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Reduce File Storage TCO with Amazon EFS and Amazon FSx

David Stein

Storage Business Development, AWS

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Agenda

- Challenges with on-premises NAS
- AWS File storage services and use cases
- TCO examples
- Getting file data into AWS
- Wrap up and Q&A

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Challenges with On-Premises File Storage

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Challenges with on-premises storage solutions

Time

- Procurement
- Delivery
- Installation
- Configuration

Cost

- Capital Expense
- Provisioning
- SW & maintenance
- Warranty renewals
- Physical

Complexity

- Expertise
- Availability
- Backup & DR
- Scalability
- Security & Compliance

What if there's a Hardware failure?! More Time! More Cost! More Complexity!

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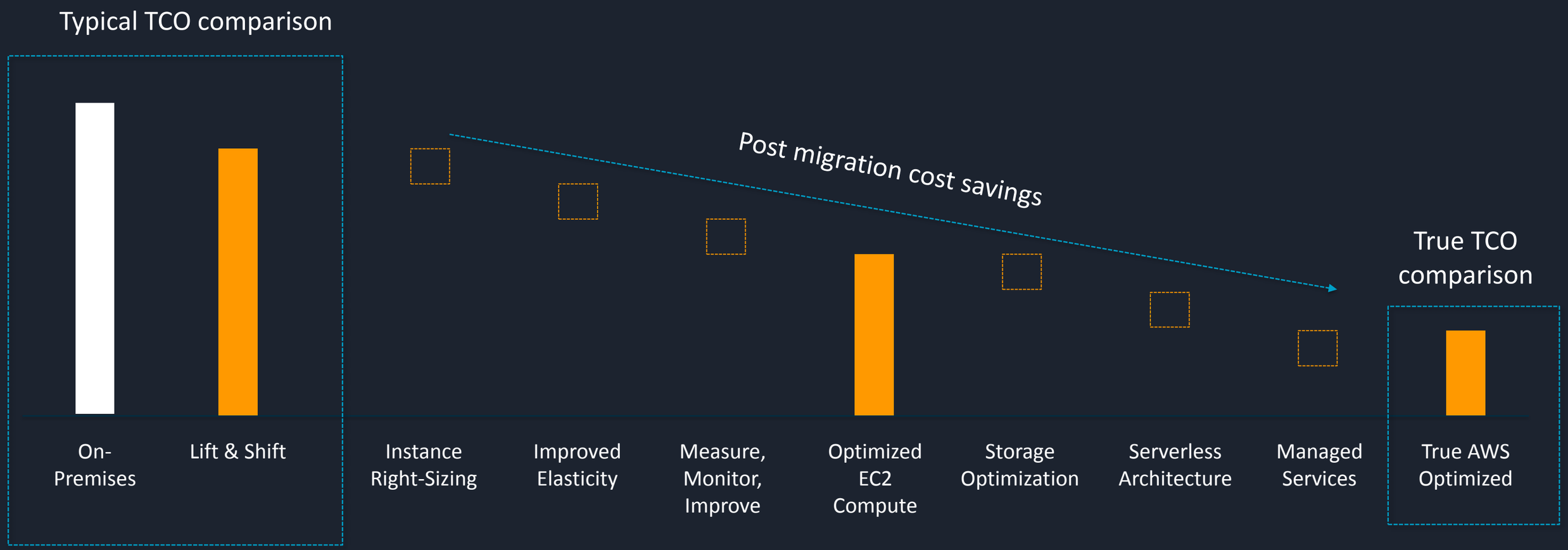
Cost savings improve through optimizations



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AWS File Storage services and Use Cases

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AWS has been helping enterprises for 13 years

Increase agility

Accelerate innovation

Strengthen security

Reduce cost

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Storage portfolio breadth & depth

Block storage

Amazon EBS

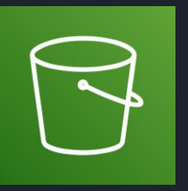
File storage

Amazon EFS

Amazon FSx for Windows File Server

Amazon FSx for Lustre

Object storage



Amazon S3

Hybrid

AWS Storage Gateway family

Transport and edge

AWS DataSync

AWS Transfer for SFTP

AWS Snow Family

Backup

AWS Backup

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Fully managed cloud file systems

AWS provides file system options that help you easily address the diverse needs of your file-based applications and workloads

FILE SYSTEMS FOR BUSINESS WORKLOADS

Amazon EFS

Fully managed cloud-native file system for Linux-based applications

LINUX-BASED WORKLOADS

Amazon FSx for Windows File Server

Fully managed Windows file servers for business applications

WINDOWS-BASED WORKLOADS

FILE SYSTEM FOR COMPUTE-INTENSIVE WORKLOADS

Amazon FSx for Lustre

Fully managed Lustre file system for high performance workloads

COMPUTE-INTENSIVE WORKLOADS

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AWS file storage innovations and features to optimize cost

File storage

EFS Infrequent Access price reduction

EFS Lifecycle Management policies

EFS Provisioned Throughput

EFS Encryption in Transit

EFS. FSx in US West (N. California),
Asia Pacific (Singapore, Tokyo), Europe (London)

EFS in Europe (Paris), Asia Pacific (Mumbai, Seoul) and Central Region (Canada)

FedRAMP compliance

FSx Windows direct integration with on-premises Active Directory

Inter-VPC/account/Region access via VPC Peering/Transit Gateway

FSx Windows support for Shadow Copies

Integration with AWS Managed AD across VPCs and Accounts

FSx in Europe (Frankfurt, Stockholm), Asia Pacific (Sydney)

