



CEPH DAYS ZURICH · OCTOBER 14, 2026

Ceph on a Shoestring and a Song

Older hardware as a hedge against rising component prices

ABOUT ME

François Baillargeon

Storage & Virtualization , Croit



Ceph, Proxmox, and 26 years of IT, helping teams make the best of their dollar.



Storage & Ceph



Proxmox & Virtualization



Automation & DevOps

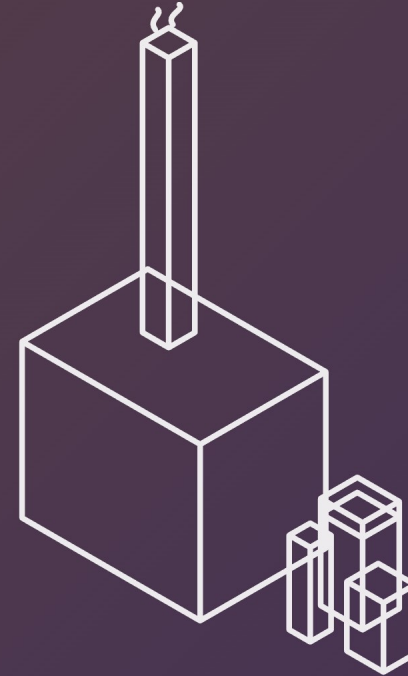
Based in Quebec City, originally from Rouyn-Noranda, Québec.

A Reason Closer to Home

I'm from Rouyn-Noranda, Québec (Canada), home to the Horne Smelter, North America's largest metals recycler.

It recycles the metals out of old electronics, including servers, but decades of emissions have left the local population with elevated blood arsenic and lead levels.

Reusing hardware longer isn't just a budget hedge. It's fewer boxes that ever need recycling.



THE PROBLEM

The Price of New

DRAM is up over 250% since last October. Flash has more than doubled. AI-scale demand is eating the same supply chain.



Flash & SSD

More than double the price of a year ago.



Memory

DRAM is up over 250% since last October.



New Platforms

Current-gen CPUs, NICs, and chassis pass that cost to you.

Same acquisition budget. Fewer new nodes than it used to buy.

THE IDEA

Same Budget, More Nodes

Ceph doesn't care how old a node is. CRUSH only cares how many failure domains you have.

The lever Ceph hands you is **host count**, not clock speed.

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ fewer, newer → more, older: 5, 8, even 10 years old

Redundancy, rebalancing headroom, and EC math are all functions of host count.

There is such a thing as fast enough.

THE CATCH

More Nodes, More to Watch

Eighteen hosts instead of six, and older ones: more drives to age, more firmware to track, more logins. **The savings only survive if one person can still see the whole fleet.**

- **Every disk, before it quits**

SMART, logs and capacity for every cluster, in one place.

- **One login, every cluster**

Each site opens from the same map, croit or native Ceph.

- **Updates rolled out centrally**

One release, every cluster, from one screen.



croit Datacenter Manager: every cluster on one map, one click to its disks, logs and updates.

THE BASELINE

Where Replication 3 Tops Out

Replica 3 is the sensible default: simple and safe, even on a handful of hosts.

33%

usable of raw capacity

2

failures tolerated at once

33% usable

67% copies

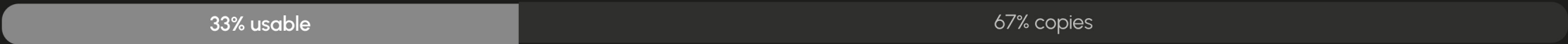
That ratio never improves, no matter how many hosts you add.

Node Count Unlocks Erasure Coding

Scheme	Efficiency	Failures	Hosts needed
Replica 3	33%	2 at once	3 (4+ practical)
EC 4+2	67%	2 at once	6 (8–10 practical)
EC 8+3	73%	3 at once	11 (16–22 practical)

USABLE CAPACITY, SIDE BY SIDE

REPLICA 3



EC 4+2



EC 8+3



IN PRACTICE · ILLUSTRATIVE

A Worked Example

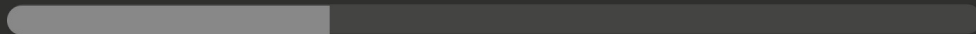
ROUTE A — FEWER, NEWER

6 new hosts



All new, current-gen. Fine for replica 3, not enough hosts for EC 8+3.

33% usable



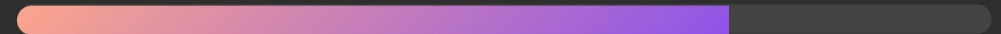
ROUTE B — MORE, OLDER

18 off-lease hosts



Same budget, spent on off-lease previous-gen gear, plenty of headroom for EC 8+3.

73% usable



Same budget. $\sim 2.2\times$ the usable capacity, one more failure tolerated.

Illustrative: your ratios will vary by chassis and disk choice

THE TRADE-OFFS

What Actually Costs You



CPU headroom

EC costs more CPU than replication, especially during recovery.



Network

Rebuilding a shard reads k others: plan real 10/25G.



Drive age

Used enterprise drives often have 80–95% life left: verify with SMART, don't assume.



Power & cooling

Older platforms draw more watts per usable terabyte.



Failure domains

CRUSH needs hosts on separate PDUs, switches, racks.



Firmware & support

Older platforms may be past vendor security updates.

THE REAL METRIC

Total Cost Per Petabyte-Year

Same illustrative fleet as before: hardware, energy, and operators, priced per usable petabyte per year.

■ Hardware ■ Energy ■ Operators



Route B spends more on power and people, but it still wins on total, thanks to efficiency.

Spend on the people, not the things.

Illustrative: plug in your own \$/kWh and labor rates

Spend on Drives, Save on Chassis



Chassis secondhand, drives verified

Off-lease compute, retrofit with PCIe NVMe adapters.



Stagger generations

Mix hardware ages so failures and end-of-life don't cluster.



Size EC with headroom

Aim for total hosts around $1.5-2 \times (k+m)$.



Watch older nodes closer

SMART, temperature, and power draw become metrics.

TAKEAWAYS

Buy More Nodes, Not Just Bigger Ones

- ✓ Higher prices, same trick: Ceph only asks for failure domains, not new silicon.
- ✓ More hosts, even older ones, turns replica 3 into EC 8+3, better efficiency *and* durability.
- ✓ Spend the savings on drives, network, and monitoring, where reused hardware needs the help.

Thank you. Further reading: croit.io/blog · Building croit Ceph on Used Hardware