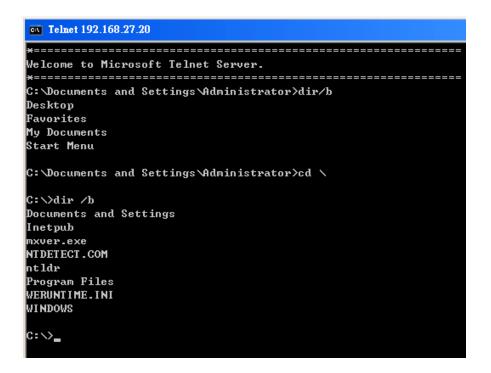
Use a crossover Ethernet cable to connect your development workstation directly to the target computer, or use a straight-through Ethernet cable to connect the computer to a LAN hub or switch. Next, use a telnet client on your development workstation to connect to the Telnet console utility of the target computer. After a connection has been established, type the login name and password as requested to log on to the computer.

After logging in through the Telnet client, a list of commands will be available for operating the computer. Use **HELP** to display all of the commands, or type **HELP** [command name] to display extended help for the selected command. Some of these commands, such as **DATE** and **TIME**, are very useful for managing the computer's system time. Other commands, such as **DIR** and **MKDIR**, are good utilities for file management. For example, to inspect the file structure of the root directory, type **DIR**.

**NOTE:** The default user id is "administrator" and the default password is not set; you need to create a new password for this account to use this telnet client.

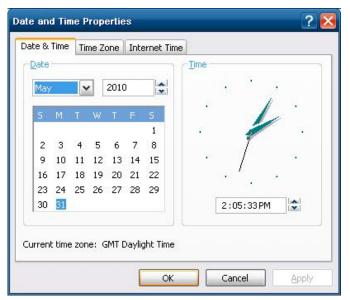
NOTE: There is a connection limitation on using Telnet clients. You are only allowed to create connections with two Telnet clients at the same time.

#### 💌 Telnet 192.168.27.20 Welcome to Microsoft Telnet Service login: administrator password:



## **Adjusting the System Time**

- Setting the System Time Manually: Use the date/time command line utility to query the current system date/time or set a new system date/time.
- Date/Time Control panel: Go to the Control Panel and double click the Date and Time icon.



• SNTP: In the Date and Time Properties window, you can see the NTP server setting.



### Starting and Stopping Services

Select **Start**  $\rightarrow$  **Control Panel**  $\rightarrow$  **Administrative Tools** and double click **Services**. Select and right-click on the service name, and then choose to stop or start.



## Simple Network Management Protocol (SNMP)

To check SNMP agent capabilities on a target V2616-XPE (e.g., suppose the network IP is 192.168.3.127) computer, log on to the workstation computer on which the SNMP manager resides and then type:

#### \> snmpwalk -v 2c -c public 192.168.3.127 system

You will see a series of messages from the SNMP agent on the V2616-XPE computer that allow you to monitor and manage the computer.

## Remote Desktop (RDP)

You can connect to the target V2616-XPE computer remotely by using **Remote Desktop**. Right-click **My Computer** on your desktop, and select **Properties**. Click the **Remote** tab for further configuration.



Make sure that the **Allow users to connect remotely to this computer** checkbox is selected. Next, click **Select Remote Users**, and add the users allowed to connect to your desktop. When finished, click **OK**.

Remote Desktop Users 🛛 🖓 🗙
The users listed below can connect to this computer, and any members of the Administrators group can connect even if they are not listed.
Bruce already has access.
Add <u>R</u> emove
To create new user accounts or add users to other groups, go to Control Panel and open <u>User Accounts</u> .
OK Cancel

### **Serial Ports**

The V2616-XPE computer offers 2 serial ports, which can run RS-232, RS-422 or RS-485 serial interface. From **Control Panel**  $\rightarrow$  **System**  $\rightarrow$  **Hardware**  $\rightarrow$  **Device Manager**, click **Ports (COM & LPT)**, you can see the two serial ports named COM1 and COM2.

🖳 Device Manager	_ 🗆 🖂
檔案(E) 執行(A) 檢視(Y) 説明(H)	
Computer   Disk drives   Disk drives   Display adapters   Display adapters <th></th>	

The V2616-XPE also comes with two internal serial ports onboard, named COM3 and COM4. These two ports are reserved. If you would like to use them, contact Moxa's TS for assistance.

Right-click the port you would like to configure, and then select **Properties**.

Select **Port Settings** tab, you can configure the serial port settings, such as interface, baudrate, (supports up to 921.6 Kbps), data bits, parity, stop bits and flow control method. Click **OK** to finish.

General	Port Settings	Driver	Details		
			Interface:	RS232	•
		E	aud Rate:	9600	•
			Data bits:	8	•
			Parity:	None	•
			Stop bits:	1	•
		Fl	ow control:	None	•

### **Enhanced Write Filter**

The "Enhanced Write Filter" protects the contents of a volume on the target media volume by redirecting all writes to another storage location called on overlay. Use the following steps to enable the Enhanced Write Filter.

- 1. Type **EWFMGR C:** to check if the state of the Enhanced Write Filter is **Disabled**.
- 2. To enable the filter, type EWFMGR C: -enable.
- 3. Reboot the system to activate the change.
- 4. Delete a file on your protected volume and reboot the system; the file you just deleted will appear.

C: Documents and	Settings\Administrator>EWFMGR c:	
Protected Volume	Configuration	
Туре	RAM (REG)	
State	DISABLED	
Boot Command	NO_CMD	
Param1	Ø	
Param2	Ø	
Volume ID	87 34 0E 72 00 02 00 00 00 00 00 00 00 00 00 00	
Device Name	"\Device\Harddisk0\DP(1)0-0+1"	
Max Levels	1	
Clump Size	512	
Current Level	N/A	
Memory used for	r data Ø bytes	
(영화) 공동은 고민이와	mapping 0 bytes	

### **File Based Write Filter**

File-Based Write Filter (FBWF) allows Windows Embedded Standard 2009 to maintain the appearance of read and write access to write sensitive or read only storage. FBWF makes read and write access transparent to applications.

Writing to storage media may be undesirable or impossible in embedded devices. FBWF redirects all writes targeted for protected volumes to a RAM cache called an overlay. In this context, an overlay can be likened to a transparency overlay on an overhead projector. Any change made to the overlay affects the picture as seen in the aggregate, but if the overlay is removed, the underlying picture remains unchanged.

Follow the steps below to enable FBWF:

1. In the command prompt, type **fbwfmgr /displayconfig** to check the current FBWF status. The status



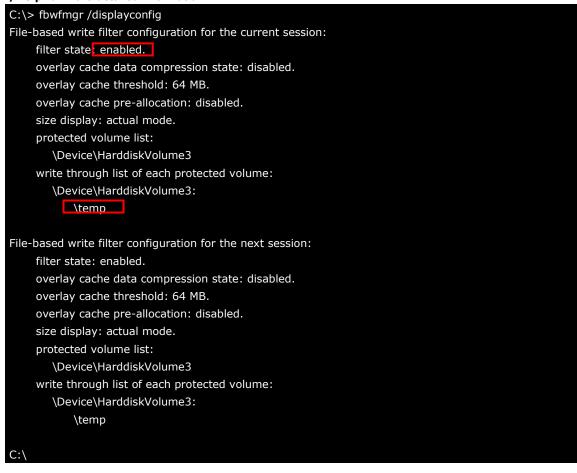
2. Type fbwfmgr /enable to enable FBWF. Reboot the system for the changes to come into effect.