FSx SOC compliance

FSx for Lustre lower minimum file size to 1.2TB

Data transfer

DataSync can now transfer data to and from SMB file shares

DataSync supports Amazon VPC endpoints

AWS Transfer for SFTP now supports AWS PrivateLink

Storage Gateway Hardware Appliance

Storage Gateway tag-on-create & tag-based access control

Tape Gateway in 2 new regions

Snowball Edge Compute Optimized

AWS Transfer for SFTP now supports AWS CloudFormation and host key import

File Gateway SMB support

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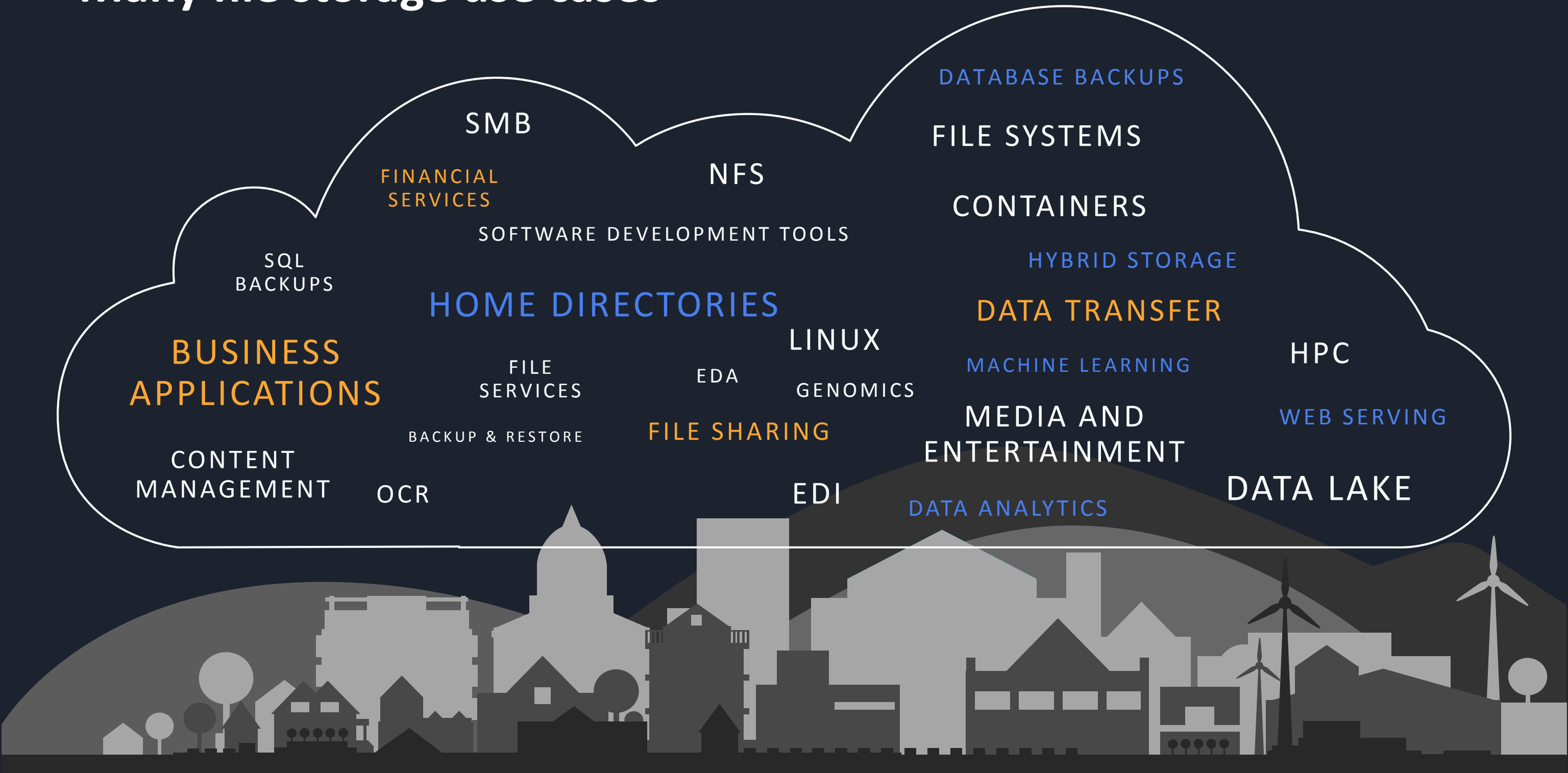
Many file storage use cases



Amazon EFS

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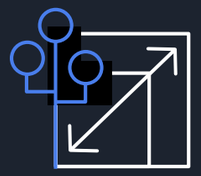
Amazon EFS

