Standardization of Systems and Processes for CDR Based Billing System in Telecom Companies

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Abstract:
In olden days the telephone system we have used the Meter Based (MB) System for billing process. The Meter Based system having the online recording of metered units in which it is having instant unit conversion according to the charge bands stored in the switch. The meter system is based on the manual process and it is not having the decentralized database. So, it is making that Inflexible billing system and Insufficient call details. So, here there is a new system in proposal that is CDR system (Call Detail Record System) for billing purpose. There is a centralized database for having centralized customer services. The CDR system is having 4-Data Centers all over India. The 4-Data Centers are connected to each other, Exchange Routers, and their respective Backbone Routers. The CDR system consisting of the application software's like Customer Relationship Management, Customer Care & Convergent Billing, Clarity Check, Payment Management System, Enterprise Reports, Integrated Voice Recognition System, Web self-care, Oracle DBMS.The CDR based Billing system in mainly proposed for online services, online query and prompt customer response. It supports for different tariffs, different billing cycles and different discounting schemes for different category of subscribers. It also helps for Accurate and timely invoicing of call details to generate error free bills. It is useful for Pre-paid and Post Paid system integration.

Keywords: *Meter Based system, Customer Relationship Management, Convergent Billing, Enterprise Reports, Integrated Voice Recognition System, and CDR based Billing system.*

I.   INTRODUCTION

1.1. DATA CENTER:

The Data Center plays a very important role in the telecom systems. The Data Center has the centralized system by connecting varieties of systems. A single effortless integrated standard operation system will support all the operational activities providing the associated advantages. The overall quality of billing and payment accrual systems should improve. The unspoiled integration of system will make possible single point high quality customer care.

The Billing was the last function in Telecom operations coming after Commercial System, Fault tracking and management system and Directory Enquiry system. New connections along with Shift and other such functions were dealt in Commercial system. This system maintained a database of existing customers for dealing with Shift, Transfer, Safe custody and other such requests from existing customers. The Fault tracking and management system specifically catered to the management of line faults and while doing so had to maintain another database on existing customers. The third system of Directory Enquiry was an important system for informing the customers about the name and address for a telephone in a fast changing landline environment. That was the period when landline network grew and was reshaped at an excited speed. The Directory Enquiry system also needed to have its own structured database.

The four core Telecom operation systems separately maintained four different databases. A single event like a request for a new connection needed four update transactions at different times for updating the four systems. The usual error content in transactions and asynchronous updates resulted finally in accumulated mismatch of the four databases. Apart from the mismatch, as the operation systems were not interlinked with each other, changing any procedure was manageable needing changes to be made separately in all the four systems.

1.2. METER BASED SYSTEM:

Online Recording of metered units with instant unit conversion according to the charge bands, stored in the switch. Limited number of charge bands. Credit limit threshold setting possible for certain percentage of subs. Fault Repair System (FRS) implemented at exchange level without any interface with billing or commercial systems. SSA wise DQ and exchange wise Interactive Voice Response Systems. No single data model for Billing, Commercial, Directory enquiry & Fault Repair System.

1.3. CDR BASED BILLING SYSTEM:

The CDR based system is mainly used for landline operations and it consists mainly of the subsystem like Directory enquiry, mediation and billing. Online mediation of CDRs eliminates the need of bill data transportation, eliminating fraud on this account. Proper accounting of payments & receivables for better financial management. Standard and ad-hoc reporting on all aspects of the business. Facilitate market studies and analyses for forming optimal sales strategies and assess business performance of self and partners and prevention. Minimization of internal and external frauds. System consolidation resulting in reduction of O&M cost.

Apart from integration, a very important aspect of these systems was the basis of Billing. In these new systems, billing was based on Call Detail Records (CDRs) for a customer accumulated over a period instead of call meters. A CDR contained details such as calling number, called number, time of call, duration of call etc. It didn't contain the call charge. This made possible the flexible rating or charging a CDR according to where the call was made, when the call was made and by whom the call was made. Time dependent, destination dependent, plan dependent flexible charging became possible. In competitive telecom business arena this flexibility of charging gained crucial importance and all operators without exception, according to their capability adopted this new concept.

The incumbent operators were in the field of landline operations where growth slowed down all over the world and mobile market exploded. The mobile systems invariably brought in these new CDR based billing systems. The quality and maturity of these billing systems in many cases determined the success of a mobile operator. Some operators needed to change their ineffective CDR based billing system for a better system within only a few years. The CDR based Billing and Customer Care systems gained a central importance in mobile operations because of their capability to support flexible and quick introduction of new customer schemes and plans, quickly activate or deactivate a connection while updating all the relevant information of a customer and finally providing high quality Customer Care.

1.4. LINUX BASH SHELL SCRIPTING:

BASH (Bourne Again Shell) is a scripting language as well as the default command interpreter in most Linux distributions, including Red Hat Linux. The ability to create quality scripts is arguably the most time and error saving aspect of Linux Systems Administration. The fact that the default shell or user environment in Linux is BASH makes learning to create scripts both very valuable as well as simple. Shell scripts can be very simple or extremely complex involving dozens of support files, but regardless of the complexity, they should be created in a consistent, self-explanatory and easy to read format. These scripts are used for making work easy in the corporate life. These Scripting and automation are the keys to consistency and reliability. By using these scripts we make scheduling processes. Scripts are mainly for having the log files, system performance, and port status.

