A photograph of three people in a modern office setting. On the left, a man in a blue polo shirt and dark jeans stands with his hands on his hips, looking towards the center. In the middle, a man in a light grey polo shirt and khaki pants holds a tablet, looking at it. On the right, a woman in a light grey blouse and dark trousers stands with her hands on her hips, looking at the tablet. The background features a large window with a grid pattern and a blue wall with vertical slats. The floor is highly reflective.

# ***NetApp vereinfacht den Sprung in die Hybride Cloud***

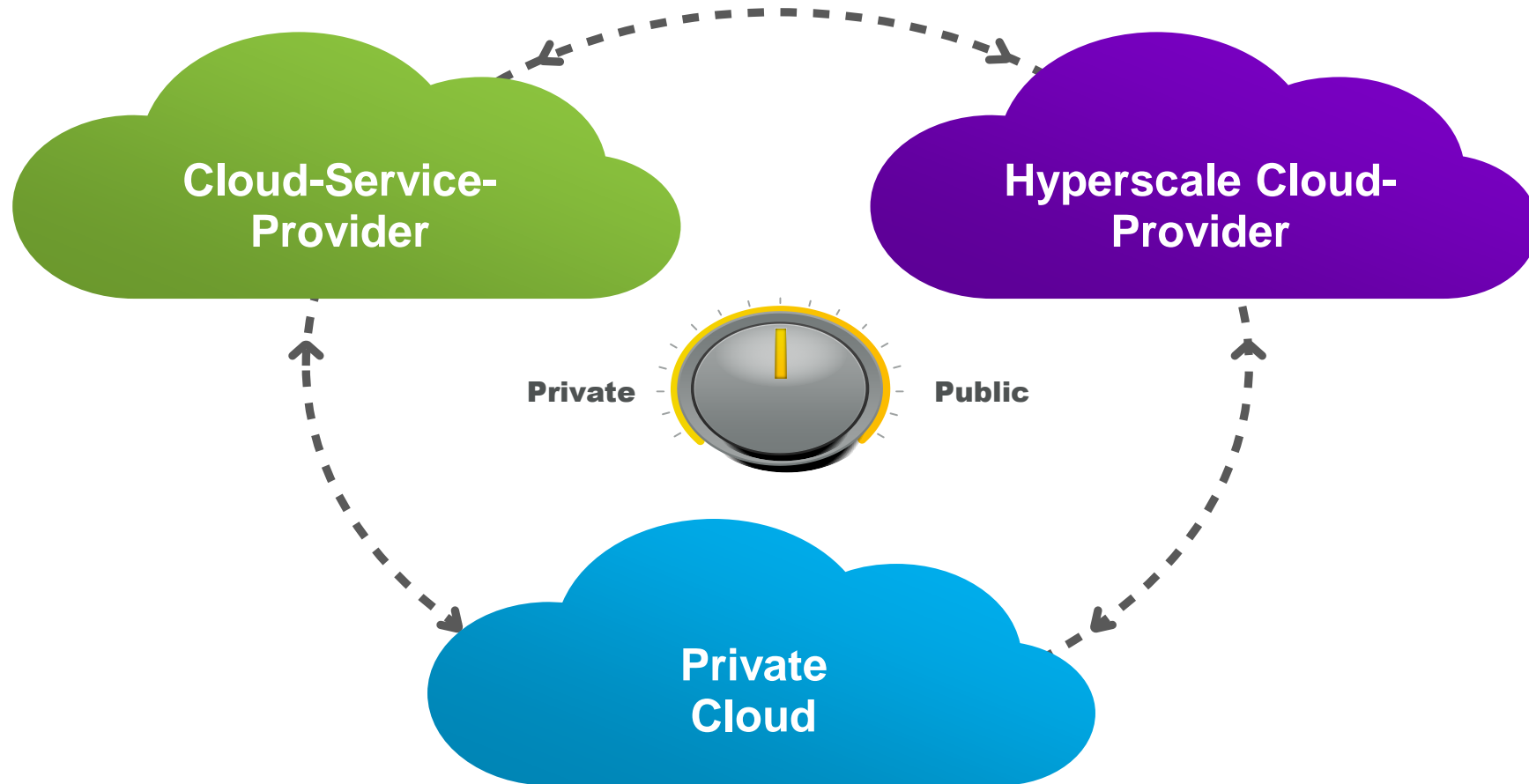
Mathias Riediger  
Senior Systems Engineer



# Begriffsdefinition: Hybrid Cloud



# Hybrid Cloud: grundlegender Trend in der IT



# Self-Hosting (Private Cloud)

Analogie: Essenszubereitung



# Cloud Service Provider

Gleiche Analogie...



# Hyperscale Cloud Provider

Und nochmal...

