

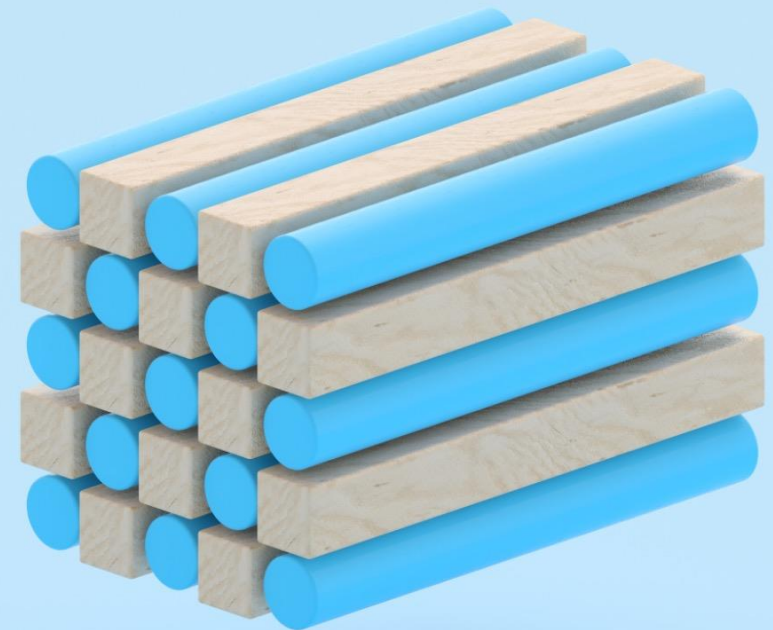
NetApp i usługi w chmurze

Czy przechowywanie danych może być tańsze i bezpieczniejsze? Jednolita platforma zarządzania danymi - ONTAP

Łukasz Bajer
Business Development Manager



Wrzesień 2023



NetApp jako Lider

Od 1992 roku



A Gartner MQ Leader

7

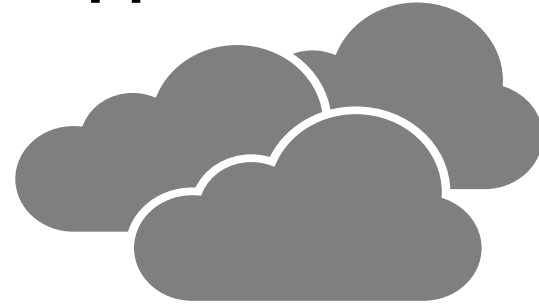
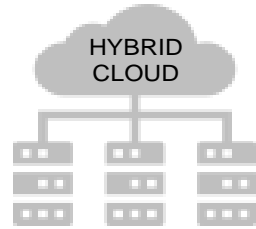
Years in a Row*

* Combination of all-flash and primary storage MQ reports

Kompletne portfolio NetApp



PUBLIC CLOUD



DATA SERVICES

Cloud Backup

Cloud Tiering

Cloud Data Sense

Cloud Sync

Cloud Volumes Edge Cache

Global File Cache

ACTIVE IQ

CLOUD INSIGHTS

BlueXP

STORAGEGRID

SANTRICITY

ONTAP

STORAGEGRID

EF

AFF

FAS

AMAZON FSX for ONTAP

AZURE NETAPP FILES

CVS FOR GOOGLE CLOUD

Cloud Volumes ONTAP (CVO)

STORAGE

ON-PREMISES STORAGE



CLOUD STORAGE



Szeroki wachlarz możliwości systemu ONTAP

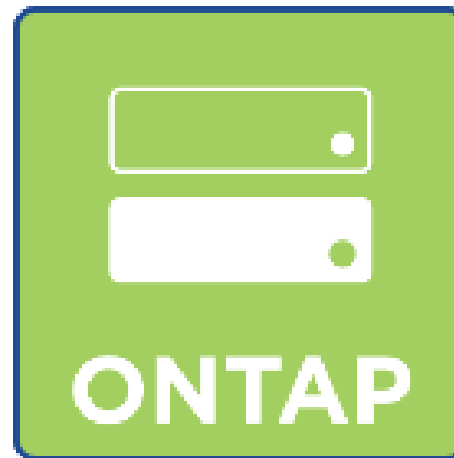


Box



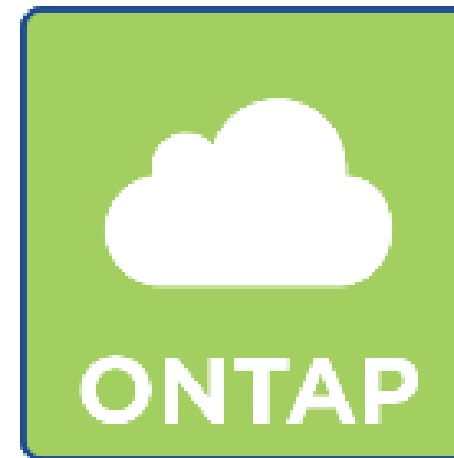
ONTAP FAS/AFF

Software



ONTAP Select

Cloud



Cloud Volumes ONTAP

NAS

SAN

S3

Deduplikacja

Kompresja

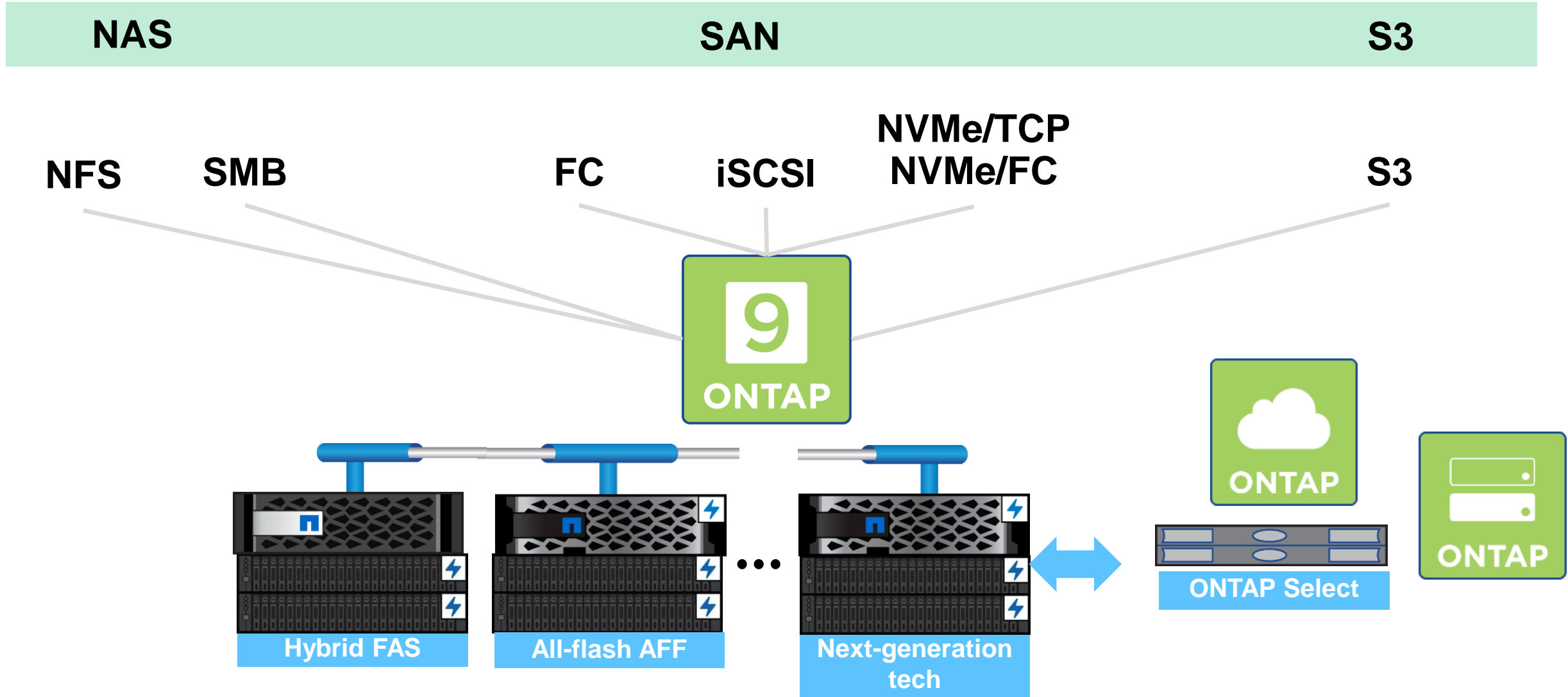
Kompakcja

Snapshot

SnapMirror

MetroCluster

Wieloprotokołowy dostęp



Bezpieczeństwo



Koszty ataków Ransomware

\$1.8mln

Średni koszt ataku
aby podnieść się po ataku
ransomware w 2021¹

\$4.8mld

Specjalne
ubezpieczenia
74% YoY wzrost
kosztów
(2020-2021)²

10x

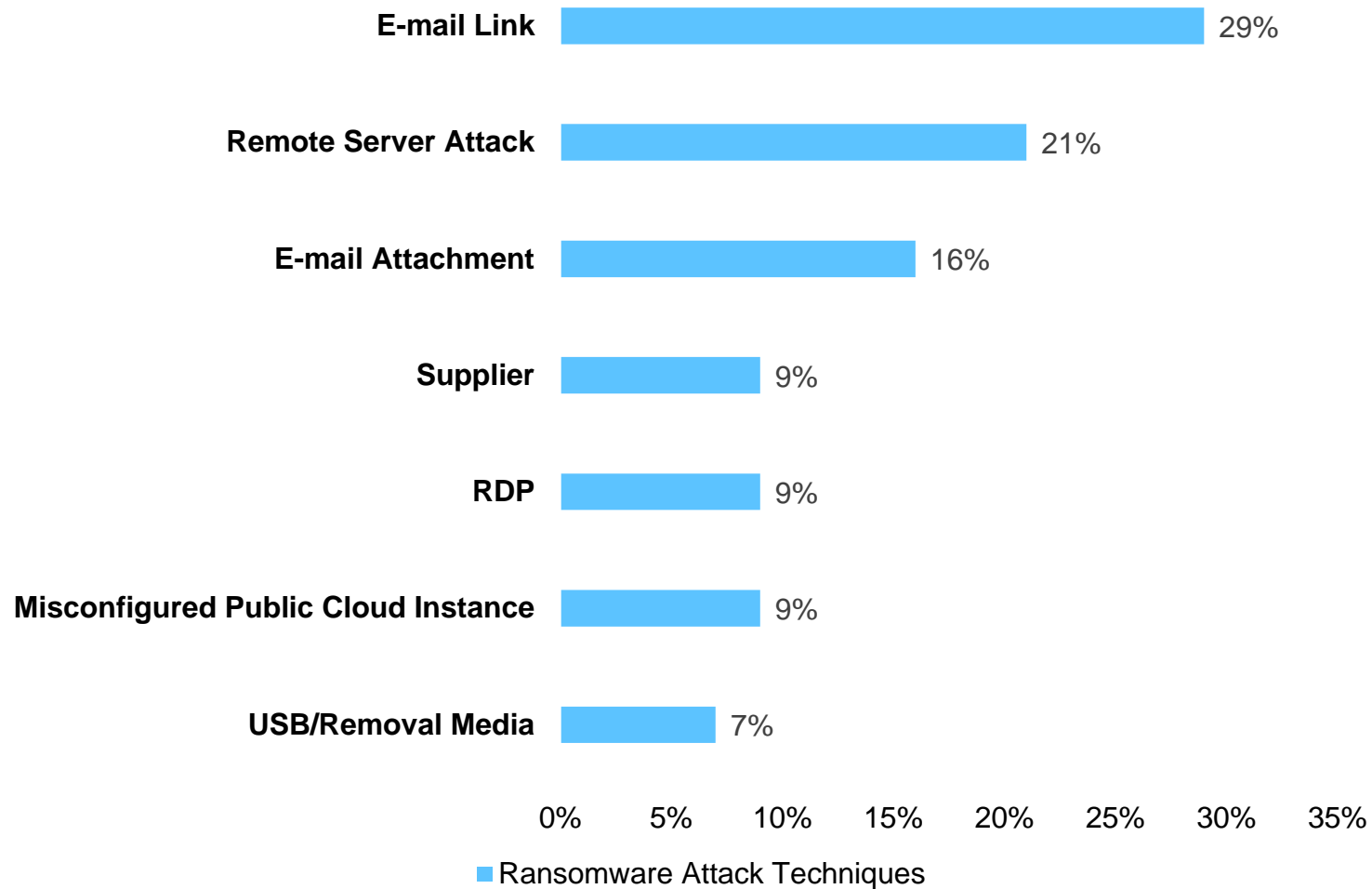
Bardziej kosztowny
prześój i
odwrócenie skutków
niż koszt opłat do
przestępców¹

¹ Sophos report survey data of 5,400 IT managers, [The State of Ransomware 2021](#); average cost was for U.S. companies. Also based on [The State of Ransomware 2020](#). For more information, see the TechTarget article [Should companies pay after ransomware attacks?](#)

² [S&P Global Market Intelligence analysis](#).

