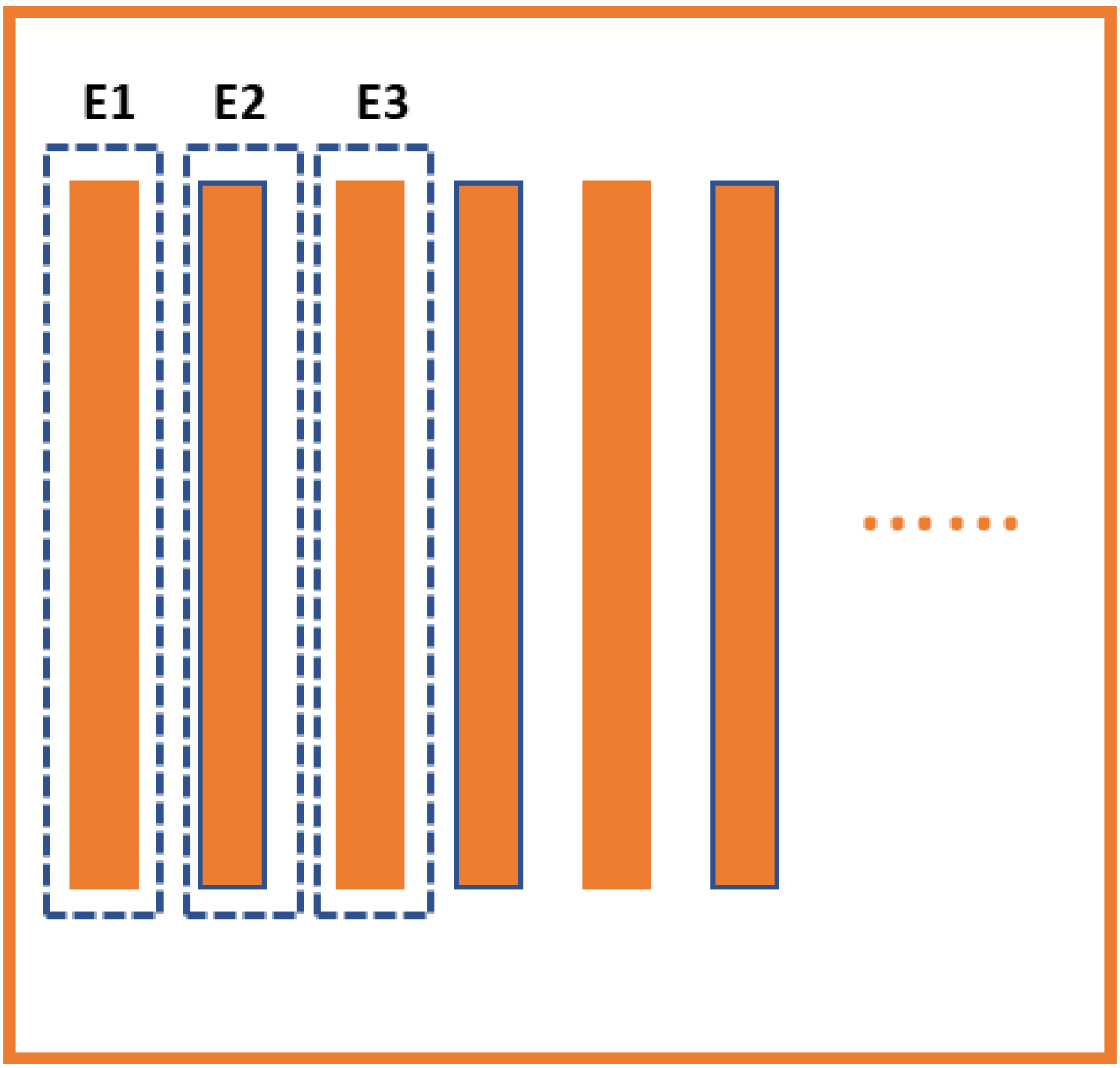
Cluster Configuration

10 nodes

16 Cores

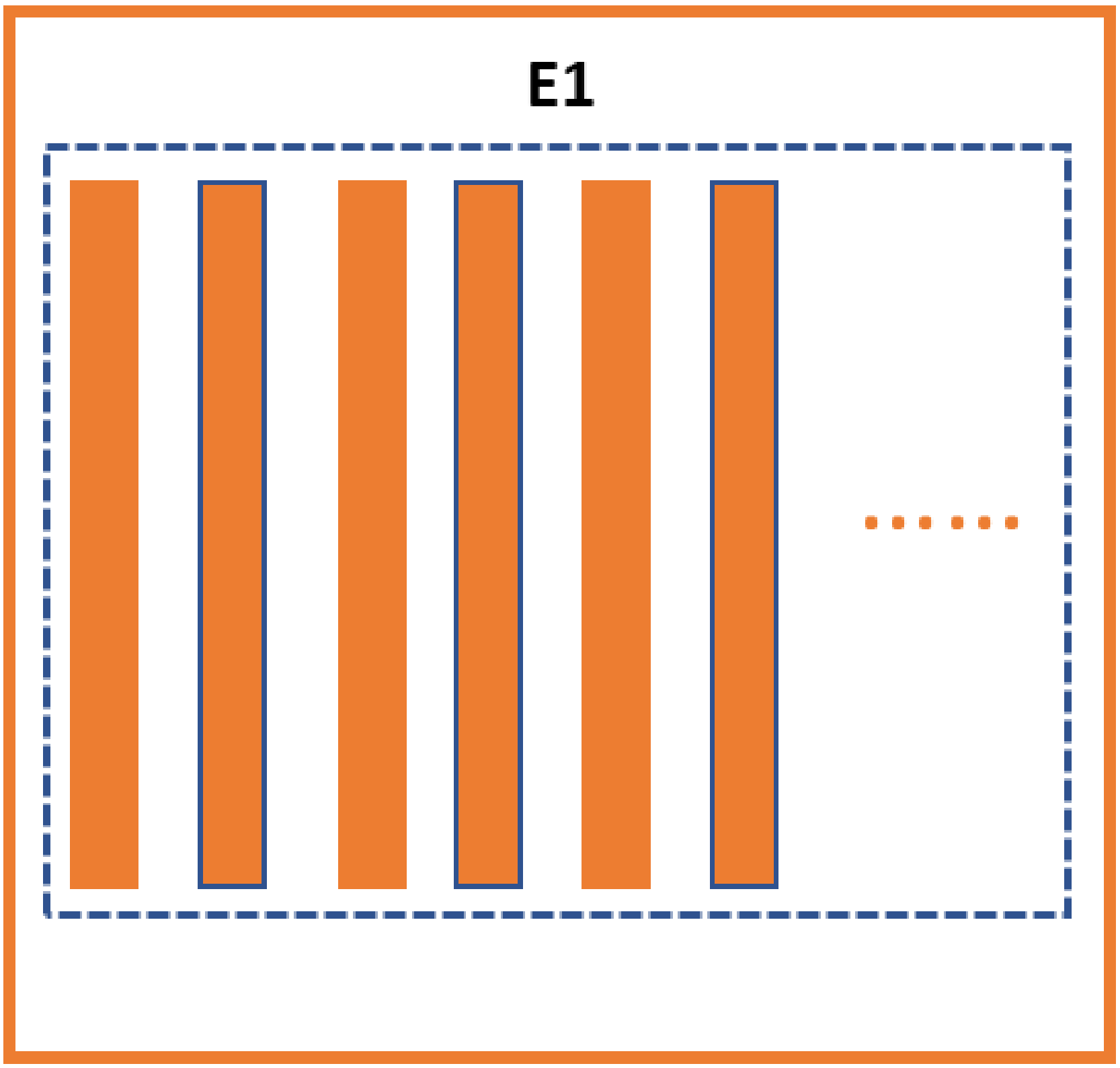
64 GB

Approach 1: Tiny Executors



1 core per executor, number of executor per node=16, executor-memory=64/16=4GB, total number of executors=10*16=160

Approach 2: Fat Executors



16 cores per executor, number of executor per node=1, executor-memory=64/1=64GB, total number of executors=1*10=10

Problems with Tiny Executors

1. Multithreading is not possible since only one core per executor.

2. When using shared variables like broadcast or accumulator it has to be replicated in all the 16 executors per node- A lot of shuffling

