



LUMI

The pan-European supercomputer of the North

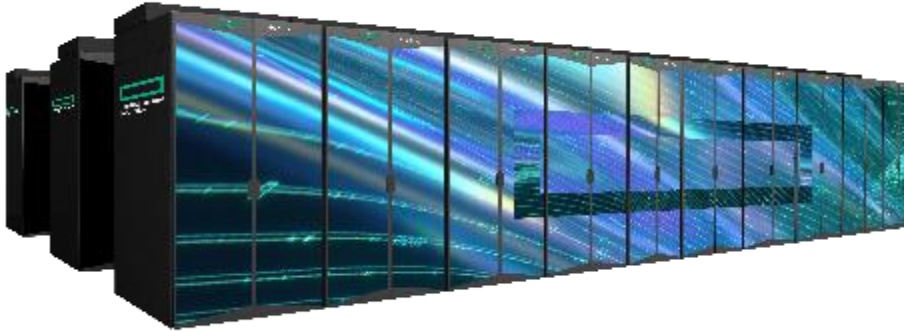
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Dr. Pekka Manninen
Director, LUMI Leadership Computing Facility
CSC – IT Center for Science, Finland
Adjunct Professor, University of Helsinki

The EuroHPC Initiative

- The **EuroHPC Joint Undertaking** will pool EU and national resources in high-performance computing (HPC)
 - **acquiring and providing a world-class supercomputing and data infrastructure** for Europe's scientific, industrial and public users
 - supporting an ambitious **research and innovation agenda**
- The EuroHPC declaration has been signed by **32 European countries**
- The first generation of EuroHPC systems announced in June 2019
 - 3 pre-exascale systems to Finland, Italy and Spain
 - 5 petascale systems to Czech Republic, Bulgaria, Luxembourg, Portugal and Slovenia
- Next generations of systems planned for 2023-2024 and 2026-2027

LUMI: one of the fastest supercomputers in the world



- LUMI will be an **HPE Cray EX** supercomputer manufactured by **Hewlett Packard Enterprise**
- Peak performance over **550 petaflop/s** makes the system one of the world's fastest
 - Fastest today is Fugaku supercomputer in Japan with 513 petaflop/s, second fastest Summit in USA with 200 petaflop/s)

1 system
550
Pflop/s
Peak Performance

Computing power
equivalent to
1 500 000
Modern laptop computers



Size of a tennis court

Modern platform for
High-performance
computing,
Artificial intelligence,
Data analytics
Based on GPU technology

