



PRO IDC

with generation 2 drive trays



Installation and User's Manual



Designed for Video Editing and Content Creation Professionals

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1. Introduction

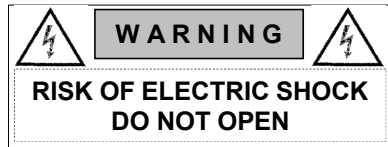
We appreciate your purchase of this product from Dulce Systems. You have everything you need to quickly and easily connect the storage unit to your editing computer or shared storage network. You are a short time way from your next blockbuster creation.

This Installation and User's Manual is intended to streamline the process of getting your RAID storage system up and running so you can get to work quickly.

For most typical video editing storage requirements, we have preconfigured the PRO IDC for a much more streamlined installation. Refer to the Pre-configuration Sheet for the exact pre-configuration of your PRO IDC, the default configured is for RAID 5 (efficient protection mode) and pre-formatted for Mac OS X. Just simply follow the installation steps outlined in this manual, and you will up and running in no time. For Windows operation, a short format process will be required.

1.1. Safety Considerations

1.1.1. SAFETY CONSIDERATIONS



WATER AND MOISTURE

To reduce the risk of fire or electrical shock, do not expose unit to rain or moisture. Do not operate unit near water – such as: bathtub, washbowl, kitchen sink or laundry tub, wet basement, or near a swimming pool.

STABILITY

Do not place this unit on an unstable cart, stand, bracket, or table. Unit may fall, causing serious injury.

VENTILATION

Do not block front and rear ventilation. Proper airflow is required to ensure reliable operation and prevents unit from over heating. Do not place unit in an enclosed space where no or insufficient ventilation is available.

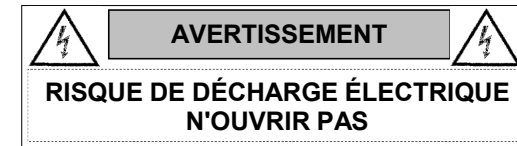
ELECTRICAL

Do not defeat the safety purpose of the grounding power plug. The power cord should be routed so that it is not likely to be walked on or pinched by items placed upon or against them.

SERVICING

Do not attempt to service this unit yourself. Opening or removing the top, side and rear covers will expose you to dangerous voltages or other hazards.

1.1.2. CONSIDÉRATIONS DE SÉCURITÉ



EAU ET HUMIDITÉ

Pour réduire le risque de feu ou de choc électrique, n'exposez pas d'unité pour pleuvoir ou l'humidité. Ne faites pas marcher d'unité près de l'eau – comme; la baignoire, la cuvette, l'évier ou la cuve de blanchisserie, la cave mouillée ou près d'une piscine.

STABILITÉ

Ne placez pas cette unité sur un chariot instable, un éventaire, une parenthèse ou une table. L'unité peut tomber, en provoquant la blessure sérieuse.

VENTILATION

Ne bloquez pas de devant et élevez la ventilation. L'écoulement d'air nécessaire est tenu de garantir l'opération sûre et prévient l'unité de sur le chauffage. L'unité ne peut pas placé dans un espace fermé où aucune ventilation ou dans suffisant n'est disponible.

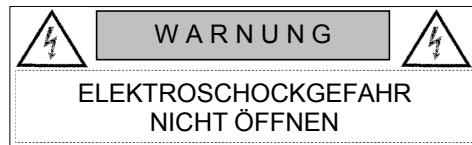
ÉLECTRIQUE

Ne vainquez pas le but de sécurité de la prise de courant de pouvoir de bases. La corde de pouvoir devrait être mise en déroute pour qu'ils ne seront pas probablement marchés sur ou pincés par les articles placés sur ou contre eux.

ENTRETIEN

N'essayez pas d'assurer l'entretien de cette unité vous-même. En s'ouvrant ou le fait d'enlever le haut, le côté et les couvertures arrière vous exposeront aux voltages dangereux ou à d'autres hasards.

1.1.3. SAFTY BERÜCKSICHTIGUNGEN



WASSER UND FEUCHTIGKEIT

Um eine Brand- oder Elektroschockgefahr weitgehend auszuschließen, Gerät nicht Regen oder Feuchtigkeit aussetzen. Gerät nicht in der Nähe von Bade- oder Waschwannen, Wasch- oder Spülbecken, feuchten Kellern oder Schwimmbecken betreiben.

STABILITÄT

Das Gerät nicht auf wacklige Karren, Ständer, Halterungen oder Tische stellen, da es herunterfallen und Verletzungen verursachen könnte.

BELÜFTUNG

Vordere und hintere Belüftungsöffnungen nicht versperren. Das Gerät muss ausreichend be- und entlüftet werden können, damit es sich nicht während des Betriebs überhitzt. Daher darf das Gerät nicht in geschlossenen Räumen aufgestellt werden, in denen keine ausreichende Be- und Entlüftung gewährleistet ist.

STROMVERSORGUNG

Nicht den Schukostecker modifizieren. Das Stromkabel sollte so verlegt werden, dass es nicht durch Auftreten oder durch spitze oder scharfe Gegenstände beschädigt werden kann.

WARTUNG

Das Gerät nicht eigenmächtig warten. Durch das Öffnen des Geräts (Abziehen der oberen, seitlichen und hinteren Abdeckung) setzen Sie sich lebensgefährlichen Spannungen aus.

1.1.4. CONSIDERACIONES DE SEGURIDAD



AGUA Y HUMEDAD

Para reducir el riesgo de fuego o electrochoque, no exponga la unidad para llover o humedad. No haga funcionar la unidad cerca del agua – como; bañera, lavatorio, fregadero o tina de lavandería, sótano mojado o cerca de una piscina.

ESTABILIDAD

No coloque esta unidad en un carro inestable, soporte, soporte o mesa. La unidad puede caerse, causando la herida seria.

VENTILACIÓN

No bloquee delantero y críe la ventilación. El corriente de aire apropiado es requerido asegurar la operación confiable y previene la unidad de sobre la calefacción. La unidad no puede colocado en un espacio incluido donde ninguna ventilación o en suficiente está disponible.

ELÉCTRICO

No derrote el objetivo de seguridad del enchufe de poder que da buenos conocimientos. La cuerda de poder debería ser derrotada de modo que ellos probablemente no sean andados en o pellizcados por artículos colocados sobre o contra ellos.

REVISIÓN

No intente atender esta unidad usted mismo. Abriéndose o quitar la cumbre, el lado y las tapas traseras le expondrán a voltajes peligrosos u otros riesgos.

1.2. System Requirements

- Windows XP / Vista / Server / 32 & 64-bit.
- Mac OS X 10.4 or higher.
- Linux / Unix.
- Apple Power Mac G5, Mac Pro, Windows compatible PC.
- 2 or 4Gb Fibre Channel Port with optical LC connection.



1.3. Technical Support

Phone	818-435-6007
FAX	818-576-0324
E-mail	support@dulcesystems.com
Web	www.dulcesystems.com

If the product requires service, please contact Dulce Systems' Technical Support and obtain an RMA number. Ship the product properly packaged to:

Dulce Systems
Attn: RMA
9620 Topanga Canyon Place, Suite E Chatsworth, CA 91311

2. Getting Started

The PRO IDC comes pre-assembled and almost ready for use, just install the Disk Modules, attach the Fibre Channels to the computer or the switch, and install the JAVA RAID Manager. If you are using a Mac, you are good to go, by default the unit is pre-formatted for Mac OS X operation. For Windows, a small format procedure is needed.

