

# Actifio CDM

## Radically Simple Copy Data Management

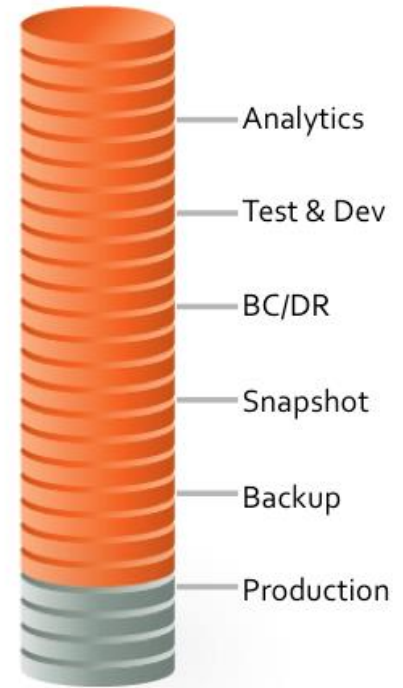
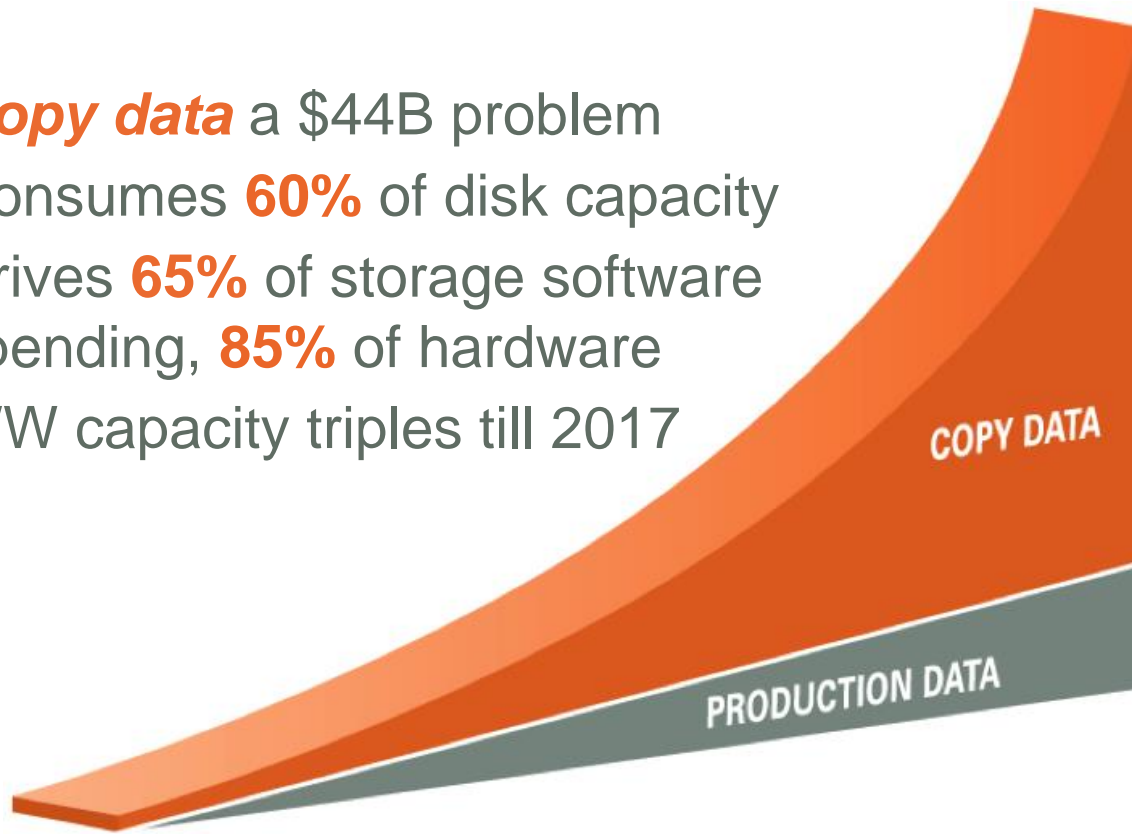


