Computational Science Activities in Korea

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Korea Institute of Science and Technology Information

Contents

- **National Supercomputing Act**

- **National Supercomputing Plan**

- **National Institute of Supercomputing and Networking**

- **National Supercomputing Infrastructure**

- **Computational Science Society**

HPC Incident in Korea

◼ "Korea is Supercom-blind"

- ❖ No supercomputer in Korea made the top500 list (2009. 6.)
- ❖ Korea used to have more than ten systems in the list

3

Supercomputing Act

◼ Early Discussion

- ❖ '98: Law system maintenance on national supercomputing

◼ Discussion in National Assembly

- ❖ '04: "Urge law system for the vitalization of national supercomputing" (State Affairs Committee)

- ❖ '05: "Urge effective utilization of supercomputer" (Science and Telecommunication Committee)

- ❖ '06: "Urge law system maintenance on national institutes" (Assembly-man Ryu)

- ❖ '08: "Demand of comprehensive plan for the promotion of supercomputing" (Assembly-woman Kim)

국가 슈퍼컴퓨팅 육성전략
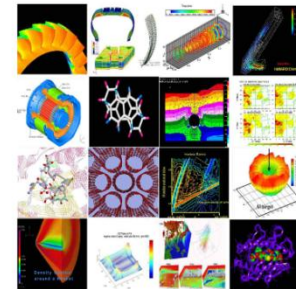
2006. 12.

한국과학기술정보연구원

▣ Bill Consideration at National Assembly

- ❖ '09.09: Proposed in the 284th Regular Session

- ❖ '10.02: Open Forum on the Promotion of National Supercomputing

- ❖ '10.04: Invited Lecture on the Promotion of National Supercomputing

- ❖ '10.08: Introduced in the 293th Plenary Session of Education, Science and Technology Committee

- ❖ '10.11: Public Hearing

- ❖ '11.03: Approved in the Subcommittee on Bill Consideration

- ❖ '11.03: Approved in the 298th Plenary Session of Education, Science and Technology Committee

- ❖ '11.04: Approved in Plenary Session of Judiciary Committee

- ❖ '11.04: Approved in the 299th General Meeting

- ❖ '11.06: Act on "National Use and Promotion of Supercomputer" Enacted

- ❖ '11.12: Promulgate the Enforcement Ordinance and Regulation

▣ Title
- ❖ "Utilization and Promotion of National Supercomputing"
- ❖ **Enacted**: 2011. 6. 7, **Implemented**: 2011. 12. 8

▣ Goal
- ❖ Contributing to the enhancement of people's quality of life and the national economic development… through the efficient implementation and systematic management of national supercomputing infrastructure

▣ Key Actions
- ❖ Establishment and execution of plan for the promotion of national supercomputing ecosystem
  - • Master Plan (5 years), Implementation Plan (1 year)

- ❖ National Supercomputing Committee
  - • Chair: Secretary of Ministry of Science, ICT and Future Planning
  - • Ministry Involved (9): **Ministry** of Science, ICT and Future Planning, **Ministry** of Strategy and Finance, **Ministry** National Defense, **Ministry** of Trade, Industry and Energy, **Ministry** of Health and Welfare, **Ministry** of Environment, **Ministry** of Oceans and Fisheries, Small and Medium Business **Administration**, Korea Meteorological **Administration**

- ❖ National Supercomputing Center
  - • Support the planning and execution of national plan

National Supercomputing Plan

❖ **3 Strategies** (or Areas)

- Expand adoption
- Efficient infrastructure (including human resource)
- R&D on core technology (including industry)

제1차 국가초고성능컴퓨팅 육성
기본계획('13 ~ '17)

계출자	교육과학기술부	기획재정부
	국 방 부	지식경제부
	보건복지부	환 경 부
	국토해양부	국가과학기술위원회
	중소기업청	기 상 청
제출년월일	2012. 12. 4.	

