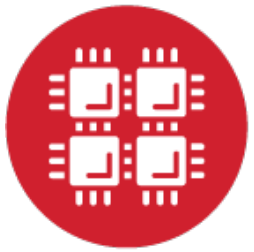

Ohio Supercomputer Center

An OH·TECH Consortium Member

Open OnDemand: A Unified Platform for Developing and Serving Gateway Apps

Douglas Johnson (presenting), David E. Hudak, Jeremy Nicklas,
Eric Franz, Brian McMichael, Basil Gohar,
Troy Baer, Trey Dockendorf, Katherine Cahill

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Outline

- Open OnDemand Project
- Open OnDemand Apps
- Science Gateway App Examples

Open OnDemand Review

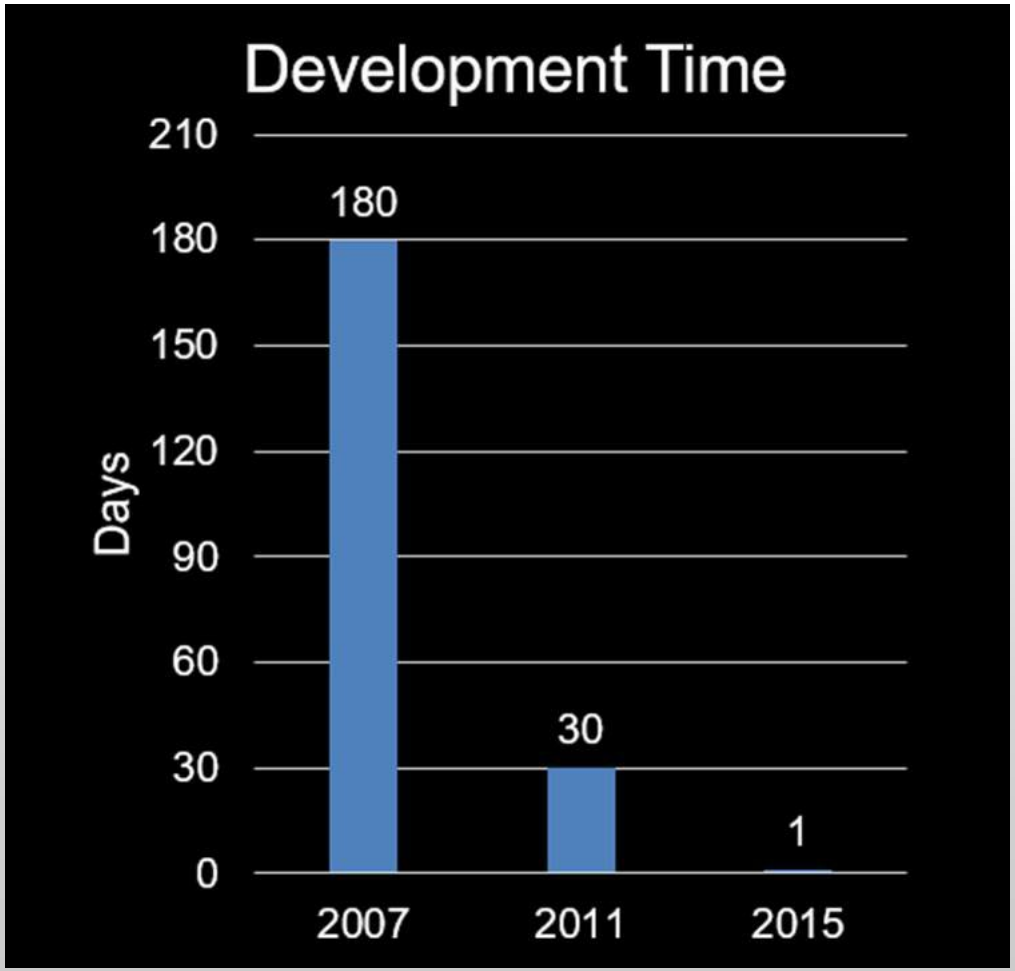
- The Open OnDemand software project
  - Goals, status
- OnDemand Functionality
  - File Browser and Editor
  - Job Control
  - Terminal Access
  - Desktop Access
- OnDemand usage at OSC

Open OnDemand Apps

- OnDemand Apps encapsulate workflow and expertise
- OnDemand users create and share apps
  - Similar in spirit to HubZero Tools and Galaxy Workflows
- OnDemand App Tools
  - App Kit: Development tools including libraries and templates
  - App Sharing: Peer-to-peer app distribution

