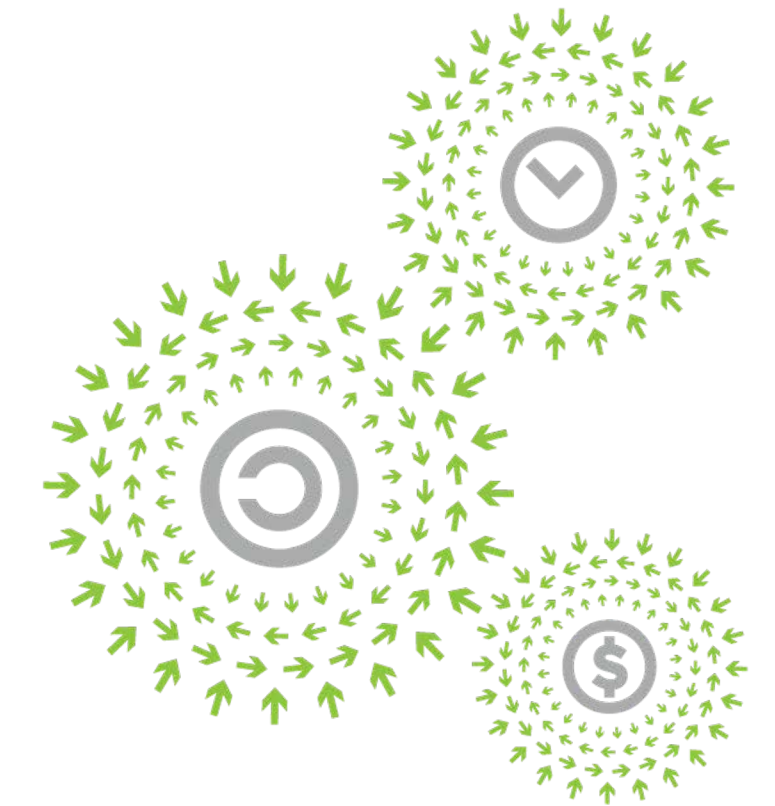


From Servers to Serverless in Ten Minutes

Erik Riedel, PhD
Senior Vice President, Engineering
ITRenew



OPEN
PLATINUM™

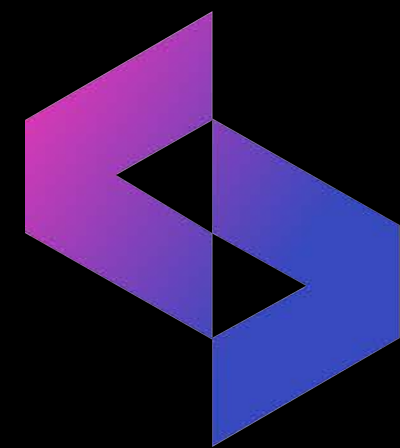
Open for All.



OCP
GLOBAL
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The Power of Hyperscale For All

Optimized for your workload, from desktside to data center. No assembly. No guesswork. Just plug them in.



SESAME BY ITRENEW

PROVEN
HYPERSCALE TECH
BUILT ON OPEN
ARCHITECTURE

CONSISTENT
PRODUCT
DEPENDABLE
SUPPLY

BETTER-THAN-
EVER TCO
FLEXIBLE,
SCALABLE



Servers



Serverless



in 10 minutes...or so...

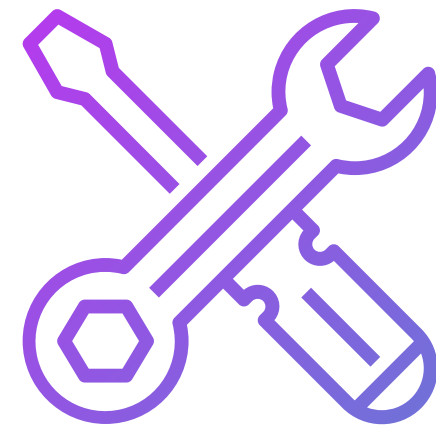


OCP
GLOBAL
SUMMIT

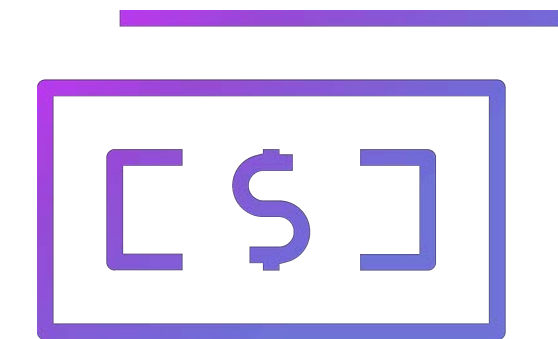
Project goal and genesis



SERVER



OCP adoption could be accelerated by offering **pre-designed** and **pre-qualified** solutions for key computing use cases.



