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# Standing on the Shoulders of Giants: Learnings from Hyperscale



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# Agenda

1. The context of Hyperscale/ the need
2. The profile of Hyperscale/ the delivery
3. Learnings from Hyperscale

# Key Statistics behind Data Center Growth – Total IP Traffic

Traffic	2017	2020	CAGR
IP Traffic per month	122 Exabytes	254 Exabytes	26%
Internet users	2.8 bn	3.9 bn	6.9%
Number of connected devices	17 bn	22.5 bn	10%
Average speed	7.2 MBps	47.7 MBps	87.8%
% traffic that is video	67%	80%	NA



Source Cisco

# Key Statistics behind Data Center Growth – Mobile IP Traffic

Total Mobile Traffic	2017	2020	CAGR
IP Traffic per month	12 Exabytes	41 Exabytes	46%
Mobile users	4.43 bn	5.5 bn	2.8%
Number of mobile ready devices	8.6 bn	11.6 bn	8.5%
Average broadband speed	2.0 MBps	6.5 MBps	26.6%



Source Cisco



This is all creating 'The Perfect Storm'



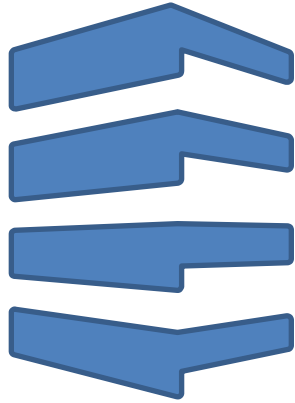
# We are entering Zettastructure ?- the Era of the Zettabyte

- By 2020 there will be 5 Zettabytes of data generated by more than 22 billion connected devices.
- One Zettabyte is  $10^{21}$
- By the end of the decade 10% of global energy will be consumed by IT when 3.2% is used actually.
- By 2040 it has been calculated that to process the world's data requirements using today's infrastructure, it would consume all the energy in the world.



# Compacting Computational Footprint

## The Jevon Paradox



**2001**

5MW site  
2MW IT load  
2000 cabinets  
~3000m<sup>2</sup>



**2014**

50kW site  
30kW IT load  
5 cabinets  
~16m<sup>2</sup>



**2018**

3.2kW site  
2.4kW IT load  
<1 cabinet  
~3.2m<sup>2</sup>

# The Profile of Hyperscale

- Hyperscale associated more than anything with growth of cloud & variable demand
- Key operational & commercial value beyond data center standards of resilience, efficiency & immediacy is scalability.
- This means facilities that are usually very large, close to fiber network intersection points and (increasingly) with access to sustainable energy sources.
- Design principles include open networks, disaggregation, software-defined orchestration, core & pod units.

