

# Dynamic Drive Pool

## **The DDP is manufactured by Ardis Technologies BV.**

The DDP is the easiest and fastest SAN around.

It is one system (a DDP), one network (Ethernet) and all from one manufacturer.

Every DDP is developed with its powerful Audio / Video File System.

## **We welcome you in the DDP World.**

On [www.ddpsan.com](http://www.ddpsan.com) you will find our product portfolio, specifications, documents and a description how the DDP technology works.

This PDF is meant to give the reader - a dealer or staffmember - a quick rundown of:

- \* the technology behind the DDP
- \* the different DDP products
- \* how they are used in different use cases
- \* infrastructure examples
- \* security
- \* the functions in the web interface

So let us first introduce our file system underneath every DDP.



# Audio Video File System

Because we could not find a proper file system for **Media and Entertainment** we decided to develop A/V FS. As a SAN file system A/V FS uses standard the iSCSI protocol in all DDP products.

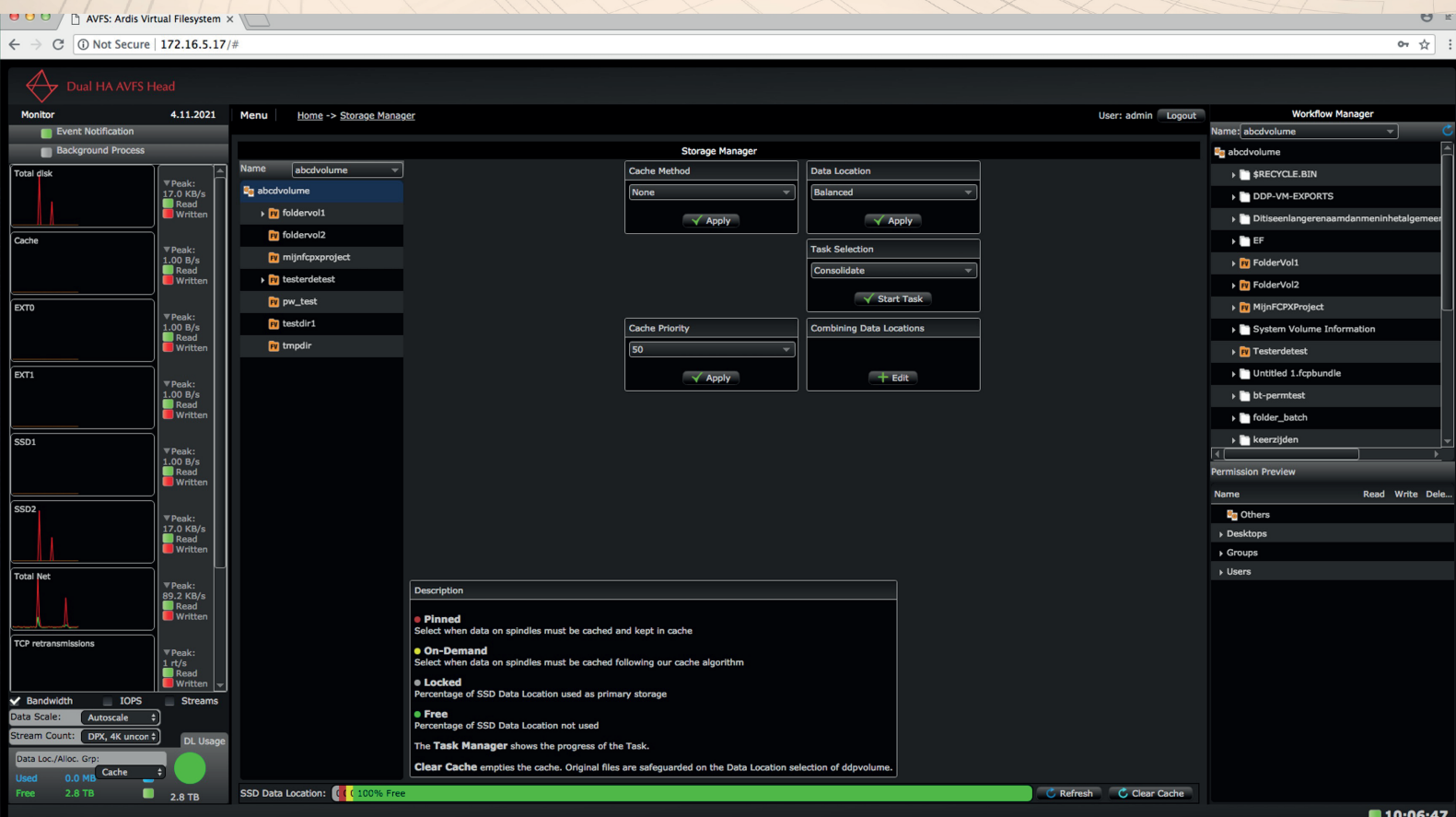
In addition the DDP10EF and HA DDP solutions can use the NVME-oF/RDMA protocol. **The high availability (HA) DDP solutions yet again go one step further** and can also be delivered with Fibre Channel. For low bandwidth requirements and push/pull access also SMB can be used.

**A/V FS is a single file system.** Do not confuse this with the phrase “single or one name space”. When that phrase is used it means that there are multiple file systems underneath the one name space. There are then often limitations, which are not there with a single file system. Project based caching as described on the next page, the use of hard links and native Avid Media-Files project sharing and bin locking support, are only possible within one file system.

**The caching mechanism in A/V FS is unique.** Read more details on the next page. Another special A/V FS feature is that any folder, subfolder, sub subfolder can be given volume properties. These are then called **folder volumes** and can be connected as a volume on the desktop on Macs and in My Computer on Windows and on Linux.

A third feature is that **access right management is folder based** and not file based. Exactly what is needed when working in M & E. And last but not least because **A/V FS is developed in house and runs on all DDP systems,** any support issue can be dealt with quickly and almost immediately.

# Project Caching



Unfortunately we need to dive a bit deeper into the technology now to explain the advantages of A/V FS. On any shared storage system you find the directory tree which shows what is on the storage.

Now let us ask the question “Can I freely copy and move files around on the storage without effecting the directory tree?” At first sight this question sounds weird.

Normally when you do a copy or move you select files or folders and then move or copy these and it shows in the directory tree that files on the storage have been moved or copied.

However state of the art shared storage systems consist of different groups of physical storage such as hard disks, SSDs, tapes or groups of hard disks of different capacities on premises or in the cloud.

To manage such systems the file system with its directory tree is kept independent from where the file data is stored. This creates the possibility to move file data around internally between these groups without effecting the directory tree. A limitation is that in many cases during such a move at some point no one can access such file. Mind you these are internal moves so a copy without effecting the directory tree does not sound like a possibility at all. With A/V FS we have gone that extra mile and implemented an internal move and copy mechanism which can be used while operator access files as they see fit without hick up.

It is a fact that SSDs are fast and can easily handle audio, video and film, but compared to hard disks they are still much more expensive. So it helps that A/V FS can unconditionally and transparently copy and move data internally.

Copying is between groups and SSD cache. Moving (consolidating) can be between all groups.

Now how does that benefit the customers?

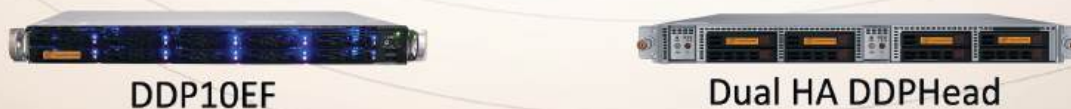
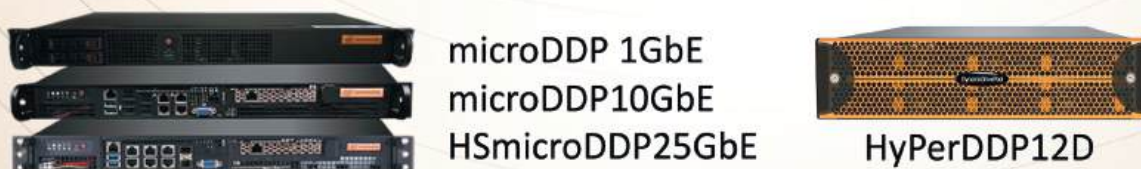
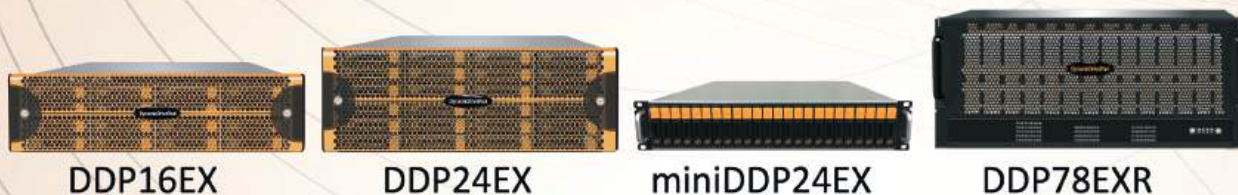
We know that material in M & E is organized in projects. And obviously projects are organized using some kind of folder/subfolder structures. So to cache a project which is on the hard disks you only need to cache the content of its folder structure to the SSDs. This is exactly what the DDP allows you to do.

When opening a project caching can start. When the project is finished its files can be cleared from the cache. The clearing is instant and the files can still be accessed from the hard disks. This is because as a unique property of A/V FS the data of files and folders in the directory tree can be at two places simultaneously.

This kind of caching is not possible in other systems. Even an internal move in other systems is not straightforward. In general a move is a copy, rename and then finally delete of the original. A file which is being read by an operator can not be deleted of course. It means that although the copy part can happen, the rename and the delete must be stalled to the point that no one has access to the file or files anymore. But when would that be?

