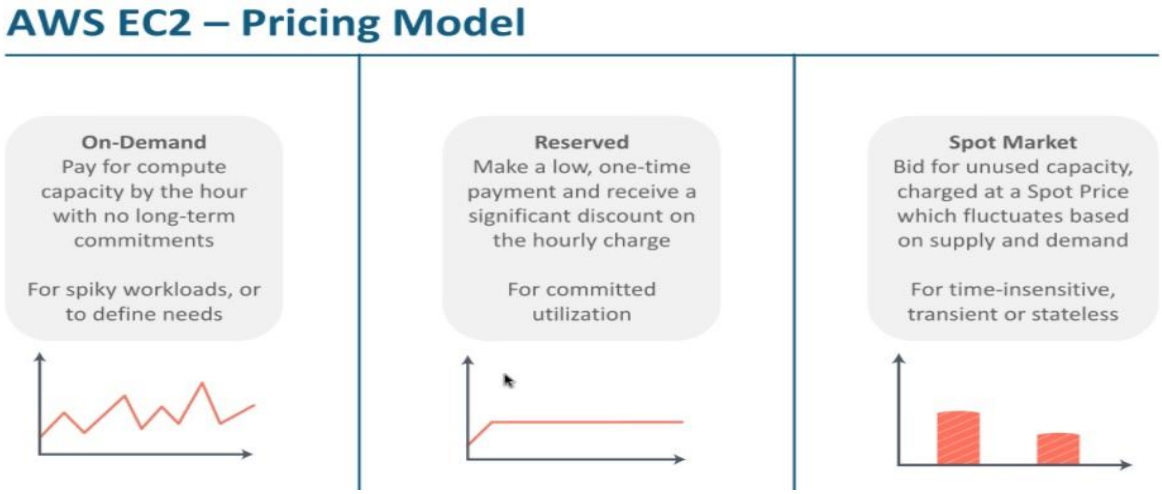
EC2 - PRICING

- **EC2 Instance Billing Models: -**

1. **On-demand Instance**
   Pay per use, charged per second/ hourly (windows) anytime instance is running (turned on)

2. **Reserved Instance**
   Pre-paid for 1 yr. and 3 yr. contract for a specific instance type regardless of you running those instances or not.

3. **Spot Instance**
   Ultra-low-cost instances purchased through the spot market which has un-utilized capacity. You set a maximum you are willing to pay per hour and you pay the spot price that's in effect for the time period your instances are running or till exceeds your set amount.