Problems with Fat Executors

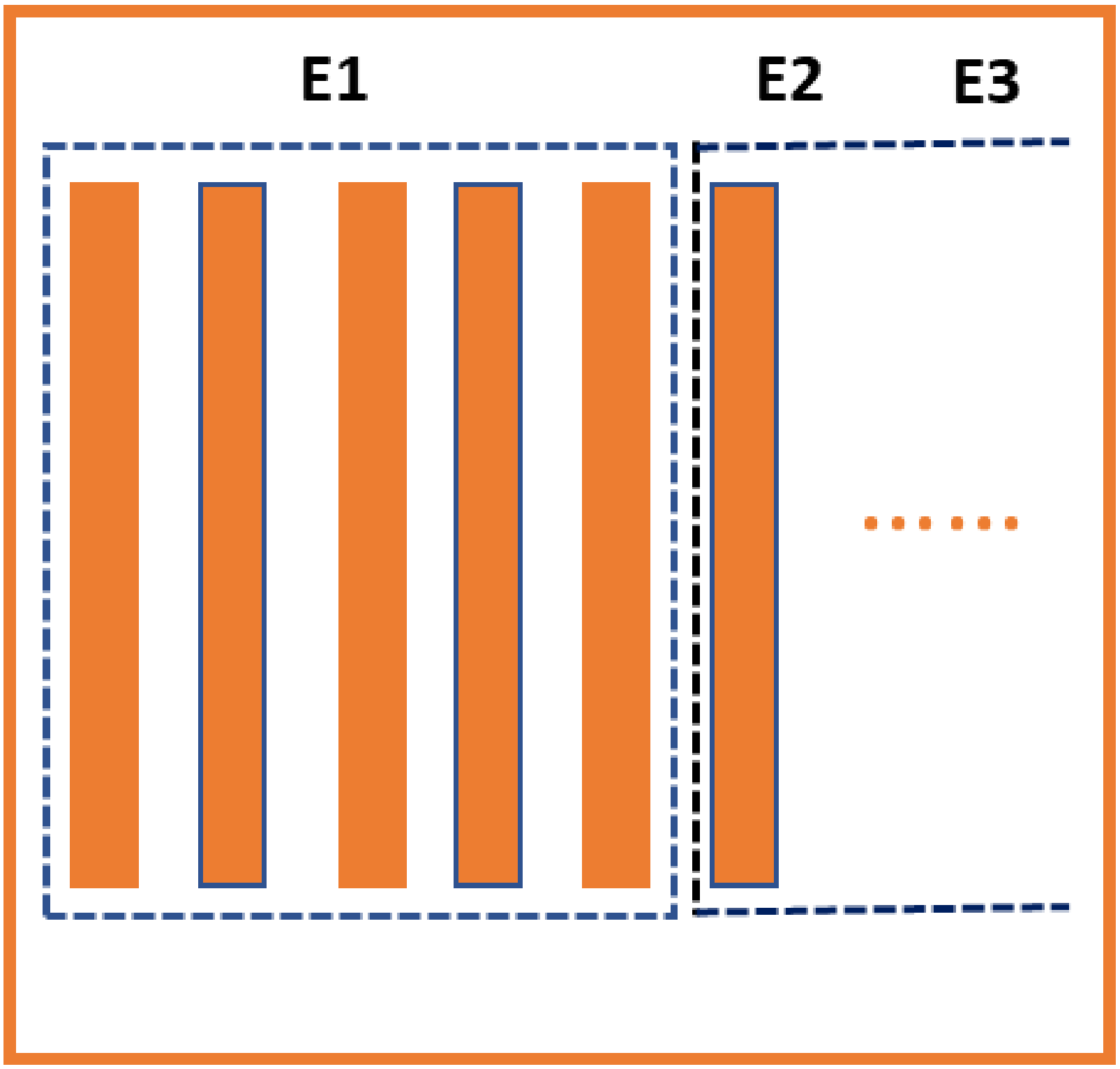
1. HDFS throughput suffers because of a lot concurrent threading.

2. Garbage Collection takes a lot time since memory per executor is very high

Approach 3: Balanced Executors

- Let's take 5 cores per executors.
- Total number of available cores=15*10=150
- Number of executors=150/5=30
- Leave 1 executor for AM, num-executors=30-1=29
- number of executors per node=30/10=3
- Memory per executor= 64/3 ~ 21GB
- Counting the 7% off heap memory actual Executor memory = 21*93% ~ 19GB

Approach 3: Balanced Executors



Optimized Config: 29 Executors, 19GB memory, 5 cores each

In practice one size does not fit all. You need to keep tuning as per cluster configuration. But in general the number of executor cores should be 2-5.