This page shows the Storage page from the DDP web interface. While on the left Ddpvolume is selected in the middle Data Location and Cache method can be selected. Cache Priority determines how fast the caching process goes.

# The different DDP products



## Here you see the different DDP product lines:

- \* **Hybrid** base systems: DDP12D, DDP16D, DDP24D and DDP24DF.  
These are modular systems. Cards, SSD and hard disk packs can be selected separately.
- \* **MiniDDP24DF** base system. Cards and SSD packs can be selected separately.
- \* **Storage base systems:** DDP16EX(R), DDP24EX(R), miniDDP24EX(R) and the DDP78EXR base systems to expand the Hybrid base systems, miniDDP24DF and DDP10EF.
- \* **MicroDDPs**, 1U. These are available with different SSD capacities.  
There are three models with different bandwidths and ports.
- \* **HyperDDP12D**, 2U. This is the budget step in DDP system.
- \* **DDP10EF** base system, 1U. Modular DDP using NVME SSDs for extreme performance.
- \* **Dual HA DDP** solutions. These consist of the 1U Dual HA DDPHead with raid storage arrays from third parties such as Seagate, Infortrend and Pure Storage.

We will discuss each product series in the next pages.



# Hybrid DDPs



**The hybrid or standalone DDP line consist of the DDP12D, DDP16D, DDP24D and DDP24DF base system.**

These are all 19 inch with normal rack depth and heights, 2U, 3U and 4U respectively.

The number in the name is the number of carriers.

These can be filled with SSD4 and SSD8 packs from 1,2,4 and 8TB SSDs and HD 4 and 8 packs up to 24TB per hard disk.

For SSD packs we advise raid5 and for hard disk up to 4TB raid5 and beyond 4TB raid6. Raid 6 sets of hard disks are either on eight or twelve disks.

These base systems come with redundant power supply, dual 1/10GbE/RJ45 ports and have six empty slots which can be filled with PCIe Ethernet and other cards.

The DDP24DF is rated at up to 6GB/s bandwidth. The others up to 2GB/s.

# MiniDDP24DF



**The miniDDP24DF base system is a 2U all SSDs shared storage system.**

The miniDDP24DF base system is a 2U all SSDs shared storage system.

It comes standard with dual onboard 10GbE/RJ45 ports and redundant power supplies.

The 24 carriers can be filled with 1,2 or 3 x SSD8 packs of 1,2,4 or 8TB per SSD.

When complete with SSDs the maximum throughput on reading is 6GB/s or 2,5GB/s on writing.

The six empty PCIe slots can be filled with low profile cards such as 10/25GbE/SFP28, 40/50/100GbE/QSFP28 network cards and SAS and EX card.

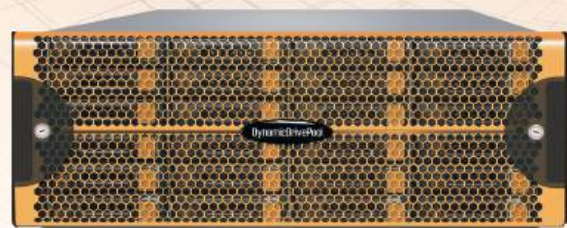
The SAS card is needed to connect an LTO tape drive/library to be combined with Archiware P5.

To expand the system with DDP storage arrays an EX card in the miniDDP24DF is required.

# Storage Arrays



DDP16EX



DDP24EX



miniDDP24EX



DDP78EXR

**The DDP16EX or EXR, DDP24EX or EXR, miniDDP24EX or EXR and the DDP78EXR are SAS equipped storage arrays.**

They come with redundant power supplies.

The EX version has one SAS controller and the EXR ones are redundant with dual SAS controller.

The empty carriers can be filled with SSD4 and 8 packs up to 8TB per SSD and with HD4 and 8 packs up to 24TB per hard disk.

In all systems 24/7 enterprise grade SAS drives are used.

An EX raid card is needed in one of the DDP base systems so that the raid configured storage array(s) can be connected using SAS cables.

Within A/V FS storage arrays become part of the single directory tree.

These storage arrays can also be added later when capacity and or bandwidth requirements increases.

# microDDP series



The microDDPs are small, lightweight, low noise DDPs

**The 1U microDDP1GbE has six 1GbE/RJ45 ports and two 10/25GbE/SFP28 ports.**

It can hold SSD4 or SSD8 packs with 1, 2, 4 or 8TB SATA SSDs.  
The total bandwidth is 1GB/s.

**The 1U microDDP10GbE has dual 1GbE/RJ45 ports and dual 10GbE/RJ45 ports.**

It can hold SSD4 or SSD8 packs with 1, 2, 4 or 8TB SATA SSDs.  
The maximum bandwidth is 2,2 GB/s.

Both DDPs are small and lightweight and can be carried by hand. Also both are very silent. These properties make these the ideal candidate for standard rental jobs and studios where space and or noise can be an issue.

Given the fact that 1000 tracks of audio uses 600GB capacity and bandwidth never will exceed a few hundred MB/s this makes it an ideal candidate for audio studios too.

**The HSmicroDDP25GbE** is explained on the next page.



# HSmicroDDP25GbE



**The HSMicroDDP25GbE is 1U and has 8 x 1GbE/RJ45 and dual 10/25GbE/SFP28 ports.**

It is a shared storage system.

It has a hot swappable redundant power supply and hot swappable, removable SAS SSDs.

The HSmicroDDP25GbE is just 5 Kg and can be hand carried.

The maximum bandwidth is 1.2GB/s.

This makes the HSmicroDDP25GbE an ideal transfer partner for projects where ingest is separate from post production.

It can be used to physically transfer the DDP or solely its mirrored SSDs or use it at the edge to transfer the material via internet to another location using Archiware P5 Synchronize.

**As a shared storage solution it natively supports Avid Media Composer, Pro Tools, Premiere, Resolve, all other post production applications and edit while ingesting.**

# HyperDDP12D



**Shared Storage: SSD Performance with HD Capacity**

HyPerDDP12D: Ultra fast hybrid Ethernet  
SAN shared storage server  
with SSD cache performance and HD capacity  
for Post Production & Broadcast

**The HyperDDP12D is a starters system with a fix configuration.**

The base system is 2U and has two on board dual 10 GbE/RJ45 ports.  
These can also be used as 1GbE.

The system comes with an SSD4 pack of 1TB SATA SSDs, a HD4 pack of 8TB hard disks and four empty slots for which another pack can be ordered any time.

The bandwidth is 1GB/s.

On [www.ddpsan.com/products](http://www.ddpsan.com/products) and then HyperDDP12D, there is a video which clearly explains the unique SSD caching mechanism of all DDPs.

The HyperDDP12D comes with redundant power supplies.

There are two PCIe slots for Ethernet cards.

To expand the HyperDDP12D it can be clustered.

Warranty on this DDP is one year.

Sliding arms and a spare hard disk can be ordered separately.

# DDP10EF



**DDP10EF: 1U, 19", up to 40GB/s  
shared storage for  
8K DPX and all other formats**

**The DDP10EF is a 1U DDP base system with redundant power supplies.**

It comes with dual 10/25/40/50/100 GbE/QSFP28 ports.

The empty PCIE slot can be filled with an EX card or an Ethernet card.

Its SIOM port can be equipped with a dual 100GbE, dual 10 / 25 GbE/SFP28 or with a dual 10GbE/RJ45 card.

Included in the delivery is also a USB2Ethernet adapter for maintenance.

The DDP10EF can be filled with a NVME SSD4 or and a NMVE SSD6 pack.

The SSDs are configured as one RAID5 set. The NVME SSD are from 0.96 to 30.72 TB.

When fully loaded and with the proper Ethernet ports read bandwidth can be up to 40GB/s and write bandwidth 24GB/s with 270TB usable capacity.

The DDP10EF can of course be used as a standalone system.

But since the DDP10EF uses A/V FS under the hood, the DDP10EF can be used as a cache when one or more hard disk storage arrays are connected.

When that is the plan an EX card must be installed in the available PCIE slot.

DDP16,24 and 78EXR storage arrays with hard disks can be connected.

On Windows and Linux the DDP10EF can be accessed using iSCSI and NVME-oF/RDMA.

On Mac iSCSI is used.

Bandwidth on a desktop can be up to 11GB/s.

On [www.ddpsan.com/Products/DDP10EF](http://www.ddpsan.com/Products/DDP10EF) and in the documentation section reachable at the end of the page there are leaflets with further information.

# Dual HA DDPHead

A/V FS - High Availability File System for M & E installed  
and can be combined with third party arrays



The amount of files and folders it can hold depends on the amount of RAM.  
The Dual HA DDPHead comes standard with dual 10/25GbE/SFP28 ports.  
For FC or Infiniband FC or Infiniband cards are also needed.



## The Dual HA DDP solutions consists of the 1U Dual HA DDPHead with two nodes.

The Dual HA DDP solutions consists of the 1U Dual HA DDPHead with two nodes each running A/V FS. Each node of the Head can be equipped with Ethernet ports up to 100GbE. The Dual HA DDPHead is fully redundant with no single point of failure. The Dual HA DDPHead as a standard provides metadata when communicating with the storage arrays and workstations.

The Head can be combined with redundant raid arrays such as the DS and GS series of **Infortrend** or the EXOS X series of **Seagate** to function as a fully redundant DDP solution underneath a single file system: A/V FS.