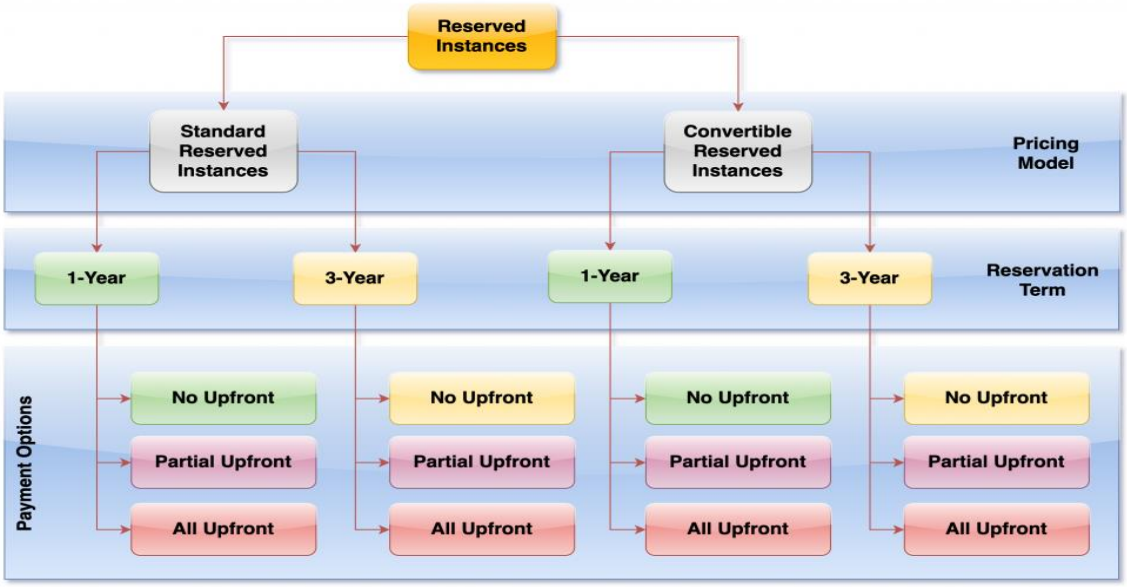


2. **Reserved Instance -RI**

- We do not actually buy instances, rather we reserve long term capacity and pay for it for instance family/config, anytime you can (in that AZ or Region)
- In demand instance that matches the reserve instance one, reserve pricing will apply to the on-demand instance.
- You can purchase it at a significant discount
- Purchase reserve instance (RI) are always available.
- Term options are 1 year or 3 years
- When purchased with an AZ scope, capacity reservation in the AZ is Guaranteed.
- When an AZ isn't specified, the RI discount will apply to a running instance of any size (within the same family) in the region in any region.
- Once **purchased** it cannot be refunded or cancelled. However, you can **sell** them on AWS RI marketplace (standard only, convertible cannot be sold)
- You are billed for RI, whether it is **running or stopped**.
- RI do not renew automatically when its term expires and billing reverts to On-demand billing.
- You have no control over which EC2 on-demand instance will have the RI prices applied to.
- RI benefits can only apply to on-demand instance (Not SPOT or Dedicated)

	Standard	Convertible
Savings over On-Demand	✅ Relatively high (Up to 72% off)	Relatively low (Up to 66% off)
Modifying RI after a purchase	*Yes*	
Exchanging RI after a purchase	No	✅ Yes
Selling on Marketplace	✅ Yes	No
Buying on Marketplace	✅ Yes	No

Standard modifications	Convertible exchanges
• Change between Regional and an Availability Zone scope • Change between Availability Zones within the same region (for AZ scoped RIs only). • Change between Classic EC2 and Virtual Private Cloud. • Altering the instance size within the same family • $0 (not financial transaction)	• A new instance type • A new operating system • A different tenancy • A different instance size • Must exchange for equal or greater value



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- **Reserved Instance Payment Options**

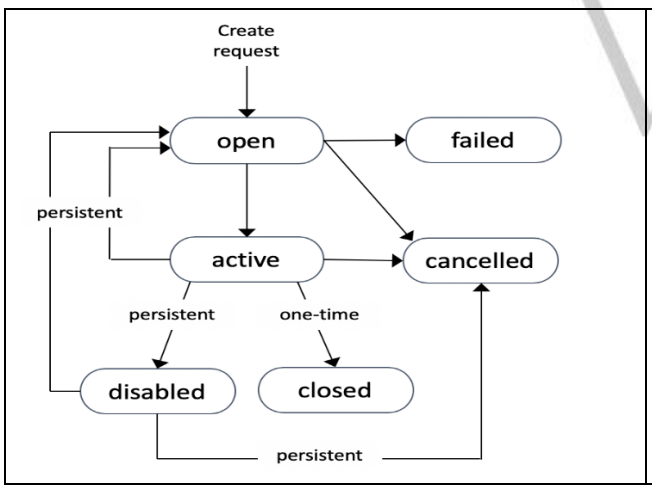
  You can choose between three Reserved Instance payment options:

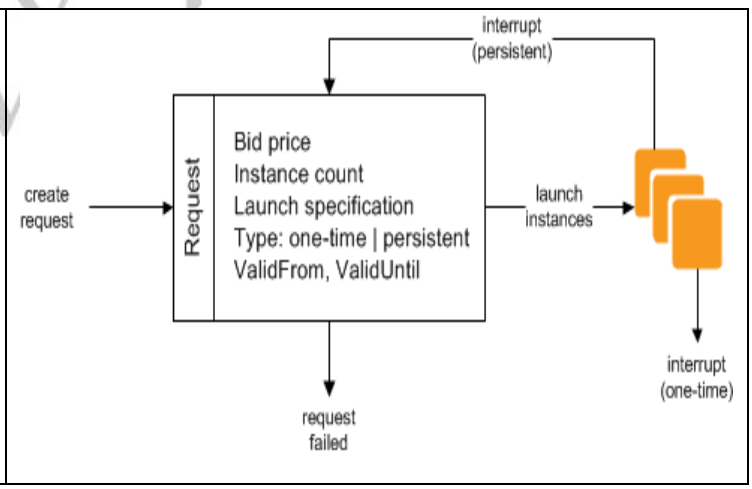
  - **All upfront:** You receive the largest discount and pay all cost one time.
  - **Partial upfront:** You receive a lower discount and half pay before and half pay after.
  - **No upfront:** You receive a smaller discount, but free-up capital to spend in other projects.

