

WIDE Project

~ Introduction and Overview ~

Seoul Workshop 2005
August 11, 2005

Director : Jun Murai



Activating networks within evolving networks.

- Internet technologies are making a transition from an era of deployment and high speed to one of qualitative evolution. The realization of a diverse range of environments enabling correspondence in a variety of forms and situations is rapidly becoming a reality.
- Meanwhile, a more reliable social infrastructure, one that has its roots deep in our every day lives, is in demand more than ever.
- Our goal is the construction of a “Dependable Internet”, one that can be used by people from all walks of life in any situation with a sense of security. This enormous challenge cannot be taken on alone, but will require cooperation in research and development on a global scale. This is exactly where the significance of the information technology research network lies.



Basic Philosophy:

Technology bringing society together.

- The basic philosophy of the WIDE Project lies in the provision of a global connection between computers and all other equipment and the construction of a distributed system that will serve a useful purpose from an individual and social viewpoint and to bring to the fore the relative issues and problems in order to bring this to fruition.
- We have held this philosophy since the project was launched in 1988 to the present day amidst remarkable developments in network technologies.
- The Project aims to construct a highly public information infrastructure that will contribute to society in a variety of fields including medicine, finance, education and law.



Research Territory: Bringing technologies together.

- The research that the WIDE Project is undertaking on the physical layers of Internet infrastructure can be likened to the water that cultivates vegetation in the soil.
- Although not visible on the surface, the results of our research are permeating through to and have great potential in all aspects of network environments.
- Just a few examples include the operation of the M Root DNS Server, forming the Internet backbone of the Asia-Pacific region, and the world's first undertaking of IPv6 (Internet Protocol version 6).
- We are reaching into territories that go beyond that of the organizational boundaries of corporations and universities into the networking of a variety of fields that only an interdisciplinary research network can achieve.



Research System: Bringing researchers together.

- The WIDE Project is made up of more than 100 loosely bound organizations including various corporations and universities.
- In recent years working groups have been set up under various research themes. Our work carried out by over 730 researchers in Japan, collaborating with foreign researchers from all over the world.
- This is the “WIDE Internet”, a shared research base that brings distant project members together.
- Operated through repeated experimentation and demonstration, the WIDE Internet provides a connection between members for sharing and discussion of information on a daily basis.



Research on our left hand, operation on our right hand.

~ Supporting social infrastructure with both hands. ~

- The Internet is a technology that knows no boundaries. Its expansion of scale gives rise to innovative technologies, and changes in optimal methodologies make it necessary to conduct case-by-case implementation experiments.
- The WIDE Project with its motto of “Research on our left hand, operation on our right hand.” is the first in Japan to establish a collaborative research foundation, the “WIDE Internet” on the Internet.
- While operational, the “WIDE Internet” also functions as a site for experiments.
- Research results are fed back to operations to build more efficient network environment for society and the business community.



Research Toward the new and unknown age of ubiquity.

- Mobile and Auto-ID technologies are expanding the network access base through the practical application of IPv6.
- The ultimate aim of the project, namely the realization of a “large scale distributed computing environment”, is nearing the age of ubiquity.



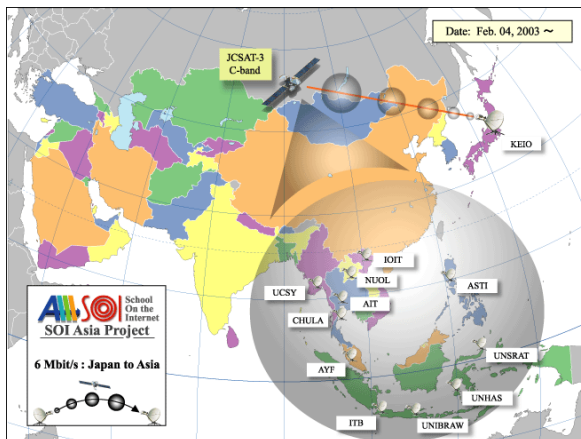
The pursuit of the possibilities of in built car computers : iCAR (Internet CAR)

- Research is currently being undertaken into information platforms necessary for the development of mobile communication technologies required to provide a link between automobiles and the Internet and into the application of such technologies.
- Research primarily consists of practical experimentation involving the provision of traffic and weather information by transmitting and accumulating information held by in-built car sensors over the Internet.



The construction of new infrastructures through the use of satellites : AI3 (Asian Internet Interconnection Initiatives Project)

- The WIDE Project is providing broadband networks to countries lacking cable network infrastructure such as countries in Southeast Asia through the use of satellite networks.
- An Internet architecture has been established maximizing the strengths of satellite communications, namely portability, geographic coverage, and dynamic circuit settings, and has been applied to the current Internet infrastructures making possible communications that were impossible using conventional network platforms.



Global sharing of education : SOI (School of Internet)

- As of April 2004, over 16,000 students (over half over these working members of the community), are registered to SOI and learn through the self learning video and materials, amassed over 2,000 hours on the SOI site, including university courses and special lectures by renowned researchers all over the world.
- Since commencement of the program in 1997, experiments into joint Japan-U.S. classes in 1998 and real-time classes in 2000 were undertaken, and in the year 2001 the “SOI Studio Project” was launched with the aim of constructing the framework for the next generation remote learning studio.
- Work on the broadcasting of lectures via satellite under the “SOI-Asia Project” also commenced in 2001 and as of October 2004, share the lectures in real-time or through the use of archives with universities and research institutions in 17 locations in 11 countries.



Creating firm links between cyberspace and real Space : Auto-ID

- Involved in researching, designing, implementing, and experimenting with systems which process information regarding an object to which a unique identifier (ID) capable of individual recognition has been attached over the Internet.
- The results are forwarded to the Auto-ID lab for further research and standardization.



Technology and deployment of IPv6 KAME, USAGI, TAHI

- The “KAME”, “USAGI”, and “TAHI” projects are undertaking the implementation and validation of IPv6.
- These projects are working on research and development on the implementation of the IPv6 and IPsec protocols, which operates on BSD based OSes for the “KAME” project and on a Linux based OS for the “USAGI” project. Accuracy of the implementation is now widely accepted and is being incorporated into BSD based OSes (FreeBSD, NetBSD, OpenBSD and BSD/OS) and Linux version 2.6 for the provision of an environment enabling the easy use of IPv6 to a large number of users.
- On the other hand, the TAHI project is aimed at providing a means of high-level verification of these technologies.



Practical application of IPv6 in mobile communications : Nautilus6

- We are currently involved in the research and development of mobile communication technologies required for the deployment of IPv6 mobility in today's society.
- The group is engaged in the research and development of the necessary fundamental technologies for mobile communications such as Mobile IPv6 and NEMO aiming for the development of practical protocols and the establishment of practical operating technologies.



Operations Supporting the dawn of the Internet Age.

- Operation of the “WIDE Internet” started as a TCP/IP based experimental platform run by the WIDE Project in 1988, four years before the appearance of WWW.
- Presently the project has served to enhance broadband environments and is proving itself as a platform for the validation of a large number of experiments. We operate the JP DNS server in 1989 and have since then sustained the JP zone.



Expanding research platforms

The WIDE Internet

- The WIDE Internet from its humble beginnings utilizing a single leased 64kbps line, has undergone broadband incorporation on an leased OC3 international line and GbE(Gigabit Ethernet) connections.
- In addition to that, the network has been linked to research networks around the world and commercial ISPs forming an important platform for joint research.



