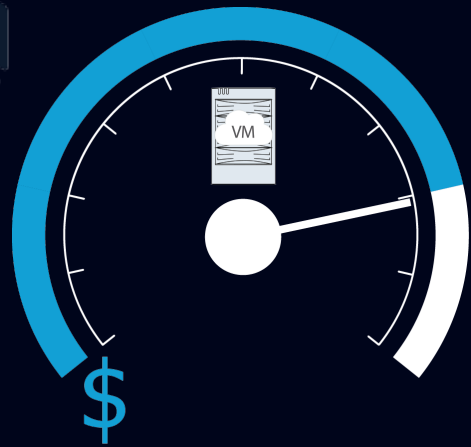




▶ Commvault® Public Cloud Architecture

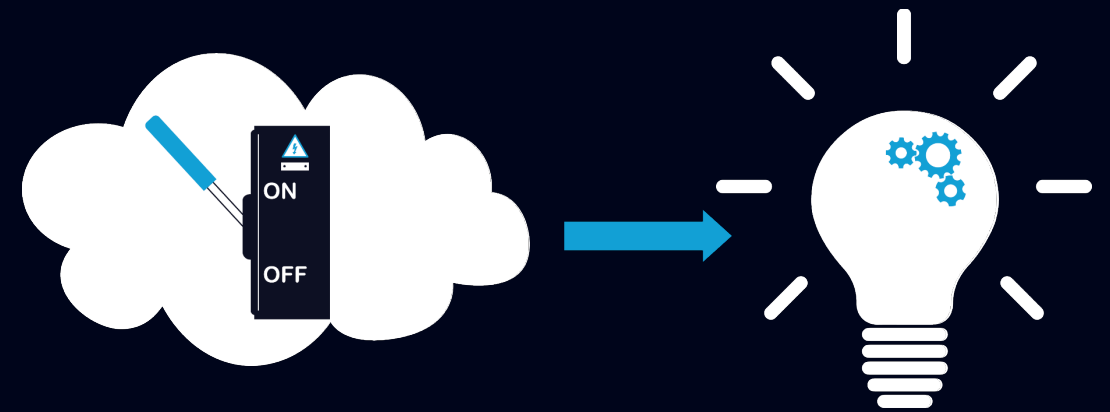
▶ Peter Maes – SE BeLux



Infrastructure as
Programmable, Addressable
Resources



Global, Flexible and
Unlimited Resources



Transforming The Disaster
Recovery Model



▶ Cloud Design Principles

▶ General cloud design principles

1

Scalability

2

Recovery

3

Efficiency

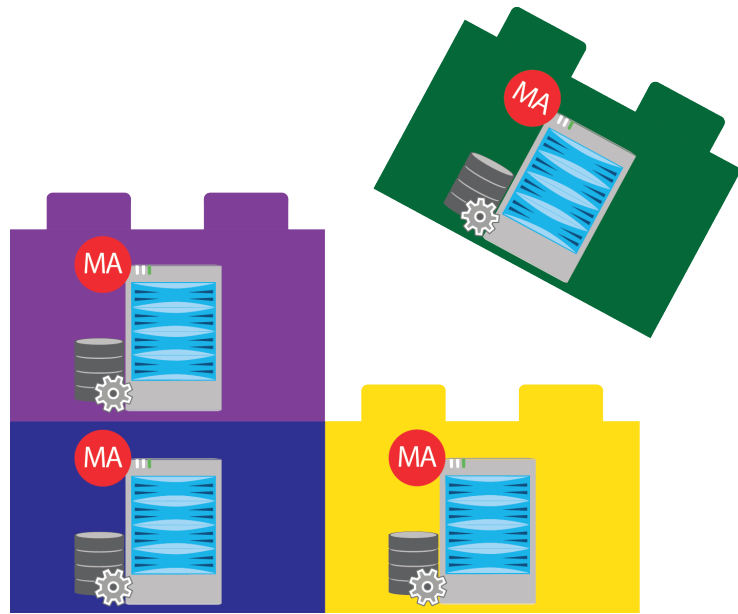
4

Automation

▶ 1. Scalability

De-duplication Building Blocks

- Scalability for both DDB & Network capacity



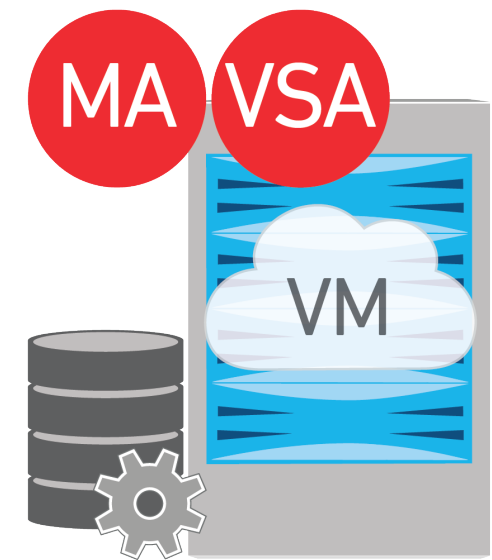
Client-side De-Duplication

- Network savings over cloud bandwidth



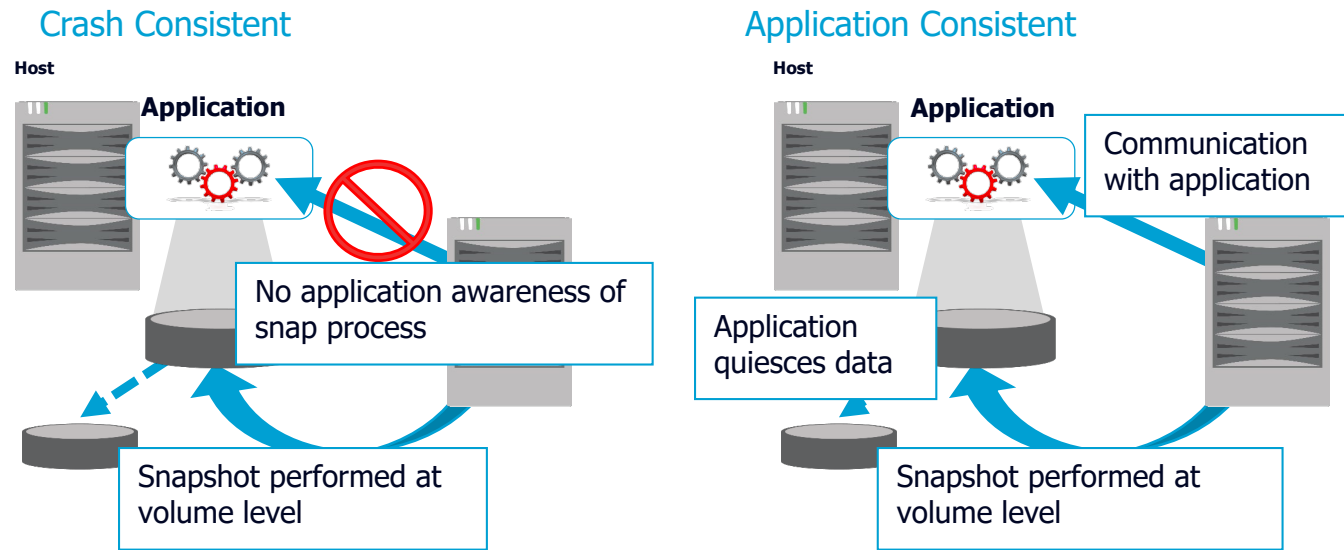
Commvault® Virtual Server Agent (VSA)

