Integration Systems of Customer Network Management And Serviced Level Agreement

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Abstract*-CNM is enabling to integrate Customer's Management Information System Using Web Browser that provides helpful visual presentations and very easy access method. Also Service Level Agreement is important fact between a customer and the service provider on levels of service characteristics and the associated set of metrics.*

In this paper, we propose architecture of Integrated Customer Network Management System that can support SLA. Improved Customer Network Management System provides not only effective and efficient end-to-end customer service management but also SLA Monitoring and violations applicable to all cases include ATM, FR, and KORNET service.

Keywords: CNM, SLA, Service Management

1. Introduction

In the Past, Customer Network Management system is a data-integration system that takes data from a service provider's fault, performance, and provisioning systems. But customer begins to demand the better guaranteed end-to-end Service with Service Level Agreement. Offering of SLA support that service provider keeps out existing customer and creates of new customers. [1]

Many Service Providers supply various measurement systems. With Internet Sites, the Subscriber can confirm their Qualities directly although each Sites measure main items like that connect time, packet loss, packet delay ratio, upload/down load speed and it can use only owned by itself ID [9].

The ITU defines a service level agreement (SLA) as " a negotiated agreement between a customer and the service provider on levels of service characteristics and the associated set of metrics. The content of SLA varies depending on the service offering and includes the attributes required for the negotiated agreement" [2].

It means that Customer takes the initiative in doing for expectation of quality and supporting full-time. Besides, the importance of real-time automation and the need for better management and control of information is demanded. [10]

Therefore, we propose architecture of Integrated Customer Network Management System that can support SLA. Customer Network Management (CNM) addresses the requirement for efficient and effective interaction between customers and service providers.

Integration of CNM and SLA information is considered not only configuration of service topology of underlying network but also end-to-end delivery of the service. It can monitor, manage effectively and personalize Information and improve customer service support.

This Paper is structured as follow.

In section 2, we describe Customer Network Management and new business OSS concept, Customer Relation Management (CRM) as earlier works of service level management. This section tells about importance of customer. Next section 3, we explain architecture of Integrated Customer Network Management System and define Function Blocks that is offered. A sample processing step from a customer's view is provided. In Section 3, Interoperation of relationship will be provided, too. In final section 4, we'll summarize our work and sum up the conclusions from this study.

2. Related Works

2.1. CNM and CRM

The Foundation upon which a service provider's Network Management is based relies on the well-known standard definition of network management functions. These are Fault, Configuration, Accounting, Performance and Security management (commonly known as FACPS) and the Customer Network Management provides the end customer with a window to view their entire enterprise network. [11]

A CNM system is a data-integration system that takes data from a service provider's fault, performance, and order management and provisioning systems. It integrates the data into a near real-time view for the enterprise customer. For an agreed-upon service period, CNM services display this data for the customer according to the customer's preference. CNM services go beyond statistical reporting to offer actual hands-on network management. [1, 11, 3]

Related work 8, it presents enhanced CNM systems that have functions and information which are needed to calculate and monitor SLA metrics. This paper proposed integrated CNM architecture, in terms that it covers multiple layer networks such as Frame Relay, ATM, and IP networks in one telecommunication domain. Of course, CNM capabilities are distributed over different layer networks and it is hard to coordinate CNM information which is dependent on each layer network. In order to solve this problem and make another CNM unified model that is suitable for multi-layer network. It adopts the layering concept and set up at end-to-end PVCs and customers own logical or physical ports. Figure1 addresses enhanced CNM view at service management level with this abstraction mechanism.

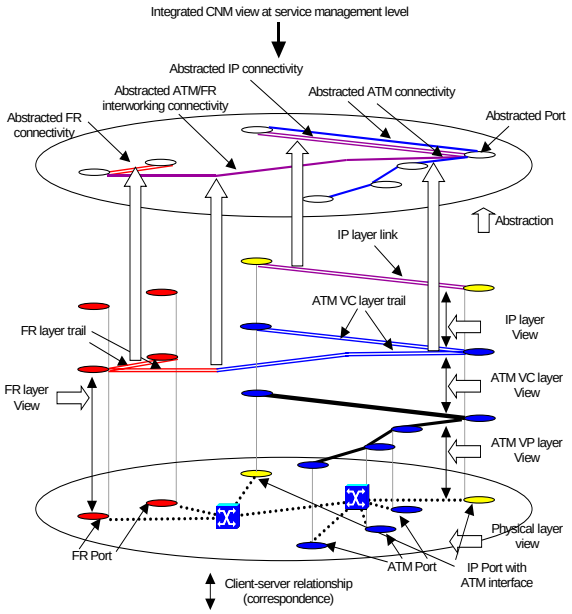

Figure 1 CNM View for Multi-Layer Network

The other hand, we have a proposal to make customer usability system. We design Integration of CNM and SLA information system which is considered not only configuration of service topology of underlying network but also end-to-end service delivery. It is able to monitor, manage effectively and personalize Information and improve customer service support.