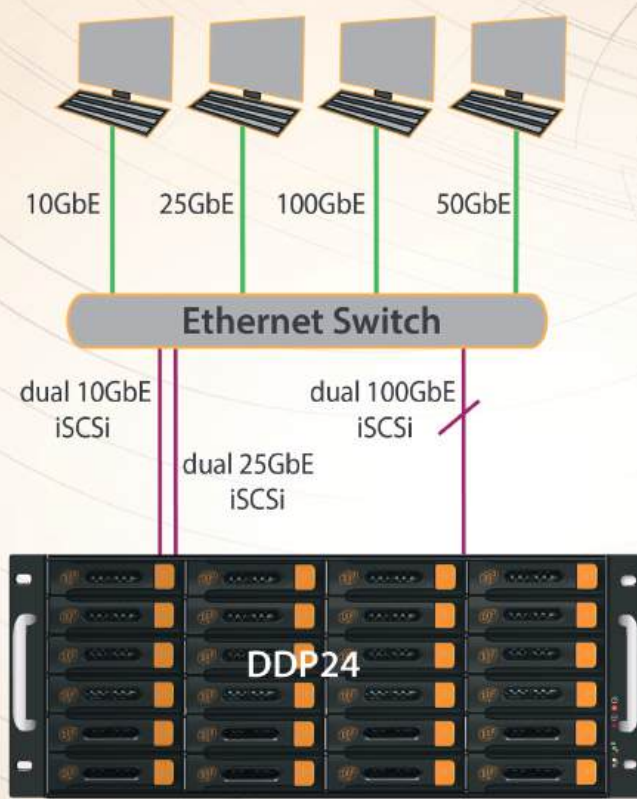
Hard disks and SAS and NVME SSD packs can be purchased to be defined as Cache. With hard disks in combination with SAS SSDs bandwidth can be up to 2GB/s for a budget solution or up to 8GB/s with fast raid controllers. For bandwidths beyond 8GB/s a NVME SSDs solution can be purchased.

The network ports of the raid arrays can be with Ethernet or Fibre channel transceivers. The easiest network setup is when Ethernet transceivers and iSCSI is used because each computer can be connected to both Dual HA DDPHead and Raid array via one Ethernet cable and one subnet.

Both the Dual HA DDPHead and the Raid arrays are connected to the computers via one or more switches and are accessed simultaneously in parallel.

For more detailed information see [www.ddpsan.com/Products](http://www.ddpsan.com/Products) and then High Availability DDPs.

# Network base setup for Hybrid DDPs, HyperDDP12D, microDDPs and miniDDP24DF



## The most common Ethernet network setup of a DDP with a switch.

The computers attached represent Macs, Windows and Linux machines.

These can be desktops, laptops, workstations, render machines, virtual machines, servers, film scanners, ingest and play out machines. They can be connected via Ethernet, WIFI or via Internet.

Any device on which the A/V FS driver can be installed will do. If this is not possible SMB can be used. Depending on the DDP PCIe cards can be installed with 1, 10, 25, 40, 50, 100 and 200GbE Ethernet ports.

Each port on the DDP must have its own subnet.

We have no switch preference other than that Flow Control and MTU must be controllable per switch port.

Also the spanning tree filter must be controllable. In most cases there already is a network infrastructure.

So the easiest way then is to connect the DDP to that network by plugging it into the existing switch. There must be enough network headroom of course.

The bandwidth each computer is allowed to use can be limited both ways using the bandwidth limiting page in the DDP web interface.

Many companies these days use copper cable not just for 1GbE but up to 10GbE.

The RJ45 cables must be cat 5/6 or up and the length of a cable strongly depends on the energy the endpoints can provide.

A length of some 50 meter is possible but the shorter the length the better.

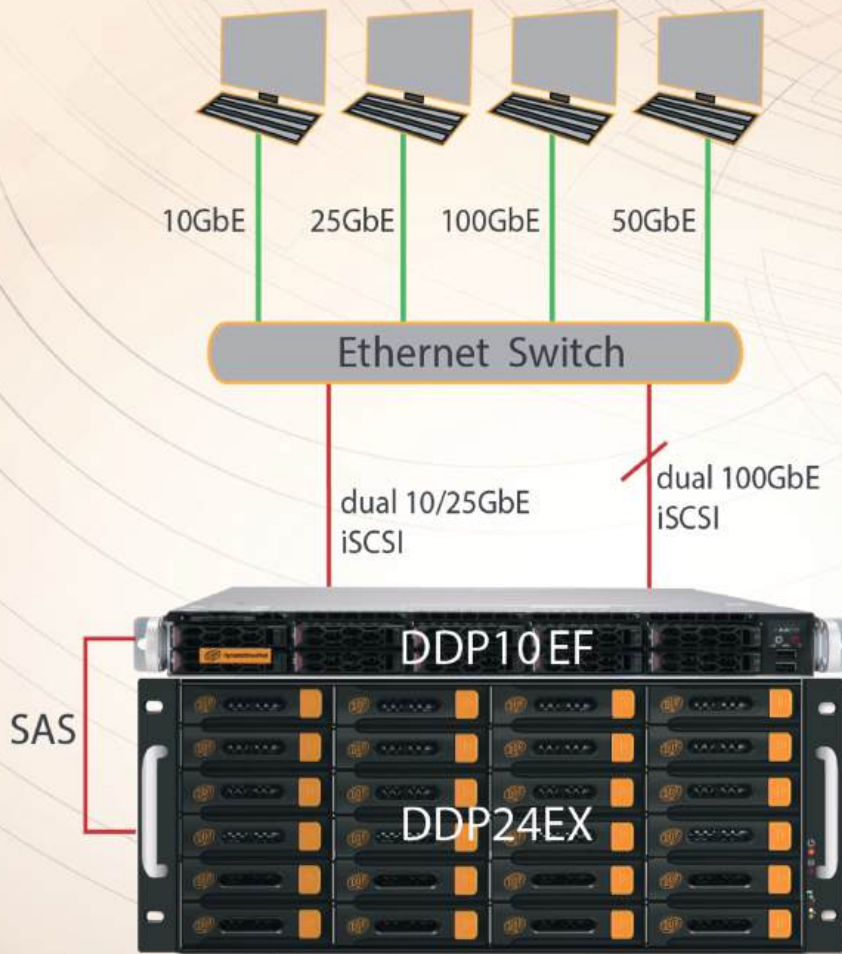
Other companies already have a multimode fiber Ethernet infrastructure within a building or between buildings.

This infrastructure is/was mostly used for 10GbE using SR/LC optical transceivers. The fiber cables differ in length and quality. The quality can be OM2, OM3, OM4 or now OM5.

With OM2, 25GbE uses the same form factor so upgrading the network to 25GbE is straightforward as long as the cable length between end points is less than 50 meter.

For 40/100GbE OM3/OM4 cables should be used. Distances with OM3 can be 100 meter. Transceivers for 100GbE/QSFP28 ports with SR/LC connections are available. So also for 100GbE bandwidth in many cases an infrastructure change is not necessary.

# Network base setup for DDP10EF using iSCSI



**This page shows the most common Ethernet network setup of a DDP10EF with a switch.**

The computers attached represent Macs, Windows and Linux machines. These can be desktops, laptops, workstations, render machines, virtual machines, servers, film scanners, ingest and play out machines.

They can be connected via Ethernet, WIFI or via Internet.

Any device on which the A/V FS driver can be installed will do.

If this is not possible SMB can be used. Depending on the DDP PCIe cards can be installed with 1, 10, 25, 40, 50, 100 and 200GbE Ethernet ports.

Each port on the DDP must have its own subnet or instead ports can be bonded. We have no switch preference other than that Flow Control and MTU must be controllable per switch port. Also the spanning tree filter must be controllable.

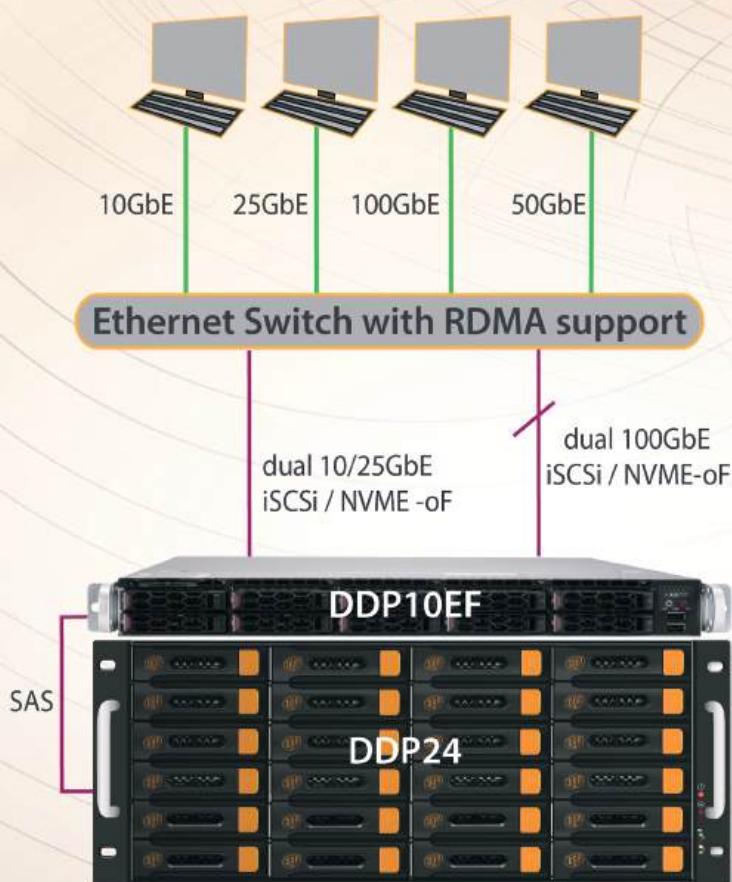
In most cases there already is a network infrastructure. So the easiest way then is to connect the DDP to that network by plugging it into the existing switch.

