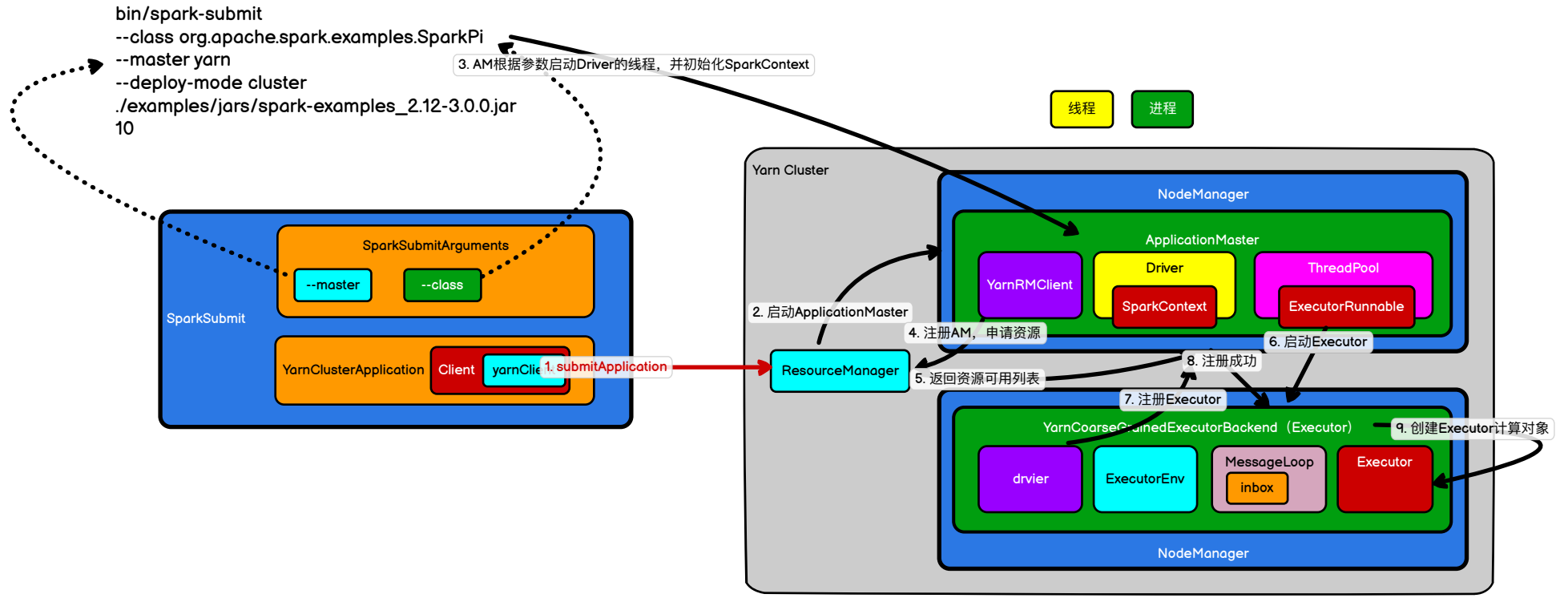
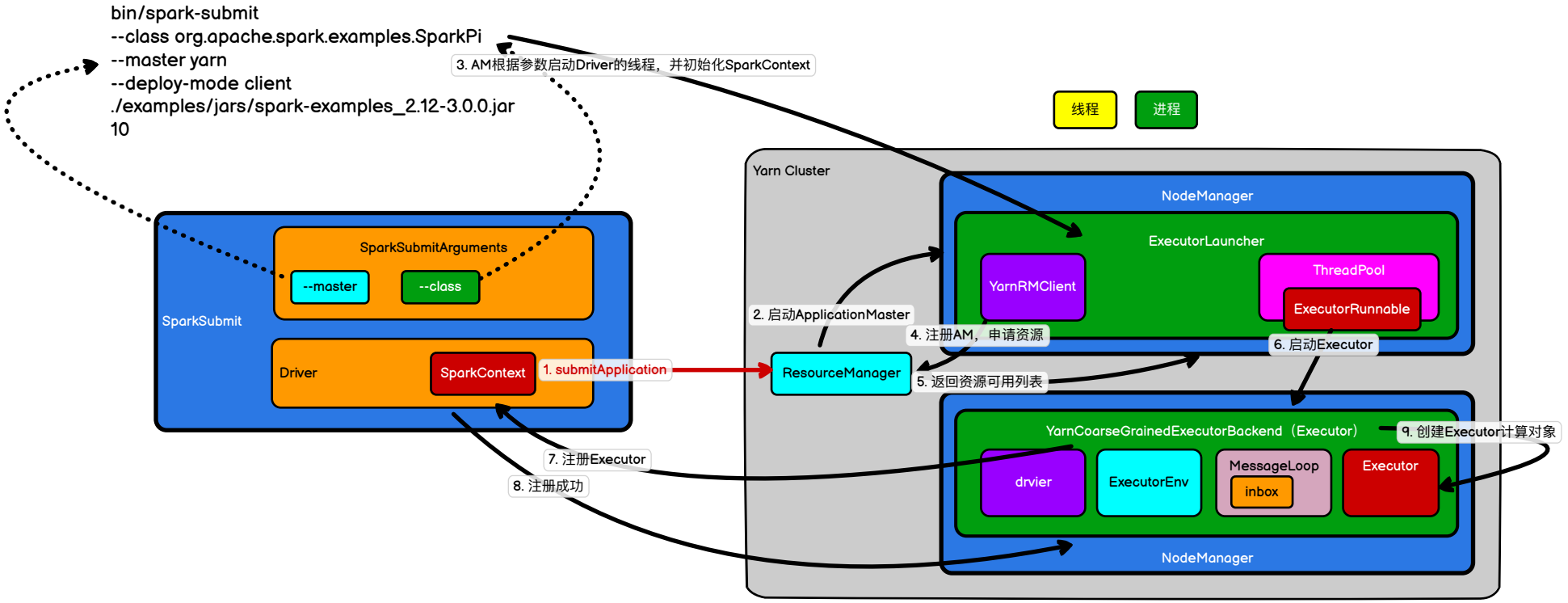

