2T−9 A Consideration Of Integrated System Management In OSI Environment

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1. Introduction

Recently, Information Networks are not only becoming lager, but their complexity is increasing because of the complex, diverse network equipments and networking services by different carriers.

To help for managing a larger and heterogeneous network, ISO has been devoting more attention to the needs of network management since 1979.

ISO/IEC JTC1 and CCITT are contributing to the Management Standards process in cooperation with each other. Currently, OSI Management Framework (ISO 7494/ 4) and Common Management Information Service and Common Management Information Protocol (CMIS/ CMIP) Standards are completed. The other OSI Management Standards are projected to be completed to 1992. [1]

The purpose of OSI Management Standards is to allow interoperability and integration between many separate network management products and services in today's Information Network, and many different network entities which are managed. This may lead to an exploration of how automatic management system will be used along with intelligent facilities.

This paper describes the necessity of network management facility and availability of network management standards. In next section, The Integrated System Management Elements Based On OSI Environment are discussed. In section 3, we propose the Basic Model of Integrated System Management with Intelligent facility. The last section concludes this study.

2. The Necessity of Network Management Facility

As the new system components are introduced into network, the management facilities have been procured. By the facts, this is leading to a proliferation of incompatible type of management system.

At the results, The System Management has itself grown over the years and has itself become unmanageable. In this environment, As the network users want to ready access to a variety of information and data processing resources which may be distributed, User is confronted with the needs to managing this collection of subnetwork and systems. So, A unified Standard Management become vital in such environment.

Management Standards are available for such environments that equipments from a manufacturer has to interwork with equipment from other manufacturer.

The production of standards for management will enable Integrated System Management to become a reality.[2]

3. Integrated System Management Elements Based On OSI Environment

The main components of this Integrated System Management environment may include the Network Users that are interested in the operation and use of the networks, Network and System Resources that require to be managed, System Management which is consist of human, software and hardware elements.

Figure 1 shows the Elements of this Integrated System Management by assuming that this network conforms to ISO OSI Reference Model.[3] The elements are as follows :

- Network Administrator : This refer to the person or persons who use the network manager to perform the network management functions.
- Network Management Manager : Manager may be resided only on in a centralized network or, may be resided multiply in a distributed network.
- Network Management Agents : Agents resided in the individual network components that are to be managed.
- System Management Application Process (SMAP) : Automatic intelligent tools and services in order to obtain real-time data on performance and traffic characteristics, diagnose communication problems and reconfigure the network to meet changing needs and OSI environment conditions.

This application process implements the network management functions to support to user needs for management of the network required.
These functions are designed to allow a modular approach to the design of management functionality.
As defined by ISO, these functions are -- fault management, configuration management, security management, accounting management, performance management and a number of support functions.[4]

- System Management Application Entity (SMAE) : This is an application layer entity which responsible for communications between system management entities.

The SMAE uses application layer protocols to communicate with peer entities.
This entity is composed of System Management Application Service Element (SMASE) which providing system management services, Common Management Information Service Element (CMISE), Association Control Service Element (ACSE), Remote Operation Service Element (ROSE).

- CMIS/ CMIP : This is a means for the management manager to communicate with the network management agents in the network components.
- Layer Management Entity (LME) : It interacts with each protocol layer to maintain the basic information about configuration and status of the layer.
- Managed Objects (MO) : This is an abstracted view of resources that represent its properties.
- Management Information Base (MIB) : The set of managed objects in a system with their attributes.This is included in the network management agents.

The network management manager will maintain an information base for the domain which may have additional managed objects.

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4. Model Design For Integrated System Management

Because of the complex, diverse Network entities, and demand for high-quality services and the difficulties to handle in the real-time events, It is indispensable to use the intelligent facilities in the network system.[5]

The purpose of Integrated System Management is to provide a single set of tools for managing all the network resources within a network. It is a network management system with additional intelligent facilities.This model is shown in Figure 2.

