

OPERATIONALIZING THE CIRCULAR OPPORTUNITY INTRODUCING SESAME: OPEN HARDWARE COMPUTE AND STORAGE FOR EVERYONE

Aidin Aghamiri, Chief Executive Officer

Ali Fenn, Chief Innovation Officer

ITRenew



About ITRenew



SERVICES

Data center decommissioning services

Circular data center operations



PRODUCTS

Sesame computer and
storage solutions

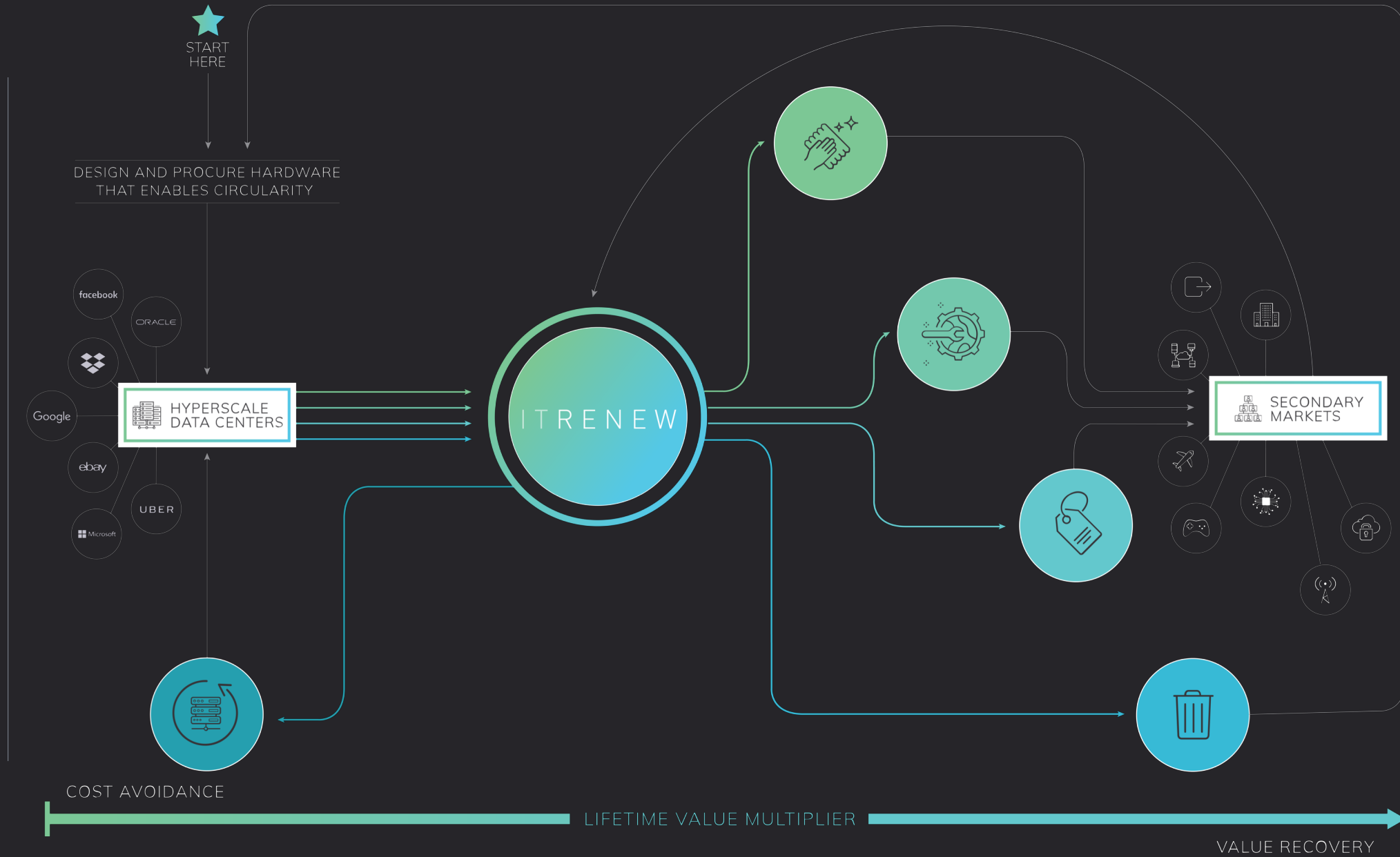


VALUE

>\$1B TCO recovery to date



The Circular Data Center Model



The opportunity

THE IMPERATIVE



\$50B+

hyperscale TCO
value recovery



\$10B+/yr

recent hardware market
currently blocked



52%

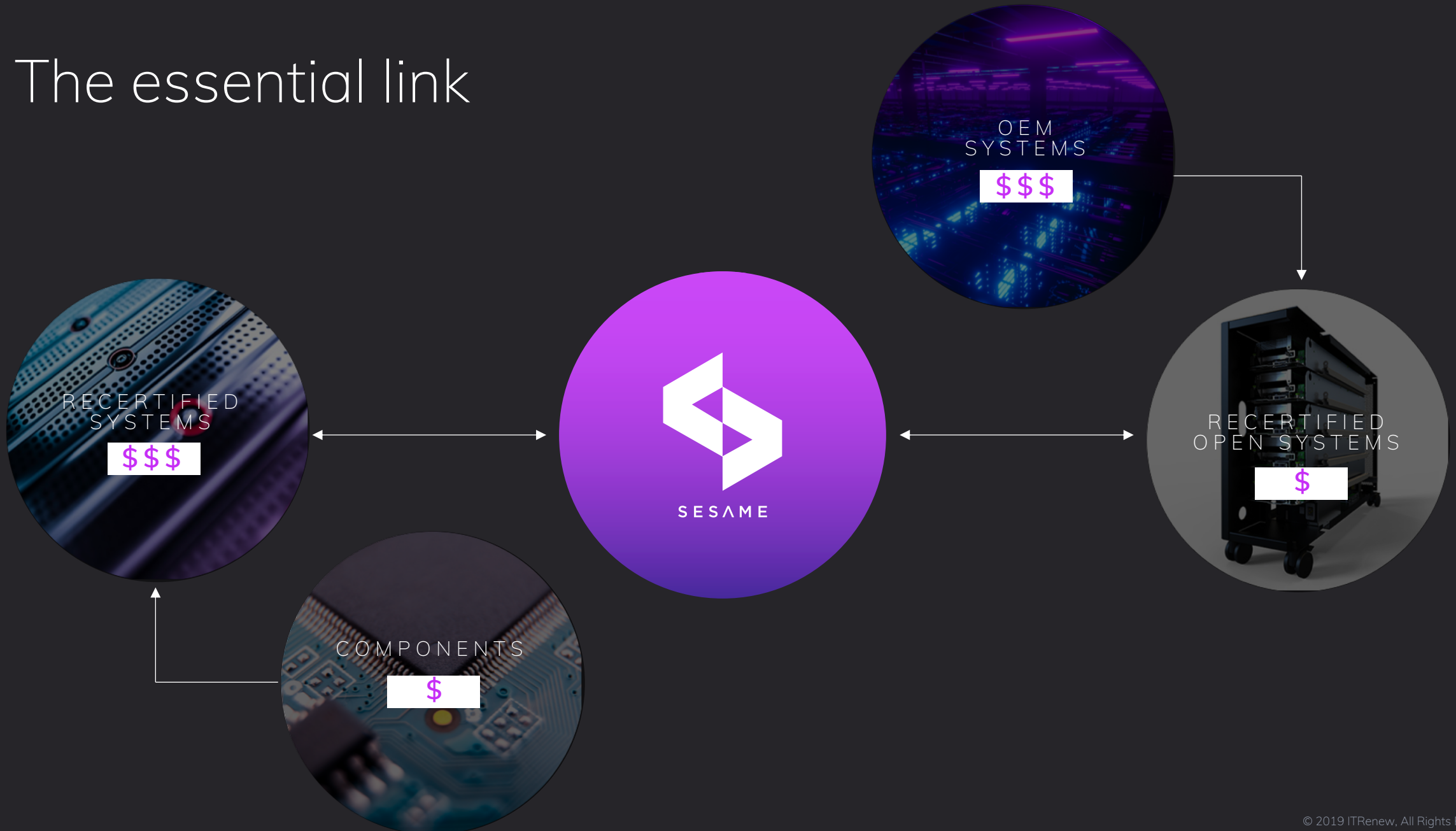
of global population
not online



368k tons

of equipment deferred
from waste streams

The essential link



