



Synology

20

19

SMART  
STREAMLINED  
SOLID

# Next Generation NAS

## Evolution of DSM Platform



Jeremie Francois  
Synology





Evolution of DSM Platform

Deep Machine Learning

Enhanced Data Safety

Hardware Resilience & Robustness

## Enjoy Greater Privileges!

Imagine a wonderful trip with your family or friends, tasting exotic food, enjoying beautiful scenery, and experiencing a whole new culture. Infinity MileageLands members can save up to 25,000 miles by booking EVA Air or UNI Air tickets on certain travel dates!

[Log in](#) [SSO Authentication](#)

Synology2019

jefflee@synology.com

••••••••

Stay signed in



[Forgot your password?](#)



# DSM 7.0

Modern  
Design

Responsiveness

Interactive  
Experience

0.1sec



Simplify the Complex: A Centralized portal

[go.synology.com](https://go.synology.com)





## To use Synology Application on your computer

QR code login simplifies authentication processes on devices that may be shared. Easily and securely login without needing to remember or type your device's address and credentials.

1. Open Synology app on your phone
2. Tap and select QR code login
3. Point your phone to this screen to capture the code.



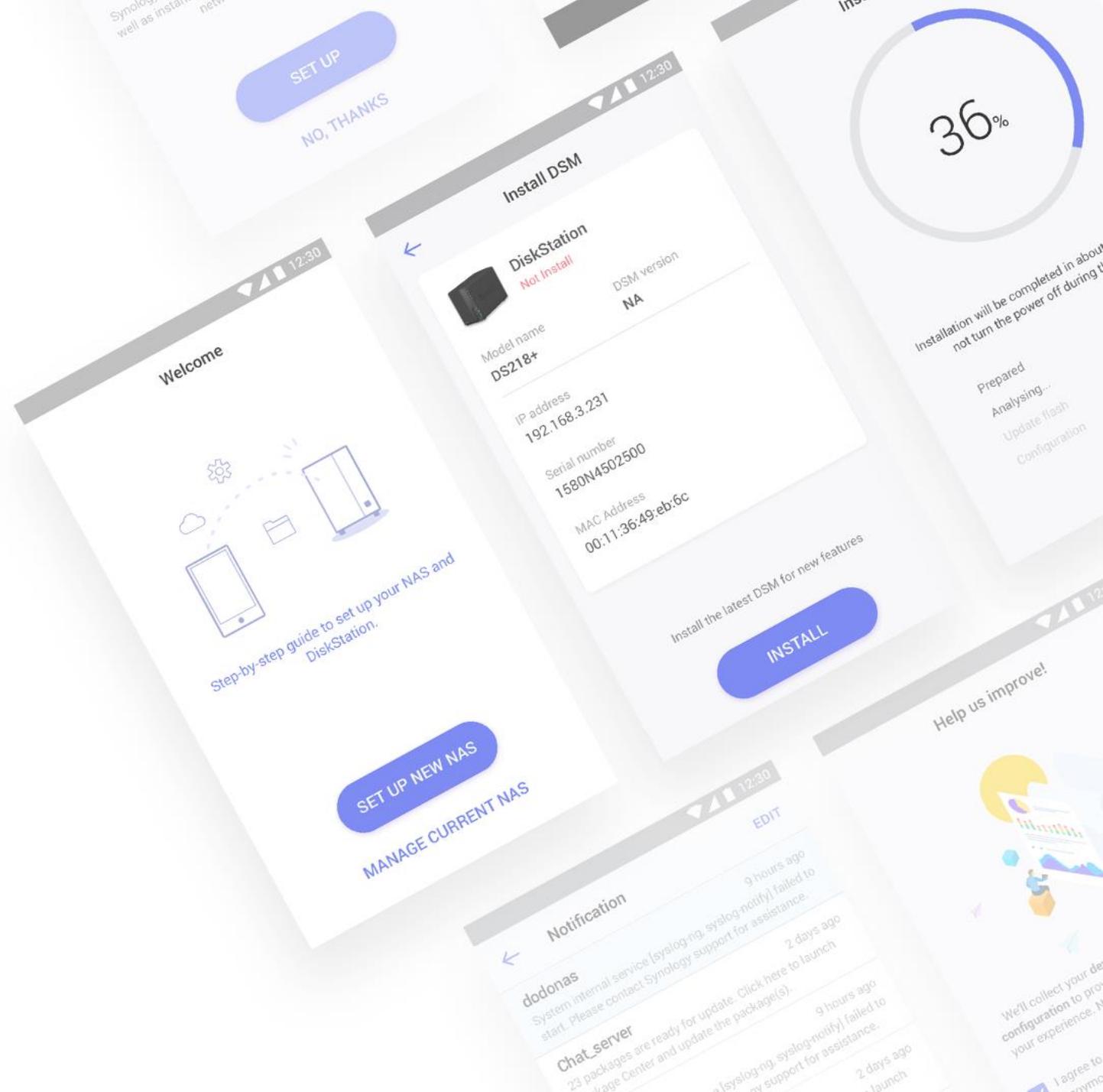
[Need help to get start?](#)

