Advanced Digital Manufacturing

From Design to the Internet of Things

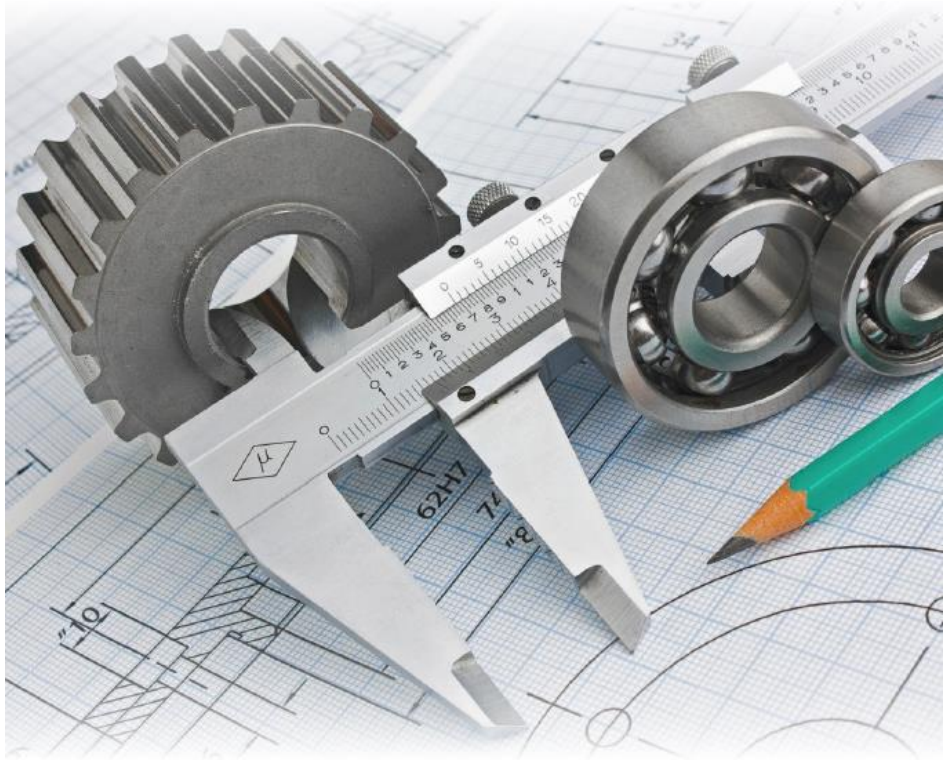
International Conference on Design and Production Engineering

Berlin, July 25 – 26, 2016



Wolfgang Gentzsch
Co-Founder & President
The UberCloud Inc.
Sunnyvale, CA

Advanced Digital Manufacturing From Design to the Internet of Things



Advanced Digital Manufacturing
From Design to the Internet of Things

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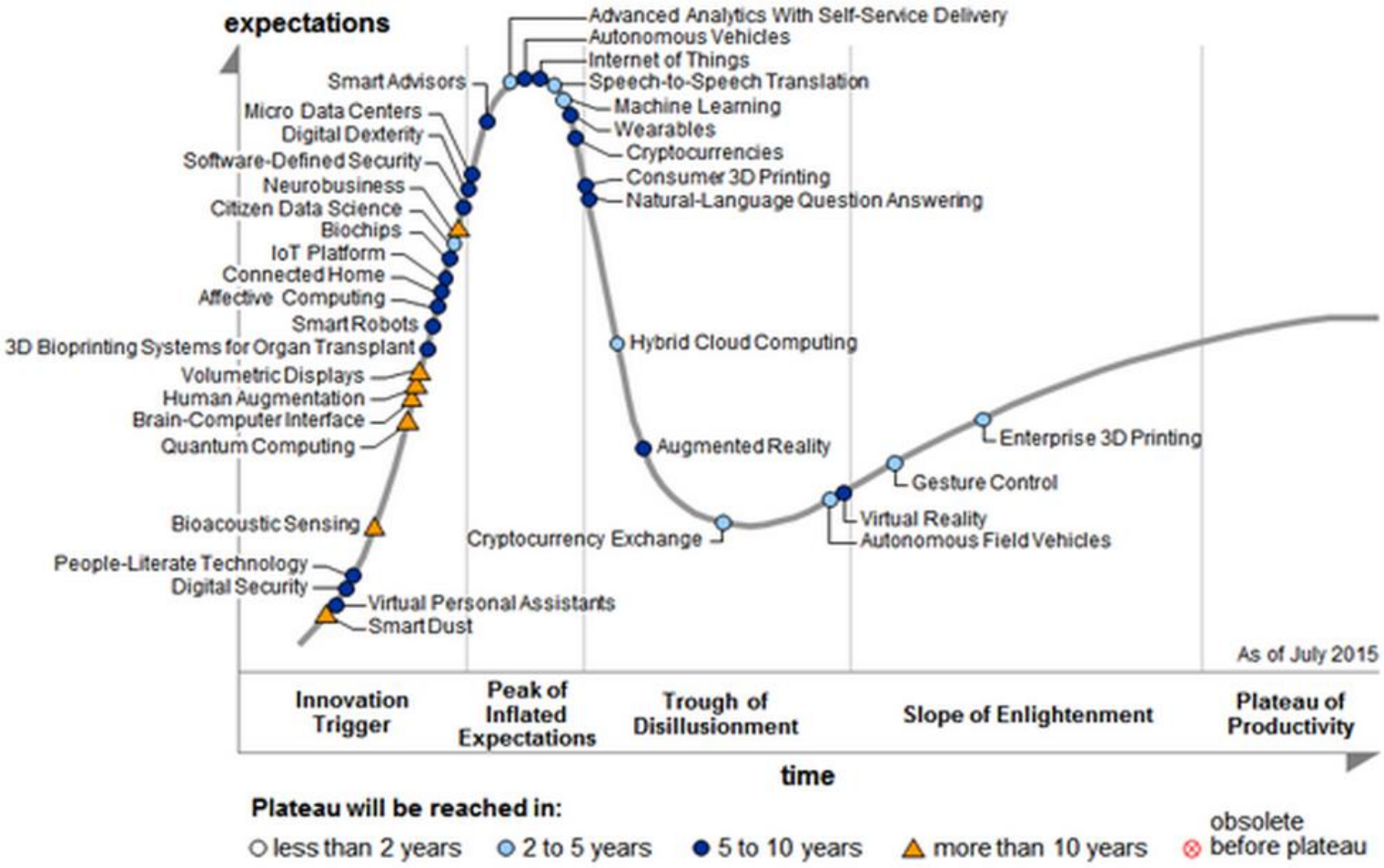
Florence Cathedral



