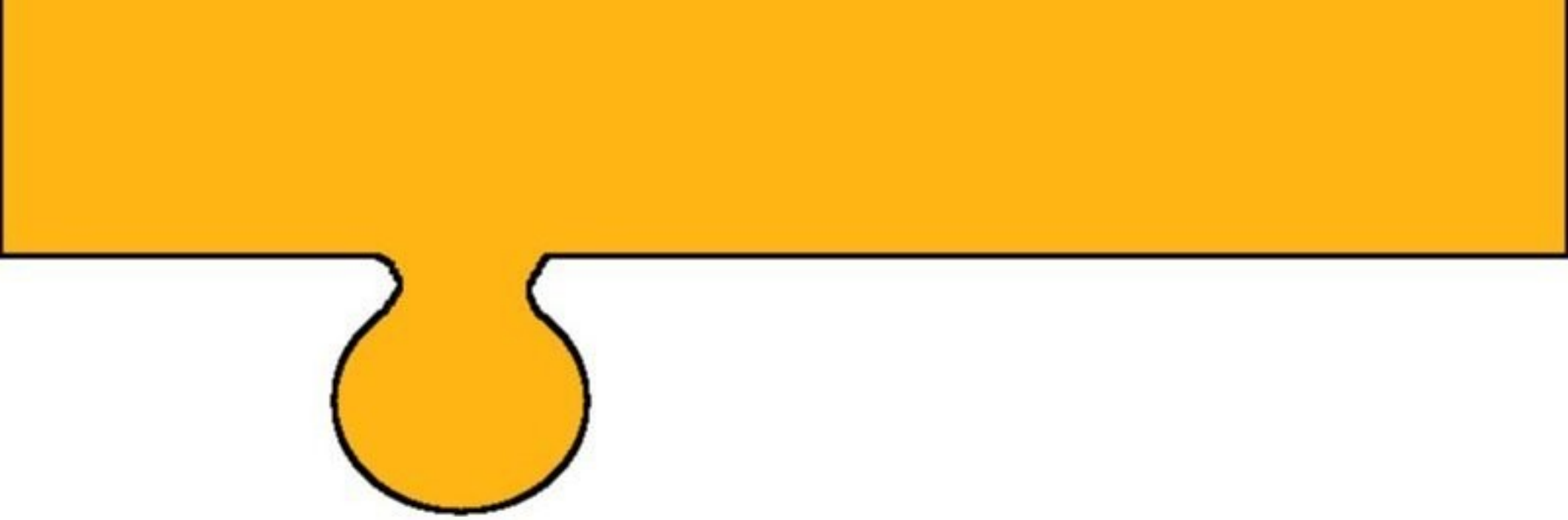


Cluster Introduction

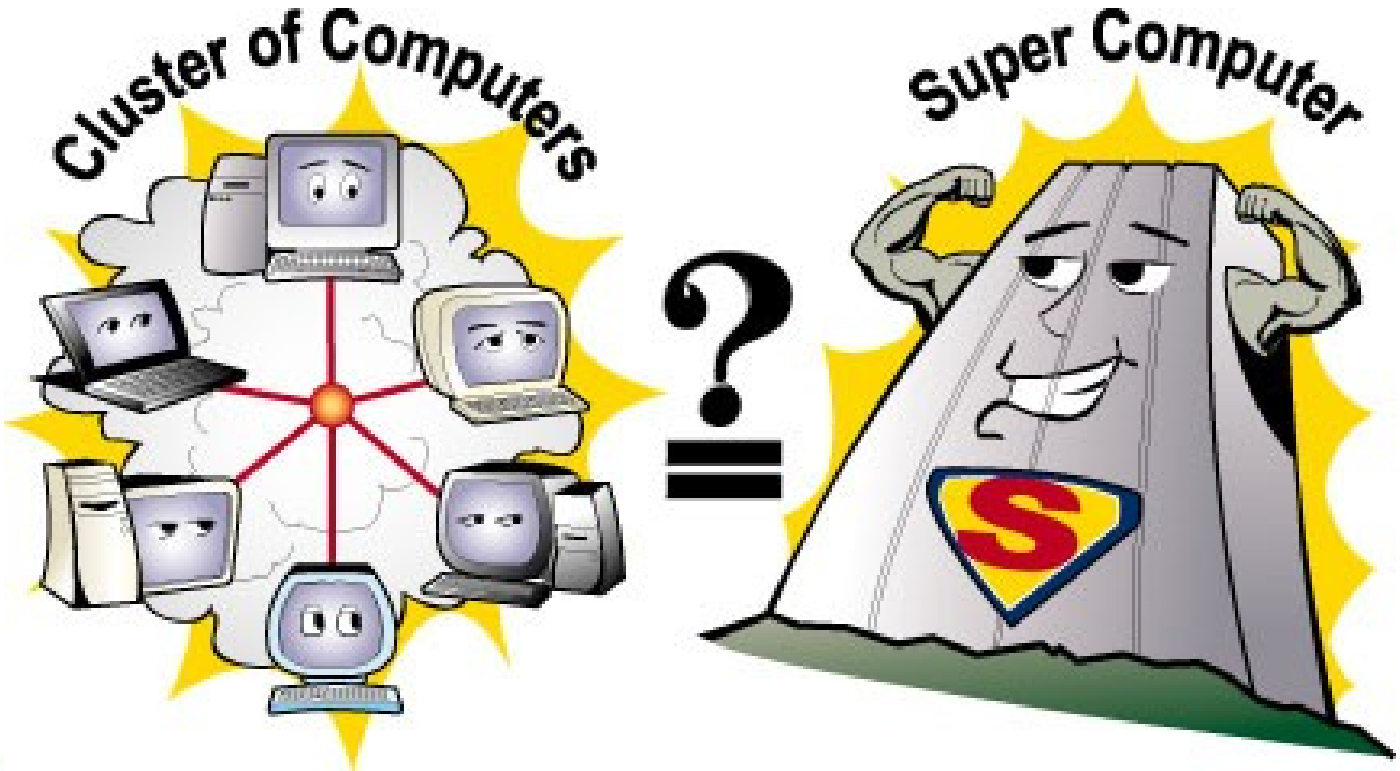
ClusterKit

About Computer Cluster

- History of computer cluster
- Computer Cluster Concept
- Type of Cluster
- How applied Cluster
- HPC World

Computer Cluster

- Computer cluster is a group of computer to work improve performance and/or availability over a single computer

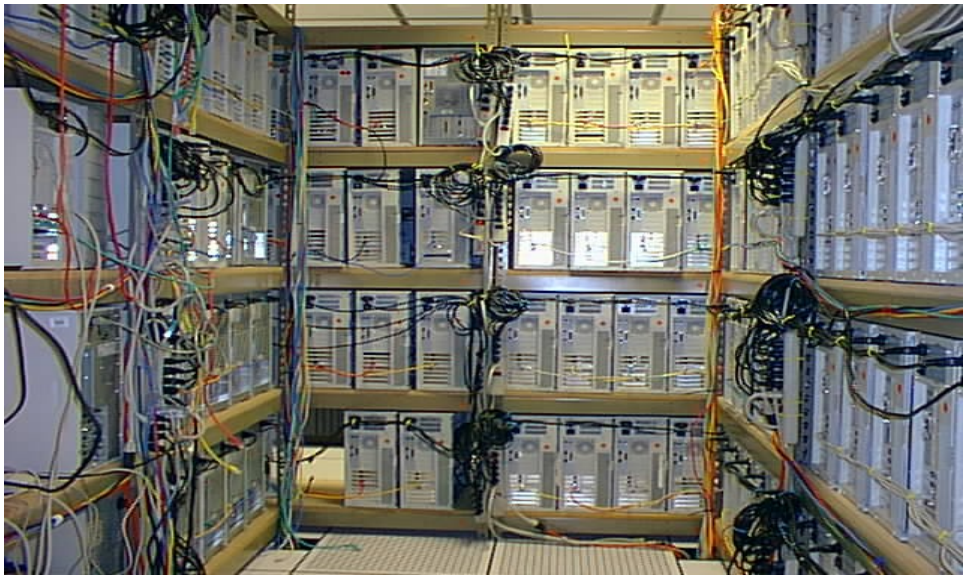


History Computer Cluster

- In late 1993, Donald Becker and Thomas Sterling began sketching the outline of a commodity-based cluster system designed as a cost-effective alternative to large supercomputers.
- In early 1994, working at CESDIS under the sponsorship of the HPCC/ESS project, the Beowulf Project was started.

Why do Compute Cluster

- One man show not work but Team Work!
  - Research
    - More complex and more amount data.
    - Simulation.
- Technical
  - Can't scale
    - heat problem
    - hard to design
    - price



