Best Practices for Capacity Management with AWS Outposts

Tech Talk

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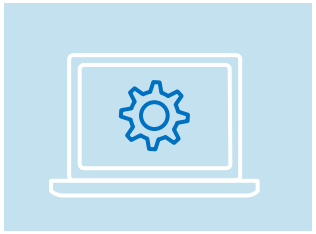
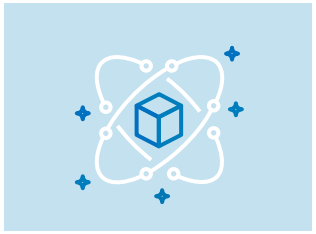
What is AWS Outposts?



Latency sensitive



Local data processing

Data residency

Migrations

AWS Outposts is a fully managed service that offers the same AWS infrastructure, AWS services, APIs, and tools to virtually any datacenter, co-location space, or on-premises facility for a truly consistent hybrid experience.

AWS Outposts is ideal for workloads that require low latency access to on-premises systems, local data processing, data residency, and migration of applications with local system interdependencies.

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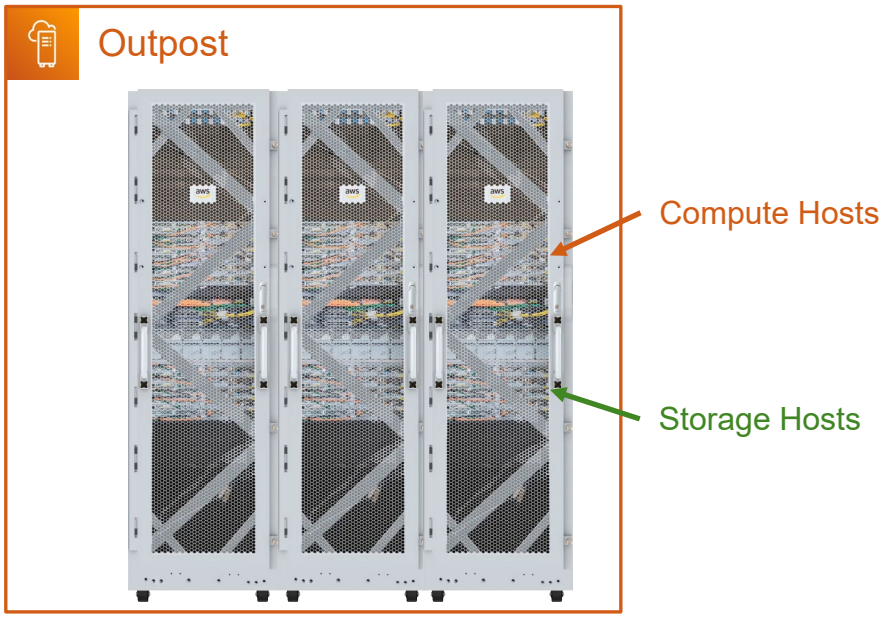
Planning Outposts Capacity



Sized in three dimensions:

- ✓ Compute
- ✓ Block storage
- ✓ Object storage

Sizing Storage:

How much EBS block storage do you need?

How much S3 on Outposts storage do you need?

Sizing Compute:

How many of which EC2 instances do you need to run?

