4 OCP PRINCIPLES FOR THE DATA CENTER FACILITY

DATA CENTER FACILITIES

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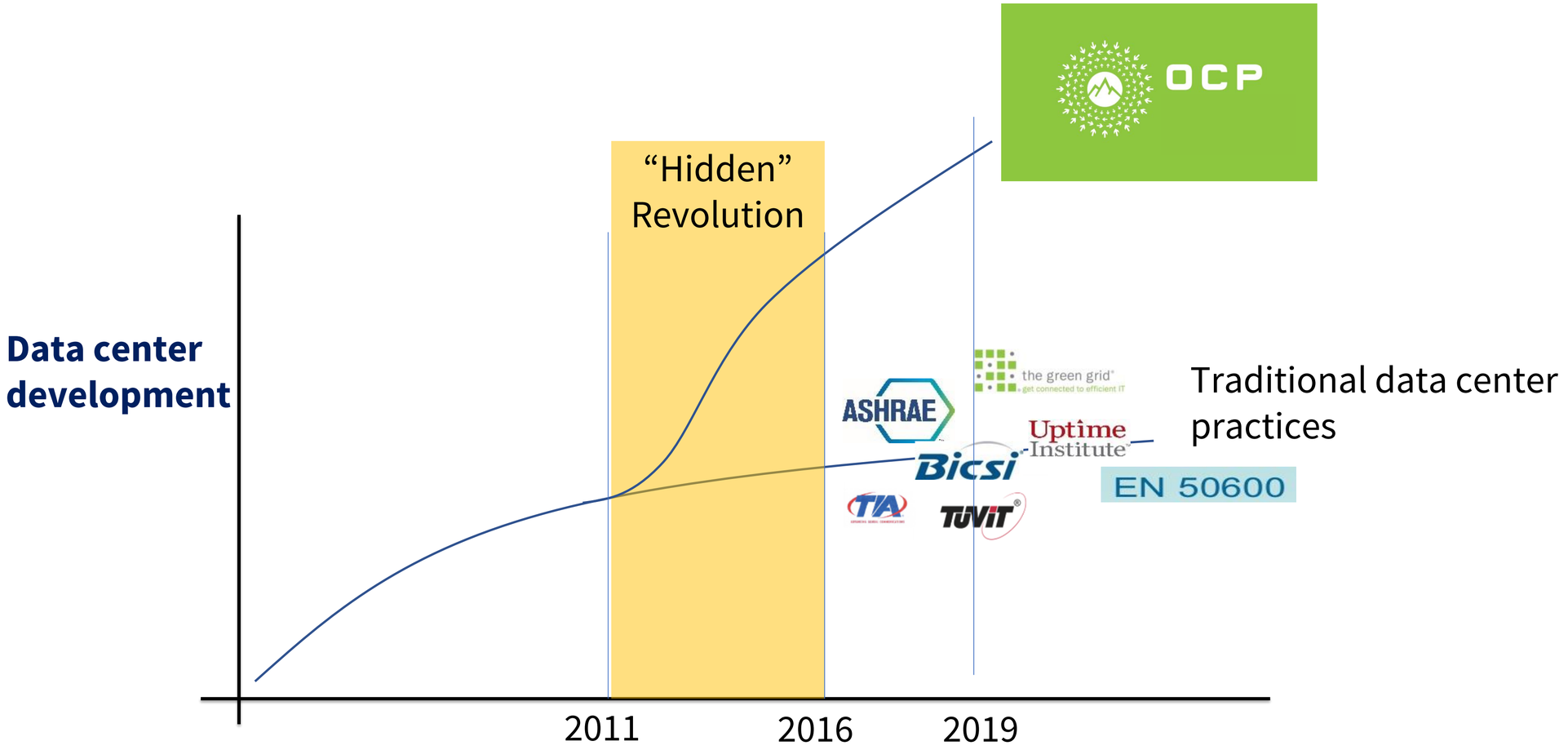
Data center revolution continues…



