

Met Office cold storage future:

Tape or cloud?

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Supercomputing Architect



What is the Met Office?

“

*To work at the forefront of weather and climate science for **protection, prosperity and well-being***

”



UK Government

UK
Government



International
community

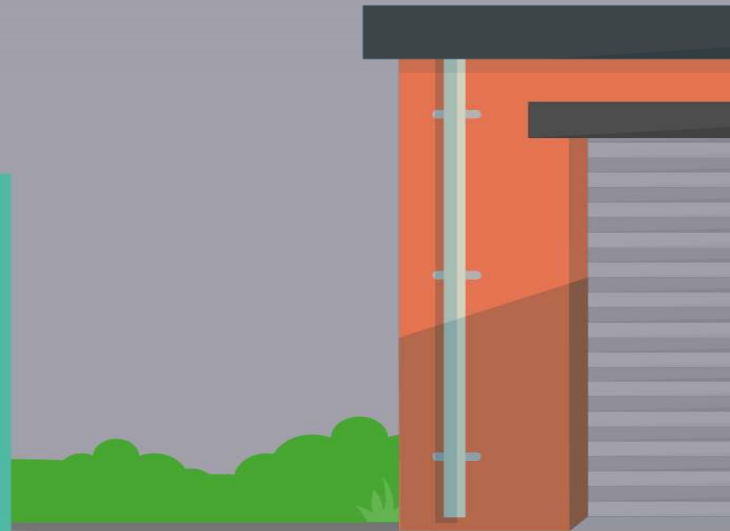


World-leading
science



Commercial
business

Met Office Data Challenge



Exponential Growth

Grains of sand...

a mug full
(25th square)



the volume of a person
(33rd square)



5th largest container ship in the world
(53rd square)



1	2	4	8	16	32	64	128
256	512	1024	2048	4096	8192	16384	32768
65536	131K	262K	524K	1M	2M	4M	8M
16M	33M	67M	134M	268M	536M	1G	2G
4G	8G	17G	34G	68G	137G	274G	549G
1T	2T	4T	8T	17T	35T	70T	140T
281T	562T	1P	2P	4P	9P	18P	36P
72P	144P	288P	576P	1E	2E	4E	9E

a teaspoon full
(16th square)