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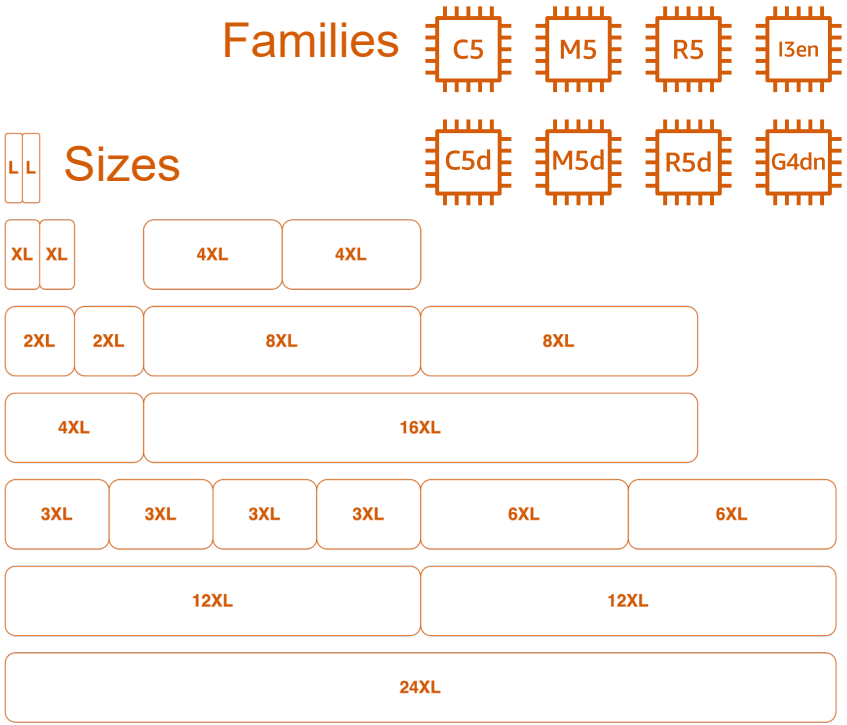
Sizing Compute

Steps:

1. Choose your instance families
2. Choose your sizes
3. Add capacity for future growth
4. Add spare capacity to provide N+M redundancy

Resource ID	Description	Configuration
OR-JS86IQP	General purpose small unit for workloads such as retail point of sale or enterprise applications	2 m5.24xlarge
OR-R2XVM9Q	Mixed capacity medium unit for running applications from several teams on the same Outpost	2 m5.24xlarge, 2 c5.24xlarge, 2 r5.24xlarge
OR-LR4DI6P	Mixed capacity large unit, often used by teams who are sharing capacity for different applications on a single Outpost	5 m5.24xlarge, 4 c5.24xlarge, 3 r5.24xlarge

aws.amazon.com/outposts/pricing



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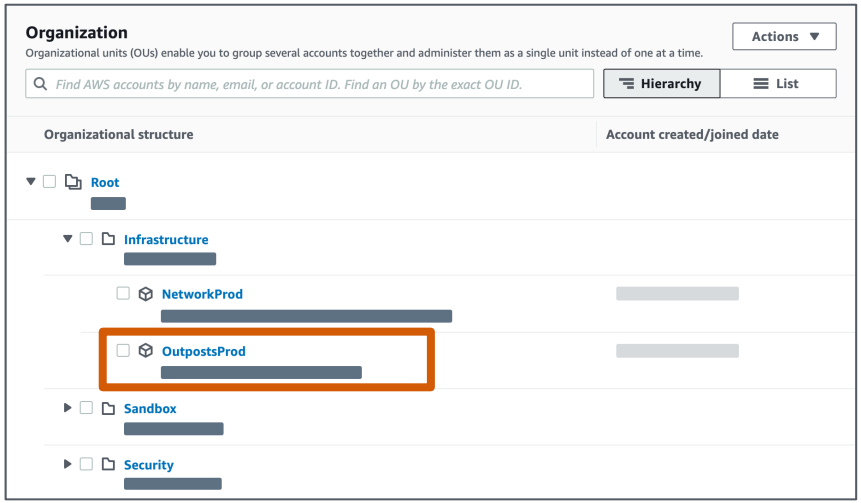
Tools to share, monitor, and manage capacity

Sharing Outposts Capacity

- AWS Organizations
- AWS Resource Access Manager



Tools to Manage & Monitor Capacity

- AWS Outposts Console
- Amazon CloudWatch
- EC2 Capacity Reservations
- EC2 Placement Groups
- AWS Cost & Usage Reports

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Monitoring Outposts Capacity with Amazon CloudWatch

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AWS Outposts CloudWatch Metrics

Namespace: AWS/Outposts

ConnectedStatus
CapacityExceptions

InstanceFamilyCapacityAvailability
InstanceFamilyCapacityUtilization
InstanceTypeCapacityAvailability
InstanceTypeCapacityUtilization
UsedInstanceType_Count
AvailableInstanceType_Count

