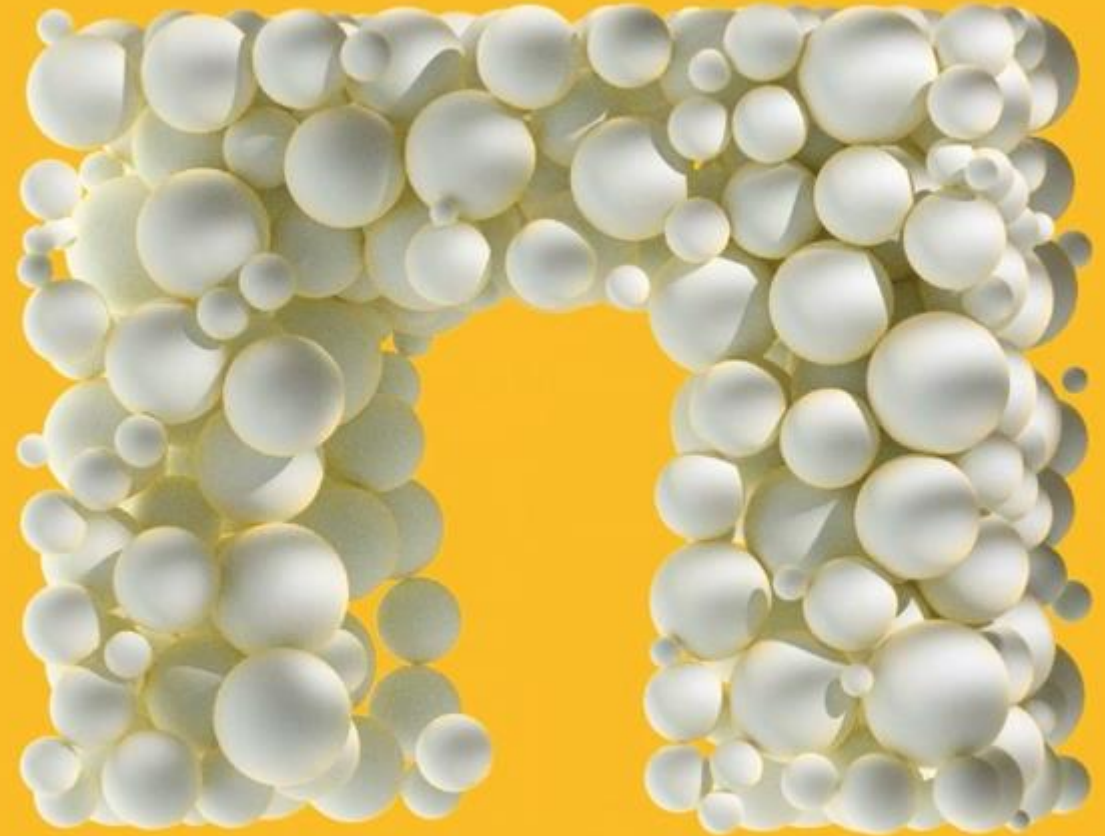


INTELLIGENT DATA INFRASTRUCTURE

Für die Dynamik unserer Zeit

Sven Heisig
Sr. Mgr. ATS
Public Sector
Germany

Mathias Riediger
Account
Technology
Specialist



NETAPP: 32 JAHRE INNOVATIONEN FÜR UNSERE KUNDEN

Anzahl Patente

*1998 erstes "Write Anywhere File Layout (WAFL)" Patent erteilt an Hitz, Malcom, Lau und Rakitzis

WAFL*

100

1000

1992-1996

1997-2001

2002-2006

2007-2011

- Write Anywhere File Layout
- First NAS Appliance Snapshots
- Network-Based Backup Protocol
- Multi-Protocol NAS Appliance
- NFSv2
- AutoSupport

- Database Solutions
- HA NAS
- SnapRestore
- SnapMirror
- SnapManager Exchange
- IMC Acquisition

- Unified NAS/SAN
- SnapVault
- SnapLock
- NearStore
- iSCSI
- V-Series
- RAID-DP
- Alacritus Acquisition