bin/spark-submit
--class org.apache.spark.examples.SparkPi
--master yarn
--deploy-mode cluster
./examples/jars/spark-examples_2.12-3.0.0.jar
10
3. AM根据参数启动Driver的线程，并初始化SparkContext
线程
进程
Yarn Cluster
NodeManager
ApplicationMaster
YarnRMClient
Driver
SparkContext
ThreadPool
ExecutorRunnable
SparkSubmit
SparkSubmitArguments
--master
--class
YarnClusterApplication
Client
yarnClie
1. submitApplication
ResourceManager
2. 启动ApplicationMaster
4. 注册AM，申请资源
5. 返回资源可用列表
6. 启动Executor
7. 注册Executor
8. 注册成功
YarnCoarseGrainedExecutorBackend（Executor）
9. 创建Executor计算对象
drvier
ExecutorEnv
MessageLoop
inbox
Executor
NodeManager


bin/spark-submit
--class org.apache.spark.examples.SparkPi
--master yarn
--deploy-mode client
./examples/jars/spark-examples_2.12-3.0.0.jar
10
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线程
进程
Yarn Cluster
NodeManager
ExecutorLauncher
YarnRMClient
ThreadPool
ExecutorRunnable
SparkSubmit
SparkSubmitArguments
--master
--class
Driver
SparkContext
1. submitApplication
ResourceManager
2. 启动ApplicationMaster
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YarnCoarseGrainedExecutorBackend（Executor）
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drvier
ExecutorEnv
MessageLoop
inbox
Executor
NodeManager