# Smooth Mobile Installation

DSM updates

Package Centre

Quickconnect / Remote access





DS file



DS photo



DS video



DS audio



Synology Drive



Synology Moments



DS finder



DS cloud



DS get



Synology Chat



DS cam



DS note



DS router



Synology VPN Plus



Synology MailPlus



Moments

Designed for personal users

Smarter photo albums

# Deep Machine Learning



MOMENTS

## Timeline



## People



## Places



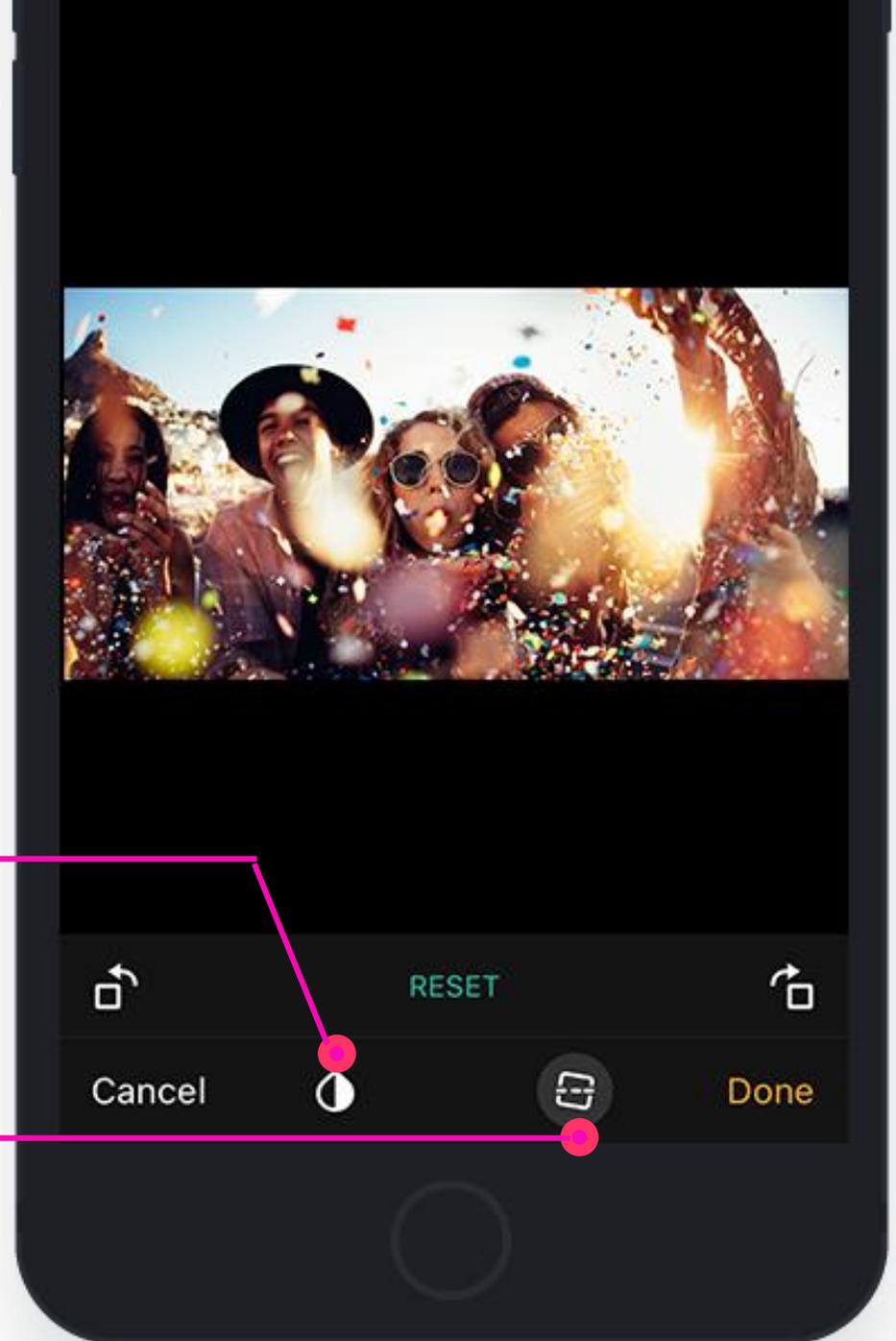
## Subjects



Bring photos to life

Color Correction

Angular Adjustment



Global voice assistant market

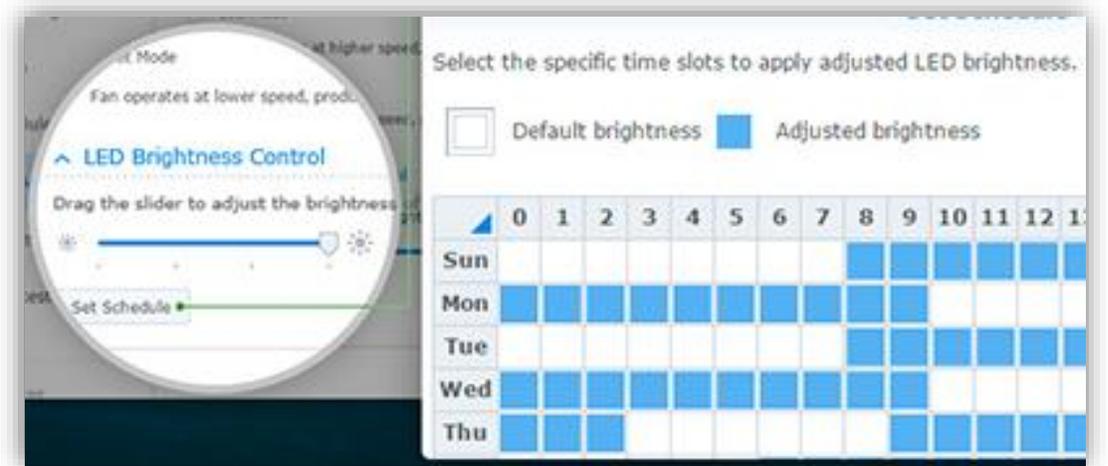
**30** billion USD by 2023

“Alexa”





Calendar Events



Synology LED

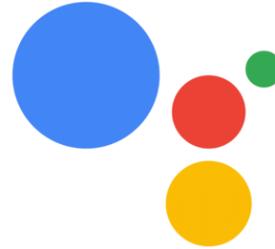
# More Voice Assistants



Amazon  
Alexa



Siri



Google  
Assistant



Tmall  
Genie

Protecting your data

# S.M.A.R.T.

Health Info - Disk 1 (DX513-2)

Overview S.M.A.R.T. Test **S.M.A.R.T. Info** History

ID	Attribute	Value	Worst	Thres...	Status	Raw data
1	Raw_Read_Error_Rate	200	200	051	OK	208
3	Spin_Up_Time	187	185	021	OK	5633
4	Start_Stop_Count	099	099	000	OK	1934
5	Reallocated_Sector_Ct	200	200	140	OK	0
7	Seek_Error_Rate	100	253	000	OK	0
9	Power_On_Hours	098	098	000	OK	1678
10	Spin_Retry_Count	100	100	000	OK	0
11	Calibration_Retry_Co...	100	253	000	OK	0
12	Power_Cycle_Count	100	100	000	OK	1
192	Power-Off_Retract_C...	200	200	000	OK	0
193	Load_Cycle_Count	198	198	000	OK	6001
194	Temperature_Celsius	119	119	000	OK	31
196	Reallocated_Event_C...	200	200	000	OK	0
197	Current_Pending_Sec...	200	200	000	OK	0

Close

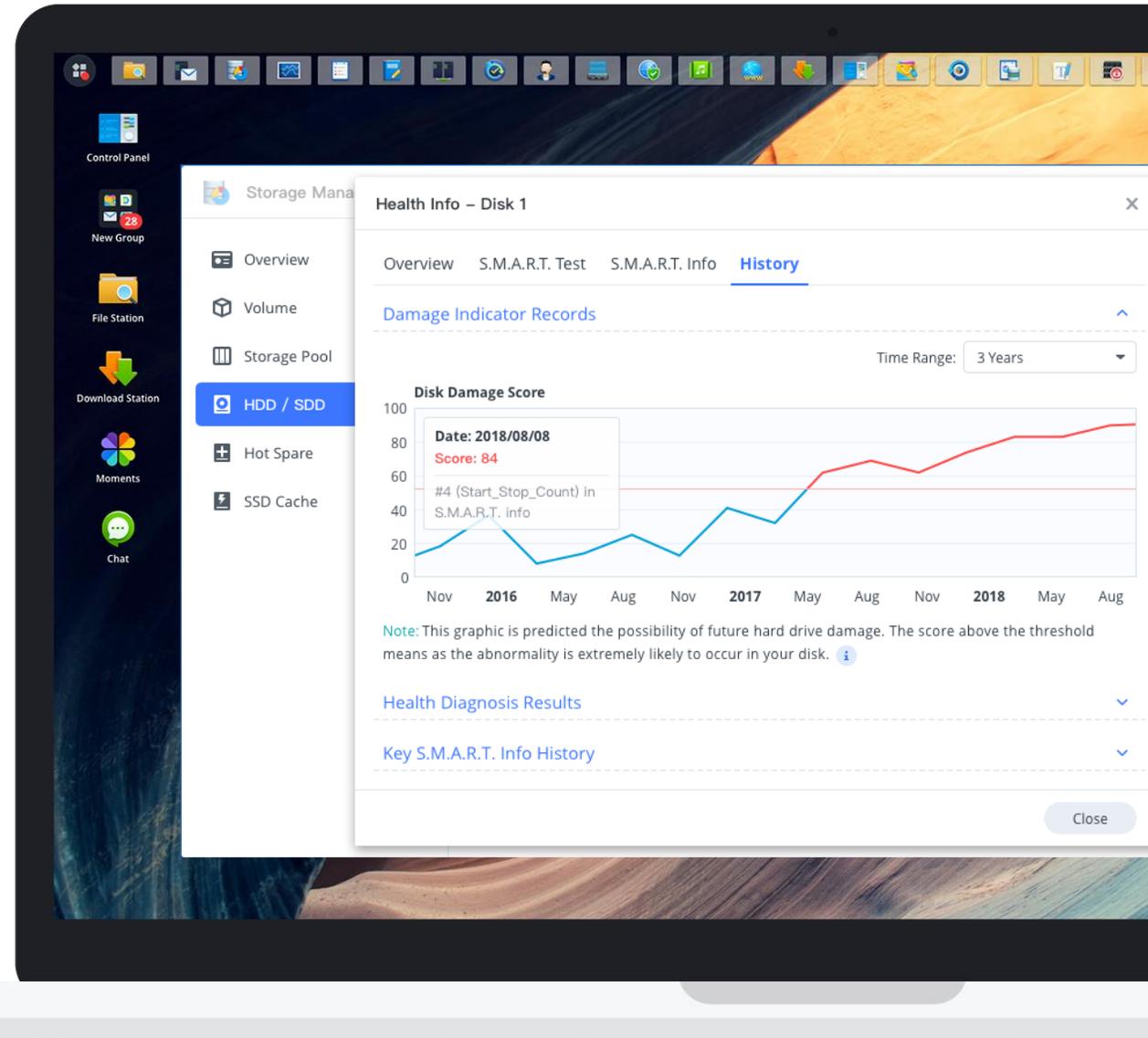


The screenshot shows the IronWolf Health Management software interface. The main window displays the health status of two disks: Disk 1 (Seagate ST4000VN008-2DR166, 3.6 TB HDD) and Disk 2 (Seagate ST6000NE0021-2EN11C, 5.5 TB HDD). Both disks are reported as 'Normal'. A detailed 'Health Info - Disk 1' window is open, showing a 'Normal' status and a 'Schedule Drive Tests' button. The 'Statistics' section for Disk 1 includes: Temperature: 31 °C / 88 °F, Power-On Time: 638 hour(s), Disk Reconnection Count: 0, Bad Sector Count: 0, Disk Re-identification Count: 0, S.M.A.R.T. Status: Normal, and IronWolf Health Status: Normal. The 'Description' section notes that no diagnostic test is scheduled and recommends running a self-diagnostic test. A circular logo for 'IRONWOLF HEALTH' is overlaid on the right side of the screenshot.

