Open. Together.

OCP SUMMIT

DO-160 and Twin lakes Servers

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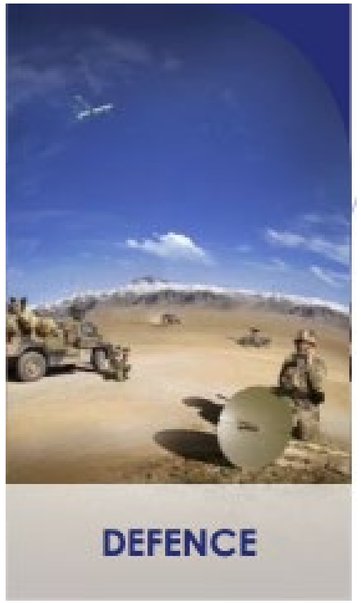
THALES

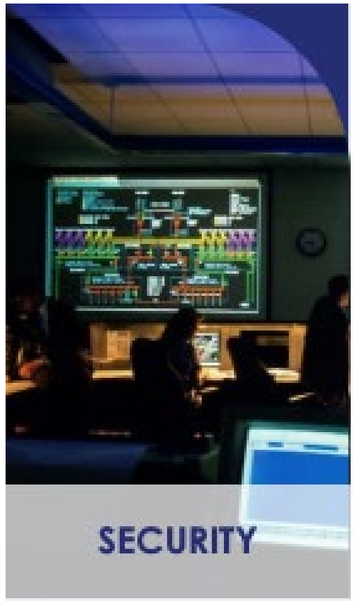
A worldwide leader, with 64,000 employees, a yearly revenue of 16B $US serving


AEROSPACE


SPACE


GROUND TRANSPORTATION


DEFENCE


SECURITY

Sensing & data gathering

Data transmission & storage

Data processing & decision making

We help customers master decisive moments by providing the right information at the right moment

