



# Exascale: A race to the future of HPC



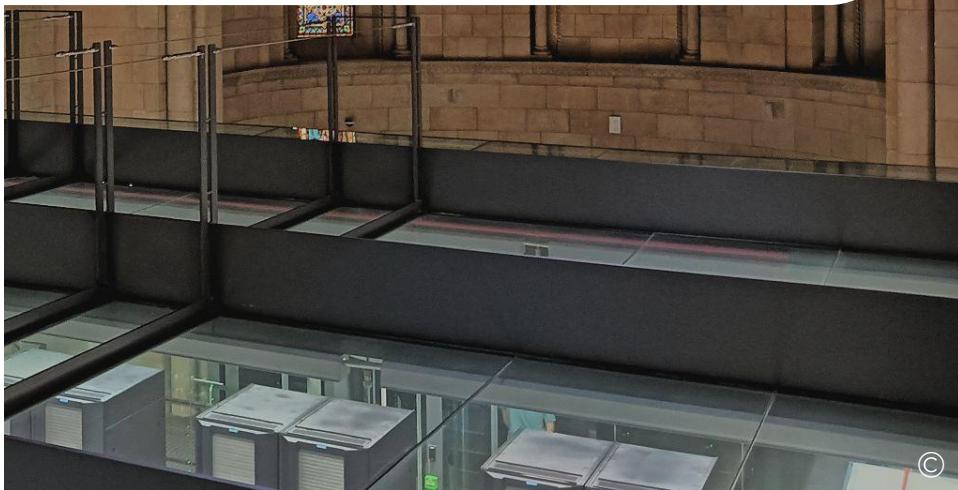
2nd October 2023

**Huilin Ni**

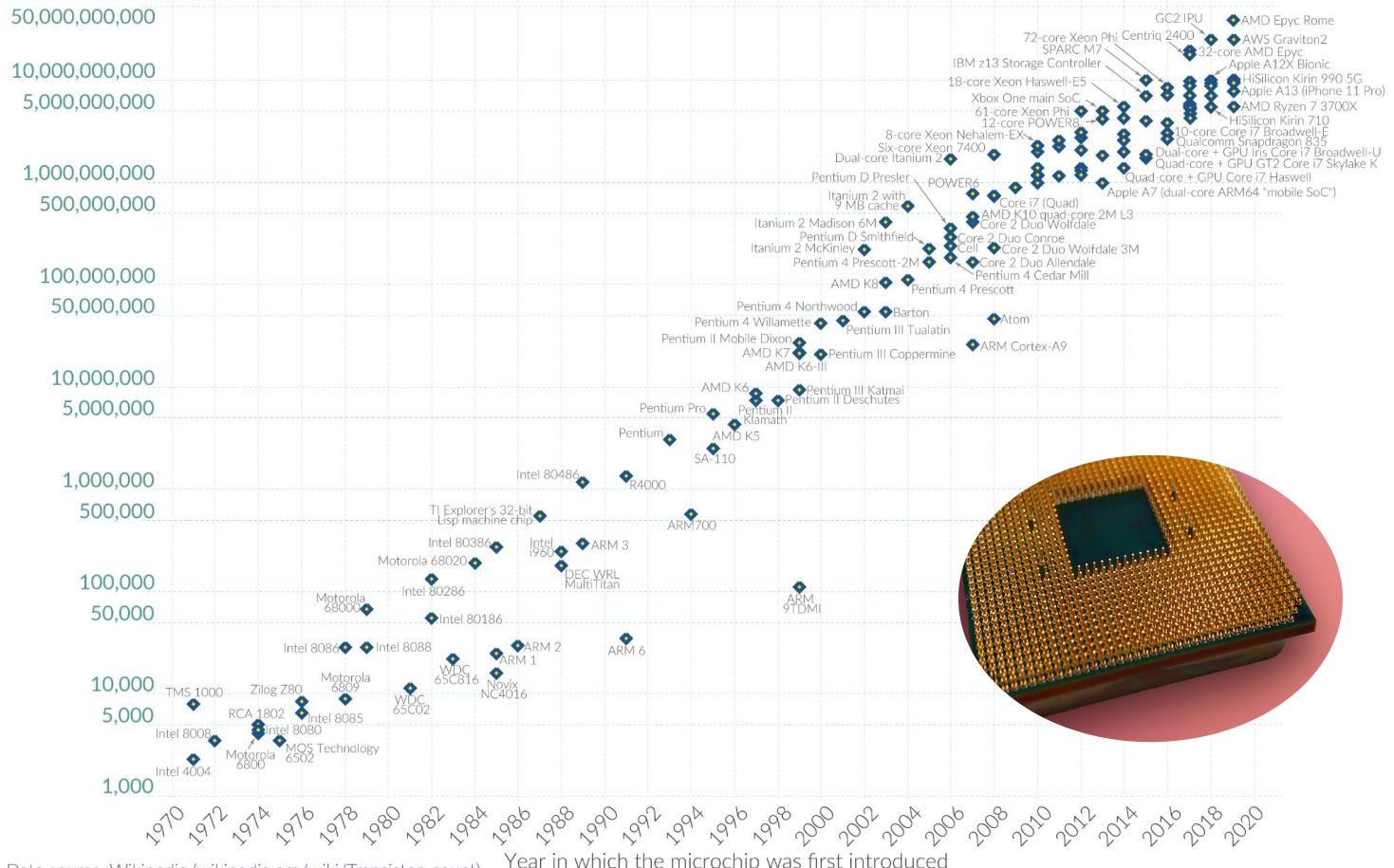
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## Transistor count



