An Integrated Management System Architecture for Utility Telecommunication Networks

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Japanese electric power companies seek to maintain highly reliable telecommunication networks in order to protect, operate, and maintain electric power systems. Hence, such companies operate telecommunication networks that consist of various kinds of network elements, such as microwave radio communication systems, optical fiber communication systems, and communication line carrier networks. Integrated management of telecommunication networks and systems is effective for QoS maintenance under the circumstances.
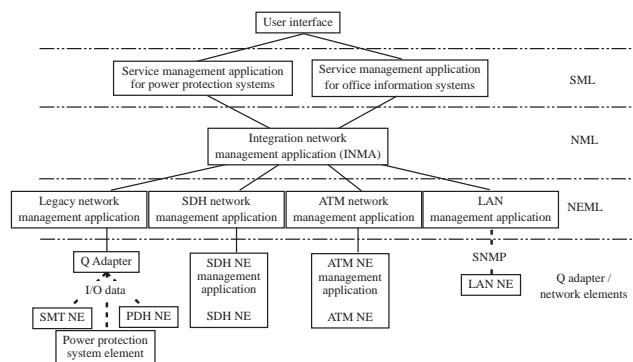

Figure 1: Integrated Network Management Application (INMA)

For the integrated management, we have expanded an integrated management system framework based on TMN. Since 10 Japanese electric power companies have constructed separate telecommunication networks, our framework includes the INMA (integrated network management application) that is used in NML and con-

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ceals information model differences regarding network elements and/or network configurations (Figure 1). Accordingly, the INMA should have technology-independent models, such as the models listed in NMF037, which is the bandwidth management ensemble for different types of networks. The INMA translates technology-dependent models to technology-independent models. These translation capabilities enable all Japanese electric power companies to utilize this framework for the integrated management.

In order to provide the INMA with the required capabilities, we propose two types of scenario MOs, configuration scenario MOs and control scenario MOs (Figure 2). The configuration scenario MOs receive notifications from EFD in NEML and/or in NML, and manipulate resource MOs and/or management knowledge MOs in NML, in accordance with the contents of the notifications. In this context, the management knowledge MOs contain information about shared management knowledge, and the resource MOs represent managed elements such as trail MOs or connection MOs defined by ITU-T. The control scenario MOs receive operation messages from SML applications, and manipulate the resource MOs in NML and/or in NEML. The management knowledge MOs in NML provide information about the resource MOs manipulated by the control scenario MOs. The control scenario MOs in the INMA perform complicated operations, so that the control scenario MOs present interfaces that are independent of the used communication technologies.
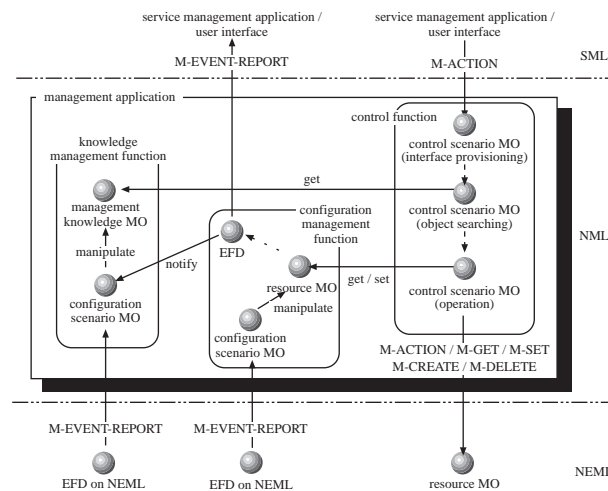

Figure 2 : Scenario managed objects

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