- Agentless operations of public cloud VMs

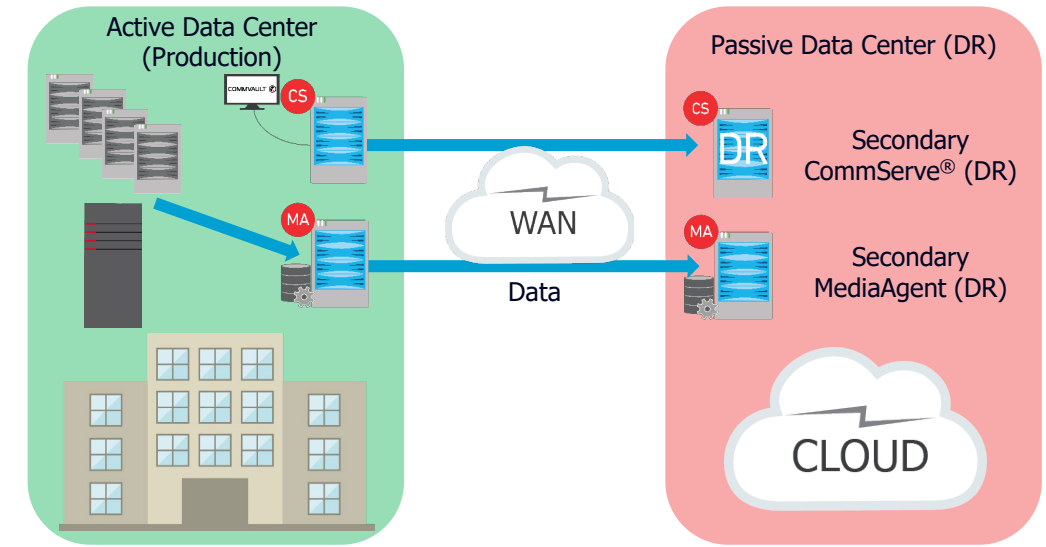


▶ 2. Design for recovery

Crash Consistency vs. Application Consistency



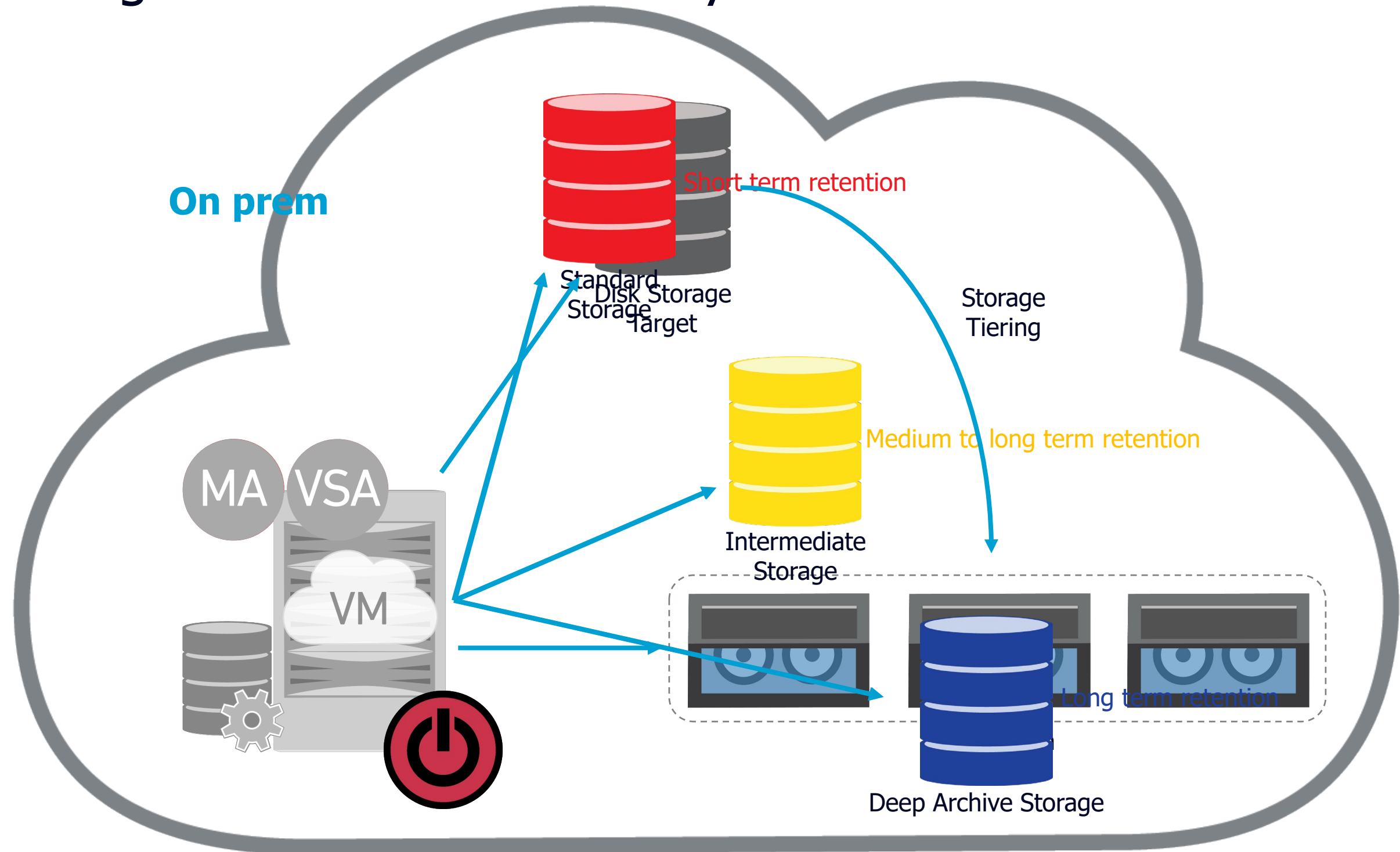
Storage-level Replication vs. Discrete Copies



Deciding What to Protect

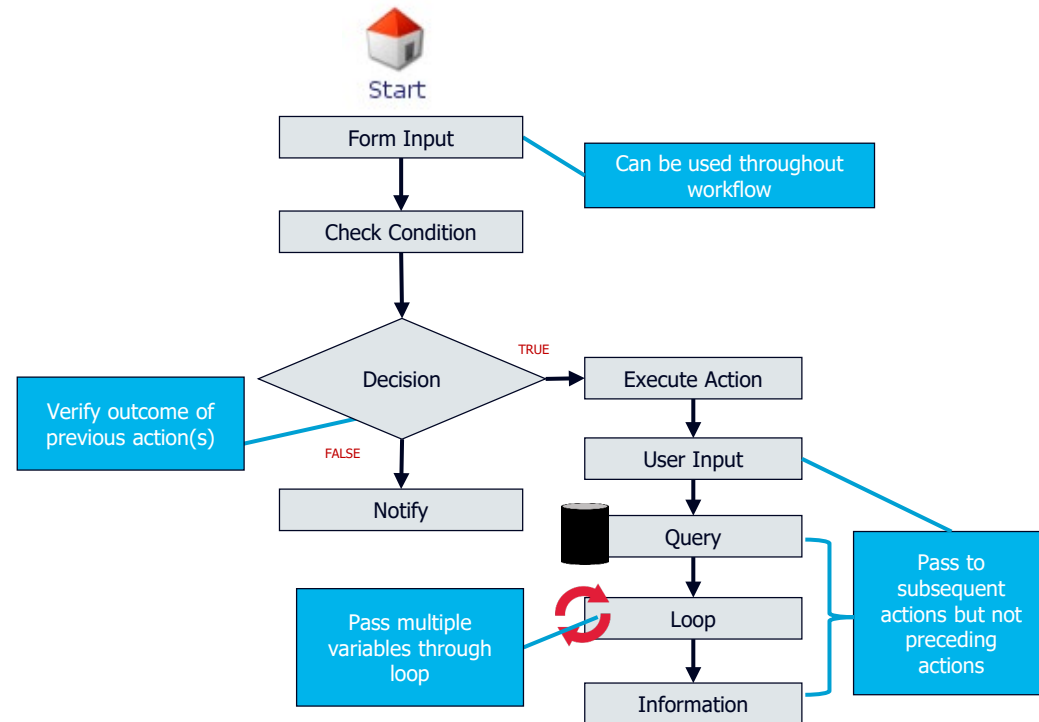


▶ 3. Designed for Cloud Efficiency

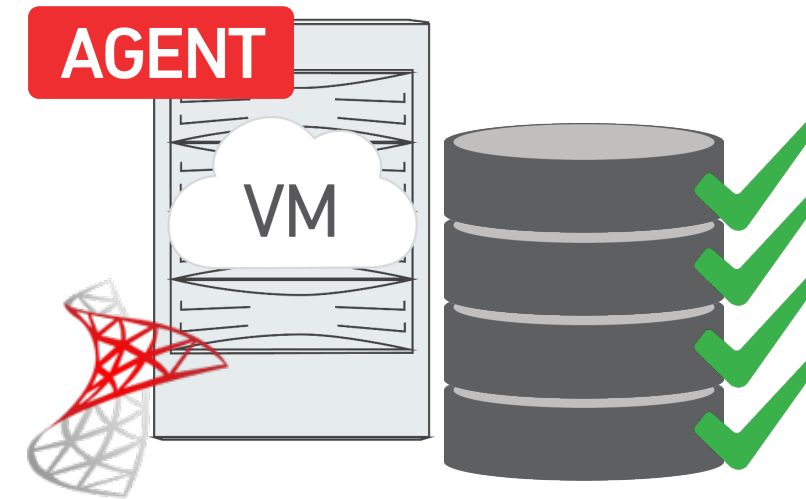


▶ 4. Automation

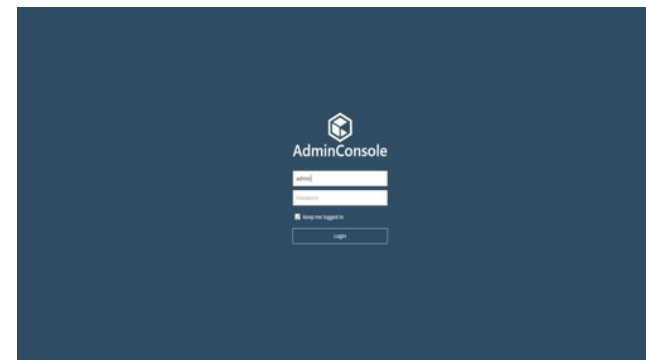
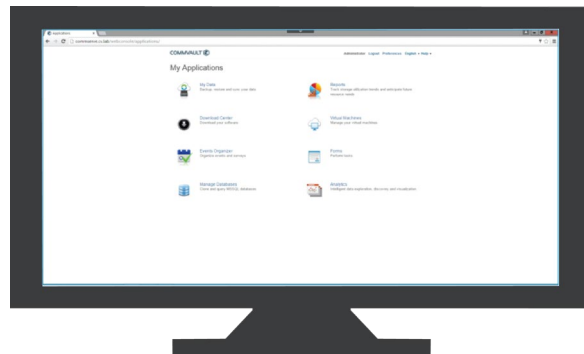
Programmatic Data Management