Ransomware Attack Techniques*

Ransomware Attack Techniques



*Sophos report survey data of 5,000 IT manager on "The State Of Ransomware 2020"

Ransomware na życzenie

As a Service

The screenshot displays a dark-themed control panel for a ransomware service. The interface is organized into several sections:

- INFO:** Fields for "Company: 1" and "Description: 1".
- FILES:** Buttons for "Linux" and "Windows", and a "Show builds" button.
- PAYMENT INFO:** Displays payment status with a green progress bar. It shows "Paid: \$ 0" and "Pending: \$ 0". It also includes "Remaining to pay" for "BTC (+20%)" and "XMR", each with a "Rate: \$" field. There are toggle switches for "Fixed rate:", "Enable BTC:", and "Enable XMR:". Buttons for "Not paid" and "Transactions (0)" are present.
- BOTS STATISTIC:** A table with columns: Bots (0), With reports (0 (0%)), Summary files (0), Summary size (0 GB), Windows (0), and Linux (0). Below the table is a search bar and a dropdown menu set to "All". The main area below the table displays "Bots not found".
- LANDING INFO:** Shows "Discount price: 10 days, 00:00:00 (not launched)". It includes "User status: Offline", "Last visit: -", "Visits: 0", "Ban chat: -" with a "+" button, "Blog post: Choose post", "Access key: Show", and "TOR LINK / WEB LINK".
- CHAT "1":** A chat interface with tabs for "Public chat" and "Our chat". It features a large text input area and a send button.

NetApp kompleksowa cyber-odporność

Ochrona skoncentrowana na danych

NetApp® cyber resilience

Ochrona danych

Dostępność danych

Wszystko redundantne z wykorzystaniem efektywnych replikacji, synchronizacji danych

Odtworzenie danych

Szybkie, efektywne i granularne kopie zapasowe oraz archiwizacja lokalnie i w chmurze

Bezpieczeństwo danych

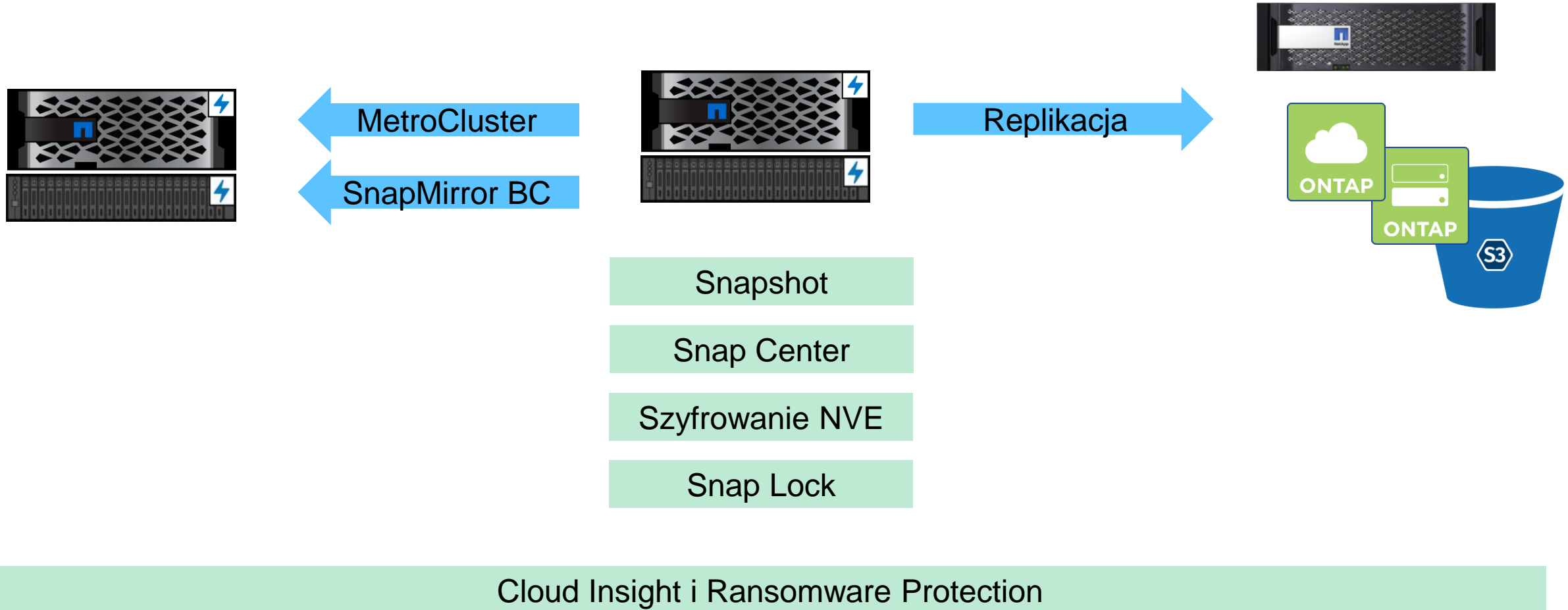
Wykrywanie zagrożeń

Monitoring, wykrywanie, ostrzeżenie oraz zapobieganie znanym i nowym zagrożeniom

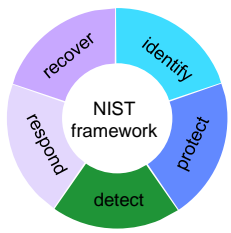
Odwrócenie zagrożeń

Szybka odpowiedź i odtworzenie aby zminimalizować przestoje

Bezpieczeństwo



NIST cyber security framework

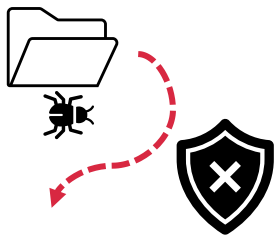


Function	NetApp® product or feature	
Identyfikacja	<ul style="list-style-type: none"> BlueXP™ classification ONTAP® System Manager Active IQ® Unified Manager 	<ul style="list-style-type: none"> Cloud Insights
Ochrona	<ul style="list-style-type: none"> Encryption Secure multitenancy Synchronous/asynchronous replication (e.g., SnapMirror® or MetroCluster™) 	<ul style="list-style-type: none"> Network security Snapshot™ copies WORM-protected files and objects Multifactor authentication (MFA)
Wykrywanie	<ul style="list-style-type: none"> Active IQ (AutoSupport®) Active IQ Unified Manager (alerting) ONTAP® System Manager Autonomous Ransomware Protection 	<ul style="list-style-type: none"> Cloud Insights Cloud Insights Storage Workload Security Advanced logging to SIEM FPolicy
Odpowiedź	<ul style="list-style-type: none"> Cloud Insights Cloud Insights Storage Workload Security Active IQ Unified Manager 	<ul style="list-style-type: none"> Automation with Ansible and REST APIs Email alerts from event management system (EMS)
Odtworzenie	<ul style="list-style-type: none"> SnapRestore® SnapMirror restore SVM DR 	<ul style="list-style-type: none"> Cloud Insights Cloud Insights Storage Workload Security BlueXP backup and recovery service

Jak ochronić się przed atakiem ransomware



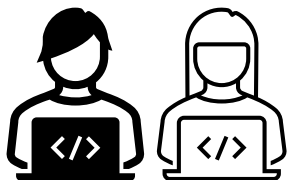
CHROŃ



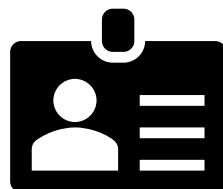
Automatically block known malicious file types



Prevent data destruction with immutable and indelible snapshots



Block rogue admins and malicious users



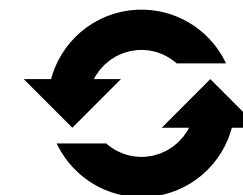
Secure data access, end-to-end

WYKRYWAJ



Automatically detect and respond to file system anomalies that may signal a ransomware attack

ODTWARZAJ



Restore data in minutes from secure snapshots

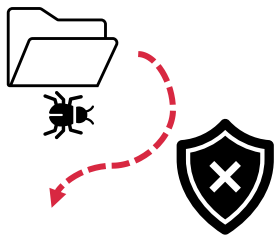
NetApp ONTAP: mamy to zabezpieczone, wcześniej wykryte, odtworzone!

Pełny pakiet ochrony



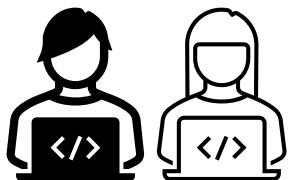
CHRONIĆ

NetApp ONTAP FPolicy



Automatically block known malicious file types

ONTAP Multi-Admin Verify



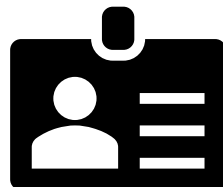
Block rogue admins and malicious users

ONTAP Tamper-Proof Snapshots



Prevent data destruction with immutable and indelible snapshots

ONTAP End-to-End Encryption



Secure data access, end-to-end

WYKRYWAJ

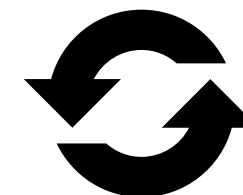
ONTAP Autonomous Ransomware Protection



Automatically detect and respond to file system anomalies that may signal a ransomware attack

ODTWARZAJ

ONTAP SnapRestore



Restore data in minutes from secure snapshots

Ransomware protection and cyber-security dashboard

The screenshot displays the NetApp BlueXP interface for Ransomware Protection. The top navigation bar includes the NetApp logo, 'BlueXP', and dropdown menus for 'Accounts' (insight_2022), 'Workspace' (blue_demo), and 'Connectors' (blue_connector). A blue arrow points to the 'Ransomware Protection' menu item in the left sidebar.

The main content area features a 'Ransomware Protection Score' of 50%, represented by a donut chart. Below the chart, there are three categories of recommendations: 'Protect | 3 Recommendations' (red), 'Detect | Show' (green), and 'Recover | 4 Recommendations' (orange).

To the right, a 'Recommended Actions (7)' section lists the following items, each with a 'Fix' button and a dropdown arrow:

- Move 258 sensitive data items from 3 unprotected data source
- Patch 52 open CVEs across 2 data sources
- Reduce permissions for 600 sensitive items with broad permissions
- Configure automatic snapshots for 3 data sources
- Back up 555 business critical files
- Configure Active directory
- Block IP

