Actifio CDM

Radically Simple Copy Data Management

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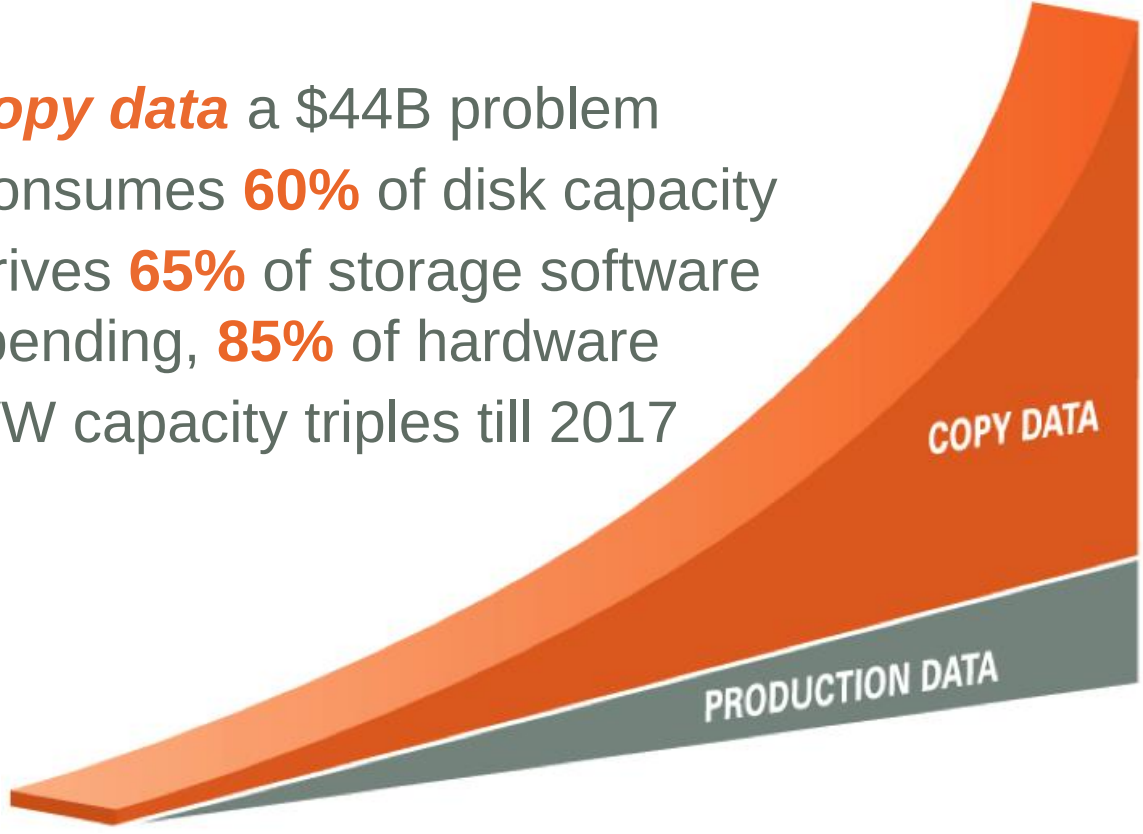
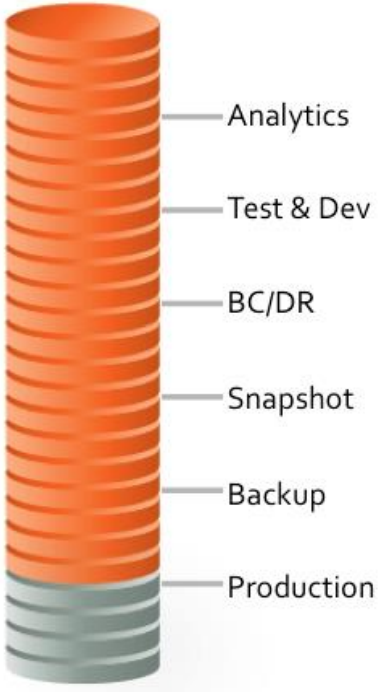
The Storage Explosion