OPEN
Compute Project

Colocation Facility Guidelines
for Deployment of
Open Compute Project Racks

Mark Dansie · 1st

OCP Regional Summit

Amsterdam, Netherlands
September 26–27, 2019

Today

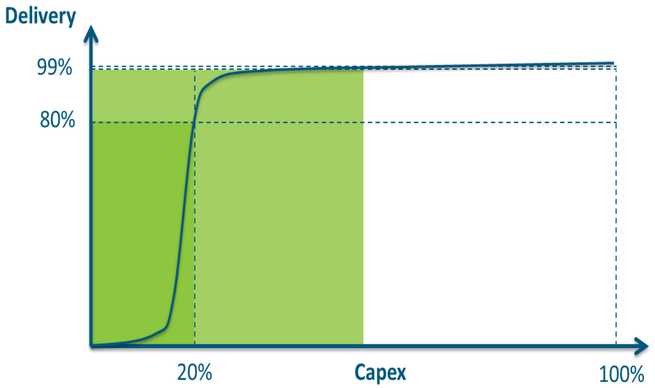
For today…

- 4 Principles
- OCP San Jose summit – panel feedback
- OCP datacenter footprint reduction

4 OCP PRINCIPLES FOR THE DATA CENTER FACILITY

DATA CENTER FACILITY

1



Simplify topology – Reduce costs

2

Integrated guidelines

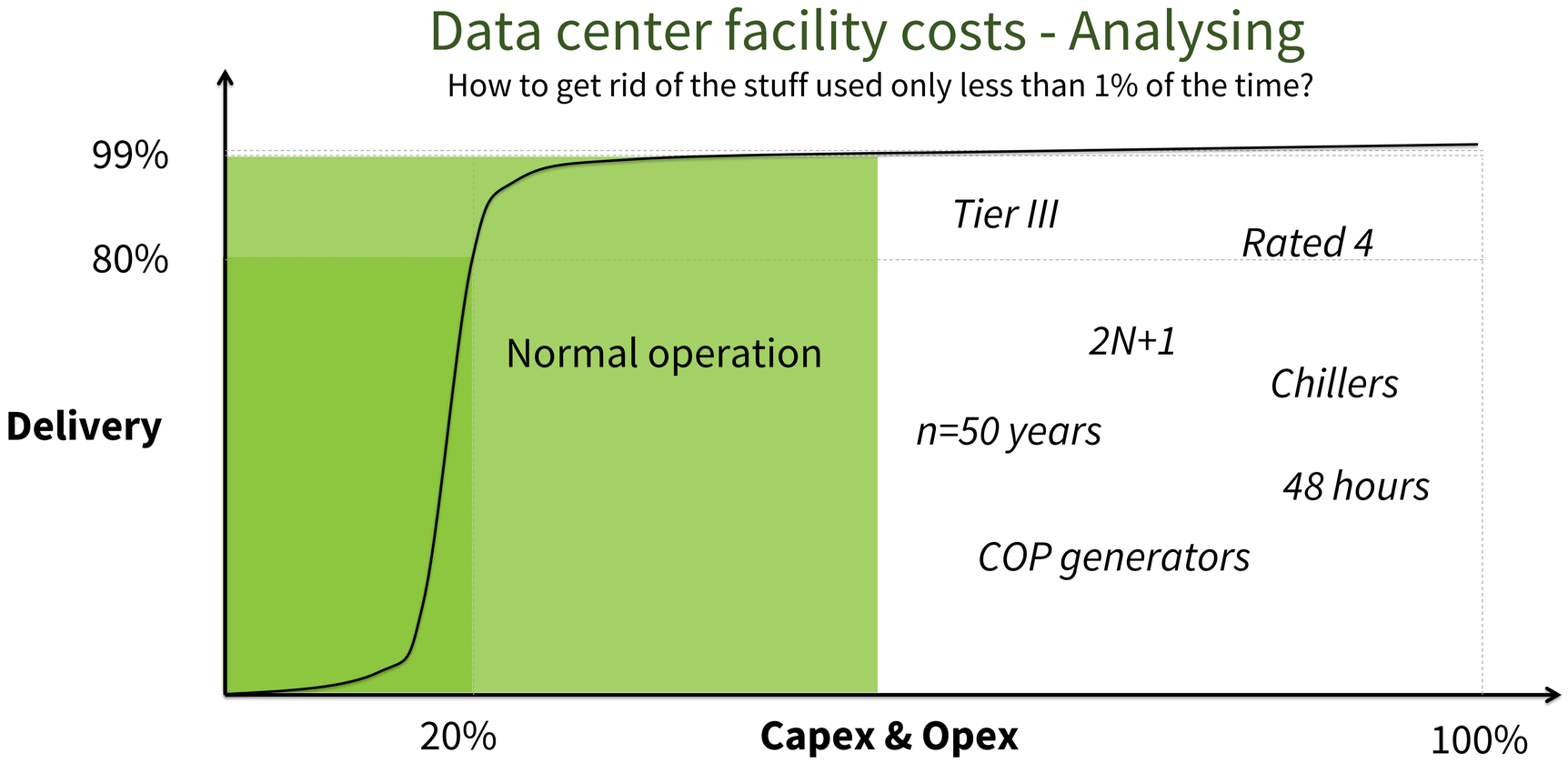
3

Time to “Think and Act”

4

OCP Integrated DC Operation & Communication

Simplify topology – Reduce costs



50% of the data center facility costs are for < 1% of the operation

Really?

