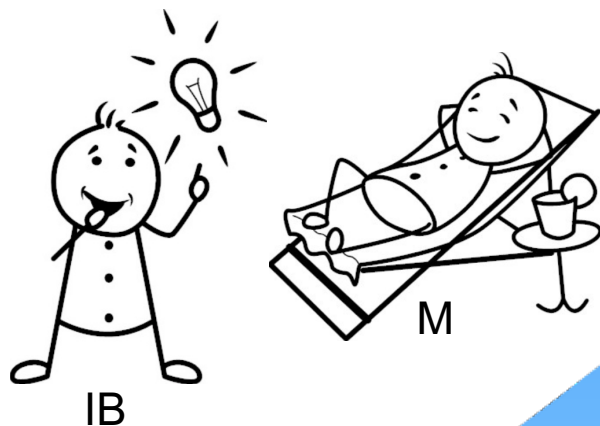


# ATEA EXPO 2019

## Tag på en rejse med IB & M

*Nye muligheder med Flash, Virtualisering m.m.*



## En ide



Hey M - Så kan  
du godt vågne  
op, jeg har fået  
en fantastisk ide!



Åh ja... V5000  
set bagfra!  
Lækkert...

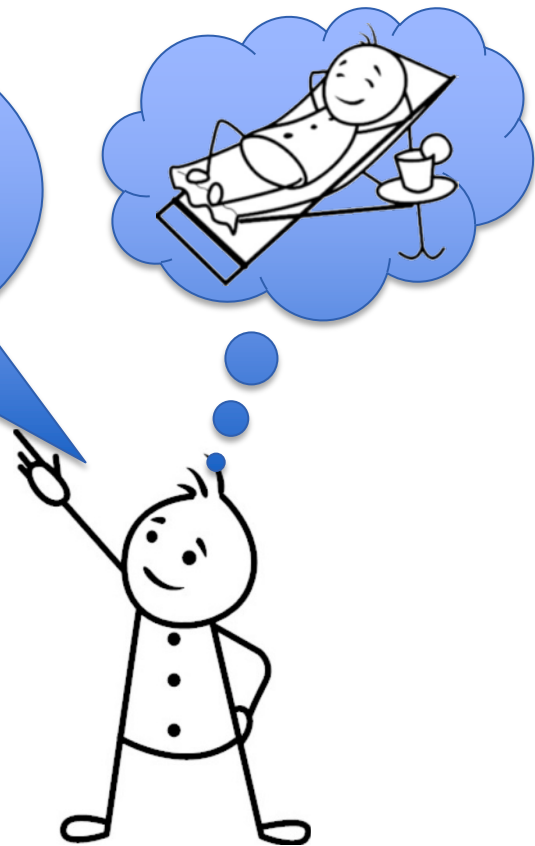


## En ide fødes...

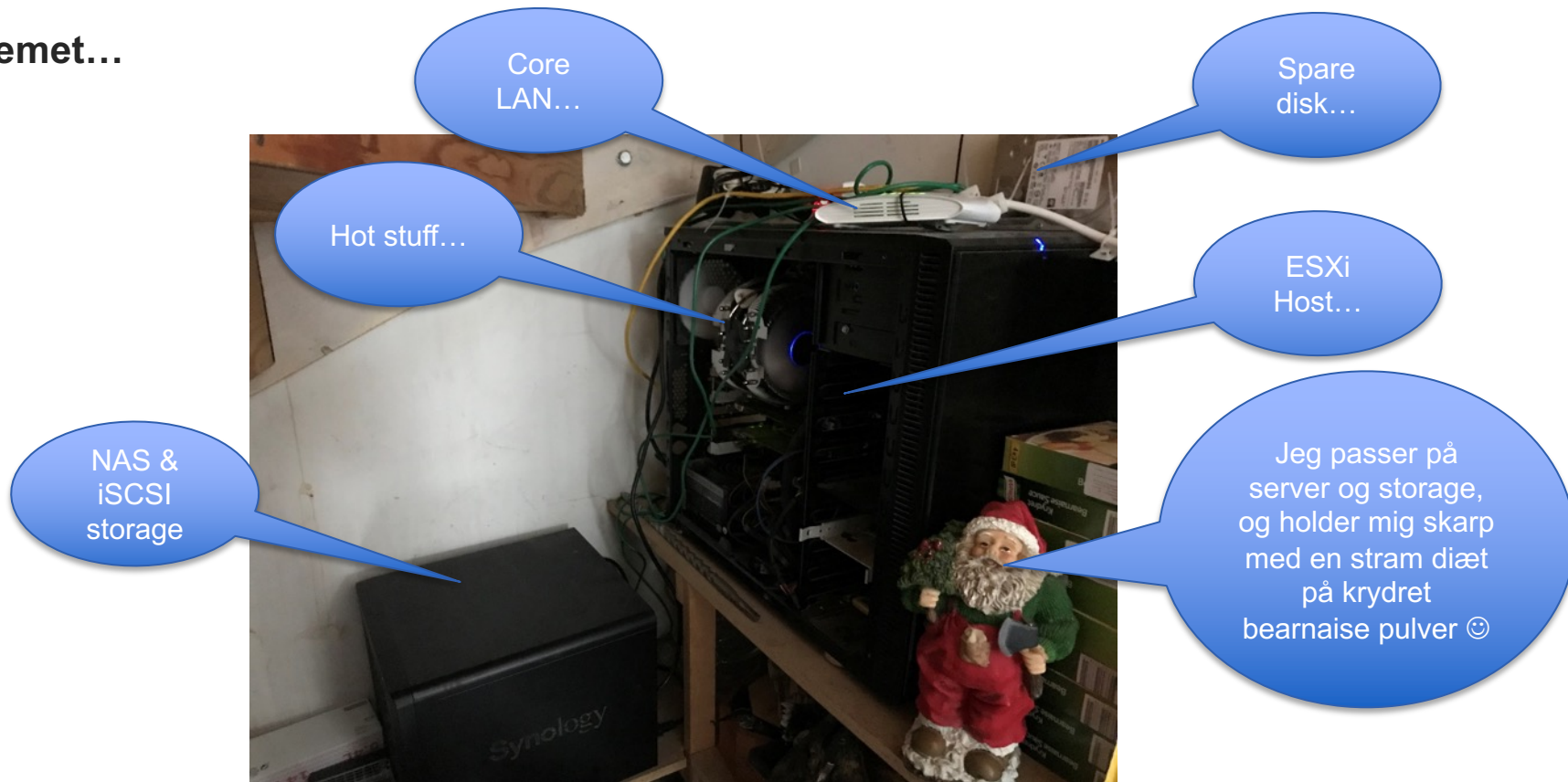
M, skal vi ikke få  
opgraderet vores  
hosting  
virksomhed?



