AMPERE®

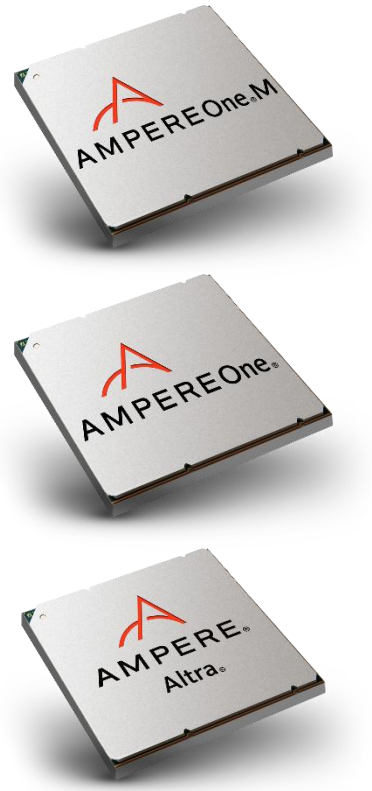
cloudstack
open source cloud computing

Double Savings on Repatriation with an Ampere Combination

Q3 2025

Pete Logan
EMEA Field Sales Engineer
Ampere Computing LLC

Who: Ampere, A Server Silicon Design Company



Performance

+

Scalability

+

Efficiency

Ampere Architecture

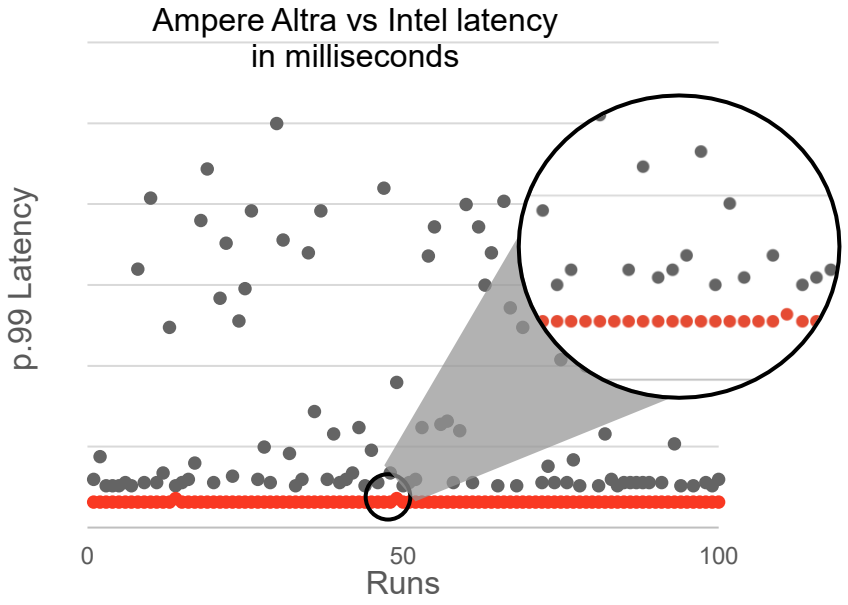
- Single-Threaded Cloud Core
- Consistent Operating Frequency
- Fine Grain Power Management
- Maximum Core Counts
- Power and Area-Efficient
- Advanced Security Features
- Larger Low Latency Private Caches
- Right Sized AI Computing