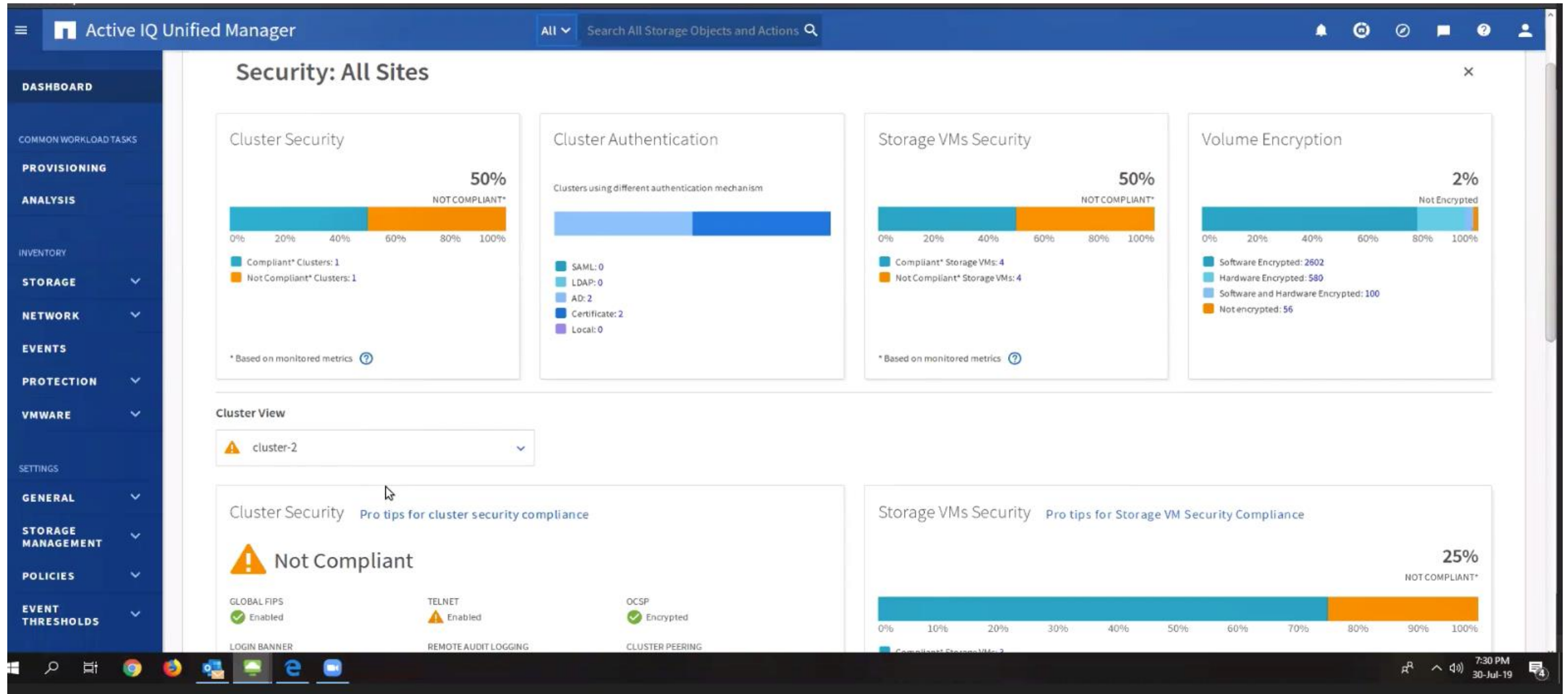
At the bottom, the 'Cyber Resilience Map' section provides a high-level overview of the environment status, with a 'View: Map Table' toggle and a 'Filter by' section including checkboxes for 'Network Equipment', 'Storage', 'Endpoints', and 'Show Networks'.

NetApp certyfikacje bezpieczeństwa

Check out security.netapp.com/certs/ for all the latest certification information

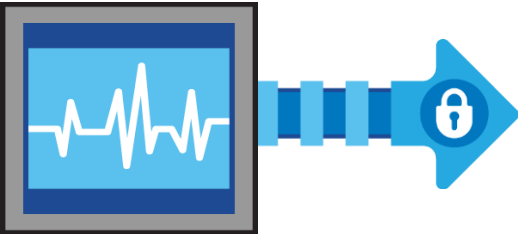
Certification	Level	Comments
Common criteria (ISO / IEC 15408)		
NetApp® ONTAP® v9.10.1P7	FDEccPP	See Certification Report
NetApp StorageGRID® 11.5	EAL 2+	See Certification Report
NetApp E-Series and EF-Series with NetApp SANtricity® OS 11.70	EAL 2+	See Certification Report
NetApp Element® software 12.2	EAL 2+	See Certification Report
FIPS 140-2		
NetApp CryptoMod	Level 1	See FIPS 140-2 Certificate # 4144
NetApp cryptographic security module (NCSM)	Level 1	See FIPS 140-2 Certificate # 4297
NetApp storage encryption (NSE) and SANtricity full disk encryption, NetApp SolidFire® full-disk encryption	Level 2	Used in ONTAP and SANtricity See NetApp disk drive and firmware matrix
DoDIN APL		
ONTAP 9.8	N/A	See Certification Report
ONTAP 9.7	N/A	See Certification Report
ONTAP 9.6	N/A	See Certification Report
Commercial solutions for classifieds validated component list		
ONTAP 9.7P13	N/A	See Certification Report

NetApp Active IQ Unified Manager Security Dashboard in 9.7 and later



NetApp ActiveIQ

Security vulnerability health tab



NetApp.com Support Community

Active IQ

MY REPORTS AUTOSUPPORT UPLOAD TOOLS RESOURCES CUSTOM GROUPS DISCOVERY DASHBOARD CONFIG COMPARE BETA HCI EXPANSION ADVISOR BETA DTULLEDG

Home >

Health 0 **Security Vulnerability** 0 Best Practices Performance 0 System Health Storage Virtual Machine Health Health Trending

High Medium Low [Preference](#)

Ack	Node	Serial No	Impact Level	Public	Category	Risk	Details	Corrective Action	Case Probability
<input type="checkbox"/>	NETAPP-CLUSTER-N01	721741000178	Medium	Yes	Security	Clustered Data ONTAP has been determined to have a version or configuration exposed to a vulnerability.	Clustered Data ONTAP has been determined to have a version or configuration exposed to a vulnerability. NTAP-20180601-0002. Potential Impact: See the Security Advisory for an overview of this vulnerability.	NTAP-20180601-0002	N/A
<input type="checkbox"/>	NETAPP-CLUSTER-N02	721741000177	Medium	Yes	Security	Clustered Data ONTAP has been determined to have a version or configuration exposed to a vulnerability.	Clustered Data ONTAP has been determined to have a version or configuration exposed to a vulnerability. NTAP-20180601-0002. Potential Impact: See the Security Advisory for an overview of this vulnerability.	NTAP-20180601-0002	N/A

Storage

Canvas

Health

Digital advisor

Remediation

ONTAP essentials

Protection

Backup & recovery

Replication

Ransomware protection

Governance

Classification

Digital wallet

Observability

Mobility

Copy & sync

Tiering

Edge caching

Extensions

Cloud Ops

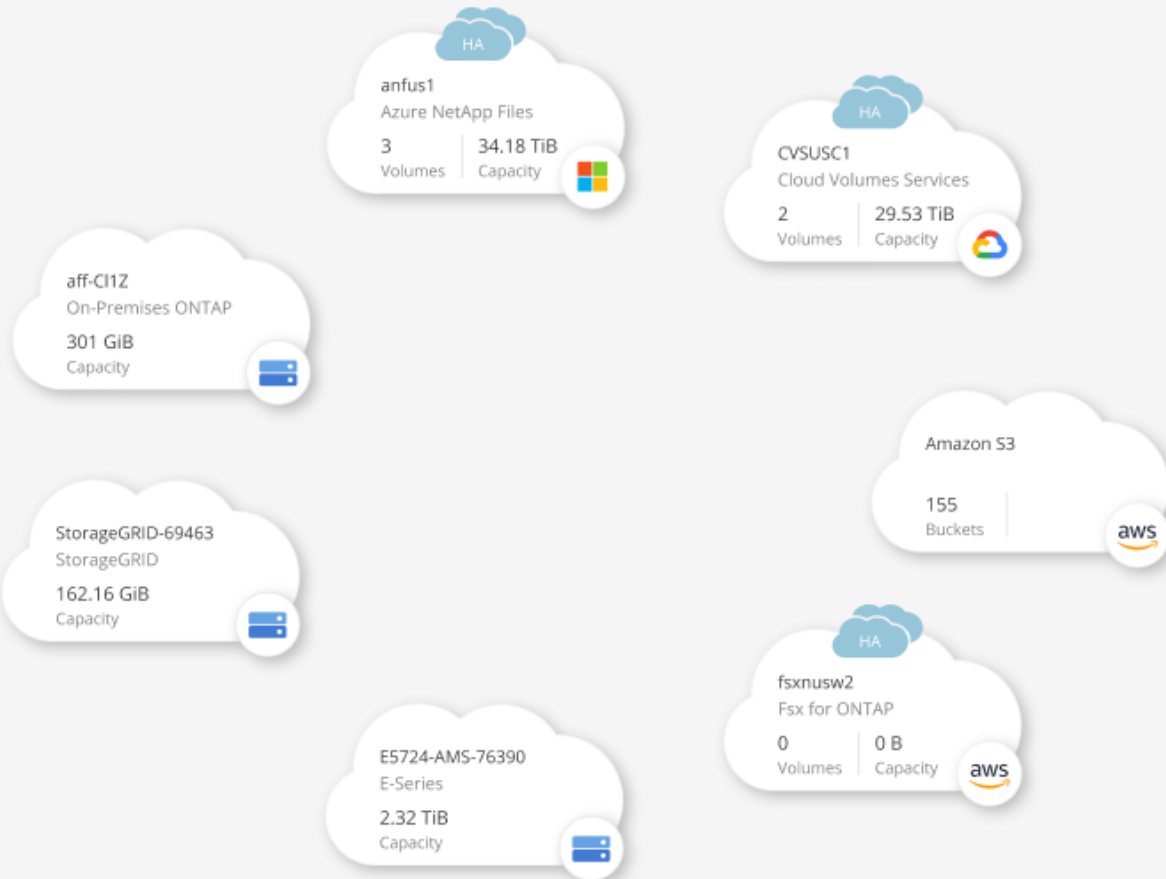
My Working Environments

My Opportunities

Go To Tabular View

Environment

Enable Services



Reset - +

Working Environment

WORKING ENVIRONMENT

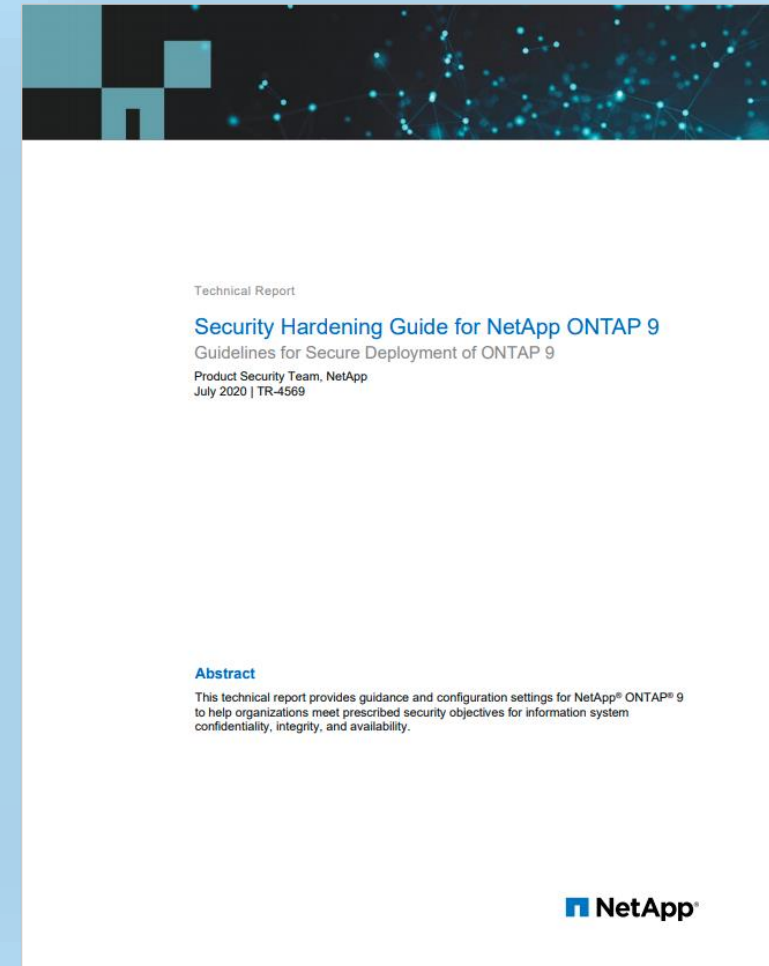
- 1 On-Premises ONTAP
301 GiB Provisioned Capacity
- 1 Cloud Volumes Service (GCP)
29.53 TiB Provisioned Capacity
- 1 Azure NetApp Files
34.18 TiB Allocated Capacity

Security Hardening Guide for NetApp ONTAP 9

TR-4569

- Best practices
- RBAC
- Auditing
- Secure protocols
- Fpolicy
- Encryption at rest and in flight
- Port usage

<http://www.netapp.com/us/media/tr-4569.pdf>





**Jedyny dostawca
zweryfikowany do
przechowywania danych o
najwyższym stopniu tajności**



Commercial Solutions for
Classified (CSfC) Program
Component List



FIPS 140-2



U.S. Department of Defense
Information Network (DoDIN)
Approved Products List
(APL)



Common Criteria

ONTAP bogaty w narzędzia

ONTAP One

Protocols	Efficiency	Anti-Ransomware	Data Protection	Tenancy & Scale
<ul style="list-style-type: none"> NFS CIFS Block Object Unified 	<ul style="list-style-type: none"> Best raw-to-usable Deduplication, Compression, Compaction Thin Provisioning Data tiering to hybrid, object, or cloud 	<ul style="list-style-type: none"> Near-real-time detection Tamper-proof Snapshot recovery Multi-admin verification Blocking of known malicious files 	<ul style="list-style-type: none"> App-integrated backup Business continuity Sync/Async disaster recovery Snapshots Clones 	<ul style="list-style-type: none"> Multi-tenancy QoS Cluster-wide scaling