Computer Cluster

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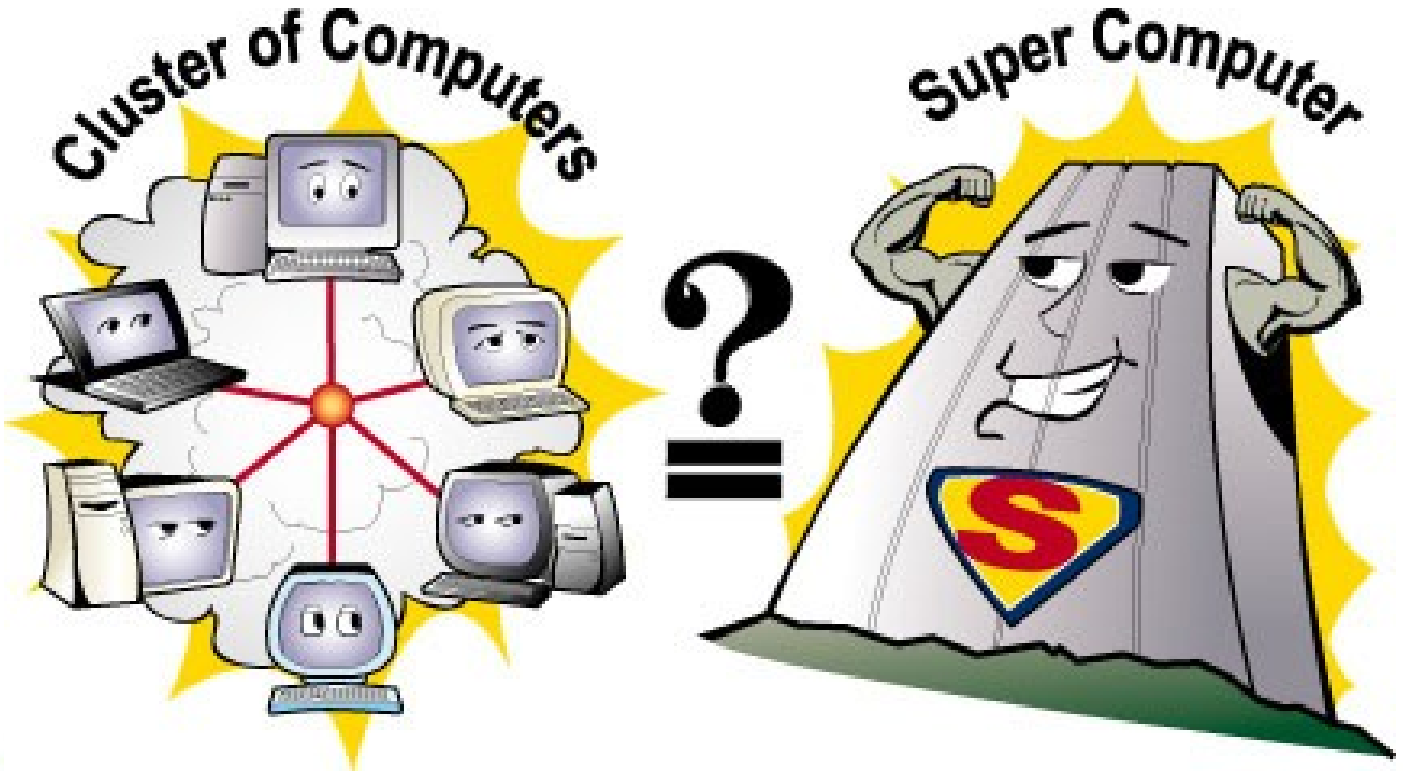