IB, en fantastisk  
ide, så kan både  
"vi" og vores  
kunder sove bedre  
om natten 😊



## Problemet...



## Nu med køleløsning...



## Fra kosteskab til en fremtidssikret løsning

Nyt datacenter, med plads til vækst.

Indkøb af core netværk og redundante forbindelser til omverden.

Julemanden var relativ billig i drift, men han skal hjem til nordpolen.

Redundante servere (Virtualisering)

Pris fornuftig storage og storage netværk.

Overvågning / Management



**IBM Storwize V5030E All Flash controller**  
23Tb effektiv plads med Raid 5 og hot-spare inden  
komprimering af data (8× 3,84Tb SSD RI)  
– *Fra kr 130.000,00 for 23Tb kapacitet*



**IBM Storwize V5030E All Flash controller**  
42Tb effektiv plads med raid 5 og hot-spare inden  
komprimering af data (14× 3,84Tb SSD RI)  
– *Fra kr. 185.000,00 for 42Tb kapacitet*



**IBM Storwize V5100 NMVe All Flash controller**  
102,9Tb effektiv plads med native komprimering\*  
(estimat baseret på 14× 4,8Tb NMVe modules)  
– *Fra kr 535.000,00 for 102,9Tb kapacitet*

\*Estimat 2:1, [læs mere her!](#)

## Opgrader din Storwize V5010E uden afbrydelser

Storwize V5010E

Storwize V5030E

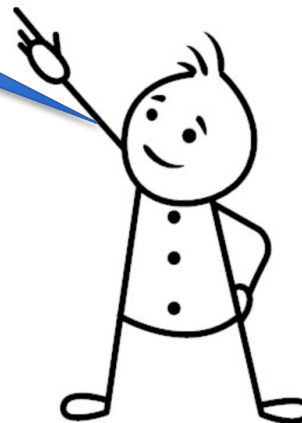
Storwize V5010E



2-Way V5030E Cluster

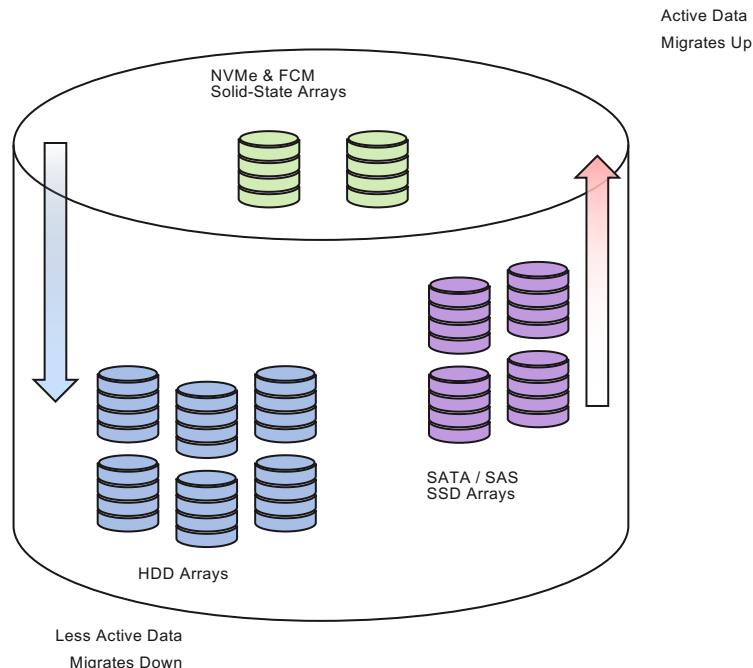
## Ikke alt der behøver Flash

Husk nu at  
spare bare  
lidt...



# Easy Tier

## AFA Tiering or Flash Accelerated Hybrid



Automated tiering  
between internal media  
types, and between  
externally virtualized  
arrays

AI based data placement  
to performance and cost  
optimize infrastructure

SCM<sup>1</sup>  
IBM FlashCore  
NVMe  
SAS SSDs  
HDDs<sup>2</sup>

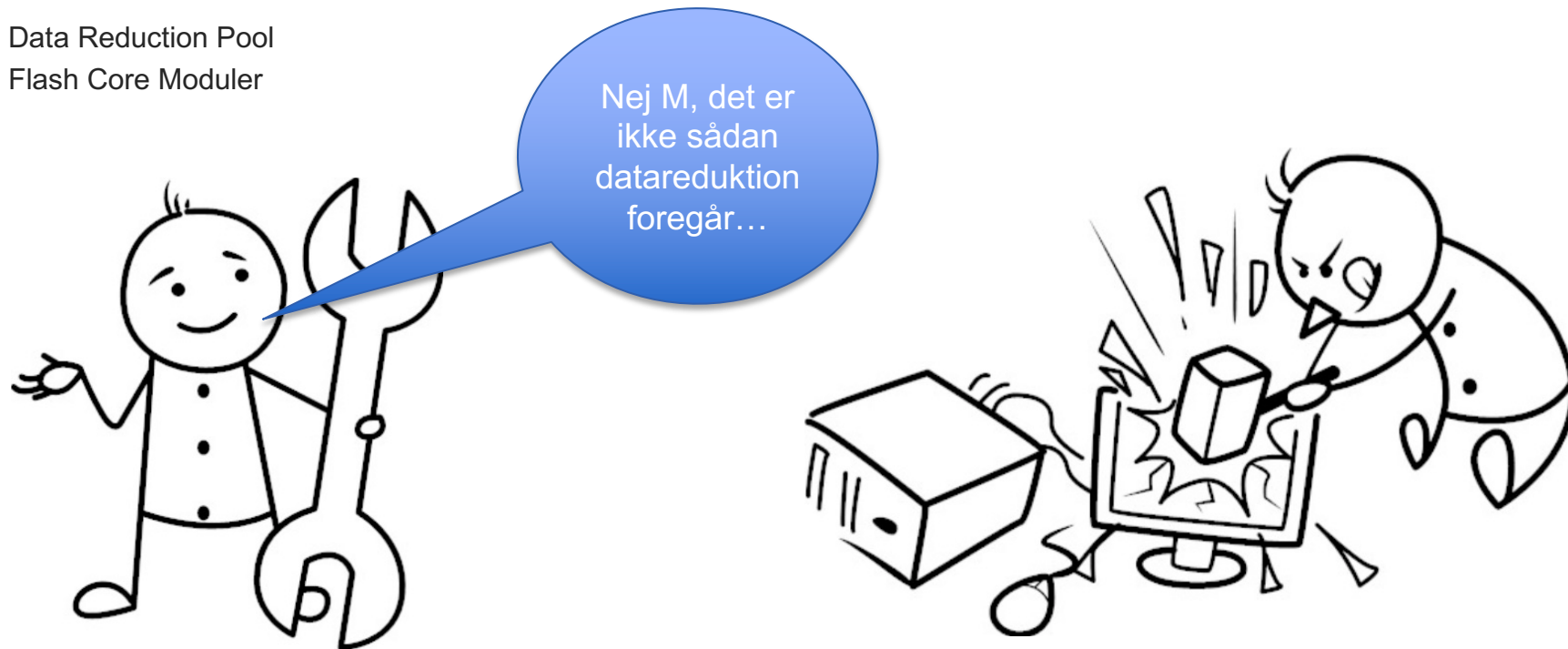
Set it and forget it ...  
unlike competitive tiering

<sup>1</sup> SCM Capable V5100

<sup>2</sup> HDDs only part of Hybrid Storage Systems

## Datareduktion?

Data Reduction Pool  
Flash Core Moduler



# FlashCore Modules (FCMs)

## NVMe accelerated flash solution



Who has it?