Do your still need to go 200 km/h with two flat tires?
…. or get at a safe 50 km/h to the next garage.

Integrated guidelines

Can we define a “better questions”?

…

What part of your data center IT environment is really critical?

Uncontrolled shutdown of IT equipment causes 20% to fail automatic restarting

The maximum power of a rack and a row a racks can be controlled already in OCP.
Why not use this possibility?

If you ramp down the your data storage access.
Your data is not lost!

Geo-redundancy can take care of local capacity limitations

…

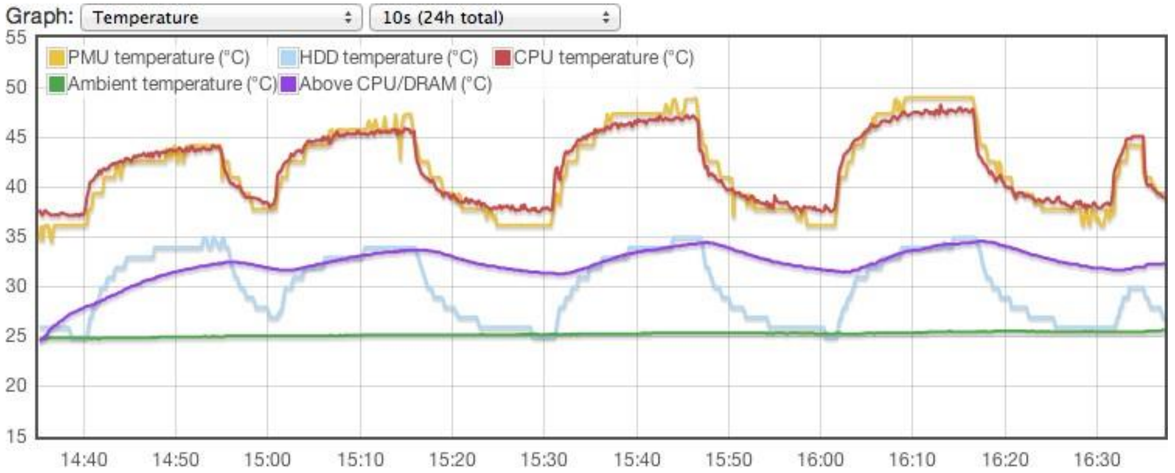
Time to “Think and Act”

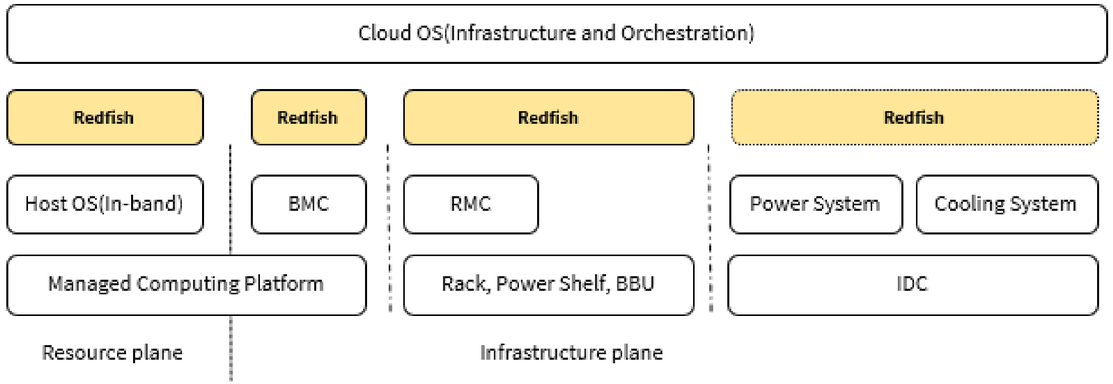
Data center IT is able to respond to conditions outside the 99%.