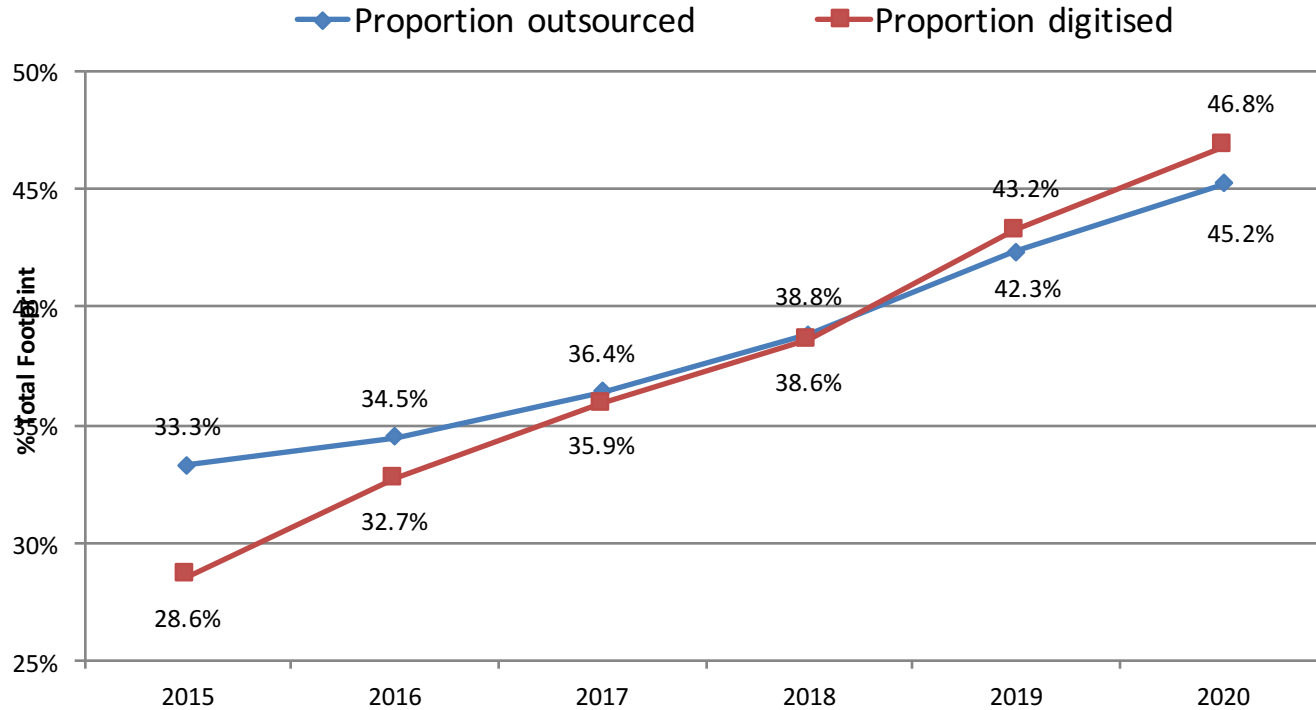


# The scope of hyperscale

- A hyperscale data center needs to support thousands of physical servers and millions of virtual machines. ... Hyperscale computing boosts overall system flexibility and allows for a more agile environment.
- Very few data centers – maybe 700-750 now from 230,000 data centers world-wide
- Still account for less than 10% of USA's total data center energy consumption
- By 2021, Cisco estimates that hyperscale will account for:
  - 53% of all data center servers
  - 69% of all DC processing power
  - 65% of all data stored in DCs, and
  - 55% of all DC traffic.



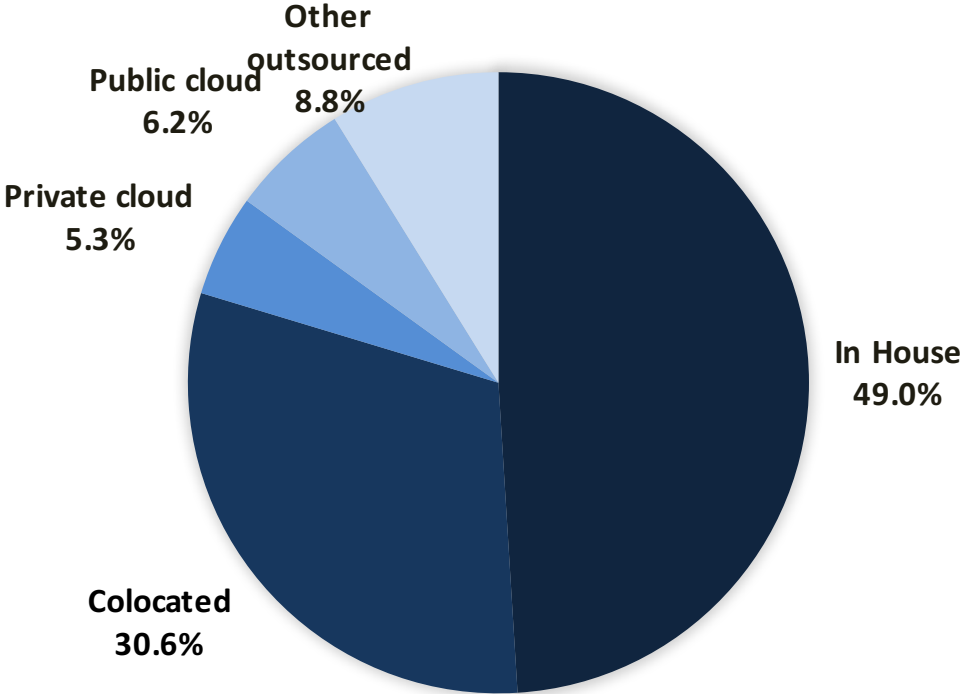
# Increased Reliance on External Providers, particularly to access cloud services in conjunction with hybrid systems Assets/Investment



