Supercomputing: a new era?

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With the beginning of the supercomputing era...
Requiring a huge amount of money, resources and skills
Against a backdrop of continuous performance development of IT systems, and significant challenges to innovation, there are a number of significant trends.

- **Massive Data**
  - Porting of codes
  - Parallel computing
  - Energy consumption

- **Access & Collaboration**
  - GPU / Multi-core
  - The Cloud

To meet an ever-increasing portfolio of needs, against a backdrop of continuous performance development, leveraging massive data through porting of codes, parallel computing, and energy consumption, is essential.
« Moving from being the smartest buyers of HPC to the smartest users of HPC »
The Cloud is changing everything

New ways to consume Performant Computing
- as a Service
- On-demand
- Elastic
- Configurable

New ways to produce Performant Computing
- Dynamic provisioning
- Automation
- Orchestration
- Customer Business Platform
Can we industrialise HPC in the same way as IT?

One type of aircraft (A320) → Standardized, commoditized data centers

Accelerated rotations → Server load maximized

Short and medium haul, direct routes → Catalogued applications and services

Single class → Defined service levels

Sale of tickets on the Internet → Services portals, APIs
More users, more services, new delivery models

- World-class centers
- Scientists
- Innovation
- Large corporations
- Production
- Central govt.
- Several months
- Small labs
- A few hours
- Research
- Marketing
- Several years
- Finance
- Regional centers
Delivering supercomputing as a service
The power of Cloud HPC

- Lower costs through shared, pooled resources
- New economic models
  - Opex based
- Lower entry barriers
  - No further investment in complex supercomputers
- Ability to share workloads within communities and industry sectors
- Sovereignty of data
- Workload elasticity
  - Large system simulation
  - Faster execution

The Cloud model provides an opportunity to industrialise and regulate usage of HPC within all industrial sectors, especially ‘the missing middle’
Inventing new applications and services

**Manufacturing and Services**

Accelerate innovation in all industry and services sectors including SMEs; *the great white horse*

**Culture and Multimedia**

Develop and deliver digital content (HD/3D); *exponential data*

**Social, Environment, Homeland Security**

Anticipate pandemic, ecological and food crisis, improve public safety: *critical national infrastructure*

**Healthcare**

Develop and provide new applications and services to support advanced health telemetrics; *wellbeing*
Commission Output through Cloud Models

Shared supercomputing platform

Added value services (Manufacturing & Svces)

Added value services (Healthcare)

Added value services (Social & Environment)

Added value services (Culture & Multimedia)

Applications (SaaS)

Customer Services Portal (Market Places)

Manufacturing & Services

Healthcare

Social & Environment

Culture & Multimedia

Extended Supply Chain Access (Private Cloud Service Provision)

Access & Collaboration will ultimately deliver next generation HPC
« Moving from being the smartest buyers of HPC to the smartest users of HPC »