UPS & UCS provides time to IT:
“To think and to act”!

Make better use time to respond
(for example to scale down and or switch off less critical)

OCP Integrated DC Operation & Communication

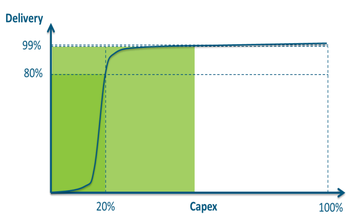




Source: OCP Intel/Baidu study on use of telemetry

IT monitoring → Input for Controls Facility
Facility monitoring → Input Controls IT

OCP Data Center as ONE integrated machine



Open Data center

Communication

Application

Telecom Services: LTE-A, 5G, LoRa

Platform Services: T-Phone, oksusu, Smart Home, Summer, T Life, Smart Factory

IT Services: BSS, ERP, OSS, Big Data

Platform

Open Software (Virtual Infrastructure)

openstack, docker, onos

Virtual Machine | *Container* | *SDN*

Unbundled

Open Hardware (Physical Infrastructure)

OPEN Compute Project

Server | *Network* | *Storage*

Open facility

Orchestration

ETSI World Class Standards — NFV MANO

Provisioning

CHEF

Monitoring

elasticsearch. logstash Kibana

"by integration: balanced strategy between maximum uptime, performance and costs"

Panel Discussion

DATA CENTER FACILITIES

4 PRINCIPLES TO REALIZE THE BENEFITS OF OCP

Robert Bunger · 1st
Program Director, CTO Office at Schneider Electric

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Introducing the Panelists

Mike Edie
Mechanical Engineer, Strategic Engineering, Facebook

Stijn de Kruijf
Data Centre Facility Developer, Royal HaskoningDHV

Russ Lindsay
SVP Infra Engr - Salesforce

Mike Moore
Region Product Manager - Data Center Solutions, Nokia

Dale Sartor
Staff Engineer, Building & Industrial Applications, Lawrence Berkeley National Laboratory

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1: OCP Environmental Conditions

DATA CENTER FACILITY

Would it be acceptable for the design of your data center to have a maximum server inlet temperature condition of 35 degC (95 degF)?

- *Why not? OPC gear can handle 40 degrees (ACS – liquid cooled can do more)*
- *Not as standard working environment; too hot!*
- *Air-management is key; recirculation occurring; Manage GPU and CPU temp*
- *Okay for Scientific HPC; automatic managed lower clock speed; Not mission critical*
- *Saves money (no compressor cooling) which can be spend on IT stack*
- *No problem for OPENedge; can handle 45-55 degrees*

YES, NO PROBLEM

NO, DON'T GO THERE

2: Emergency Generator Capacity

DATA CENTER FACILITY

Can you imagine operating a future data center with an emergency generator capacity < 80% of the normal operating load capacity?

- *Why not? for locations which have high available grid at HV*
- *Generators come with issues Capex$, Opex$, regulations, Emissions, Noise*
- *Uptime and resilience of software stack is key (five 9's)*
- *No allowance for the facility to fail ; should perform 100%*
- *Scientific computing can work with power capping / geo-redundancy*

YES, NO PROBLEM

NO, DON'T GO THERE

3: OCP Data Center Facility

DATA CENTER FACILITY

Would there be a market in the near future for OCP colocation facilities with in-rack UPS?

- *Co- locators still provide centralized UPS / No solid market request to change*
- *Dense IT solutions don't want to spend 2 OU on in-rack UPS*
- *Easy for maintenance on infrastructure because open transition allowed up till rack level*

YES, NO PROBLEM

NO, DON'T GO THERE

4: OCP Principles Beyond the Rack

DATA CENTER FACILITY

Are the power distribution paths to a row of racks of N acceptable in large scale deployments?

