

EC2 Pricing Models

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There are 5 different ways to pay for EC2 (Virtual Machines)

On-Demand

Least Commitment

- low cost and flexible
- only pay per hour or the *second
- short-term, spiky, unpredictable workloads
- cannot be interrupted
- For first time apps

Spot *up to 90%*

Biggest Savings

- request spare computing capacity
- flexible start and end times
- Can handle interruptions (server randomly stopping and starting)
- For non-critical background jobs

Reserved *up to 75% off*

Best Long-term

- steady state or predictable usage
- commit to EC2 over a 1 or 3 year term
- Can resell unused reserved instances

Dedicated

Most Expensive

- Dedicated servers
- Can be on-demand or reserved or spot
- When you need a guarantee of isolate hardware (enterprise requirements)

AWS Savings Plan is another way to save but can be used for more than just EC2.



On-Demand

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On-Demand is a **Pay-As-You-Go (PAYG) model**, where you consume compute and then you pay.

When you **launch** an EC2 instance it is **by default** using **On-Demand Pricing**



Launch instances

On-demand has **no up-front payment** and **no long-term commitment**

You are charged by the **second (minimum of 60 seconds)** or the **hour**

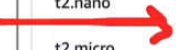
per-second for:

Linux, Windows, Windows with SQL Enterprise, Windows with SQL Standard, and Windows with SQL Web Instances that do not have a separate hourly charge

per-hour:

full hour for all other instance types.

When looking up pricing it will always show EC2 pricing is the **hourly rate**



| Viewing 363 of 363 available instances | | | | | |
|--|-------------------------|--------|----------|-----------|-----------------------|
| <input type="text" value="t2"/> | | | | | |
| Instance name ▲ | On-Demand hourly rate ▼ | vCPU ▼ | Memory ▼ | Storage ▼ | Network performance ▼ |
| t2.nano | \$0.0058 | 1 | 0.5 GiB | EBS Only | Low |
| t2.micro | \$0.0116 | 1 | 1 GiB | EBS Only | Low to Moderate |

On-Demand is for applications where the workload is for **short-term**, **spikey** or **unpredictable**.

When you have a **new app** for development or you want to run experiment.



Reserved Instances (RI)

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Designed for applications that have a **steady-state, predictable usage**, or require **reserved capacity**.

Reduced Pricing is based on **Term x Class Offering x RI Attributes x Payment Option**

Term — The longer the term the greater savings.

You commit to a **1 Year** or **3 Year** contract.
Reserved Instances do not renew automatically

When the expire your instance will use On-Demand with no interruption to service

Class — The less flexible the greater the savings

Standard Up to **75%** reduced pricing compared to on-demand. You can modify **RI Attributes**.

Convertible Up to **54%** reduced pricing compared to on-demand. You can exchange RI based on **RI Attributes** if greater or equal in value.

~~Scheduled~~ AWS no longer offers Scheduled RI

Payment Options — The greater upfront the great the savings

All Upfront

Full payment is made at the start of the term

Partial Upfront

A portion of the cost must be paid upfront and the remaining hours in the term are billed at a discounted hourly rate

No Upfront

You are billed a discounted hourly rate for every hour within the term, regardless of whether the Reserved Instance is being used

RIs can be **shared between multiple accounts within an AWS Organization**

Unused RIs can be sold in the **Reserved Instance Marketplace**



Reserved Instances (RI)

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Filter base on your requirements

Purchase Reserved Instances

Platform

Linux/UNIX

Tenancy

Default

Offering class

Convertible

Instance type

t3.micro

Term

1 month to 12 months

Payment option

Any

Only show offerings that reserve capacity

Search

| Seller | Term | Effective rate | Upfront price | Hourly rate | Payment option | Offering class | Quantity available | Desired quantity | Normalized units per hour | |
|--------|-----------|----------------|---------------|-------------|-----------------|----------------|--------------------|--------------------------------|---------------------------|------------------------|
| AWS | 12 months | \$0.008 | \$69.00 | \$0.000 | All upfront | Convertible | Unlimited | <input type="text" value="1"/> | 0.5 | <div>Add to cart</div> |
| AWS | 12 months | \$0.008 | \$0.00 | \$0.008 | No upfront | Convertible | Unlimited | <input type="text" value="1"/> | 0.5 | <div>Add to cart</div> |
| AWS | 12 months | \$0.008 | \$35.00 | \$0.004 | Partial upfront | Convertible | Unlimited | <input type="text" value="1"/> | 0.5 | <div>Add to cart</div> |

Your cart: 1 Reserved Instance, total due now: \$69.00

Monthly recurring cost: \$0.00

Additional taxes may apply.

