

20^e édition

infoprodigital

Forum **TERATEC** 25

21 & 22 MAI 2025

Parc Floral, Paris

ATELIER CONTINUUM / EDGE / EMBEDDED

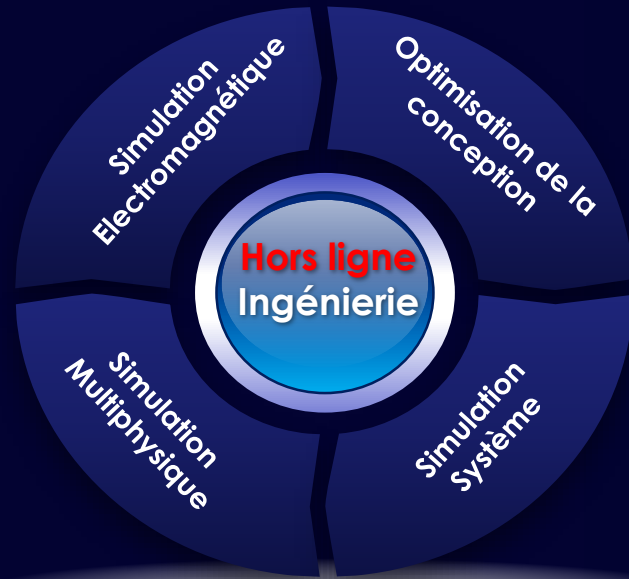
En partenariat avec

L'USINENOUVELLE

L'USINEDIGITALE



Continuum HPC / Edge / Embedded



Contrainte sur la performance
(validité, précision,...)



Boucle OODA

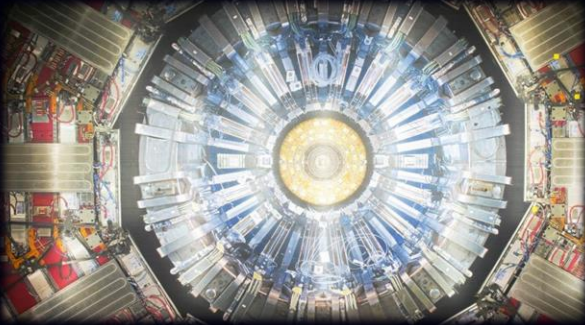
Contraintes

Gestion des ressources
Puissance de calcul et capacités de stockage
La latence
La sécurité
Operational MLOPS



Supremacy of data generation over computation

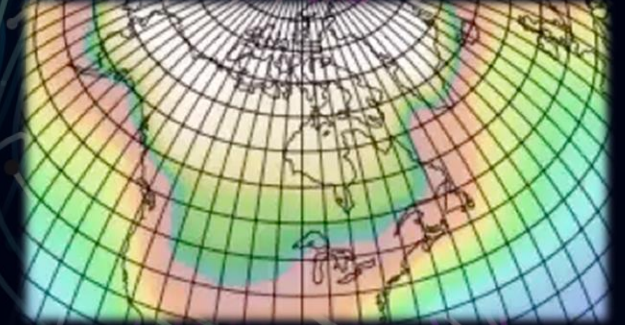
Large Hadron Collider
Tens of Petabytes per year



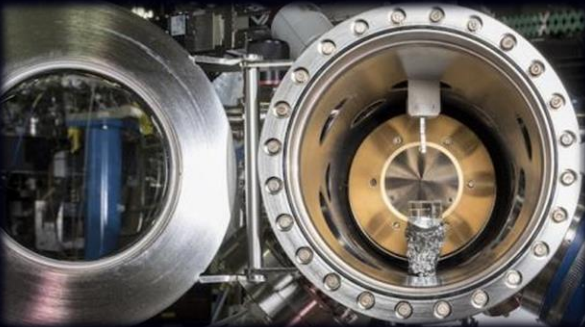
Square Kilometer Array
400 exabytes per year