Many service provider & enterprise SaaS companies are looking for **solutions** to roll onto the floor, plug in, and quickly run workloads.

We are working with **infrastructure software** stacks and **software partners** to pre-design and pre-qualify solutions with OCP equipment.

20

20

19

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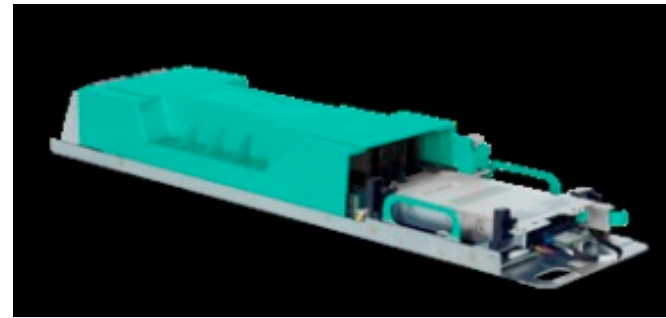
14

13

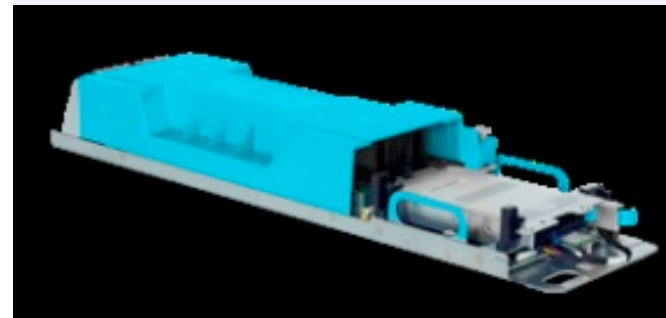
13



Servers



single or 2- socket nodes, 25 GbE connectivity



flash-based storage nodes; millions of IOPS and terabytes of capacity

external TOR switches (2x)		
ingress	ingress	ingress
internal TOR switches (2x)		
compute	compute	compute
compute	compute	compute
compute	compute	compute
compute	compute	compute
compute	compute	compute
compute	compute	compute
power zone BB		
compute	compute	compute
compute	compute	compute
compute	compute	compute
storage	storage	storage
storage	storage	storage
storage	storage	storage
mgmt	mgmt	mgmt
infra	infra	infra
power zone AA		

up to 45 nodes



SERVER



SESAME
for Open Systems





Servers



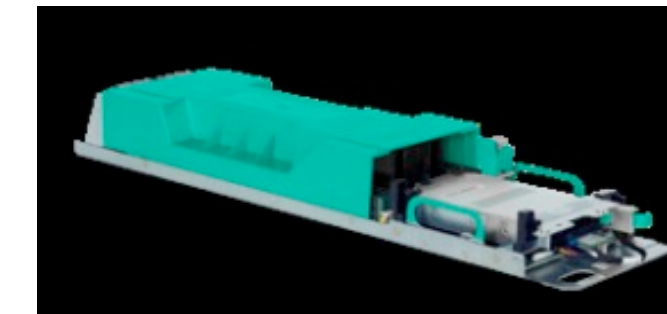
compute
compute
compute
compute
infra
power supply + switch

up to 5 nodes



external TOR switches (2x)		
ingress	ingress	ingress
internal TOR switches (2x)		
compute	compute	compute
compute	compute	compute
compute	compute	compute
compute	compute	compute
compute	compute	compute
compute	compute	compute
power zone BB		
compute	compute	compute
compute	compute	compute
compute	compute	compute
storage	storage	storage
storage	storage	storage
storage	storage	storage
mgmt	mgmt	mgmt
infra	infra	infra
power zone AA		