Source: DCD



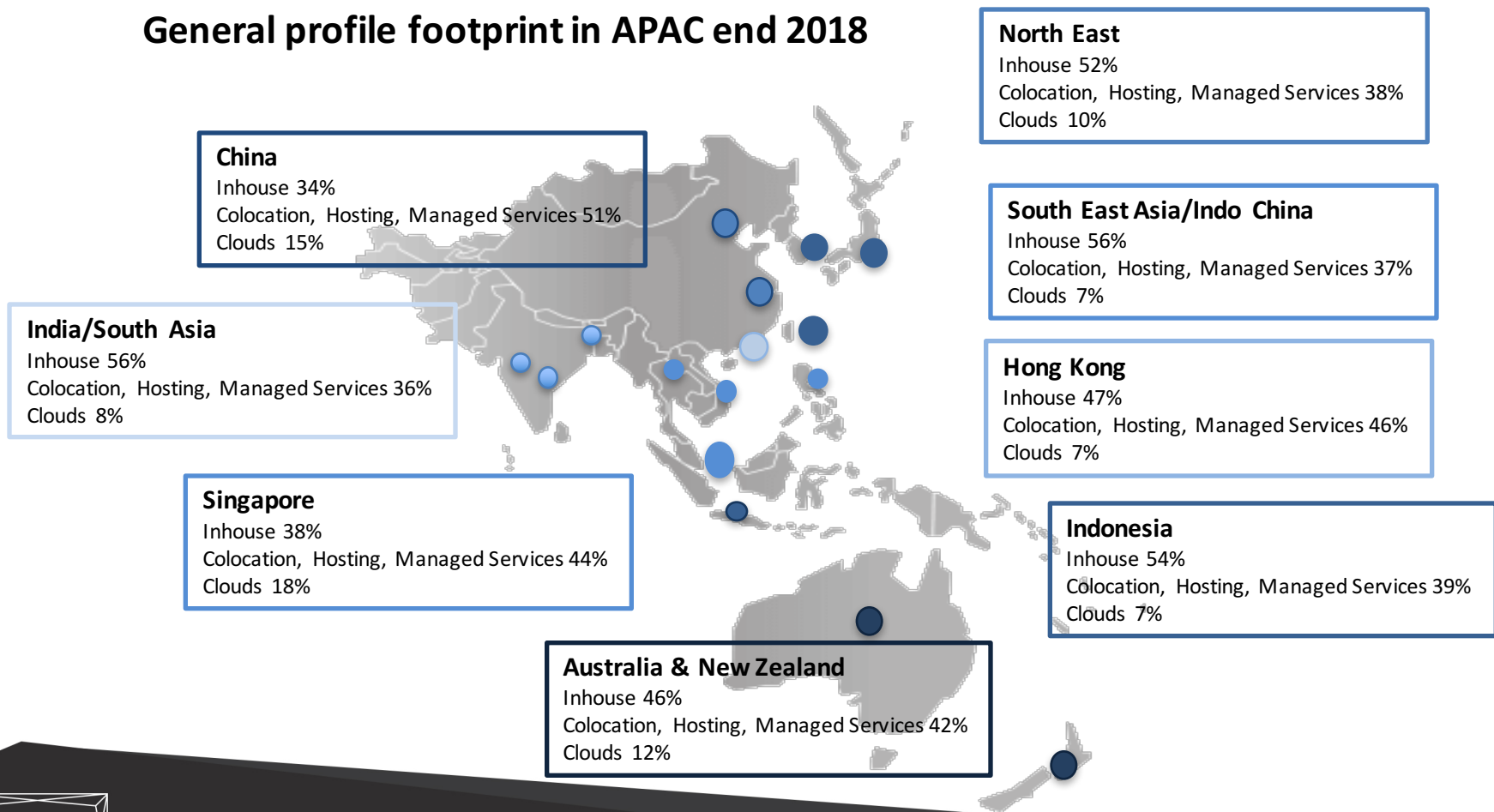
# January 2019 research indicates in-house moving under 50% of footprint across APAC