Climate modeling
400 Petabytes per year



Advanced Light Source
7 Terabytes per hour



Genomics
Exabytes per year

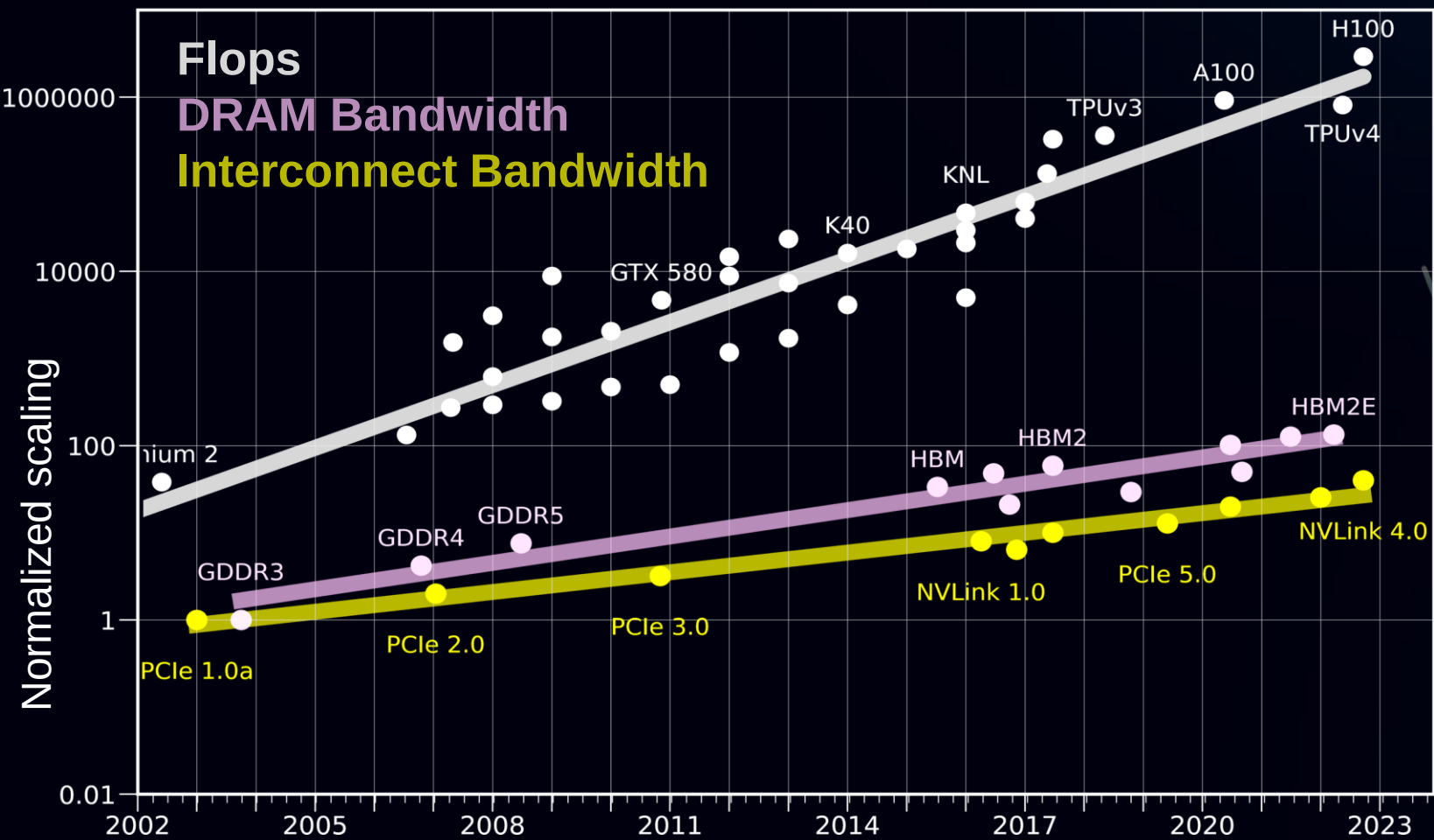


