

Products & Services

Compute

Scale to meet your application demands, whether one server or a large cluster. Choose from 10+ instance sizes and a variety of operating systems.

- [Amazon Elastic Compute Cloud \(EC2\)](#)
- [Amazon Elastic MapReduce \(EMR\)](#)

Storage

Utilize cost-effective solutions for storing and retrieving any amount of data, any time, anywhere.

- [Amazon Simple Storage Service \(S3\)](#)
- [Amazon Elastic Block Store \(EBS\)](#)

Database

Leverage scalable database solutions including managed MySQL, Oracle and SQL Server database services, hosted enterprise database software, or non-relational database solutions.

- [Amazon DynamoDB](#)
- [Amazon Relational Database Service \(RDS\)](#)

Networking

Customize and control your network resources, both inside and outside the cloud.

- [Amazon Virtual Private Cloud \(VPC\)](#)
- [Amazon Route53](#)

Solutions



Application Hosting

Access a reliable, on-demand infrastructure to power your applications, from hosted internal applications to SaaS offerings.

[Read More](#)

High Performance Computing

Easily run your data-and compute-intensive workloads with instant provisioning and pay-as-you go pricing.

[Read More](#)

Web Applications

Host your website, whether a blog or a highly-available global website, with AWS's scalable infrastructure platform.

[Read More](#)

Backup and Storage

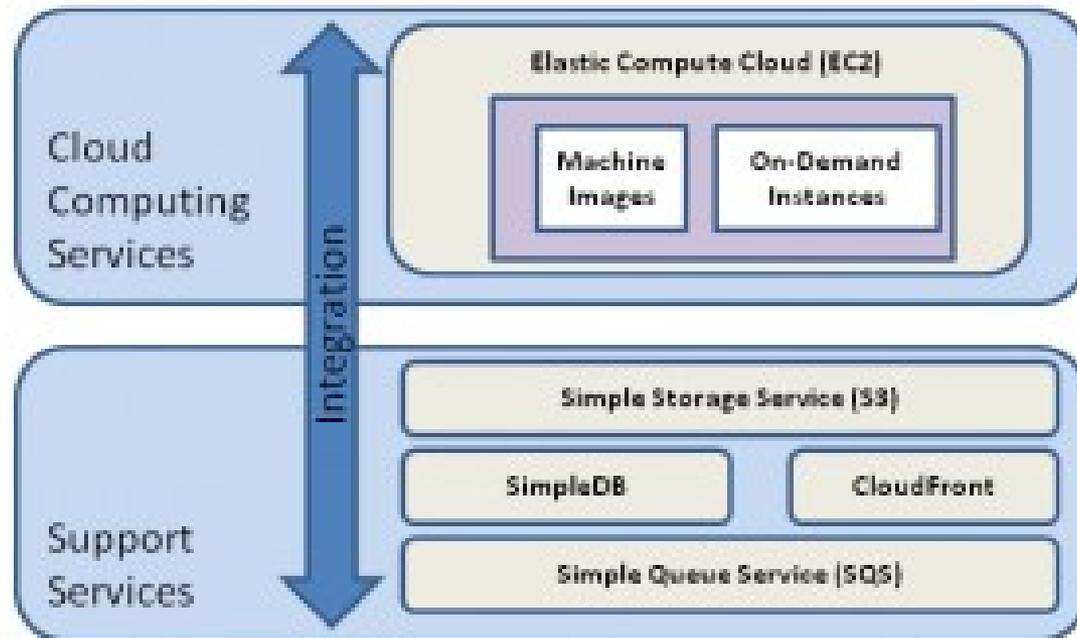
Store data and build dependable backup solutions using AWS's highly reliable, inexpensive data storage services.

[Read More](#)

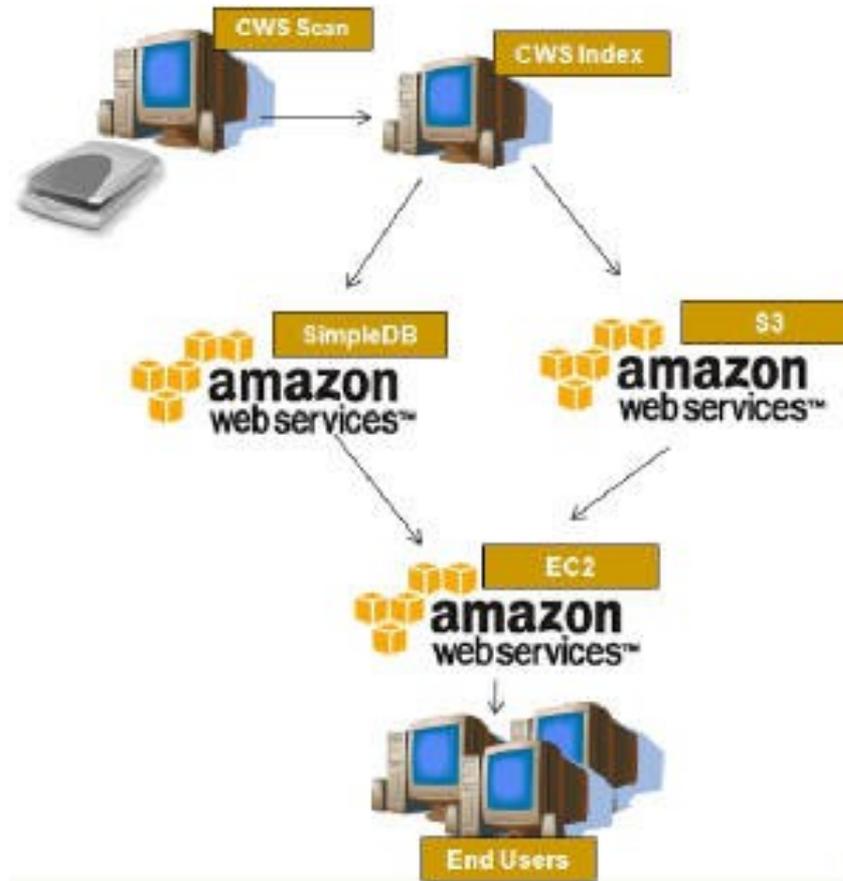
Amazon Elastic Compute Cloud (Amazon EC2)

- Amazon Elastic Compute Cloud (Amazon EC2) is a **web service that provides resizable compute capacity** in the cloud. It is designed to make web-scale computing easier for developers.
- Amazon EC2's simple web service interface **allows you to obtain and configure capacity with minimal friction**.
- **It provides you with complete control of your computing resources** and lets you run on Amazon's proven computing environment.
- Amazon EC2 reduces the time required to obtain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change.
- Amazon EC2 changes the economics of computing by allowing you to pay only for capacity that you actually use.
- Amazon EC2 provides developers the tools to build failure resilient applications and isolate themselves from common failure scenarios.

