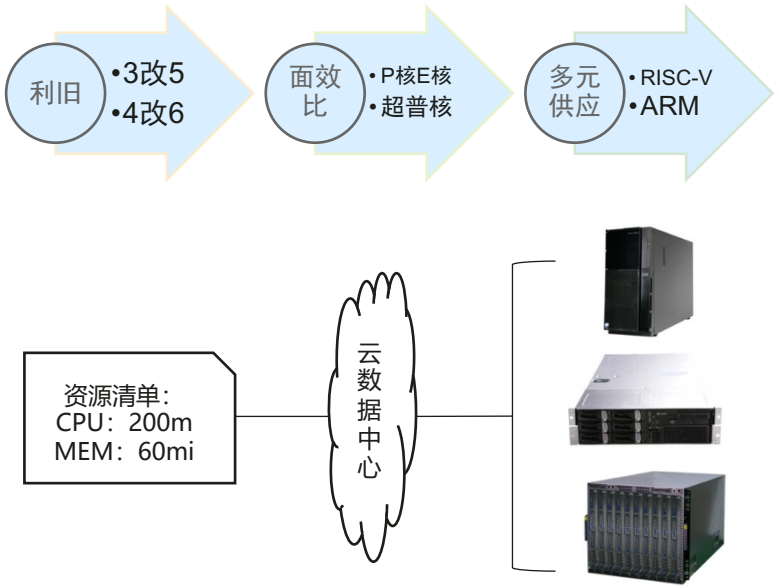
stratosphere：基于异构硬件构建运行时一致性

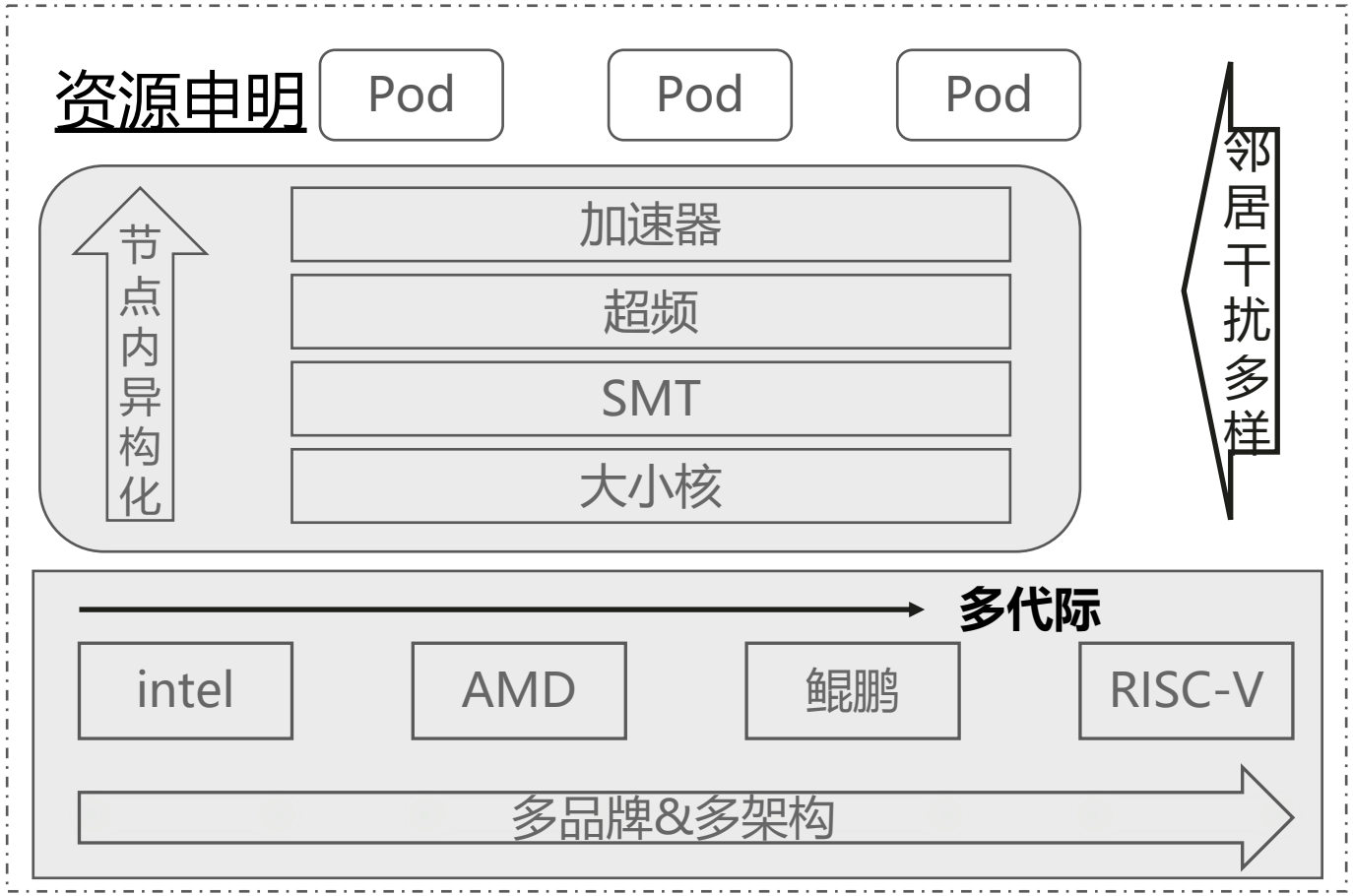
华为OS内核Lab： 李华

开放原子开源基金会 OPENATOM FOUNDATION | OpenEuler

基础设施利旧&面效比&多元化供应等使数据中心异构现象变得突出