IBM is the only vendor to deliver these purpose-built TLC flash modules with inline high-performance compression!

Data reduction without performance impact

Hardware assisted encryption

Endurance without penalty

FIPS 140-2 certification

Unequalled NVMe flash capacity per module

Supported by IBM FlashWatch guarantee

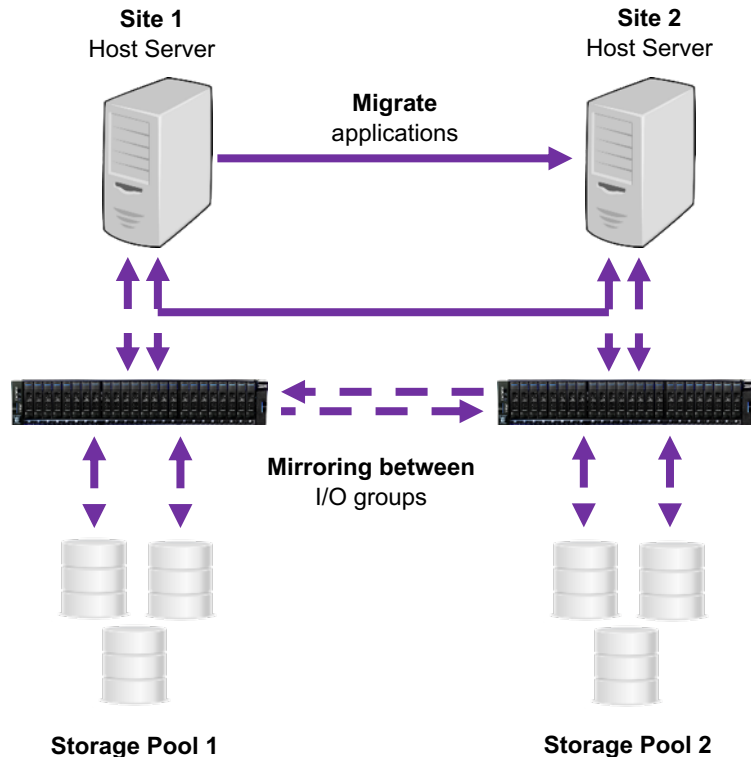
4.8TB, 9.6TB, 19.2TB capacity options  
up to 5:1 compression



## Datacenter redundans



# High Availability with HyperSwap



Extreme high availability solution

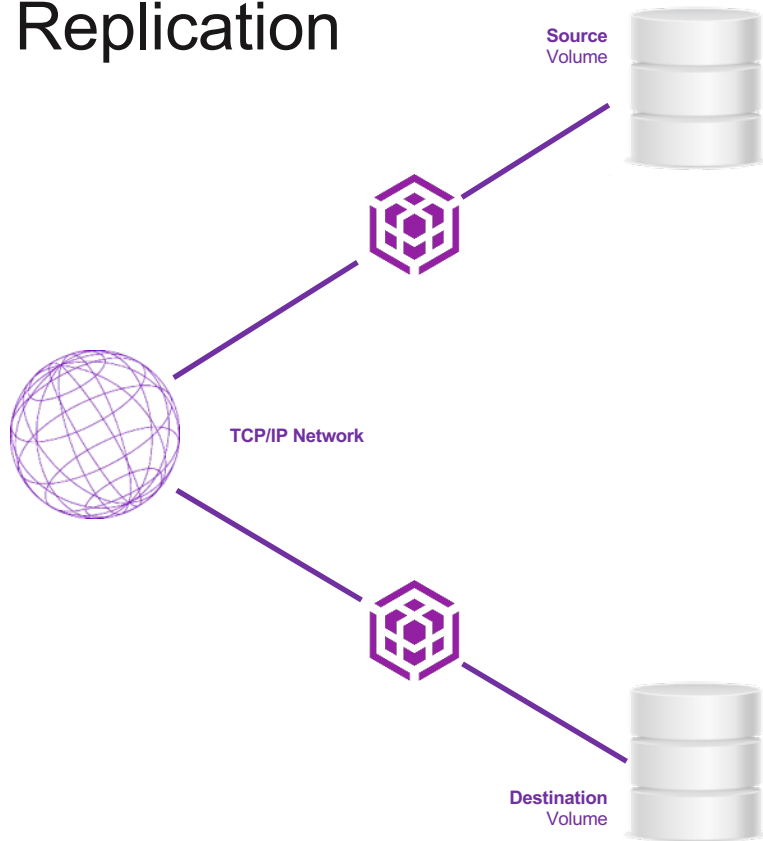
Eliminate costs of downtime

Completely redundant storage infrastructure even after site failure

Continuous data access with no performance impact

Freely move data without disruption across sites

# Disaster Recovery With IP Replication



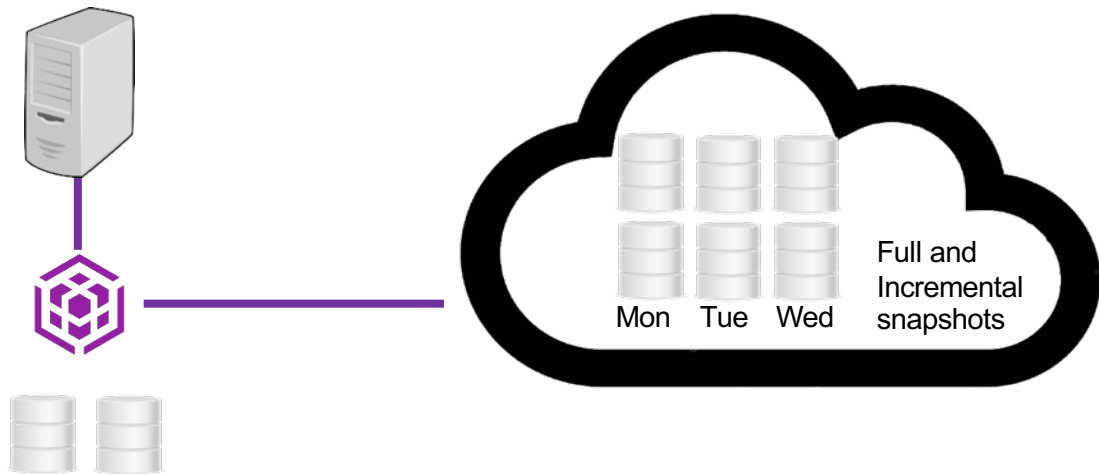
Enables use of Ethernet connections for remote mirroring