Scalable, elastic, cloud-native Linux file system



Elastic and scalable

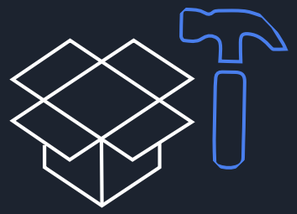
10 GB/sec & 500K

IOPS

Performance

Storage classes

Shared access



Highly durable and available

Secure and compliant

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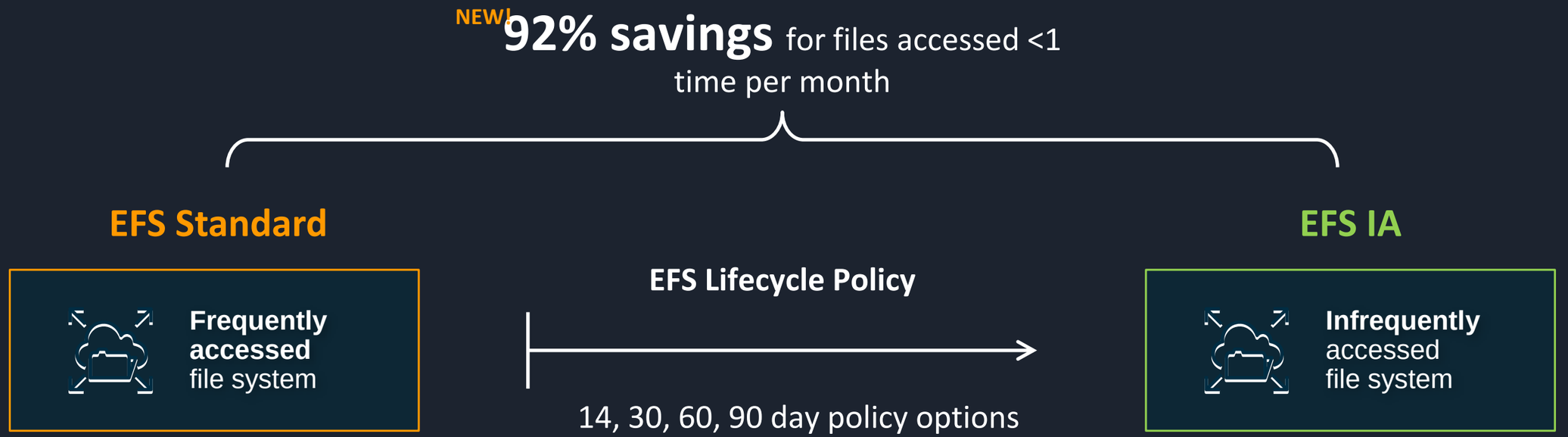
EFS Infrequent Access

Automatically lower cost storage for EFS file data as it becomes less frequently accessed



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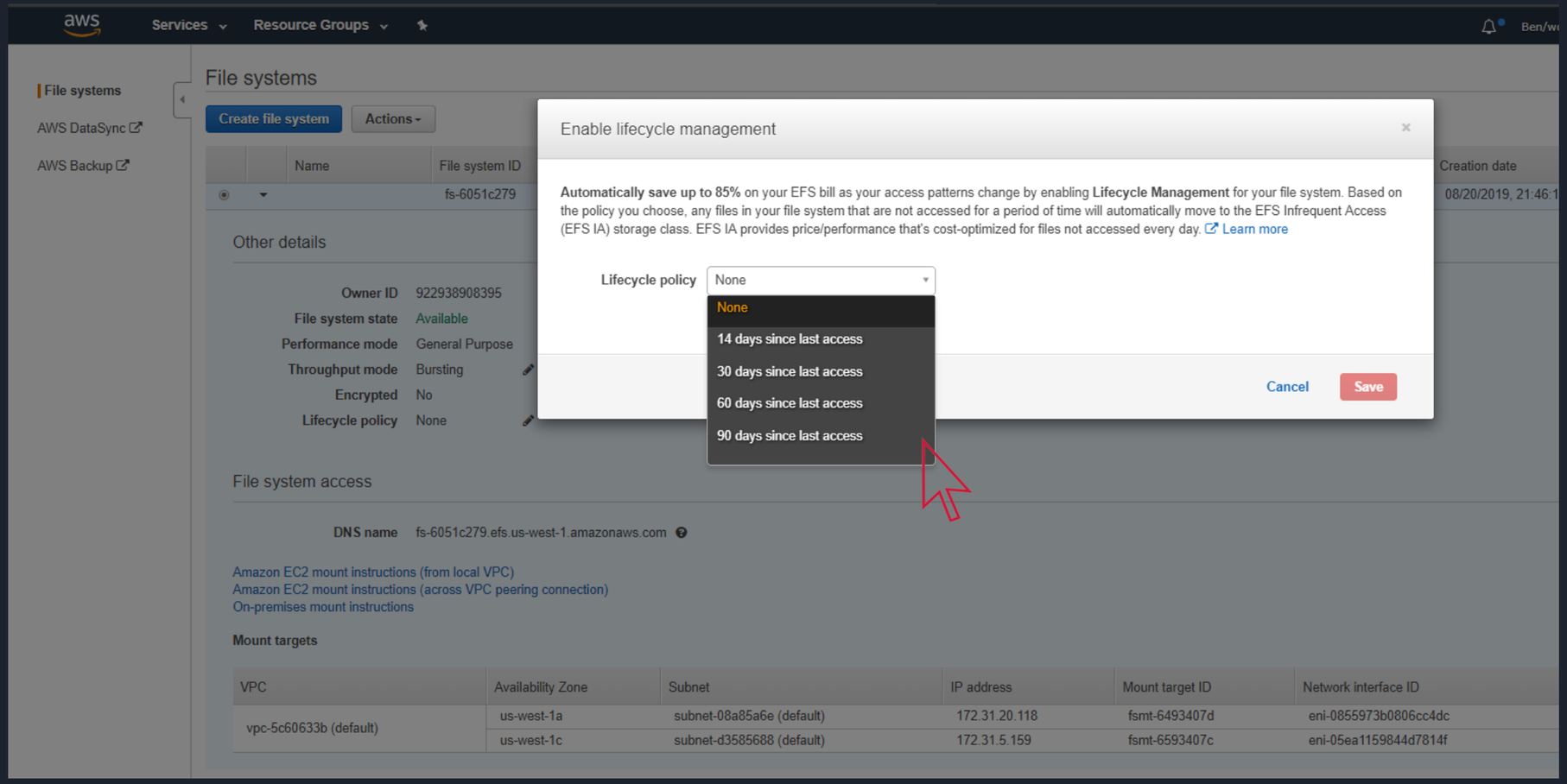
Saving 92% is as easy as 1-2-3 clicks