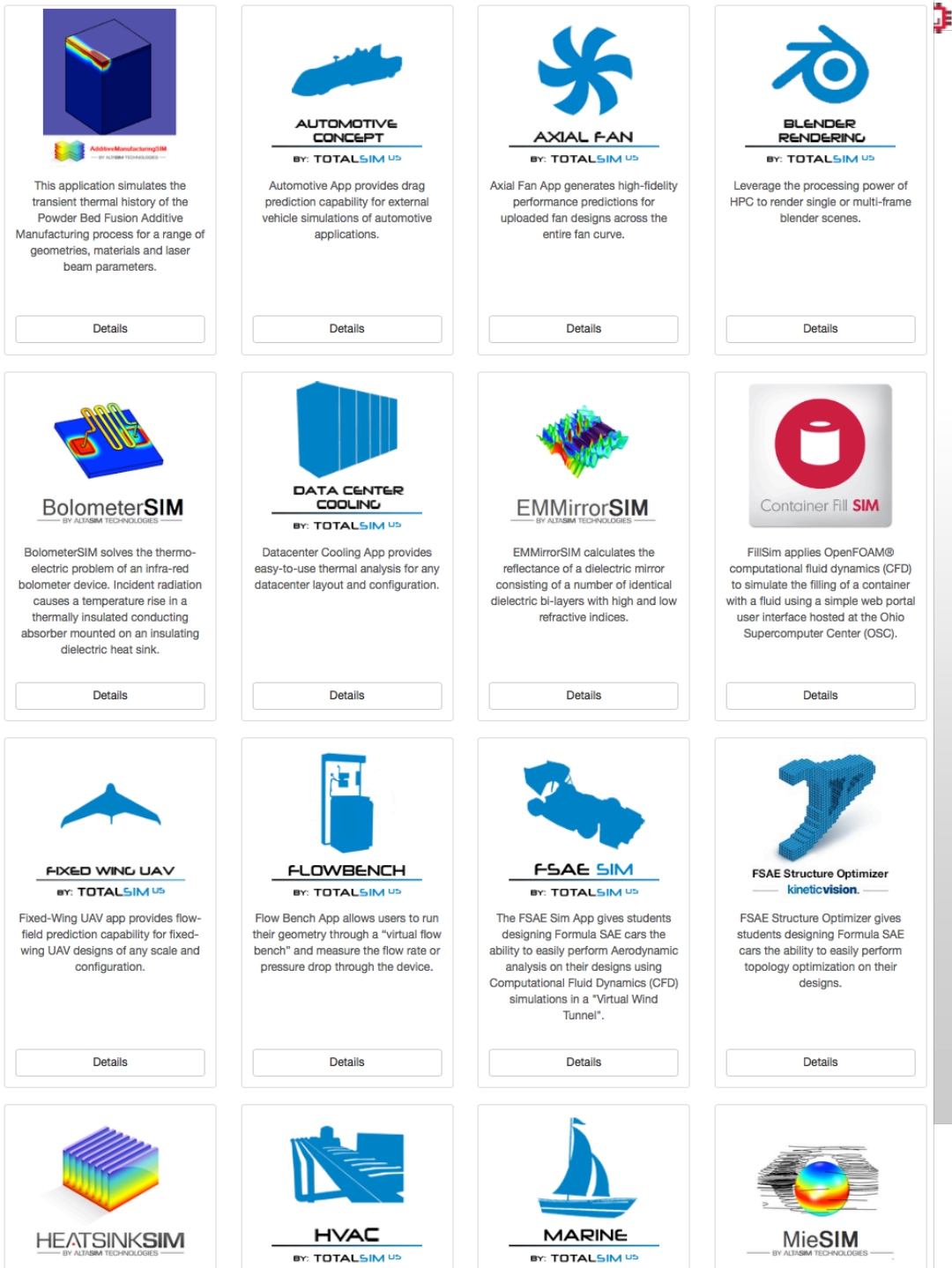
Build Gateways with Open OnDemand

- Build Gateways fast
  - App Kit libraries and templates
  - No need for additional web deployment
  - No new user accounts
    - Uses existing HPC system accounts
- Build Gateways different
  - “Plug in” existing tools from the platform
    - File Browser, Editor, Terminal, VNC