No separate appliances required

Uses artificial intelligence to improve network bandwidth utilization up to 3x

Deploy less costly network infrastructure

# Cloud FlashCopy



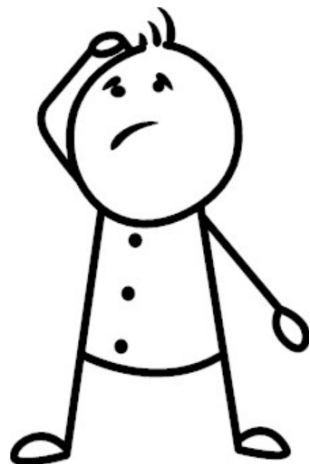
**Full and incremental restore from cloud snapshots**

**Supports volume groups for mutual consistency**

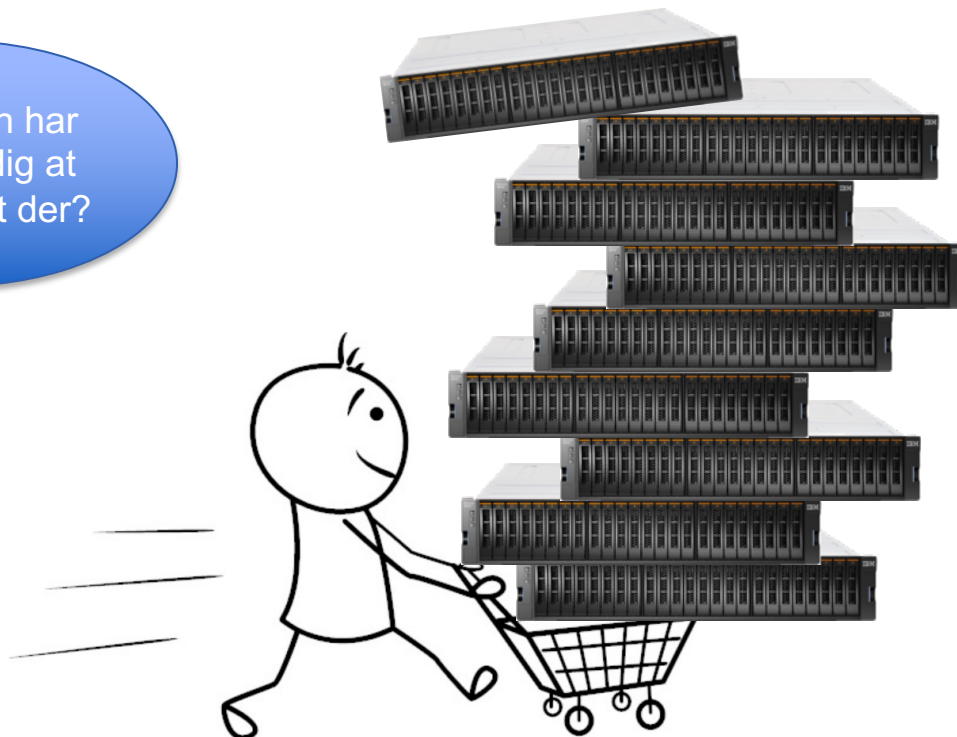
**Import and export of volumes between systems**

**Supported cloud providers: IBM Cloud, Openstack Swift, Amazon S3**

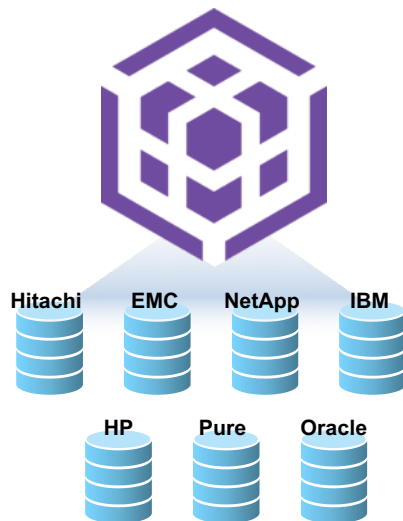
## Hvad med vækst/opkøb?



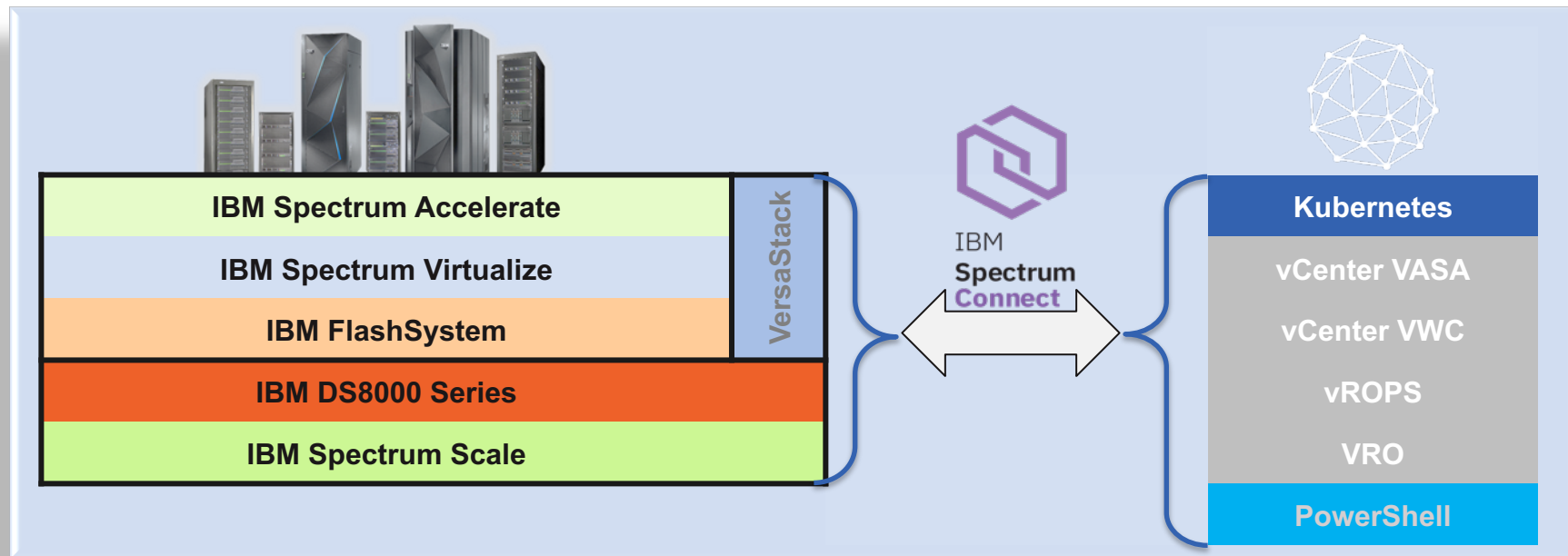
M, hvordan har du tænkt dig at styre alt det der?