II. EXISTING SYSTEM

OSS and BSS modules implemented in decentralized manner .No system to consolidate meter readings at one place .Billing process depends upon collection and transfer of subscriber wise exchange meter reading (OMR and CMR).Deployment of various Integrated packages. Fault Repair System (FRS) implemented at exchange level without any interface with billing or commercial systems. SSA wise DQ and exchange wise Interactive Voice Response Systems No single data model for Billing, Commercial, Directory enquiry & Fault Repair System.

2.1. FEATURES OF METER BASED SYSTEM:

- Online Recording of metered units with instant unit conversion according to the charge bands, stored in the switch.
- Limited number of charge bands.
- Credit limit threshold setting possible for certain percentage of subs.

2.2. DRAWBACKS OF METER BASED SYSTEM:
•   Inflexible billing system. Insufficient call details which cannot be used for future processing and analysis.
•   Tariff change involves huge effort
•   Corporate level data consolidation not possible due to distributed databases.
•   Subscription level fraud – Not possible to rate or impose credit limits against individual subscribers
•   No standard system for payment and Receivables management.
•   Decentralized database – Cannot provide Nationwide customer services over telephone or web like:
–   bill inquiry
–   directory inquiry
–   Connection status, Complaint Handling information about new/special services etc.

III.   PROPOSED SYSTEM

It is about Standardization of the Systems and Processes over all the south BSNL Exchanges at the single Data center. It is mainly used for Call Detail Record system in the server tapes. It is also having tariff based Billing System and providing efficient customer care service.

In this system we are having different applications for different purposes. Some of those are IVRS, Mediation, Billing, Accounting, and Security. These applications are to be maintained under the servers. So, those servers are to be maintained and managed by having backups, error logs etc...

3.1.   BENEFITS OF PROPOSED SYSTEM:
•   Move from telephone based system to Customer based system
•   Accurate and timely invoicing of call details to generate error free bills.
•   Supports different tariffs, different Billing cycles, and different discounting schemes for different category of subscribers.
•   Pre-paid and Post Paid integration possible
•   Easy implementation of change in business policies and rules.
•   Host of online services, online query and prompt customer response
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IV.   DESIGIN OF CDR SYSTEM
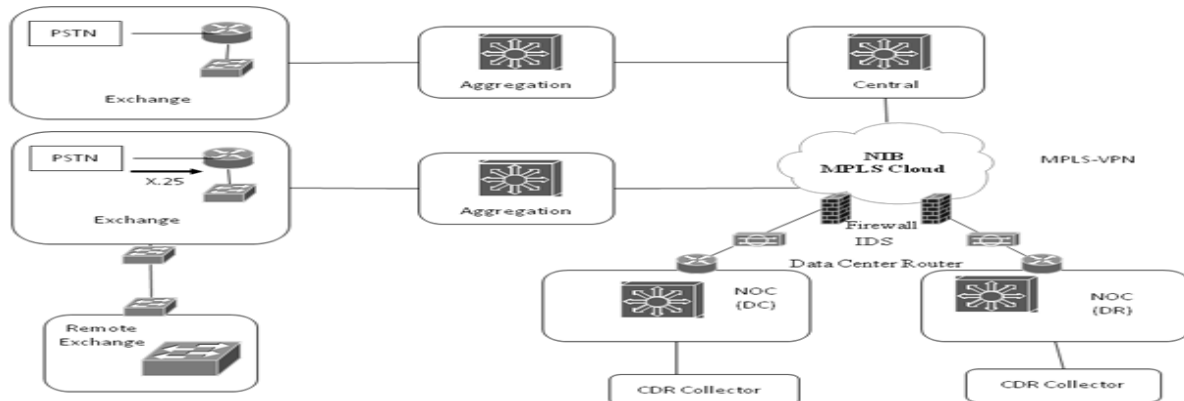## 4.1. DATA FLOW FROM LOCAL EXCHANGE TO DATA CENTER

Fig: 1 Data Flow from Local Exchange to Data Center

V.   METHODOLOGY

The varieties of systems in all over BSNL exchanges are integrated to a single standard operation system at Data Center. By having the secure routing of network using IPSec, Network based IDS and SACS. The overall quality of billing and payment management systems are improved by IVRS and managed at Database servers. By the integration systems the total Call Record system and the Customer Detail record system is centralized and should be maintained at the server tapes. It is used to make different bill rating for different tariffs, different Billing cycles and different discounting schemes for different category of subscribers through their Databases. These are to be given secure by taking backup.

VI.   CONCLUSION

The CDR system is mainly used as up-gradation of the Meter Based Billing System. The CDR System used to support for bill rating purpose of different tariffs. It helps for Accurate and timely invoicing of call details to generate error free bills. Having backups for the purpose of the disaster recovery.

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