

JST Research Initiative toward Dependability and Security

--- activity report ---

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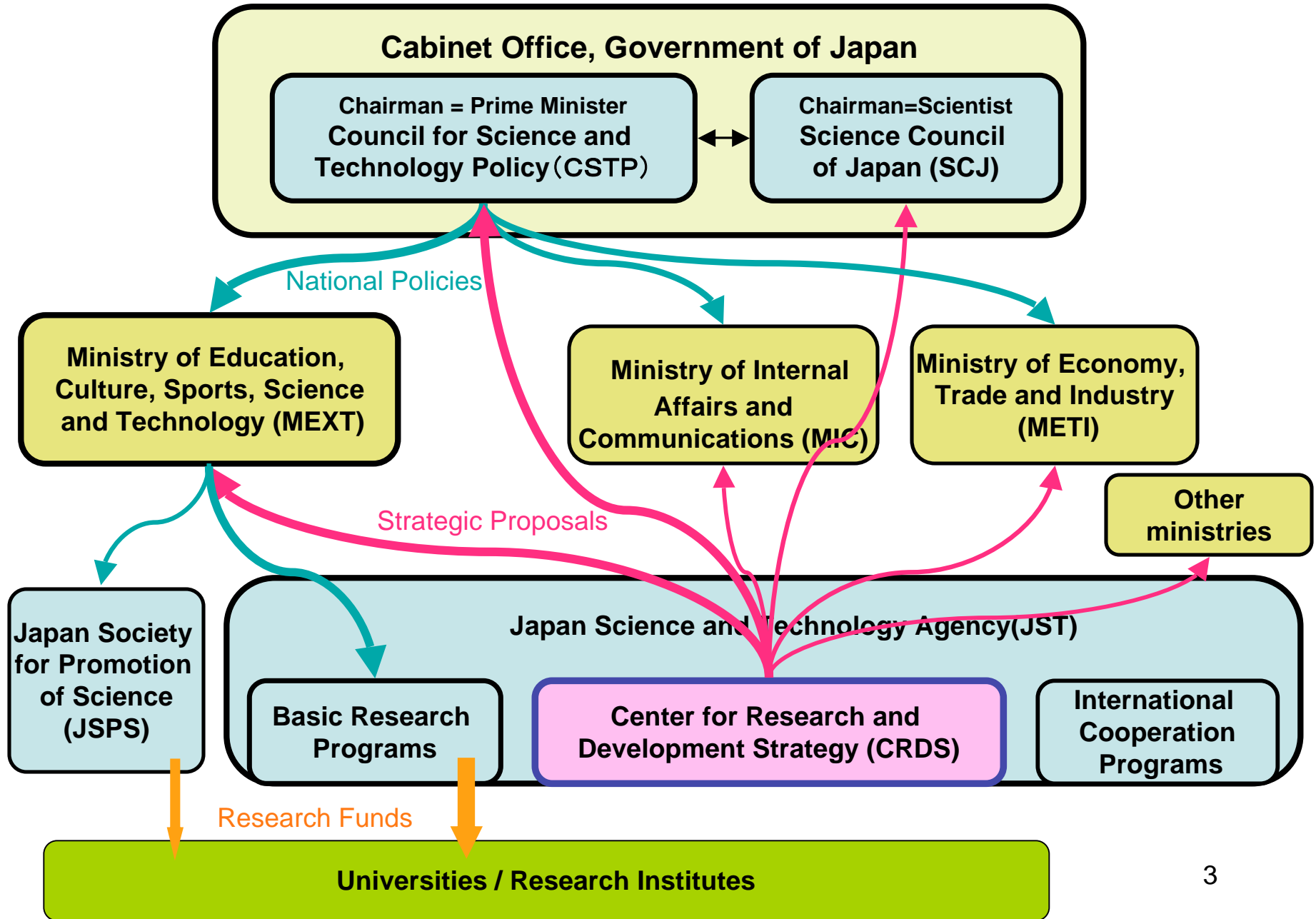
National Plan for Science & Technology

- 1st period (1996~2000) 17 trillion Yen
- 2nd period (2001~2005) 24 trillion Yen (1% of GDP)
- 3rd period (2006~2010) 25 trillion Yen

- One of the three national visions for S & T policy for 2nd & 3rd period

- ***Assuring 信頼性 and 安全性 of life and society***
- ***dependability security***

To invest 200B\$ for 5 Years (2006-2010) in S&T



Two initiatives on Dependability & Security

- The Science Council of Japan (SCJ) has established a new working group on security & dependability to discuss problems including human-made faults, vulnerabilities in societal systems, responsibility of ICT researchers in information society.
- The Japan Science & Technology Agency (JST) is proposing a strategic initiative for research and development on dependability and security in information society, and plans to propose a series of research programs in this direction.

