



# Intel® Xeon Phi™ Processor Update

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# THANK YOU -- Intel® HPC Developer Conference Nov'17

**Technical Content:** Building Stickiness, Exposing Benefits, Sharing Industry Open Standards & Best Practices



## Key Topics:

- Systems
- Enterprise
- Artificial Intelligence
- Parallel Programming
- Visualization Development
- High Productivity Languages

80 Technical Lectures  
(30 minute)

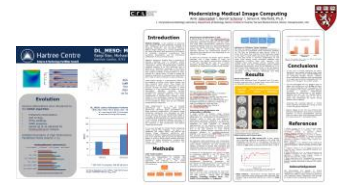


225+ Speakers  
71% non-Intel



15 Hands-on Tutorials  
(90 minute)

~40 Poster Sessions



7.3M Impressions  
30 Countries  
~ 5.5 mins avg on site

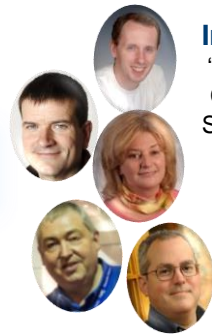
Social Media  
(follow)





## Keynote, Panelist, Plenaries: Demonstrate Intel's Commitment to the Future



Emcee : 


**Keynote:**  
"The intertwined futures of HPC & AI"  
  

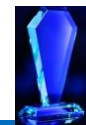



**Industry Panel:**  
"New Paradigm in Computing: What Should Developers Know?"

**Day 1 Plenary:**  
"Gravitational waves: the role of computing in opening a new field of astronomy"  
  


**Day 2 Plenary:**  
"Deep Learning for Science"  
  


**Closing Plenary:**  
"Leading the evolution of compute: Neuromorphic and Quantum computing"  




**& Awards:**  
"Intel® HPC Developer Conference 2017 Awards" (including a People's Choice)

# Intel® Xeon Phi™ Processor Top500 Listings

November 2017 Top500 List<sup>1</sup> has 14 Intel Xeon Phi deployments – over 80.9 PetaFlops

## Nine listings in Top50:



#7: Trinity (DOE/NNSA/LANL/SNL, USA); Cray XC40 – 14.1 PFs



#8: Cori (DOE/SC/LBNL/NERSC, USA); Cray XC40 – 14.0 PFs



#9: Oakforest-PACS (JCAHPC, Japan); Fujitsu CX1640 M1 – 13.5 PFs



#12: Stampede2 (TACC, USA); DellEMC PowerEdge C6320P/C6420 – 8.3 PFs



#14: Marconi (CINECA, Italy); Lenovo SD530 – 7.5 PFs



#18: Theta (DOE/SC/Argonne National Laboratory, USA); Cray XC40 – 5.9 PFs



#23: Tera-1000-2-Part 1 (CEA, France); Bull Sequana X1000 – 5.0 PFs



#32: Onyx (ERDC DSRC, USA); Cray XC40 – 3.4 PFs



#41: Camphor 2 (ACCMS, Kyoto University, Japan); Cray XC40 – 3.1 PFs



<sup>1</sup>Top 500 Results: <https://www.top500.org/list/2017/11/>; PF numbers rounded off

# Roadmap Updates



- **Knights Landing:** In production and seeing increased adoption.
- **Knights Mill:** In production and systems will be available later this year.
- **Knights Hill:** Intel re-targeted investments in the “Knights Hill” product as we continue to focus on achieving exascale class computing as soon as feasible

# Roadmap Goals Moving Forward

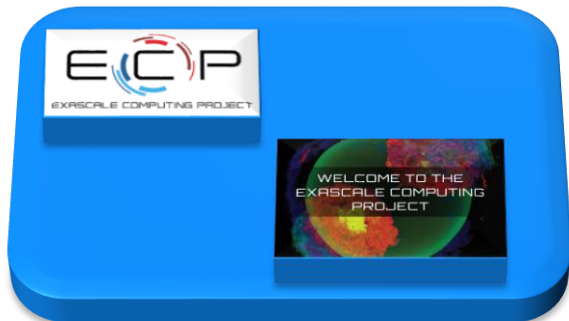


**Hasten Pace Of Architectural Innovation  
And Increase Cadence Of New Products**

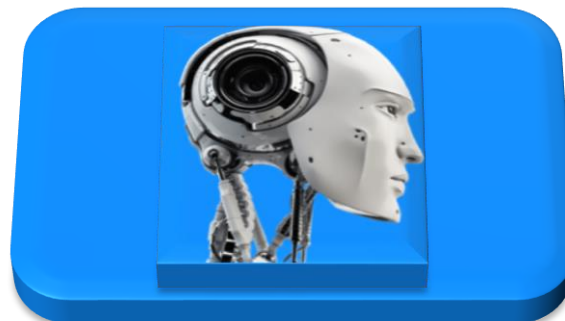
**Deliver Improved, Real World  
Application Performance**