up to 45 nodes

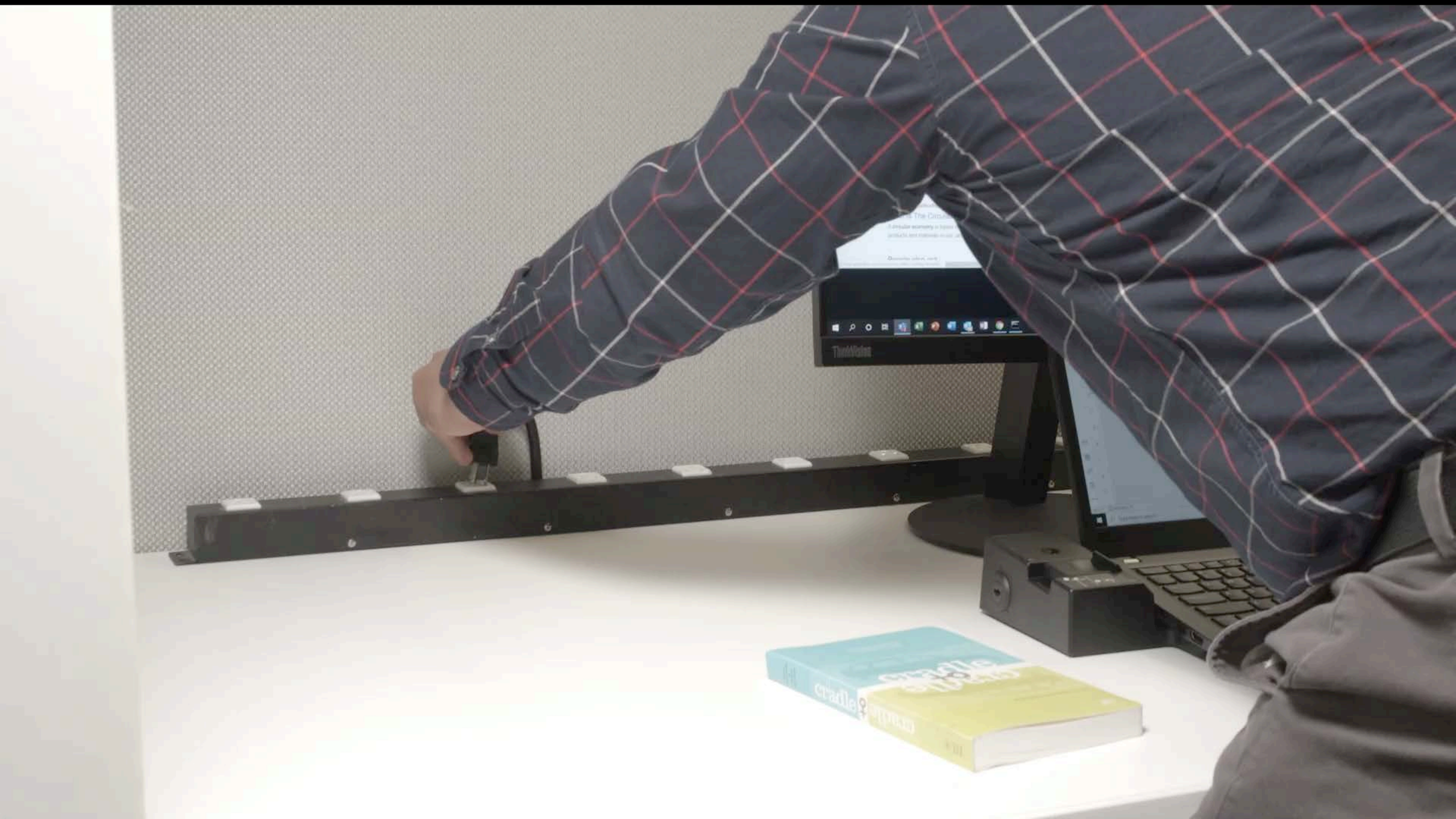


single or 2- socket nodes, 25 GbE connectivity



flash-based storage nodes; millions of IOPS and terabytes of capacity





Prerequisites – Before You Start

Provisioning Server	Linux	DevOps	Automation
Our Choices	Ubuntu 19.04	docker, Ansible	Rancher
Deployed Services	DRP (PXE server) DHCP (static IPs)	Digital Rebar docker registry	Rancher

1st Step – PXE Entire Rack

- IPMI power on all the discovered nodes for wipe, install, first boot

03 min 51 sec Power on -> Disk Erased

07 min 34 sec Reboot -> Linux Installed (mSATA device)

04 min 02 sec Reboot -> Boot from installed disk (*)

