



## Amazon EFS

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### Q. What is Amazon Elastic File System?

Amazon EFS is a fully-managed service that makes it easy to set up and scale file storage in the Amazon Cloud. With a few clicks in the AWS Management Console, you can create file systems that are accessible to Amazon EC2 instances via a file system interface (using standard operating system file I/O APIs) and supports full file system access semantics (such as strong consistency and file locking).

Amazon EFS file systems can automatically scale from gigabytes to petabytes of data without needing to provision storage. Tens, hundreds, or even thousands of Amazon EC2 instances can access an Amazon EFS file system at the same time, and Amazon EFS provides consistent performance to each Amazon EC2 instance. Amazon EFS is designed to be highly durable and highly available. With Amazon EFS, there is no minimum fee or setup costs, and you pay only for the storage you use.

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### Q. What use cases does Amazon EFS support?

Amazon EFS is designed to provide performance for a broad spectrum of workloads and applications, including Big Data and analytics, media processing workflows, content management, web serving, and home directories.

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instance.

[Amazon S3](#) is an object storage service. Amazon S3 makes data available through an Internet API that can be accessed anywhere.

[Learn more](#) about what to evaluate when considering Amazon EFS.

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### Q. What regions is Amazon EFS currently available in?

Please refer to [Regional Products and Services](#) for details of Amazon EFS service availability by region.

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### Q. How do I get started using Amazon EFS?

To use Amazon EFS, you must have an AWS account. If you do not already have an AWS account, you can sign up for an AWS account and instantly get access to the [AWS Free Tier](#).

Once you have created an AWS account, please refer to the Amazon EFS [Getting Started](#) guide to begin using Amazon EFS. You can create a file system via the AWS Management Console, the AWS Command Line Interface (AWS CLI), and Amazon EFS API (and various language-specific SDKs).

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Amazon EFS is compatible with all Linux-based AMIs for Amazon EC2. You can mix and match the instance types connected to a single file system. For a step-by-step example of how to access a file system from an Amazon EC2 instance, please see the [instance type guide here](#).

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### Q. How do I manage a file system?

Amazon EFS is a fully-managed service, so all of the file storage infrastructure is managed for you. When you use Amazon EFS, you avoid the complexity of deploying and maintaining complex file system infrastructure. An Amazon EFS file system grows and shrinks automatically as you add and remove files, so you do not need to manage storage procurement or provisioning.

You can administer a file system via the AWS Management Console, the AWS command-line interface (CLI), or the Amazon EFS API (and various language-specific SDKs). The Console, API, and SDK provide the ability to create and delete file systems, configure how file systems are accessed, create and edit file system tags, and display detailed information about file systems.

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### Q. How do I load data into a file system?

There are a number of methods for loading existing file system data into Amazon EFS, whether your existing file system data is located in AWS or in your on-premises servers.



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For more information about moving data to the Amazon cloud, please see the [Cloud Data Migration](#) page.

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## Data Protection and Availability

### Q. How is Amazon EFS designed to provide high durability and availability?

Every file system object (i.e. directory, file, and link) is redundantly stored across multiple Availability Zones. In addition, a file system can be accessed concurrently from all Availability Zones in the region where it is located, which means that you can architect your application to failover from one AZ to other AZs in the region in order to ensure the highest level of application availability. Mount targets themselves are designed to be highly available.

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### Q. How do I back up a file system?

Amazon EFS is designed to be highly durable. Using the [EFS-to-EFS Backup](#) solution, you can schedule automatic incremental backups of your Amazon EFS file system. For more information, please see the Amazon EFS [Walkthrough: Backup Solutions for Amazon EFS File Systems](#).



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### Q. How much data can I store?

Amazon EFS file systems can store petabytes of data. Amazon EFS file systems are elastic, and automatically grow and shrink as you add and remove files. You do not provision file system size or specify a size up front, and you pay only for the storage you use.

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### Q. How many Amazon EC2 instances can connect to a file system?

Amazon EFS supports one to thousands of Amazon EC2 instances connecting to a file system concurrently.

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### Q. How many file systems can I create?

The number of file systems you can create per account differs by region. For information on Amazon EFS limits, please visit the [Amazon EFS Limits page](#).

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### Q. How does Amazon EFS performance compare to that of other storage solutions?