**Single Platform Scalable to Multiple Workloads  
– Mod/Sim, AI (Machine & Deep Learning),  
Analytics → On-prem and in the Cloud**

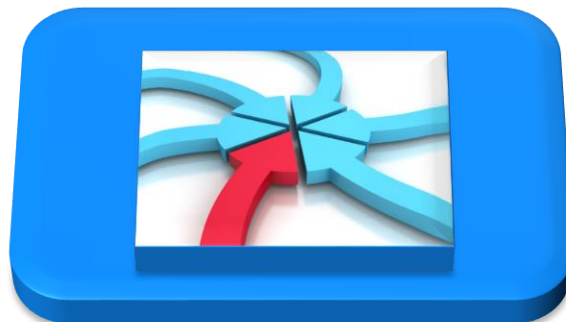
# HPC Trends



**Exascale Computing**

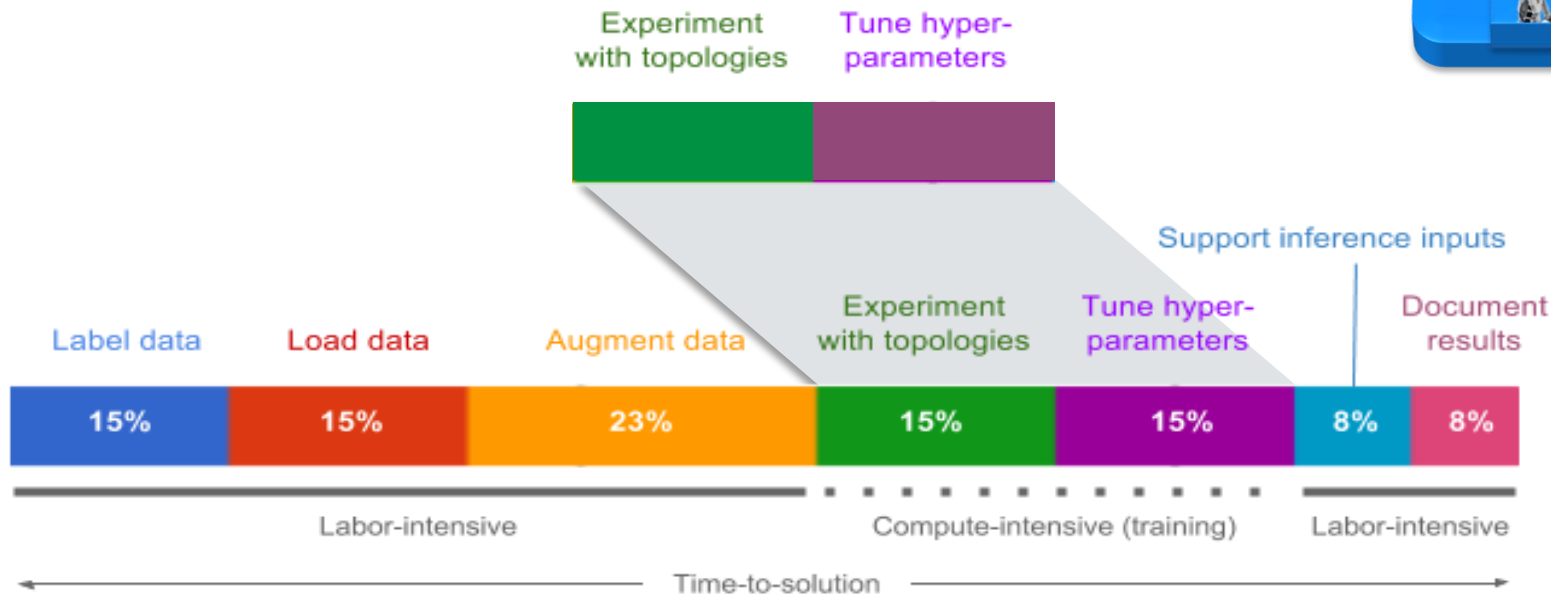


**Artificial Intelligence**



**Workflow Convergence**

# Dev Cycle & Time-to-Solution



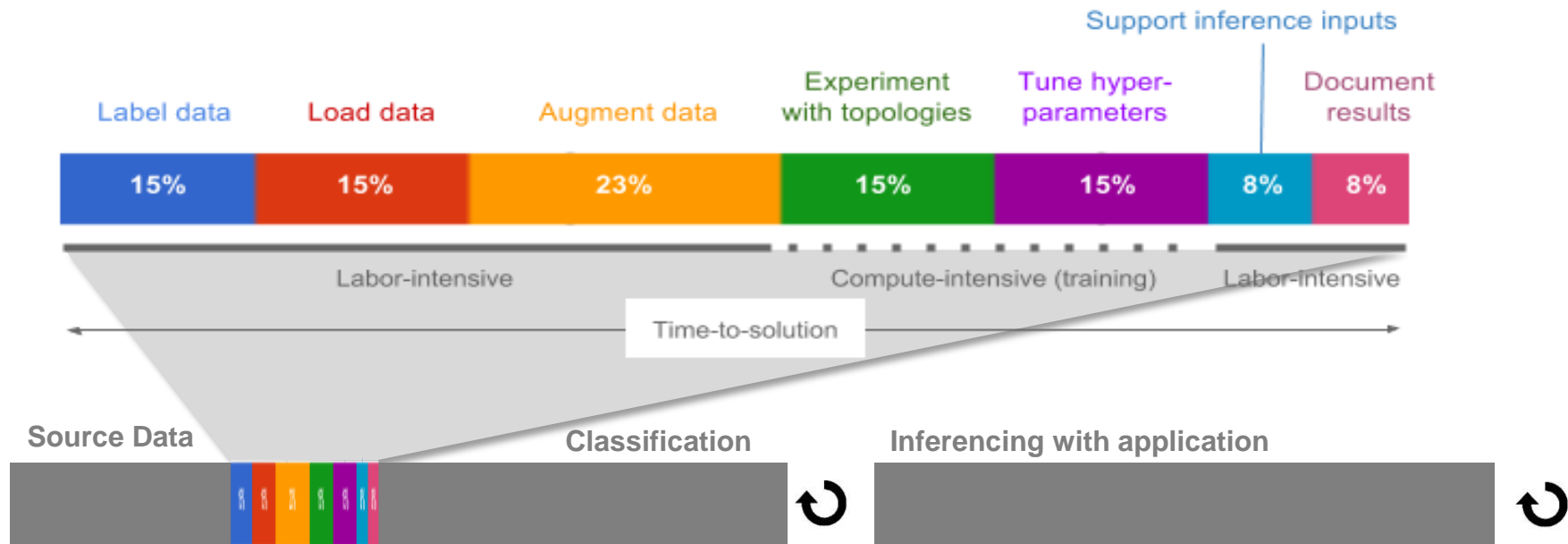
**30% of the DL dev cycle involves DL training**  
**70% of the DL dev cycle is labor-intensive**

# Dev Cycle & Time-to-Solution



DL training is a fraction of time to get to solution

Time to solution is not data scientist time; it is infrastructure deployment time