Cancel

View cart

Add to cart



Reserved Instances (RI) – RI Attributes

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RI Attributes (aka Instance Attributes) are limited based on Class Offering and can affect the final price of an RI instance. There are 4 RI Attributes:



1. Instance type: For example, m4.large. This is composed of the instance family (for example, m4) and the instance size (for example, large).



2. Region: The Region in which the Reserved Instance is purchased.



3. Tenancy: Whether your instance runs on shared (default) or single-tenant (dedicated) hardware.



4. Platform: The operating system eg. Windows or Linux/Unix.

Regional and Zonal RI

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When you purchase a RI, you determine **the scope** of the Reserved Instance.
The scope **does not affect the price**.

Regional RI: purchase for a Region

does *not* reserve capacity.

RI discount applies to instance usage in any AZ in the Region.

RI discount applies to instance usage within the instance family, regardless of size. Only supported on Amazon Linux/Unix Reserved Instances with default tenancy.

You can queue purchases for regional RI

Zonal RI: purchase for an Availability Zone

reserves capacity in the specified Availability Zone.

RI discount applies to instance in the selected AZ (No AZ Flexibility)

No instance size flexibility
RI discounts discount applies to instance usage for the specified instance type and size only.

You can't queue purchases for zonal RI



RI Limits

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There is a limit to the number of Reserved Instances that you can purchase per month.

Per month you can purchase

- **20** Regional Reserved Instances *per Region*
- **20** Zonal Reserved Instances *per AZ*

Regional Limits

You cannot exceed your running On-Demand Instance limit by purchasing regional Reserved Instances.

The default On-Demand Instance limit is 20.

Before purchasing RI ensure your On-Demand limit is equal to or greater than your RI you intend to purchase

Zonal Limits

You can exceed your running On-Demand Instance limit by purchasing zonal Reserved Instances

If you already have 20 running On-Demand Instances, and you purchase 20 zonal Reserved Instances, you can launch a further 20 On-Demand Instances that match the specifications of your zonal Reserved Instances



Capacity Reservations

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EC2 instances are backed by different kind of hardware, and so there is a **finite amount of servers** available within an Availability Zone per instance type or family.

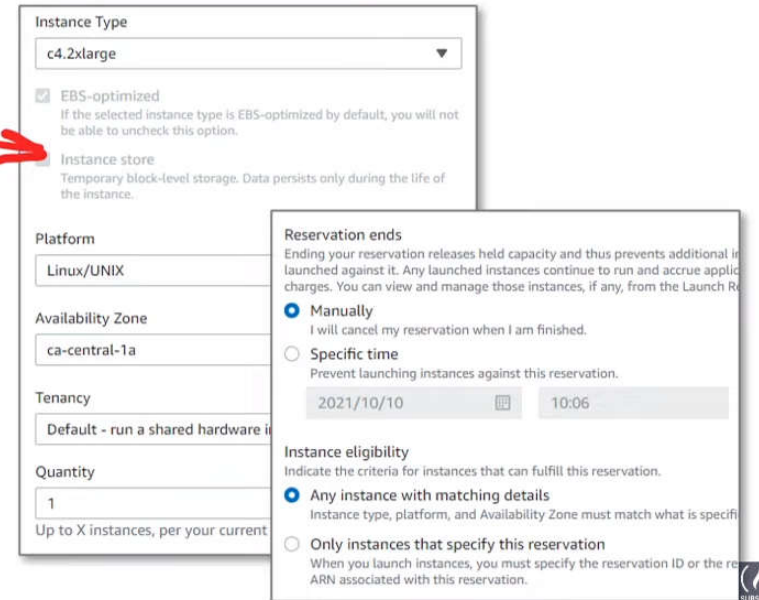


You go to launch a specific type of EC2 instance but AWS has ran out of that server!