C:\>fbwfmgr /enable

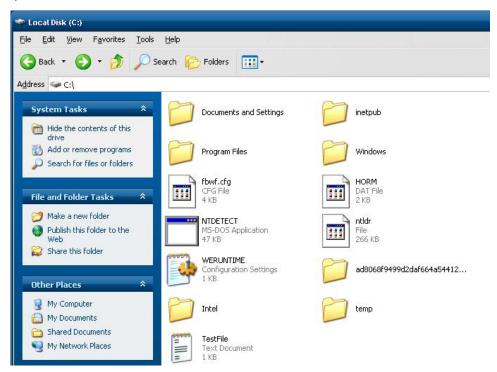
File-based write filter will be enabled on the next reboot.

C:\>

 When the system has rebooted, type **fbwfmgr /displayconfig** in the command prompt again to confirm thatthe status has been changed to **enabled**. The default folder for FBWF will be \temp. Type **fbwfmgr** /help for more detailed information.



4. You may copy a file (in this example, we will use TestFile.txt) to C:\temp and to C:\, and then reboot the system.



5. After rebooting the system, you should see that the file in C:\ has disappeared and that the file in C:\temp remains.

# **Management Tools**

The V2616-XPE ready-to-run embedded computers are shipped with the Windows Embedded Standard 2009 operating system already installed. This network-centric platform is designed to serve as a front-end for data acquisition and industrial control applications. A set of Windows XP management tools are installed on the V2616-XPE computer to resolve management issues.

The following topics are covered in this chapter:

- Computer Management
- Component Services
- Event Viewer
- Internet Information Services (Web/FTP)
- ODBC Data Source Administrator
- Performance Monitor

### **Computer Management**

[Control Panel]  $\rightarrow$  [Administrative Tools]  $\rightarrow$  Computer Management.

You can use the tools for a variety of tasks, such as disk partition, disk mount/dismount, and create/remove users.

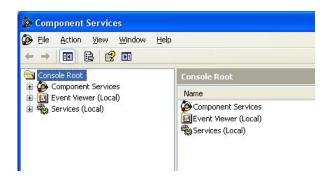
You can also check services in the Computer Management window.



## **Component Services**

[Control Panel] → [Administrative Tools] → Component Services.

You can install/view/remove COM components with this tool.



## **Event Viewer**

#### [Control Panel] $\rightarrow$ [Administrative Tools] $\rightarrow$ Event Viewer.

Every V2616-XPE event, including system, applications, and security events are logged in this event database.

File Action View Help				
← → 🖪 🔂 🔗	Event Viewer (Local)			-0.
Application	Name	Туре	Description	Size
Security	Application	Log	Application Error Records	64.0 KB
System	Security	Log	Security Audit Records	64.0 KB
	関 System	Log	System Error Records	64.0 KB

### **Internet Information Services (Web/FTP)**

[Control Panel]  $\rightarrow$  [Administrative Tools]  $\rightarrow$  Internet Information Services.

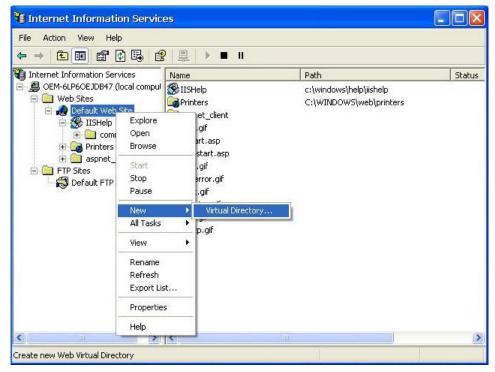
If you need to set up Web or FTP, you must use this tool for configuration purposes, and you can also start/stop HTTP/FTP services.

🐐 Internet Information Service	es			
<u>File Action View H</u> elp				
← → 🖪 🗟 😫 →	<b>I</b> II			
1 Internet Information Services	Computer	Local	Version	Sta
主… 🗿 OEM-YTK0GJTQINS (local compul	SOEM-YTKOGJTQINS (local computer)	Yes	IIS V5.1	

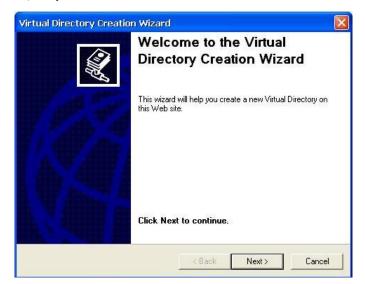
A default web page is located in the directory **c:\Inetpub**. Use this default page to test your web server.

Follow the steps shown below to create the virtual directory.

1. Create a virtual directory by selecting **Default Web Site** → **New** → **Virtual Directory.** 

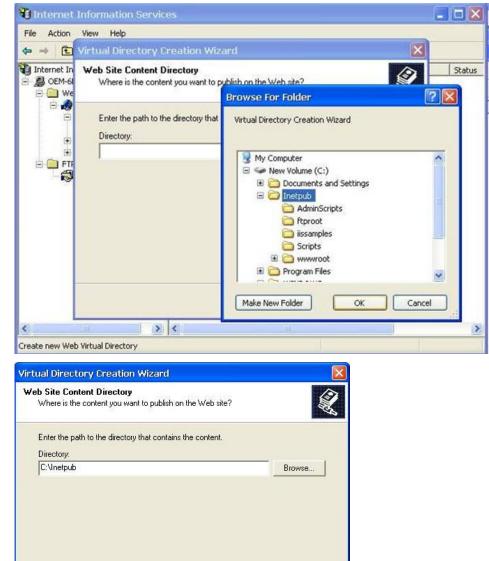


2. Follow the virtual directory creation wizard and complete the steps to create the virtual directory c:\Inetpub.



Virtual Directory Creation Wizard	X
Virtual Directory Alias You must give the virtual directory a short name, or alias, for quick refere	ence.
Type the alias you want to use to gain access to this Web virtual direct same naming conventions that you would for naming a directory.	ory. Use the
Alias:	
<back next=""></back>	Cancel

3. Type the alias into the text box. Click **Next** to continue.

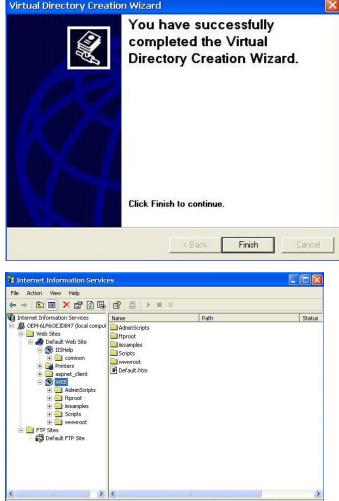


Next>

Cancel

< Back



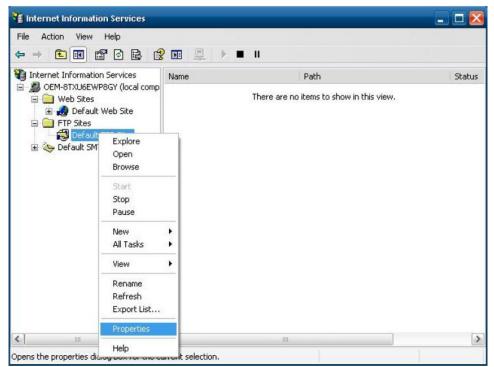


- 4. When you complete the steps, the virtual directory **WEB** will appear under **Default WEB Site**.
- 5. On your desktop, type [IP Address]/WEB/Default.htm

(e.g., 192.168.1.127/WEB/Default.htm). The following message will appear. The steps are indicated in the following sequence of diagrams.