2.1. Packaging



Please do not discard the boxes and packing materials in case you might need to reuse them later. Always ship the product in its original packaging. Improperly packaged products will be subjected to shipping damage, for which you will be liable for the repair.

2.2. Check List

- Installation and User's Manual.
- Power Cords (North America user only).
- 3u 19" rackmount 16 disk bay system enclosure.
- 16 Disk Modules.
- One Ethernet Cable.
- 2 One 3-meter LC to LC optical Fibre Channel cable.
- 2 SFP Optical Transceiver.
- Rackmount rails (optional)

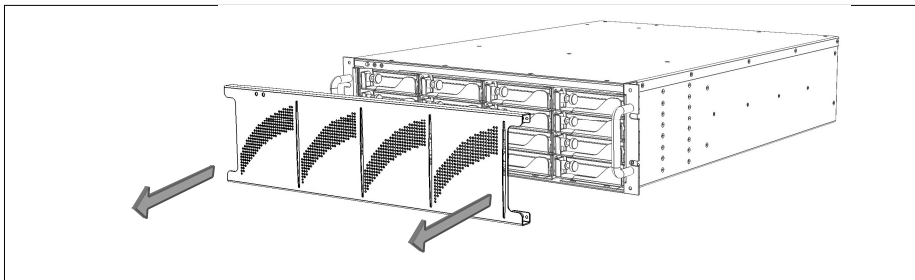
3. Overview

The PRO IDC consists of two independent RAID controllers, each controller manages 8 disk drives. Each controller operates independent of each other and each are seen as separate individual LUNs to the operating system.

3.1. The Bezel

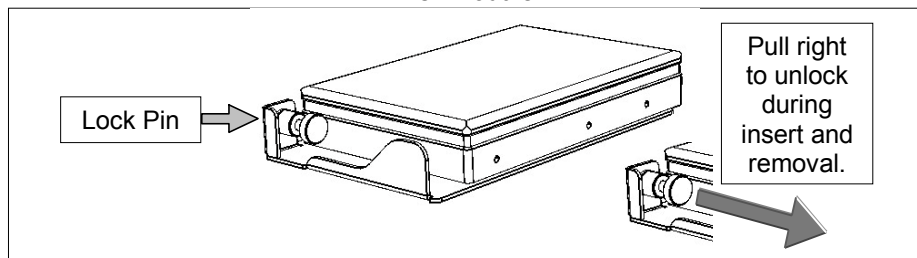
The front bezel can be easily removed to access the Disk Modules. The bezel is held on by four snap pins located at each of the four corners.

Use both hands, push from behind the left and right side of the bezel. Access through the rack mount handles.



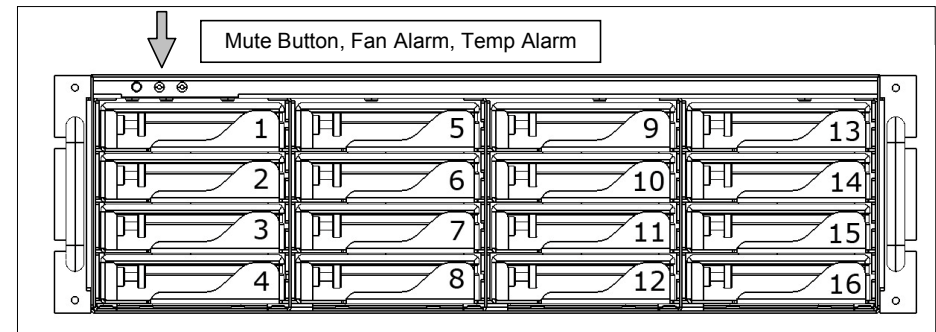
3.2. Disk Module

Disk Module

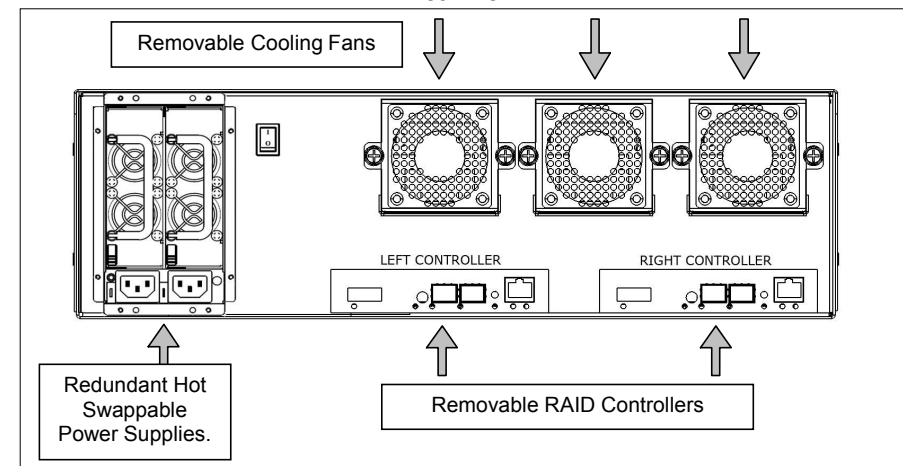


3.3. Front and rear views

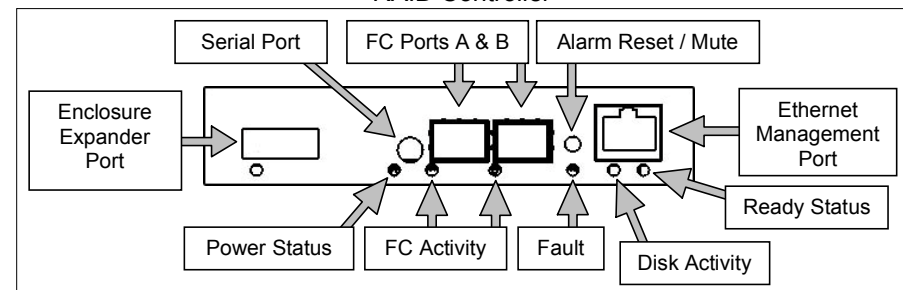
Front view



Rear view



RAID Controller

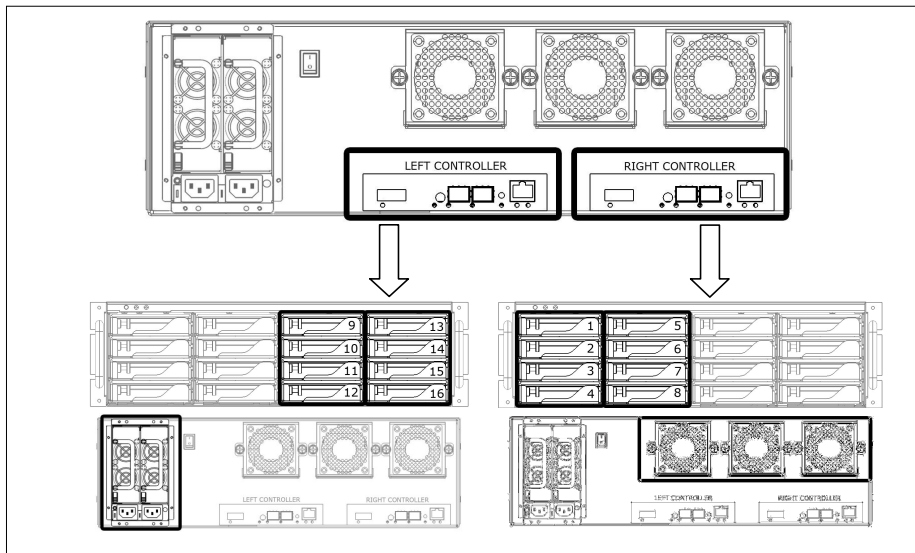


3.4. Independent Left and Right Controllers

Each controller is independent of each other. Each controller manages its own set of eight drives. One controller does not have access to the other controller's disk drives.

