Business Solutions

CONVERGENCE@DIGITAL GLOBALSOFT: IMPLEMENTING IP BASED NETWORKS

Digital GlobalSoft is a globally focused software development and IT services company. It has its own independent charter for growth and functioning and also enjoys the unique advantage of having Compaq Computer Corporation, USA, as a major investor, customer and supporter. Digital GlobalSoft is headquartered in Bangalore, India, and has trained software professionals with diverse technical skill sets. This number is steadily growing to help us achieve our stated vision and goals. The Company has four development centers, three in Bangalore and one in Houston Texas.

Digital GlobalSoft offers a comprehensive portfolio of Software & Infrastructure Management services with a focus on eBusiness solutions backed by its strong expertise in Internet technologies.

The company's services are backed by years of experience and expertise on platforms such as Digital Unix, Solaris, Open VMS and Windows NT. Additionally, Digital GlobalSoft has built strong skills in Linux, NSK and also offers Non-Stop Unix.

Digital GlobalSoft delivers a 'single vendor - total solution' advantage, with the attendant cost and management benefits!

Financial Perspective (FY 2002 v/s FY 2001)

- Total revenues higher by 75% to Rs 3,452 million from Rs 1,969 million making Digital the IT services vendor with best performance for the year … a year of many challenges.
  - Revenues from Compaq business increase 73% to Rs 2,811million from Rs 1,626 million, and contribute to 85% of operating revenues
  - Non-Compaq business revenues higher by 138% at Rs 506 million compared with Rs 213 million, and contribute to 15% of operating revenues
- Revenue **growth maintained across all geographies:**
  - US business increases 68% to Rs 2,511million, contributing to 76% of operating revenues
  - Europe business increases 159% to Rs 664 million, contributing to 20% of operating revenues
  - Asia-**Pacific business up 67% to Rs 142 million, contributing to 4% of operating revenues**

- PBDT increases by 86% to Rs 1,170 million compared with Rs 630 million
- Net profit after tax grows by 71% to touch Rs 927 million
- EPS **(diluted) increases to Rs 28.18 from Rs 16.58**

Digital GlobalSoft's Plans

Digital GlobalSoft recently setup - "Digital Park", a 21 acre state of the art campus in Bangalore. The campus is home to 600 of its software developers today and its two planned data centres (one active physical centre & one backup disaster recovery centre) which will provide managed hosting services to its Indian & Global customers.

The company has outlined an investment of Rs. 13 crore in setting up data centers, installing gigabit backbone network and purchasing desktops. This would grow to house about 4,500 professionals as the company grows. Its plans include:

- Setting up two separate campus LAN networks – one exclusively for Compaq and one for Digital's other customers who are looking for e-infrastructure services. This is part of its larger objective of providing High end Infrastructure management solutions, Application Consulting and Implementation and expanding its offering in areas of security and network management for customers.
- Connecting its 600 software professionals and providing them multiple means of communications
- Supporting its data centres (one physical data center and the second a disaster recovery center) needs of high bandwidth and redundancy
- Implementing a scalable infrastructure that will support its expansion plans (4500 professionals over the next 2-3 years)

Problem with the existing IT infrastructure

Digital GlobalSoft's core business is IT solutions & services for enterprise and technology markets. Its business model relies on "offshore" model of software development and its data centers for providing e-infrastructure services to its customers.

Digital GlobalSoft's existing infrastructure comprised of:

- LAN networks operational at the three digital office locations in Bangalore. The LAN switches were sourced from Enterasys / Nortel. The routers were sourced from Cisco.
- Traditional Nortel PBXs at these locations.
- VAX VMS mainframes and terminals with applications primarily based on Microsoft platforms.
- Major application used is SAP.
- Microsoft Applications such as SQL Server, Outlook, NetBios over WAN to connect to central exchange servers, HTTP / Java based Applications, Microsoft Conference Server and Netmeeting and Citrix.

However, the current legacy infrastructure had some inherent limitations which didn't support Digital GlobalSoft's needs of:

- Multimedia applications
- A single security policy for each user regardless of where they access the network, and the ability to centrally administer security policies for all users of the network
- Network availability & scalability
- Lower Total Cost of Ownership (TCO) for the infrastructure
- 24x7 redundant data centre setup to ensure that its e-infrastructure clients were convinced that it could manage their services.
- Realization of its IT vision for service delivery

"In order to create alternate forms of communication in our growing, multi-location operations, we at Digital felt the need to go beyond legacy modes of communications such as mail and basic telephony and implement solutions such as desktop to desktop video, Net meeting and streaming media which necessitated our opting for Convergence" said A.N Rao, CIO, Digital GlobalSoft.

