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

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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

Start Here

Design and procure hardware that enables circularity

Hyperscale Data Centers

ITRENEW

SECONDARY MARKETS

Cost Avoidance

Lifetime Value Multiplier

Value Recovery

Model Key:
- Recertify systems
- Remanufacture systems
- Remarket parts
- Recycle residual
- Recertify systems & parts for reuse
The opportunity

$50B+
hyperscale TCO value recovery

$10B+/yr
recert hardware market currently blocked

52%
of global population not online

368k tons
of equipment deferred from waste streams
The essential link
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 =

1% SHARE OF TOTAL MARKET SHARE

4-4.5% OF ODM SERVER MARKET
Orchestrating The New Global IT Hardware Market

- 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
- Design, engineering and product expertise, rigorous commitment to quality
- Market-making scale and diversity of downstream channels

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The market is ready, services are ready. Product becomes the critical enabler.
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)

<table>
<thead>
<tr>
<th></th>
<th>SpecINT</th>
<th>SpecFP</th>
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<tbody>
<tr>
<td>2620v4</td>
<td>632</td>
<td>569</td>
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<tr>
<td>2680v3 (DDR 4 @ 2133Mhz)</td>
<td>1030</td>
<td>781</td>
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<tr>
<td>2678v3 (=2680v3 w/ DDR3 @1867Mhz)</td>
<td>773</td>
<td>586</td>
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**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!

EDGE COMPUTING FOR 5G DEPLOYMENT
CRYPTOMINING
GAMING SYSTEMS
EMBEDDED AEROSPACE
HOSTING & DEDICATED SERVERS
IoT & FOG INFRASTRUCTURE
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

- Usable data at the edge
- Global network capacity

![Graph showing the growth of usable data at the edge and global network capacity from 2016 to 2021](image-url)
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.

OpenCompute Hyperscale Servers

Hyperscale Data Centers

Refurbish for Edge Computing

2000 LOCATIONS BY 2023

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EDJPODS

Open. Together.
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.
“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.
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
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

VISIT US AT BOOTH C15

• 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!
THANK YOU