
AWS
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ENT310

Scaling your Oracle applications on AWS

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Agenda

1. Overview
2. Oracle database considerations
3. Work backwards
4. Compute
5. Storage
6. Whiteboarding

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Overview

- On-premises solutions are architected around on-premises constraints
- Oracle application scaling is primarily driven by database considerations
- Database scaling requirements are diverse by application
- Leverage depth and breadth of the cloud

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Oracle RAC on AWS

If required, multiple RAC options on AWS

Do you really need RAC?

- Scalability vs. performance
- Availability vs. complexity
- Operations

Most Oracle apps receive little or no benefits from RAC

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Oracle Exadata

Exadata can solve real on-premises challenges

Why was Exadata originally implemented?

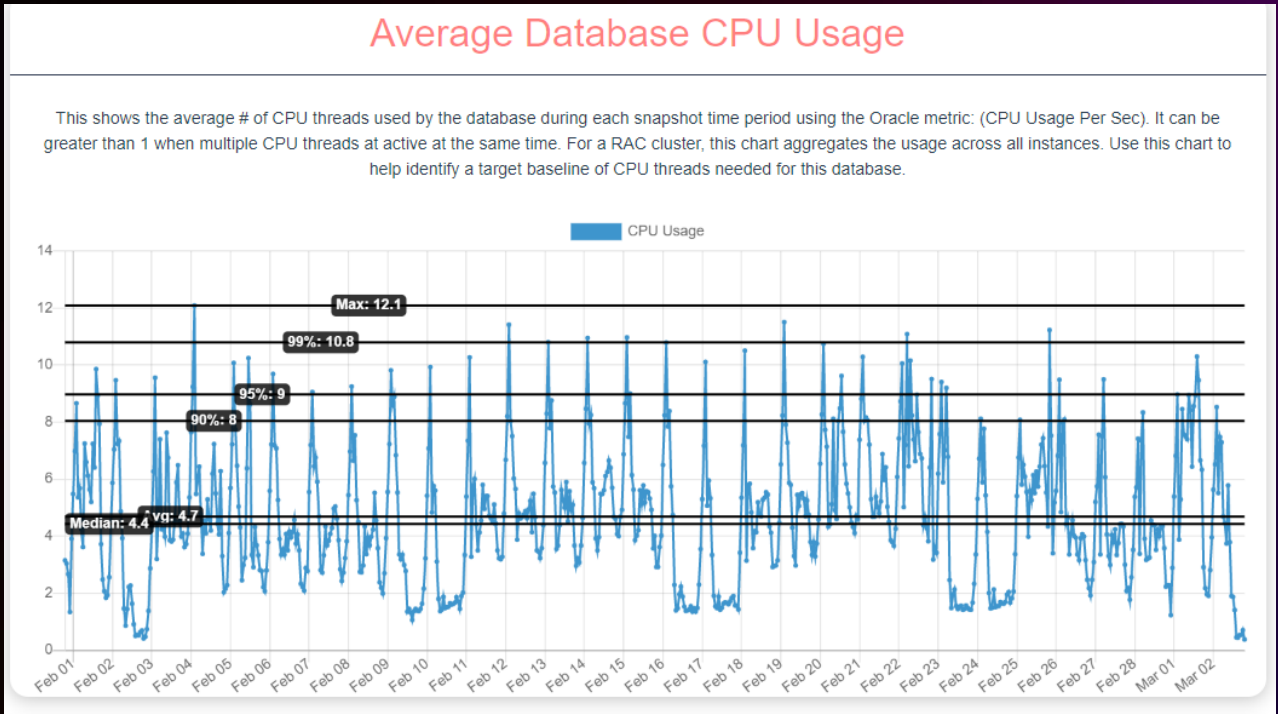
- Scalability and performance
- Engineering vs. cost
- Exadata only features

Oracle apps rarely leverage Exadata “secret sauce”