Moore's Law

Data source: Wikipedia ([wikipedia.org/wiki/Transistor\\_count](https://en.wikipedia.org/wiki/Transistor_count))

OurWorldInData.org – Research and data to make progress against the world's largest problems.

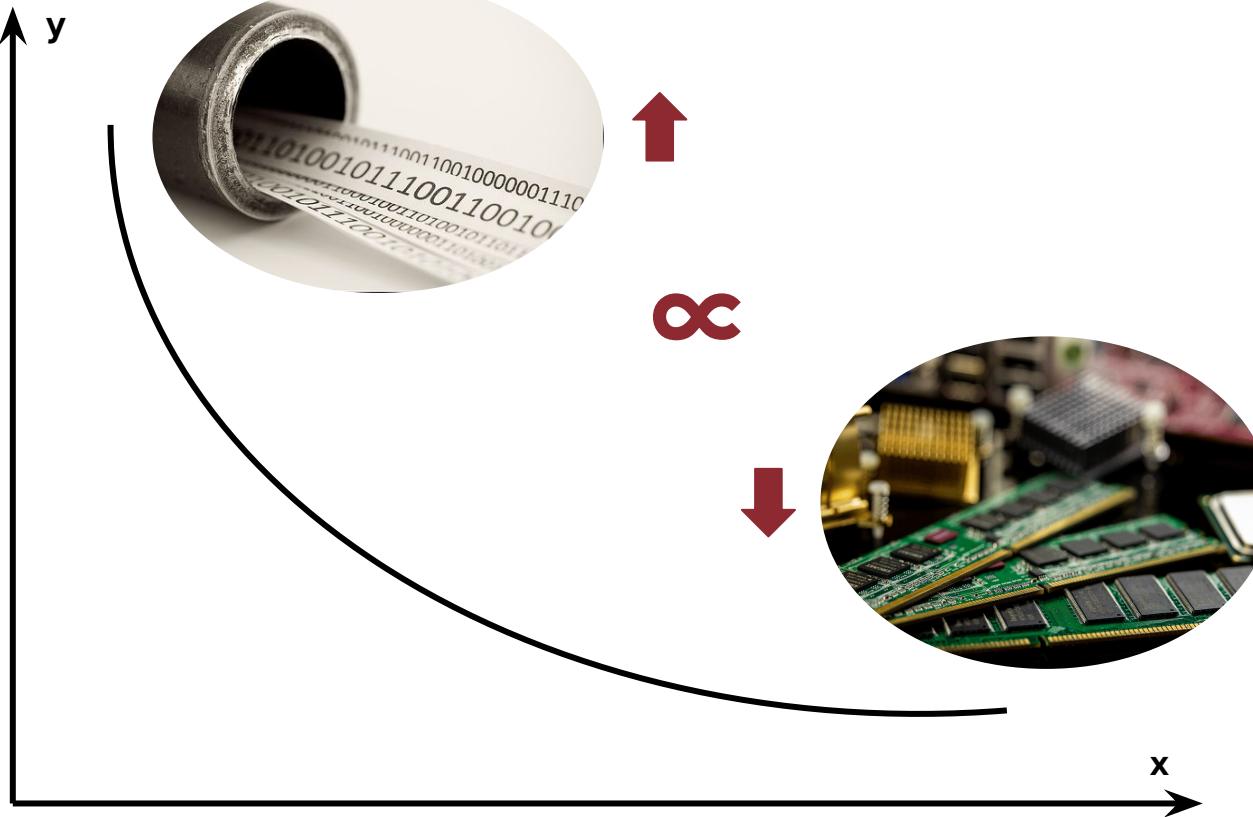
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## Green500 Data