The background of the slide is a world map with a network overlay. The map is rendered in a dark, muted blue color. Overlaid on the map is a complex network of thin, light blue lines that connect various points across the globe. These points are represented by small, glowing orange-yellow dots. The network lines are more prominent in some areas, such as North America and Europe, and more sparse in others. The overall effect is one of global connectivity and digital infrastructure.

So what does it take to deliver the
circular IT hardware opportunity
and unblock that \$10B/yr market?

Open is NECESSARY

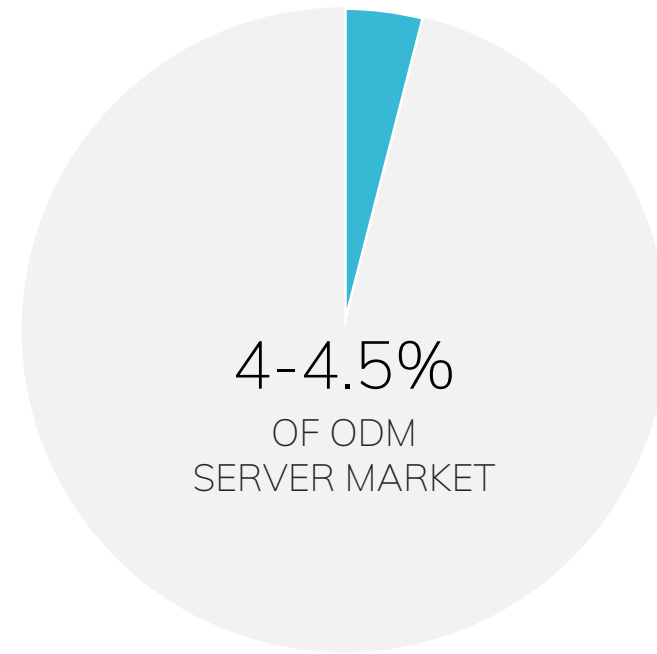
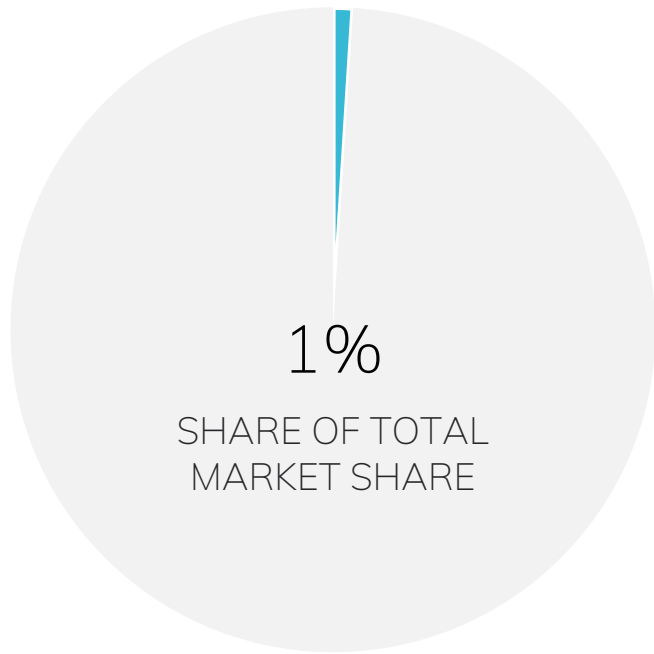
THE OCP MISSION

to design, use and enable mainstream delivery
of the most efficient designs for scalable computing



But not sufficient

OCP OUTSIDE OF HYPERSCALERS =





The market is ready,
services are ready.

Orchestrating
The New Global IT

Product becomes
the critical enabler.