Challenge toward a next generation Ethernet : 10G Ethernet

- The WIDE Project has established the framework for wide-area Ethernet long-distance data transfer and has developed operational technologies and are putting to use the results of this research to construct and conduct joint verification experiments for a large-scale, next generation network (10Gbps Ethernet).

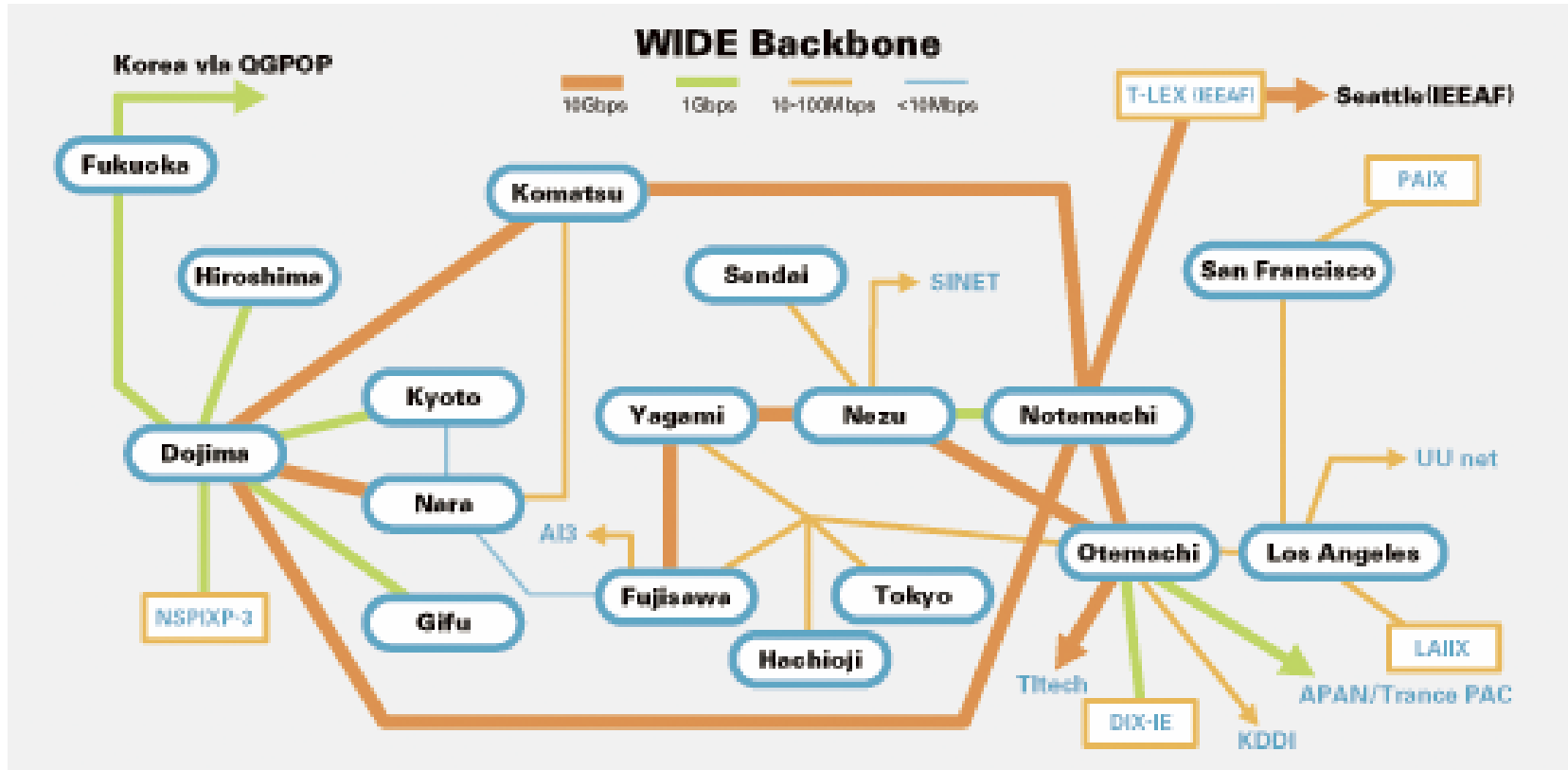


Ultra-wide band optical network technologies T-LEX (Lambda Internet)

- The IEEAF (Internet Educational Equal Access Foundation) operating a next-generation research and education network, commenced the operation of a Japan-U.S. 10Gbps Lambda based network in June 2004.
- The T-LEX (Tokyo-Lambda Exchange) constructed in accordance with the launch of this network serves as a public Lambda Internet exchange point. (Interconnection point)



WIDE Backbone



Connecting IPv6 technologies to ISP: NSPIXP (Network Service Provider Internet eXchange Point)

- The NSPIXP started operations in 1994 on a single Ethernet Hub experimenting interconnection technologies with the aim of creating more effective Internet operations in Japan.
- Subsequently with the increased use of the Internet, the system was migrated to NSPIXP-2 using FDDI and NSPIXP-3 commenced operations connecting multiple points in Osaka with the Gigabit Ethernet.
- NSPIXP was later migrated from FDDI to the Gigabit Ethernet/Fast Ethernet, and in April 2004 changed its name to DIX-IE (Distributed IX in EDO) and commenced distributed operations. NSPIXP was established to further promote the adoption of IPv6 and now functions as a connection point for Japan's primary Internet service providers.





Server	Operator	Status
A	Network Solutions, Inc	working
B	USC/ISI	confirmed
C	PSInet	working
D	UMD	working
E	NASA	confirmed
F	ISC	working
G	DISA	confirmed
H	ARL	working
I	NORDUnet	confirmed
J	(TBD)	working
K	RIPE	confirmed
L	ICANN/IANA	confirmed
M	WIDE	confirmed



Operation of DNS in the Asia-Pacific region

DNS (Domain Name System)

-M Root DNS Server -

- Ever since the dawn of the Internet, the WIDE Project has been operating the JP DNS.
- As part of our responsibility in contributing to the development of the Internet we have been operating the M Root DNS server since 1997.



Root Server Anycast Status

Server	Operator	Anycast?	Sites	Geographic Coverage
A	VeriSign	no	1	
B	ep.net	yes	4	Greater Los Angeles
C	Cogent	yes	4	United States
D	University of Maryland	no	1	
E	NASA Ames Research Ctr	no	1	
F	ISC	yes	30	Worldwide
G	US DoD NIC	no	1	
H	US Army Research Lab	no	1	
I	Autonomica/NORDUnet	yes	27	Worldwide
J	VeriSign	yes	16	Worldwide
K	RIPE NCC	yes	13	Worldwide
L	ICANN	no	1	
M	WIDE Project	yes	5	Worldwide
			105	



Root Server Anycast Summary

- Root server anycast is a tremendous success
 - Root server system extended truly worldwide with a diverse presence
 - More servers mean better performance (lower latency) and increased capacity: security and stability
- No significant technical issues
 - Current mix of anycast/non-anycast provides assurance of stability
- Anycast does introduce some additional operational complexity
 - So far the operators have managed this complexity without incident



Six research groups working closely together achieving multiple results.