Data volumes are growing
far beyond

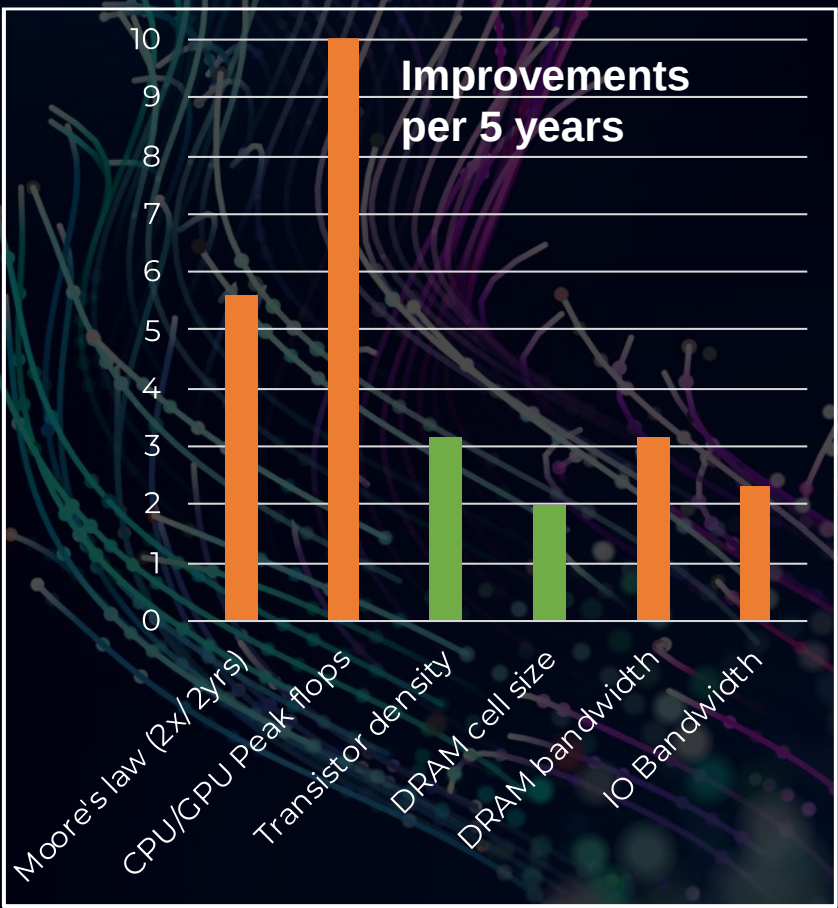


The need of leading edge HPC applications is far broader then ever

