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Cloud Rationalization
Next Year's Buzzword

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Our Story So Far...

A Brief History of Data Centers

- ENIAC in 1945
  - University of Pennsylvania, required a dedicated building
- Computer Rooms
  - 1960's dedicated rooms in existing buildings to house transistorized computers
- Network Closet
  - 1980's Rise of client-server architecture, server housed in network closet and attached to office network
- Data Center
  - 1990's Internet connectivity and dedicated servers in centralized facility, back to a shared, dedicated building
- Cloud
  - 2000's Virtualized services delivered from shared physical servers
- Hyperscalers
  - 2010's Massive build-out of physical infrastructure to support expanded Cloud offerings
- Infrastructure-as-a-Service
  - 2020's The entire physical stack is now programmatically available with multiple providers at every level

Growth has been driven by the quest to find economies of scale and economies of scope in Compute

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https://blog.enconnex.com/data-center-history-and-evolution

A Brief History of Cloud

- Named in 1994
- VMWare virtualization in 1999
- AWS EC2 in 2006
- OpenStack in 2010
- Terraform in 2014
- Kubernetes in 2014
- *-as-a-Service
  - API-driven services to be interconnected via common protocols

Layers of abstraction mean physical infrastructure is well hidden

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How Did We Get Here

Cloud has been dominant for over a decade

- Cloud-only apps and services have been built and run and grown successfully for years
- There are plenty of companies with no expertise in anything behind the Cloud provider's API
- Infrastructure-as-a-Service has become "Service," and Infrastructure is a low class, dirty word Software does not speak

There are lots of organizations which have either lost or never had expertise in systems and networks

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Performance Wheel

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So What's the Problem

Cloud-native companies are discovering problems with

- Cost
- Control
- Performance
- Compliance
- Scope and Size of Service

Cloud-native means Cloud-dependent

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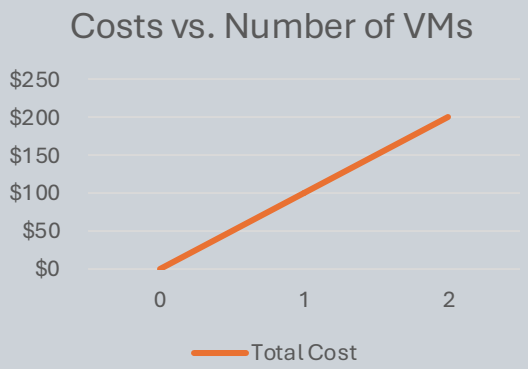
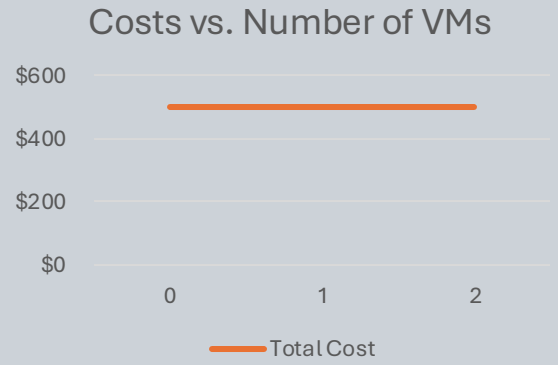
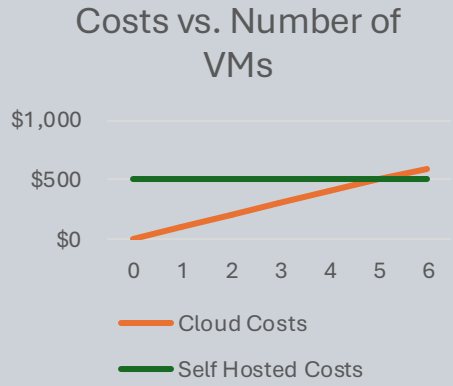
Cost

Cloud	Self Hosted	Versus
Costs are entirely variable, and increase linearly with usage. A second VM doubles the cost of a single VM.	Costs are fixed up to a given server. The added cost of running a second VM on top of an existing server is roughly $0.	Cost lines cross at some point, and it becomes cheaper to self-host.







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Control

GCP auto-deleted the entire account of a $125Bn pension fund

https://www.theguardian.com/australia-news/article/2024/may/09/unisuper-google-cloud-issue-account-access

- "UniSuper has approximately $125bn in funds under management."

https://cloud.google.com/blog/products/infrastructure/details-of-google-cloud-gcve-incident

- "... there was an inadvertent misconfiguration of the GCVE service by Google operators due to leaving a parameter blank. This had the unintended and then unknown consequence of defaulting the customer's GCVE Private Cloud to a fixed term, with automatic deletion at the end of that period."