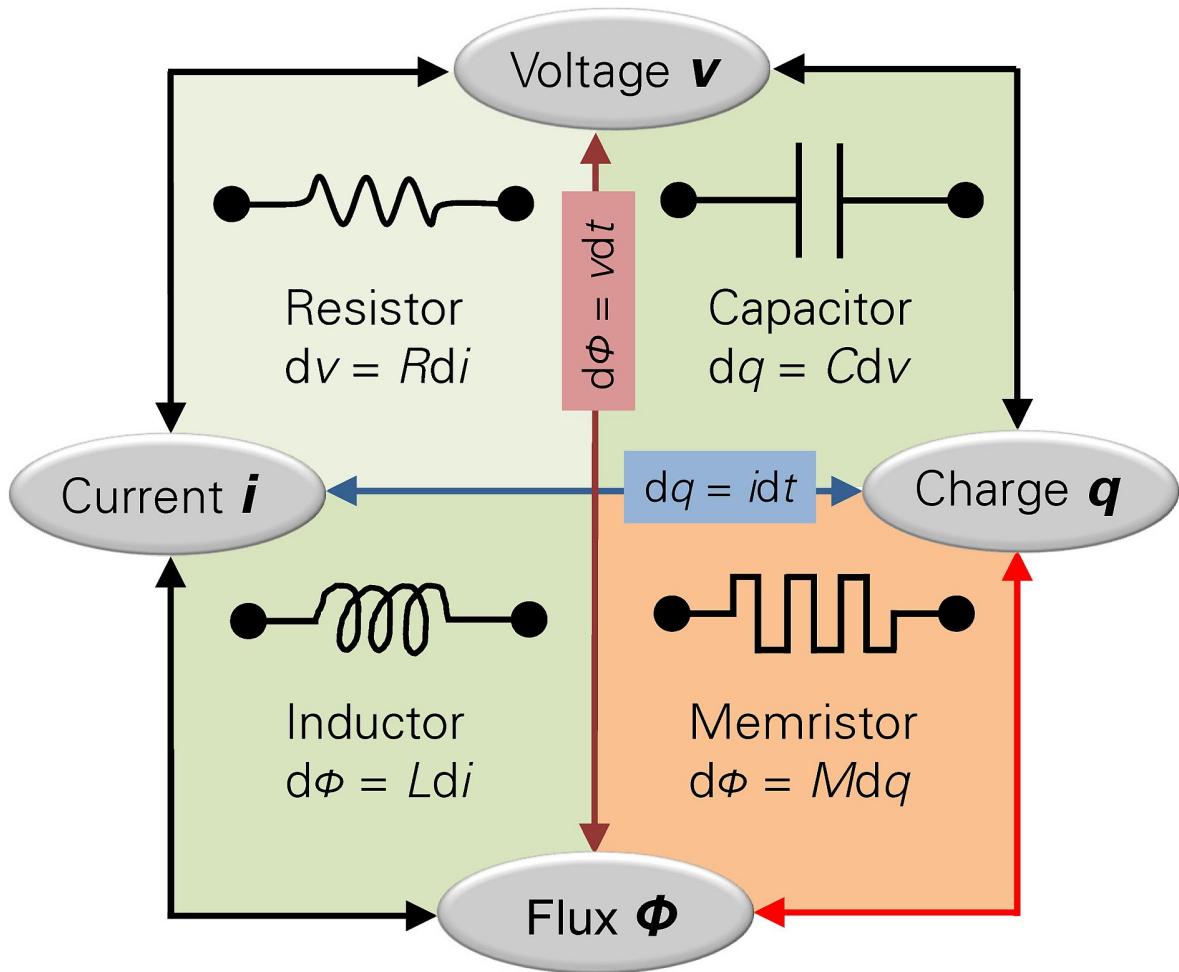
TOP500		System	Cores	Rmax (PFlop/s)	Power (kW)	Energy Efficiency (GFlops/watts)
Rank	Rank					
1	255	<b>Henri</b> - ThinkSystem SR670 V2, Intel Xeon Platinum 8362 32C 2.8GHz, NVIDIA H100 80GB PCIe, Infiniband HDR, Lenovo Flatiron Institute United States	8,288	2.88	44	65.396
2	34	<b>Frontier TDS</b> - HPE Cray EX235a, AMD Optimized 3rd Generation EPYC 64C 2GHz, AMD Instinct MI250X, Slingshot-11, HPE DOE/SC/Oak Ridge National Laboratory United States	120,832	19.20	309	62.684
3	12	<b>Adastra</b> - HPE Cray EX235a, AMD Optimized 3rd Generation EPYC 64C 2GHz, AMD Instinct MI250X, Slingshot-11, HPE Grand Equipment National de Calcul Intensif - Centre Informatique National de l'Enseignement Supérieur (GENCI-CINES) France	319,072	46.10	921	58.021
4	17	<b>Setonix – GPU</b> - HPE Cray EX235a, AMD Optimized 3rd Generation EPYC 64C 2GHz, AMD Instinct MI250X, Slingshot-11, HPE Pawsey Supercomputing Centre, Kensington, Western Australia Australia	181,248	27.16	477	56.983
5	77	<b>Dardel GPU</b> - HPE Cray EX235a, AMD Optimized 3rd Generation EPYC 64C 2GHz, AMD Instinct MI250X, Slingshot-11, HPE KTH - Royal Institute of Technology Sweden	52,864	8.26	146	56.491