- ***Copy data*** a $44B problem
- Consumes **60%** of disk capacity
- Drives **65%** of storage software spending, **85%** of hardware
- WW capacity triples till 2017





*IDC Insight document (#239875)

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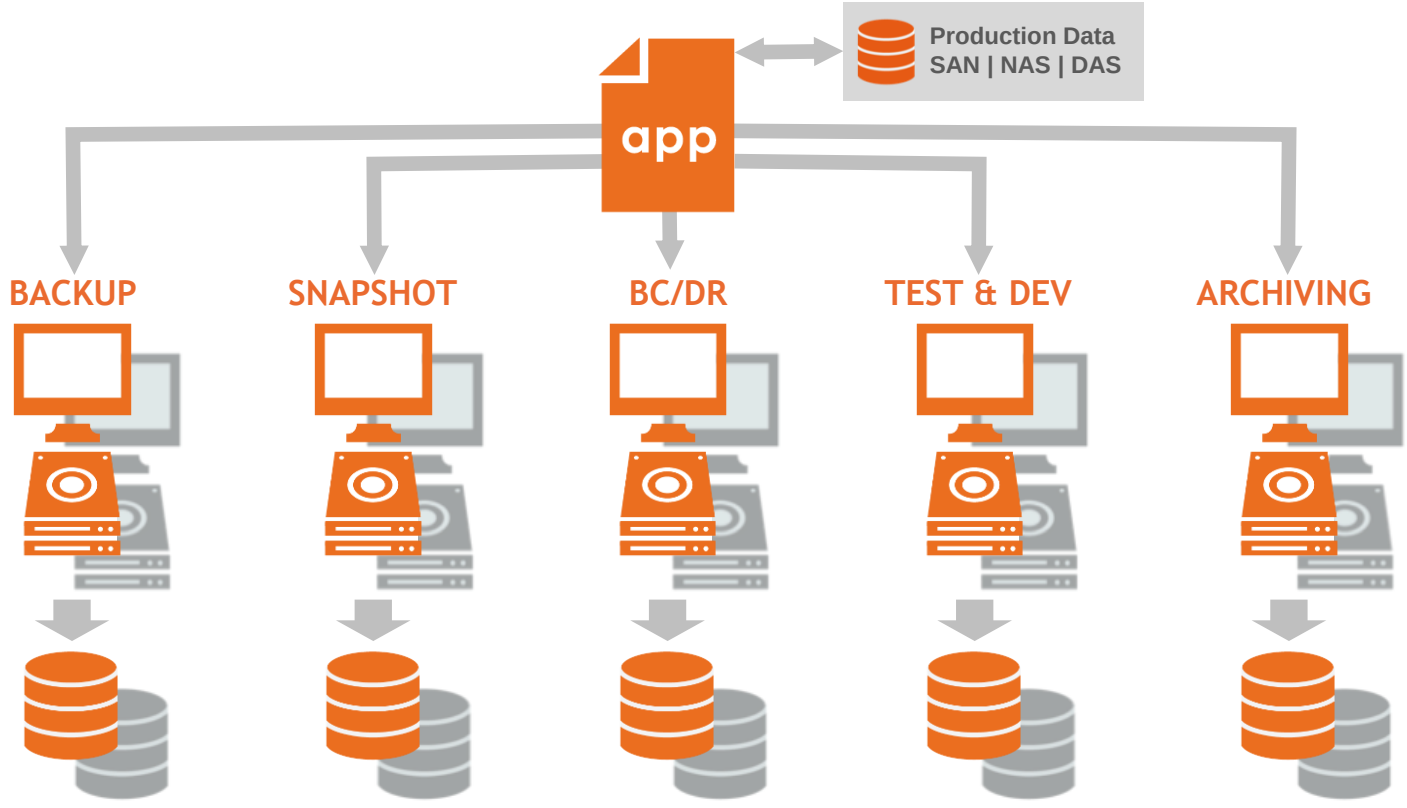
The Root Cause



Physical IT

Virtual IT

DUPLICATION + INFRASTRUCTURE + OPERATIONS + COMPLEXITY + COST

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What We Do

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Radically simple copy data management.

