

1st Design

introduces

IntelliRaid™

What is
IntelliRaid?



IntelliRaid is

**Intelligent Enterprise Level
Storage for Video Production At
Desktop Prices!**

IntelliRaid Benefits

- **Intelligence:** Setup and interrogation of IntelliRaid controller status is clear and easy using the user-friendly LCD front panel or the unique Graphical User Interface.
- **Capacity:** Available in 1, 2 or 4 Controller Arrays with up to 10TBs of raw data.
- **Reliability:** New SATA2 smart drives with up to 1.2 million hours MTBF. Dual power input, wire-less backplane, redundant and hot-swappable power and fans.
- **Flexibility:** Controllers support Raid 0, 1, 1-0, 3 and 5. Raid 3 allows for data redundancy so 1 drive failure per controller will not lose data.
- **Performance:** IntelliRaid is a SCSI 320 controller attached to SATA2 300Gbs storage with read ahead and write caching. A dual controller array yields well over 400 MBs sustained data.

IntelliRaid Features

- Easy Setup GUI in clear language
- Status and Error Reporting via email and GUI
- Remote Interrogation via network
- Reliability through SATA2 technology
- Performance exceeding HD RT requirements
- Auto-Repair with automatic "Hot Spares"
- Flexibility of Multiple Raid configurations
- Scalability and Raid Migration without unloading and loading data
- Lowest Cost per Gigabyte in the industry!

IntelliRaid Configurations

- **Raid 0:** Performance - no protection
- **Raid 1+0:** Performance + Fail Safe (100% Overhead)
- **Raid 1+0+Spare:** Performance + Fail Safe + Hot Spare
- **Raid 3:** Performance + Fail Safe (20% Overhead)
- **Raid 5:** Performance + Fail Safe (20% Overhead)
- **Raid 3+Spare:** Performance + Fail Safe + Hot Spare
- **Raid 5+Spare:** Performance + Fail Safe + Hot Spare

IntelliRaid

Intelligent Graphical User Interface

Raid 3+1 Hot Spare Configuration

The screenshot shows the IntelliRaid web interface in a Microsoft Internet Explorer browser window. The browser address bar shows the URL <http://192.168.0.00.130/>. The interface features a left-hand navigation menu with several expandable sections:

- Quick Function**
- RaidSet Functions**
- VolumeSet Functions**
- Physical Drives**
- System Controls**
 - System Config
 - UF320 SCSI Target Config
 - EtherNet Config
 - Alert By Mail Config
 - SNMP Configuration
 - View Events/Mute Beeper
 - Generate Test Event
 - Clear Event Buffer
 - Modify Password
 - Upgrade Firmware
 - Restart Controller
- Information**
 - RaidSet Hierarchy** (highlighted)
 - System Information
 - Hardware Monitor

The main content area displays the **F¹Design IntelliRaid** logo and a **Raid Set Hierarchy** table:

Raid Set	IDE Channels	Volume Set(Ch/Id/Lun)	Volume State	Capacity
Raid Set # 00	Ch01	Ctrl 02--VOL#00 (0/0/0)	Normal	750.2GB
	Ch02			
	Ch03			
	Ch04			

Below the RAID Set Hierarchy table is the **IDE Channels** table:

Channel	Usage	Capacity	Model
Ch01	Raid Set # 00	250.1GB	WDC WD2500KS-00MTB0
Ch02	Raid Set # 00	250.1GB	WDC WD2500KS-00MTB0
Ch03	Raid Set # 00	250.1GB	WDC WD2500KS-00MTB0
Ch04	Raid Set # 00	250.1GB	WDC WD2500KS-00MTB0
Ch05	Hot Spare	250.1GB	WDC WD2500KS-00MTB0

The browser status bar at the bottom indicates an Internet connection.

IntelliRaid

Intelligent Graphical User Interface

Automatic Rebuild with Hot Spare

FtDesign IntelliRaid

Raid Set Hierarchy

Raid Set	IDE Channels	Volume Set(Ch/Id/Lun)	Volume State	Capacity
Raid Set # 00	Ch01	Ctrl 01--VOL#00 (0/0/0)	Rebuilding(2.2%)	750.2GB
	Ch02			
	Ch03			
	Ch04			
	Ch05			

IDE Channels

Channel	Usage	Capacity	Model
Ch01	Raid Set # 00	250.1GB	WDC WD2500KS-00MTB0
Ch02	N.A.	N.A.	N.A.
Ch03	Raid Set # 00	250.1GB	WDC WD2500KS-00MTB0
Ch04	Raid Set # 00	250.1GB	WDC WD2500KS-00MTB0
Ch05	Raid Set # 00	250.1GB	WDC WD2500KS-00MTB0

IntelliRaid

Intelligent Graphical User Interface

Log onto the IntelliRaid Controller with
Secure Password Protection



Enter Network Password

This secure Web Site (at 192.168.0.129) requires you to log on.

Please type the User Name and Password that you use for Raid Console.

User Name: admin

Password: ****

Save this password in your password list

OK Cancel

IntelliRaid

Intelligent Graphical User Interface

IntelliRaid Status Screen

The screenshot shows the IntelliRaid web interface in a Microsoft Internet Explorer browser window. The browser title is "Raid Console - admin - Microsoft Internet Explorer". The address bar shows "http://192.168.0.129". The page features a navigation menu on the left with the following items: Quick Functions, RAID Set Functions, Volume Set Functions, Physical Drives, System Controls, and Information. The main content area displays the "1st Design IntelliRaid" logo and a "Raid Set Hierarchy" table. Below this is an "IDE Channels" table.

1st Design IntelliRaid

Raid Set Hierarchy

Raid Set	IDE Channels	Volume Set(Ch14 Luns)	Volume State	Capacity
Raid Set # 00	Ch01	Backup2-VOL#00 (050)	Normal	1000 0GB
	Ch02			
	Ch03			
	Ch04			
	Ch05			

IDE Channels

Channel	Usage	Capacity	Model
Ch01	Raid Set # 00	300 1GB	Maxtor 6L300S0
Ch02	Raid Set # 00	300 1GB	Maxtor 6L300S0
Ch03	Raid Set # 00	300 1GB	Maxtor 6L300S0
Ch04	Raid Set # 00	300 1GB	Maxtor 6L300S0
Ch05	Raid Set # 00	300 1GB	Maxtor 6L300S0

IntelliRaid

Intelligent Graphical User Interface

Extensive GUI Capability

Quick Function

[Quick Create](#)

RaidSet Functions

[Create Raid Set](#)

[Delete Raid set](#)

[Expand Raid Set](#)

[Activate Raid Set](#)

[Create Hot Spare](#)

[Delete Hot Spare](#)

[Rescue Raid Set](#)

VolumeSet Functions

[Create Volume Set](#)

[Delete Volume Set](#)

[Modify Volume Set](#)

[Check Volume Set](#)

[Stop Volume Set Check](#)

Physical Drives

[Create Pass Through](#)

[Modify Pass Through](#)

[Delete Pass Through](#)

[Identify Drive](#)

System Controls

[System Config](#)

[U320 SCSI Target Config](#)

[EtherNet Config](#)

1st Design IntelliRaid

Raid Set Hierarchy

Raid Set	IDE Channels	Volume Set(Ch/Id/Lu)
Raid Set # 00	Ch01	HotRock2-VOL#00 (0/0/0)
	Ch02	
	Ch03	
	Ch04	
	Ch05	

IDE Channels

Channel	Usage	Capacity	
Ch01	Raid Set # 00	300.1GB	Maxtor 6L300S0
Ch02	Raid Set # 00	300.1GB	Maxtor 6L300S0
Ch03	Raid Set # 00	300.1GB	Maxtor 6L300S0
Ch04	Raid Set # 00	300.1GB	Maxtor 6L300S0
Ch05	Raid Set # 00	300.1GB	Maxtor 6L300S0

IntelliRaid

Intelligent Graphical User Interface

Check System Configuration Screen Detail

The screenshot shows a web browser window titled "Raid Console - admin - Microsoft Internet Explorer". The address bar shows "http://192.168.0.0.129". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". The toolbar contains icons for Back, Forward, Stop, Home, Search, Favorites, Media, and other utilities. The search bar shows "Google" and "Search Web".