The divergences of the microelectronics performances



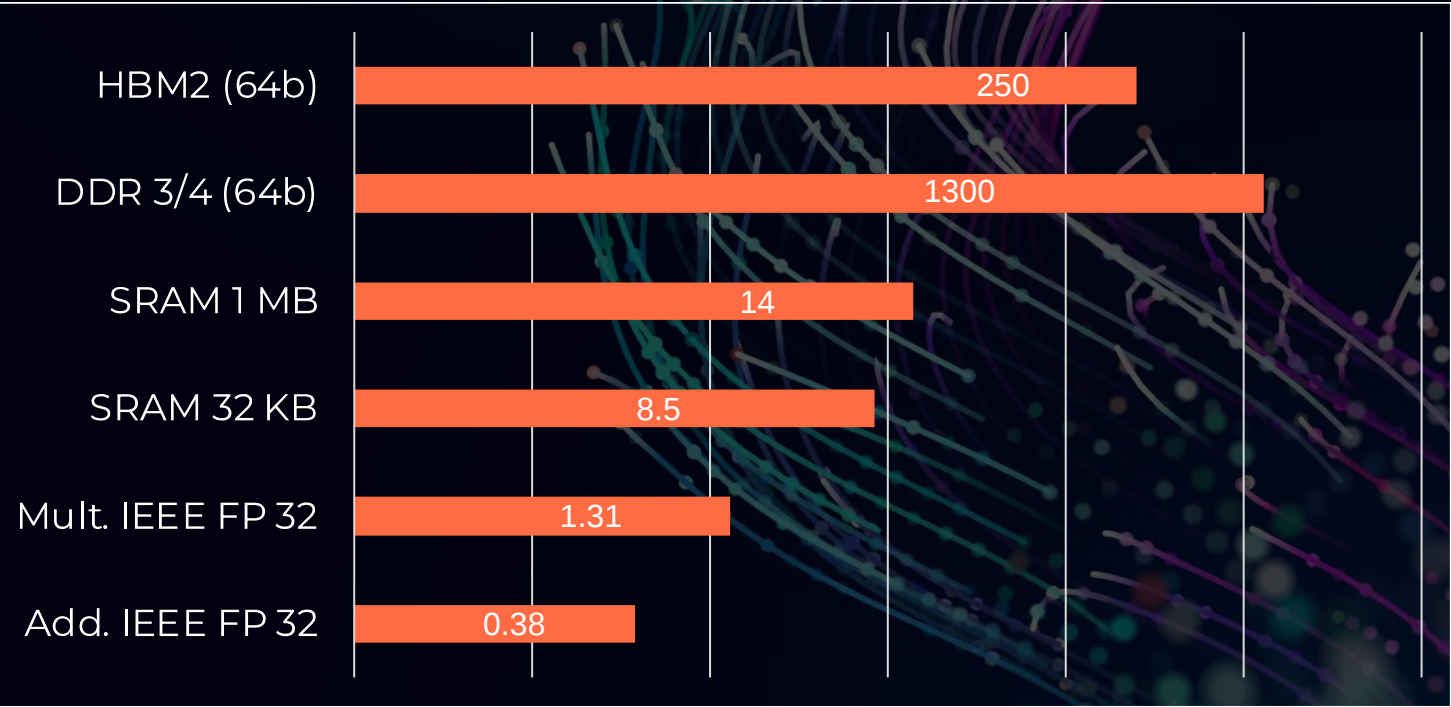
Source: medium.com (AI and Memory Wall)