6. If you need to use the FTP server, you must create the default password for your account and turn on the write permission on your home directory located in c:\intepub\ftproot. Select FTP Sites → Default FTP Site → Properties → Home Directory, and checkmark the Write checkbox. You should now be able to transmit files through the ftp server.

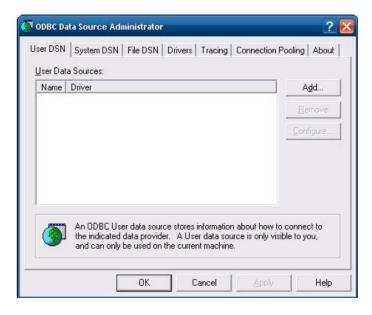


FTP Site	Security A	ccounts	Messages	Home Directory	
When c	onnecting to	this reso	ource, the co	ntent should come	e from:
		💿 a dire	ectory locate	d on this compute	0
			are jocated o	on another comput	er
	ite Directory	-	110 1		<u> </u>
Loca	al Path:	c:\inetp	oub/ftproot		Browse
		Rea	d		
		Vrite	э		
		🗹 Log	<u>v</u> isits		
Direct	ory Listing SI	tyle			
0	UNI <u>X</u> ®				
0	M <u>S</u> -DOS ®				
		-		Cancel	Apply H

## **ODBC Data Source Administrator**

#### [Control Panel] → [Administrative Tools] → Data Sources (ODBC)

This database source configuration tool is for users to add, delete, or set up the data source, and then display information about the installed ODBS drivers. You can create a new data source or trace the calls to ODBC functions.



## **Performance Monitor**

**[Control Panel]**  $\rightarrow$  **[Administrative Tools]**  $\rightarrow$  **Performance.** You can use this tool to monitor system and network resources.

i Performance		- 🗆 🔀
<ul> <li>Eile Action View Favorites</li> <li>         ← →</li></ul>	<u>Window</u> Help	_ & ×
Console Root	Image: Image	
	1.000 Pages/sec Memory \     100 Avg. Disk QuTotal Physic \	0.000 1:40 Computer \OEM-8TX \OEM-8TX \OEM-8TX

# **System Recovery**

The V2616-XPE ready-to-run embedded computers are a Windows Embedded Standard 2009 platform. This chapter describes the recovery process in the event of system instability.

The following topics are covered in this chapter:

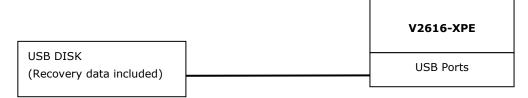
- Recovery Environment
- □ Recovery Procedure
- Saving the System to the USB Drive

## **Recovery Environment**

The environment includes a V2616-XPE embedded computer and a bootable USB disk with the recovery programs and system image file.

#### Hardware

The hardware used includes a PC, a V2616-XPE computer and a USB disk with the recovery programs. (Note: The USB disk should be at least 2GB.).



## **Recovery Procedure**

#### Step 1: Prepare your USB drive

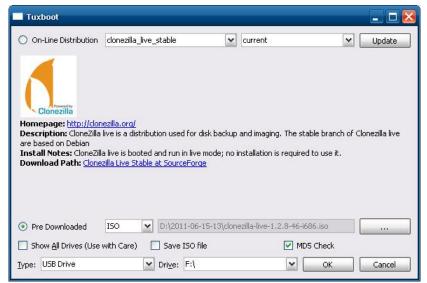
 Execute tuxboot-windows-23.exe from the utility\_tools/CloneZilla folder on the Software CD, select Pre Download, and then click "..."

Tuxboot						🛛
On-Line Distribution	clonezilla_live_	stable	Current		<b>.</b>	Update
Homepage: http://clon Description: CloneZilla are based on Debian Install Notes: CloneZill. Download Path: CloneZill.	live is a distribu a live is booted	and run in live mo	· · · · · · · · · · · · · · · · · · ·			nezilla live
• Pre Downloaded	ISO 💌					
Show <u>A</u> ll Drives (Use <u>Type</u> : USB Drive	with Care) 🛛 🚺	Save ISO file Dri⊻e: F:\		MD5 Check		Cancel

2. Select the ISO file in the directory.

pen Disk Image	File					?
Look jn:	2011-06-15	-13	•	🗢 🔁	-11 1	
My Recent Documents	THE REPORT OF THE PARTY OF THE	9-1.2.8-46-i686.iso				
Desktop						
My Documents						
My Network Places	File <u>n</u> ame:	clonezilla-live-1.2.8-46-i68	6		<u> </u>	<u>O</u> pen
	Files of type:	All Files (*.iso *.zip *.img *.	az * bz2 *	tar * 7 * Izh	-	Cancel

3. Select **USB Drive** type, select a **Drive**, and then click **OK** to continue.



4. The boot files will be copied to your USB drive.

Tuxboot	_ 🗆 🔀
1. Downloading Files (Done)	
2. Extracting and Copying Files (Current)	
3. Installing Bootloader	
4. Installation Complete, Reboot	
Extracting files, please wait	
Archive: D:\2011-06-15-13\clonezilla-live-1.2.8-46-i686.iso	
Source: EFI\boot\bootx64.efi (694 KB)	
Destination: F:\EFI\boot\bootx64.efi	
Extracted: 3 of 36 files	
	8%

5. When finished, click **Exit** to stop the program.

Tuxboot	_ 🗆 🔀
1. Downloading Files (Done)	
2. Extracting and Copying Files (Done)	
3. Installing Bootloader (Done)	
4. Installation Complete, Reboot (Current)	
After rebooting, select the USB boot option in the BIOS boot menu. Reboot now?	
Reboot Now	Exit
KCDOC NOW	

Manually copy the xpe\_savedisk directory from the /recovery folder on the Software CD to \home\partimag\ on the USB drive.

#### **Step 2: Change the BIOS Settings**

You will need to change the BIOS settings to boot from the USB disk.

1. Turn on the computer and press **DEL** to enter the BIOS setup menu. Select **Hard Disk Boot Priority** and then press **Enter**.

	k - AwardBIOS CMOS Setup Ut 11s Power HW Monitor Def	
<ul> <li>Hard Disk Boot Priority First Boot Device Second Boot Device Third Boot Device Boot Other Device</li> <li>Advanced BIOS Features</li> <li>Advanced Chipset Feature</li> <li>PnP/PCI Configurations</li> </ul>	[CDROM] [Hard Disk] [Removable] [Enabled]	Item Help Menu Level ► Select Hard Disk Boot Device Priority
		ESC:Exit F1:General Help F7:Turbo Settings

 Select USB disk and then press "+" to move it to the first boot device position and then make sure your newly installed Compact Flash card is the second boot device.