Open source
software stack to
enable support

Global operations and
logistics footprint –
time to market is critical

Automation and machine
learning to fuel both
customization and
efficiency at hyperscale

Market-making
scale and diversity
of downstream
channels

Design, engineering
and product
expertise, rigorous
commitment to
quality



Sesame

Introducing Sesame

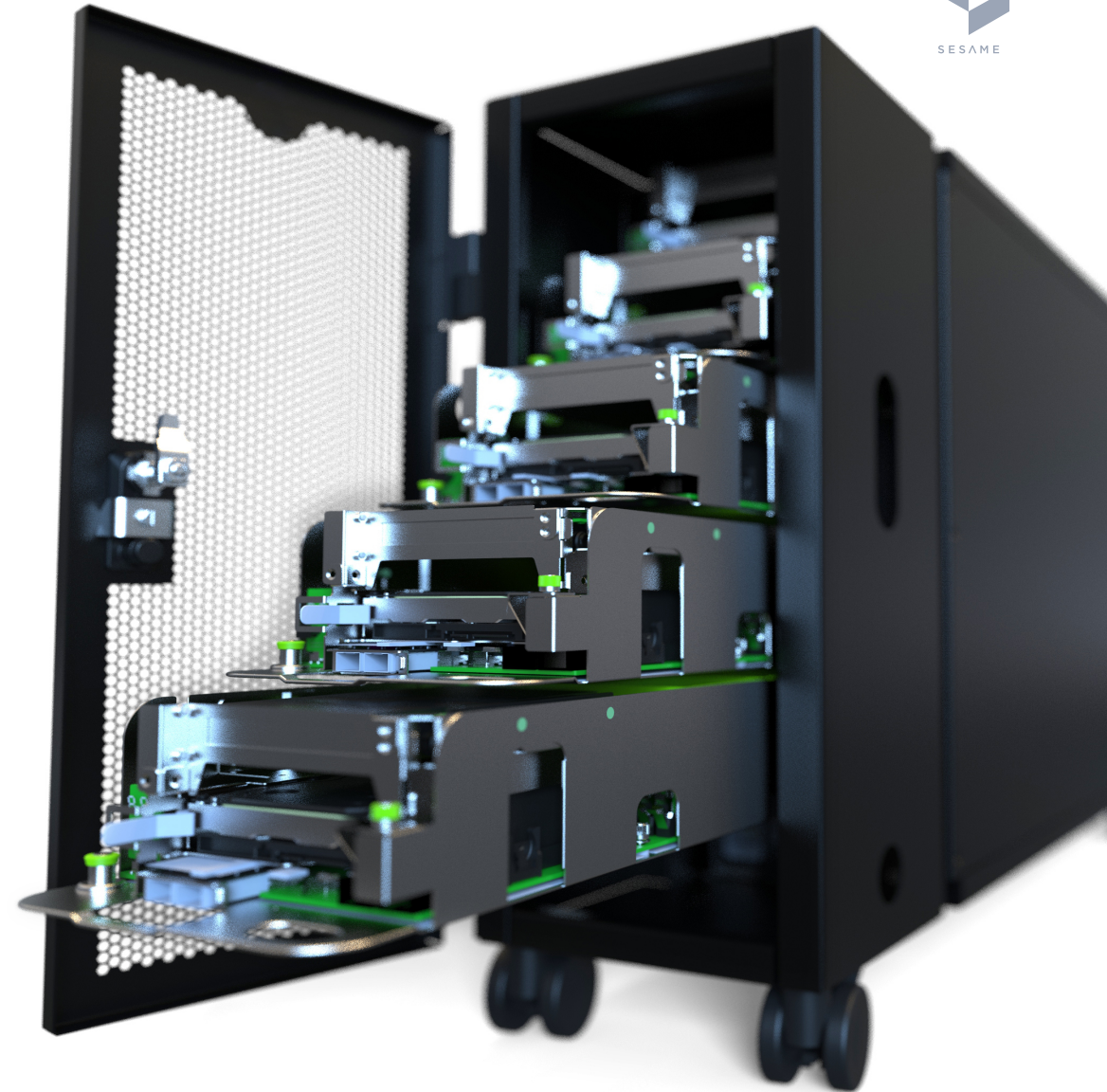
FIRST OF ITS KIND, RECERTIFIED,
OPEN HARDWARE COMPUTE AND
STORAGE SYSTEMS

- Full line of compute, storage, networking solutions
- Enabled by
 - Close design collaboration with hyperscale partners (supportability, time to market)
 - Availability of supply (broad adoption and consistency)
 - Comprehensive recertification process
 - Open source software innovation (LinuxBoot, Open BMC)
 - Remanufacturing services
- Disruptive economics to enable adoption at scale



Sesame quality is first rate

- Hyperscale burn in pays off
- Recertification process involves complete disassembly
- New parts replace DBDs and any damage
- Shipping in volume since December 2016
 - Failure data capture at leave of each:
 - Racks, servers, storage, CPUs, PDUs, power shelves, switches, HDDs, Memory
 - Results:
 - Aggregate failure rate = 0.25%
- Fully warrantied, supported by channel + ITRenew, globally



Comparative economics and performance

DELL PowerEdge R730

- Dual 2620v4
- 64GB DDR4 ECC
266 MT/s
- X1 200GB SATA SSD
- \$3,887 (Feb 2019)

(list: \$8,188 with instant discount applied,
source dell.com)



SESAME-LEOPARD

- Dual 2678v3 (12C/24T)
- 64GB DDR3 ECC
1867 MT/s
- X1 120GB SATA SSD
- \$1,849 (Feb 2019)

(source sesame product catalog)



Equivalent throughput on many applications (SpecINT, SpecFP)

	SpecINT	SpecFP
2620v4	632	569
2680v3 (DDR 4 @ 2133Mhz)	1030	781
2678v3 (=2680v3 w/ DDR3 @1867Mhz)	773	586

Sesame Compute Cycle Comparison

Moore's Law (cycles / watt/yr)	25%
Sesame Server Lag	2 years

Opex assumptions:

- Includes DC ops cost + power
- Servers 30% busy
- Busy watts/ server: 300

Sesame cycles at equal capex	214%
------------------------------	------

Sesame is open hardware for everyone

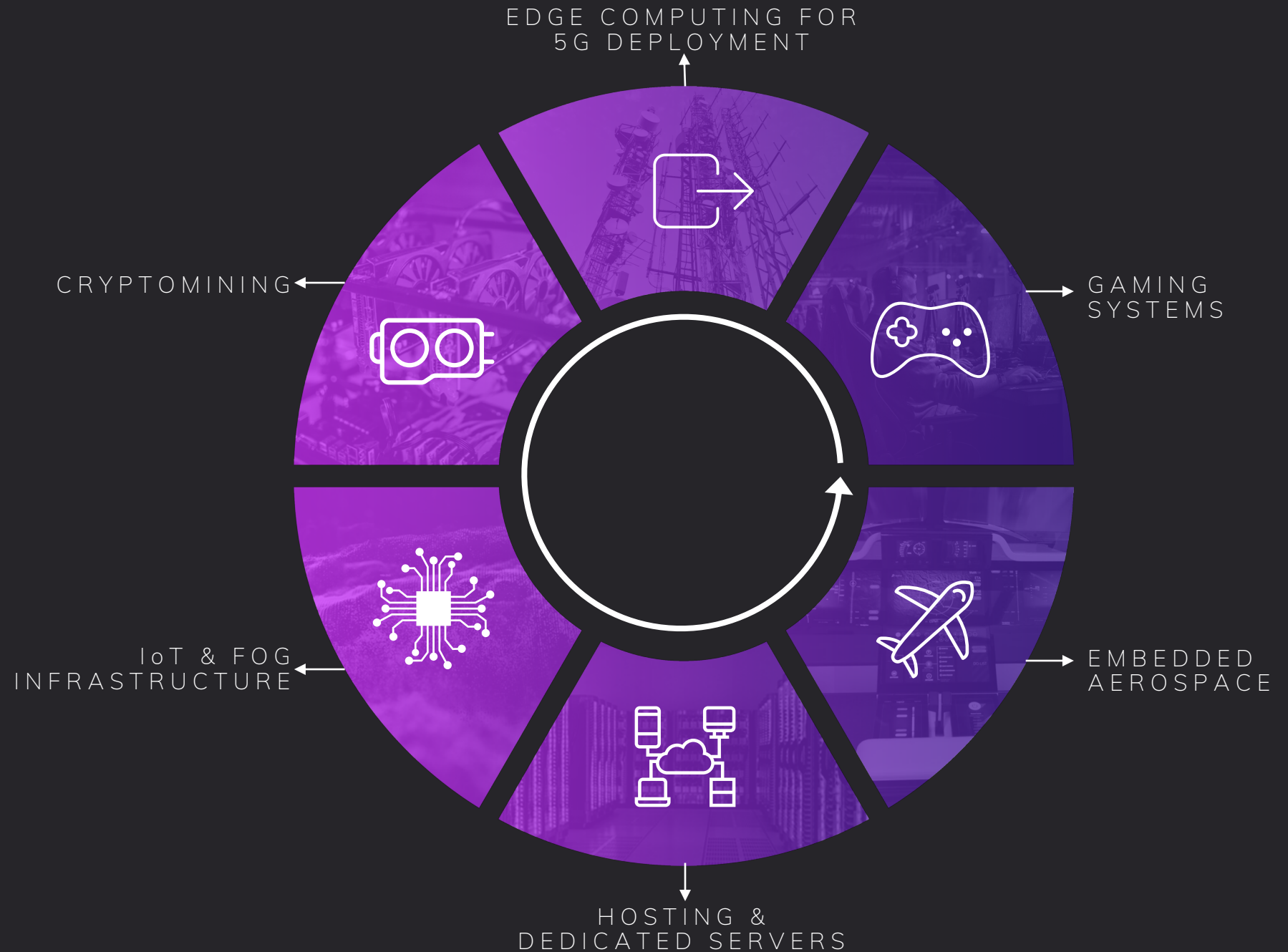
ONE SIZE DOES **NOT** FIT ALL

- Rack solutions for data center deployments
- Server, storage systems for remanufacture and embedded systems
- Discover Chassis (4 pack) for easy POC, edge deployments, small scale data center needs
- Rugged Pod for extreme environments



Circular in Action

- HYPERSCALERS:
\$\$ BILLIONS!
- EVERYONE ELSE:
ACCESS, SCALE,
DISRUPTIVE
PRODUCT
ECONOMICS!