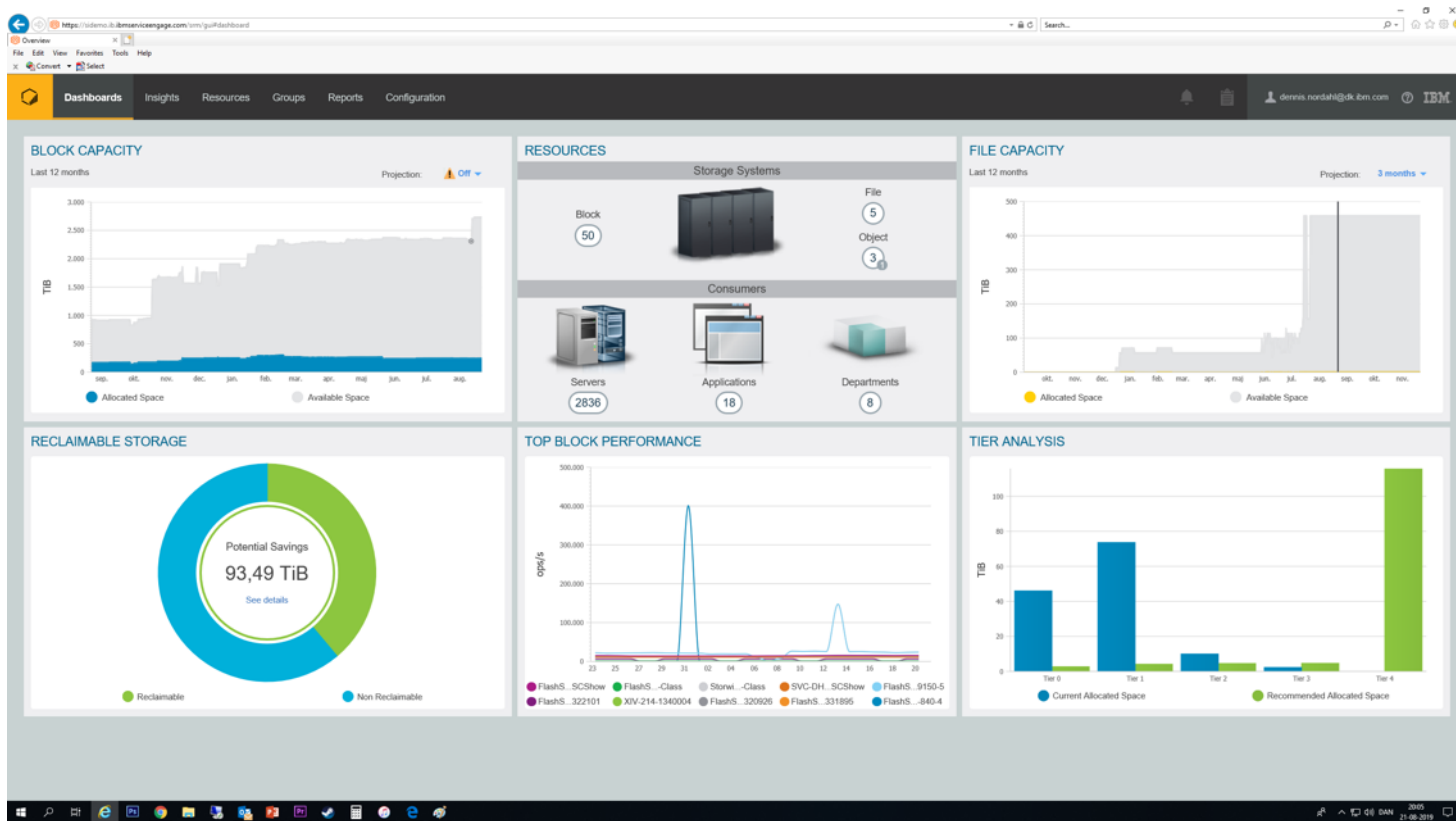
# Virtualising?



## Spectrum Connect (mere integration med virtuelle workloads samt orkestrering)



# IBM Spectrum Control / Storage Insights



# Three great reasons to try...



## (1)

### Zip, Nada, It's Free!

- ✓ Nothing to Purchase
- ✓ You can set it up in the next few minutes
- ✓ It will help you immediately

## (2)

### Nothing to Maintain

- ✓ It's hosted in the IBM Cloud
- ✓ No application updating
- ✓ Always up to date
- You will need a data collector on your site
  - It can be on a VM