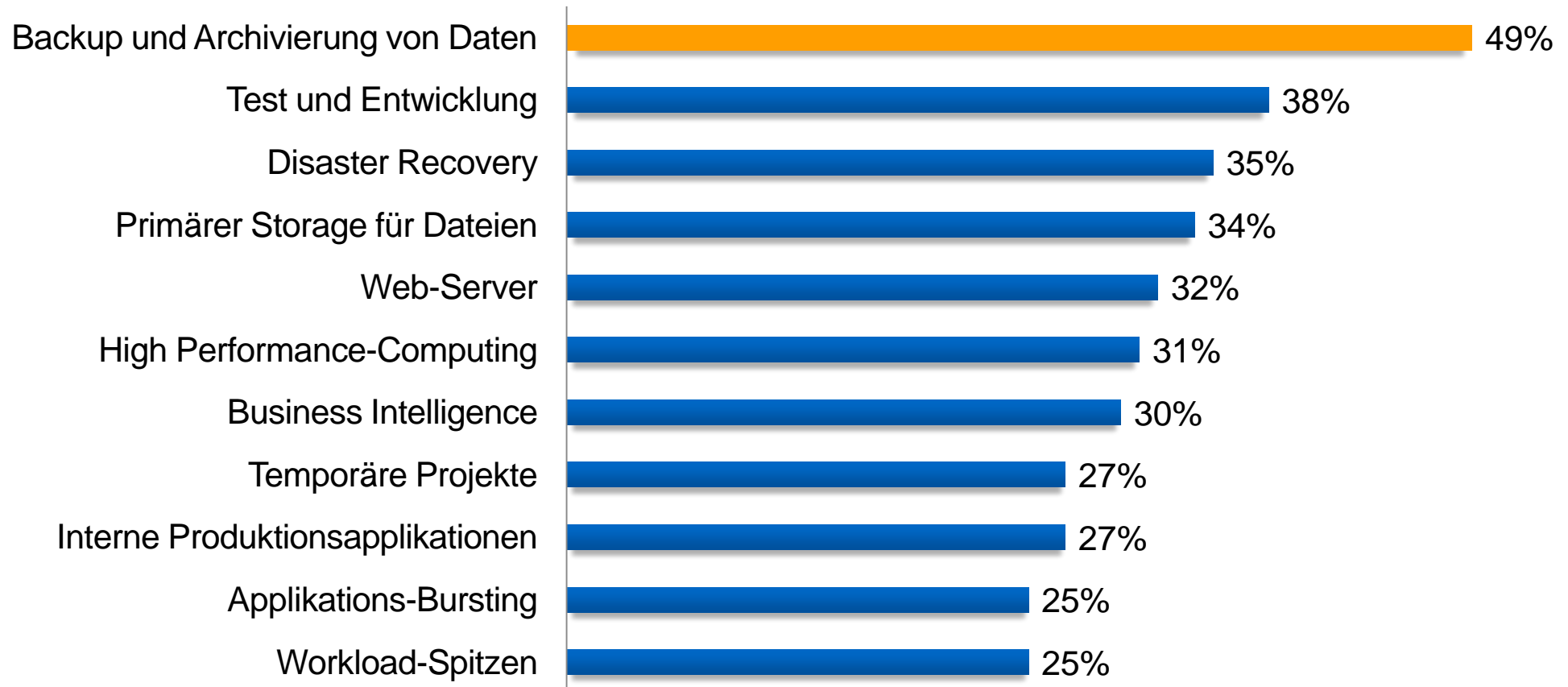


Würden Sie Daten in die Cloud geben?



# Backup und Archivierung sind die ersten Workloads, die in die Cloud verschoben werden.

**Für welche der folgenden Zwecke hat Ihr Unternehmen bereits Cloud-Infrastrukturservices in Anspruch genommen?**







# Schön und Gut – ABER ...

... ist Backup in die Cloud nicht viel zu unsicher und kompliziert?

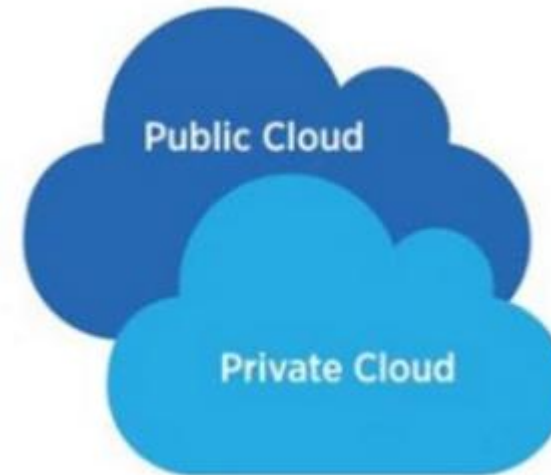
# Eigentlich nicht

Alles was man braucht ist ein Cloudgateway, Object Store und eine IP Verbindung

Cloudgateway



Object Storage



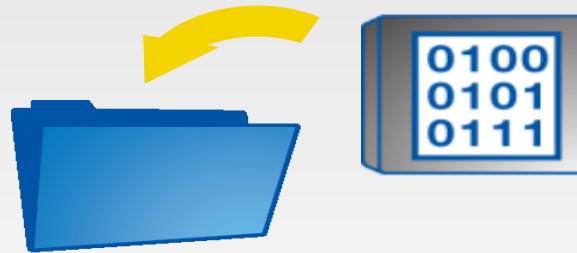
# ABER - was zum Teufel ist ein Object Storage?

## Block



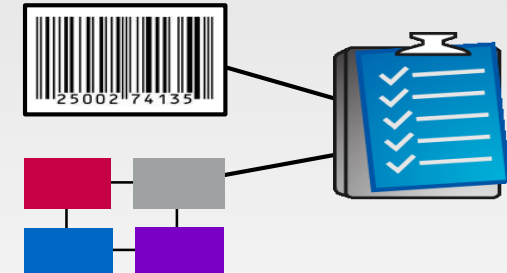
Dedizierte Position auf Disks  
Tracks  
Sectors

## File



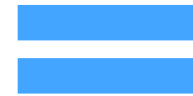
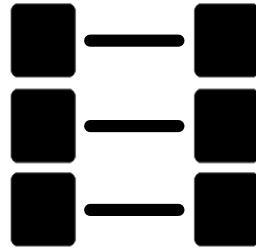
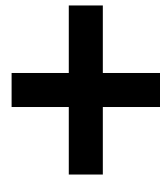
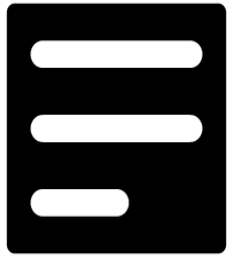
Dedizierte Datei/Ordner in  
fixer logischer/hierarchischer  
Struktur  
Dateipfad  
Dateiname  
Datum

## Object



Flexible Container  
beliebiger Grössen  
Nutzdaten und Metadaten  
Unique Identifier

# Object Storage Concept



Object  
+  
Unique ID

Beliebiger  
Datentyp

Metadaten



Service-Level=Gold  
Region=EMEA  
Owner=BobW



# File vs. Object: Abstraktion

Analogie: Langzeitparkplatz am Flughafen – “Valet Parking”

## File



## Parkhaus

`\\parkhaus1\level4\abschnitt_rot\B14`

## Object



## Valet



Object UID 317

# Objekt vs Block/File

Wann nutze ich was?