Science Council of Japan (SCJ)

- 2000 members from all over the science communities in Japan
 - Natural & Information Science
 - Medical & Bio Science
 - Social & Human Science
- Working Group on Security & Dependability
- Launched January, 2007
- 17 members from universities and industries
 - First meeting: Jan. 29
 - Second meeting: March 29

Marriage of Security and Dependability

- Security research assumes ;
 - private information (key) is appropriately protected
 - systems are correctly implemented
- But, non-malicious faults in the specification, design, configuration, or operation can cause vulnerabilities
- \Rightarrow Assuring security requires dependability !

- Dependability research assumes;
 - faults occur accidentally
- But, malicious (human-made) faults are not accidental
- \Rightarrow Assuring dependability requires security !

Information-Societal Technology

- Assuring security and dependability in information society requires not only information technology, but also , societal technology
- Critical Infrastructure (energy, communication, transportation, banking, government)
- Metrics, Evaluation , Benchmarking
- Visualization of “dependability & security values” and mapping to economic values
- Societal security systems
- Audit, Authentication, Standard
- Education
- Law

Summary of Issues discussed

- Marriage of security and dependability
- Cooperation with social science and humanity
- Relations to societal systems
- Proposals to higher-level education
- International Cooperation
- Technology challenges

Japan Science and Technology Agency (JST)

Government-related agency (<http://www.jst.go.jp/EN/>)

- core organization for implementing Japan's science and technology policy

Center for R & D Strategy (CRDS)

(<http://crds.jst.go.jp/en/index.html>)

Mission: Identify important research areas based on the interest of society, and submit proposals to the Government

Strategic Research Initiative on Dependability/Security in Information Society

- JST/CRDS has identified “dependability & security in information society” as one of the most important research areas, and is going to submit a proposal
- promote research and development for dependability & security technology based on quantitative metrics
- create a new economic value for dependable and secure service of computing systems and networks
- give reasonable incentive for industries to work explicitly toward dependability and security, and enhance corporate values and competitive power
- contribute to international activities towards global standards

JST Workshop on Dependability/Security Evaluation

- was held in Tokyo in November 24-25, 2006, by invitation
- to review current status for dependability/security evaluation, and
- to discuss important research areas and challenges
- Including metrics, measurement, evaluation, benchmark, visualization, standardization, mapping to economic value, impact on societal systems
- attended by 20 leading researchers in a variety of areas, including dependable computing, network security, software engineering, enterprise systems, web service, service engineering, robotics, automotive electronics, railway control systems, computer surgery, cognitive science, economics, from Japanese universities and industries, as well as technical officers from JST, MEXT, METI, MIC, etc

Conclusions and Input to the Proposal

- Unification of dependability and security
- Socio-information technology toward dependability and security of networked systems and critical infrastructures
- Metrics from users' (stakeholders') point of view at a service level that can be decomposed and reduced consistently into design specifications at a development level
- Platforms that support dependability measurement adaptable to advances in technologies and changes in societal environment
- Modelling of human-made faults
- Dependability and security testbeds

Challenges

--- difficult, but important ---

- Define **metrics** that represent the degree of dependability for services provided by networked systems from **user's point of view** so that the value of dependability is made **visible** and mapped to **economic values**.
- Establish methodologies to verify and assure the **dependability of summarized and prioritized information** from a huge amount of information produced and recorded on globally networked systems.

Next steps

- SCJ
 - continues to discuss toward the marriage of security and dependability, and bridging the gap between technology seeds and society needs
- JST/CRDS
 - will publish a proposal of “strategic research initiative on dependability and security for information society” by the end of July
 - will have a workshop for implementation of the proposal in Autumn