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	Amazon EFS	Amazon EBS (io1)
Per-operation latency	Low, consistent	Lowest, consistent
Throughput scale	Multiple GBs per second	Single GB per second

Amazon EFS’s distributed nature enables high levels of availability, durability, and scalability. This distributed architecture results in a small latency overhead for each file operation. Due to this per-operation latency, overall throughput generally increases as the average I/O size increases, since the overhead is amortized over a larger amount of data. Amazon EFS's support for highly parallelized workloads (i.e. with consistent operations from multiple threads and multiple EC2 instances) enables high levels of aggregate throughput and IOPS.

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**Q. What’s the difference between “General Purpose” and “Max I/O” performance modes? Which one should I choose?**

“General Purpose” performance mode is appropriate for most file systems, and is the mode selected by default when you create a file system. “Max I/O” performance mode is optimized for applications where tens, hundreds, or thousands of EC2 instances are accessing the file system — it scales to higher levels of aggregate throughput and operations per second with a tradeoff of



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system, the maximum throughput available to the file system scales linearly and automatically with your storage.

File system throughput is shared across all Amazon EC2 instances connected to a file system. For example, a 1TB file system that can burst to 100 MB/s of throughput can drive 100 MB/s from a single Amazon EC2 instance, or 10 Amazon EC2 instances can collectively drive 100 MB/s. For more information, please see the documentation on [File System Performance](#).

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## Provisioned Throughput

Q. What is Provisioned Throughput and when should I use it?

Provisioned Throughput enables Amazon EFS customers to provision their file system's throughput independent of the amount of data stored, optimizing their file system throughput performance to match their application's needs.

Amazon EFS Provisioned Throughput is available for applications with a high throughput to storage (MB/s per TB) ratio. For example, customers using Amazon EFS for development tools, web serving or content management applications, where the amount of data in their file system is low relative to throughput demands, are able to get the high levels of throughput their applications require without having to pad the amount of data in their file system.



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### Q. How does Amazon EFS Provisioned Throughput work?

When you select Provisioned Throughput for your file system, you can provision the throughput of your file system independent of the amount of data stored and pay for the storage and Provisioned Throughput separately. (ex. \$0.30 per GB-Month of storage and \$6.00 per MB/s-Month of Provisioned Throughput in US-East (N. Virginia))

When you select the default Bursting Throughput mode, the throughput of your file system is tied to the amount of data stored and you pay one price per GB of storage (ex. \$0.30 per GB-Month in US-East (N. Virginia)).

In the default Bursting Throughput mode, you get a baseline rate of 50 KB/s per GB of throughput included with the price of storage.

Provisioned Throughput also includes 50 KB/s per GB (or 1 MB/s per 20 GB) of throughput in the price of storage. For example, if you store 20 GB for a month on Amazon EFS and configure a throughput of 5 MB/s for a month you will be billed for 20 GB-Month of storage and 4 (5-1) MB/s-Month of throughput.

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### Q. How will I be billed in the Provisioned Throughput mode?





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Throughput mode or change between Provisioned Throughput and the default Bursting Throughput modes as long as it's been more than 24 hours since the last decrease or throughput mode change.

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Q. What is the throughput of my file system if the Provisioned Throughput mode is set less than the Baseline Throughput I am entitled to in the bursting mode?

In the default Bursting Throughput mode, the throughput of your file system scales with the amount of data stored. If your file system in the Provisioned Throughput mode grows in size after the initial configuration, it is possible that your file system has a higher baseline rate in the Bursting Throughput mode than the Provisioned Throughput mode.

In such cases, your file system throughput will be the throughput it is entitled to in the default Bursting Throughput mode and you will not incur any additional charge for the throughput beyond the bursting storage cost. You will also be able to burst according to the [Amazon EFS throughput bursting model](#).

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## Access Control



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(IAM). You can control access to files and directories with POSIX-compliant [user and group-level permissions](#).

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## Encryption

### Q: What is Amazon EFS Encryption?

Amazon EFS offers the ability to encrypt data at rest and in transit.

Data encrypted at rest is transparently encrypted while being written, and transparently decrypted while being read, so you don't have to modify your applications. Encryption keys are managed by the AWS Key Management Service (KMS), eliminating the need to build and maintain a secure key management infrastructure.

Data encryption in transit uses industry standard Transport Layer Security (TLS) 1.2 to encrypt data sent between your clients and EFS file systems.

Encryption of data at rest and of data in transit can be configured together or separately to help meet your unique security requirements.

For more details, see the [user documentation on Encryption](#).

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You can enable encryption at rest in the EFS console or by using the AWS CLI or SDKs. When creating a new file system in the EFS console, click "Create File System" and click the checkbox to enable encryption.