Proven Development Platform

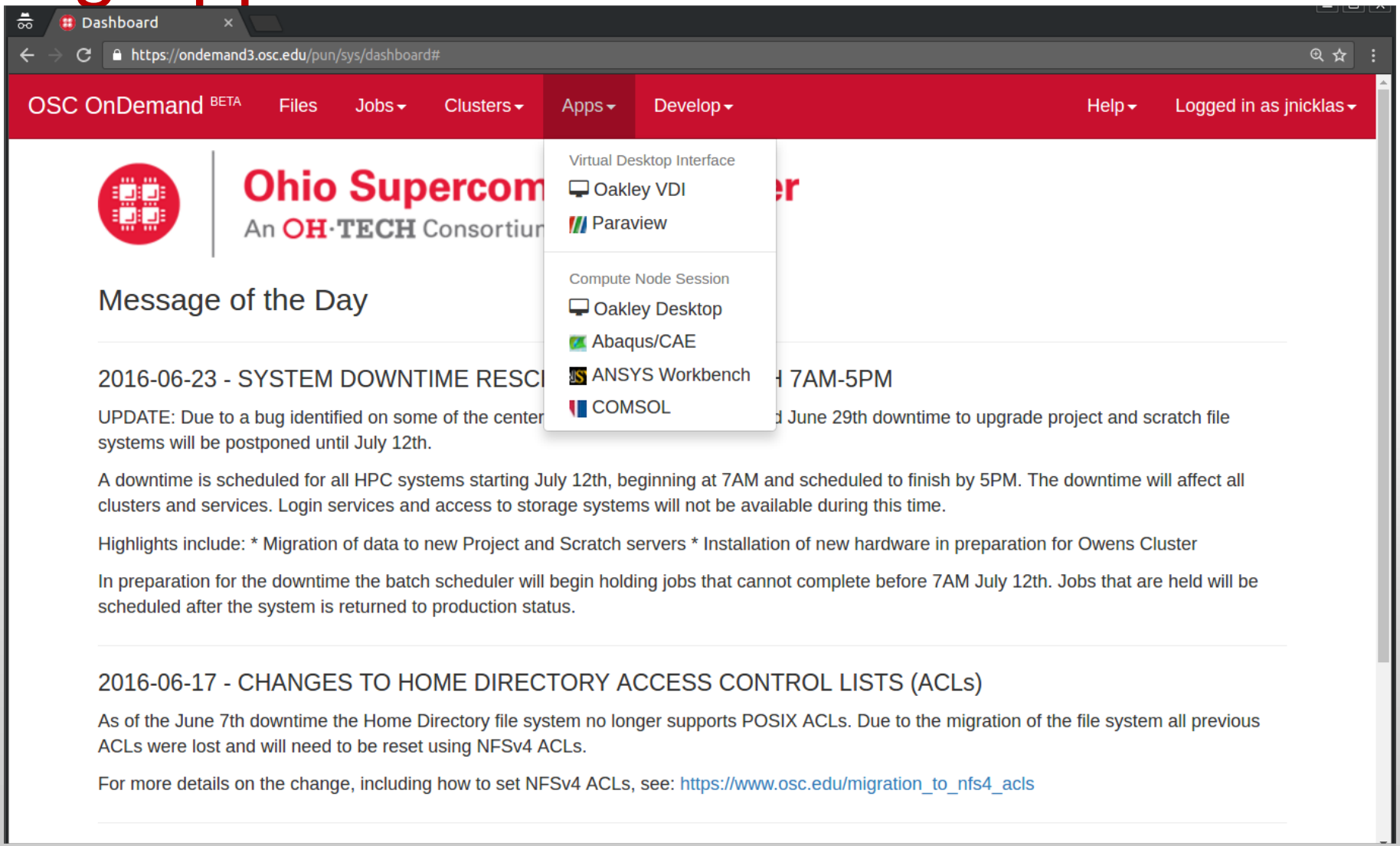
- Five developer teams have built over 30 apps in the last 18 months