- *Business to decide*
- *Larger software stacks are design to resist failure on rack, row and even data center level and are able to move applications around*
- *Network availability is critical*
- *Shift load during maintenance window is done already*
- *Row of racks would be acceptable as increment*

YES, NO PROBLEM

NO, DON'T GO THERE

5: OCP and Industry Guidelines Gap

DATA CENTER FACILITY

Do you reference industry standards or guidelines (S&G) in your design such as Uptime Institute, TIA-942, BICSI, …?

- *Standards are based on the idea where Facility and IT are two separate worlds*
- *Awareness of reasoning behind criteria e.g. 19”, input voltage*
- *Avoid blindly use of standards and out-of-date versions*
- *Challenging the industry guidelines by OCP is good*
- *Different IT architecture require other data center facilities*
- *Close connections in the industry between the different industry groups*

YES, NO PROBLEM

NO, DON’T GO THERE

6: Divide Between IT and Facility

DATA CENTER FACILITY

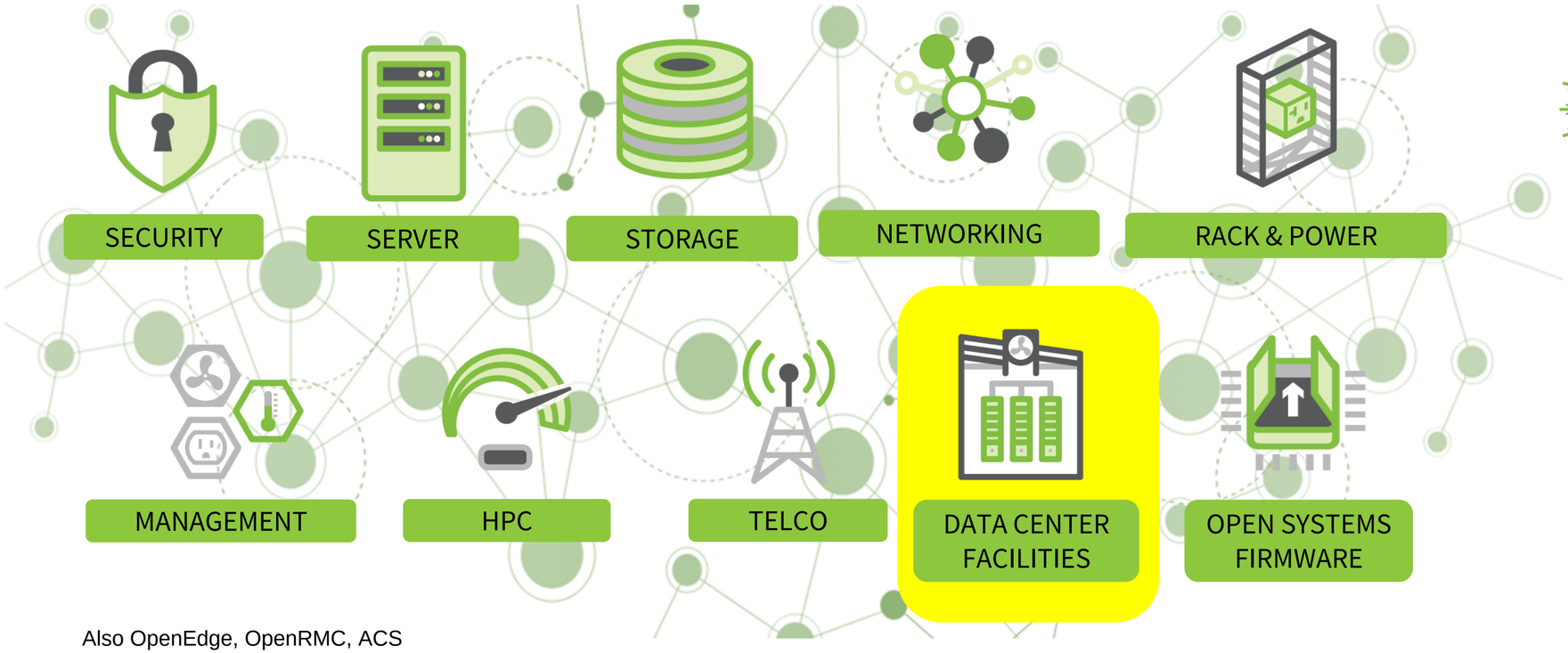
In the data center communication between Software, IT hardware and Data Center facility to improve the total operation and environment?