Netty： 通信框架，AIO

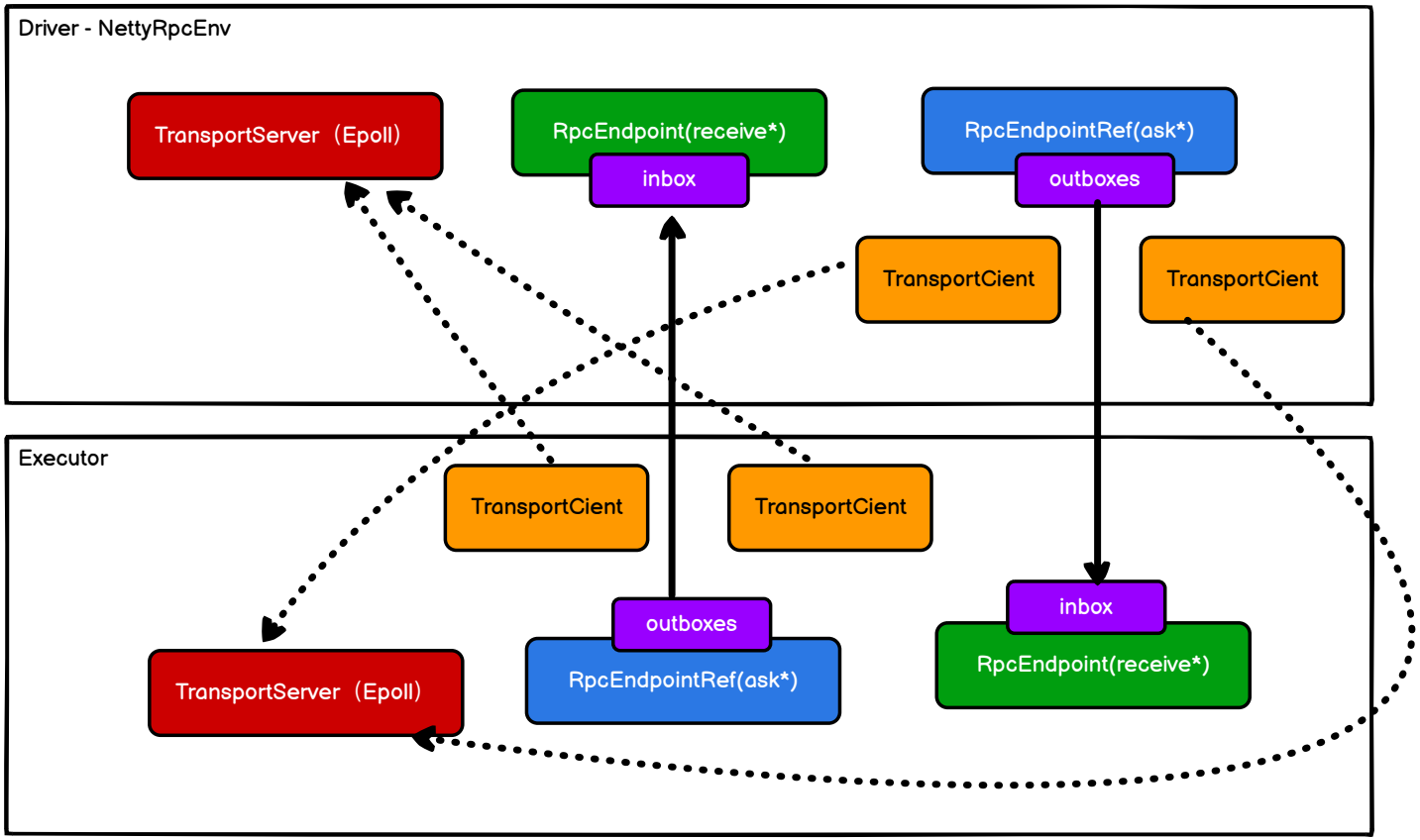
BIO： 阻塞式IO

NIO： 非阻塞式IO

AIO： 异步非阻塞式IO

Linux对AIO支持不够好，Windows支持好

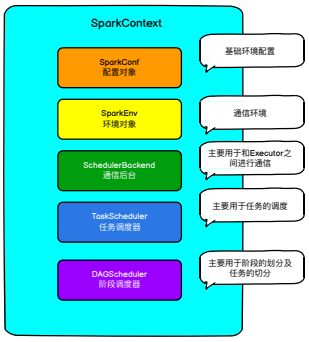
Linux采用Epoll方式模仿AIO操作

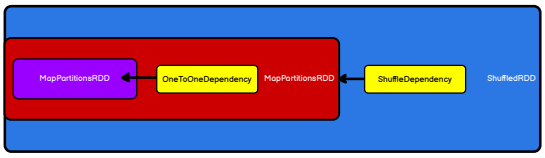