- Data ONTAP 7G
- FlexVolumes
- FlexClone
- Thin Provisioning
- MetroCluster
- SM for SQL
- NFSv4
- SATA Disk

- Topio Acquisition
- Spinnaker Acquisition (Data ONTAP GX)
- Scale Out
- MetroCluster
- FlexCache
- FlexShare & MultiStore
- Decru Acquisition

- Deduplication
- Rapid Raid Recovery
- Flash Cache
- Protection Manager
- File-Level FlexClone

- Data ONTAP 8
- Onaro Acquisition (OnCommand Insight & Cloud Insights)
- FCoE

- Data Motion
- FlexPod
- SSD Aggregates
- Bycast Acquisition (StorageGRID)

- FAS Compression
- Flash Pool
- Engenio Acquisition (E-Series)
- Akorri Acquisition

3500

2018

2012-2017

- First End-to-End NVMe/FC Host to Flash Array
- First 100GbE connectivity
- NetApp ONTAP AI with NVIDIA
- Cloud Volume Service (CVS) for AWS
- Cloud Volume Service (CVS) for Google Cloud

- Cloud Insights
- Ansible Modules
- Cloud Tiering
- MCC 100GbE IP, 100GbE NVMe/RoCE
- StackPointCloud Acquisition

- FabricPool
- Azure NetApp Files (ANF)
- CVO for Microsoft Azure
- NPS for Google Cloud
- Active IQ
- Adaptive Quality of Service
- Greenqld Acquisition
- Plexistor Acquisition
- Immersive Partner Solutions Acquisition

- ONTAP 9
- NVMe
- Compaction
- RAID-TEC
- FlexGroups
- Volume Encryption
- 40GbE & 32Gb FC
- Cloud Sync
- Trident

- Layered Erasure Coding
- SnapCenter
- Storage Virtual Machine Disaster Recovery
- AFF enhancements: in-line zero block deduplication, adaptive compression & dedupe
- SolidFire Acquisition

- Launched Data Fabric
- All Flash FAS (AFF)
- StorageGRID Webscale
- Cloud Volumes ONTAP for AWS
- SteelStore Acquisition

- EF540 Flash Array
- UTA
- NPS for Azure & IBM Cloud
- Quality of Service
- IonGrid Acquisition
- Clustered Data ONTAP
- Data ONTAP Edge
- NetApp Private Storage (NPS) for AWS
- Dynamic Disk Pools
- Cache IQ Acquisition

2019

2020

- 200th Flash Patent for NetApp
- Second Generation End-to-End NVMe Flash Array
- Keystone
- NetApp Lenovo Joint Venture
- NetApp Aggregate Encryption
- All-SAN Array with Symmetric Active/Active
- Entry-Level MetroCluster
- NKS/Trident for HCME (CSI Trident)
- Flash-Based StorageGRID

- Cloud Backup Service
- Cloud Volumes ONTAP (CVO) for Google Cloud
- Cloud Secure
- ONTAP REST APIs and Revamped System Manager
- Cognigo Acquisition (Cloud Compliance)

- FAS500f
- SnapMirror Business Continuity
- S3 in ONTAP
- SolidFire Software-Defined
- NFSv4.2
- FlexCache SMB Support
- IPsec In-Flight Data Encryption
- AI Control Plane

- Azure NetApp Files (ANF) Cross-Region Replication
- Azure NetApp Files (ANF) Backup and Restore
- CloudJumper Acquisition (Virtual Desktop Service)

- Talon Acquisition (Global File Cache)
- Spot Acquisition - Added Spot Storage
- Cloud Backup for cloud & on-prem
- Cloud Compliance for cloud & on-prem
- Astra K8s Application Lifecycle Mgmt
- CVS Software-Defined
- CVO Storage VM's

- Cloud Manager SaaS Improvements - K8s
- Compute (Spot Integration)
- Monitoring (Cloud Insights Integration)
- SnapCenter Integration
- Active IQ Integration
- Global File Cache (GFC) Integration