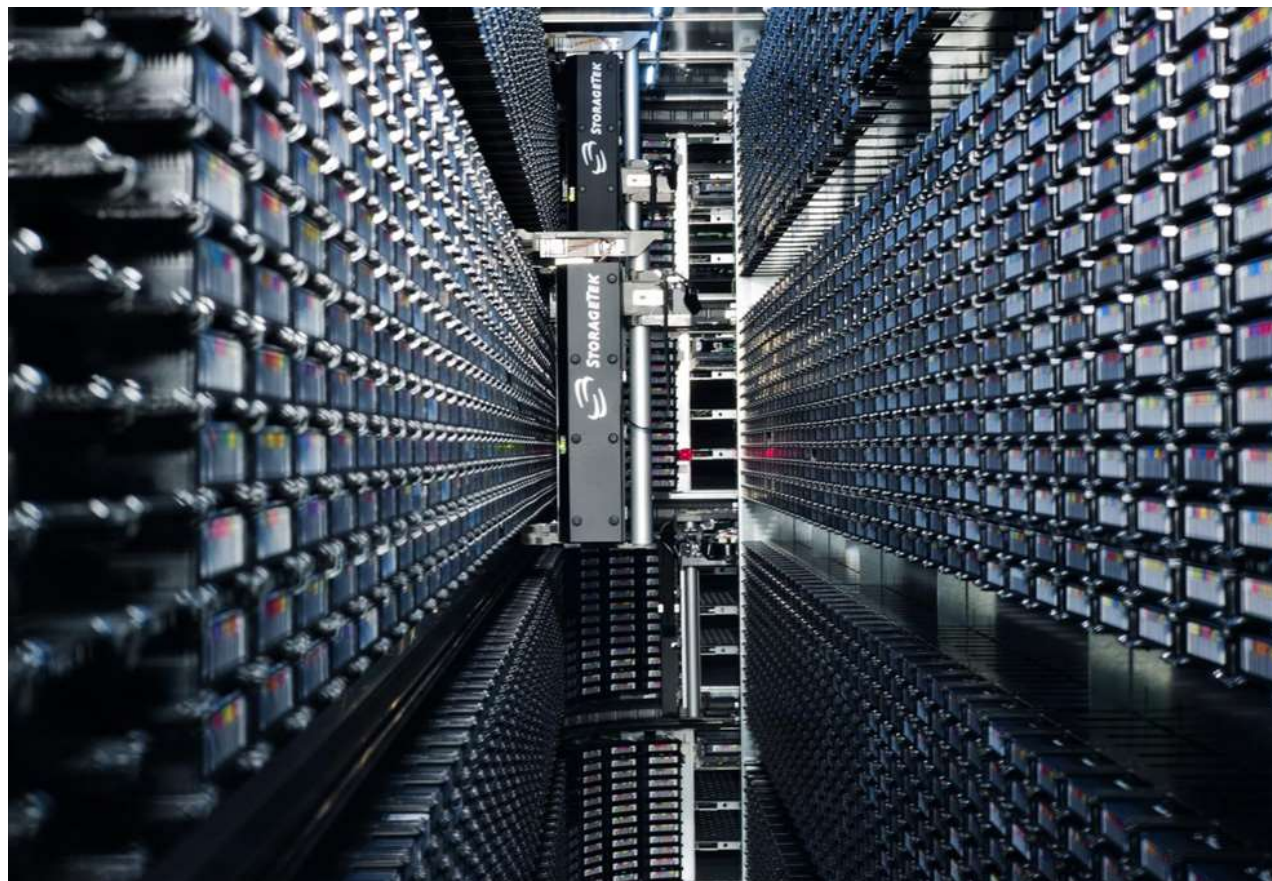
in a cargo container
(39th square)