The main content area displays the "1st Design IntelliRaid" logo. Below the logo, there is a section titled "System Configurations" with a table of settings:

System Configurations	
System Beeper Setting	Disabled
Background Task Priority	High(80%)
Terminal Port Configuration	Baud Rate 115200, Stop Bits 1
JBOD/RAID Configuration	RAID
Max SATA Mode Supported	SATA300
HDD SMART Status Polling	Enabled
Disk Capacity Truncation Mode	No Truncation

Below the table, there is a checkbox labeled "Confirm The Operation" which is currently unchecked. At the bottom of the configuration area, there are two buttons: "Submit" and "Reset".

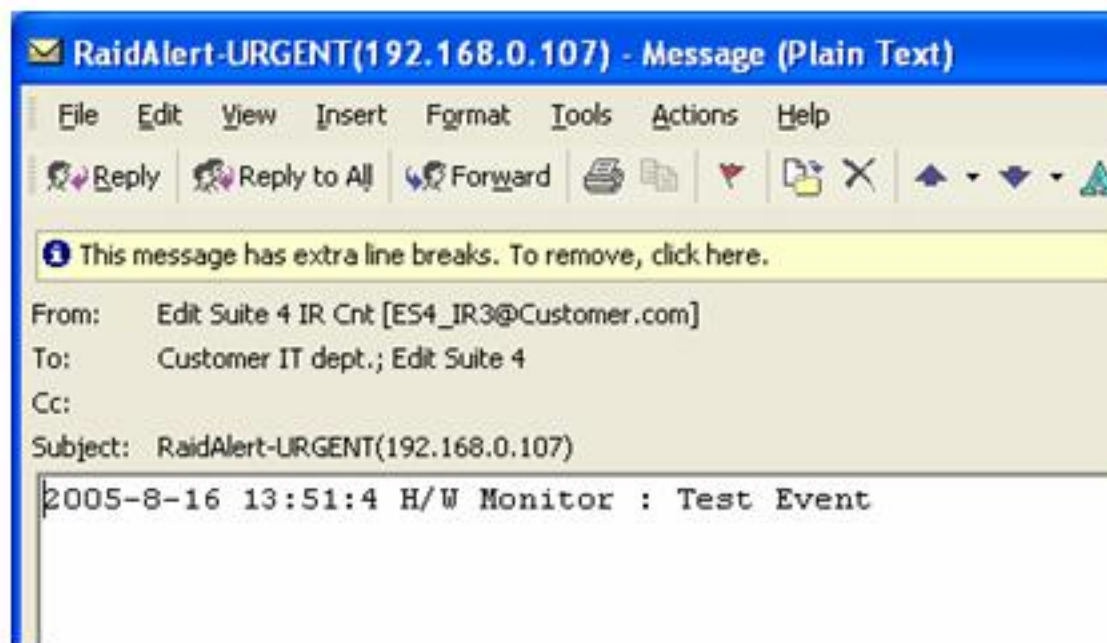
The left sidebar contains a navigation menu with the following sections:

- Quick Function**
 - [Quick Create](#)
- RaidSet Functions**
 - [Create Raid Set](#)
 - [Delete Raid set](#)
 - [Expand Raid Set](#)
 - [Activate Raid Set](#)
 - [Create Hot Spare](#)
 - [Delete Hot Spare](#)
 - [Rescue Raid Set](#)
- VolumeSet Functions**
 - [Create Volume Set](#)
 - [Delete Volume Set](#)
 - [Modify Volume Set](#)
 - [Check Volume Set](#)
 - [Stop Volume Set Check](#)
- Physical Drives**
 - [Create Pass Through](#)
 - [Modify Pass Through](#)
 - [Delete Pass Through](#)

IntelliRaid

Intelligent Graphical User Interface

Remove Disk # 5 while Raid is live
to generate a test email to the IT Dept



Then insert a new drive into Drive slot 5
while Raid is live (all hot swappable)