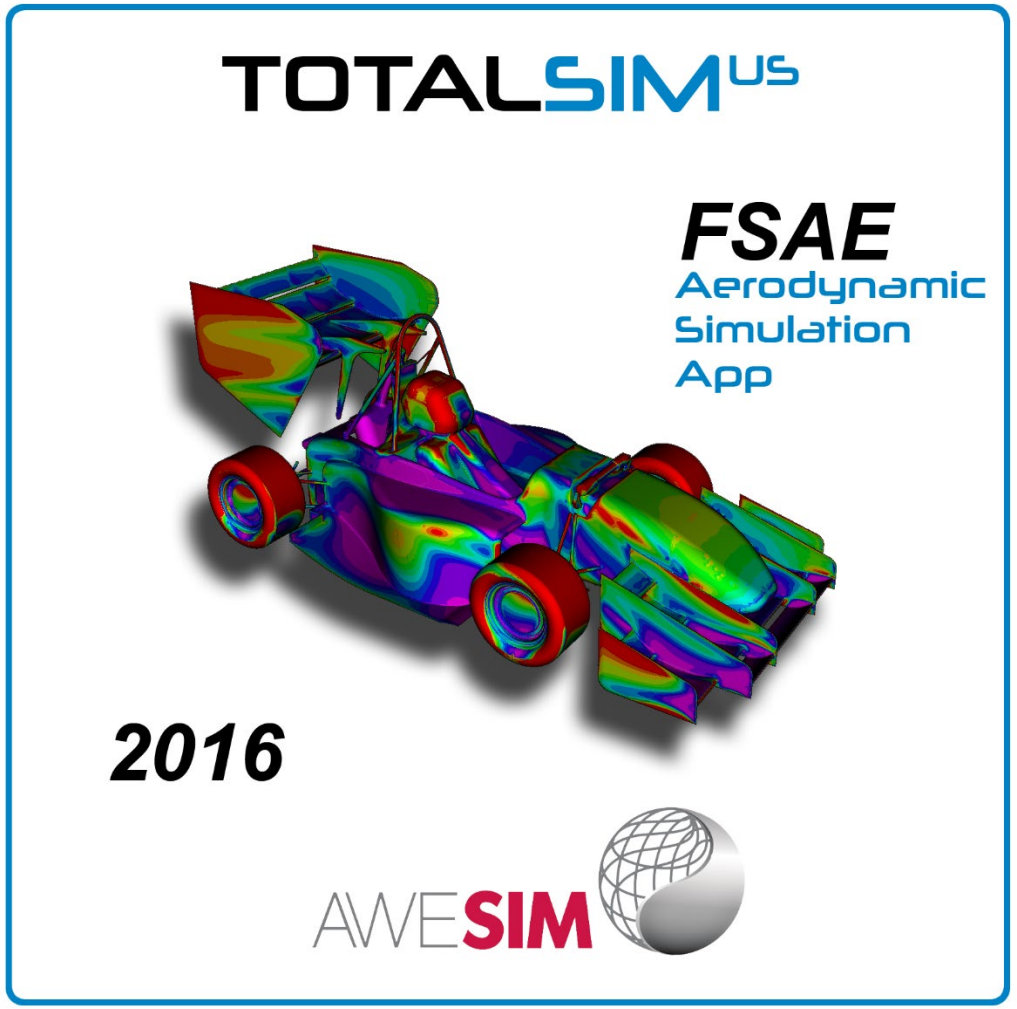
OOD Science Gateway Examples

- Job submission apps (Abaqus, Ansys, Blender,)
- Web workflow apps (Cantilever Beam, FSAE, WeldPredictor, VFT, TruckSim, FillSim, FanSim)
  - https://www.awesim.org/en/products/
- COMSOL Server apps