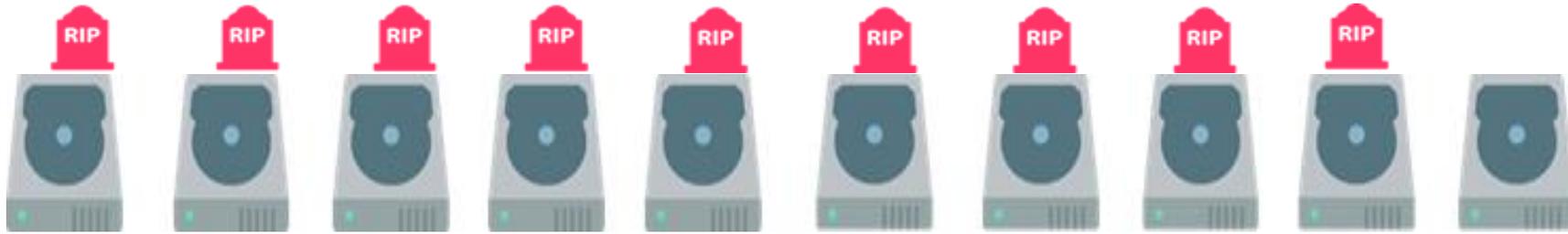
IronWolf Health Management

# HDD Failure Prediction

*An ounce of prevention is worth a pound of cure.*



# Accuracy Rate



**90%**

The system predicts the hard disk needs to be replaced, and its probability of failure in the short term.

# Real-Time Data Clone

No recalculating parity

Automatic

Saves time and system resource



# Real-Time Data Clone

No recalculating parity

Automatic

Saves time and system resource





- Overview
- Volume
- Storage Pool
- HDD/SSD**
- Hot Spare
- SSD Cache

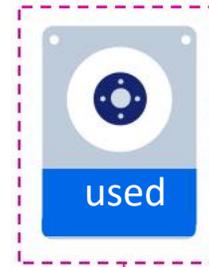
**HDD/SSD** | Logs | Test Scheduler | General

Health Info | Action ▾ 🔍 ☰ ☰

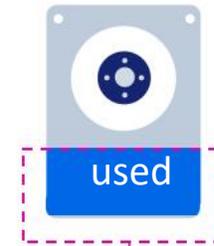
	<b>Disk 1 - Normal</b> WDC WD30EFRX-68AX9N0 , 2.7 TB HDD	▾
	<b>Disk 2 - Normal</b> Seagate ST4000DM000-1F2168 , 3.6 TB HDD	▾
	<b>Disk 3 - Normal</b> TOSHIBA DT01ACA050 , 465.8 GB HDD	▾
	<b>Disk 4 - Normal</b> WDC WD30EFRX-68AX9N0 , 2.7 TB HDD	▾

# Accelerated RAID Rebuild

Intelligently rebuild data block  
Accurately and efficiently utilize system resource  
Synology patent application in process



Traditional  
RAID Rebuild



Accelerated  
RAID Rebuild

# Rapid RAID Rebuilds

**8** hrs

All blocks checked

Testing environment: 3x HDD (4TB) to build RAID 5, 40% of usage

# Recovery time

**3** hrs

Testing environment: 3x HDD (4TB) to build RAID 5, 40% of usage

# Risk-free Storage Space Management



# Efficient Management on Different Scales



# CMS

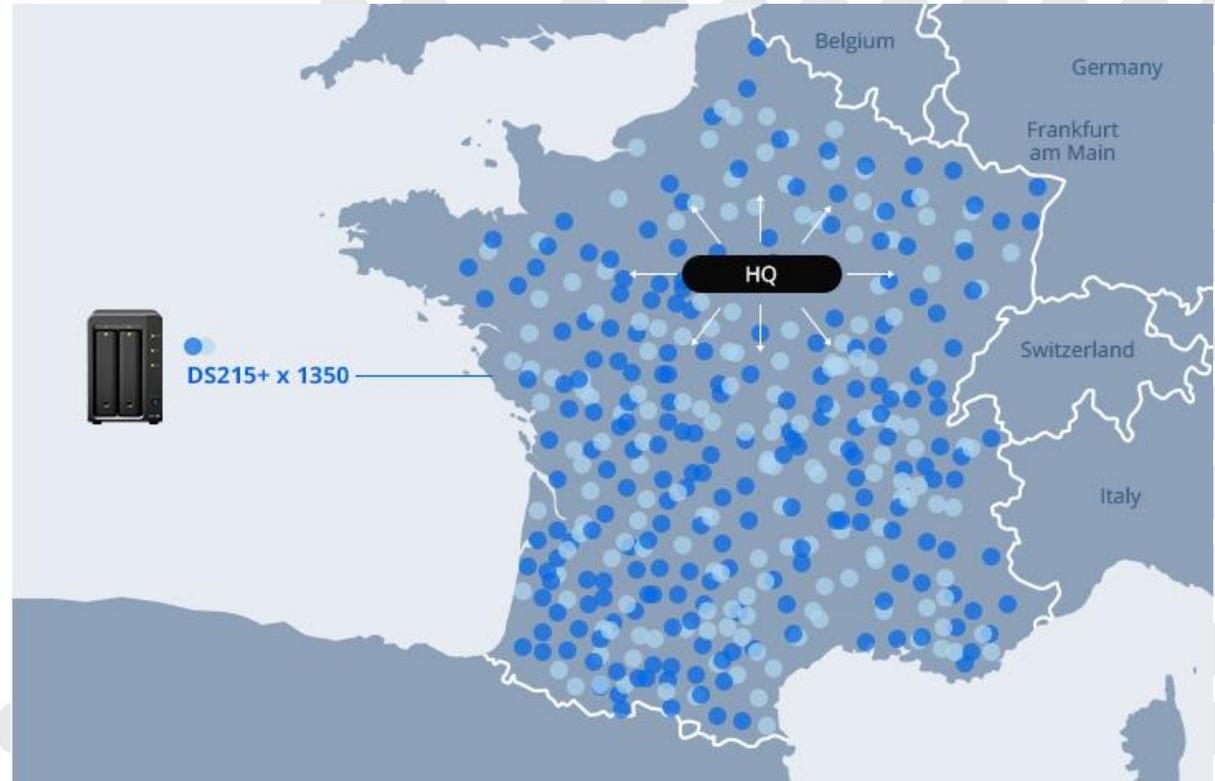
Centralised Management  
System

**One** Interface, **N** servers

Groups and Policies

# KRYS GROUP

- The leading optical retail group in France
- 2017: 1 €billion revenue
- Manages 1,350 Synology NAS



10,000

Server Management

# CMS

Capacity of 10,000 servers

Efficient & intuitive group management

Customizing task managements

The screenshot displays the CMS dashboard with a sidebar menu and several main panels. The sidebar includes: Overview, Servers, Groups, Policies, Tasks, Logs, CLIENT MANAGEMENT (expanded), DSM Update, Packages, Storage, and Services. The main content area features:

- Servers Panel:** A blue header card showing "10000 Servers". Below it is a table with columns "Availability" and "Servers".

