

Rubrik Elastic App Service: Fast and Adaptive Database Application Protection

EMPOWERING DATABASE AND BACKUP ADMINS WITH A FLEXIBLE, EFFICIENT, AND UNIFIED FRAMEWORK

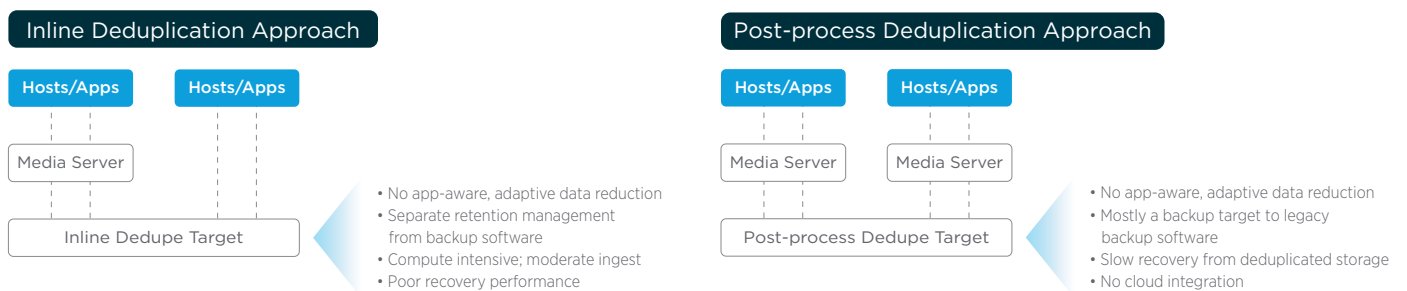
CHALLENGES WITH EXISTING SOLUTIONS

Database application backup and recovery have been complex with different approaches. Many enterprise backup solutions were created decades ago when tape was the primary, if not only, backup target because disk-based storage was very expensive. Production workloads were also small enough to support the periodic full backup method. As a result, deduplication target appliances emerged to solely address the storage efficiency problem with periodic full backups. Over time, to overcome inefficiencies with antiquated backup software designs, the deduplication appliance vendors developed host-side intelligence to bypass backup servers. This “native backup” from host applications to the deduplication target gained momentum among database administrators (DBAs) who preferred complete control over database backup and recovery.

However, deduplication targets have many of their own caveats. First and foremost, they were designed to support legacy backup software and, in many cases, cannot solve inefficient problems with backup software (brain for backup and recovery) that was designed for tape and smaller workloads. Fast forward, now we have enterprises racing to hybrid cloud and next-generation applications where age-old deduplication techniques are a misfit.

Second, almost all of deduplication appliances were designed with inflexible deduplication methods. For example, most deduplication appliances in the market use inline deduplication, which is very storage efficient but consumes a lot of compute and memory resources, increasing cost and impacting ingest speed. Since raw storage has been commoditized, this CPU-centric design has fallen out of step with market pricing trends. More importantly, recovery is much slower with inline deduplication – usually half the throughput as ingest – due to data rehydration penalty. The rehydration process, combined with the fact that they are not designed for random IOs, makes it also less feasible for instantly accessible test/dev clones and instant recovery – an increasingly popular demand from DBAs and application admins. Post-process deduplication solutions, on the other hand, do not have the performance issue with ingest and recovery from the latest backup, but recovery from deduplicated backup will be slow due to rehydration. They may also suffer from poor random IOs – not suitable for the live mount use cases (see Figure 1).

Figure 1. Legacy Approaches to Target Deduplication



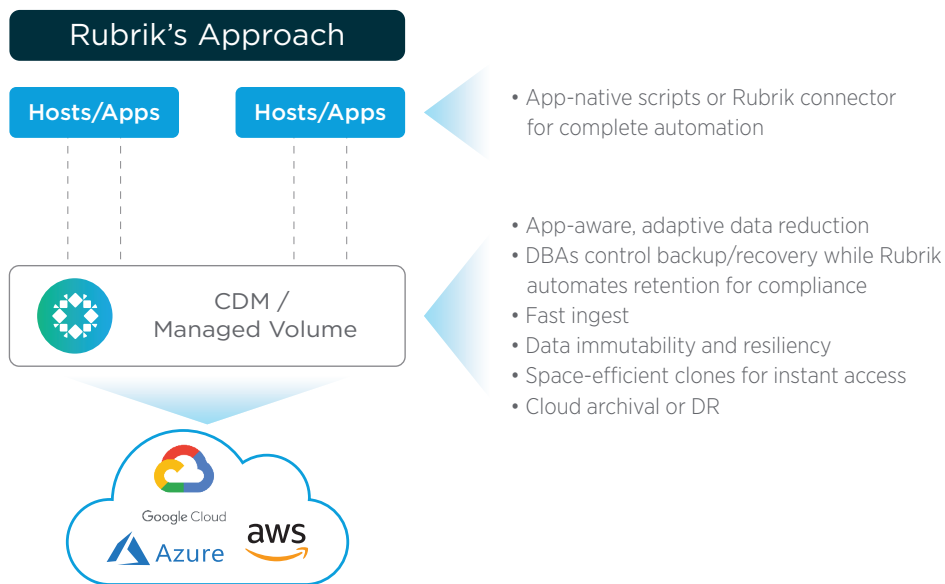
Third, deduplication targets are not application or database aware (case in point, native compression of database workloads), which is typically the function of heavy backup agents. As these targets perform “blind” deduplication, it results in wasted resources in compute and memory, especially if run in metered environments like Public Cloud infrastructure.