The Right Controller manages drives 1 to 8 and also monitors the Cooling Fans status.

The Left Controller manages drives 9 to 16 and also monitors the Power Supply status.



4. Installation

Please follow these few steps to install the PRO IDC. This process typically takes about 30 minutes to complete.

Overview of installation:

- Rackmount installation
- Disk Module Installation
- FC Cables Installation
- Ethernet Configuration
- RAID Manager Installation



By default, the PRO IDC is shipped pre-configured in RAID 5 mode and pre-formatted for Apple Mac OS X. Check the Pre-configuration Sheet for your exact configuration.



Windows operation will require a format/partition process. The PRO IDC is shipped already pre-configured in RAID 5. Simply run the Windows Disk Management utility to prepare the RAID for Windows usage.

4.1. Rackmount Installation

The PRO IDC can be rackmounted to a standard 19" rack. 3u height space is required. An optional rackmount kit is available for 24" to 30" depths.

Mount the left and right rails to the rack, ensure sufficient 3u space is available. Adjust depth as required.

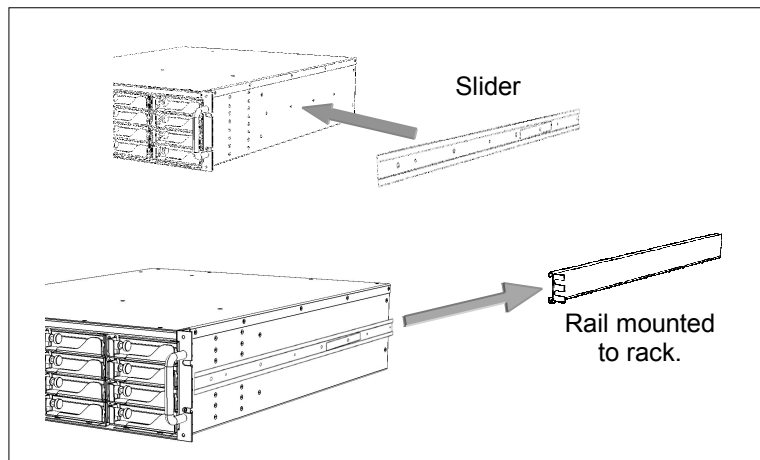
Mount the left and right sliders on the PRO IDC.



The PRO IDC loaded with Disk Modules will be heavy, install the PRO IDC to the rack before installing the drives will make it easier. Install the PRO IDC carefully on the rack by aligning the sliders in the rails.

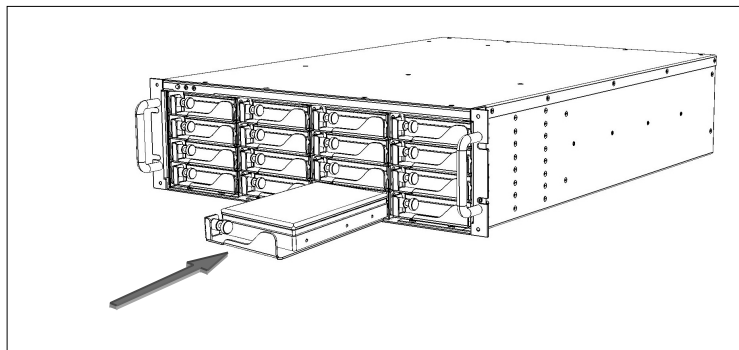


Front heavy topple warning – Do not operate or configure the PRO IDC in the rack extended position when mounted on the rack, your entire rack might tip over and will cause severe damage and harm.



4.2. Disk Module Installation

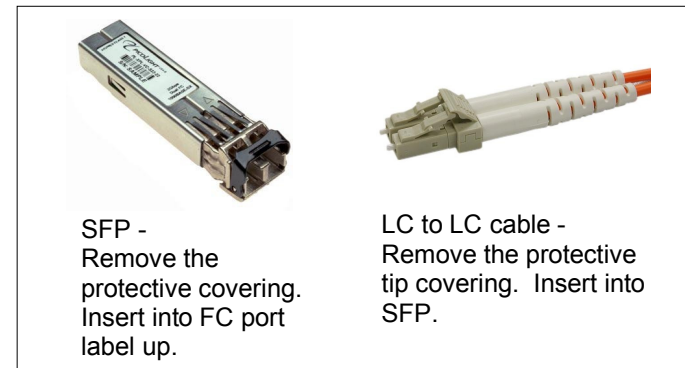
Remove the front bezel. Install each marked Disk Module into the slot indicated. Pull the Lock Pin to the right and insert drive tray fully, release Lock Pin to secure.



DO NOT ship the PRO IDC with the Disk Modules installed, the Disk Modules MUST be packaged separately in a single or multi-pack to properly protect them during shipment.

4.3. FC Cable Installation

Install a SFP into one of the FC port of each controller from the rear of the PRO IDC. Install the LC to LC optical Fibre Channel Cables.



4.4. Drivers

Drivers are not needed to operate the PRO IDC. But the Fibre Channel adapter the PRO IDC connects to will need drivers, please refer to the requirements of the adapter.

4.5. Ethernet Configuration

The PRO IDC uses the built-in Ethernet ports for RAID management, both controllers must be connected to your existing network for configuration.



Network supporting HDCP for automatic IP Address assignments: Connect both controllers to your network. The PRO IDC will automatically request from the network the necessary IP addresses.

Network without DHCP: Defaults to the static IP address below. Working with one controller first, leaving the other disconnected. Manually connect to the controller and change to the desired static IP address with RAID Manager. RAID Manager > Administration > IP Connection. Connect the 2nd controller and repeat.

Auto Assign (DHCP)	or	169.254.32.10
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4.6. RAID Manager Installation

The PRO IDC uses a Java based RAID Manager to configure and manage the RAID. Use the supplied installation CD or visit our web site and download the RAID Manager Installer.

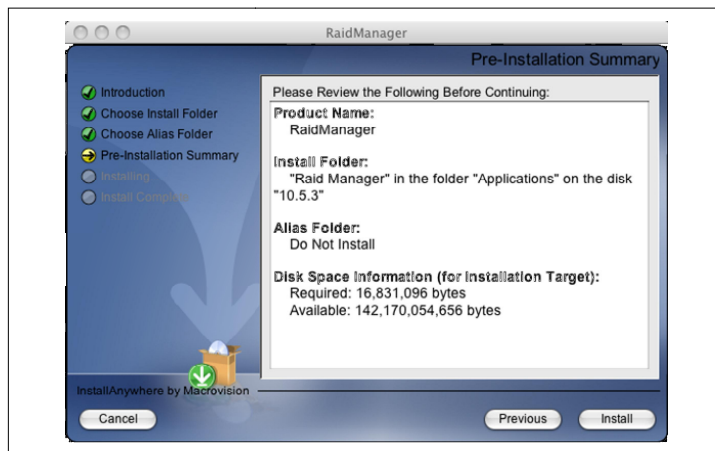
Download From:	www.dulcesystems.com/download
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Apple: Start the install program from the Downloads folder on the dock after download completes..



Windows: Save the install.exe on the desktop then run it after download is complete.



Mac screen shot shown. Windows will be similar.

