

## PeterStar—Driving Towards a Data Oriented Future



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Peter Akulshin  
Director of Telematic Services  
PeterStar

**Meeting customers' needs for increasingly converged services with one of the most advanced metro Ethernet, MPLS-enabled networks in Russia**

### Background

PeterStar is one of the most successful alternative telecommunications companies in St Petersburg. Operating in St. Petersburg, the surrounding region and Moscow, the company provides integrated, high quality, telecommunications services including local, national and international telephony, data, Internet access and value-added services to businesses.

### Challenge

PeterStar operates in a fiercely competitive market with some 30 companies seeking to win business in the dynamic and rapidly developing corporate data transmission segment. Recognizing that its commercial

future lay in meeting the increasing needs for IP-based communications, PeterStar's challenge was to rapidly and dramatically increase its ability to provide data and converged voice and video services to customers demanding world-class solutions.

### Solution

Working with Cisco Systems, PeterStar has built a city-wide multiservice network based on Cisco's Dynamic Packet Technology (DPT) and metro Ethernet on which to offer a growing portfolio of advanced IP-based services: from MPLS IP VPNs and Voice over IP to (soon) video on demand.

### Results

At a stroke, PeterStar has leapt further ahead of its competitors, creating a high capacity, highly resilient and cost effective platform from which to offer advanced services. At a cost estimated by PeterStar to be three-and-a-half times less than a comparable ATM-based network, the company is on course to see a return on investment (ROI) in less than three years.



PeterStar is the leading alternative service provider to the local PTT in St Petersburg with over 23 per cent of the region's communications market—some 50 per cent of the total share enjoyed by alternative providers. In 2002 PeterStar's revenues grew by \$8 million to reach \$56 million.

The company's success is founded on an absolute focus on meeting its customers' needs. Historically regarded as a fixed voice operator and point-to-point leased line provider, recent years have seen PeterStar develop a successful portfolio of packet-based corporate data and Internet access services. A citywide optical fibre network over 1000kms long is fully interconnected with the local PTT's network—the Petersburg Telephone Network. In addition, the company had built a network of dozens of Asynchronous Transfer Mode (ATM) switches typically providing point-to-multipoint ATM/Frame Relay data services, and access to the Internet.

“Everything we do is driven by our customers,” explains Peter Akulshin, PeterStar's Director of Telematic Services. “We introduced Frame Relay and ATM to meet customer's needs—both in terms of installing networks for customers and building our own, which is still the largest ATM network in St Petersburg. In recent years, however, we have seen a clear trend towards IP technologies. ATM services, no matter how well they are designed, are no longer competitive in terms of price.

“100Mbit/s bandwidth over an ATM network will typically cost three-and-a-half times more than over a pure IP network, even allowing for the fact that our ATM network is five years old,” says Akulshin. ATM hardware costs were seen to prohibit significantly scaling up of core bandwidth within the network, which in any case would always carry a protocol overhead of around 10 percent of the total bandwidth available. Likewise, the connection-oriented nature of ATM and Frame Relay was felt to be a barrier to the multi-site communications customers now require.

In 2001 the cost of providing bandwidth was thrown into sharp focus for PeterStar when one of the city's major banks required links at speeds of 10Mbit/s and above between a dozen of its offices located throughout the city. At the same time, PeterStar started to receive requests for high-speed broadband Internet access.

To help it answer the problem of how to deliver real broadband IP services at speeds of up to 100Mbit/s and beyond at a lower cost base, PeterStar turned to Cisco. A visit to the Italian service provider FastWeb—for whom Cisco had delivered a metro Ethernet-based infrastructure—showed a glimpse of the future.

Akulshin was one of the people from PeterStar who took part in that visit and remembers well its impact. “The visit was really very important indeed. After seeing how metro Ethernet could be used to deliver a full range of voice, video and data services we decided to build our own network,” Akulshin says.

### Delivering Value Across the City

The ability of PeterStar's own metro Ethernet network to extend real broadband connectivity across the city is already being appreciated by customers. And not just large corporates. The network is playing a key role in enabling the e-transformation of the city.

With five years in business, Quantum Communications is one of a new breed of Russian companies creating wealth through the Internet. An Internet Service Provider, Quantum typically uses the Cisco Aironet 350 Series of 802.11b-compliant wireless local area networking (WLAN) products to provide last-mile access to the company's optical fibre backbone network, which is based on Cisco 7204 Series Multiprotocol routers and Cisco 3550 Series Intelligent Ethernet Switches.