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Work backwards

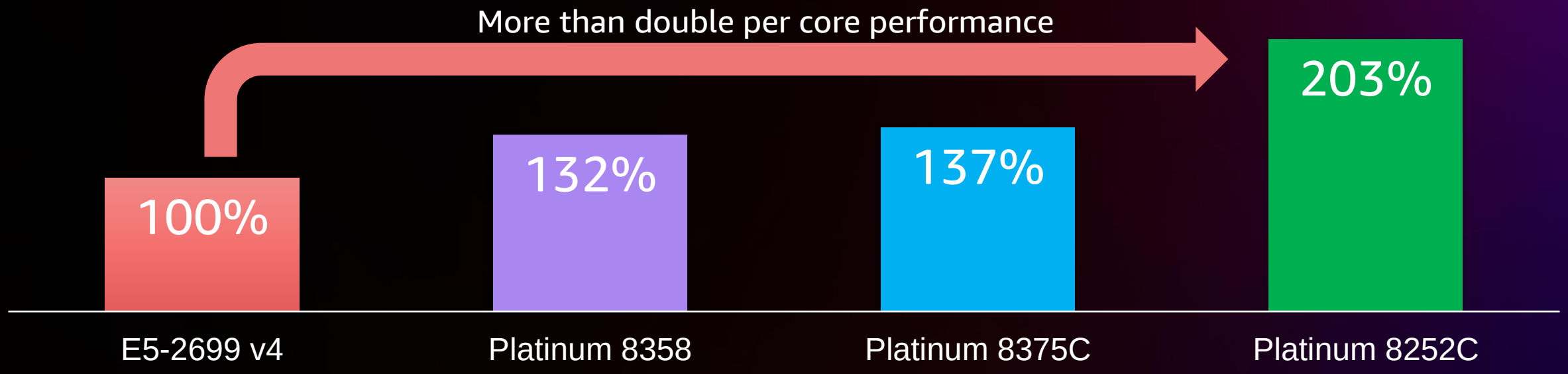
- Required thread count for given CPU make/model?
- I/O patterns at different SGA allocations?
- Chatty-write behavior?
- Storage capacity requirements?



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Normalize CPU performance

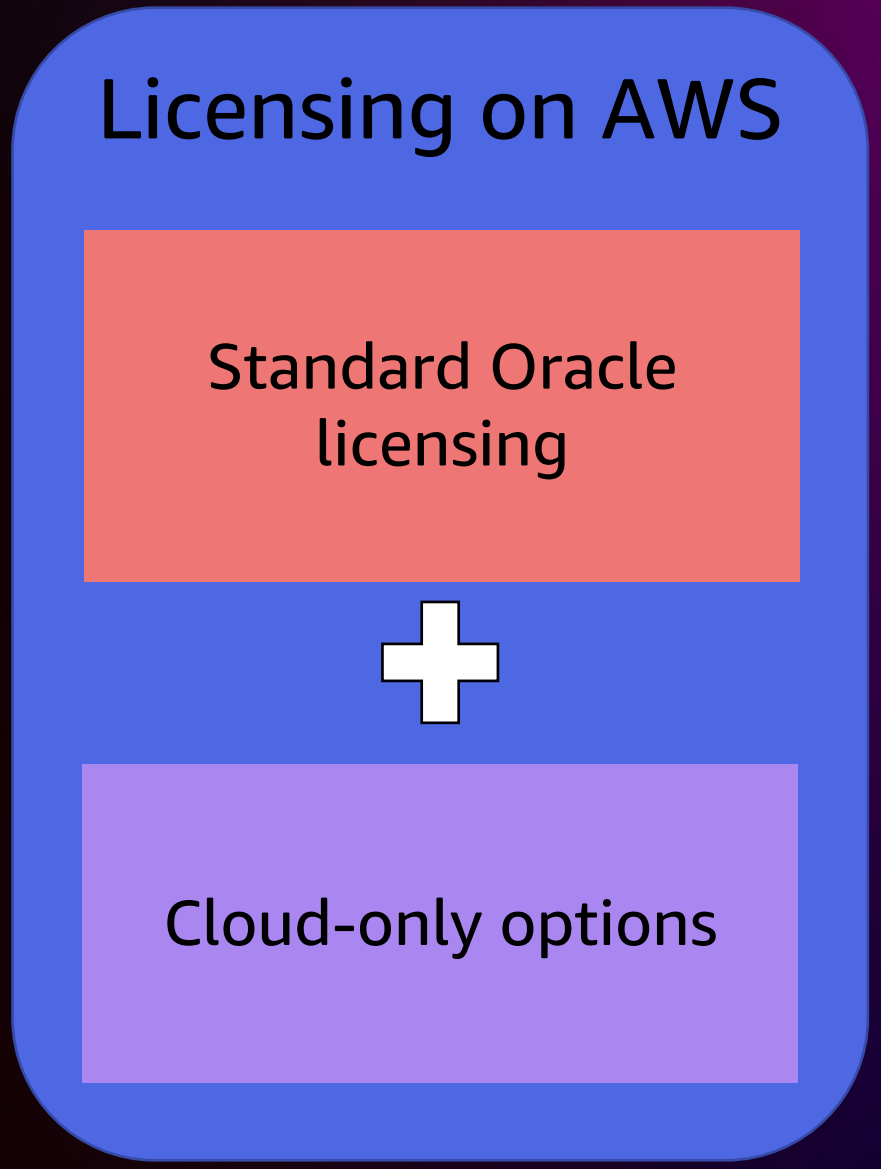
- Not all CPUs provide the same performance
- PassMark (cpubenchmark.net) is a great resource to normalize the performance of different x86 CPUs
- Use the dual CPU performance PassMark metric and divide by core count
- Right-size your thread count requirement based on CPU performance