There must be enough network headroom of course.

The bandwidth each computer is allowed to use can be limited both ways using the bandwidth limiting page in the DDP web interface.

In this setup the DDP10EF also has an EX card installed. The EX card is a raid card which drives the DDP24EX storage array via the SAS cable.

# Network base setup for DDP10EF using iSCSI and NVME-oF/RDMA



**This page shows a network based on the latest Ethernet RDMA technology.**

RDMA stands for Remote Direct Memory Access and it means that data can be transported over a cable direct from RAM in the DDP to RAM in the computer. Using RDMA bandwidth per desktop can be as high as 11GB/s.

Manufacturers such as HP, Dell, Cisco, Arista, Mellanox, FS and many more have switches which support RDMA using PFC (Priority Flow Control) in addition to standard flow control.

Also MTU and the spanning tree filter must be controllable.

The computers attached represent Macs, Windows and Linux machines. These can be desktops, laptops, workstations, render machines, virtual machines, servers, film scanners, ingest and play out machines.

Any device on which the A/V FS driver can be installed will do. If this is not possible SMB can be used.

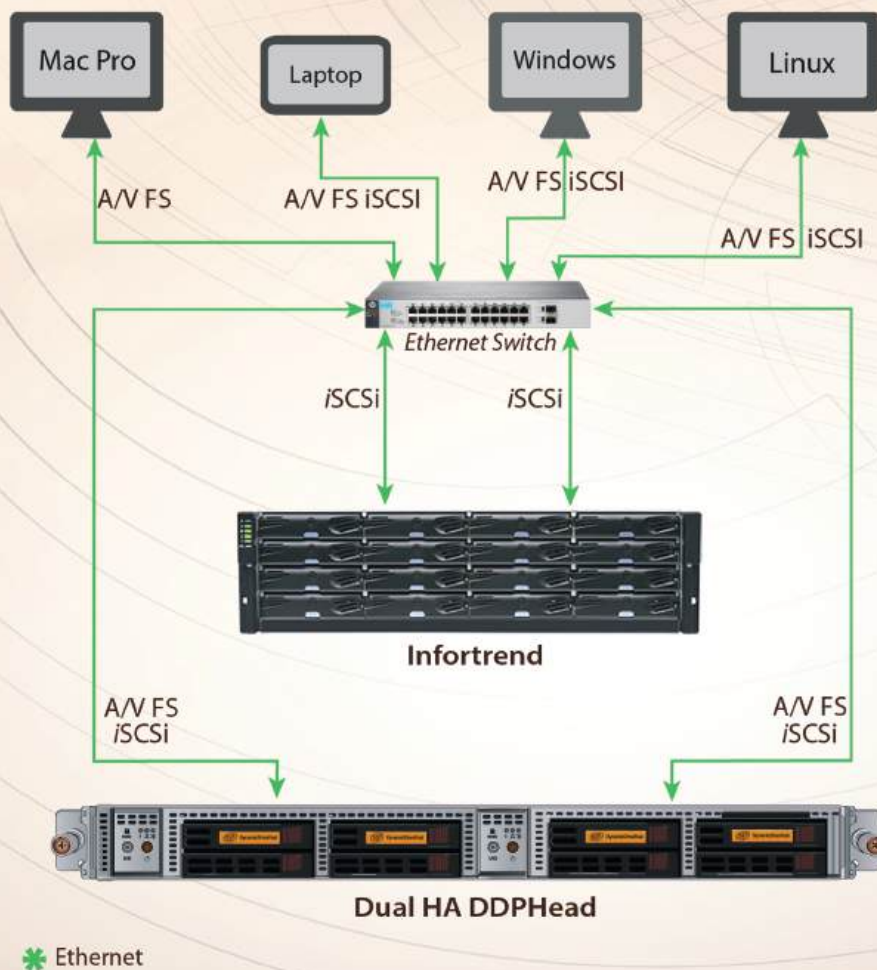
The bandwidth each computer is allowed to use can be limited both ways using the bandwidth limiting page in the DDP web interface.

In this setup the DDP10EF also has an EX card installed. The EX card is a raid card which drives the DDP24EX storage array via the SAS cable.

On Macs both the NVME SSDs in the DDP10EF and the hard disks in the DDP24EX are accessed via iSCSI.

With Windows and Linux the NVME SSDs can be accessed by iSCSI or NVME-oF and the hard disks via iSCSI.

# All Ethernet with DS



## This page shows the most simple Ethernet network setup for a Dual HA DDP setup.

Each node of the Dual HA DDPHead and each controllers in the DS raid arrays are equipped with quad 10/25GbE/SFP28 ports.

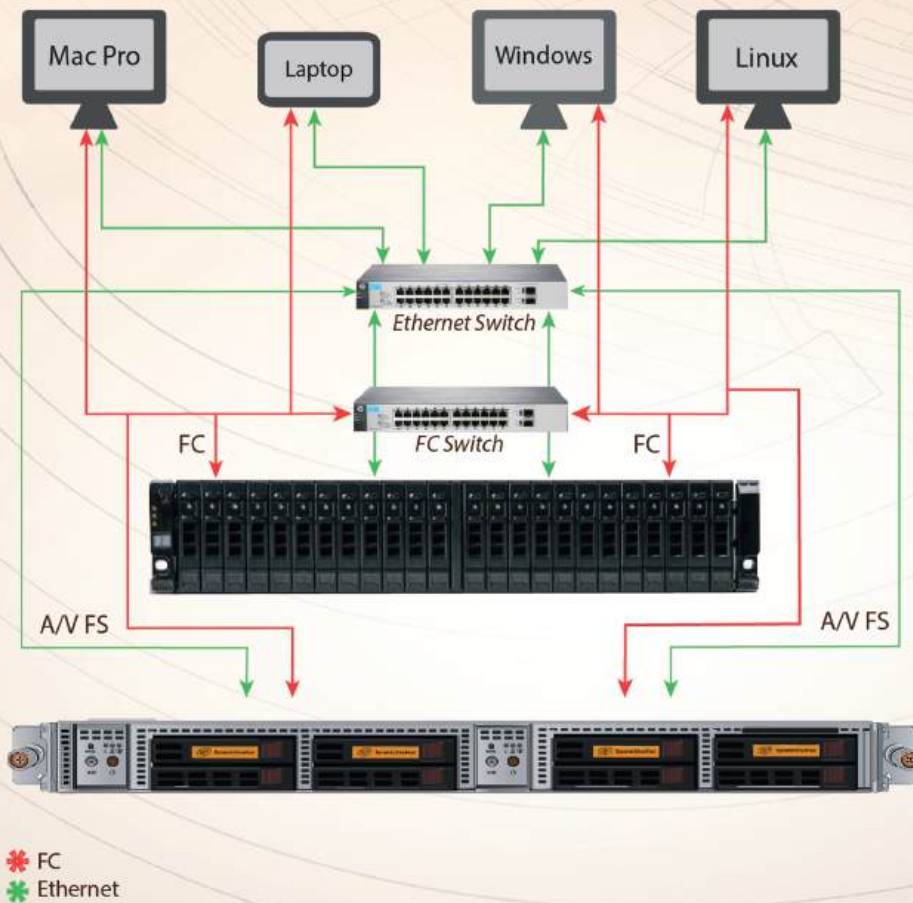
These ports are connected to a standard Ethernet switch and via the switch distributed to the application computers.

All devices shown on the slide must be able to communicate with each other also the Dual HA DDPHead and the DS or GS raid array.

To be able to communicate with each other all devices must be on the same subnet. Each port on node or controller must have its own subnet. So when multiple ports must be used, computers can be grouped over these subnets or when possible ports can be bonded.



# All FC with Seagate Nytro X 2U24



## This page shows a network setup with Fibrechannel and AVFS.

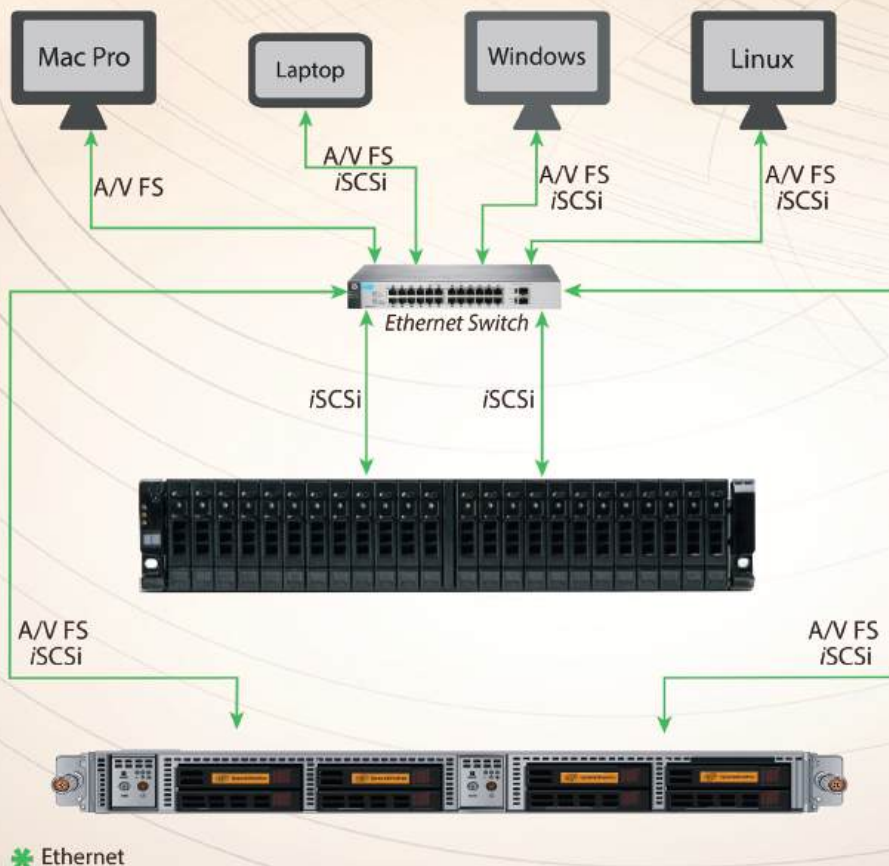
The Dual HA DDPHead carries a FC port in each node along with an Ethernet Connection for the Metadata.