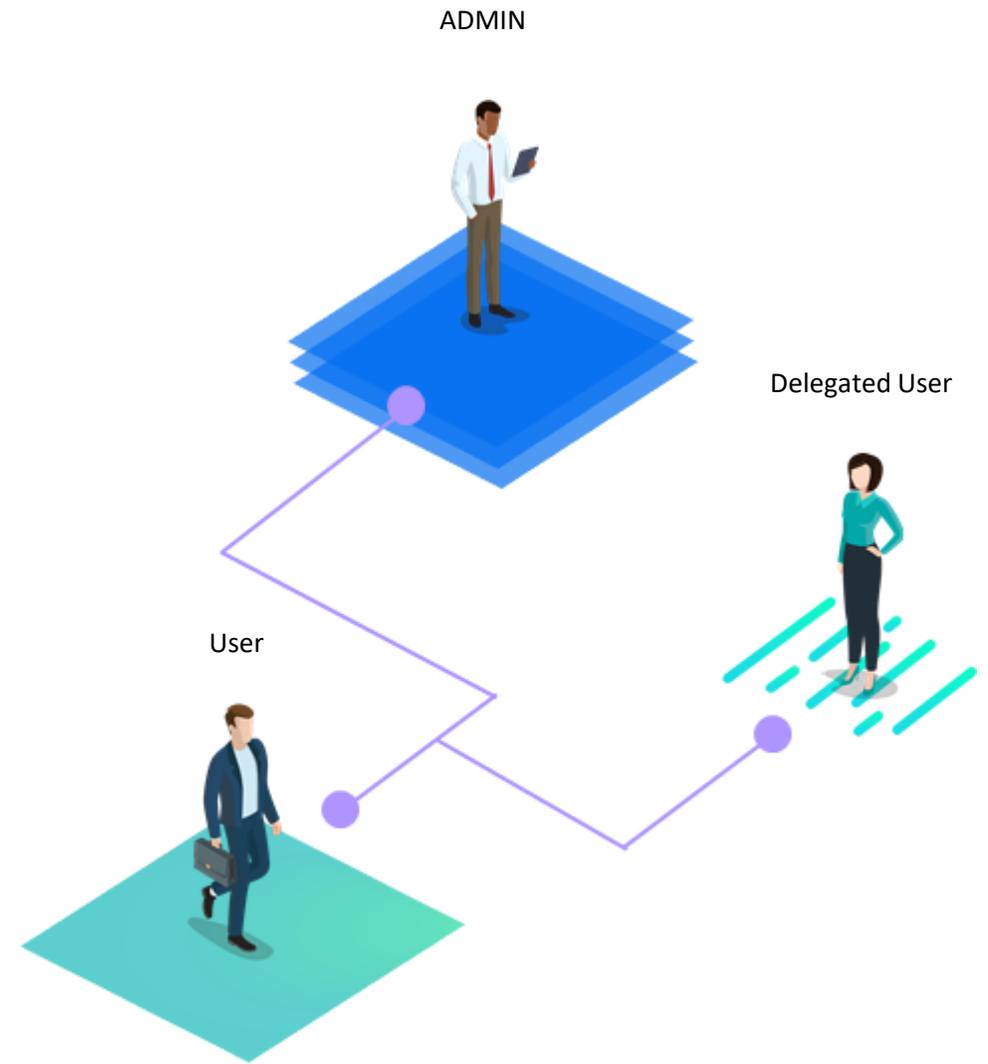
Availability	Servers
On	10000
Processing	0
Abnormal	0
- DSM Update Panel:** A green header card with a checkmark icon and the text "Up-to-date" and "All servers are up-to-date".
- Volumes Panel:** An orange header card with a warning icon and the text "Warning". Below it is a table with columns "Status" and "Servers".

Status	Servers
>90%	32
80~90%	134
<80%	9539
- Disks Panel:** A green header card with a checkmark icon and the text "Healthy". Below it is a table with columns "Status" and "Servers".

Status	Servers
Normal	9903
Crashed	0
Deactivated	97
- Packages Panel:** A table with columns "Package Name", "Running", "Abnormal", "Stopped", and "Not Installed".

Package Name	Running	Abnormal	Stopped	Not Installed
Surveillance Station	109	2	7	9878
Hyper Backup	885	22	0	9089
Snapshot Replication	2028	12	2	7680
Virtual Machine Manage	1392	20	2	8558