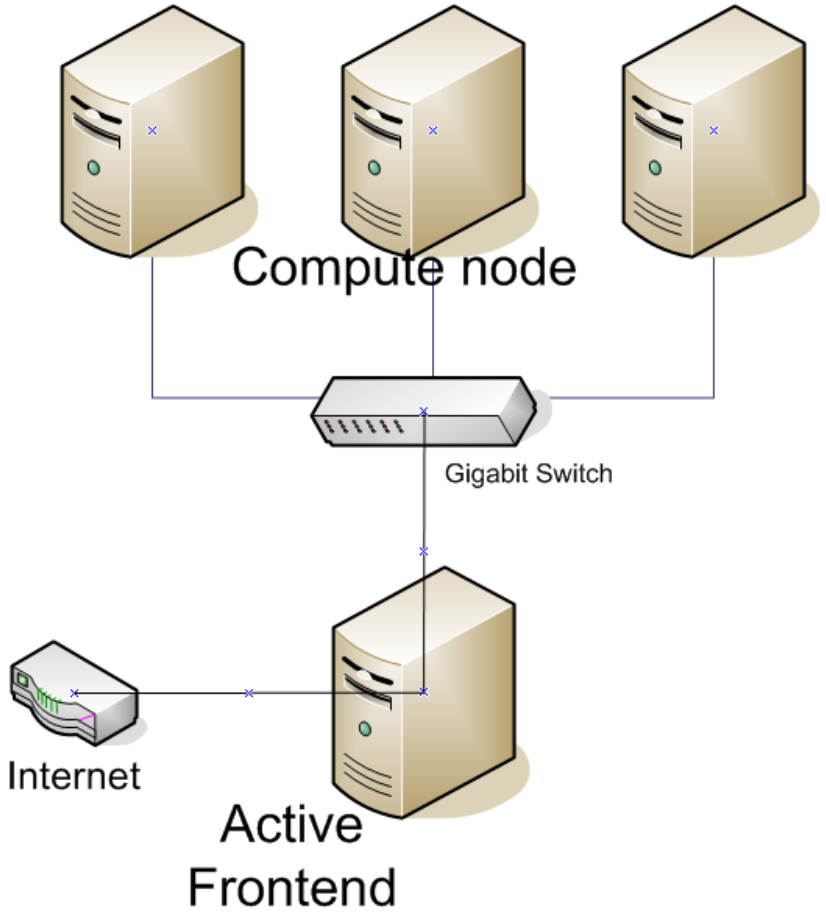
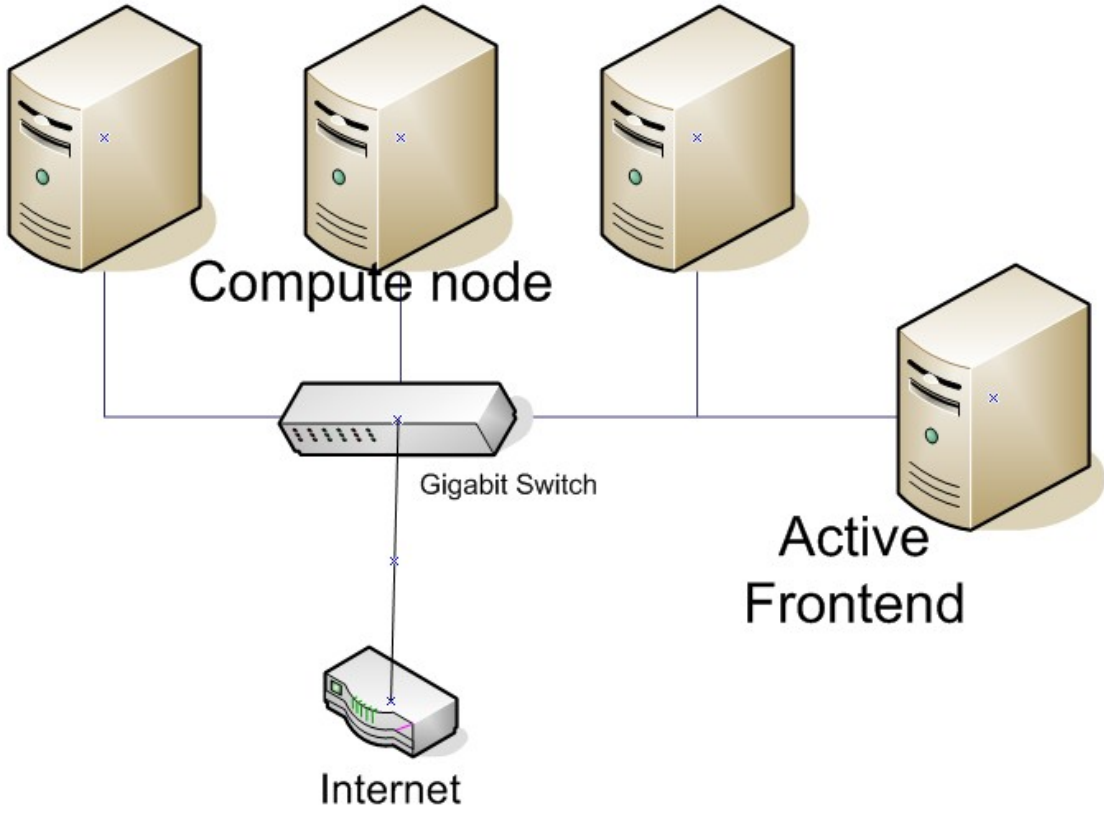


