



Customer Case Study

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Brazilian Justice Tribunal of Santa Catarina

Brazilian Justice Tribunal of Santa Catarina

- Justice Tribunal of Santa Catarina (TJSC)
 - Civil and Criminal Court
- Santa Catarina in numbers:
 - Nearly 7 million residents
 - 295 cities
 - 6th largest GDP by region in Brazil
- TJSC in numbers:
 - 13,000 employees
 - Internal and public services
 - Courts, Judicial Processes, Appeals, Taxes
 - Nearly 14 million judicial cases recorded since inception of Oracle-based system
 - 723,000 just in 2015
 - **All judicial processes are recorded in digital format..fully paperless**
 - **24x7** services for **Legal Appeals** requirements

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- TJSC and Oracle:
 - Oracle user since 1998
 - Nearly 40 production databases
 - 15 critical databases:
 - 30TB total volume
 - Judicial Process, Appeals, Taxes, HR
 - 24x7 access
 - Major Database:
 - More than 8,000 internal users by day
 - More than 70,000 web access by day
 - 17TB size and 100,000 IOPS
 - DSS/OLTP workloads
- TJSC and Engineered Systems:
 - 4 Exadatas: 1 Half V2 (HP), 1 Half X2 (HP), 1 Full X4 (HP), **1 Full X5 (EF)**
 - Among the first OLTP users of Exadata
 - **2 Recovery Appliances**
 - No outages since 2010 (1st Exadata deployment, 2nd in all of Brazil)
 - All databases run on Exadata with IORM (catPlan and dbPlan), Database Resource Manager, RAC Services and Instance Caging

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- Local Partner Samaia IT
 - System Integrator
 - Platinum Partner
 - Winner of the bidding
 - Concepts & implementation of the project
- Samaia IT projects with TJSC:
 - 4 Exadata racks
 - 2 Recovery Appliances
 - 2 StorageTek SL150 tape libraries



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- TJSC and Other HA Infrastructure:
 - Data Center Bunker (started in 2014)
 - Redundant Network Switches
 - Cisco Nexus 7000
 - 1 and 10Gbps network
 - Redundant Storage
 - EMC VNX 5500, VNX 5400
 - Redundant Media Management
 - 2 StorageTek SL150 (8 LTO-6 Drives)
 - HP Blades for Applications and VMware

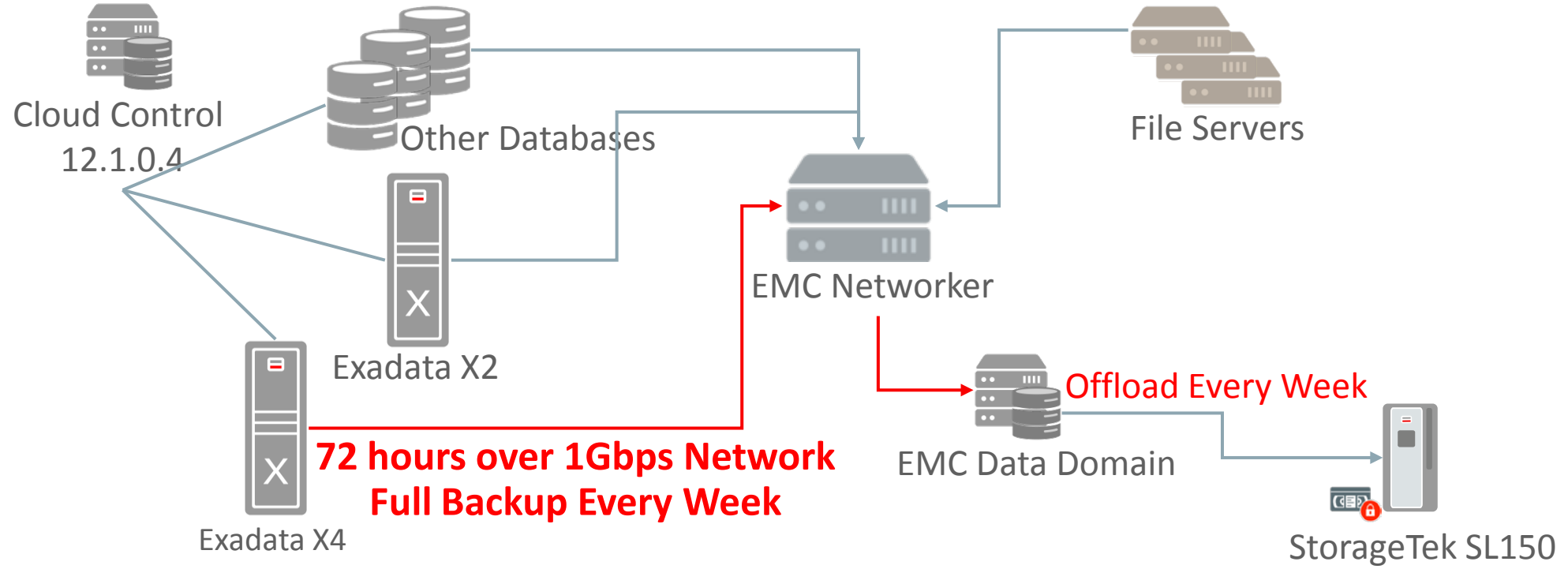
– You don't want to remain in jail just because of an Oracle Database outage, right?