## (3)

### Enhanced IBM Support

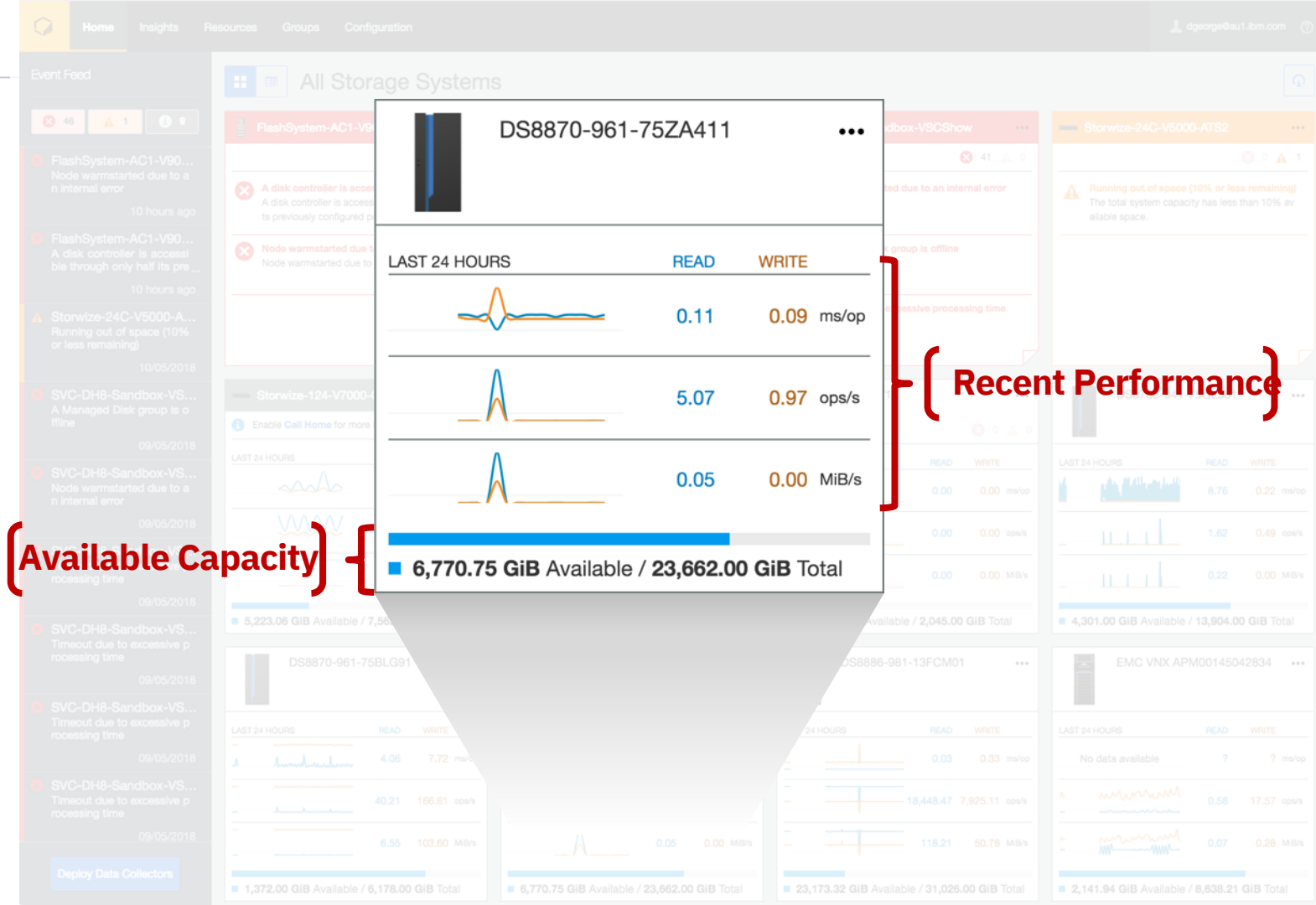
- ✓ Log collection automated and submitted
- ✓ IBM can get Log information
- ✓ Automated Helpdesk Ticket creation
- ✓ IBM Support History

#### IBM Storage Insights

Optimize your storage infrastructure using this cloud-based storage management and support platform with predictive analytics

[Sign up for free](#)[Launch interactive demo](#)

# Enterprise Storage Dashboard



# Enterprise Storage Dashboard



# Device Dashboard

Home

SVC-DH8-Sandbox-VSCShow

41

0

LAST 24 HOURS

READ

WRITE

0.00

211.14

ms/op

0.00

4,321.32

ops/s

0.00

123.56

MB/s

49,314.96 GiB Available / 57,826.00 GiB To...

Storwize-24C-V5000-ATS2

0

1

LAST 24 HOURS

READ

WRITE

0.20

0.00

ms/op

0.03

0.00

ops/s

0.00

0.00

MB/s

294.00 GiB Available / 22,310.00 GiB Total

Storwize-524-V7000-VSCShow

1

Enable Call Home for more insights

LAST 24 HOURS

READ

WRITE

No data available

?

ms/op

No data available

?

ops/s

No data available

?

MB/s

37,979.82 GiB Available / 40,404.00 GiB To...

Beta-SV1

SVC-DH8-Sandbox-VSCShow

Get Support

Get Support from IBM

Overview

Events

Tickets

Properties

Capacity

Compression Savings: 15.19 %

Physical Capacity

14.72%

8,511.04 GiB

Allocated Space

Volume Capacity

85.28%

49,314.96 GiB

Available Space

Capacity Savings

26.78%

4,693.95 GiB

Allocated Space

73.22%

12,836.05 GiB

Unallocated Space

633.45 GiB

0.00 GiB

12,836.05 GiB

Compression

Deduplication

Thin-Provisioning

Total Savings 13,469.50 GiB

View Pools

View Compressed Volumes

View Deduplicated Volumes

View Thin-Provisioned Volumes

Performance

Response Time

ms/op

400

300

200

100

0

Read

0.00 ms/op

Write

211.14 ms/op

May 30, 2018, 5:10 PM

I/O Rate

ops/s

8,000

6,000

4,000

2,000

0

Read

0.00 ops/s

Write

4,321.32 ops/s

May 30, 2018, 5:10 PM

Data Rate

MB/s

200

150

100

50

0

Read

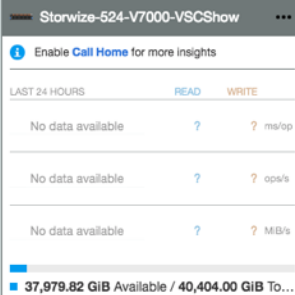
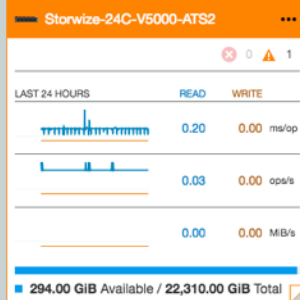
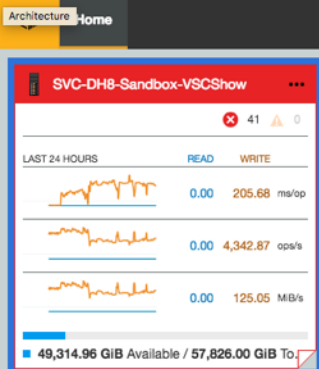
0.00 MB/s

Write

123.56 MB/s

May 30, 2018, 5:10 PM

# Device Events



Beta-SV1 ...