Why: Ampere® Processors for DC, Edge and Telco

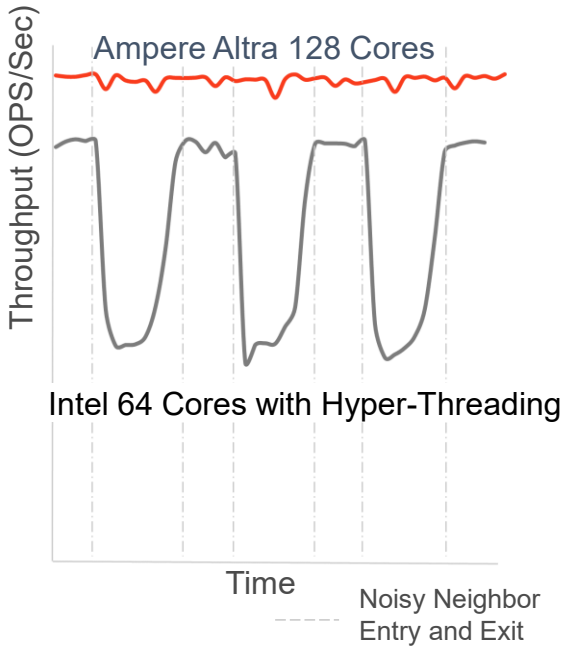
Deliver High throughput, low latency, low-jitter, deterministic at 80%+ load

Via many single-threaded, fixed frequency, efficient cores with large private caches

