E2-E3: ENTERPRISE & WHOLESALE

CHAPTER-13

CDR

(Date Of Creation: 01-04-2011)
**CDR**

**Introduction And Scope**
BSNL is going to implement a CDR based convergent billing and customer care system. This project is going to replace all the existing systems of Commercial, TRA (Telecom Revenue Accounting), FRS (Fault Repair Service) and DQ (Directory Enquiry). The project will cover the customer care and billing for the following services:

- Landline
- Broadband
- Leased line

The project is not simply a replacement of the existing systems, but it is much more than that. For the first time in the history of BSNL, we are going to have State-of-the-Art Customer Relationship Management (CRM) software. This software will take care of all types of requests from the customers and integrate with other systems such as Order Management and Billing systems. This software will also provide a Web Self Care (WSC) module which will enable customers to access the system through Internet for placing any request, for making payments, or for general enquiry.

This project envisages installation of provisioning and mediation systems which will interface with around 3000 PSTN switches and MSC based WLL systems. The subscriber management shall be done through the Provisioning system. The CDRs generated for all the calls will be pulled by the Mediation system.

We are going to have world renowned rating and billing systems which will process the mediated CDRs. The combination of CRM and the billing system will enable BSNL to introduce flexible user-friendly tariff Plans. It will also enable us to introduce schemes which we are not able to do now with the present billing systems.

The project also involves implementation of Payment Management system. It is specially designed and developed by TCS for BSNL. This system will be common for all the Circles in BSNL. It allows acceptance of payments from all types of channels i.e. Online terminals, Post Offices, Banks, Internet payments, etc. The Payment Management system
and the Billing system are integrated with an Accounting system which performs the accounting functionality and generation of sub-ledgers.

There is going to be separate software for bill formatting. The software will allow us to prepare the bills as per the design (uniform for all circles) that includes all types of graphics, logos, advertisements, etc. in multi color and bilingual formats. The system will prepare a Print file, which can then be given to the printer for printing. The printing sub system is not part of this project. The Print file will be used by the SSAs/Circles for printing the bills by using the existing methods whether outsourced, or in-house. BSNL is proposing to have Zonal Printing systems with probably five Printing Centres across the country. The Print file will then be sent to the Central Printing systems and distributed to the customers from there.

**Implementation**

The entire project is going to be implemented with four Data Centres at Hyderabad, Pune, Chandigarh and Kolkata. These four Data Centres will take care of all the activities of the Circles in the respective Zones. The South and East Zones are considered as one project and the North and West Zones are considered as the second project. The Zone-wise distribution of Circles is given below:

<table>
<thead>
<tr>
<th>ZONE</th>
<th>CIRCLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUTH</td>
<td>Andhra Pradesh, Chennai District, Tamilnadu, Karnataka, Kerala</td>
</tr>
<tr>
<td>EAST</td>
<td>Kolkata Telecom District, West Bengal Circle, Orissa, Jharkhand, Bihar, Assam, North East-I, North East-II, Andaman &amp; Nichobar</td>
</tr>
<tr>
<td>WEST</td>
<td>Maharashtra, Gujarat, Madhya Pradesh, Chattisgarh.</td>
</tr>
<tr>
<td>NORTH</td>
<td>Punjab Circle, UP-East, UP-West, Haryana, Rajasthan, Himachal Pradesh, Uttarakhand, Jammu &amp; Kashmir</td>
</tr>
</tbody>
</table>

The Billing system for South East is going to be from M/s.Comverse with whom BSNL has a 10-year contract. So the same billing system as is being used in the GSM and Broadband will be used in this project for the South East Zone. In the North West, the system for billing will be from M/s.Converges.
Convergent Billing
This project shall implement a convergent billing system, which enables us to issue a single bill for a customer taking any type of service from BSNL. The electronic stapling software shall be implemented in all the four zones. A customer having presence only in a particular zone, spanning across SSAs and Circles, can have a single bill for all the services he takes from BSNL whether the bill for the particular service is prepared or not from this system. The electronic stapling software installed at Hyderabad, shall take care of Corporate customers having All India presence. This system will have interfaces with other zonal billing systems, GSM billing systems and the NIB billing system. With these interfaces, it is possible to issue a single bill to a Corporate customer having All India presence. The system is also capable of taking the payments against this single bill and then distributing the payments back to the original billing systems of the different services taken by the customer for proper accounting. This is one of the biggest advantages of this project.