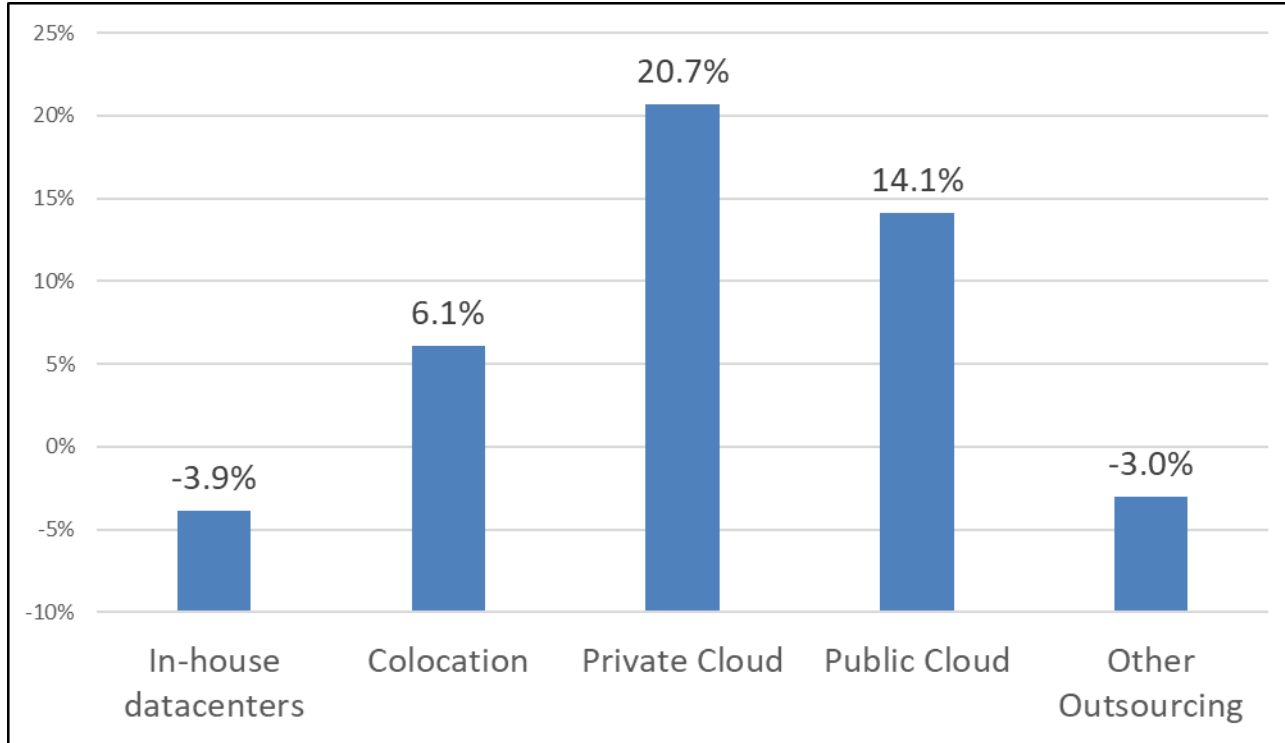
Source: DCD



# General profile footprint in APAC end 2018



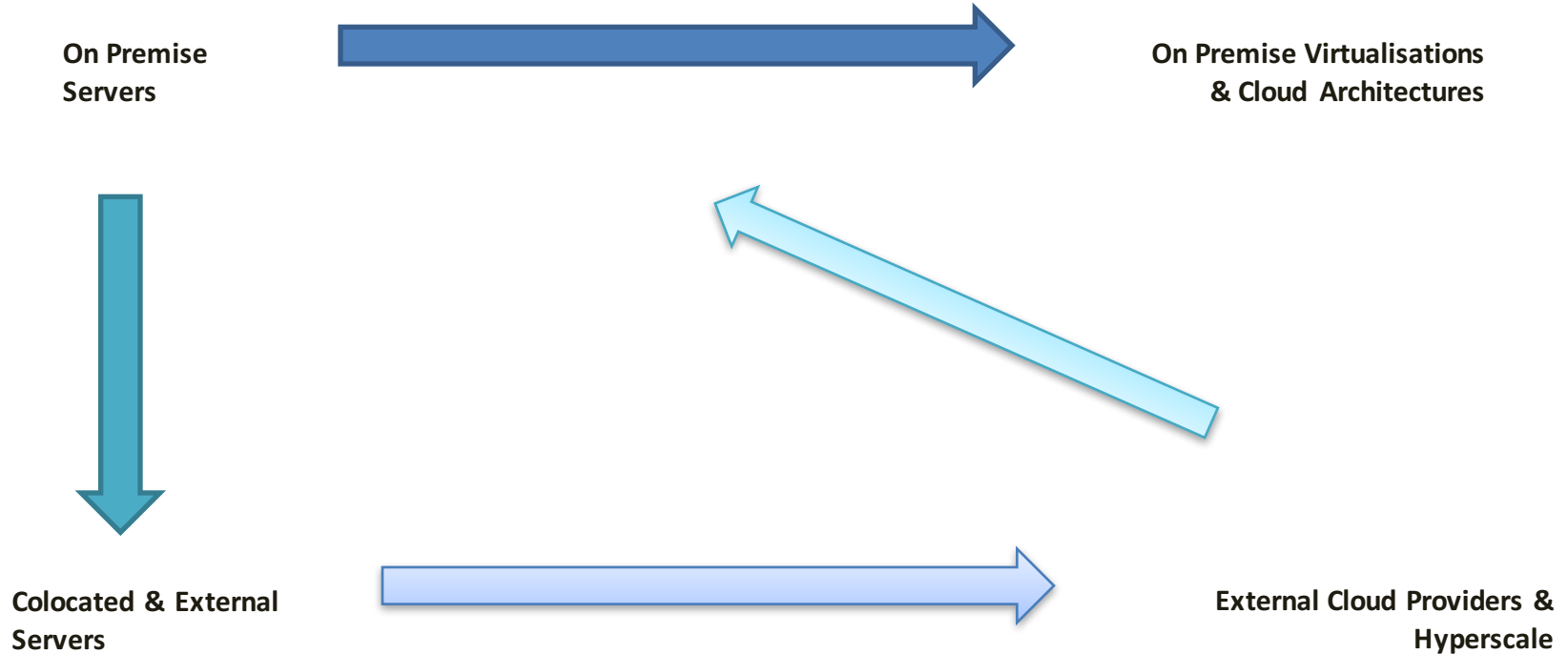