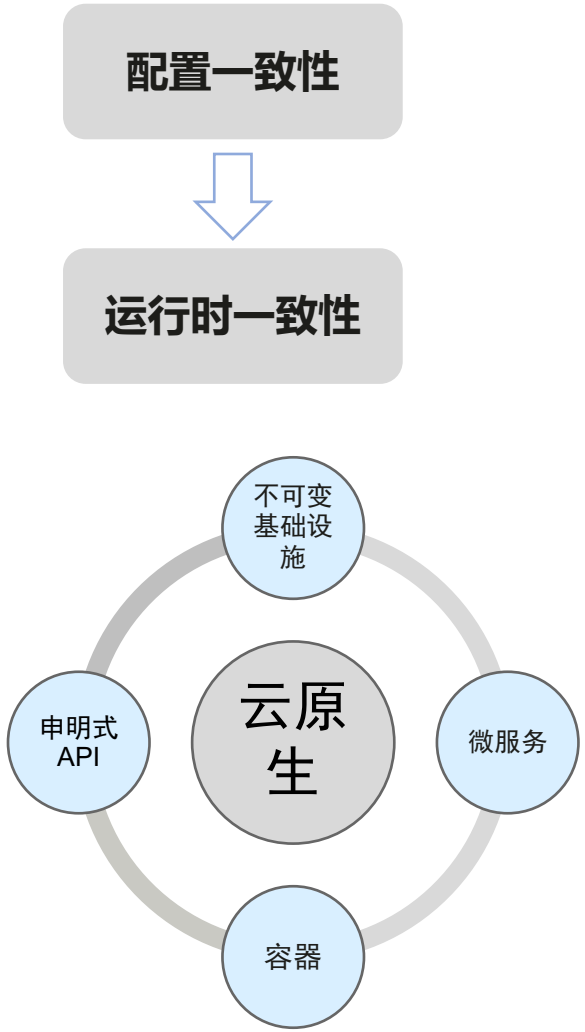


数据中心不可避免的存在CPU多架构、多品牌、多代际服务器，对容器化应用的性能度量和部署及计算基础设施的资源规划和调度管理都带来了沉重的负担。

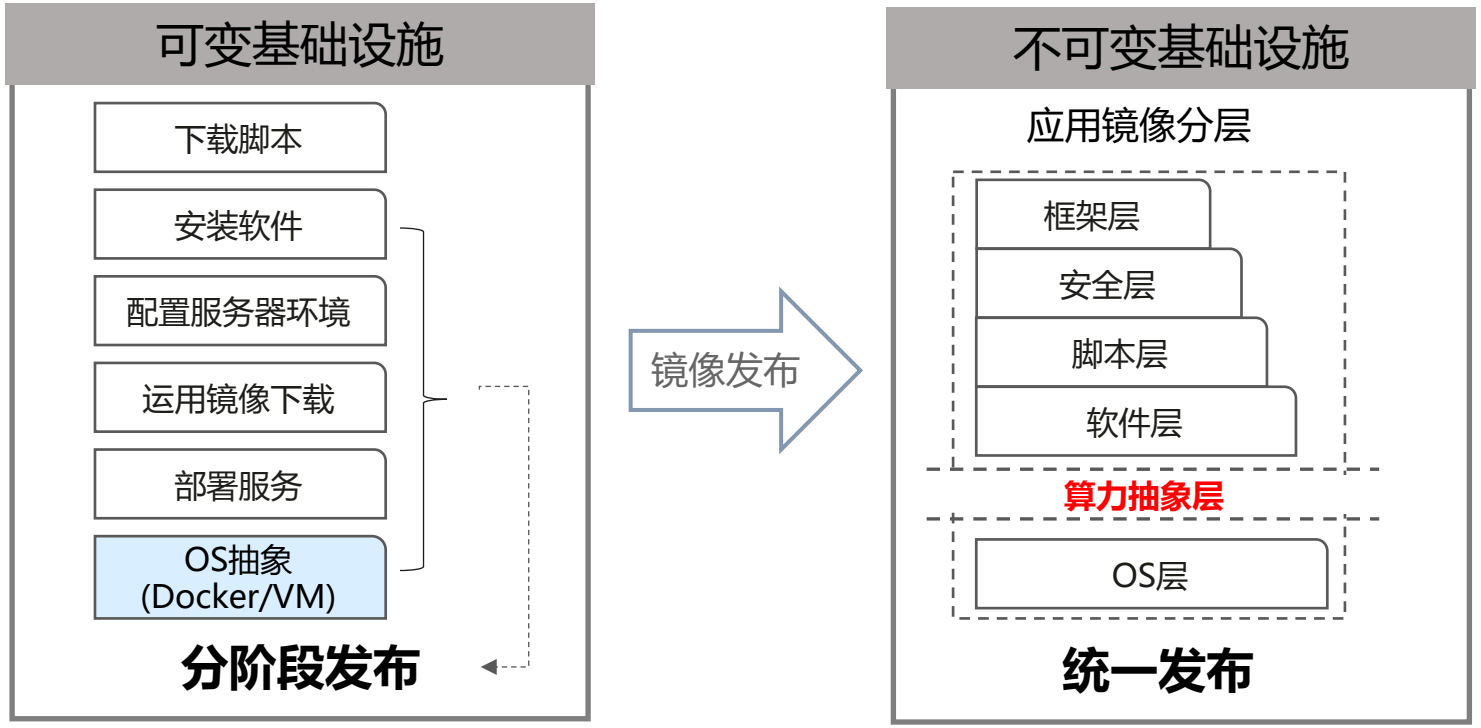


- *数据中心通用算力异构化*

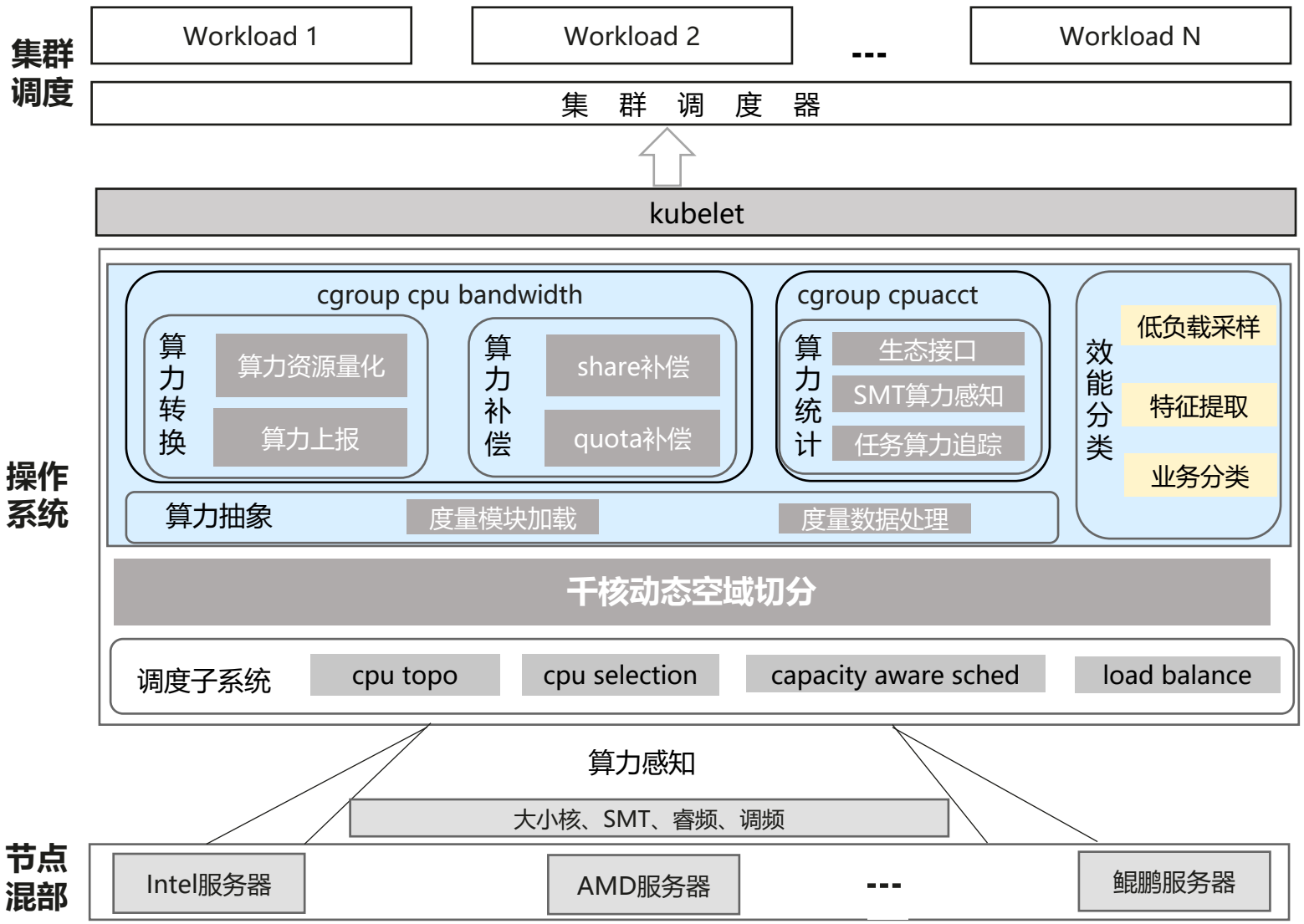