AWS



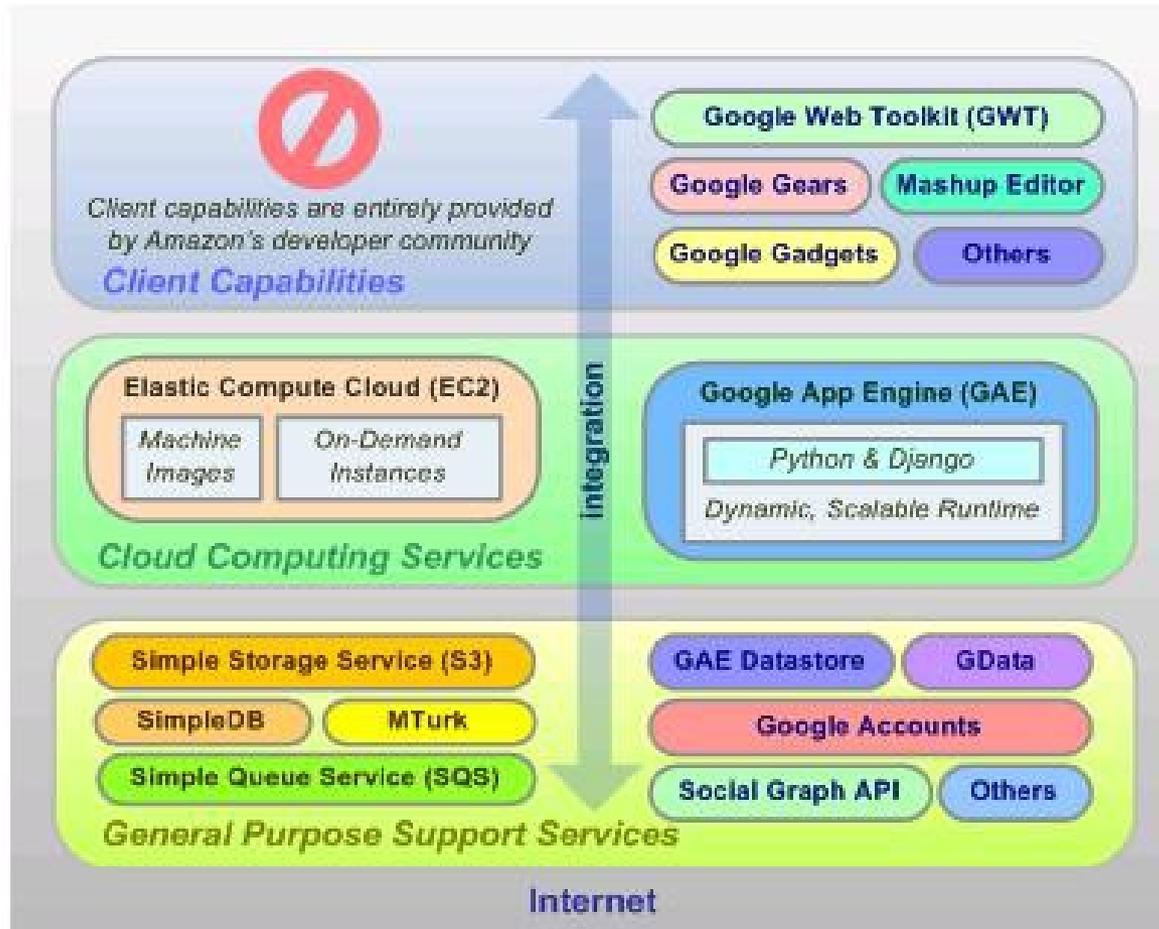
AWS



AWS



Comparing Two of the Leading Software Platforms In The Cloud



Amazon EC2 Functionality

- **Amazon EC2 presents a true virtual computing environment**, allowing you to use web service interfaces to launch instances with a variety of operating systems, load them with your custom application environment, manage your network's access permissions, and run your image using as many or few systems as you desire.
- **To use Amazon EC2, you simply:**
 - ❖ **Select a pre-configured, templated Amazon Machine Image (AMI)** to get up and running immediately. Or create an AMI containing your applications, libraries, data, and associated configuration settings.
 - ❖ **Configure security and network access** on your Amazon EC2 instance.
 - ❖ **Choose which instance type(s) you want**, then start, terminate, and monitor as many instances of your AMI as needed, using the web service APIs or the variety of management tools provided.
 - ❖ **Determine whether you want to run in multiple locations, utilize static IP endpoints, or attach persistent block storage to your instances.**
 - ❖ **Pay only for the resources that you actually consume**, like instance-hours or data transfer.

Service Highlights

- **Elastic** – Amazon EC2 enables you to increase or decrease capacity within minutes, not hours or days. You can commission one, hundreds or even thousands of server instances simultaneously. Of course, because this is all controlled with web service APIs, your application can automatically scale itself up and down depending on its needs.
- **Completely Controlled** – You have complete control of your instances. You have root access to each one, and you can interact with them as you would any machine. You can stop your instance while retaining the data on your boot partition and then subsequently restart the same instance using web service APIs. Instances can be rebooted remotely using web service APIs. You also have access to console output of your instances.
- **Flexible** – You have the choice of multiple instance types, operating systems, and software packages. Amazon EC2 allows you to select a configuration of memory, CPU, instance storage, and the boot partition size that is optimal for your choice of operating system and application. For example, your choice of operating systems includes numerous Linux distributions, and Microsoft Windows Server.

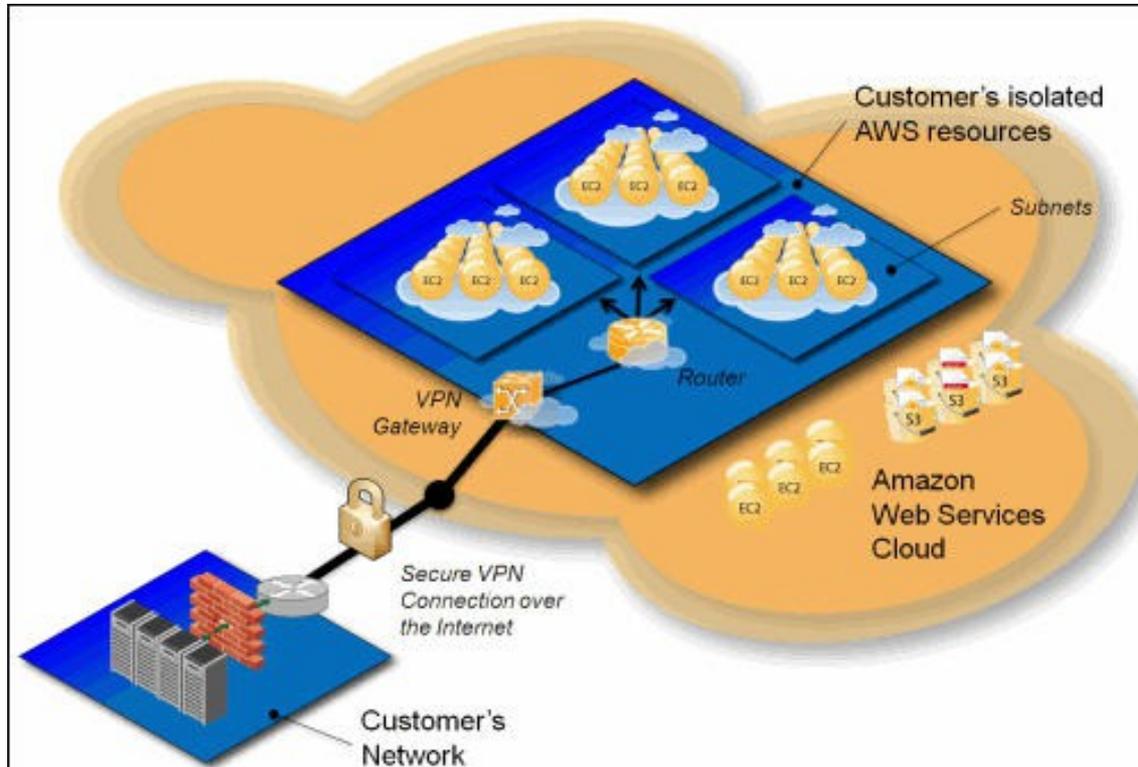
Service Highlights

- **Designed for use with other Amazon Web Services** – Amazon EC2 works in conjunction with Amazon Simple Storage Service (Amazon S3), Amazon Relational Database Service (Amazon RDS), Amazon SimpleDB and Amazon Simple Queue Service (Amazon SQS) to provide a complete solution for computing, query processing and storage across a wide range of applications.
- **Reliable** – Amazon EC2 offers a highly reliable environment where replacement instances can be rapidly and predictably commissioned. The service runs within Amazon's proven network infrastructure and datacenters. The Amazon EC2 Service Level Agreement commitment is 99.95% availability for each Amazon EC2 Region.