NETAPP: 32 JAHRE INNOVATIONEN FÜR UNSERE KUNDEN

 Anzahl Patente

*1998 erstes "Write Anywhere File Layout (WAFL)"
Patent erteilt an Hitz, Malcom, Lau und Rakitzis

2500

2021

- Amazon FSx for NetApp ONTAP
- Cross-Region Replication for ANF and CVS on Google Cloud Platform
- Spot Wave, Spot PC & Spot Security
- Astra Control Center
- Astra Data Store
- Google Distributed Cloud Hosted
- Cloud Data Sense
- Cloud Manager Digital Wallet
- ONTAP autonomous ransomware protection
- AFF A900
- NetApp DataOps Toolkit
- FlexPod with Cisco Intersight
- SVM Migration
- NVMe/TCP

- NVIDIA GPUDirect with NFS/RDMA
- NetApp ONTAP Is First Enterprise Storage Platform to Receive Validation from U.S. NSA for Security and Encryption
- SEC 17a-4f Compliant Object Storage (Object Lock)

- NetApp Keystone for StorageGRID, E-Series, FlexPod-as-a-Service, CVO, Cloud Backup, and NVIDIA's DGX Foundry-as-a-Service
- Data Mechanics Acquisition
- CloudCheckr Acquisition
- AIQ Predictive Automated Firmware Updates

2022

- Manipulationssichere Snapshots
- One-click Defense
- Verbessertes Schutz vor Ransomware Angriffen
- Security Härtung
- Einfache Fpolicy Aktivierung für Ransomwareschutz
- Multi-Protokoll inkl. S3
- Gleichzeitiger Zugriff NAS & Object
- Portable ARP Trainingsdaten (Primary -> Secondary)

2024

2023

2022

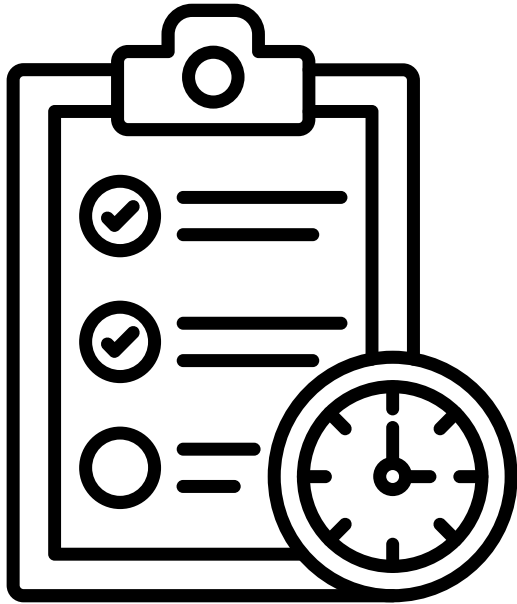
- ASA Serie
- FAS 2820
- ONTAP ONE
- Ransomware Garantie
- 6nines
- C-Series
- ASA C-Series

- SVM Mobility
- 12-Node NVMe Cluster Support
- Mehr Volumes (30.000)
- Größere Volumes
- Größere LUNs
- FlexCache Writeback
- FlexGroup Rebalance
- Cluster Scaling
- NFS V4 Session Trunking



Agenda

Intelligent Data infrastructure



- Intelligent Data Infrastructure
- The most secure storage on the planet
- AI driven ransomware protection
- 3-2-1 Backup weitergedacht
- Grundschutz / NIS2 / Dora
- Q & A oder Bier

Across several eras in the age of data, NetApp has led in data infrastructure innovation



Increasing amount of data, complexity and cost



Adoption



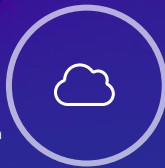
Acceleration



Complexity



Simplification



Data Siloes & Unification

NetApp becomes the first vendor to **unify file & block workloads, and structured & unstructured data**

Hybrid Cloud

NetApp creates the first **data fabric strategy** that eliminates silos & provides unified control across any environment

Hybrid Multiclouds

NetApp becomes the **ONLY** vendor to introduce **cloud ops and data services** as key data infrastructure pillars in addition to being the **only vendor natively embedded in all major clouds**