从配置一致性向运行一致性演进



不可变基础设施从配置一致性向运行一致性趋向与演进。

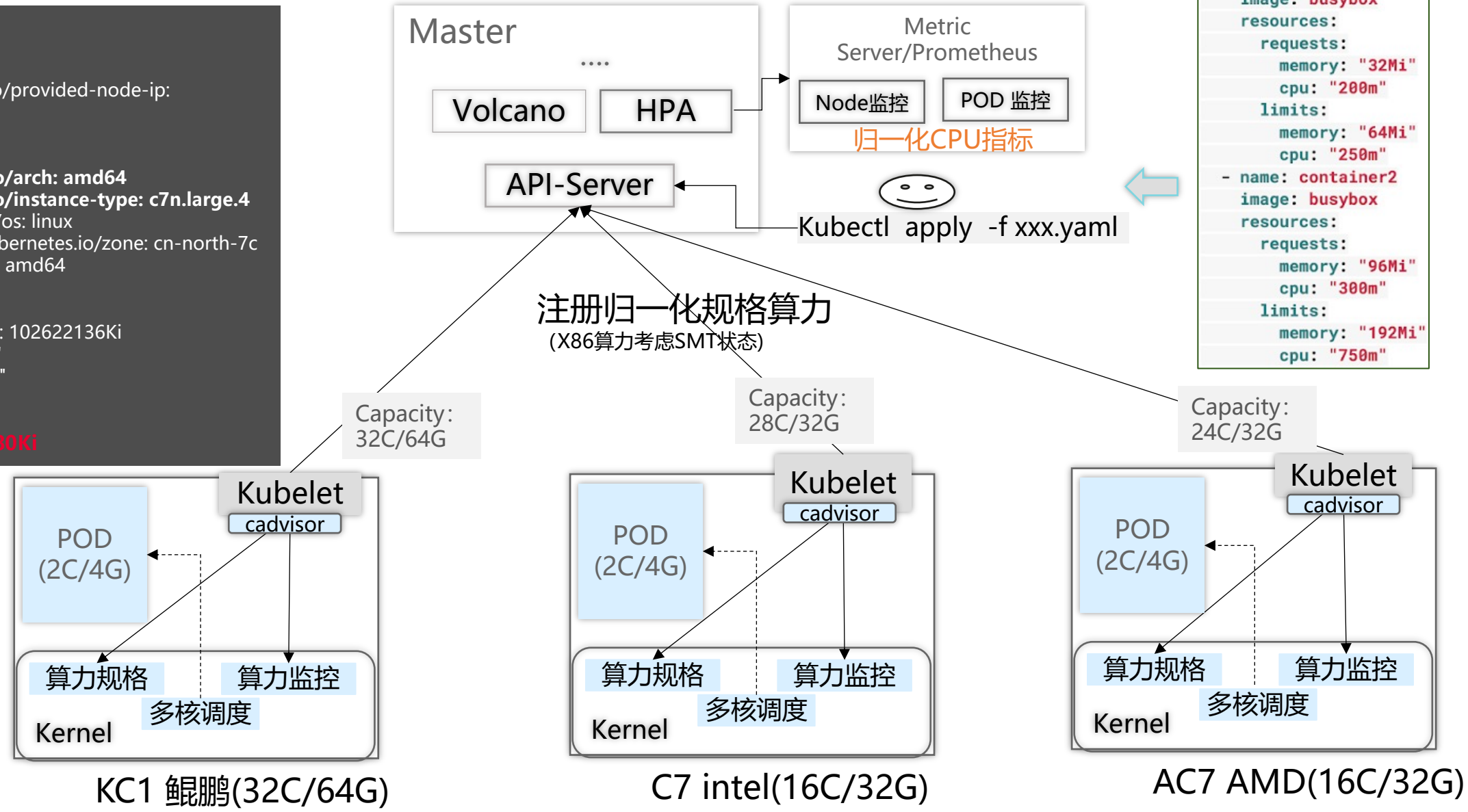


基于OS构建一致性的算力抽象，从物理核走向虚拟核



基于虚拟核构建容器等价算力底座

```
kind: Node
  metadata:
    annotations:
      alpha.kubernetes.io/provided-node-ip:
192.168.0.139
....
 labels:
      beta.kubernetes.io/arch: amd64
      beta.kubernetes.io/instance-type: c7n.large.4
      beta.kubernetes.io/os: linux
failure-domain.beta.kubernetes.io/zone: cn-north-7c
      kubernetes.io/arch: amd64
capacity:
      cpu:  "32"
      ephemeral-storage: 102622136Ki
      hugepages-1Gi: "0"
      hugepages-2Mi: "0"
      localssd: "0"
      localvolume: "0"
      memory: 7614880Ki
```