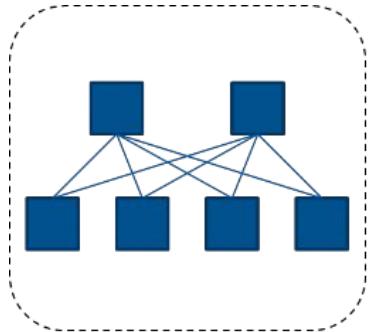
Energy VS  
Performance



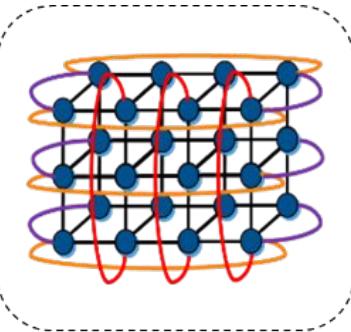
Handicaps



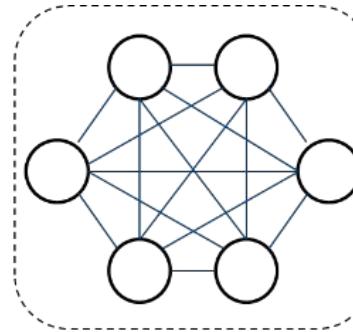
Memory



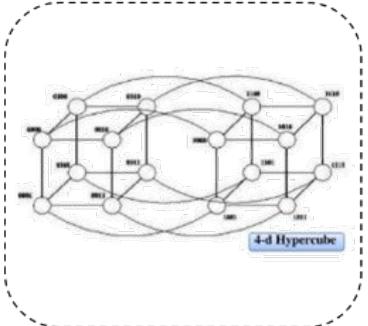
Fat Tree



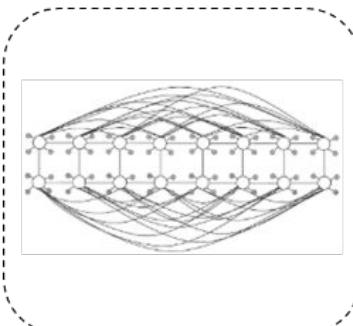
Torus



Dragonfly