Andreas Mauser  
Inside Sales Manager



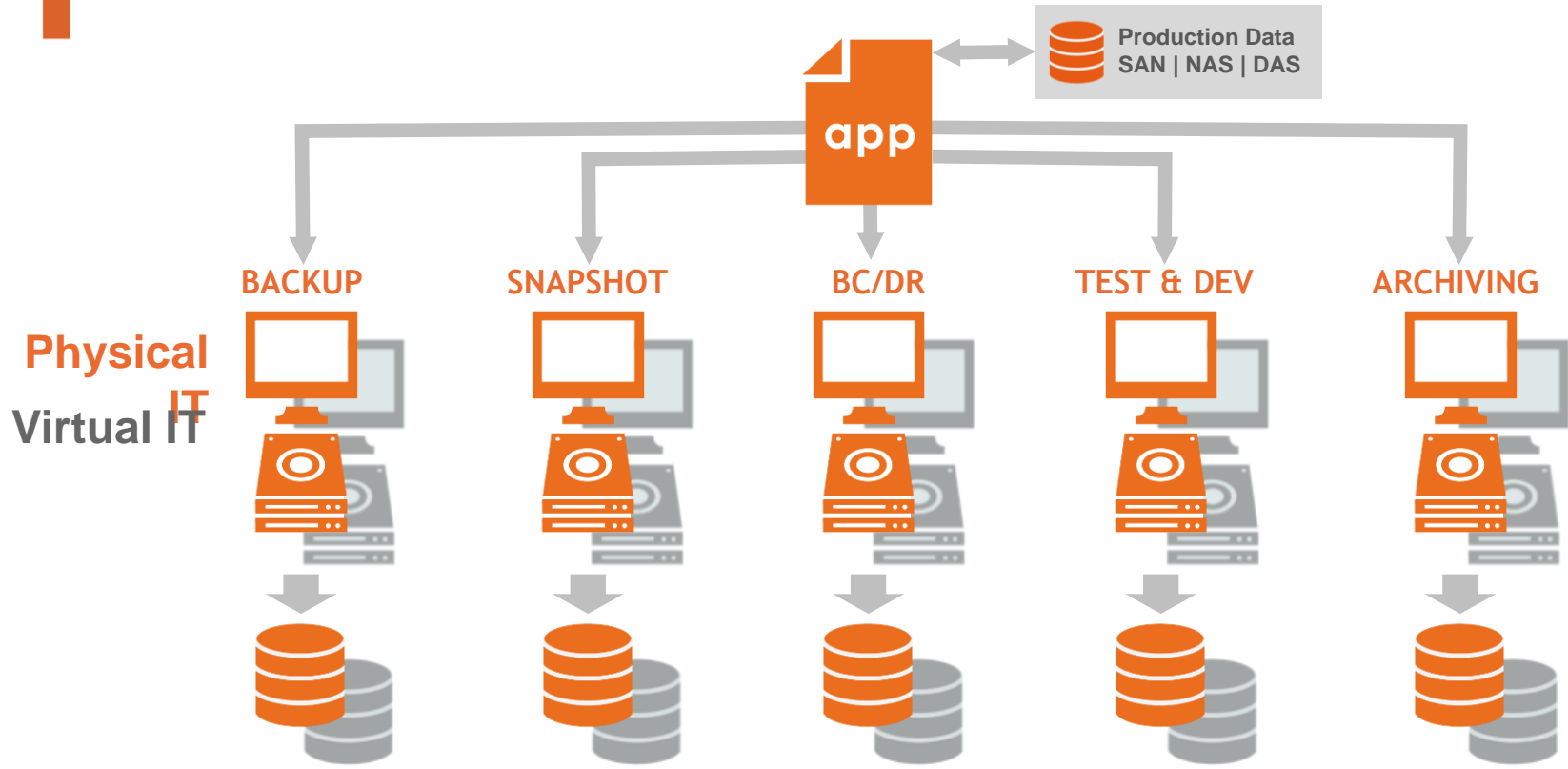
# The Storage Explosion

- **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)