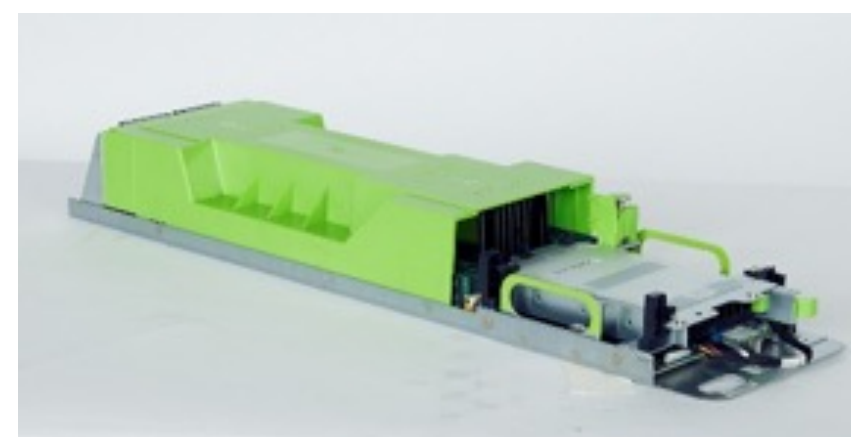
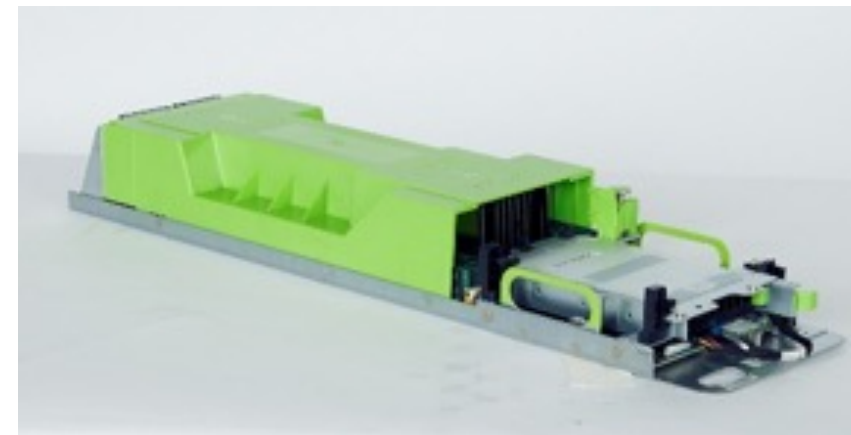
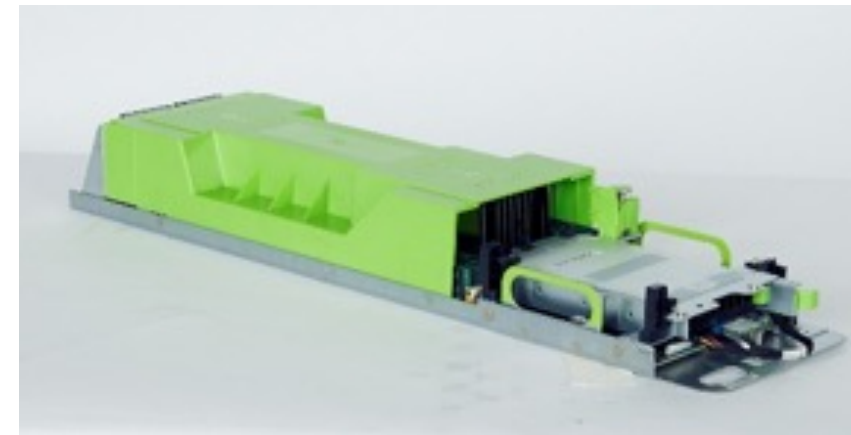
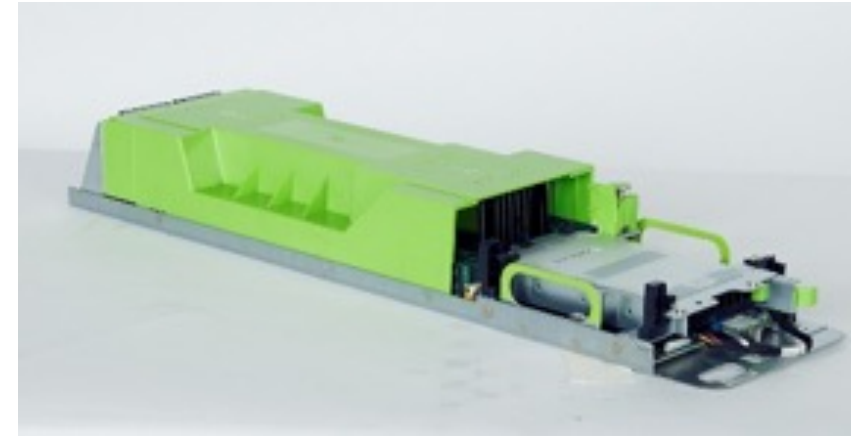
- (including 2 min of PXE timeout and 30 sec of grub menu)