Phoenix - AwardBIOS CMOS Setup Utility Advanced			
Hard Disk Boot Priority	Item Help		
<ol> <li>JSB-HDD0 : SD/MMC Card Reader</li> <li>Ch0 M. : AFAYA MDM 1G</li> <li>Ch0 S. : AFAYA CF 256M</li> <li>Bootable Add-in Cards</li> </ol>	Menu Level ► Use <1> or <4> to select a device, the press <+> to move it up, or <-> to move i down the list. Press <esc> to exit this menu.</esc>		
↑↓:Move PU/PD/+/-:Change Priority F5:Previous Values F6:System Default			

3. Press **F10** and then press **Enter** to save and exit bios setup.

#### Step 3: Restore the system from USB drive

Connect the USB disk to any of the V2616-XPE's USB ports and then reboot the computer. The system will boot from the USB disk and the Pre-installation Environment and the recovery utility will appear.

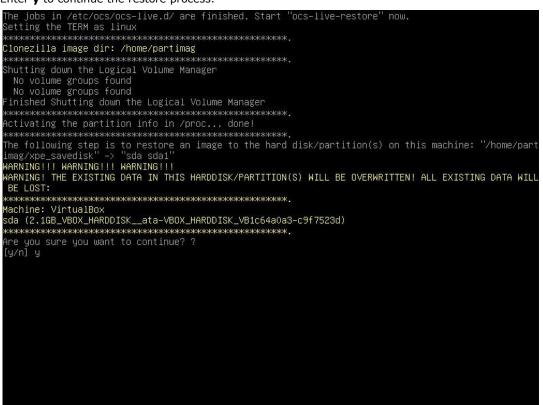
1. Select clonezilla live restore disk.



2. Wait for the USB drive boot process to finish.

[ 5.153522] sd 0:0:0:0: Isdal Attached SCSI disk
[ 5.163726] sd 0:0:1:0: Isdal Attached SCSI disk
[ 5.163726] sd 0:0:1:0: Attached SCSI generic sg1 type 0
[ 5.310750] sd 0:0:1:0: Attached scsi generic sg1 type 0
[ 5.334915] sr 1:0:0:0: Attached scsi generic sg1 type 5
Begin: Loading essential drivers ... [ 5.69577] Attacos(R) L2 Ethernet Driver - version 2.2.3
[ 5.692430] Copyright (c) 2007 Atheros Corporation.
[ 5.77270] Broadcom NetXtreme II 5771x 10Gigabit Ethernet Driver bnx2x 1.62.00-6 (2011/01/30)
[ 5.914014] Btrfs loaded
[ 5.955475] device-mapper: uevent: version 1.0.3
[ 5.955475] device-mapper: uevent: version 1.0.3
[ 5.955475] device-mapper: iotl: 4.19.1-ioctl (2011-01-07) initialised: dm-devel@redhat.com
dome.
Begin: Rumning /scripts/init-premount ... done.
Begin: Mounting root file system ... [ 6.178946] Uniform Multi-Platform E-IDE driver
[ 6.913744] PAT: utf8 is not a recommended 10 charset for FAT filesystems, filesystem will be cas
e sensitive!
[ 7.047997] aufs: nodule is from the staging directory, the quality is unknown, you have been war
med.
[ 7.072516] aufs 2.1-standalone.tree-38-rcN-20110228
Begin: Rumning /scripts/live-premount ... done.
[ 7.09770] squashfs: version 4.0 (2009/01/31) Phillip Lougher
Begin: Rumning /scripts/live-premount ... done.
Begin: Rumning /scripts/live-realpremount ... done.
Begin: Rumning /scripts/live-premount ... done.
Begin: Rumning /scripts/live-tottom
... done.
Begin: Ru

3. Enter **y** to continue the restore process.



4. Enter y to confirm again.

```
lve.d∕ are finished. Start "ocs−live–restore" now.
Setting the TERM as linux
Clonezilla image dir: /home/partimag
 *****
hutting down the Logical Volume Manager
No volume groups found
No volume groups found
inished Shutting down the Logical Volume Manager
                                                жжжж.
ctivating the partition info in /proc... done!
    ****
                                                жжжж
BE LOST:
******
Achine: VirtualBox
sda (2.1GB_VBOX_HARDDISK__ata-VBOX_HARDDISK_VB1c64a0a3-c9f7523d)
***
Are gou sure gou want to continue? ?
[y/n] y
CK, let's do it!!
This program is not started by clonezilla server.
The following step is to restore an image to the hard disk/partition(s) on this machine: "/home/part
imag/xpe_savedisk" -> "sda (sda1)"
WARNING!!! WARNING!!! WARNING!!!
WARNING! THE EXISTING DATA IN THIS HARDDISK/PARTITION(S) WILL BE OVERWRITTEN! ALL EXISTING DATA WILL
BE LOST:
    Machine: VirtualBox
sda (2.1GB_VBOX_HARDDISK__ata-VBOX_HARDDISK_VB1c64a0a3–c9f7523d)
***
```

5. Wait for the process to finish.

Partclone v0.2.23 http://partclone.org Starting to restore image (-) to device (/dev/sda1) Calculating bitmap Please wait done! File system: NTFS Device size: 2.1 GB Space in use: 1.7 GB Free Space: 325.4 MB Block size: 2048 Byte Used block : 849156	
Elapsed: 00:00:42 Remaining: 00:04:03 Rate: 366.11MB/min	
15%	14.74%

6. Select (0) **Poweroff** to power off the computer.



7. Remove the USB drive after the computer has been powered off.

#### Step 4: Change the BIOS Settings to Boot from the Original Disk

Now you will need to change the boot priority so that it can boot from the original disk. As the system reboots, press **DEL** to enter the BIOS setup menu.

1. Select Hard Disk Boot Priority and then press Enter. Make sure the hard disk has first boot priority.

Phoenix - AwardBIOS CMOS Setup Utility		
Advanced Advanced		
Hard Disk Boot Priority	Item Help	
<ol> <li>Ch0 M. : AFAYA MDM 1G</li> <li>USB-HDD0 : SD/MMC Card Reader</li> <li>Ch0 S. : AFAYA CF 256M</li> <li>Bootable Add-in Cards</li> </ol>	Menu Level Use <↑> or <↓> to select a device , then press <+> to move it up , or <-> to move it down the list. Press <esc> to exit this menu.</esc>	
↑↓:Move PU/PD/+/-:Change Priority F10:3 F5:Previous Values F6:System Defaults I	Gave ESC:Exit 77:Turbo Defaults	

2. Press **F10** and then press **Enter** to save and exit BIOS settings.

#### **Step 5: Reboot the Computer**

You need to wait about 10 to 15 minutes for the system to restart, since the system configuration files will be initiated while booting up for the first time. **Do not turn off the computer or shut down the computer** while the system is restarting; otherwise, the IIS service will be terminated. When the operating system has successfully launched, you will need to restart your computer so that the new settings can be activated.