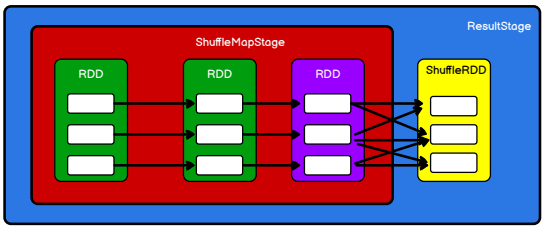
RPCEnv : 通信环境

Backend： 后台

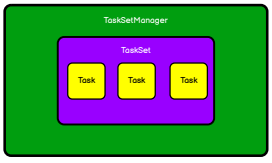
Endpoint： 终端

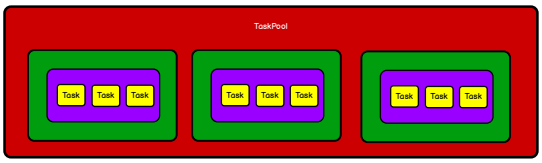


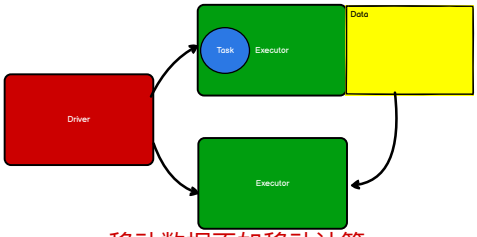




Spark中阶段的划分等于shuffle依赖的数量 + 1







移动数据不如移动计算