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- TJSC and Backup/Recovery – without Recovery Appliance
 - EMC Networker
 - 8.0.2
 - Two Node Clustered Media Servers
 - 1Gbps communication network
 - Data Domain
 - DD670 configured as VTL
 - 50TB usable capacity
 - **2 Gbps SAN network**
 - **Shared: Databases and File Servers**
- Problems:
 - **Low deduplication** for databases
 - Even after following EMC best practices
 - **Slow, nearly 3 days** to backup most critical 17 TB database
 - Large DBA effort to manage backups
 - Needed to expire old backups from DD every day, due to space constraints (no additional savings from deduplication).
 - Nearly 3 days to recover 17 TB database
 - Difficult to deliver adequate RPO and RTO due to network and HW constraints

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- TJSC and Backup/Recovery – without Recovery Appliance



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Before Recovery Appliance..50, 65, 90+ hours to complete full backups

ORACLE Enterprise Manager Cloud Control 12c

Enterprise Targets Favorites History Search Target Name

opg5 Cluster Database Performance Availability Security Schema Administration

Results

Total 91 (Completed 84 Failed 7)

Backup Name	Status	Start Time	Time Taken	Input Size	Output Size	Output Rate (Per Sec)
BACKUP_OPG5_INCREM_082715013001	COMPLETED	Aug 26, 2015 7:31:00 PM BRT	01:33:06	306.63G	426.72G	78.23M
2015-08-26T00:35:13	COMPLETED	Aug 26, 2015 12:35:14 AM BRT	00:46:18	207.80G	364.06G	134.20M
2015-08-24T23:47:43	COMPLETED	Aug 24, 2015 11:47:44 PM BRT	00:58:06	110.49G	312.58G	91.82M
2015-08-21T19:15:33	COMPLETED	Aug 21, 2015 7:15:34 PM BRT	51:35:07	17.46T	17.34T	97.93M
2015-08-21T00:21:14	COMPLETED	Aug 21, 2015 12:21:26 AM BRT	02:47:30	1010.49G	1.12T	117.32M
BACKUP_OPG5_INCREM_082015050002	COMPLETED	Aug 19, 2015 11:00:39 PM BRT	01:20:49	110.03G	268.63G	56.73M
BACKUP_OPG5_INCREM_081915050001	COMPLETED	Aug 18, 2015 11:00:23 PM BRT	01:23:00	109.90G	270.28G	55.57M
BACKUP_OPG5_INCREM_081815050004	COMPLETED	Aug 17, 2015 11:00:36 PM BRT	02:58:28	251.26G	582.83G	55.74M
BACKUP_OPG5_INCREM_081415050004	COMPLETED	Aug 13, 2015 11:00:33 PM BRT	01:17:24	108.43G	235.20G	51.86M
BACKUP_OPG5_INCREM_081315050003	COMPLETED	Aug 12, 2015 11:00:34 PM BRT	01:18:38	121.70G	255.12G	55.37M
BACKUP_OPG5_INCREM_081215050003	COMPLETED	Aug 11, 2015 11:00:26 PM BRT	01:28:39	111.39G	246.85G	47.52M
BACKUP_OPG5_INCREM_081115050001	COMPLETED	Aug 10, 2015 11:00:24 PM BRT	01:24:35	92.83G	291.37G	58.79M
BACKUP_OPG5_SEMANA_080815011000	COMPLETED	Aug 7, 2015 7:10:42 PM BRT	65:59:24	16.16T	16.04T	70.82M
2015-08-06T23:50:02	COMPLETED	Aug 6, 2015 11:50:20 PM BRT	18:24:09	289.05G	458.39G	7.09M
2015-08-05T23:50:02	COMPLETED	Aug 5, 2015 11:50:20 PM BRT	02:34:38	139.54G	263.06G	29.03M
2015-08-04T20:13:46	COMPLETED	Aug 4, 2015 8:14:04 PM BRT	04:03:08	44.28G	313.06G	21.98M
2015-07-31T23:30:03	COMPLETED	Jul 31, 2015 11:30:21 PM BRT	90:18:14	16.91T	16.65T	53.69M
2015-07-30T23:50:02	COMPLETED	Jul 30, 2015 11:50:20 PM BRT	03:38:33	337.78G	498.87G	38.96M