# The Root Cause



DUPLICATION + INFRASTRUCTURE + OPERATIONS + COMPLEXITY + COST

# What We Do

# actifio

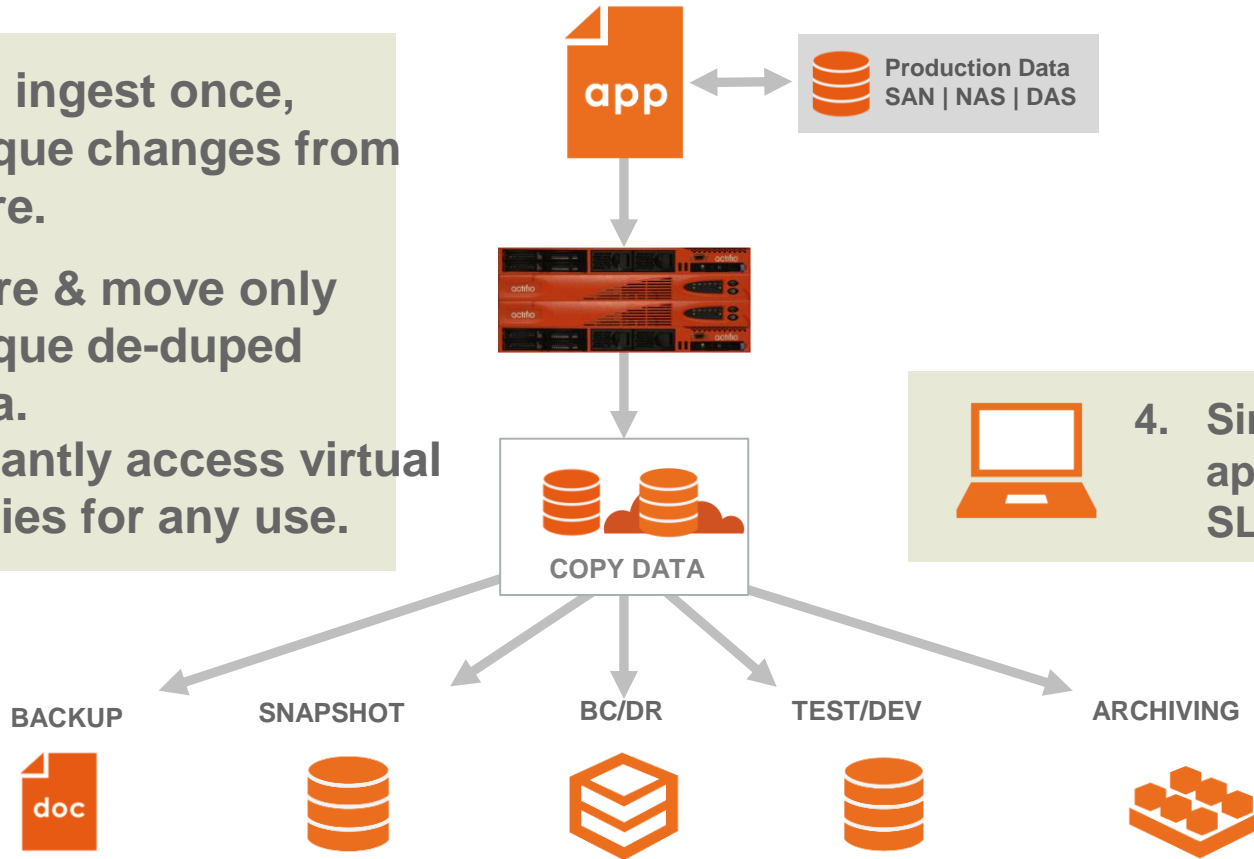
*Radically simple copy data management.*