## Use File/Block if...

- Latenz muss < 10ms sein
- Transaktionaler Workload (VDI, Databases, ERP, etc.)
- Hohe Anforderungen an Performance, z.B. extremer Durchsatz, viele IOPs
- Rein lokaler Zugriff

## Use object if...

- Latenz spielt untergeordnete Rolle
- Zugriff über HTTP (S3, Swift, CDMI)
- Kein File (oder Objekt) Locking nötig
- Anwendung ist verteilt über mehrere Standorte
- Ein Namensraum über verschiedene Lokationen
- Große Datenmengen (PB, viele Objekte)
- Eher paralleler Zugriff
- Eher statische Daten (einmal schreiben, hin und wieder lesen)

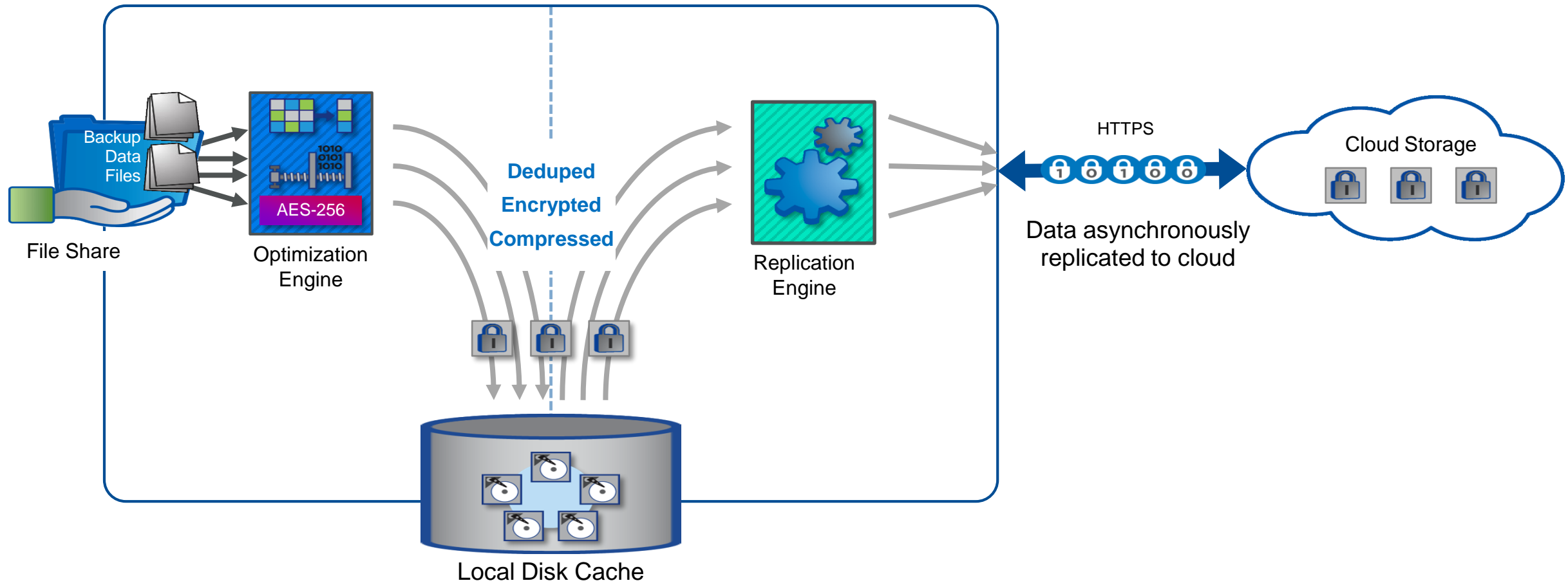
# Object Storage Concepts: Object APIs

Wie greift man auf Object Stores zu?

- **Amazon S3:** S3 (**S**imple **S**torage **S**ervice) – Amazon's Cloud Storage
- **SWIFT:** Object Storage Komponente des OpenStack Cloud Software Projektes
- **CDMI** (**C**loud **D**ata **M**anagement **I**nterface): SNIA Standard (z.Zt. in v1.02)