Service Highlights

- **Secure** – Amazon EC2 provides numerous mechanisms for securing your compute resources
 - ◆ Amazon EC2 includes web service interfaces to configure firewall settings that control network access to and between groups of instances.
 - ◆ When launching Amazon EC2 resources within Amazon Virtual Private Cloud (Amazon VPC), you can isolate your compute instances by specifying the IP range you wish to use, and connect to your existing IT infrastructure using industry-standard encrypted IPsec VPN.
 - ◆ You can also choose to launch Dedicated Instances into your VPC. Dedicated Instances are Amazon EC2 Instances that run on hardware dedicated to a single customer for additional isolation.
 - ◆ For more information on Amazon EC2 security refer to our [Amazon Web Services: Overview of Security Process document](#).

VPC



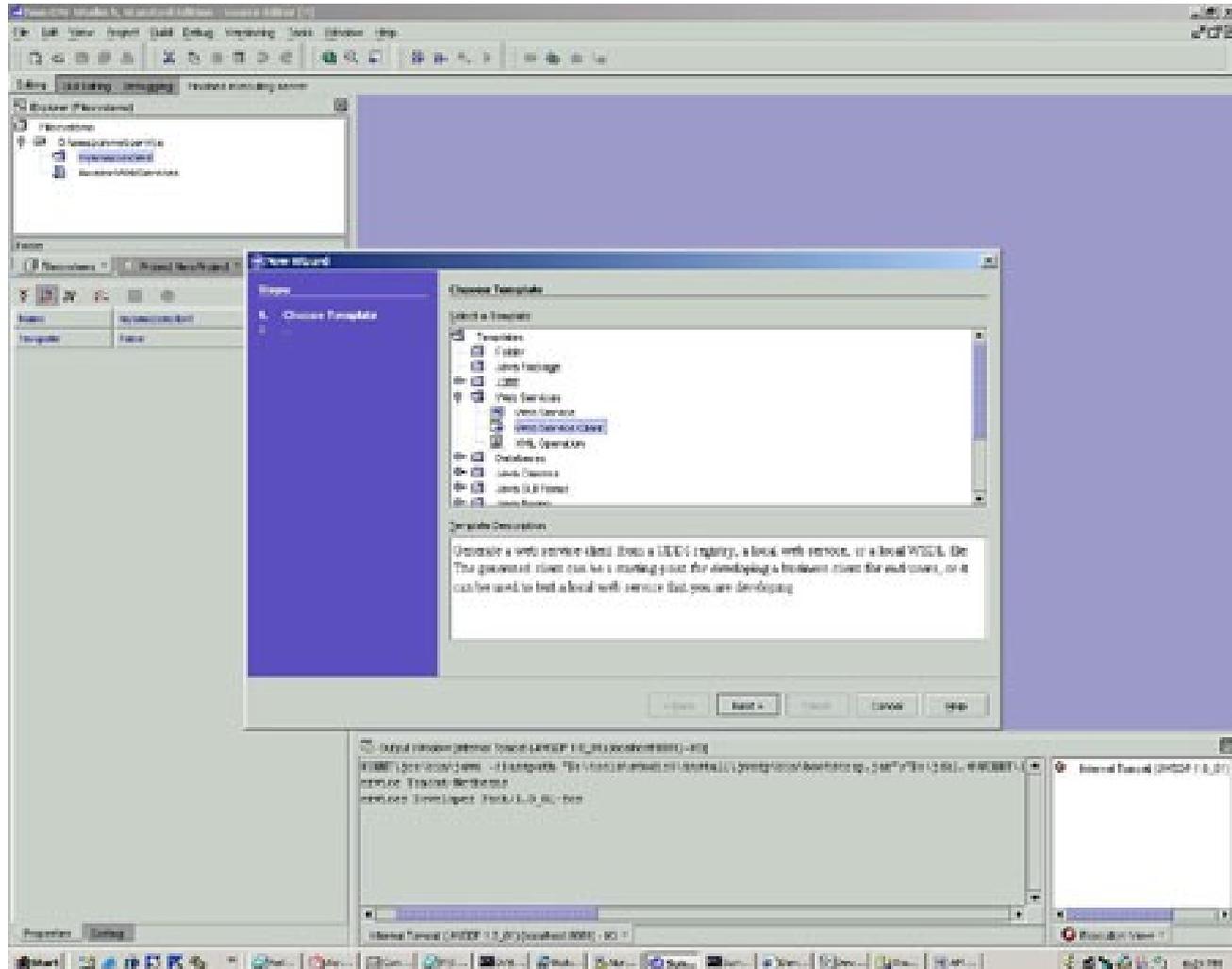
Service Highlights

- **Inexpensive** – Amazon EC2 passes on to you the financial benefits of Amazon’s scale. You pay a very low rate for the compute capacity you actually consume. See Amazon EC2 Instance Purchasing Options for a more detailed description.
 - ❖ **On-Demand Instances** – On-Demand Instances let you pay for compute capacity by the hour with no long-term commitments. This frees you from the costs and complexities of planning, purchasing, and maintaining hardware and transforms what are commonly large fixed costs into much smaller variable costs. On-Demand Instances also remove the need to buy “safety net” capacity to handle periodic traffic spikes.
 - ❖ **Reserved Instances** – Reserved Instances give you the option to make a low, one-time payment for each instance you want to reserve and in turn receive a significant discount on the hourly charge for that instance. There are three Reserved Instance types (Light, Medium, and Heavy Utilization Reserved Instances) that enable you to balance the amount you pay upfront with your effective hourly price.
 - ❖ **Spot Instances** – Spot Instances allow customers to bid on unused Amazon EC2 capacity and run those instances for as long as their bid exceeds the current Spot Price. The Spot Price changes periodically based on supply and demand, and customers whose bids meet or exceed it gain access to the available Spot Instances. If you have flexibility in when your applications can run, **Spot Instances can significantly lower your Amazon EC2 costs.**

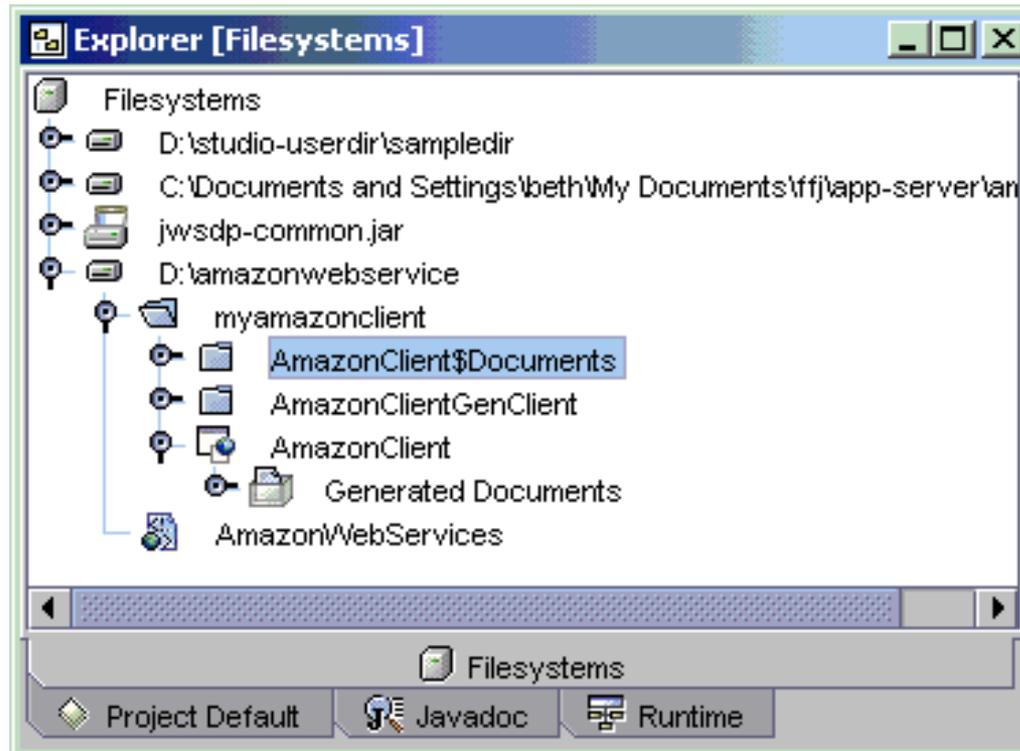
Service Highlights

- **Easy to Start** –
- Quickly get started with Amazon EC2 by visiting AWS Marketplace to choose preconfigured software on Amazon Machine Images (AMIs).
- You can quickly deploy this software to EC2 via **1-Click launch** or with the EC2 console.