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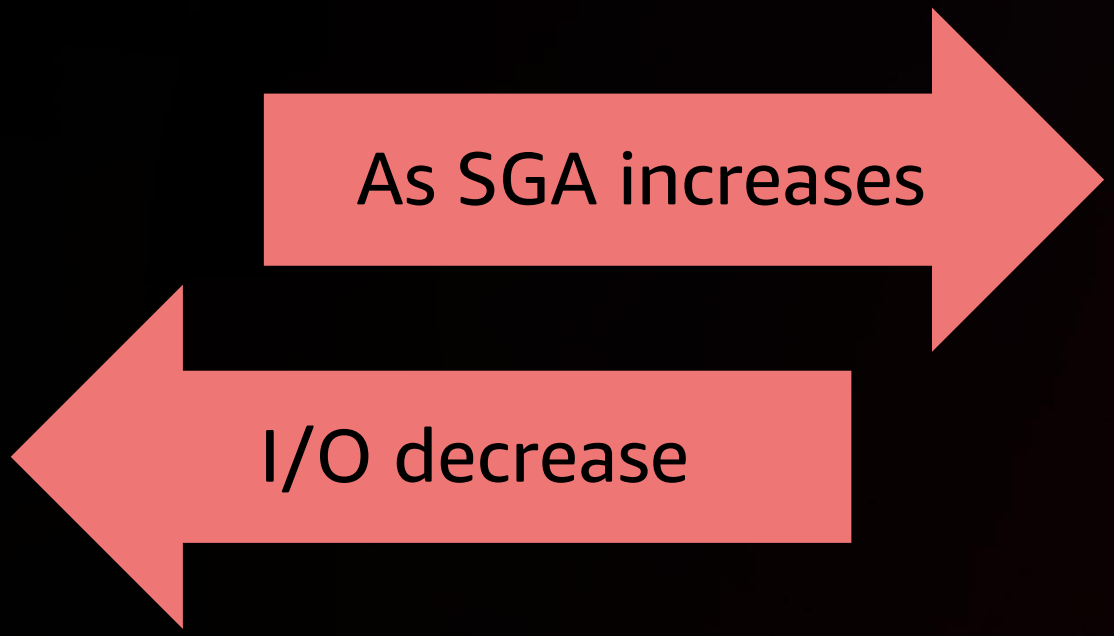
Oracle on Amazon EC2 licensing