IntelliRaid

Intelligent Graphical User Interface

Check Status of Raid locally or remotely e.g. from IT Department

1st Design IntelliRaid

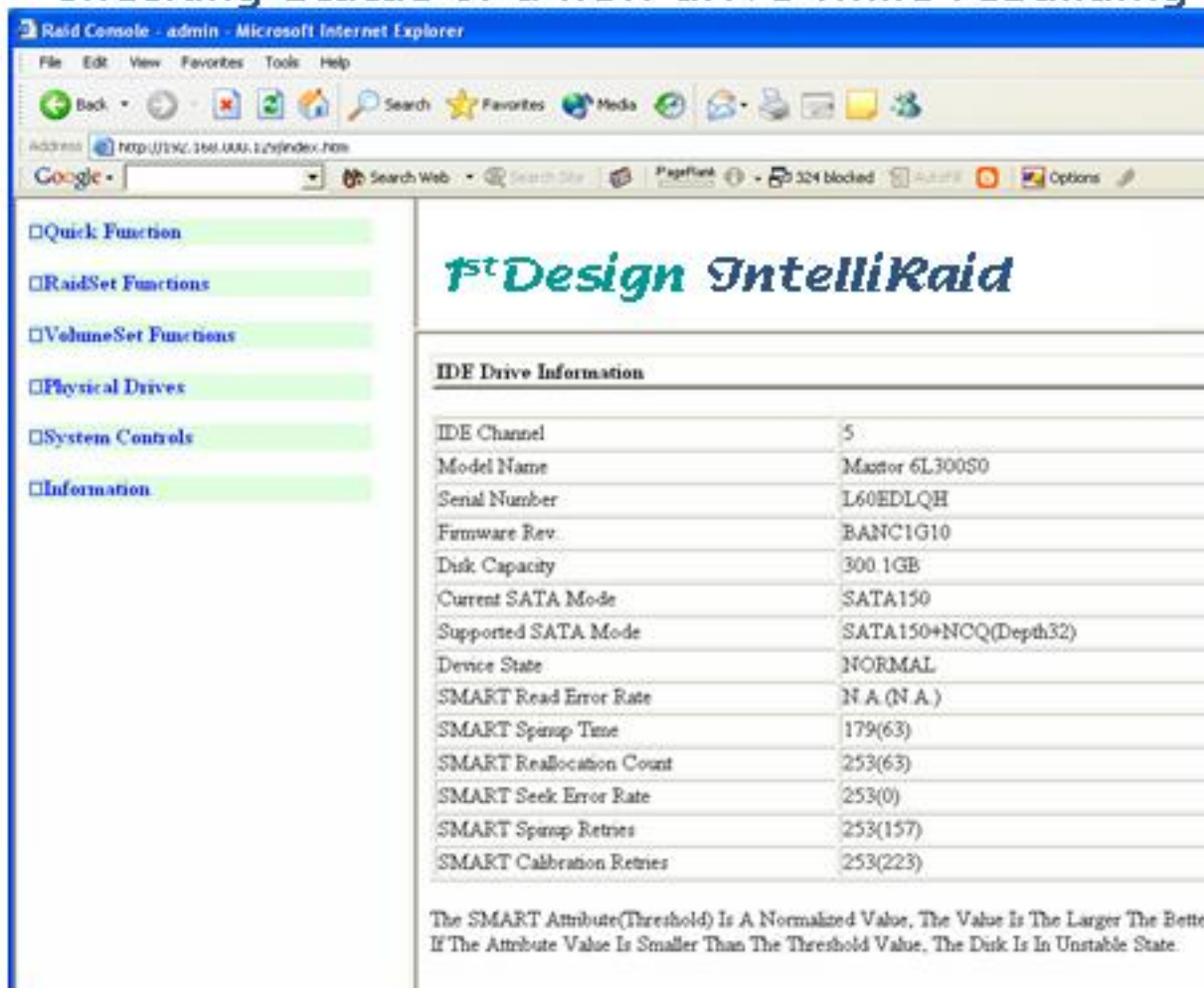
Raid Set Hierarchy

Raid Set	IDE Channels	Volume Set(Ch/Id/Lun)	Volume St
Raid Set # 00	Ch01	HotRock2-VOL#00 (0/0/0)	Rebuilding(0.99%)
	Ch02		
	Ch03		
	Ch04		
	Ch05		

IntelliRaid

Intelligent Graphical User Interface

Checking Status of a new drive while rebuilding



The screenshot shows the IntelliRaid web interface in a Microsoft Internet Explorer browser. The browser's address bar displays the URL <http://192.168.1.101/index.htm>. The page features a navigation menu on the left with the following items: Quick Function, RaidSet Functions, VolumeSet Functions, Physical Drives, System Controls, and Information. The main content area displays the **F^tDesign IntelliRaid** logo and a section titled **IDE Drive Information**. This section contains a table with the following data:

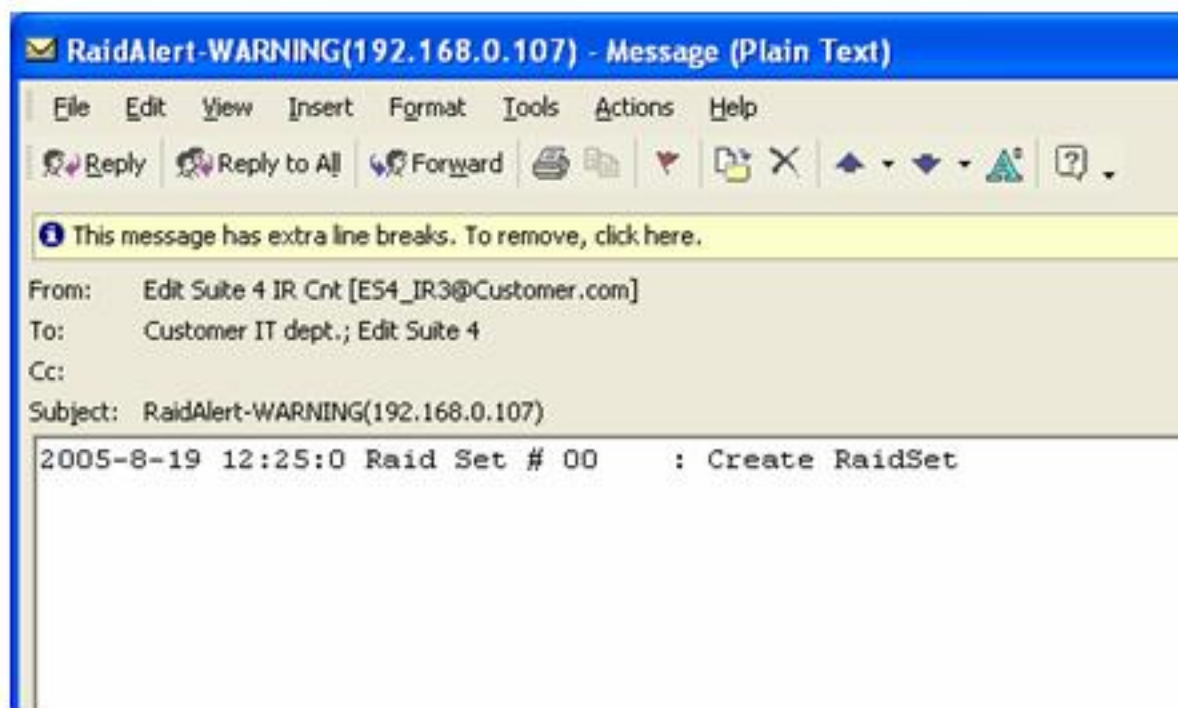
IDE Channel	5
Model Name	Maxtor 6L300S0
Serial Number	L60EDLQH
Firmware Rev.	BANC1G10
Disk Capacity	300.1GB
Current SATA Mode	SATA150
Supported SATA Mode	SATA150+NCQ(Depth32)
Device State	NORMAL
SMART Read Error Rate	N.A.(N.A.)
SMART Spinup Time	179(63)
SMART Reallocation Count	253(63)
SMART Seek Error Rate	253(0)
SMART Spinup Retries	253(157)
SMART Calibration Retries	253(223)

Below the table, a note states: "The SMART Attribute(Threshold) Is A Normalized Value, The Value Is The Larger The Better If The Attribute Value Is Smaller Than The Threshold Value, The Disk Is In Unstable State."