Accessing Apps in OnDemand Dashboard



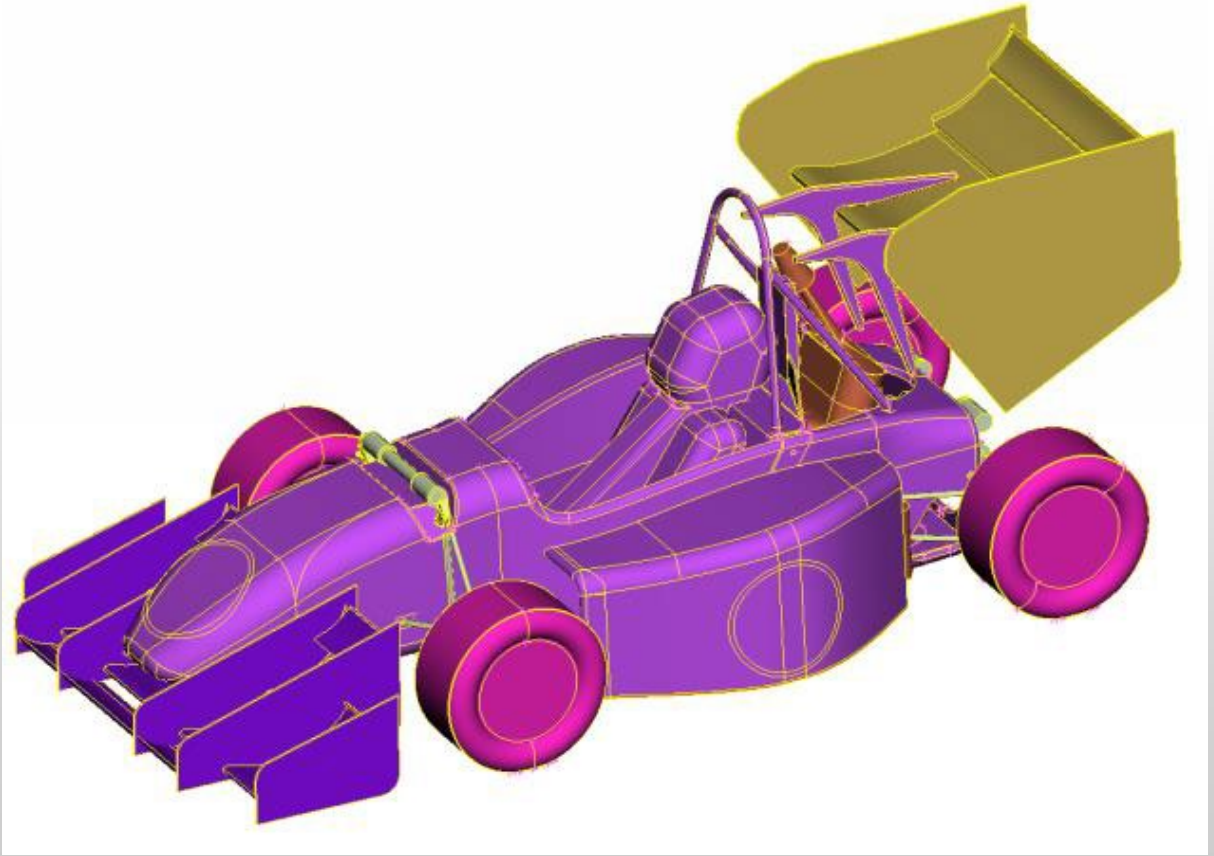
M&S APP EXAMPLE

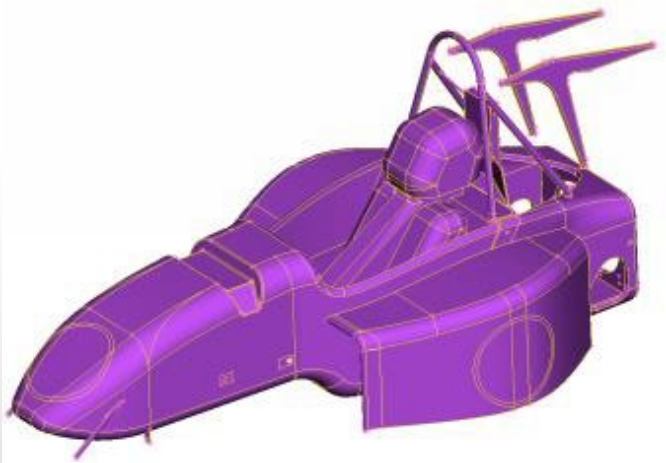


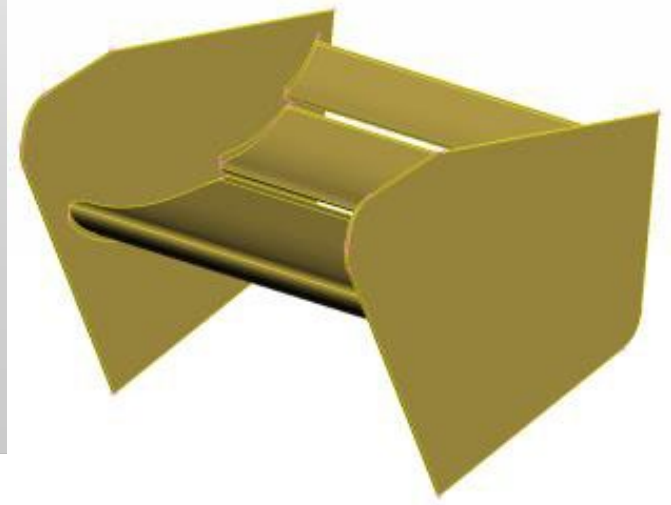
This app automatically:

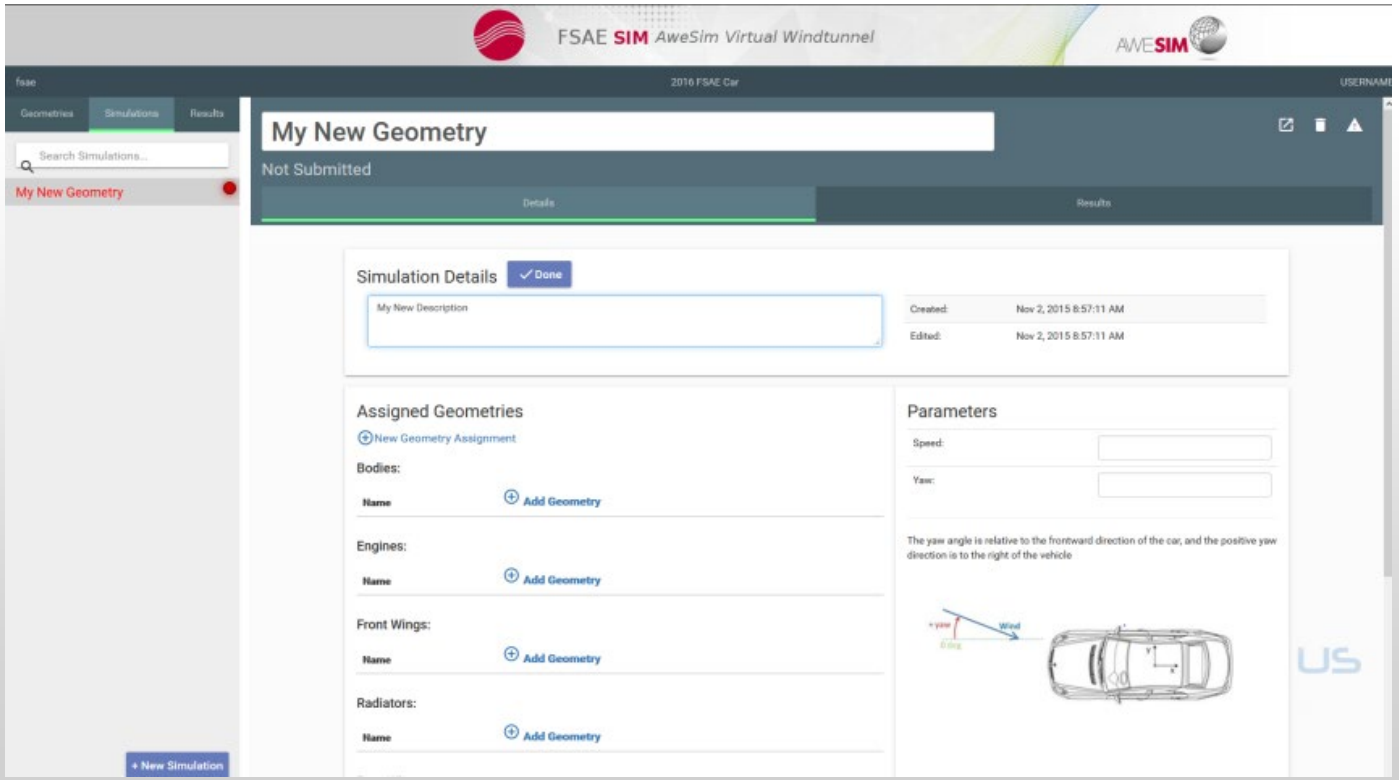
- meshes geometry
- configures solver settings
- generates output visualizations
- organizes the results

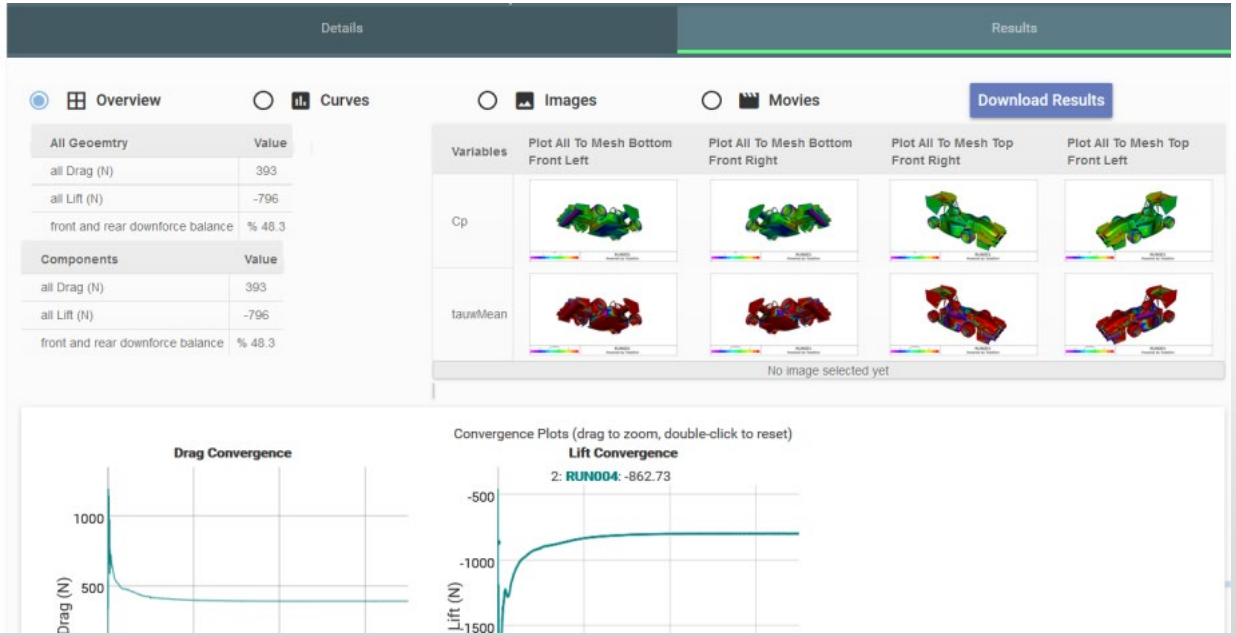
so that university students can focus on designing and improving their formula SAE cars and not setting up complex CFD simulations