Vision

Top 7 Nation for Supercomputing

Expand the use of supercomputing through the creation of new demand

Establish Top 10 supercomputing service infrastructure

Secure independent supercomputing development capacity

- ◼ **Expand the use of supercomputing through the creation of new demand**
  - ❖ Promote national research and development using national supercomputing
  - ❖ Strengthen industry innovation by using national supercomputing
  - ❖ Expand public and private service based on supercomputing
  - ❖ Expand public participatory activities to promote the understanding of supercomputing

- ◼ **Establish global top 10 supercomputing service infrastructure**
  - ❖ Secure supercomputing resource in response to future demand
  - ❖ Establish efficient national supercomputing service system
  - ❖ Train demand-based experts for supercomputing ecosystem

- ◼ **Secure independent supercomputing development capacity and foster the basis for industrialization**
  - ❖ Secure independent development capacity for supercomputing system
  - ❖ Expand R&D of original technology for the next generation supercomputing development
  - ❖ Foster industry basis related to supercomputing

About NISN

▣ Mission (Article 9, Clause 1)

❖ Support Promotion and Utilization of National Supercomputing

▣ Function (Article 9, Clause 3)
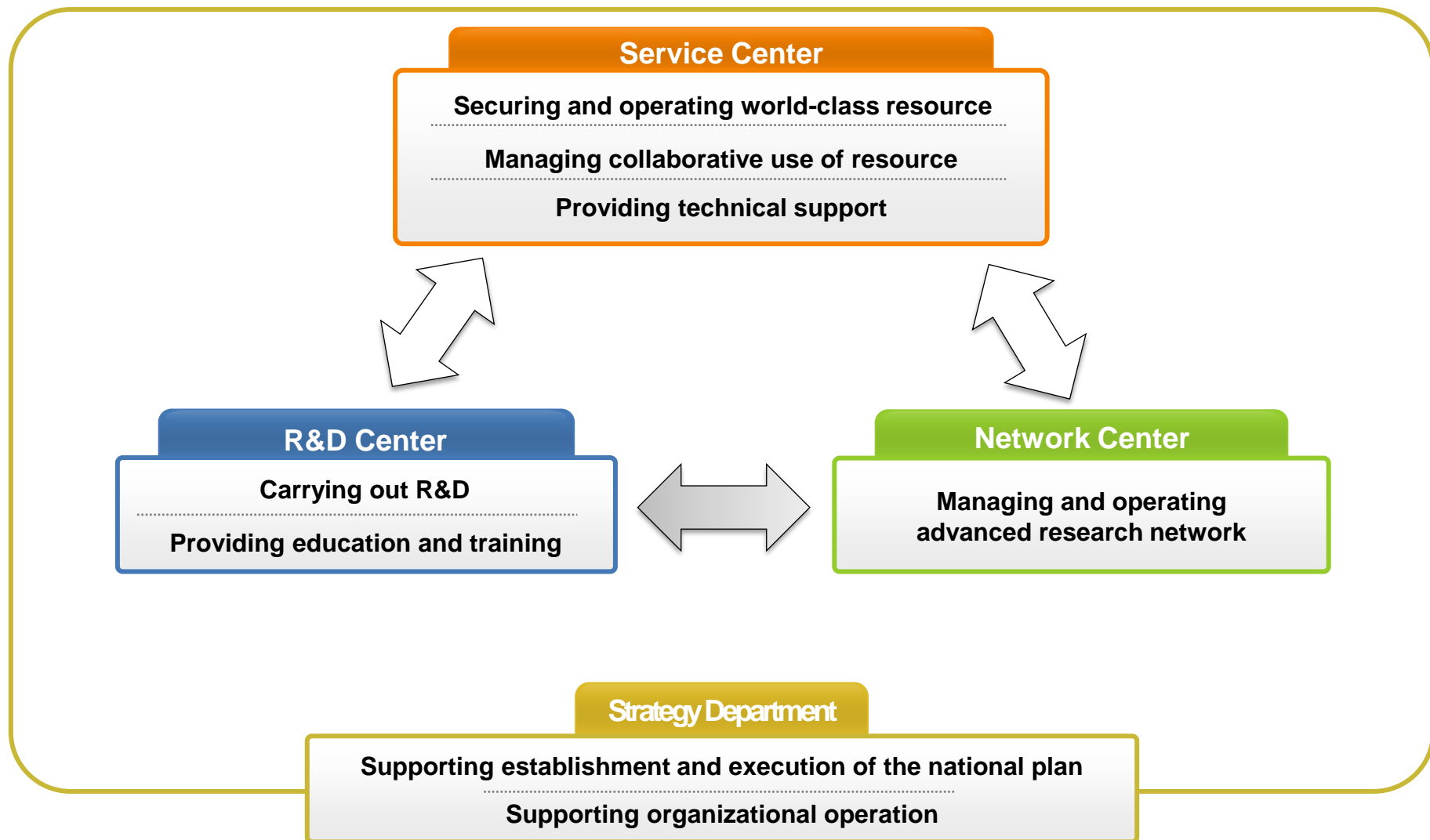
❖ Securing and operating world-class resource