Filippo Brunelleschi

Gartner Hype Cycle for Emerging Technologies

Figure 1. Hype Cycle for Emerging Technologies, 2015

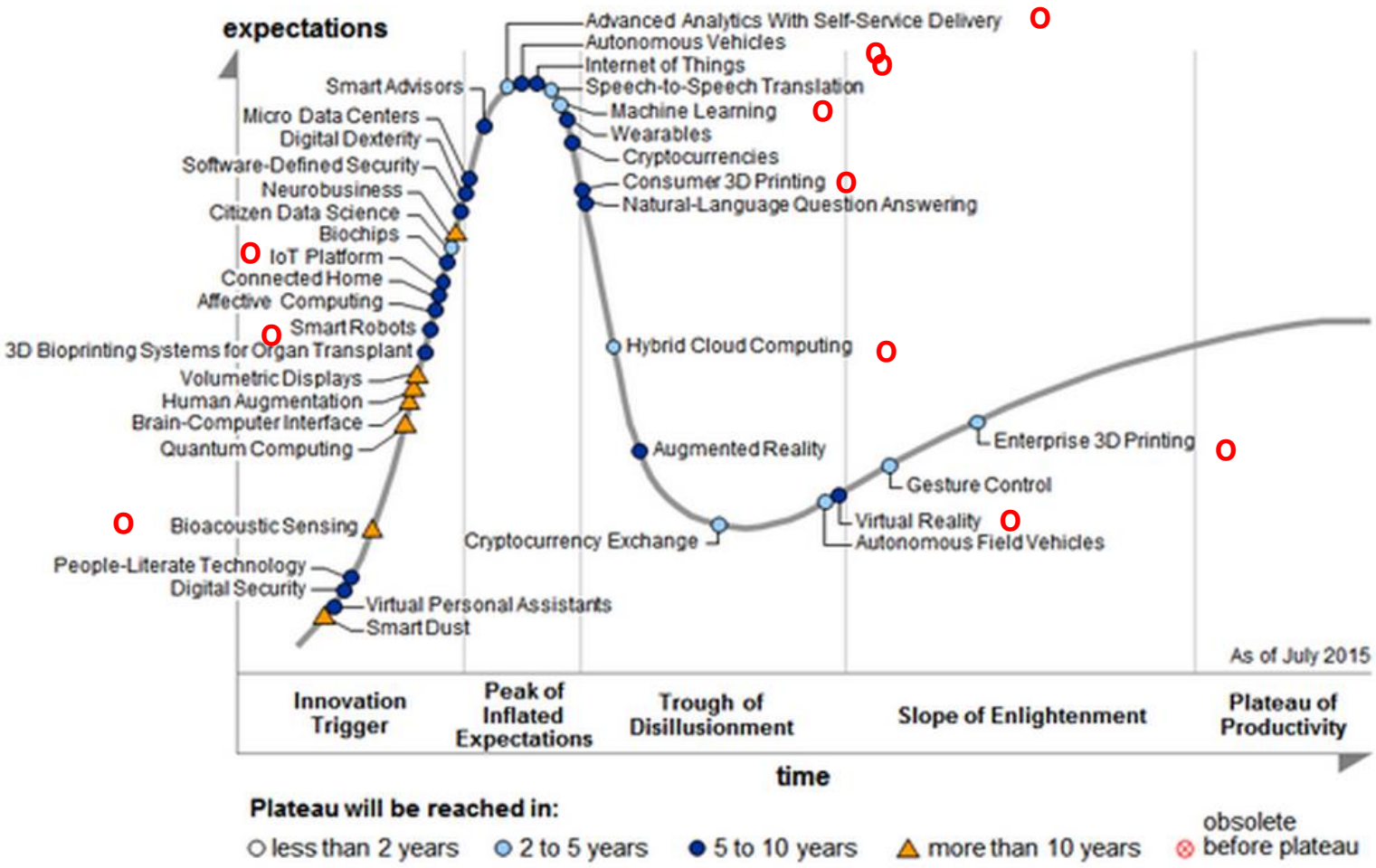


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Gartner Hype Cycle for Emerging Technologies

Figure 1. Hype Cycle for Emerging Technologies, 2015

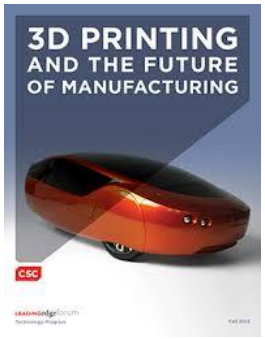
O Advanced Manufacturing



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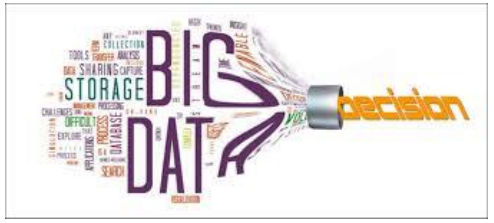








future
ADVANCED MANUFACTURE





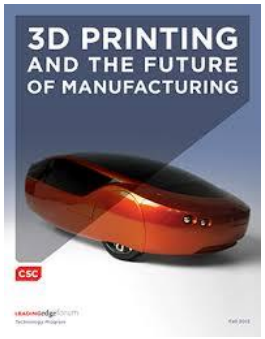




Advanced Digital Manufacturing
From Design to the Internet of Things

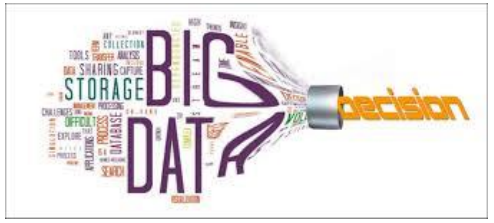








future
ADVANCED MANUFACTURE









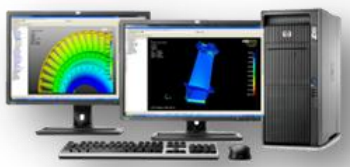
Engineers' major computer simulation tools: workstations, servers, and clouds





