

Capacity & Scaling

Considerations

- RAM
- Disk space
- Disk IO
- Read/Write Profile
- Number of nodes and ring size
- Network IO

Capacity Planning

- Initial Capacity
- Scaling Profile
- Scaling Thresholds

Initial Capacity

- How many objects?
- What size are the objects?
- Object count change over time?

Access Profile

- How many requests per second?
- What is the request distribution?

Bottlenecks

KV	2i	MapReduce	Search
Disk I/O	Disk I/O	Disk I/O	CPU
Network	Network	Memory	Memory
Memory	Memory	CPU	Network
CPU	CPU	Network	Disk I/O

Estimating Disk Capacity

- Disk space per node

$(\text{objects} * \text{size} * n_val)$

node count

Estimating Disk Capacity

- Disk space per node

$(60,000,000 * 10\text{kB} * 3 \text{ replicas})$

5 nodes

= 360GB per node

- (not including free space)

ring_creation_size

- Can only be set once
- Power of 2
- All nodes must agree
- 10-30 vnodes per node is considered best

Thresholds

- CPU: 75% x num_cores
- Memory: 75% utilization
- Swap: >0% used
- File Descriptors: 75% of ulimit

Tips

- Bitcask calculator
- Scale early to avoid handoff pain
- Scale up in groups not a node at a time
- Up transfer limit off-peak (if you have one)
- Auto scale up but not down
- Configuration management avoids human error