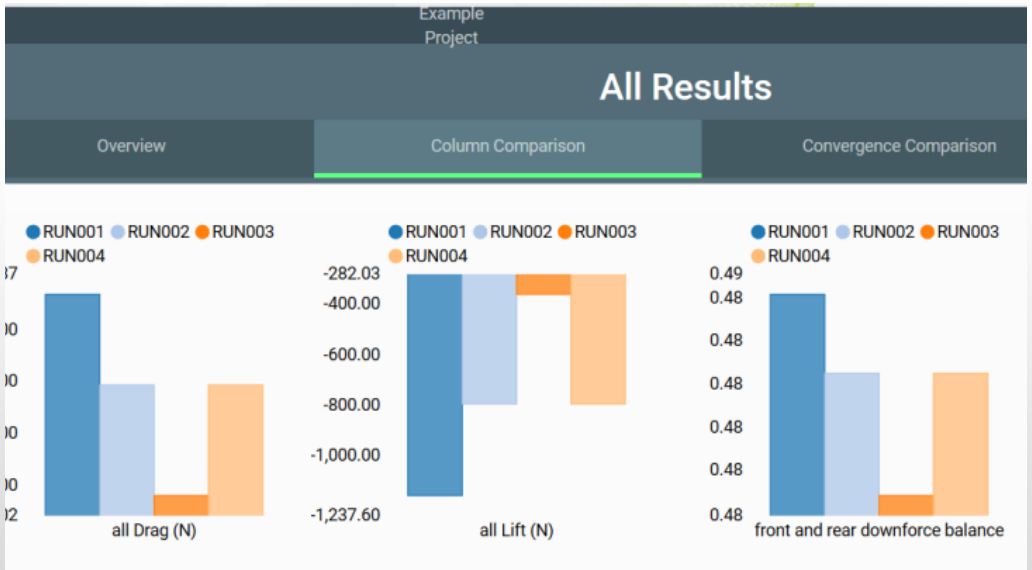


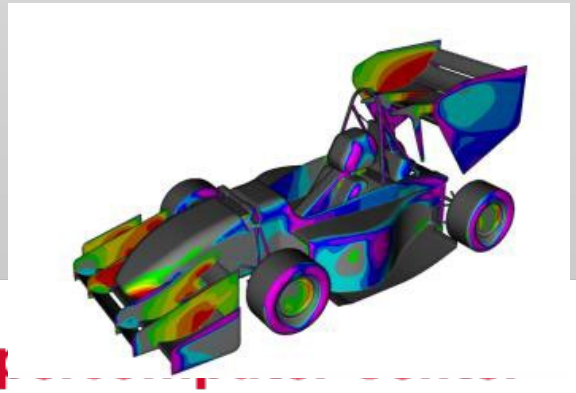


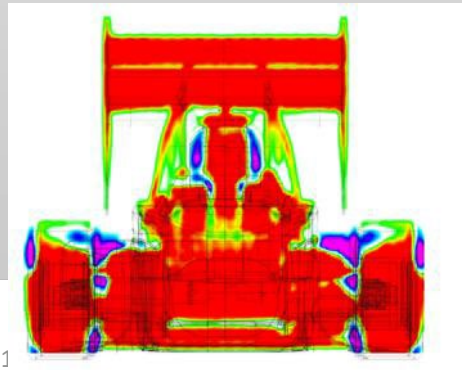



FSAE SIM AweSim Virtual Windtunnel
AWESIM
fsae
2016 FSAE Car
Geometries
Simulations
Results
Search Simulations...
My New Geometry
My New Geometry
Not Submitted
Details
Results
Simulation Details
Done
My New Description
Created: Nov 2, 2015 8:57:11 AM
Edited: Nov 2, 2015 8:57:11 AM
Assigned Geometries
New Geometry Assignment
Bodies:
Name
Add Geometry
Engines:
Name
Add Geometry
Front Wings:
Name
Add Geometry
Radiators:
Name
Add Geometry
Parameters
Speed:
Yaw:
The yaw angle is relative to the frontward direction of the car, and the positive yaw direction is to the right of the vehicle
+ New Simulation





