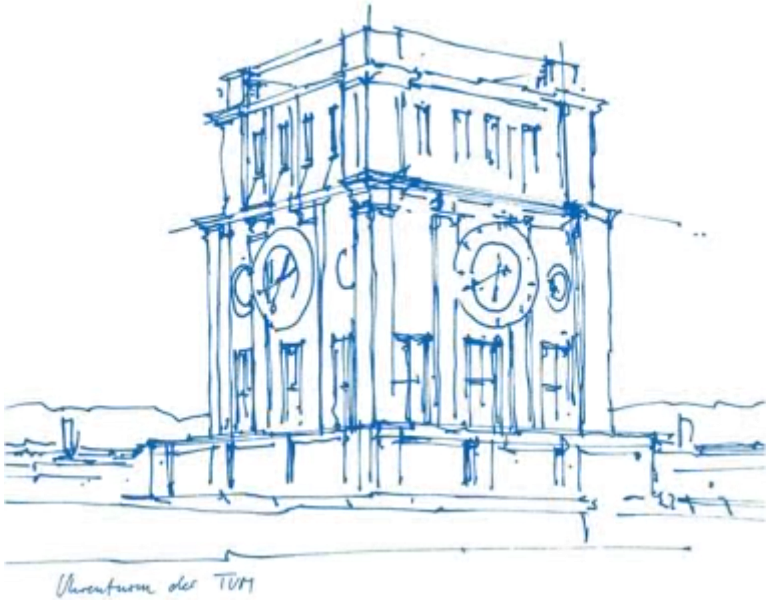
Cloud Hardware Evolution Through the Looking Glass



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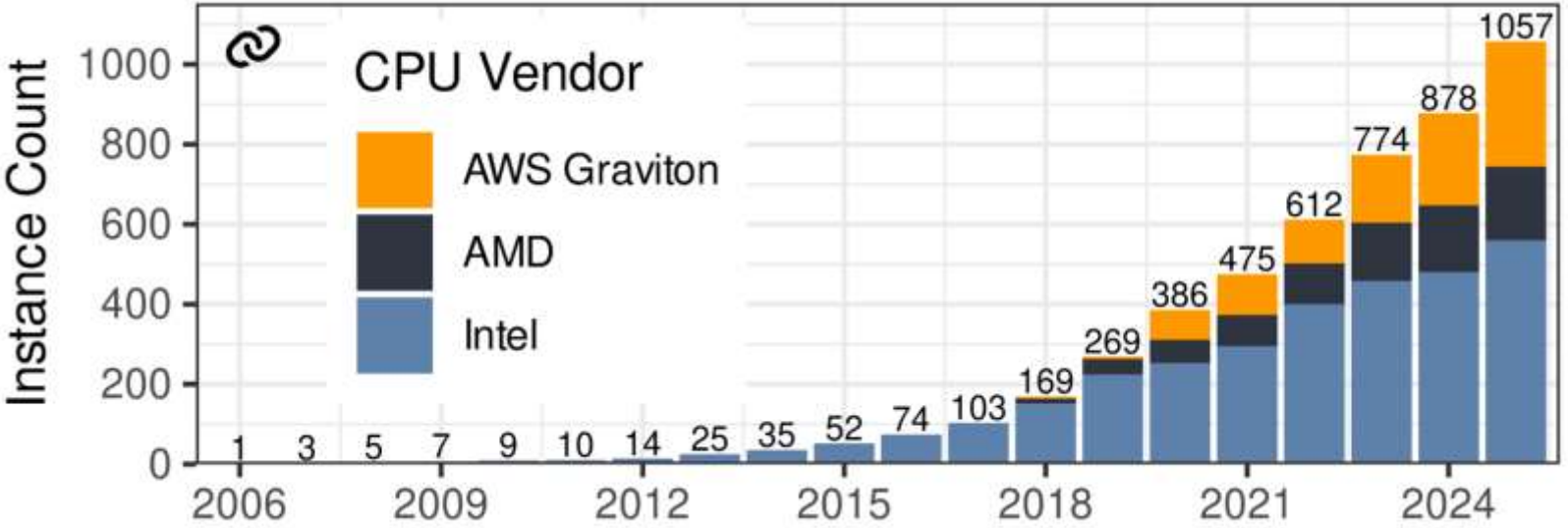
QUIZ TIME