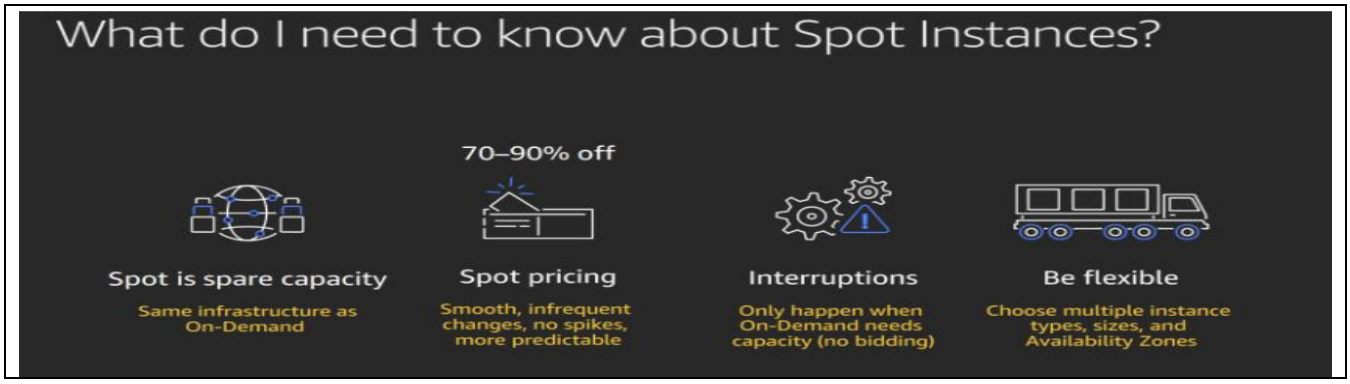
Type of RIs	No Upfront	Partial Upfront	All upfront
Savings for 1-year Standard RI	23%	26%	27%
Savings for 1-year Convertible RI	14%	17%	19%
Savings for 3-year Standard RI	42%	45%	47%
Savings for 3-year Convertible RI	35%	39%	40%

3. SPOT INSTANCE

- AWS SPOT Instances allow customers to use computer capacity without upfront commitments, at prices cheaper (80-90%) than on-demand instance pricing.
- Customers bid on spot instance AWS off-peak pricing fluctuates, if the price meets the bid price, the instances are allocated for the bidding account.
- Spot instance may be terminated/stopped at anytime by AWS when the market prices goes higher than the previous bid price by the client (who got the instance)
- All instance families are available for spot instance.







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❖ Dedicated Hosts & Dedicated Instances

Dedicated Instance

Dedicated Instances are Amazon EC2 instances that run in a VPC on hardware that's dedicated to a single customer. Dedicated instances are physically isolated at the host hardware level from instances that belong to other AWS accounts

Dedicated instances may share hardware with other instances from the same AWS account that are not Dedicated instances

Pay for Dedicated Instances On-Demand, save up to 70% by purchasing Reserved Instances, or save up to 90% by purchasing Spot Instances

Some AWS Services feature may not work with dedicated tenancy, even not all Instance family will support the dedicated tenancy

Important :- EBS Volume are always on multi tenancy

Dedicated Host

An Amazon EC2 Dedicated Host is a physical server with EC2 instance capacity fully dedicated for your use

Can be referred as a Physical EC2 Server in a Availability Zone dedicated for you to use

When a price reservation is associated with a Dedicated Host, the Dedicated Host cannot be released until the reservation is over