# Workflow Convergence

## → Simulation, Data Analytics and AI



Our customers are telling us HPC is changing.....

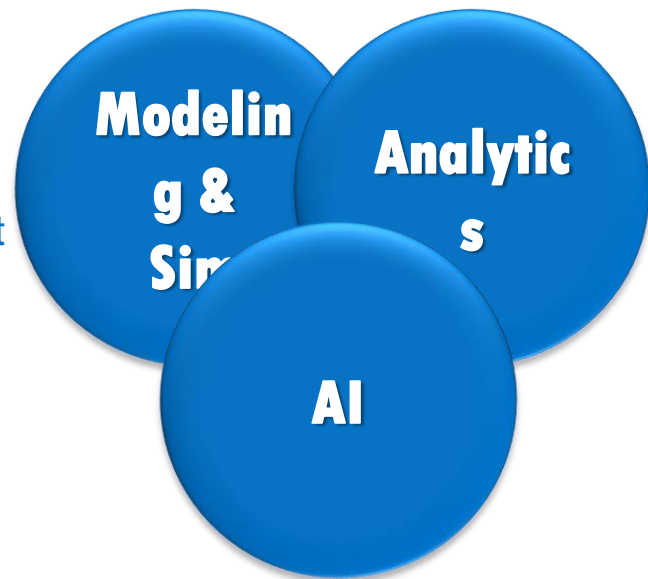
- Clear evidence → ECP must treat Mod/Sim, AI, and Analytics as first class citizens (hardware & software)

AI has become a major consumer of computing cycles and it is expected to grow

- Compute deployment both at edge and in large cloud
- Will drive economies in fabric, compute with a large focus on power and perf/W

Convergence is happening in many areas

- Cloud management, development tools/environments, Fabric architectures, and Frameworks/topologies





We stand committed to  
the engagement with our  
ecosystem community.