ONTAP

Data management software

Delivering automation, efficiency, data protection, and security capabilities across the NetApp portfolio for file, block, and object



Sprzętowe portfolio systemów z ONTAP



FAS Systems

FAS 2700/FAS2800



144 dyski
SSD, SAS, NL-SAS

FAS 8300



720 dysków
SSD, SAS, NL-SAS

FAS 8700



1440 dysków
SSD, SAS, NL-SAS

FAS 9000



1440 dysków
SSD, SAS, NL-SAS

FAS 9500



1440 dysków
SSD, SAS, NL-SAS

AFF C-series

AFF C250



48 dysków
NVMe / QLC

AFF C400



96 dysków
NVMe / QLC

AFF C800



240 dysków
NVMe / QLC

AFF A-series

AFF A150



72 dyski
SSD

AFF A250



48 dysków
NVMe

AFF A400



480 dysków
NVMe + SSD

AFF A700



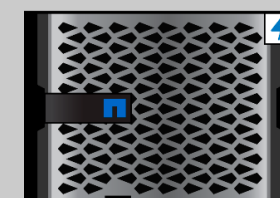
480 dysków
NVMe + SSD

AFF A800



240 dysków
NVMe + SSD

AFF A900



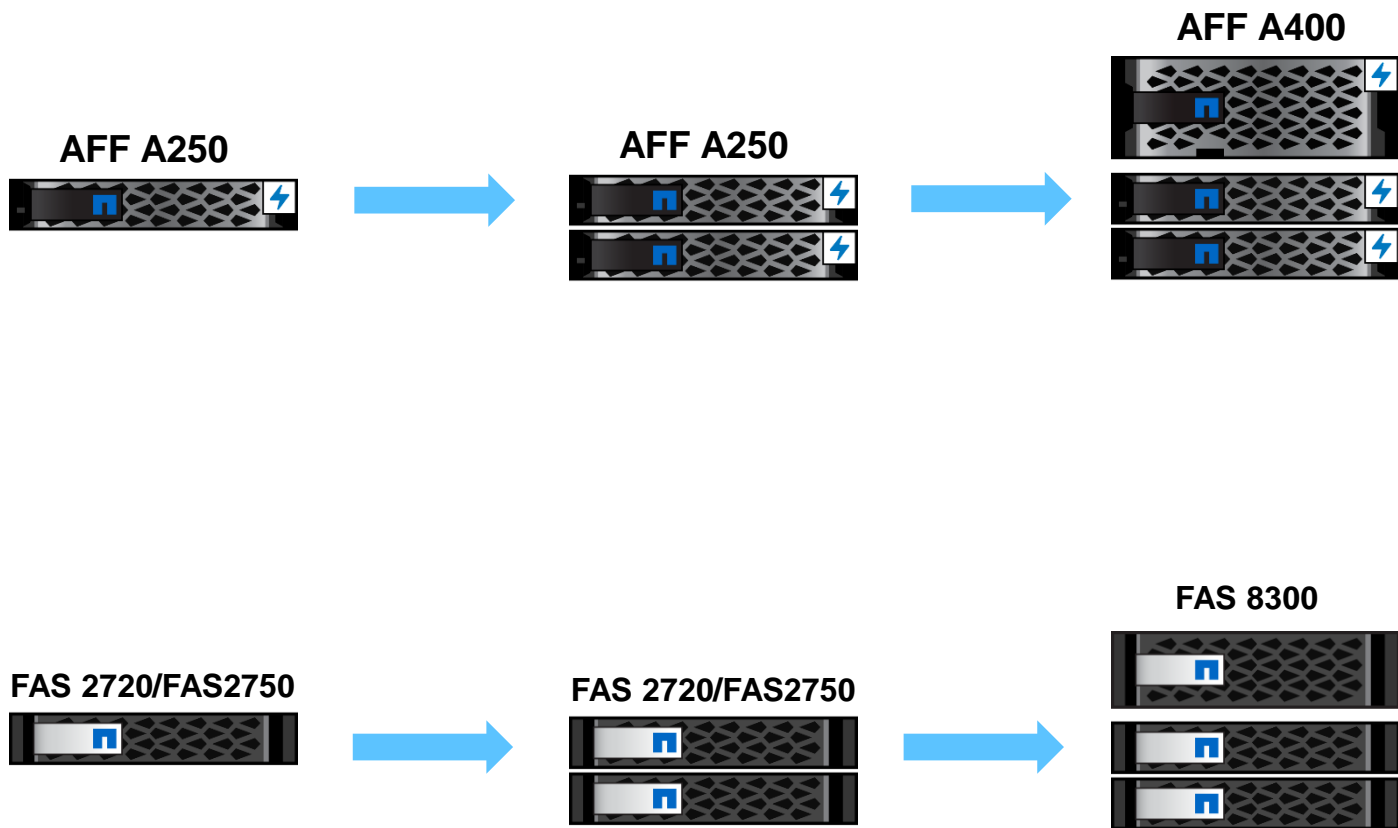
480 dysków
NVMe + SSD

NetApp

Distributor Partner
Services Certified



Długowieczność



Najlepsze rozwiązania w parze z Programem Storage Lifecycle



NetApp AFF and FAS systems



NetApp
Storage
Lifecycle
Program

Free controller
every 3 years

Cloud Advantage

Capacity refresh

Support-
managed
software updates

Premier level
support services

**Łatwiejsza decyzja teraz
i pewność długoletniej inwestycji w przyszłości.**

Sprzętowe portfolio systemów z ONTAP



FAS Systems

FAS 2700/FAS2800



144 dyski
SSD, SAS, NL-SAS

FAS 8300



720 dysków
SSD, SAS, NL-SAS

FAS 8700



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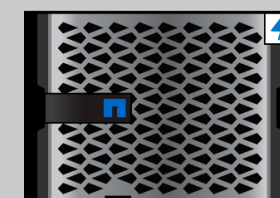
480 dysków
NVMe + SSD