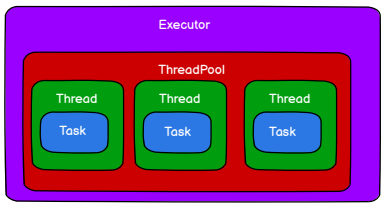
计算和数据的位置存在不同的级别，这个级别称之为本地化级别

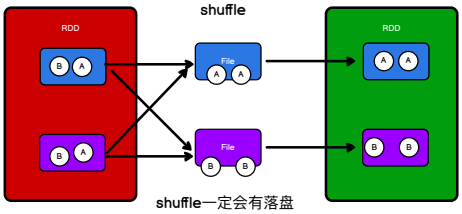
进程本地化：数据和计算在同一个进程中

节点本地化：数据和计算在同一个节点中

机架本地化：数据和计算在同一个机架中

任意

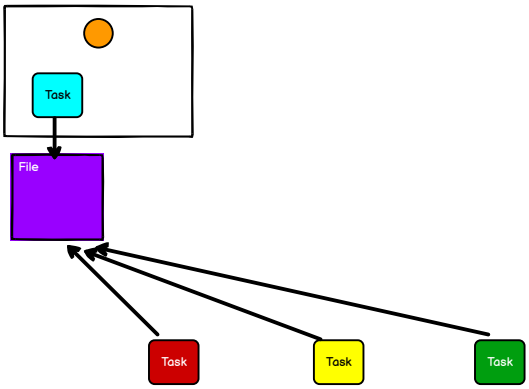