Amazon EFS IA

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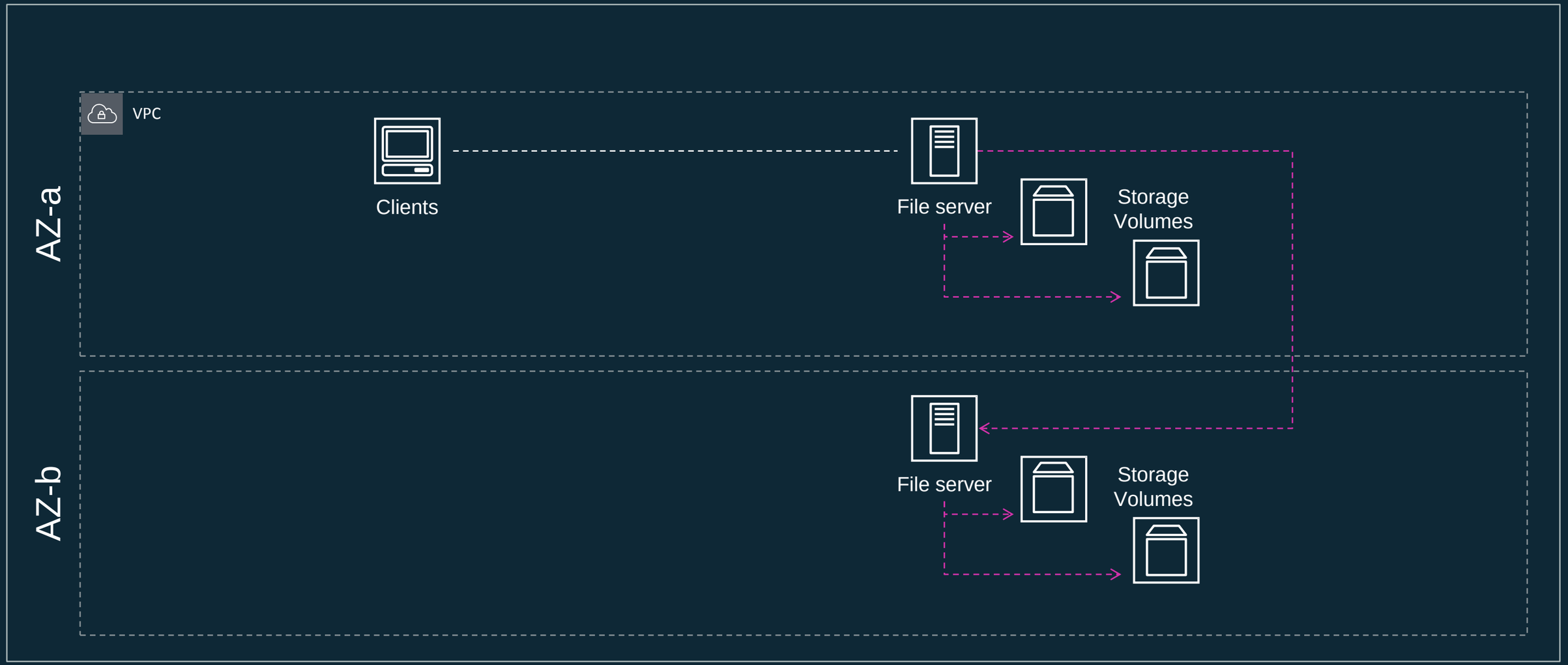
Before Amazon EFS… DIY shared file storage



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TCO example

Amazon EFS

Amazon EFS cost:

Standard storage class (100 GB * $0.30/GB-month*):	$30 per month
Infrequent Access storage class (400 GB * $0.025/GB-month*):	$10 per month
Infrequent Access data access (400 GB*1*$0.01/GB*) =	$4 per month
TOTAL:	$44 per month

DIY – provisioning 600 GB of Amazon EBS (i.e., ~85% utilization)

Storage (2x 120 GB EBS gp2 volumes):	$24 per month
Storage (2x 480 GB EBS sc1 volumes):	$24 per month
Compute (2x m5.xlarge instances):	$281 per month
Inter-AZ data transfer costs (est.):	$130 per month
TOTAL	$459 per month

*US N. Virginia pricing

Amazon EFS is ~90% less than DIY

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EFS Infrequent Access Customer Success

"Switching to EFS IA was very easy and reduced operations costs significantly. We have some legacy applications, and EFS enabled us to quickly lift and shift them to the cloud without interruption of operations. With the roll out of EFS IA, we've saved as much as $10k per month on our cloud NFS costs."
— Ian Cooke, Computational Scientist and CTO, Dagan

"Implementing EFS IA with Lifecycle Management was really easy. We enabled Lifecycle Management through a few clicks in the console, and EFS did the rest. Infrequently accessed files began migrating to lower priced storage transparently, per the selected policy, without any impact to our users or applications."