INTRODUCING EDJX

James Thomason, CTO, EDJX
Twitter: @ctosays

The Edge Problem



1 CONNECTED PEOPLE AND THINGS WILL GROW 3X BETWEEN 2019-2025 TO OVER 75 BILLION DEVICES

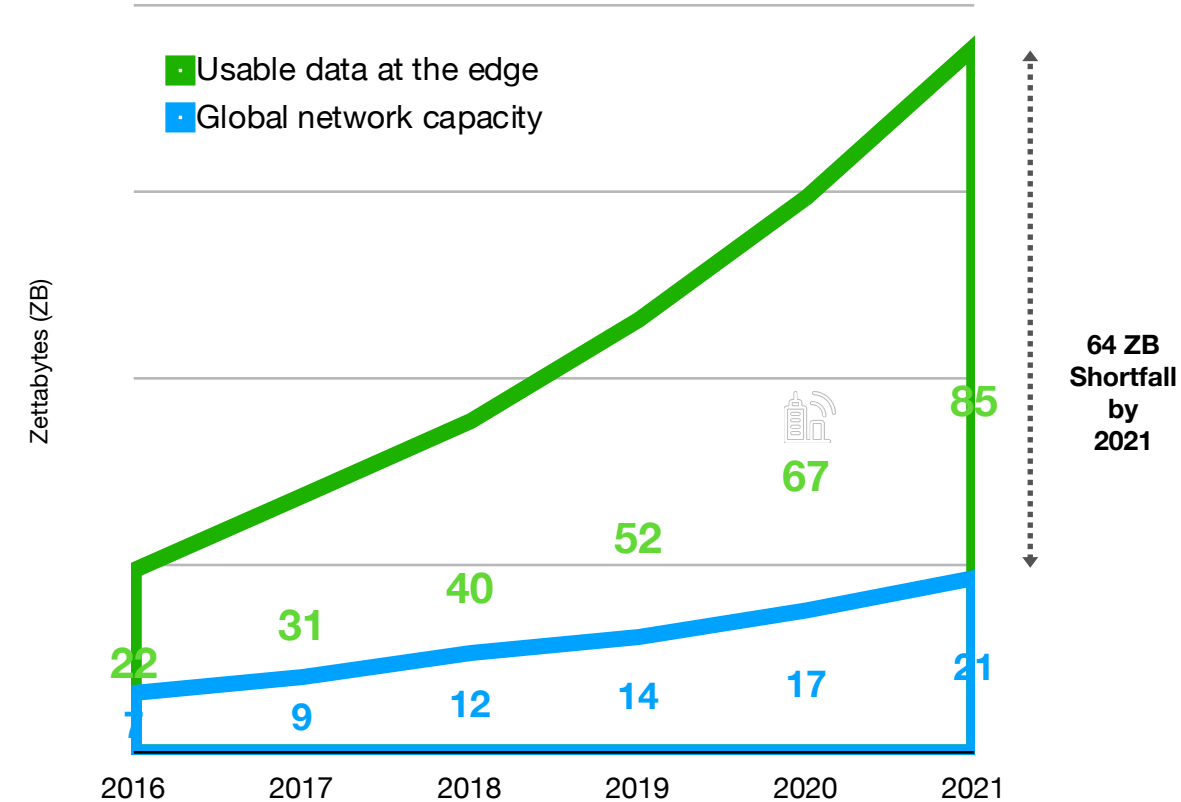


2 DATA GENERATED AT THE EDGE EXPLODES 5X FROM 520ZB IN 2019 TO OVER 2500ZB BY 2024



3 64ZB SHORTFALL IN BANDWIDTH TO THE CLOUD BY 2021 AS COMPUTING MOVES INTO THE REAL WORLD

Useful Edge Data vs Capacity



Quantifying the Edge Problem



1 PETABYTE = 2 datacenter cabinets ultra-high density storage. = \$250K

1 EXABYTE = 2000 cabinets would fill a 4 story datacenter that takes up a city block = \$250M

1 ZETTABYTE = 1000 data centers or about 20% of Manhattan = \$250B

PROCESSING 10% OF EDGE DATA (250ZB) COSTS \$62.5 TRILLION?

Credit for this analogy goes to Backblaze: <https://gizmodo.com/the-one-hundred-trillion-dollars-hard-drive-5557676>

We Believe Edge Computing Dominates 2021-2029



**Computing must move to the edge.
To succeed, edge computing must be:**

➤ **Ephemeral**

There when you need it.

➤ **Transparent**

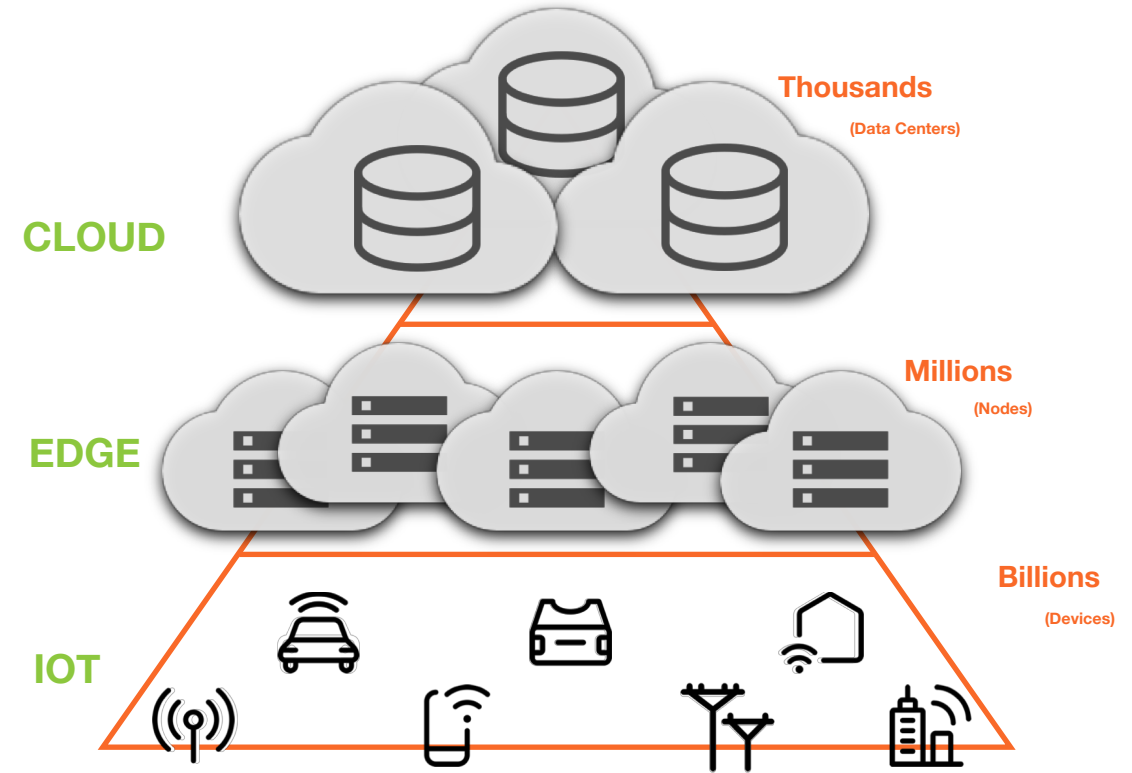
No special software required.

➤ **Instantaneous**

Available at request time.