AFF A800



240 dysków
NVMe + SSD

AFF A900



480 dysków
NVMe + SSD

NetApp

Distributor Partner
Services Certified



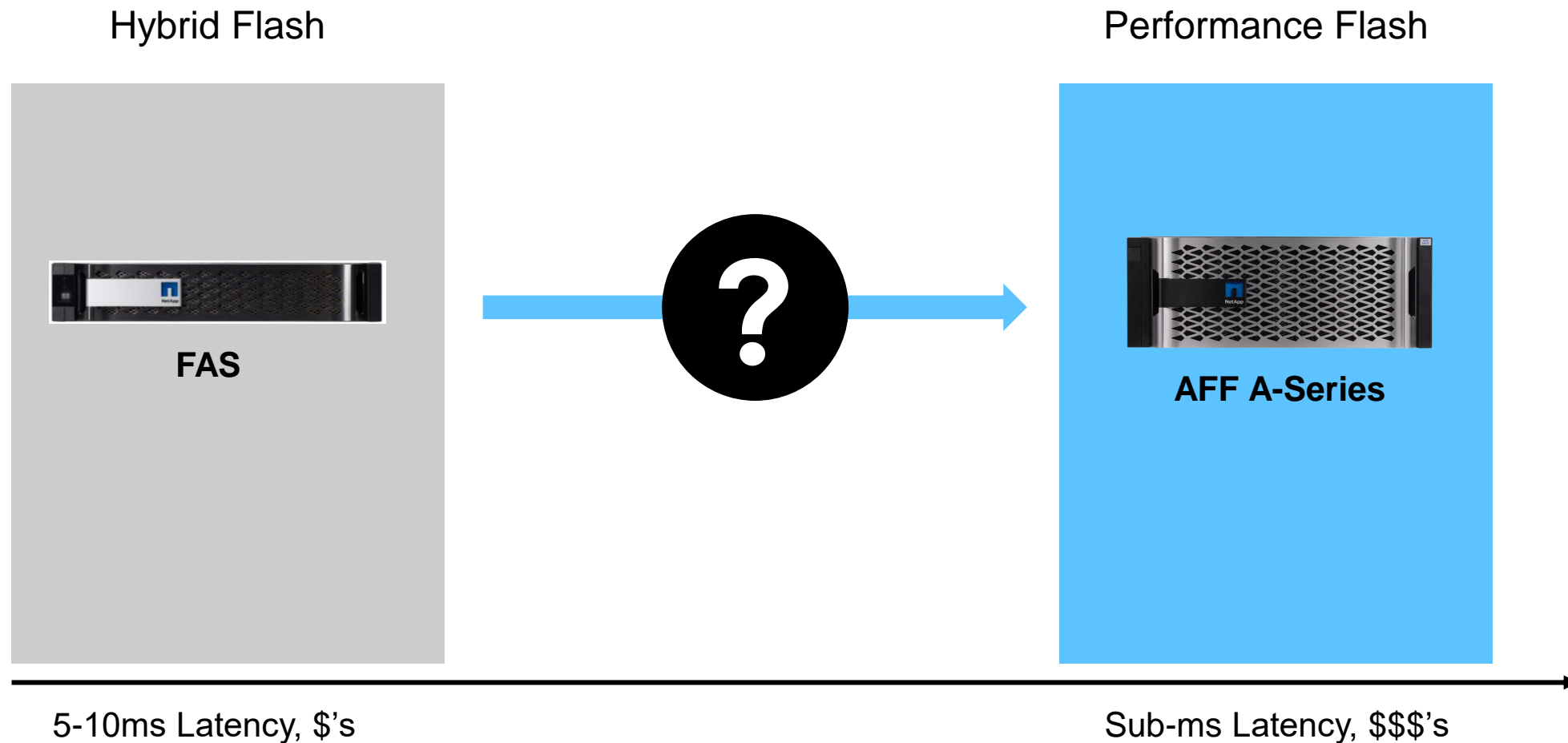
A i B



ENTERPRISE CAPACITY FLASH

Transformacja z hybrydy do all-flash

Cena jako czynnik limitujący



Szybsza transformacja do All-Flash

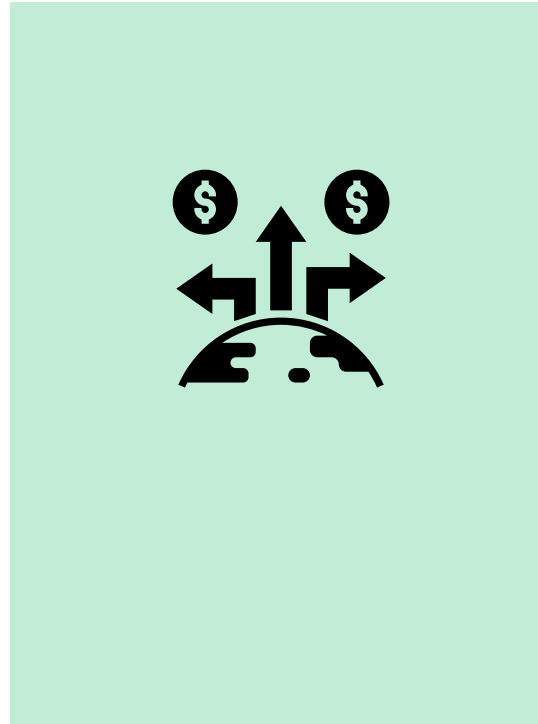
Kompromis wydajność, pojemność, cena

Hybrid Flash



5-10ms Latency, \$'s

Capacity Flash



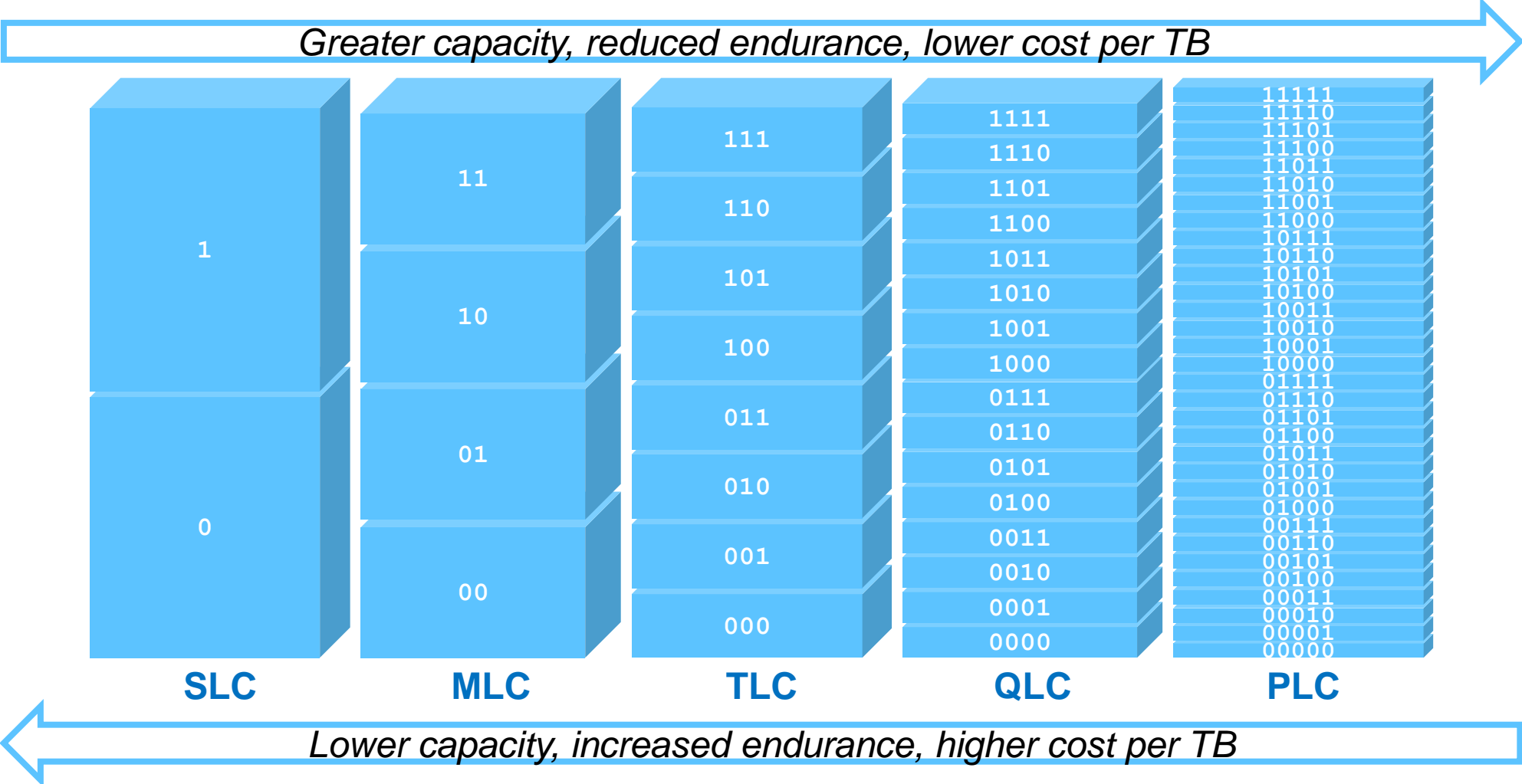
2-4ms Latency, \$\$'s

Performance Flash



Sub-ms Latency, \$\$\$'s

NAND flash types



NetApp AFF C-Series

Nowa rodzina systemów All-Flash

Efektywna

- Best price/performance
- Best raw-to-effective data efficiency
- Tier to Hybrid Flash or Cloud
- Better energy efficiency

Skalowalna

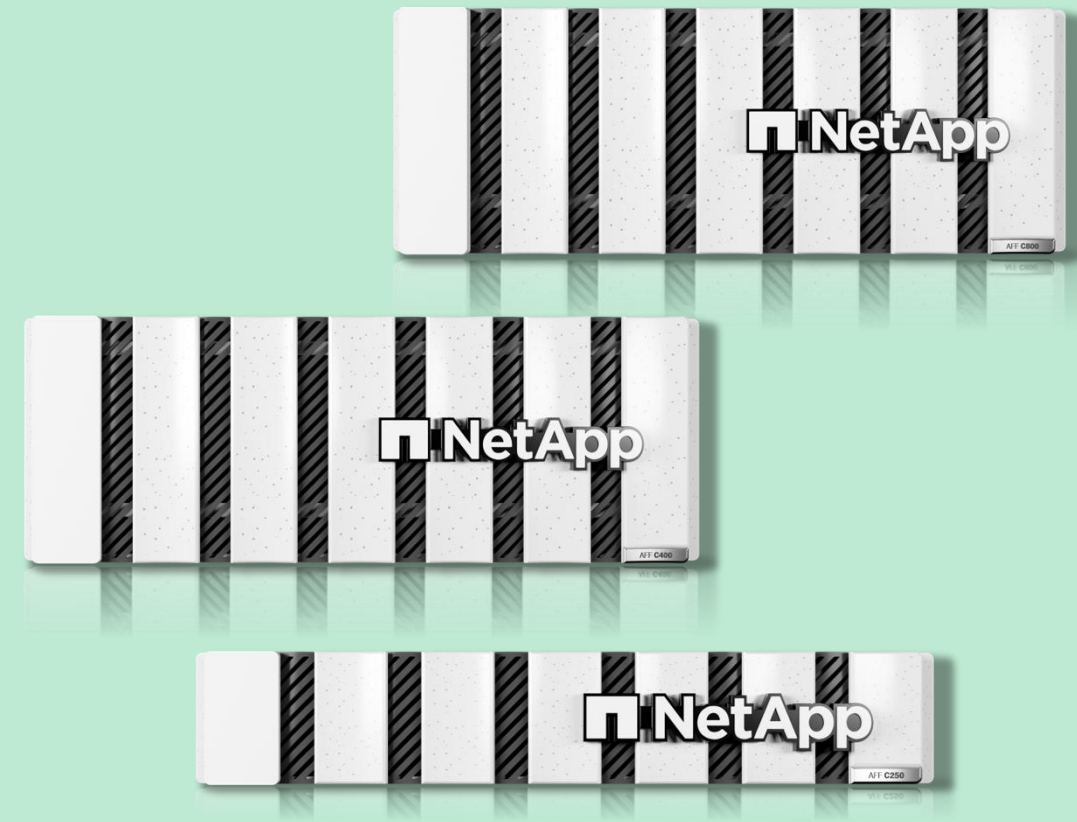
- Entry capacity aligned with needs
- Clustered scalability
- Connect to Performance Flash or Hybrid Flash

Bezpieczna

- Ransomware protection
- Business continuity, D/R
- Application-integrated Backup and Recovery

Połączona z chmurą

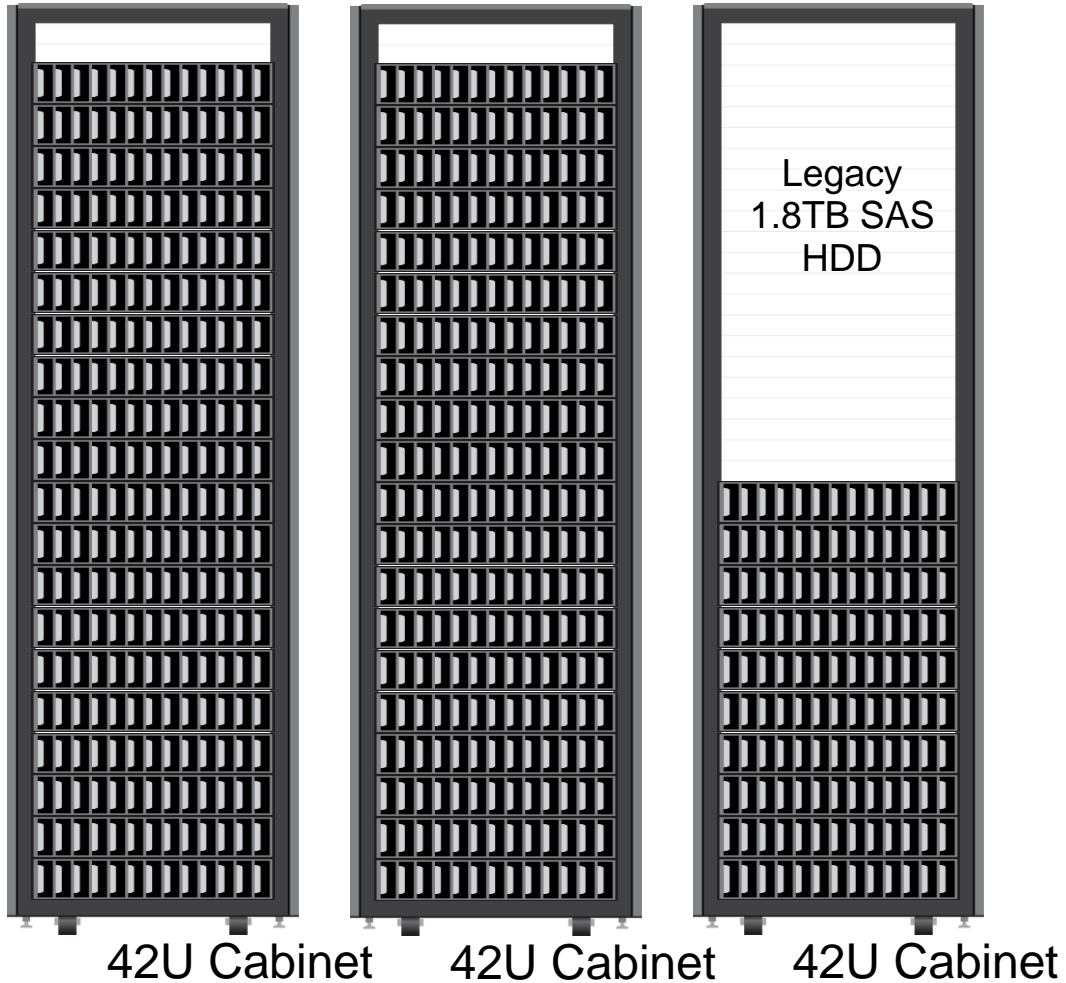
- D/R to Cloud
- Backup to Cloud
- Tier to Cloud



NetApp AFF C-Series
HIGH-CAPACITY ALL-FLASH STORAGE SYSTEMS

AFF C-Series: 50x Density

Porównanie SAS (10krpm) drives bez efektywności



AFF C250



Bezel mock-up; Not final; initial shipments may use older bezel

vs.

98% mniej zajętej przestrzeni rack
97% mniej konsumpcji energii

	kWh/year
50 x SAS 10K Systems	131,400
1 x C250	4,344

Equivalent to the greenhouse gas emissions of 20 gasoline vehicles for an entire year.

7. TABELA CEN ENERGII ELEKTRYCZNEJ DLA POSZCZEGÓLNYCH GRUP TARYFOWYCH

7.1. ZESTAW PIERWSZY DLA ENERGII ZAKUPIONEJ NA UŻYTEK WŁASNY

GRUPA TARYFOWA	CENA ENERGII ELEKTRYCZNEJ *)					
	całodobowa	szczytowa	pozaszczytowa	dzienna	nocna	w szczycie zepołudniowym
Korporacja Wygodna Plus A21	2138,00					
Korporacja Aktywna Plus A22	x	23				
Korporacja Optymalna Plus A23	x					
Korporacja Wygodna B11/B11em	2171,00	x	x	x	x	x
Korporacja Wygodna B21/B21em	2138,00	x	x	x	x	x
Korporacja Aktywna B22	x	2333,00	2106,00	x	x	x
Korporacja Optymalna B23	x	x	x	x	x	2282,00
						[zł/kWh]
Biznes Wygodny C21/C21em	2,1660	x	x	x	x	x

kWh/Year Cena prądu Koszty



97% less power consumption

	kWh/year
K Systems	131,400
	4,344



Equivalent to the greenhouse gas emissions of 20 gasoline vehicles for an entire year.

All calculations are estimates, individual power usage may vary. Specifications are subject to change prior to quote tool availability. Consult final specs online at that time.