Going forward, the key challenges for Digital GlobalSoft clearly were – greater scalability and decrease in time to deploy, greater reliability and higher Time to Service (High Availability), ensuring anytime-anywhere connectivity and enhanced network security. And all this has to be done on a platform that brings in integration from design upwards and is highly manageable.

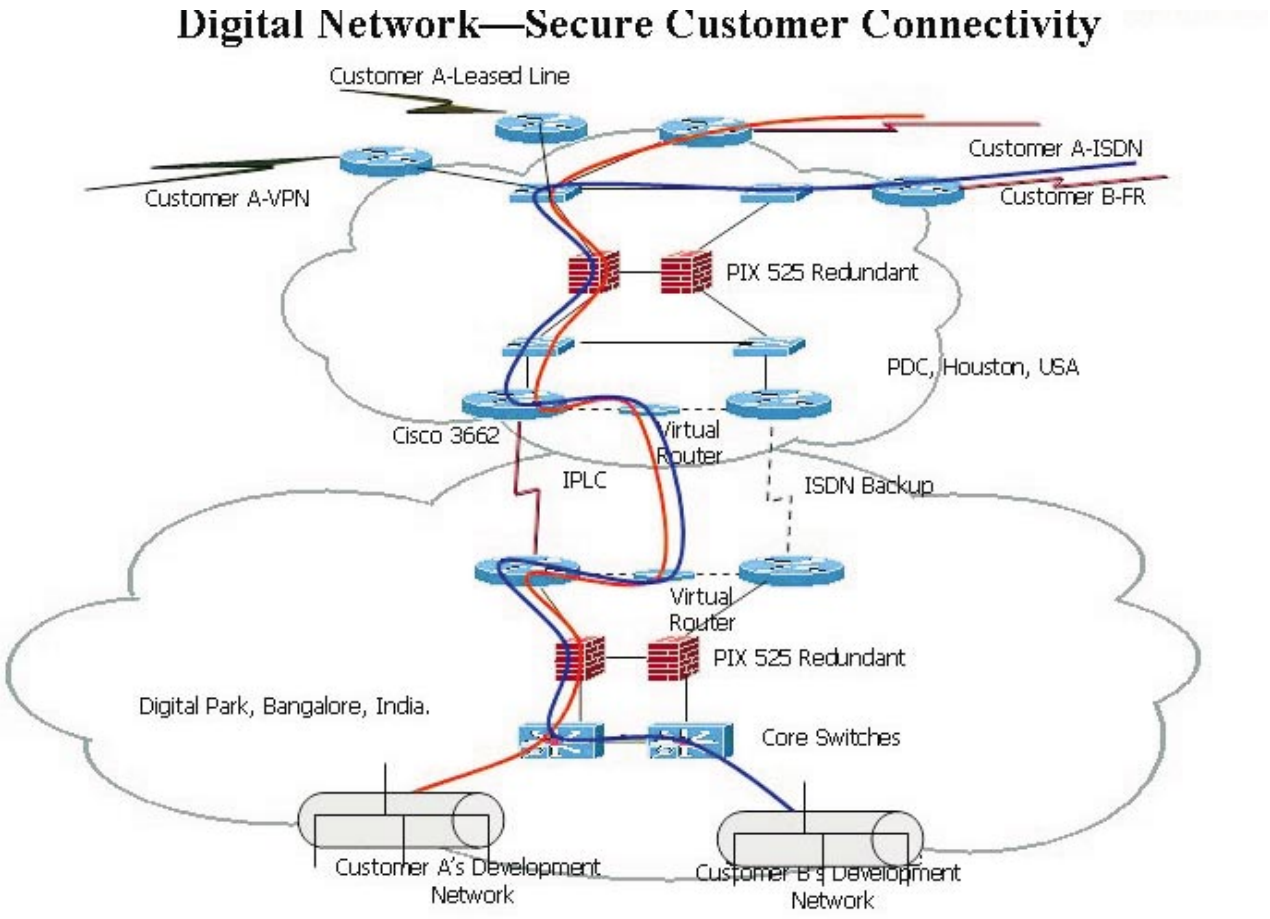
"The challenges get enhanced when one has to plan for a campus that grows over a period of time and forms the service delivery infrastructure for a diverse set of businesses – existing and new. Business should have the flexibility of multiple modes of connectivity to support the traffic and technology patters that are unique to them. That really formed the design philosophy behind bringing up the campus infrastructure", said Rao.

