Zero Data Loss Recovery Appliance

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FedEx Services

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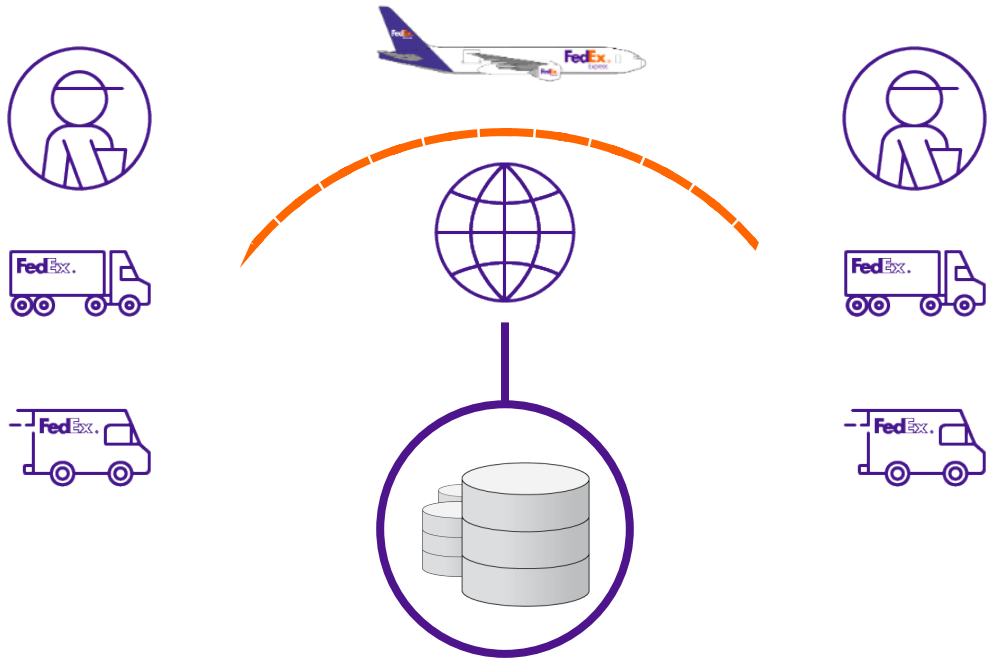
FedEx

About FedEx

Transportation, logistics and supply chain company

>450,000 team members worldwide
>220 countries network
>15 Million packages daily
>681 aircrafts
>180 Thousand vehicles



Oracle Database

>3,500 Oracle Database
>2.1 PetaBytes
>5 Major US Datacenters

Database Engineering
Oracle Enterprise Manager
Database & Data Security
Backup and Recovery

“I WILL MAKE EVERY FEDEX EXPERIENCE OUTSTANDING”

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Our Recovery Appliance Story

Recovery Appliance POC / Eval

- Bake off vs Current state
- ZDLRA detected back up anomaly not previously known
- POC / Eval was a success
- Minor testing exceptions due to FedEx organization or processes

2015

- Performance degradation across multiple Production DB
- DB Backups causing SAN Disk Read saturation.

2016

Major Production Issue

Major Production Issue

- Performance degradation across multiple Production DB
- DB Backups saturated the Fiber Channel to the SAN.

2017

- 13 ZDLRA X7 for Production and Dev/Test
- 5 PetaBytes Total
- Migration 49% Complete

2018

All In with ZDLRA

And More ZDLRA

- 9 ZDLRA X8 for Production and Dev/Test
- 6.2 PetaBytes Total

2019

* Issue detected by ZDLRA – BCT file corruption bug 20509482

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FedEx – Legacy Database Backup Challenges

- Full backups impacting production DB performance and putting stress on storage subsystems
- Experienced silent backup failures with our traditional backup appliance due to high reader threads on storage appliance
  - Implemented process to mitigate “lost backup” scenario (Not an option for us):
    - Run RMAN CROSSCHECK after backups
    - Run periodic RMAN Catalog Validation
- Database recovery performance was at best about 2TB/hour
- Network traffic over LAN and WAN (replication) high due to data growth and multiple weekly full backups