Follow the on screen prompts to complete the installation. See next section for RAID Manager operational instructions.

5. RAID Manager Operations

5.1. Start RAID Manager

Start the RAID Manager from the RAID Manager folder.



Apple: Applications folder > RAID Manager folder



Windows: All Programs menu > RAID Manager folder

5.2. Connect RAID Manager to PRO IDC

5.2.1. PRO IDC Discovery

RAID Manager needs to know the IP Address of the PRO IDC, use the Search (Windows) or Advanced (Mac) method to auto discover or use Manual if you know the IP Address.

Discovery will show two PRO FCs that makes up the PRO IDC.

Mac users should use the Advanced method due to the security nature of the Mac operating system. Windows and Mac users with root user access can use Search.





Advanced / Search method could take up to 5 minutes to cover the entire search range. This operation is only needed to be performed once, after discovery the RAID Manager will remember the IP Address.

5.2.2. Login

The Systems Found list will show the discovered PRO IDCs. Double click on an entry to start the login.

Username:	admin
Password:	admin

5.3. RAID System Information

The System Information screen (under the Monitoring menu) provides a quick overview of the PRO IDC configuration. The PRO IDC has two independent RAID controllers. Each half is configured and managed separately.

The System Information shows the status and configuration of the physical drives connected, the RAID setup and the Volumes assigned under each RAID.

This screen shot is of the left controller, showing disks 1 to 8 of which it manages.

Monitoring > System Information

System Name: PRO FCg2 (192.168.0.189)
 Dulce Raid Manager Version: D1.5.42
 SAN ID: 000000003030145 Firmware: Version D353
 System Type: PRO FCg2
 Date & Time: 25/03/2009 19:15:17
 Controller 1: 000000003040145 Controller 2: Not Present
 Enclosure ID-SN: 1-<UNKNOWN>

Disks

Enclosure	Bay	Disk Model	Serial Num...	Firmware	Capacity (...)	Usage	Status
1	1	HD172502	VFL101R1FJ14GF	A7EA	250	IDC-left	✓
1	2	HD172502	VFL101R1F0H4RF	A7EA	250	IDC-left	✓
1	3	HD172502	VFL101R1F0WJUN	A7EA	250	IDC-left	✓
1	4	HD172502	VFL101R1F0WPF8	A7EA	250	IDC-left	✓
1	5	HD172502	VFL101R1F0WNS	A7EA	250	IDC-left	✓
1	6	HD172502	VFL101R1FKMM9	A7EA	250	IDC-left	✓
1	7	HD172502	VFL101R1F0WKG	A7EA	250	IDC-left	✓
1	8	HD172502	VFL101R1FHXMV	A7EA	250	IDC-left	✓

Expanders

Enclosure	Slot	Expander Mod...	Serial Number	Firmware	Status
1	1	PRO FCg2	000005020145	0410	✓

RAIDs

Name	RAID Level	RAID Profile	Capacity (GB)	State
IDC-left	5	Media Server-No init	1742	Good

Logical Volumes

Name	Capacity (GB)	RAID	Host Mapping	Serial Number	Status
IDC-left	1742	IDC-left	Selected Hosts	ff01000053300009	Global

Hosts

Host Name	Node Name	Port Name	Port 1A	Port 1B	Port 2A	Port 2B
HBA	200000062b15b8c8	100000062b15b8c8	Not Logged In	0000EF	Not Logged In	Not Logged In
HBA(1)	200000062b15b8c9	100000062b15b8c9	0000EF	Not Logged In	Not Logged In	Not Logged In

PRO FCg2 (192.168.0.189):

5.4. RAID Creation

A new PRO IDC is normally pre-configured and formatted, you might not need to go through this process, check the Pre-Configuration sheet that came with the PRO IDC for details.

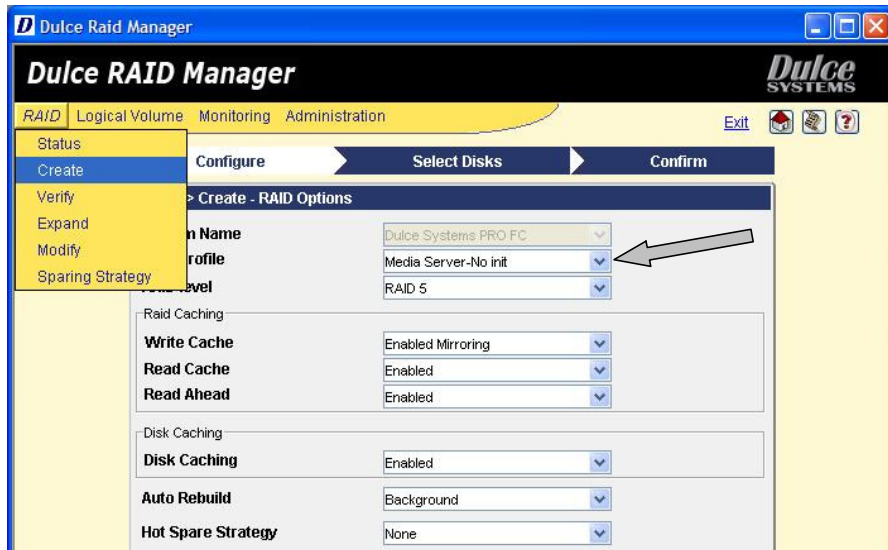
There are two independent RAID controllers in the PRO IDC, each half is managed separately.

If you are changing the RAID configuration, you will need to 1st delete the RAID then create a new RAID, see the Delete RAID section in this manual.

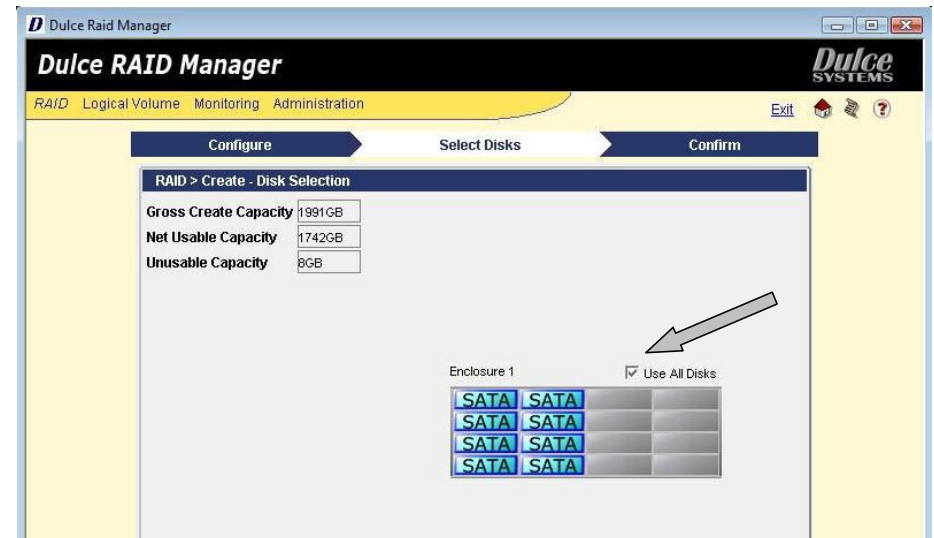
Creating a RAID set is easy; 1st create a RAID set of your choice with the disk drives attached. 2nd create a Logical Volume under the new RAID set.

Click on the RAID menu and select Create. Select your desired options and click Next. A number of preset RAID Profiles are provided.

The Media Server – No Init profile will give you instant RAID availability, no need to wait for long RAID format.