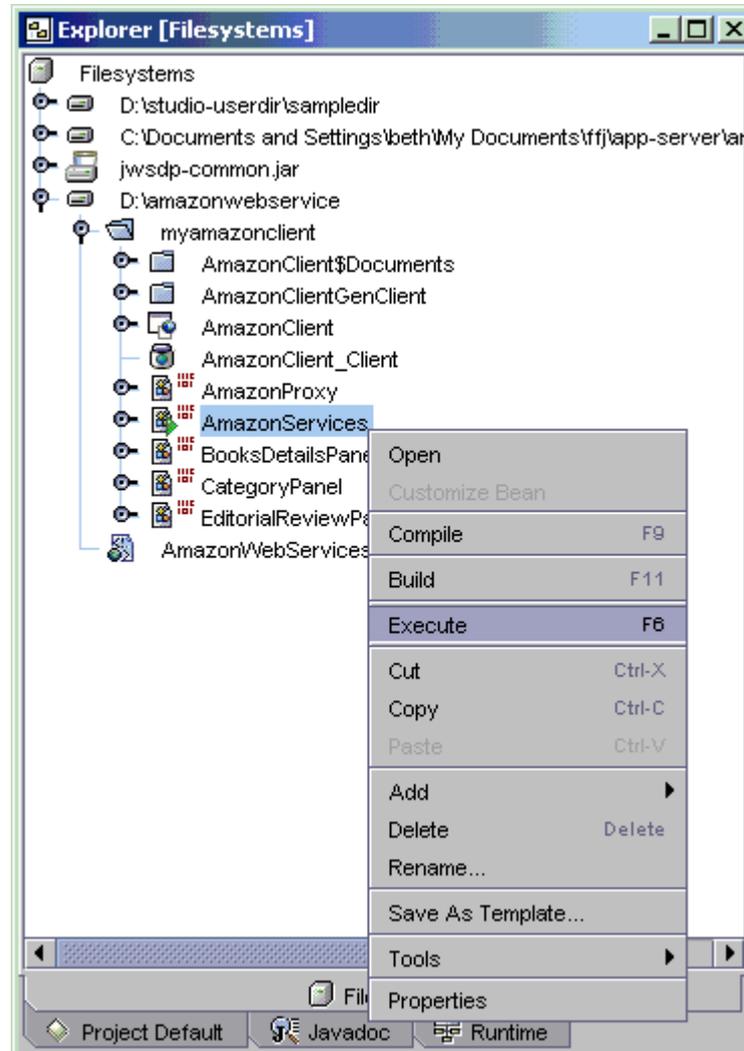
Easy to Start



Easy to Start



Easy to Start



Easy to Start

Setup Steps

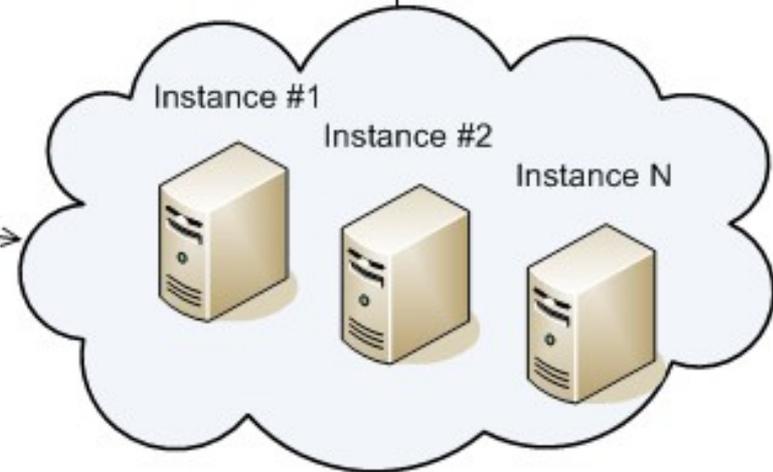
- ✓ Download SOAPSonar
- ✓ Load X.509 & WSDL
- ✓ Setup SOAP Authentication
- ✓ Call EC2 SOAP API