— Justin Falk, Director of IT, OnePacs

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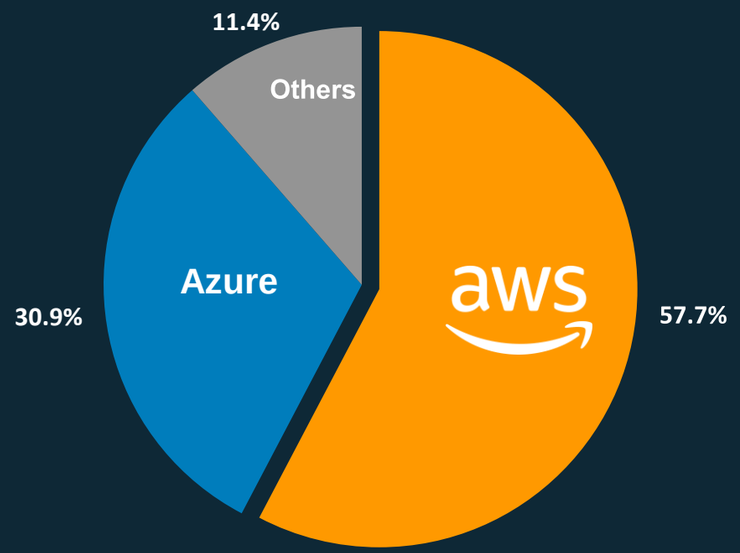
Almost 2/3 of Windows instances running on public cloud run on AWS

Worldwide Windows Public Cloud IaaS Instances by Cloud Provider, 2017



Note: Includes Windows instances deployed in the public cloud IaaS market during 2017 Source: IDC estimates, 2018

IDC, Windows Server Operating Environment Market Update, Doc # US44217118, Aug 2018

https://d1.awsstatic.com/analyst-reports/IDC_Slide_WindowsonAWS_JM181015.pdf

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Amazon FSx for Windows File Server

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Amazon FSx for Windows File Server

Fully managed Windows file server, built on Windows Server

Native Windows compatibility

Fast and flexible performance

Enterprise Ready

Broad accessibility

Fully managed

Secure and Compliant

Cost Effective

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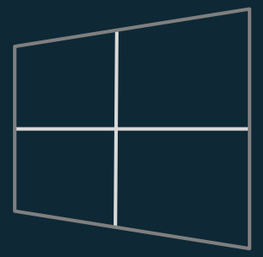
Native Windows compatibility and features



Native Windows compatibility

NTFS

SMB

Native SMB 2.0 to 3.1.1

AD

Integrates with Microsoft AD and supports Windows ACLs

DFS Namespaces and DFS Replication

Windows Server

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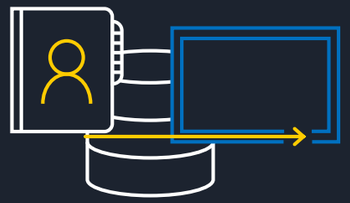
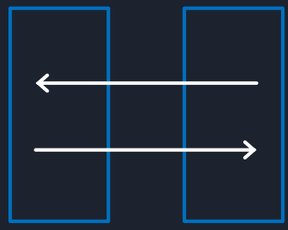
Direct integration with on-premises AD environments

Easily Lift-and-Shift File Storage

Extend existing Windows environments without added complexity



Retain access control to existing users without any modifications



Automatically replicate data between on-premises file servers and Amazon FSx

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Amazon FSx for Windows File Server pricing

Storage capacity:	$0.130 per GB-month
Throughput capacity:	$2.200 per MBps-month
Backup pricing:	$0.050 per GB-month

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Example TCO

1024 GB of storage 8 MBps of baseline tput	1024 GB-months x $0.130/GB-month = $133/mo 8 MBps-months x $2.200/MBps-month = $18/mo
	Total: $151/mo ($0.147/GB-mo)
+ 500 GB of backup	+ 500 GB-months x $0.050/GB-month = $25/mo
	Total: $176 ($0.172/GB-mo)

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Amazon FSx for Windows File Server Customer Feedback

*"With Amazon FSx we have a **managed solution** that eliminates the need for us to manage the tasks associated with operating file storage, including performing backups and applying software patches." - Greg Bell, Senior Systems Administrator*

"We were able move our Windows file-based application to AWS quickly and solved a critical performance issue. Based on our successful lift-and-shift experience, we're looking to move more of our legacy applications requiring Windows native compatibility, to Amazon FSx."

*We no longer need to worry about maintenance of the file system environment or patching of the underlying servers. This is allowing the team to **focus on more business-critical parts of our application structure**." John Waller, Senior Engineer, DocXellent*

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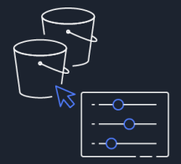
Amazon FSx for Lustre

Fully managed Lustre file system for compute-intensive workloads

Massively scalable performance



Seamless access to your data repositories

Fully managed

Native file system interface

Cost-optimized for compute-intensive workloads

Secure and compliant

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Moving file data into AWS

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More Options for Data Transfer

AWS
Direct Connect

Amazon
Kinesis
Firehose

Amazon Kinesis
Data Streams

Amazon Kinesis
Video Streams

Amazon S3
Transfer
Acceleration

AWS
Storage
Gateway

AWS
Snowball

AWS
Snowball Edge

AWS
Snowmobile

AWS
DataSync

AWS
Transfer
for SFTP

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AWS DataSync for EFS or S3

Online transfer service that simplifies, automates, and accelerates moving data

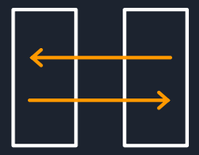
Fast

Parallelized transfer, 10Gbps per agent, scale-out with multiple agents

Automated

No scripts, does validation, filtering, throttling, scheduling

One-time migrations or on-going transfers



Flexible

Multiple protocols (NFS, SMB) & destinations (S3, EFS)