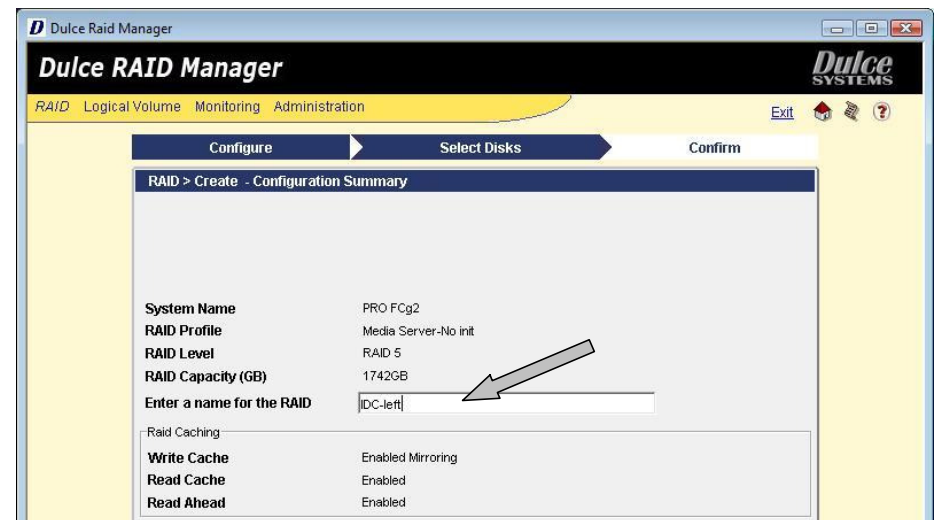


Check the Use All Disks or individually select each disk for the RAID.

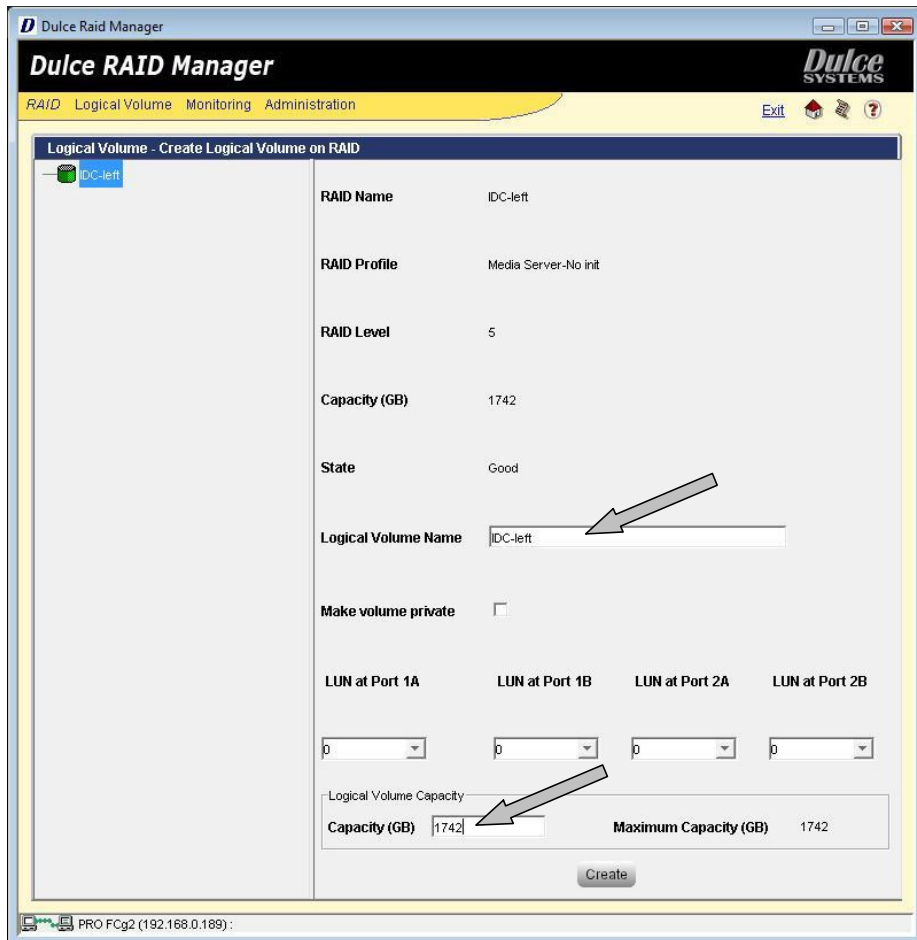


Enter a name for the RAID and Logical Volume, they are only used within RAID Manager, this is not a name you will see in your operating system.

You can use 'IDC-Left' or 'IDC-Right' to better describe the two for the RAID and Volume names.



Enter the desired Capacity (always the maximum) for the Logical Volume, then lastly click on Create.



Attach the two controllers to your computer or switch. You would see the PRO IDC as two available disks in the format utility of your operating system.

5.5. RAID Deletion

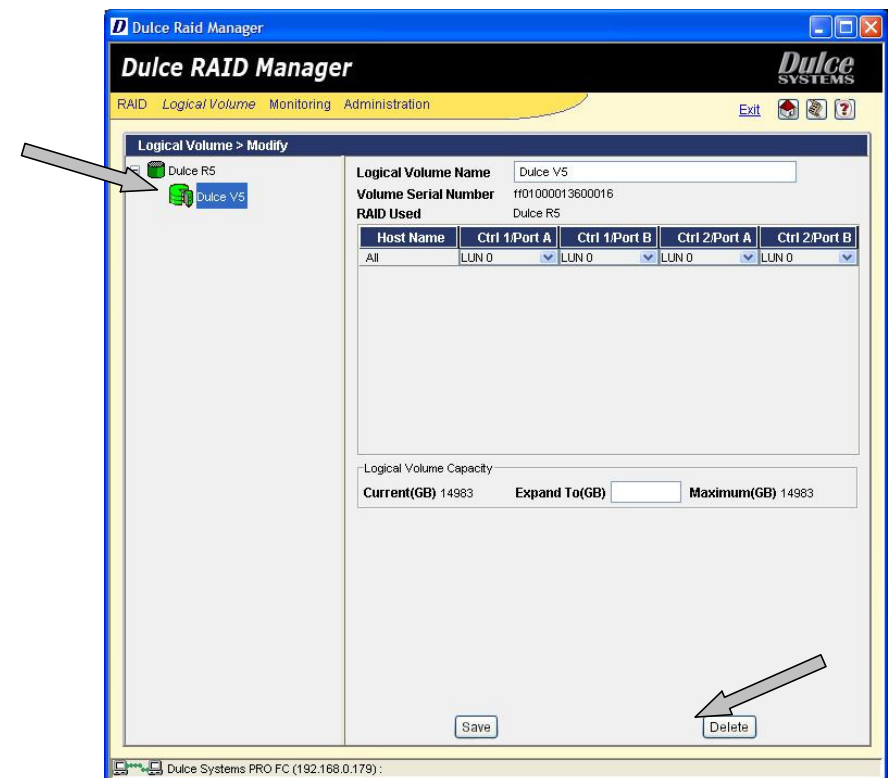


Deleting a Logical Volume and RAID will destroy all data.

1st: Delete the Logical Volume, from the Logical Volume menu select Modify.