- The research underpinning the WIDE Project is conducted in six groups with each pursuing their respective field of research.
- Each group pursues its own theme working closely with the other groups to uncover innovative fields of research.
- The research carried out by each group is carefully examined by the 20 board members at monthly board meetings.
- Although research is carried out throughout Japan, group members assemble at research meetings held twice a year (in Tokyo, Nara, and other locations) to discuss day-to-day results and issues and for intensive 4-day camps to discuss research topics in more detail.
- “Joint Research Conferences” are also held once every six months to provide the project sponsors with reports pertaining to research activities.
- Reports compiling the results of conducted research are distributed at the end of March every year.



Internet Area

Focuses on discussions on third layer (Internet layer) protocol

Security Area

The discussion of the Internet security related matters

General and Deployment Area

This group is involved in the discussion of general issues and the deployment of technologies that are not touched upon by the other working groups.

Transport Area

This group discusses the fourth layer (transport layer) and on occasion the second layer (datalink layer) protocol.

Operation and Management Area

Involved in the discussion of management and operation technologies for Internet networks and servers.

Application Area

Discusses how to create and increase the provision of applications that users employ on the Internet through implementation and experimentation.

Since the dawn of the Internet,
the fields of research to be addressed are unlimited.

- Over 20 years has passed since the transmission of data between two computers founded the principle of networking, and 16 years has passed since the founding of the WIDE Project. During this time, experiments carried out by numerous research cooperatives constituting a variety of organizations and researchers have given rise to significant achievements.
- Today, we are preparing ourselves for 10Gbps network environments. The role the WIDE Project has played in the construction of the Internet environments that you see at present is largely responsible for the evolution of the Internet into what it is today.



Intensive 4-day camp the “WIDE Camp”

- In addition to periodically held research conferences, camps held in spring and autumn are particularly important for discussions and the exchange of information.
- These 4-day intensive camps have provided a stage for the unearthing of numerous innovative research themes.
- The camps provide a venue for reporting the results of completed research and BoF (Birds of a feather) discussions of research that is still in the idea-stage and allow participating members to speak freely regardless of social position.
- The camps also have a working group that compiles documents and gathers data from an experimental network.





16-25 August 1996: The 2nd Rally Raid MONGOL Succeeded in broadcasting the rally from Mongol over the Internet.



2002/1/25: WIDE Workshop at Stanford University
The first overseas WIDE Workshop at Stanford University with the cooperation of Cisco Systems Inc.



July 14-19 2002: 54th IETF Meeting, Yokohama
Hosted IETF meeting in Asia for the first time.



September 25 2002: WIDE Project Sponsor Meeting held at the Nihon Kaiun Club
Conferences are held twice a year to report the results of joint research to sponsors of the WIDE Project.



December 18-19 2002: Global IPv6 Summit in Japan
We actively invite international summits.



September 18 2003: The 15th anniversary of the WIDE Project at Akasaka Prince Hotel
Had a party to express our appreciation to our sponsors for supporting 15 years, with approximately 350 attendees.



March 3-6 2003: WIDE Spring Camp 2003; Nagahama Royal Hotel (Shiga Pref.)
We hold intensive 4-day camp twice a year.



June 30-July 02 2004: NETWORLD+INTEROP 2004 TOKYO held at Makuhari Messe
Providing technical support since the 1st exhibition in 1994.

June 1992:
Hosted INET'92 (Kobe)



The circle of cooperation is growing beyond national, industrial, and educational boundaries.

- The WIDE Project, working in close cooperation with international organizations such as IETF and ISOC is part of a technology consortium aimed at providing solutions to current issues and standardizing network and Internet related technologies.
- Activities undertaken by the project to date have been recognized as highly successful and the exchange of information on a global scale as enhanced is ever increasing, facilitated through events such as the WIDE workshop held at Stanford University in January 2002.
- Among other activities, work currently being carried out in the area of satellite communications under the AI3 Project, is greatly influencing the deployment of the Internet through Asia and is contributing to the nurturing of human resources and the development of infrastructures in the years to come.
- On the domestic scene, the WIDE Project since hosting the INET92 in Kobe has been making assertive bids for other such international conferences and is supporting and providing state-of-the-art technologies, something that has been made possible through our extensive research.
- The Project is dedicated to the deployment of the Internet from an international viewpoint, supporting events such as the 54th IETF (July 2002) and the ACM Mobihoc 2004 (May 2004) held for the first time in Asia.



Related global organizations(1)

- **The ACM Mobihoc** <http://www.sigmobile.org/mobihoc/>
- **Asia Pacific Advanced Network (APAN)** <http://www.apan.net/>
- **Asia Pacific Network Information Center (APNIC)** <http://www.apnic.net/>
- **Asia Pacific Networking Group (APNG)** <http://www.apng.org/>
- **Asia Pacific Regional Internet Conference on Operational Technologies (APRICOT)**
<http://www.apricot.net/>
- **Association of Pacific Rim Universities (APRU)** <http://www.apru.org/>
- **Auto-ID Labs** <http://www.autoidlabs.org/>
- **Cooperative Association for Internet Data Analysis (CAIDA)**
<http://www.caida.org/>
- **DNS-MODA (Manufacturers Operation & Developers Association)**
<http://www.dns-moda.org>
- **DNS Root Server System Advisory Committee (ICANN/RSSAC)**
<http://www.icann.org/committees/dns-root/>
- **EPC Global** <http://www.epcglobalinc.org/>
- **Global Lambda Integrated Facility (GLIF)** <http://www.glif.is/>
- **iGrid** <http://www.igrid2005.org/>



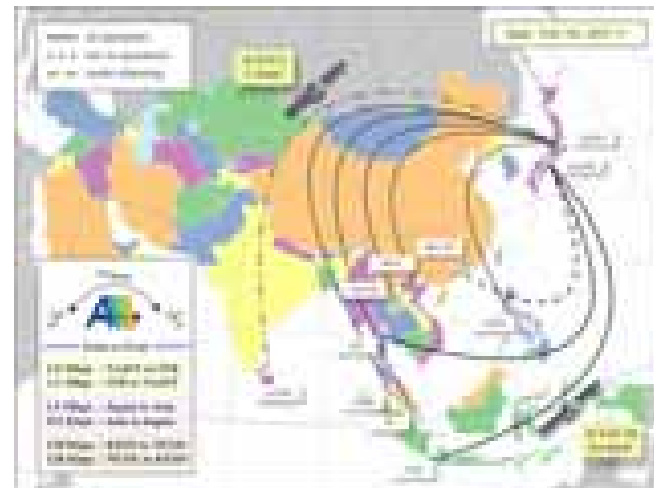
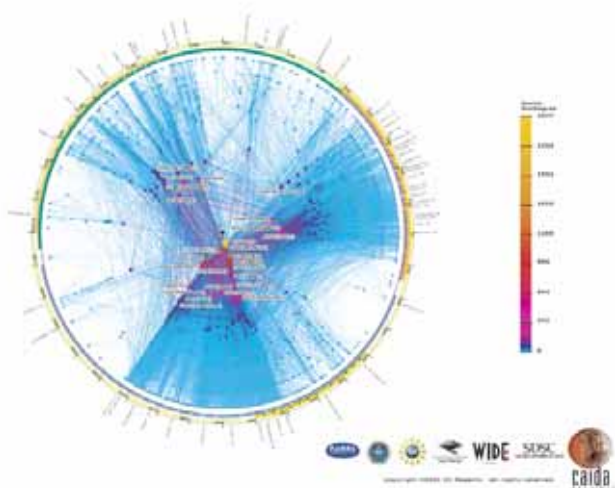
Related global organizations(2)

