



EliteAAA Case Study

BSNL

CRESTEL AAA and Centralized Policy Control enables BSNL to provide Next Generation IP based services on its National Internet Backbone-II

About the Project

Bharat Sanchar Nigam Ltd. is India's largest and the world's 7th largest telco, providing Broadband, GSM Mobile, Leased Line, MPLS-VPN, Dial-up, with pre-paid and post-paid business models. BSNL has more than 2.5 million Broadband subscribers and 6 million subscribers accessing the Internet through Wi-Fi, MPLS-VPN and Dial-up services.

The company has set up a world class multi-gigabit, multi-protocol convergent IP infrastructure that provides triple play service convergence through the same Backbone and Broadband Access Network, using National Internet Backbone-II (NIB-II).

BSNL's Requirement

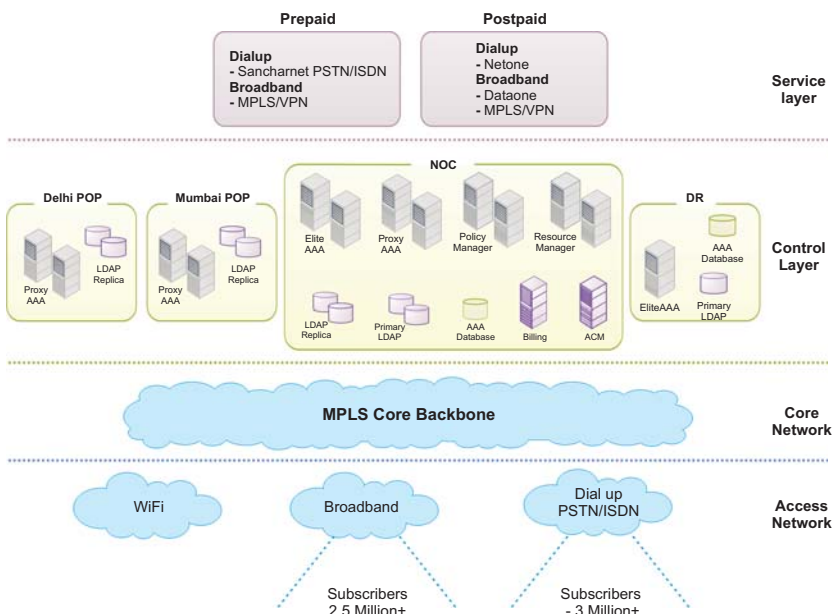
In its mission to build a world-class infrastructure that would help accelerate the Internet revolution in India, BSNL identified several requisites that would enable them to reduce operational costs and accomplish the following goals:

- Centralize AAA activities, Policy Management and Resource Management for offering prepaid and postpaid models for the following services:
 - MPLS Virtual Private Dial Network (VPDN)
 - MPLS Virtual Private Network (VPN)
 - Dial-up and ISDN
 - Broadband
 - Wi-Fi
- Implement subscriber-sensitive access control, offer flawless service delivery with appropriate service levels irrespective of the access mode, and centrally maintain usage sessions and usage accounting
- Have a GUI-based policy engine for assembling AAA policies of various types, without any programming intervention

Solution Highlights

Elitecore's solution to BSNL fulfilled all their requirements by way of an architecture that deployed the following components:

- **Elite Policy Manager** acts as a central repository where policies can be framed and stored. These policies could be applied on an individual or group of subscribers, and centered on network and usage attributes, subscriber, and service attributes as needed for delivering the service. The best part was that a single policy could be applied on similar conditions for one or more services.
- **Elite AAA** server operates as a focal point for all AAA activities for prepaid and postpaid services offered by BSNL. In case of postpaid, it also generated CDRs that is fetched by the mediation system.
- **Elite Resource Manager** was used for defining IP Pools from where IPs could be dynamically allocated to subscribers in case of certain services. The resource manager preserved sessions to record service usage done by the subscribers. In case of prepaid services, the Elite Resource Manager generates raw CDRs that are rated in real-time. In case of failure, these CDRs are fetched by the the Mediation System for further processing.
- **Integration with Third Party Billing System**
 For accounting service usage made by prepaid subscribers, "Parlay API" was implemented in Elite Resource Manager to interface with Kenan's Account Charge Manager (ACM) for session creation, session time calculation, and used units' deduction for the prepaid service usage.