* caveats for investigation: in some instances, the use of IPMI chassis bootdev at the end of the install, reverts UEFI to traditional BIOS mode and requires additional reboot step, extending the time

Servers



- compute
- compute
- compute
- compute
- infra
- power supply + switch



DRP (PXE server)
DHCP (static IPs)



SERVER

SCALE

compute	CRIMSON	2x 12c 256GB 10G
compute	CRIMSON	2x 12c 256GB 10G
compute	CRIMSON	2x 12c 256GB 10G
compute	CRIMSON	2x 12c 256GB 10G
	96 cores	1 TB memory

1st Step – Success ! OSes Deployed

Endpoint: 64:00:6a:68: [link]
Logged in as rocketskates.

SYSTEM

- Overview
- Machines**
- Plugins
- Info & Preferences
- License Manager

SITES MANAGER

NETWORKING

- Subnets
- Leases
- Reservations

Versions: DR v4.2.6 & UX v1.14.5

Machines **Refresh** **Add** **Clone** **Delete** **Force**

Run [play] [pause]

Workflow [dropdown] [plus] [minus] [refresh]

Machine Actions [poweron] [refresh] [refresh]

Results: [power] [power] [power] [power] [play]

				Name	Address	Profiles		Workflow	Stage	Task	BootEnv
<input type="checkbox"/>	<input checked="" type="checkbox"/>	i	🛡	node01	192.168.88.11 [link]	🛡	<input type="radio"/>	🔗 ubuntu-wipe-install	✅ complete	✅	🟢 local
<input type="checkbox"/>	<input checked="" type="checkbox"/>			node02	192.168.88.12 [link]	🛡	<input type="radio"/>	🔗 ubuntu-wipe-install	✅ complete	✅	🟢 local
<input type="checkbox"/>	<input checked="" type="checkbox"/>			node03	192.168.88.13 [link]	🛡	<input type="radio"/>	🔗 ubuntu-wipe-install	✅ complete	✅	🟢 local
<input type="checkbox"/>	<input checked="" type="checkbox"/>			node04	192.168.88.14 [link]	🛡	<input type="radio"/>	🔗 ubuntu-wipe-install	✅ complete	✅	🟢 local

2nd Step – Deploy Rancher

Deploy provisioning server via Ansible

Provisioning server uses Ansible to deploy RKE k8s to all nodes

Provisioning server deploys Rancher and prerequisites into the deployed k8s (*)

* we use one controller/etcd + three workers in a 4-node cluster

2nd Step – Success! – Rancher Deployed



Nodes

[Edit Cluster](#)

Cordon || Drain ↻ Delete 🗑️

Search

<input type="checkbox"/> State ↕	Name ↕	Roles ↕	Version ↕	CPU ↕	RAM ↕	Pods ↕
<input type="checkbox"/> Active	node01 10.0.0.11 📄	All	v1.16.3 👤 18.9.7	0.4/48 Cores	0.1/252 GiB	9/110 ⋮
<input type="checkbox"/> Active	node02 10.0.0.12 📄	Worker	v1.16.3 👤 18.9.7	0.3/48 Cores	0/252 GiB	3/110 ⋮
<input type="checkbox"/> Active	node03 10.0.0.13 📄	Worker	v1.16.3 👤 18.9.7	0.4/48 Cores	0.1/252 GiB	4/110 ⋮
<input type="checkbox"/> Active	node04 10.0.0.14 📄	Worker	v1.16.3 👤 18.9.7	0.3/48 Cores	0/252 GiB	3/110 ⋮

3rd Step – Configure Storage

More details than can be shown here
due to time constraints. See our blog post at [link](#)