Today

Intelligence

NetApp delivers **silos-free infrastructure**, then harnesses **observability and AI** to enable best data management everywhere

**WITH
INTELLIGENT DATA
INFRASTRUCTURE,
YOU CAN RISE TO
EVERY MOMENT**



BETHE SILO BUSTER

Deliver simplicity by managing complex workloads and eliminating infrastructure silos across apps, data, and clouds

SIMPLICITY



BETHE BUDGET HERO

Make your on-premises and cloud infrastructure spend go further

SAVINGS



BETHE SUSTAINABILITY CHAMPION

Power more sustainable operations with energy-efficient technologies, tiering, and analytics

SUSTAINABILITY



BETHE BUSINESS DEFENDER

Keep your business running with built-in security, rapid recovery, and infrastructure observability

SECURITY



BETHE AI WORKLOAD INNOVATOR

Embed intelligence into your data infrastructure to enable your AI workloads—for new levels of productivity and innovation

SMARTS



BETHE APPLICATION AGILITY DRIVER

Maximize your infrastructure and applications scalability and team responsiveness

SCALABILITY



NetApp **The most secure storage
on the planet**

The only enterprise storage vendor validated to store top-secret data everywhere



Commercial Solutions for Classified (CSfC) Component List



FIPS 140-2



Department of Defense Approved Product List (DoDIN APL)

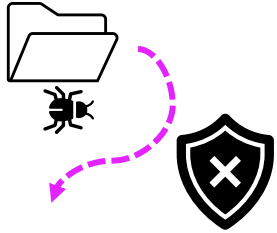


Common Criteria

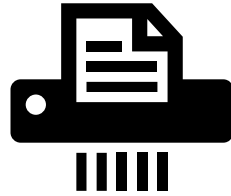
NetApp ONTAP: we have you covered... protect, detect, and recover!

The strongest anti-ransomware suite of any enterprise storage

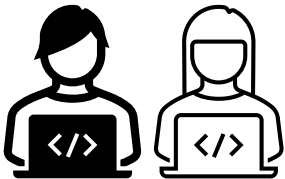
PROTECT



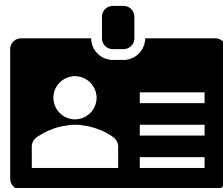
Automatically block known malicious file types



Prevent data destruction with immutable and indelible snapshots



Block rogue admins and malicious users



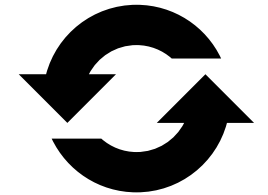
Secure data access, end-to-end

DETECT



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

RECOVER



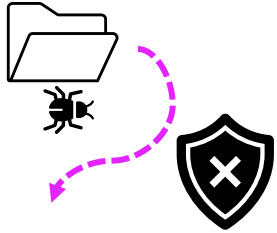
Restore data in minutes from secure snapshots

NetApp ONTAP: we have you covered... protect, detect, and recover!

The strongest anti-ransomware suite of any enterprise storage

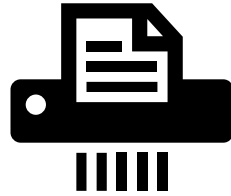
PROTECT

NetApp ONTAP FPolicy



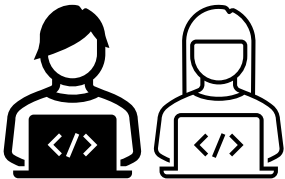
Automatically block known malicious file types

ONTAP Tamper-Proof Snapshots



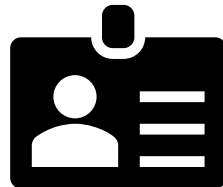
Prevent data destruction with immutable and indelible snapshots

ONTAP Multi-Admin Verify



Block rogue admins and malicious users

ONTAP End-to-End Encryption



Secure data access, end-to-end

DETECT

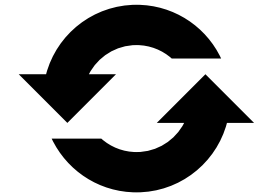
ONTAP Autonomous Ransomware Protection



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

RECOVER

ONTAP SnapRestore



Restore data in minutes from secure snapshots

Autonomous Ransomware Protection/AI

Next-generation ransomware threat detection



World's first AI-driven On-Box ransomware detection for primary storage.