IntelliRaid

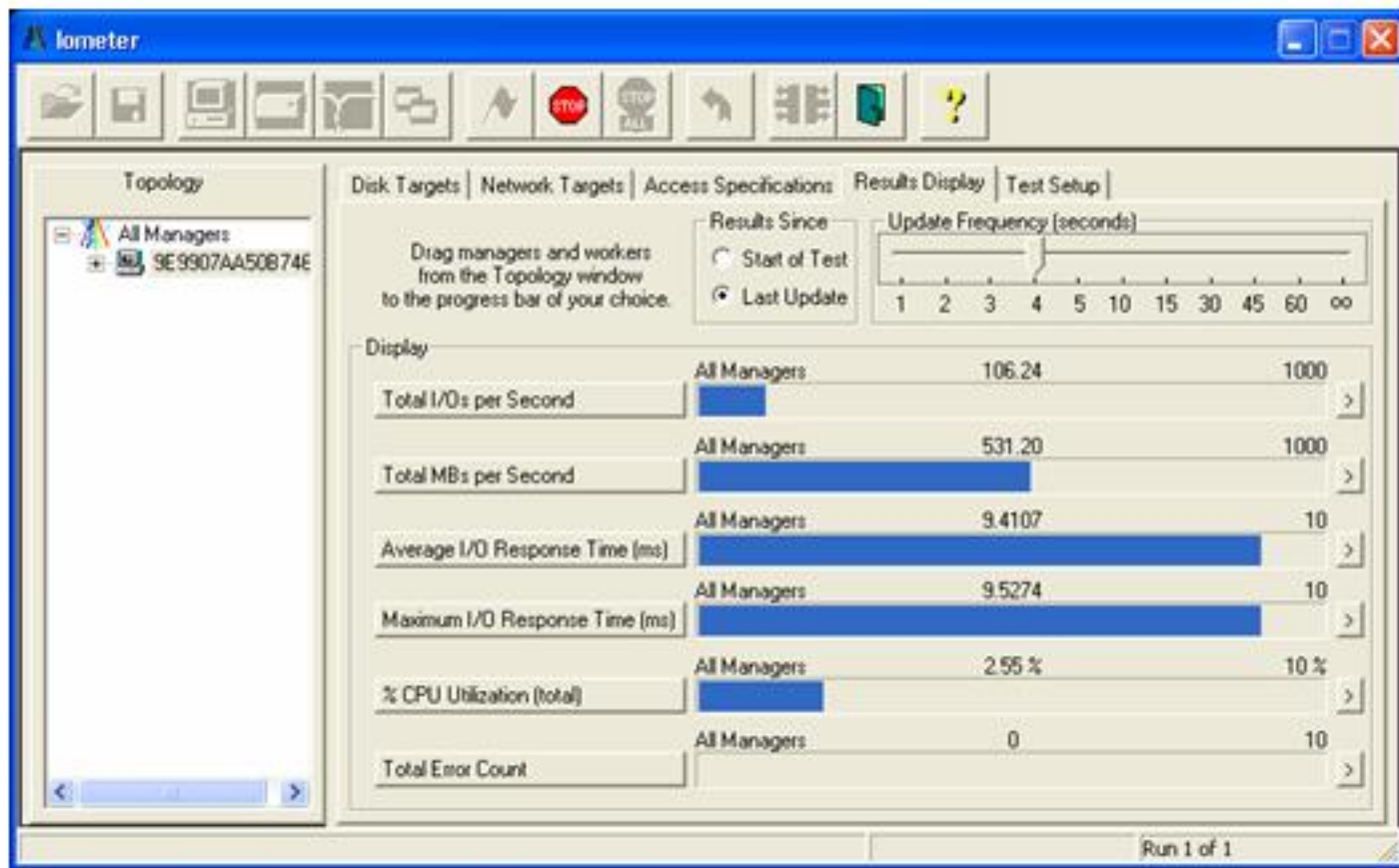
Intelligent Graphical User Interface

Email is sent to confirm rebuild completion



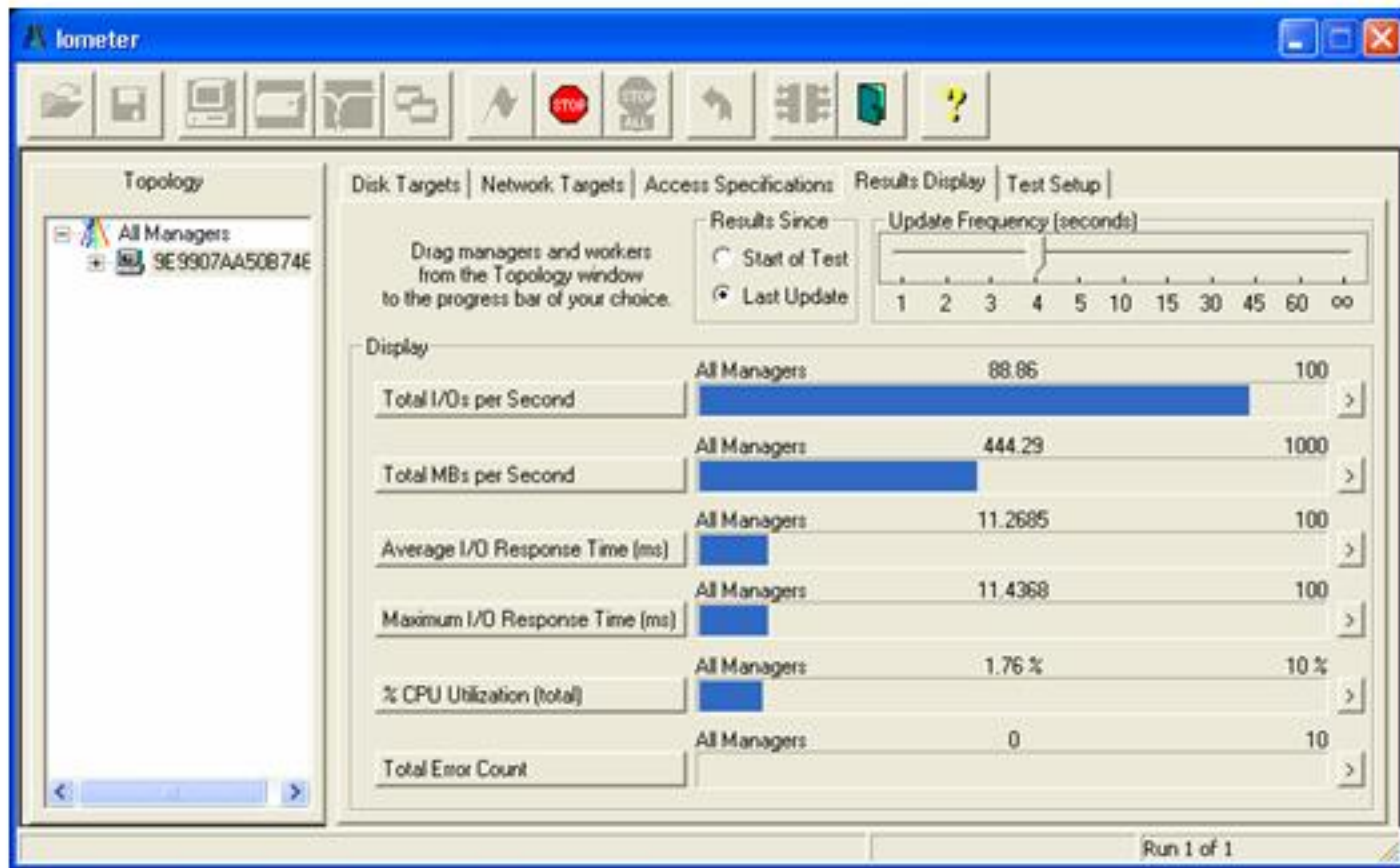
IntelliRaid

READ performance



IntelliRaid

WRITE performance



SCSI HBAs with *IntelliRaid*

- Adaptec 29320/39320, 29160/39160
- Atto UL3S/UL3D, UL4S/UL4D
- LSI U320, 20320

IntelliRaid vs. Others

Enterprise Level Performance

Feature	IntelliRaid	Huge	Medea	Benefit
Host Connection dual SCSI 320	Yes	Yes	Yes	High Performance / Cost Effective Storage
Controller / Disks	SATA2	IDE	IDE	SATA2 Highest performance
Sustained Throughput	>450 MBs	>200 MBs	>350 MBs	Real-Time Uncompressed 10-bit High Definition
- Write Caching	Yes	No	No	Higher performance
- Read Ahead	Yes	No	No	Higher performance
- Prog. R/W Performance Optimization	Yes	No	No	Optimize Performance for Video applications