Let's analyze the **benefits & challenges** for 20 million engineers & scientists

Engineers' major computer simulation tools: workstations, servers, and clouds



94%

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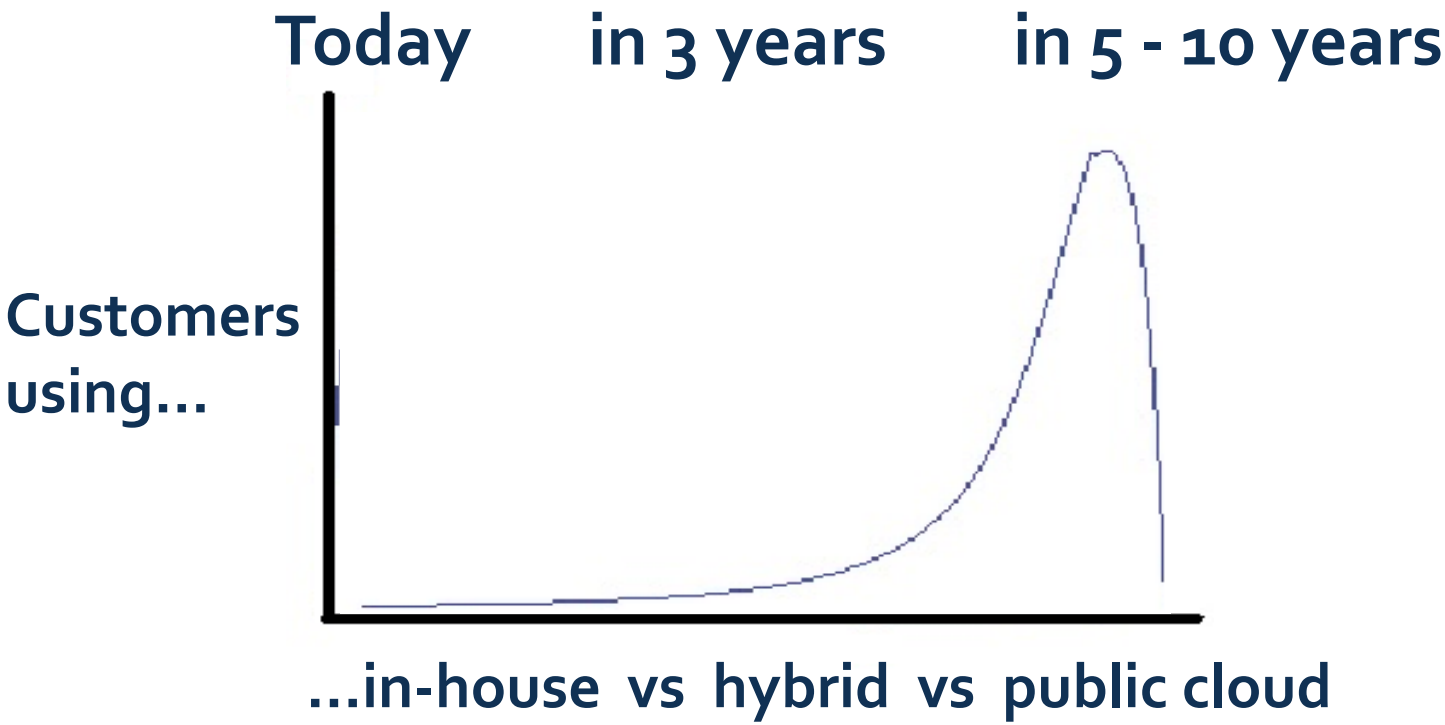




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Adoption of Cloud Computing *)



*) For engineering and scientific applications

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Benefits of **clouds**

- **More** (infinite) computing
- **On demand, pay per use**
- **Scaling resources dynamically,** up and down
- **Choice,** with multiple providers
- **Result:** better, faster, cheaper.



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. . . HPC Cloud Challenges



- It's a new operating paradigm
- Cloud expertise needed
- Access to clouds is cumbersome
- Loosing control over your jobs and data
- Security, privacy, trust in service provider
- Intellectual property
- Software Licensing
- Heavy data transfers

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CAE Cloud Challenges
Security
Portability
Compliance
Data Transfer
Standardization
Software Licenses
Resource Availability
Transparency of Market
Cost & ROI Transparency
No Cloud Expertise Needed

Briefly: Introducing The UberCloud

- **UberCloud Community:** for engineers & scientists to discover, try, and buy computing on demand in the cloud
- **UberCloud Experiments:** free cloud experiments taking engineers' applications to the cloud, in a team
- **UberCloud Marketplace:** shopping mall with stores from software, resource, and expertise providers
- **UberCloud Containers:** software containers providing automated packaging and portability, and ease of access and use, for workstations, servers, and clouds