❖ Managing collaborative use of resource

❖ Carrying out R&D on supercomputing

❖ Providing education, training, and technical support

❖ Managing and operating advanced research network

❖ Supporting establishment and execution of the national plan
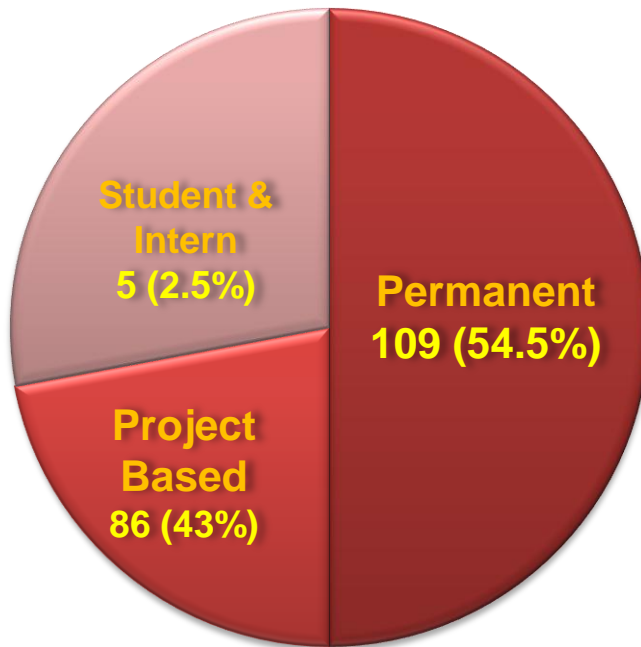
▣ Inauguration Ceremony (2012. 12)

❖ US: NCSA, Calit2 (NSF), NCCS, LBNL (DOE)

❖ Japan: AICS, CCS

❖ China: NSCC-TJ, CNIC, SSC

❖ Europe: JSC, CSC

National Institute of Supercomputing and Networking - Organization

Service Center
- Securing and operating world-class resource
- Managing collaborative use of resource
- Providing technical support

R&D Center
- Carrying out R&D
- Providing education and training

Network Center
- Managing and operating advanced research network

Strategy Department
- Supporting establishment and execution of the national plan
- Supporting organizational operation

▣ Personnel (200 people)

Form of Employment

Student & Intern
5 (2.5%)

Permanent
109 (54.5%)

Project Based
86 (43%)

Degree Obtained

Bachelor
45 (22.5%)

Doctor
72 (36%)

Master
83 (41.5%)

Supercomputing Infrastructure
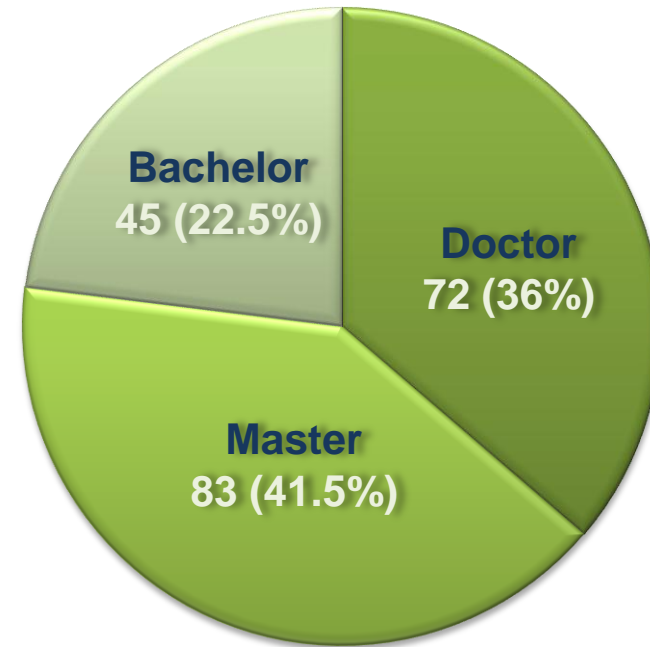
# KSCA (Korea Supercomputing Centers Alliance)

❖ KSCA was established in 2001 for collaborating for supercomputer operation, sharing of their resources, and developing operation technology

❖ 20 Members (university, research institute, government, industry)