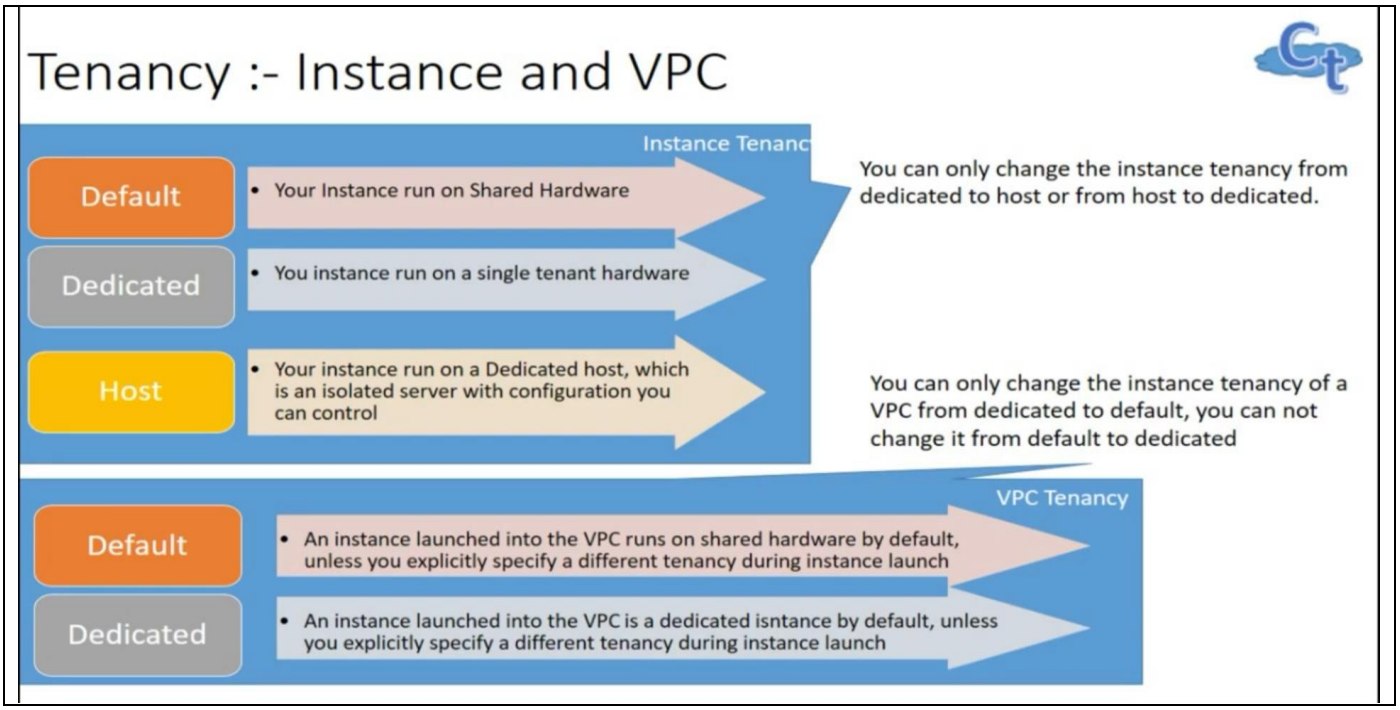
Auto-Recovery and Auto Scaling Groups are also not supported

Visibility of sockets and physical cores
You have visibility of the number of sockets and physical cores that support your instances on a Dedicated Host. You can use this information to manage licensing for your own server-bound software that is licensed per-socket or per-core

Instance placement controls
You have the option to launch instances onto a specific Dedicated Host, or you can let Amazon EC2 place the instances automatically. Controlling instance placement allows you to deploy applications to address licensing, corporate compliance, and regulatory requirements

Multiple instance size support
You can run different instance sizes within the same instance family on a Dedicated Host by leveraging the Nitro-based instances. This allows you to maximize utilization of your Dedicated Host fleet as well as your software licenses.

Affinity
Affinity allows you to specify which Dedicated Host an instance will run on after it has been stopped and restarted.



Key Differences ...?