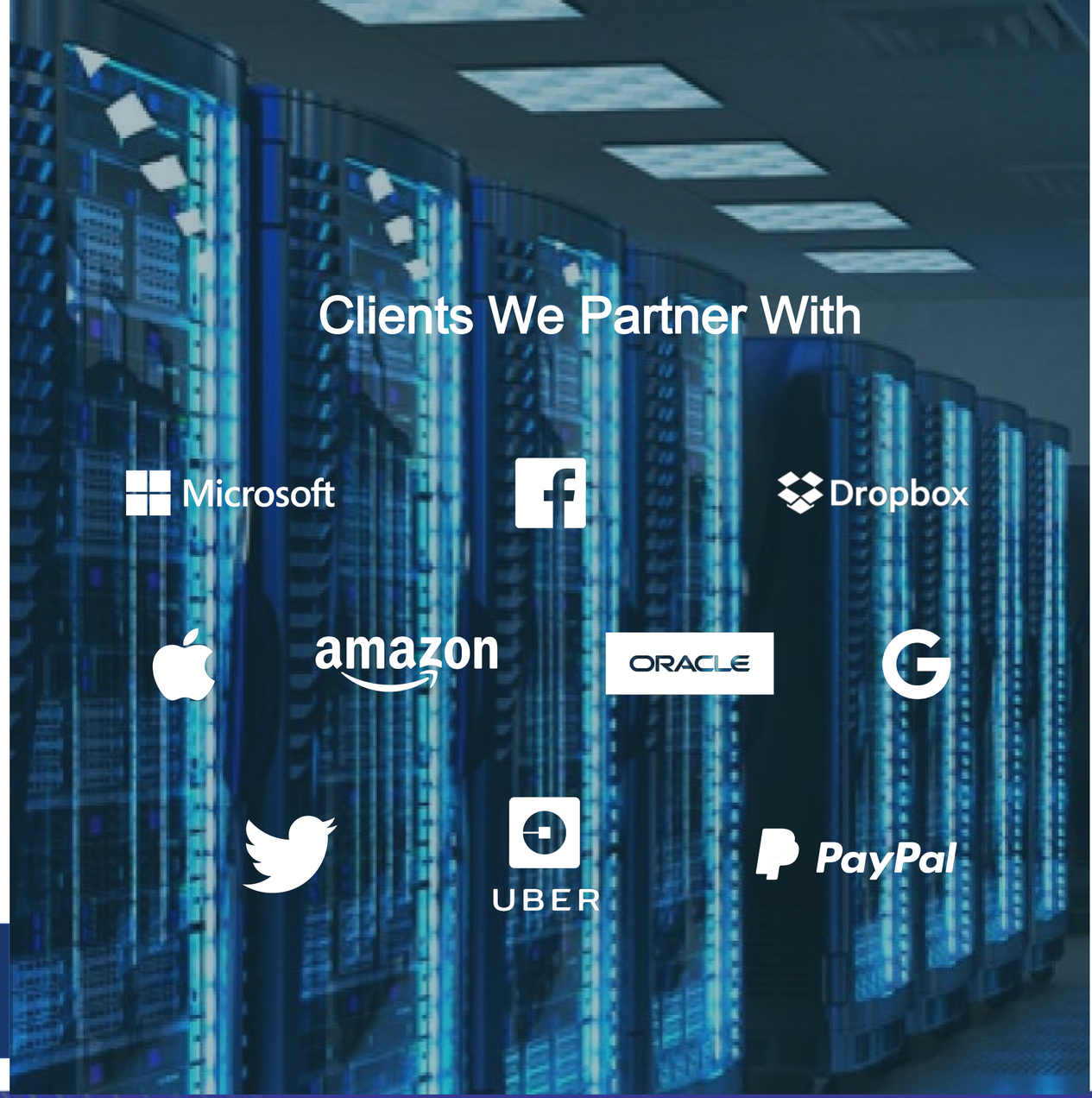
ITRENEW

- Leading provider of circular data center solutions to the hyperscale cloud market: technology, logistics, monetization
- Leading global provider of technology -enabled data center decommissioning services, including data sanitization software and IT asset remarketing
- Manufacturer of Sesame open compute and storage solutions, 1st of its kind suite of recertified and warrantied solutions for global use cases

SPLITTED DESKTOP

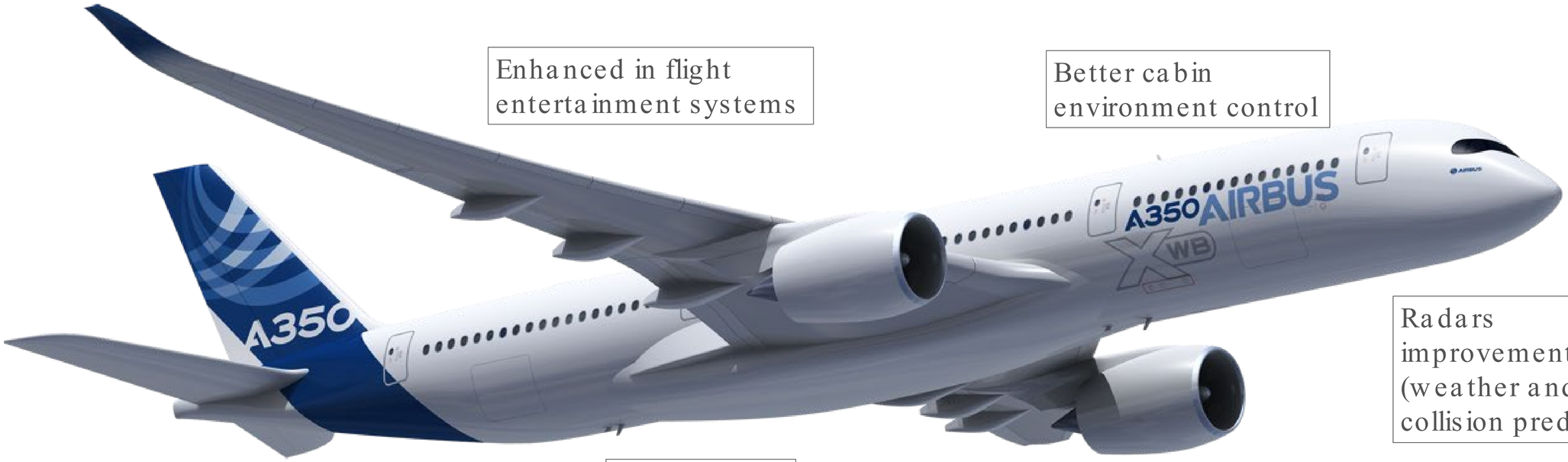
- Delivering TCO value recovery > $1Billion to date

Redefining and powering LTV (a.k.a. not your grandfather's ITAD)