- **Internet 2** <http://www.internet2.org/>
- **Internet Architecture Board (IAB)** <http://www.iab.org/>
- **Internet Assigned Numbers Authority (IANA)** <http://www.iana.org/>
- **Internet Educational Equal Access Foundation (IEEAF)**
<http://www.ieeaf.org/>
- **Internet Engineering Task Force (IETF)** <http://www.ietf.org/>
- **Internet Engineering Planning Group (IEPG)** <http://www.iepg.org/>
- **Internet Society (ISOC)** <http://www.isoc.org/>
- **Internet Systems Consortium (ISC)** <http://www.isc.org/>
- **Institut National De Recherche En Informatique Et En Automatique (INRIA)**
<http://www.inria.org/>
- **The IPv6 Forum** <http://www.ipv6forum.com/>
- **StarBED** <http://www.starbed.org/>
- **Tokyo Lambda Exchange (T-LEX)** <http://www.t-lex.net/>

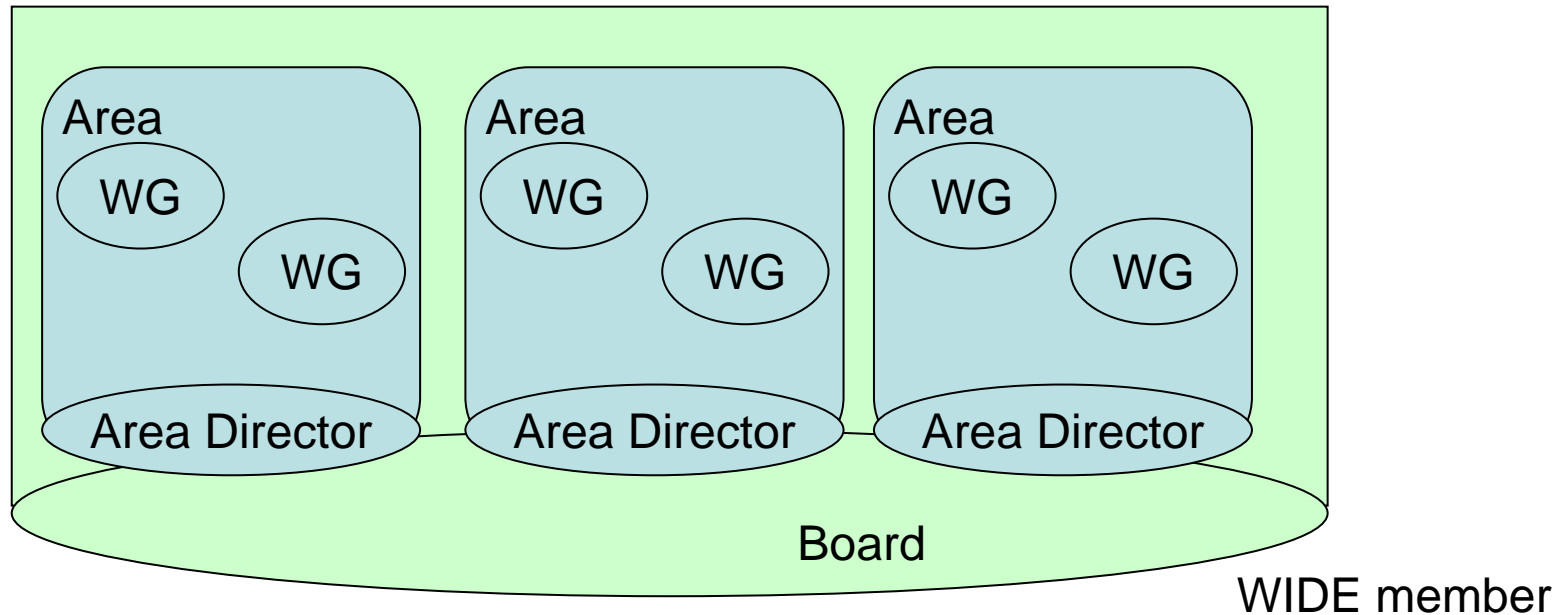


Activities we are participating in

- Japan Network Information Center (JPNIC)
- Japan Network Operators Group (JANOG)
- Other various academic activities



The research underpinning the WIDE Project



- WG (Working Group) – core of research activity – 47 WG
- Area – WG belongs to one of Area – 6 Area
- Area Director – Area handling & information share between area
- Board – Project handling

WIDE member

- Positive participation
 - not study,
 - concrete target/aim
- Registration of WIDE member
 - recommendation by board member required to become a WIDE member
 - member whom WIDE project needs
- Tao of WIDE
 - Make community, read community, forward community



Activity of WIDE member

- WG
 - can create if needed.
 - Mailing List, BoF
- WIDE meetings
 - 2 Workshops per year
 - WG BoF, 2days
 - 2 camp meetings per year
 - WG BoF, Camp Net, WIP/plenary session, 4days
 - board camp
 - study new technology + Direction, 3days
- Publication of Activity
 - society, workshop, paper, thesis, standardization
 - software · WIDE drafts · WIDE report
- **Only WIDE member shares a activity of WIDE meetings**



Working Group

- Core of research activity
 - Easily create
 - Basically comprised of WIDE member
 - Mailing List, BoF, Knowledge share on Web page
- Publication
 - Paper
 - document (report, guideline)
 - software



Area Director

- Area handling & information share between area
- 2 ADs / area
 - tenure : 2 years

1. Internet Area	Masafumi Oe (NAOJ) Ryuji Wakikawa (KEIO Univ.)
2. Transport Area	Shigeya Suzuki (KEIO Univ.) Yoshifumi Nishida (SONY CSL)
3. Security Area	Yojiro Uo (IJJ) Ruri Hiromi (INTEC)
4. Operation/ Management Area	Satoshi Uda (JAIST) Taiji Kimura (NAIST/JPNIC)
5. Application Area	Masaaki Sato (KEIO Univ.) Yusuke Doi (Toshiba)
6. General & Deployment Area	Keiichi Shima (IJJ) Yashuhito Watanabe (CUC)

Working Group

1. Internet Area	IP traceback, KAME Project, LAbel SwiTching (LAST), tahi project, USAGI Project, XCAST, Nautilus6, Netnice, Routing
2. Transport Area	DNS, DVB-RCS, Integrated Distributed Environment with Overlay Network (IDEON), taca, SCTP
3. Security Area	IPsec, moCA, Secure6
4. Operation/ Management Area	ENUM, IRC, MAWI, NSPIXP, two, wlanops, Trouble Ticket, Streaming, netman, roft
5. Application Area	Cue, IAA-DEV, InternetCar, Mew, smtp, Realspace Networking (SPEARS), MagicPoint, 10G, NP, Global Navigation Satellite System (GNSS), Networking and Visualization (netviz), auto-id, common XML IF to RDB (XIRD), GLI, iGeoid, Live E!
6. General & Deployment Area	AI3, NetBSD, SOI, YAK, DeepSpace1, IPv6 Fix, antispam

Internet Area

IP traceback	Involves in the research and development of IP trace back and discussions relating to its practical use based on experimentation.
KAME Project	Conducts research and development into the reference implementation of IPv6 and IPsec protocol on BSD.
USAGI Project	Conducts research and development into the reference implementation of IPv6 and IPsec protocol on Linux.
TAHI Project	Conducts research and development into the reference implementation of IPv6 and IPsec protocol on Linux. Concentrates on the research into validation technologies necessary for the evaluation of IPv6 and IPsec protocol stacks and the development of verification tools
XCAST	Conducts research and development into explicit multicasting of IPv6 protocol(XCAST6) and the standardization of these technologies with IETF.
LAST (Label SwiTching)	Concentrates on research and development and discussions relating to signaling and transport technologies for protocol label switching.
Nautilus6	Conducts research and development into mobile communications required for the deployment of IPv6 mobility across the globe.
netnice	Involves in the planning and development of applications and a multi-platform for Netnice, a traffic control mechanism for end-host operating systems.