The system will also help us introduce Combo Plans, offering flexible tariff plans to customers availing Landline, Broadband and GSM services.

Hardware
As far as hardware is concerned, we are buying Data Centre (DC) Class servers which are high-end servers having 64 cores/CPUs in each machine. These high end machines shall be used for hosting the main applications such as Billing and CRM. We are buying low-end servers which are two-CPU servers for small applications like Anti-virus, HTTP, Web servers, Authentication etc. They are mostly Windows or Linux based servers. In the Hyderabad Data Centre alone, we are going to have 18 DC class servers and around 200 low-end servers.

Network
This project shall implement a country-wide Intranet. This network will connect all SSAs, Circles and the Corporate Office, providing connectivity to all its main exchanges, all officers dealing with customers, such as JTOs, SDEs, AOs, and the entire management. So far, each SSA or Circle has established networks for implementing DOTSOFT and other local systems. This project is going to integrate all the networks and provide a country-wide IP network with MPLS as the backbone. This network will be used not only for implementation of the CDR project, but also for implementing all other IT projects in future, such as ERP.
The following figure shows in general the exchange network and the collection methodology of CDRs. Each exchange is connected to a router, which is called LE router (Local Exchange router). All new technology switches such as OCB, EWSD, 5ESS, AXE, shall be connected using X.25 cards and Ethernet interface (wherever available). All CDOT exchanges will be connected to the LE router using CES equipment supplied by CDOT through HCL. All E10B exchanges will be connected to the LE router through MTE (Magnetic Tape Emulator). Each LE router is connected to the Aggregation Router through E1 links. All the E1s coming from the different exchanges will be aggregated to the Aggregation Router. Each Aggregation Router in each SSA shall be connected over STM-1 link to the nearest MPLS node. For redundancy purposes, the connectivity shall be established to two MPLS nodes. The Data Centre is also connected to the MPLS network presently through STM-1 links, to start with. This end link will be enhanced to 1 GBPS link or more, later. Thus, each exchange shall be connected to the Data Centre over E1 end links and through the MPLS network.

The existing CSR network will also get connected to the Aggregation Router. Thus, all the terminals of Commercial, TRA, FRS and Directory Enquiry which are now connected to the local systems, will be connected to the Data Centres through the Aggregation Router. The project envisages –

- Establishment of new network for collection of CDRs from the exchanges,
- Usage of existing CSR network, with addition of a few CSRs, if necessary,
- and re-utilization of existing PCs in the network.

**PCs**
A few numbers of PCs are allotted to each SSA either for new locations, or for replacement of old PCs. In case SSAs require more PCs than are provided in the CDR project, then SSAs have to take necessary action to procure those PCs. In general, as per Corporate Office orders, all PCs which are more than 5 years old, are eligible for scrapping and replacement. If existing PCs can be upgraded, then it has to be done by upgrading the RAM to 256 MB (Minimum) if possible. If new PCs are being bought, then they have to be purchased with 512 MB RAM, minimum if WINDOWS XP is the Operating System, or 1GB RAM, if WINDOWS VISTA is the Operating System. The project will not have in general any client software to be loaded. Applications shall be Web based. Therefore, the end user’s PC needs to have a browser with atleast WINDOWS XP as the Operating System. WINDOWS 98 PCs have to be either upgraded to XP or replaced.