EC2 Compute

EBSVolumeTypeCapacityUtilization
EBSVolumeTypeCapacityAvailability
EBSVolumeTypeCapacityUtilizationGB
EBSVolumeTypeCapacityAvailabilityGB

EBS Block Storage

AvailableReservedInstances
UsedReservedInstances
TotalReservedInstances

[CloudWatch metrics for AWS Outposts]

Namespace: AWS/S3Outposts

OutpostTotalBytes
OutpostFreeBytes
BucketUsedBytes
AccountUsedBytes

S3 Object Storage

[Amazon S3 on Outposts CloudWatch metrics]

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Demo:
Monitoring AWS Outposts with Amazon CloudWatch

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Managing Outposts Utilization with EC2 Capacity Reservations

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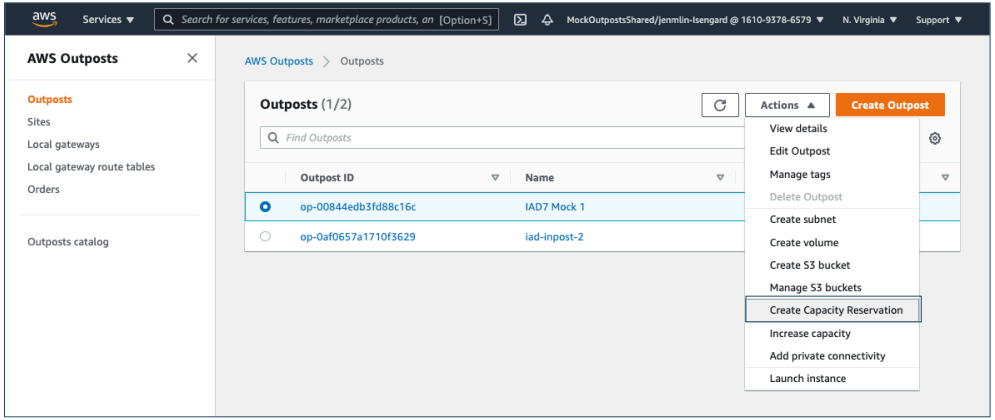
EC2 Capacity Reservations on Outposts

Capacity reservations are ideal for customers who want to know their application has resources for future increases in demand, including planned or unplanned spikes, backup and disaster recovery, or for planned growth and buffer.

When you create a capacity reservation from the Outposts console, the Outpost ARN and available instance types are pre-populated.



You can monitor reservation utilization via CloudWatch. Metrics include:
`UsedInstanceCount, AvailableInstanceCount, TotalInstanceCount, InstanceUtilization`

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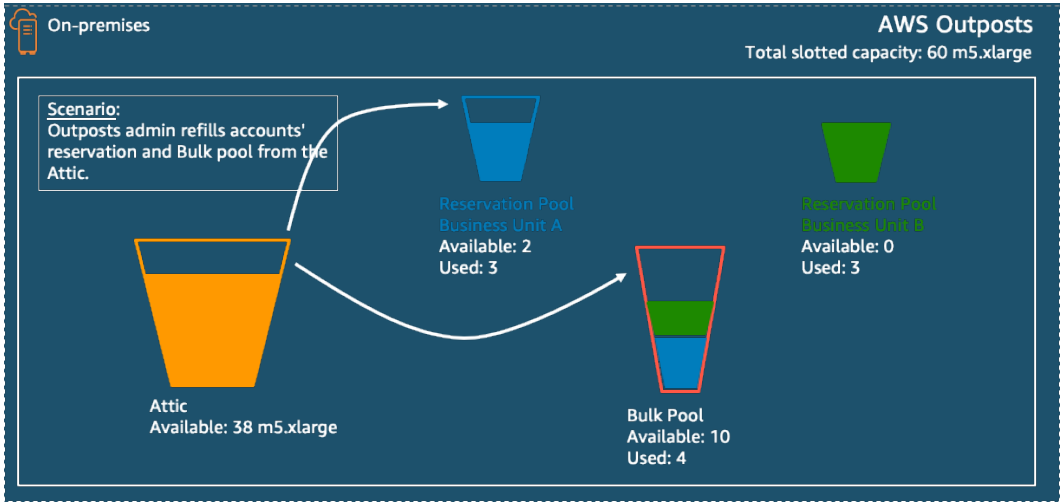
EC2 Capacity Reservations on Outposts

You can also share capacity reservations with other accounts in your AWS Organization using Resource Access Manager. Keep in mind though, that unreserved capacity on the Outpost is still available to any account the Outpost has been shared with.