AWS Integrated

Secure and compliant

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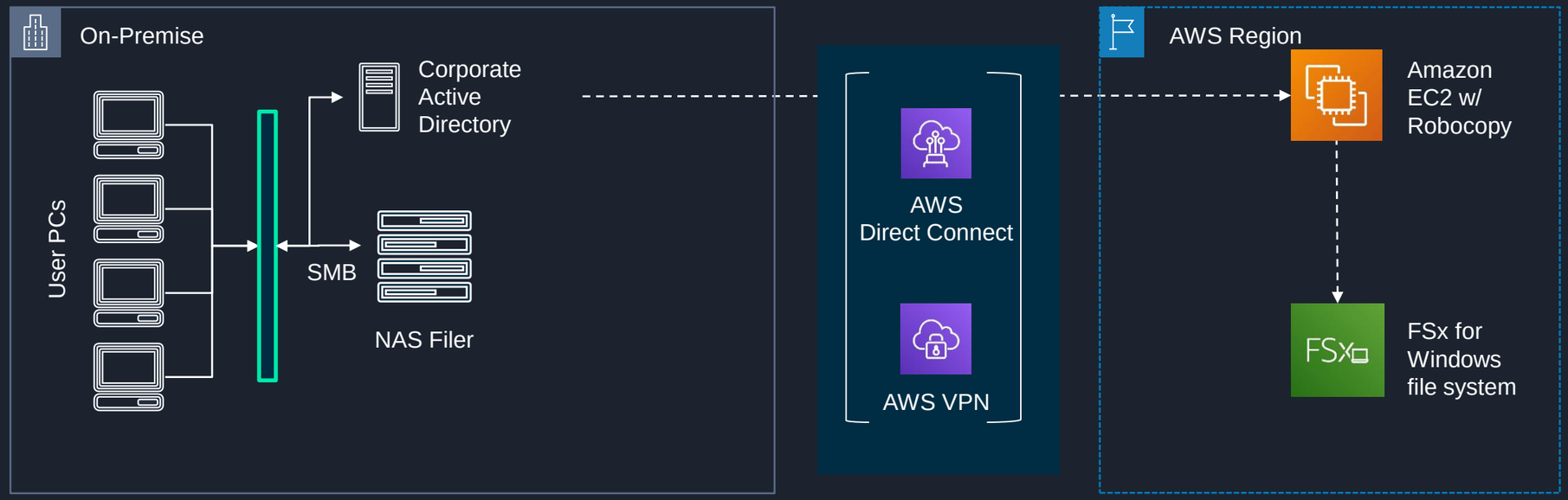
Migrate home directories to FSx for Windows

Amazon FSx

Option 1: Robocopy



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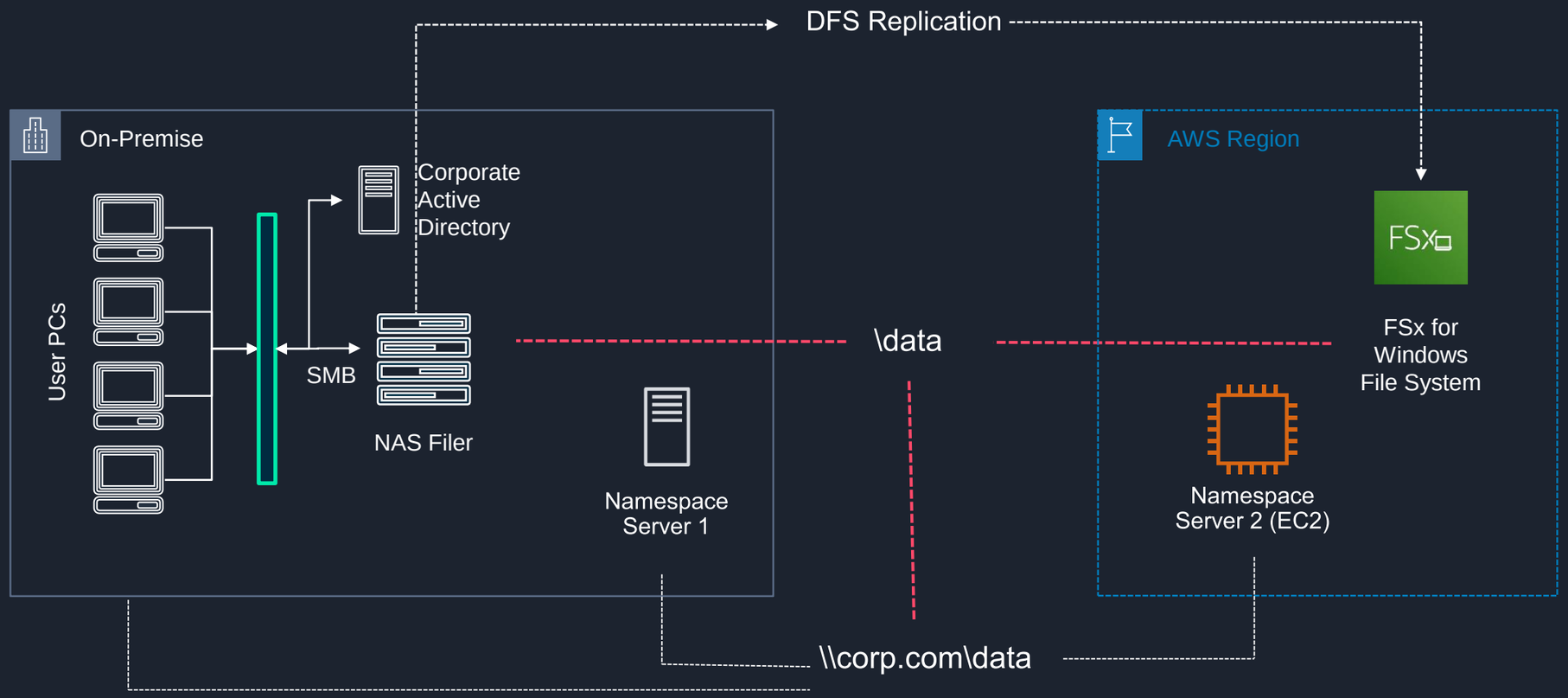
Migrate home directories to FSx for Windows

Amazon FSx

Option 2: DFS replication and DFS namespaces (New!)