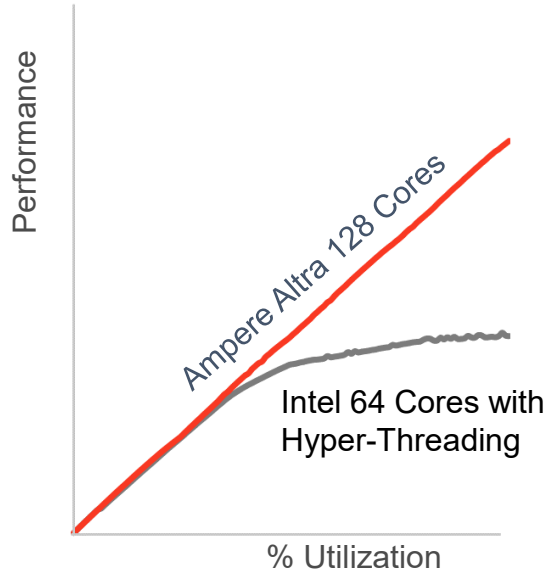
Predictable Low Latency



Consistent Throughput

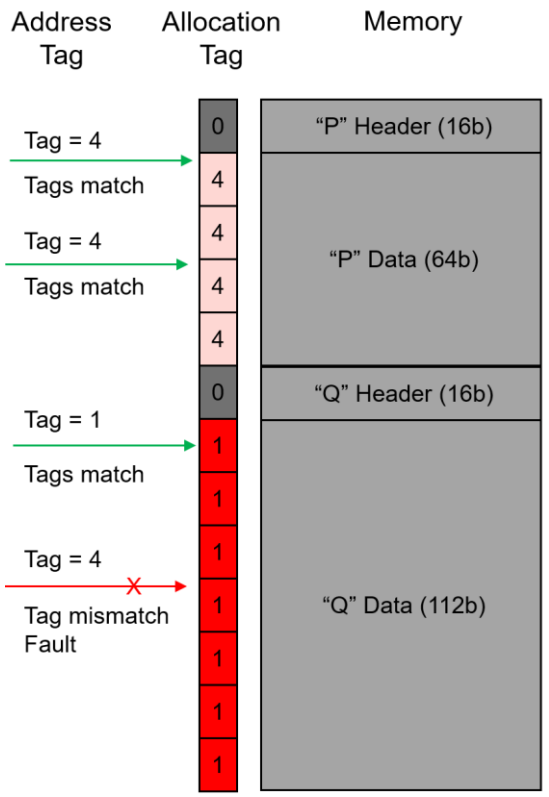


Linear Scaling

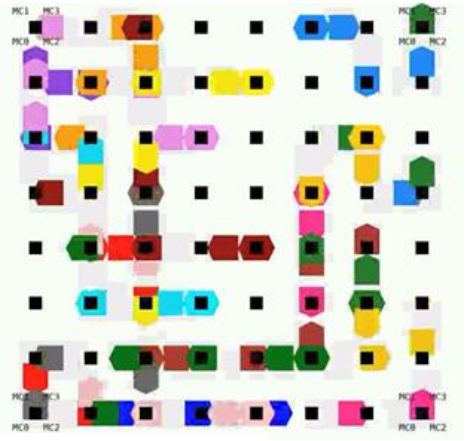


What: AmpereOne® Cloud Native Features

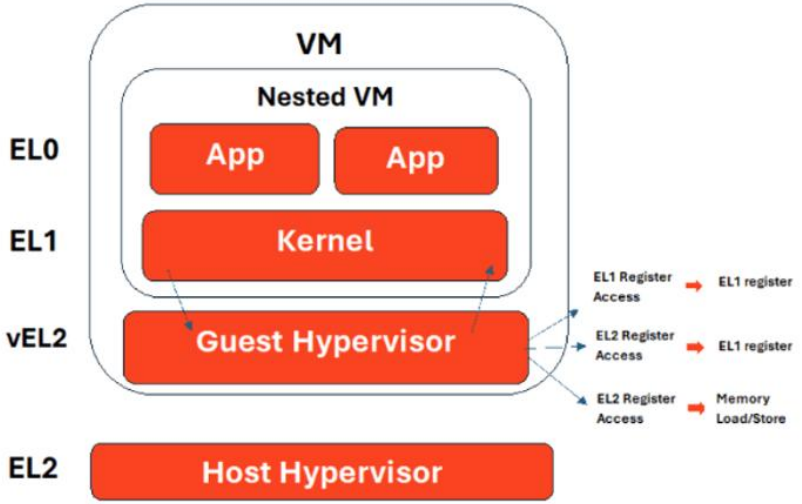
Memory Tagging



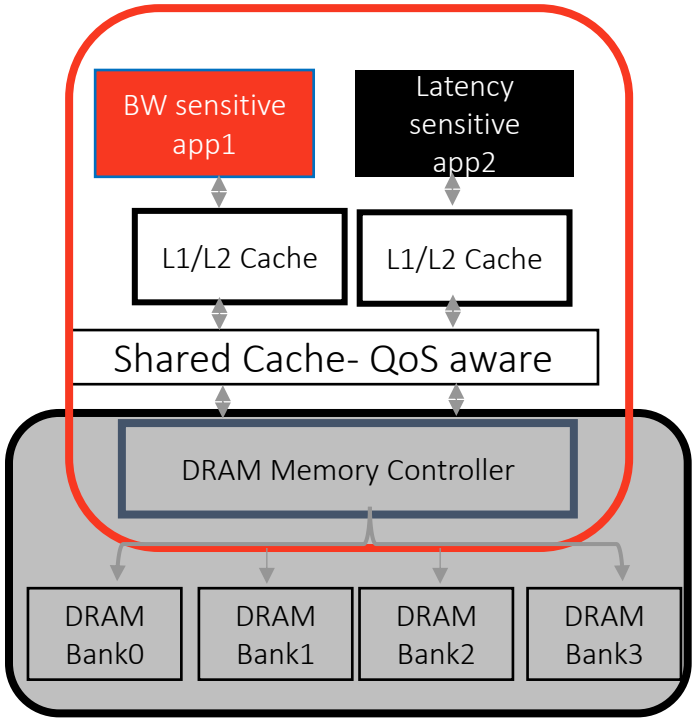
Adaptive Traffic Management

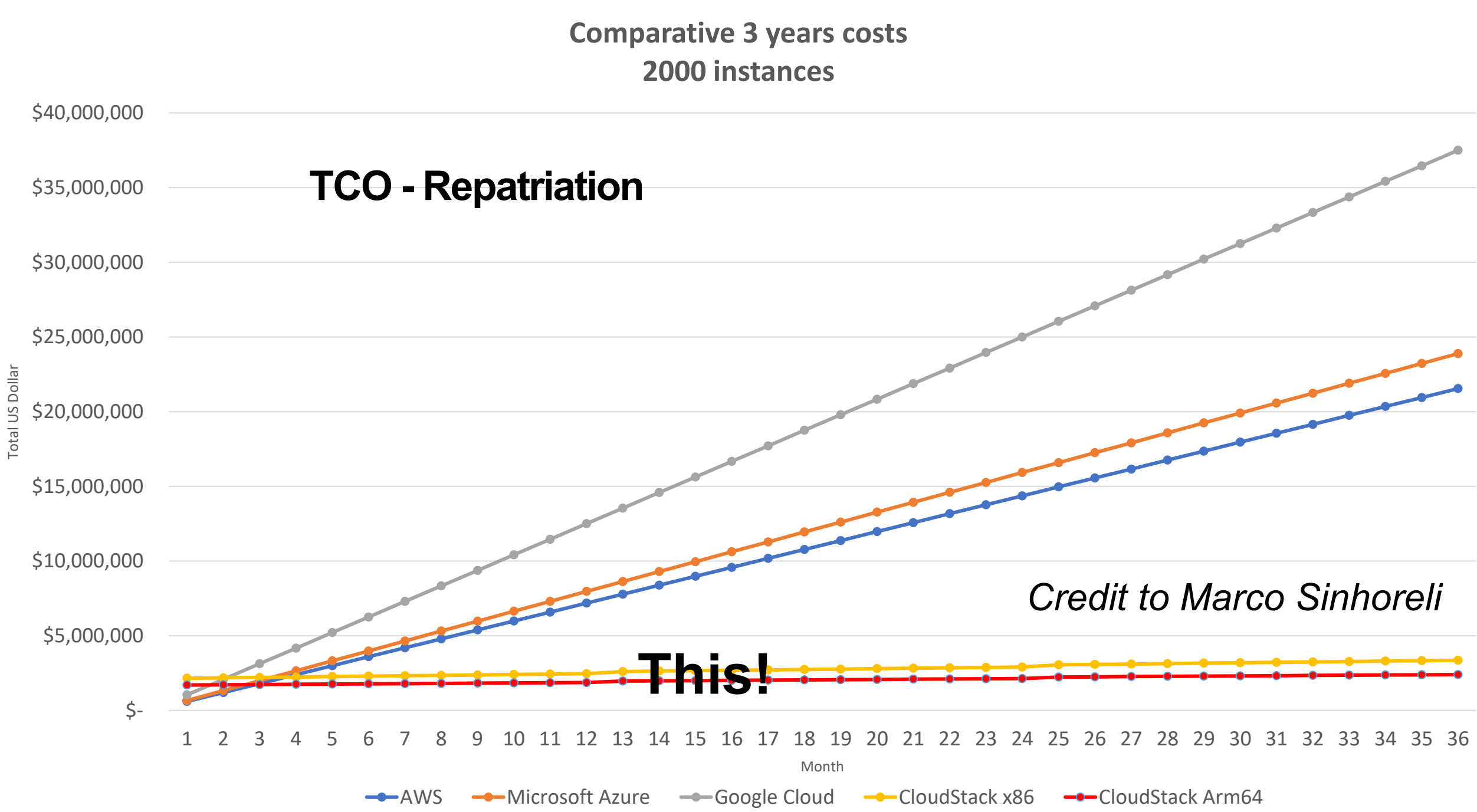


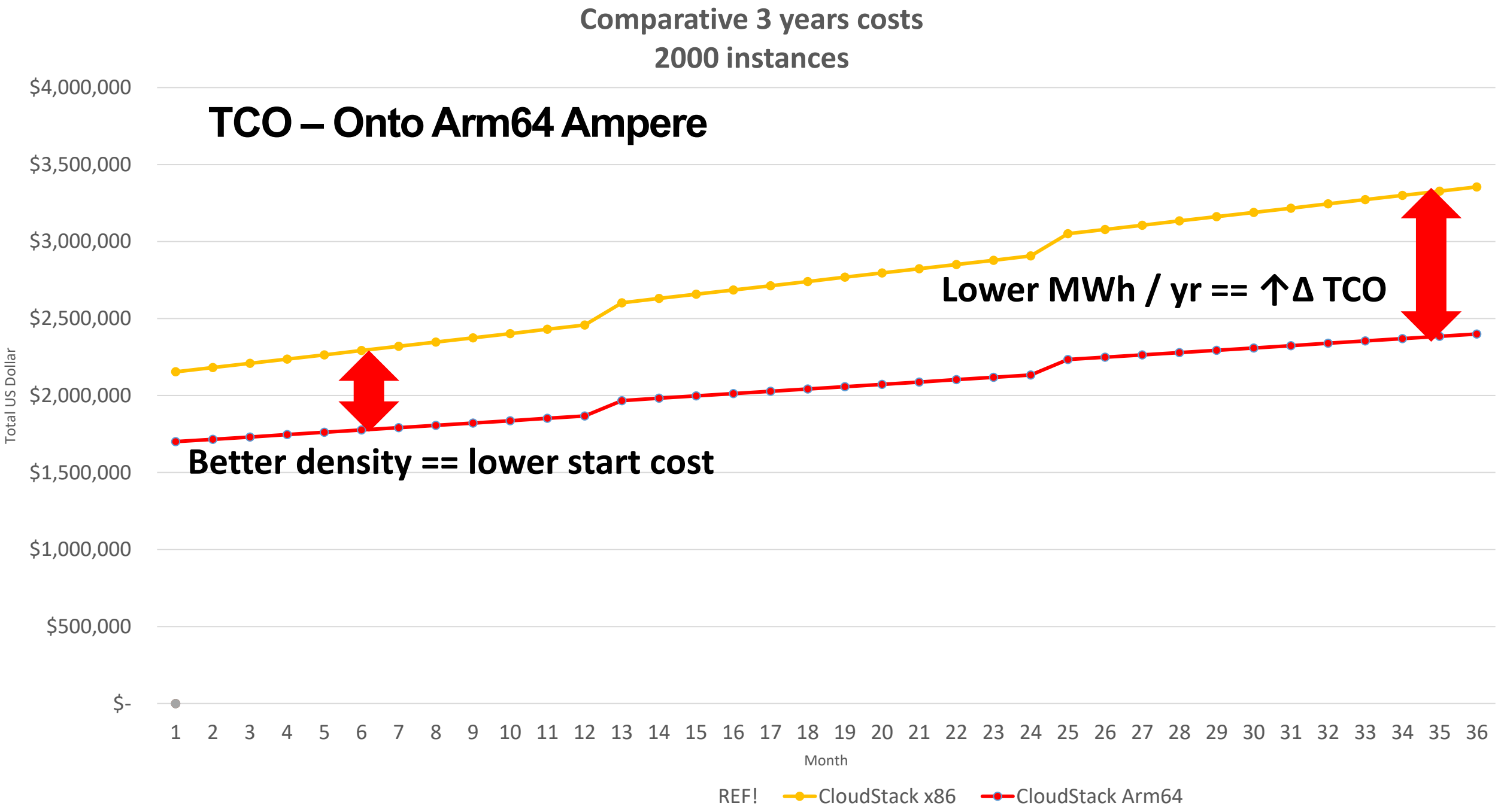
Nested Virtualisation



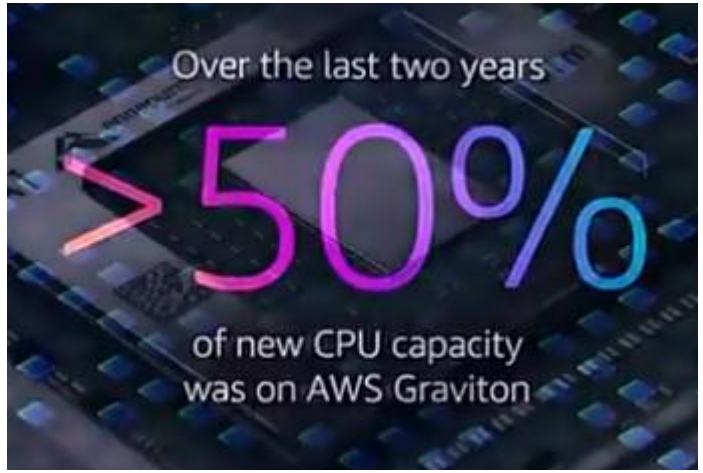
QoS Enforcement




Comparative 3 years costs
2000 instances
TCO - Repatriation
Credit to Marco Sinhoreli
This!
$40,000,000