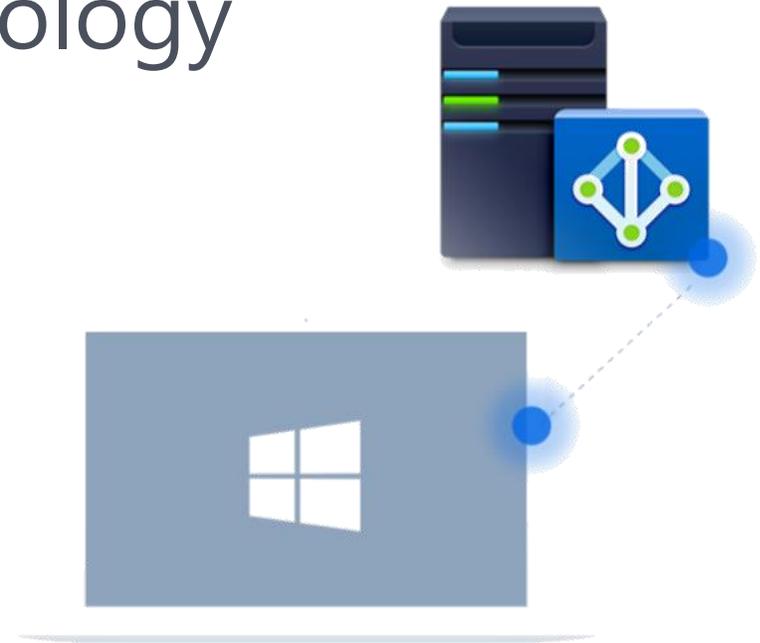
# Admin delegation





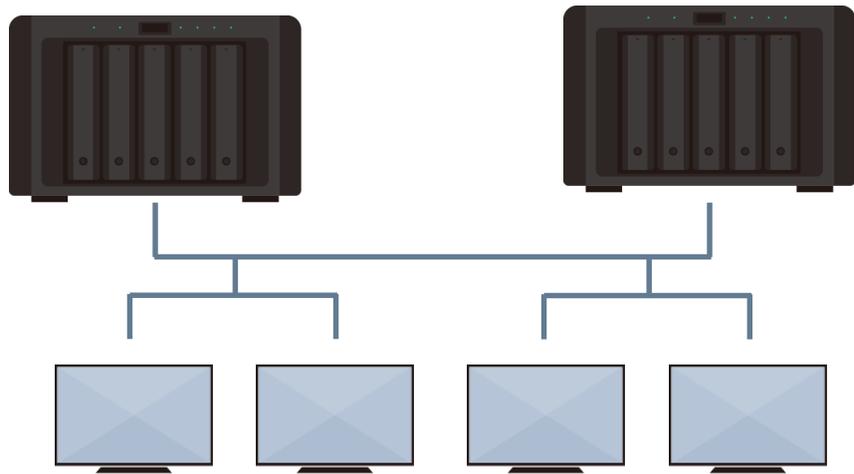
# Directory Server For Windows Domain

# Migrate from existing AD to Synology



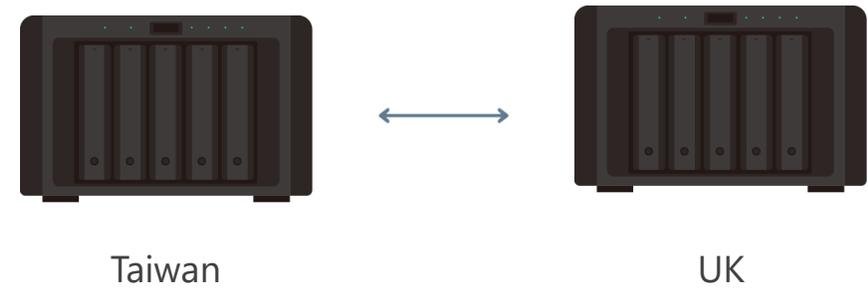
## Dual active controller

Covers load balancing & failover features



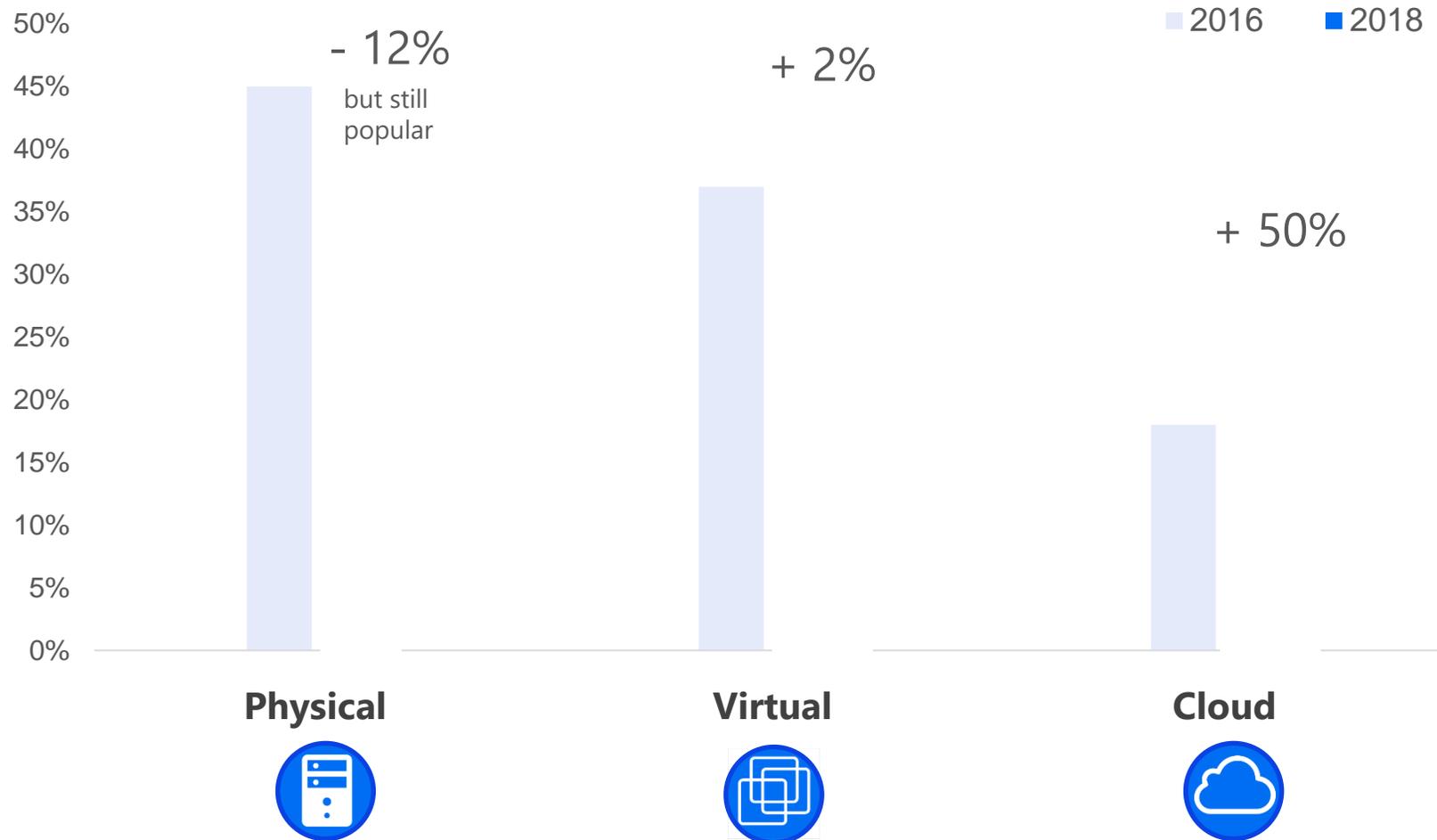
## Read-only domain controller (RODC)

Cross-site and real-time security confirmation





# Data is scattered across storage platforms



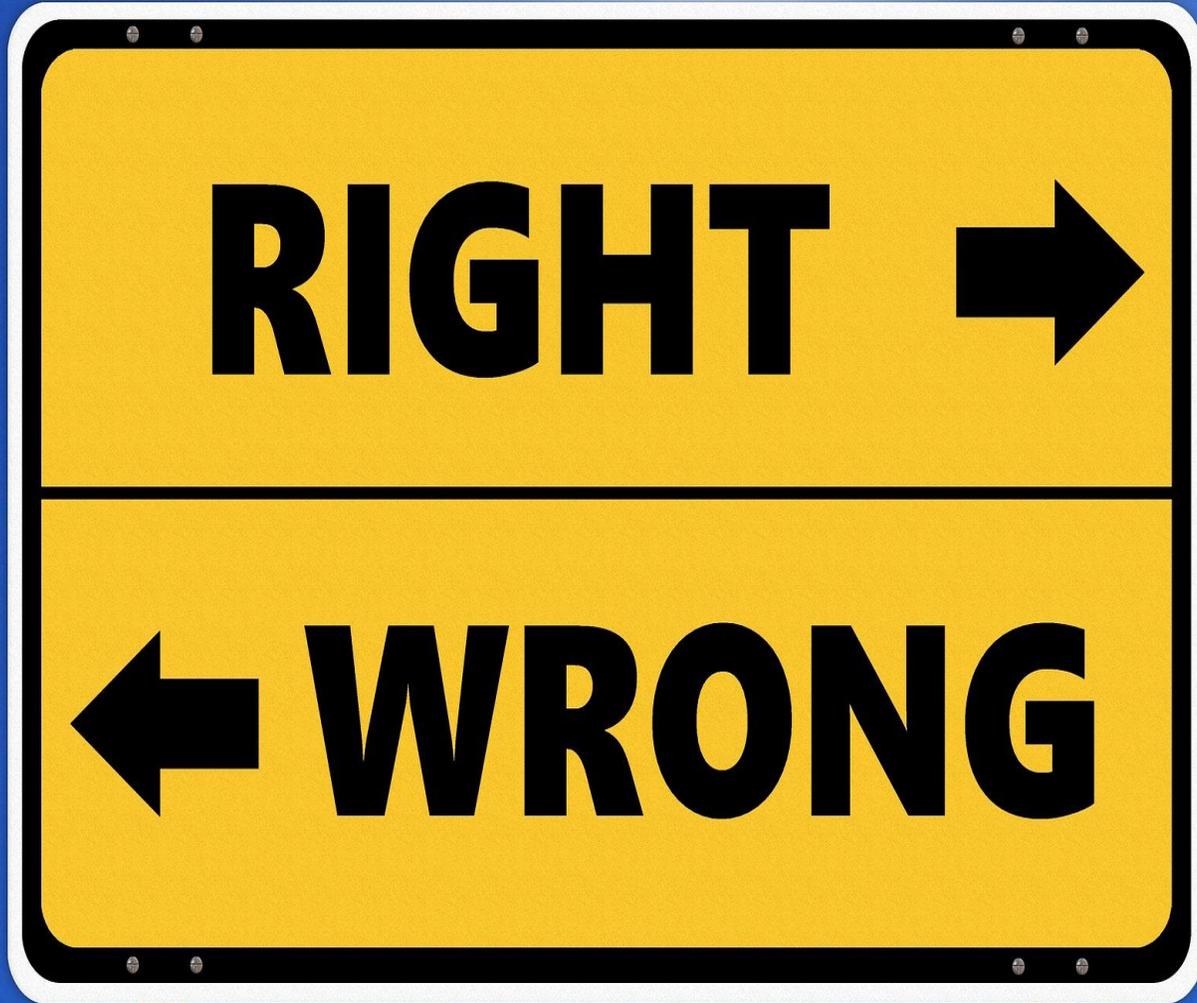
## More challenges to come....

