

# Some Odds and Ends About Computational Infrastructure

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# Computing Infrastructures

- Local Laptop/Desktop – Short jobs with small data
- Local Cluster – Larger jobs and larger data but subject to availability
- HPC – Prime performance with parallelized code
- HTC – Sustained computing over a long period for serialized
- Cloud – Need deeper permission on an OS and have deeper pockets

# Some Examples of Academic CIs Worldwide

- HTC
  - EGI (formally European Grid Initiative)
  - OSG (Open Science Grid)
  - ASGI (Asia Pacific Grid Initiative)
  - NorduGrid
  - Earth System Grid (ESG)
  - Many other regional and national infrastructures

# Some Examples of Academic CIs Worldwide

- HPC
  - XSEDE (eXtreme Science and Engineering Discovery Environment)
  - PRACE (Partnership for Advanced Computing in Europe)
  - Compute Canada
  - Greek Research and Technology Network (GRNET)
  - Many other national infrastructures

# Some Examples of Academic CIs Worldwide

- Cloud
  - EGI Federated Cloud
  - NeCTaR – National eResearch Collaboration Tools and Resources
  - Jetstream (Part of XSEDE)
  - SwissACC (Swiss Academic Computing Cloud)
  - Many other national cloud infrastructures

# Let's take one step at a time

Small

Local



Large

Distributed

- Can you run one job on one computer?
- Can you run one job on another computer?
- Can you run 10 jobs on a set of computers?
- Can you run a multiple job workflow?
- How do we put this all together?

This is the path we'll take





# Let's do a real statistical simulation

The **Z boson** is a neutral elementary particle which - along with its electrically charged cousin, the W - carries the weak force. Discovered in 1983 by physicists at the Super Proton Synchrotron at CERN, the **Z boson** is a neutral elementary particle.

Can you find the Z?



# Questions?

- Questions? Comments?
  - Feel free to ask me questions now or later:  
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Exercises start here:

<https://twiki.grid.iu.edu/bin/view/Education/RDASummerSchool/RDASchoolMaterials>

Presentations are also available from this URL.