**SVC-DH8-Sandbox-VSCShow** [Get Support](#)

SAN Volume Controller - 2145  
8.1.2.1 (build 142.6.1805101736000)

Overview **Events** Tickets Properties

**A disk controller is accessible through only half its previously configured ports** May 1, 2018 01:16:02

Reporting Hardware: 75BAGR0

Actions

Acknowledge

Filter...

| Name                       | Type  | Time                  | Description |
|----------------------------|-------|-----------------------|-------------|
| Node warmstarted du...     | Er... | May 3, 2018, 17:55:15 |             |
| Timeout due to exces...    | Er... | May 3, 2018, 17:53:51 |             |
| Persistent unsupporte...   | Er... | May 3, 2018, 03:44:46 |             |
| Persistent unsupporte...   | Er... | May 3, 2018, 01:35:49 |             |
| Persistent unsupporte...   | Er... | May 3, 2018, 01:35:44 |             |
| Node warmstarted du...     | Er... | May 2, 2018, 05:30:33 |             |
| Timeout due to exces...    | Er... | May 2, 2018, 05:29:02 |             |
| A disk controller is ac... | Er... | May 1, 2018, 01:16:02 |             |
| A disk controller is ac... | Er... | May 1, 2018, 01:15:01 |             |
| Timeout due to exces...    | Er... | May 9, 2018, 18:43:10 |             |
| Timeout due to exces...    | Er... | May 9, 2018, 18:33:12 |             |
| Global Mirror seconda...   | Er... | May 9, 2018, 18:33:12 |             |

Showing 44 items | Selected 1 item

Refreshed a few moments ago

# Device Support

SVC-CG8-svc2a

3

0

A Managed Disk group is offline

Node has been missing for 30 minutes

Persistent unsupported controller config

LAST 24 HOURS

READ

WRITE

0.00

205.68

0.00

4,342.87

0.00

125.05

49,314.96 GiB Available / 57,826.00 GiB To

(Current Open Tickets with IBM)

SVC-CG8-svc2a

SAN Volume Controller - 2145

7.8.1.5 (build 135.5.1802161136000)

Get Support

Overview Events Tickets 4 Properties

Ticket updates are displayed here within 24 hours.

Open Tickets (4)

- 1384  
10285,227,000  
Opened on May 8, 2018
- overheat shutdown  
93624,227,000  
Opened on May 1, 2018
- problem  
91818,227,000  
Opened on Apr 25, 2018
- This is test PMR and can be ignored  
88067,227,000  
Opened on Apr 11, 2018

Closed Tickets (50)

- 9000 S RITA RD TUCSON AZ 85744  
11381,227,000  
Closed on May 25, 2018
- DEMO HW PMR  
11267,227,000  
Closed on May 11, 2018
- 1376  
10284,227,000  
Closed on May 8, 2018
- 1338  
93459,227,000  
Closed on May 1, 2018
- 1281  
92721,227,000  
Closed on Apr 28, 2018
- 1296  
92722,227,000  
Closed on Apr 28, 2018
- Response Time Issue  
91568,227,000  
Closed on Apr 24, 2018

overheat shutdown

Severity Ticket 93624,227,000

( IBM PMR Number )

Opened on May 1, 2018

APAR: -

Add Log Package to Ticket

( Send Logs to IBM )

Get Logs for [system]

Type or select the ticket to add a log package

Select a ticket or type ticket number...

Click the type of log package to add

Fastest

Type 1

Type 2

Type 3

Type 4

Slowest

Type 1: Standard logs

Contains the most recent logs for the system and software, including the event and audit logs.

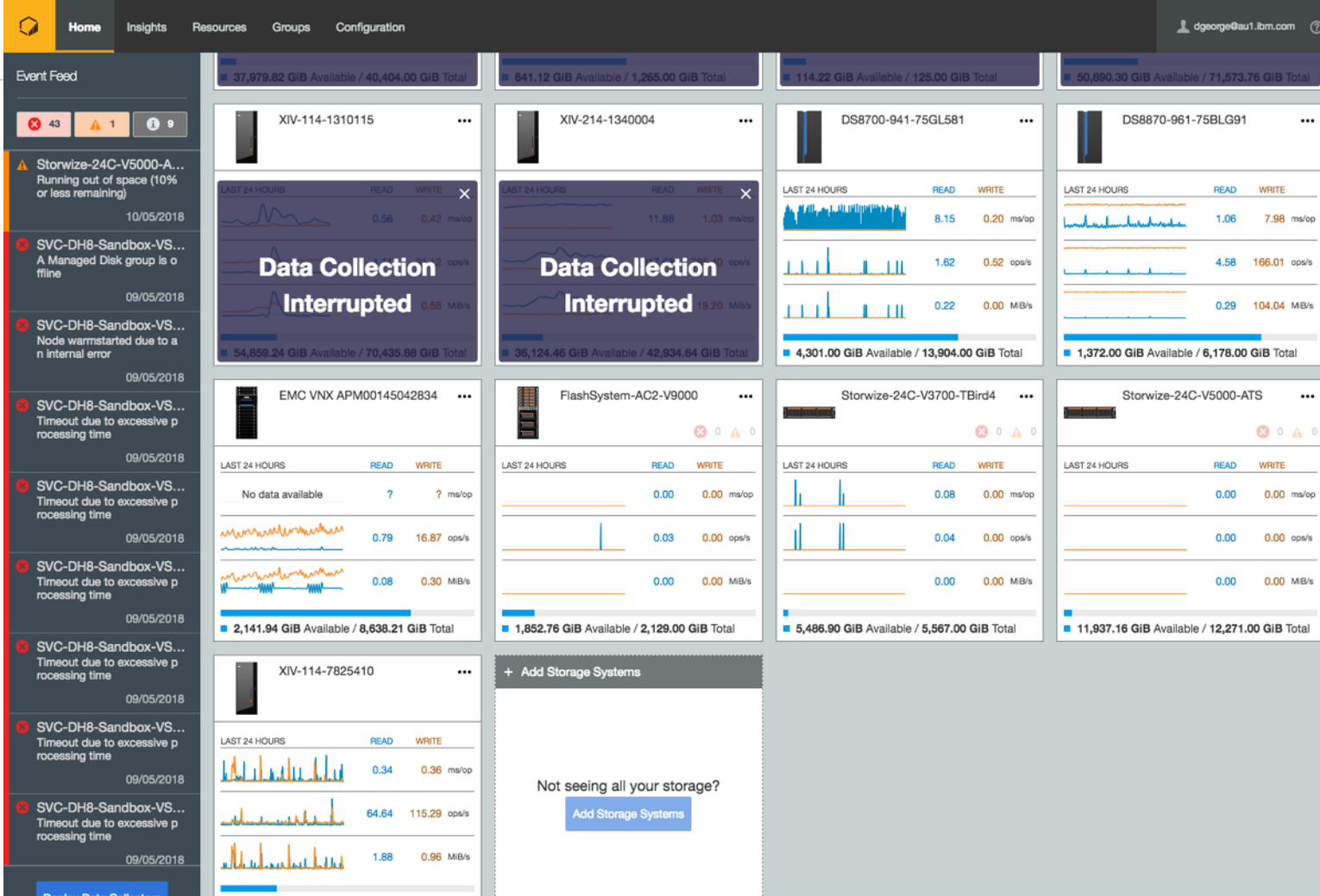
The logs will be uploaded to ECUREP for you.