Cluster via connection

- Close Cluster

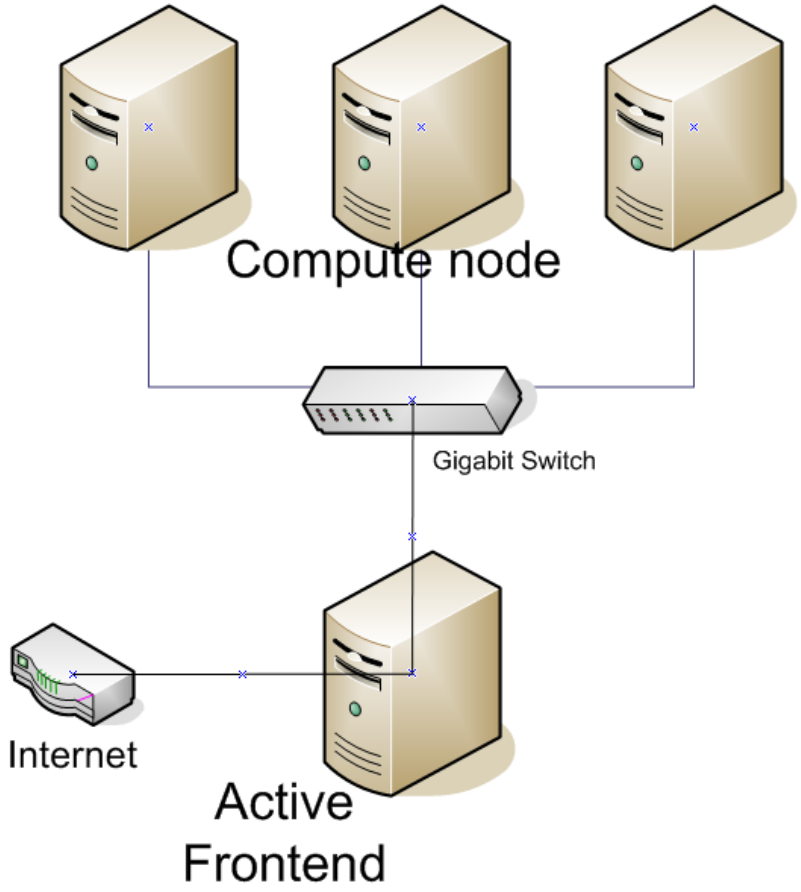


- Open Cluster

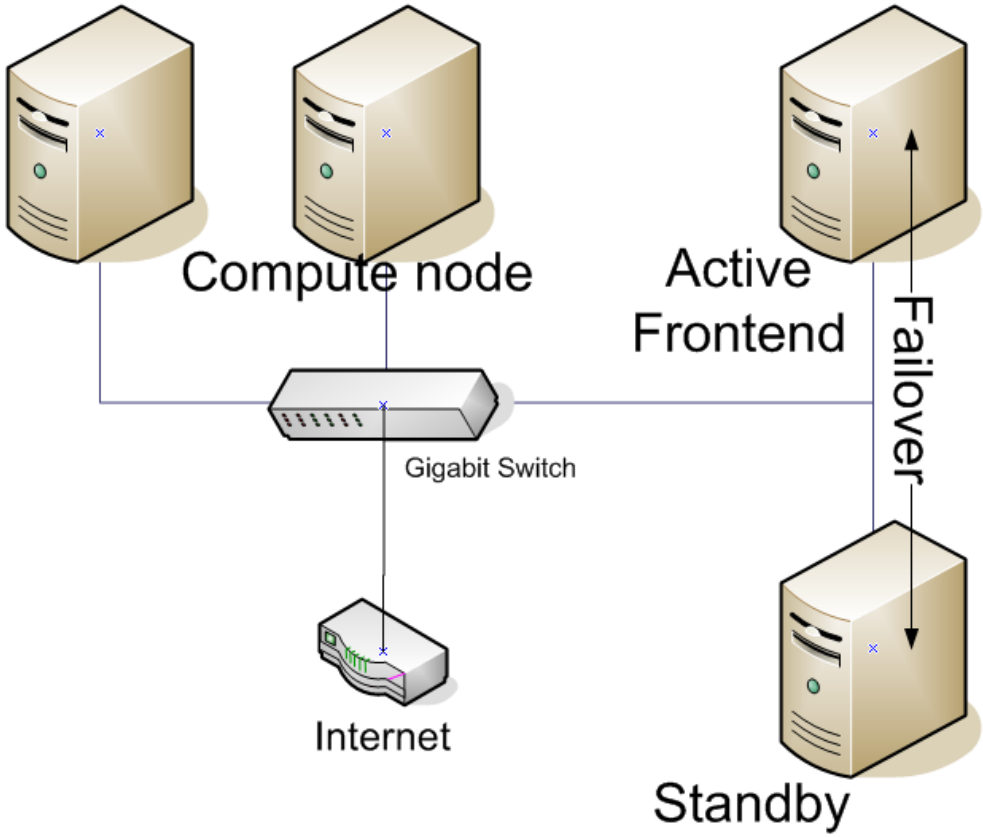


Cluster via usability

- High Performance Cluster

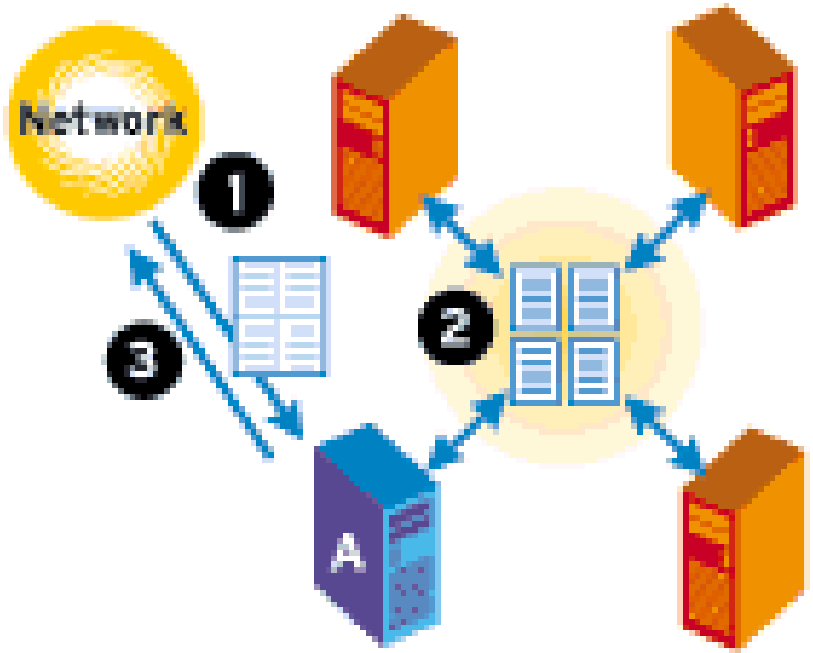