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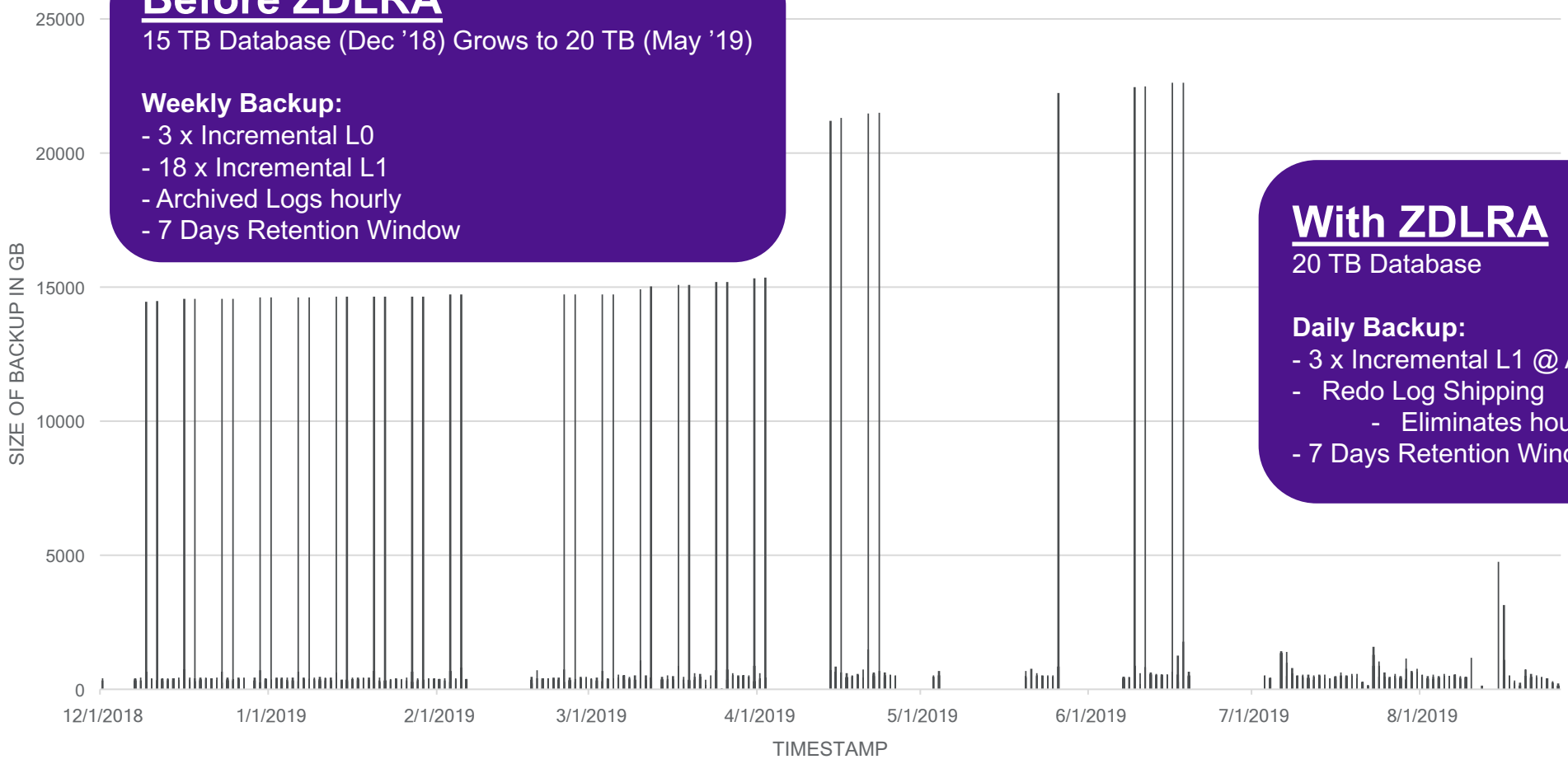
Backup Size Profile of One Database – Networking Team is Very Happy with ZDLRA!

Before ZDLRA

15 TB Database (Dec ’18) Grows to 20 TB (May ’19)

Weekly Backup:
- 3 x Incremental L0
- 18 x Incremental L1
- Archived Logs hourly
- 7 Days Retention Window



With ZDLRA

20 TB Database

Daily Backup:
- 3 x Incremental L1 @ Average 391GB
- Redo Log Shipping
  - Eliminates hourly archived log backups
- 7 Days Retention Window