Workload Auto-Detection and Auto-Protection



Self-Service Access and Restore





▶ Cloud Solutions with Commvault®

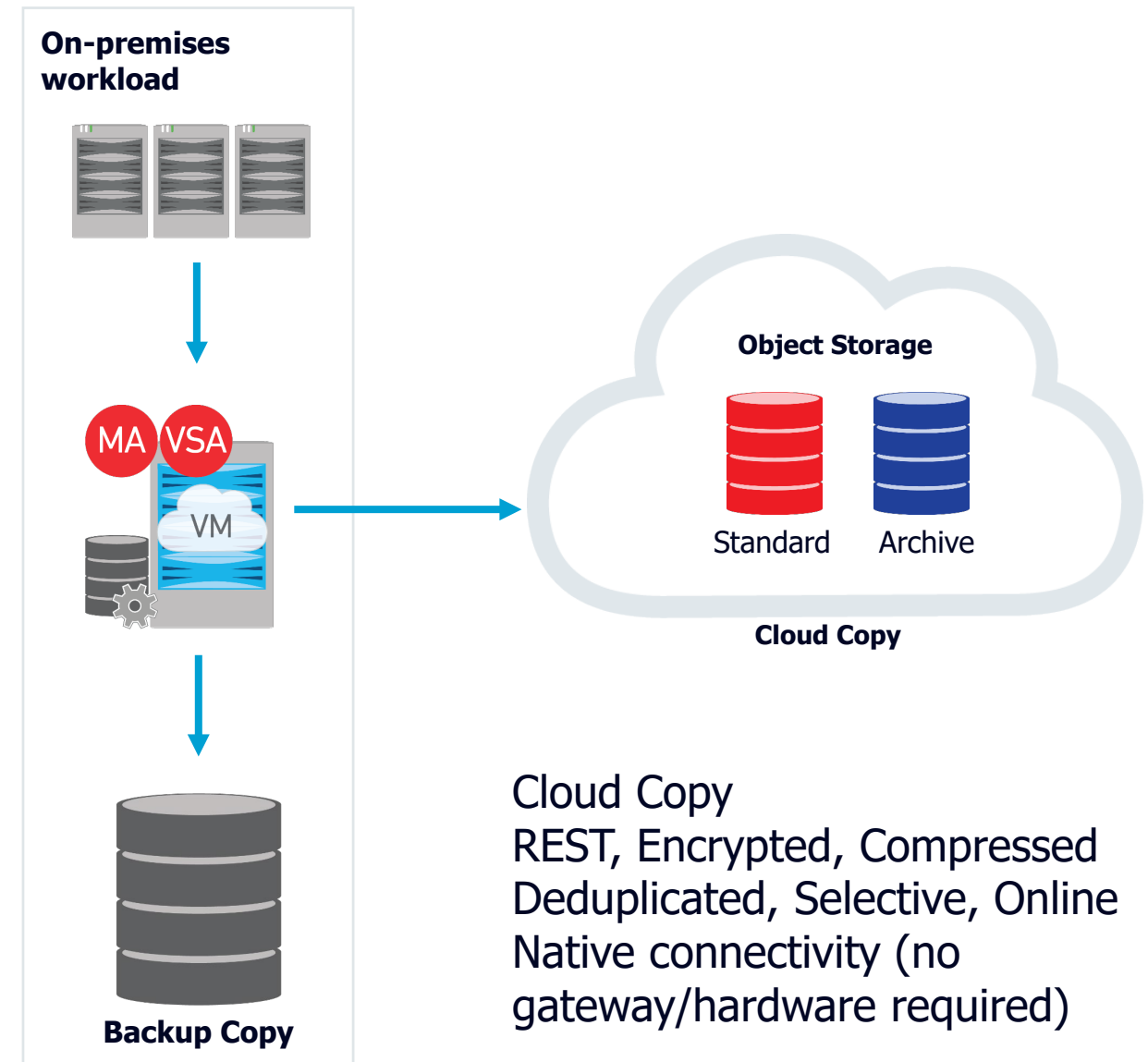
▶ Backup/archive to the cloud

Scenario / Suitability

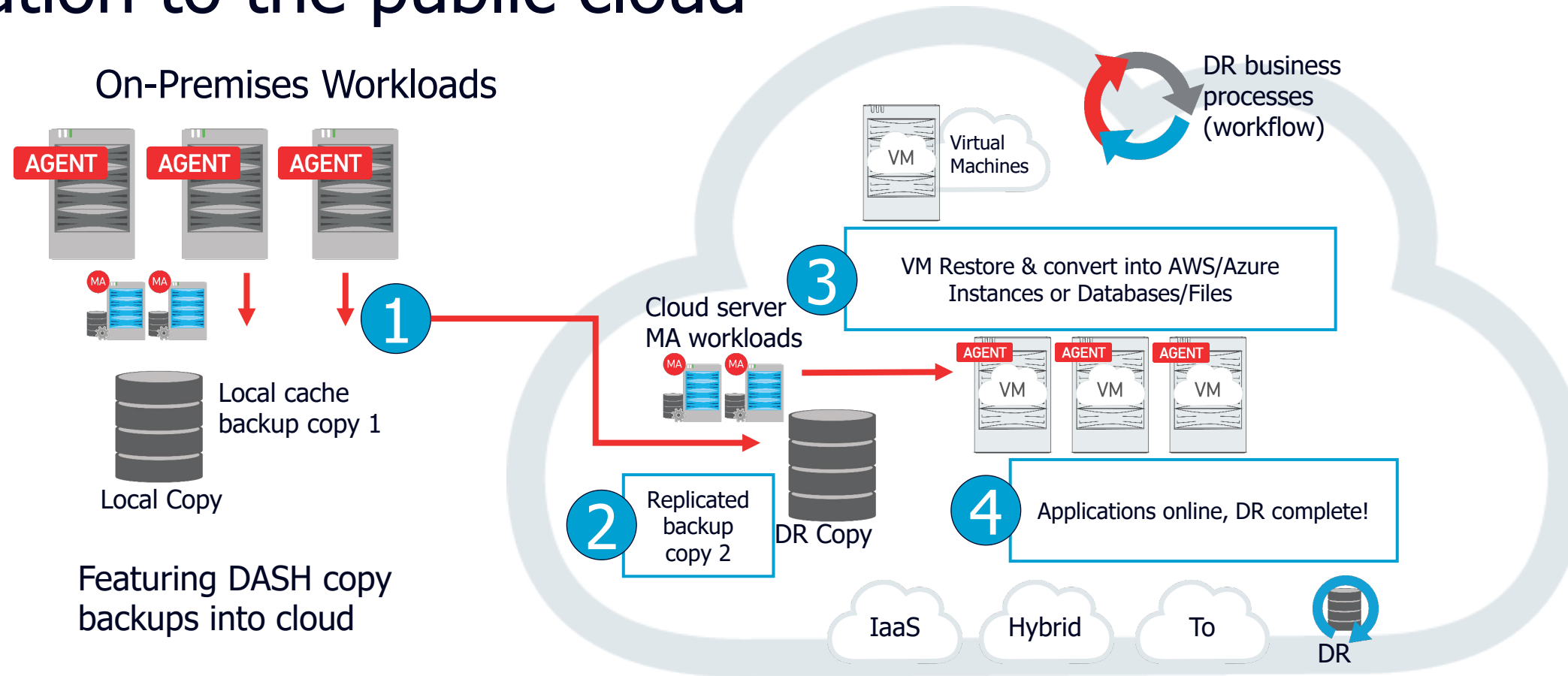
- Offsite storage / tape replacement
- Native, Direct connectivity to supported object storage endpoints

Requirements

- Minimum 1 x MediaAgent on premise
 - *No VM in cloud required for backup & recovery to the cloud*
- 1 x DDB for the cloud library (hosted on on-premise MediaAgent)
 - *Additional DDB required for local copy if desirable*
- Direct internet connection or dedicated network to cloud provider for best performance
 - *AWS Direct Connect, Azure ExpressRoute*



► Migration to the public cloud



Scenario / Suitability

- Lift & Shift Virtual Machines
- Application Migration Feature
- Application Restore Out-of-Place

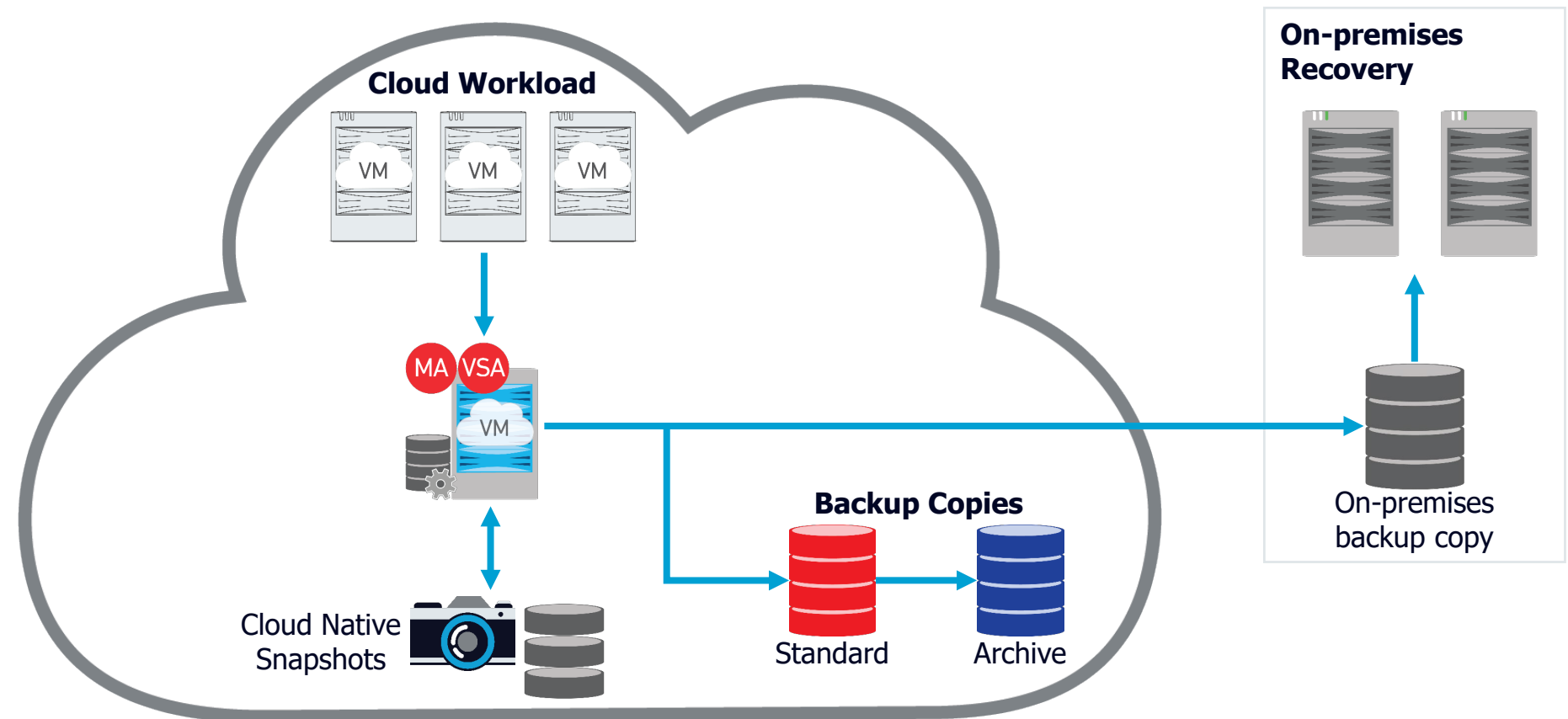
Requirements

Minimum 1 x MediaAgent on premise to protect and capture workloads
Minimum 1 x MediaAgent (& DDB) in Cloud to protect workloads post-migration/performance
Dedicated network to cloud provider highly recommended
Application Specific Features *refer to Commvault Orchestrate™ module*

► Protection in a public cloud

Scenario / Suitability

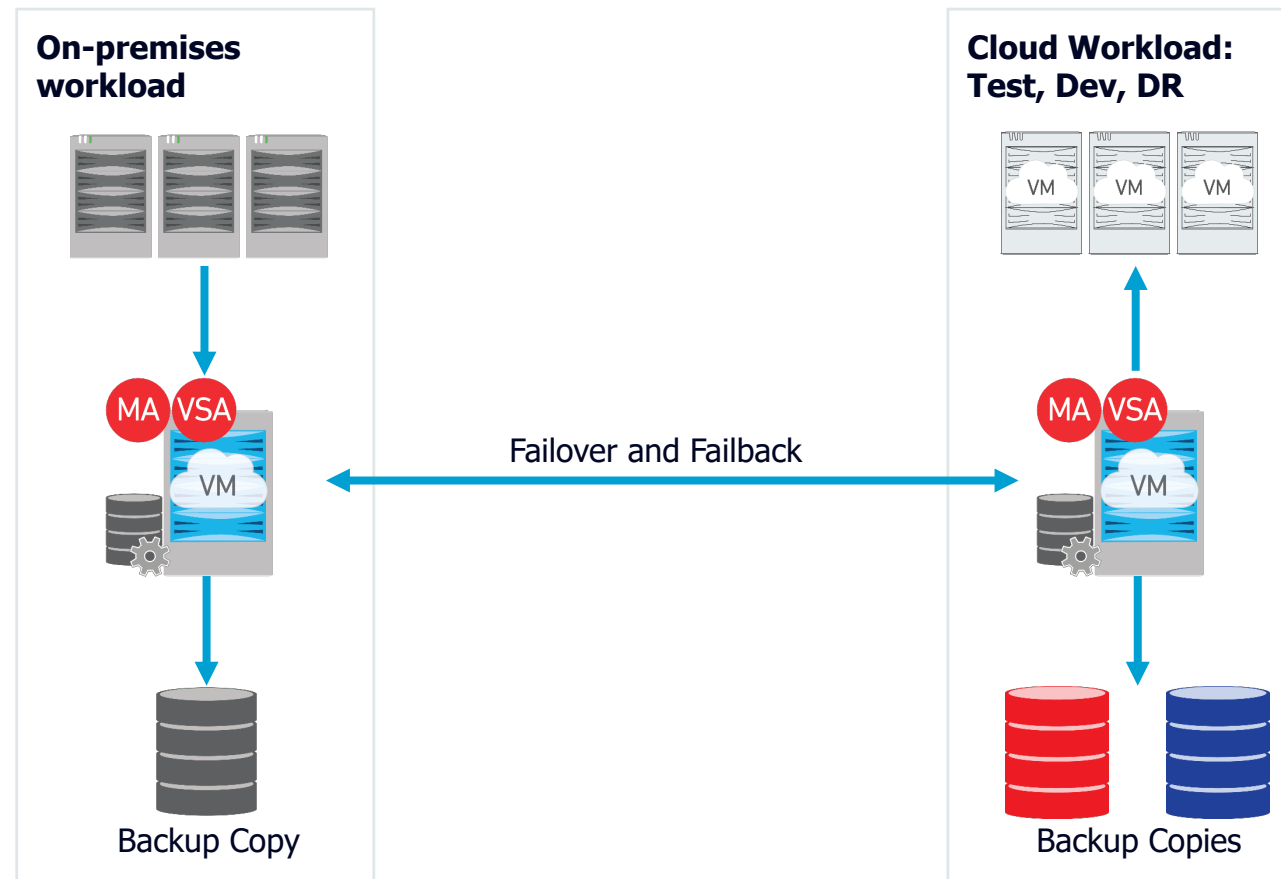
- Data Protection for cloud-based workloads
- Agent-less instance protection (with supported providers)
- DASH Copy to another region, cloud or back to on premise