**33%**

more data to be stored

**4.1**

average no. of backup solutions

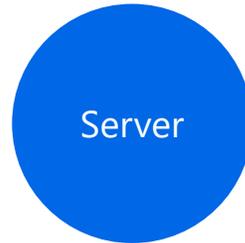
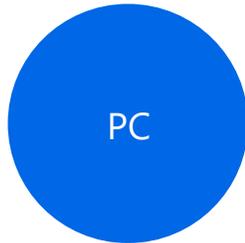


Hardware  
Disaster Recovery  
Cost Effectiveness  
Restore  
Deployment  
Easy Management  
Reliability  
Security  
Data

# Active Backup Suite

Local file backup

Backup from public cloud services





Employee

With employee's  
own user account



Active Backup for Business  
**Portal**

Access and restore



Files



Folders

# Physical to Virtual (P2V)

Windows  
Physical



Active Backup



# Physical to Virtual (P2V)

Windows  
Virtual

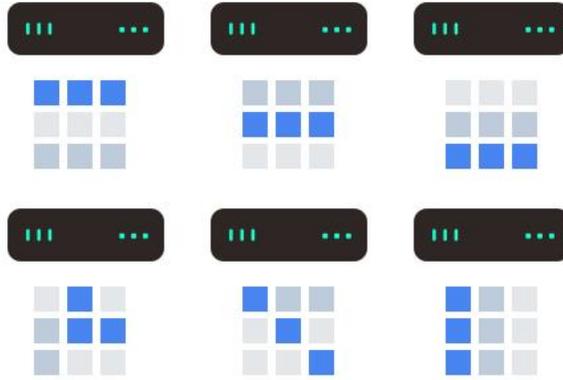


Virtual Machine  
Manager





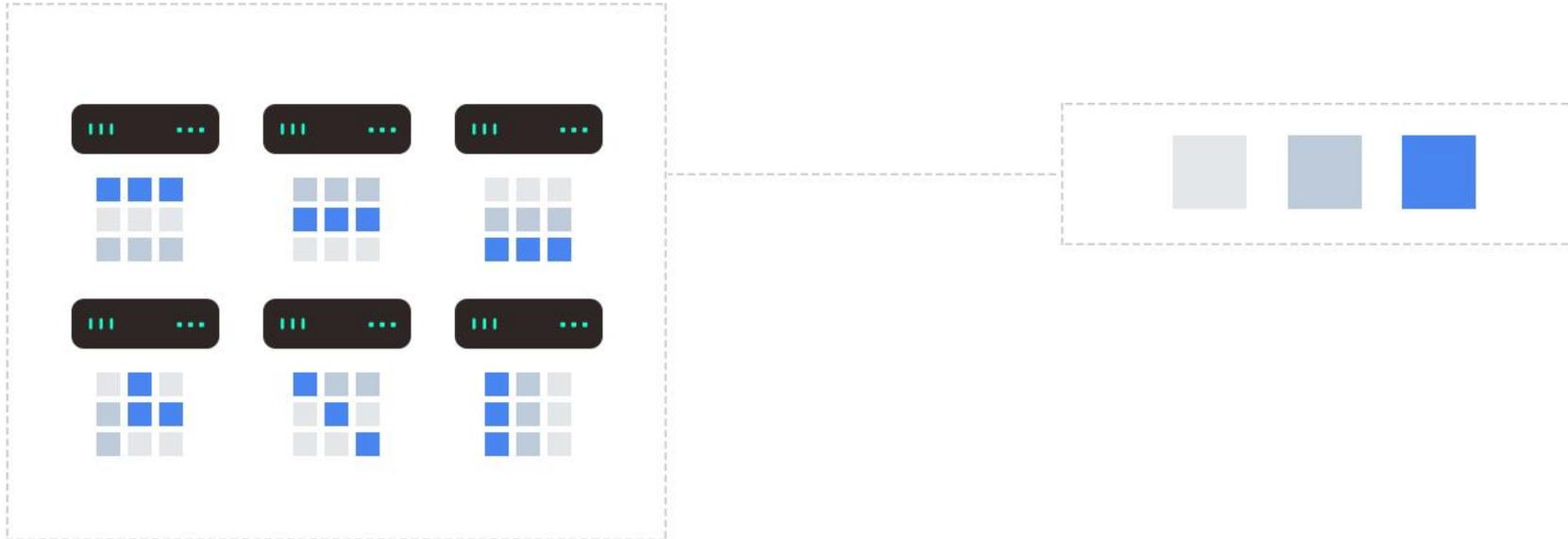
# High Efficiency Backup



Total Data **66 TB**



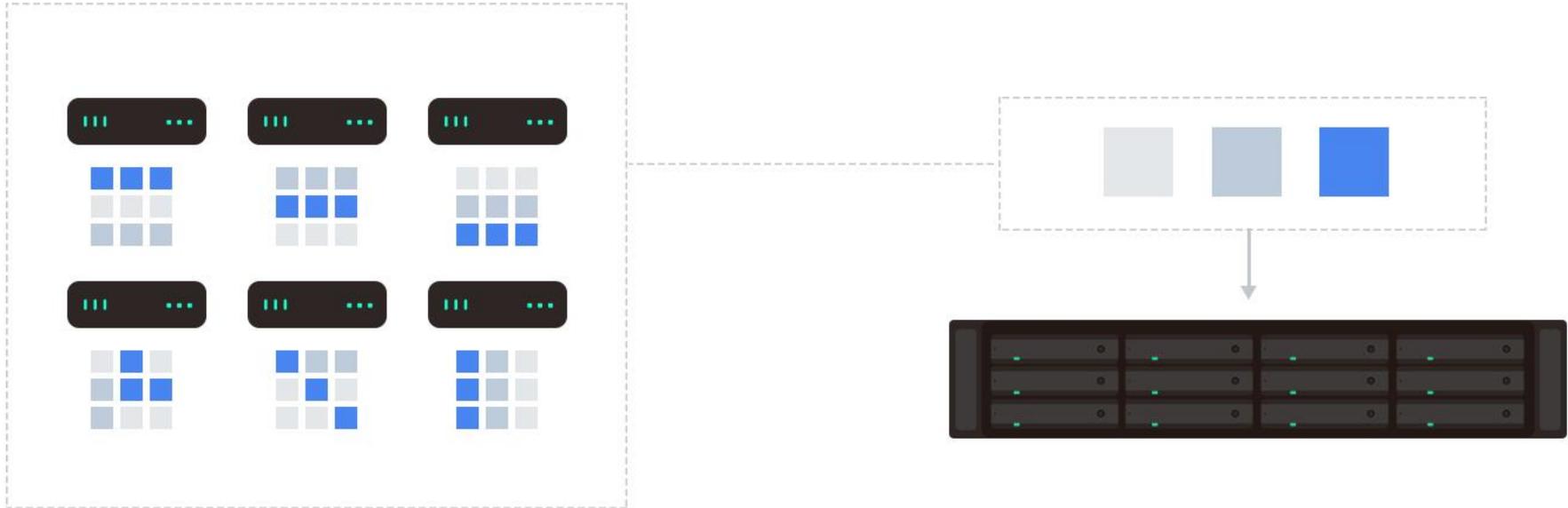
# High Efficiency Backup



Total Data **66 TB**



# High Efficiency Backup



Total Data **66 TB**

Total Backup Data **17 TB**

# Competitor Cost Analysis

- Physical Workloads Backup
- Virtual Workloads Backup

	Synology®		A-brand	
	PC	Server	PC Advanced	Server Advanced
<b>Licensing cost</b>				
3-year Subscription	Free	Free	\$1245 per 5 clients	\$1799 per host
3-year Perpetual + Maintenance			\$809.6 per 5 clients	\$2447 per host
<b>Features</b>				
Mass deployment	V	V	V	V
Application-aware backup	V	V	V	V
Global deduplication	V	V	V	V
Changed Block Tracking (CBT)	V	V	V	V
Concurrent backup constraints	1 – 10	1-10	-	-
Policy-based group management	V	V	V	V
Backup verification	-	Power on video (Backup server)	Data integrity check	Data integrity check
Bare-metal/Volume-level restore	V	V	V (boot media)	V
Universal restore	-	-	V	V
Self-service file restore	V	V	V	V
Instant restore to VMware	-	V	-	v
<b>Instant restore to VMM</b>	-	<b>V</b>	-	-