Organizations are facing changing market economics, modern workloads born out of digital transformation initiatives, new DevOps requirements for instant access to copy data, and different control points for database backup. They are in urgent need of an integrated data management solution designed for automation, flexibility and well-rounded efficiency, with the consideration of modern consumption-friendly pricing dynamics.

THE INNOVATION RUBRIK BRINGS WITH ELASTIC APP SERVICE

Rubrik introduced a new offering called Elastic App Service (EAS), which is a portfolio name for multiple services to protect any database or application using their own native data backup utility. The first of its many services, introduced with v5.0 release, is the new, built from ground up Managed Volume capability. Rubrik’s design principles for EAS follow the industry best-practice guidelines gained over the years to offer a well-rounded compute and storage efficiency. Elastic App Service (see Figure 2), together with Rubrik Backup Service, enables the Rubrik Cloud Data Management (RCDM) to offer enterprises a highly automated solution with robust choices of backup methods for different control points and/or workloads.

Figure 2. Rubrik’s Intelligent and Flexible Data Reduction Approaches



EAS allows DBAs to use their pre-built app-native scripts to manage backup and recovery and use RCDM as an automated and centralized backup target. However, unlike other deduplication targets in the market that offer a inflexible inline or post-process deduplication methods, EAS is designed with the intelligence to choose the most appropriate data reduction method under the hood for a given workload, overcoming many constraints with traditional deduplication targets. Specifically, Rubrik’s innovation stands out in the market in the following areas:



APP-AWARE DATA REDUCTION

For many mainstream or emerging databases and applications, EAS performs effective data reduction without using excessive compute and memory. This is achieved by leveraging, whenever available, host-side change-tracking mechanisms to reduce data from the source, as well as choosing an optimal chunking method based on the nature of application or database for data reduction. In contrast, traditional deduplication targets perform blind deduplication without application awareness, resulting in high compute consumption, average ingest throughput and

poor restore performance. Today EAS supports app awareness for the following data sources:

- **Oracle:** Use RMAN backup set or image copies
- **SAP HANA:** SAP certified for Backint, HANA Studio and Cockpit
- **Microsoft SQL Server:** Native and third-party SQL Server data backup/dump tools
- **MySQL:** Native and third-party MySQL data backup/dump tools

- **PostgreSQL:** Native and third-party PostgreSQL data backup/dump tools
- **NoSQL (MongoDB, Cassandra, others):** Uses Rubrik Datas IO's application-consistent, automated backup with semantic deduplication and advanced features such as data masking and queryable recovery.



BROAD DATABASE/APPLICATION SUPPORT

EAS broadens Rubrik's support to any database or applications. For those database applications that are not included in the app-aware drop-down menu, it blindly deduplicates whatever lands on it, mimicking the behavior of traditional deduplication devices. For example, when backing up vendor-specific tools like IBM DB2 Merge backups. SAP BR*Tools can make use of EAS volumes that are not tagged at all or tagged for Oracle backup sets.



CO-STEWARDSHIP BETWEEN DBAS AND BACKUP ADMINS

DBAs are empowered with self-service backup and recovery, while backup admins can ensure backup data compliance using the same RCDM SLA Domain for archiving or replication, unlike legacy solutions that separate deduplication appliance management from backup software management.



INSTANTLY ACCESSIBLE ZERO OVERHEAD CLONES

Unlike legacy deduplication targets that are not built for test/dev use cases, the snapshots of EAS can be mounted and exposed on demand to test/dev environments, reducing the time needed to make copy data available for Test/Dev use cases without impacting production.



FAST INGEST

Rubrik's innovative approach and scale-out architecture result in faster ingest – at many orders of magnitude – than traditional deduplication target solutions.



DATA RESILIENCY AND AVAILABILITY

The EAS is a distributed volume that is protected via erasure coding (4:2) across multiple nodes, making backup data resilient to both drive and node failures. Unlike single-head deduplication devices, EAS withstands node failures with automatic failover of floating IP addresses.



DATA IMMUTABILITY

Data landed in EAS is immutable, even when app host is held by ransomware. Unlike traditional solutions that serve as general NFS/CIFS targets, whose entire backup repository can be encrypted and locked up by ransomware (which negates the purpose for the backup), Rubrik's EAS offers an immutable repository once the backup is complete and the NFS share is unmounted.



TIGHT INTEGRATION WITH RCDM

Unlike traditional deduplication target devices, which were designed to function separately from backup software (fragmented management points), EAS is tightly integrated into the overall RCDM platform, using the same simple automated SLA based policy management.

CONCLUSION

Rubrik's EAS offers an innovative and automated approach to deliver high-performance ingest and instant access to data copies to cater to modern-day data management requirements. Unlike other deduplication target solutions in the market, which have inflexible choices and associated constraints, EAS offers adaptive data reduction methods under the cover, making the sensible decision for customers across their enterprise workloads. Moreover, the tight integration with the backup engine and other services in RCDM provides an unparalleled operational simplicity, empowering infrastructure agility.



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Rubrik delivers a single platform to manage and protect data in the cloud, at the edge, and on-premises. Enterprises choose Rubrik's Cloud Data Management software to simplify backup and recovery, accelerate cloud adoption, and enable automation at scale. As organizations of all sizes adopt cloud-first policies, they rely on Rubrik's Polaris SaaS platform to unify data for security, governance, and compliance. For more information, visit www.rubrik.com and follow [@rubrikinc](https://twitter.com/rubrikinc) on Twitter.