Usługi i rozwiązania NetApp w chmurze



Cloud deployment optimization



ANALYZER



ECO



OCEAN



ELASTIGROUP



Full control on Kubernetes deployment

Management

Astra Control (Service)

Astra Control (Center)

Astra Trident

Storage

Astra Data Store



Cloud Backup



Cloud Tiering



Cloud Data Sense



Cloud Sync



Cloud Volumes Edge Cache



Global File Cache



ACTIVE IQ

CLOUD INSIGHTS

BlueXP

AMAZON FSX for ONTAP

AZURE NETAPP FILES

CVS FOR GOOGLE CLOUD

Cloud Volumes ONTAP (CVO)

CLOUD STORAGE



Storage

Canvas

Health

Digital advisor

Remediation

ONTAP essentials

Protection

Backup & recovery

Replication

Ransomware protection

Governance

Classification

Digital wallet

Observability

Mobility

Copy & sync

Tiering

Edge caching

Extensions

Cloud Ops

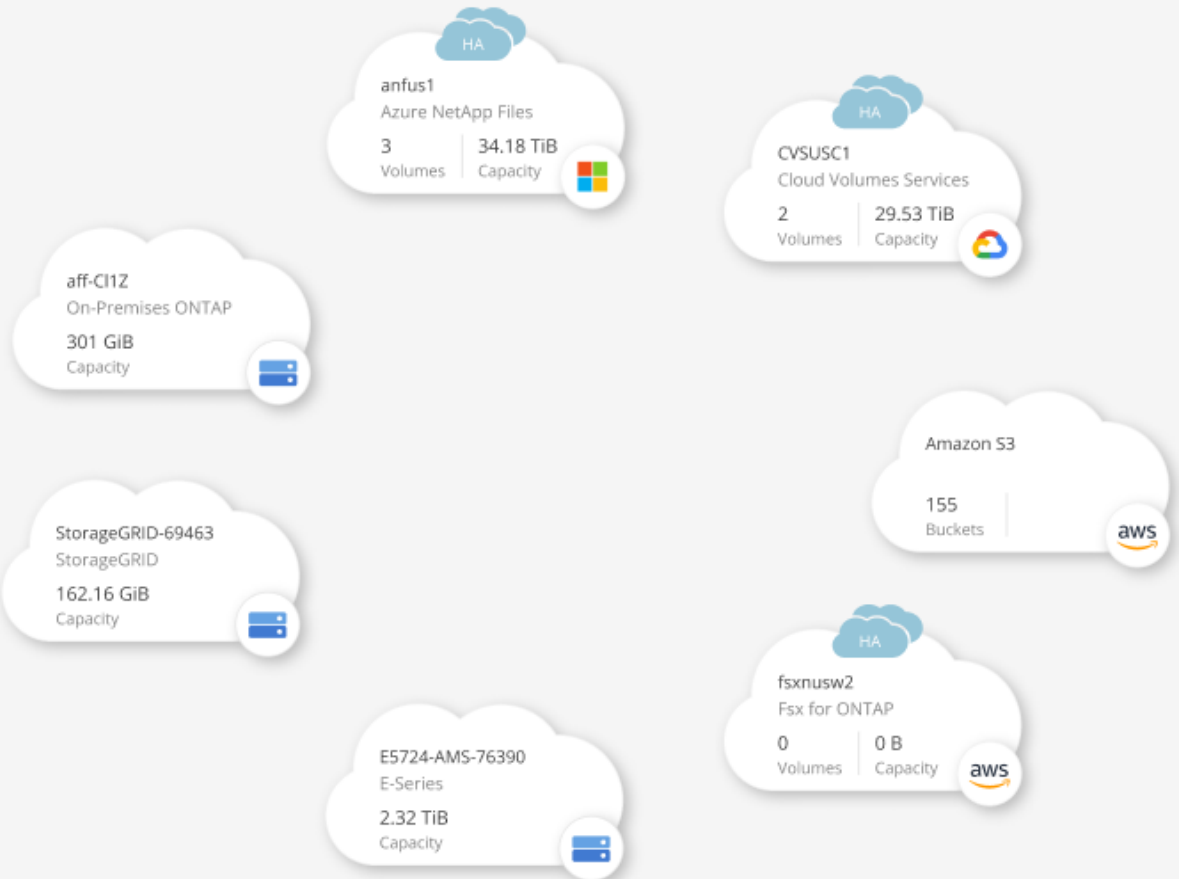
My Working Environments

My Opportunities

Go To Tabular View

Environment

Enable Services



Reset - +

Working Environment

WORKING ENVIRONMENT

- 1 On-Premises ONTAP
301 GiB Provisioned Capacity
- 1 Cloud Volumes Service (GCP)
29.53 TiB Provisioned Capacity
- 1 Azure NetApp Files
34.18 TiB Allocated Capacity

NetApp BlueXP

The screenshot displays the NetApp BlueXP interface. At the top, there is a navigation bar with the NetApp logo and 'BlueXP' text. On the right side of the navigation bar, there are dropdown menus for 'Account' (set to 'Prod'), 'Workspace' (set to 'Workspace-1'), and 'Connector' (set to 'N/A'). There are also icons for notifications, settings, help, and user profile.

Below the navigation bar, there are tabs for 'Canvas', 'My Working Environments', 'My Opportunities', and 'New'. The 'Canvas' tab is active, showing a central workspace with several cloud icons representing different working environments. Each icon contains text about the environment's name, type, and capacity. For example, 'anfdev' is an Azure NetApp Files environment with 0 volumes and 0 B capacity. 'E5724-AMS-87132' is an E-Series environment with 2.32 TB capacity. 'Amazon S3' is an Amazon S3 environment with 149 buckets.

On the right side of the canvas, there is a sidebar titled 'Working Environments'. It lists the following environments and their capacities:

- 1 Cloud Volumes ONTAP (101 GiB Provisioned Capacity)
- 1 FSx for ONTAP (High-Availability) (0 B Provisioned Capacity)
- 2 Cloud Volumes ONTAP (High-Availability) (202 GiB Provisioned Capacity)
- 1 On-Premises ONTAP (301 GiB Provisioned Capacity)
- 1 Azure NetApp Files (0 B Provisioned Capacity)
- 1 Kubernetes Clusters (13 GiB Provisioned Capacity)

At the bottom right of the canvas, there is a 'Reset' button with minus and plus icons. A chat icon is also visible in the bottom right corner.



Cloud Insights

NetApp Cloud Insights



Pełna integracja ponad 100 wtyczek zbierających
Stała kontrola i pogląd na całe środowisko



Monitoring

Wykrywanie zdarzeń
Krótszy czas rozwiązania



Optymalizacja

Redukcja kosztów
Zapobieganie

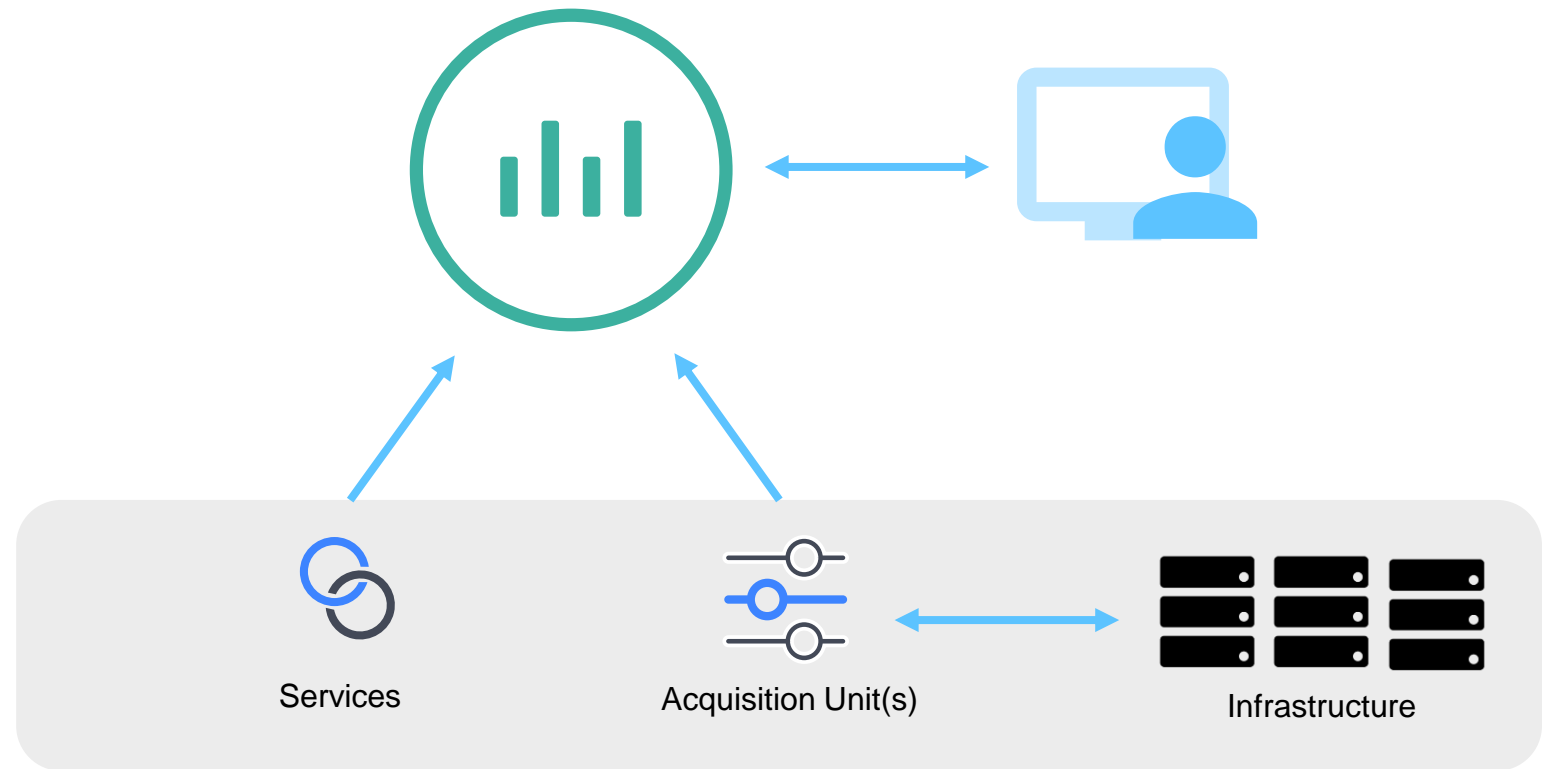


Bezpieczeństwo

Zmniejszenie podatności na
wewnętrzne zagrożenia

Architektura

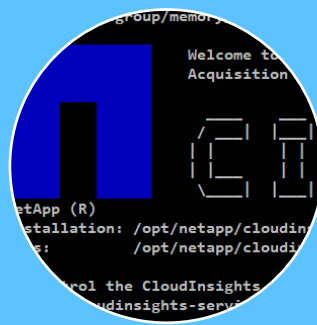
- Acquisition unit (AU)
- Infrastructure collectors
 - Cloud
 - Storage
 - Compute
- Services collectors
 - Web
 - Database
 - Application
 - Host
 - ...oraz inne