- Start by right-sizing!!!
- Multiple options to license
- Amazon's Oracle licensing partners can help



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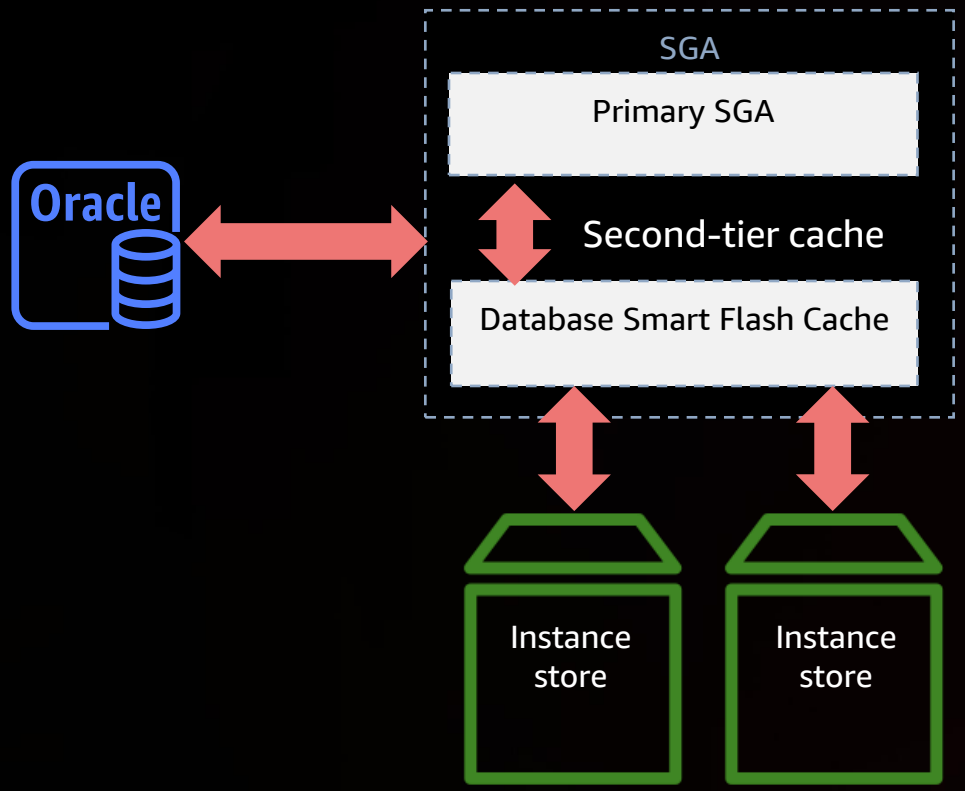
Scaling memory



- Higher levels of SGA reduce read IOPS and throughput requirements for persistent storage
- Large SGAs provide the ability to enable “big table buffer cache” to support table scans from SGA
- High buffer cache hit ratio mitigates performance impact of chatty reads

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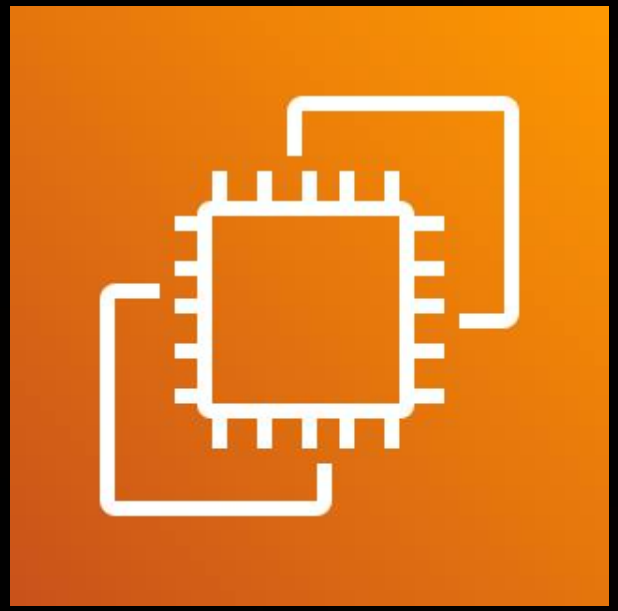
Oracle Database Smart Flash Cache