SOAPSonar™

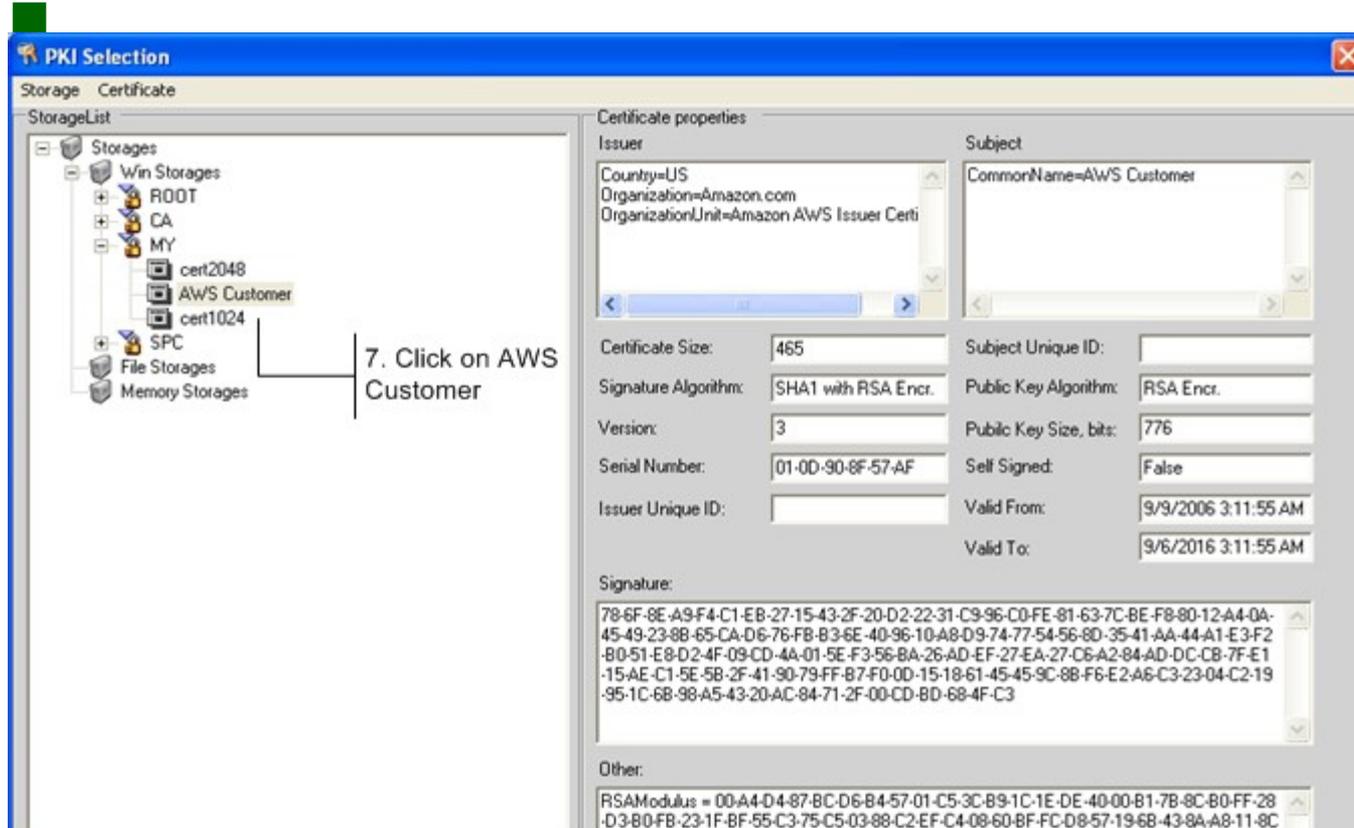


SOAP
Over
HTTPS

Amazon Elastic Compute Cloud



Easy to Start



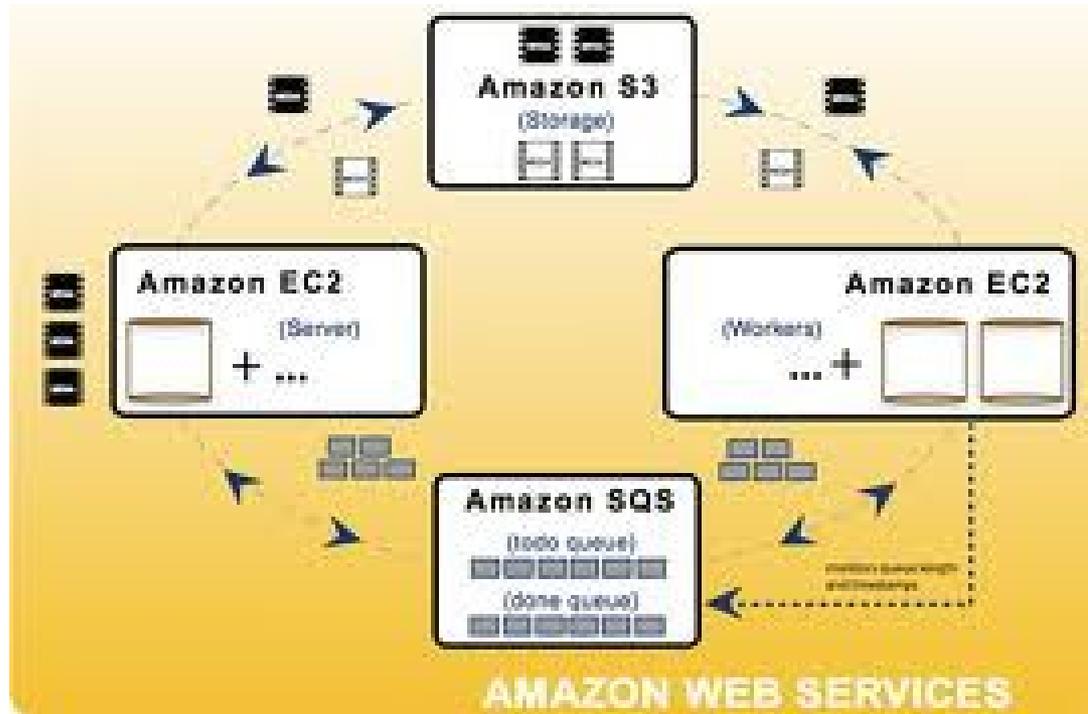
Features

- **Amazon EC2 provides a number of powerful features** for building scalable, failure resilient, enterprise class applications, **including:**
 - ◆ **Amazon Elastic Block Store** – Amazon Elastic Block Store (EBS) offers persistent storage for Amazon EC2 instances. Amazon EBS volumes provide off-instance storage that persists independently from the life of an instance. Amazon EBS volumes are highly available, highly reliable volumes that can be leveraged as an Amazon EC2 instance's boot partition or attached to a running Amazon EC2 instance as a standard block device. When used as a boot partition, Amazon EC2 instances can be stopped and subsequently restarted, enabling you to only pay for the storage resources used while maintaining your instance's state. Amazon EBS volumes offer greatly improved durability over local Amazon EC2 instance stores, as Amazon EBS volumes are automatically replicated on the backend (in a single Availability Zone). For those wanting even more durability, Amazon EBS provides the ability to create point-in-time consistent snapshots of your volumes that are then stored in Amazon S3, and automatically replicated across multiple Availability Zones. These snapshots can be used as the starting point for new Amazon EBS volumes, and can protect your data for long term durability. You can also easily share these snapshots with co-workers and other AWS developers.

Features

- **Multiple Locations** – Amazon EC2 provides the ability to place instances in multiple locations. Amazon EC2 locations are composed of Regions and Availability Zones. Availability Zones are distinct locations that are engineered to be insulated from failures in other Availability Zones and provide inexpensive, low latency network connectivity to other Availability Zones in the same Region. By launching instances in separate Availability Zones, you can protect your applications from failure of a single location. Regions consist of one or more Availability Zones, are geographically dispersed, and will be in separate geographic areas or countries. The Amazon EC2 Service Level Agreement commitment is 99.95% availability for each Amazon EC2 Region. Amazon EC2 is currently available in eight regions: US East (Northern Virginia), US West (Oregon), US West (Northern California), EU (Ireland), Asia Pacific (Singapore), Asia Pacific (Tokyo), South America (Sao Paulo), and AWS GovCloud.
- **Elastic IP Addresses** – Elastic IP addresses are static IP addresses designed for dynamic cloud computing. An Elastic IP address is associated with your account not a particular instance, and you control that address until you choose to explicitly release it. Unlike traditional static IP addresses, however, Elastic IP addresses allow you to mask instance or Availability Zone failures by programmatically remapping your public IP addresses to any instance in your account. Rather than waiting on a data technician to reconfigure or replace your host, or waiting for DNS to propagate to all of your customers, Amazon EC2 enables you to engineer around problems with your instance or software by quickly remapping your Elastic IP address to a replacement instance. In addition, you can optionally configure the reverse DNS record of any of your Elastic IP addresses by filling out this form.

AWS



Key components



Features

- **Amazon Virtual Private Cloud** – Amazon VPC is a secure and seamless bridge between a company's existing IT infrastructure and the AWS cloud. Amazon VPC enables enterprises to connect their existing infrastructure to a set of isolated AWS compute resources via a Virtual Private Network (VPN) connection, and to extend their existing management capabilities such as security services, firewalls, and intrusion detection systems to include their AWS resources. See [Amazon Virtual Private Cloud](#) for more details.
- **Amazon CloudWatch** – Amazon CloudWatch is a web service that provides monitoring for AWS cloud resources and applications, starting with Amazon EC2. It provides you with visibility into resource utilization, operational performance, and overall demand patterns—including metrics such as CPU utilization, disk reads and writes, and network traffic. You can get statistics, view graphs, and set alarms for your metric data. To use Amazon CloudWatch, simply select the Amazon EC2 instances that you'd like to monitor. You can also supply your own business or application metric data. Amazon CloudWatch will begin aggregating and storing monitoring data that can be accessed using web service APIs or Command Line Tools. See [Amazon CloudWatch](#) for more details.

Features

- **Auto Scaling** – Auto Scaling allows you to automatically scale your Amazon EC2 capacity up or down according to conditions you define. With Auto Scaling, you can ensure that the number of Amazon EC2 instances you're using scales up seamlessly during demand spikes to maintain performance, and scales down automatically during demand lulls to minimize costs. Auto Scaling is particularly well suited for applications that experience hourly, daily, or weekly variability in usage. Auto Scaling is enabled by Amazon CloudWatch and available at no additional charge beyond Amazon CloudWatch fees. See Auto Scaling for more details.
- **Elastic Load Balancing** – Elastic Load Balancing automatically distributes incoming application traffic across multiple Amazon EC2 instances. It enables you to achieve even greater fault tolerance in your applications, seamlessly providing the amount of load balancing capacity needed in response to incoming application traffic. Elastic Load Balancing detects unhealthy instances within a pool and automatically reroutes traffic to healthy instances until the unhealthy instances have been restored. You can enable Elastic Load Balancing within a single Availability Zone or across multiple zones for even more consistent application performance. Amazon CloudWatch can be used to capture a specific Elastic Load Balancer's operational metrics, such as request count and request latency, at no additional cost beyond Elastic Load Balancing fees. See Elastic Load Balancing for more details.