The DS raid arrays have FC transceivers.

The FC connections can be 16 or 32 Gb/s Each desktop attached has both a FC connection for the data and an Ethernet connection for the metadata.

The FC ports in the Dual HA DDPHead are needed for data and metadata communication with the raid arrays.

# Dual HA DDP & Seagate NYTRO X 2U24

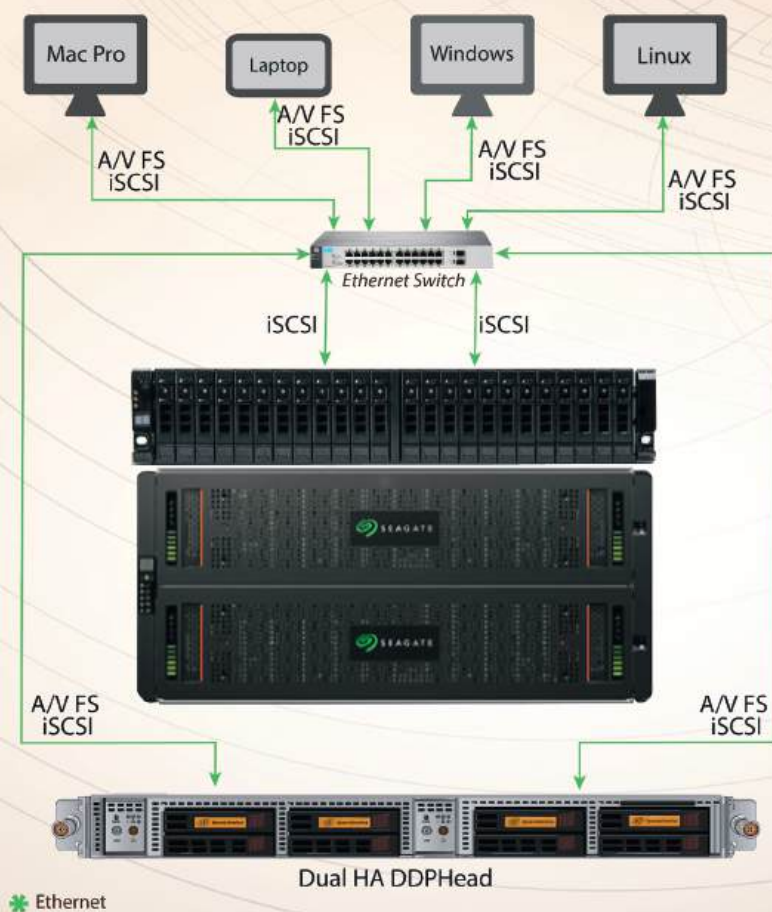


**This is an Ethernet/iSCSI setup using Seagate raidarrays.**

The picture shows desktops, NYTRO X 2U24, Dual HA DDPHead. The Data Locations on the NYTRO X 2U24 are connected to the workstations and the dual HA DDPHead in parallel.

For AVFS/iSCSI the simplest setup is when the desktops have both data and metadata and the 4 IP addresses all on a single cable. It is simple but then there is no network redundancy. For network redundancy and separate data and metadata traffic four lines per desktops are needed plus a redundant switch setup.

# Dual HA DDPHead & Seagate NYTRO X 2U24 and EXOS X 5U84



## This is another iSCSI setup with Seagate storage and Dual HA DDPHead.

This is a two tier setup where the NYTRO X 2U24 for example is used as project cache and the EXOS X 5U84 is used as an online storage pool feeding the cache in a just in time manner.

Alternatively ingest is to flash and copied through to spindles. This way desktops predominantly "see" the NYTRO accessing the 5U84 when a file is not on the cache.

Moving data between EXOS and NYTRO goes unnoticed via the network when the infra - structure is properly setup.

The connection is either 10GbE or 25GbE.

Per controller four 10//25GbE/SFP28 ports are available.

# User cases where the DDP can be found

- Postproduction companies
- Rental companies
- Broadcasters
- Advertising agencies
- Film, video and audio companies
- Film archiving

**DDPs are only found in Media & Entertainment: the underlying file system A/V FS is specifically developed for working with audio, video and film material.**

This is the business we like and grew up with. Of course we closely watch the cloud and AI developments. We do what we do best, which is handling the DDP series of products up to its extreme performance capabilities. Let us now say something about responsibility. If a company A is trusted with media from another company B to work on, it means that company A is responsible for all security aspects of that media. Also when company A decides to store the media on to cloud company C, company A remains responsible. So what arguments does company A have to trust that company C safeguards the media enough? Accessing cloud storage via internet is always much, much more vulnerable to security breaches than an on premise setup with a transfer room and production computers without internet access. The use of an on premise DDP and transfer room for all in and outgoing files with proper virus protection and an antivirus software and Mover/Checker system is the most secure solution there is.

We will discuss this on the next page.

DDPs are shared storage SAN system and A/V FS file system is specifically developed in house for this.

It is a SAN system not a NAS, has access right management specifically for M & E and comes with a unique caching mechanism which has been explained earlier.

DDPs are on premise shared storage systems. If there is a need to use the cloud the gateway to the cloud is via the built in Archiware P5 software.

DDPs are agnostic to any audio, video and film application including MAM systems, ingest, play out and encode systems whether they use (partly) AI or not. For many of these application access speed is of the essence. This is good because that is what the DDP deliver best.

In almost all cases potential customers already use a shared storage solution.

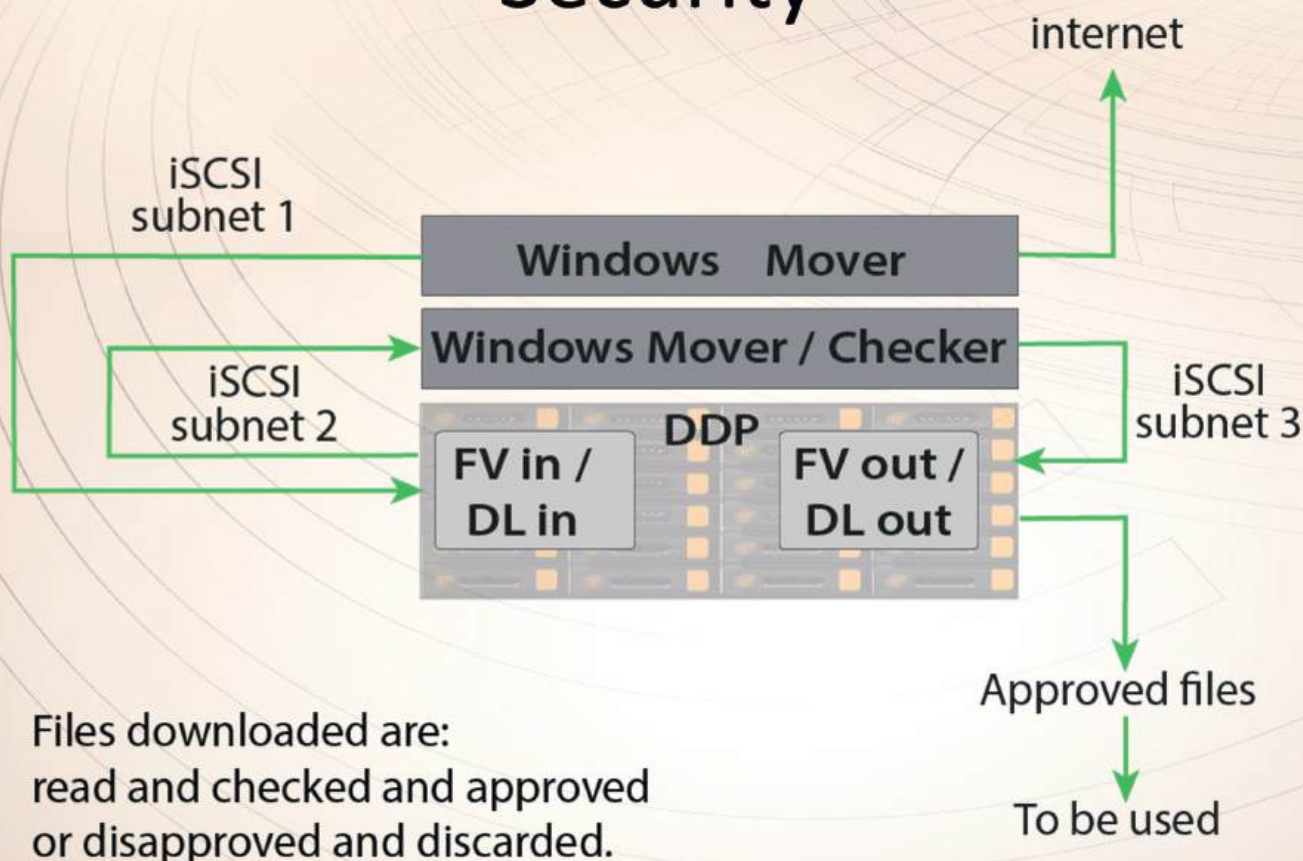
When such system is between 5 to 7 years of age economically it is then end of life and need to be replaced. When the customer is happy with current supplier and brand they will most likely replace it with a new one from the same brand.