Transport Area

DNS	Discusses the implementation, operation, evaluation, and analysis of the DNS protocol.
RCS (DVB RCS)	Conducts research into the use of satellite communication systems on the Internet that incorporate compact-sized earth stations capable of two-way traffic.
IDEON (Integrated Distributed Environment with Overlay Network)	Conducts research and development into the overlay network, which forms an infrastructure for what we call P2P applications.
taca	Conducts research into the technologies necessary for home networks.
SCTP	discuss topics related to SCTP (Stream Control Transmission Protocol) which is receiving attention in the IETF community as the successor of TCP.

Security Area

IPsec	Discusses key exchange protocol and general IP security issues including implementation, evaluation and standardization.
moCA	Works on the development of applications using CA (Certificate Authorities) and PKI (Public Key Infrastructure) and applying PKI to the WIDE and CA experimental operations.
Security of IPv6	IPv6 is mobile due to a number of nodes being connected to a network. This group discusses IPv6 security amidst such an environment.

Operation/Management Area

ENUM	Conducts experimental operation of ENUM and holds discussions relating to the implementation on servers and clients.
IRC (Internet Relay Chat)	Development of IRC related software and the operation of IRC servers.
MAWI	Focuses on the measurement and analysis of Internet traffic.
Roft (Research of Flow Trend)	Measures flow information extracted from routers using primarily S-Flow technologies.
Route View	Compiles requests relating to the monitoring and recording systems necessary for the utilization of routing information and reviews the implementation of such systems.
Netman (Network management)	Extracts information from network nodes and processes it for practical use in network management.
TTS (Trouble Ticket System)	Discusses the design of network operation management systems "Trouble ticket systems" and their implementation.
streaming	Focuses on discussions relating to Internet streaming technologies and their operation.
Wlanops (Wireless LAN Operation)	Identifies problems arising in the operation of wireless LAN, the proposal of counter measures and pursues the development of operational tools.
two	Focuses on discussions relating to the construction and operation of the WIDE Internet Backbone and its implementation.
NSPIXP	Verifies the problems associated with interconnecting ISP (Internet Service Providers) through the operation of Internet exchanges such as DIX-IE and NSPIXP-3.

Application Area (1)

cue	Involves work on the development and improvement of mail leaders that operate on Unix with a focus on speed and data volume.
IAA Development (IAA-DEV)	This group discusses the IAA System (I Am Alive/a register and search system that provides information on disaster victims), the aim of providing a more advanced and robust system in addition to the operation and development of the system.
ICAR (InternetCAR)	This group is involved in the discussion and development of technologies required to provide a link between motor vehicles and the Internet and various applications under such environments.
Mew	Involved in the development of mail readers that support extensive platforms operating on Emacs / Xemacs.
SMTP	Discusses topics on protocol, algorithms and other technologies related to e-mail exchange and develops e-mail distribution software such as smtp feed (SMTP Fast Exploding External Deliverer).
SPEARS (Realspace Networking)	Real space networking is a form of network that provides a virtual link between all matter including home appliances, daily commodities, pets, and humans. This group discusses issues related to the construction of such realspace networks.
Magicpoint	Involved in the development of text-based presentation tools that have high readability and outstanding descriptive capabilities.
10G	Discusses the usage and applications of a 10Gbps bandwidth and conducts research into the changes that occur when an Internet connection goes broadband.
NP	Undertaking the development of NP and the discussion of the sharing of TIPS in relation to its use.

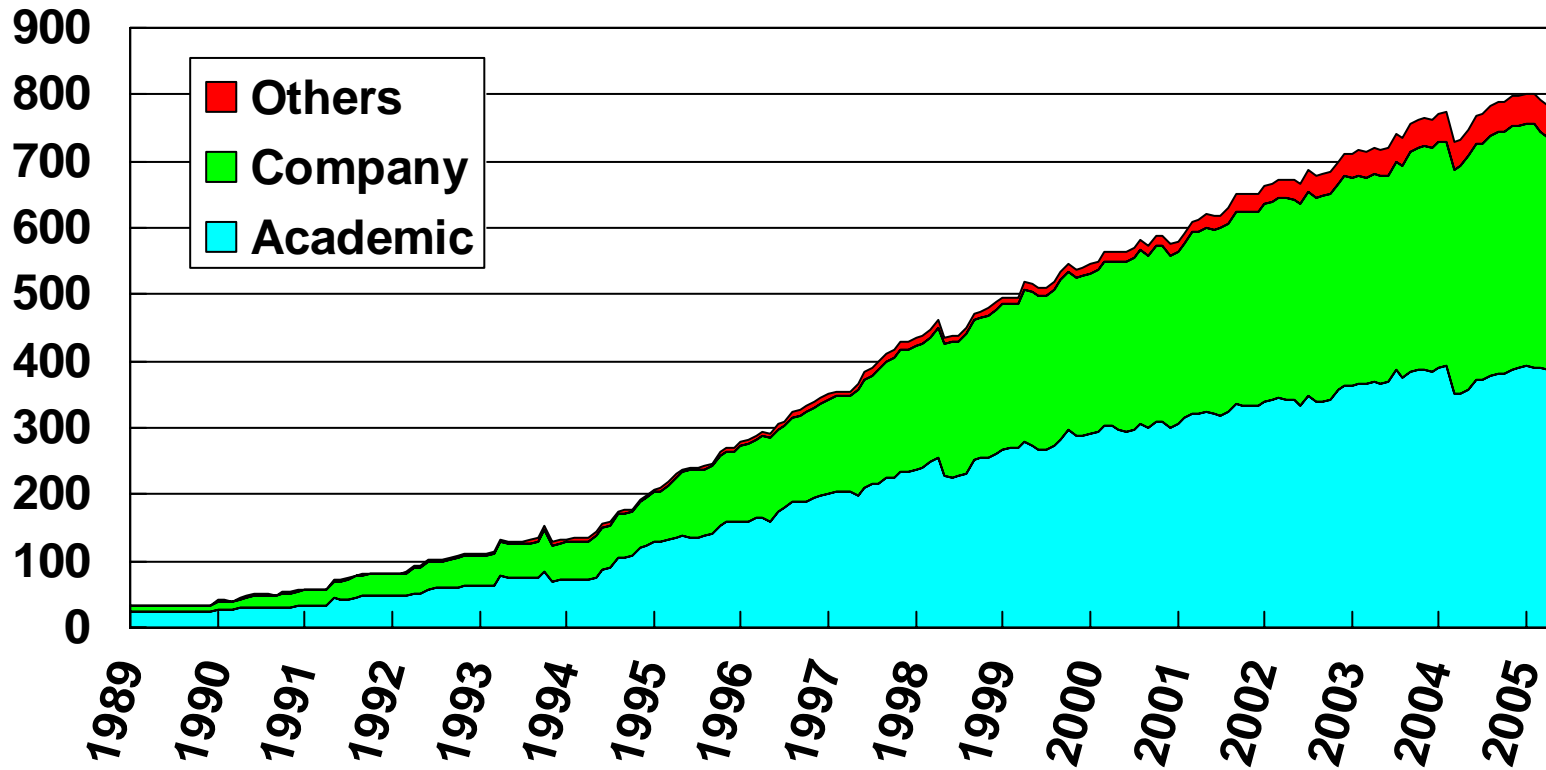
Application Area (2)