Next-gen AI/ML ensures precise detection from day one.



Auto-update delivers optimal, efficient, and accurate turn-key detection.



Effortless, automatic upgrades for existing ARP customers.

99%+

PRECISION

(Alerts are accurate)

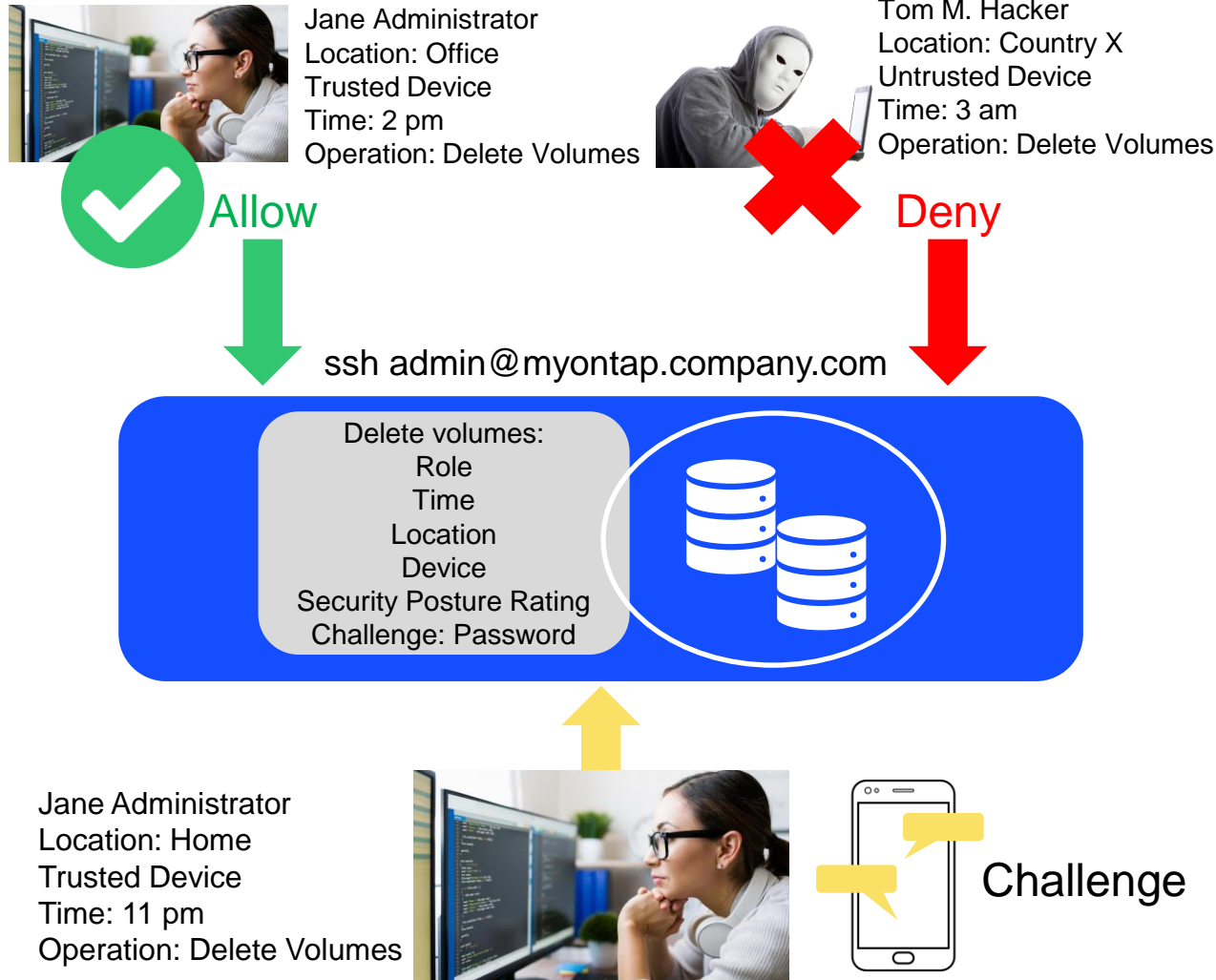
RECALL

(Detecting every attack)