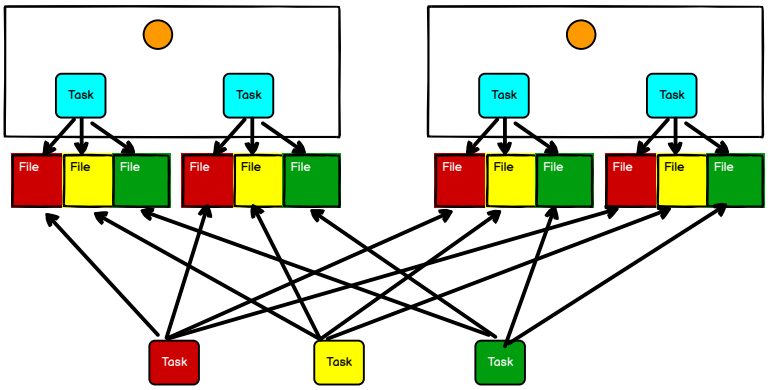


shuffle一定会有落盘

如果shuffle过程中落盘数据量减少，那么可以提高性能

算子如果存在预聚合功能，可以提高shuffle的性能


Task
File
Task
Task
Task


Task
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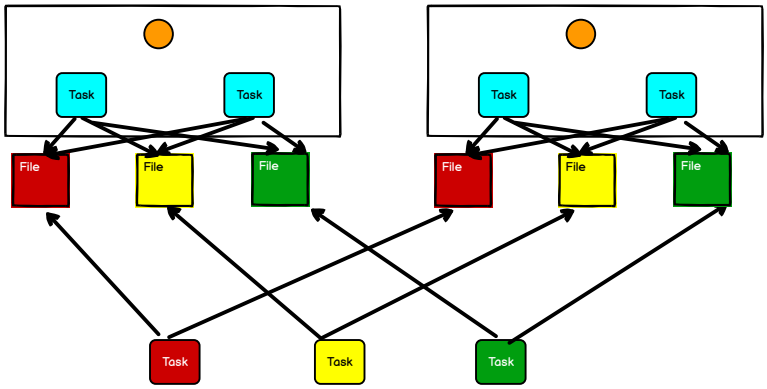
Task