- High Availability Cluster and Load Balance

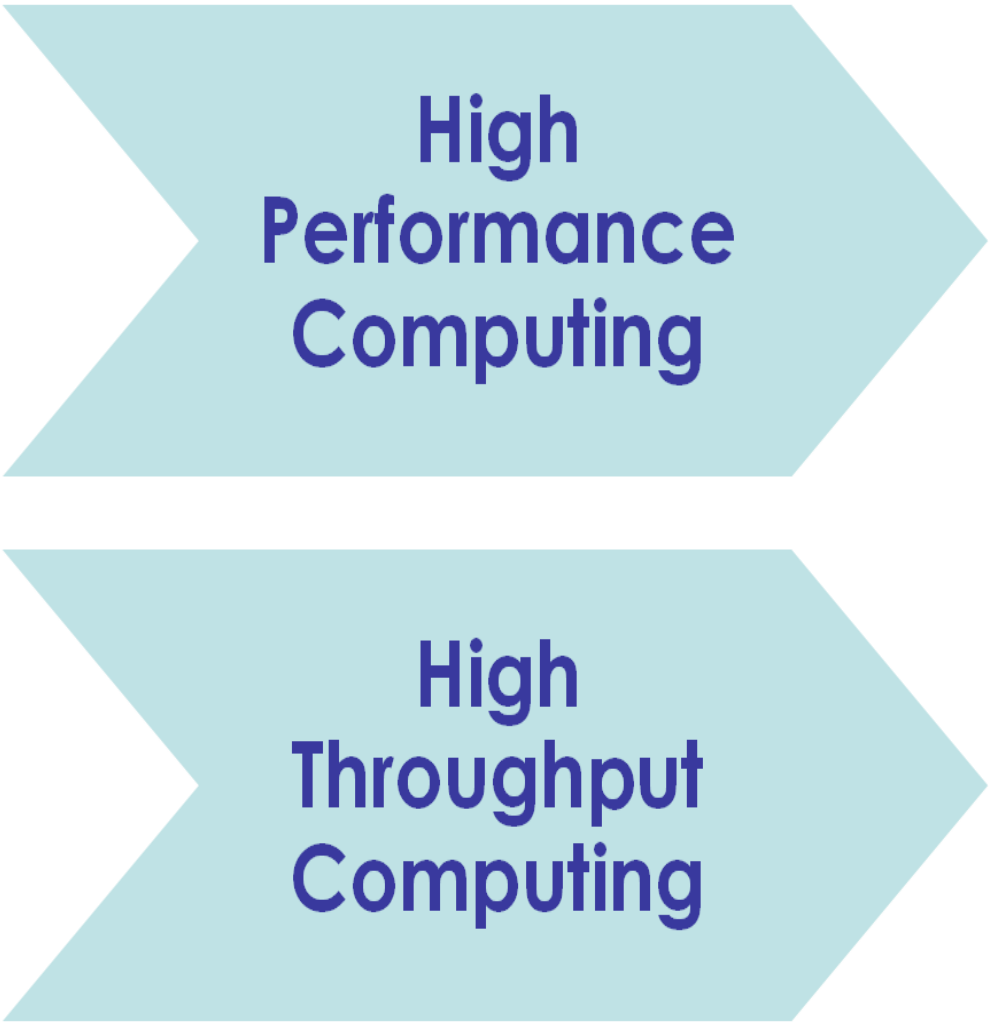


High-performance clustering

- Link many computers together to team up and finish problem fasters by having multiple computer working on the same problem independently