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



# 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.

# 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

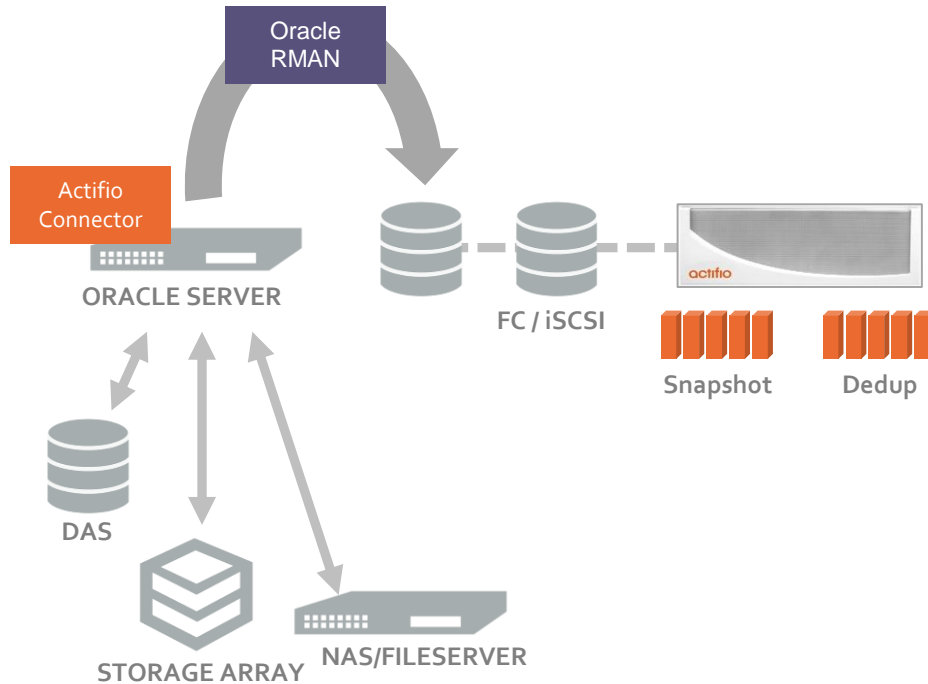
## **In-Band Configuration**

- 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

# 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

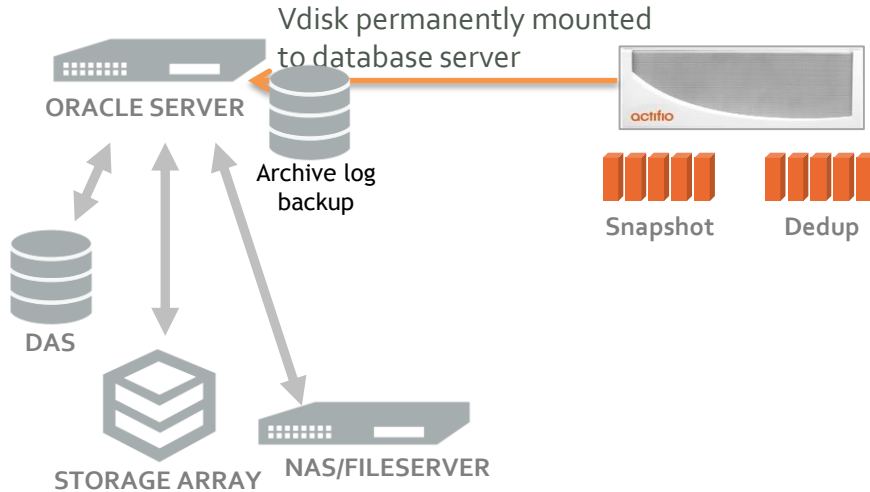


# Data Capture: Oracle RMAN backup

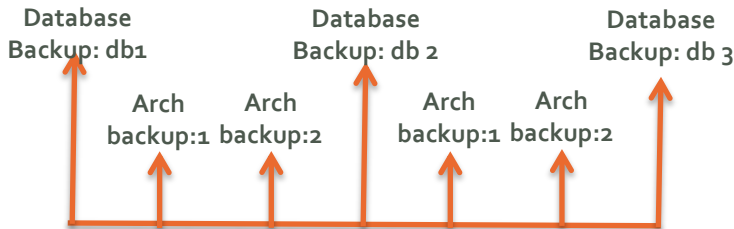
## Oracle RAC --Transparent fail-over of backup

- 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.

# 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 2<sup>nd</sup> 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.