GNSS (Global Navigation Satellite System)	Involved in discussions relating to high-accuracy positioning systems that make use of global navigation satellite systems and the Internet.
GLI	The geographical location information systems (GLI System), which mainly manages vehicles and persons, this group focuses on improvement and deployment through the usual experiments.
Netviz (Networkin and Visualization)	Looks into network visualization and other representation techniques.
Auto-ID	Involved in researching, designing, implementing, and experimenting with systems which process information regarding an object to which a unique identifier (ID) capable of individual recognition has been attached on the Internet.
XIRD	Discusses, designs and implements the technologies that allow access to RDB (Relational Database) using XML technologies.
iGeoid (Internet GEOgraphical Information platform Development)	Discusses methods for acquisition, management, circulation and use of geographic location information on the Internet.
Live E !	discusses technical problems of "Live E!", which is a information infrastructure leveraging weather sensors.

General and Deployment Area

AI3 (Asian Internet Interconnection Initiatives)	Concentrates on the research and development of technologies necessary for the operation of the Internet in Asia via satellite.
SOI (School of Internet)	This group is involved in the establishment of universities on the Internet and research into the roles of higher learning through experimentation.
YAK	Concerned with the compilation of terms and phrases used in technical translations and the discussion of new terms and phrases.
NetBSD	This group is involved in the support of research using NetBSD such as the sharing of NetBSD related technologies and the reporting of problems.
Deep space one	Concentrates on discussions relating to methods and procedures and develops support tools for experiments carried out on large-scale network test beds such as StarBed.
IPv6 Fix	fixing specification/implementation/operational problems that give IPv6 a negative impression, and thereby promote further migration to IPv6.
antispam	Improvement and deployment of technologies which reduces spam messages.