Capacity Reservation is a service of EC2 that allows you to **request a reserve of EC2 instance type** for a specific Region and AZ

The reserved capacity is charged at the selected instance type's On-Demand rate whether an instance is running in it or not.

You can also use your regional reserved instances with your Capacity Reservations to benefit from billing discounts



The screenshot displays the AWS EC2 console's Capacity Reservation configuration page. The 'Instance Type' dropdown is set to 'c4.2xlarge'. Below it, the 'EBS-optimized' checkbox is checked, and the 'Instance store' checkbox is unchecked. The 'Platform' is set to 'Linux/UNIX', and the 'Availability Zone' is 'ca-central-1a'. The 'Tenancy' is set to 'Default - run a shared hardware instance'. The 'Quantity' is set to '1'. On the right side, the 'Reservation ends' section shows the 'Manually' option selected. The 'Instance eligibility' section shows the 'Any instance with matching details' option selected. A red arrow points from the text 'request a' in the preceding text block to the 'Instance Type' dropdown menu.

Instance Type
c4.2xlarge

☒ EBS-optimized
If the selected instance type is EBS-optimized by default, you will not be able to uncheck this option.

☐ Instance store
Temporary block-level storage. Data persists only during the life of the instance.

Platform
Linux/UNIX

Availability Zone
ca-central-1a

Tenancy
Default - run a shared hardware instance

Quantity
1
Up to X instances, per your current reservation

Reservation ends
Ending your reservation releases held capacity and thus prevents additional instances from being launched against it. Any launched instances continue to run and accrue applicable charges. You can view and manage those instances, if any, from the Launch console.

☒ Manually
I will cancel my reservation when I am finished.

☐ Specific time
Prevent launching instances against this reservation.

2021/10/10 10:06

Instance eligibility
Indicate the criteria for instances that can fulfill this reservation.

☒ Any instance with matching details
Instance type, platform, and Availability Zone must match what is specified in the reservation.

☐ Only instances that specify this reservation
When you launch instances, you must specify the reservation ID or the reservation ARN associated with this reservation.

Standard vs Convertible RI

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There are some key difference between Standard and Convertible

Standard RI

RI attributes can be modified

- Change the AZ within same Region
- Change the scope of the Zonal RI to Regional RI or visa versa
- Change the instance size (Linux/Unix only, default tenancy)
- Change network from Ec2-Classic to VPC and visa-versa

Can't be exchanged

Can be bought or sold in the RI Marketplace

Convertible RI

RI attributes can't be modified (you perform an exchange)

Can be exchanged during the term for another Convertible RI with new RI attributes, including:

- instance family
- instance type
- platform
- scope
- tenancy

Can't be bought or sold in the RI Marketplace



RI Marketplace

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EC2 Reserved Instance Marketplace allows you to **sell your unused Standard RI** to recoup your RI spend for RI you do not intend or cannot use.

- Reserved Instances can be sold after they have been active for at least 30 days and once AWS has received the upfront payment (if applicable).
- You must have a US bank account to sell Reserved Instances on the Reserved Instance Marketplace.
- There must be at least one month remaining in the term of the Reserved Instance you are listing.
- You will retain the pricing and capacity benefit of your reservation until it's sold and the transaction is complete.
- Your company name (and address upon request) will be shared with the buyer for tax purposes.
- A seller can set only the upfront price for a Reserved Instance. The usage price and other configuration (e.g., instance type, Availability Zone, platform) will remain the same as when the Reserved Instance was initially purchased.
- The term length will be rounded down to the nearest month. For example, a reservation with 9 months and 15 days remaining will appear as 9 months on the Reserved Instance Marketplace.
- You can sell up to \$20,000 in Reserved Instances per year. If you need to sell more Reserved Instances.
- Reserved Instances in the GovCloud region cannot be sold on the Reserved Instance Marketplace.

Spot Instances

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AWS has **unused compute capacity** that they want to maximize the utility of their idle servers.