## % Change in Digital Infrastructure in next 2 years across APAC



Source: DCD



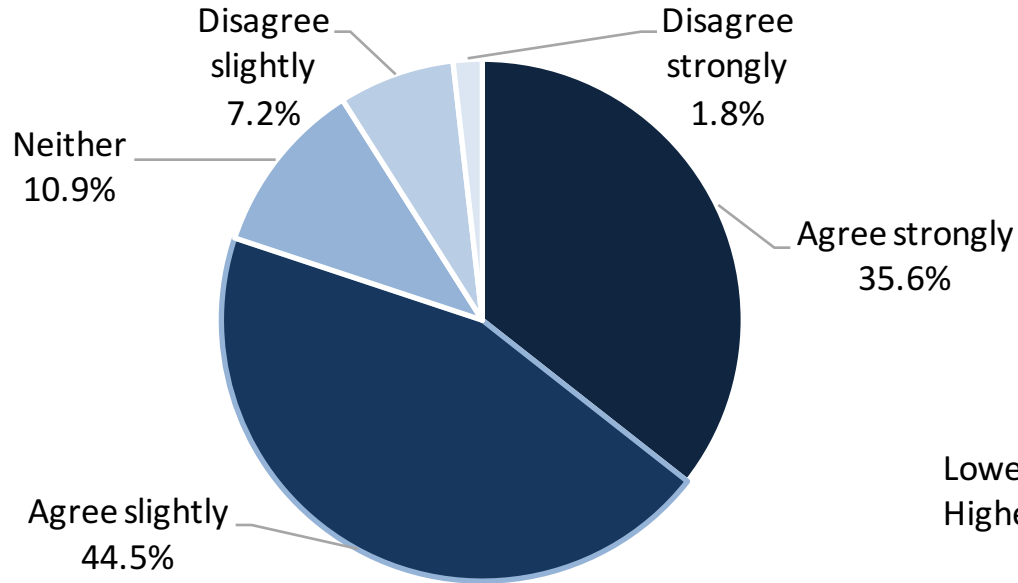
# The Infrastructure cycle of Constant Re-Balancing