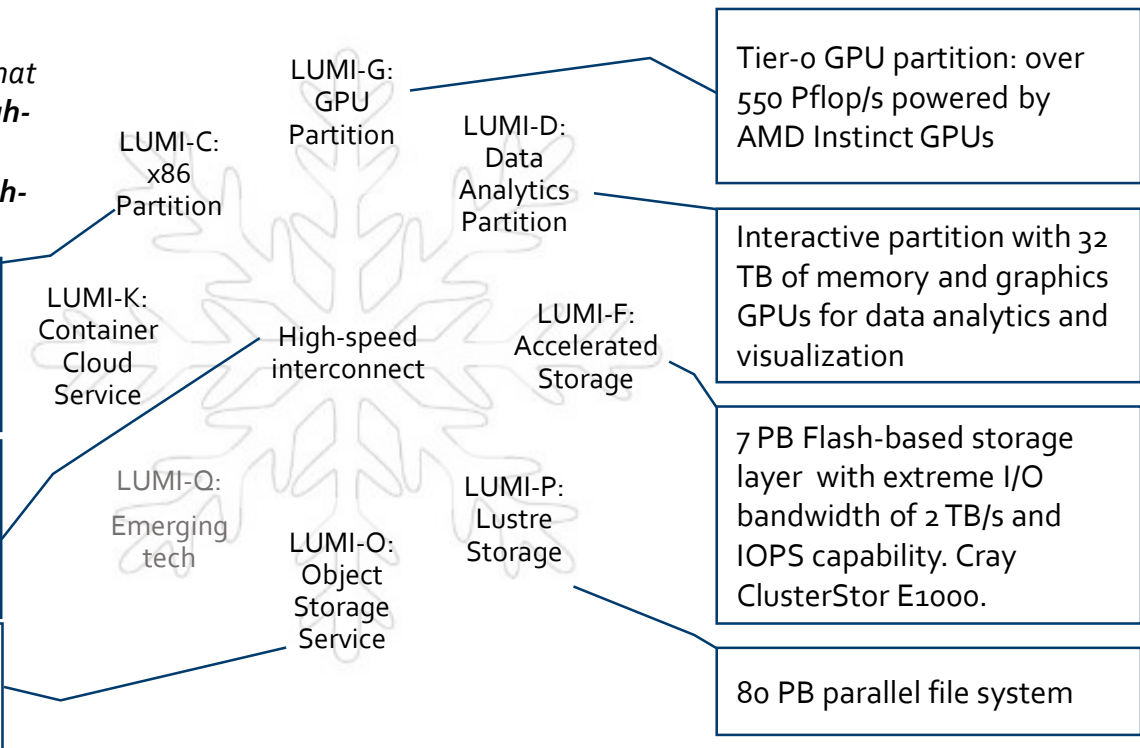
LUMI, the Queen of the North

LUMI is a Tier-0 GPU-accelerated supercomputer that enables the convergence of high-performance computing, artificial intelligence, and high-performance data analytics.

- Supplementary CPU partition
- ~200,000 AMD EPYC CPU cores

Possibility for combining different resources within a single run. HPE Slingshot technology.

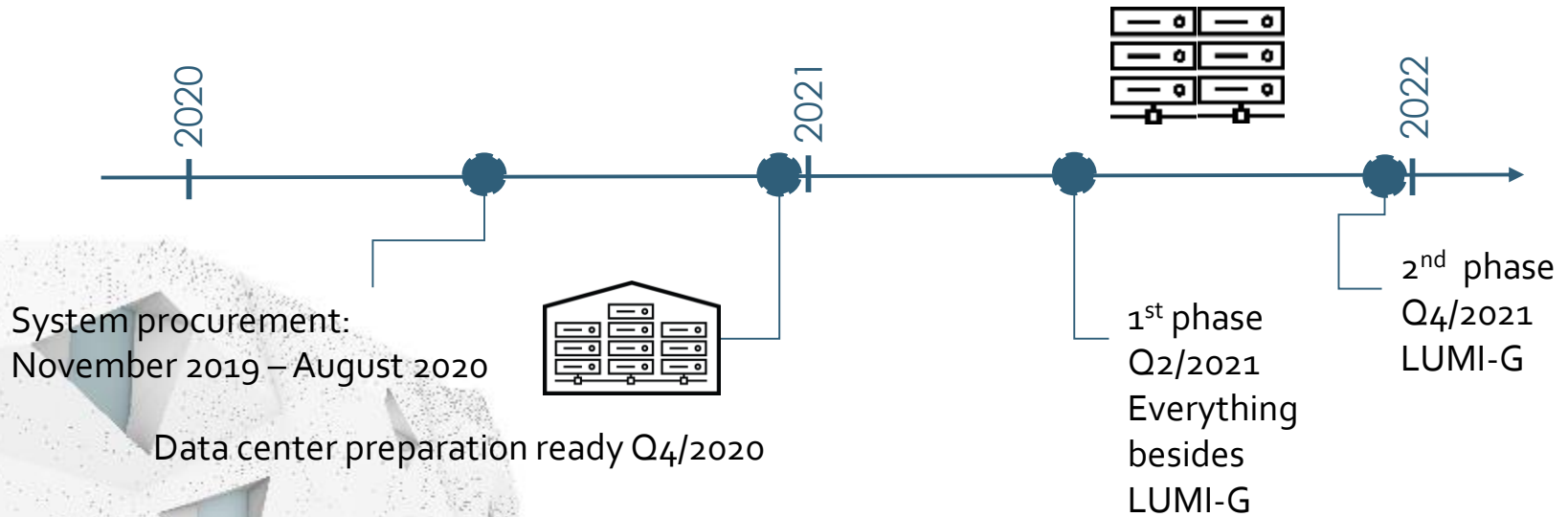
30 PB encrypted object storage (Ceph) for storing, sharing and staging data



LUMI capacities, a brief summary

- Extreme computing capacity based on LUMI-G and LUMI-C partitions
 - LUMI queue policies will support jobs from single CPU core or a GPU to 50% of the nodes, even 100% with special arrangements
 - Jobs can combine resources from both sides within a workflow, even within the same executable
- Interactive use (visualization, data analysis, pre/post processing,..) on LUMI-D
- Broad stack of pre-installed scientific software, databases and datasets, both commercial and community
- Sharing datasets over LUMI-O service
- Running microservices on LUMI-K
- Exploring the quantum computing world with LUMI-Q

LUMI Timeline



Enterprise use of LUMI resources

- Up to 20% of LUMI's capacity is reserved for industry and SMEs
- New R&D&I opportunities are available utilizing world-class HPC resources combined with data-analytics and AI capabilities
- Novel co-operation possibilities for enterprises with universities and research centers
- Business Finland's Business AI program provides free-of-charge computing resources for startups and SMEs for significant research projects
- Computing resources can also be used in co-innovation projects of companies and academia
 - Resources arranged through academic PIs in these cases