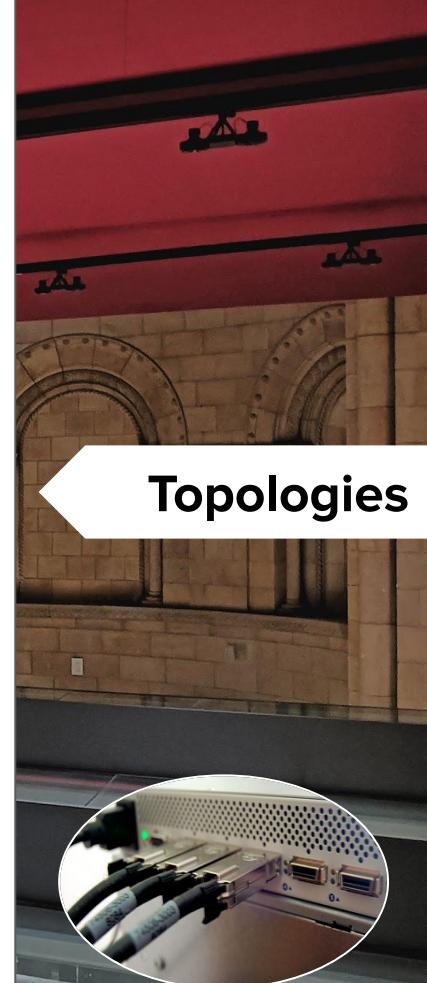


Hypercube



HyperX

Topologies

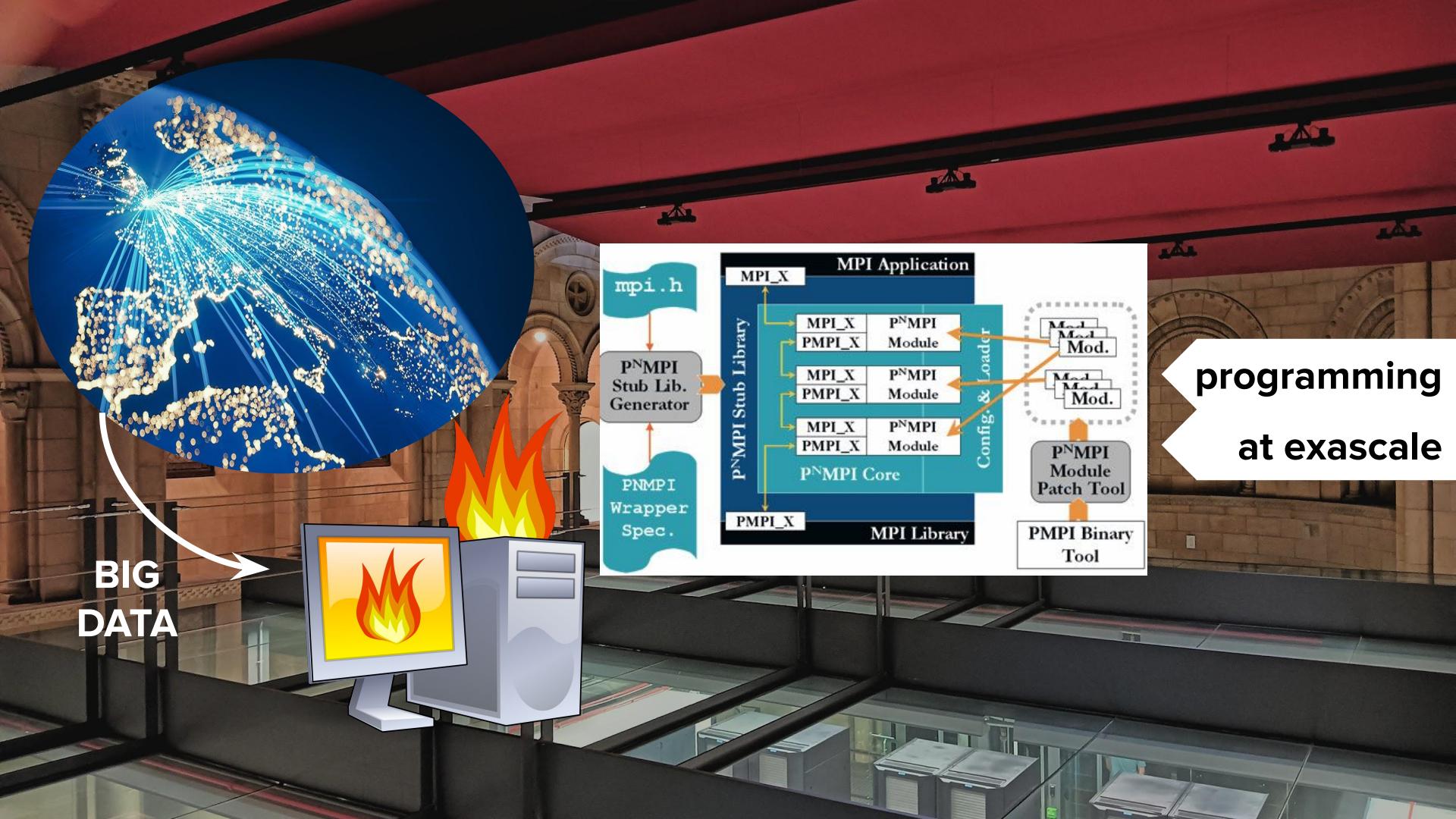


\*\*\* Hardware Malfunction  
call your hardware vendor for support  
\*\*\* The system has halted \*\*\*

Redirect



sys resilience





It's all about  
business



