



TELE ATLAS CISCO ENTERPRISE SOLUTIONS



Tele Atlas is the world leader in digital mapping. It has created the largest digital maps of both Europe and North America - covering around 290 million inhabitants in Europe and giving complete digital map coverage of the United States, with 265 million inhabitants.

Based in Hertogenbosch, The Netherlands, Tele Atlas employs 1500 people in 15 countries and maintains its data through continuous field surveys.

Tele Atlas was the outcome of a visionary idea - of providing geographic data in a digital format. Digital maps are geographic databases with detailed street level coverage of cities and towns. Tele Atlas is working to evolve the art of digital mapping by providing the most up-to-date and comprehensive geographic data available - accurately, completely and correctly. The company created a new genre of information resource, which has enabled countless new business applications such as car navigation systems, location based services and fleet management etc.

Tele Atlas' India operations were set up in 1999 in NOIDA near New Delhi. The basic focus behind setting up shop in India is to leverage India's strengths as a digital powerhouse - to use the Indian Centre as the back-end production unit for the entire Tele Atlas marketing machinery.

"As we say at Tele Atlas - IF THERE IS A WAY, WE WILL FIND IT! Tele Atlas's vision is to enable clients, partners and the industry at large to develop technology that changes the way the world is explored and new environments are built - by building applications which deliver smarter options to consumers." said Philippe Funcken, Plant Manager, Tele Atlas (India)

Industry Overview

The campus's legacy network comprised a mixture of ThickNet and ThinNet over an ATM backbone. ThickNet is a 10Base5 Ethernet standard which uses a thick coaxial cable. The network nodes are attached with transceivers that tap into the cable and provide a line to a 15-pin plug in the adapter card. ThinNet is a 10Base2 Ethernet standard that uses a thin coaxial cable. Network nodes are attached to the cable via T-type BNC connectors in the adapter cards. "The network was not very fast and there was frequent downtime," said Dr Agarwal. The passive components like cables and connectors were from Lucent Technologies.



Telematics is the term coined for a suite of in-car services (ranging from plain vanilla traffic navigation to integrated driver-specific content and application) powered by wireless communications, global positioning systems (GPS) and onboard electronics. UBS Warburg estimates that telematics will be a \$ 9 billion a year industry by 2005, and \$ 13 billion industry by 2010. And, what is even more exciting, it is estimated that about 1.5 million automobiles have already (by year end 2000) been telematics-equipped!!!! This entire service offering can be delivered only on the back of a reliable digital database of maps.

Quite simply, the consumer is still not impressed – she wants more!!! With satellites going up to support on-ground consumers and GPS getting enabled, Digital Mapping may soon be the “Way” ahead!!

This is one industry that promises to deliver the science fiction of the 21st Century.

Tele Atlas’ technology challenges

TeleAtlas India’s mandate is to act as backend operations to manage updates on the company’s existing products, as well as to develop products for newer markets across the world. India operations are a key link in the entire value chain of the development, production and maintenance of TeleAtlas’ Digital Mapping Database.

Given this, it was critical to ensure that the India operations was capable of achieving not only the high levels of consistency that was required, but also that rising market demands are met. Tele Atlas’s Indian operations needed to be future-proof to accommodate the anticipated inflow of high-volume data inputs from all over the world. The company was also conscious of the need to invest in a converged technology platform that would deliver cost benefits and service efficiencies. Hence, it was essential to establish a 100% reliable and redundant network environment connecting Tele Atlas’ Indian Centre to the firm’s various offices across the world.

Further, TeleAtlas was keen to set up an IP-Telephony network over a Local CUG – which could be extended as and when the company decided to invest in a WAN IP-Telephony network. Lastly, TeleAtlas was keen to develop XML based productivity enhancement applications.

The company found that its existing TDM network lacked the scalability to grow and adapt to the intensive requirements of the company.

“Networking emerged as the critical lifeline which could support the entire Tele Atlas India production unit to all our world-wide centers. Very clearly, the existing Frame Relay based WAN and flat LAN network options would not have been able to scale to our requirements.” said Frank Maes, Plant and IT Manager, Tele Atlas (India)

The evaluation process

The planning phase comprised designing a network that addressed past issues – while understanding future business needs. Given that the nature of work at Tele Atlas involved high-end graphics, the network needed to deliver optimal user experience.



Given the challenges, TeleAtlas initiated a specific study to ascertain the kind of solutions available in the market. The requirement was for an end-to-end network solution that not only supported Voice, Data and Video streamlining capabilities but was also scalable as well as intelligent enough to support value added applications that could enable Tele Atlas' core process (the production and maintenance of a database of Digital Maps).

The planning stage lasted about 2 months – within which market information on various solutions was gathered & studied and the services offered by each solution was mapped in with the requirements of the new IT infrastructure sought to be put in place.

All these factors called for a thorough evaluation process for the choice of a solution partner and Cisco was clearly seen as the only vendor that could deliver a converged solution.