Features

- **High Performance Computing (HPC) Clusters** – Customers with complex computational workloads such as tightly coupled parallel processes, or with applications sensitive to network performance, can achieve the same high compute and network performance provided by custom-built infrastructure while benefiting from the elasticity, flexibility and cost advantages of Amazon EC2. Cluster Compute and Cluster GPU Instances have been specifically engineered to provide high-performance network capability and can be programmatically launched into clusters – allowing applications to get the low-latency network performance required for tightly coupled, node-to-node communication. Cluster Compute and Cluster GPU Instances also provide significantly increased network throughput making them well suited for customer applications that need to perform network-intensive operations.

Features

- **VM Import/Export** – VM Import/Export enables you to easily import virtual machine images from your existing environment to Amazon EC2 instances and export them back at any time. By importing virtual machines as ready to use EC2 instances, you can leverage your existing investments in virtual machines that meet your IT security, configuration management, and compliance requirements. You can export your previously imported EC2 instances back to your on-premise environment at any time. This offering is available at no additional charge beyond standard usage charges for Amazon EC2 and Amazon S3. Learn more about VM Import/Export.
- **AWS Marketplace** – AWS Marketplace is an online store that helps you find, buy and quickly deploy software that runs on AWS. You can use AWS Marketplace's 1-Click deployment to quickly launch pre-configured software and be charged for what you use, by the hour or month. AWS handles billing and payments, and software charges appear on your AWS bill. Learn more about AWS Marketplace.

Instances

■ Standard Instances

- Instances of this family are well suited for most applications.
- **Small Instance** (Default) 1.7 GB of memory, 1 EC2 Compute Unit (1 virtual core with 1 EC2 Compute Unit), 160 GB of local instance storage, 32-bit or 64-bit platform
- **Medium Instance** 3.75 GB of memory, 2 EC2 Compute Units (1 virtual core with 2 EC2 Compute Units each), 410 GB of local instance storage, 32-bit or 64-bit platform
- **Large Instance** 7.5 GB of memory, 4 EC2 Compute Units (2 virtual cores with 2 EC2 Compute Units each), 850 GB of local instance storage, 64-bit platform
- **Extra Large Instance** 15 GB of memory, 8 EC2 Compute Units (4 virtual cores with 2 EC2 Compute Units each), 1690 GB of local instance storage, 64-bit platform

■ Micro Instances

- Micro instances (t1.micro) provide a small amount of consistent CPU resources and allow you to increase CPU capacity in short bursts when additional cycles are available. They are well suited for lower throughput applications and web sites that require additional compute cycles periodically..
- Micro Instance 613 MB of memory, up to 2 ECUs (for short periodic bursts), EBS storage only, 32-bit or 64-bit platform

Instances

■ High-Memory Instances

- Instances of this family offer large memory sizes for high throughput applications, including database and memory caching applications.
- **High-Memory Extra Large** Instance 17.1 GB memory, 6.5 ECU (2 virtual cores with 3.25 EC2 Compute Units each), 420 GB of local instance storage, 64-bit platform
- **High-Memory Double Extra Large Instance** 34.2 GB of memory, 13 EC2 Compute Units (4 virtual cores with 3.25 EC2 Compute Units each), 850 GB of local instance storage, 64-bit platform
- **High-Memory Quadruple Extra Large** Instance 68.4 GB of memory, 26 EC2 Compute Units (8 virtual cores with 3.25 EC2 Compute Units each), 1690 GB of local instance storage, 64-bit platform

■ High-CPU Instances

- Instances of this family have proportionally more CPU resources than memory (RAM) and are well suited for compute-intensive applications.
- **High-CPU Medium Instance** 1.7 GB of memory, 5 EC2 Compute Units (2 virtual cores with 2.5 EC2 Compute Units each), 350 GB of local instance storage, 32-bit or 64-bit platform
- **High-CPU Extra Large** Instance 7 GB of memory, 20 EC2 Compute Units (8 virtual cores with 2.5 EC2 Compute Units each), 1690 GB of local instance storage, 64-bit platform

Instances

■ **Cluster Compute Instances**

- Instances of this family provide proportionally high CPU resources with increased network performance and are well suited for High Performance Compute (HPC) applications and other demanding network-bound applications. You can learn more about Cluster instance concepts by reading the Amazon EC2 documentation. For more information about specific use cases and cluster management options for HPC, please visit the HPC solutions page.
- **Cluster Compute Quadruple Extra Large** 23 GB memory, 33.5 EC2 Compute Units, 1690 GB of local instance storage, 64-bit platform, 10 Gigabit Ethernet
- **Cluster Compute Eight Extra Large** 60.5 GB memory, 88 EC2 Compute Units, 3370 GB of local instance storage, 64-bit platform, 10 Gigabit Ethernet

Instances

■ Cluster GPU Instances

- Instances of this family provide general-purpose graphics processing units (GPUs) with proportionally high CPU and increased network performance for applications benefitting from highly parallelized processing, including HPC, rendering and media processing applications. While Cluster Compute Instances provide the ability to create clusters of instances connected by a low latency, high throughput network, Cluster GPU Instances provide an additional option for applications that can benefit from the efficiency gains of the parallel computing power of GPUs over what can be achieved with traditional processors. [Learn more](#) about use of this instance type for HPC applications.
- Cluster GPU Quadruple Extra Large 22 GB memory, 33.5 EC2 Compute Units, 2 x NVIDIA Tesla “Fermi” M2050 GPUs, 1690 GB of local instance storage, 64-bit platform, 10 Gigabit Ethernet
- EC2 Compute Unit (ECU) – One EC2 Compute Unit (ECU) provides the equivalent CPU capacity of a 1.0-1.2 GHz 2007 Opteron or 2007 Xeon processor.
- See [Amazon EC2 Pricing](#) for details on costs for each instance type.
- See [Amazon EC2 Instance Types](#) for a more detailed description of the differences between the available instance types, as well as a complete description of an EC2 Compute Unit.

Operating Systems



Operating Systems

[Red Hat Enterprise Linux](#)

[SUSE Linux Enterprise](#)

Fedora

[Windows Server](#)

[Amazon Linux AMI](#)

Gentoo Linux

[Oracle Enterprise Linux](#)

[Ubuntu](#)

Debian

Software

Databases

[Microsoft SQL Server Standard](#)

[MongoDB](#)

[Acunu Storage Platform Standard Edition w/ Apache Cassandra](#)

[TurnKey PostgreSQL - Object-relational Database System](#)

[Couchbase Server - Enterprise Standard](#)

Application Servers

[Amazon EC2 Running IBM WebSphere Application Server](#)

[Tomcat Java Web Application Deployment provided by JumpBox](#)

[Tomcat on Apache - Java Servlet and JSP Platform by TurnKey Linux](#)

[Zend Server \(Clustered\) w/Gold Support](#)

Pricing

- Pay only for what you use. There is no minimum fee. Estimate your monthly bill using [AWS Simple Monthly Calculator](#). The prices listed are based on the Region in which your instance is running. For a detailed comparison between On-Demand Instances, Reserved Instances and Spot Instances, see [Amazon EC2 Instance Purchasing Options](#).
- **Free Tier***
 - ◆ As part of AWS's Free Usage Tier, new AWS customers can get started with Amazon EC2 for free. [Upon sign-up, new AWS customers receive the following EC2 services each month for one year:](#)
 - ✓ 750 hours of EC2 running Linux/Unix Micro instance usage
 - ✓ 750 hours of EC2 running Microsoft Windows Server Micro instance usage
 - ✓ 750 hours of Elastic Load Balancing plus 15 GB data processing
 - ✓ 30 GB of Amazon Elastic Block Storage (EBS) plus 2 million IOs and 1 GB snapshot storage
 - ✓ 15 GB of bandwidth out aggregated across all AWS services
 - ✓ 1 GB of Regional Data Transfer

