Semantic Information-Oriented Network (SIONet)

Gnutella's service announcement in March 2000 stirred worldwide interest by referring to a new P2P model. Basically, the P2P model needs not the broker—the centralized management server—that until now has figured so importantly in prevailing business models, and offers a new approach that enables entities such as end terminals to discover out and locate other suitable entities on their own without going through an intermediary server. Indeed, Gnutella has now implemented this business model based on a P2P interaction approach.

In a parallel development, NTT Laboratories proposed a brokerless model (P2P model) back in 1998, based on SIONet as the implementing technology. Prototype version \( \alpha \) of SIONet was developed in 1998, followed by prototype version \( \beta \) in 1999, and versions 1.0 and 1.1 of SIONet in the year 2000.

SIONet is essentially a meta network based on an autonomous decentralized collaboration scheme. In contrast to conventional networks that require a destination address for packets to reach their proper destinations, packets are delivered in SIONet based on semantic information. This enables entities to search for and zero in on other specific entities in the vast sea of distributed non-specific entities that are connected to the Internet.

In the SIONet-based approach, networks are constructed through autonomous decentralized interaction among distributed entities, including a number of functional SIONet configuration elements. There are a number of different types of these SIONet configuration elements—semantic information switches, semantic information routers, semantic information gateways, event places, sessions and so on—that work together as needed to build scalable and highly secure networks from the bottom up. We are now exploring the prospects of implementing community networks that are in the SIONet intelligent layer.

(Network Innovation Laboratories)

* P2P: Peer-to-Peer

What is SIONet?
- Semantic Information-Oriented Network (SIONet)
- A network that transmits events (packets) based on semantic information
- Dynamically searches for, discovers and identifies destinations
- Conventional networks (e.g., IP network)
- A network that transmits events (packets) based on destination address

IT System Architecture Planning Platform (ITAP)

A great range of IT systems are being developed and deployed by companies today as mission-critical business tools to support their corporate activities. Ironically, these initiatives can be counterproductive if IT systems are deployed without sufficient planning, for poorly conceived IT systems can cause corporate performance to actually decline, and it takes an enormous amount of time and effort to improve a company's performance. In the fundamental planning stage of IT system deployment, it is important to first clarify the requirements of business processes executed by the IT system, then determine the performance of system elements needed to satisfy these requirements, and perform an end-to-end assessment of all the elements combined.

Awareness of these general requirements led us to develop the IT system architecture planning platform (ITAP), a system that provides systematic support for consultations regarding the deployment of IT systems. Essentially, the ITAP scrutinizes a target system on two levels—on a business process level and on a system (hardware, software, and network) level—and analyzes and evaluates the relationship between the constituent elements and the system's overall performance. The advantage of this approach is that the proposed IT system can be closely tailored to the company's needs during the design stage by taking the company's business processes into account from the beginning (how the IT system will be used and the nature of the business workflow in the company), and by analyzing business transactions and information flows between system elements (application traffic profiling, or ATP). A clear grasp of a company's network and equipment configuration is also important for performing comprehensive assessment network simulations (taking protocol stacks into account) and business process-driven network simulations (BDPNs). The ITAP was designed to be applied during the stage of fundamental planning for IT systems.

On-going efforts are making the ITAP even more useful by extending its protocol coverage to such lower level protocols as WDM and MPLS* and newly standardized protocols, and by upgrading the system's hybrid simulation techniques to support actual measured data and advanced analytical methods.

(Service Integration Laboratories)

* MPLS: Multi-Protocol Label Switching

IT system architecture planning platform (ITAP)