There can be the following reasons why a customer is interested in a different solution:

1. *To expensive for what is offered and needed*
2. *Need higher performance than offered*
3. *Unhappy with the dealer so changes the supplier*
4. *Experienced problem and hold the manufacturer responsible/unreliable*

5. *Think that another system is easier to operate also regarding desktop installing*
6. *Unhappy with the support offered*
7. *Support contracts too expensive*
8. *Want an integrated MAM with cloud access*

# Security



## Security is needed against data loss and theft and ransomware attacks.

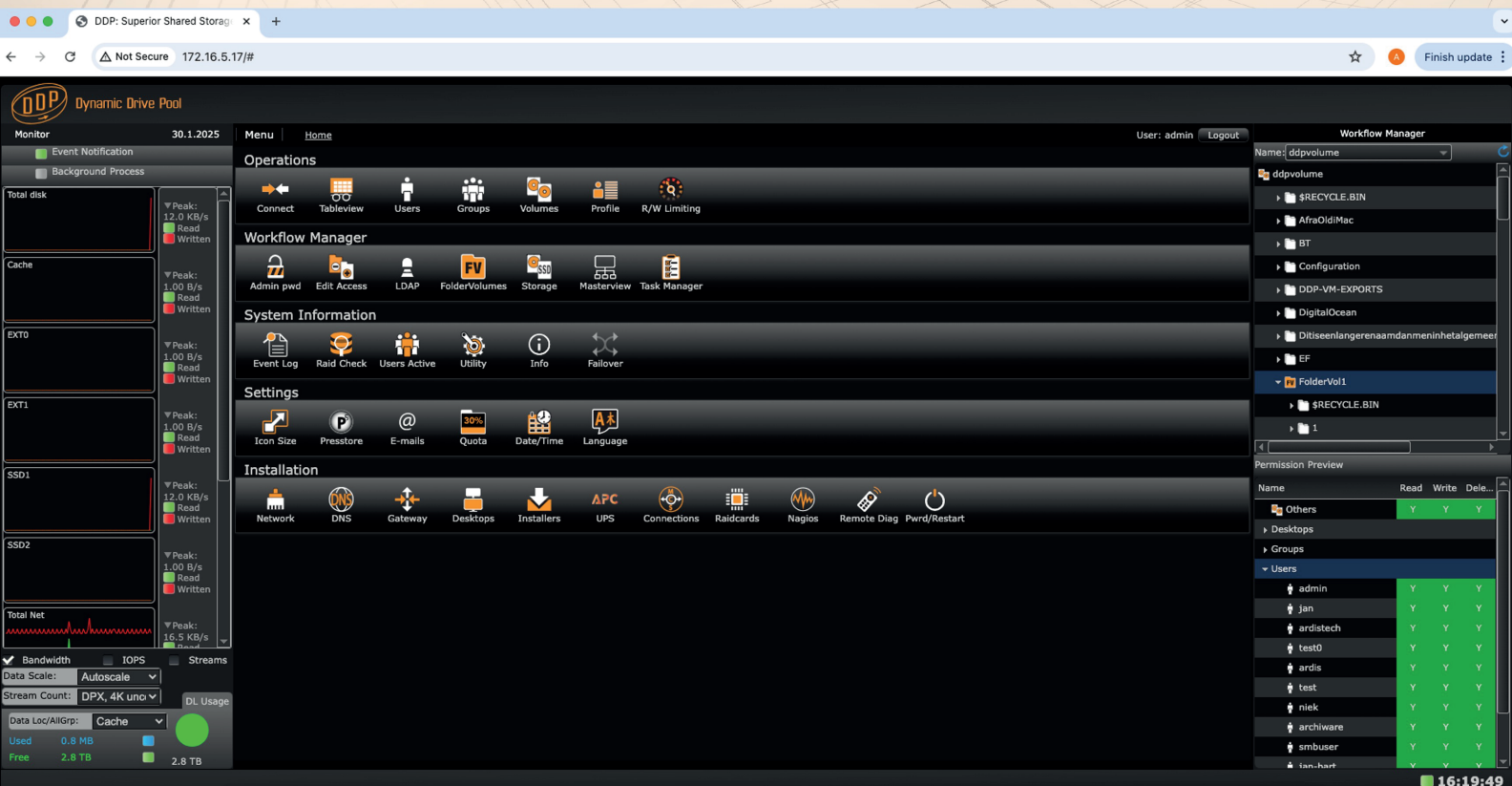
Data loss can be prevented by having proper raid protection such as raid6 instead of raid5. Also having secure backups helps. Data theft can be minimized by using/doing the following. Each DDP comes standard with the following security improvements:

1. Users and groups logins can be authenticated via a domain controller
2. When logged on a user only has access to the folder for which access is granted
3. To access the web interface HTTPS with standard or your own certificates can be used
4. Two factor authentication for web interface access can be enabled per user and group
5. DDPs come standard with an audit utility which tracks all user actions. It can monitor in line and or logs the actions
6. Optionally DDPs can deliver a group of hard disks and or SSDs with in line encryption enabled
7. DDPs come with a front bezel for which two keys are needed to unlock this and get to the drives or SSDs
8. Preventing any one from connecting devices such as a USB sticks or external drives to computers
9. Screening of persons to be hired

## To become not a victim of ransomware the following must be done as a minimum.

- a. Have a Mover/Checker and virus scanner between internet and the internal network using a transfer room and block internet access on production computers. Only allow internet access according to the slide: Take one DDPs with three subnets called iSCSI subnet1, iSCSI subnet 2 and iSCSI subnet 3. The DDP has two folder volumes called FVin and FVout each with their own Data Locations. Via Internet files incoming are to ingested into FVin. Via the antivirus and Checker program the files on FVin are scanned and checked. Safe files are moved to FVout. Others are quarantined.
- b. Have an air gap between the backup and production system
- c. Make regular backups
- d. Do not engage in automatic updates
- e. Have a proper firewall and the antivirus software up to date

# Web Interface



## After logging on to the DDP the web interface shows.

On the left there is the IO Monitor which shows the ongoing performance of the DDP.

At the bottom the pie shows total, free and used capacity of each of the Data Locations (DL) in the DDP. DLs are selectable in the Storage Manager. This is discussed later.

The large middle section show the function pages.

On the right the file system with the directory and its folder structure is displayed. Folders are shown with white icons. The orange are folders which have been given volume properties.

Also on the right there is the section which shows access right (R,W, No Delete) for Users, Groups and Desktops. For more explanation please go to [www.ddpsan.com](http://www.ddpsan.com) and then the Technology section.

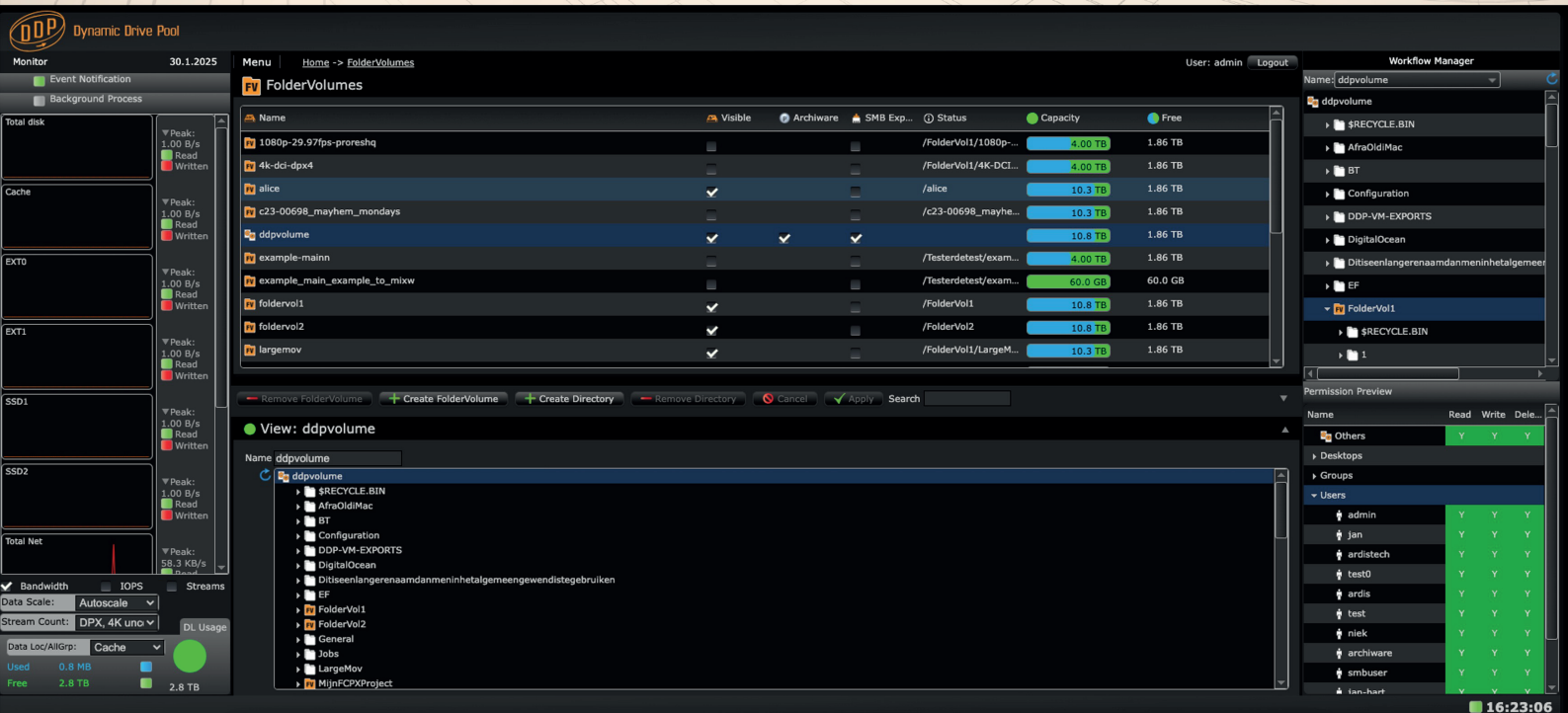
It is not part of these pages to discuss all functions/pages shown.