**IVRS and Integration with Call Centres**
This project is going to have centralized IVRS (in each zone), CTI (Computer Telephony Interface), IP EPABX, etc. The core equipment required for Call Centre operations will therefore be installed at the Data Centres. The existing Call Centres, mostly one per each Circle, will then be connected to the Data Centres. In future, the 1500 calls and the 198 calls will be routed to this IVRS. Depending upon the Number or the CLI, the call will be routed through the IP network to the respective Call Centres. IP phones are provided to each Circle as part of this project. The Call Centre Agent will therefore have one IP phone and a PC connected over an IP network to the Data Centre. The customer data is displayed on the screen of the computer and the IP phone provides the voice communications with the customer. This is how the existing Call Centres will be integrated with the Data Centres.

**Software**
The main components of the software that are being procured in this project are:
- CRM (including FRS)
- Billing
- Accounting
- Mediation
- Provisioning
- Web Self Care (WSC)
- Bill formatter
- Revenue Assurance (RA)
- Inventory management, which takes care of customer inventory such as MDF particulars, Pillar, DP particulars, etc.
- Directory enquiry
- Inter Operator Billing and Accounting system (IOBAS)
- Fraud Management System (FMS)
- Enterprise Management System (EMS)
- Enterprise Application Interface (EAI)
- RDBMS (mostly Oracle)

**Disaster Recovery**

The customer care and billing and other related operations of 334 SSAs are going to be migrated to the four Data Centres. It is very important therefore to have a business continuity Plan in case of a disaster. A disaster is defined as an event that makes continuation of normal functions of a Data Centre impossible. An event could be any one of the incidents like Flood, Fire, prolonged power shut down, strike, earthquake, etc.

In this project, Hyderabad is configured as the DR site for Kolkata and vice versa. Similarly, Pune is configured as the DR site for Chandigarh and vice versa. The degradation of performance for the applications failing over to the DR site is permitted upto 50%. This means for example, a billing operation taking 8 hours in the normal course, can take upto 16 hours in case of a disaster.

**After CDR Project**

The introduction of this new project will eliminate the need of individual SSAs maintaining and operating IT systems for all the four functionalities, i.e. Commercial, TRA, FRS and DQ. The SSAs shall be the end-users of the systems and will have better tools and software at their disposal to provide better customer services, leaving the database related jobs to the IT team at the Data Centres. Because of the introduction of new systems and to take advantage of the features of the system, it is proposed to change certain business processes within BSNL, a few of them are explained below:

1. **Revenue Accounting:**

In the new system Balance brought forward accounting method shall be used instead of invoice based accounting. For example, a June Bill issued to a customer if not paid, will
be added to the July Bill and the July Bill will be issued for an amount which is equal to both the June and July amounts. Every customer will be identified by an Account Number which shall be unique throughout the country. Revenue booking shall be based on the Account even though the services under the account are scattered across the various SSAs. The customers can pay any amount at any time and it shall be credited to the account and adjusted against the outstanding.

2. Surcharge/Late Fee
Surcharge will be treated as late fee, which will be a percentage of the outstanding instead of at the slab rate as is being done today. The late fee concept is already introduced in the GSM billing system and the same shall be followed here.

3. PCO Billing
For PCO billing, the commission payable and the minimum guarantee will be as per the billing cycle instead of on a monthly basis. PCO operators are now eligible for discounts instead of commission. These changes are already done in the existing systems and shall be continued in the new system.

4. Deposits
Deposits are already made uniform i.e. Rs.500/- for Local, Rs.1000/- for STD and Rs.2000/- for ISD. This shall be common for all the Plans. Therefore, we shall not be offering any OYT or TATKAL deposits/schemes. The existing OYT subscribers shall continue to be billed till the completion of 20 years. However, no new OYT connection shall be provided.

5. Billing Cycles
The number of billing cycles in an SSA may increase. The new system is going to have a centralized billing process common for all the SSAs in a zone. Therefore, the customers in the entire zone shall be divided into different billing cycles to evenly distribute the process load on the servers. The number of billing cycles may even go upto 15 once the project is rolled out in all the SSAs.