Seeking the Solution

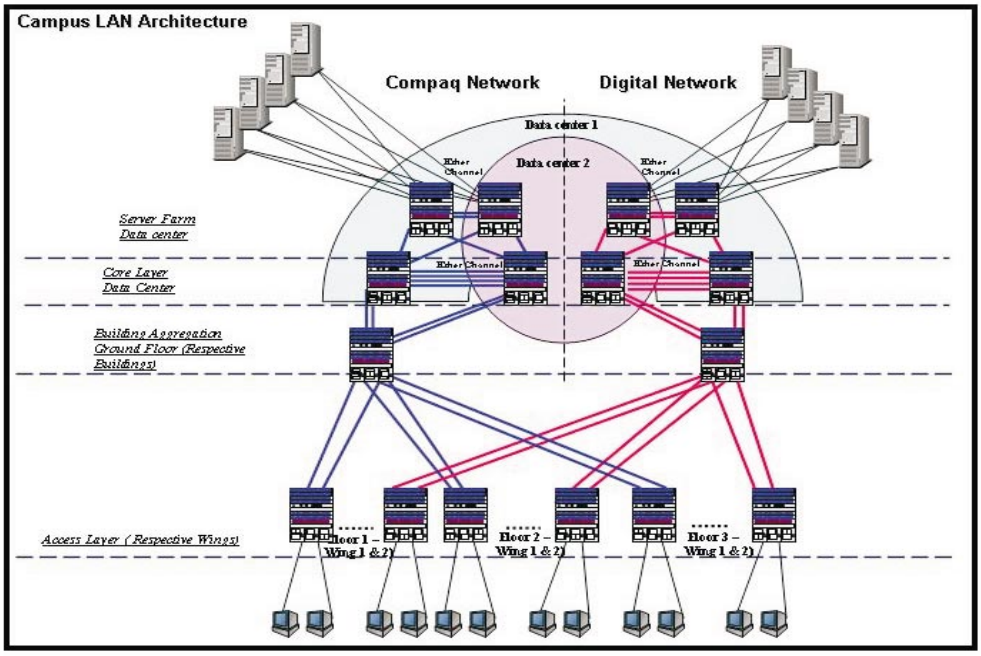
Keeping in mind Digital GlobaSoft's future plans (providing e-infrastructure services to its existing and potential customers) the need was to clearly invest in a converged IP based infrastructure that would support its growth while keeping the Total Cost of Ownership (TCO) at minimum. ***For Convergence@ Digital GlobalSoft to become a reality*** - The new infrastructure was to provide not only a new world experience to its employees by delivering the benefits of voice, video and data services but also ensure that its e-infrastructure customers were convinced of its capabilities to manage their infrastructure.

For this, Digital GlobalSoft opted for two separate Campus LAN networks at their new "Digital Park" Campus – a "Compaq Network" exclusively for Compaq and a "Digital Network" for its other customers who would want e-infrastructure managed services. In addition, the infrastructure would be required to support the need for isolated secure networks for individual customers whose delivery might be from anywhere in the campus.

Hence the two campus LANs, which have been setup have their own central resources such as core switch, server farm switch, servers etc. which are located in the physical data centre. This means that the physical data centre has separate sections, one where the "Compaq Network" central resources and servers reside and the other where the "Digital Network" central resources reside currently and their future customers' servers will reside. The "Compaq Network" connects the existing 600 professionals working on Compaq at "Digital Park" to their colleagues working on Compaq in the other three Bangalore offices through a WAN. The "Digital Network" currently connects through the WAN to the Digital Proximity Centre in Houston Texas. The "Digital Network" will provide e-infrastructure managed services such as SAP support, VPN, Security, Network Management solutions amongst others to potential clients.