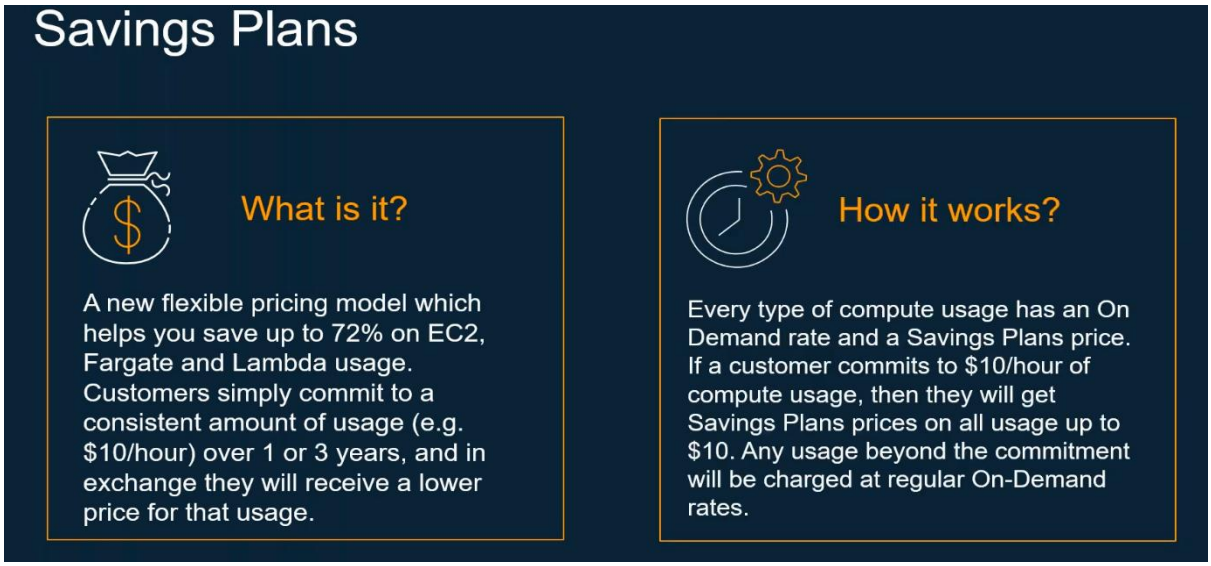
Characteristics	Dedicated Instance	Dedicated Hosts
Enable the use of dedicated physical servers	×	×
Per instance billing	×	
Per host billing		×
Visibility of socket cores, host ID		×
Affinity between a host and Instance		×
Target Instance Placement	×	×
Add capacity using a allocated request		×

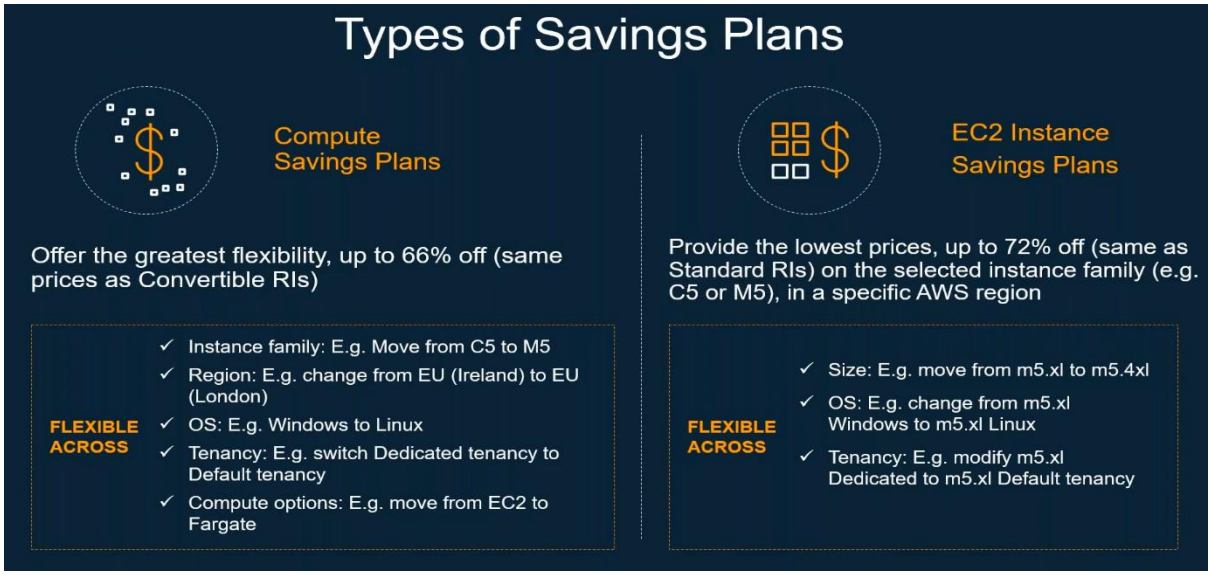
	Dedicated Host	Dedicated Instance
Billing	Per-host billing	Per-instance billing
Visibility of sockets, cores, and host ID	Provides visibility of the number of sockets and physical cores	No visibility
Host and instance affinity	Allows you to consistently deploy your instances to the same physical server over time	Not supported
Targeted instance placement	Provides additional visibility and control over how instances are placed on a physical server	Not supported
Automatic instance recovery	Supported. For more information, see Host recovery.	Supported
Bring Your Own License (BYOL)	Supported	Not supported