IntelliRaid vs. Others

Enterprise Level Intelligence

Feature	IntelliRaid	Huge	Medea	Benefit
Live Intelligent Raid Migration	Yes	No	No	Reconfigure w/o unloading data
Hot swappable	Yes	No	No	Ease of Maintenance
Hot Spare disks	Yes	No	No	Unattended auto rebuild
Intelligent front user interface	Yes	No	No	Notification and configuration in English
LAN Graphical User Interface	Yes	No	No	Clear fast interaction with controllers from any system on LAN
Email event notification	Yes	No	No	User and IT notified when help is needed
Remote Access LAN / WAN	Yes	No	No	IT and even remote support is possible

IntelliRaid vs. Others

Enterprise Level Reliability

Feature	IntelliRaid	Huge	Medea	Benefit
Raid Levels	0,1,1-0,3,5	0,1,3 HD Turbo-50% Capacity loss	0,1,3	No Turbo mode with 50% capacity loss necessary
Power Supply	Dual Redundant Hot Swap 400w	Single 250w	Dual 250w?	Withstand surges / dips
Redundant Power Input	Yes	No	No	No single point of failure for critical databases
Disk MTBF	Up to 1.2 M hrs @100% Duty Cycle	Up to 50 K hrs	Up to 200K	Significant increase in uptime / reliability
Remote Service	Yes	No	No	1 Beyond can access
Status Event Log	Yes	No	No	History to help analysis