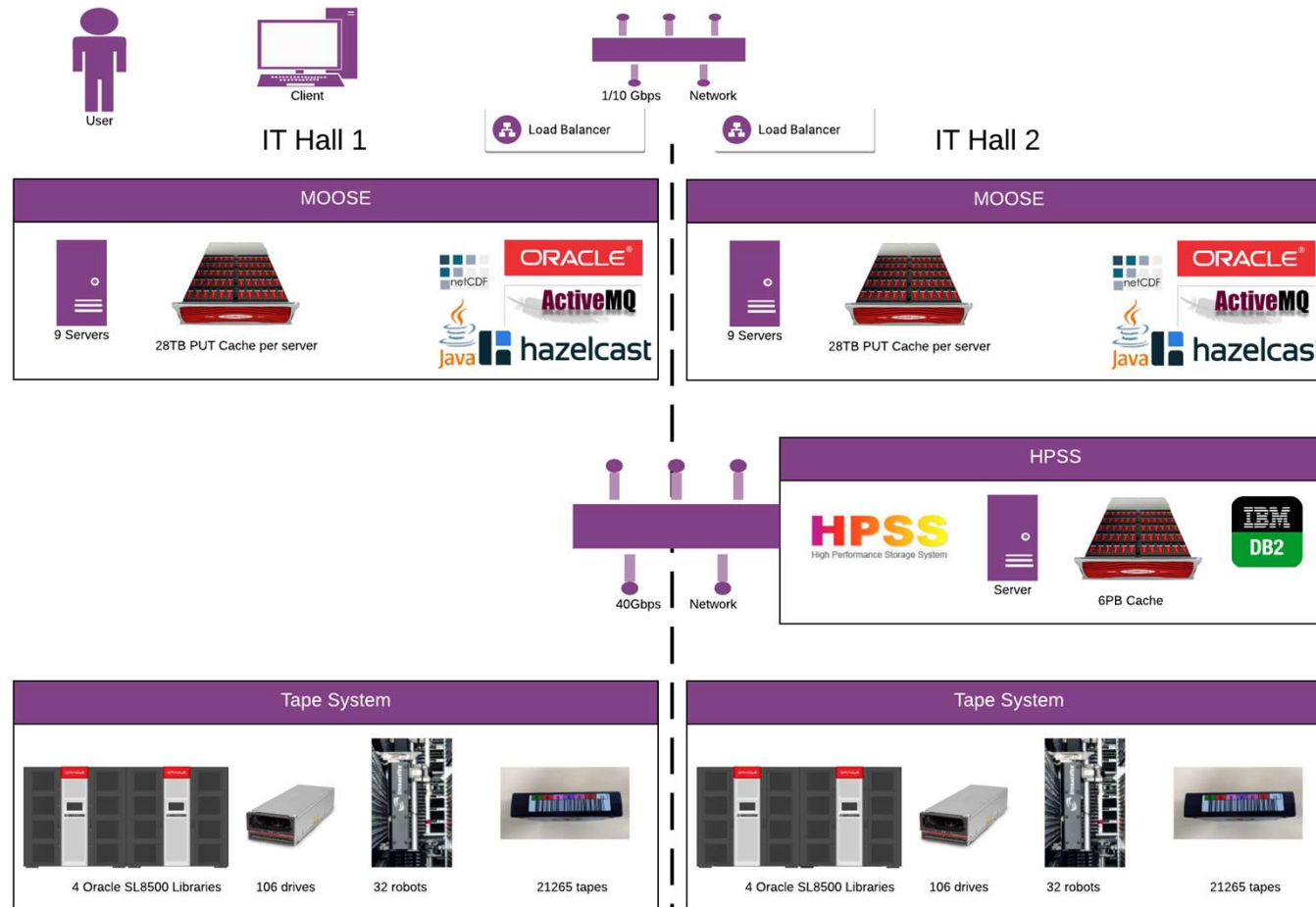


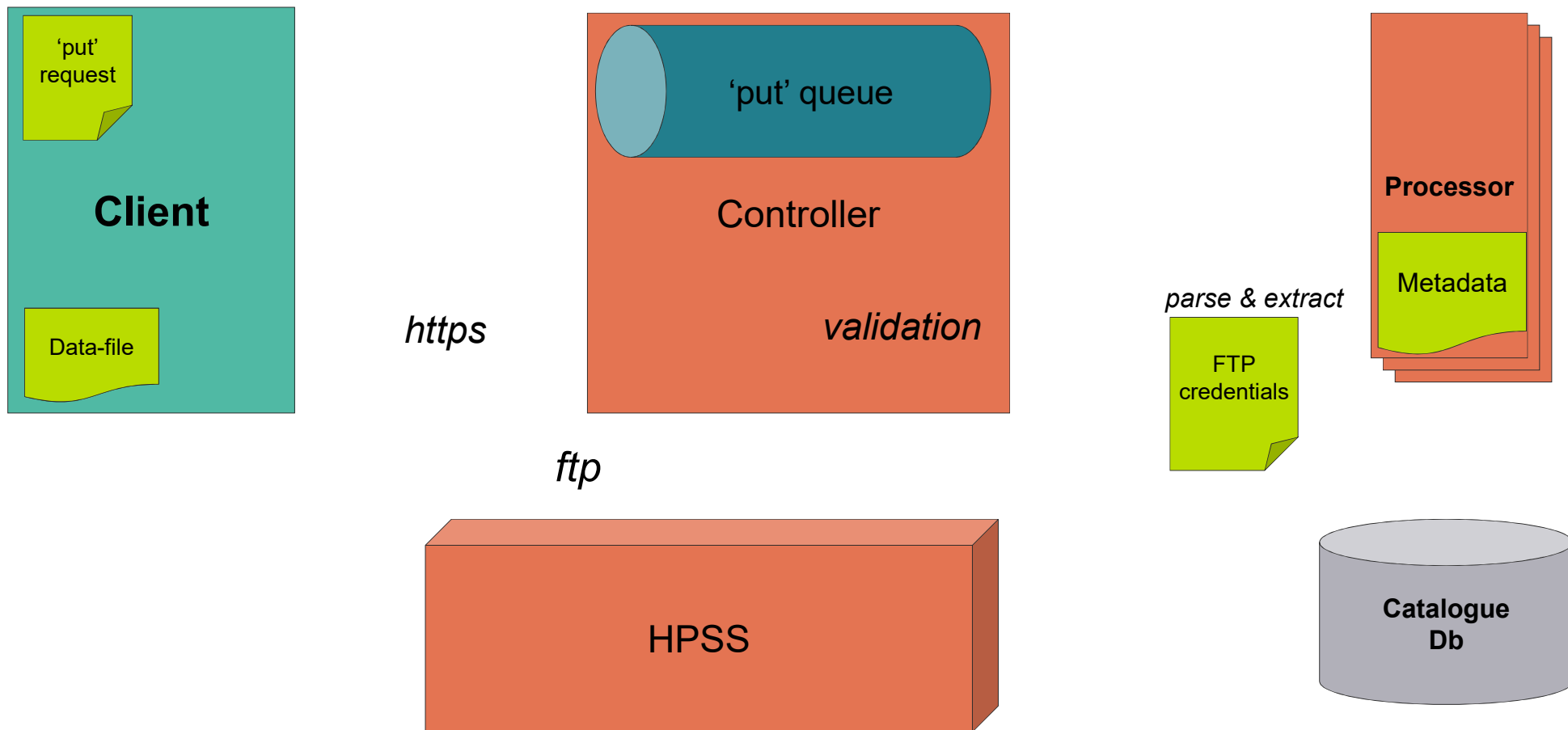
TWICE the worldwide container ship capacity
(64th square)