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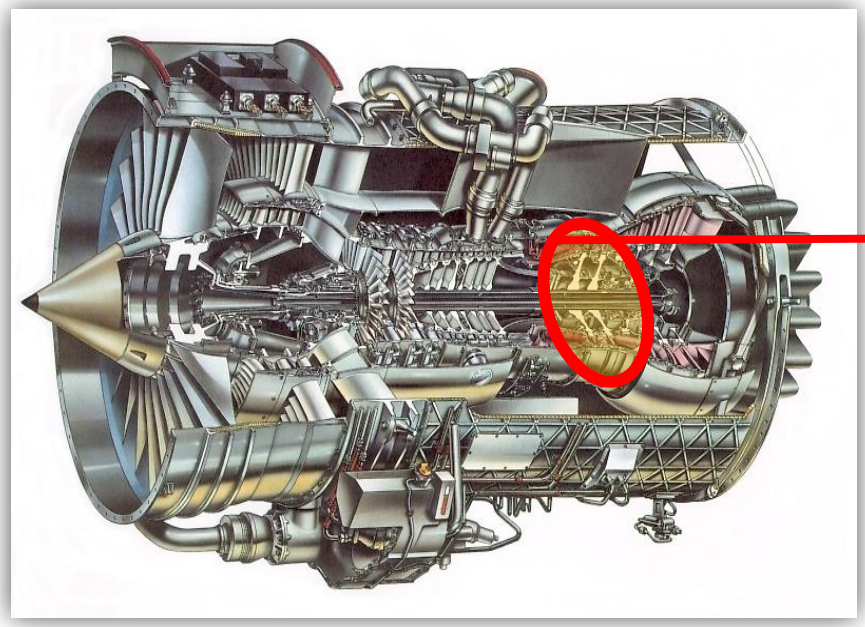
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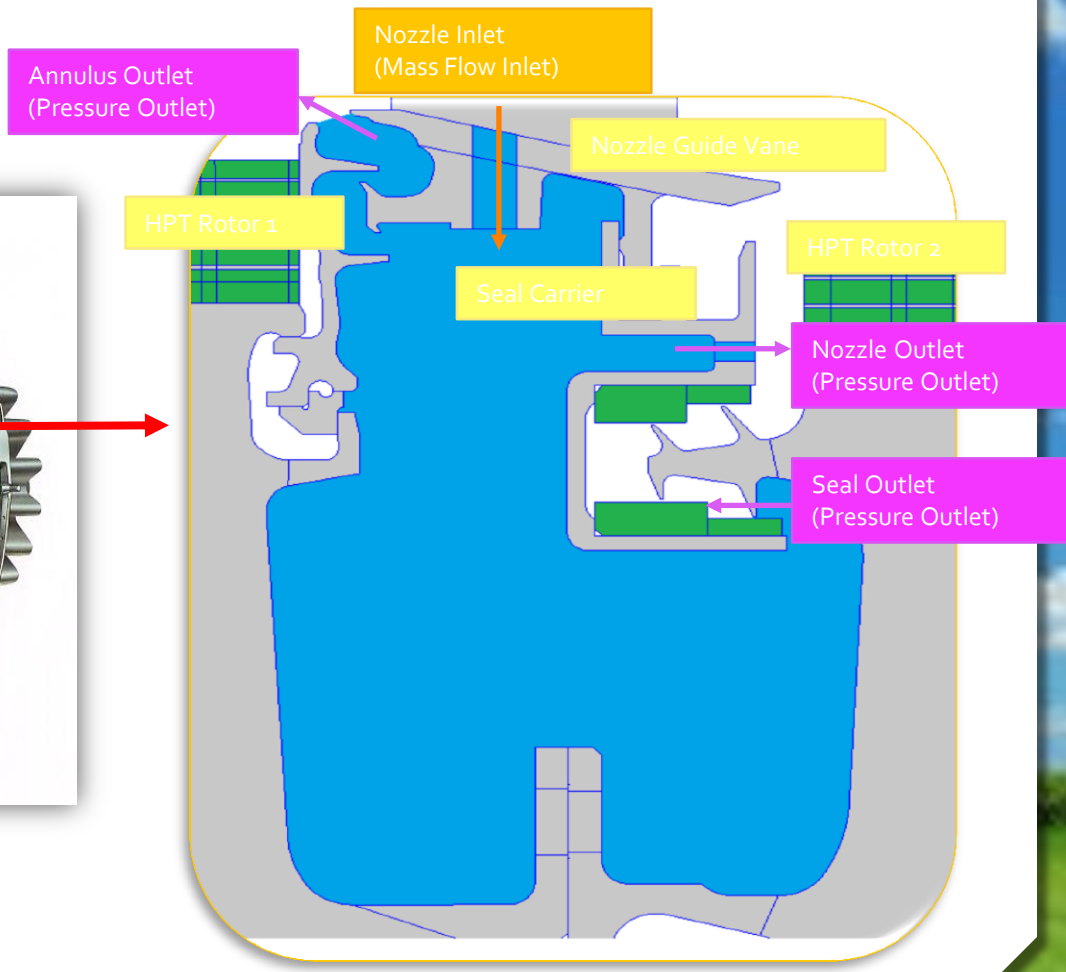
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Team 118: Temperature predictions for jet engine components