Bad things happen- who should bear the risk? At small scale, outsourcing risk is acceptable because the cost of a handful of angry customers is relatively small. At large scale, a formal SLA will bound risk to the company offering the service.

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Performance

- VM contention
- Network contention
- API access contention
  - Rate limits
- Data Gravity
  - Egress is expensive, Ingress is free

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Compliance

PCI

CCPA

GDPR

SLA

Even if your cloud vendor claims compliance, can you enforce it?

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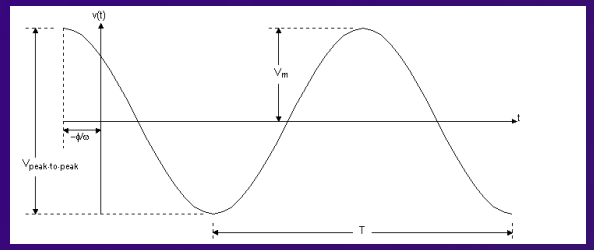
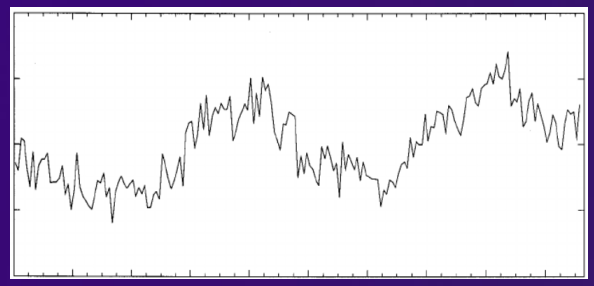
Size and Scope of Service

Optimizing for base load



Optimizing for individual projects



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Negative Externalities

- Cloud where it makes sense
  - New projects, dev work, scaling risk, business continuity
- Self hosting where it makes sense
  - Known large scale, large expected traffic, older projects where scope is known, batch processing
- Anything in-between
  - Shop specific custom knowledge

Retionalization does not mean no more cloud, instead it means evolving into an intelligent Hybrid

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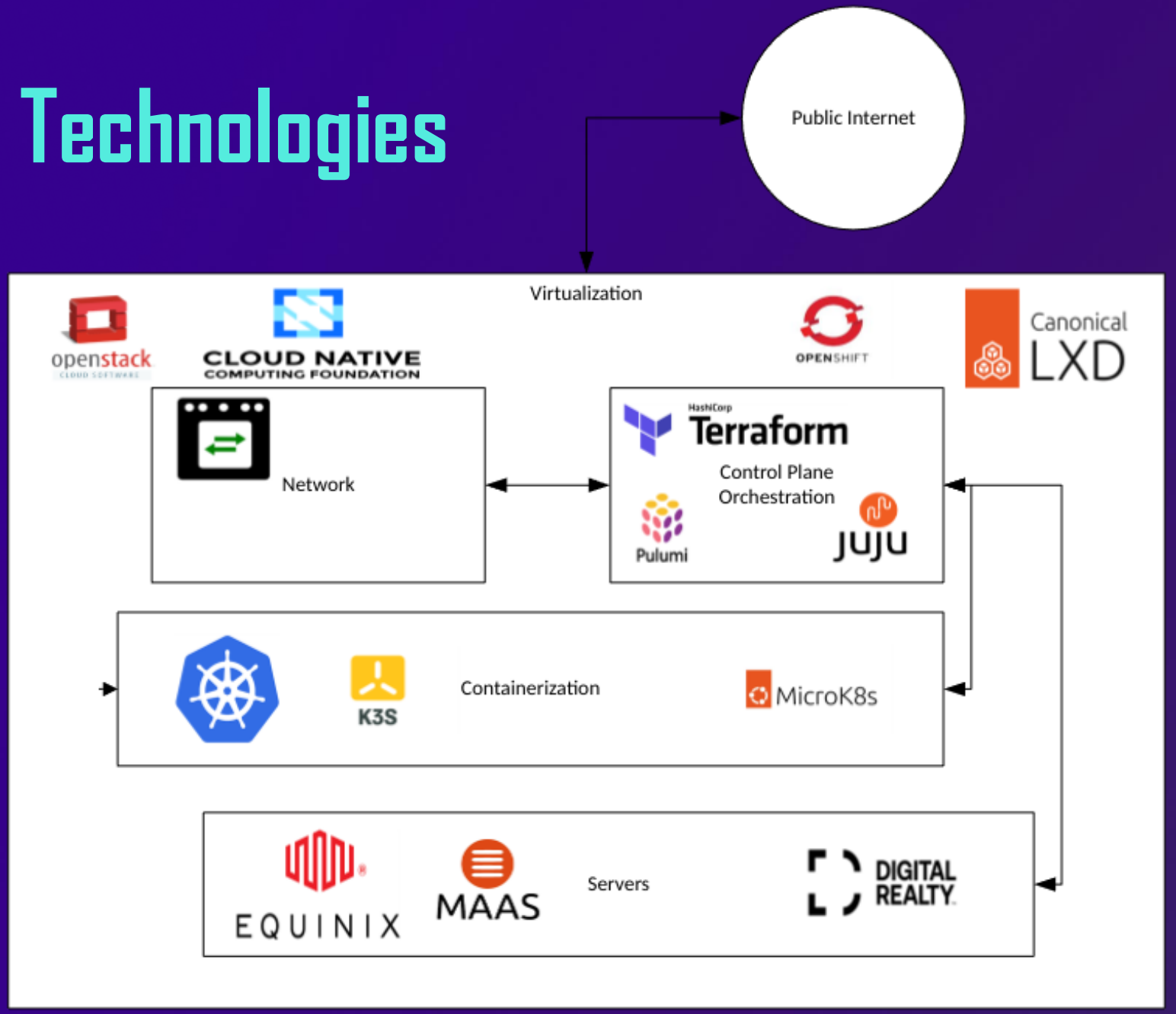
Enabling Technologies