# 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.

# 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

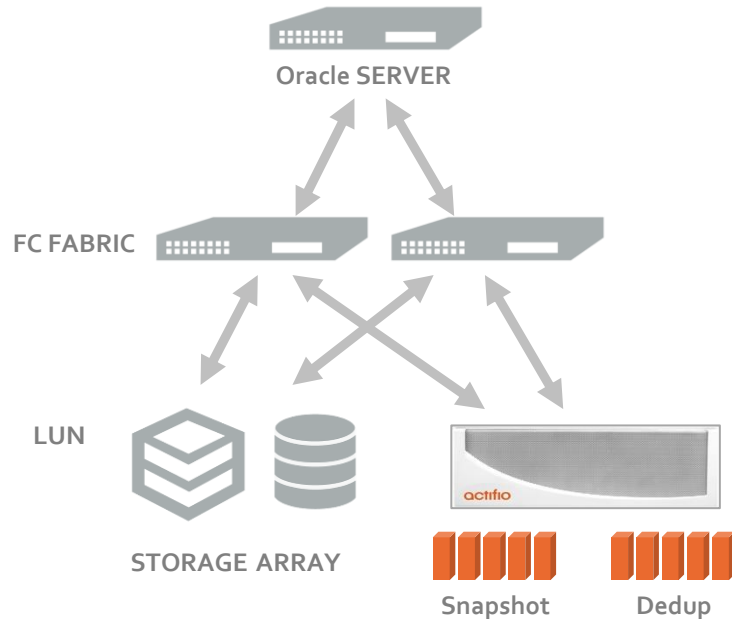
- Dev Ops and Workflow:

- 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 .

# Data Capture: Oracle In-Band

## METHOD:

Actifio Snapshots providing immediate data protection & zero backup window



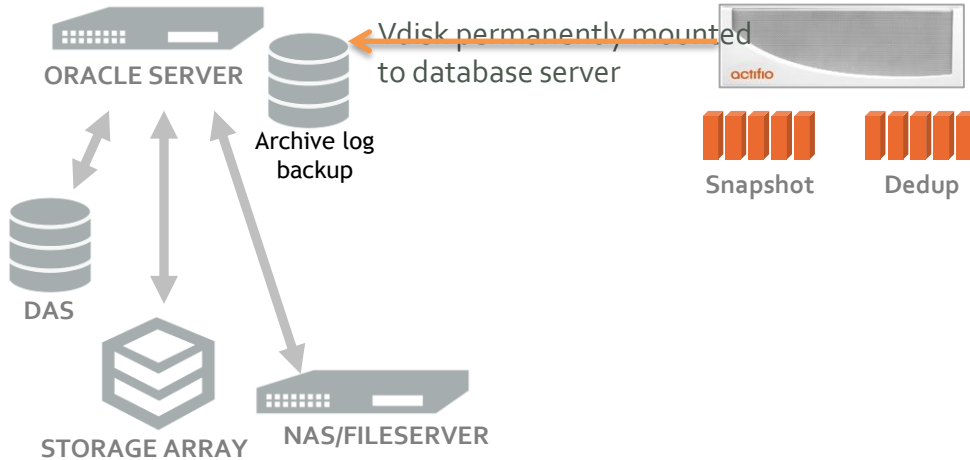
## Initial Setup

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

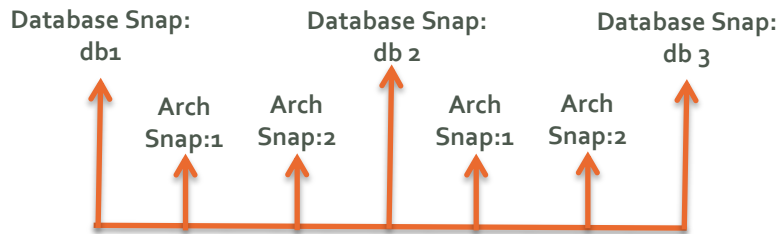
## Data Capture

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.

# Data Capture: Oracle Archive Log



1. Protect archive folder as file system
2. Mount a vdisk permanently to database server.
3. Configure Archive protection as:
  - Configure the database to add 2<sup>nd</sup> 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.