CFD Model of a High Pressure Turbine Interstage Cavity

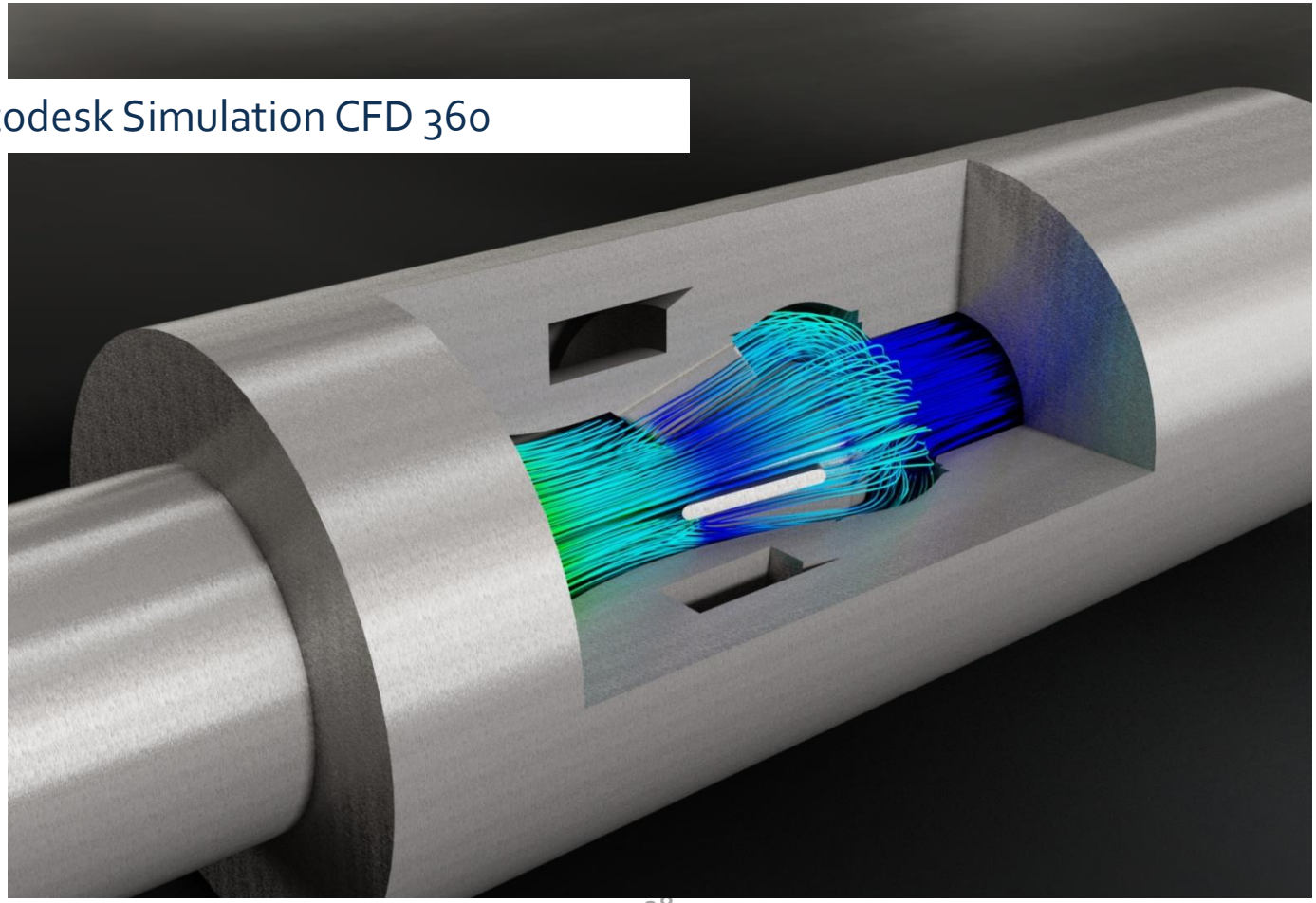


© Rolls-Royce The Jet Engine



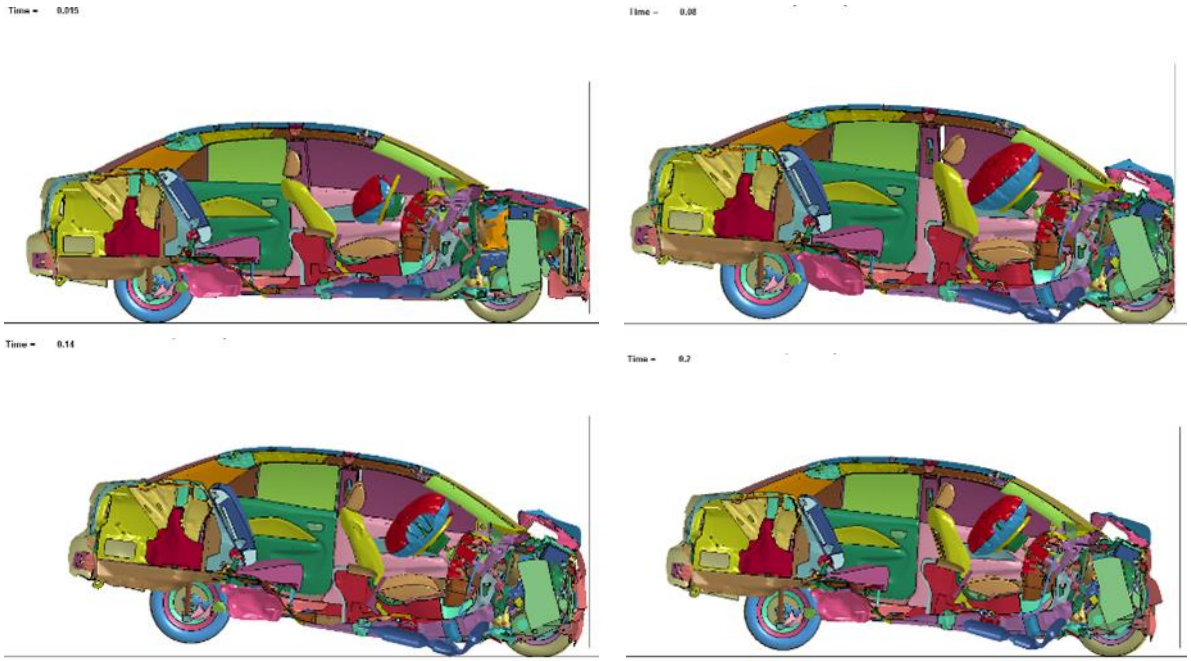
Team 142: Virtual testing of a severe service control valve