Some customers are exploring using capacity reservations to control utilization of Outpost capacity across accounts. To do this you'll want to ensure the majority of the Outpost is reserved.



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Demo:
Creating and Using EC2 Capacity Reservations

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Controlling Instance Distribution with EC2 Placement Groups

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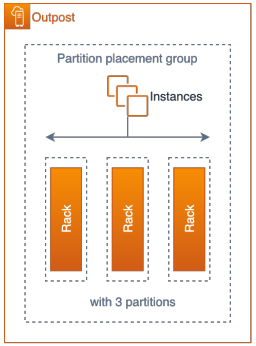
EC2 Placement Groups on Outposts

Placement groups allow you to influence the placement strategy of instances on the underlying hardware. The following placement strategies are available on Outposts:

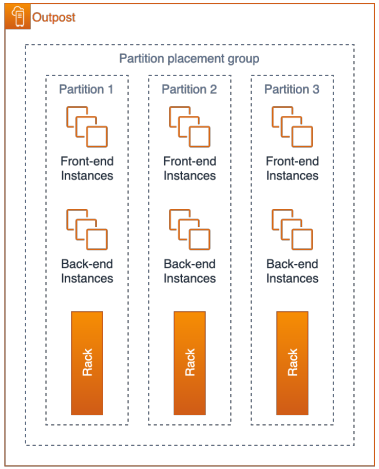
- Spread – Instances in the group are placed on distinct racks, max 7 per group
- Partition – Each partition is placed on a distinct set of racks, no limit on instances in each partition, max 7 partitions
- Cluster – Instances are clustered on racks in the same network spine, in the case of Outpost this would cluster within an ACE rack deployment

An instance can be in one placement group at a time. Instances must be `'stopped'` to move or remove from a placement group.

Partition Strategy

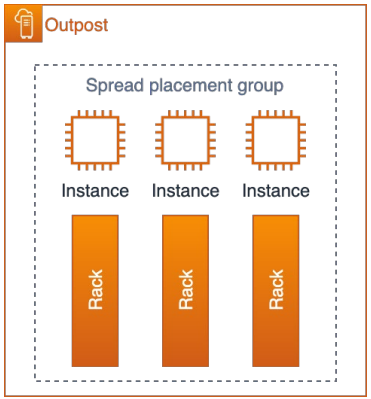


automatic distribution



targeted placement

Spread Strategy



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EC2 Placement Groups on Outposts

Launch an instance into a placement group:

```
aws ec2 create-placement-group --group-name group1 --strategy spread

aws ec2 run-instances --image-id ami-abc12345 --count 1
  --instance-type c5.large --key-name MyKeyPair
  --security-group-ids sg-1a2b3c4d --subnet-id subnet-6e7f829e
  --placement "GroupName = group1”
```

Partition Placement Groups allow automatic or targeted placement:

```
aws ec2 create-placement-group --group-name HDFS-Group-A --strategy partition
  --partition-count 5

aws ec2 run-instances --placement "GroupName = HDFS-Group-A, PartitionNumber = 3"
```

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Demo:
Using EC2 Placement Groups on AWS Outposts

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Next Steps

Getting Started!

- **Don’t have an Outpost deployment?**
  Talk with your AWS account team
- **Plan your Outposts capacity by:**
  Sizing your compute, block storage, and object storage requirements
- Monitor, manage, and control your capacity with:
  - Amazon CloudWatch
  - EC2 Capacity Reservations
  - EC2 Placement Groups

Additional Resources

AWS Organizations

AWS Resource Access Manager

Capacity Reservations on AWS Outposts

Amazon CloudWatch

EC2 Placement Groups

AWS Cost & Usage Reports

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Q&A

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Thank you!

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