# Competitor Cost Analysis

- Physical Workloads Backup
- Virtual Workloads Backup

Synology® V-brand A-brand N-brand

Active Backup for  
Business (VMware)

Backup & Replication  
9.5 Standard

Backup Advanced for  
Virtual Host Standard

N for VMware Pro

## Licensing cost

	Active Backup for Business (VMware)	Backup & Replication 9.5 Standard	Backup Advanced for Virtual Host Standard	N for VMware Pro
3-year Subscription	Free	\$1347 per socket	\$1857 per host	\$888 per socket
3-year Perpetual + Maintenance		\$1050 per socket	\$1751.4 per host	\$638.4 per socket

## Features

Snapshot-based backup	v	v	v	v
Replication	-	v	v	v
Backup copy	Next stage	v	v	v
Backup to cloud	Next stage	v	V (paid option)	v
Global deduplication	v	- (by backup task)	v	v
Changed Block Tracking	v	v	v	v
Backup compression	Data transfer compression	v	v	v
Backup verification	Power on video (Backup server)	Ping test, heartbeat, application	Data integrity check	Power on Screenshot (Production site)
File / VM / Instant restore	v	v	v	v
Object restore	-	v	v	v
Instant restore to VMM	v	-	-	-

# Full-featured Backup Strategy

Cloud Storage



Office 365 / G Suite



Synology C2

Synology NAS



Active Backup

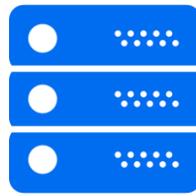


Snapshot Replication

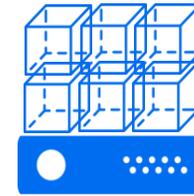
Other Servers/VM



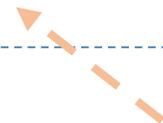
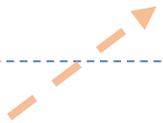
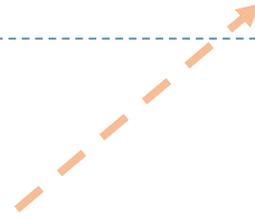
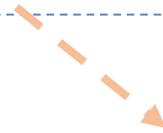
PC



Server



Virtual Machines



Coming soon!



SharePoint support  
*Through Active Backup for Office 365*

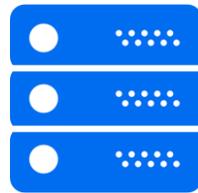


Active Backup Suite

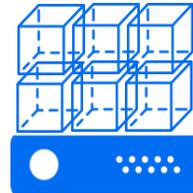
**FREE** Software Provided



PC



Server



Virtual Machine



Cloud

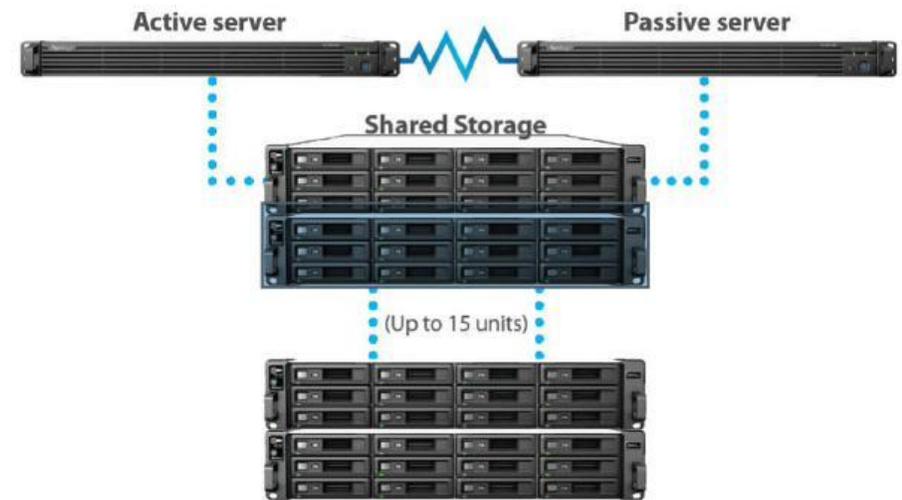


Two is one, and one is none.