- *Political issues to overcome*
- *Security to guarantee*
- *IT owns the facility*

YES, NO PROBLEM

NO

Linking with other the groups is key

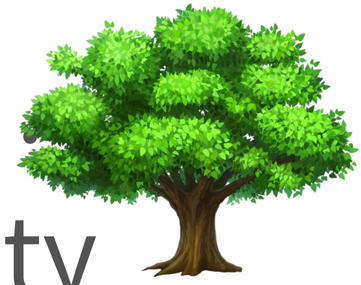


OCP FUTURE TECHNOLOGIES SYMPOSIUM

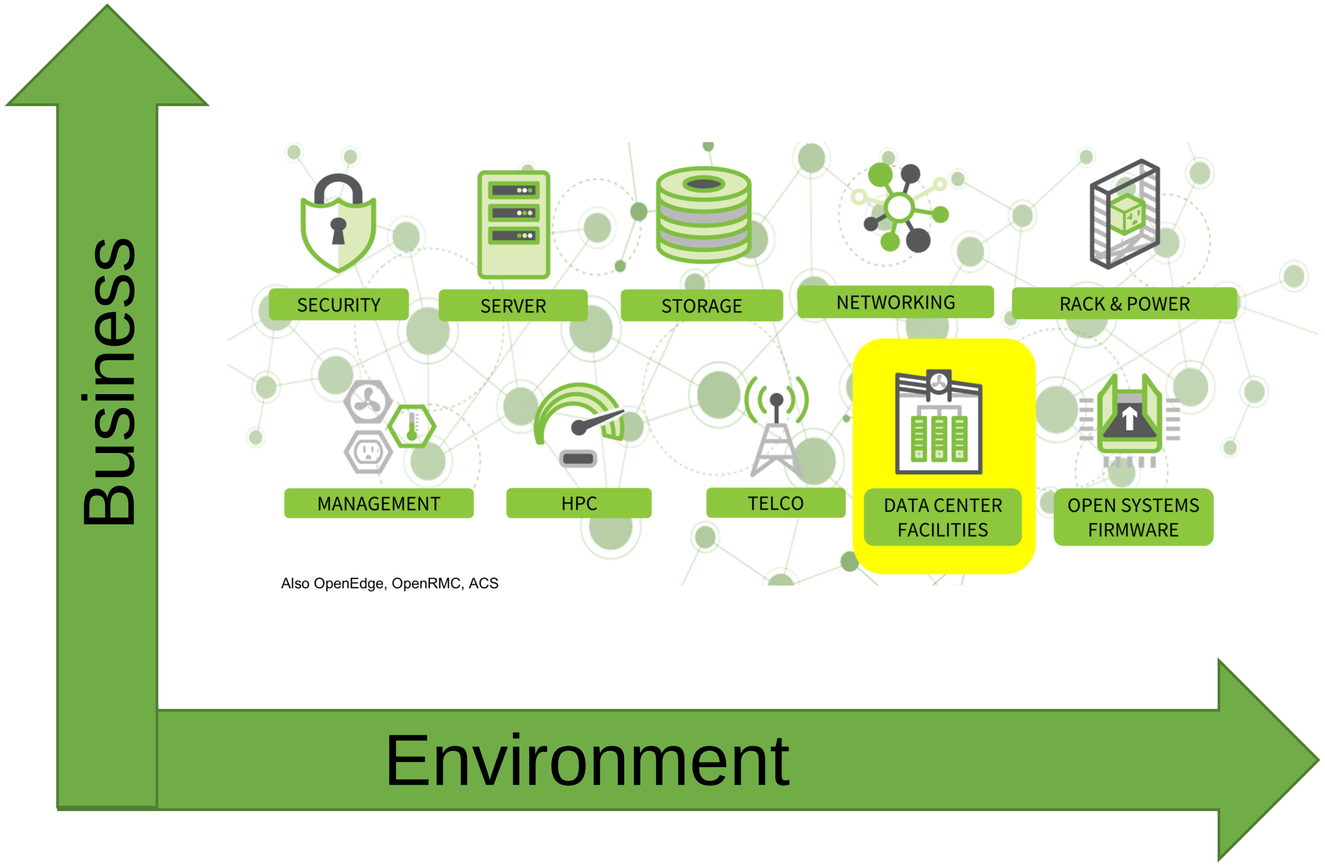
Also OpenEdge, OpenRMC, ACS

… especially for the facility

OCP Data Center as ONE integrated machine.