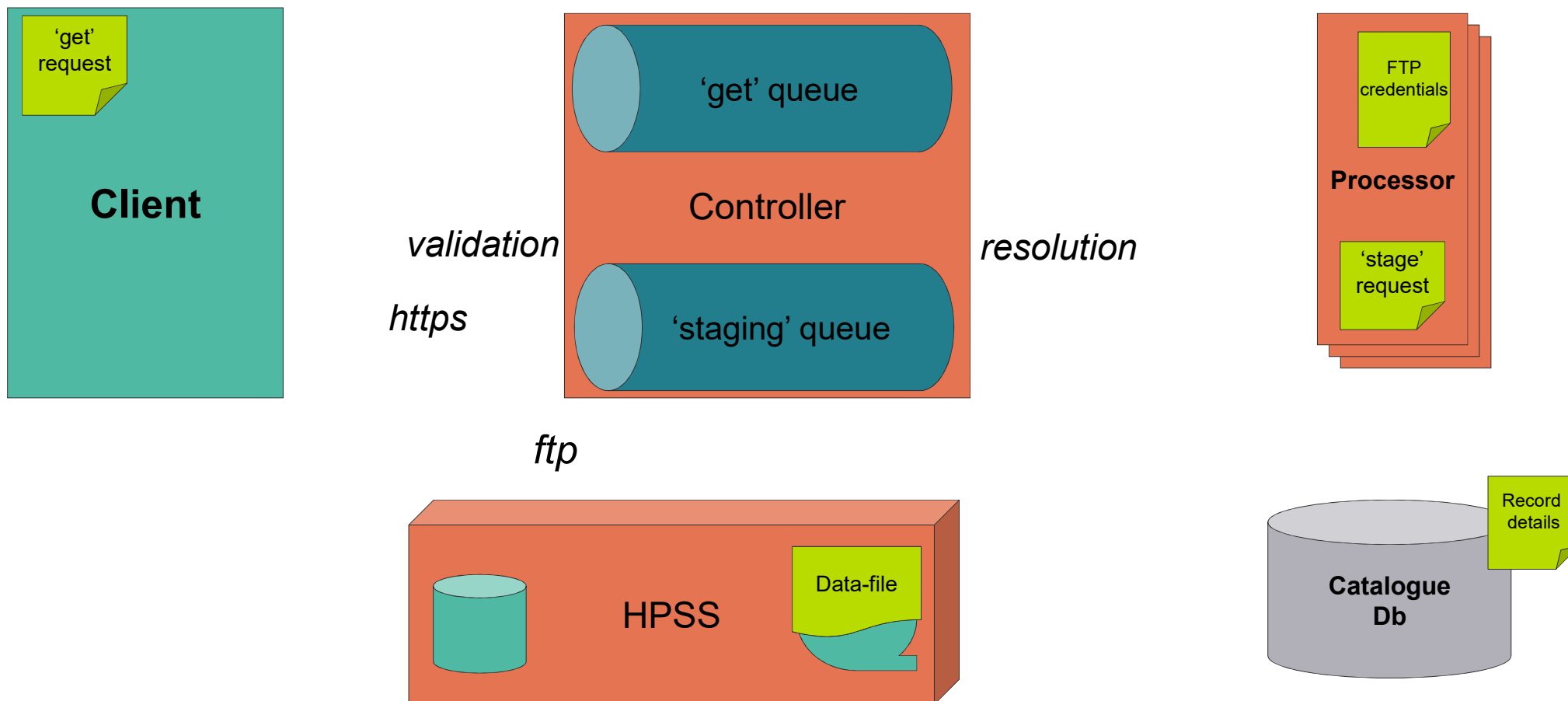


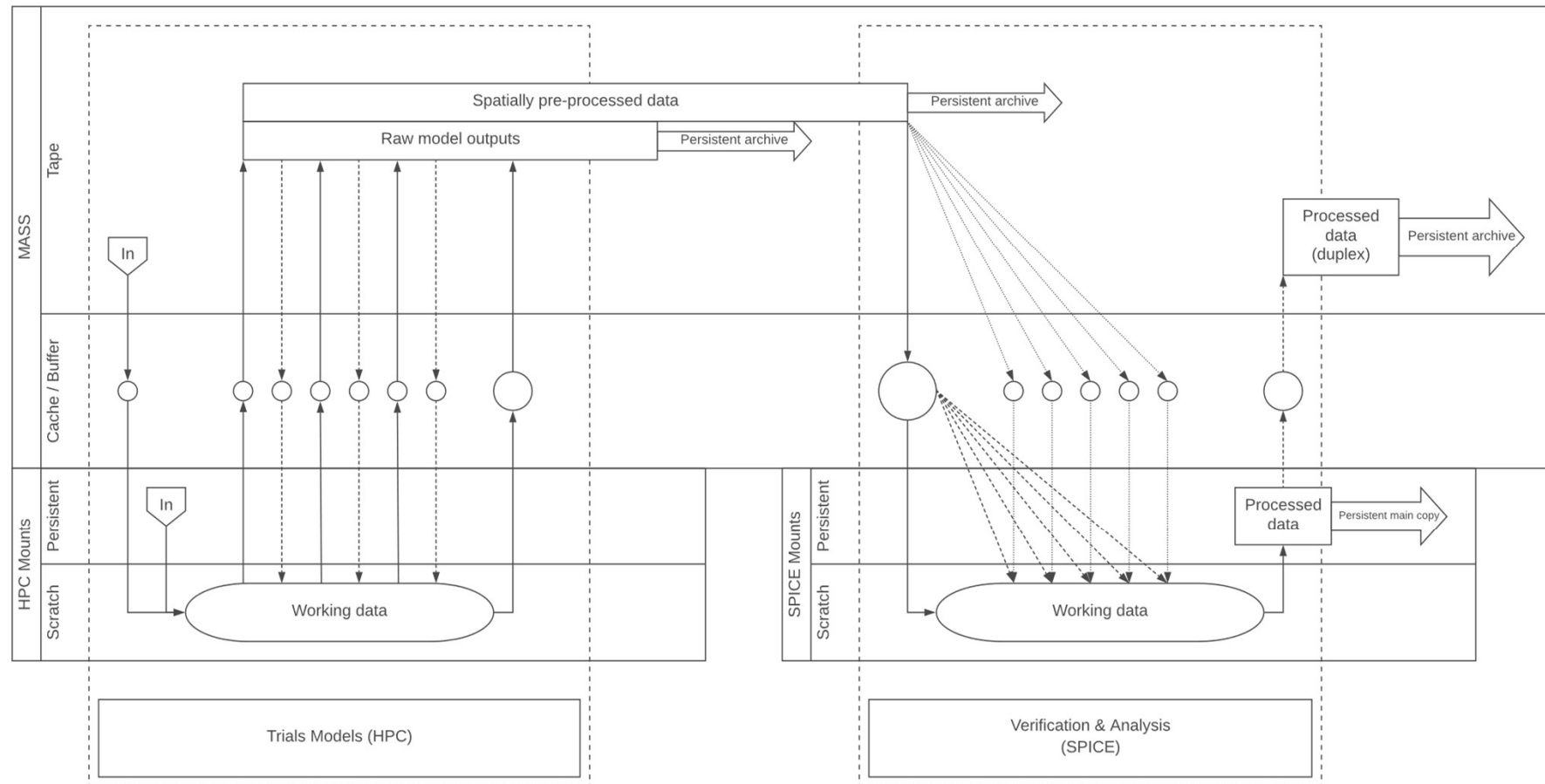
Primary Data	150PB
Replicated Data	120PB
Growth (Average)	200TB/Day
Libraries (SL8500)	8
Slots	76200
Robots	64
Drives (T10000D)	212
Tapes (T10000)	42530
Tape Capacity (TB)	10
Total Capacity (TB)	425300
HPSS Cache (DDN)	6PB