Some words from our lawyers... No ransomware detection or prevention system can completely guarantee safety from a ransomware attack. While it's possible an attack might go undetected, NetApp technology acts as an important additional layer of defense.

Dynamic Authorization Framework

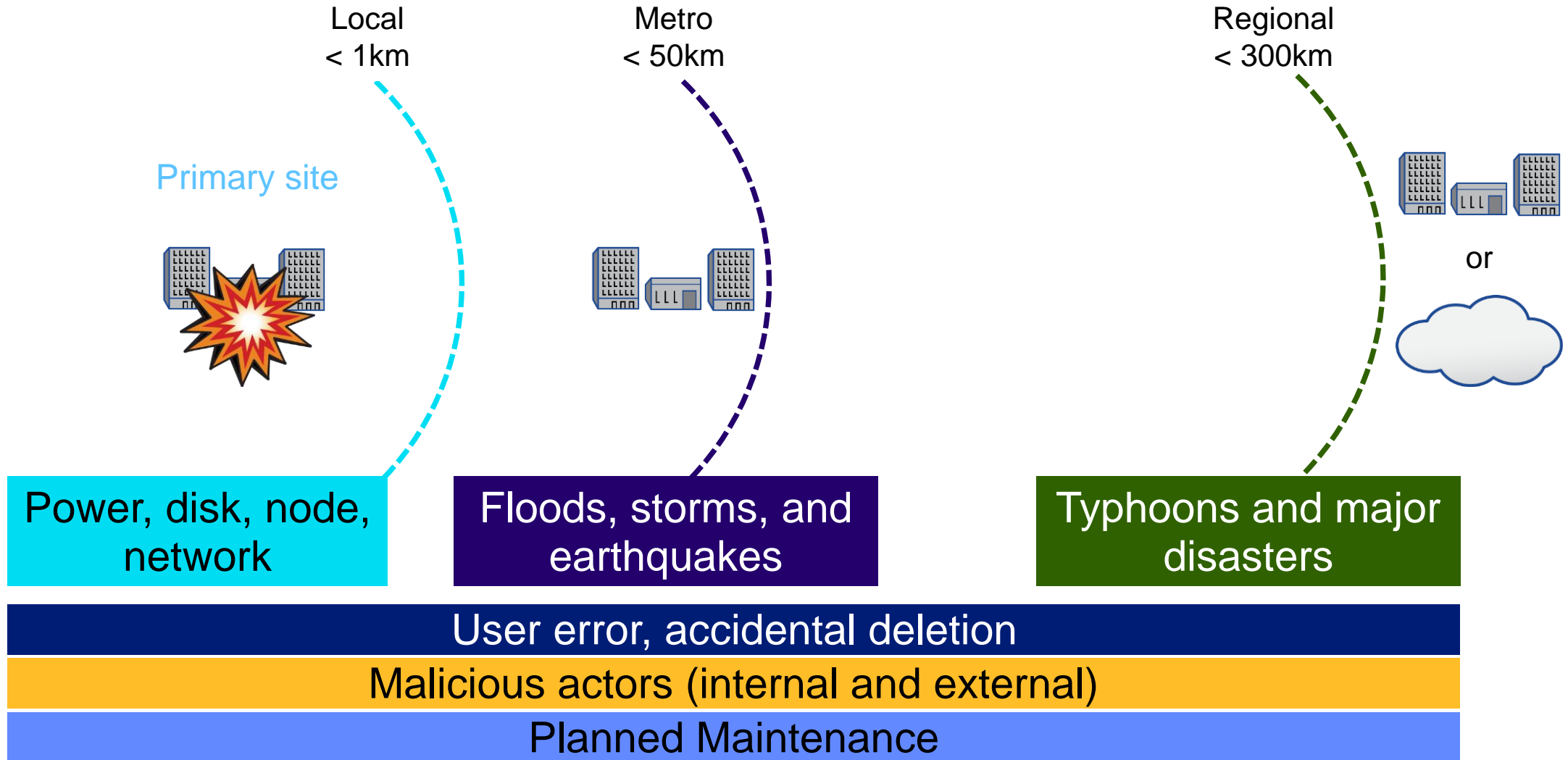
Real time security based on environment



- ONTAP Dynamic Authorization framework uses user attributes such as time of day, location, IP address, trusted device, user authentication and authorization history, and resource attributes such as commands and objects to determine if a request should be challenged by the system.
- Multi-release journey
- For ONTAP 9.15.1 release
 - SSH/CLI only
 - Initial Trust Score and framework
 - Custom component support

Data protection must be multi-layered

Simple to complex...minor to major...localized to regional



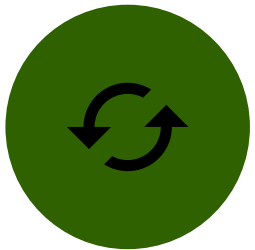


Kundenzitat