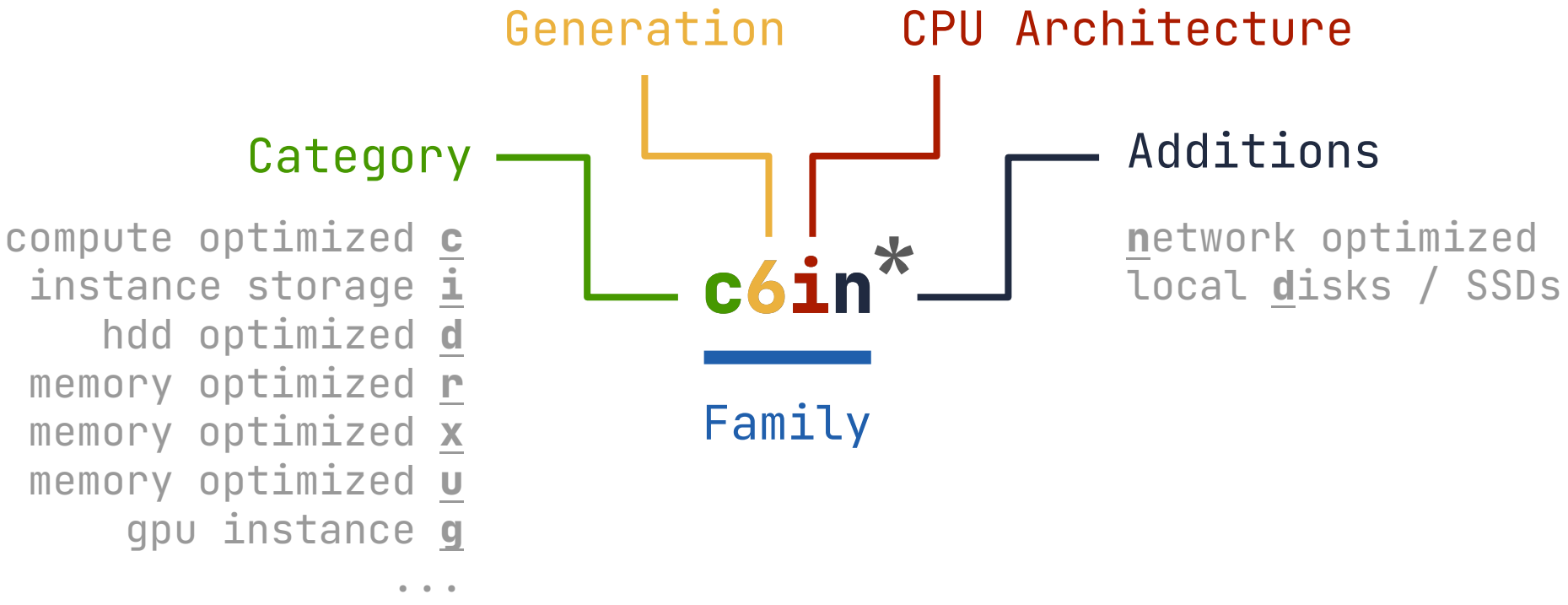
How many EC2 instance types are there in AWS?

Answer: Over 1000



across 167 instance families

Instances


Generation
CPU Architecture
Category
Additions
compute optimized c
instance storage i
hdd optimized d
memory optimized r
memory optimized x
memory optimized u
gpu instance g
...
c6in*
Family
network optimized
local disks / SSDs

Instances

compute optimized **c**
instance storage **i**
hdd* optimized **d**
memory optimized **r**
memory optimized **x**
memory optimized **u**
gpu instance **g**
...

