HPC Experiment

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HPC in the UberCloud

Thanks to
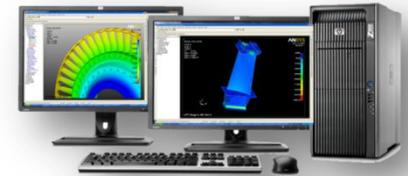
TABOR COMMUNICATIONS

HPCwire

HPC In the Cloud

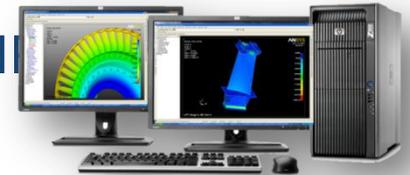Digital Manufacturing report

The UberCloud HPC Experiment Objective

For SMEs and their engineering applications

to jointly explore the end-to-end process

of accessing and using remote computing resources,

as a service, on demand,

and learning how to resolve the many roadblocks.

Why this Experiment ?

+ Foster use of **HPC** in Digital Manufacturing

+ Focus on: **remote** resources in HPC Centers & in HPC

+ Support initiatives from Intel, NCMS, and many others to uncover and support the '**missing middle**'

+ **Observation:** business clouds are becoming widely accepted, but acceptance of simulation clouds in industry is still in early adopter stage (CAE, Bio, Finance, Oil & Gas, DCC)

+ **Barriers:** Complexity, IP, data transfer, software licenses, performance, specific system requirements, data security, interoperability, cost, etc.

Goals for this Experiment

+ Build an **open community** around HPC as a Service

+ Find the **best process** for an end-user to get into HPC as a Service

+ Hands-on, exploring and understanding the **challenges** with Digital Manufacturing as a Service

+ Study each step of the end-to-end process of accessing and using remote computing resources and find ways to overcome the **challenges**

+ **document** our findings, roadblocks, lessons learned, and recommendations
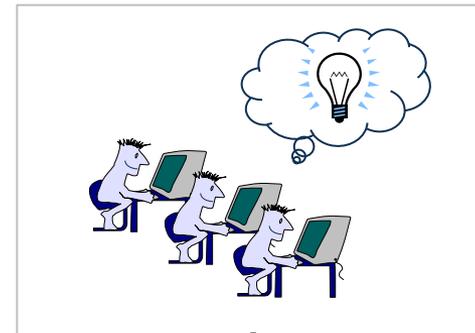
Where are we with the experiment

+ Started last August: Now Round 2: currently **330 participating** organizations and individuals

+ Experiment reaches to every corner of the globe, participants are coming from **29 countries**

+ **Registration** at: www.hpcexperiment.com and www.cfdexperiment.com and www.compbioexperiment.com

+ **59 teams** have been formed in Rounds 1 & 2

+ **Round 3** in preparation, start April 1, 2013

Some statistics of Round 1 (completed)

+ 160 registered participants (today: 330) from 25 countries

+ 36 end-users, 38 experts, 20 ISVs, 17 resource providers, 20 offering edu & training, 29 'observers' = 99 HPC + 61 CAE

+ Status of the Round 1 Teams, end of October:
  + 15 – successfully completed in time
  + 1 – monitoring application execution
  + 1 – starting first job execution
  + 3 – setting up the team (late-comers)
  + 5 – stalled

Participants
Some of our Resource Providers

Media Sponsor

Participants
Some of our Software Providers

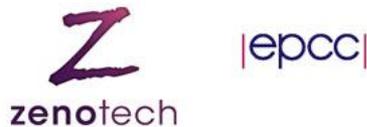Some of our ISVs want to be anonymous

Participants
Some of our HPC Experts

Some of our HPC Experts want to be anonymous

Building the teams

+ **You register as End-User, Software Provider, Resource Provider, or an Expert, and provide your profile**