- US Navy Seal



High Availability



RC18015xs+ Dual Controller

# Unified Controller – UC300

Dedicated **iSCSI** server, equipped with **Dual Active** controller





Dual Active  
Xeon D-1521

Up to 64GB  
Memory

100,000+  
Write IOPS



## SATA DOM

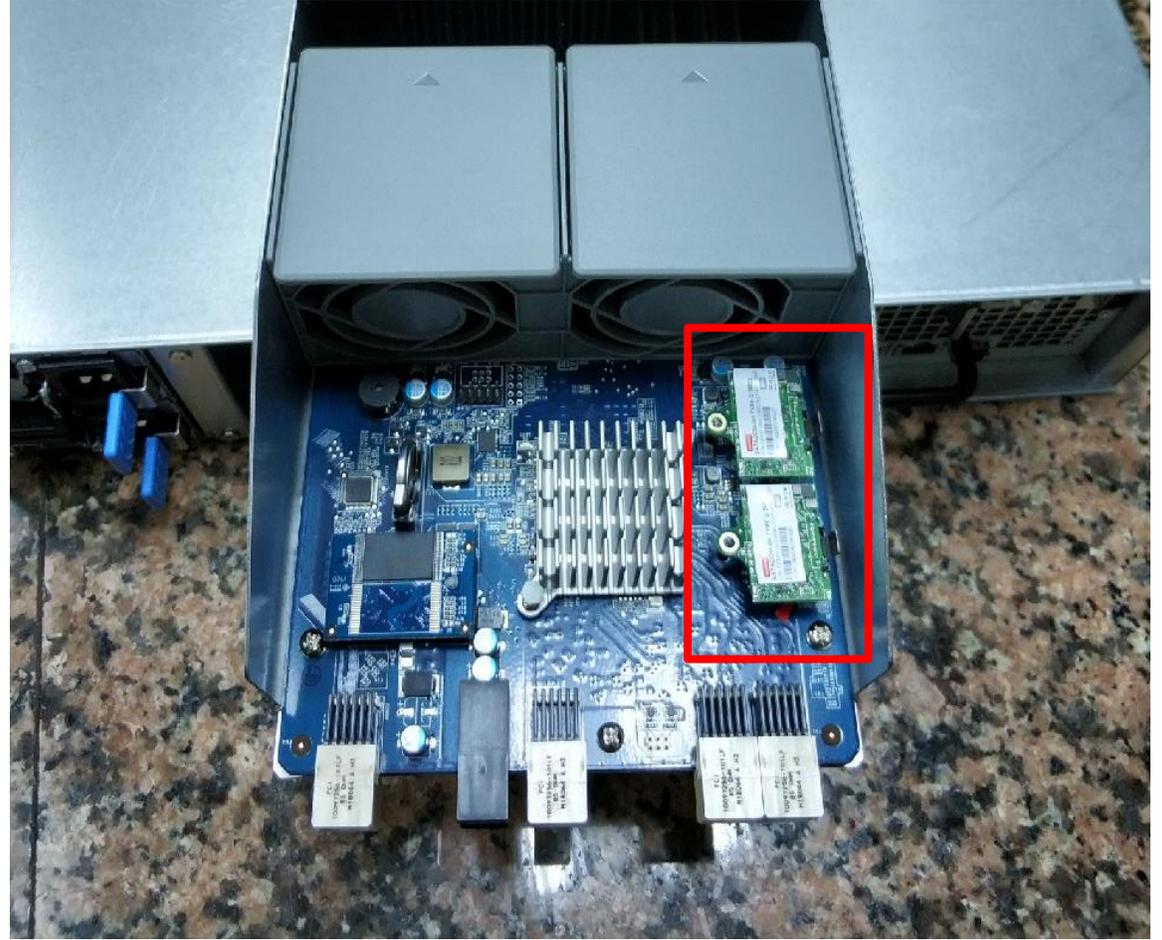
## Extra 4 SSD slots

## Dual Protection

## NTB

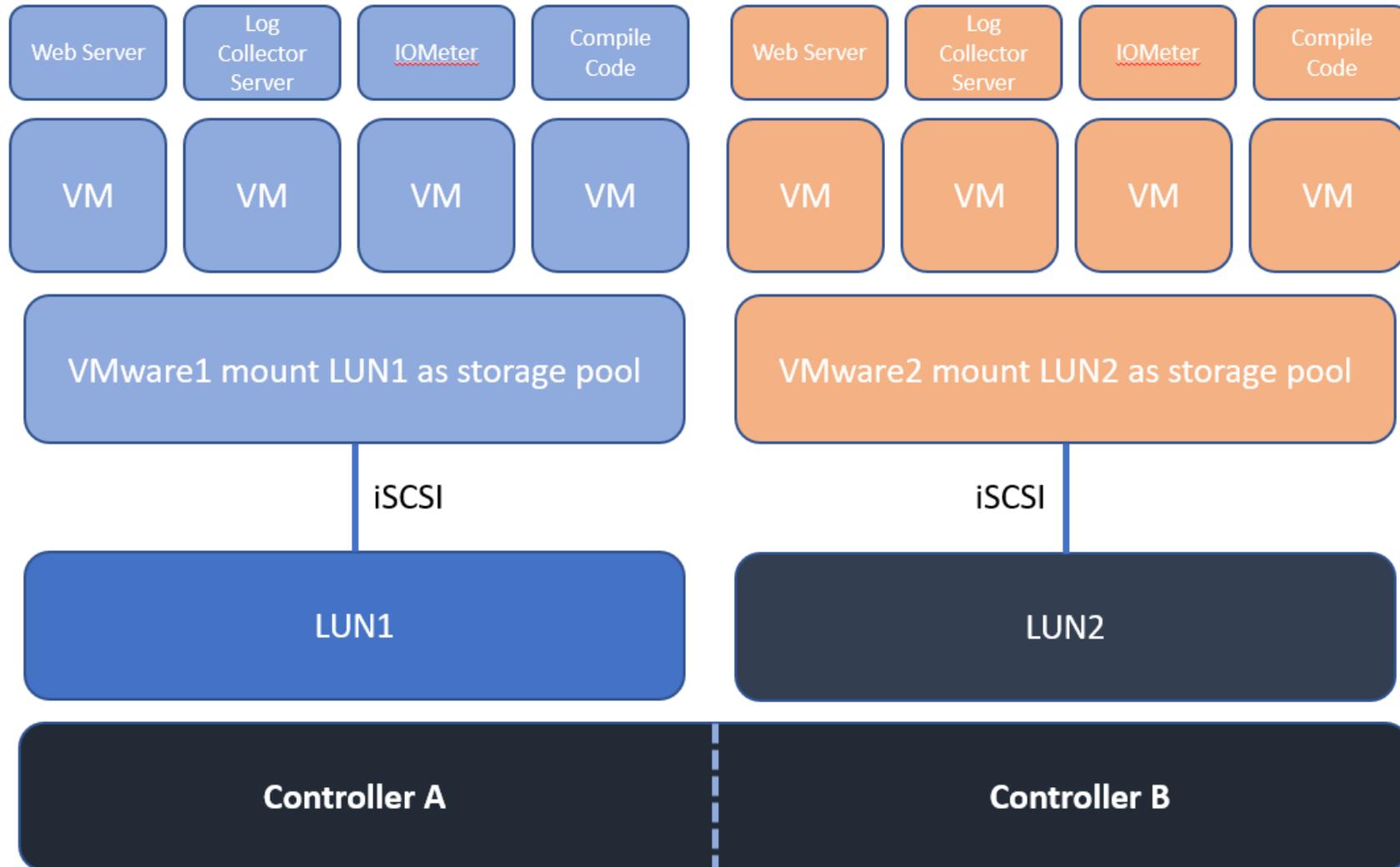
(Non-Transparent Bridge)

- No more installation
- System not influence by services
- Independent from HDD
  
- No need internal space for SSD cache
- Best practice hint
  
- CPU / Memory / Network / Power / SATA Dom / Mother board ...
  
- High performance & Low latency (32Gbps)
- More reliable than network
- No extra cost for 10G





# Test Scenario – Dual Active



Announcements | NodeBB

10.12.15.34:4567

# Web Service

Home / Announcements

New Topic

- test 1 → 8 days ago
- Wed Sep 12 05:38:02 2018 1 → 6 days ago
- Wed Sep 12 05:38:16 2018 1 → 6 days ago
- Wed Sep 12 05:38:16 2018 1 → 6 days ago

WELCOME BACK ADMIN!  
You have successfully logged in

# UC300 Monitor

CH-UC300 - Synology UC300

10.12.12.80:5000

## High Availability Manager

**Normal**  
System is functional

### Controller Information

Controller B — Controller A

### Host Utilization

	Controller A (Normal)	Controller B (Normal)
CPU Utilization	45%	47%
CPU Load Average	8.44 / 1 min	13.21 / 1 min
	9.11 / 5 min	11.93 / 5 min
	9.81 / 15 min	11.97 / 15 min
Memory	6%	6%
Disk Activity	15%	16%

vSphere - demo-ubuntu-lun2-2

demo-ubuntu-lun1-2

# Log Collector Services

Logstalgia

Wednesday, April 22, 2009 15:47:08

aol.com

ask.com

comcast.net

dialup.xtra.co.nz

global-gateway.net.nz

paradise.net.nz

192.147.202-

192.240.42-

192.32.127-

CSS

Script

/js/adclient.js

/js/menu.js

Images

/images/\* (11)

Misc

/adclick.php?c=\* (8)

/gallery.php?\*

/latest.php?ca

/news.html

/stories.php?d

/stories/enter

00015043

```

root@taipeidemo-virtual-machine: ~/kernel/linux-4.18.7
pio/gf119.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/g
pio/gk104.o
LD [M] net/bluetooth/rfcomm/rfcomm.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/base.o
CC [M] net/bluetooth/af_bluetooth.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/nv04.o
CC [M] net/bluetooth/hci_core.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/nv4e.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/nv50.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/g94.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/gf117.o
CC [M] net/bluetooth/hci_conn.o
CC [M]
2c/gf119
CC [M]
2c/gk104
  
```

# Compile code

47998.93

# IO Stress (IOPS)

Settings

Total I/Os per Second

Range 0  Show Trace

Test Controls

Next >> Stop

NodeBB

Home / Login

Username / Email

admin

Password

.....

Remember Me?

Login

Don't have an account? Register Forgot Password?

CH-UC300 - Synology UC300

10.12.12.80:5000

### High Availability Manager

**Normal**  
System is functional

Controller Information

Controller B — Controller A

#### Host Utilization

	Controller A (Normal)	Controller B (Normal)
CPU Utilization	44%	54%
CPU Load Average	7.36 / 1 min	12.1 / 1 min
	8.91 / 5 min	11.7 / 5 min
	9.74 / 15 min	11.89 / 15 min
Memory	6%	6%
Disk Activity	15%	18%

```

root@taipeidemo-virtual-machine: ~/kernel/linux-4.18.7
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/g
pio/nv10.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/g
pio/nv50.o
CC [M] net/bluetooth/rfcomm/sock.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/g
pio/g94.o
CC [M] net/bluetooth/rfcomm/tty.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/g
pio/gf119.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/g
pio/gk104.o
LD [M] net/bluetooth/rfcomm/rfcomm.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/base.o
CC [M] net/bluetooth/af_bluetooth.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/nv04.o
CC [M] net/bluetooth/hci_core.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/nv4e.o
CC [M] drivers/gpu/drm/nouveau/nvkm/subdev/i
2c/nv50.o

```

vSphere - demo-ubuntu-lun2-2 x demo-ubuntu-lun1-2

demo-ubuntu-lun1-2

強制使用美式鍵盤配置 檢視全螢幕 傳送 Ctrl+Alt+Delete

Logstalgia

Wednesday, April 22, 2009 15:47:04

00015023



**53499.16**  
All Managers - Total I/Os per Second

Settings

Total I/Os per Second

Range 0  Show Trace

Test Controls

Next >> Stop



# Dual Active Controller

Breakthrough model for Enterprise market



Evolution of DSM Platform

Deep Machine Learning

Enhanced Data Safety

Hardware Resilience & Robustness



Synology

20

19

SMART  
STREAMLINED  
SOLID