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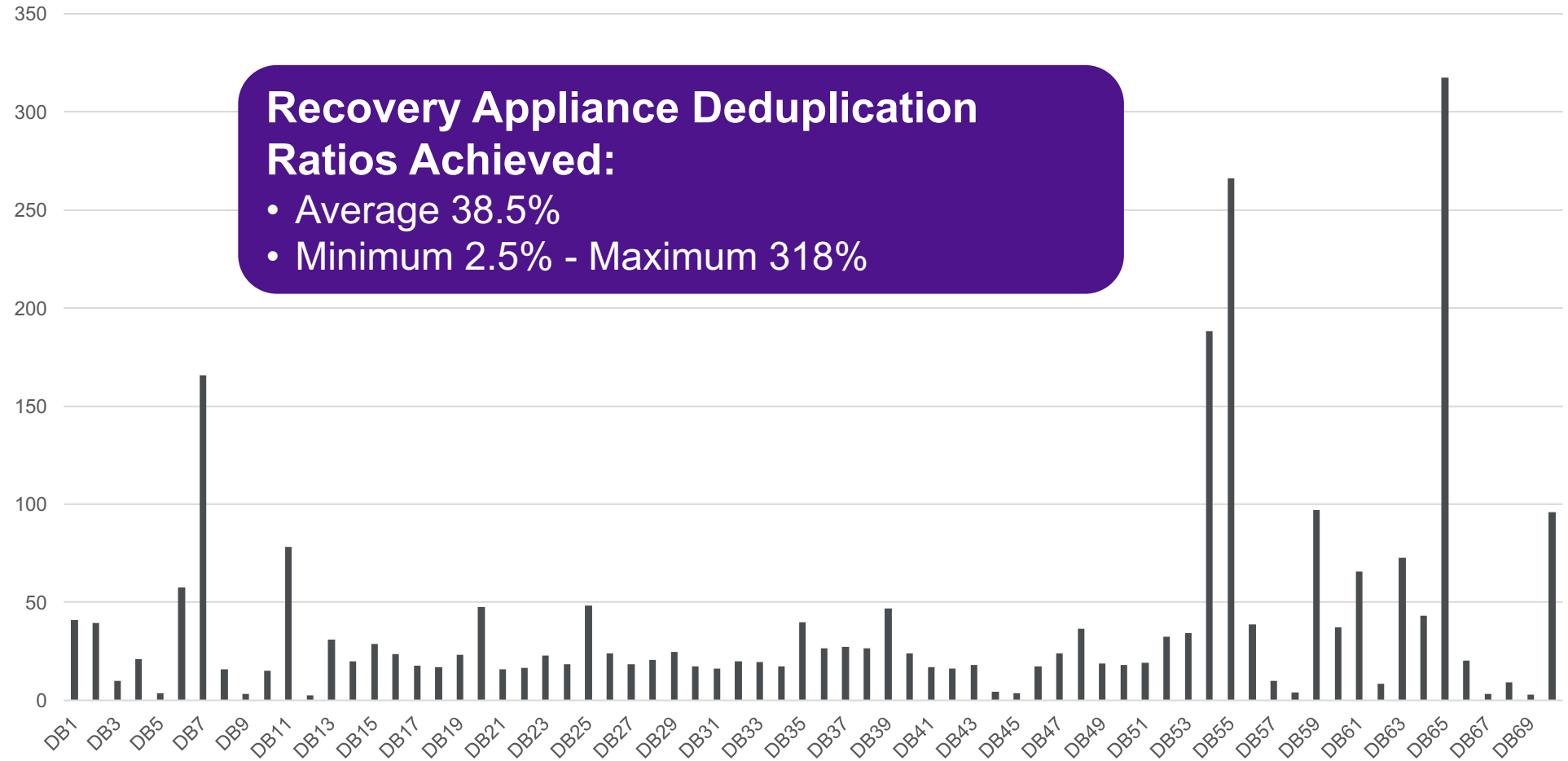
Our ZDLRA Deduplication Ratio Averages 38.5%



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FedEx – Recovery Appliance Landscape

- Minimal database server impact due to backup processes
  - No more performance degradation
- Backups are continuously validated on ZDLRA
  - No more RMAN CROSSCHECK or Catalog Validation tasks just to ensure backups are viable
- Ongoing transactions automatically protected
  - No more hourly archived log backups and RPO reduced from an hour to < 1 second
- Recovery Status is automatically monitored and reported
  - No more having to babysit backups!

Key Items

- This is an appliance. LEAVE IT ALONE!
- Flashback Recovery Area Management
- Platinum Support Services

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Thank You

Presenter Nikhil Rughoonundon

Manager IT

Database Engineering

Oracle Database Administration

Database and Data Security

Oracle Enterprise Manager

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