Recovery Time measured in ***seconds***. Even for multi-terabyte files.

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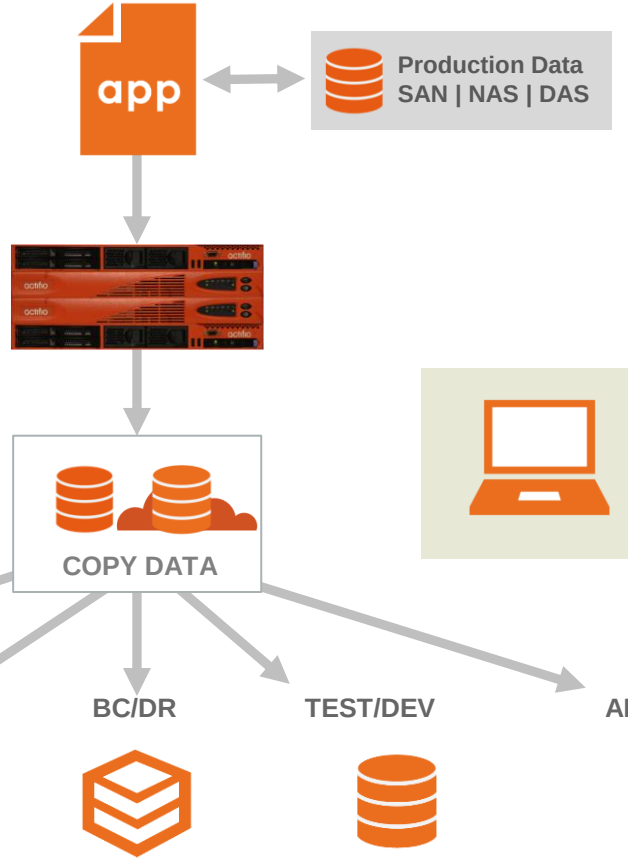
A New Approach

1. Full ingest once, unique changes from there.
2. Store & move only unique de-duped data.
3. Instantly access virtual copies for any use.



4. Single pane, app-centric, SLA-driven.

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Oracle Database Management

A Single solution for
Backup, Disaster Recovery, Business Continuity & Rapid Application Development

Oracle Database Environment

Two options for using Actifio CDS for Oracle Database copy data management:

Network Configuration (Out-Of-Band)

- Actifio CDS is connected over FC or ISCSI in the network (not in data path)
- RMAN backup using RMAN to directly write to copy data store presented by Actifio CDS
- Incremental for ever backup using RMAN Incrementally Updated Backups, rolling forward image copy backups

In-Band Configuration

- Actifio CDS is configured within the SAN fabric (in the data path)
- Volume based snapshot
- Capture incremental changes by monitoring the traffic between the database application and the SAN disk storage system