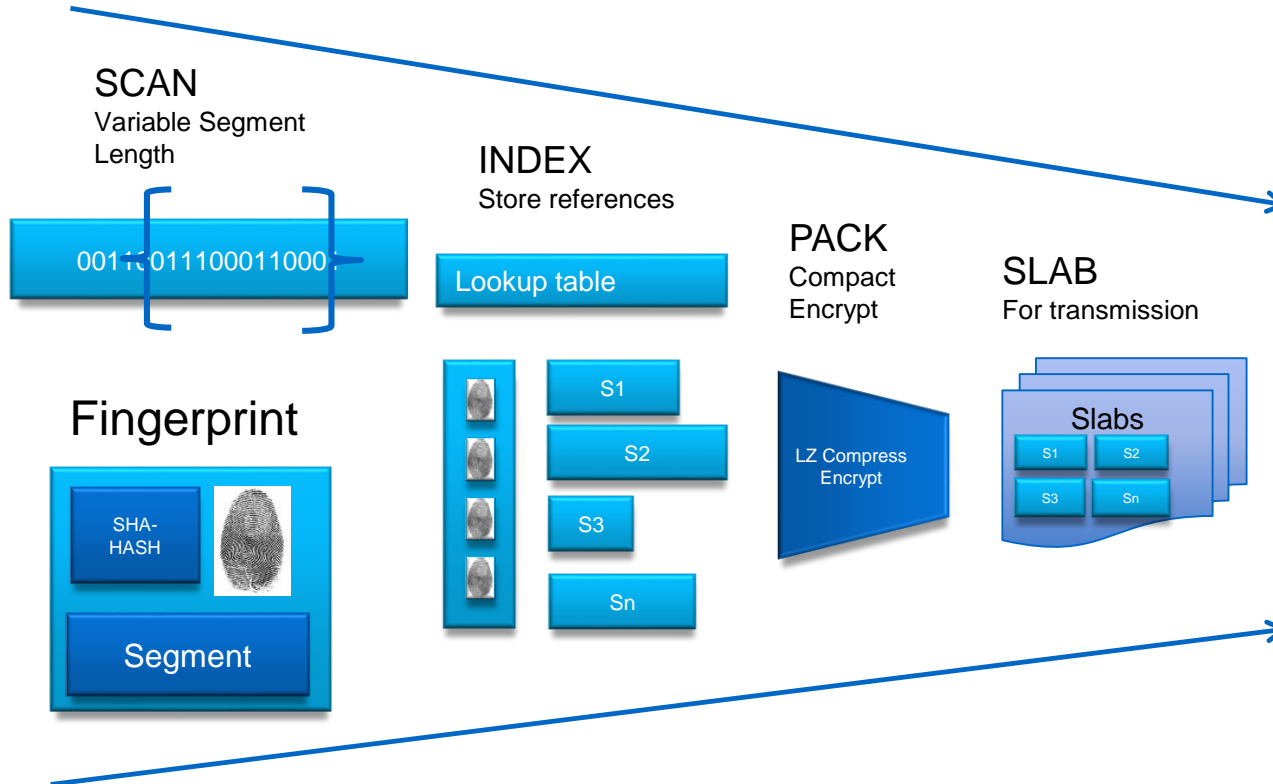
# Und was in Gottes Namen ist ein Cloudgateway?





# Globale Effizienz

## ■ Deduplication technology overview

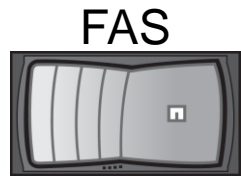


## Inline variable segment length deduplication

More matches allows greater reduction of data

- Yields maximum data reduction
- Compression further compacts data
- Data is grouped into slabs to optimize transmission and storage within the cloud

# Nahtlose Integration



FAS



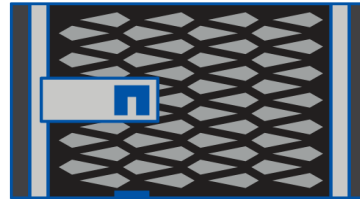
E-Series

Non-NetApp  
Storage

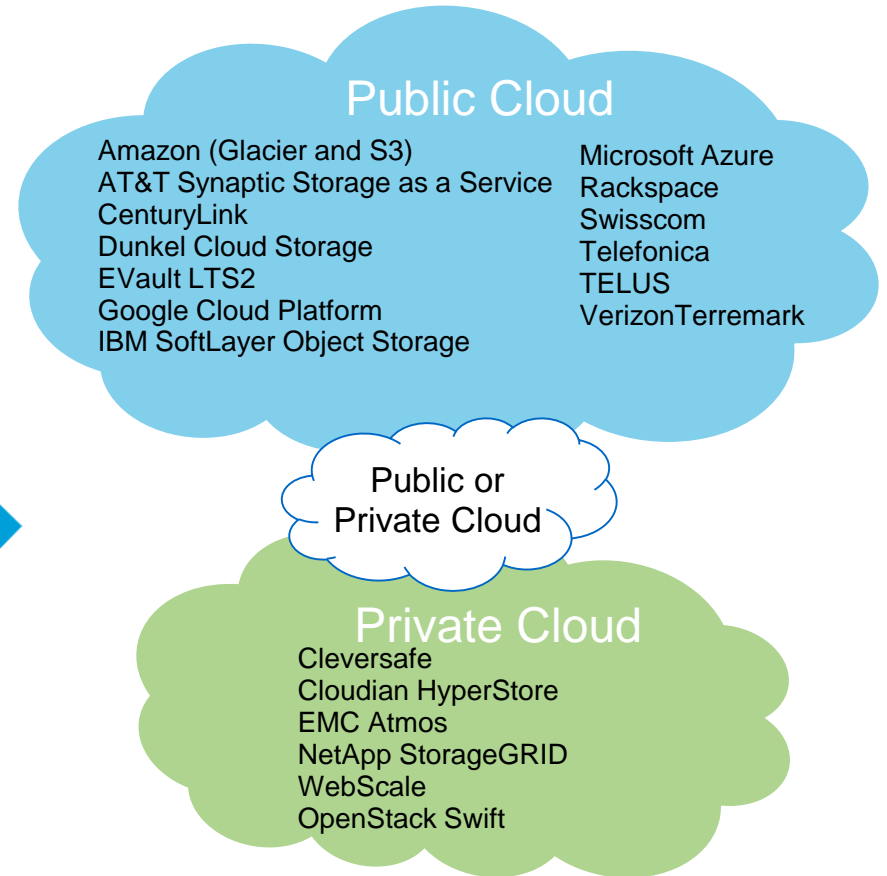


Arcserve  
Commvault Simpana  
Dell vRanger  
EMC NetWorker  
HP Data Protector  
IBM Spectrum Protect  
Microsoft SQL Server  
NetApp SnapProtect  
Oracle RMAN  
Veeam  
Veritas Backup Exec  
Veritas Enterprise Vault  
Veritas NetBackup

