

Placement group

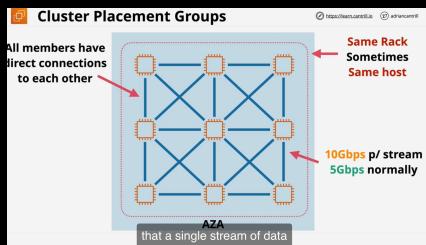
- ① clusters
- ② Spread
- ③ Partition

EC2 Placement Groups

- **Cluster** - Pack instances close together
- **Spread** - Keep instances separated
- **Partition** - groups of instances spread apart

but it will be clear once I've explained it

Used for Higher Speed transfers
can be speed upto 10Gbps normally
they are 5Gbps



once EC2 instance is selected it is locked into same AZ for cluster group and we cannot change the AZ afterwards. As they are being close to each other they have

- ① Lower Latency
- ② Higher Speed
- ③ All members have direct connections

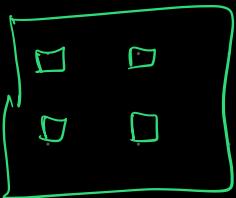
enhanced networking is used
one AZ only - locked when launching first instance.

Cluster Placement Groups

- Can't span AZs - **ONE AZ ONLY** - locked when launching first instance
- Can span VPC peers - but impacts performance
- Requires a supported instance type
- Use the same type of instance (**not mandatory**)
- Launch at the same time (**not mandatory ... very recommended**) -
- **10Gbps single stream performance**
- Use cases : **Performance, fast speeds, low latency**

or the scientific analysis

Spread Placement Group



The diagram illustrates the concept of Spread Placement Groups. It shows two Availability Zones, AZA and AZB, each containing three distinct racks. Red arrows point from the text "Distinct Racks" to the three racks in AZA. A red box highlights the three racks in AZA, with the text "7 Instances per AZ - Isolated infrastructure Limit" below it. The racks in AZB are also shown.

7 instances per AZ

- Provides infrastructure isolation
-each **INSTANCE** runs from a different rack
- Each rack has its own **network** and **power** source
- **7 Instances per AZ** (HARD LIMIT)
- Not supported for Dedicated Instances or Hosts
- **Use Case** : Small number of critical instances that need to be kept separated from each other
for each member of the application as possible,

to maximize Availability

③ partition Placement Group

max 7 partitions per AZ
each partition is separated in AZ
if one partition fail it doesn't affect other partitions
for ex. for 75 instances we could partition them in group of 25
3 partition groups

Partition Placement Groups

- **7 Partitions per AZ**

- Instances can be placed in **a specific partition**
- ...or auto placed
- Great for topology aware applications
- ...HDFS, HBase, and Cassandra
- Contain the impact of failure to part of an application

EC2 dedicated host:

Limitations & Features

- **AMI Limits** - RHEL, SUSE Linux, and Windows AMIs aren't supported
- **Amazon RDS** instances are not supported.
- **Placement groups** are not supported for Dedicated Hosts.
- Hosts can be shared with other ORG Accounts...**RAM**

You're able to share a Dedicated Host

Enhanced Networking

Used for high end networking.
— uses technique called SR-IOV

- Using this they act as two separate logical cards
Which reduces CPU consumption & reduces drops in packages
— Higher I/O
Lower Host CPU usage

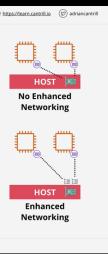
Enhanced Networking

- Uses SR-IOV - NIC is virtualization aware
- No charge - available on most EC2 Types
- Higher I/O & Lower Host CPU Usage
- More Bandwidth
- Higher packets-per-second (PPS)
- Consistent lower latency

No Enhanced Networking

Enhanced Networking

To the lesson if you do want to know



EBS Optimized

- EBS = Block storage over the network
- Historically network was shared .. data and EBS
- EBS Optimized means dedicated capacity for EBS
- Most instances support and have enabled by default
- Some support, but enabling costs extra

for storage networking to an EC2 instance.

Amazon Aurora