Prices

Linux/UNIX Usage Windows Usage

Standard On-Demand Instances

| | | |
|-----------------|------------------|------------------|
| Small (Default) | \$0.080 per Hour | \$0.115 per Hour |
| Medium | \$0.160 per Hour | \$0.230 per Hour |
| Large | \$0.320 per Hour | \$0.460 per Hour |
| Extra Large | \$0.640 per Hour | \$0.920 per Hour |

Micro On-Demand Instances

| | | |
|-------|------------------|------------------|
| Micro | \$0.020 per Hour | \$0.020 per Hour |
|-------|------------------|------------------|

High-Memory On-Demand Instances

| | | |
|-----------------------|------------------|------------------|
| Extra Large | \$0.450 per Hour | \$0.570 per Hour |
| Double Extra Large | \$0.900 per Hour | \$1.140 per Hour |
| Quadruple Extra Large | \$1.800 per Hour | \$2.280 per Hour |

High-CPU On-Demand Instances

| | | |
|-------------|------------------|------------------|
| Medium | \$0.165 per Hour | \$0.285 per Hour |
| Extra Large | \$0.660 per Hour | \$1.140 per Hour |

Cluster Compute Instances

| | | |
|-----------------------|------------------|------------------|
| Quadruple Extra Large | \$1.300 per Hour | \$1.610 per Hour |
| Eight Extra Large | \$2.400 per Hour | \$2.970 per Hour |

Cluster GPU Instances

| | | |
|-----------------------|------------------|------------------|
| Quadruple Extra Large | \$2.100 per Hour | \$2.600 per Hour |
|-----------------------|------------------|------------------|

Data Transfer**

- **Internet Data Transfer**
- The pricing below is based on data transferred "in" and "out" of Amazon EC2.

Pricing

Data Transfer IN

All data transfer in \$0.000 per GB

Data Transfer OUT

First 1 GB / month \$0.000 per GB

Up to 10 TB / month \$0.120 per GB

Next 40 TB / month \$0.090 per GB

Next 100 TB / month \$0.070 per GB

Next 350 TB / month \$0.050 per GB

Next 524 TB / month [Contact Us](#)

Next 4 PB / month [Contact Us](#)

Greater than 5 PB / month [Contact Us](#)

Amazon Simple Storage Service (Amazon S3)

- **Amazon S3 is storage for the Internet.** It is designed to make web-scale computing easier for developers.

Amazon S3 provides a simple web services interface that can be used to store and retrieve any amount of data, at any time, from anywhere on the web.

- It gives any developer access to the same highly scalable, reliable, secure, fast, inexpensive infrastructure that Amazon uses to run its own global network of web sites.
- The service aims to maximize benefits of scale and to pass those benefits on to developers.

Amazon S3 Functionality

- Amazon S3 is intentionally built with a **minimal feature set**.
 - ❖ Write, read, and delete **objects** containing from 1 byte to 5 terabytes of data each. The number of objects you can store is unlimited.
 - ❖ Each **object** is stored in a bucket and retrieved via a unique, developer-assigned key.
 - ❖ A **bucket** can be stored in one of several Regions. You can choose a Region to optimize for latency, minimize costs, or address regulatory requirements. Amazon S3 is currently available in the US Standard, US West (Oregon), US West (Northern California), EU (Ireland), Asia Pacific (Singapore), Asia Pacific (Tokyo), South America (Sao Paulo), and GovCloud (US) Regions. The US Standard Region automatically routes requests to facilities in Northern Virginia or the Pacific Northwest using network maps.
 - ❖ **Objects stored in a Region never leave the Region unless you transfer them out**. For example, objects stored in the EU (Ireland) Region never leave the EU.

Amazon S3 Functionality

- **Authentication mechanisms** are provided to ensure that data is kept secure from unauthorized access. Objects can be made private or public, and rights can be granted to specific users.
- **Options for secure data upload/download and encryption of data at rest** are provided for additional data protection.
- **Uses standards-based REST and SOAP interfaces** designed to work with any Internet-development toolkit.
- Built to be flexible so that protocol or functional layers can easily be added. The default download protocol is HTTP. A BitTorrent™ protocol interface is provided to lower costs for high-scale distribution.
- **Includes options for performing recurring and high volume deletions.** For recurring deletions, rules can be defined to remove sets of objects after a pre-defined time period. For efficient one-time deletions, up to 1,000 objects can be deleted with a single request.
- **Reliability backed** with the Amazon S3 Service Level Agreement.

Protecting Your Data

- **Data stored in Amazon S3 is secure by default**; only bucket and object owners have access to the Amazon S3 resources they create.
- **Amazon S3 supports multiple access control mechanisms**, as well as **encryption** for both secure transit and secure storage on disk.
- **With Amazon S3's data protection features, you can protect your data from both logical and physical failures**, guarding against data loss from unintended user actions, application errors, and infrastructure failures.
- For customers who must comply with regulatory standards such as PCI and HIPAA, Amazon S3's data protection features can be used as part of an overall strategy to achieve compliance.
- **The various data security and reliability features offered by Amazon S3** are described in detail below.

Data Security Details

- Amazon S3 supports several mechanisms that give you flexibility to control who can access your data as well as how, when, and where they can access it. Amazon S3 provides four different access control mechanisms: Identity and Access Management (IAM) policies, Access Control Lists (ACLs), bucket policies, and query string authentication. IAM enables organizations with multiple employees to create and manage multiple users under a single AWS account. With IAM policies, you can grant IAM users fine-grained control to your Amazon S3 bucket or objects. You can use ACLs to selectively add (grant) certain permissions on individual objects. Amazon S3 Bucket Policies can be used to add or deny permissions across some or all of the objects within a single bucket. With Query string authentication, you have the ability to share Amazon S3 objects through URLs that are valid for a predefined expiration time.
- You can securely upload/download your data to Amazon S3 via the SSL encrypted endpoints using the HTTPS protocol. Amazon S3 also provides multiple options for encryption of data at rest. If you prefer to manage your own encryption keys, you can use a client encryption library like the Amazon S3 Encryption Client to encrypt your data before uploading to Amazon S3. Alternatively, you can use Amazon S3 Server Side Encryption (SSE) if you prefer to have Amazon S3 manage encryption keys for you. With Amazon S3 SSE, you can encrypt data on upload simply by adding an additional request header when writing the object. Decryption happens automatically when data is retrieved.

Data Security Details

- Amazon S3 also supports logging of requests made against your Amazon S3 resources. You can configure your Amazon S3 bucket to create access log records for the requests made against it.
- These server access logs capture all requests made against a bucket or the objects in it and can be used for auditing purposes.
- For more information on the security features available in Amazon S3, please refer to Access Control and Using Data Encryption topics in the Amazon S3 Developer Guide.
- For an overview on security on AWS, including Amazon S3, please refer to Amazon Web Services: Overview of Security Processes document.

Data Durability and Reliability

- Amazon S3 provides a highly durable storage infrastructure designed for mission-critical and primary data storage.
- **Objects are redundantly stored on multiple devices across multiple facilities in an Amazon S3 Region.** To help ensure durability, Amazon S3 PUT and COPY operations synchronously store your data across multiple facilities before returning SUCCESS.
- **Once stored, Amazon S3 maintains the durability of your objects by quickly detecting and repairing any lost redundancy.** Amazon S3 also regularly verifies the integrity of data stored using checksums. If corruption is detected, it is repaired using redundant data. In addition, Amazon S3 calculates checksums on all network traffic to detect corruption of data packets when storing or retrieving data.

Data Durability and Reliability

- Amazon S3's standard storage is:
 - ❖ Backed with the Amazon S3 Service Level Agreement.
 - ❖ Designed to provide 99.999999999% durability and 99.99% availability of objects over a given year.
 - ❖ Designed to sustain the concurrent loss of data in two facilities.
 - ❖ Amazon S3 provides further protection via Versioning. You can use Versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. This allows you to easily recover from both unintended user actions and application failures. By default, requests will retrieve the most recently written version. Older versions of an object can be retrieved by specifying a version in the request. Storage rates apply for every version stored.