Autodesk Simulation CFD 360



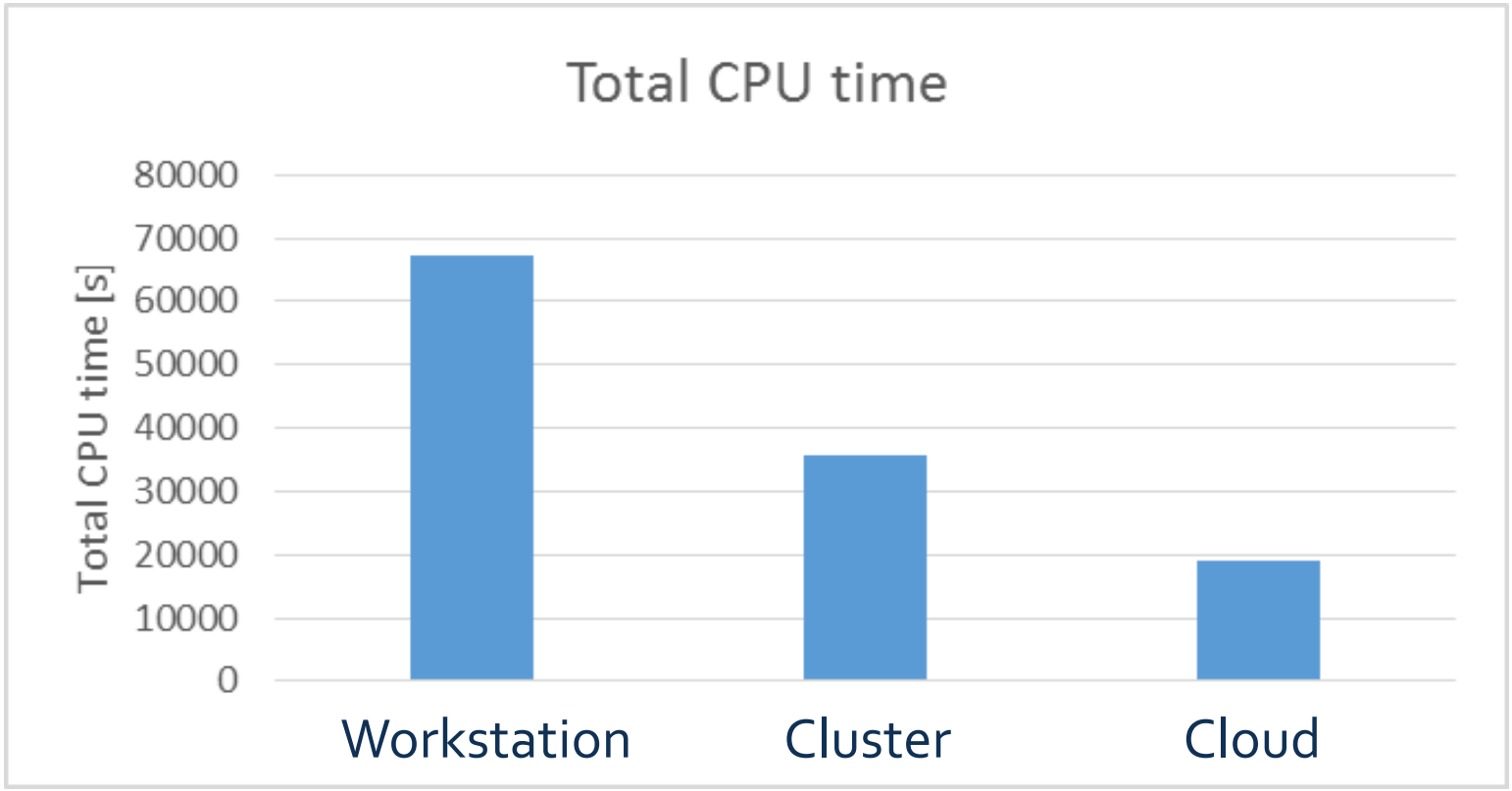
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Team 170 - Simulating Car Frontal Impact in the Cloud



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Team 170 - Simulating Car Frontal Impact in the Cloud



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We learned a lot from these experiments . . .



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What we do for Digital Manufacturing







Taking engineering applications
in software containers to ANY computer,
from workstations, to servers, to any cloud







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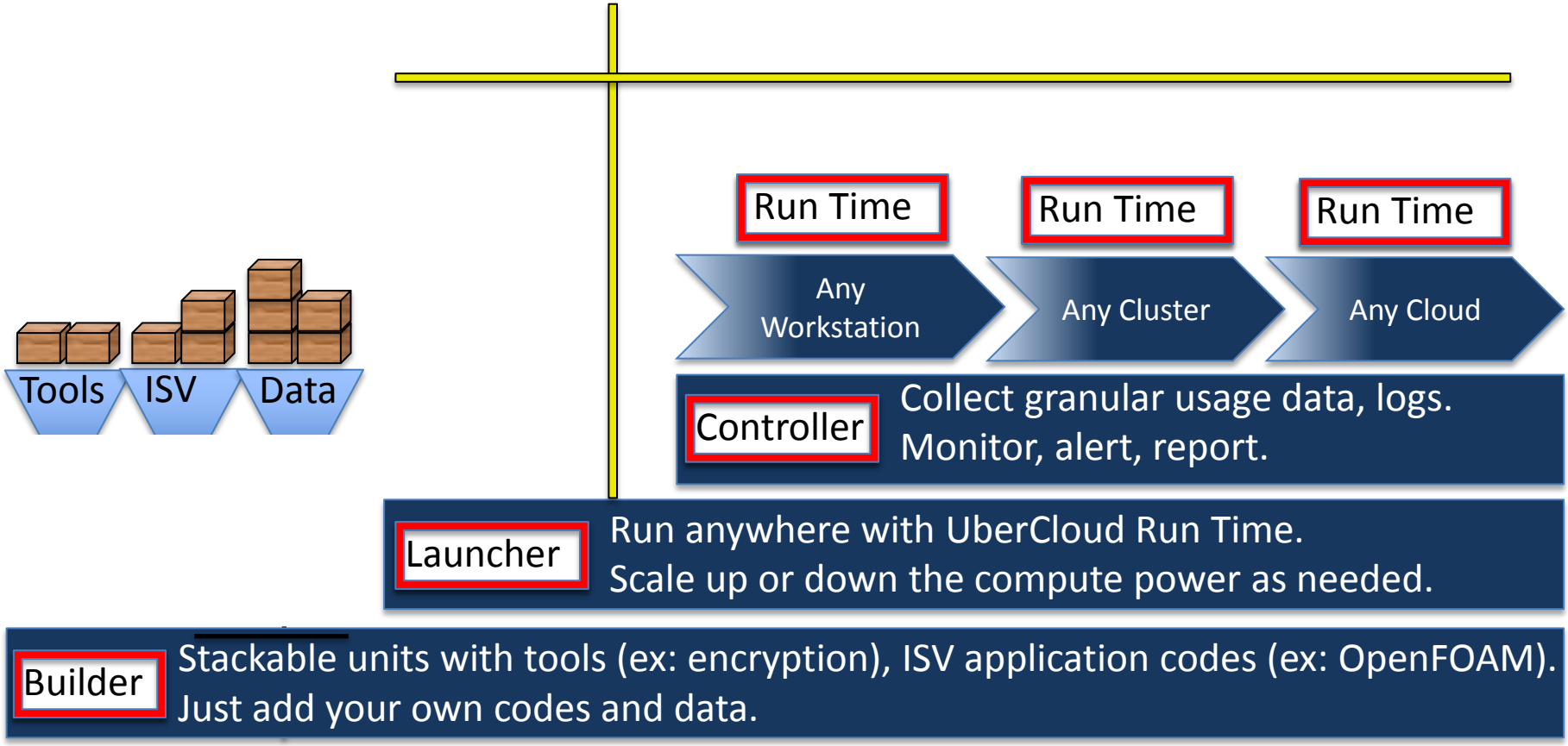
Containers

Packageability, portability, accessibility, usability, and scalability, and coming with low overhead.