# 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:

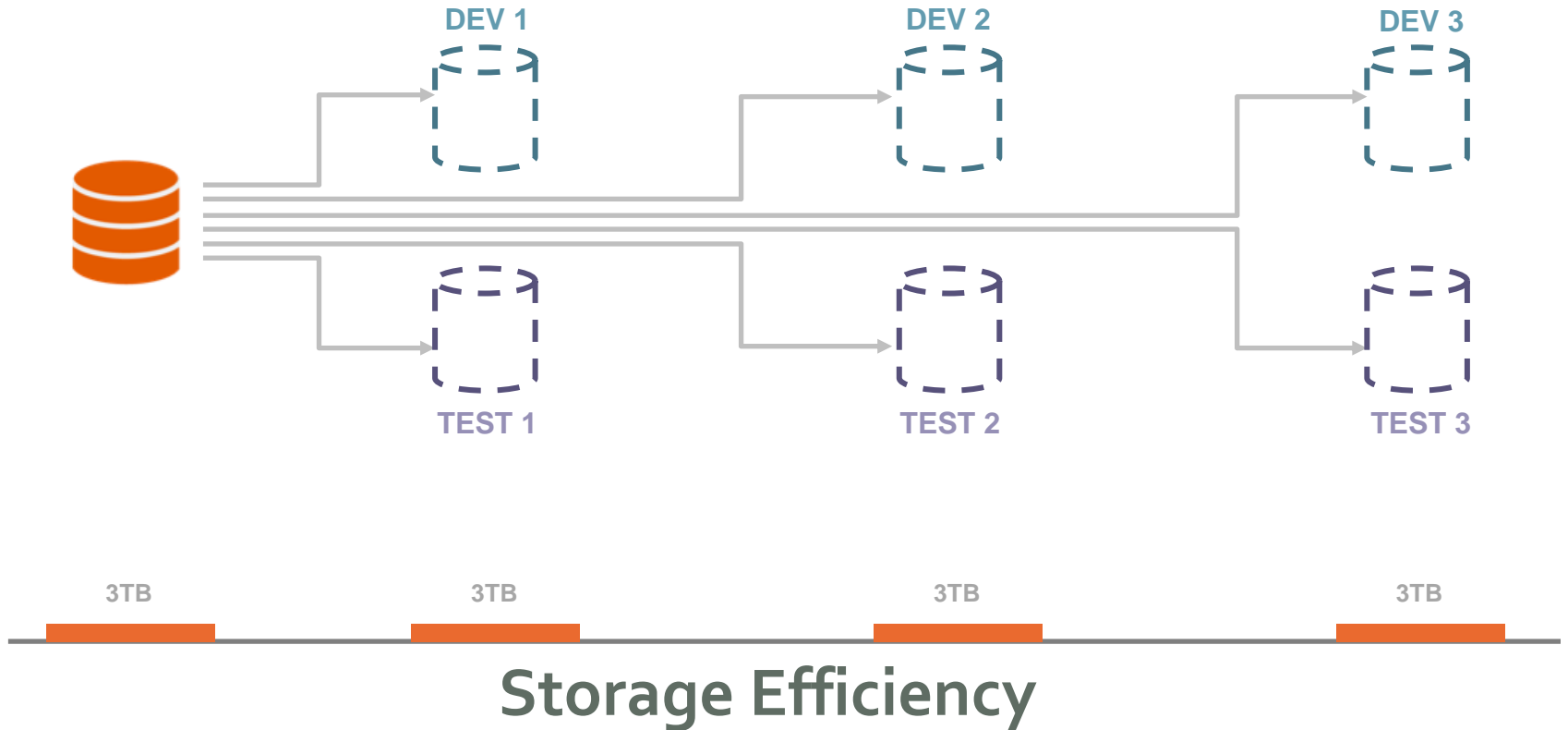
- Database must be running in archive mode for application consistent backup

# 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 .



# Virtual Instance: Simplicity & Savings



# Copy Data Management



@actifio

**actifio**  
Radically Simple

**Forbes**  
America's Most  
Promising Companies

**GOLD**  
2012  
STORAGE MAGAZINE  
PRODUCTS OF THE YEAR  
SearchStorage.com

**2011**  
PRODUCTS of the YEAR  
Storage Magazine / SearchStorage.com  
SILVER

**datacentre**  
solutions  
awards 2013

**Gartner.2013**  
Magic Quadrant for Enterprise  
Backup/Recovery Software