❖ Main KSCA member have been joined to PLSI project since 2007 for sharing their resources and vitalizing regional HPC ecosystem
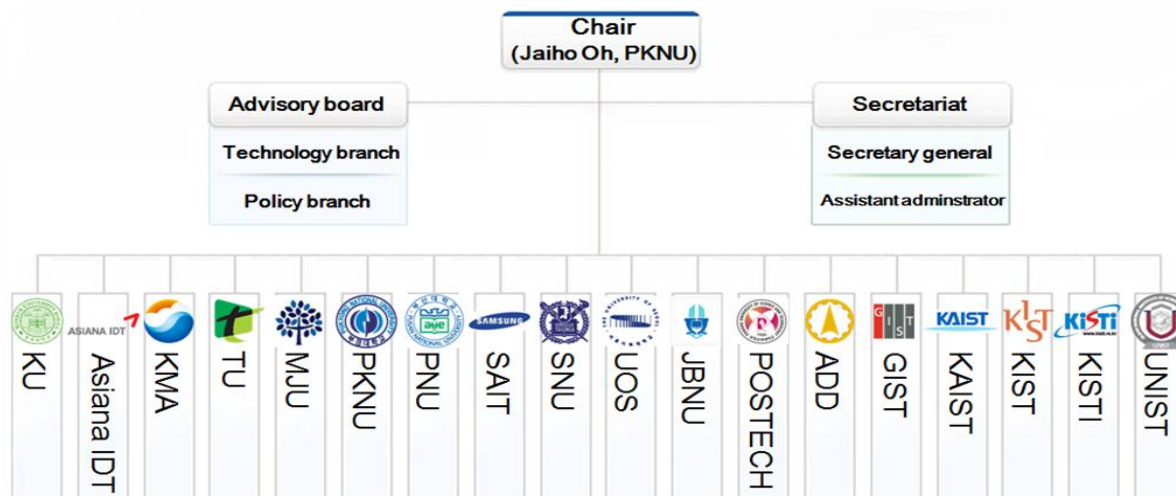
❖ Shared Infrastructure

- 11 Participants: KISTI, PKNU, PNU, UNIST, GIST, KIAS, …
- Resource: 21 Systems, 8764 CPU, 102 TF (84 TF from KISTI)
- Service: Integrated System, User Portal, Support, Training

✓ Serving as Pilot National Supercomputing Infrastructure
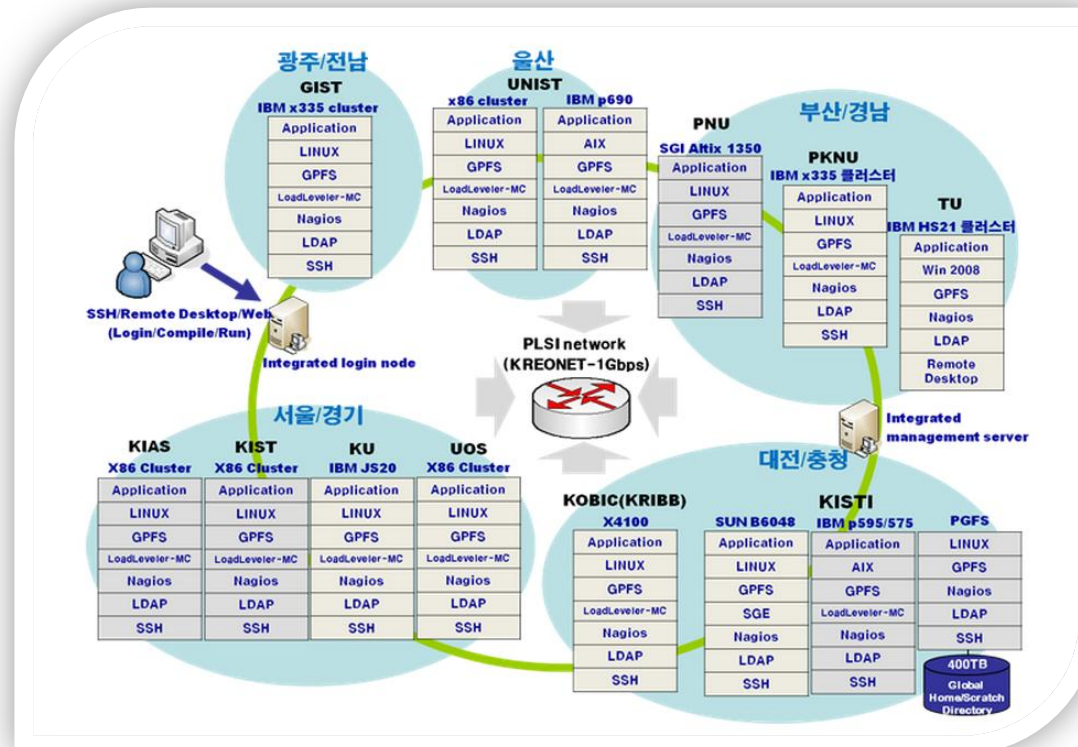
❖ **Secure supercomputing resource for responding to future demand**
  - Construct systematic resource demand forecast and management system
  - Secure world-class supercomputing resource
  - Expand research network resource for supporting supercomputing service