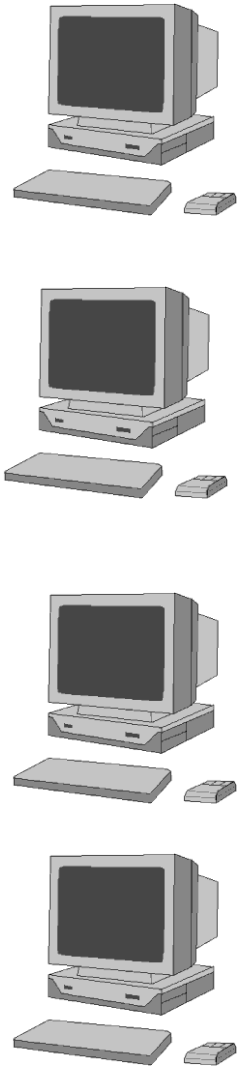


Type of Execution Job

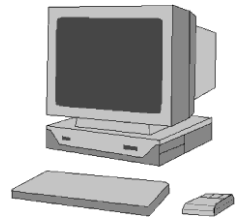


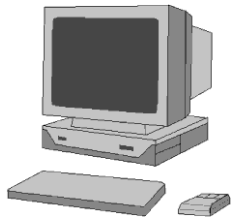
High Performance Computing

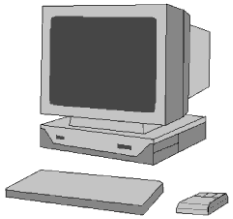
Big job

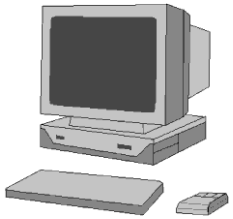


High Throughout Computing

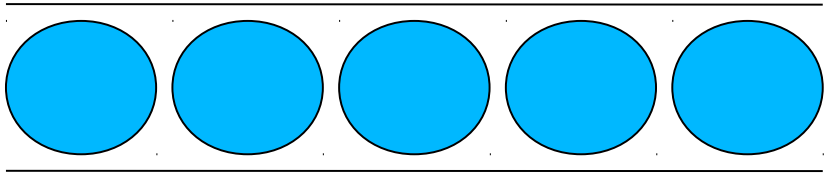






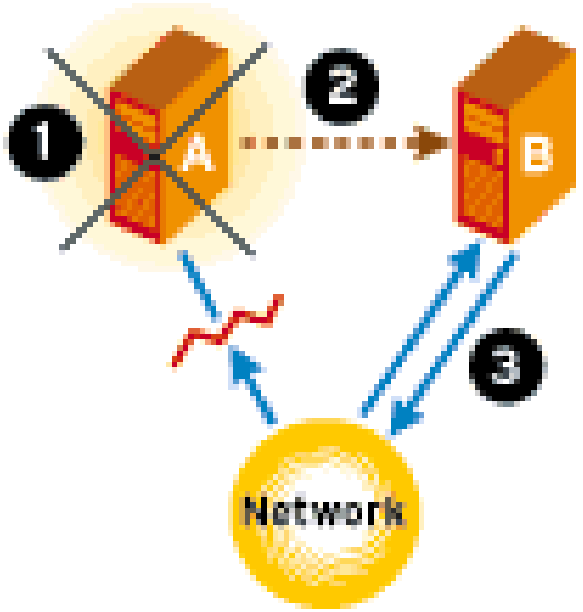


Jobs Queue



High-availability clustering

- Make more reliable computer system by having many computers working together and takeover when any of them fail



Benefit of cluster

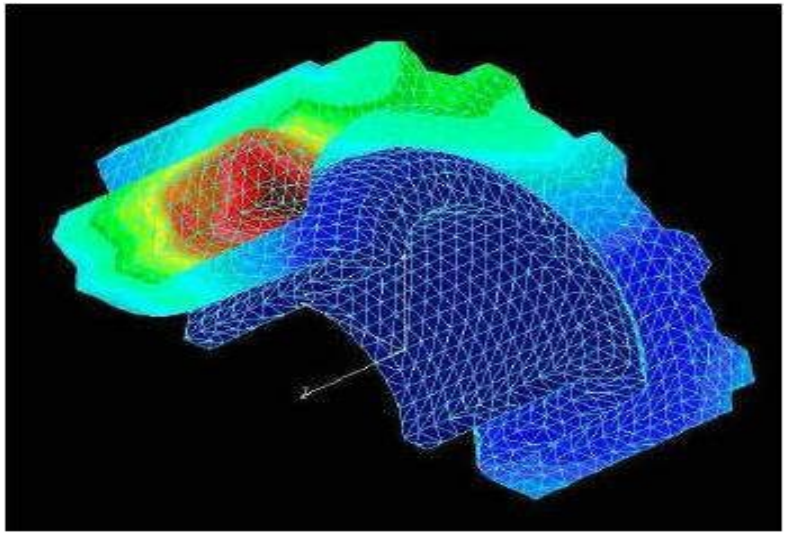
- Low startup cost
- Scalability
- Rapid response, technology tracking
- More user-driven configuration
- Order of magnitude price-performance advantage

How applied to use cluster

- High Performance Compute Cluster
- High Throughput Compute Cluster
- Render farm
- HA Server
- Load balance server
- Cluster database
- Web Cluster

What cluster do ?

- Aerodynamics
- Air pollution prediction
- Bioinformatics
- Chemistry
- Financial analysis
- Graphic Rendering
- Oil and gas
- Weather prediction
- CFD



THE Sun
Thursday, 4 February 2010

film biz

http://www.thesun.co.uk/sol/homepage/showbiz/film/2760950/Avatar-week-in-The-Sun-3D-secrets-behind-the-300m-movie.html

2,400 hours to make one second of action

By GRANT ROLLINGS

Published: 07 Dec 2009

Add a comment (3)

CINEMA will never be the same again as the most expensive movie ever made takes the greatest technological leap forward since colour pictures.

