4 PRINCIPLES TO REALIZE THE BENEFITS OF OCP FOR THE DATA CENTRE FACILITY

Stijn de Kruijf
Data Centre Facility Developer @Royal HaskoningDHV

October 2, 2018
OCP enables a lot of benefits for the data centre

190M mails
40M WhatsApp's
250k hours Netflix watched
1M people watching other gamers via Twitch
The deployment of OCP hardware is increasing fast!

Where are the savings for the data centre facility?
4 PRINCIPLES TO REALIZE THE BENEFITS OF OCP FOR THE DATA CENTRE FACILITY

- Introduction
- Data centre facility costs
- Guidelines
- UPS principle
- OCP integrated data centre design
- Wrap up the 4 principles
Introduction - Open Data Centre

Open Data Centre facility
Introduction - DC Development Fragmentation

- I don’t worry too much about indoor climate
- Strict indoor climate; Redundant power; High Tier. Be a good host!
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Connectivity and flex capacity
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
- Internet scale
- Colocation
- End-user
- Campus
- Science
- Enterprise
- My data centre, my requirements
- Energy - make ends meet!
- Deliver real; time calculation power please
- Connectivity and flex capacity
- Streaming content delivery
- Is my private data still private?
Introduction - Revolution

Data centre development

“Hidden” Revolution

2011 2016 2018

Traditional data centre practices

EN 50600
Data Centre Facility Costs

3000 $/kW - 18000 $/kW IT Power

Quite a difference for a 40,000 kW data centre!!
Data centre facility costs - Capex (excluding IT racks)

- Land 5%
- Grid Connection 5%
- Shell 20%
- Fit-out 30%
- Large components 25%
- Development 10%
50% of the data centre facility costs are for < 1% of the operation.
Data centre facility costs

Still want to go 240 km/h with two flat tires?
Mismatch

DC Facility must deliver the maximum power and cooling under each and every circumstance.

Get rid of the 50%
Guidelines - How should it be done? Analysing

EN 50600
Guidelines - How should it be done? Analysing

EN 50600
Guidelines - How should it be done?
Mismatch

[Logos of ASHRAE, Green Grid, Bicsi, Code of Conduct, TIA, Uptime Institute, TUVIT]

EN 50600

Blank sheet guidelines
UPS principle - Can we define a “better question”?

- 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!

- Communication (5% of DC) is most critical. Storage and Compute can be ramped up and down.

- Geo-redundancy can take care of local capacity limitations
UPS principle – UPS with IT load

UPS closer to IT, smaller failure domain + provides time for IT to decide
### UPS principle - Power

- High reliable utility power
- MV and HV incoming power 99.99%

---

Do you really need to run the data centre at maximum when utility power fails?

Generators +2

---

The data centre IT can respond to utility power failure.

2 generators total might be enough!
UPS principle - Cooling

- Cooling depending on outside climate conditions

Do you really need to run the data centre at maximum at these moments?

Is 32 degrees Celsius a magic number? What’s happening beyond?

The data centre IT load can respond to temperature

- 99% temperature hours/year
- Wet bulb cumulative

32 degrees Celsius
27 degrees Celsius

32 degrees Celsius
UPS principle

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

UPS provides time to think!

Also some cold storage + pumps/fans required on UPS as well.
OCP integrated data centre design - the chain

One or Two way approach?
OCP integrated data centre design - communication

Open Data Centre

Communication

Applications

Platform

Open Software (Virtual Infrastructure)

Unbundled

Open Hardware (Physical Infrastructure)

Open facility

Telecom Services

LTE-A 5G LoRa

Platform Services

T-Phone oksusu Summer T Life Smart Factory

IT Services

BSS ERP OSS Big Data

SDN

Virtual Machine

Container

Server

Network

Storage

Orchestration

Provisioning

Monitoring

NFV MANO

Chef

Elasticsearch

Logstash

Kibana

OCP thinking makes it possible
Wrap up the 4 principles

1. Get rid of the 50%
2. Blank sheet guidelines
3. 5 minutes for DC to decide
4. Integrated Communication
Get rid of the 50%

5 minutes for DC to decide

Blank sheet guidelines

Can we define the fifth principle together?

Integrated Communication
OPEN. FOR BUSINESS.