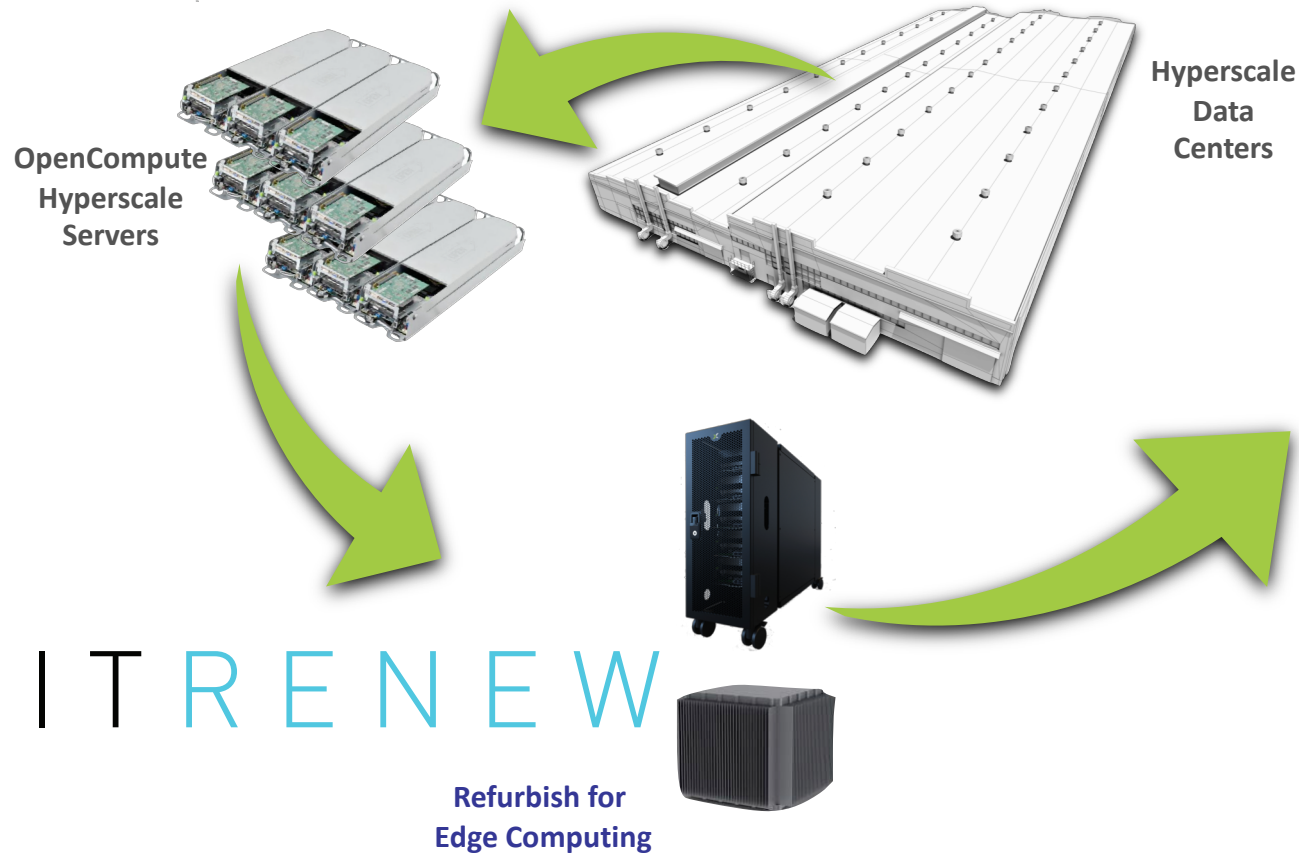
➤ **Accessible**

Low power devices should be able to use it.



Introducing EDJX

Building the world's largest **edge computing network** through the circular economy.

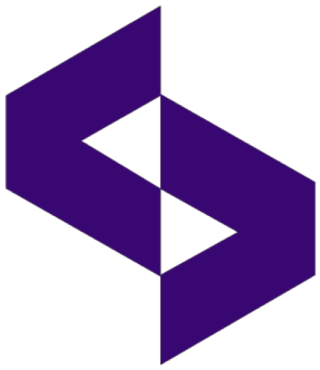




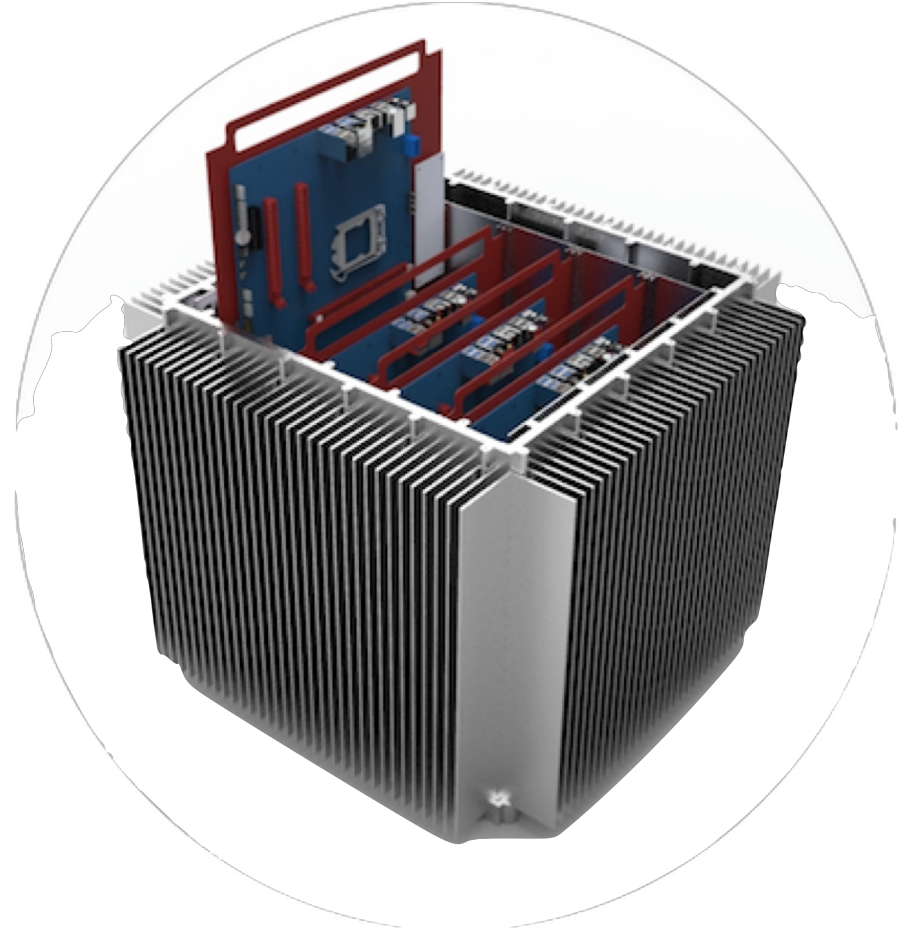
SESAME



Open. Together.