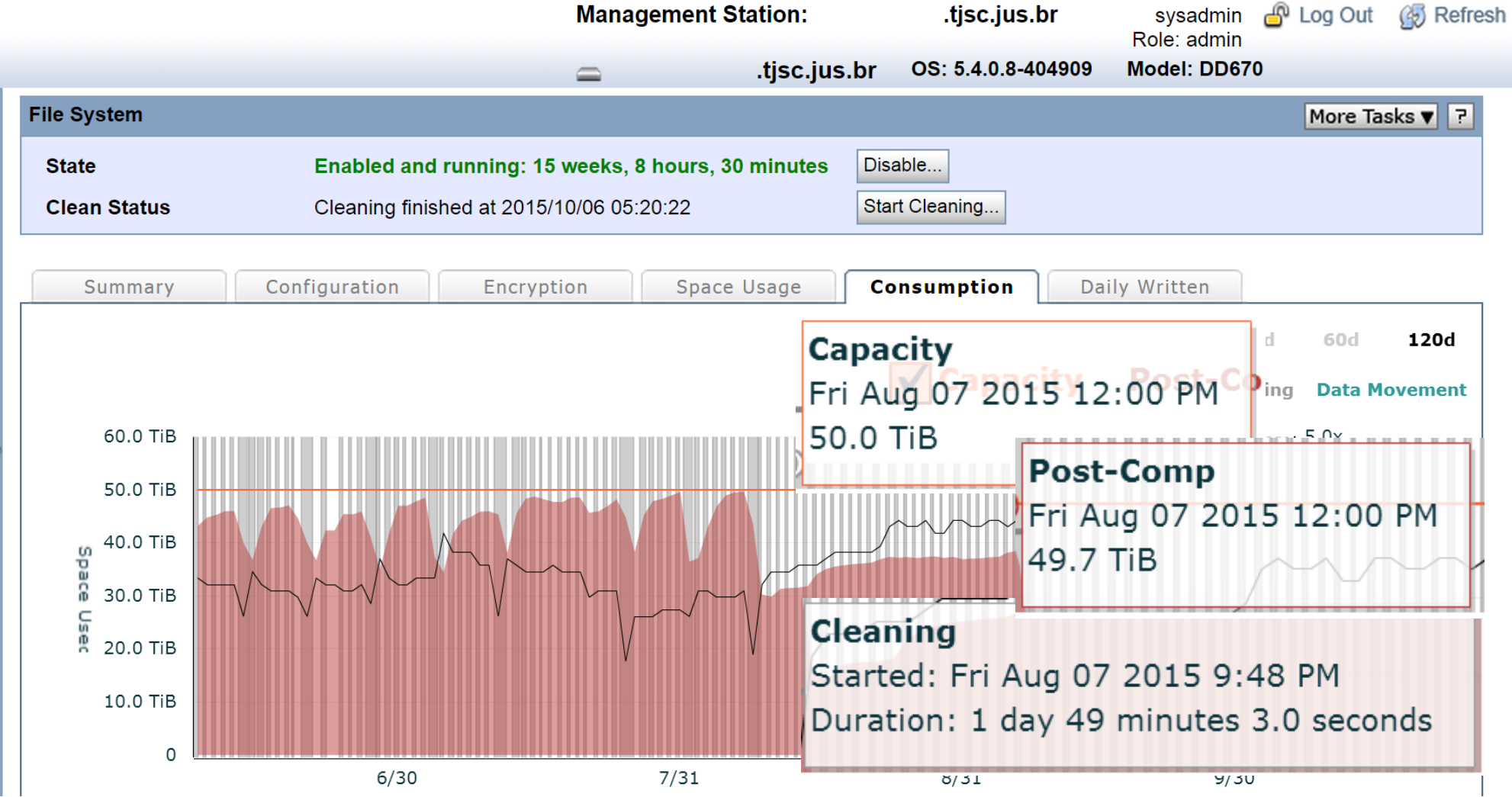
50+ HRS!