Reduced Redundancy Storage (RRS)

- **Reduced Redundancy Storage (RRS)** is a storage option within Amazon S3 that enables customers to reduce their costs by storing non-critical, reproducible data at lower levels of redundancy than Amazon S3's standard storage. It provides a cost-effective, highly available solution for distributing or sharing content that is durably stored elsewhere, or for storing thumbnails, transcoded media, or other processed data that can be easily reproduced. The RRS option stores objects on multiple devices across multiple facilities, providing 400 times the durability of a typical disk drive, but does not replicate objects as many times as standard Amazon S3 storage, and thus is even more cost effective.
- **Reduced Redundancy Storage is:**
 - ❖ Backed with the [Amazon S3 Service Level Agreement](#).
 - ❖ Designed to provide 99.99% durability and 99.99% availability of objects over a given year. This durability level corresponds to an average annual expected loss of 0.01% of objects.
 - ❖ Designed to sustain the loss of data in a single facility

Pricing

- Pay only for what you use. There is no minimum fee. Estimate your monthly bill using the [AWS Simple Monthly Calculator](#). We charge less where our costs are less, and prices are based on the location of your Amazon S3 bucket.
- **AWS Free Usage Tier***
- As part of the AWS Free Usage Tier, you can get started with Amazon S3 for free.
- **Upon sign-up**, new AWS customers receive 5 GB of Amazon S3 storage, 20,000 Get Requests, 2,000 Put Requests, and 15GB of data transfer out each month for one year.

Storage Pricing



| | Standard Storage | Reduced Redundancy Storage |
|----------------------|-------------------------|-----------------------------------|
| First 1 TB / month | \$0.125 per GB | \$0.093 per GB |
| Next 49 TB / month | \$0.110 per GB | \$0.083 per GB |
| Next 450 TB / month | \$0.095 per GB | \$0.073 per GB |
| Next 500 TB / month | \$0.090 per GB | \$0.063 per GB |
| Next 4000 TB / month | \$0.080 per GB | \$0.053 per GB |
| Over 5000 TB / month | \$0.055 per GB | \$0.037 per GB |

Data Transfer Pricing

Pricing

Data Transfer IN

All data transfer in \$0.000 per GB

Data Transfer OUT

First 1 GB / month \$0.000 per GB

Up to 10 TB / month \$0.120 per GB

Next 40 TB / month \$0.090 per GB

Next 100 TB / month \$0.070 per GB

Next 350 TB / month \$0.050 per GB

Next 524 TB / month [Contact Us](#)

Next 4 PB / month [Contact Us](#)

Greater than 5 PB / month [Contact Us](#)

Amazon Elastic Block Store (EBS)

- Amazon Elastic Block Store (EBS) provides block level storage volumes for use with Amazon EC2 instances.
- Amazon EBS volumes are off-instance storage that persists independently from the life of an instance.
- Amazon Elastic Block Store provides highly available, highly reliable storage volumes that can be attached to a running Amazon EC2 instance and exposed as a device within the instance.
- Amazon EBS is particularly suited for applications that require a database, file system, or access to raw block level storage.

Features of Amazon EBS volumes

- Amazon EBS allows you to create storage volumes from 1 GB to 1 TB that can be mounted as devices by Amazon EC2 instances. Multiple volumes can be mounted to the same instance.
- Storage volumes behave like raw, unformatted block devices, with user supplied device names and a block device interface. You can create a file system on top of Amazon EBS volumes, or use them in any other way you would use a block device (like a hard drive).
- Amazon EBS volumes are placed in a specific Availability Zone, and can then be attached to instances also in that same Availability Zone.
- Each storage volume is automatically replicated within the same Availability Zone. This prevents data loss due to failure of any single hardware component.

Features of Amazon EBS volumes

- Amazon EBS also provides the ability to create point-in-time **snapshots** of volumes, which are persisted to Amazon S3.
- These snapshots can be used as the starting point for new Amazon EBS volumes, and protect data for long-term durability. The same snapshot can be used to instantiate as many volumes as you wish.
- AWS also enables you to create new volumes from AWS hosted public data sets.
- Amazon CloudWatch exposes performance metrics for EBS volumes, giving you insight into bandwidth, throughput, latency, and queue depth. The metrics are accessible via the AWS CloudWatch API or the AWS Management Console. For more details, see Amazon CloudWatch.

Using Amazon EBS Volumes

- **Amazon EBS volumes are created in a particular Availability Zone and can be from 1 GB to 1 TB in size.** Once a volume is created, it can be attached to any Amazon EC2 instance in the same Availability Zone. Once attached, it will appear as a mounted device similar to any hard drive or other block device. At that point, the instance can interact with the volume just as it would with a local drive, formatting it with a file system or installing applications on it directly.
- **A volume can only be attached to one instance at a time, but many volumes can be attached to a single instance.** This means that you can attach multiple volumes and stripe your data across them for increased I/O and throughput performance. This is particularly helpful for database style applications that frequently encounter many random reads and writes across the dataset. If an instance fails or is detached from an Amazon EBS volume, the volume can be attached to any other instance in that Availability Zone.
- **Amazon EBS volumes can also be used as boot partitions for Amazon EC2 instances, which allows you to increase the size of your boot partition up to 1 TB, preserve your boot partition data beyond the life of your instance, and bundle your AMI in one-click.** You can also stop and restart instances that boot from Amazon EBS volumes while preserving state, with very fast start-up times. As with any use of Amazon EBS, you only pay for the amount of resources you consume.

Amazon EBS Snapshots

- Amazon EBS provides the ability to back up point-in-time snapshots of your data to Amazon S3 for durable recovery.
- Amazon EBS snapshots are incremental backups, meaning that only the blocks on the device that have changed since your last snapshot will be saved. If you have a device with 100 GBs of data, but only 5 GBs of data has changed since your last snapshot, only the 5 additional GBs of snapshot data will be stored back to Amazon S3. Even though the snapshots are saved incrementally, when you delete a snapshot, only the data not needed for any other snapshot is removed. So regardless of which prior snapshots have been deleted, all active snapshots will contain all the information needed to restore the volume. In addition, the time to restore the volume is the same for all snapshots, offering the restore time of full backups with the space savings of incremental.
- Snapshots can also be used to instantiate multiple new volumes, expand the size of a volume or move volumes across Availability Zones. When a new volume is created, there is the option to create it based on an existing Amazon S3 snapshot. In that scenario, the new volume begins as an exact replica of the original volume. By optionally specifying a different volume size or a different Availability Zone, this functionality can be used as a way to increase the size of an existing volume or to create duplicate volumes in new Availability Zones. If you choose to use snapshots to resize your volume, you need to be sure your file system or application supports resizing a device.

Amazon EBS Snapshots

- **New volumes created from existing Amazon S3 snapshots load lazily in the background.** This means that once a volume is created from a snapshot, there is no need to wait for all of the data to transfer from Amazon S3 to your Amazon EBS volume before your attached instance can start accessing the volume and all of its data. If your instance accesses a piece of data which hasn't yet been loaded, the volume will immediately download the requested data from Amazon S3, and then will continue loading the rest of the volume's data in the background.
- **Amazon EBS shared snapshots allows you to share these snapshots, making it easy for you to share this data with your co-workers or others in the AWS community.** With this feature, users that you have authorized can quickly use your Amazon EBS shared snapshots as the basis for creating their own Amazon EBS volumes. If you choose, you can also make your data available publicly to all AWS users. Users to whom you have granted access can create their own EBS volumes based on your snapshot; your original snapshot will remain intact. This is a great way for developers to easily share data with the rest of the Amazon EC2 community, and makes it easy for new customers to create Amazon EBS volumes from an existing snapshot. Because all the data is stored in the Amazon cloud, users don't have to wait for time consuming downloads, and can access it within minutes.

Gluster