Also this reference is defined new information model for mapping relationship between standard CNM Model and Physical Connection Graph in TINA. But we don't need new model. Integration CNM System can use old CNM information together with SLA information.

Related work 13 defines CRM Concept.

Customer Relationship Management is the establishment, development, maintenance and optimization of long term mutually valuable relationships between consumers and organizations.

Successful CRM is focused on understanding the needs and desires of the consumer and is achieved by placing these needs at the heart of the business by integrating them with the organization's strategy, people, technology and business processes**.** It means that mostly basic CRM involves customers, organizations and relationships, and the combination creates the need for management.

Therefore CRM is creating a competitive advantage by being the best at understanding, communicating, and delivering and developing existing customer relationships in addition to creating and keeping new customers.[13]

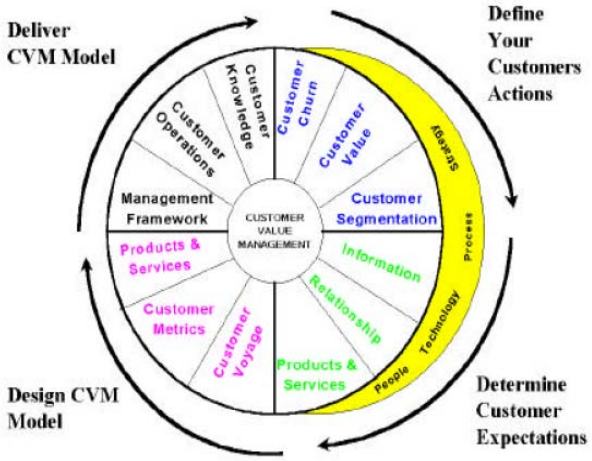

Figure 2 The Customer Value Management Model

Because recognizing the needs and requirements of customers is becoming an ever more important success factor that we develop customer web sites to offer personal information of own network and services with a complete, integrated view of the customer in an optimized environment.

It enables companies to deal with their customers proactively recognizing their needs in advance and keeping promises made to them. Partnership with customers is characterized by action, not by reaction, too.

2.2. Service Level Agreement

. A Service Level Agreement (SLA) is part of the contract between the service provider and its consumers. It describes the provider's commitments and specifies penalties if those commitments are not met. [5] In other words, offering of SLA is beneficial to service provider who can differentiate from service competitors and prioritize service improvement opportunities.

Service Level Agreements are fundamental to business.

They define minimum levels of availability from key suppliers, and often determine what actions will be taken in the event of serious disruption. As a consequence, they require full consideration and attention and must be constructed extremely carefully. This is not an area in which to cut corners. [2]

The SLA will be covering all key aspects of the service. It will fully embrace such issues as problem management, compensation (often essential in terms of motivation), warranties and remedies, resolution of disputes and legal compliance. It essentially frames the relationship, and determines the major responsibilities, both in times of normal operation and during an emergency situation.

It is now widely accepted that service provision and receipt should be governed by an agreement. This is essential to define the parameters of the service, for the benefit of both the provider and the recipient. It must obviously cover many other issues, as well as defining the service itself. [2, 5]

In Relation Works 5 , it propose a formal mapping mechanism between QoS parameters in SLA and the network performance metrics that only focus on the network access service like Figure 3.

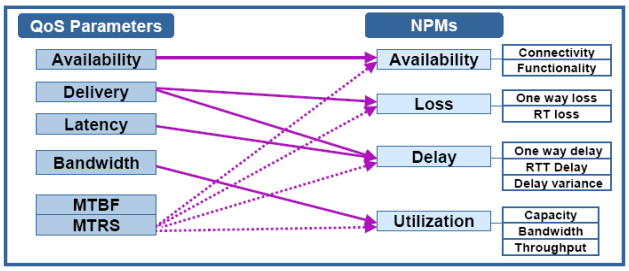

Figure 3 QoS Parameter to NPM mapping

Network Management System can gather data using that parameter and then Integration System manufacture and collect statistics with the inside modules.