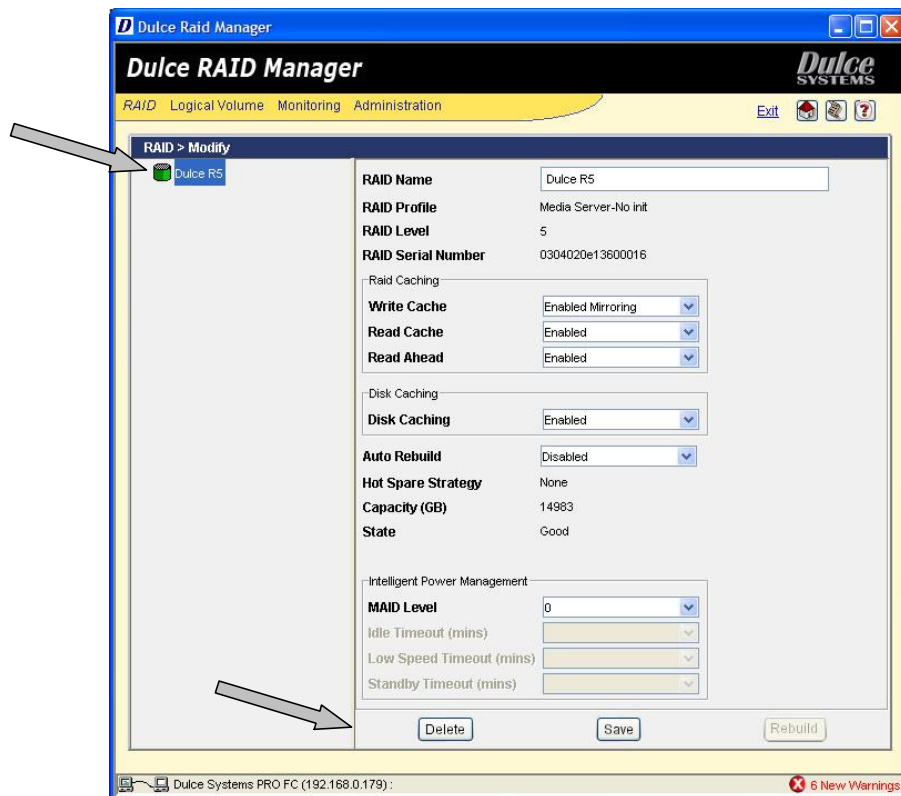
On left side, expand the RAID to expose the Logical Volume under it. Click on the Logical Volume to select it, click on Delete.



2nd: Delete the RAID, from the RAID menu select Modify.



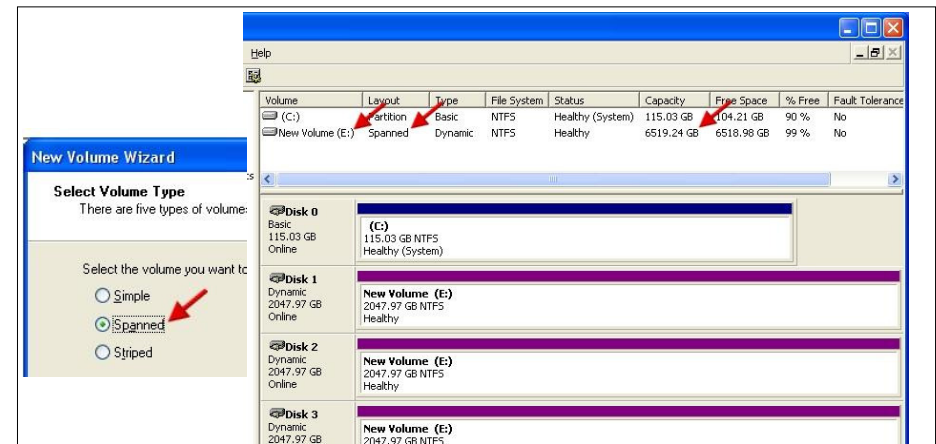
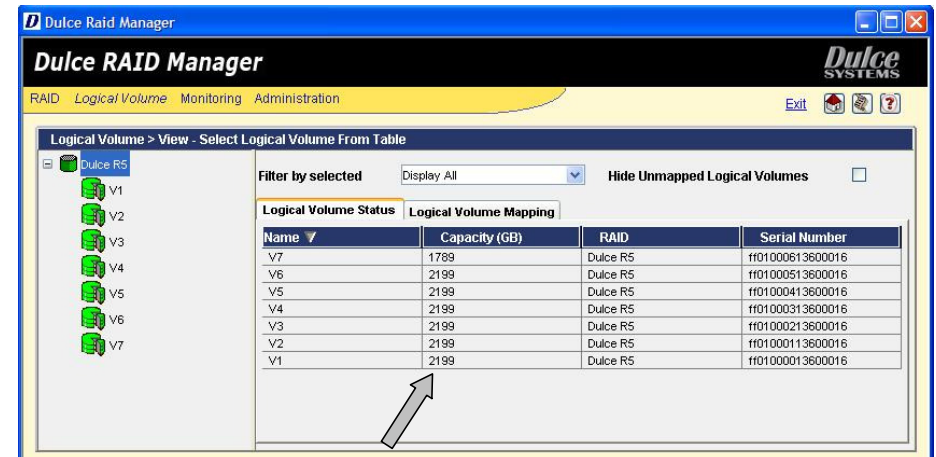
On the left side, click on the RAID to select it, then Delete.



5.6. Create >2TB RAID Set for Windows XP (32bit)

This only applies to Windows XP (32 bit) where it has a 2TB disk size limitation.

Create a RAID of your choice with the number of desired disk drives, then create multiple Logical Volumes of 2TB size. This will present to Windows XP as several disks of 2TB sizes. Use Windows Disk Manager to Span them together (not Stripe) to create one drive letter of the sum of all the <=2TB sized disks.



6. Alarm Conditions / Degraded RAID Set

There are several possible sources for alarms, the front and rear indicators and the RAID Management will provide the details of the alarm.

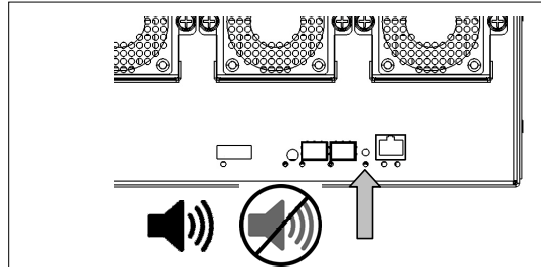


Mute Alarm:

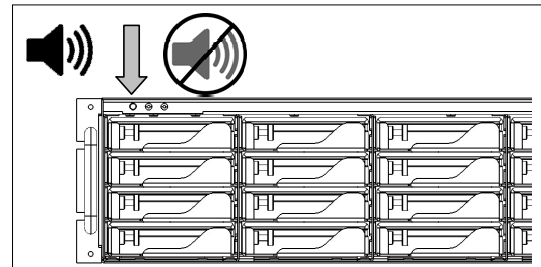
1) Alarm Reset button in the rear of unit.

Controller Alarm confirmed with a red ALT indicator.

- Temperature (enclosure detected over heating condition)
- Fan (enclosure cooling fan not operational, could lead to overheating)
- RAID related problem such as a failed disk drive.



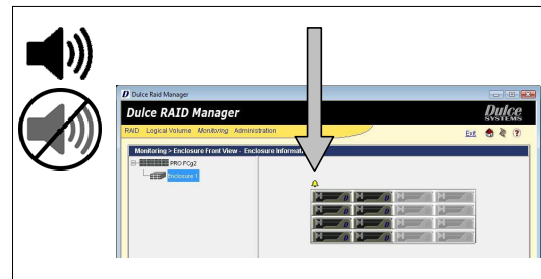
2) Reset button at the top front left of unit.