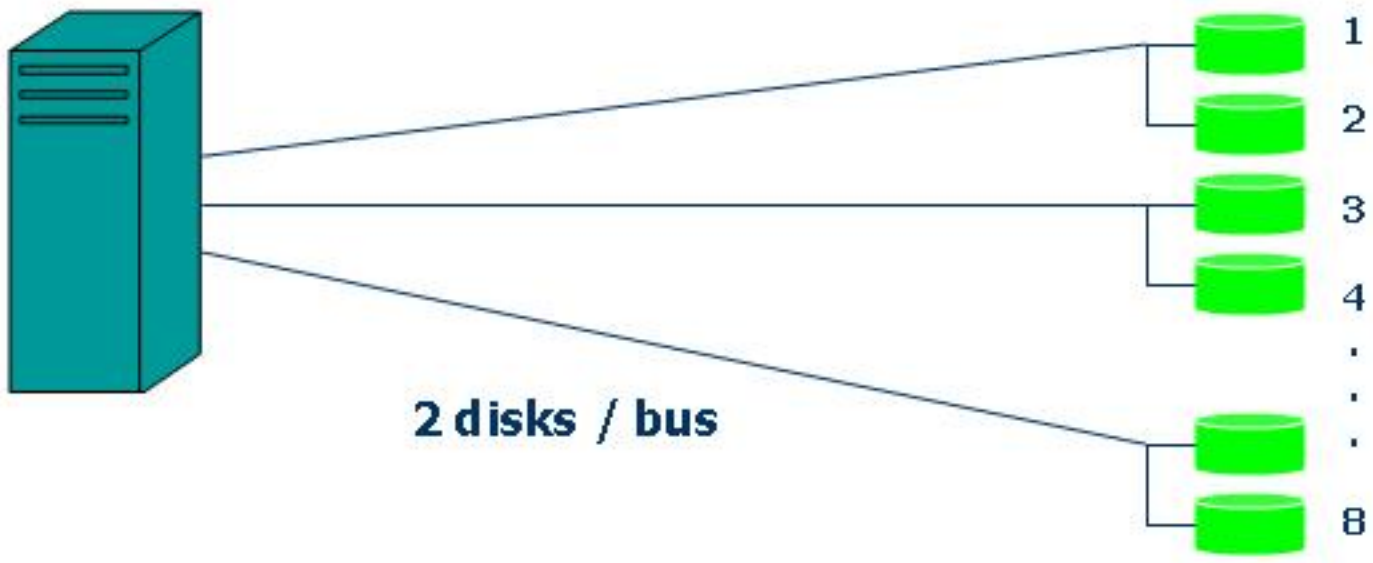
Storage Development

1970's SCSI



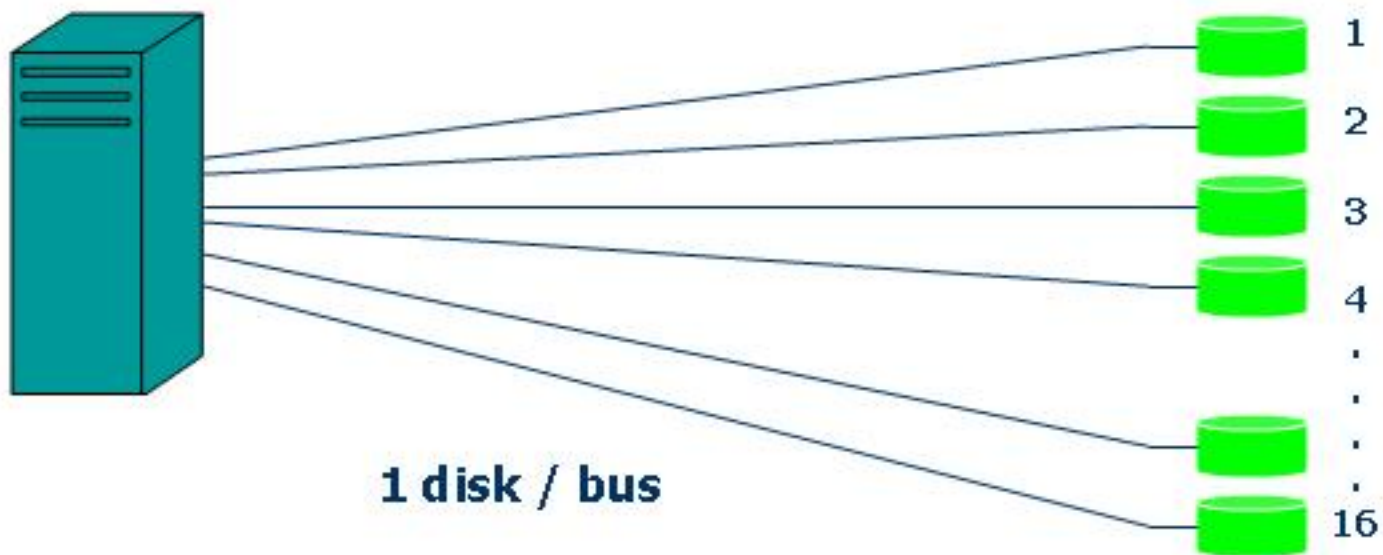
Storage Development

1990's IDE



Storage Development

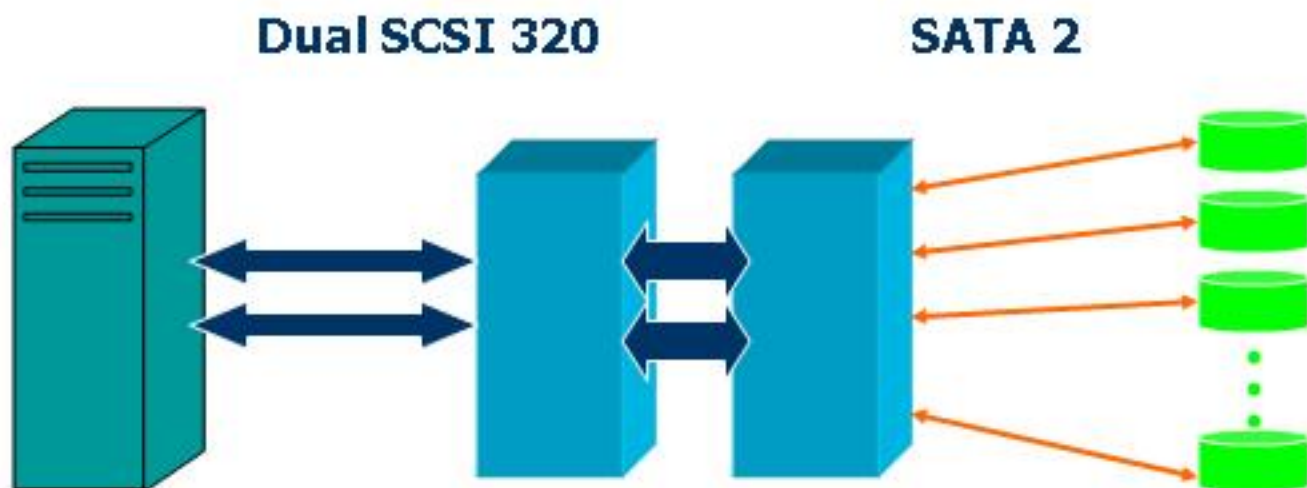
2000's SATA 1 – 2 more to come



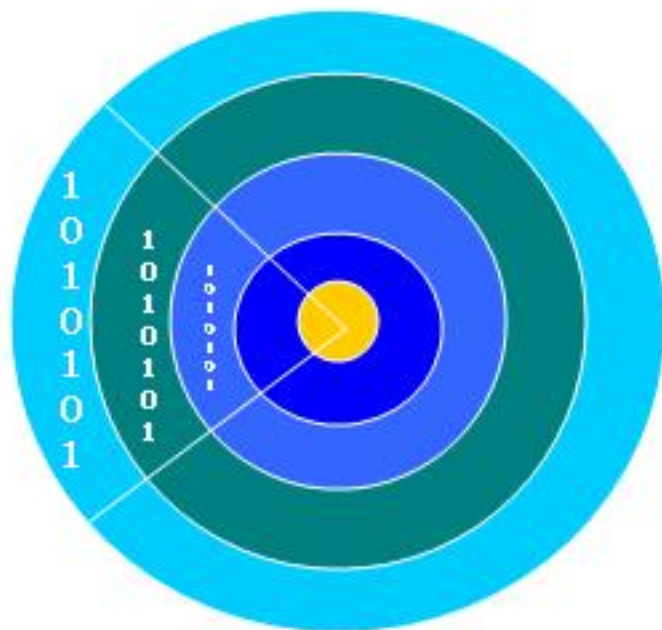
Storage Development



The *IntelliRaid* Difference



The *IntelliRaid* Difference