Implementing the Solution

Building a High Speed and High Availability Multi-Services Enabled Local Area Network Infrastructure

Based on Tele Atlas' needs, a redundant LAN based on Cisco's Catalyst 6500 series backbone switches and the Catalyst 4006 floor switches was set up. This equipment was used to set up a building-wide LAN consisting of Gigabit Ethernet at the core – leading out to 10/100 speeds connectivity to each user. The LAN was connected on to Cisco's 3660 and 2600 series routers – which enabled the WAN connectivity; as well as provide a voice gateway – connecting into the PSTN.

The network consists of two numbers of Catalyst 6509 switches in the Core with Layer-3 and Layer-4 switching capabilities and high-speed back plane, and providing Gigabit backbone with fault tolerance and resiliency and connectivity to the other floors. The core of the network also provides:

- For connectivity to the server farm, where the servers with dual NICs can connect to the core in a redundant manner, with one NIC connected to the Core Switch A, and the other NIC card connecting to the Core Switch B.
- Enhanced RMON II capabilities by having an integrated Network Analysis Module, which gives extensive network management capabilities.

To offer fault tolerance in connectivity of the access switches to the core switches, one Gigabit port of the Catalyst 4006 switch is connected to the Core Switch A, and the other Gigabit port is connected to the Core Switch B. In the event of failure of one fiber link, the other will be used automatically, without any break in connectivity.

To further increase the fault tolerance of the network, and to make it highly available, two identical switches (A and B) in the core will serve as backup to one another, and are configured with redundancy protocol between them.



Most interestingly, the entire high-end Cisco IP-Telephony solution has been implemented at Tele Atlas. This includes the Cisco Media Convergence Server, the Cisco IP-PBX solution comprising IP-Phones – 7910 and the latest 7960 – supported by the Cisco Call Manager software and Cisco's uOne (unified messaging) solution – Cisco Unity. A Cisco 3640 Voice gateway router supported the entire voice solution.

The network integrates software services such as Quality of Service, Class of Service, Layer-3 switching, Layer-4 switching, policy based switching, application admission control, Virtual LAN segmentation, and Inter-VLAN routing. These features enable the integration of Multi Services based network infrastructure.

LAN IP Telephony: The future is voice over the LAN IP network

The network at Tele Atlas, exploits the power of IP network and infrastructure, and uses converged voice and data on the network. Approximately 300 Cisco IP-Phones (both 7960 as well as 7910's) have been deployed across the building and enable voice communication over a New World IP network.

The Call Manager software set up on a Media Convergence Server handles the main call processing. This Call Manager provides functionalities similar to the traditional EPABX – with added advantages delivered by an IP-network. The IP- Phones have a full-duplex 3-port switch, built-in, which allows the PC and phone to get connected to the network, using a common physical infrastructure. Therefore, the IP Phones are connected to same access switches – the 4006 – that connect the data devices. The IP-Phones draw inline power from the 4006 through the same UTP cable that carries data traffic. Further, the IP-phone's are QoS enabled – to ensure prioritization of voice traffic over data by default. Other applications like Voice Mail, integrated with the IP telephony, have also been deployed.

For interfacing and communicating to the outside PSTN network, the voice gateway has been used. The voice gateway functionality on the 3600 series router, enables the connectivity of PSTN trunks, and thereby allowing incoming and outgoing calls between the PSTN and the IP Telephony network.

The LAN switches have been enabled to provide inline power to the IP Phones throughout the network. The IP Telephony network enjoys the same high availability and fault tolerance as the data network, as both the voice and data applications are utilizing the same infrastructure.



Summary of the Implementation

The Tele Atlas Network has been designed with the thought of “Convergence” in the mind, as utilizing IP as the ubiquitous transport offers the enterprise significant statistical gains in bandwidth efficiency, lower overall bandwidth requirements, ease of management, lower infrastructure costs, and the ability to deploy new innovative applications rapidly.

Why Cisco – building an intelligent, future-conscious network

“Apart from the comfort that was provided in settling for the worldwide leader in networking for the Internet, we bet on Cisco because they are the only vendors who can provide the ENTIRE solution.” Frank Maes, Plant and IT Manager, Tele Atlas (India).

Very clearly, the Cisco solution based on a packet based IP network has delivered immediate benefits of cost reduction. The IP-Telephony solution, now that it is fully implemented, has been QoS enabled and has proven to be reliable.

“We initially did have a bit of a doubt on how the IP-based voice solution will perform -but I am glad that all our fears were proved wrong!” Frank Maes, Plant and IT Manager, Tele Atlas (India)

Cisco’s smart switches and routers have ensured smart bandwidth utilization by managing traffic more efficiently on per user/process/protocol basis. Further, the network allows for greater interaction, value addition and sharing – enhancing employee productivity. Carrying voice and data over a single network increases end user efficiency by providing exciting new services right to the desktop.

The user can access Tele Atlas’ international training modules / videos – on demand, share information efficiently with colleagues across the world, optimize time spent in administrative tasks etc. This effectively makes the employee more productive, while reducing the cost of network administration and internal support requirement.

Moreover, a converged IP-based network delivers Tele Atlas a first mover competitive advantage in a fiercely competitive world – thus opening up newer market opportunities and potential hitherto not recognized or realized. Going forward, the new world network architecture has provided Tele Atlas the headroom it requires to scale its crucial Indian operations.

As they say at Tele Atlas – “The Journey has only begun!!!”