So energy expensive memory throughput

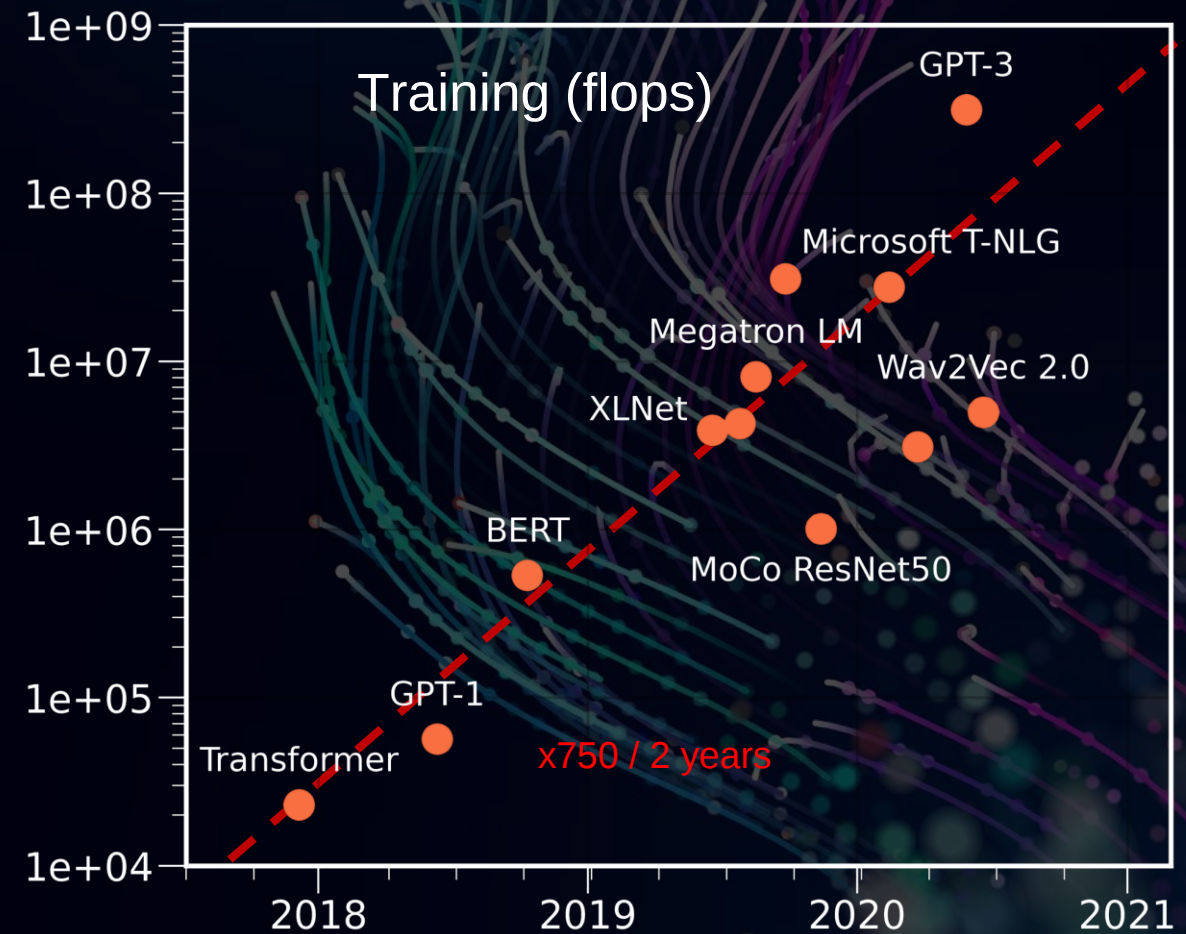
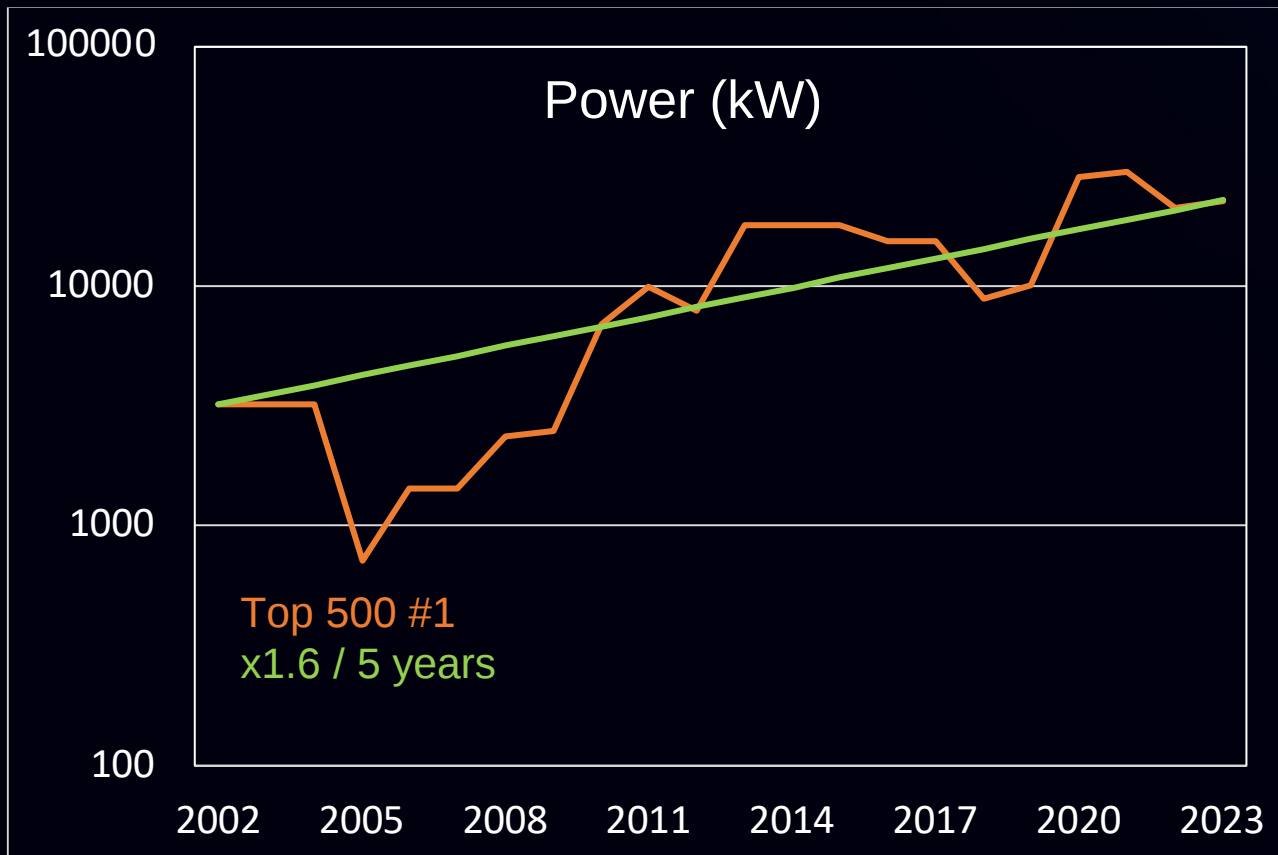
Operation		Picojoules per operation		
		45 nm	7 nm	Ratio
Add. (IEEE)	FP 16	0.4	0.16	2.5
	FP 32	0.9	0.38	2.4
Mult. (IEEE)	FP 16	1.1	0.34	3.2
	FP 32	3.7	1.31	2.8
SRAM 64b access	32 KB	20	8.5	2.4
	1 MB	100	14	7.1
DRAM 64b access		Circa 45 nm	Circa 7nm	
	DDR 3/4	1 300	1 300	1.0
	HBM2	250-450		