3) RAID Manager GUI.

RAID Alarm

- Degraded RAID Set (one or more drives not detected or down)
- Temperature (RAID Controller detected over heating)



RAID Manager > Monitoring > Enclosure Front/Back View. Double click on the yellow bell.

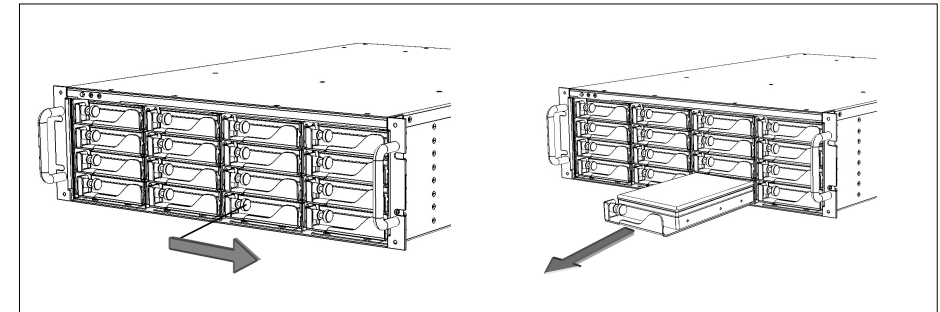
The Event Viewer screen provides a log of events which triggered the alarm. To view it, from the Monitoring menu, click on Event Viewer.

6.1. Replacing a Disk Module

A defective Disk Module can be easily replaced. Hot swapping is allowed without interruption to your workflow if the RAID is operating in one of the drive redundant RAID mode (1,5,6).

In a redundant RAID mode, rebuild will start automatically after replacement of a defective module.

- Pull the Lock Pin to the right and pull the Disk Module out.



The RAID rebuild will consume some processing power from the overall operation speed of the PRO IDC, the rebuild can be suspended during time sensitive operations.

From RAID Manager, click on RAID > Modify. Select the RAID on the left side, then click on Stop Rebuild at the lower right.

The audible alarm will sound, follow the Alarm Condition / Mute Alarm to handle it.

7. Formatting and Partitioning

7.1. Apple OS X Formatting



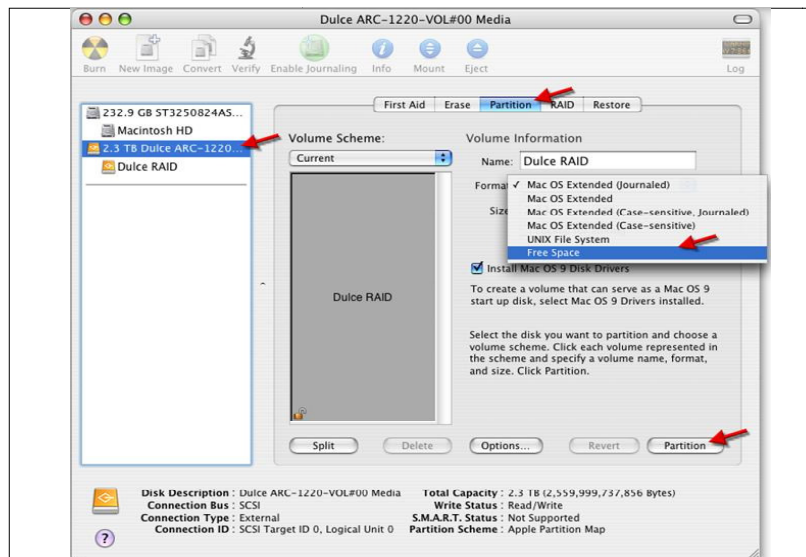
The PRO IDC are shipped pre-configured for Mac OS X, the RAID will appear on the desktop after driver installation and reboot.

Should it be necessary to re-format and partition the RAID, use the Apple Disk Utility.

To start Disk Utility, move pointer to upper left corner of screen, click on Go then click on Utilities. Locate and launch Disk Utility.

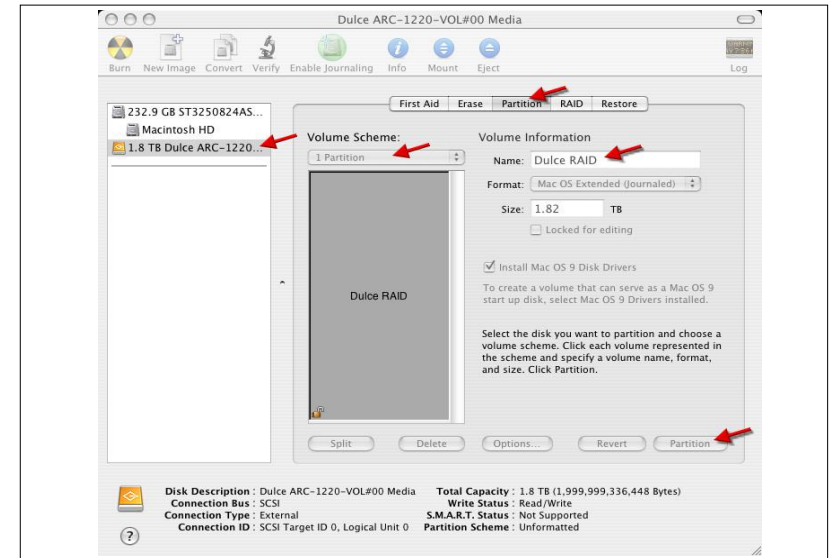
7.1.1. Erase an existing partition

Select the RAID on left, click on Partition tab, select Free Space. Click on Partition on lower right.



7.1.2. Create a new partition

Select Dulce on the left side drive list, click on Partition tab, change Volume Scheme to 1 Partition, change Name as desired, click on Partition on lower right.



The drive will appear on the desktop after successful completion of the Partition.