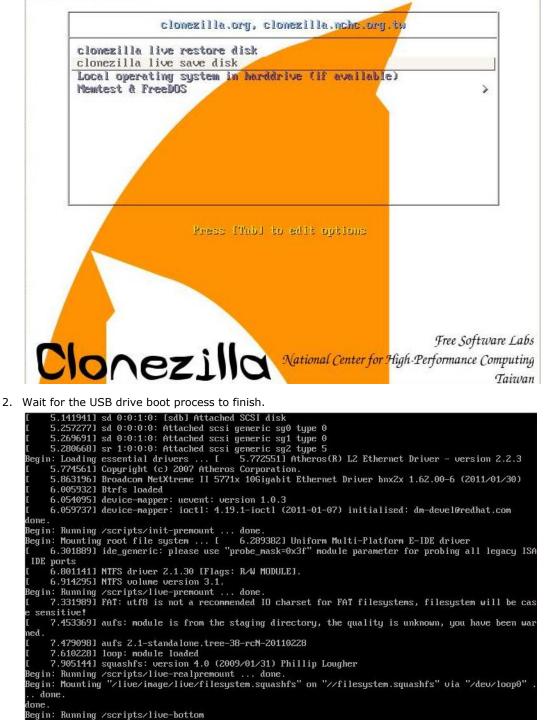


#### Saving the System to the USB Drive

You may also save the current system to the USB drive for system recovery in case the system crashes. Before saving the system to the USB drive, we suggest you remove all files under \home\partimag\ on the USB drive. In addition, change the BIOS settings to make the USB drive the first boot priority.

When the system has been launched, take the following steps.

1. Select clonezilla live save disk.



- ... Begin: Configuring fstab ... done.

- Begin: Preconfiguring networking ... dome. Begin: Loading preseed file ... dome. Begin: Running /scripts/init-bottom ... dome. INIT: version 2.88 booting Using makefile-style concurrent boot in runlevel S.

#### 3. Enter **y** to continue.

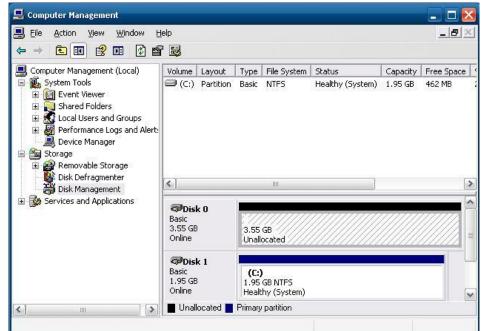
4. Wait for the process to finish.

5. Select (0) Poweroff so that the computer will power off when the process is finished.

## How to Partition a New SATA Disk Drive

The V2616-XPE computer comes with pre-installed Windows XP Embedded platform. As some new hard disk drives may not be detected by the computer, this chapter describes how to format the new SATA disk drive when users cannot find the hard disk on the computer.

1. Right-click My Computer on the desktop, select Manage, and then select Disk Management.



2. Right-click the unallocated section and then select New Partition.

B File Action View Window H	elp			_82
⇔ → € 🗷 😫 🖬 🔮 📽				
🖳 Computer Management (Local) 🖃 🌇 System Tools	Volume Layout	Type File System Basic NTFS	Status Healthy (System)	Capacity Free Space 1.95 GB 462 MB
Event Viewer     Shared Folders     Shared Folders     Local Users and Groups     Device Manager     Storage     Removable Storage     Disk Defragmenter     Disk Defragmenter     Disk Management	٤	int -		
<ul> <li>Bisk Management</li> <li>Services and Applications</li> </ul>	Contraction Contractico Contra	3.55 GB Unallocated		New Partition
	Disk 1 Basic 1.95 GB Online	(C:) 1.95 GB NTFS Healthy (System)		Properties Help
() III ()		Primary partition		

3. Click Next.

New Partition Wizard	
	Welcome to the New Partition Wizard This wizard helps you create a partition on a basic disk. A basic disk is a physical disk that contains primary partitions, extended partitions, and logical drives. You can use any version of Windows or MS-DOS to gain access to partitions on basic disks. To continue, click Next.
	K Back Next > Cancel

4. Select **Primary partition** and then click **Next.** 

ew Parti	tion Wizard
	t Partition Type lere are three types of partitions: primary, extended, and logical.
Se	lect the partition you want to create:
	Primary partition
	○ Extended partition
	O Logical drive
	Description
	A primary partition is a volume you create using free space on a basic disk. Windows and other operating systems can start from a primary partition. You can create up to four primary partitions or three primary partitions and an extended partition.
	< <u>B</u> ack Next≻ Cancel

5. Accept the default value and then click **Next**.

ew Partition Wizard Specify Partition Size Choose a partition size that is between the	e maximum and minimum sizes.
Maxium disk space in megabytes (MB): Minimum disk space in MB: Partition size in MB:	3638 4 
	< Back Next > Cancel

6. Select the drive letter for the hard disk drive and then click **Next**.

New Partition Wizard
Assign Drive Letter or Path For easier access, you can assign a drive letter or drive path to your partition.
<ul> <li>▲ssign the following drive letter:</li> <li>Mount in the following empty NTFS folder:</li> <li>■ Browse</li> <li>● Do not assign a drive letter or drive path</li> </ul>
< <u>B</u> ack <u>N</u> ext > Cancel

7. Select **Perform a quick format** option and then click **Next**.

		Þ
u must format it first.		Ŷ
nat this partition, and if	so, what settings you war	nt to use.
ne following settings:		
NTFS	~	
Default	<b>~</b>	
New Volume		
at		
r compression		
< <u>B</u> ack	k <u>N</u> ext>	Cancel
	ne following settings: NTFS Default New Volume at compression	nat this partition, and if so, what settings you war ne following settings: NTFS Default New Volume at r compression

8. Click Finish.

Completing the New Partition Wizard You have successfully completed the New Partition Wizard.
You selected the following settings:
Partition type: Primary partition Disk selected: Disk 0 Partition size: 3638 MB Drive letter or path: D: File system: NTFS Allocation unit size: Default Volume label: New Volume Durick format: Yes
To close this wizard, click Finish.
< <u>B</u> ack Finish Cancel

9. Right-click **New Volume** and select **Mark Partition as Active** to activate the new partition of the hard drive.

1	📕 Computer Management							X
1	📕 File Action View Window He	ip 🖻 🗲 🔍 😼					_ 8	×
	Event Viewer     Shared Folders     Shared Folders     Socal Users and Groups     Socal Users and Groups     Socal Performance Logs and Alert:	Volume (C:) New Volume (D:)	Layout Partition Partition	Basic	File System NTFS NTFS	Status Healthy (System) Healthy	Capacity 1.95 GB 3.55 GB	Fr 46 3.
	Bevice Manager     Storage     Storage     Bemovable Storage     Disk Defragmenter     Disk Management     Services and Applications	≪ ] @Disk 0 Basic				]		>
		3.55 GB Online	New Volu 3,55 GB N Healthy	ittes (C	);) ///////////////////////////////////	Ope Expl		
		Contraction Contractica Contra	<b>(C:)</b> 1.95 GB N Healthy (S			Char	Partition a nge Drive Le nat	s Active atter and Paths
[	< N	Primary partition				Dele	te Partition	993
L						Prop	erties	
						Help	2	

The disk partition process is now complete, and the new disk drives can be used on this V2616 computer.