Requirements

- VSA + MA deployed on a proxy within cloud provider for agentless backup (supported providers only)
- Agents deployed in each VM for non-supported providers and apps requiring application consistency
- Minimum 1 x MediaAgent in cloud and (optional) 1 x MediaAgent for secondary site (whether cloud or on premise)
- 1 x DDB hosted on MediaAgent
- Dedicated network from cloud provider to on premise highly recommended when replicating back to on premise

▶ Disaster recovery in a public cloud



Scenario / Suitability

- Off-site storage & cold DR site in the cloud
- LiveSync data replication for warm recovery in cloud
- VM restore & convert
- Automate Failover and Failback of VMs

Requirements

Minimum 1 MediaAgent on premise

Minimum 1 x MediaAgent in cloud

Powered-on for recovery operations only

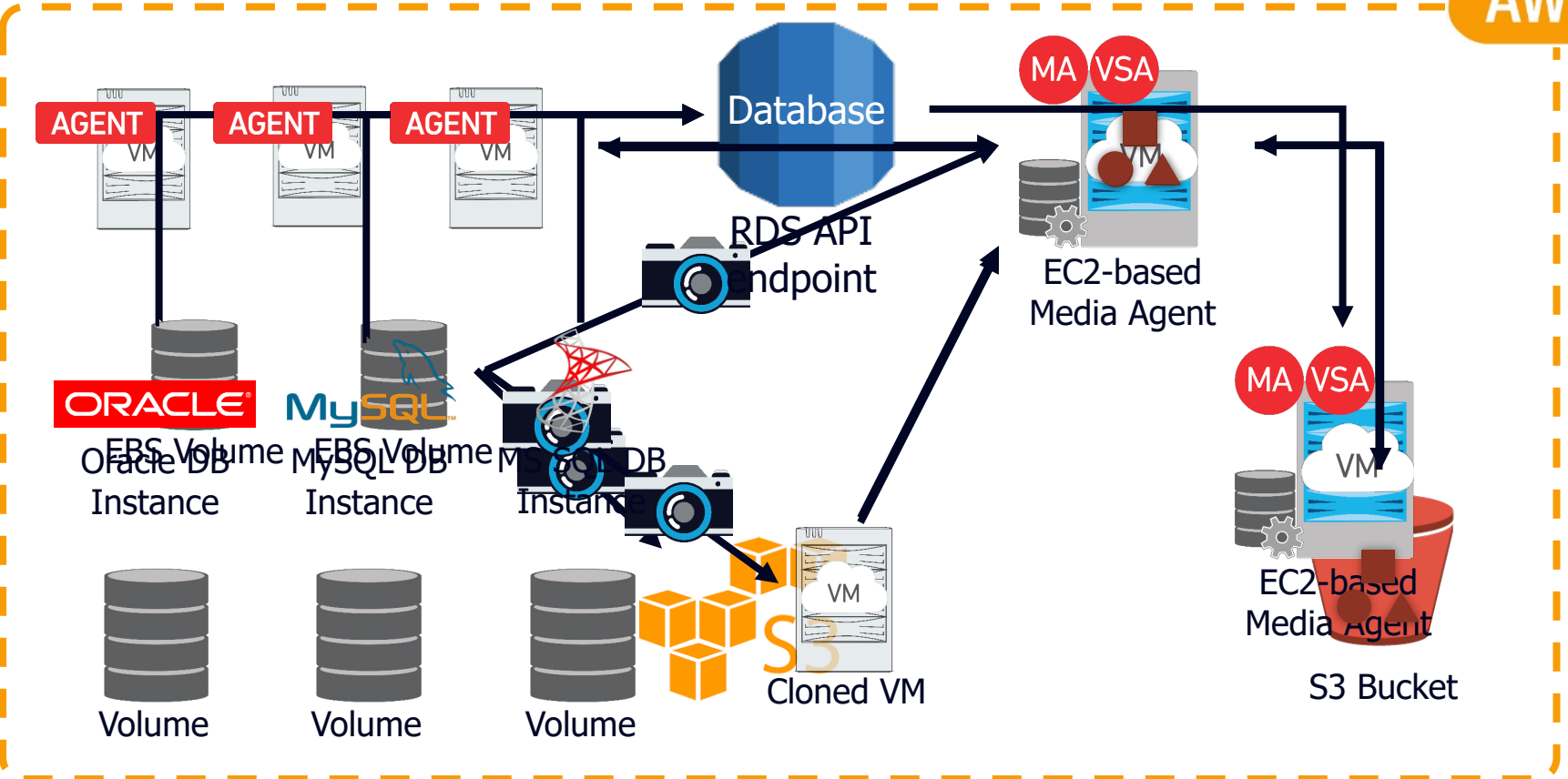
Dedicated network to cloud provider highly recommended



▶ Amazon Web Services

▶ AWS protection

- Agent-In-Guest (Streaming)
- Snapshot-based Agent-In-Guest (EBS IntelliSnap®)
- Agent-less EC2 Instance Protection (VSA)
- Agent-less EC2 Instance Protection (VSA IntelliSnap)
- Amazon S3 storage backup
- Agent-less RDS Instance Protection



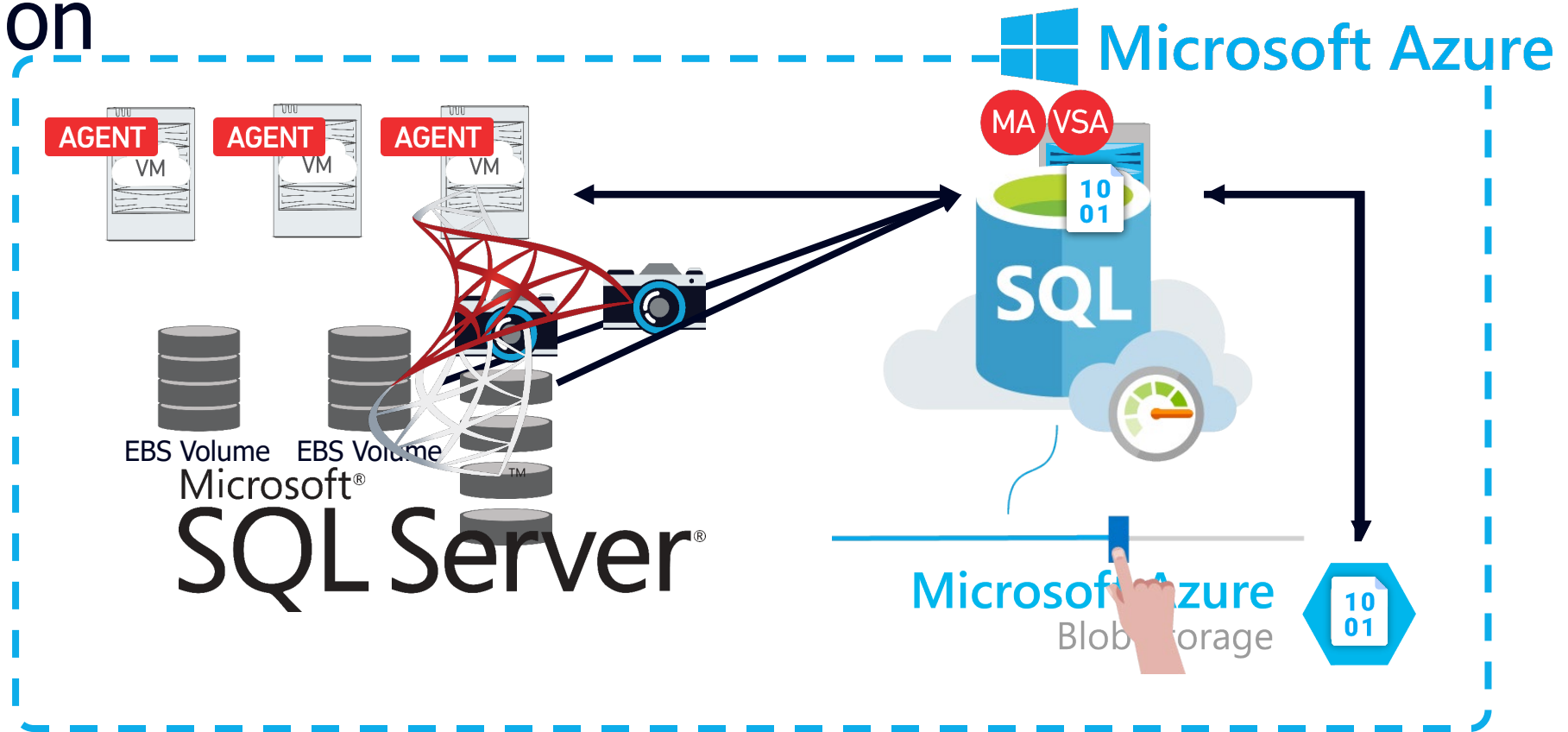
- Agentless EC2 Instance Protection for EC2 DR and file level data
- Application Consistent Snapshots (OS/SA/VM) on Linux only
- Snapshots from RDS Instance to S3 backup using DAS or aux
- Fast storage based snapshots through the same data agent
- No OS level backup currently supported
- Offload extraction tasks from snapshot into S3 through backup copy
- Keep VSA/Media Agent on 150GB DR copy in a different geographic region
- Backup copy can extract Snapshot for long-term retention at lower cost point
- Minimum 1x Data Agent per instance for interced dataset (i.e. File, SQL)