Moreover, customer can see a graphical view with Web site and can use this to send in a report and the service Provider can analyze the propensity to use of customers. It becomes important data to create new service goods or to induce a customer to use it.

3. Integration of CNM and SLA

Several years ago, providers began implementing service-level agreements, which offered customers the reassurance that they would get the level of service for which they paid. [7] With Integrated Information of CNM and SLA, we can satisfy to know their configuration, contact data, usability of Service at real-time.

3.1. Function Blocks

1) Visual and SLA Metrics

Integration CNM System enables network management and service management visualization. Many Customers have the resources to provide a contracted level of service as specified SLA and view graphically with all the base units and subscriber units displayed in customer network.

In order to inform of contract SLA, it has to define SLA Metrics at first. The metrics are determined by the baseline of requirements/goals in the contract. Service level contracts specify requirements and goals for availability, response time and output bandwidth. [2, 5] There are a generic threshold values that are used as a warning and an important distinction between what the violation of a requirement and a goal implies. If the threshold value is violated, it initiates penalty charging.

A Sample Metrics is like table 1. This ADSL Metrics should be measurable and reliable. Customer graphic interface display not only both contract and standard metrics and value.

Metrics Code	Description	Thres hold	Value	Unit
ADS10	Service Opening	2	8	Day
ADS20	Trouble Delay Time	120	180	Min.
ADS21	Accumulated Trouble Time	20	24	Hour
ADS31	Packet Loss Rate	3	5	%

Table 1 A Sample SLA Metrics

2) Fault Management and Real time Monitoring

Fault Management is one of primary importance for Customer. It is necessary to monitor the alarms and events that occur across the entire network at real time. Including this function, Integration CNM System supplies architecture on real-time fault monitoring with the Microsoft .NET environment platform. It provides a view of the fault status as stored in the Customer Network Management System and real time critical fault alarm in the Network Element.

The main functionality of the CNM fault monitoring is to watch closely according to the agreed Service Level and it is based on billing and compensates System. The figure4 shows a violation of fault information and listed it by occurred time.

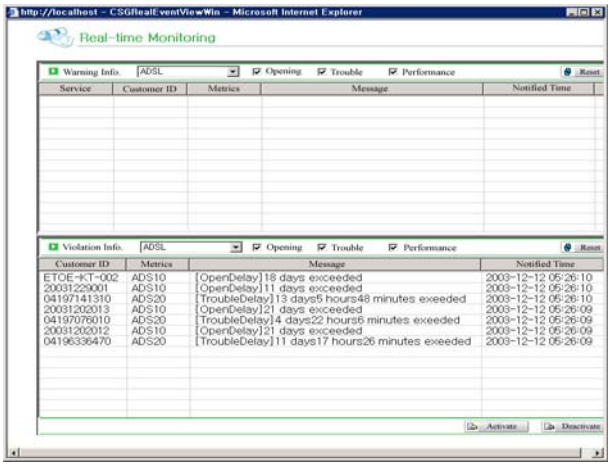

Figure 4 Real-time Fault Monitoring

Following to the fault monitoring processing steps, it checks the threshold and compares the metrics value. The threshold is the optimum level fault time which can be alerted to the customer or the service providers by sending the 'warning' message or SMS (Short Message Service). After receiving warning alarm, customers can observe the detail reason and then claim compensation about the unavailable service time.

3) Performance Management and Statistics

Performance Management offers to monitoring and controlling of QoS parameters [11]. Performance Management is important standard to choice service. If it does not satisfy the quality of network, the customer will change another service provider. In that point, the service performance is the most important thing to both customer and provider.

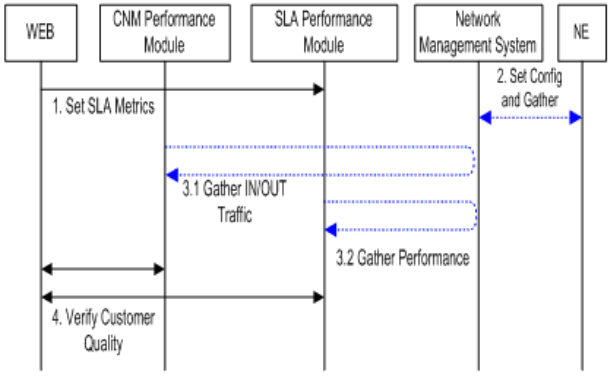

Figure 5 Performance Processing Step

QoS Parameter is gathered by network elements or NMS every hour. Integrated CNM System displays the collected data and statistics by day, week, month, year at customer's web. Figure5 presents a simple process step of performance management. According to the service kind, SLA metrics are set in starting time. It transfers to the network management system and network elements to gather QoS Parameters then two performance module begin to gather performance data continuously.