Cancel

Get Logs



# We also monitor the data collector





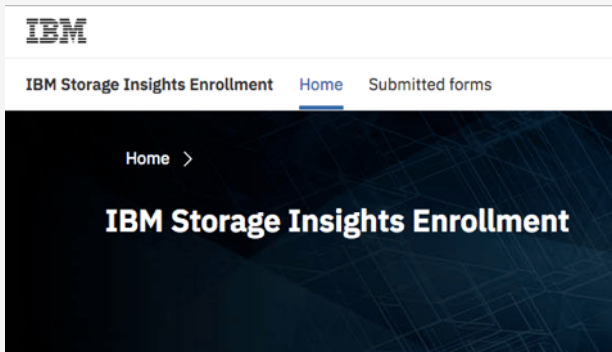
# Three steps to get started...

(1)

**Sign up!**

Head over to

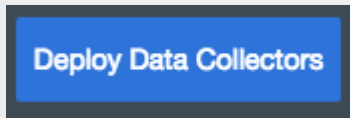
<https://ibm.biz/insightsreg>



(2)

**Login to your Dashboard**

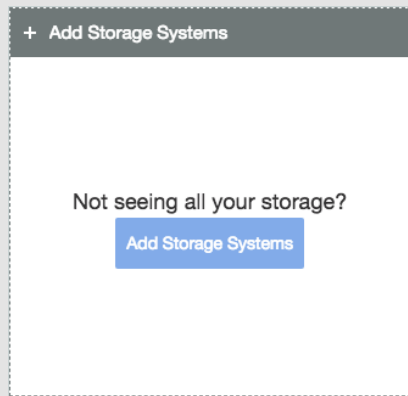
Follow the link to get and install the data collector



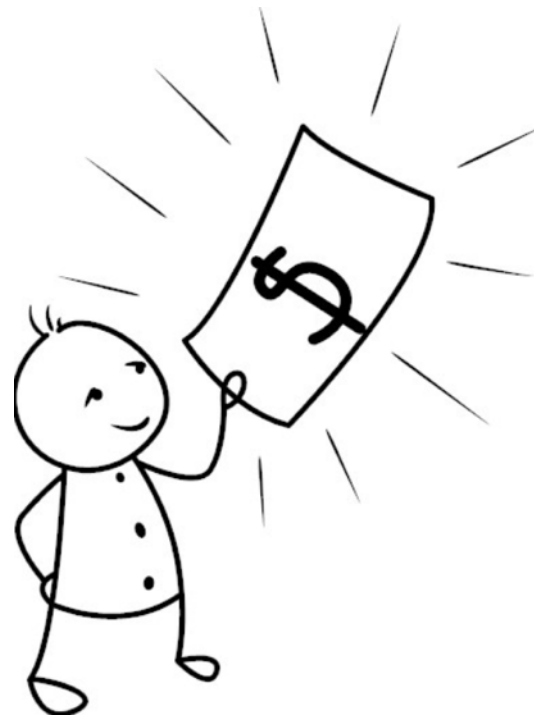
(3)

**Register your Controllers**

If your controllers are not there...

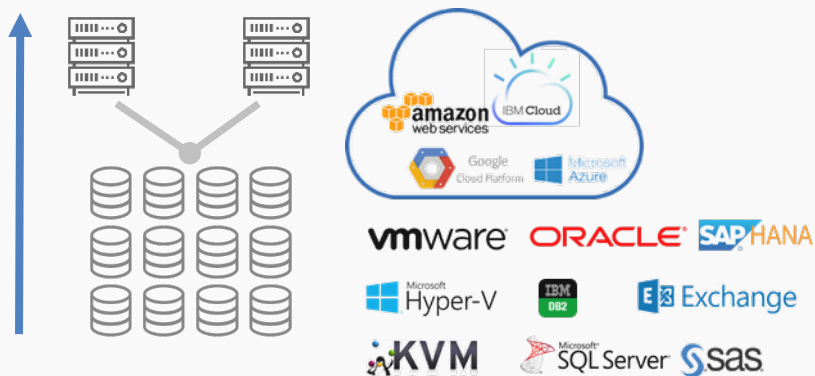


## Hvor skal vores 2 venner hen?



# Vejen til næste generations datacenter med IBM

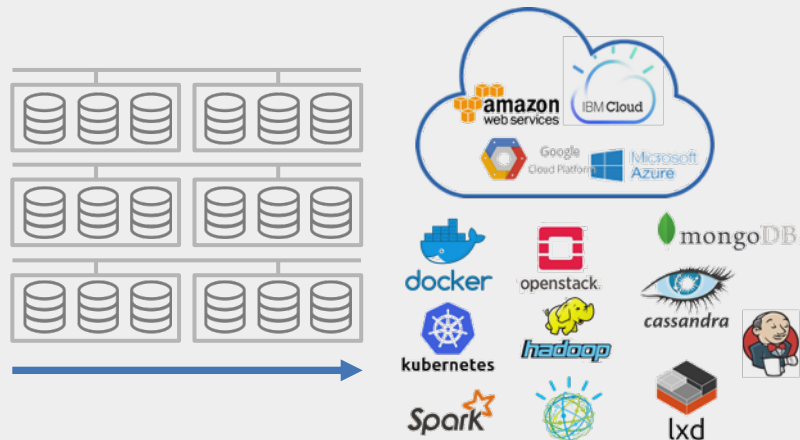
## Traditional Application Workloads



### MODERNIZE

Optimize and drive efficiencies, while continuing to deliver high levels of service delivery

## New Generation Application Workloads



### TRANSFORM

Deliver and operate new hybrid cloud application infrastructure to support new Cognitive and agile workloads

SAVE HERE



INVEST HERE

**This is the end...**



## Mere plads: 2 PB all-flash løsninger i forskellige styrker



Control Enclosure

Expansion Enclosure



24 x 30TB SAS SSD = 1440TB



24 x 15TB SAS SSD = 720TB

**~2160TB w/ 2:1 Sight Unseen Guarantee**

The **V5030E** has numerous CPU cores, some of which may be employed to provide software-based data reduction.



Control Enclosure

Expansion Enclosure



24 x 19.2TB NVMe FCM = 921TB



24 x 30TB SAS SSDs = 1440TB



**Price**

**Performance**

### NVMe in a Clustered Solution



Clustering three **V7000** using only FCMs, with inline hardware compression



(24 x 19.2TB FCM = 921TB) + (24 x 19.2TB FCM = 921TB) + (24 x 4.8TB FCM = 230TB) = **~2072TB Sight Unseen Guarantee**

**V5100** using FCMs, with inline hardware compression..and SAS SSDs utilizing hardware assistance acceleration for compression