Data can be encrypted in transit between your Amazon EFS file system and its clients by using the EFS mount helper.

Encryption of data at rest and of data in transit can be configured together or separately to help meet your unique security requirements.

For more details, see the [user documentation on Encryption](#).

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### **Q: Does encryption impact Amazon EFS performance?**

Encrypting your data has a minimal effect on I/O latency and throughput.

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## **On-premises Access**

### **Q: How do I access an EFS file system from servers in my on-premises datacenter?**



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You can mount your Amazon EFS file systems on your on-premises servers, and move file data to and from Amazon EFS using standard Linux tools and scripts. The ability to move file data to and from Amazon EFS file systems enables three use cases.

First, you can migrate data from on-premises datacenters to permanently reside in Amazon EFS file systems.

Second, you can support cloud bursting workloads to offload your application processing to the cloud. You can move data from your on-premises servers into your EFS file systems, analyze it on a cluster of EC2 instances in your Amazon VPC, and store the results permanently in your EFS file systems or move the results back to your on-premises servers.

Third, you can periodically copy your on-premises file data to EFS to support backup and disaster recovery scenarios.

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**Q: Can I access my Amazon EFS file system concurrently from my on-premises datacenter servers as well as Amazon EC2 instances?**

Yes, you can access your Amazon EFS file system concurrently from servers in your on-premises datacenter as well as Amazon EC2 instances in your Amazon VPC. Amazon EFS provides the same file system access semantics, such as strong data consistency and file locking, across all EC2 instances and on-premises servers accessing a file system.

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### **Q: How do I copy existing data from on-premises file storage to Amazon EFS?**

There are a number of methods to copy existing on-premises data into Amazon EFS. EFS File Sync provides a fast and simple way to securely sync existing file systems into Amazon EFS, and works over any network, including AWS Direct Connect

[AWS Direct Connect](#) provides a high bandwidth and lower latency dedicated network connection over which you can mount your Amazon EFS file systems. Once mounted, you can use EFS File Sync to copy data into Amazon EFS up to 5x faster than standard Linux copy tools.

For more information on EFS File Sync, please see the [EFS File Sync section](#) of this FAQ.

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## **EFS File Sync**

### **Q. What is EFS File Sync?**

EFS File Sync provides a fast and simple way to securely move data from existing on-premises or in-cloud file systems into Amazon EFS file systems. EFS File Sync copies files and directories into



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on-premises the agent is deployed in your datacenter, and when the source file system is in AWS the agent is deployed as an Amazon EC2 instance. Standard rates apply for this EC2 instance. Visit the [documentation for EFS File Sync](#) to learn how to get started.

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### Q. How is my data protected using EFS File Sync?

All data transferred by EFS File Sync from the source file systems to the destination in Amazon EFS is encrypted via SSL/TLS.

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### Q. Does EFS File Sync support copying data between AWS Regions?

Yes. You can deploy an EFS File Sync agent in one AWS Region, and sync to an EFS file system in another AWS Region. Your source file system can be either an EFS file system, or a file system shared from an EC2 instance. Visit the [documentation](#) for more information on setting up EFS File Sync.

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### Q. In what regions is EFS File Sync available?

EFS File Sync is available in all [regions where Amazon EFS is available](#).



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Amazon CloudWatch allows you to monitor file system activity using metrics. AWS CloudFormation allows you to create and manage file systems using templates.

AWS CloudTrail allows you to record all Amazon EFS API calls in log files.

AWS Identity and Access Management (IAM) allows you to control who can administer your file system. AWS Tagging services allows you to label your file systems with metadata that you define.

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### **Q. What type of locking does Amazon EFS support?**

Locking in Amazon EFS follows the NFSv4.1 protocol for advisory locking, and enables your applications to use both whole file and byte range locks.

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### **Q. Are file system names global (like Amazon S3 bucket names)?**

Every file system has an automatically generated ID number that is globally unique. You can tag your file system with a name, and these names do not need to be unique.

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With Amazon EFS File Sync, you pay per-GB for data copied to Amazon EFS. For EFS File Sync pricing information, please visit the [Amazon EFS File Sync Pricing page](#).

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### Q. Do your prices include taxes?

Except as otherwise noted, our prices are exclusive of applicable taxes and duties, including VAT and applicable sales tax. For customers with a Japanese billing address, use of AWS services is subject to Japanese Consumption Tax. [Learn more](#).

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