

Recovery Appliance Journey@ Anthem Inc.

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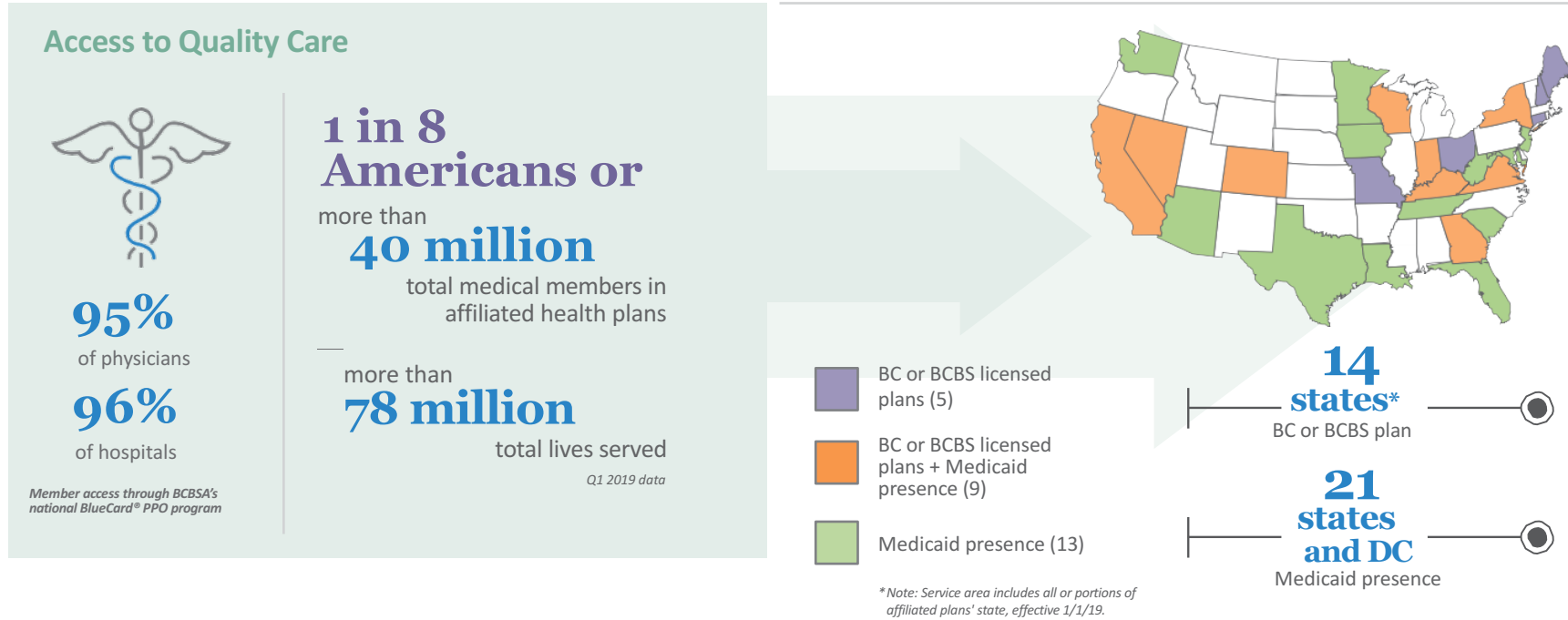
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Introduction to Anthem

Anthem is one of the nation's leading health benefits companies



Subsidiaries



Oracle Infrastructure at Anthem@

Until early 2014 Anthem was a major AIX shop with over 800+ databases hosting mix application (OLTP, DSS, Data warehouse).

In 2014 we purchased our first Exadata X4s that consisted of two full and two half racks (**6 clusters with total 20 compute nodes**).

In 2017 we purchased 5 ZDLRAs (2x 2-rack clusters, one single rack) and deployed in 3 datacenters.

By 2019 75% of our environment has moved to Exadata hardware which has grown to **30 Clusters** hosting 800+ databases. Including AIX servers we have 1000+ databases.

We currently have a mix of X4's, X5's, X6's, X7's and X'8s. There is currently a project underway to migrate off all X4 hardware.

Our databases support a wide variety of applications including Claims, Billing, Finance and Customer Service. Many of these are mission-critical environments.

Legacy Backup Solution

Until 2017 we used RMAN to backup to IBM Spectrum Protect (formally Tivoli Storage Manager)