Both Campus LAN Networks are based on Cisco's AVVID architecture and deploy Cisco's IP Telephony and Security Solutions. The networks are alike and are designed and configured as follows:



The Campus LAN Infrastructure is modelled and designed on Cisco's High Availability & Scalable large Campus design. Cisco's multilayer campus design is hierarchical and modular. It consists of central core switching component where the emphasis is on high performance multigigabit transport designed to deliver maximum of 256Gbps speeds. The Server farm module has high density gigabit / fast Ethernet connectivity to servers and central resources. The distribution switch aggregates a lot of wiring closet access switches on the building floors and connects to the core on multiple redundant gigabit links (4 Gbps). The prime functionality of the distribution switch is to provide secure, policy based access to users on access switches. The access switches provide connectivity to desktops and converged devices such as IP Phones and support converged applications such as Video, Multicast and Data.

The multilayer design is modular to ensure scalability as building blocks are added. A multilayer campus intranet is highly deterministic, which makes it easy to troubleshoot as it scales. It also provides for easy expansion of the current infrastructure.

Digital GlobalSoft uses Cisco Catalyst 6500 Mutiservices Switch at the Core, Server Farm and Distribution Layers of the network. There are Network Analysis Modules at the Core for network analysis and management. The Server farm switch has an intrusion detection module to protect critical servers in the data center. The access switches are the economical and feature rich Catalyst 4006s and Catalyst 3500XLs which are capable of providing the needed back-plane speeds at the access level. That makes the multi tier structure traffic engineered to cater to the potential data streams and also provides a means to do this cost effectively. All access switches reach the distribution switches on two alternate fibre paths and all distribution switches dual home into the data centers which provide fully replicated core and server farm switches. This makes for a highly available campus backbone that has enough path diversity.

Digital GlobalSoft has deployed Cisco IP telephony solutions based on the Cisco Call Manager and Cisco IP Phones in a Closed User Group (CUG). The IP Phones connect to the Catalyst access switches and provide an additional connection for user workstations. The Server farm switches have E1 services module for legacy PSTN interconnection to IP telephony, when the solution is allowed, as well as provide Digital Signal Processing (DSP) resources for conferencing with IP Phones.

Digital GlobalSoft uses Cisco 7200VXR and Cisco 3600 series Multiservices router platform for running voice, video and data across the WAN. Cisco 2600 series platform is used for remote access and Internet connectivity. The RAS users are authenticated with Cisco Secure ACS Software. The PIX Firewall is used for security and VPN Services. Firewall and IDS are managed using the Cisco Secure Policy Manager Network Management Solution (NMS).

Complementing Cisco's security solutions, Rao said, ***"Having security measures embedded directly into the network elements ensures a certain degree of inherent protection. Cisco's secure Intrusion Detection System and Cisco PIX Firewall provides Digital GlobalSoft an enterprise wide real-time system designed to detect report and terminate unauthorized activity both from within and outside its network"***

The entire network infrastructure is managed with CiscoWorks LAN Management Suite.

Why Cisco

The two primary reasons that Digital GlobalSoft opted for Cisco were:

a) Cisco's solution integration was at the design level

b) Cisco was an end-to-end solutions provider.

"Choosing Cisco as our technology partner was the culmination of rigorous testing, extensive competitive analysis and third party validation. Based on our thorough assessment it was clear that Cisco had the technology, was clearly 6-12 months ahead of their competition in their thinking and development process and was focused on the end-to-end solution to meet our needs. Willingness to understand our needs from a business standpoint of view and ability to custom architect a solution to align with those needs was an important faculty Cisco displayed consistently. Throw in a highly dependable support strategy and organization and we have a vendor we can count on for a big initiative like campus IT infrastructure" said Rao. He further added that, "Digital GlobalSoft was looking for an end-to-end vendor, someone who without comprising on quality could deliver best of breed functionality".

Cisco's network infrastructure at "Digital Park" consists of carrier class mutiservice Routers, Switches, IP Telephony, Firewalls, Network Management & Analysis, Intrusion Detection and Load Balancing appliances.

"Sourcing all networking solutions from Cisco helped us gain tight integration and the advantage of cross platform development. This means we could get IDS technology on switches and the like ... that gave us the flexibility we required", said Rao. He further added that, "Cisco's platforms also offer Quality of Service (QoS) required for offering and controlling services across WAN."