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$-
Total US Dollar
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
Month
AWS
Microsoft Azure
Google Cloud
CloudStack x86
CloudStack Arm64


Comparative 3 years costs
2000 instances
TCO – Onto Arm64 Ampere
Lower MWh / yr == ↑Δ TCO
Better density == lower start cost
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
Total US Dollar
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
Month
REF!
CloudStack x86
CloudStack Arm64

Hyperscalers Now – is this Existential?



Re:Invent Q4 2024
Most CPU is Graviton for the last 2 years.
¼ is already Arm.
https://www.arm.com/markets/computing-infrastructure/cloud-computing/aws#1

Q4 2025 paper.
All future apps will be multi arch.
30k apps already ported.
https://arxiv.org/pdf/2510.14928

OCI deploys Ampere both internally and externally.
Oracle DB & Fusion Enterprise apps ported.
https://www.oracle.com/news/announcement/oci-compute-instances-nvidia-ampere-2023-09-19/

Azure, Meta, SAP S/4 HANA & the Chinese Hypers (Tencent, Alibaba, Bytedance, JD, Baidu, Kingsoft) all have Arm programs, some on Ampere.

AmpereOne® is the way to keep pace with the hyperscalers.

How: Porting **& Porting**

Porting Light

Graviton – AWS
Axiom – GCP
Cobalt – Azure

All Arm cores – Sneaky use is Hyper Lock In

Basic binary compatibility

Ampere offers a low effort landing for the same builds / apps / whatevers.

Porting Heavy

`github.com/AmpereComputing/`**`ampere-porting-advisor`**

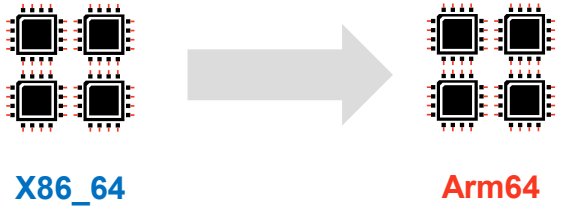
```
docker run my/repo/path:/repo porting-advisor /repo
```

```
python3 src/porting-advisor.py ~/my/path/to/my/repo
```

Python 3+ | Java 8+ | Go 1.11+ | C/C++ | Fortran 🧙

Dependencies | Code patterns | Incompatibilities

Cross compile ? != 🍎 M[1-4]



How – The Joint Architecture for CloudStack on Ampere

It's all pretty normal, very little to see here….