# Standing on the Shoulder of Giants:

*“How the cloud 'giants' design and operate their data centers can teach smaller facilities a great deal”*

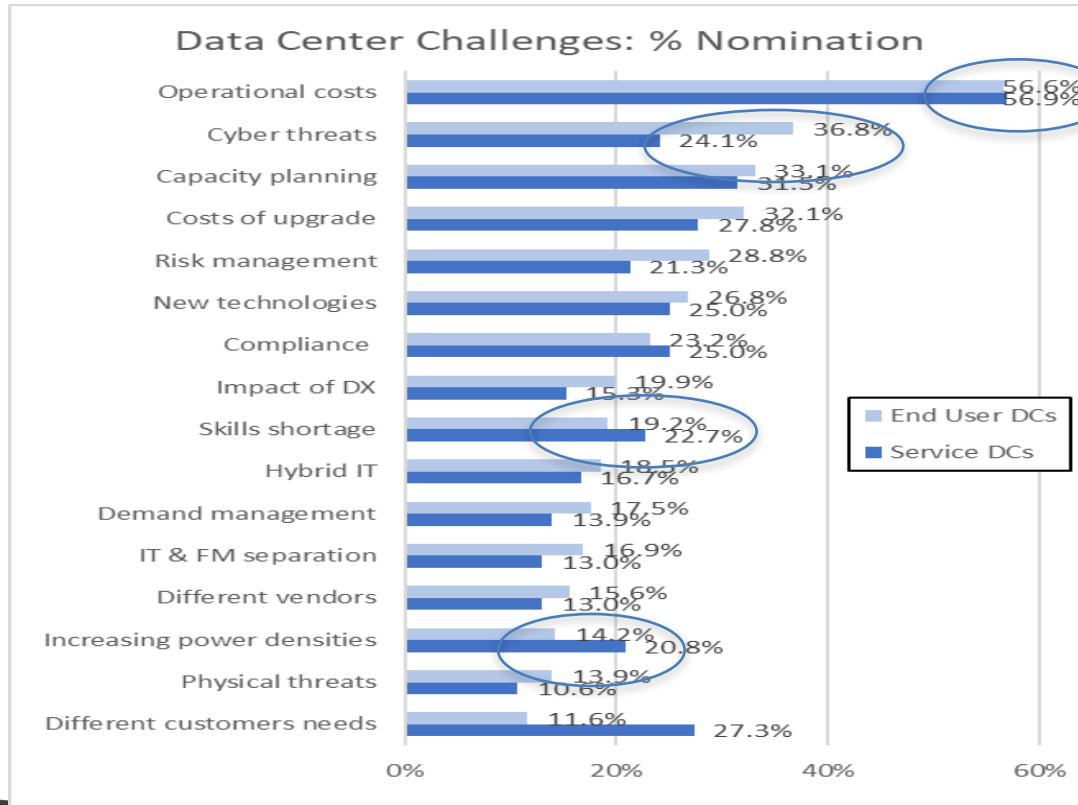


Lower in Japan  
Higher among financial sector

Source: DCD



# Solutions & learnings looked for



Source: DCD



# Thank You