NetApp AltaVault



Cloud-integrated  
storage appliance



Seamlessly integrates into  
existing infrastructure

Inline deduplicates,  
compresses, and  
encrypts

Caches recent backups  
locally, replicates copies to  
the cloud

Store data in the public or  
private cloud of choice

# File Shares & Exports als Backup Target



- + Compression
- Data pinning
- + Deduplication
- Early eviction



- Compression
- Data pinning
- Deduplication
- + Early eviction



- + Compression
- + Data pinning
- + Deduplication
- Early eviction

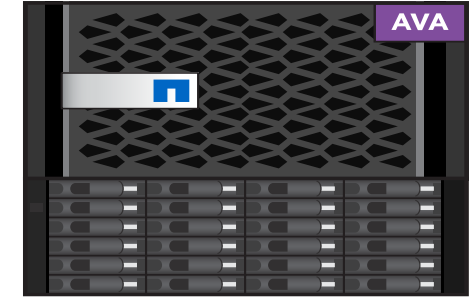
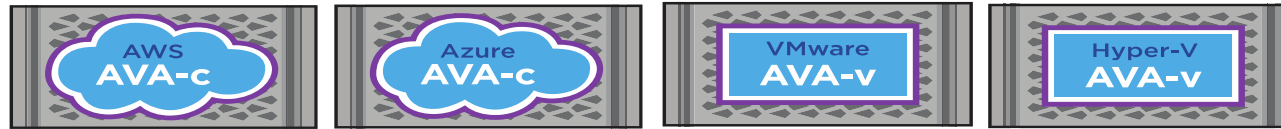
- Create shares for various data types
- Compression, deduplication, data pinning, and early eviction can be selectively applied for each share
- Supports multiple backup servers
- Tune performance and provide control and flexibility.

# Variabler Scope auf den Backupstrom

- Automatically detects stream insertions and format
- AltaVault intelligently optimizes deduplication
- Provides AltaVault highest level of deduplication
  - Detects markers inserted to data streams by backup applications
- Automatic detection of backup application files
- Handles multiple backup applications concurrently
- Automatic optimization of segments from 512 bytes to 32k bytes



# Hardware oder Appliance gefälltig?



	Cloud-based appliances			Virtual cloud-integrated appliances			Physical cloud-integrated appliances	
Model	AVA-c4	AVA-c8	AVA-c16	AVA-v8	AVA-v16	AVA-v32	AVA400	AVA800
Usable Disk Cache Capacity	4TB	8TB	16TB	8TB	16TB	32TB	32TB - 192TB	48TB - 384TB
Licensed Cloud Capacity	20TB	40TB	80TB	40TB	80TB	160 TB	160TB–960TB	240TB–1.92PB
Backup Throughput (Maximum)	300GB/hr	350GB/hr	2.6TB/hr	900GB/hr	1.8TB/hr	2.6TB/hr	5.5TB/hr	8TB/hr



ABER ...

... die Implementierung dauert ja ewig!

**ALTAVAVULT DEMO**

**IN 5 MINUTEN IN DIE**

**CLOUD**



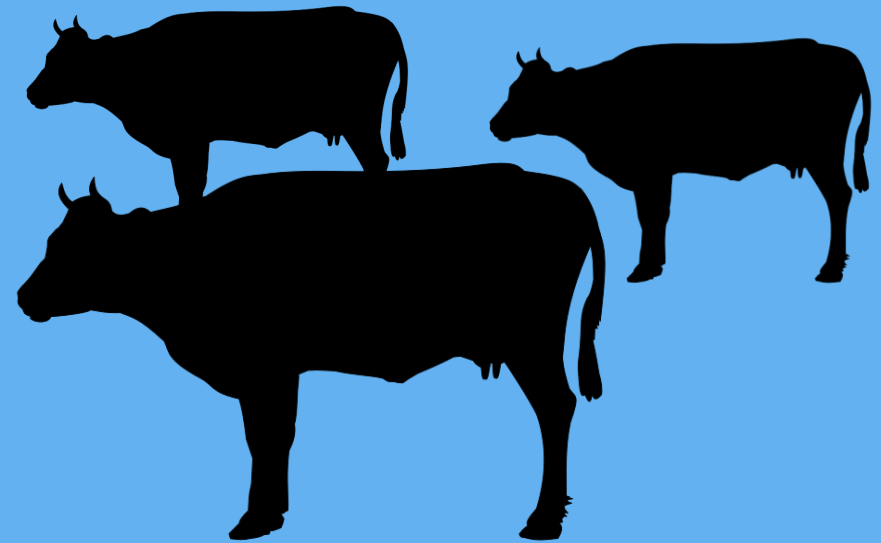
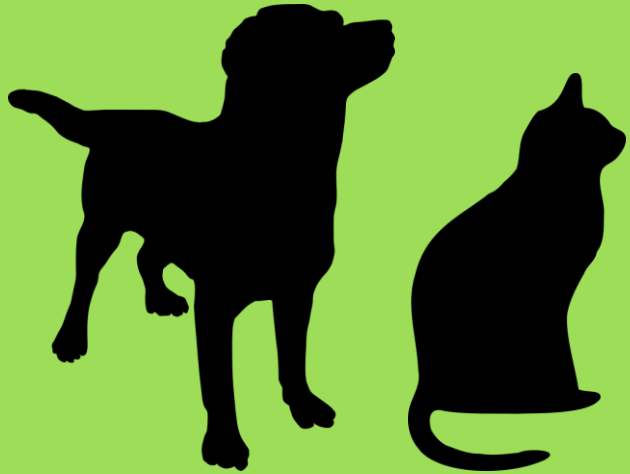
Die IT Welt dreht sich immer schneller