In this model, SMAP can be divided in accordance with network environment to perform network management functions: Management Application (MAP) Module and other resources. In MAP module shown in Figure2, It consists of Monitor and Counselor.

Monitor represents the major part of the SMAP which is performing management tasks, and Counselor is the expert system that realizes intelligent network management functions.

Counselor collaborates on a work with Monitor in order to offer recommendations.Through the User Access Point (UAP), Administrator (or, User) may control and monitor globally for each network entities which is a real component to be managed.

Monitor coordinates all the components it controls and manges.

Because Monitor is not able to decide independently, Monitor sends information to Counselor for consultation which its topics may be on network configuration problem, network fault problem,etc.

Monitor has an Information Base to store operational information about managed network entities.

Counselor must be coexist with a Monitor or a Sub-Monitors which is controlled by other Monitor using CMIP.

It is an interactive expert system that realizes intelligent network management functions. Within Counselor, there are a collection of programs and its separate knowledge base.

Counselor may not have facilities to communicate with network entities. A database named Management Knowledge Base (MKB) stores required knowledge and it is available for consultation when a Counselor receive a consultation request from Monitor.

Using the Integrated System Management Model, It can solve much of the management problems which is experienced in current multi-vendor networks.It is also able to reduce the expertise needed to control, and monitor the network.

5. Conclusion

The growing Information network management is very important to ensure all network resources interwork correctly and effectively. So, A standard management method becomes vital in information network.

This paper described the Basic Model for Integrated System Management. This proposed model have used the basic concepts developed for OSI network management. Their elements needed for network management in Integrated System Management are also described. Particularly among their elements, we proposed the configuration of System Management Application Process (SMAP). Two important concepts in this configuration are Monitor and Counselor which all management tasks are completed by collaborating with each others.

This Integrated System Management Model will be useful concepts to providing the basic set of management tools for all network. From now on, we will plan to investigate this model more detail with a prototype implementation.

References

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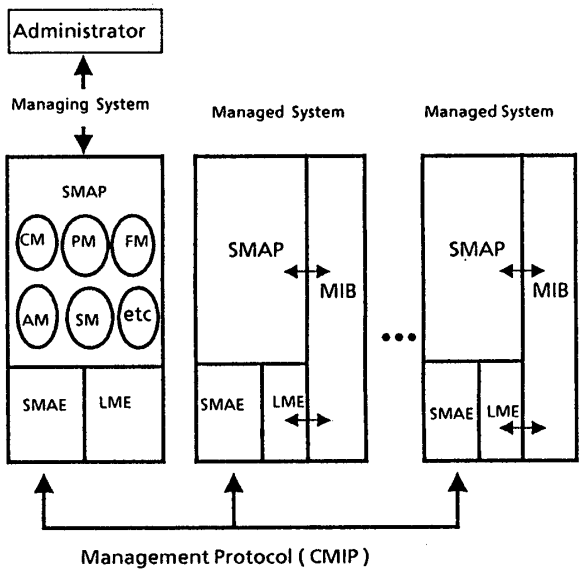

Figure1. Integrated System Management Elements

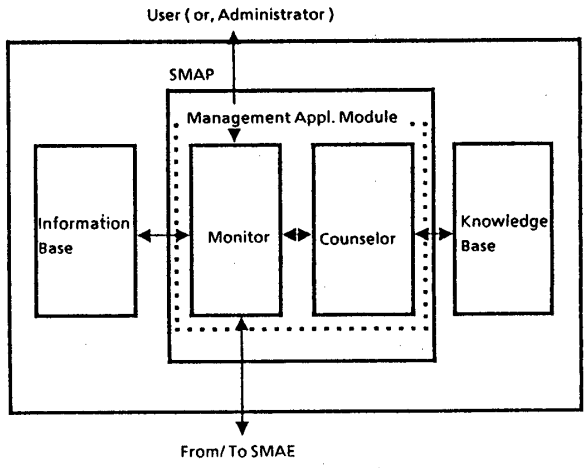

Figure 2. The Configuration of SMAP