How – The Joint Architecture for CloudStack on Ampere

Okay, some details:
For CloudStack 4.19 & Ubuntu 22.04 onwards

Aarch64 on both Instance & Management

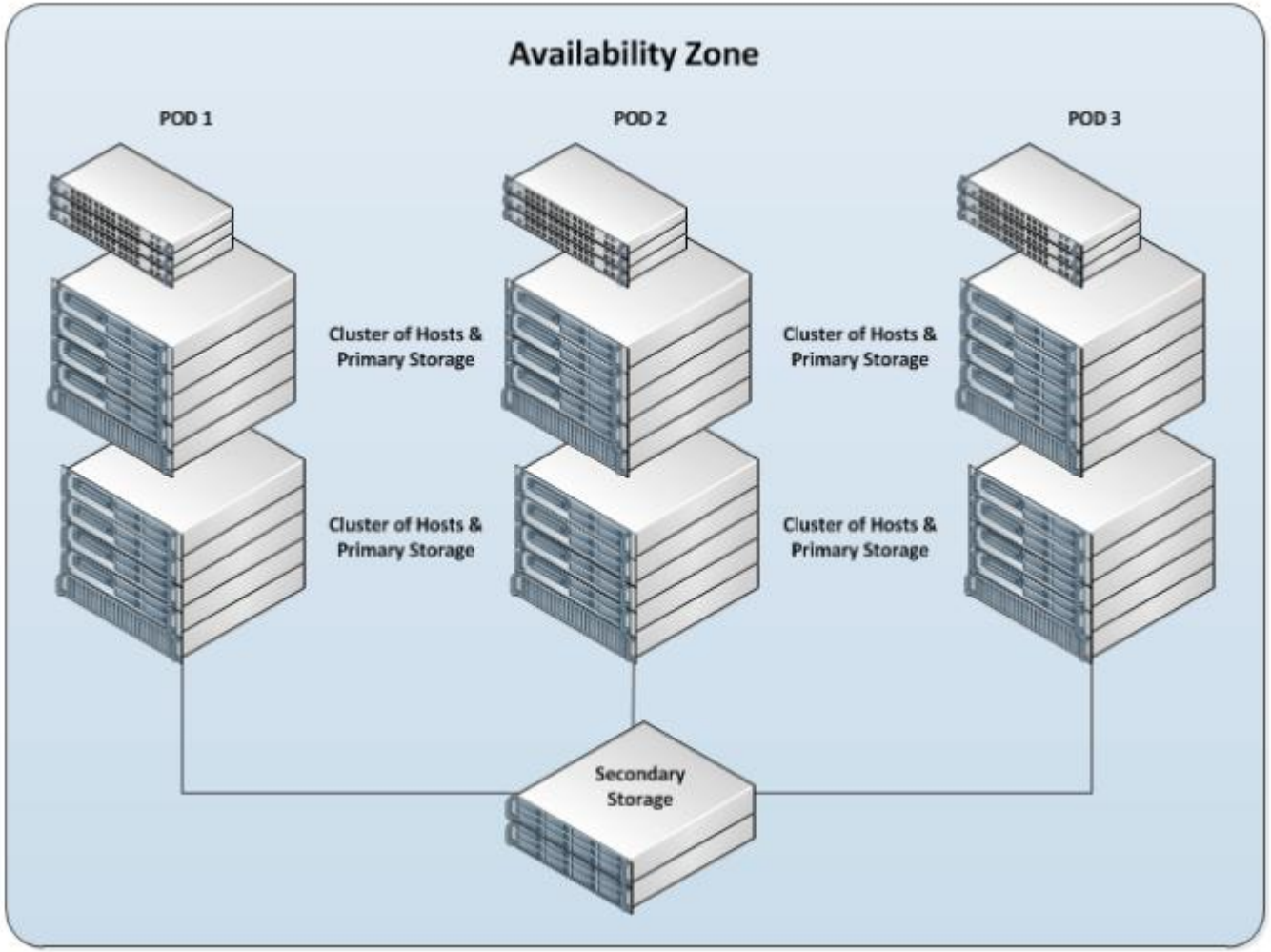
Instances – SystemVM Templates differ:
`systemvmtemplate-4.19.1-aarch64-kvm.qcow2`

KVM accel is supported in NEON

`/proc/cpuinfo` – freq manual in `agent.prop`

Doh! - ISOs should be aarch64 versions

Overcommit headroom – <=4.5x



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https://www.shapeblue.com/reference-architecture-for-iaas-cloud-on-arm64-architecture

https://amperecomputing.com/developers

Test drive Arm64 instances on Apache CloudStack at:
https://www.shapeblue.com/apache-cloudstack-public-demo-cloud/

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