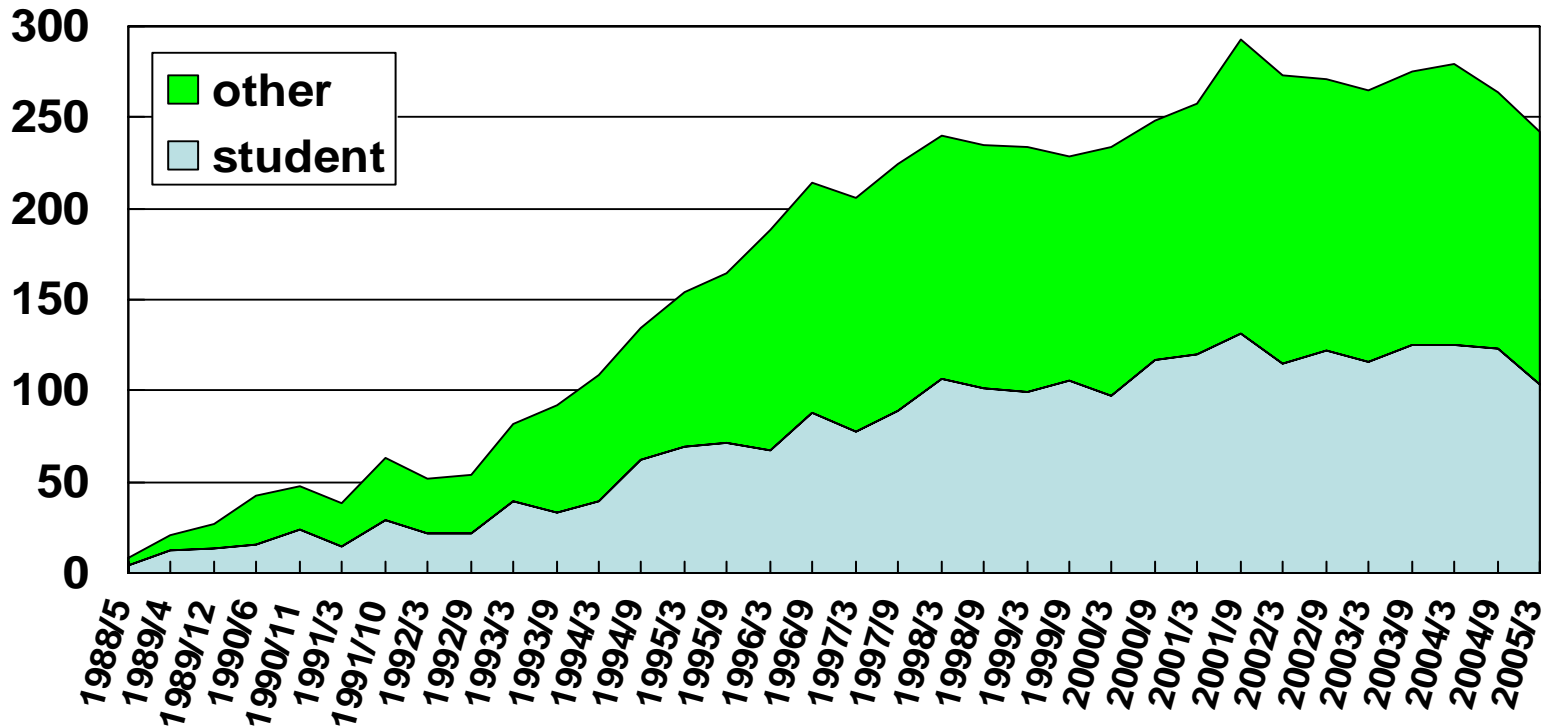
WIDE member



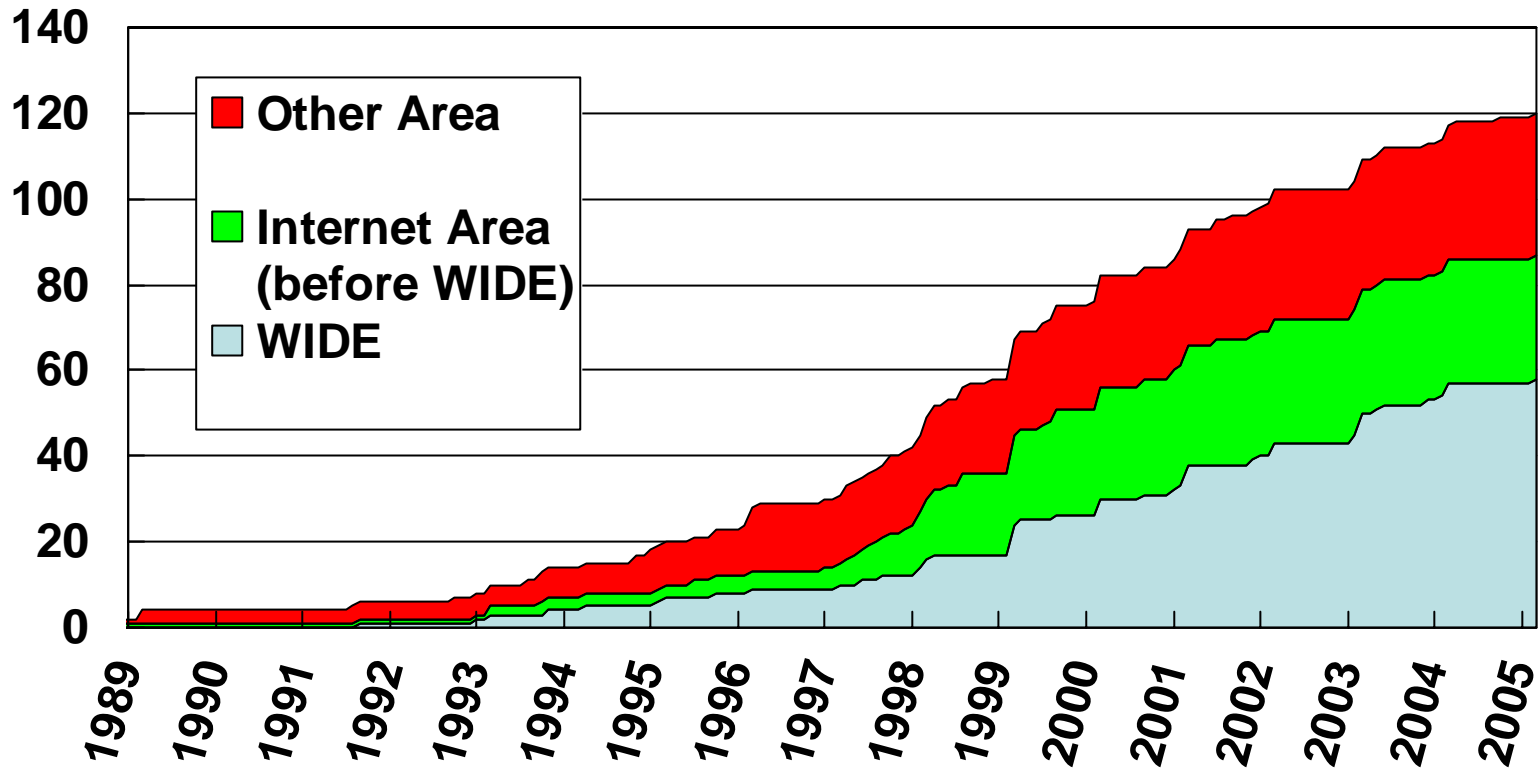
784 members



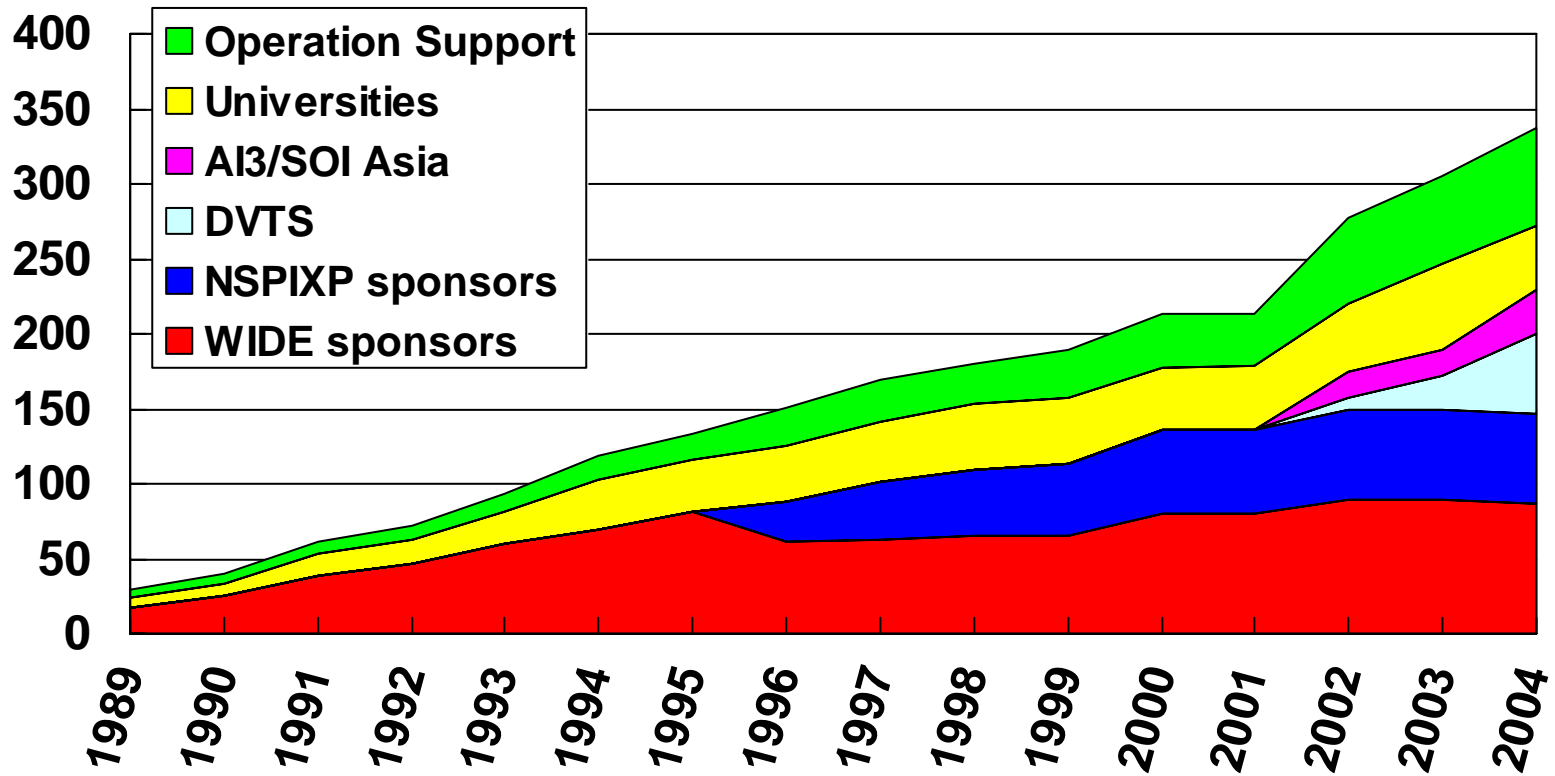
entry of WIDE camp meeting



Ph.D holders



WIDE organization



Researches in Academic domain

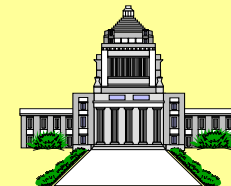
Research output (Papers, Standards etc)