- Implement subscriber-sensitive access control, offer flawless service delivery with appropriate service levels irrespective of the access mode, and centrally maintain usage sessions and usage accounting
- Have a GUI-based policy engine for assembling AAA policies of various types, without any programming intervention
- Deliver Quality of Service to subscribers based on the network type and subscribers' preferences.
- Ensure high availability and load-balancing of services to cut down the risk of single point failure and improved system performance on busy networks
- Support AAA and service delivery using the same access control policies to the subscribers even when they are roaming
- Centralize and automate operations to reduce OpEx.
- Reduce revenue leakage by implementing techniques to spool data at multiple locations.

Implementation

Centralized Control with Distributed Operations

The Control Layer of architecture comprised prudent placement of servers at different sites for stable traffic management. Elite AAA Server, Elite Policy Manager and Elite Resource Manager were placed at the Network Operations Center (NOC) site at Bangalore. This site also had a Primary LDAP database, AAA database, a 3rd party billing system and Access Control Manager (ACM). Local operations were performed at the Point of Preference (POP) sites having Proxy AAA server, LDAP Database and its replica. This network structure bore the following results:

- AAA activities, Policy Management and Resource Management were centrally handled at the NOC whereas handling of operational tasks was done locally at the POP sites.

- The Service Layer of the deployment structure covered all services with AAA for all services being handled within the same infrastructure. Simultaneously it enabled EliteAAA to provide AAA and L2TP support for MPLS VPN service.

- Policies were defined at NOC and updated in Elite AAA database as well as the Primary LDAP. This allowed AAA activities for roaming subscribers using the same policy that were associated with their profile.

- BSNL could configure a single policy for multiple services using the "Multi-service selection" feature of Elite Policy Manager if all those services had same policy orchestration.

- Chances of data loss were minimized by copying the LDAP data of POP sites to LDAP replicas at NOC site, thus preventing revenue leakage.

- Resources like IP that are critical for delivery of data services were managed centrally in Elite Resource Manager.

• AAA for Prepaid and Postpaid Subscribers Together:

Despite having centralized AAA, Policy Management, and Resource Management functions, BSNL could execute separate process flows for prepaid and postpaid services in parallel, without any interruptions.

- Prepaid Service Flow

Prepaid subscribers were authenticated and authorized at the NOC by checking the credentials in the LDAP and obtaining policy details from Elite AAA database. Elite Resource Manager paired with ACM acquired session details before allowing access and after disconnection, charging the subscriber in real-time for service usage.

- Postpaid Service Flow

Proxy AAA server generated a CDR. The mediation system fetches the CDR from the server and forwarded it to the Billing System. The Mediation Server could fetch CDRs from all AAA servers, giving BSNL the benefit of consolidating usage records.

• Failover, Load-balancing, and High Availability:

Accounting information was spooled from the Proxy AAA servers of distributed POP sites to the Proxy AAA server at the NOC site. This guaranteed uninterrupted service delivery even in cases of system failure. Centralized management and distributed operations helped balancing the load between servers. High availability was delivered due to replication of AAA servers, and presence of LDAP database and AAA database at each POP site.

Results

Benefits to service provider

- Management of prepaid and postpaid subscribers within common infrastructure
- Faster rollout of services by defining policies based on subscriber usage pattern, market conditions and upcoming socio-economic events
- Future-ready for Multi-play, Subscriber Service Selection Portal, and quick launch of triple-play services within common infrastructure
- Controlling subscriber churn through notifications and personalized subscriber experience
- Provide appropriate QoS depending upon the type of network and subscriber access preferences leading to optimum network utilization
- Reduce operational expenses due to centralized management and reliable infrastructure with reduction in response time

Benefits to Subscribers

- Avail services without compromising on quality and service availability as a result of the full-proof network and failover measures taken by the service provider
- Use services even while roaming out of the service provider network
- Receive assistance in form of real-time notifications at the right time. For example, get notified when the credit limit is about to exhaust



www.crestel.in
info@elitecore.com

© Copyright 2007 Elitecore Technologies Limited. All Rights Reserved.

Corporate Office

Elitecore Technologies Ltd.
904, Silicon Tower, Off. C.G. Road, Ahmedabad - 380 006. INDIA.
Tel: +91-79-66065606, Fax: +91-79-26407640

Sales & marketing

Mumbai Tel: +91-22-66951280 / 1380 Fax: +91-22-66923363
USA New Jersey Tel: 201-422-92001 Fax: 201-735-5888