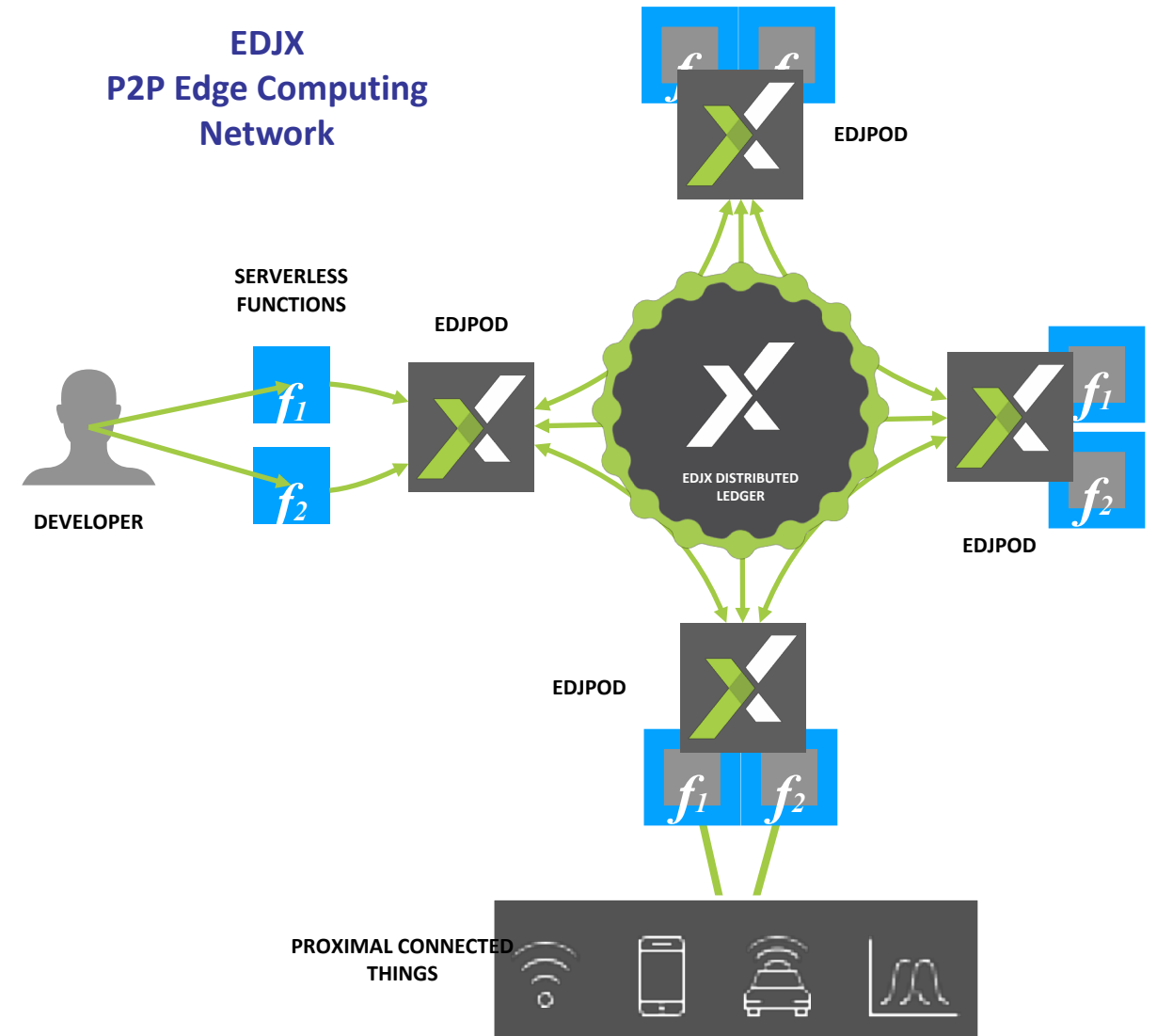
SESAME



How EDJX works

EDJX is a P2P edge computing platform for creating planet-scale applications using the serverless paradigm:

- **EDJX nodes** automatically form a global p2p mesh network for executing serverless functions secured by blockchain
- **Developers** create and push functions to the network which are distributed among the nodes
- **Apps and Connected Things** use edge computing resources by the millisecond which are recorded to the blockchain



Dashboard

Home > Dashboard

Applications Today


3

Active2

Error0

Inactive1

Highest Cost

 GraphQL

43 Days Runtime


\$4,566.38

edjcoins


Functions Today

25


3 Need attention

 myNumberFunctionEndpoint

Failed in spinup

 slackbot

Faild

 dev_get_index

Failed in spinup

Nodes Today

5

Active5

Error0

Inactive0

Earnings

\$412.22


edjcoins

Requests Today

18.3k

To 3 Applications

Wallets View

 3 Wallets Connected

\$11,533.08

Total edjcoins

Latest Activity

Wallet 1.1.0

May 5, 2019 10:20 pm

342.22

In

Global Network Today

2.5k

Worldwide Nodes

1.1 T

TOTAL GB-SEC

1.06 T

AVAIL GB-SEC















GraphQL

Home > Applications > GraphQL

ID 59e99e7c-da46-4f46-a542-3325645872f9

Delete

✓ Active

Save

Summary

NAME

GraphQL

OWNER

Adam Santos

WALLET

Wallet 1.1.0

Cost

Year

\$1,242.10 edjcoins

\$122

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Usage

Today

1,296 USED GB-SEC

Mar 23, 2018 09:22-13:29

Functions 15

+ Add New

+ Filter

Q

STATUS	NAME	APP ID	GB-SEC	TRANSFER	REQUESTS	COST	
<div></div>	graphql-request	59e99e7c-da46-4f46-a542-3...	1280	1427 MB	892	\$0.143	<div></div> <div></div>