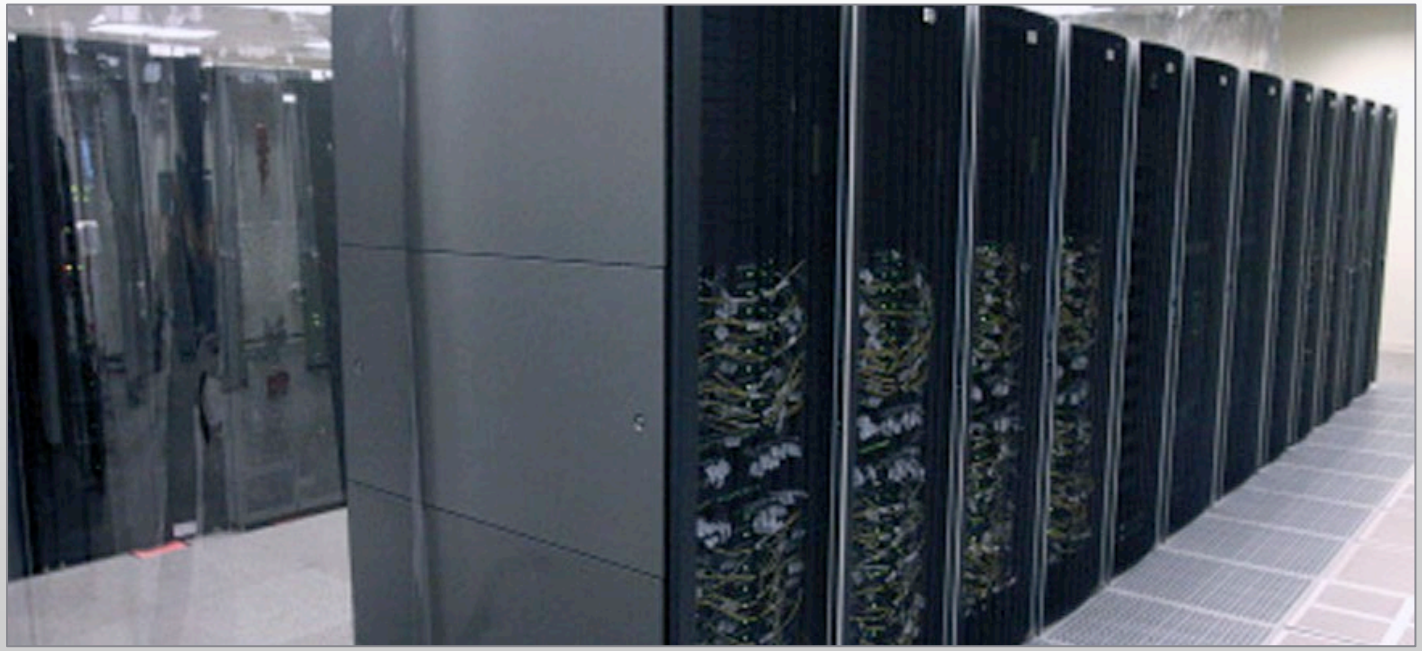




Personal Laptop

2	Processors Used	**48**
14	Time (days)	**1/2**

OSC's Oakley Supercomputer



Developed over the course of several weeks in late 2015 by TotalSim, LLC

In active use by FSAE teams at:

THE OHIO STATE UNIVERSITY

The University of Akron

INDIANA UNIVERSITY
PURDUE UNIVERSITY
INDIANAPOLIS

UNC CHARLOTTE

USC

Science Gateway Challenges Addressed by Open OnDemand

- **Challenge**: User administration
  - Creating managing user accounts
  - Enforcing user separation in the app
    - Making sure users can only see their data
    - Making sure users are charged for jobs submitted
- **OOD Solution**: system level user separation
  - Use existing system-level accounts
  - User separation enforced by PUN model
- **Challenge**: Web infrastructure deployment
  - Getting your HPC Center to install a publicly-accessible LAMPS stack
  - Getting your HPC Center to give you admin access to it
  - Getting a public DNS entry, maybe other things…
- **OOD Solution**: Single web infrastructure serves all apps
  - Any Open OnDemand user at the HPC Center can create and share apps
  - Similar goal for HubZero and Galaxy

Project Status

Further documentation as well as source code can be found at:

https://github.com/OSC/Open-OnDemand

or by visiting:

http://go.osu.edu/ood