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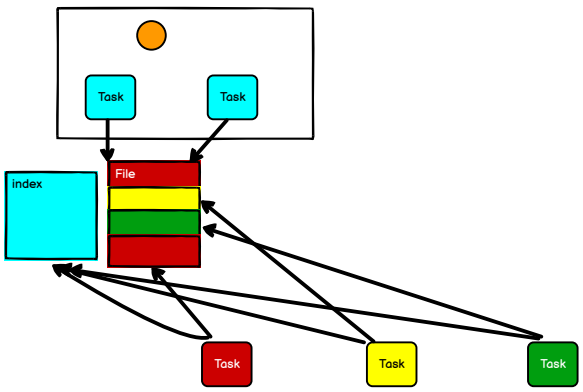
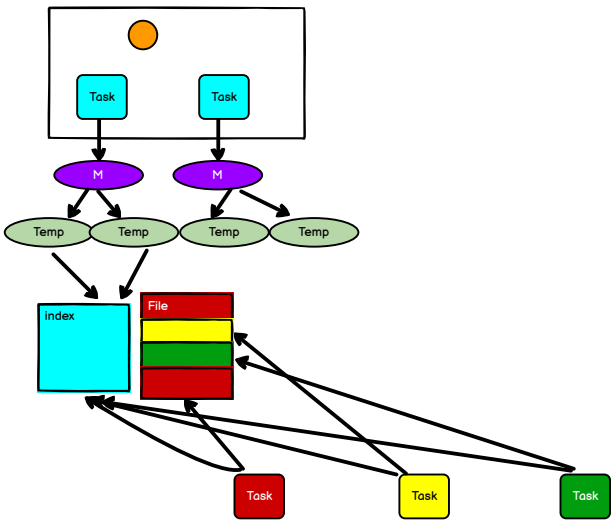
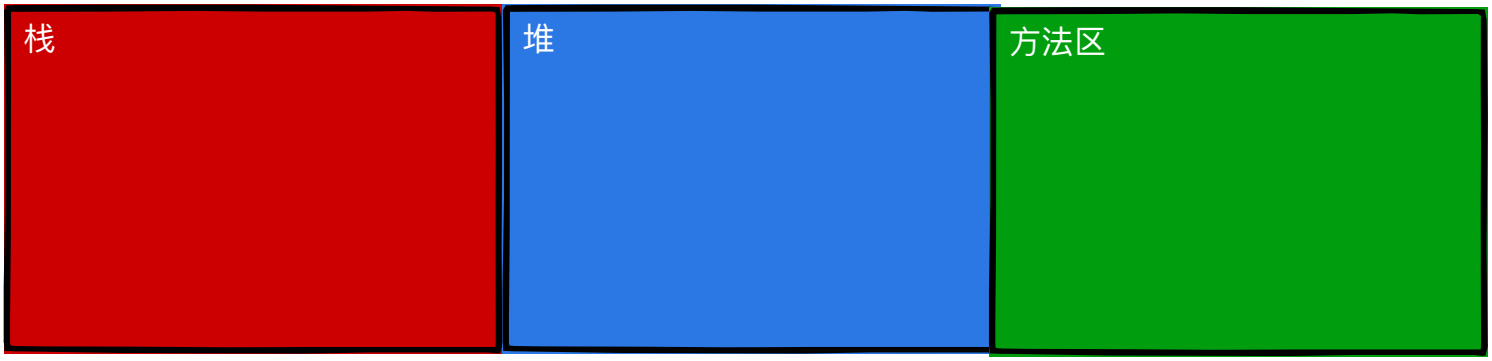
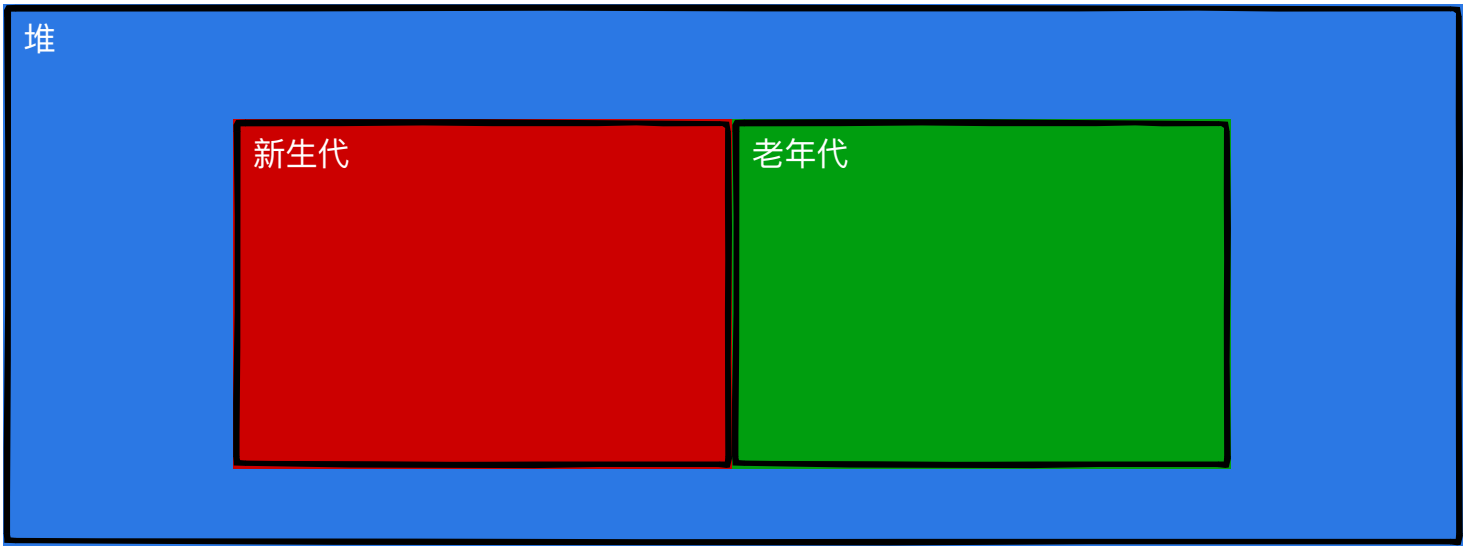
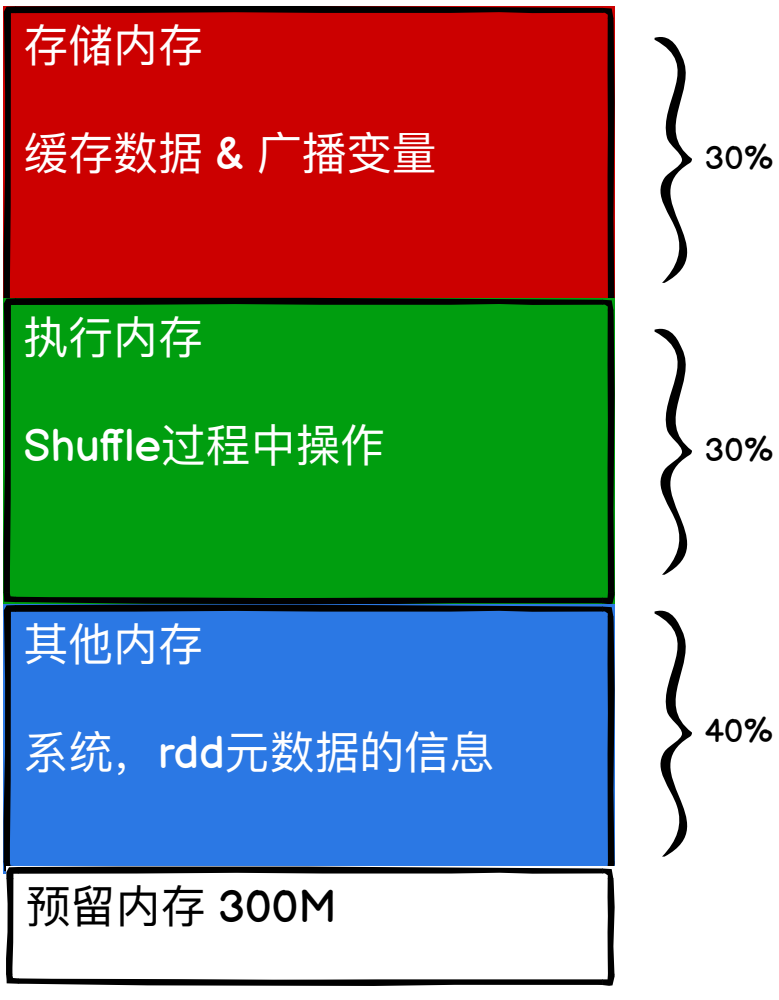