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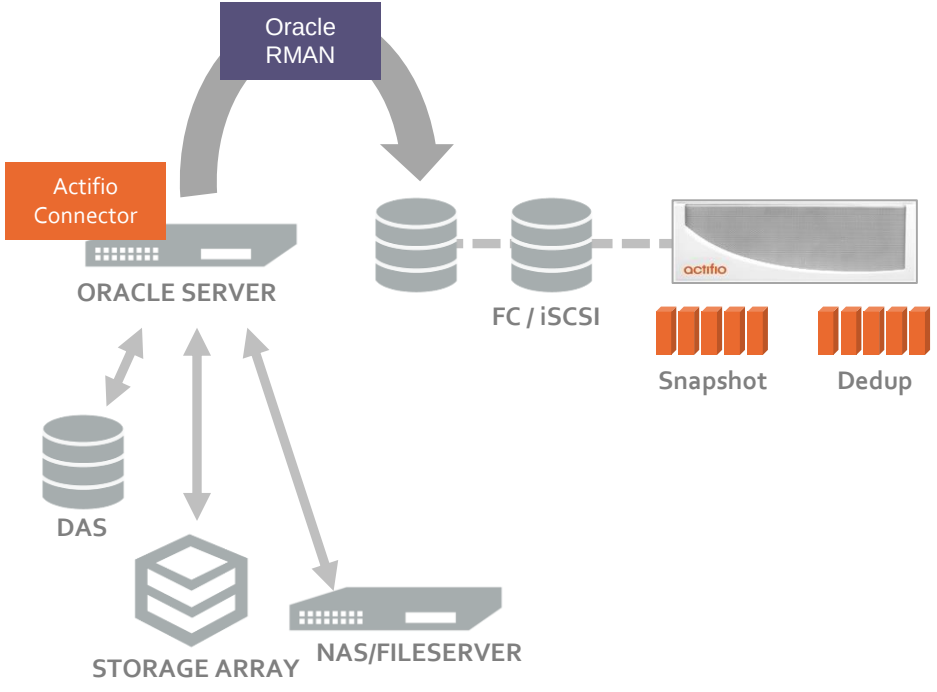
Data Capture - Oracle Out Of Band

METHOD:

RMAN Integration across fiber/iSCSI SAN



1. Mount Staging Disk on Server
   - Mounted via FC or iSCSI
2. RMAN BACKUP
   - First backup: RMAN level-0 image copy backup
   - RMAN level-1 incremental backup (get changed block only)
   - Roll-forward and merge the latest image (changed Block) with the last full with RMAN recover copy making new full on backup staging disk
3. Un-Catalog backup from database control file or recovery catalog using RMAN
4. Un-Mount Staging Disk on Server
5. Snapshot Staging Disk on Actifio

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Data Capture: Oracle RMAN backup

Oracle RAC --Transparent fail-over of backup

- Actifio out-of-band Oracle RMAN incremental forever backup provides transparent fail-over of backups within the RAC nodes continuing in an incremental fashion (based on backup fail-over configuration set by the customer).
- For example in a 4 node RAC configuration:
    - Oracle RMAN out-of-band protection is set from node 4 (maintenance node).
    - Configuration is set to continue the backup from node 3, 2, 1 in order, in case node 4 is not available.
    - In case of node 4 not available, Actifio backup will continue its RMAN incremental backup from the next available node specified in the configuration.
    - Actifio also provides capability of switching the maintenance node dynamically without affecting the incremental behavior.

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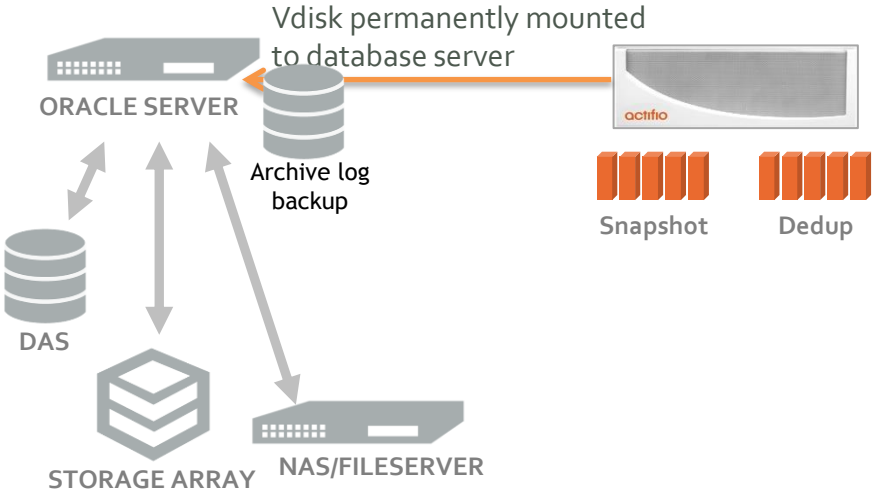
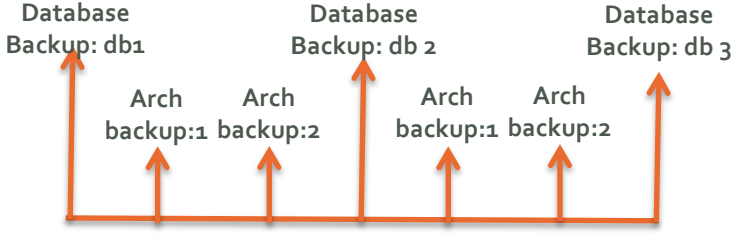
Data Capture: Oracle Archive Log