Advisiandigital

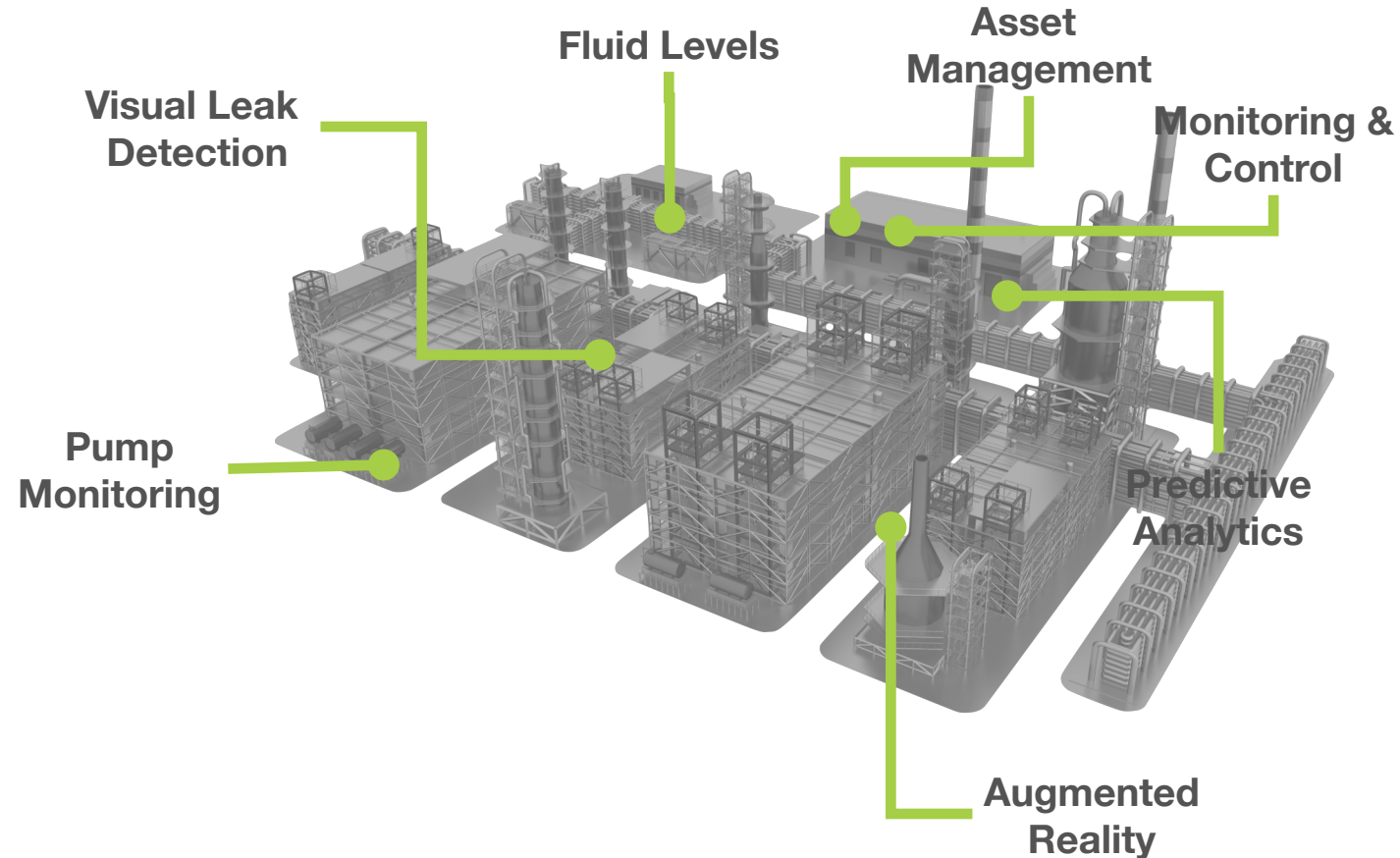
WorleyParsons Group



Refinery of the Future Oil & Gas Supply Chain

“Like many other industries, the Energy and Resources market is undergoing a major transformation fueled by the demand for instant data analysis and workflow automation at the edge. We believe EDJX could accelerate the pace of development and release of groundbreaking solutions that solve real world challenges.”

– Bradley Andrews, President of Advisian Digital.



Open. Together.

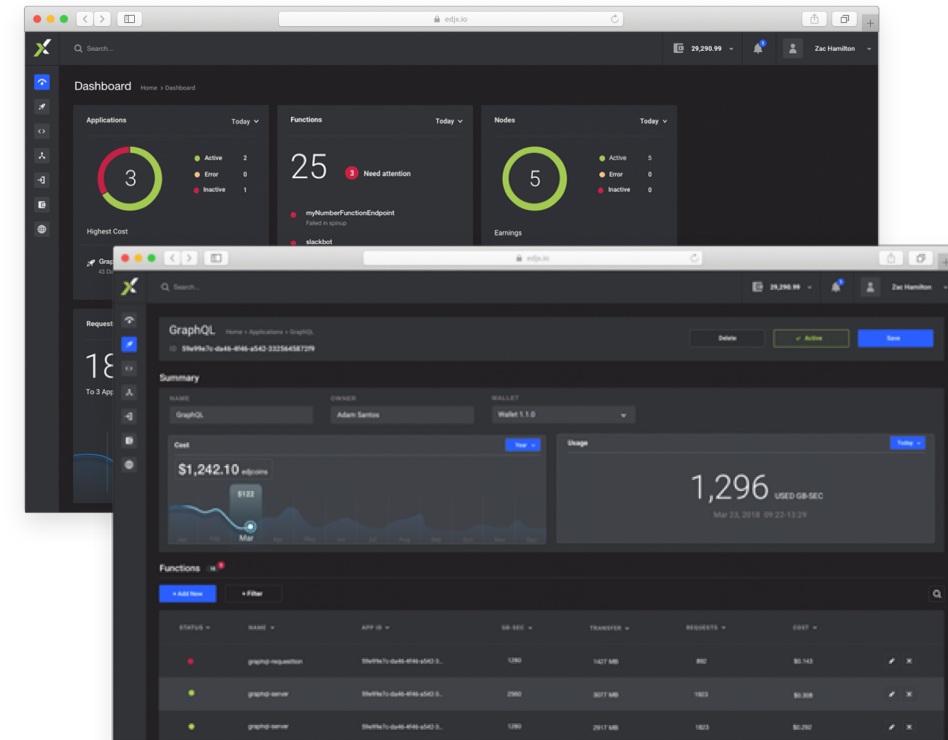
Be One of the First to Try



Register now for our limited early-access:

- **Granting access on a rolling basis as we deploy**
- **No fees for usage during early-access**
- **Inquire to host EdjPods at your site**

Sign up at: <http://edjx.io>



Open. Together.

Summary



ITR and Sesame
make OCP available
to everyone



Sesame unblocks the market
with high quality gear at
disruptive economics



Sesame fuels
primary market
for OCP gear



Sesame enables LTV
upstream and TCO
downstream



Circular data centers
enable sustainability and
opportunity to harness
the global, positive
power of IT hardware

- If you run a large data center we can help you **recover significant LTV \$\$**
- If you are budget constrained and trying to scale, **Sesame gets you 2x the cycles at equivalent capex!**