平替的低算力机型的核数=算力系数倒数倍*高算力机型核数

容器等价算力评估

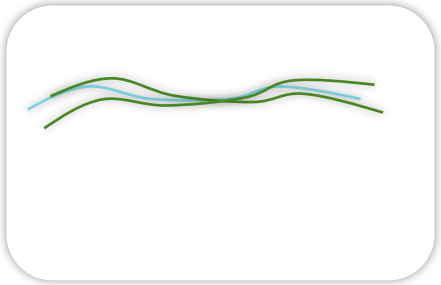
相同工作负载下
异构节点上等价算力

监控指标

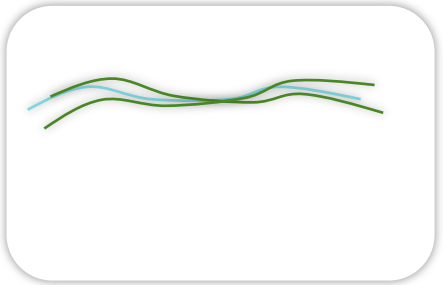
负载实例性能基本一致　　归一化CPU算力利用率差值<10%

GRS
工作负载

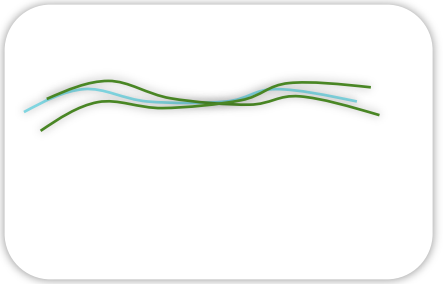
```
    timeoutSeconds: 5
  resources:
    limits:
      cpu: "2"
      memory: 4Gi
    requests:
      cpu: "2"
      memory: 4Gi
  terminationMessagePath: /dev
```



GRS 平均时延



POD CPU监控



节点CPU监控

stress

压测服务

ELB

CPU: 2C
MEM: 4G

Kc1(ARM)

C7

AC7

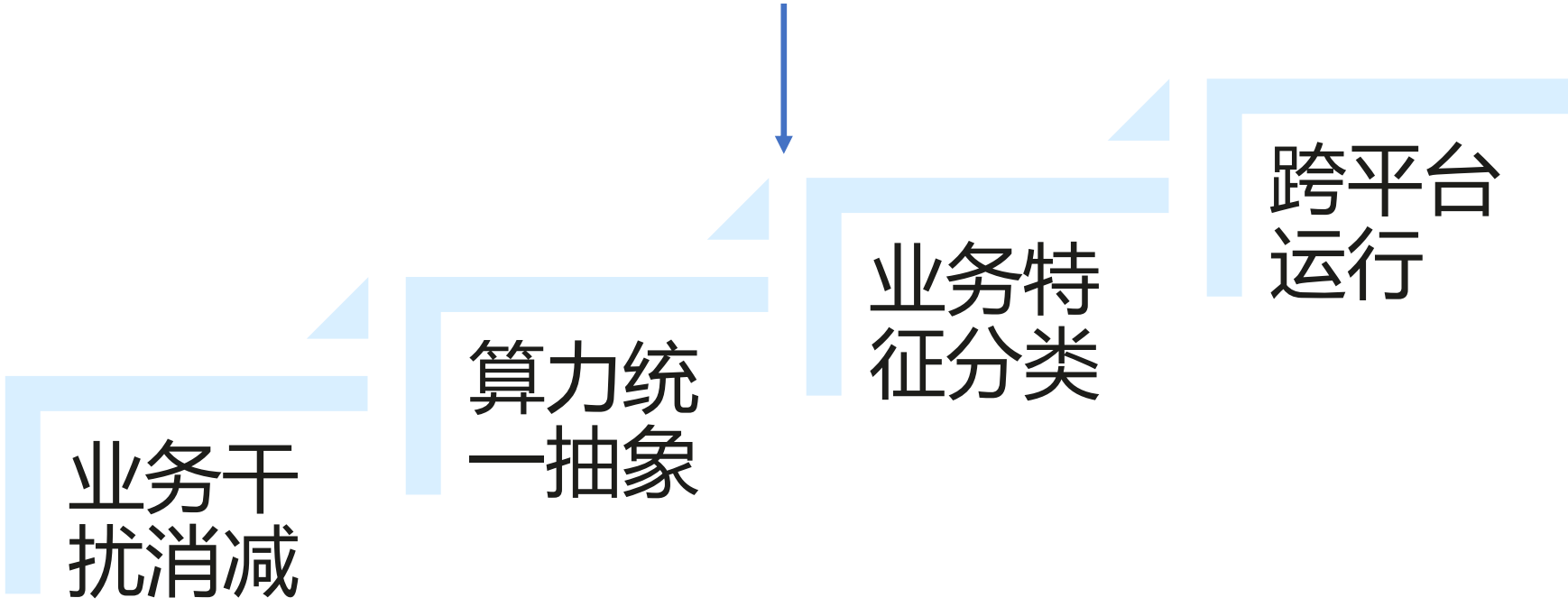
GRS
Kubelet
Kernel
Docker&ContainerD

归一化算力注册

API-Server
Volcano

Master节点

路线图



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