65+ HRS!

90+ HRS!!

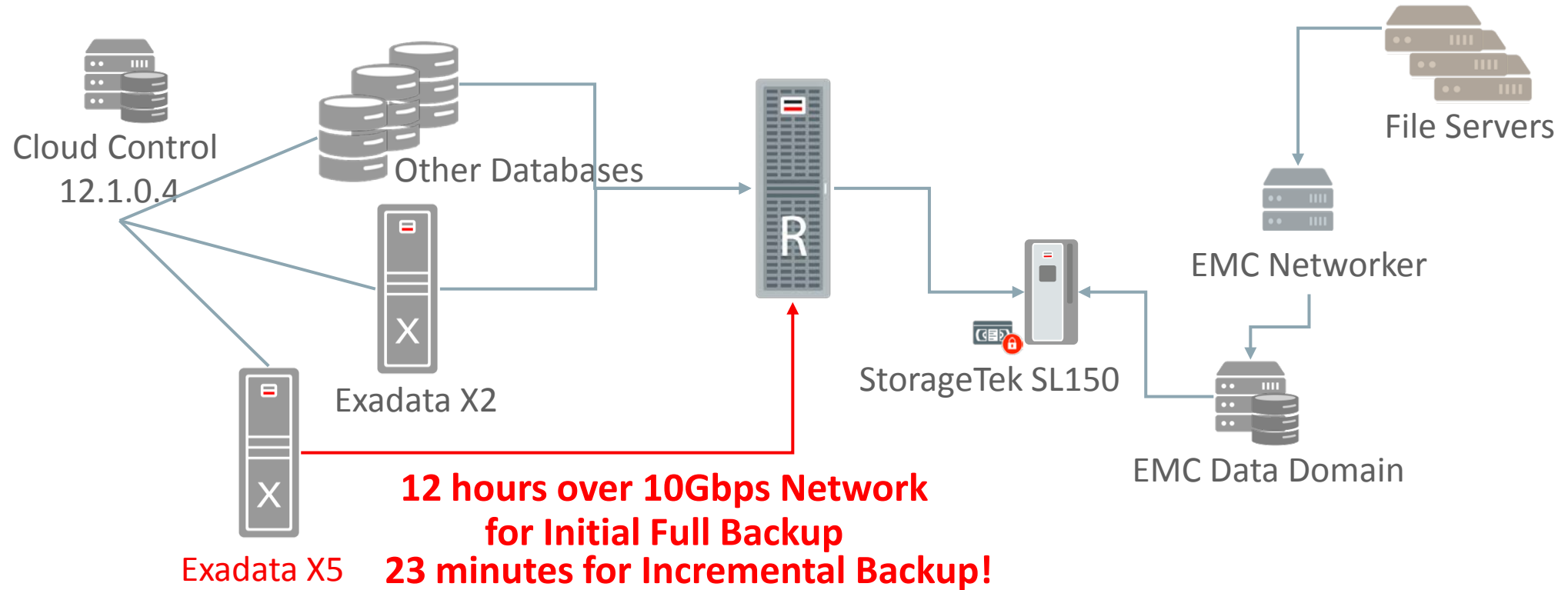
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Data Domain Cleaning Task – 1 day+ to Complete



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- TJSC and Backup/Recovery – **NOW WITH RECOVERY APPLIANCE**



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ORACLE Enterprise Manager Cloud Control 12c

Enterprise Targets Favorites History

Search Target Name

opg5 Cluster Database Performance Availability Security Schema Administration

Logged in as sys | splanx-edgx5-04.tjsc.jus.l

View Backup Report

The following backup jobs are known to the database. The data is retrieved from the recovery catalog. View Backup Sets And Image Copies

Search

Status: All Start Time: Within 1 month Type: All Go

Results

Total 15 (Completed 14 Failed 1)

Backup Name	Status	Start Time	Time Taken	Type	Output Devices	Input Size	Output Size	Output Rate (Per Sec)
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Protected Database Detail: OPG5

Status Incidents and Events

Unprotected Data and Recovery Window

Unprotected Data: 17.41 hrs
Recovery Window: 11.00 days
Unprotected Data Threshold:
Recovery Window Goal: 10.00 days