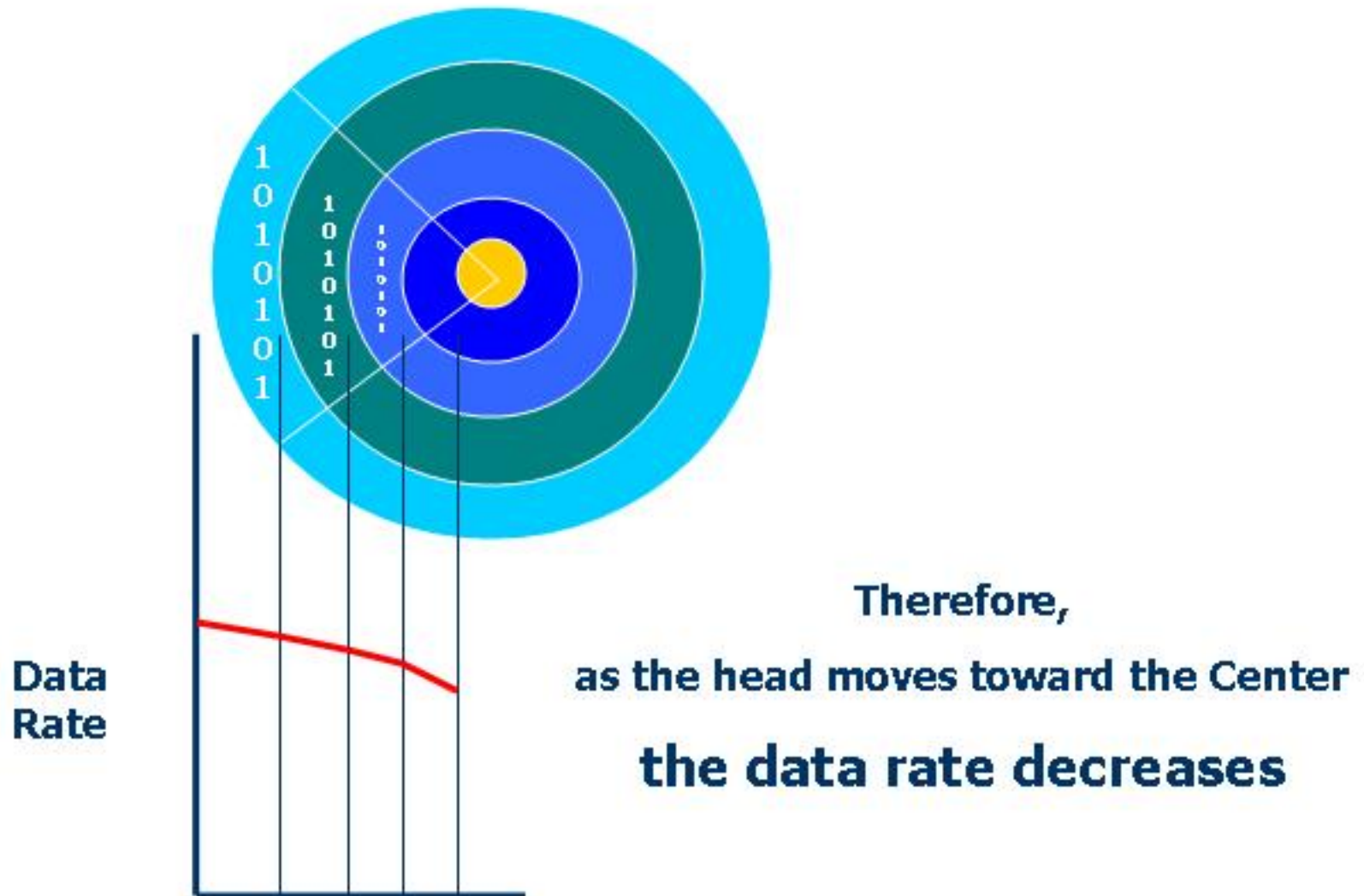


Disk Platter

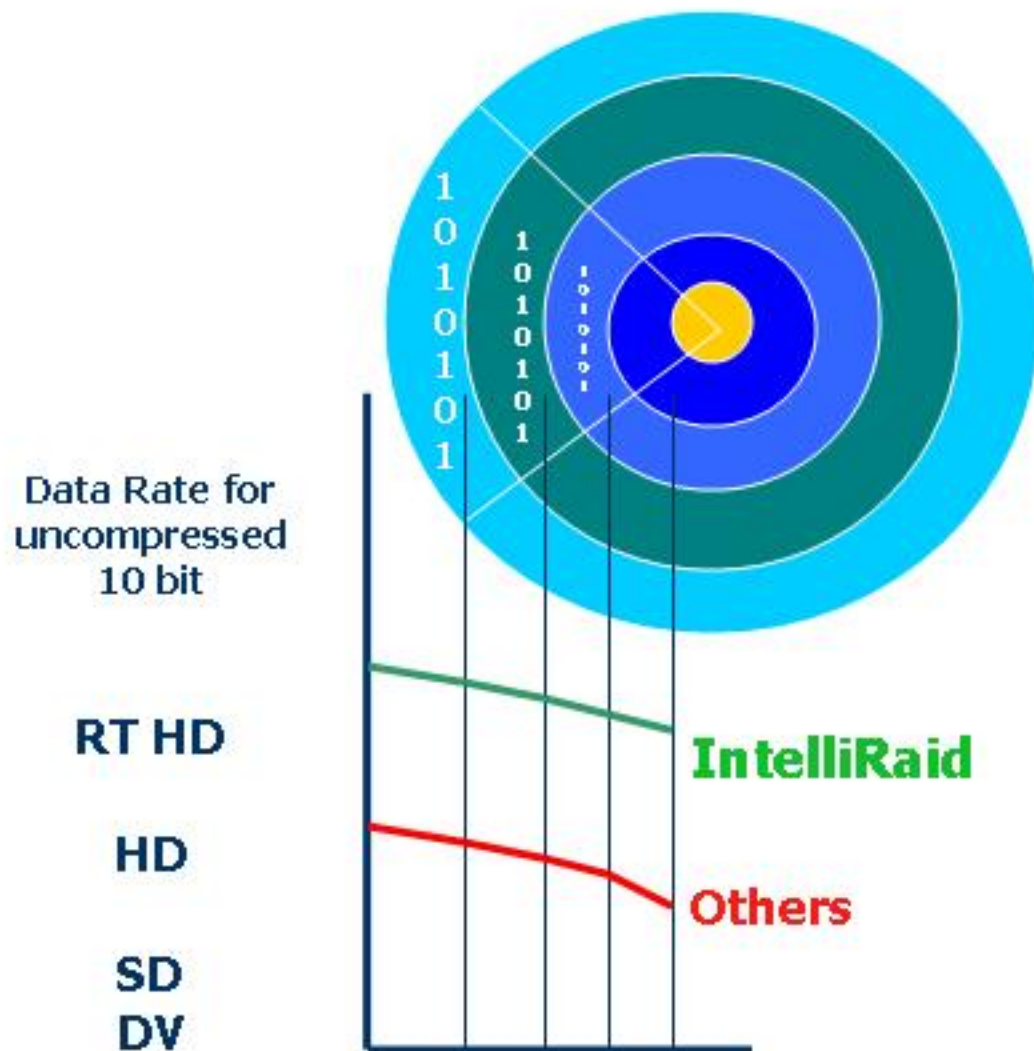
As the head moves toward the Center

There are fewer bits per rotation

The *IntelliRaid* Difference

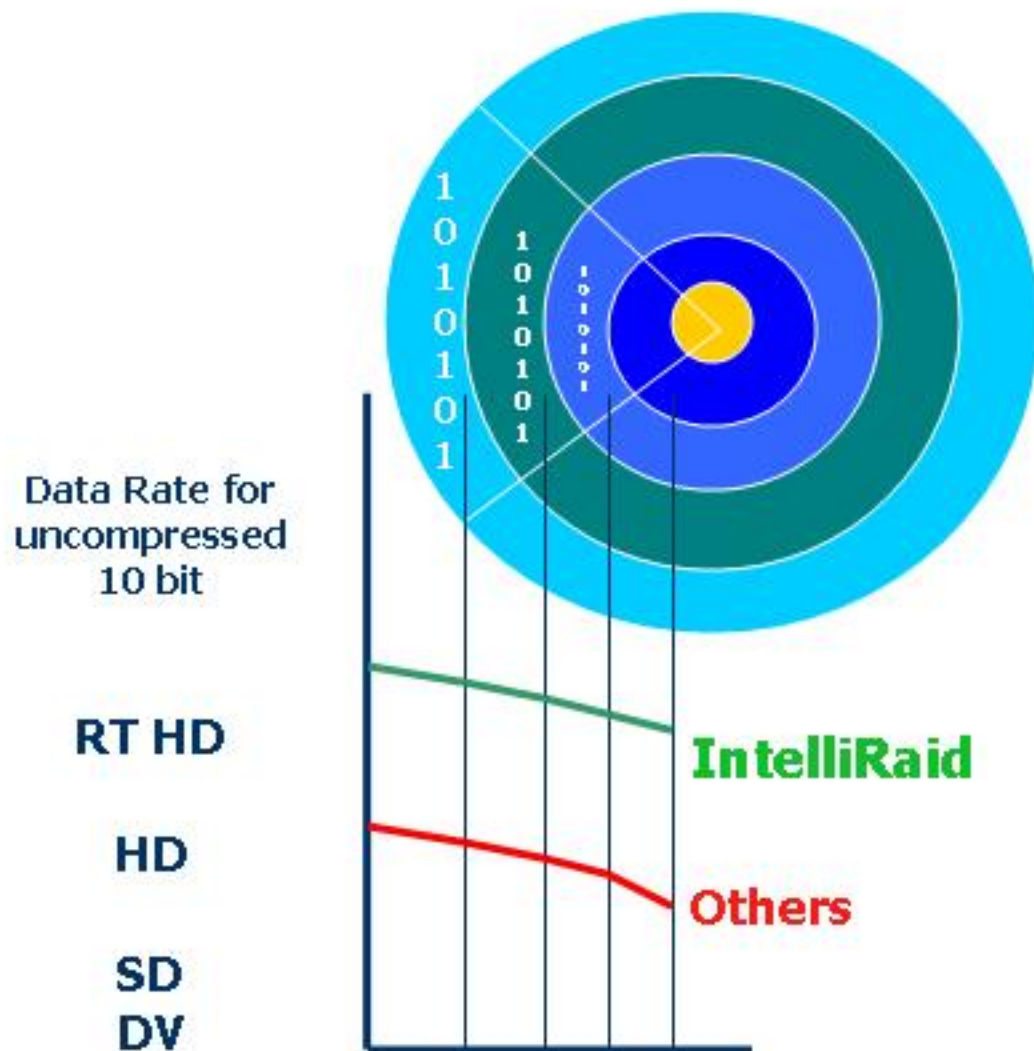


The *IntelliRaid* Difference



This is not as pronounced in
IntelliRaid -
the controller
is more capable
and much faster