Issues with previous backup solution

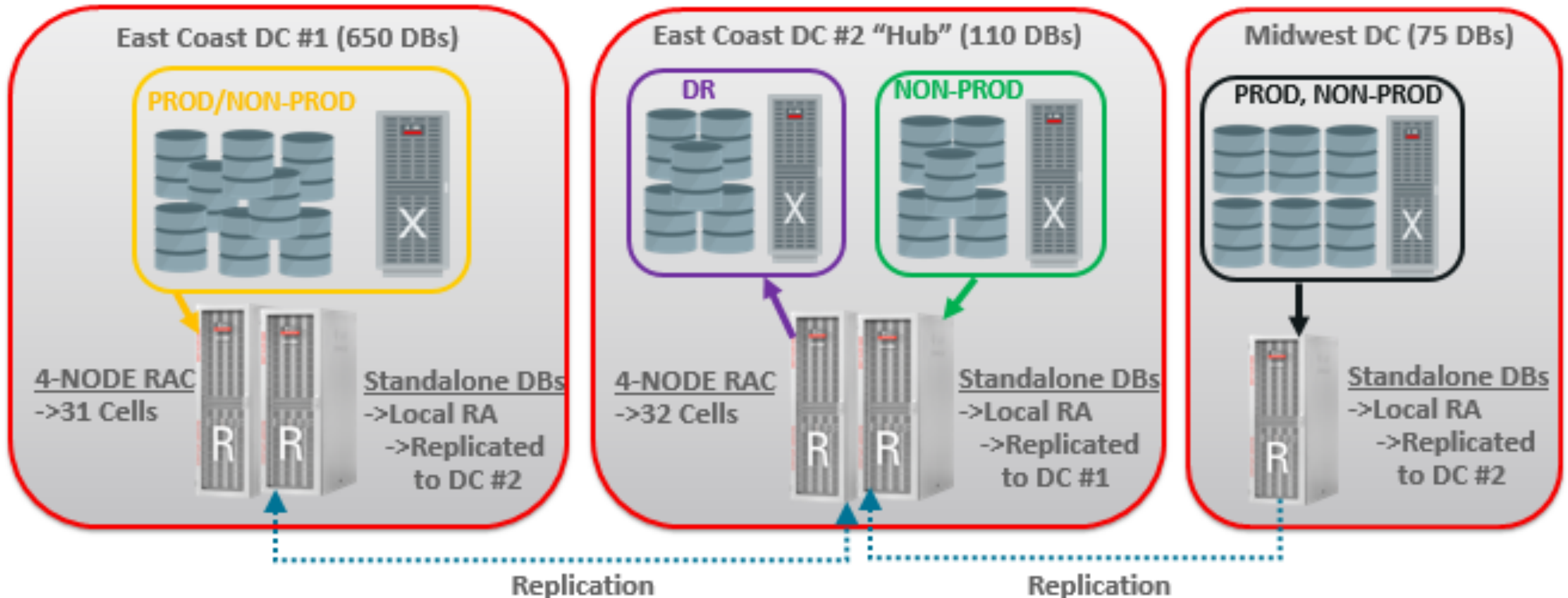
- Slow restores.
 - RMAN restores/duplicates didn't always get priority over other tasks.
 - We were limited in the number of RMAN channels we could allocate.
- We were concerned we wouldn't be able to meet our RTO/RPO objectives (many of our critical databases have a 4-hour RTO and 15-minute RPO). All of our critical databases also use Data Guard.
- We had very little control over our backup environment.
- With our data volume and growth this was a costly solution.

Drivers to evaluate and proceed with ZDLRA purchase

- We wanted faster restores to meet our RTO/RPO objectives.
- For production we needed near Zero Data Loss.
- Trying to reduce our administrative burden.
- More control over our backup environment.
- The main driver was cost savings.

Current ZDLRA Architecture

* Every database backup is replicated, has a daily incremental backup and does redo log shipping to the Recovery Appliance.



ZDLRA Benefits Realized

We've seen significant cost savings using ZDLRA. We are on target to meet our savings goal in the first 3 years of using ZDLRA.

Significantly faster restore/duplicate times. We have seen backup and recovery times that are 3-5 times faster using ZDLRA.

Incremental backup forever strategy has reduced the amount of time it takes to run backups. This is huge benefit on our Exadata platform where we have a large number of databases on each compute node. This allows us to put more databases on a node and still complete backups.

We have more control and visibility over the end-to-end database backup and recovery process.

ZDLRA – Lessons Learned

The **System Activity Report** is an important tool to determine the overall health of the ZDLRA. Its important you become familiar with the different sections and review regularly.

The ZDLRA patching process is straightforward and simple.

- We prefer to do the ZDLRA patching and let Platinum Services patch the Exadata components. I've written an Ansible script that automates the pre/post ZDLRA patch tasks.

We had a lot of operational and performance issues initially but ZDLRA has become much more performant and stable over time.

Oracle's support teams (sales, development, Oracle support and ACS) have been instrumental in helping us work through our issues. We continue to have an open dialogue about current issues and product improvements.

ZDLRA Journey - Summary

In the early stages we spent a lot of time maintaining the ZDLRA but over time that has improved.

Early on, there were a number of challenges with backup, restore and replication operations but with Support's help they were resolved.

Over time performance and stability has gotten much better. Backups and restores are fast and reliable.

Overall Key Benefits:

- Significant storage cost savings compared to our legacy backup solution.
- Faster RMAN restore and duplicate times. Backup and recovery times have sped up 3-5 times compared to our legacy solution.
- More control over end-to-end database backup and recovery process.