Where do we stand …

Computing is everywhere



Enhanced in flight entertainment systems

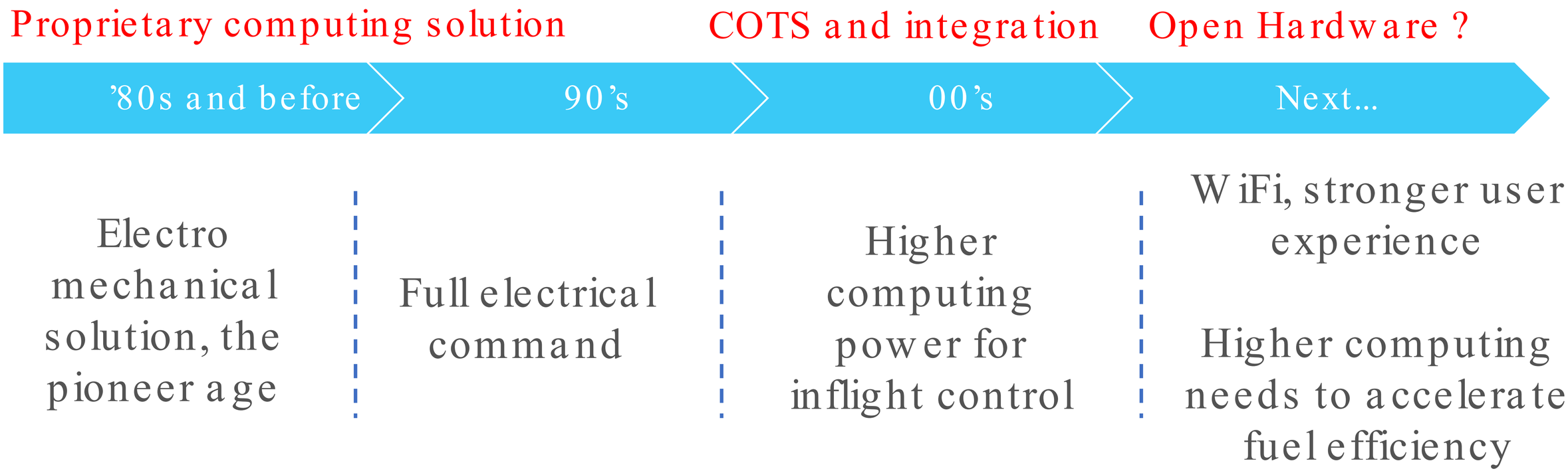
Better cabin environment control

Radars improvements (weather and collision prediction)

Higher fuel efficiency

Enhanced flight control allowing to build wider aircraft

But it didn’t happened in a day



DO-160

- Well known (if you make fly things) and established standard for environmental testing of airborne equipment
- Covers requirements for critical and non critical functions
- Strong constraints which covers requirements from Edge computing with some “slight” adaptations
- COTS solutions exist currently, do not be afraid

DO-160 Vs OCP specification overview

Specification (extract)	**RTCA - DO160 G** Temperature controlled internal section of an aircraft	**OCP - Twin Lakes server** Specification V1.00	**Main effects**	**Design impacts**
Temperature **Operation**	-40°C/+70°C	+15°C/+50°C	Thermal expansion mismatching failures, cracks	Components, materials & Assembly process
Survival	-55°C/+70°C	-40°C/+70°C		
variation	2°C/min	Not specified		
Altitude	15 000 ft	6 000 ft	ballooning and radiation effect	Components
Humidity	50°C/95%HR/48h	20% to 90%HR	corrosion, short cut	Design, components, materials & Assembly process
Mechanical Shocks	6g/11ms/3axes	6g/11ms/3axes	detachments, failures, cracks	Design & Connectors
Vibration	5 to 2000Hz 10g peak/1h/3axes	5 to 500Hz 0,3g/10sweeps/3axes	Fatigue, failures, fretting corrosion	Design & connectors
Flammability	non propagation of flame	Not specified	Fire propagation	Component and materials

Single socket vs Dual sockets

- In-flight redundancy is key
- Power availability is under massive constraint
- In some cases algorithms predictability and proof are required

Let’s keep thing simple and focus on single socket

Twin lakes

What is next and where are the bottlenecks ?

- We can probably overcome most of the technical issues
- Open hardware is addressing some of our next challenges
  - Progress on « Moore Law 2.0 » (with power efficiency)
  - Provide trust on Security (through a white box approach)
  - Ensure Long term availability (with Open Source Firmware and schematic/BOM fully released)
  - Reduce costs (NRC and RC through collaboration and volume)
- There is a need to:
  - Build proof of concepts with new hardware

Open issues and progressing together

- Thales is using OCP hardware provided by ITRenew/Sesame.
- This covers part of the supply chain but current OCP partners business goals are not aligned with Aerospace constraints.
  - Low volume, long term availability, etc.
- How to overcome it together?

Call to Action

- Contribute to design ruggedization and standardization
- Join ITRenew Open Hardware lab in the bay area (upcoming meetups)
- Contribute to Open Source Firmware initiative
- Provide hardware for testing and build early prototype

Contact us if you are willing to build adapted designs!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OCP Global Summit | March 14–15, 2019
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