7nm - Picojoules per operation (log₁₀ scale)



Source: Ten Lessons From Three Generations Shaped Google's TPUs

The irresistible rise in energy consumption

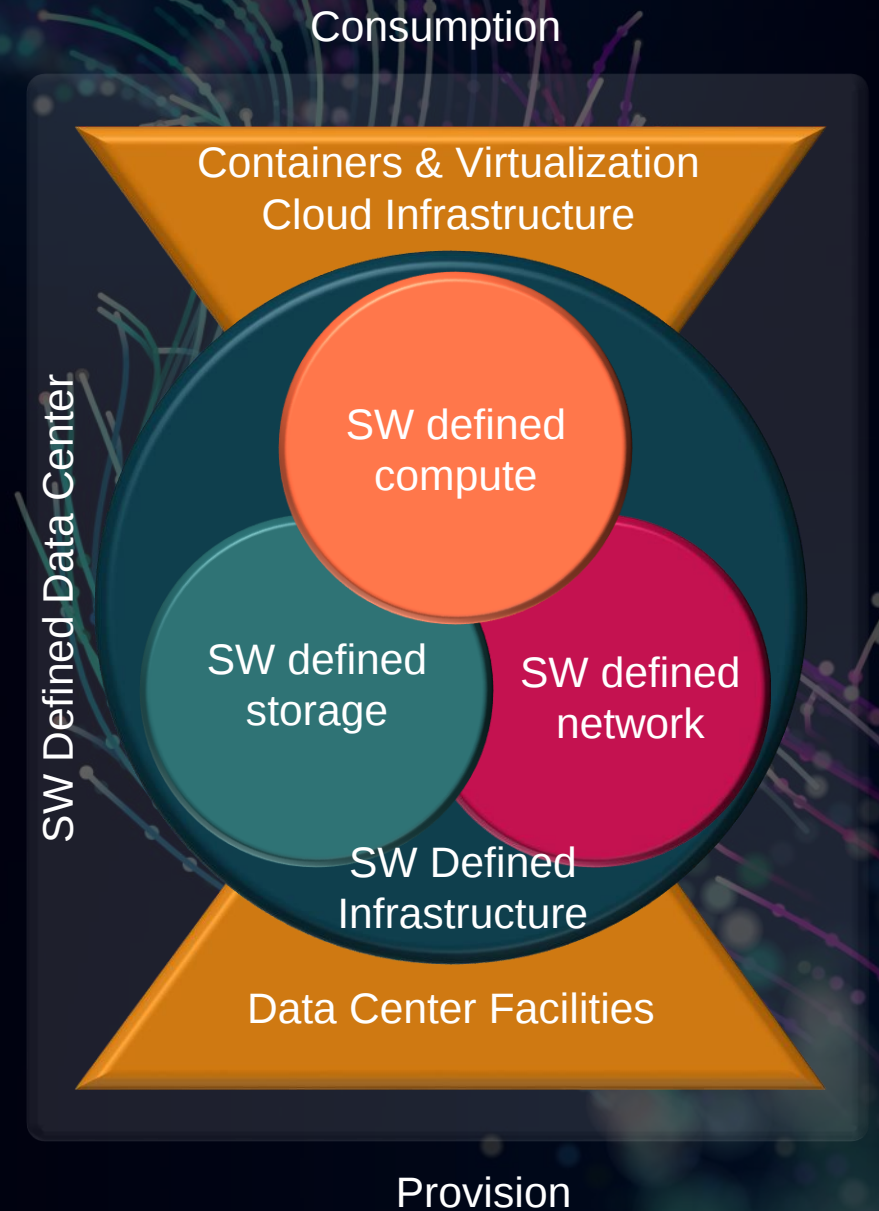
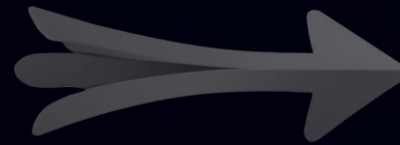


Source: medium.com (AI and Memory Wall)

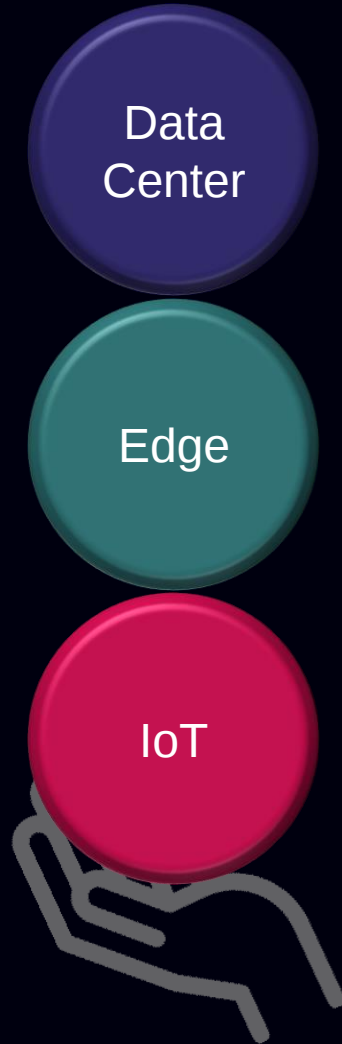
Reinvent HPC for a brilliant phygital future