1. Protect the archive folder as file system
2. Mount a staging disk permanently to database server.
3. Configure Archive protection as:
   - Configure the database to add 2nd archive destination (as optional destination) to Actifio mounted vdisk

     OR
   - Configure pre script to run archive backup on Actifio mounted vdisk
4. Configure Snapshot of the Vdisk (frequency based on application RPO).



- Full or point in time recovery between two backups.

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Out Of Band: Versions & Requirements

Supported Versions:

- Oracle version: 10g, 11g , 12c
- Oracle set up: Support all oracle configuration
  - **ExaData**
  - **Standalone File system**
  - **standalone ASM**
  - **RAC with ASM**
- Support for Linux RHEL, SLES, AIX, HPUX and Windows available. Other OS support in progress.

Requirement:

- Connector install on protected database server.
- Database must be running in archive mode for RMAN Hot backup
- Recommend to run the database with change block tracking on.

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Out Of Band: Copy Data Access

- Database Restore and Recovery:

  Physical Recovery

  - Full database recovery with RMAN using database backup image and archived backup image
  - Point-In-Time database recovery to any given point with RMAN using database backup image and roll forwarding the archive backup image
  - Table space and data file recovery with RMAN using database backup image and the archive backup image
  - Block corruption recovery with RMAN using database backup image and the archive backup image

  Logical Recovery

  - Logical / Granular Database Recovery Management (Schema, Index, Procedures, etc.)
  - Ability to selectively manage objects within the database, not JUST the full database

- Dev Ops and Workflow:
  - Test and Dev database can be instantly refreshed using mount of database backup image. Test and Dev database will be running out of mounted virtual copy of database backup image.
  - Workflow set up for automating and provisioning a virtual copy of database to one or many test and dev environment using point in time production backup snapshot .

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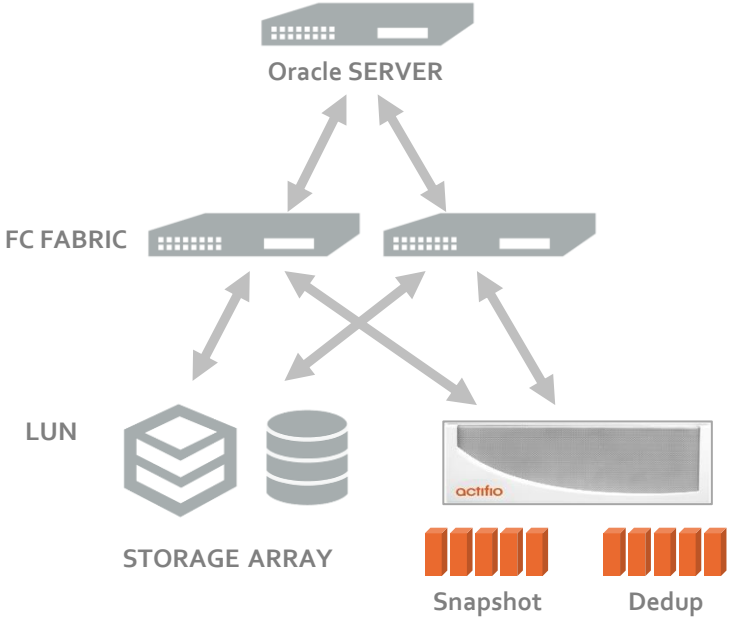
Data Capture: Oracle In-Band