Backup Space

Used: 26052.7 GB
Needed: 24022.64 GB
Reserved: 38912.0 GB

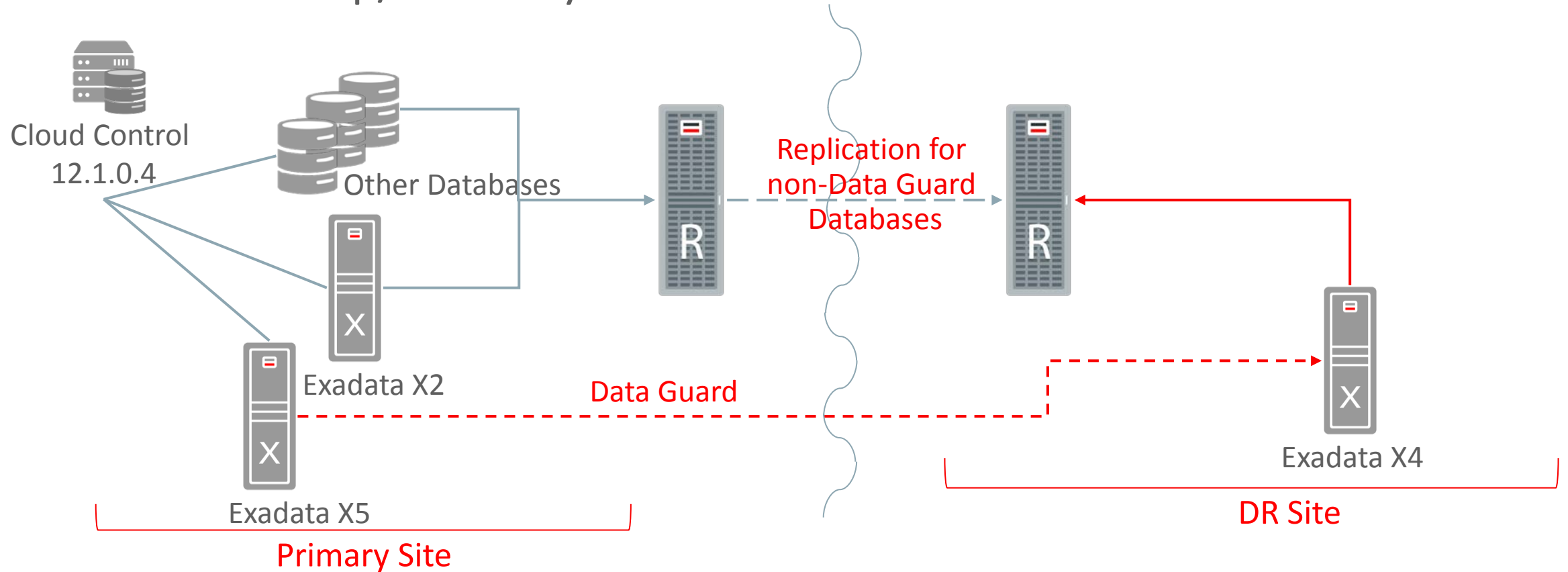
De-Duplication Ratio 11.9 : 1
Keep Backup Space None
Next Scheduled Backup View
Last Copy To Tape Oct 6, 7:07 PM BRT
Last Replication N/A
TIP For more information, view the following reports for this database.
Protected Database Report
Backup Report

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- Backup/Recovery Benefits **with Recovery Appliance**
 - **Reduce RTO and RPO**
 - High Protection and Zero Data Loss
 - High Deduplication Factor
 - **Incremental Forever**
 - New level 0 (virtual full) after only **23 minutes** incremental backup time
 - Nearly **200X improvement** in backup performance
 - Fast 10 Gbps Network
 - Facilitated DB Migration from Exadata X4 to X5
 - 2 Recovery Appliances less expensive than expanding Data Domain to support same backup requirements
- *The major benefit for us was **Incremental Forever and Virtual Full***

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- TJSC and Backup/Recovery – **UPCOMING FULL MAA + RECOVERY APPLIANCE**



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- TJSC and Recovery Appliance

- WHY:

- Key Features: Virtual Full / Incremental Forever
- Easy / measurable growth as required
- Impossible to sustain Data Domain
 - Lower Deduplication, Lower Performance
- Reduce the complexity of backup infrastructure
 - No more effort to tune and control every VTL of Data Domain
- Oracle on Oracle, ONE support organization for entire environment

- TJSC:

- www.tjsc.jus.br

- <https://www.youtube.com/user/canaltjsc>