# **RAID 0/1 Function Configuration**

The V2616-XPE computers have two storage trays that allow users to install two 2.5-inch SATA hard disks, and support RAIA 0 and RAID 1 functions for data backup and recovery. Before using the RAID functions, you need to install two SATA hard disks with the same capacity in the V2616-XPE computer.

The following topics are covered in this appendix:

- **Configuring the RAID 0 Function**
- Configuring the RAID 1 Function

## **Configuring the RAID 0 Function**

- 1. Power on the device.
- 2. Launch the **Intel Rapid Storage Technology** program from the right-bottom corner of the desktop.
- 3. Press the Create button, select the Real-time data protection (RAIDO) option, and then click Next.

🔁 Intel® Rapid Storage Tech	nology	
Status Create	Manage Preferences	intel
1. Select         2. Configure         3. Confirm	Select Volume Type <ul> <li>Flexible data protection (Recovery)</li> <li>Real-time data protection (RAID 1)</li> <li>Optimized disk performance (RAID 0)</li> </ul>	Protection Performance Capacity Combine two to six disks to create a volume where data is broken down into strips that are distributed across all disks.
	Next	More help on this page

4. Enter the volume name.

🔁 Intel® Rapid Storage Tech	nology		_ 🗆 🛛
Status	Manage		(intel)
1. Select	Configure Volume		
2. Configure	Name: RAID-0	Array_0000	
3. Confirm	Select two to six disks: ⑦ Disk on port 1 (59 GB) Disk on port 5 (7 GB) Minimum selection required		RAID-0 Type: RAID 0 0 GB
	Advanced	t	
	Back Next Cancel		More help on this page

- 5. Use the following settings to save the data to another disk.
  - a. Select the disks installed on the computer.
  - b. Select if you would like to keep data from one of the selected disks.
  - c. Specify the volume size by adjusting the scrollbar.
  - d. Determine the data strip size.

When finished, click **Next** to continue.

🚭 Intel® Rapid Storage Tech	nnology	- D 🔀
Status	Manage	(intel)
1. Select	Configure Volume	
2. Configure	Name: RAID-0	Array_0000
3. Confirm	Select two to six disks: ⑦ ✓ Disk on port 1 (59 GB) ✓ Disk on port 5 (7 GB)	59 GB RAID-0 Type: RAID 0 15 GB
	Do you want to keep data from one of the selected disks? Yes: Disk on port 1 (59 GB) Yes: Disk on port 5 (7 GB) No	7 GB
	Specify the volume size: Volume size: 15,254 MB Array allocation:	
	<ul> <li>Advanced</li> <li>Data strip size: 128 KB ▼</li> <li>✓ Enable volume write-back cache </li> </ul>	
	Back Next Cancel	More help on this page

6. Confirm the settings and then click **Create Volume**.

🔁 Intel® Rapid Storage Tech	nology	_ 🗆 🔀
Status Create	Manage	(intel)
1. Select 2. Configure 3. Confirm	<ul> <li>Confirm Volume Creation</li> <li>Review the selected configuration.</li> <li>WARNING: Completing this action will permanently delete existing data on the following disks. Back up data before continuing.</li> <li>* Disk on port 1 (59 GB)</li> <li>This process could take a while depending on the number and size of the disks. You can continue using other applications during this time.</li> </ul>	Array_0000
	Back Create Volume Cancel	More help on this page

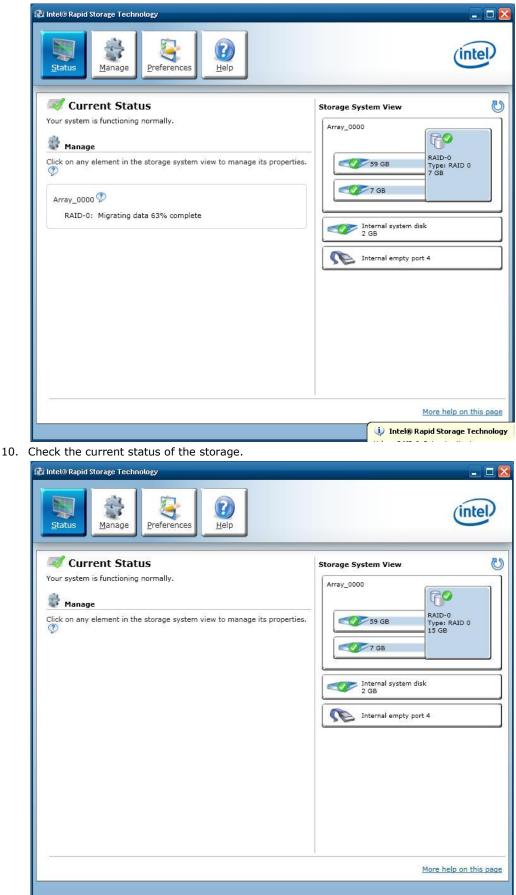
7. Make sure you want to continue, and then click **OK**.

🔁 Intel® Rapid Storage Tech	nology	_ 🗆 🗙
Status Create	Manage Preferences	intel
1. Select 2. Configure 3. Confirm	Confirm Volume Creation Review the selected configuration. WARNING: Completing this action will permanently delete existing data on the irm Volume Creation	Array_0000 RAID-0 Type: RAID 0 X 15 GB
An E	volume creation     e you sure you want to continue?     WARNING: Completing this action will permaner     following disks. Back up data before continuing.     * Disk on port 1 (59 GB)     pre help	ntly delete existing data on the
	Back Create Volume Cancel	More help on this page

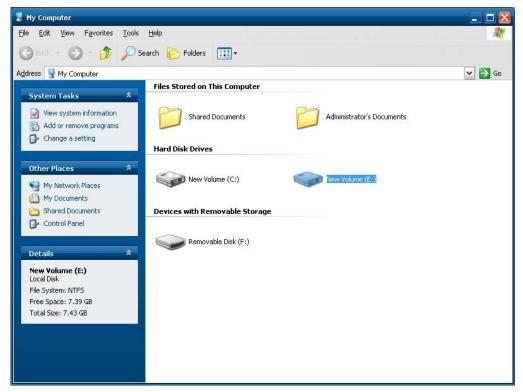
8. Click  ${\bf OK}$  when volume creation is complete.