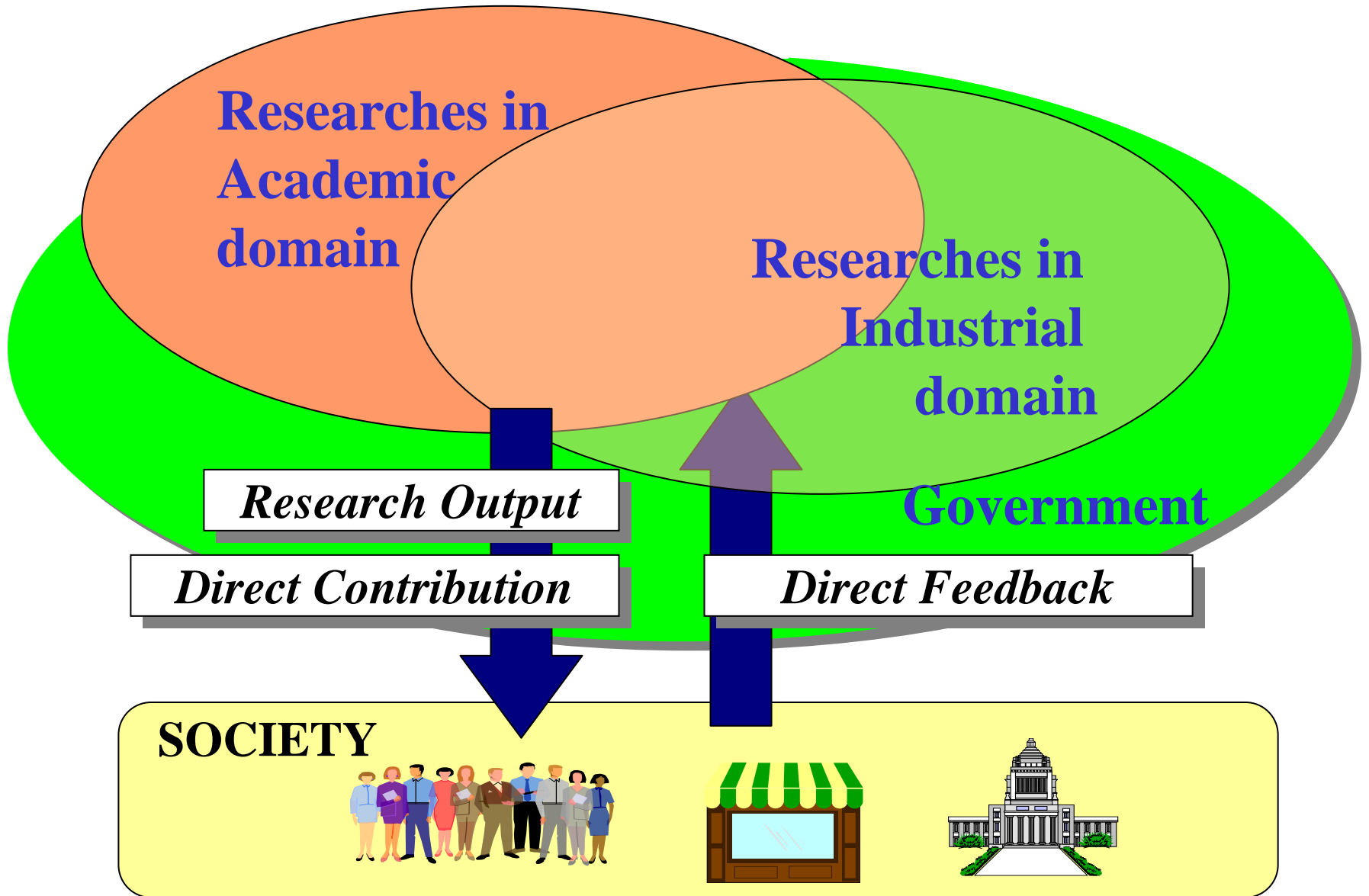
Researches in Industrial domain

Direct Contribution

Direct Feedback

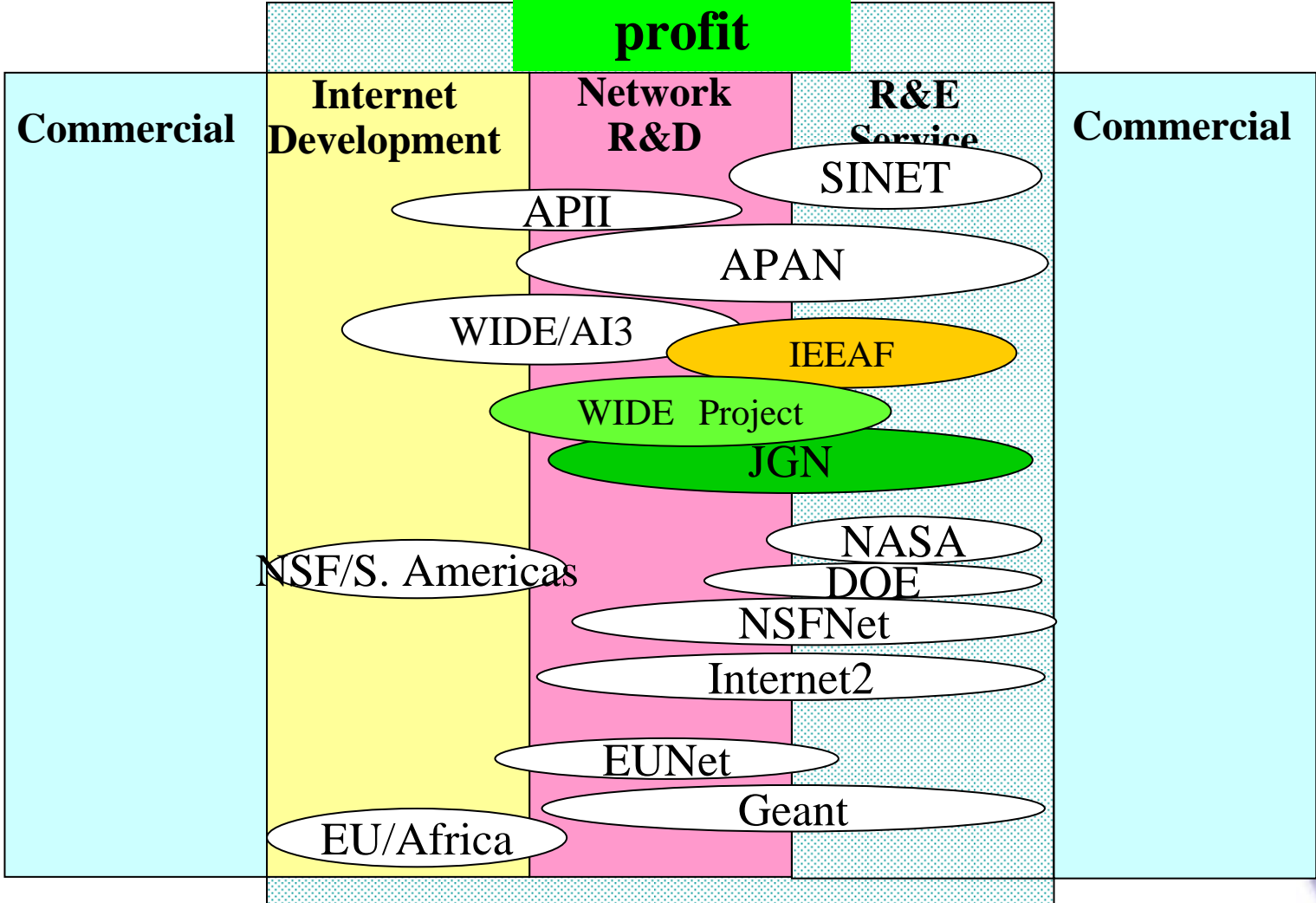
SOCIETY







Not for profit





Aggressiveness

Targeted Applications
to test/prove/deploy
the networking technologies

R&D & E
Service Networks

Semi-production

Super advanced

R&D Network

R&D of Science Applications

R&D of Networking Technologies

Aggressiveness