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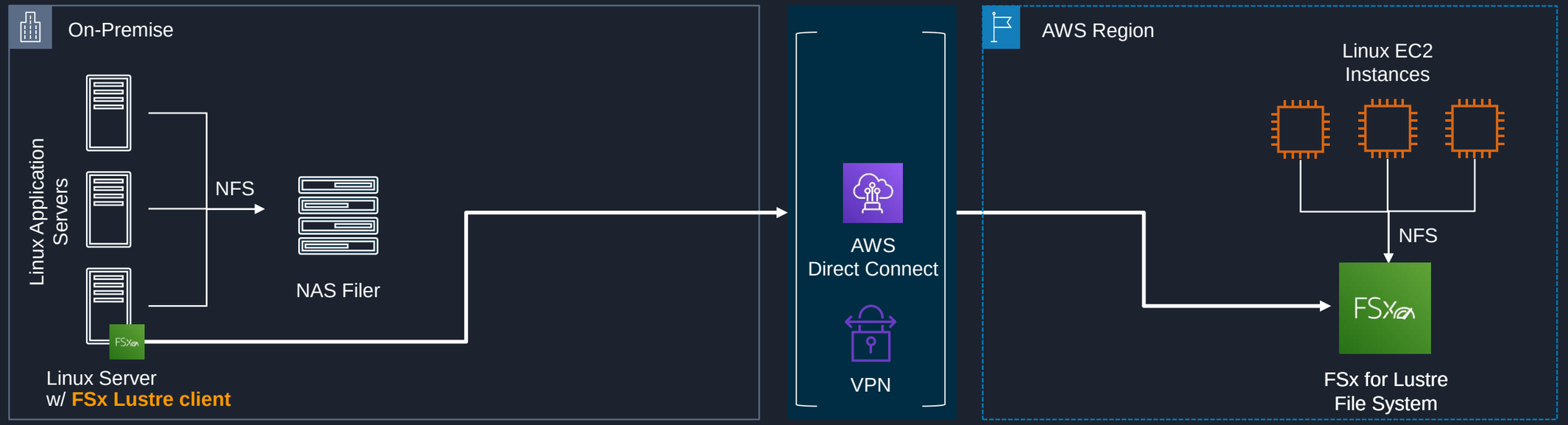
Migrate high-performance workloads to FSx for Lustre

Option 1: On-prem DX or VPN access

Amazon FSx



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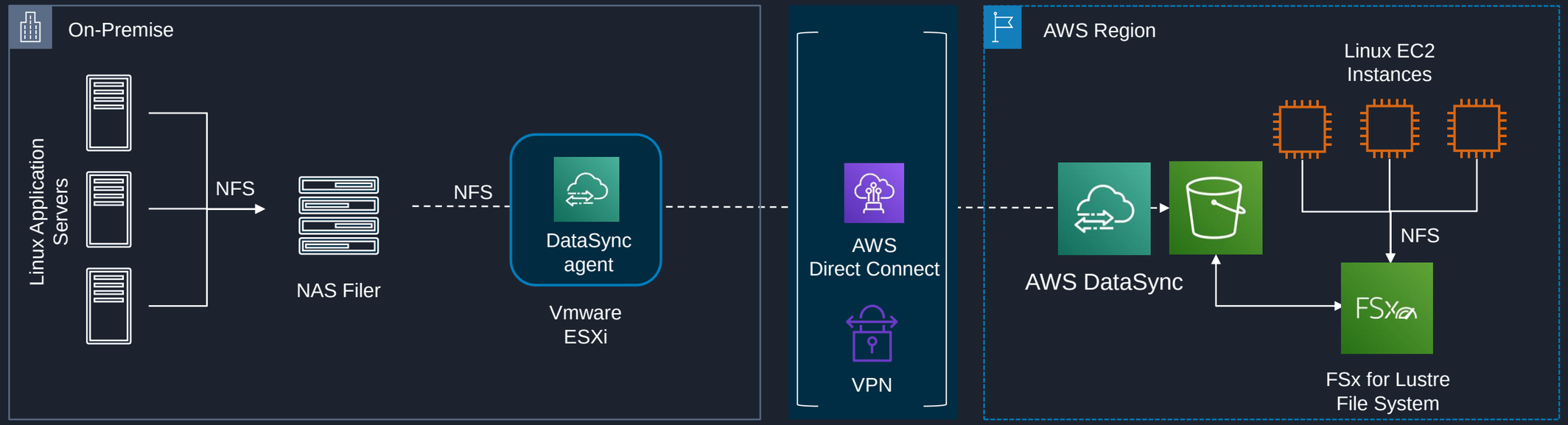
Migrate high-performance workloads to FSx for Lustre