Intel® Rapid Storage Te	echnology	_   >
Status Manag	e Preferences Help	(intel)
1. Select 2. Configure 3. Confirm	Confirm Volume Creation Review the selected configuration. WARNING: Completing this action will permanently delete existing data on the following disks. Back up data before eation Complete	Array_0000 RAID-0 Type: RAID 0
Once recog partit	ume was created successfully. the migration is complete, you will need to restart you nize the new volume size. Also, you will need to exter ion to utilize any new volume space, using Windows D other applications during the migration.	nd the existing partition or create a new
	Back Create Volume Cancel	More help on this page

9. Wait for the migrating process to finish.



11. Double-click **My Computer** on the desktop and check if two disks have been combined.



12. If the disk size in disk manager is not correct, you will need to reboot the computer to get the correct disk size.

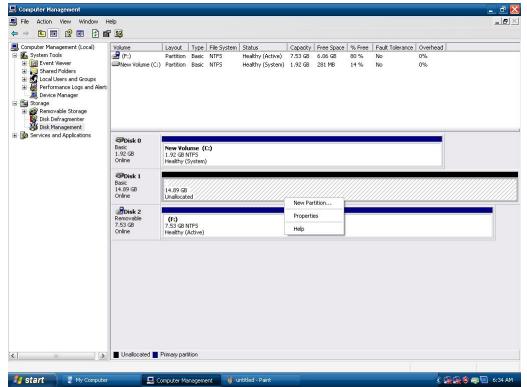
📙 Computer Management										_ 7
📕 Eile Action Yiew Window He	elp									_8>
	ļ									
Event Viewer     Event     Event Viewer     Event Viewer     Event Viewer     Event Vi	Volume Vew Volume (C:) New Volume (E:)	Partition Basic Partition Basic	NTES	Status Healthy (Active) Healthy (System) Healthy	7.53 GB	6.06 GB 281 MB	% Free 80 % 14 % 99 %	Fault Tolerance No No No	0% 0% 0% 0%	
- ﷺ Disk Management ⊞ ﷺ Services and Applications	Poisk 0       Basic       1.92 GB       Online       Poisk 2       Removable       7.53 GB       Online       Poisk 3       Basic       7.44 GB       Online	New Yolume (C 1.92 GB NTF5 Healthy (System) (F:) 7.53 GB NTF5 Healthy (Active) New Yolume (E 7.44 GB NTF5 Healthy								
<	Primary partition									

📕 Computer Management											_ 7 🔀
📕 File Action View Window H	elp										
🗢 → 🖻 🖬 😫 🗙	📽 🚅 🔯										
Computer Management (Local)  Computer Management (Local)  Computer Tools  Computer Newer  Computer Shared Folders  Cocal Users and Groups  Computer Manager  Device Manager  Computer Storage  Computer Storage	Volume (F;) New Volume (C:) New Volume (E:)	Partition Partition	Basic   Basic	NTES	Status Healthy (Active) Healthy (System) Healthy	7.53 GB	Free Space 6.06 GB 281 MB 7.40 GB	% Free 80 % 14 % 99 %	Fault Tolerance No No No	Overhead 0% 0% 0%	
Disk Defragmenter	Colored Color	New Yolu 1.92 GB N Healthy (S New Yolu 7.44 GB N Healthy	TFS ystem) me (E:)	-				7.45 GB			
	Bisk 2 Removable 7.53 GB Online	<b>(F:)</b> 7.53 GB N Healthy (A									
		Drimovu o	inn								
< N	📕 Unallocated 📕	rimary partit	tion								

13. Right-click the disk and re-configure the disk size by selecting **Delete Partition**.

	Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free	Fault Tolerance	Overhead	
System Tools     S		Partition Partition	Basic Basic	NTFS NTFS	Healthy (Active) Healthy (System) Healthy	7.53 GB 1.92 GB 7.44 GB	6.06 GB 281 MB	80 % 14 % 99 %	No No	0% 0%	
Bisk Management Services and Applications	Image: Constraint of the second se	New Volu 1.92 GB N Healthy (S	TFS	:)							
Basic 14.89 GB Online	Basic 14.89 GB Online	New Volu 7.44 GB N Healthy	ime (E: TFS	•)/////////////////////////////////////		Open Explor					
	Removable 7.53 GB	<b>(F:)</b> 7.53 GB N Healthy (A				Mark F Chang Forma					
						1.22.0	e Partition				
						Prope	rties				
	Unallocated <b>1</b>										

14. Right-click the disk again, and then select New Partition.



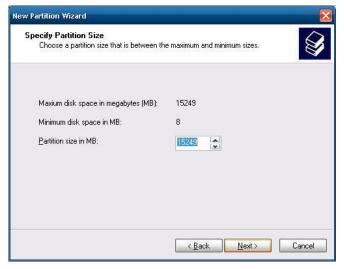
15. Follow the instructions of the New Partition Wizard, and then click Next to continue.

New Partition Wizard	
	Welcome to the New Partition Wizard This wizard helps you create a partition on a basic disk. A basic disk is a physical disk that contains primary partitions, extended partitions, and logical drives. You can use any version of Windows or MS-DOS to gain access to partitions on basic disks. To continue, click Next.
	K Back Next > Cancel

16. Select Primary partition.

New Partition Wizard	
Select Partition Type There are three types of partitions: prim	nary, extended, and logical.
Select the partition you want to create:	R
Primary partition	
◯ <u>E</u> xtended partition	
◯ Logical drive	
Description	
Windows and other operating syste	create using free space on a basic disk. ms can start from a primary partition. You can or three primary partitions and an extended
	< <u>B</u> ack <u>N</u> ext > Cancel

17. Enter the partition size in the field, and then click **Next** to continue.



18. Select Assign the following drive letter, and then click Next to continue.

v Partition Wizard	
Assign Drive Letter or Path For easier access, you can assign a drive let	ter or drive path to your partition.
<ul> <li>Assign the following drive letter;</li> <li>Mount in the following empty NTFS folder</li> <li>Do not assign a drive letter or drive path</li> </ul>	D V

- 19. Select Format this partition with the following settings.
  - a. File system: NTFT.
  - b. Allocation unit size: Default.
  - c. Volume label: New Volume (the default value).
  - d. Checkmark Perform a quick format.

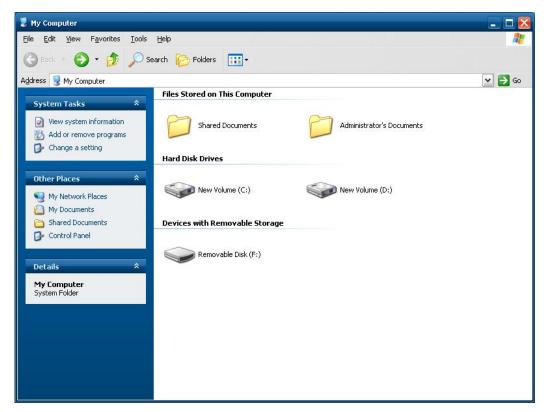
Choose whether you want to for	nat this partition, and if	so, what settings you v	vant to use.
ODo not format this partition			
Format this partition with the second sec	e following settings:		
<u>F</u> ile system:	NTFS	~	
Allocation unit size:	Default	~	
⊻olume label:	New Volume		
Perform a quick form	iat		
<u>Enable file and folde</u>	r compression		

20. Click Finish to close the New Partition Wizard.

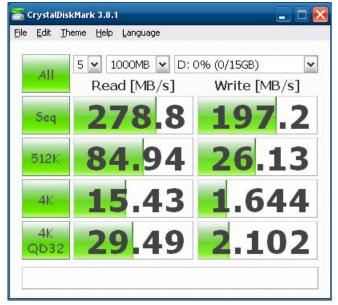
New Partition Wizard		$\mathbf{X}$
	Completing the New Partition Wizard You have successfully completed the New Partition Wizard.	
	You selected the following settings:	
	Partition type: Primary partition Disk selected Disk 1 Partition size: 15249 MB Drive letter or path D: File system: NTFS Allocation unit size: Default Volume labet: New Volume Durck format Yes	
	To close this wizard, click Finish.	
	< <u>B</u> ack Finish Cance	:

21. When finished, you may check the disk status via disk management or My Computer.

📕 Computer Management											_ 7 🔀
📕 Eile Action View Window Help	)										X
	5 <b>0</b>										
Computer Management (Local)	/olume	Layout	Туре	File System	Status	Capacity	Free Space	% Free	Fault Tolerance	· Overhead	
🖃 🌇 System Tools	🖥 (F:)	Partition	Basic	NTFS	Healthy (Active)	7.53 GB	6.06 GB	80 %	No	0%	
	∍New Volume (C:)				Healthy (System)			14 %	No	0%	
	■New Volume (D:)	Partition	Basic	NTFS	Healthy	14.89	14.83 GB	99 %	No	0%	
🕀 🌆 Performance Logs and Alert:											
🦳 🔜 Device Manager											
🖃 🎦 Storage 🕀 🈭 Removable Storage											
Bisk Defragmenter											
Disk Defragmenter											
🗄 🌆 Services and Applications	@Disk 0										
	Basic 1.92 GB	New Volu 1.92 GB N	ime (C	:)							
	Online	Healthy (S									
	@Disk 1										
E	Basic	New Yolu	ıme (D	:)							
	14.89 GB Online	14.89 GB Healthy	NTFS								
		risaicity									
	Boisk 2	(= )									
1	7.53 GB	(F:) 7.53 GB N									
	Online	Healthy (A	Active)								
	Primary partition										
											1



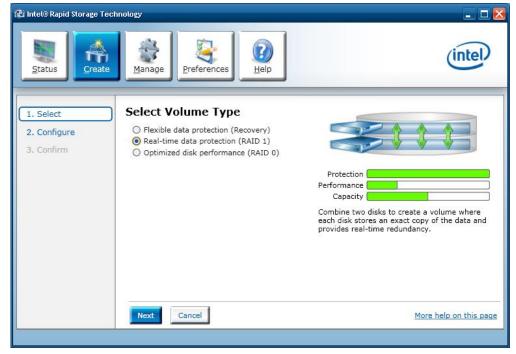
22. Check the disk performance with the CrystalDisk Mark Tool.



### **Configuring the RAID 1 Function**

- 1. Power on the device.
- 2. Launch the Intel Rapid Storage Technology program from the right-bottom coroner of the desktop.

3. Press the Create button, select the Real-time data protection (RAID1) option, and then click Next.



- 4. Configure the following settings:
  - a. Select two disks.
  - b. Select **Yes** to keep data from one of the selected disks.
  - c. Checkmark Enable volume write-back cache.

When finished, click **Next** to continue.

🔁 Intel® Rapid Storage Tech	nology	🛛 🔀
Status	Manage	intel
1. Select	Configure Volume	
2. Configure	Name: Volume_0000	Array_0000
3. Confirm	Select two disks: ② ✓ Disk on port 1 (59 GB) ✓ Disk on port 5 (7 GB)	Volume_0000 Type: RAID 1 7 GB
	Do you want to keep data from one of the selected disks?	7 GB
	<ul> <li>Yes: Disk on port 1 (59 GB)</li> <li>Yes: Disk on port 5 (7 GB)</li> <li>No</li> </ul>	
	<ul> <li>✓ Advanced</li> <li>✓ Enable volume write-back cache </li> </ul>	
	Back Next Cancel	More help on this page

5. For the next step, click **Create Volume** to continue.

🔁 Intel® Rapid Storage Tech	nology	_ 🗆 🖂
Status	Manage	(intel)
1. Select 2. Configure 3. Confirm	Confirm Volume Creation Review the selected configuration. WARNING: Completing this action will permanently delete existing data on the following disks. Back up data before continuing. * Disk on port 1 (59 GB) This process could take a while depending on the number and size of the disks. You can continue using other applications during this time.	Array_0000 Volume_0000 Type: RAID 1 7 GB 7 GB
	Back Create Volume Cancel	More help on this page

6. Click **OK** to continue.

🔁 Intel® Rapid Stora	ge Technology	_ 🗆 X
Status	reate Manage Preferences	(intel)
1. Select 2. Configure 3. Confirm	Confirm Volume Creation Are you sure you want to continue? WARNING: Completing this action will permanently delete exist following disks. Back up data before continuing. * Disk on port 1 (59 GB)	ting data on the Volume_0000 Type: RAID 1 7 GB
	More help OK Back Create Volume Cancel	Cancel More help on this page

7. Click **OK** when volume creation is finished.

🔁 Intel® Rapid Storage Tec	shnology	
Status Manage	Preferences Help	intel
1. Select 2. Configure 3. Confirm	Confirm Volume Creation Review the colored configuration WAR WAR WAR The volume was created successfully. The volume was created successfully. The volume was created successfully. More help torning time. Back Create Volume Cancel	Array_0000 Type: RAID 1 7 GB OK More help on this page

8. Check the storage status.

🖓 Intel® Rapid Storage Technology	🛛
Status Manage	intel
Image         Click on any element in the storage system view to manage its properties.         Image         Array_0000 Image         Volume_0000: Migrating data 32% complete	Storage System View Array_0000 Volume_0000 Type: RAID 1 7 GB Internal system disk 2 GB Internal empty port 4
	More help on this page

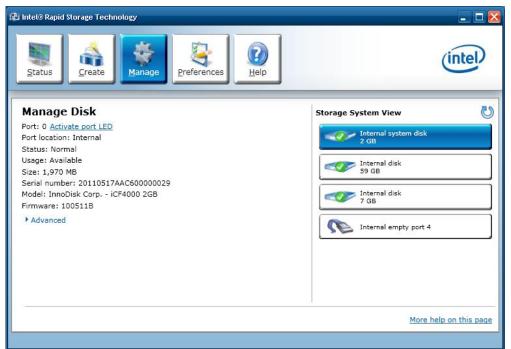
Select the **Manage** tab and then select **Delete Volume**.



9. Click **Yes** to continue.

Intel® Rapid Storage Technology	
Status Manage Preferences	intel
Manage Volume	Storage System View
Name: Volur Status: Norr Type: RAID Size: 7,625 <u>Delete volun</u> Are you sure you want to delete this volume? MARNING: Completing this action will perr Back up data before continuing. <u>More help</u>	manently delete existing data on the selected volume.
	Internal system disk 2 GB Internal empty port 4
	More help on this page

10. When finished, check the storage status.



11. Check if data on the two disks are the same.

🗢 New Volume (D:)			🛛 🔀
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools	Help		<b></b>
🌀 Back 👻 🕥 - 🏂 🔎 Se	earch 😥 Folders 🛄 🕶		
Address 🥯 D:\			💌 🛃 Go
File and Folder Tasks	Debian-nowuse	e_11_remoteVideo	
<ul> <li>Publish this folder to the</li> <li>Web</li> <li>Share this folder</li> </ul>	e_31_remoteVideo	e_Video	
Other Places			
🚽 My Computer			
My Documents     Shared Documents			
Shared Declarities			
Details ×			