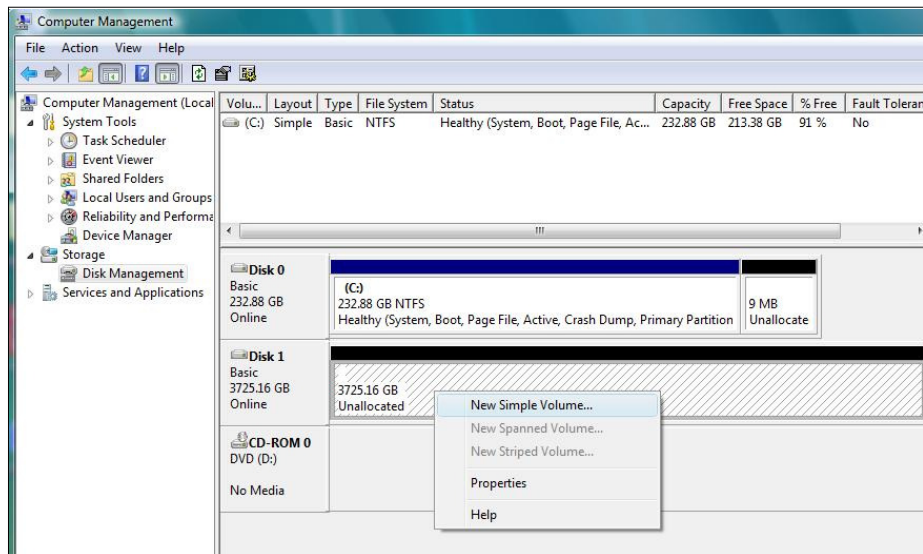
7.2. Windows XP / Vista Formatting



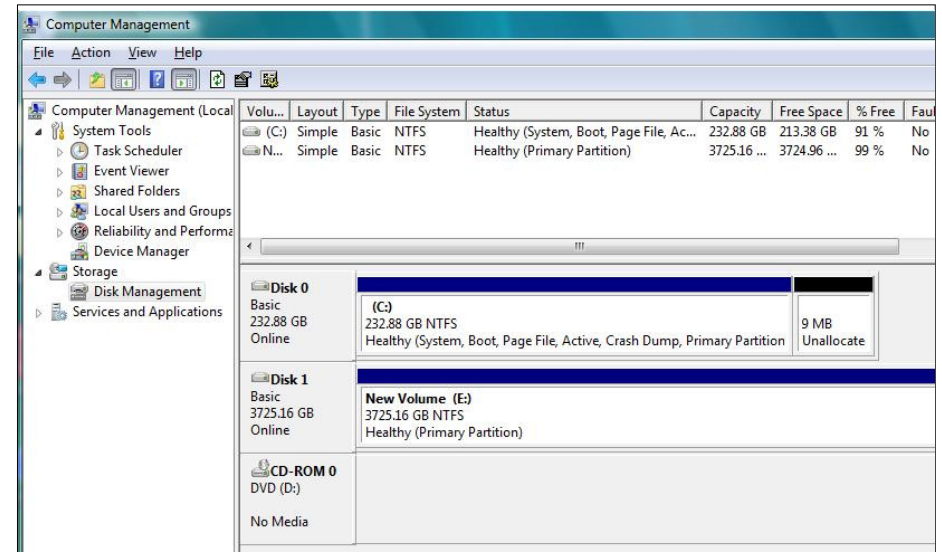
Start Disk Management (can be found at Control Panel > System and Maintenance > Administrative Tools > Computer Management. Under Storage.)

If the RAID shows up as Unknown / Not Initialized, right click on the disk and Initialize it.

If the drive is larger than 2TB, if using Vista, right click over the disk and Convert to GPT Disk. Windows XP 32 bit does not support larger than 2TB capacity. Configure with multiple capacities of 2TB or less.



Right click the Unallocated segment and select New Simple Volume. Enter the desired Volume Size, assign the desired Drive Letter or Path, check Perform a Quick Format at the Format Partition screen.



8. RAID Level Descriptions

Although the RAID Controller supports a large variety of RAID Levels, RAID 0 or RAID 3 are most commonly used for video and content creation purpose.

RAID Level	Description	Advantage	Disadvantage	Ideal for
0	Striping.	Highest performance.	No disk redundancy, one drive failure will lose all data.	Highest resolution HD, 2K, and maximum multiple streams.
1	Mirroring.	Highest redundancy.	Less cost efficient for redundancy, loses ½ disk capacity.	Data protection is paramount, maximum disk failure protection.
3	Striping with a dedicated parity drive.	Efficient drive redundancy, 1 drive used for parity.	Loses 1 disk drive capacity.	Well balanced for video requiring performance and redundancy.
5	Striping the parity across all drives.	Efficient drive redundancy, parity distributed to all drives.	Loses 1 disk drive capacity.	Well balanced for file server requiring performance and redundancy.
6	Striping with two dedicated parity drives.	Double drive redundancy, 2 drives used for parity.	Loses 2 disk drive capacity.	Mission critical.
JBOD	Just a Bunch of disks.	Each drive can be accessed individually from operating system.	No redundancy.	Audio applications.
RAID + Spare	A drive is set aside as an online hot spare.	Automatic rebuild of a failed drive.	Loses another drive capacity. (In addition to the drive(s) needed for the RAID level selected.)	Minimizes degraded RAID level exposure time.

9. Limited Warranty

WHAT THE WARRANTY COVERS

Dulce Systems warrants your product against any defect in material and workmanship and conforms to Dulce published specifications under normal use.

WHAT THE WARRANTY DOES NOT COVER

The warranty does not cover equipment which has been damaged due to accident, misuse, abuse, fire, flood, "Acts of God," or other contingencies beyond our control; use of incorrect line voltages; improper or insufficient ventilation; failure to follow operating instructions; or improper or unauthorized repair; improperly packaged for shipping; packaged in non-approved shipping container; shipping damage.

The warranty is voided by removal or alteration of the product or parts identification labels.

Dulce has no liability for general, consequential, incidental or special damages. These include loss of recorded data, the cost of recovery of lost data, lost profits and the cost of the installation or removal of any Products, the installation of replacement Products, and any inspection, testing, or redesign caused by any defect or by the repair or replacement of Products arising from a defect in any Product.

WHAT THE WARRANTY PERIOD IS

Dulce Systems warrants your PRO IDC product for 36 months and if the product is registered with Dulce within 30 days of purchase, we will extend the warranty for another 6 months totaling 42 months. We warrant the Duo for 36 months. The warranty period begins at the date of shipment to the original end user, company or organization.

Our warranty applies to repaired or replaced Products for the balance of the applicable period of the original warranty or ninety days from the date of shipment of a repaired or replaced Product, whichever is longer.

WHAT WE WILL DO TO CORRECT THE PROBLEM

We may elect which remedy or combination of remedies to provide at our sole discretion. We shall have a reasonable time after determining that a defective Product exists to repair or replace a defective Product. Our replacement Product under its limited warranty will be manufactured from new or reconditioned parts.

Your exclusive remedy for any defective Product is limited to the repair or replacement of the defective Product.

We will return the repaired or replacement Product to you prepaid using the same method of shipping (ex: overnight, ground, 2nd day, ...) as was shipped to us. If a more expedited return shipping method is required, extra charges might apply at our discretion.

HOW YOU CAN GET SERVICE

Contact our Technical Support to obtain a RMA (Return Materials Authorization) number. The model number, serial number, and description of the problem will be required. A valid proof of purchase might be required to further validate the Products warranty eligibility, the valid proof of purchase document must show the product model, serial number, purchase date, and supplier name. If the valid proof of purchase is not available, the original manufacturing date of the product will be used to determine the warranty period.

No returns will be accepted without a RMA number. We reserve the right to refuse the delivery of the return.

You shall bear all shipping, packing and insurance costs and all other costs, excluding parts and labor, necessary to effectuate repair or replacement under this warranty.

All products returned to us must be shipped in the original packaging or Dulce approved packaging. If you do not have the original packaging, call us to request packaging. A nominal fee will be charged for the requested packaging and for shipment. Ship the RMA to us pre-paid.

Products that are improperly packaged for shipping; packaged in a non-approved shipping container; or incur shipping damages are not covered under warranty.

HOW STATE LAW RELATES TO WARRANTY

In the United States, some states do not allow exclusion or limitation of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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10. Product Registration



REGISTER NOW ADDS 6 MONTHS

Register your product within 30 days of purchase
and **extend your warranty by another 6 months.**

1 minute = 6 months

It will take only one minute to register and you'll get 6 months in return!

By registering your PRO IDC, the standard 36 months warranty will be extended for another 6 months. That's a total of 42 months (3 years and 6 months warranty.) The longest warranty in the industry!

Please visit our web site and register online.

www.dulcesystems.com/register

A valid proof of purchase might be required to further validate the Products warranty eligibility, the valid proof of purchase document must show the product model, serial number, purchase date, and supplier name. If the valid proof of purchase is not available, the original manufacturing date of the product will be used to determine the warranty period.



www.dulcesystems.com