Amazon EC2 Pricing Options

On-Demand	Reserved	Scheduled Reservation	Spot Instances	Dedicated Instances	Dedicated Host
No commitment Pay by the hour Any partial hour converted to full A new billing cycle starts whenever an instance changes to "Running" state A billing cycle ends when instance changes to "Stopping" state Billing cycles don't start at 9am, 10 am etc.	2 terms available – 1 year or 3 years 3 Payment options: - Full Upfront - Partial Upfront - No Upfront (not for 3 years term) Lot of saving in comparison to On-Demand Gives you Capacity Guarantee as well You commit the usage for chosen term You can re-sell on AWS if you choose not to use Considered for full term	Available for 3 frequencies – Daily, weekly or monthly Savings when compared to On-Demand Good for recurring workloads requiring lesser number of hours 1 year term available	Unused capacity at AWS is given in market for bidding Look at pricing history and decide bid price Instances are terminated with 2 minutes notice when market price goes above bid price If terminated by AWS, last partial hour is free Optionally, use Spot Block option with bid to block the instance (maximum 6 hours)	Comparatively, higher rates than On-Demand instances In addition to that $2 per hour - An additional fee is charged once per hour in which at least one Dedicated Instance of any type is running in a region (you pay this once per hour regardless of how many Dedicated Instances you're running)	Pay for full Physical host, irrespective of number of instances running Suitable when you want to use hardware-bound licenses Underlying host does not change when you stop and start an instance

❖ Savings plan



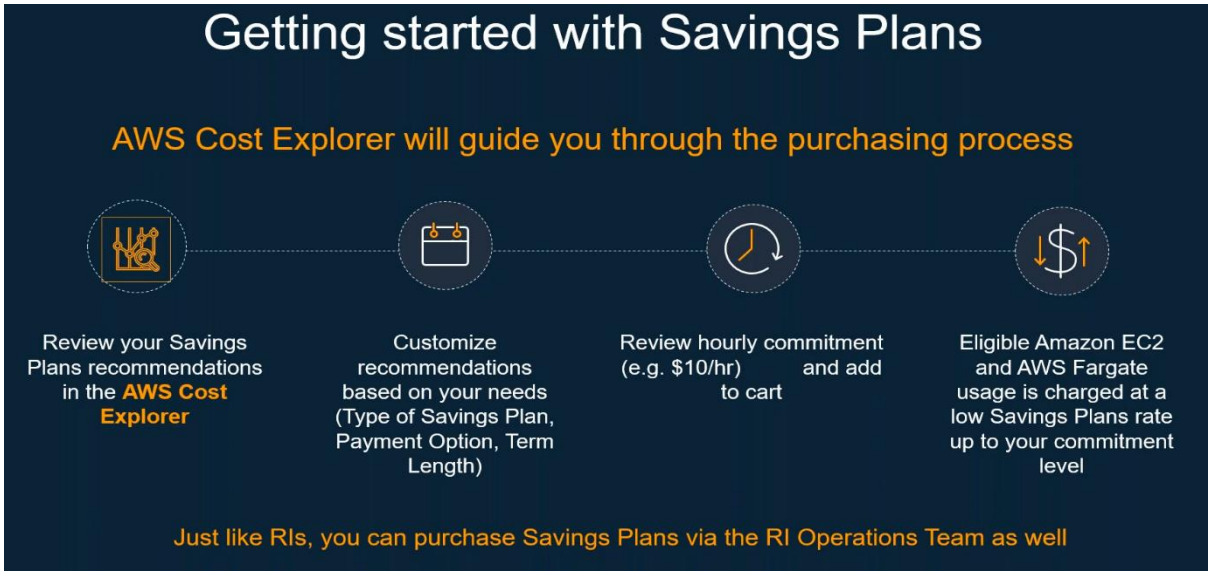


Comparing RIs and Savings Plans

Savings plans offer all the benefits of RI as well as improved flexibility and reduced management