METHOD:

Actifio Snapshots providing immediate data protection & zero backup window



Initial Setup

1. Original LUN Mapping
   - Array to Server
2. Unmap LUN
3. Map LUN from Array to Actifio
4. MAP LUN from Actifio to Server
   - Array to Actifio to Server

Data Capture

1. Quiesce Application
   - Database hot backup mode using Actifio pre script for application consistent snapshot.
2. Snapshot In-band LUN
3. Un-Quiesce Application:
   - End database hot backup mode using Actifio post script.

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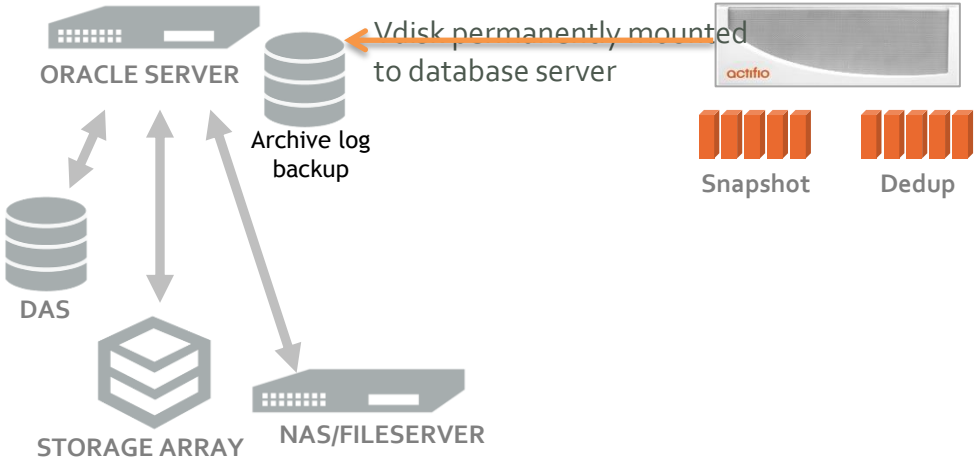
Data Capture: Oracle Archive Log



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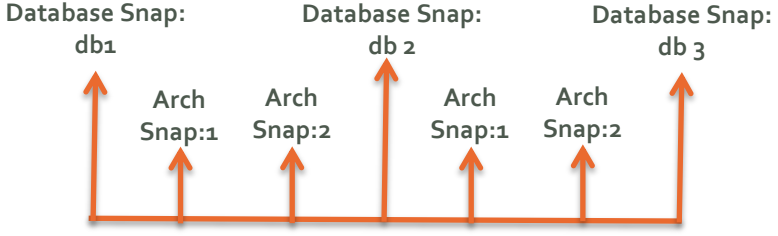

- Full or point in time recovery between two backups.

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In Band: Versions & Requirements

- Oracle version: 9i, 10g, 11g , 12c
- Oracle set up: Support all oracle configuration
  - **Standalone File system**
  - **Standalone ASM**
  - **RAC with ASM**
- Support for all OS

Requirements:

- Database must be running in archive mode for application consistent backup

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In Band: Copy Data Access

- Instant in-place full or PIT database recovery using snapshot restore and roll forward of archive backup using RMAN
- ASM to ASM restore and recovery on same server or to a new server.
- Table space/Data file recovery with RMAN by cataloging the backup snapshot
- Database block corruption with RMAN by cataloging the backup snapshot.
- Dev Ops and Workflow:
  - Test and Dev database can be instantly refreshed using mount of database backup image. Test and Dev database will be running out of mounted virtual copy of database backup image.
  - Workflow set up for automating and provisioning a virtual copy of database to one or many test and dev environment using point in time production backup snapshot .