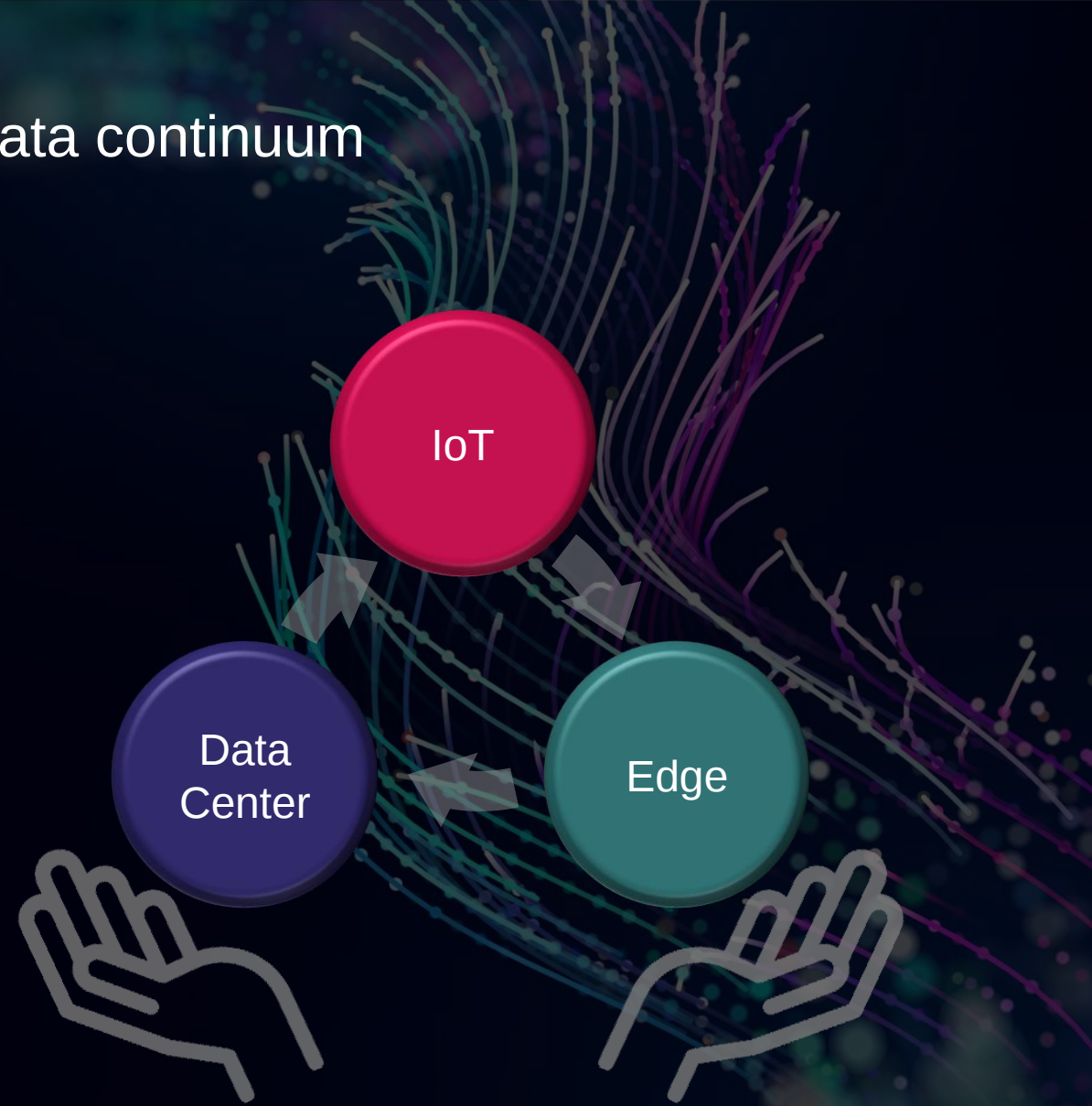
Software is eating the world (Marc Andreessen)
Yet hardware is still shaping it



New era of the cooperation in compute and data continuum



From
Hierarchy
To
Swarm



Michaël BERTIN

(CEA DAM, Ingénieur de recherche)

Rodolphe GELIN

(Ampere, Expert Artificial Intelligence and Robotics)

Adrien GIRARD

(IRT Saint Exupéry , AI Project Manager and Business Developer)

Andry RAZAFINJATOVO

(Ryax Technologies, CEO)

Emmanuel DOTARO

(Thales, VP Expert 5G 6G)