REFER TO DOCUMENTATION.COMVAULT.COM

▶ Microsoft Azure

▶ Microsoft Azure protection

- Agent-In-Guest (Streaming)
- Agent-less Azure Instance Protection (VSA)
- Agent-less Azure Instance Protection (VSA IntelliSnap[®])
- Azure Blob storage backup
- Azure DBaaS support



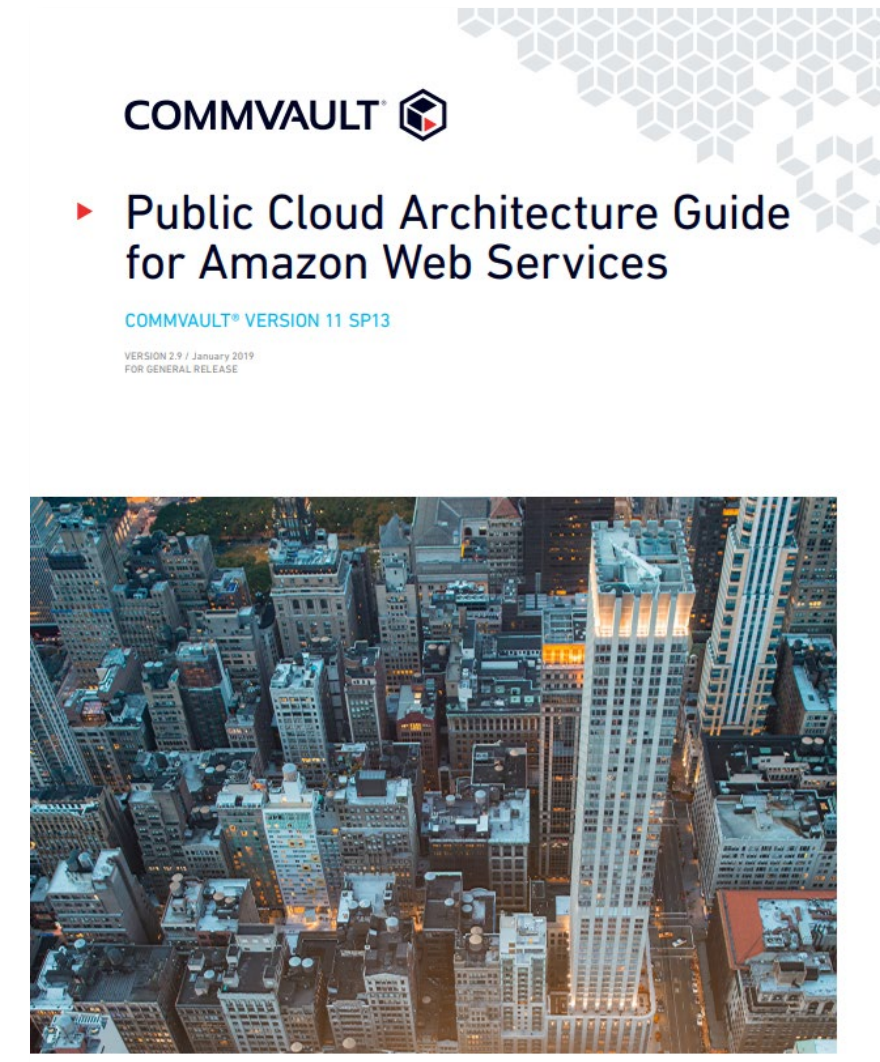
- Agentless protection for SQL by VSA (Agentless Protection)
- Backup of VSA Filesystem and data files for VSA/MA (or selective)
- Backup of the virtual disk for Agentless protection (used for Agentless with SQL Agents)
- Backup of backup copies to increase performance
- Lower Cost option for longer term retention using existing infrastructure
- Secondary Agent can provide DR copy in a different geographic region
- Support for Unmanaged and Managed disks
- Minimum 1 x Data Agent per instance for intended dataset (i.e. File, SQL)



► Architecture Sizing & Considerations

▶ Cloud Architecture Guides

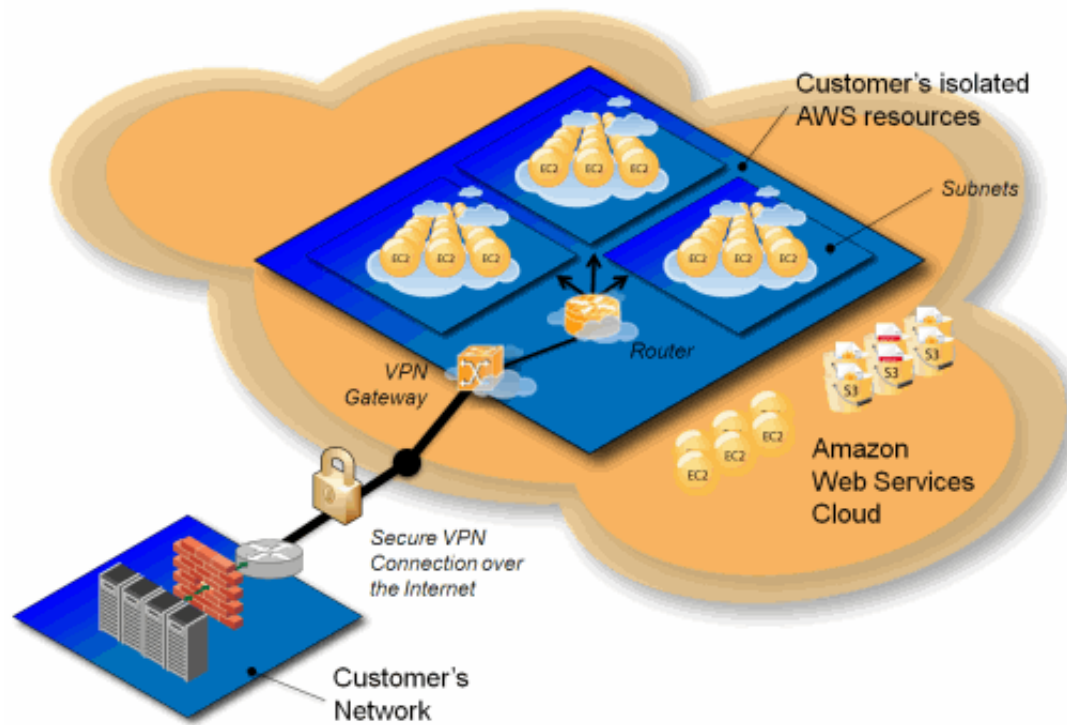
- Latest architecture sizing and considerations
- Best practices
- Specifications for:
 - CommServe®
 - MediaAgents
 - Storage