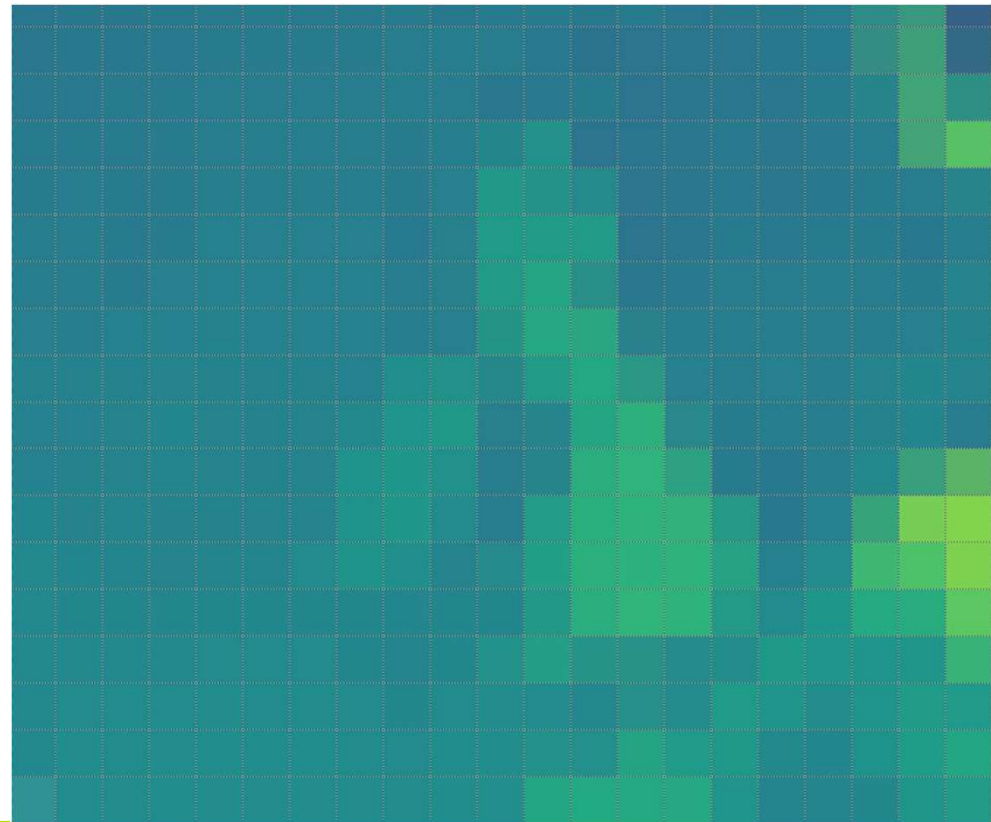




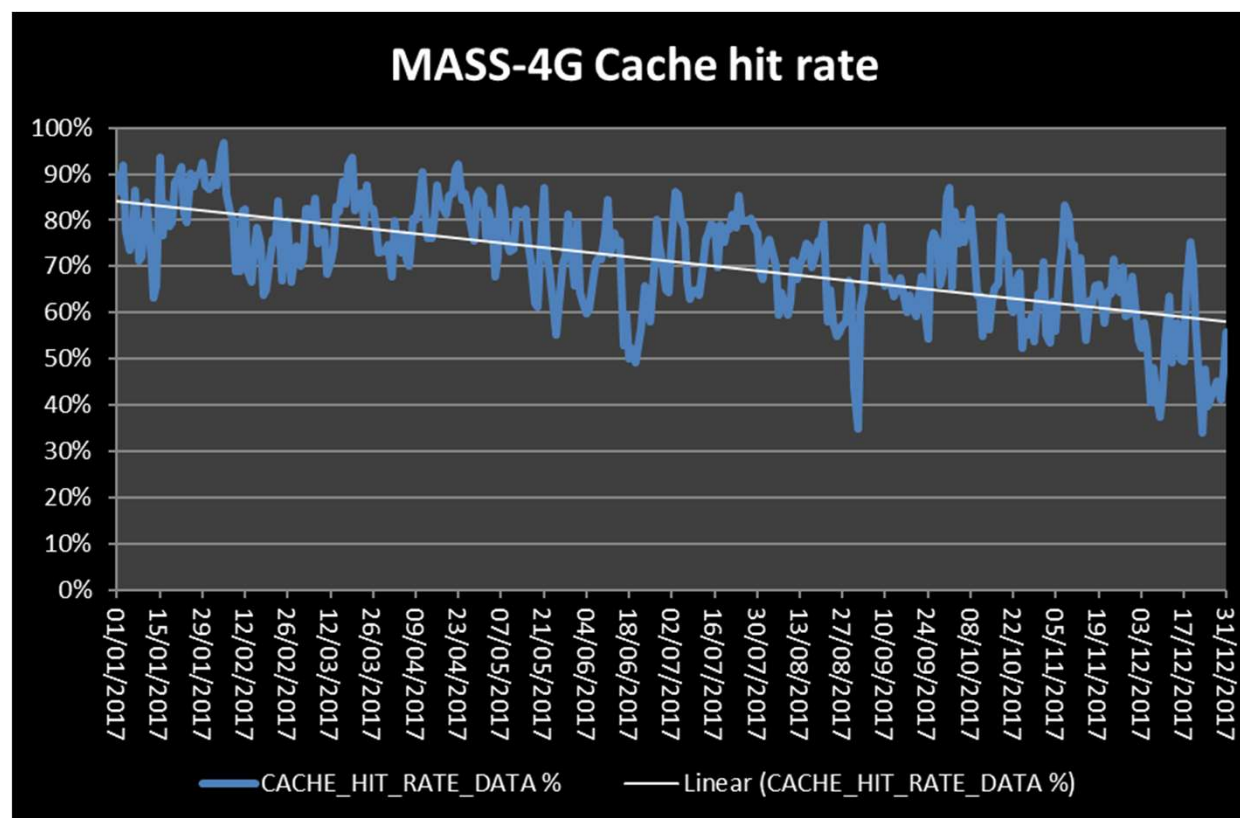
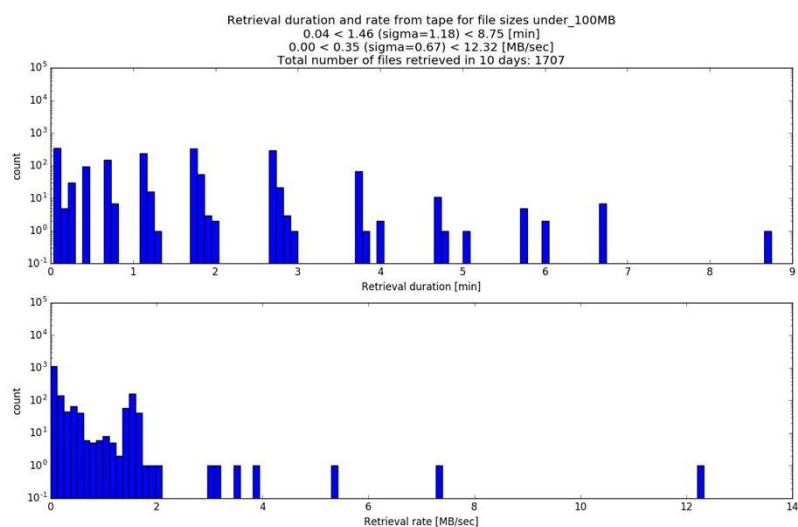