6. CDR Based Billing
The existing tariff which is based on MCUs and number of calls will get migrated to MOU (Minutes of Usage) based system. The discounts may be given not in terms of Free Calls, but shall be in terms of Free Talk Time given as Minutes per month or Rupees per month.
Though the system offers a lot of flexibility in configuring different Plans, BSNL in turn may have to follow certain discipline in offering various Plans to the customers. It is proposed to authorize the Circle Office team to configure the plans as per business requirements and in future SSAs may not be able to configure new Plans on their own. Each Plan shall be identified by a Plan Code in the system. This discipline will help the organization in monitoring the launch of tariff Plans across the country and it will help BSNL to take correct business decisions.

7. What the SSAs Should Do in Preparing for the Project:
   - Providing connectivity of exchange routers to MPLS VPN. Each exchange must be connected through one E1 link to the Aggregation Router. A redundant (second) E1 link will be connected to the second Aggregation Router.
   - Connectivity of Aggregation Router of SSA to two of the nearest MPLS nodes through STM-1 links
   - Connecting the existing CSR network to the Aggregation Router of the SSA.
   - Providing Transmission media to all these connectivities. Coordination with the Telecom Region to get channel allocation and connectivity to the MPLS node.
   - Coordination with NIB (Data network Circle) for allotment of STM-1 ports at all the MPLS nodes.
   - Cleaning and preparation of the data in the existing systems for data migration - to follow the guidelines given already by DDG(TRF).
   - Reconciliation of data between switches and the billing systems. All the numbers found working in the telecom switch should be reconciled with those working in the billing system also. The number of disconnected/closed connections must also be reconciled between the switch and the billing system.
   - All connections which are closed must be settled and accounts finalized and are not to be transferred to the new system.
   - Thorough review of outstanding must be done and fictitious outstanding and other outstanding must be written off as per the Corporate Office guidelines.
   - Deposits data must be verified and corrected in the existing system before we take up data migration.
   - All the facilities like CLIP, STD, ISD, Call forwarding, etc., must be gathered for all the customers and kept ready before data migration.
   - All the accessories being charged to the customers in the existing billing system must be thoroughly verified.
• FRS data for all the customers regarding MDF, Pillar, and DP must be gathered and kept ready. To start with, it is important to collect the information regarding Localities and Sub-localities, Pillars and DPs. Mapping of the External plant inventory to the Locality and the JTO Outdoor is very important. Instructions issued in this regard by CGM IT may please be followed.

• All the new technology switches, CDOT and E10 B exchanges must be kept ready for CDR generation for 100% of calls. The requirement of X.25 interface cards and cables must be projected to the Corporate Office, keeping IT Circle informed.

• The upgradation and procurement of PCs as mentioned earlier in this Article must be done on top priority.

• SSAs may ensure availability of Bar Code Scanners at all Online counters and availability of A4 page scanners for scanning the application forms.

• All the Circles must review the existing network and project requirement of network elements for the Roll-out phase of this project to the IT circle.

• All the SSAs are requested to watch the CDR Project link provided in the BSNL Intranet Portal for regular updates and information on the progress of this project.

This project can be successful only with the coordination and cooperation of all the Wings of BSNL and in the SSAs, especially those of IT, Planning, Accounts, and Engineering officers. This is one of the biggest IT Projects taken up by any Telecom Operator in India and it is our duty to see that it is a success.
Chapter 13: CDR

Sample Self study Objective type questions

1. The entire CDR project is going to be implemented with__________ Data Centres.
   a. Four   b. Five      c. Six       d. Eight

2. ____________is configured as the DR site for Kolkata in CDR Project.

3. ____________is configured as the DR site for Chandigarh in CDR Project

4. The South and East Zones are considered as__________.
   a. Project-I   b. Project-II

5. North and West Zones are considered as the __________
   a. Project-I   b. Project-II

6. The CDR project is going to replace all existing systems for Commercial, TRA, FRS and DQ.
   a. True   b. False

7. The project will cover the customer care and billing for the following services.
   a. Landline   b. Broadband   c. CDMA   d. Leased line   e. All a, b, c & d

8. OYT connection shall be provided in CDR
   a. True   b. False

9. The tariff in CDR System is based on MOU (Minutes of Usage) based system.
   a. True   b. False

10. Each LE router is connected to the Aggregation Router through E1 links.
    a. True   b. False