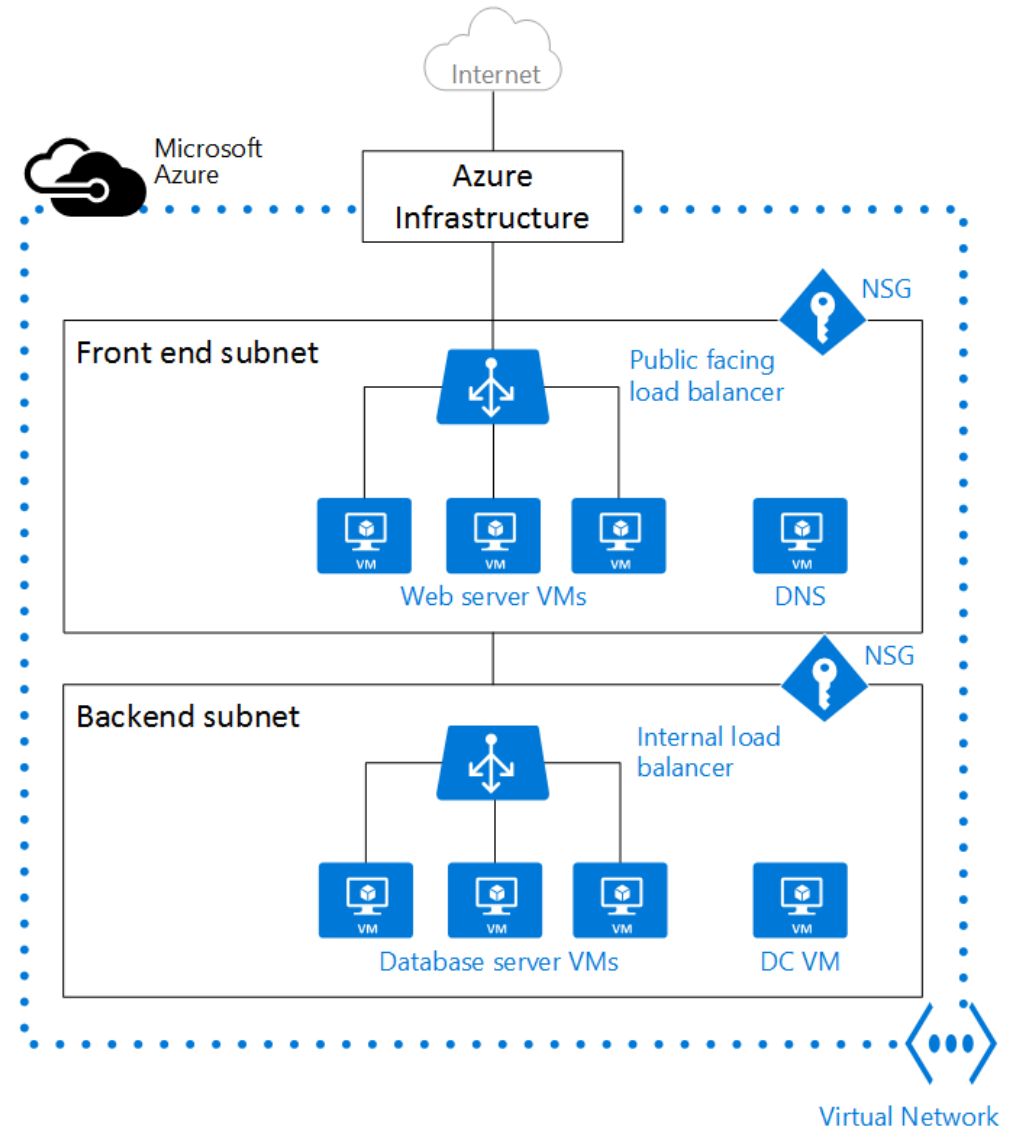
DOCUMENTATION.COMMVAULT.COM

▶ Networking

Virtual Private Cloud / Azure Virtual Network



AWS VPC Example

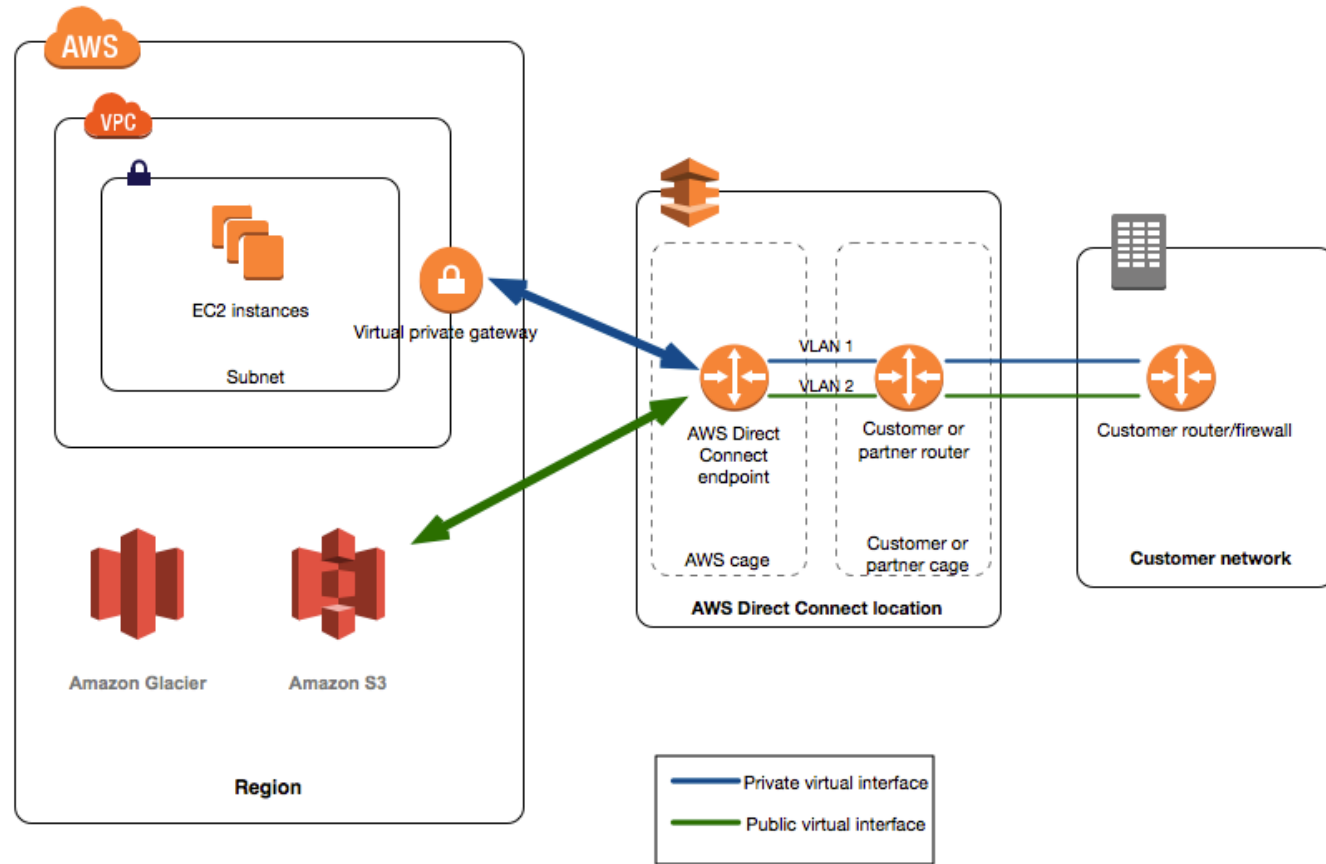


Azure Virtual Network Example

► Networking

Bridging on premise infrastructure – VPN or directconnect/expressroute

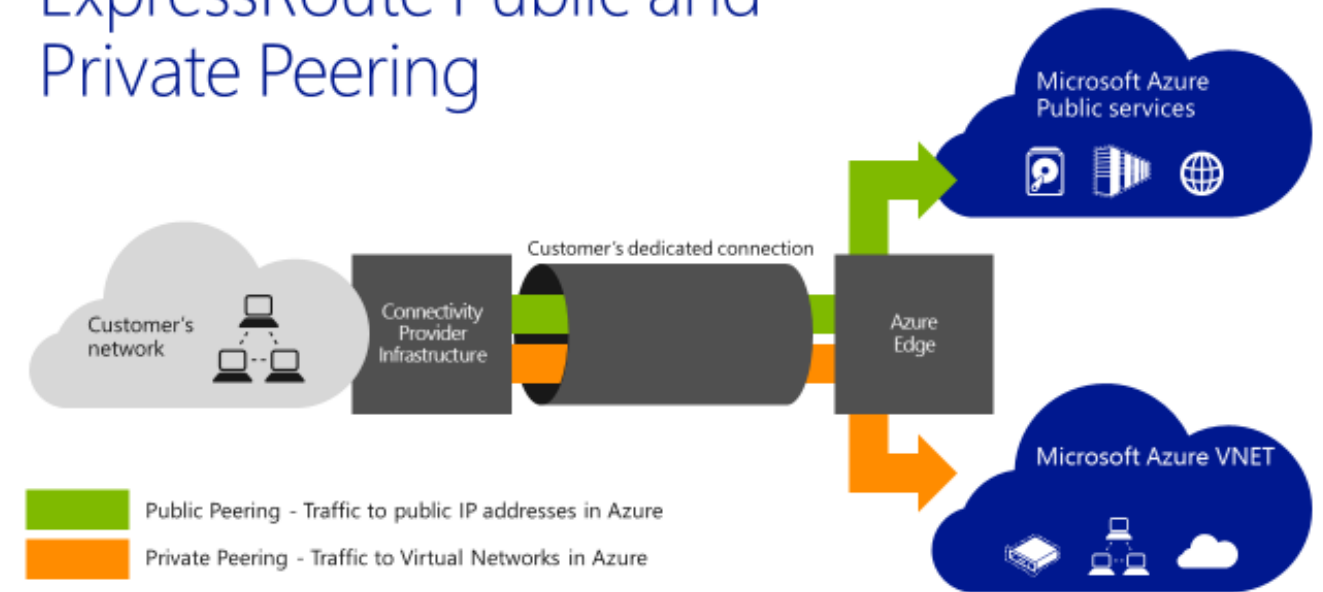
AWS Direct Connect



Or

Azure ExpressRoute

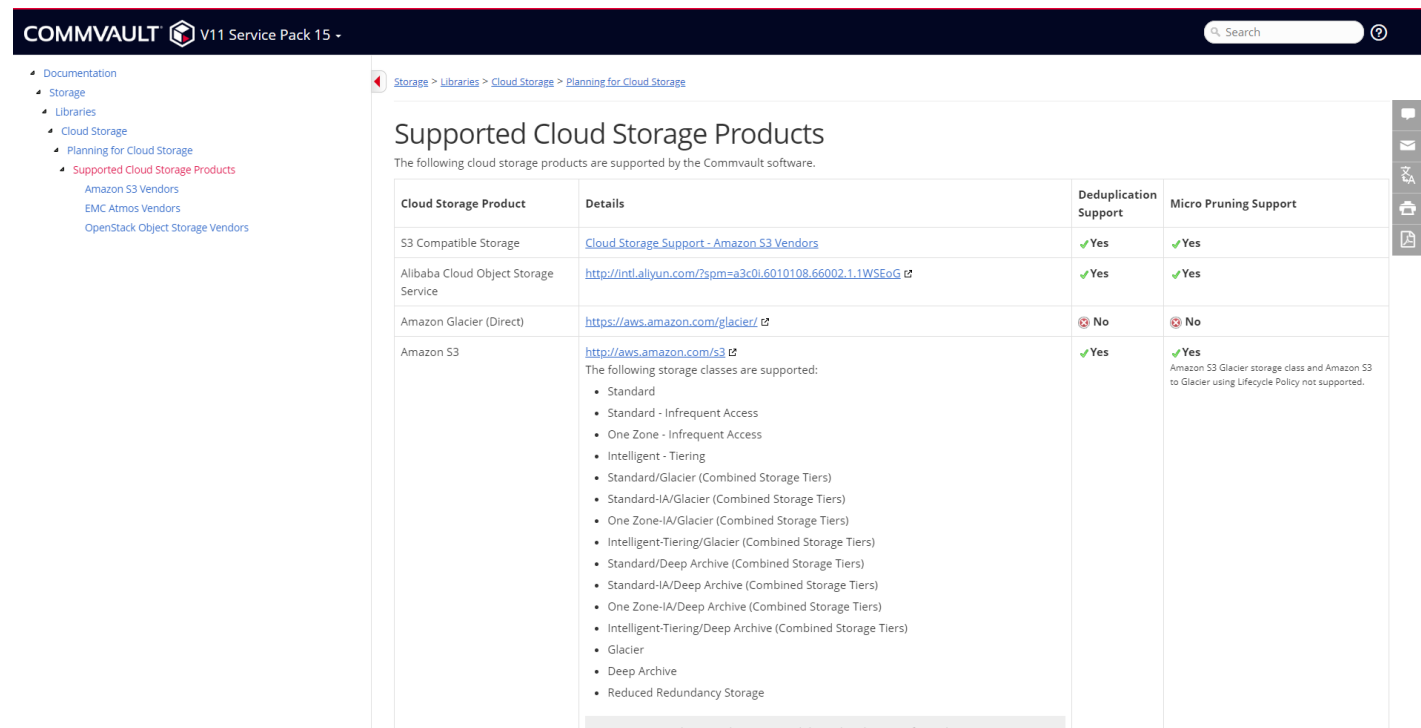
ExpressRoute Public and Private Peering



▶ Native cloud connectivity

Commvault® Cloud Storage

- Native integration through MediaAgent and HyperScale™
- Direct communication with Object Storage
- REST API interface over HTTPS