	Compute Savings Plans	EC2 Instance Savings Plans	Convertible RIs*	Standard RIs
Savings over On Demand	Up to 66%	Up to 72%	Up to 66%	Up to 72%
Low price in exchange for monetary commitment	✓	✓	✗	✗
Pricing automatically applies to any instance families	✓	✗	✗	✗
Pricing automatically applies to any instance size	✓	✓	✗**	✗**
Pricing automatically applies to any Tenancy, or OS	✓	✓	✗	✗
Automatically apply to Fargate Usage	✓	✗	✗	✗
Pricing automatically applies to across any AWS Region	✓	✗	✗	✗
1- and 3-year Term length options	✓	✓	✓	✓

* Convertible RIs can be changed across instance families, sizes, OS and tenancy they require customers to manually perform exchanges.
** Regional Convertible RIs and Regional Standard RIs provide instance flexibility



Purchasing Savings Plans in your AWS Organization

Savings Plans can be purchased at Payer account or Linked account

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How Savings Plans recommendations work

Establish baseline
Based on your On-Demand and Savings Plans covered usage over the last 7, 30, or 60 days, and the Savings Plans currently owned by your account

Re-compute
Add an incremental Savings Plans commitment and re-compute what your bill would have been on an hour-by-hour basis over this time period

Compare
If your bill would be lower with this additional commitment, we repeat the process

Recommend
Provide the recommendation for the given configuration that will result in the lowest bill based on past usage and recommendations step size

AWS Savings Plans recommendations take into account your existing RI as well as Savings Plans account affinity and application order

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Savings Plans in the CUR

SavingsPlansCoveredUsage
*The **SavingsPlanCoveredUsage** line item describes the usage that received Savings Plans benefits*

SavingsPlansNegation
SavingsPlanNegation** line items offset the unblended cost of **SavingsPlanCoveredUsage