Łatwe uruchomienie



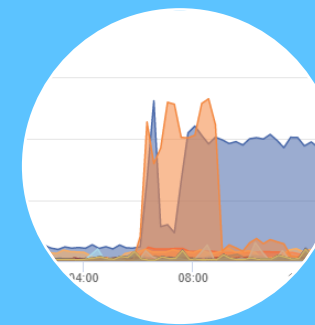
Zapisz się na
bezpłatny trial



Instalacja
AU



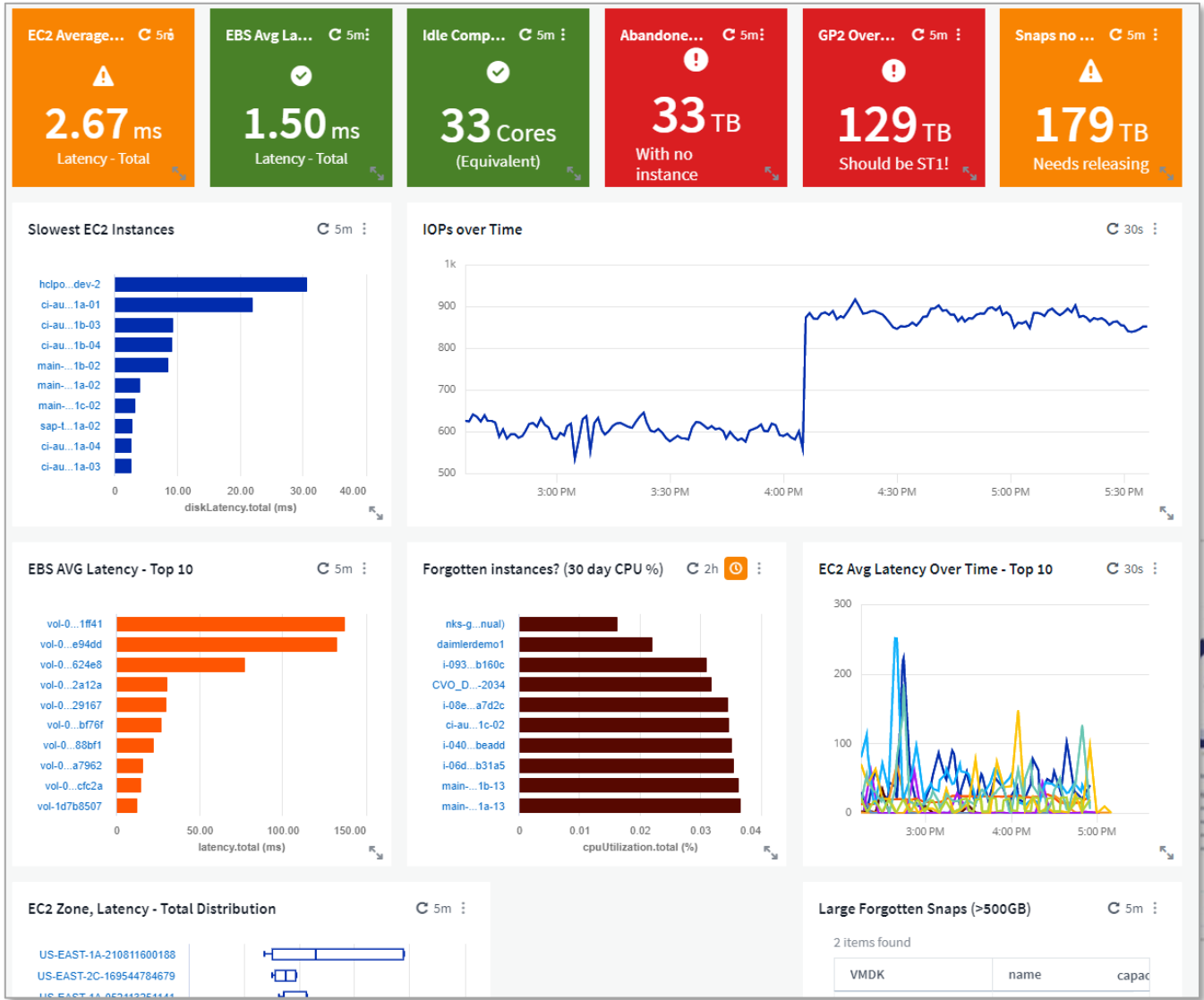
Konfiguracja DC



Gotowy dashboard z
galerii



NetApp Cloud Insights



Cloud Insights Pomaga klientom

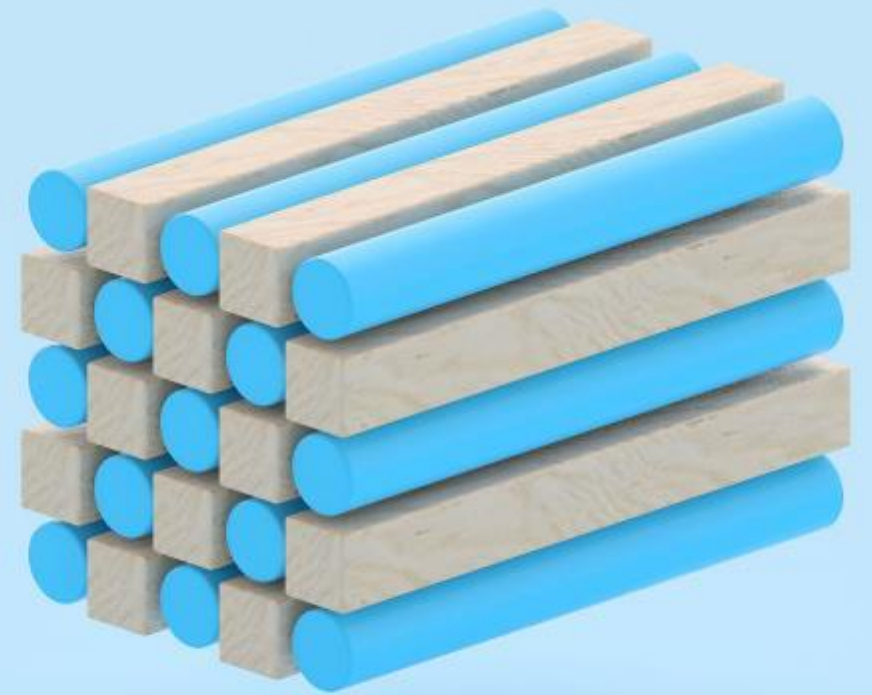
- Znaleźć i naprawić problem szybciej
- Łatwiej zarządzać zasobami zrobić więcej, mniejszym kosztem
- Sprostać wymogom SLOs i SLAs podczas migracji i w chmurze
- Zatrzymać ransomware i jego skutki



<https://cloud.netapp.com/cloud-insights>

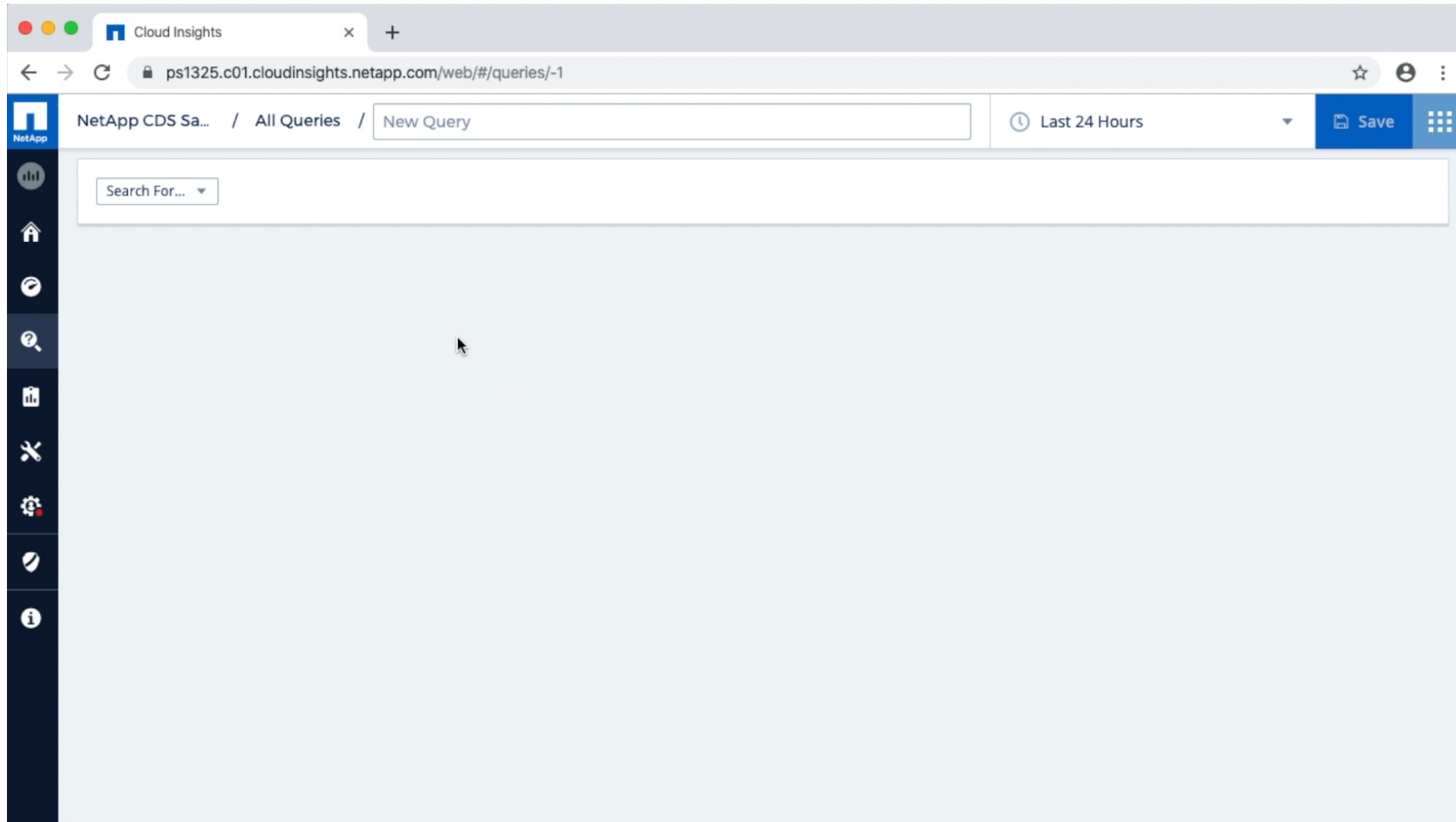
Poszukiwanie oszczędności

Optymalne wykorzystanie zasobów



Szukanie oszczędności

Czy masz budżet bez dna?



Łukasz Bajer

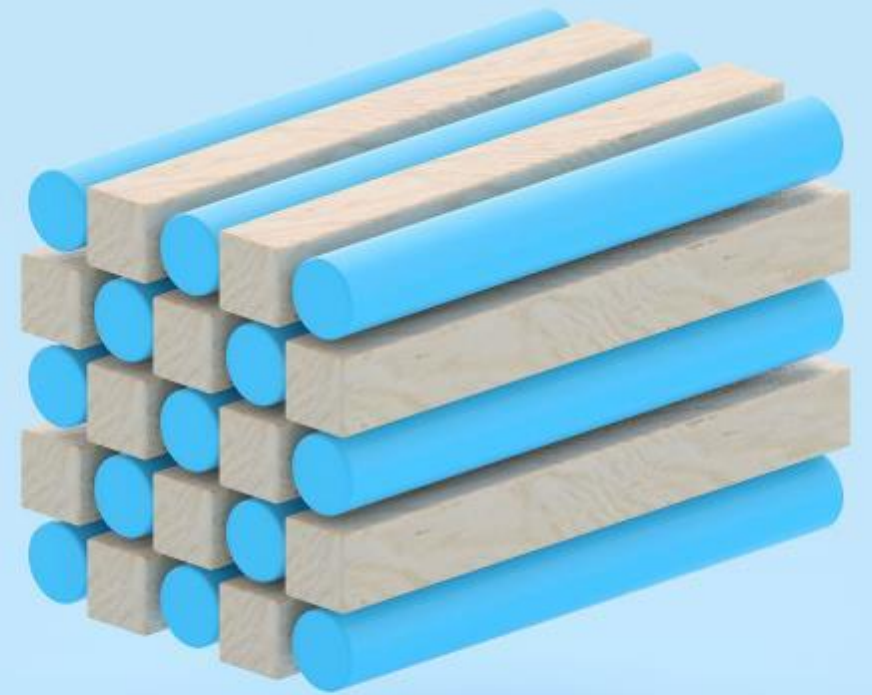
Business Development Manager

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Lukasz.Bajer@arrow.com



E-series



NetApp E/EF-Series Leadership



systems shipped



years of OS hardening

200+

patents

85,000

items in current interoperability matrix

#1

NetApp® SANtricity® is the #1* SAN OS

*Based on NetApp plus OEM sales

Sprzętowe portfolio systemów SANtricity



E-series

EF600



444 dyski
NVMe + SSD + NL-SAS

EF300



264 dyski
NVMe + SSD + NL-SAS

E5700



480 dysków
SAS + SSD + NL-SAS

E2800



180 dysków
SAS + SSD + NL-SAS

Chasis & Expansions

DE460C



DE212C



DE224C



NE224



Wydajność



Atrakcyjna
cena



Prostota i
niezawodność

Modele Eseries

E5700



- 480 dysków
- SAS, NL-SAS, SSD
- FC, SAS, iSCSI, IB, NVMe-oF

- 1mln iops. < 0,3ms
- 21GB/s (odczyt) / 9GB/s (zapis)

E2800

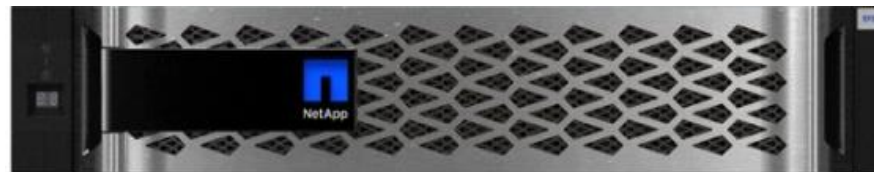


- 180 drives
- SAS, NL-SAS, SSD
- FC, SAS, iSCSI

- 300 tyś. iops.
- 10GB/s (odczyt) / 3,7GB/s (zapis)

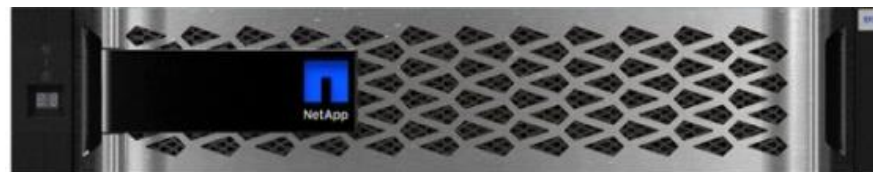
Kontrolery - ile mocy potrzeba?