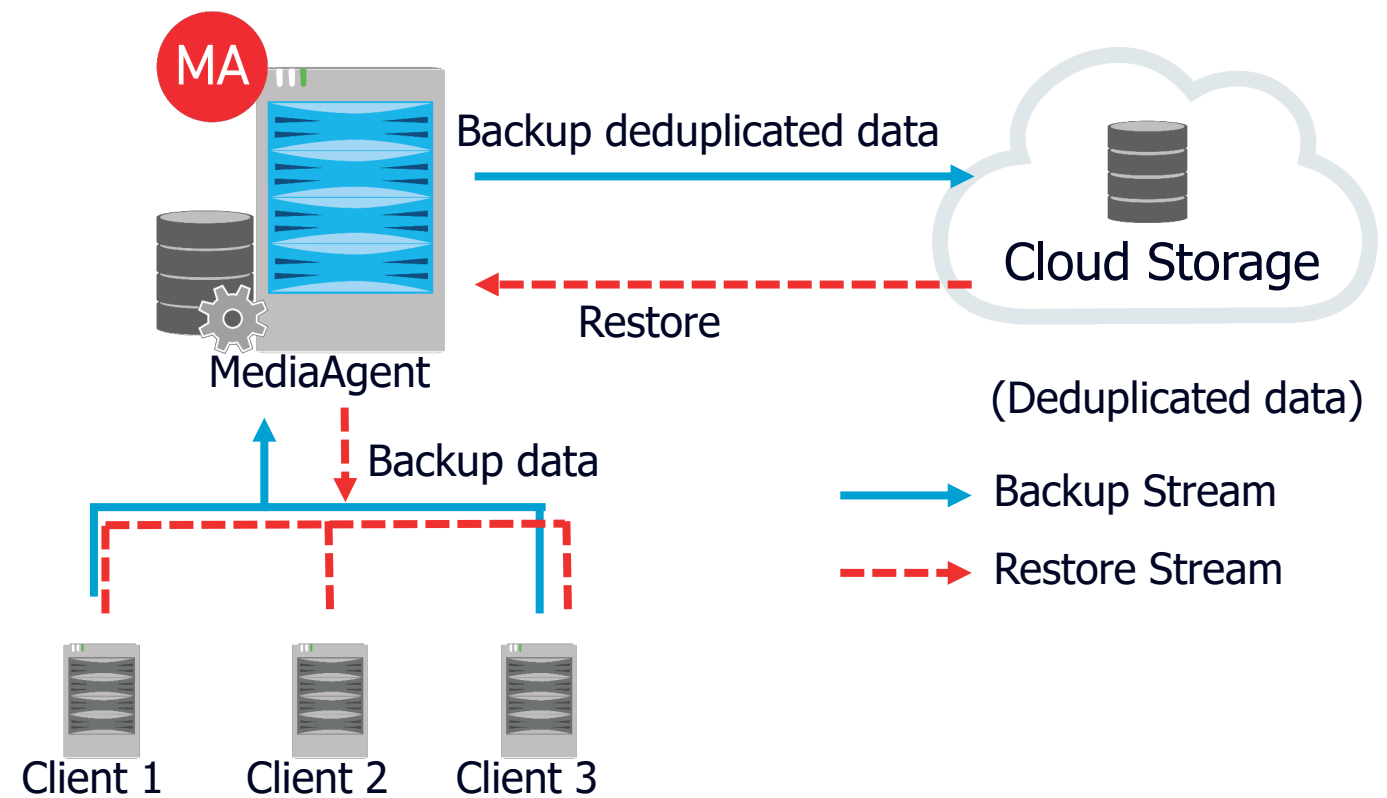
COMMVAULT V11 Service Pack 15

Storage > Libraries > Cloud Storage > Planning for Cloud Storage

Supported Cloud Storage Products

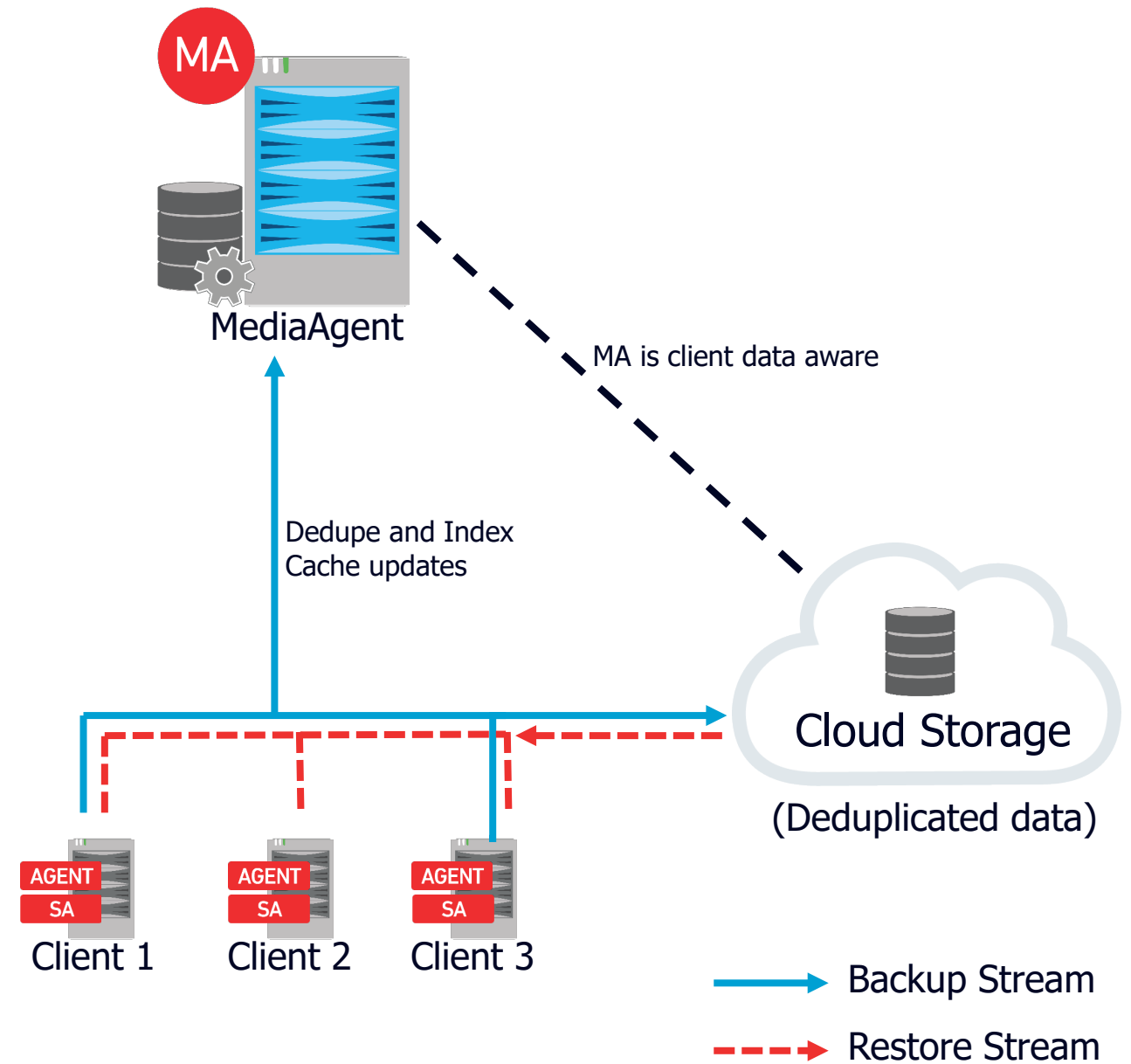
The following cloud storage products are supported by the Commvault software.

Cloud Storage Product	Details	Deduplication Support	Micro Pruning Support
S3 Compatible Storage	Cloud Storage Support - Amazon S3 Vendors	✓ Yes	✓ Yes
Alibaba Cloud Object Storage Service	http://intl.aliyun.com/?spm=93c0i.6010108.66002.1.1WSEoG	✓ Yes	✓ Yes
Amazon Glacier (Direct)	https://aws.amazon.com/glacier/	✗ No	✗ No
Amazon S3	http://aws.amazon.com/s3 The following storage classes are supported: <ul style="list-style-type: none">StandardStandard - Infrequent AccessOne Zone - Infrequent AccessIntelligent - TieringStandard/Glacier (Combined Storage Tiers)Standard-IA/Glacier (Combined Storage Tiers)One Zone-IA/Glacier (Combined Storage Tiers)Intelligent-Tiering/Glacier (Combined Storage Tiers)Standard/Deep Archive (Combined Storage Tiers)Standard-IA/Deep Archive (Combined Storage Tiers)One Zone-IA/Deep Archive (Combined Storage Tiers)Intelligent-Tiering/Deep Archive (Combined Storage Tiers)GlacierDeep ArchiveReduced Redundancy Storage	✓ Yes	✓ Yes <small>Amazon S3 Glacier storage class and Amazon S3 to Glacier using Lifecycle Policy not supported.</small>



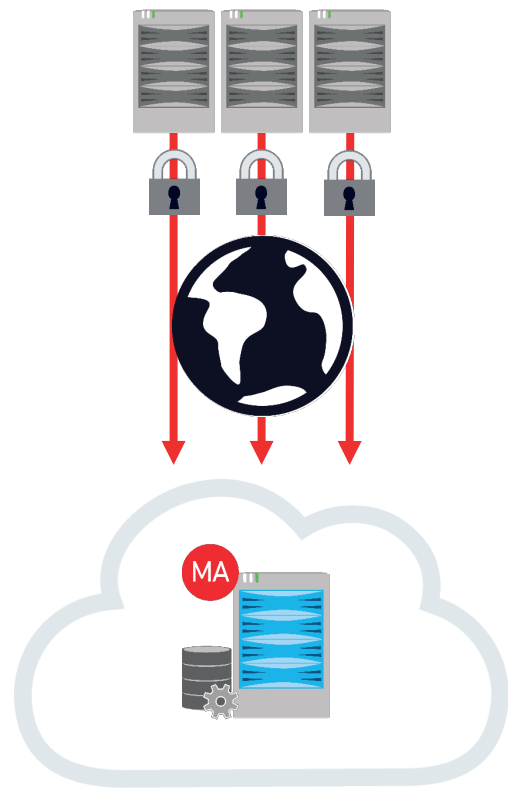
▶ Cloud Storage Accelerator

- Clients back up directly to cloud storage target
- Reduces network hops
- Faster backup and restore times
- Can save costs by not running an MA in the cloud
- Reduces MA requirements