The Connect and Tableview pages are there to make connections between desktops and folder volumes. The Users, Groups and Edit Access pages are used to allow access and access rights.

With R/W Limiting the bandwidth can be managed. Other pages such as LDAP etc. are obvious. Worth noting is that **Archware P5 is integrated**.

Other pages again are maintenance pages. Mind you one has to be admin to be able to open most of these pages. Normally an operator logs on and start working with the folder volumes with project or projects assigned.

# Folder Volumes



In **the middle** you see a top window and a window below.

Either one can be expanded using the little arrows between the windows on the right.

In the **top window on the left** the folders which have been given volume properties are shown. Because of these volume properties these folders can be connected (mountable) to a desktop using the Connect or Tableview page. Normally folder volumes are connected using the AVFS/iSCSI protocol. For non critical desktops the SMB protocol is there when its active box is checked.

The **Status column** shows the directory path. The **directory tree** is visualized on the right.

The **Capacity column** shows the capacity which has been entered in the quota page.

The Remove FolderVolume and the Search function use the selection of the top window.

The other functions work on **the bottom** window. To remove a folder volume it is logical to search the list with folder volumes.

The **window below** displays the **directory tree**.

Folders (white icon) and folder volumes (orange icon) can be created, named and removed. Also folders created on the desktop show up here. There is complete freedom.

A folder can have multiple sub and sub sub folder volumes with folders or vice versa. When a folder volume is created it shows up in **the top window** immediately. Since there are no limits how to create a folder/folder volume structure you can match it 1 tot 1 to any project structure. When using Avid each folder volume can hold an Avid MediaFiles directory with its own Quota, Cache and Data Location settings. Since the folder volume is just a folder underneath A/V FS released capacity becomes available to all and expansion is just changing the quota.

# Quota Page



**This is the quota page.**

Quota can be assigned to an FV.

These are hard quota. It means that when the limit is reached the ingest stops.

However the quota can be changed on the fly.

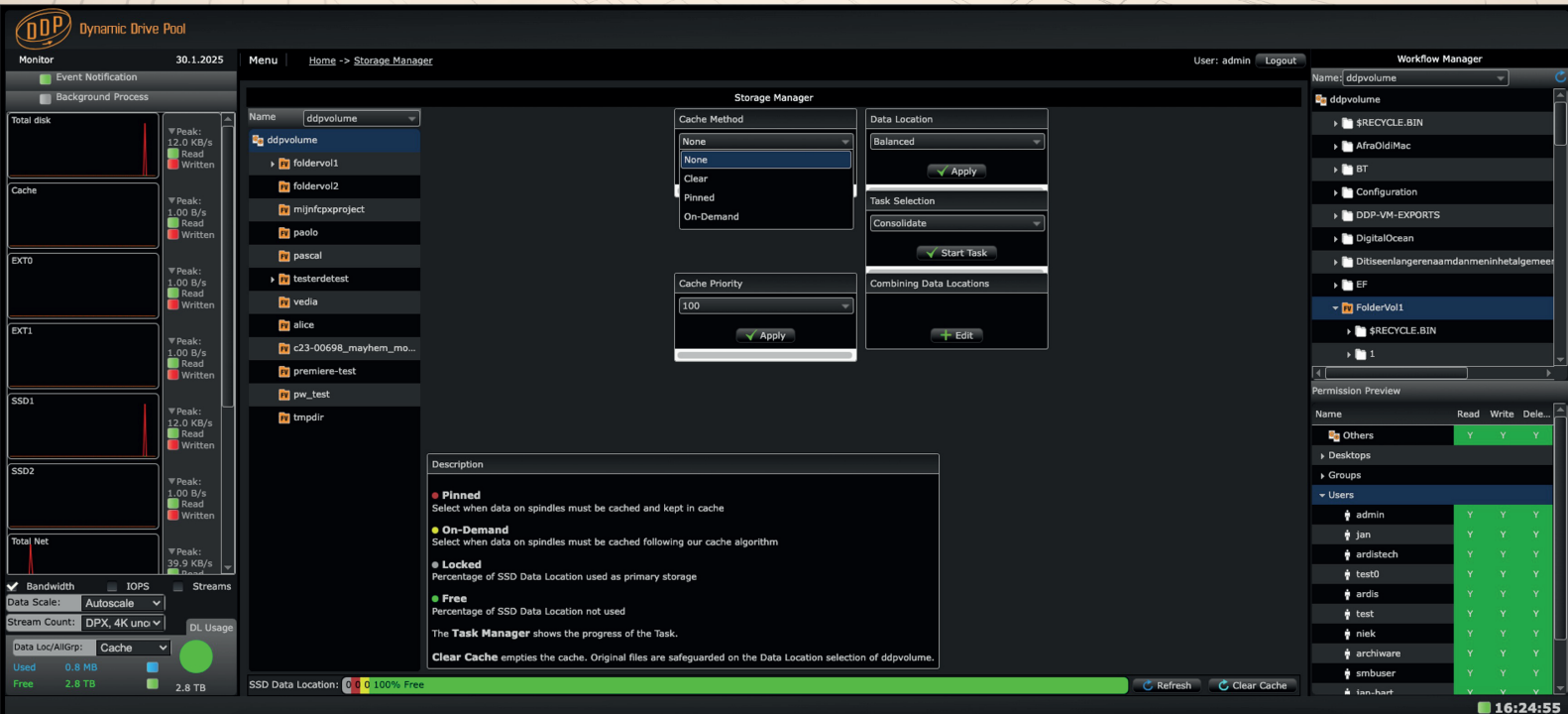
Also each folder volume can be given any quota value in percentage or a real number.

Be aware that quota do not add up to 100 %. So if all quota's are 100 % the first one filling up the capacity wins.

Quota percentage is calculated against the sum of all Data Locations with exclusion of the capacity of the cache. This means that quota behavior is as expected when all Data Locations are accessible.



# Project Caching



We already have discussed Project Caching on the third page.

Here and on the next pages we dive a bit deeper in the relation between folder volumes and Data Locations/Cache.

The page shown is the Storage Manager page. The window shows the directory tree with folder volumes on the left and the actual Storage Manager in the middle more or less. At the bottom a bar is shown. The Storage Manager shows: Cache Method, Data Location, Task Selection, Cache Priority and Combining Data Locations.

So **how do we connect a folder volume to the Data Location** thus the physical storage?

As follows: Select foldervol1 from the directory tree and select Balanced as Data Location and Cache Method On Demand. What does this mean?

This means that any file ingested or copied in foldervol1 ended up on the hard disks. It also means that when a file in foldervol1 is opened or its directory is being read or scanned the file on the hard disks is automatically copied to the Cache. The copy speed is determined by the Cache Priority setting.