NVMe AFA (EF300)



**~670k iops
<200 microsekund
20GB/s (odczyt)/ 12,5GB/s (zapis)**

NVMe AFA (EF600)

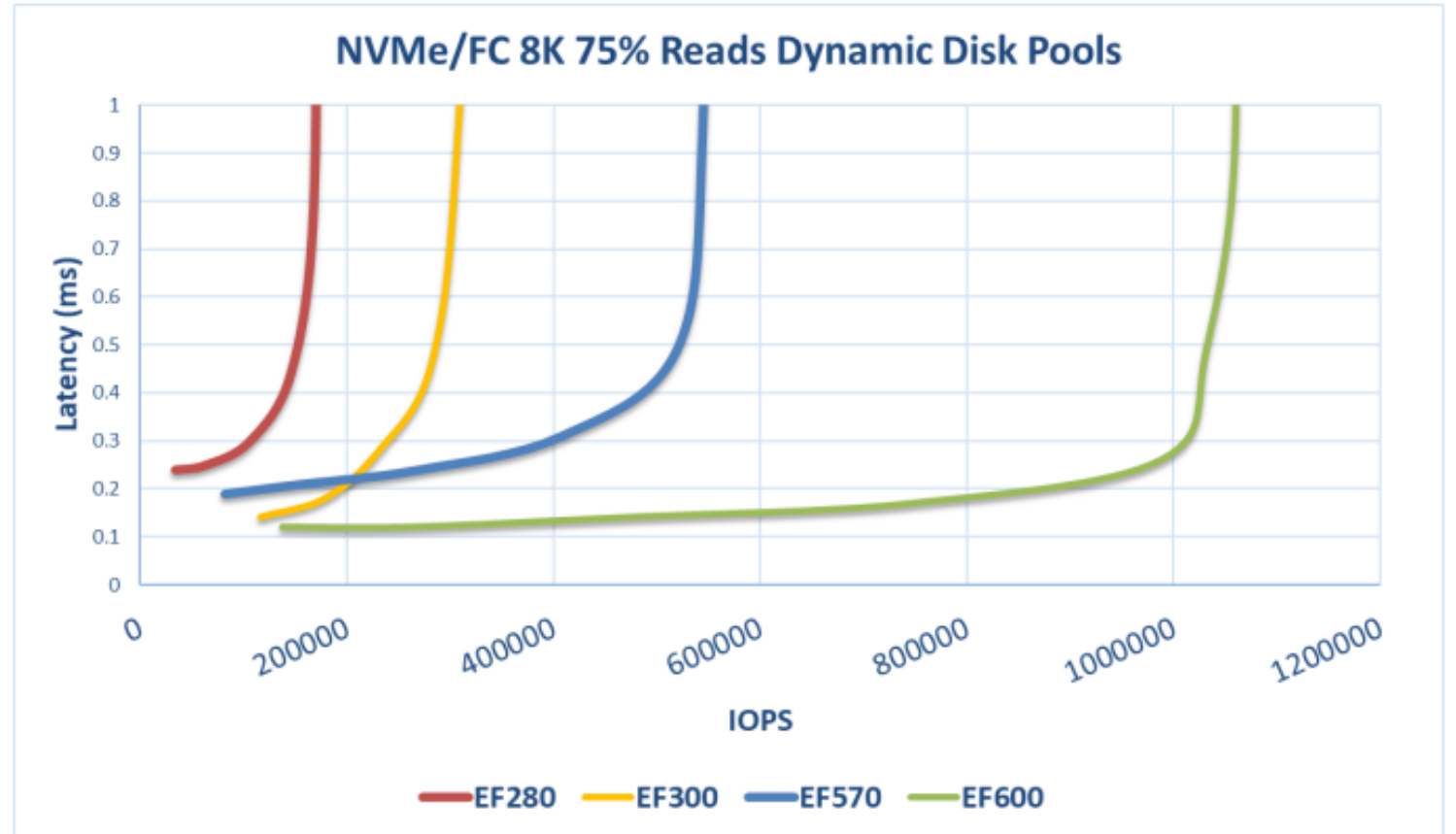


**~2 mln iops
<100 microsekund
44GB/s (odczyt)/ 12,5GB/s (zapis)**

Wysoka wydajność w praktyce

Wysokowydajne równoczesne przetwarzanie danych

ORACLE®



Porównanie wydajności kontrolerów

RAID 6	EF280	EF300	EF570	EF600
Interface	FCP	100Gb NVMe/IB	IB	NVMe/IB
Max Read IOPS	300K<210usec	670K<250us	1.0M<250usec	2M<250usec
Max Write IOPS	45K<160usec	100K<190us	180K<100usec	340K<190usec
Read Bandwidth	10 GB/sec<830usec	20 GB/sec<200us	21 GB/sec<200usec	44 GB/sec<200usec
Write Bandwidth (Cache Mirroring Enabled)	3.7 GB/sec<3,300usec	9 GB/sec<300us 7 with PI ON only NVMe/IB	9 GB/sec<460usec	12.5GB/sec<300usec
Write Bandwidth FSWA	6 GB/sec	12 GB/sec	14 GB/sec	24 GB/sec
Low Latency (Reads)	55K<140usec	150K<200us	180K<170uS	140K<110usec
Low Latency (Writes)	45K<160usec	50K<100us	180K<100uS	200K<80usec
SSD Count	24	24	48	24

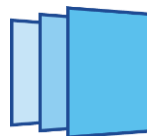
Funkcjonalności systemu SANtricity

Wczasy All - Inclusive



Dynamic Disk Pools

Szybka odbudowa, bez spowolnień
Również klasyczny RAID: 1, 3, 5, 6, 10



Snapshot, Volume Copy & Remote Mirroring

Ochrona, klonowanie i replikacja



NetApp ActiveIQ

Analiza zachowań, wsparcie proaktywne



Data Assurance

Bezpieczeństwo, weryfikacja zapisanych danych (wg. Standardu T10PI)



Enterprise Security & Administration

Zarządzanie oparte na rolach
wieloskładnikowa autentykacja, bezpieczny CLI oraz wsparcie dla Active Directory



Encrypted Drives*

Wsparcie dysków FIPS oraz FDE, lokalne lub zewnętrzne zarządzanie kluczem

* Limited to non-restricted countries

Sprzętowe portfolio systemów SANtricity



E-series

EF600



444 dyski
NVMe + SSD + NL-SAS

EF300



264 dyski
NVMe + SSD + NL-SAS

E5700



480 dysków
SAS + SSD + NL-SAS

E2800



180 dysków
SAS + SSD + NL-SAS

HPC/AI
&
Modern Analytics



Media
&
Entertainment



Video Analytics
&
Surveillance



Backup
&
Recovery



Enterprise Databases
&
VMware



Chasis & Expansions

DE460C



DE212C



DE224C



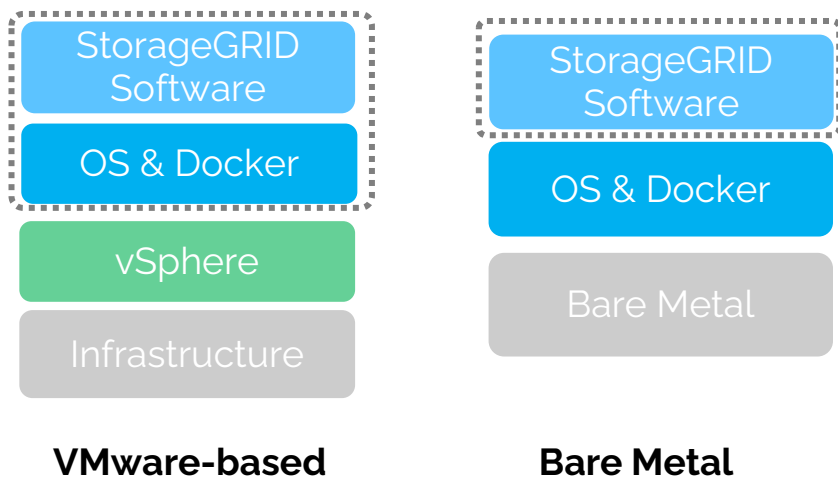
NE224



System obiektowy NetApp StorageGrid



Software-Defined Deployment



Engineered Systems

SG5760

SG5712

- Optymalny koszt

SG6060-Expansion

- Duża skala; setki PB'ajtów

SG6060

- Systemy transakcyjne

SGF6024

- Flash

SG1000



- Duże wysokowydajne instalacje

SG100/SG1000

- Fizyczny appliance dla Admin Node oraz Gateway Node
- Klasyfikatory ruchu - QoS

SG100



- Mniejsze i średnie systemy
- Jako Admin node zamiast VM

Łukasz Bajer

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Sprzętowe portfolio systemów z ONTAP



FAS Systems

FAS 2720/FAS2750



144 dyski
SSD, SAS, NL-SAS

FAS 8300



720 dysków
SSD, SAS, NL-SAS

FAS 8700



1440 dysków
SSD, SAS, NL-SAS

FAS 9000



1440 dysków
SSD, SAS, NL-SAS

FAS 9500



1440 dysków
SSD, SAS, NL-SAS

AFF C-series

AFF C250



48 dysków
NVMe / QLC

AFF C400



96 dysków
NVMe / QLC

AFF C800



240 dysków
NVMe / QLC

AFF A-series

AFF A150



72 dyski
SSD

AFF A250



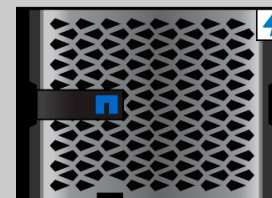
48 dysków
NVMe

AFF A400



480 dysków
NVMe + SSD

AFF A700



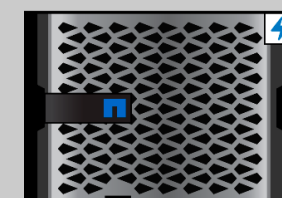
480 dysków
NVMe + SSD

AFF A800



240 dysków
NVMe + SSD

AFF A900



480 dysków
NVMe + SSD

NetApp

Distributor Partner
Services Certified



Usługi i rozwiązania NetApp w chmurze



Cloud deployment optimization



ANALYZER



ECO



OCEAN



ELASTIGROUP



Full control on Kubernetes deployment

Management

Astra Control (Service)

Astra Control (Center)

Astra Trident

Storage

Astra Data Store



Cloud Backup



Cloud Tiering



Cloud Data Sense



Cloud Sync



Cloud Volumes Edge Cache



Global File Cache



ACTIVE IQ

CLOUD INSIGHTS

BlueXP

AMAZON FSX for ONTAP

AZURE NETAPP FILES

CVS FOR GOOGLE CLOUD

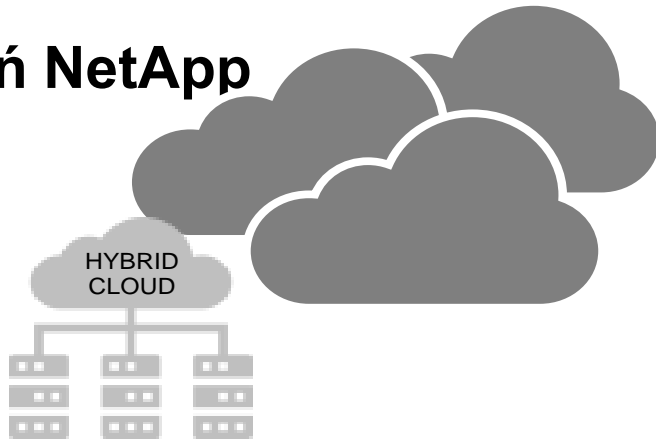
Cloud Volumes ONTAP (CVO)

CLOUD STORAGE



Portfolio rozwiązań NetApp

PUBLIC CLOUD



STORAGE & DATA SERVICES

Cloud Backup

Cloud Tiering

Cloud Data Sense

Cloud Sync

Cloud Volumes Edge Cache

Global File Cache

ACTIVE IQ

CLOUD INSIGHTS

STORAGEGRID

SANTRICITY

SYSTEM MANAGER

BlueXP

STORAGEGRID

EF

AFF

FAS

AMAZON FSX for ONTAP

AZURE NETAPP FILES

CVS FOR GOOGLE CLOUD

Cloud Volumes ONTAP (CVO)

ON-PREMISES STORAGE



CLOUD STORAGE

