



Enterprise Network in India

How Cisco IT in India Overcame Regulatory Constraints to Build an Enterprise Network



A Cisco on Cisco Case Study: Inside Cisco IT

Overview

- Challenge

Regulatory constraints hindered the deployment of many aspects of the Cisco India network infrastructure

- Solution

Cisco India IT worked closely with regulators and service providers in India to gain approval for various network services and capabilities

- Results

The Cisco India network today is very reliable, efficient, cost effective, and maximizes communication among employees and partners

Overview (Contd.)

- Next Steps

Continue to expand the network and the services available to employees and partners

Challenge: Overcoming Regulatory Constraints

- Technologies deployed within Cisco India are typical of those at other major Cisco sites
- However, regulatory constraints hindered the deployment of many aspects of the Cisco India network infrastructure
- Cisco India IT had to work closely with Indian regulators and service providers over a five-year period to gain reasonable relief from these restrictions

Solution: Working with Regulators and Service Providers

- Between 2000 and 2005, Cisco India IT worked with regulators and service providers to gain approval for services in the following technology areas:

Closed User Group

Remote Access Service

Local Internet Gateway

Wireless LAN

VPN Concentrator

Service Provider Redundancy

Softphone Remote Access

Solution: Closed User Group

- Companies located in India and connected to their parent company outside India cannot connect to any private or public networks (known as Closed User Groups or CUGs) within India without first seeking approval by the Department of Telecommunications (DoT), India's regulatory authority
- Cisco India received permission to set up the CUG in mid-2000 after several visits with regulators in New Delhi, a number of follow-up calls, and answering many questions
- More than a half dozen Cisco Partners are connected to the CUG today

Solution: Closed User Group (Contd.)

- Each new partner requires a new application and approval
- Direct interconnection between the CUG network and partner networks is strictly prohibited
- All partners maintain separate buildings where employees are dedicated to Cisco projects and only have access to the Cisco CUG network

Solution: Remote Access Service

- Some Cisco India employees must be able to access the Cisco network from their homes
- Cisco India set up a pilot RAS server in Bangalore at the end of 2000 to evaluate the requirements of users and test the equipment

5 BSNL ISDN PRI (2 Mbps) circuits installed to support the traffic

Users require an ISDN line (128 kbps) in their homes to access the RAS server

Solution: Remote Access Service **(Contd.)**

- RAS service required approval by DoT and an annual license fee per circuit
- Cisco received approval for RAS in January 2001
- Today, 300+ users have access to the RAS service in Bangalore

Solution: Local Internet Gateway

- To access data files and applications on the World Wide Web, Cisco India engineers had to connect to the nearest Internet access point on the Cisco WAN: San Jose
- This connection traversed the Cisco WAN to San Jose and (frequently) back again to web servers in India, bringing files back to Bangalore via San Jose
- Backhauling network traffic over costly international circuits was not efficient and resulted in significant latency, which affected performance

Solution: Local Internet Gateway **(Contd.)**

- Cisco India IT filed an application with DoT seeking permission to deploy an Internet gateway in Bangalore, eliminating costly backhaul
- DoT approved Cisco India IT's application in December 2001
- Service was installed for Internet traffic

Solution: Wireless LAN

- Prior to January 2003, Regulators in India required companies to obtain both import licenses and operational licenses for wireless LAN equipment
- After January 2003, partial deregulation eliminated the need to apply for an operational license as long as the wireless equipment would be confined within a building
- Cisco IT India applied for a license in June 2003 and received approval within approximately eight weeks

Solution: Wireless LAN (Contd.)