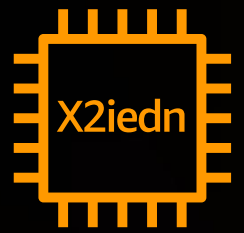
- Extend SGA beyond available RAM, into the Amazon EC2 instance store
- Requires Oracle Enterprise Linux (OEL)

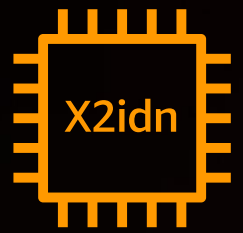
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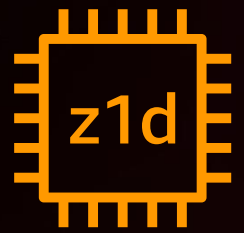
Amazon EC2 instance store

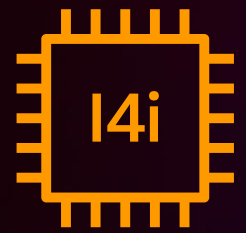


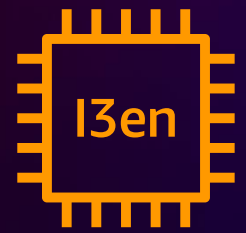
- Included with select EC2 instances
- Temporary storage
- High IOPS and bandwidth
- Extremely low latency
- Up to 60TB per instances







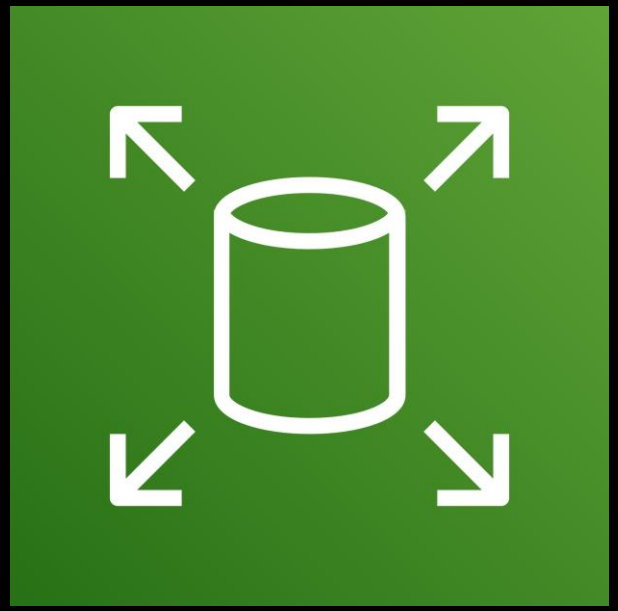




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Amazon Elastic Block Store (Amazon EBS)



- Durable block storage
- Dedicated Amazon EBS bandwidth



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File systems (Amazon FSx)



- SAN-like storage features
- Shares network interface
- Connects with SMB, NFS, and/or iSCSI



Amazon FSx for NetApp ONTAP



Amazon FSx for OpenZFS



Amazon FSx for Lustre



Amazon FSx for Windows File Server

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Amazon Simple Storage Service (Amazon S3)



- Supported by Oracle Secure Backup
- Extremely durable
- Cost effective
- Cross-region replication
- Shares network interface