} which should I pick?

DEMO TIME

Hardware Evolution

- CPU Performance
- Memory Capacity
- Memory Bandwidth
- NVMe SSD Capacity
- NVMe SSD Bandwidth
- Network Bandwidth
- GPU & Accelerator FLOPs

PER DOLLAR

Core Count

TAKEAWAY

scaling up goes a long way
dollars per core stagnate

$2/hour

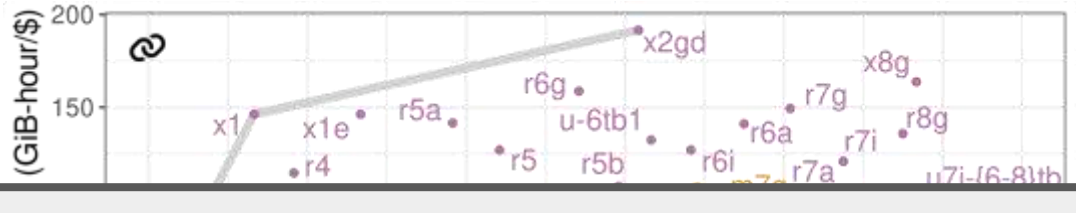
$125/hour

Multi-Threaded CPU Performance / $

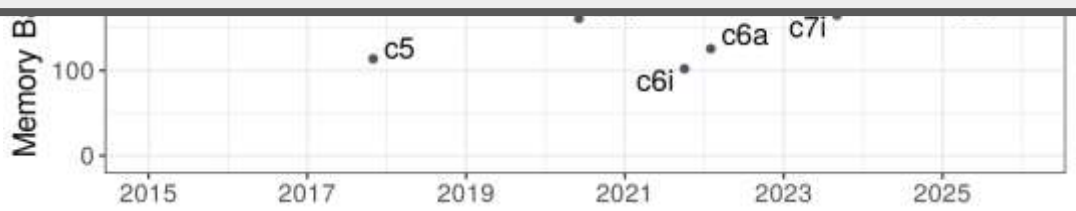
TAKEAWAY

moderate CPU performance gains
build your DB for ARM

Memory



Bandwidth

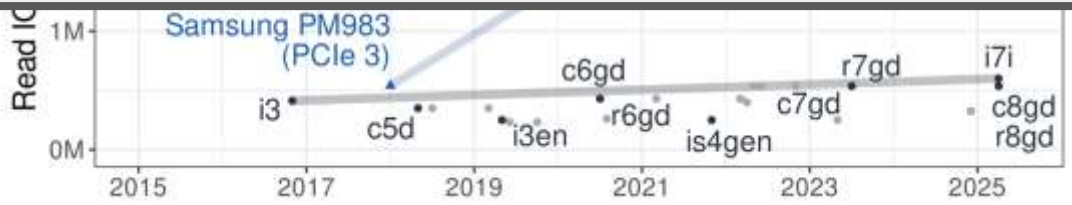


TAKEAWAY

no more price gains for in-memory DBs

Network

Bandwidth



TAKEAWAY

network bottleneck disappearing
build for NVMe (but only on-prem?)

GPU Performance / $

TAKEAWAY

big potential in accelerators for DBs?

trn2 has limited availability

Other Clouds

AMD instance with 16 cores (32 vCPUs), 128 GiB RAM

TAKEAWAY

moving to alt-clouds may save you big $$$

STACKIT	DE	g1a.32d-EU01	Epyc 3	**1.5203**
OVH Cloud	DE	BX.128	Epyc 3	**0.8554**
Hetzner	DE	CCX53	Epyc 3/4	**0.3548**

4.7x

Discussion: DB Architecture

- **CPU stagnation:** move to accelerators?
- **fast networks:** compression? log vs page shipping?

  no caches, only S3?

- **cheap alt-clouds:** cross-cloud infrastructur

cloudspecs.fyi