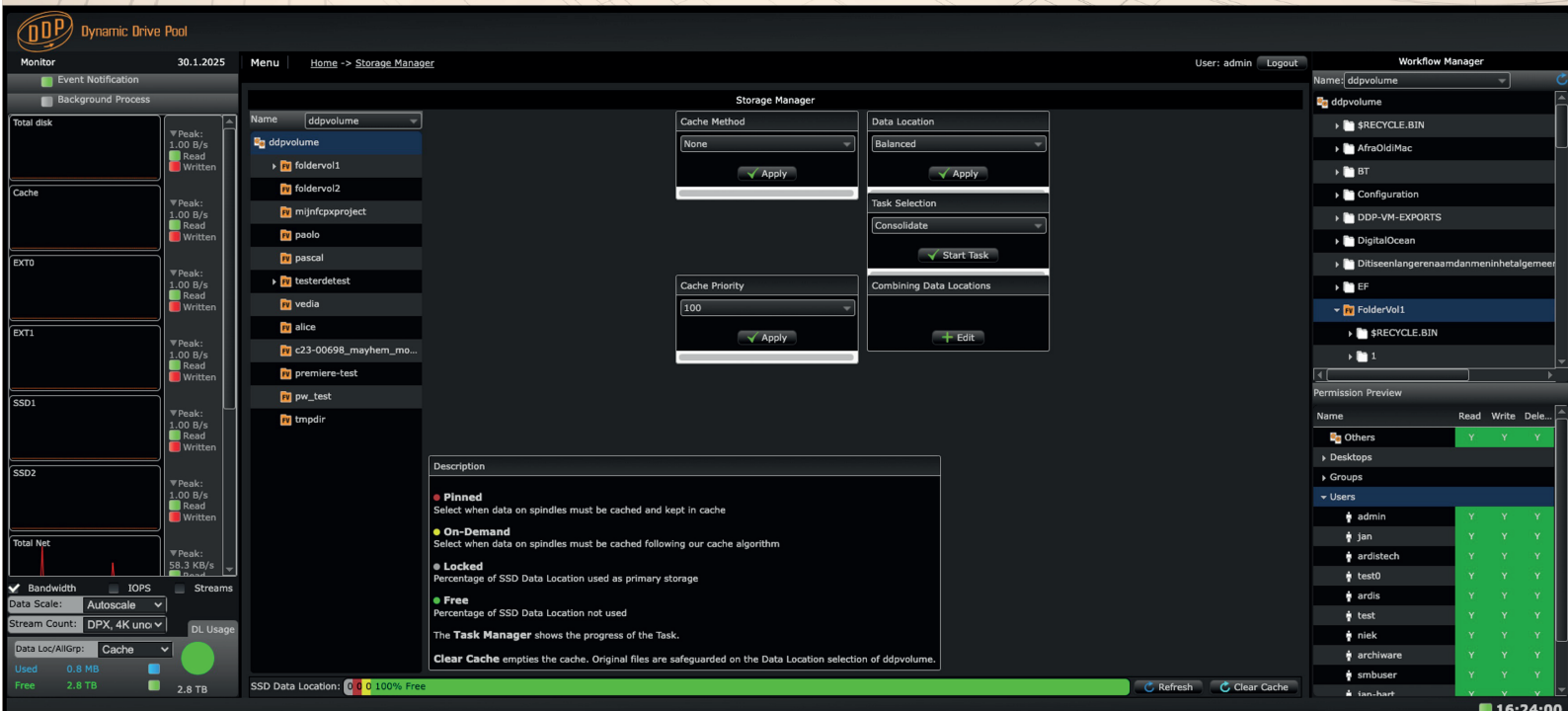
Lets take another example again with foldervol1. And now we select Cache as Data Location and Cache Method None. In that case any file ingested or copied in foldervol1 goes to the Cache and is copied through to the hard disks.

By the way, these settings become effective after Apply and can be changed dynamically at any moment in time.

The bar show which percentage of the Cache is empty or stored On Demand or stored Pinned or is on the Cache but does not have a copy on the hard disks yet (grey). We will discuss the Task Selection and Combining Data Locations on the next page. The IO Monitor is also important for admin. This way admin can monitor the internal data streams. When data is copied from the hard disks to the Cache it would as green (read) in the hard disks windows and as red (write) in the Cache window. With a standard DDP there would be no activity in the network window. More on the next page.



# Internal Data Moving



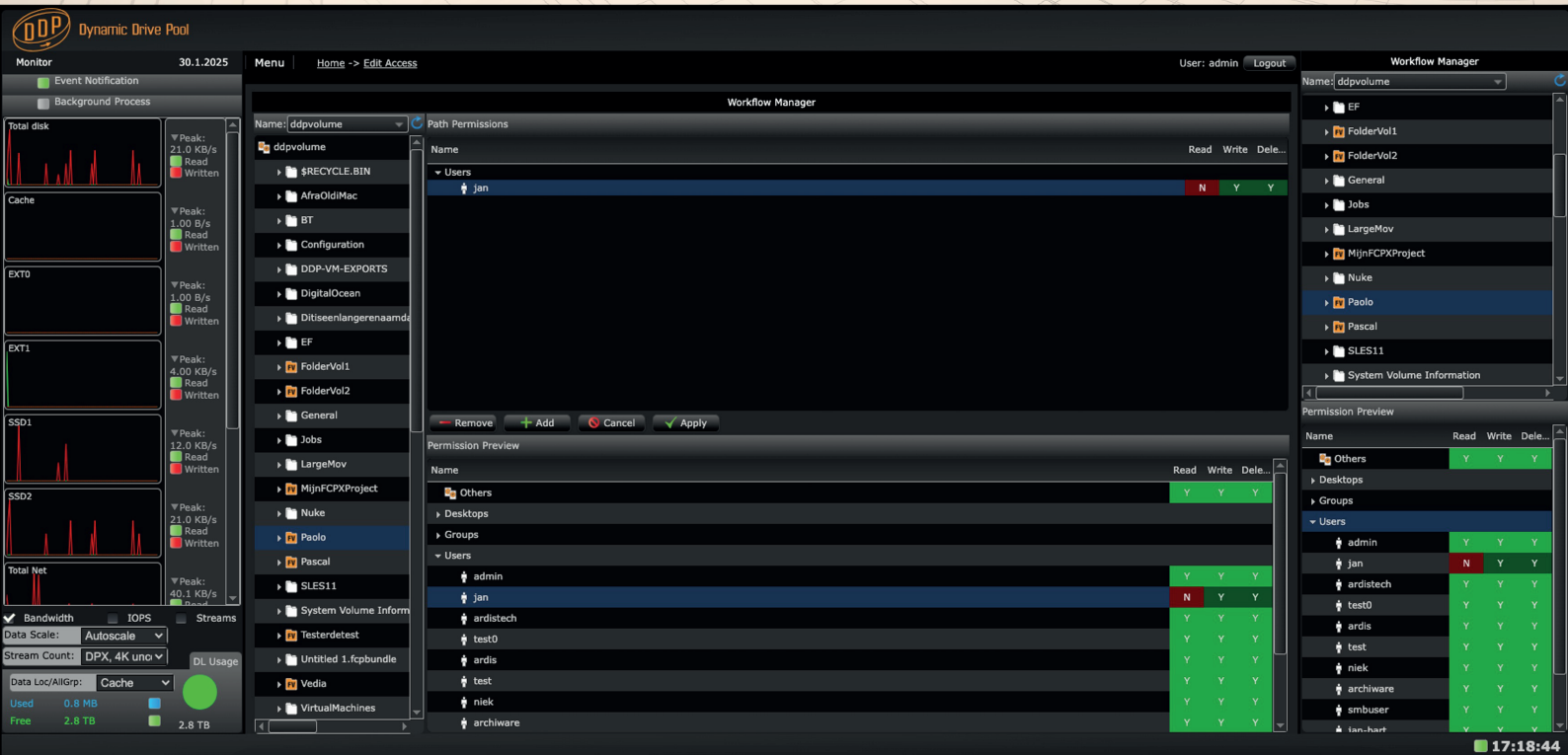
On the previous page we discussed the copying process between Cache and hard disks. **Now we focus on internal data movements examples.**

The Task Selection in the slide contains two tasks: Consolidate and Rebalance. Consolidate moves files from a source to a target. The source is selected by selecting a folder volume. The target is selected underneath Data Location and the Consolidate task starts once Consolidate is selected and Apply is pressed. The progress of the task can be monitored in the **Task Manager**. The function **Rebalance** takes the source material from the folder volume selected and balance the data over all normal Data Locations. The process can be followed in the Task Manager. Mind you all of these activities described happen **transparent to the operator**.

There is also the option of **Combining Data Locations** so what is the use of that? Bigger DDP installations often have a large number of Data Locations which may not be the same size, or some may do encrypting have another raid configuration or there are just practical reasons not to spread the files of a project over all these. Using Combining Data Locations limited numbers of Data Locations can be grouped and selected as a target.

There is a reason why these internal activities are so easy to do and why it is so easy to add storage of different capacities and to cluster different DDPs. **Each DDP consists of one or more raid sets**. In many situations there is one Data Location per raid set. Each incoming file is in its entirety written on one Data Location. When Balanced is selected in this page files alternate between the (group of) Data Locations.

# Edit Access



**This page is to explain how DDP handles which user, group of desktops gets which folder volumes and what are the access rights of this user, group or desktop.**

The first is quite standard. Users can logon and the folder volumes with the projects are there. Which folder volumes appear can be prepared by admin or depending on the company is for the operator to decide.

It is also possible to synchronize and authenticate with AD/OD/LDAP.

The step next is to determine the access right for users, groups or desktops. Access rights can be set in this Edit Access page per folder and folder volume.

Regarding preferences: the access control of the desktops go before the groups and the groups go before the users.

Dark red and green colors are used for the level set while lite red and green indicate inherited rights. Rights can be changed on the fly and take effect immediately.

# Competition



Reliable  
& Modular



A/V FS iSCSI  
Ethernet



Flexible  
& Fast



Performance/  
Price ratio



## DDP & Competition

**There are many shared storage competitors in this small part of the M & E market.**

**So how does the DDP stand out in relation to these competitors?**

We know all these competitors. Of course we know these otherwise we would not do our job.

**One huge difference between DDP and others is: DDPs provide project caching with wire speed performance and is completely modular.**

Because the file system used on DDPs is specially developed for M & E Ardis Technologies is able to keep support costs as low as possible and delivers each DDP with **two years warranty**. Another important aspect is that **support can be up to seven years**.

Also in A/V FS user/group access rights and connections are folder based (project based). To manage these does not require an IT specialist. Common sense is good enough.

If you are working with Avid video edit applications such as Media Composer or other Avid products it is good to know that **DDP natively supports Avid editors** with as many workspaces as you need while when deleting a workspace the released capacity becomes available to all. It is also good to know that **DDP works perfectly with Pro Tools** no matter how many crossfades or small file there are.

Of course the **DDP performs perfectly with any M & E application** to be used or in use at the moment.

# Thank You



**More information on the [DDPSAN.COM](http://DDPSAN.COM) website**

**Made by Ardis Technologies BV, Netherlands**

**For HR pictures contact us [info@ardistech.com](mailto:info@ardistech.com)**

**Thank you very much for reading this explanation!**

**In case you have questions, please do not hesitate in asking us.  
[info@ardistech.com](mailto:info@ardistech.com)**