S3 Standard


S3 Intelligent-Tiering


S3 Standard-IA


S3 One Zone-IA


S3 Glacier Flexible Retrieval


S3 Glacier Deep Archive


S3 Glacier Instant Retrieval


S3 on Outposts

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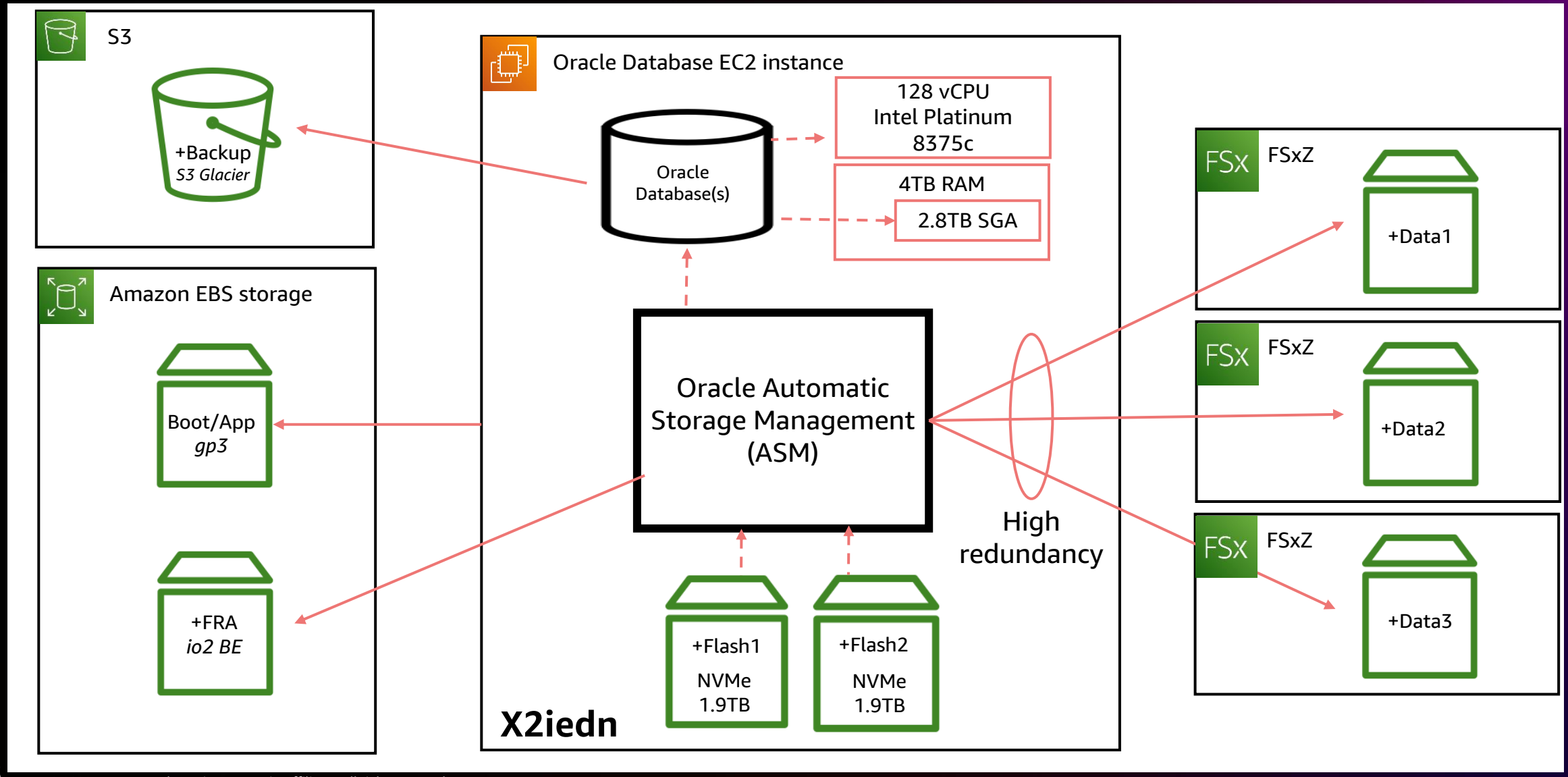
Hypothetical Oracle DB workload

- Concurrent threads = 128 on Intel Platinum 8375c
- Database size = 40 TiB
- I/O projections

SGA	IOPS	Throughput
256GB	1.4mm	13 GBps
512GB	800k	8 GBps
1 TB	450k	6 GBps
2 TB	250k	4 GBps
4 TB	225k	3.8 GBps

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Whiteboard – Engineering a High Performance Oracle Database



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Thank you!

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