A world like no other ... Avatar

Avatar is the first film from director James Cameron since 1997's Titanic and has been more than a decade in the making.

Challenge of Avatar Movie

- One frame of certain shots, it's 24 frames per second, took 100 computer hours to render. Just one second was 2,400 hours.
- Weta operates a 10,000-square-foot facility that uses HP BL2x220c blades to process the effects for AVATAR and other films. The computing core contains some 40,000 processors and 104 terabytes of RAM.

The Data-Crunching Powerhouse Behind 'Avatar'

December 22nd, 2009 : John Rath

http://www.datacenterknowledge.com/archives/2009/12/22/the-data-crunching-powerhouse-behind-avatar/

3D Animation

iSGTW INTERNATIONAL SCIENCE GRID THIS WEEK

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Home > iSGTW 20 February 2008 > iSGTW Link of the week - Kung Fu Panda digs grids

Link of the week - Kung Fu Panda digs grids

Grid computing isn't always about saving the world. It can be about creating a new world, in this case, the world of the Kung Fu Panda, a new animation feature by Dream Works to be released in June.

Creating animation films like Kung Fu Panda typically requires around 25 million render hours from start to finish. The Dream Works computer farm comprises a 4000-processor

References

- Shrek the Third
  - http://www.linuxjournal.com/print/9653
- Kung Fu Panda digs grids
  - http://www.isgtw.org/?pid=1000931
- Avatar
  - Google Keyword **"avatar movie render"**

How applied to use cluster

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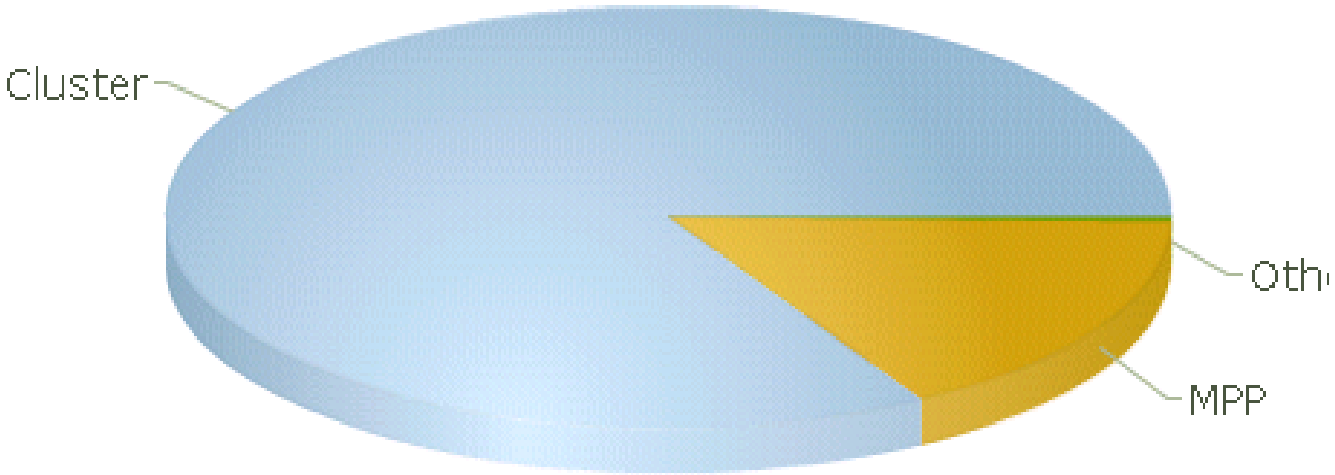
HPC World

- Cluster 417 (83.40%)
- Constellations 2 (0.40%)
- MPP 81 (16.20%)

Data of 11/ 2009
http://www.top500.org/



HPC in Thailand

- **BIOTEC**
  - "Eclipse" 704 Cores
  - Big Mac 96 Cores
- **Ramkhamhaeng University**
  - "Sila" 256 Cores
- **ThaiGrid**
  - "Tera" 800 Cores
  - Windows cluster 33 nodes
- **Chula University**
  - 88 processors called PAKSA at Chemical dep.
- **ThaiHPC Group**
  - 32 nodes * 4 groups
- **GISTDA**
  - 6 nodes pilot cluster.

Apply HPC in Thai

- Thai National Grid Center
  - Tera Cluster
  - Machines 200 nodes

  has 800 cores
  - Used computing the science

  and engineering
  - Provided Software
    - Amber9
    - Fluent
    - ANSYS CFX

Apply HPC in Thai (cont'd)

- Rankhamhaeng University
  - Sila Cluster
  - Machines 23 nodes has 286 cores
  - Used computing the science
  - Provided Software
    - Autodock
    - GAMESS
    - Guassian

Apply HPC in Thai (cont'd)

- BIOTEC
  - Eclipse Cluster
  - Machines 23 nodes has 704 cores
  - Used computing the science
  - Provided Software
    - Autodock
    - Amber
    - Gaussian

BIOTEC
a member of NSTDA