Cisco Catalyst Switches were chosen because they offered not only good performance and scalability but also the benefits of flexible technology, interfaces, services, security and convergence. The range of models makes it easy to cost effectively bring up the multi tier architecture without compromising traffic engineering considerations.

Cisco Routers were chosen because of their multiservices capability (capability to offer services to run Voice, Video, Multicast and Data). Cisco routers also offered value added security features like Network Based Application Recognition and Extended Access Control Lists

Cisco PIX firewalls were chosen because of performance and enhanced security advantages of a dedicated appliance. Cisco PIX also work well for VPN services (Site - Site, Remote Access) and is certified to work end to end with Cisco routers.

Cisco RAS and CiscoSecure ACS is another example of end to end solution benefits to Digital.

Cisco IP telephony solution was chosen for its distinct advantages of rich set of applications and location independence and from the fact that it was born out of strong data capabilities.

"The Digital GlobalSoft network is a multi-tiered system of network management using Cisco's end-to-end technology. Its Data Centre in Bangalore is a mission critical business unit for the company's global managed server hosting services. For them to opt for a comprehensive Cisco platform for one of their most significant IT investments globally is a tremendous endorsement of Cisco's product superiority, end-to-end solutions platform and customer support & services," said B Ashok, Vice President, Cisco Systems India.

Implementing the Cisco Solution

The overall network design was divided into three phases of implementation. The first phase consisted of installation of the two parallel networks - a "Digital Network" and a "Compaq Network". The details of the implementation were coordinated between the Digital and the Cisco team.

"We decided to do initial staging of Switches, Routers, Firewalls, Intrusion Detection, Network Management and Cisco Secure VPNs as a proof of concept that whatever was planned would work fine in the final implementation," said Rao.

The staging process began around August 2001. As a part of the initial staging process, a staging document was generated with a detailed IP addressing scheme for the initial phase and the subsequent phases. A detailed naming convention for all devices used in the design was evolved. The staging documentation also included configuration and troubleshooting for all equipment being used in the network. Templates were created for each configuration. From the templates a customized configuration was generated for each device.

"There were enormous challenges which needed to be overcome to ensure a successful implementation. Critical Applications like Microsoft Conferencing Services, VPNs, IP Telephony Services were tested during the staging phase and most of the issues were resolved during the staging process itself" said Rao.

Post the staging process, all configured equipment was shifted to the Data Centre. Value added services such as IDS and NAM were fine tuned post deployment at the data center.

The entire implementation was effectively carried out by the Digital team in consultation with the Cisco team.

Benefits to Digital GlobalSoft

Convergence@Digital Globalsoft set out to build not only a converged network to carry voice, video and data traffic - but also one that would be scalable, secure, reliable and would protect long-term investments in infrastructure. Some apparent benefits of Cisco products/solutions for Digital GlobalSoft are:

- Lower TCO - managing ONE network - instead of two or three separate networks
- IP based networks deliver the benefits of convergence - voice, video and data
- IP Telephony solution based on the Call Manager are scalable and location independent. Deployment of the IP Telephony solutions on the two networks drove down communication costs in a closed user group (CUG)
- Highly scalable networks - from the current 600 employees to the planned 4500 employees over the next two - three years.
- Higher bandwidth availability for data traffic
- Secure VPNs
- End-to-end secure networks along with easier manageability because of the Cisco Works Network Management Solution

"We have stringent measures to address security - internal and external. Firewalls and Intrusion detection systems have been deployed to cater to enhanced security. Cisco's IDS technology on Switches or Firewall / IDS functionality on routers provide the flexibility in designing and deploying resources and has to a large extent help address security. Policies define standards for secure network design and defensive actions, allowing network managers to incorporate a consistent multilayer defense strategy into their procedures"

To sum up Convergence@Digital GlobalSoft, Mr. Rao said, ***"We at Digital GlobalSoft embarked on a mission in August 2001 - to revolutionize the way our employees used IT and enhance their experience as well as convince our customers that we could deliver on their expectations of us. Thus began a journey for us to invest in setting up a network that will not only deliver the benefits of convergence but also scale up as per our expansion plans protecting our investments in it. It has been a long winding journey since then but our commitment is reflected in the fact that the entire implementation has been completed in only 243 days (7.5 months) and looking back, I am glad we decided to partner with Cisco"***

Convergence@Digital GlobalSoft is a reality today purely because of the commitment of the top management to adopt IT for driving business efficiencies.