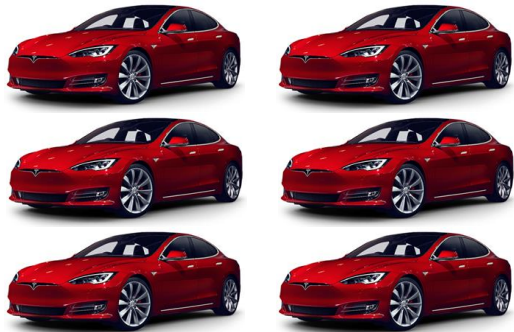


# Pets and Cattle

Analogie: Haustiere vs. Nutztiere



# Das NetApp Storage Portfolio



EF-Series

SolidFire

AFF

FAS

E-Series

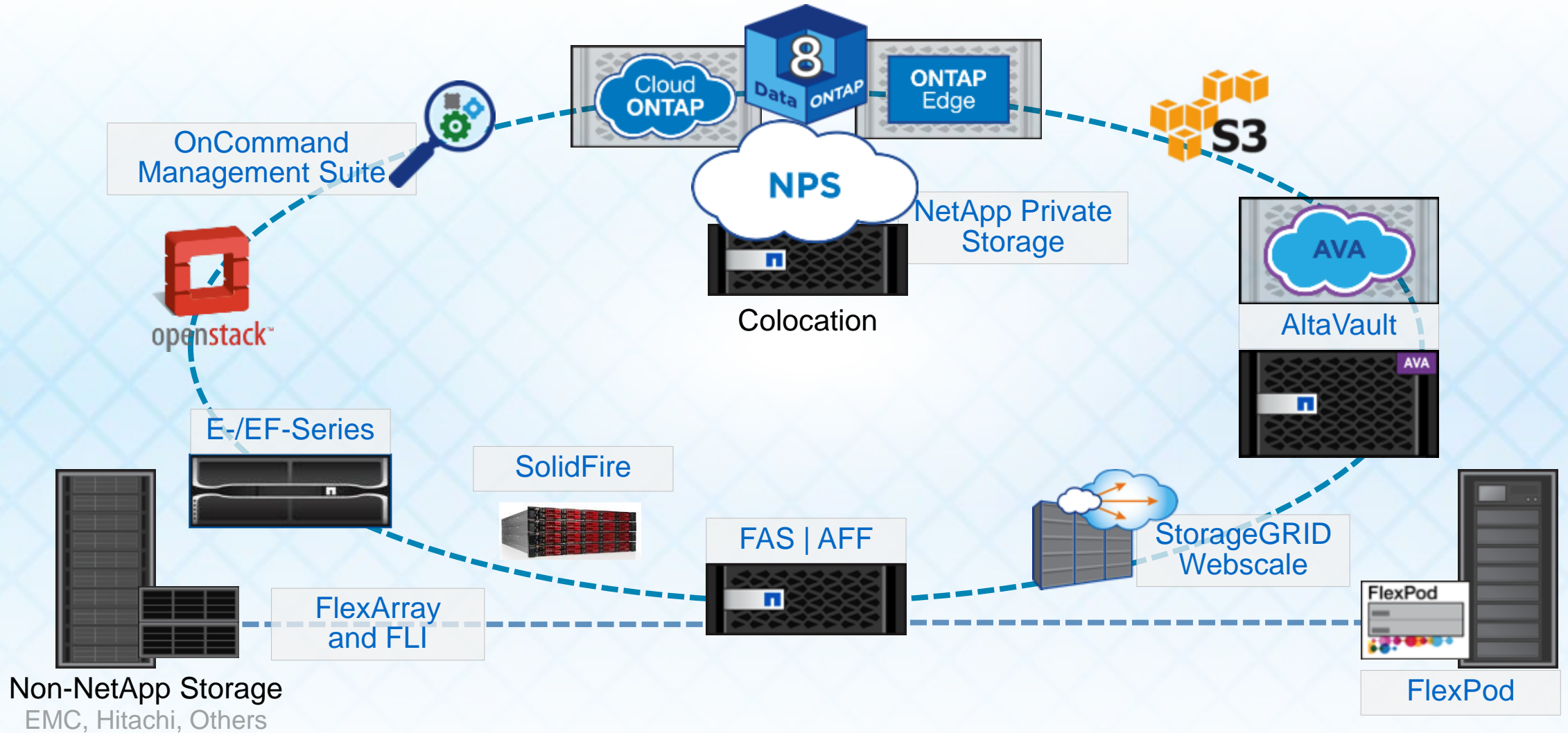


Storage Grid

AltaVault

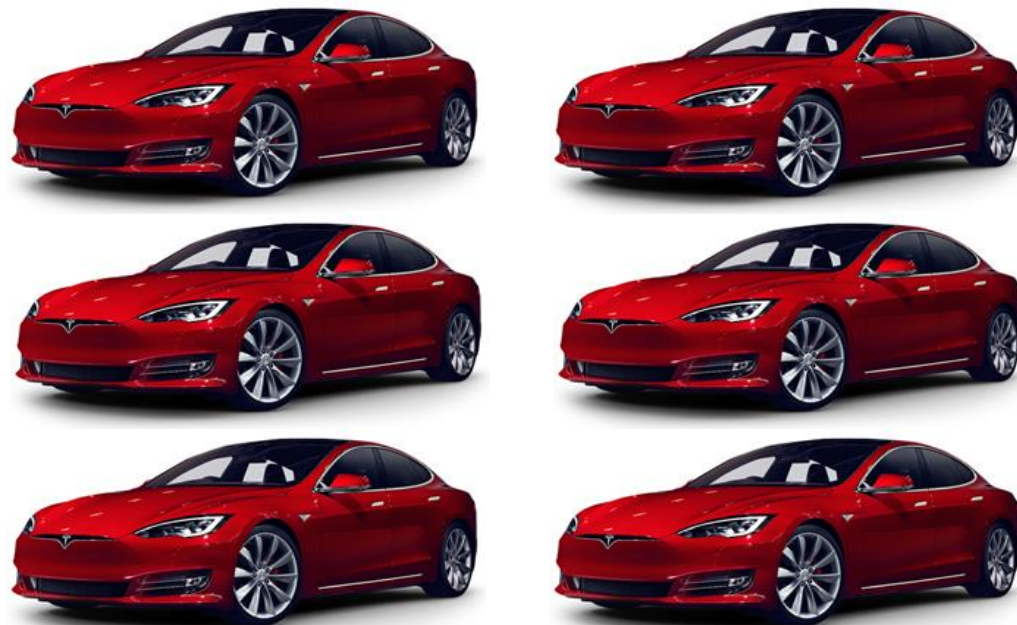


# The NetApp Data Fabric Ecosystem



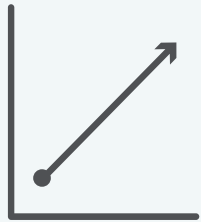
# NetApp Solidfire

designed for Cloud



# All-flash Speicher Plattform

## Für das Data Center der nächsten Generation.



Scale-Out



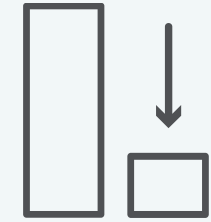
Guaranteed  
Performance



Automated  
Management



Data Assurance



Global  
Efficiencies

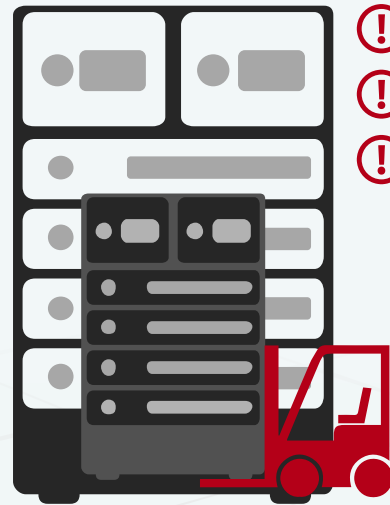
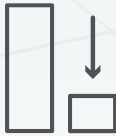


# Scale-Out

Erweitern, wenn benötigt