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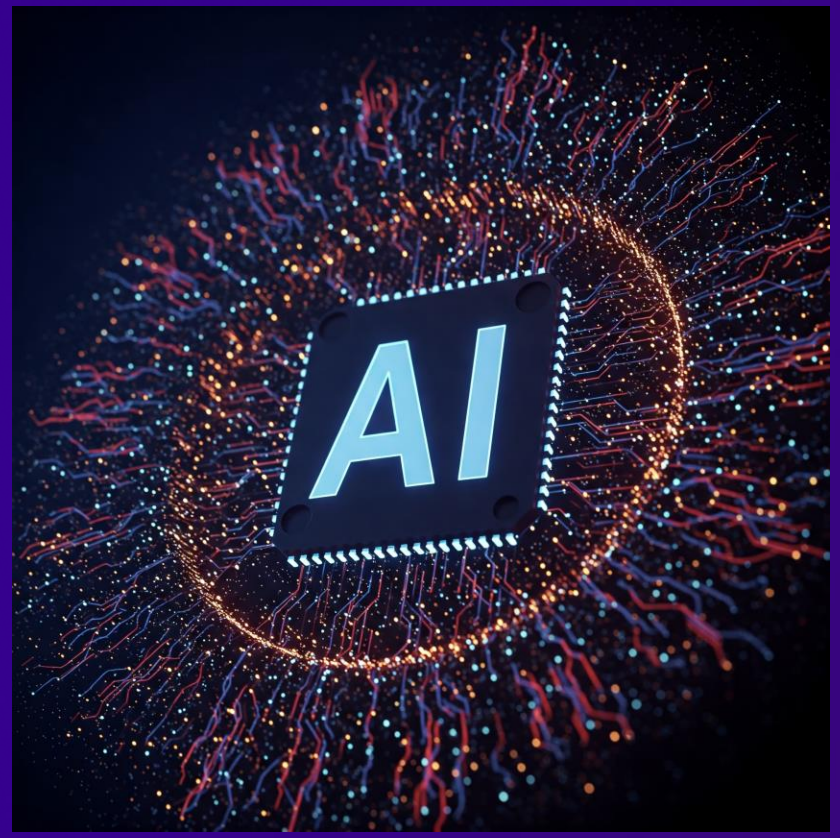
The Latest Spin of the Wheel