4th Step – Configure Workloads

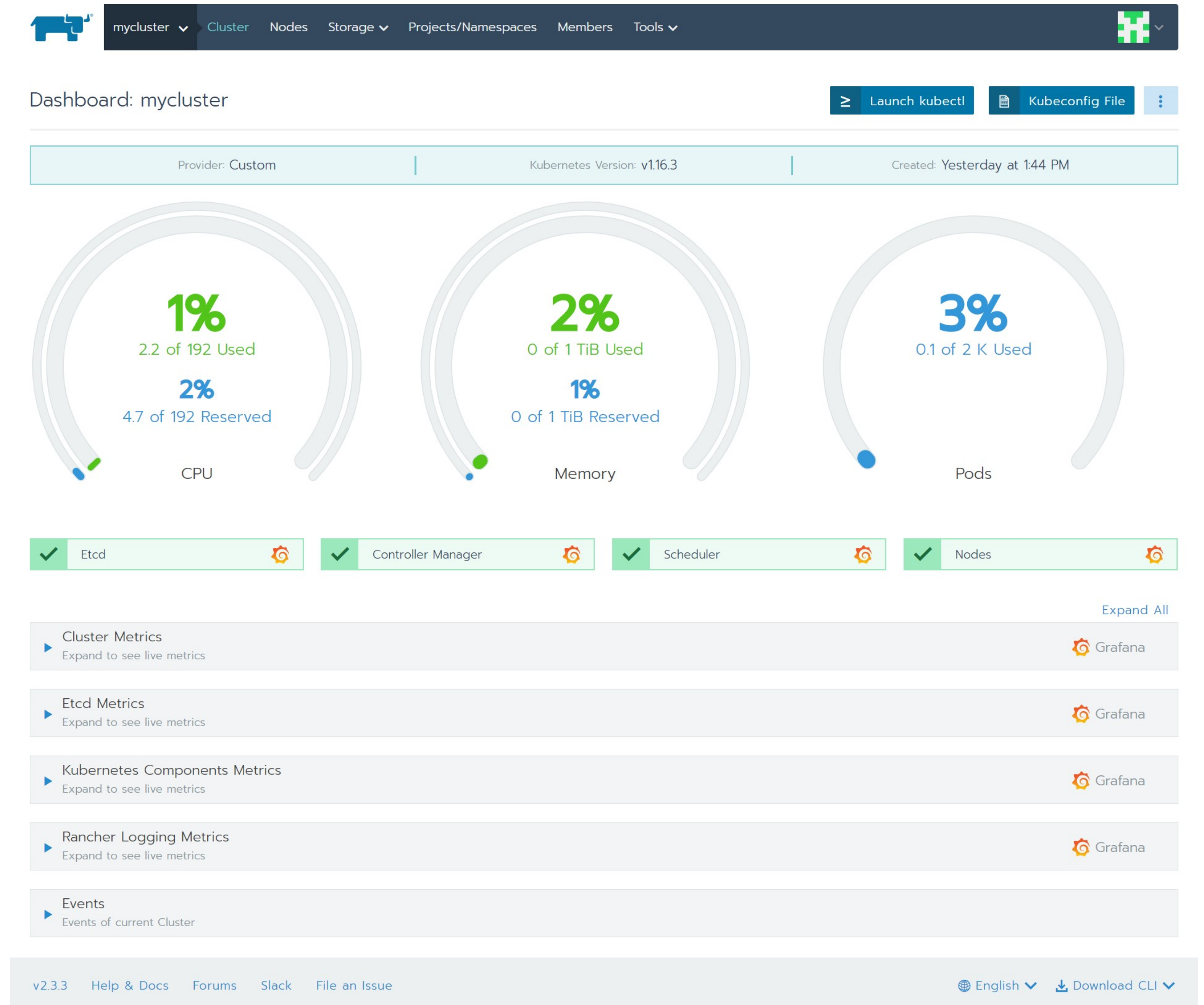
Ansible to Rancher to provision pods to exercise cluster

Ansible to Rancher to provision other monitoring tools

Then workloads are visible at the k8s master IP which shows cluster and node health + dashboard + graphs of loads & resource usage

4th Step – Success!

Workloads Configured



Let's Review – How Long Did It All Take?

```
changed: [node04]
changed: [node01]
changed: [node03]
changed: [node02]

PLAY [localhost] *****

TASK [Gathering Facts] *****
Wednesday 01 April 2020 23:23:26 -0400 (0:00:00.936) 0:23:25.266 *****
ok: [localhost]

TASK [rke : Create cluster deployment directory] *****
Wednesday 01 April 2020 23:23:27 -0400 (0:00:00.657) 0:23:25.900 *****
ok: [localhost]

TASK [rke : Create rke cluster.yml] *****
Wednesday 01 April 2020 23:23:27 -0400 (0:00:00.334) 0:23:26.234 *****
ok: [localhost]

TASK [rke : Retrieve rke binary] *****
Wednesday 01 April 2020 23:23:28 -0400 (0:00:00.723) 0:23:26.958 *****
ok: [localhost]

TASK [rke : Turn up Kubernetes via RKE] *****
Wednesday 01 April 2020 23:23:29 -0400 (0:00:01.361) 0:23:28.319 *****
```