THE CURRENT CUSTOMER EXPERIENCE:  
Storage Expansion



ISLAND OF STORAGE

- ❗ Difficult
- ❗ Expensive
- ❗ Forklift Upgrades

CUSTOMER EXPERIENCE *with* SOLIDFIRE:   
Scale-Out



- ✓ Simplify Budgeting
- ✓ Non-Disruptive
- ✓ Easy to Manage
- ✓ Instant Resources
- ✓ Compatibility Guarantee



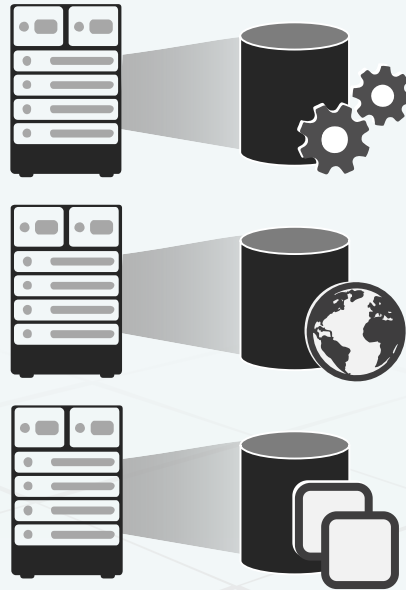
# Garantierte Performance

## Absolute Kontroller der Performance



### THE CURRENT CUSTOMER EXPERIENCE: Performance Issues

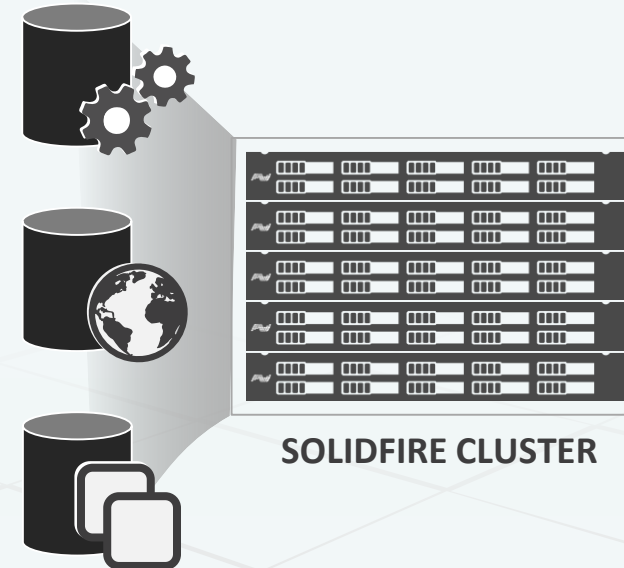
- ❗ Dedicated Storage for Each Application
- ❗ Fixed Performance for Each System
- ❗ Painful Redesign if Changes are Needed



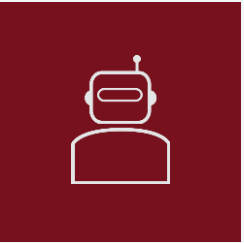
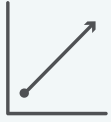
### CUSTOMER EXPERIENCE *with SOLIDFIRE*: Guaranteed Performance