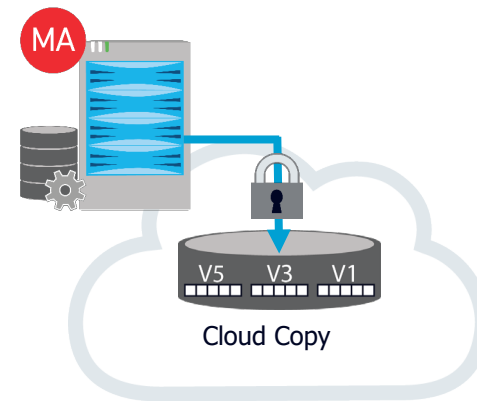
▶ Data security

In-flight



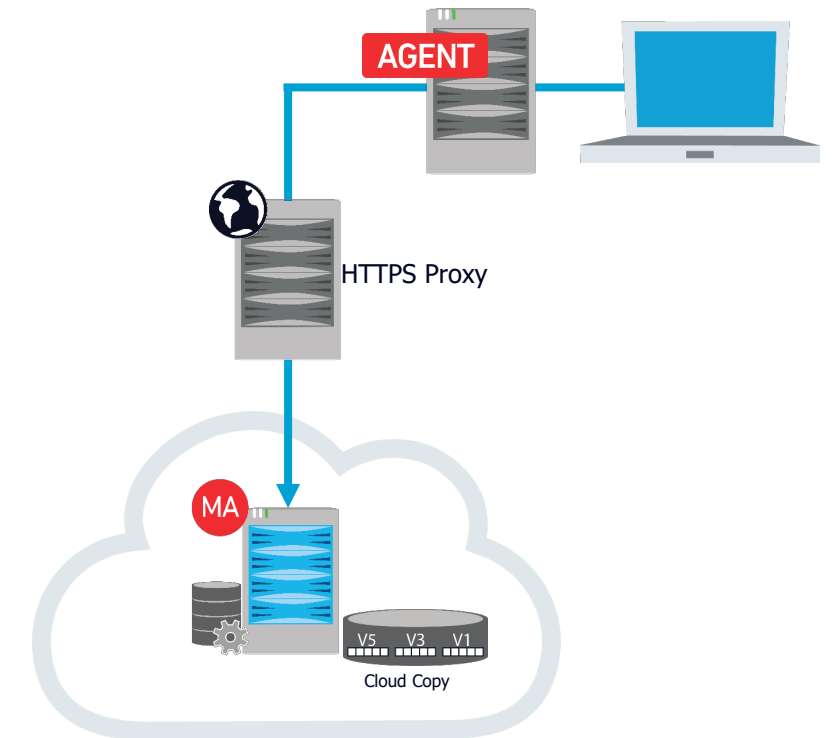
✓ Encrypt between nodes

At-rest



✓ Encrypt all data at rest

HTTPS Proxies

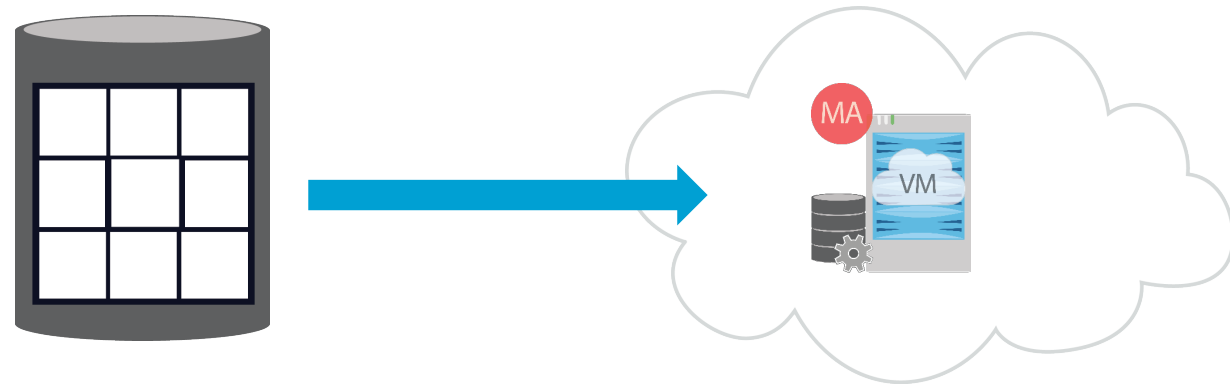


✓ HTTP(S) may impact network performance

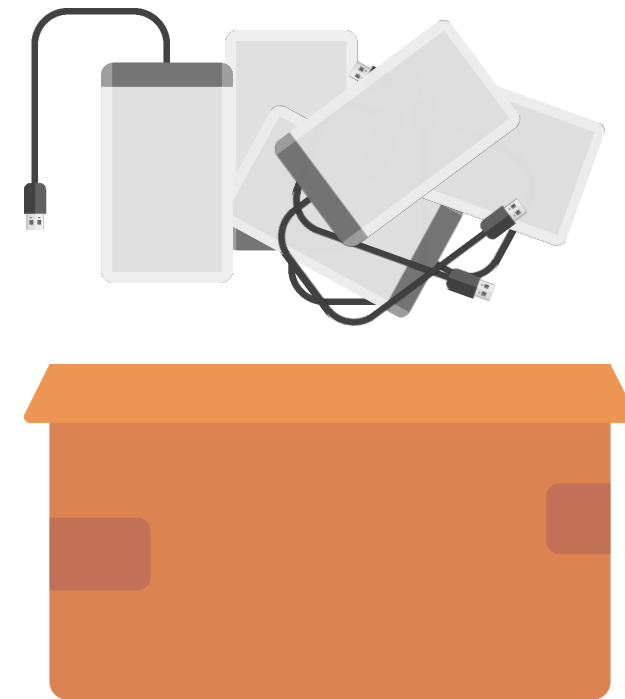
▶ Data seeding

- Process of moving initial set of data from its origin to the a public cloud provider

“Over-the-wire”

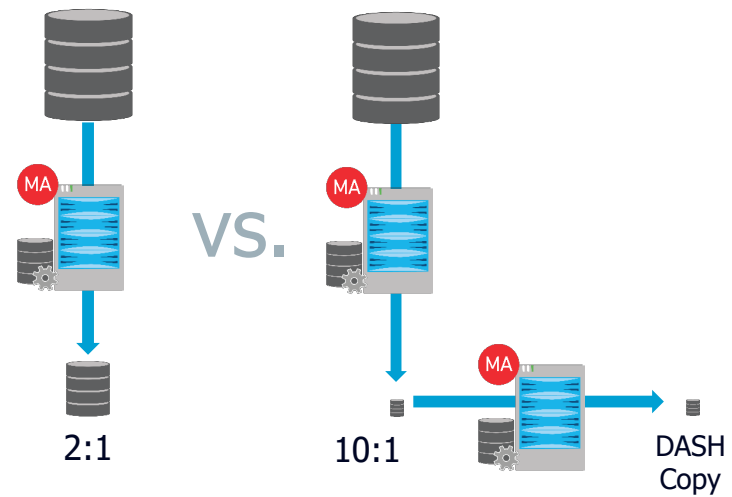


Drive Seeding

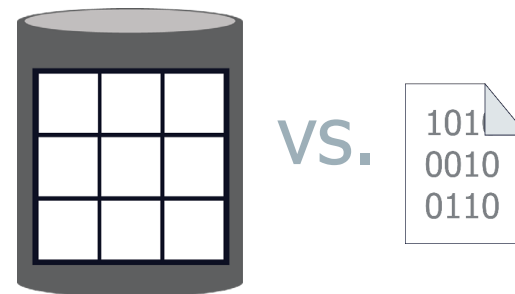


► Performance / storage

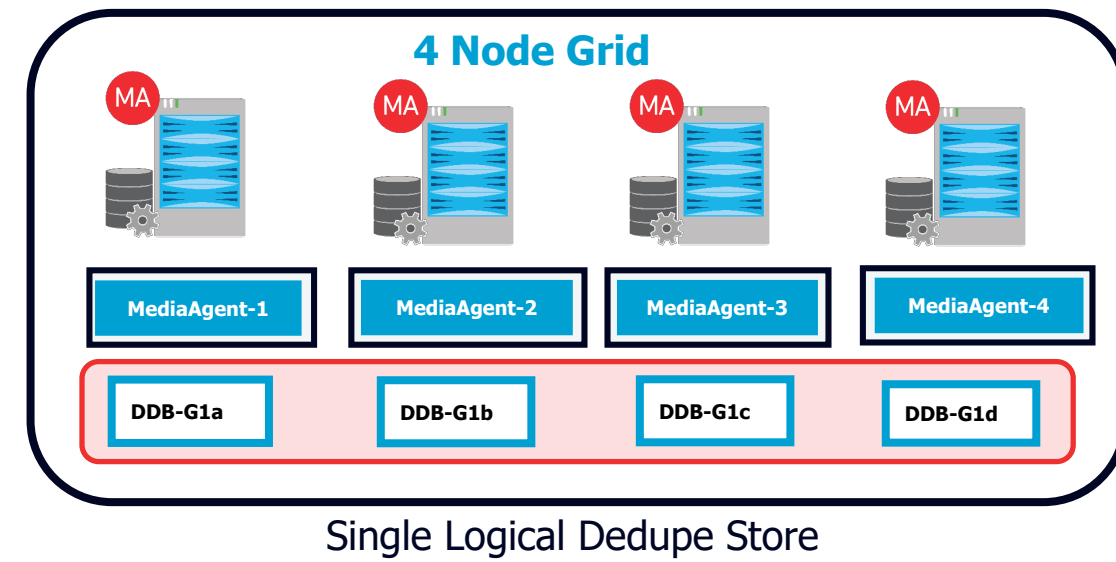
Compression vs. Deduplication



Block vs Object



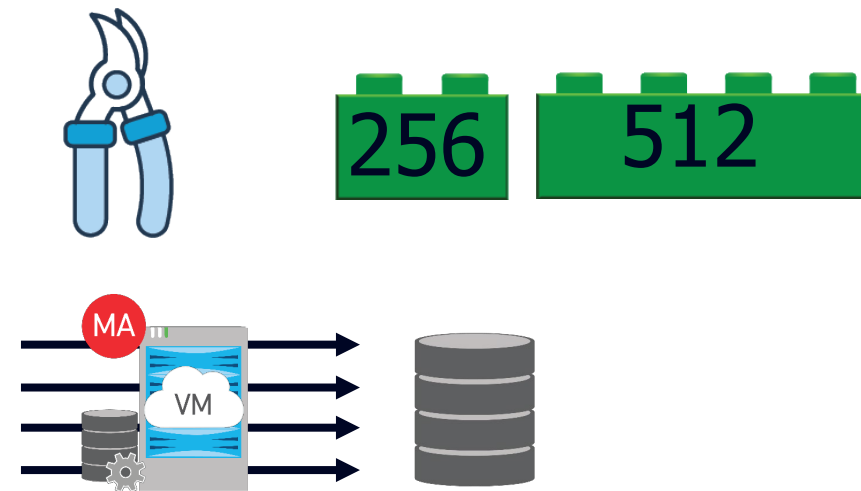
Partitioned Deduplication



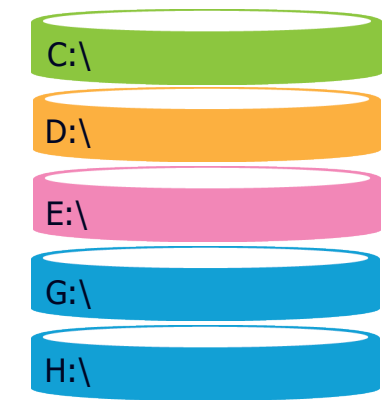
Storage Class



Fine Tuning



Multiple Mount Paths



▶ Cloud design summary

1

Follow the Cloud design principles: Scalability, Design for Recovery, Efficiency, and Automation

2

Design for the appropriate Cloud use-case(s) and use the right tool for job

3

Design Commvault[®] components using the latest architecture sizing guidelines

4

Consider other key components that influence the design (e.g. networking, security and storage)

Ontdek de kracht van Microsoft Azure Intelligent Cloud met Azure NetApp Files & Cloud Volumes ONTAP

Geert van Teylingen, Microsoft