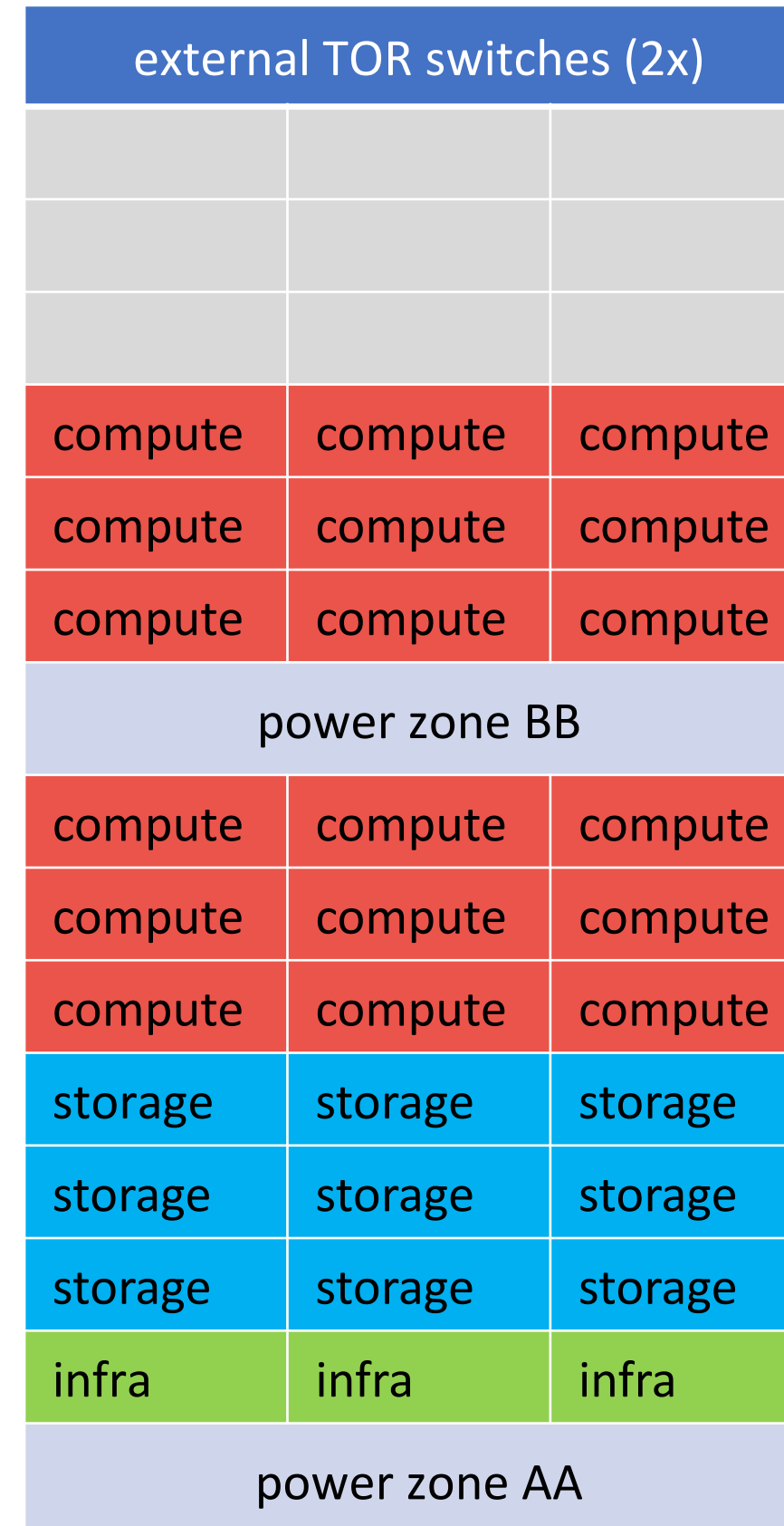


Case Study

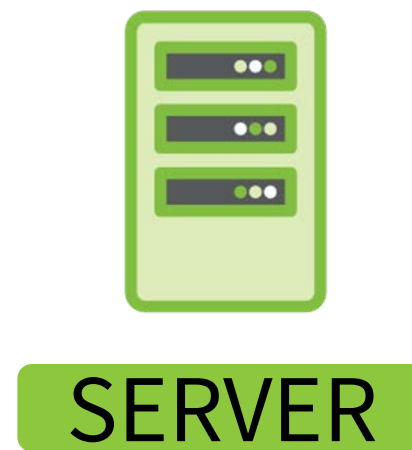
large-scale Sesame customer in the media & entertainment space