“Während in Villarriba schon der MetroCluster ins zweite RZ geschwenkt wurde, sind sie in Villabajo noch dabei, manuell die Services zu verschieben!”



**Built into
NetApp ONTAP®**



Consolidate critical workloads on same cluster

**Ease of
management**



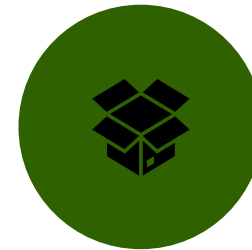
NetApp ONTAP System Manager simplicity

**Site
redundancy**



Host app at primary or secondary

**Cost
effective**



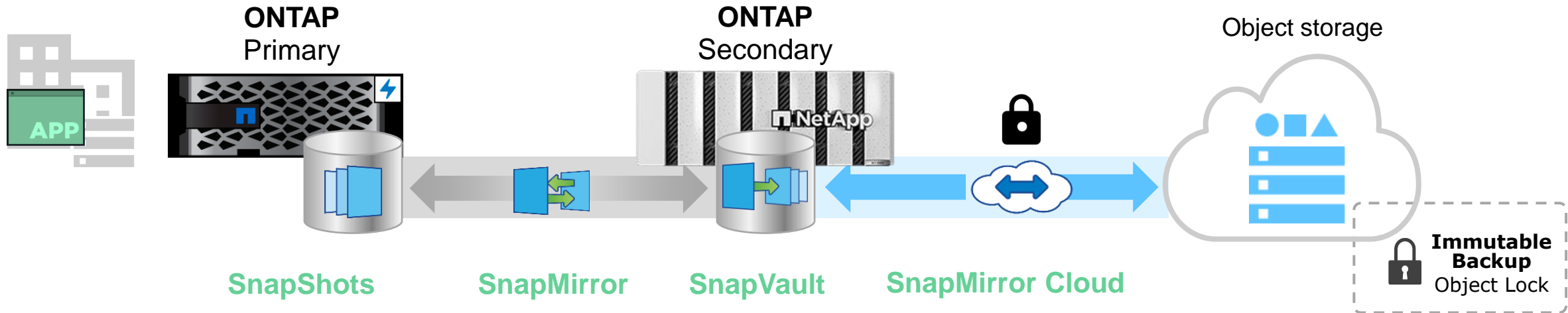
Optimized configuration for your requirement

**Use of
mirror copy**



Perform dev/test with secondary copy

3 - 2 - 1 Sicher



3rd Party Backup Vendors



DPSA meets NIS2 / BSI Grundschutz / Dora

Policies on risk analysis and information system security

Incident handling

Business continuity: such as backup management, disaster recovery and crisis management

Security in network and information systems acquisition, development and maintenance, including vulnerability handling and disclosure

Policies and procedures to assess the effectiveness of cybersecurity risk-management measures