- ✓ Mixed Workload Consolidation
- ✓ Guaranteed Storage Performance
- ✓ Simplified Management







# Automatisches Management


## Hervorragend für eine Private Cloud geeignet

### THE CURRENT CUSTOMER EXPERIENCE: Manual Management

- ❗ Too Many Manual Tasks
- ❗ Overly Complex to Manage
- ❗ Long Wait Times

#### Dozens of Manual Tasks

DESIGN | INSTALL | OPERATE  
SCALE | UPGRADE

 Weeks of  $\div \sqrt{\leq}$  formulas & coding

INTEGRATED  
into BUSINESS

### CUSTOMER EXPERIENCE *with* SOLIDFIRE: Automated Management

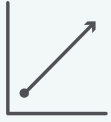
#### Automated Storage Tasks

DESIGN | INSTALL | OPERATE  
SCALE | UPGRADE

 SOLIDFIRE

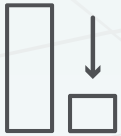
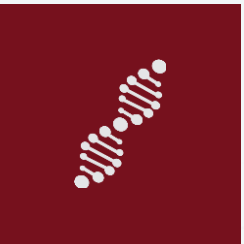
INTEGRATED  
into BUSINESS

- ✓ Automated to Simplify
- ✓ On-the-fly Adjustments
- ✓ Deep Integrations



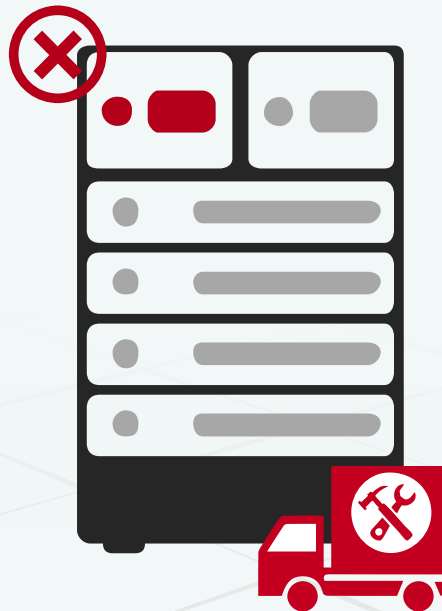
# Daten Verfügbarkeit

## Automatische Datenverteilung



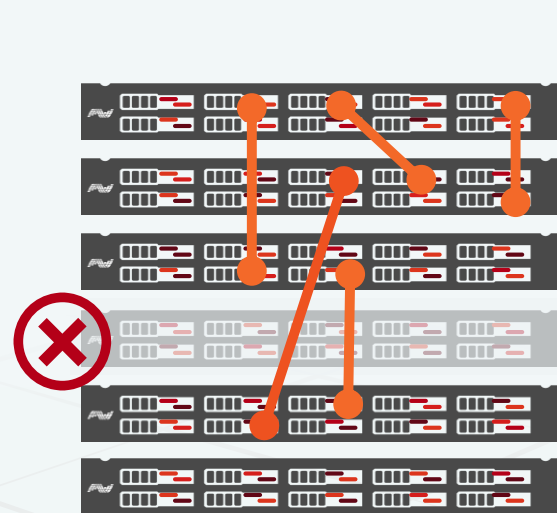
### THE CURRENT CUSTOMER EXPERIENCE: Data Failures

- ❗ High Risk
- ❗ Manual Repair
- ❗ Low Redundancy

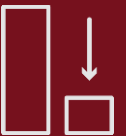
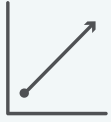


**FIRE DRILL | REACTIVE**

### CUSTOMER EXPERIENCE *with* SOLIDFIRE: Data Assurance



- ✓ Automated to Simplify
- ✓ On-the-fly Adjustments
- ✓ Deep Integrations
- ✓ Drive Wear Guarantee

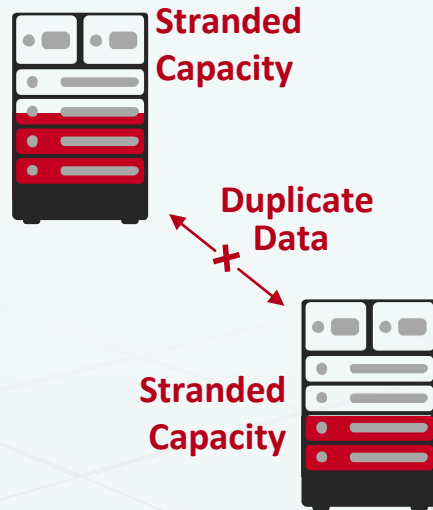


# Globale Effizienztechnologie

**Daten aller Nodes werden berücksichtigt**

THE CURRENT CUSTOMER EXPERIENCE:  
Isolated Efficiency

- ❗ Isolated Efficiency
- ❗ Missed Dedupe Opportunities
- ❗ Wasted Capacity



CUSTOMER EXPERIENCE *with* SOLIDFIRE:   
Global Efficiency



- ✓ Deduplication
- ✓ Compression
- ✓ Thin Provisioning
- ✓ Always On
- ✓ Global
- ✓ No Impact

# IDC Studie: NetApp ist Marktführer bei Storage für Public Cloud Infrastruktur\*



**NetApp #1**  
bei externer Storage  
Kapazität für Public Cloud  
Infrastruktur

Viele der weltweit größten  
Cloud Services basieren  
auf NetApp, inklusive der  
über 275 NetApp Service  
Provider Partner

# 380



# Offizielle Referenzen



# Danke

...und nutzen Sie NetApp 😊