Amazon FSx

Option 2: Use DataSync



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Spend less money

Cost-effective

Pay $0.04 per-GB of data copied, with no minimum commitments or upfront fees

E.g., transferring 100 GB into EFS costs $4

Service infrastructure is fully managed and scaled based on usage

Agents automatically updated and patched

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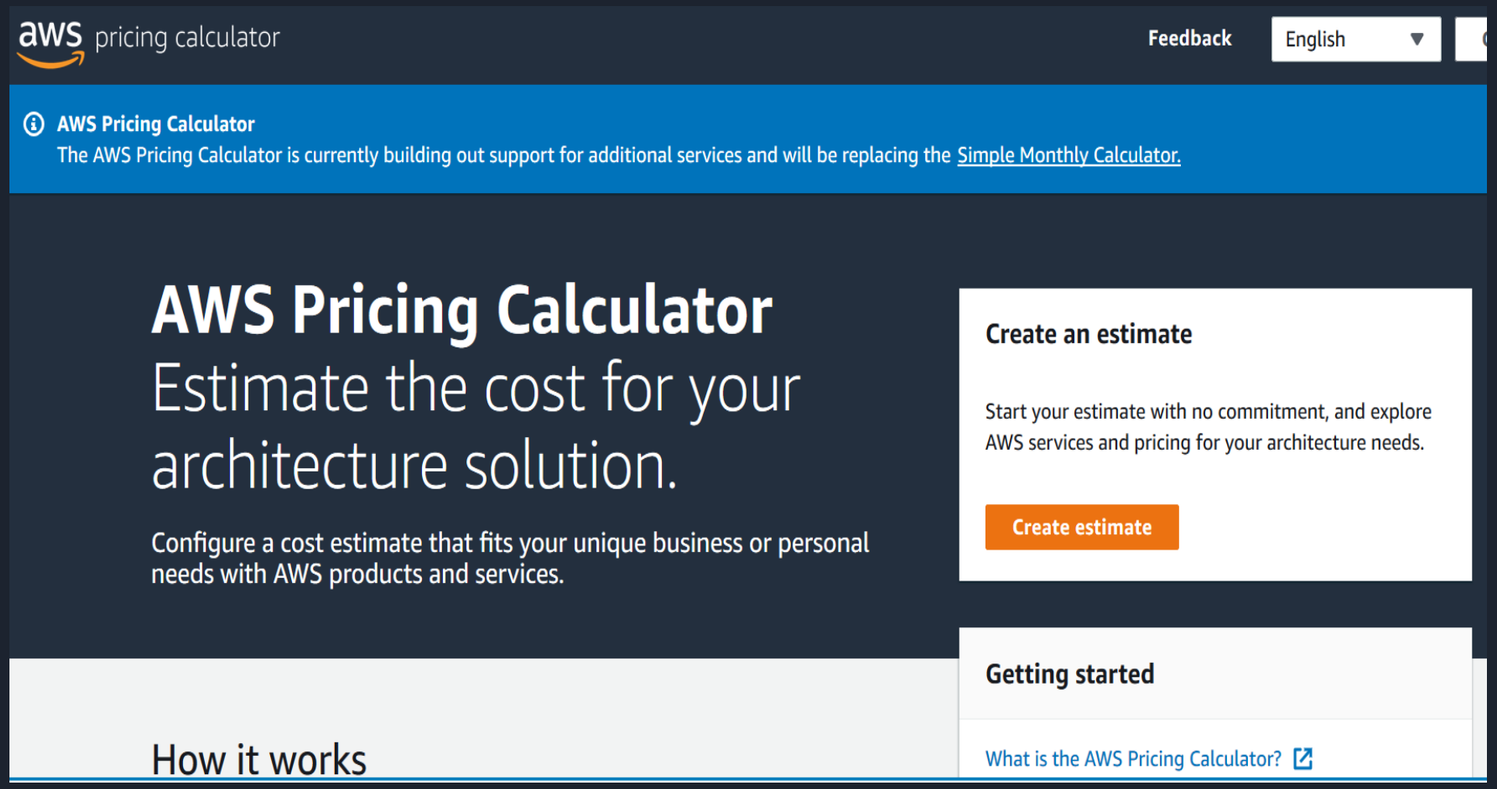
Getting Started Resources



https://calculator.aws

https://aws.amazon.com/blogs/

https://aws.amazon.com/efs/

https://aws.amazon.com/fsx/windows/

Blogs, Papers, Video Tutorials, CloudFormation templates

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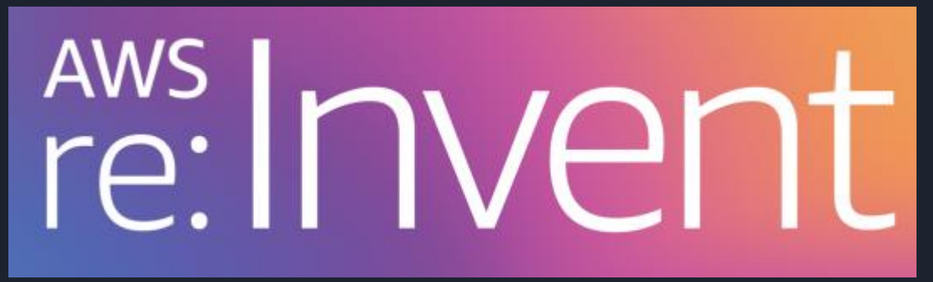

STG201-L - Leadership session: Storage state of the union

STG 202 What's new in AWS file storage

STG204-R - [REPEAT] Get your data to AWS: How to choose and use data migration services

STG211 - How to use AWS storage for on-premises file-based applications

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Thank you!

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