

Met Office HPC Update

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<p>HPC1</p>	<p>HPC2</p>	<p>HPC4: XCK</p>
<p>Name: XCE Cray XC40</p>	<p>Name: XCF Cray XC40</p>	<p>HPC4: XCT</p>
<p>2.8 Petaflops 1.5MW</p>	<p>2.8 Petaflops 1.5MW</p>	<p>HPC4: GW4</p>
<p>109,376 Cores* 385TB RAM</p>	<p>109,376 Cores* 385TB RAM</p>	<p>Auxiliary Test Systems: XCK: Knights Landing XCT: Test XC40 GW4: ARM Testbed</p>
<p>4PB Sonnexion</p>	<p>9PB Sonnexion</p>	
<p>IT Hall 1</p>	<p>IT Hall 2</p>	

Total Multi-Site Capability:
 12.6 Petaflops
 5.2-5.5MW
 460,672 Cores
 1.6PB RAM
 27PB Sonnexion

<p>HPC3</p>
<p>Name: XCS Cray XC40 7 Petaflops 2.2-2.5MW 241,920 Cores** 840TB RAM 14PB Sonnexion</p>
<p>IT Hall 3</p>

*89,856 Broadwell, 19,520 Haswell

**241,920 Broadwell

insufficient
power to site

ageing
electrical infrastructure

limited
resilient churn space

procurement
conveyor-belt



```
504     doChangeState: function(state, btn) {  
505         var doChangeState = function() {  
506             if (cur.changingGroupState) return;  
507             function participate(yes) {  
508                 if (yes) {  
509                     val('members_count', cur.count_val,  
510                         replaceClass(btn, 'color1_bg', 'color2_bg', btn),  
511                         val(btn, cur.unsubscribe_lang),  
512                         setStyle('aria_row', 'left', btn)  
513                 } else {  
514                     val('members_count', cur.count_val,  
515                         replaceClass(btn, 'color2_bg', 'color1_bg', btn),  
516                         val(btn, cur.subscribe_lang),  
517                         setStyle('aria_row', 'left', btn)  
518                 }  
519             }  
520             cur.changingGroupState = true;  
521             lockButton(btn);  
522             if (cur.noAuth) {  
523                 widgets.auth();  
524                 window.postMessage({type: 'auth_req', data: {url: window.location.href}});  
525                 if (window.location.protocol === 'https:') {  
526                     setStyle('aria_row', 'left', btn);  
527                 }  
528             }  
529         }  
530     }  
531 }  
532
```

10-year investment of
£1.2bn

in advancing Weather & Climate Science & Services

fully managed service from
Microsoft

a completely new delivery & operating model

100% remains operational
within the UK

an important aspect of post-Brexit R&I investment

100% powered through
carbon neutral

sources including operational capabilities

delivered as
two generations

with a complete mid-term technology refresh

up to 18x greater
Supercomputing

capacity over 10 years – 6x then 3x

next generation high performance
MASS

data storage & archiving platform

enhanced & extensible
SPICE / VDI

scientific compute platforms

```
503     doChangeState: function(state, btn) {  
504         var doChangeState = function() {  
505             if (cur.changingGroupState) return;  
506             function participate(yes) {  
507                 if (yes) {  
508                     val('members_count', cur.count_tot,  
509                         replaceClass(btn, 'color_1g', 'color_1g color_2g'));  
510                     val(btn, cur.unsubscribe_lang);  
511                     setStyle('ania_row', 'left', 0);  
512                 } else {  
513                     val('members_count', cur.count_tot,  
514                         replaceClass(btn, 'color_1g color_2g', 'color_1g'));  
515                     val(btn, cur.subscribe_lang);  
516                     setStyle('ania_row', 'left', 0);  
517                 }  
518                 cur.changingGroupState = true;  
519                 lockButton(btn);  
520                 if (cur.noAuth) {  
521                     widgets.empty();  
522                     window.postMessage({type: 'auth_req', data: {url: cur.authUrl}});  
523                     if (authorized == 0) {  
524                         setLanguage(window.location.href);  
525                     }  
526                 }  
527             }  
528             participate(true);  
529         }  
530     }  
531 }  
532
```

6x performance
generation 1

~3000 Milan & ~7000 Genoa nodes

delivered as
4 quadrants

across 2 geographically distinct hosting zones

file systems
lustre and gpfs

flash and disk tiers

high performance
slingshot interconnect

two-layer dragonfly topology

HPE PFSS home storage

1 PiB – all flash. Metadata optimised

HPE ClusterStor critical storage

> 7PiB, 650 GiB/s r/w – flash/disk

HPE ClusterStor research storage

> 32 PiB, 1 TiB/s rw – flash/disk

HPE ClusterStor collaboration storage

> 7 PiB, 230 GiB/s – all disk

Exeter Hall 1 & 2



Mainframe

Z (Dev)

Aux Services

EXPRESSROUTE
Managed
Network

UK Zone 1



[Azure UK South Availability Zone 1]



Supercomputing
Quadrant A

Supercomputing
Quadrant B

Azure
ClusterStor



X (Test)

PUT/GET

>10km

UK Zone 2



[Azure UK South Availability Zone 2]



Supercomputing
Quadrant C

Supercomputing
Quadrant D

Azure
ClusterStor

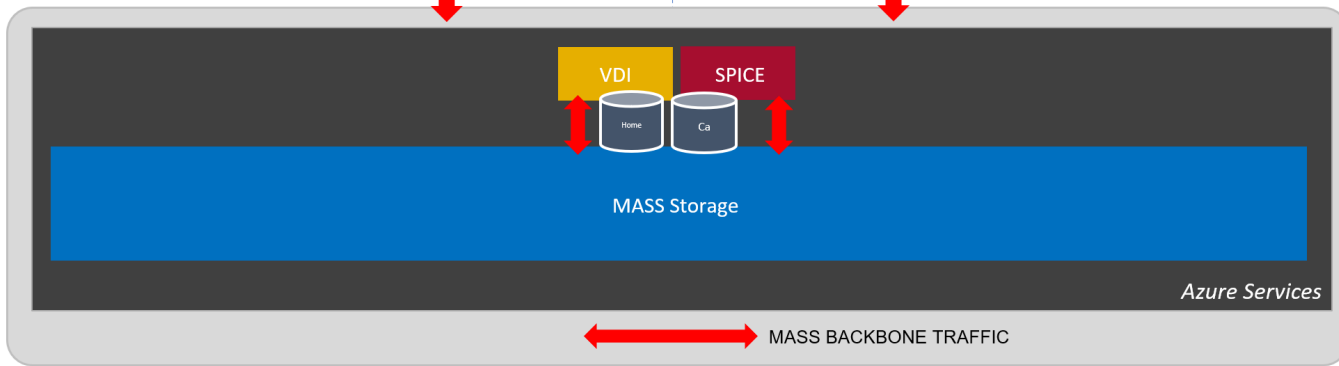


Y (Test)

PUT/GET

Storage System Key

- Critical (x2)
- Small-File (x1)
- Research (x2)
- Collaboration (x1)
- SPICE Campaign (x1)
- SPICE / VDI Home (x1)





completed
data centres and networks

installed
generation 1 quadrants

porting
on development system

preparing for
acceptance testing

early assurance
factory acceptance
complete

functionality
system integration
acceptance
in preparation

service
user acceptance
in preparation

operational service
commencement

Thank You!