❖ **Establish efficient national supercomputing service system**
  - Three layer architecture: national – specialized – interconnection
    - ✓ National center (NISN): world-class resource, support large scale national strategic projects, national service infrastructure leader
    - ✓ Specialized center: medium scale resource, support specific domain (or ministry), regional service leader
    - ✓ Interconnection center: institute-wide resource, support local demands, institute service leader

NATIONAL CENTER (NISN)

Cooperation to establish collaboration infrastructure

SPECIALIZED CENTER

INTERCONNECTION CENTER
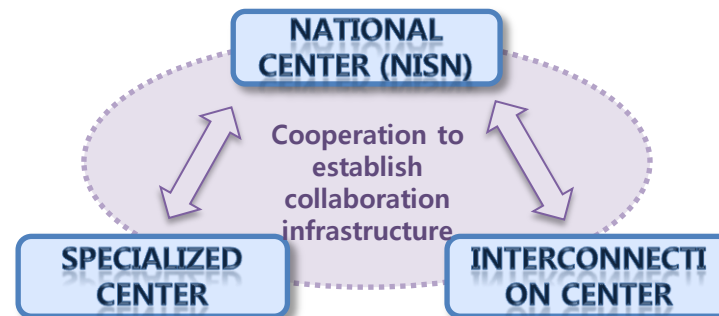
Computational Science Society

◼ Introduction

- ❖ Korean Society for Computational Sciences and Engineering(KSCSE) was founded on October of 2009

- ❖ Promote and encourage the domestic computational science and engineering in science and industry

- ❖ Homepage www.cse.or.kr

◼ Statistics (as of 2013)

- ❖ President
  - • Dong-Pil Min

- ❖ Board Members
  - • 6 Vice-Presidents
  - • 20 Officers

- ❖ Membership
  - • 386 People

■ **Activity**

❖ 2009
- Inaugural Meeting and Workshop
  (10.12, COEX Intercontinental Hotel)

❖ 2010
- Invited talks & Multicore/GPU Computing Workshop
  (5. 27~28, KIAS)
- Fall Conference (12.6, Ramada Hotel)

❖ 2011
- Incorporated Association (1.31, MEST)
- Spring Conference & MPI/Heterogeneous Computing
  (5.19~20, Seoul National University)
- Fall Conference (12.1, Seoul Education Culture Center)

❖ 2012
- Spring Conference (6.22, Yonsei University)
- Fall Conference (10.10, EL Tower)

❖ 2013
- Spring Conference in conjunction with FKPPL Workshop
  (6.5, Yonsei University)
- Fall Conference in conjunction with HPC User Forum
  (10.1, EL Tower)

KSC (Korea Supercomputing Conference)

◼ **Annual Meeting**

- ❖ KSC2009
  - 10.12~13, COEX Intercontinental Hotel
  - Attendance 343: University 143, Industry 86, Government 114
- ❖ KSC2010
  - 10.6~7, Ramada Hotel
  - Attendance 246: University 81, industry 61, Government 104
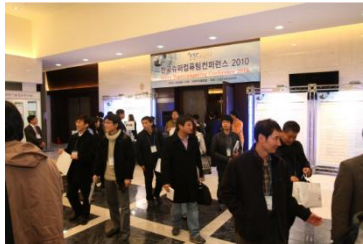- ❖ KSC2011
  - 12.1~2, Seoul Education Culture Center
  - Attendance: 354
- ❖ KSC2012
  - 10.10~12, EL Tower
  - Attendance: 301
- ❖ KSC2013
  - 9.30~10.2, EL Tower

Super Korea!

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