CNM performance module deals input/out traffic because it based on customer not service. But SLA performance Module handles packet loss, packet delay, network QoS and etc. Customer is able to extract customer qualities like Figure 6.

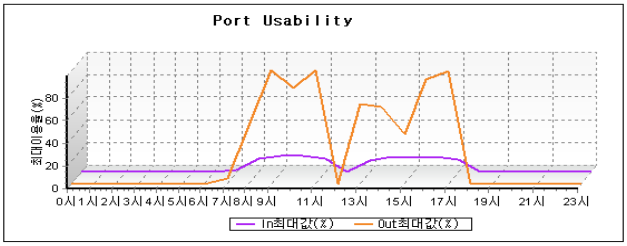

Figure 6 Performance Graph in Customer Web

As same as fault management, Integrated CNM System has the quality real-time monitoring function which checks the threshold of service quality. After receiving warning alarm, customers can check the detail reason. If the service provider must bear a responsibility, customer would have claimed compensation about that quality.

Proposed System includes making a report. In addition, it must offer the capability to access historical statistic data about the QoS parameters.

3.2. Interoperation Relationship

Customer and service provider contract the service level agreement. It include speed, bandwidth, usability and etc. Network management systems feel the effect of the contract and customer network management extend the management scope. Integration of CNM and SLA information is considered not only configuration of service or topology of underlying network but also end-to-end delivery of the services. It is able to monitor, manage effectively and personalize Information and improve customer service support.

This System has another user interface which is showed the basic information and QoS, SLA metrics. In the Figure 7, SLA (1) is interpreted in a broad sense rather than CNM. As main submenu, CNM (2) have Performance Management, Provisioning Management, Fault Management, Service Management, User Management, and Board.

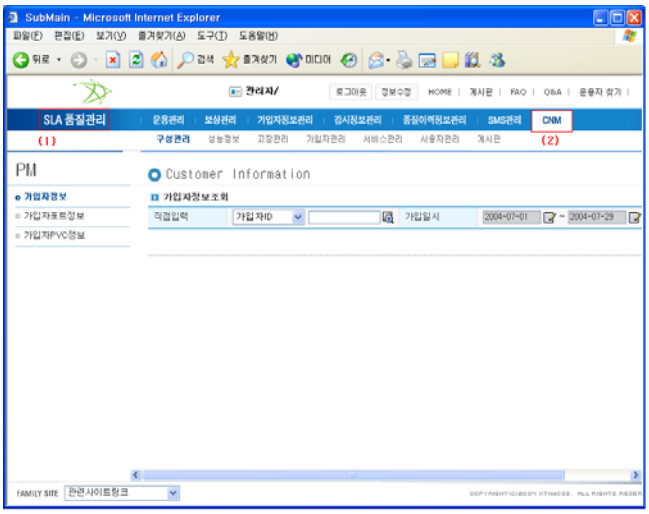

Figure 7 Integration Web Pages

Development of system get accomplished Microsoft .NET and interwork via XML. Interworking with XML format is responsible for translating and pushing the translated XML document into the message queue. After then performance modules collect and manipulate the network performance data.

5. Summary.

CNM is enabling to integrate Customer's Management Information System using Web Browser that provides helpful visual presentations and very easy access method and Service Level Agreement is important fact between a customer and the service provider on levels of service characteristics and the associated set of metrics.

In this paper, we propose an Integrated CNM System that is having a concept of SLA, QoS Parameters and evaluation of services quality. Also we design the Integration System and its generic architecture. We believe that this paper can serve as a guideline for service providers who intend to deploy an SLA based network service and set up a CNM System.

In a future work, we will propose architecture of integrated CNM and SLA system and archive in educational Service. It enables to build relationships with customers by their Internet. And it delivers enterprise-scale connectivity deployed across a shared infrastructure with identical policies enjoyed on a private network.

6. Reference

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