

Summary

Introduction

The cost of data centers includes several components. The size of the different components depends on what type of data center is being built. For carrier-neutral operators primarily in the business of selling colocation space, the cost of land & buildings is dominant. For a company like Meta (Facebook), it's a much different mix. Facebook's gross plant on the books as of 2020 included the following: land (2.7%), buildings (34.9%), leasehold improvements (8.7%), network equipment (44.2%), computer software and office equipment (4.9%), and finance lease right-of-use assets (4.6%).

Our focus is network equipment, software, and related technology contracts, including power.

In the following tab, "VC data", we attempt to track the major publicly announced contracts between technology vendors and companies either owning or renting data center space. The contracts cut across many different categories of technology, in particular: servers (and the chips that run them), switches, routers, storage, security, optical interconnect, software, and power/cooling. The database attempts to be comprehensive for January 2020 through January 2022. The focus is on publicly announced contracts. That is a limitation, as announced contracts only cover a subset of all deals. Such announcements require sign-off from both parties. However, announced deals give a good sense of the vendors active in the data center space and the important technology developments impacting data center construction and operation.

Recent contract activity

This database includes 39 contracts announced in 4Q21 (4Q20: 31), plus 5 announced in January 2022. Based on this recent activity, a few comments:

- More supercomputer deployments in data centers, including by Meta (FB), announcements focused on breaking records and breakthroughs in performance
- Data center interconnect deals continue to see lots of announcements, revolving around speed upgrades such as Ciena's 800Gbps deals with CityFibre and Omantel
- Modular data centers seeing some announcements and more interests both among telcos & carrier-neutral providers
- Awareness of environmental footprint of data centers (and high cost of power/cooling) seems to be rising and spurring along more deal announcements
- Latest generation of DC chips being adopted by multiple providers for various cloud applications, including AMD's 3rd Gen AMD EPYC (IBM, Meta Microsoft, Amazon) and Intel's 3rd Gen Intel Xeon Scalable (Amazon and Microsoft); NVIDIA's Triton Inference Server software adoption by Alibaba, Amazon, Alphabet (Google) and Microsoft
- Ciena's announced contracts (mostly DCI-related) totaled 7 in 4Q21, more than other vendors, but Nokia is showing up more and more in the data center market, with 5 contracts in the Oct 2021 - Jan 2022 four month period, covering DC interconnect optical, routers, PSE-3 coherent DSP. NVIDIA and AMD also recorded 5 contracts each, largely with webscale adoption of new chip designs.

Database summary

[See contracts](#)Summary of contracts included in "VC data" tab:

Quarter announced	Contracts
3Q19	1
4Q19	3
1Q20	16
2Q20	30
3Q20	34
4Q20	31
1Q21	21
2Q21	37
3Q21	26
4Q21	39
1Q22	5
TOTAL	243

Year	Contracts
2019	4
2020	111
2021	123
2022	5
TOTAL	243

Technology involved	2019	2020	2021	2022
Cloud networking		5	3	
DC chips	1	25	38	1
DC infra (turnkey)		1		
DC power/ cooling infra		10	16	
DCI		18	17	1
Digital workspace		1	1	
IP infra	2	15	5	1
IP infra, Network software			1	
IP infra, Optical transport			3	
IP infrastructure		1		
IP infrastructure, Network software			1	
Modular Data Center				1
Network Software		7	8	
Optical transport	1	10	10	
Optical transport, Network Software		1	1	
SDN		1	1	
Security		2	4	
Servers		3	4	
Servers, Network software		4	3	
Servers, Storage		1		
Storage infra		2	3	
Supercomputer			4	1
TOR switch		4		
TOTAL	4	111	123	5