- Ready-to-execute s/w, to deliver the tools an engineer needs
- No need to install software, deal with complex OS commands, or configure
- Software tools are pre-installed, configured, tested, running on bare metal, without loss of performance
- CAE-enhanced for engineering & scientific applications
- ANSYS, CD-adapco, Comsol, Numeca, OpenFOAM, Simulia…

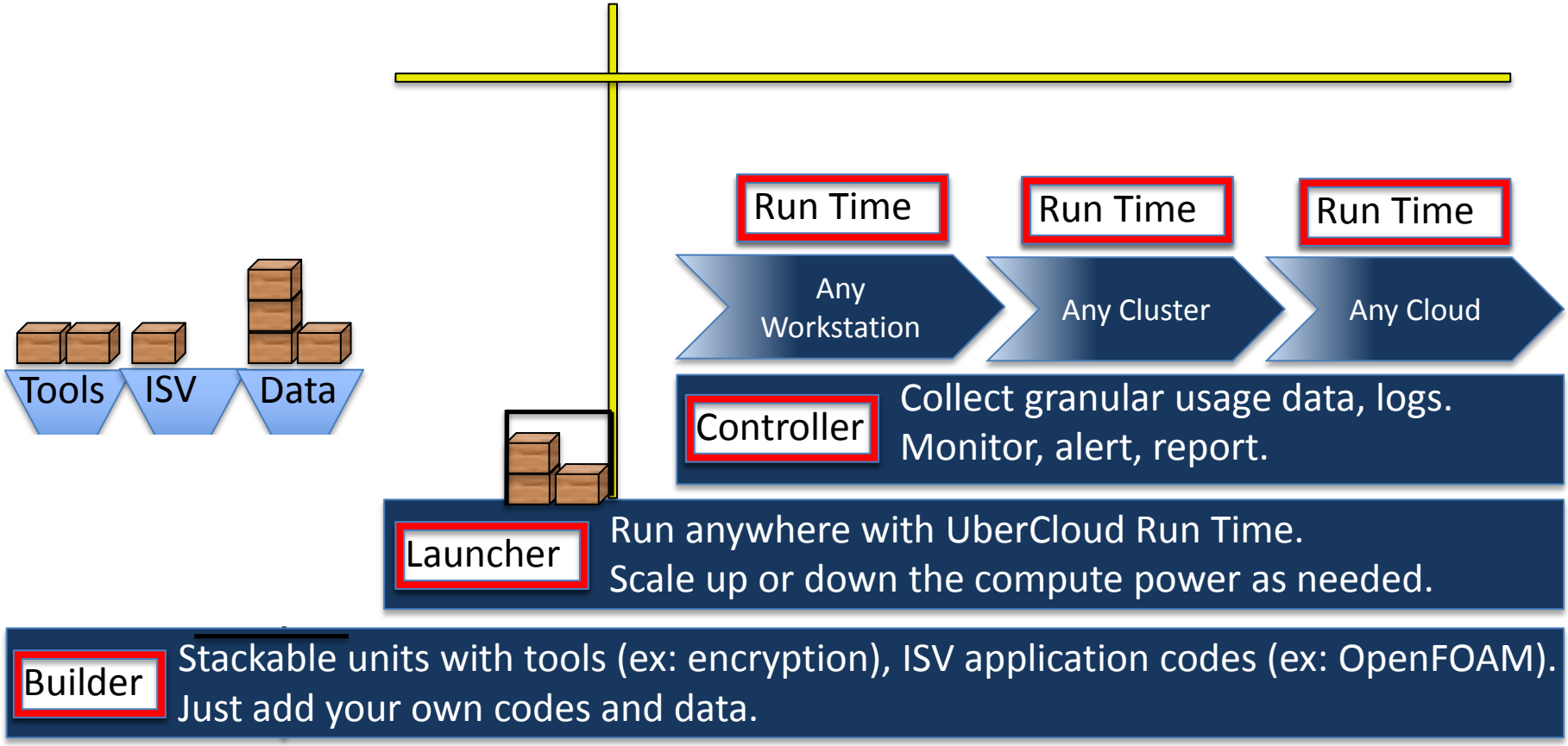
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Containers: Build once, run anywhere



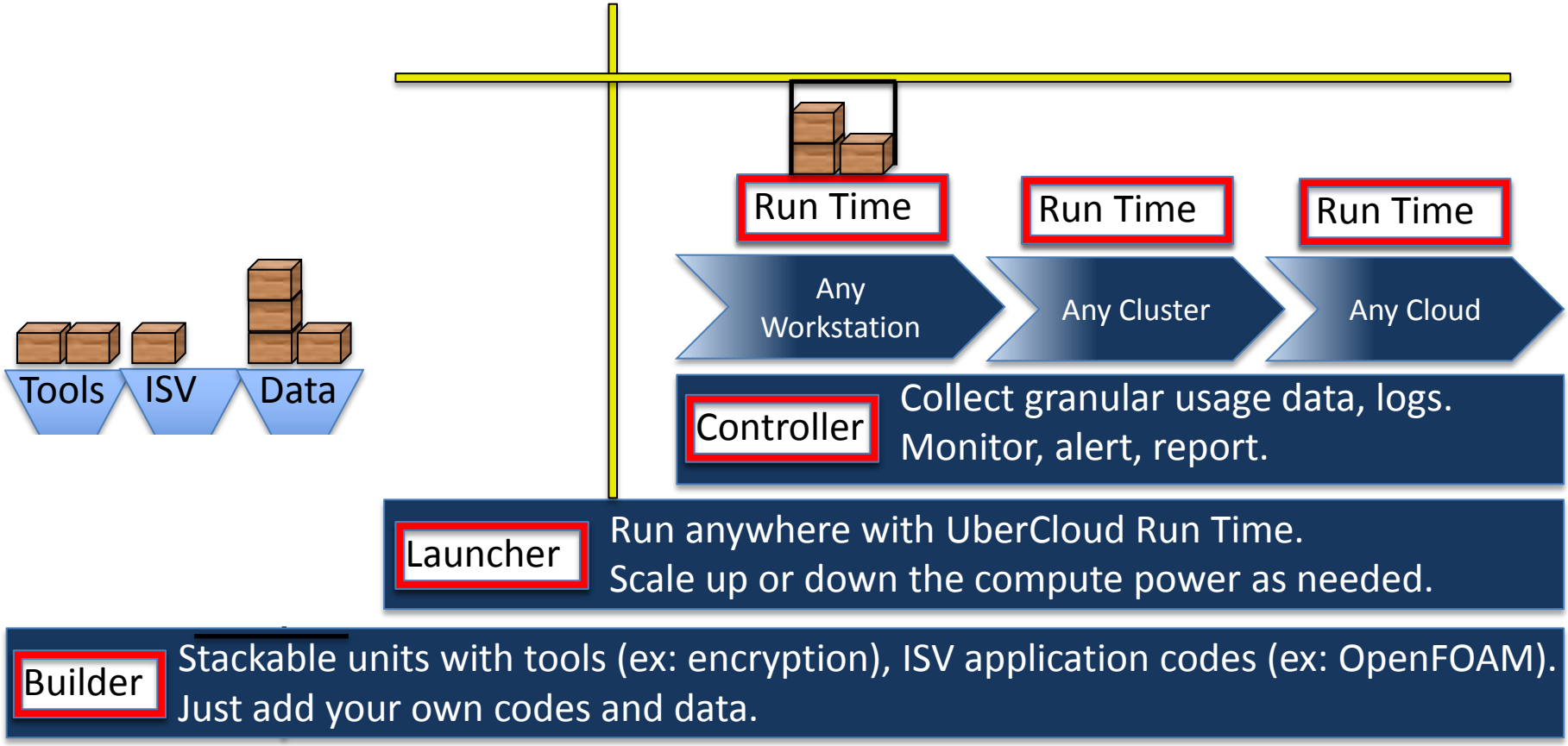
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Containers: Build once, run anywhere