- Cisco IT India set up a pilot WLAN deployment in August 2003
- Based on the results of this pilot, Cisco IT completed deployment of Access Points throughout all the Cisco research and development centers and sales sites within India in October 2003
- Today, nearly 80 access points have been deployed

Solution: Local VPN Concentrator

- Prior to 2003, any employee of a Cisco India partner accessing the Cisco network from home via a VPN connection traversed the Cisco WAN network to San Jose where the VPN tunnel would be terminated and the user authenticated
- Cisco India IT recognized that a VPN concentrator deployed in Bangalore could provide local authentication and termination, eliminating the need to travel to San Jose and back again, dramatically reducing latency

Solution: Local VPN Concentrator **(Contd.)**

- Cisco India IT submitted a request in July 2003 to allow deployment of a local VPN concentrator in Bangalore
- DoT approved request in September 2003
- Today, latency has been reduced from 230 milliseconds to between 40 and 50 milliseconds, improving performance and productivity for more than 100 VPN users

Solution: Service Provider Redundancy

- Until 2002, India's telecom industry was completely dominated by one service provider, BSNL; no alternative carriers existed
- By the second half of 2002, several private service providers began offering competitive services
- Cisco India IT was very interested in evaluating some of these private carriers, which could provide a level of diversity on the Cisco India CUG

Solution: Provider Redundancy (Contd.)

- Concerned about loss of revenue and market share to competitors, BSNL notified its customers, including Cisco India, that if they purchased circuits from a private service provider, BSNL would immediately terminate all services it supplied to those customers
- Cisco India IT made a number of appeals to BSNL and Telecom Regulatory Authority of India (TRAI) without success

Solution: Provider Redundancy (Contd.)

- Finally, in November 2003, Cisco India and BSNL reached agreement
 - Cisco India would maintain primary circuit at each location from BSNL and back-up circuit from competitor
 - If the two were different bandwidth, higher bandwidth purchased from BSNL
- Cisco had at least two E1s connecting each of the partner sites
- Replace one BSNL E1 circuit with a private service provider E1 circuit to achieve service provider diversity

Solution: Softphone Remote Access

- In deploying VoIP in India, Cisco IT had to abide by regulatory constraints that forbid the interconnection of VoIP and the Public Switched Telephone Network (PSTN)
- In June 2003, regulators in India approved a new service called “IN Exchange” that allowed voice calls to terminate at the local Cisco office in India and be carried over the WAN to San Jose
- IN Exchange had a major limitation
 - It was associated with a specific residential telephone line; Cisco India employees could not use the service when traveling

Solution: Softphone Remote Access **(Contd.)**

- In March 2005, Cisco India sought approval to use Cisco IP Softphone, a Windows-based application for the PC
- Cisco reasoned a call placed or received by a Cisco IP Softphone was an end-to-end packet-based call similar to a VPN connection, which was already allowed
- After submitting a formal request in writing, service providers in India gave Cisco IT permission to implement the service in March 2005

Results: Working Well With Regulators

- The Cisco India network today is very reliable, efficient, cost effective, and maximizes communication between Cisco employees and partners
- Although difficult at times, applying for and receiving regulatory approvals from telecom regulators was well worth the time and effort spent
- Cisco India IT continues to have a close working relationship with regulators in India

Next Steps: Expanding the WLAN

- A new Cisco India building, Subramanya Arcade, in Bangalore will use the new Aironet 1200 series WLAN Access Points equipped with 802.11g
 - Current regulatory restrictions limit 802.11g (54 Mbps) devices to operating in the 802.11b (11 Mbps) mode
 - Full deregulation of 802.11g devices is expected soon
- Installation of Access Points will be performed by contractor
 - Cisco India IT decided that a professional team could ensure better coverage

Next Steps: Increasing Competition

- Before the advent of a more competitive telecom marketplace, BNSL, the incumbent service provider, largely dictated the terms and conditions of service
- With a more open and competitive market today, Cisco India IT is seeking to change some of these terms
- Cisco India IT is challenging the 2002 agreement with BNSL stipulating that primary circuits should be purchased from BSNL and back-up circuits from the private provider
- Cisco India IT hopes to eliminate that clause and have the freedom to choose services from providers without restrictions

Next Steps: Flexible Remote Access

- Cisco India has begun a pilot to evaluate Cisco IP Softphone for Cisco employees
- The initial pilot phase will involve approximately 200 users
- Once bandwidth requirements are established, the service will be rolled out to a larger group

Eventually all Cisco India employees will have the capability to make and receive remote calls

Next Steps: Flexible Remote Access (Contd.)

- Cisco IP Softphone is being replaced globally by Cisco IP Communicator

Phase two of the rollout will likely involve the newer IP Communicator product

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