4 workload nodes (PoC platform)



27 workload nodes (production platform)



OCP Case Studies



We Did This With Three Different Stacks

RANCHER 20 minutes to full cluster readiness	KSPHERE 60 minutes to full cluster readiness	TALOS 31.5 minutes to full cluster readiness	STACKS
1,650 pods	1,800 pods	3,000 pods	SLEEP CONTAINER
500 pods* * docker errors started at 507 pods, crashed at 600 pods	500 pods* * containers began to die, kubelet crashed at 550 pods	500 pods* *health checks began to fail at 500 pods	NGINX CONTAINER

** note that all these tests were done after overriding the default 110 maximum pods per node, as set by Kubernetes

Conclusion



SERVER

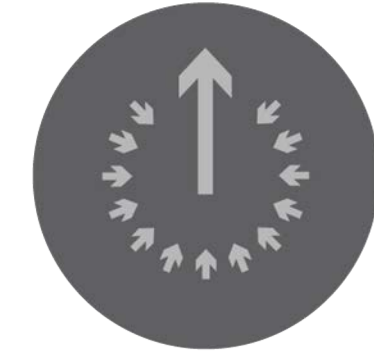
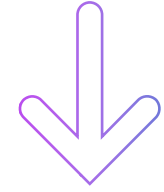
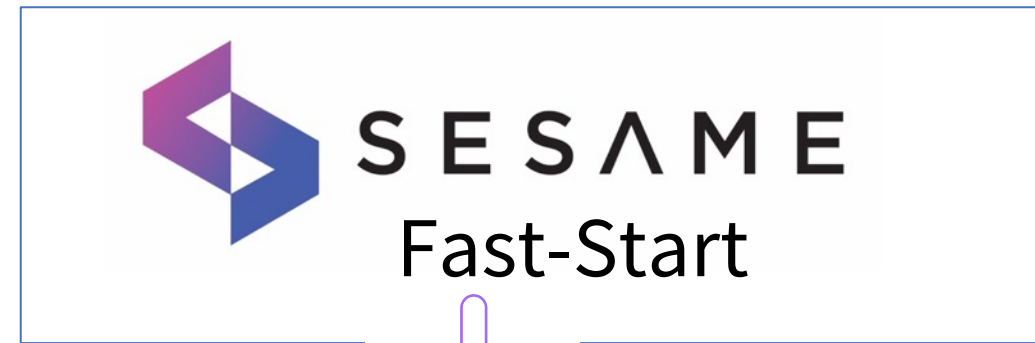
Not quite 10 minutes, as we had hoped...

...but 20 minutes is achievable (on a 4-node cluster),
and the gaps to 10 minutes are clear
(for both 4-node and 45-node clusters)



QUESTIONS?

Product/Facility Info



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Call to Action

CHECK US OUT AT THE OCP MARKETPLACE:

<https://www.opencompute.org/circular-economy/5/sesame-for-open-systems>

QUESTIONS OR COMMENTS, REACH US:

[@RiedelAtWork](https://twitter.com/RiedelAtWork)



A screenshot of a Twitter profile for Erik Riedel. The profile picture shows a man with a beard and short hair. The background of the profile banner is a landscape with trees and a utility pole under a cloudy sky. The text on the profile includes his name, handle, bio, location, and follower counts.

Erik Riedel
@RiedelAtWork

engineering leader, do-er, & creator @itrenewinc; pursuing sustainable #innovation; democratizing tech; #inclusive teams; think big; he/him

📍 Boston, MA 🔗 twitter.com/er1p 📅 Joined September 2016

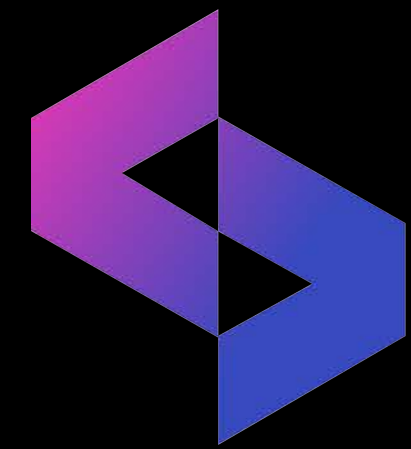
3,257 Following 801 Followers



<https://github.com/SesameEngineering>

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