Insourcing becomes bloated and inefficient, and market shifts

Do what you're great at, outsource the rest to lower costs

In Search of Lower Costs, Better Quality, Better Performance,

Outsourcing becomes bloated and inefficient, and market shifts

Insource to address new needs and lower costs

You are here

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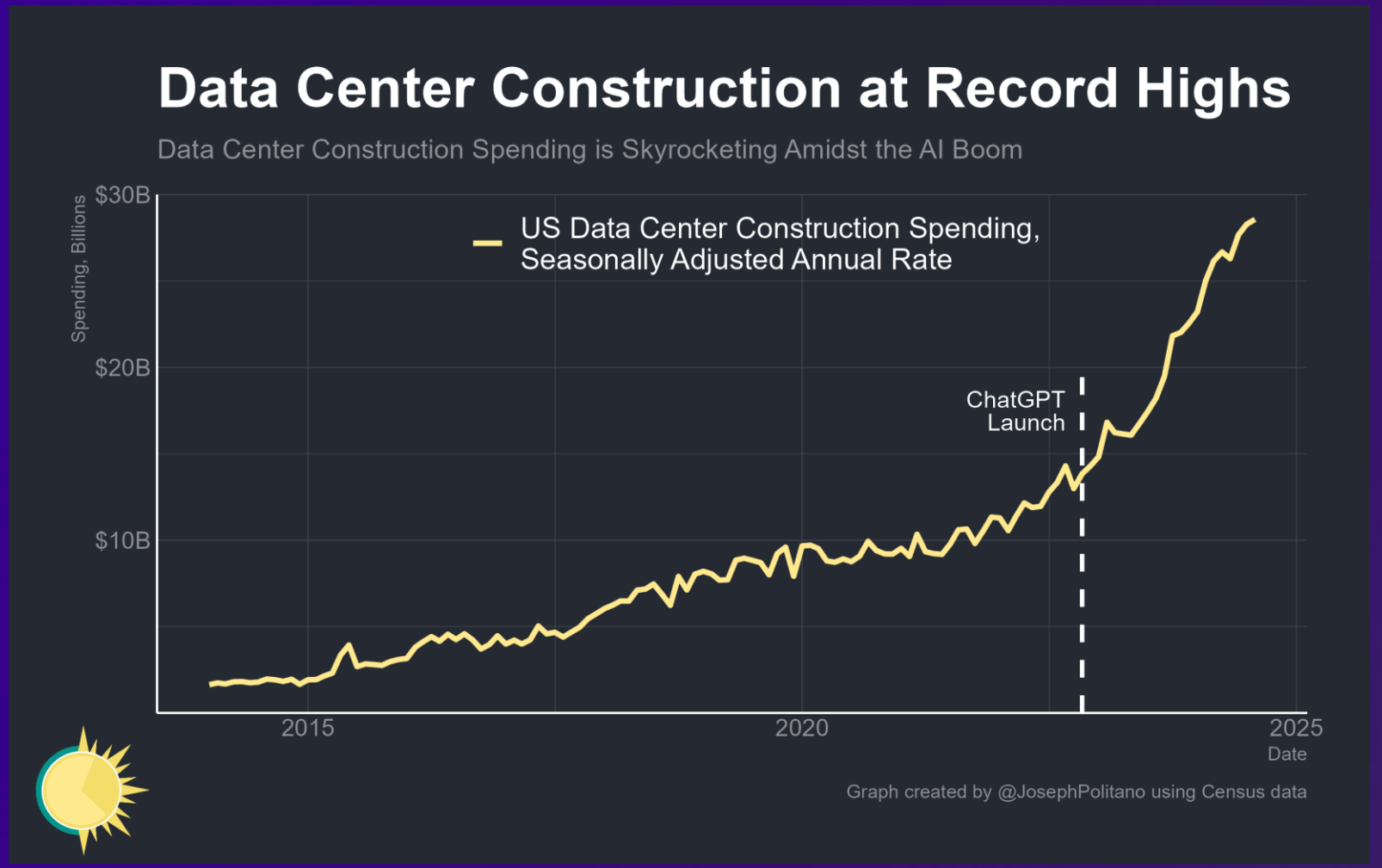
Wherever You Go, There You Are



https://www.apricitas.io/p/the-ai-investment-boom

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Build the Stack You Want

There are multiple projects which replicate a professional cloud

Pick-and-choose the parts which work for you, and ignore what doesn't

Customize based on your shop's requirements

Optimize to deliver an ideal production environment

If you like your cloud, you can keep it

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Vendors for Every Part of the Stack

- What you want to do for yourself
  - Control your own Cloud
  - Control your own network circuits and bandwidth
- What you want to outsource
  - Utilize a third party Metal-as-a-Service

    Third party is responsible for physical hardware only

Getting the risk-reward balance right

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Questions?

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