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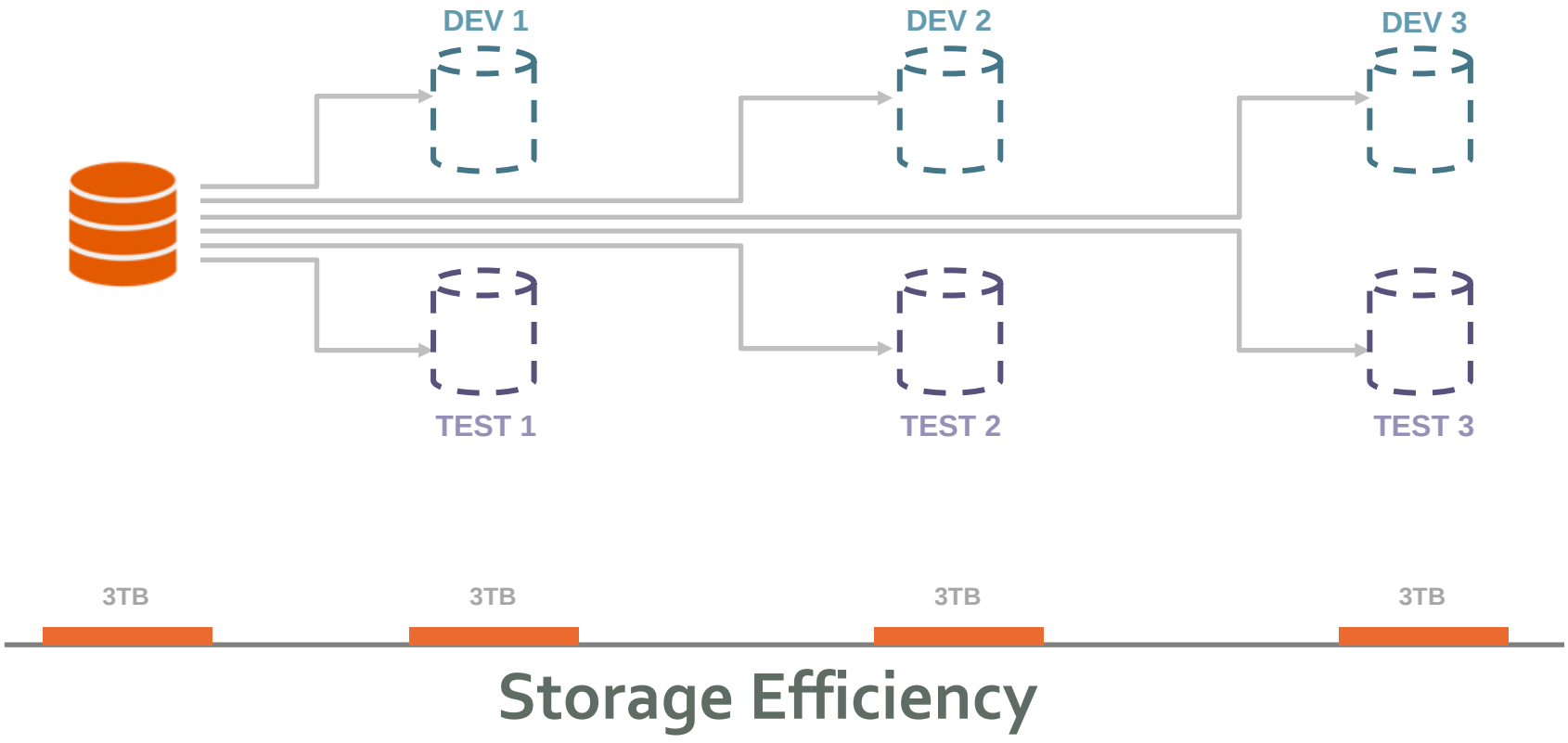
Virtual Instance: Simplicity & Savings



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