

# BROADBAND COMMAND CENTER

## NET SERVICOS IMPLEMENTS LDAP

### Benefits:

1. Device provisioning from LDAP directory
2. Dynamic configuration file generation
3. Data visibility across multiple departments
4. Integration with DNS

Brazilian MSO NET Servicos is off and running, with pay TV and broadband services growing 13 percent and 22 percent respectively over the past year. Its telephony count has grown by 29 percent.

Spread across 93 separate operations, NET Servicos is highly regionalized, but has a centralized billing system. These parameters led the operator to request a tweaked version of Incognito's device provisioning software, Broadband Command Center (BCC).

NET Servicos asked Incognito to integrate BCC with LDAP (lightweight data access protocol), a directory protocol better suited for its distributed footprint than DHCP. This 2006 implementation positioned the operator well for the dramatic growth in broadband and voice services it experienced thereafter.

### Competition and Constraints

NET is the largest MSO in Latin America, passing nearly 11 million homes in a country of 193 million inhabitants. As of 1Q10, it counted 3.8 million pay TV, 3 million broadband and 2.7 million voice subscribers.

The explosion in voice subscribers from 300,000 only two years ago followed the country's introduction of number portability. Though Government policy remains a strategic factor, and NET's plan to bring broadband access to 35 million people over the next two years is seen as a potential threat. Also in play are possible changes to rules that affect Telmex, the company that holds a controlling stake in NET.

Competition to NET comes from direct broadcast satellite (DBS) providers and Brazil's thriving wireless operators. In 2006, Net bought Vivox, the second largest cable operator in Brazil.

Across the country, the economic tide appears to be rising. "We are growing very fast," NET IP Engineering Infrastructure Manager Marelo Sarmiento said, "but the competition is also growing very fast."

While policies such as number portability accelerated NET's growth, the government also has played a role in constraining the MSO's architecture choices. "We're not allowed to build fiber between cities," Sarmiento said. "Every operation is a unique operation."

While decentralized in operations, NET's IT functions require a centralized billing system. As a result, all communications with billing occurs over the Internet, via IP transit provided by Embratel (a Telmex company). That created a transport technology dilemma.

The problem is that apart from the considerable costs incurred, the unpredictable performance of these links—in terms of latency, packet loss, etc.—made them unsuitable for DHCP flows.

## Why LDAP?

Given these constraints, NET saw LDAP as a bridge between DOCSIS provisioning and billing. Sarmento called it a well-known protocol, with both open and proprietary implementations.

"It's easy to customize and also to extend," he said.

Another way to look at LDAP is in terms of a classic IT choice. "The big point to remember is LDAP is not a database, it's a directory," Sarmento said.

In other words, as a directory it uses data that are read more than written to or updated. It stores attribute-based data that lend themselves to hierarchical structure. And its operations are generally simpler than those of a database.

The LDAP data model, or schema, defines the content of entries in a so-called sub-tree, which helps maintain the consistency and quality of data and reduces duplication. At the same time, by means of LDAP replication, it's possible to mirror any branch of the directory tree. Combined with a master-slave concept, replication is useful in distributing data across a large operational area.

## Implementation and Benefits

In order to meet NET's LDAP requirements, Incognito developed an extra step in the DOCSIS provisioning sequence. After receiving an IP address and configuration file from the DHCP and TFTP servers, respectively, the modem or MTA makes a query/response to the LDAP server before touching the DNS server (all via TCP).

The LDAP fields can then be mapped to DHCP and DOCSIS files settings. Because DOCSIS relies upon the modem or MTA to initiate a configuration request, one implementation issue is that if a change occurs, enforcing it requires resetting the CPE device.

That said, NET deployed its first 10 clusters of LDAP servers in Sao Paolo, the country's largest city and the company's headquarters, in a successful trial. Further deployment in 2006 was brisk. "We did 35 new operations in three weeks," Sarmento said.

Other benefits of the BCC with LDAP solution include maintenance of centralized billing, data visibility across multiple departments, local LDAP backup, provisioning facilitated by pointing multiple DHCP servers to a single LDAP context, and simplified splits and adds.

Asides from the LDAP special request, Incognito's BCC also met NET's other requirements for dynamic file generation and integration with DNS. Upcoming challenges for NET are the need to adopt PacketCable hybrid mode provisioning, prepare further for IPv4 address exhaustion and establish centralized management techniques and procedures.

## THE BROADBAND COMMAND CENTER ADVANTAGE

Broadband Command Center is a service provider-grade provisioning solution that offers simplified management, load-balanced failover, high security, and easy integration with OSS/BSS or your customer care center. Solution highlights include:

### Dynamic File Generation.

Add new devices or change parameters in a matter of touches.

### Flexibility.

Support internal or external provisioning data sources, multiple device types, and various standards.

### Scalability.

Expand the solution to suit your changing needs without sacrificing efficiency or performance. Experience fast and reliable provisioning.

For more information, download the Broadband Command Center fact sheet at: <http://goo.gl/t7JBkR>