It's like when a hotel offers booking discounts to fill vacant suites or planes offer discount to fill vacant seats

Spot Instances provide a discount of **90%** compared to On-Demand Pricing

Spot Instances can be terminated if the computing capacity is needed by other On-Demand customers

Designed for applications that have flexible start and end times or applications that are only feasible at **very low** compute costs.

☒ **Load balancing workloads**
Launch instances of the same size, in any Availability Zone.
Good for running web services.

☐ **Flexible workloads**
Launch instances of any size, in any Availability Zone. Good for running batch and CI/CD jobs.

☐ **Big data workloads**
Launch instances of any size, in a single Availability Zone. Good for MapReduce jobs.



AWS Batch is an easy and convenient way to use Spot Pricing

Termination Conditions

Instances can be terminated by AWS **at anytime**

If your instance is **terminated by AWS**, **you don't get charged** for a partial hour of usage.

If **you terminate** an instance **you will still be charged** for any hour that it ran.

Dedicated Instances

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Dedicated Instances is designed to meet regulatory requirements.

When you have strict **server-bound licensing** that won't support multi-tenancy or cloud deployments you use **Dedicated Hosts**.



Multi-Tenant

think of everyone living in an apartment



Multi-Tenant

When multiple customers are running workloads on the same hardware. **Virtual Isolation** is what separates customers



Single Tenant

think of everyone having their own house



Single-Tenant



Single-Tenant



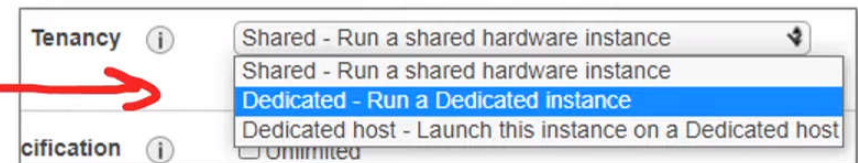
Single-Tenant

When a single customer has dedicated hardware. **Physical Isolation** is what separates customers

Dedicated can be offered for:

- **On-demand**
- **Reserved (up to 60% savings)**
- **Spot (up to 90% savings)**

You choose tenancy when you **launch** your EC2
(Notice there is a Dedicated Host)



Enterprises and **Large Organizations** may have security concerns or obligations about against sharing the same hardware with other AWS Customers.

AWS Savings Plan

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Savings Plans offer you the similar discounts as Reserved Instances (RI) but **simplifies the purchasing process**

There are 3 types of Savings Plans:

- **Compute Savings Plans**
- **EC2 Instance Savings Plans**
- **SageMaker Savings Plan**

Savings Plan type

☒ **Compute Savings Plans**

Applies to EC2 instance usage, AWS Fargate, and AWS Lambda service usage, regardless of region, instance family, size, tenancy, and operating system.
[Learn more](#)

☐ **EC2 Instance Savings Plans**

Applies to instance usage within the committed EC2 family and region, regardless of size, tenancy, and operating system.
[Learn more](#)

☐ **SageMaker Savings Plans**

Applies to SageMaker service usage, regardless of region, instance family, and component.
[Learn more](#)

You can choose two different terms

- **1 Year**
- **3 Year**

Term

- ☒ 1-year
☐ 3-year

You choose the following Payment Options:

- All Upfront
- Partial Upfront
- No Upfront

Hourly commitment

Your hourly commitment at Savings Plan

\$0.092

Payment option

- ☒ All Upfront
☐ Partial Upfront
☐ No Upfront

You choose an hourly commitment

AWS Savings Plan

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AWS Savings Plan has 3 different savings types:



Compute

Compute Savings Plans provide the most flexibility and help to reduce your costs by up to 66%. These plans automatically apply to EC2 instance usage, AWS Fargate, and AWS Lambda service usage regardless of instance family, size, AZ, region, OS, or tenancy.



EC2 Instances

provide the lowest prices, offering savings up to 72% in exchange for commitment to usage of individual instance families in a region.
automatically reduces your cost on the selected instance family in that region regardless of AZ, size, OS or tenancy.
give you the flexibility to change your usage between instances within a family in that region.



SageMaker

Helps you reduce SageMaker costs by up to 64%.
automatically apply to SageMaker usage regardless of instance family, size, component, or AWS region.