… enables sustainability CHAIN responsibility



- *Not spoiling energy, materials, water*
- *No waste → Circular approach*
- *Innovating on green energy*
- *Innovation on energy storage*

Enabling our community and end users toward a climate neutral infrastructure

Steve Helvie · 1st

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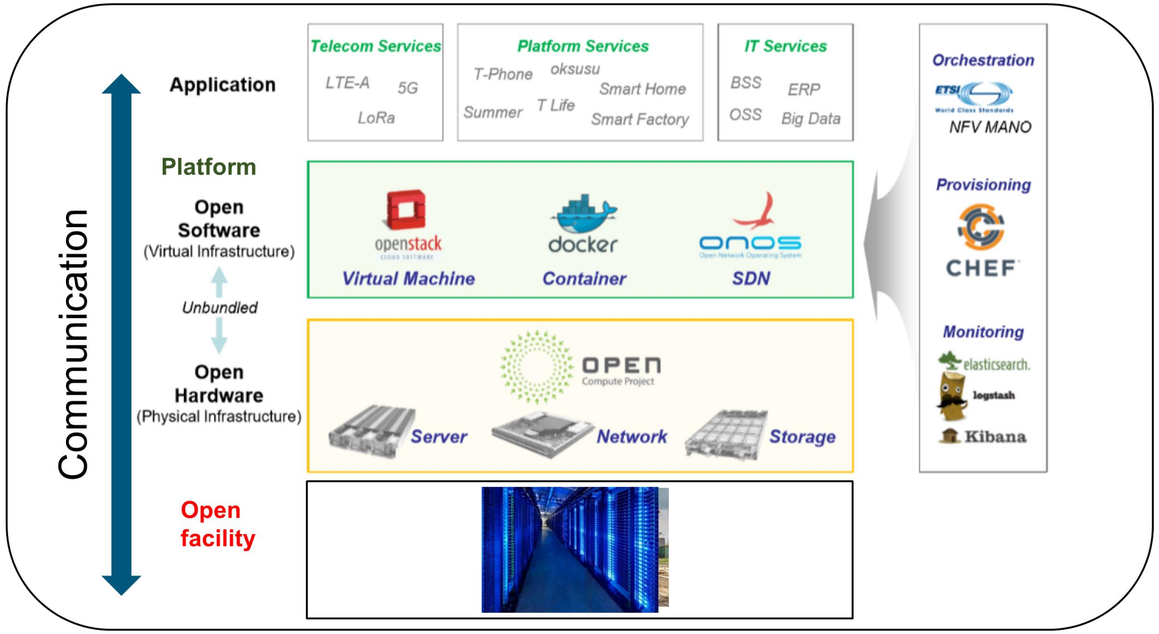
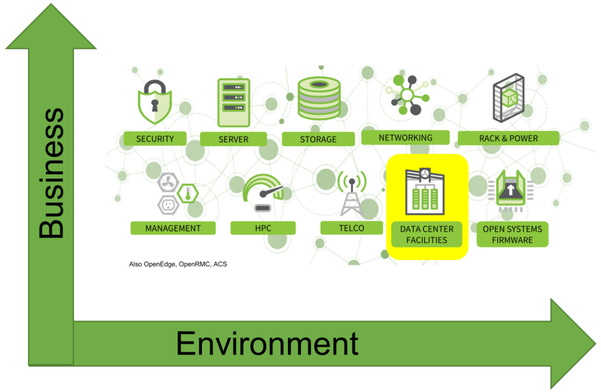
Open Data Centre



Chain Responsibility



The Open Integrated Domain Specific Data Center

How do I get involved?

Email Volunteer Leaders

PL: Brevan.Reyher@ocproject.net

IC: Robert.Bunger@ocproject.net

Participate in Monthly Meeting

Time: 3rd Wednesday at 10:30 Eastern/7:30 Pacific

Link: https://global.gotomeeting.com/join/490785413

Calendar: https://www.opencompute.org/projects/data-center-facility

Additional Information

Project Wiki: https://www.opencompute.org/wiki/Data_Center_Facility

Mailing List: https://ocp-all.groups.io/g/OCP-DCF

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