RIs and Savings Plans
You can continue purchasing EC2 RIs to maintain compatibility with your existing purchasing and cost management processes
Your existing RIs will continue to work as-is alongside Savings Plans
You can reserve EC2 capacity with On-Demand Capacity Reservations. If you have active Savings Plans, your ODCR will be charged at Savings Plans Rates
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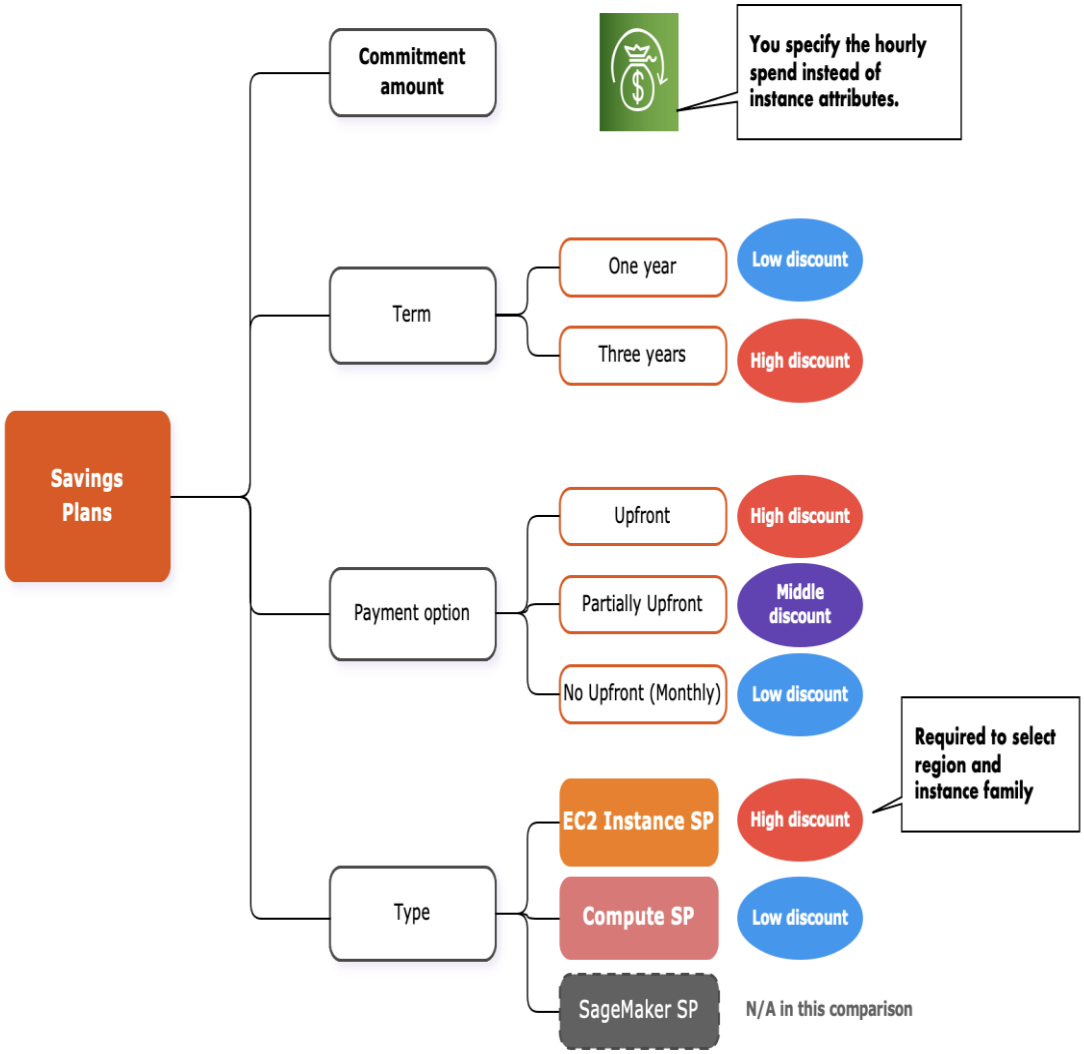
Savings Plans
Commitment amount
You specify the hourly spend instead of instance attributes.
Term
One year
Low discount
Three years
High discount
Payment option
Upfront
High discount
Partially Upfront
Middle discount
No Upfront (Monthly)
Low discount
Type
EC2 Instance SP
High discount
Required to select region and instance family
Compute SP
Low discount
SageMaker SP
N/A in this comparison

Compute and EC2 Savings Plans Compared

	Compute Savings Plans	EC2 Savings Plans
Discount (up to)	66%	72%
1- or 3-year commit	✓	✓
Any instance family	✓	✗ (must choose instance family)
Any instance size	✓	✓
Any region	✓	✗ (must choose region)
Any operating system	✓	✓
Any tenancy	✓	✓
Applies to EC2, ECS, EKS	✓	✓
Applies to Fargate	✓	✗

	Compute Savings Plans	EC2 Savings Plans
Can change instance family	✓	✗
Can move regions	✓	✗
Fargate	✓	✗

Savings Plans and Reserved Instances

Savings Plans	Standard Reserved Instances	Convertible Reserved Instances
✓ Two flavors: **EC2** and **Compute**	✓ Commit 1 or 3 years for up to 72% discount	✓ Commit for 1 or 3 years for up to 66% discount
✓ Commit 1 or 3 years to **EC2 Savings Plans** for up to 72% discount	✓ Choose instance family (m5, c5, etc)	✓ You can exchange Reserved Instances for Compatible Reserved Instances
✓ Commit 1 or 3 years to **Compute Savings Plans** for up to 66% discount	✓ Choose operating system (Windows or Linux)	✓ True-up costs could apply if you exchange Reserved Instances for pricier Reserved Instances
✓ **EC2 Savings Plans** only require you to choose instance family (m5, c5, etc) and region (us-east-1, etc).	✓ Choose region (us-east-1, etc)	✓ No-upfront, partial-upfront, and full up-front options available
✓ **Compute Savings Plans** apply globally to any instance family, size, operating system, region, and tenancy	✓ Choose tenancy (shared or dedicated)	
✓ No-upfront, partial-upfront, and full up-front options available	✓ You can only ever change availability zone, platform (classic or VPC), or instance size (if running Linux)	
	✓ No-upfront, partial-upfront, and full up-front options available	