The *IntelliRaid* Difference

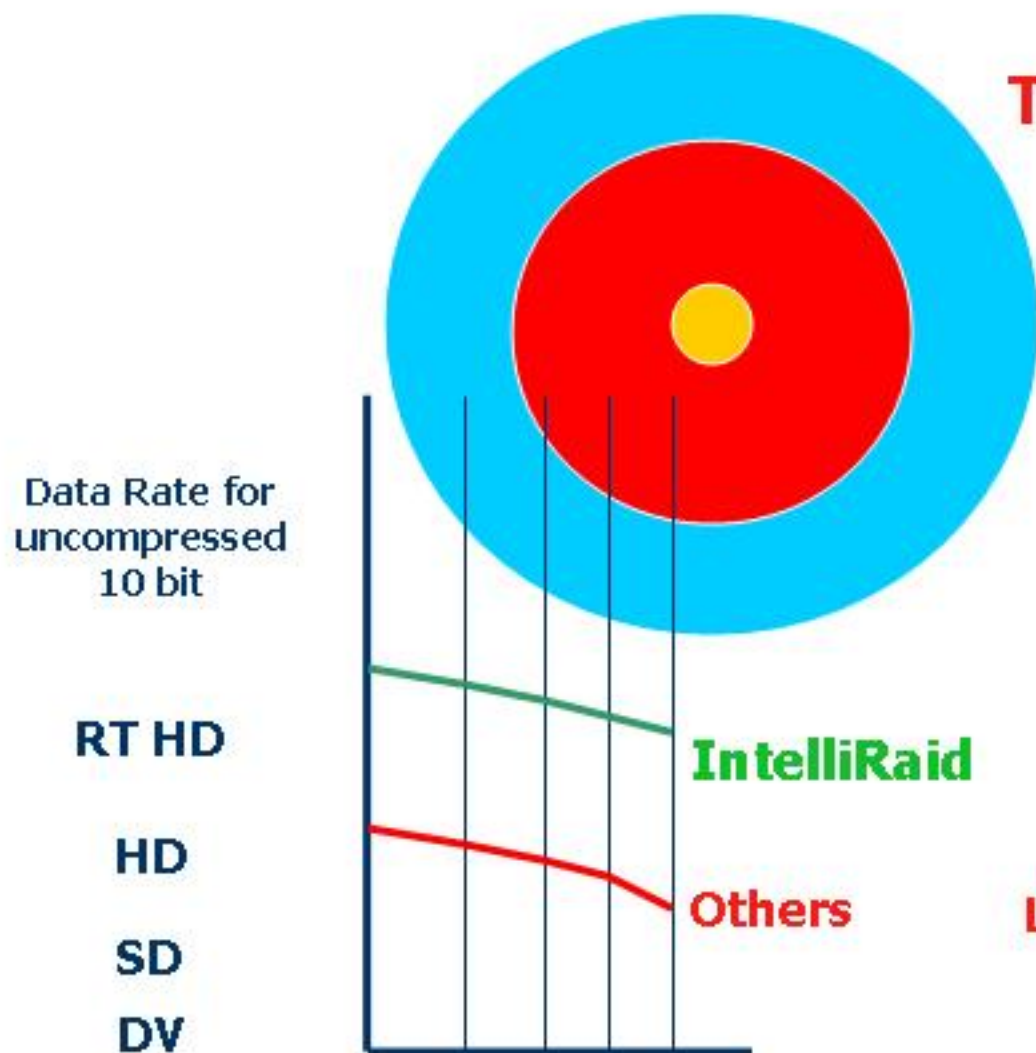


Note the problems

For others:

- HD is borderline
- RT HD impossible!

The *IntelliRaid* Difference



To solve the HD problem
Others use

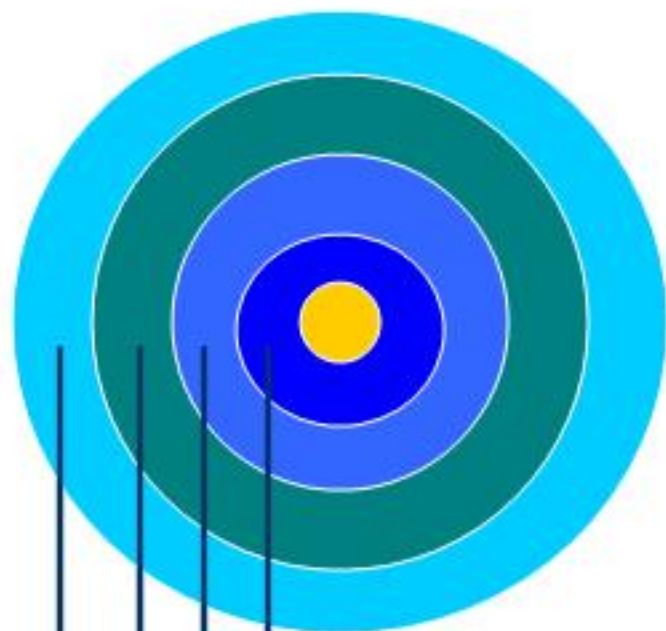
"Turbo Mode"

It blocks the
Inner 30% of the disk

Since the inner-space
Is not capable of HD
It must be blocked,

Lost Capacity = \$/GB increase!

The *IntelliRaid* Difference



**IntelliRaid can
Define volumes**

**Each Volume can have:
a different size and
Raid Definition**

No disk space is ever blocked

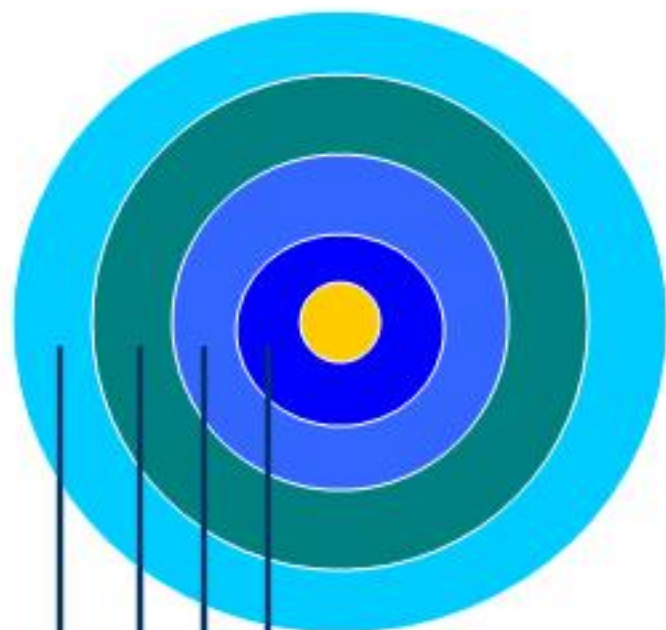
Volume 4 – 0.5 TB Raid 3

Volume 3 – 0.5 TB Raid 5

Volume 2 – 1 TB Raid 0

Volume 1 – 1 TB Raid 3

The *IntelliRaid* Difference



Volume 4 – 1TB Raid 3

Volume 3 – 1TB Raid 5

Volume 2 – 1TB Raid 0

Volume 1 – 2TB Raid 3

**IntelliRaid can
Migrate volumes**

Each Volume can change:
to a different size or
Raid Definition

Without removing data!

IntelliRaid vs. Others

Compare to **similar cost storage**
and gain:

- **Intelligent interface. Local or remote**
- **Double the performance**
- **Increased reliability**
- **Future-proof features**

IntelliRaid vs. Others

Compare to **similar performance storage**
and gain:

- **Unmatched features**
- **Quiet small footprint operation**
- **Savings up to 66%!**

The ***IntelliRaid*** Difference

That's **Intelligent Storage**

That's

IntelliRaid