+ **End-User** joins the experiment; we ask the **ISV** to join

+ We select a suitable **Team Expert** from our database

+ End-User and Expert analyze **resource requirements**

+ We suggest a computational **Resource Provider**

+ After all four team members agree, the team is **ready to go**

Team Work
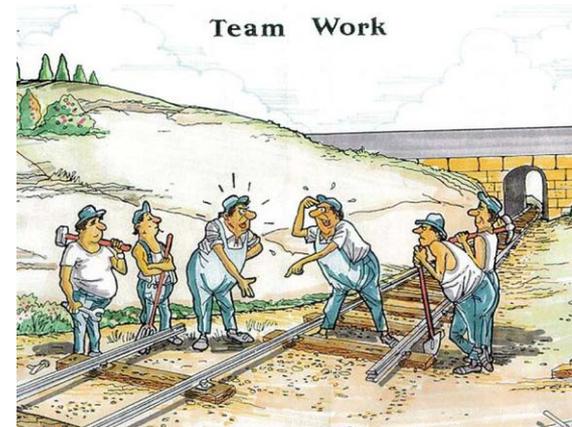
Teams, it's all about teams
20 teams from Round 1:

+ Anchor Bolt
+ Resonance
+ Radiofrequency
+ Supersonic
+ Liquid-Gas
+ Wing-Flow
+ Ship-Hull

+ Cement Flow
+ Sprinkler
+ Space Capsule
+ Car Acoustics
+ Dosimetry
+ Weathermen

+ Wind Turbines
+ Combustion
+ Blood Flow
+ ChinaCFD
+ Gas Bubbles
+ Side impact
+ ColombiaBio

Bumps on the road

+ Time delays: Vacation times get in the way;

plus everybody has a day job

+ No standards: Access and usage processes of providers are different, some complex

+ Hands-on: Process automation at our providers vary greatly.

+ Lack of automation: Currently the end-to-end process is manual (intentionally).

+ Participants spent only small portion of their time, some are responsive, others are not.

+ Getting regular updates from Team Experts is a challenge **because this is not their day job !**

Are we discovering hurdles?

+ Reaching out to industry **end-users** who are ready and willing to engage in HPC and especially HPC as a Service

+ About half of our participants want to remain **anonymous**, for different reasons (policies, internal processes, failure…)

+ **HPC is complex**; at times it requires multiple experts

+ **Matching** participants is critical to a team's success

+ Resource providers (e.g. HPC Centers) often face **internal policies**, legal hurdles, licenses,…

+ **Barriers:** Complexity, IP, data transfer, software licenses, performance, specific system requirements, security, interoperability, cost, etc.

WARNING

CHALLENGES AHEAD

Now Planning the UberCloud HPC Experiment Round 3

+ April – June 2013

+ Expecting 500 organizations, ready for 30 more teams

+ More professional, more automation, more user-friendly

+ Extending applications: HPC, CAE, Life Sciences, Big Data

+ Better guidance: more detailed 25-steps end-to-end

+ Better Basecamp 'team rooms' for collaboration

+ Growing the UberCloud Exhibit services directory for our service providers, community-wide

+ 3-level support: front line (within a team), 2nd level (UberCloud Mentors), 3rd level (software & hardware providers)
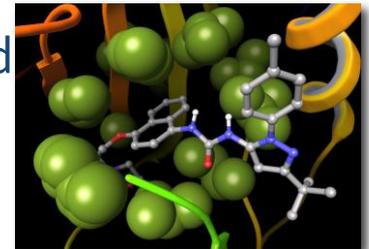
Why would you want to join?

+ HPC as a Service is the next big thing, great benefits are looking for you

+ HPC is complex; together it is easier to tackle the complexity

+ Barrier of entry through an experiment is low

+ Learning by doing; experimenting without risk; no failure

+ Becoming an active part of this growing community

+ Exploring the end-to-end process and learning how this fits into your research and/or business direction in the near future

HPC Experiment

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Thank You