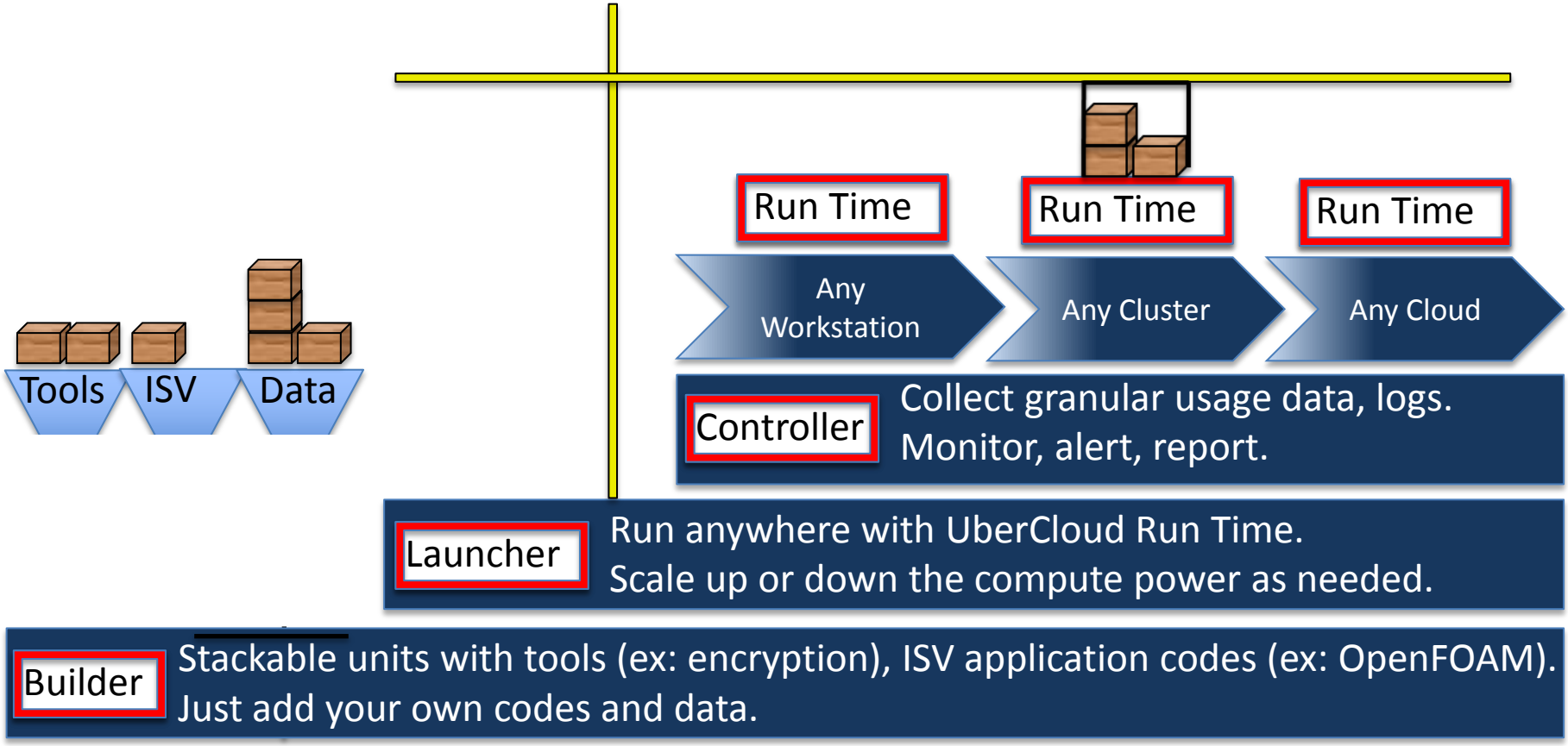
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Containers: Build once, run anywhere



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Containers: Build once, run anywhere



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CAE Software Containers: Reducing / Removing Cloud Challenges

CAE Cloud Challenges	SW Containers
Security	√
Portability	√
Compliance	√
Data Transfer	√
Standardization	√
Software Licenses	√
Resource Availability	√
Transparency of Market	√
Cost & ROI Transparency	√
No Cloud Expertise Needed	√

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Finally, in only a few more years:

- Ubiquitous computing
- For every engineer and scientist
- For digital experiments
- For product design and developments
- For product optimization
- And many more.

Thank You !

Please register at

http://www.**TheUberCloud**.com

It's free