Retrieval bottlenecks for models with boundary conditions



Small file performance and low cache hit rate



“Private cache” usage



Improved FILTER usage



Consider cloud solutions before alternatives

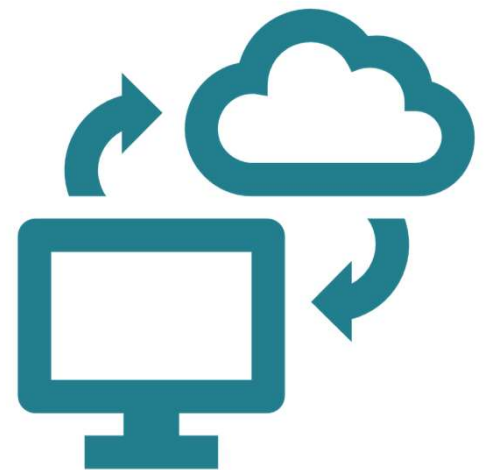
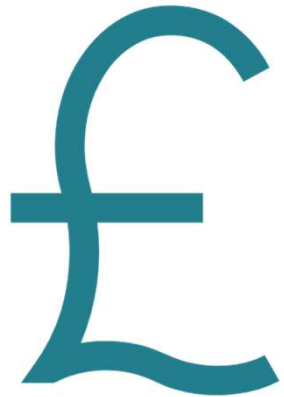
When procuring new or existing services, public sector organisations should consider and fully evaluate potential cloud solutions first before considering any other option. This approach is mandatory for central government and strongly recommended to the wider public sector.

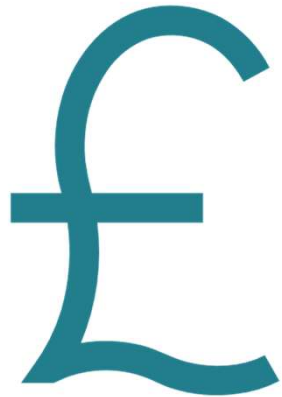
Public cloud first

By Cloud First, we mean the public cloud rather than a community, hybrid or private deployment model. There are circumstances where the other deployment models are appropriate but the primary benefits for government come when we embrace the public cloud.



Inevitable





1. Collected costs
2. Compared of cost against current system
3. Looked at future capacity and potential costs



1. MOOSE is not just an abstraction layer
 - a) It also does significant performance optimisation and will be difficult to fit with cloud
2. Critical part of research and operational workflows. This system has to work.
3. We would be the first HPC centre to do this.
4. Potential loss of world class skill in this area
5. Opportunity to do more analysis over large datasets



1. Volume
2. Durability
3. Performance

Thanks

Any questions?