Task
Task
File
index
Task
Task
Task

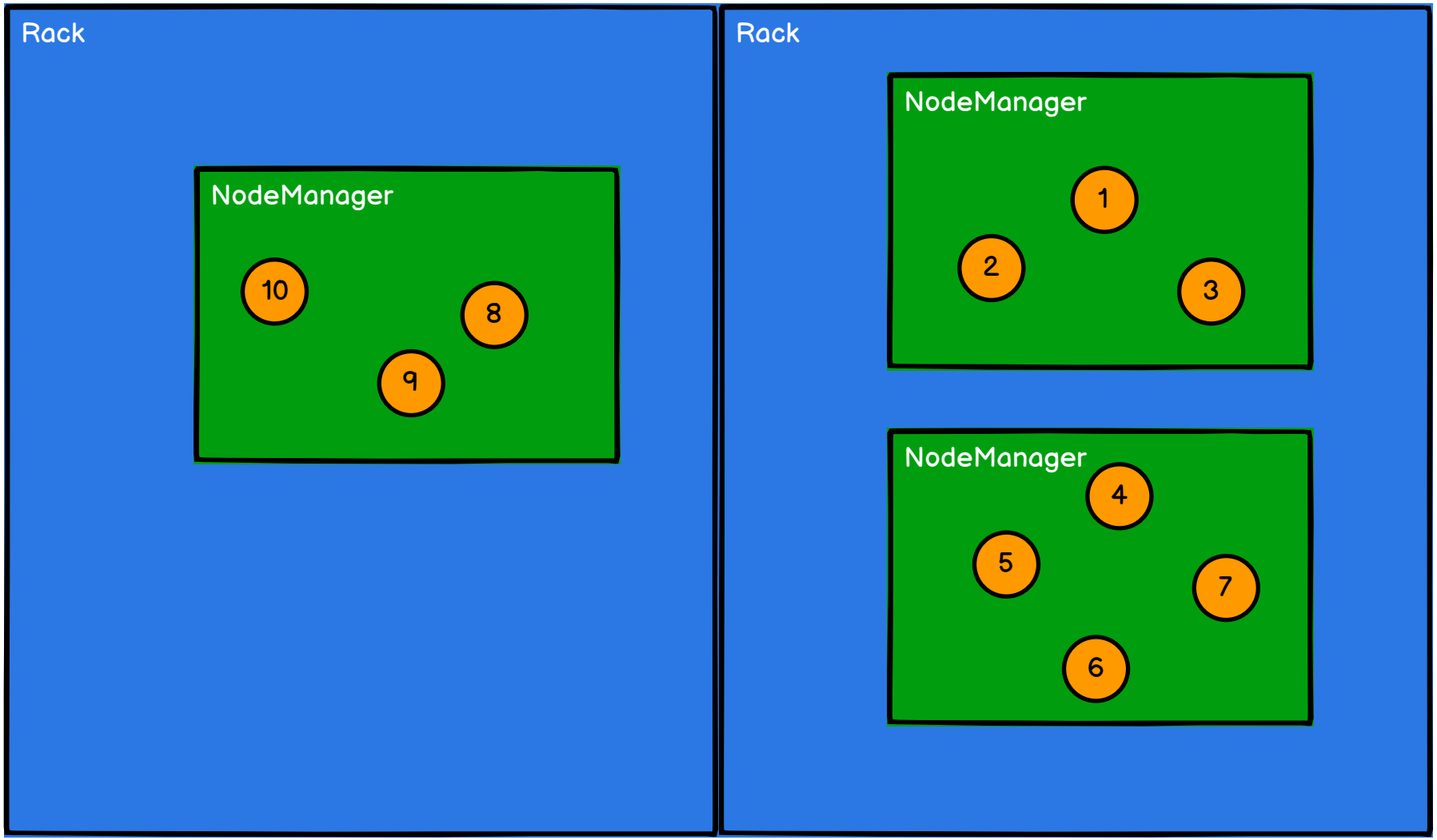

Task
Task
M
M
Temp
Temp
Temp
Temp
File
index
Task
Task
Task


栈
堆
方法区


堆
新生代
老年代

统一内存管理


存储内存
缓存数据 & 广播变量
30%
执行内存
Shuffle过程中操作
30%
其他内存
系统，rdd元数据的信息
40%
预留内存 300M


Rack
NodeManager
10
8
9
Rack
NodeManager
1
2
3
NodeManager
4
5
7
6

首选位置