Driving Data Center Innovation

Keynote Presentation
OCP Futures Symposium
November 8th San Jose Convention Center

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Setting an agenda for research

- IT Ecosystems
- Composable Silicon
- Sustainability
- Research Community Led
  - Hyperscale
  - Open Innovation

OCP Future Technologies Symposium
Hyperscale innovation accelerates market shifts

- Those very familiar with OCP are looking to leverage hyperscale’s innovations
  - Energy efficient equipment designs
  - Operational methods for reduced energy consumption
- Automation allowing reduction in ratio of personnel to IT equipment under management
- Customizations enabled by open hardware and firmware
- Improved compute density per rack to handle AI and other computational intensive workloads
- Colocation providers look to differentiate through OCP ready facilities
- Some look to OCP for standardization such as NIC and accelerator card form factors
- Circular economy is becoming more important especially as supply chains for new equipment remain tight
- Potential for lower cost of operations

**OCP Recognized Equipment Drivers**

- Improve efficiency, reduce energy consumption: 44%
- Follow hyperscale service provider innovation: 39%
- Open source hardware: 35%
- Lower cost, easier maintenance: 32%
- Attractive pricing, CAPEX reduction: 25%
- Compute density: 24%
- Differentiate from competitors: 19%
- Single global standardised equipment: 15%
- Refurbished equipment, circular economy: 10%
- Other: 0%

Note: n=100
Source: Om�a

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IT Ecosystems form with adoption of edge computing

- Edge computing a significant investment area, will see increased compute at edge locations: User edge, SP edge (Comm and Cloud)
- Edge will contain significant hardware for accelerated computation
- Software technologies such as software containers and microservices architectures are critical element to enabling a write once, run everywhere capability
  - Need software compatibility with on-device firmware
  - Need orchestration on very wide scale
- Remote management must be built into equipment
- Physical security must be maintained for street mounted equipment
- Prepare for self-contained enclosures: wall box, single and multiple rack
Composable silicon matches workload diversity

- Workloads needing parallel, analog, computational architectures continue to multiply and quantum computing may be in the horizon
  - Analytics & data pipeline
  - AI and ML
  - Security
  - Packet processing
- Integrated circuits assembled for specialized workloads will become desirable for edge computing with targeted applications
- Enable integrated circuit co-packaging of diverse components to deliver best-in-class workload targeted computational performance.
- Achieved through open die-to-die interfaces and
- Establishment of a marketplace where components can be bought and sold and
- Supplier agreements allowing a IC integrator to assemble and sell a assembled integrated circuit

Fastest Growing Software Workloads

- Database and analytics (incl. storage)
- Artificial Intelligence (Inference)
- Telecommunication network processing (virtual RAN, core network processing, OSS & BSS)
- E-commerce
- Artificial Intelligence (Training)
- Media and graphics (incl. content delivery networks)
- Search Engine
- Video collaboration
- Social media
- Gaming
- Other

Note: crn223
Source: Omdia
OCP familiar DC operators invest in sustainability

- Sustainability finally seems to be moving from the realm of discussion without action to investment
- Collaborations needed between OCP and other sustainability organizations
- Need to be sure OCP focuses on sustainability related to the entire IT ecosystem:
  - DC buildings, physical infrastructure, IT Infrastructure
  - Edge locations
- But maintain specialization on learning from deployments at scale
Top projects equipment efficiency, renewable energy

What can the OCP do to help with sustainability?

• Lead the way through focused projects and working groups
• Help set reasonable targets for sustainability
• Provide metrics that are easy to track
• Provide guidance on best practices to achieve sustainability goals
• Promote companies that take an active role in sustainability as encouragement

DC Sustainability Projects

- More efficient equipment: 63%
- Renewable energy sources: 62%
- Equipment with minimum non-recyclable components: 30%
- Refurbished equipment: 40%
- Liquid cooling: 36%
- Other: 0%

Note: n=102
Source: Omida

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Takeaways

Prevailing Forces Guide Investment

Composable Silicon Market Emerges

Sustainability Investment is Real