(a) policies on risk analysis and information system security;					
Test Description	cluster1	cluster2	cluster3	cluster4	Comment
Check if Ontap Version is still supported	⚠	⚠	⚠	⚠	Update to P5 to be confirmed
(b) incident handling					
Test Description	cluster1	cluster2	cluster3	cluster4	Comment
Check if Autosupport is enabled	☑	☑	☑	☑	0
Check if cluster log forwarding is enabled	✗	✗	✗	✗	Audit logs are not sent out to syslog server
Check audit logging for get requests	✗	✗	✗	✗	GET requests are not logged for ONTAPI, CLI and HTTP
Check if event forwarding filters are correctly configured	☑	☑	☑	☑	0
Check if events are forwarded. (ALL)	✗	✗	☑	☑	Events are not forwarded for clusters aff400
Check if events are forwarded. (SYSLOG)	i	i	☑	☑	Events are forwarded to 2 syslog servers for fas8200 clusters
Check if events are forwarded. (SNMP)	✗	✗	☑	✗	SNMP is configured on all clusters, but trapost is empty 3 of them
Check if vscan is enabled on all CIFS SVMs	i	i	⚠	⚠	Vscan is enabled on most CIFS SVMs and disabled on 6 CIFS SVMs
Check if vscan pool is configured	i	i	☑	☑	0
Check if NAS auditing is enabled	⚠	⚠	☑	☑	NAS file auditing enabled on one SVM
Check if FPolicy is configured	i	i	☑	☑	Fpolicy is used with Prolion on both clusters fas8200
(c) business continuity, such as backup management and disaster recovery, and crisis management					
Test Description	cluster1	cluster2	cluster3	cluster4	Comment
Check if Anti Ransomware License is available	☑	☑	✗	✗	ARP license not found on both cluster fas8200



UNIFIED DATA STORAGE

Single storage OS

Power any data type, workload, and application

Natively embedded in the world's largest clouds

Manage data as a first-party service in the public cloud



Unified control

Use a single NetApp management console and/or each public cloud console

INTEGRATED DATA SERVICES

Built-in data security & protection

Backup data while detecting and thwarting threats

Policy-based data governance

Classify your data for greater compliance and integrity

Comprehensive sustainability

Energy-saving storage, resource optimization, and visibility into your efficiency

CLOUDOPS SOLUTIONS

Infrastructure optimization

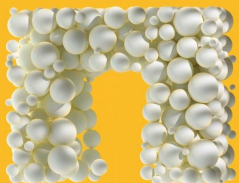
AI-powered optimization, on-premises and in the cloud

Application services

Develop, deploy, and scale applications with greater agility

Operations automation

Intelligent automation to boost productivity



Datenspeicher für jeden Bedarf – alles powered by ONTAP

Für die niedrigsten Kosten,
Sekundäre Anwendungsfälle

HYBRID FLASH

FAS



Für bestes Preis-
/Leistungsverhältnis

CAPACITY FLASH

AFF C-Series



Für beste Performance
Auf Tier-1-Workloads

PERFORMANCE FLASH

AFF A-Series



Unified

Block
optimiert

ASA C-Series



ASA A-Series



ONTAP

Umfassende Datenmanagement-Software mit Automatisierungs-, Effizienz-, Datenschutz- und Sicherheitsfunktionen für Dateien, Blöcke und Objekte






Modernize to all-flash SAN at half the cost




Modernize to all-flash SAN at half the cost



MORE VALUE
THAN HYBRID FLASH
STORAGE

LESS COST
THAN COMPETITIVE
ALL-FLASH STORAGE



100%
ALL FLASH STORAGE

**SIX
NINES**
AVAILABILITY
GUARANTEED

UP TO
97%
LOWER POWER
CONSUMPTION

NetApp

SAN-
OPTIMIZED
ALL-FLASH
STORAGE



RANSOMWARE
RECOVERY
GUARANTEED

COMPREHENSIVE
DATA
MANAGEMENT

4:1
STORAGE EFFICIENCY,
GUARANTEED

Fragen & Antworten



DANKE