Dennis Kulikov, Technical Director at Quantum, explains how his company takes advantage of the new PeterStar network: “We actually use the PeterStar MAN (metropolitan area network) to extend our own core network, enabling us to deliver our services further as well as providing alternative capacity for extra resilience.”

Customers' access to the Internet is typically provided at 1Mbit/s or 2Mbit/s, but transparent inter-LAN access can be provided at 10Mbit/s, or faster using PeterStar's network, while inter-node bandwidth is scalable up to 1Gbit/s if required.

“As well as providing us with secure and lower cost bandwidth, PeterStar's MAN has increased the number of customers we can reach. We currently have around 300 customers who access our Points of Presence via the PeterStar network. No other service provider gives us that ability, to extend our services over a simple Ethernet connection.”

### The Foundation for Advanced IP Services

One of the most important of the new services PeterStar is now able to offer its corporate customers is IP Virtual Private Networks (IP VPNs) using Multi Protocol Label Switching (MPLS)—the first such service in St Petersburg. MPLS is another Cisco development. It provides a single infrastructure network that not only simplifies network management but also enables information and communication strategy convergence, reducing costs further while also improving overall business performance.

There are several ways to build IP VPN services, such as private lines, Frame Relay, ATM, and IP-tunnelling. However, prior to the availability of MPLS-based IP VPNs, none of these alternatives fully satisfied all the requirements of enterprise and small/medium businesses in terms of connectivity, security and quality of service (QoS) while being easy and cost-efficient to implement for the service provider.

“Our large customers are showing great interest in MPLS-based IP VPNs,” says Akulshin. “Today we find that our customers understand far more about new technologies and the advantages they offer and are keen to take advantage of them. This is a big change from, say, 1997 when we started to migrate from leased lines to Frame Relay. Customers would often take a couple of years to understand why this migration was necessary. Now customers take such decisions much faster, within months.”

With the need for higher bandwidth connections between offices driving the need for IP VPNs, customers’ demand for more bandwidth for Internet access is the second key driver. The new network will make it possible for PeterStar to offer real broadband connections from 10Mbit/s up to 100Mbit/s and beyond if necessary. Currently PeterStar’s main rival is able to offer access up to 1Mbit/s using Asymmetric Digital Subscriber Line (ADSL).

Using MPLS, the new network also provides an ideal foundation on which to develop IP telephony, and PeterStar is already installing NetCentrex hardware and software to provide a new range of feature-rich packet-based telephony services.

Further downstream, the company plans to offer a range of video-based services such as high-quality videoconferencing. PeterStar is also considering video on demand. Individual video services may include ‘personal VCR’ functions (the choice of content, fast forward, rewind, pause, bookmarks for fast search, and so on) with digital TV quality. Cisco switches have an integrated video coding function that makes it possible to set up new profitable services requiring secure transmission: for instance, real time transmission of sport events or movies.

### Changing the Way PeterStar Sees Itself

PeterStar is already on track to make good its business case objective of seeing ROI within three years—gained primarily from new revenue growth from new services.

Asked, however, what he sees as the most significant benefit PeterStar is gaining from metro Ethernet, Akulshin’s response is enlightening: “In the first years of its existence, PeterStar was a telephone company, dedicated to providing voice services. Making a full-scale data company out of the traditional voice operator required a new Metro Ethernet network with an MPLS backbone to

enable new-generation converged services that are being developed in St Petersburg, Russia and the rest of the world. Today, data revenues make up a significant part of our total income. Our general strategy has been modified due to the changing market situation and growing demand for new services.”

### Competitive Tender

PeterStar had already been working with Cisco for over eight years and has a number of Cisco Certified specialists within the company. Nevertheless, for a project of this importance, the company went to competitive tender and carefully evaluated vendors’ responses.

“Technology and commercial terms are important,” says Akulshin, “but so too are support and maintenance and a vendor’s response to customer’s needs. We compared each vendor’s equipment and proposals very carefully, eventually selecting Cisco because its hardware, technology and overall proposals were the best for us.”

Speed to market was an important consideration for PeterStar, which was keen to be the first service provider to be able to offer feature-rich IP-based services to both capture market share and to enhance its brand to the corporate market. A project team was quickly formed, with PeterStar’s people supported by Cisco and personnel from Cisco Gold Certified Partner AMT Group, based in Moscow.

As well as providing technical assistance, Cisco was also able to help in developing PeterStar’s business case. “Usually PeterStar will always develops its own business case itself because naturally we know the St Petersburg market better than any one else. However, Cisco Russia provided us with such high caliber consultancy services that it helped us to develop detailed descriptions of the services we planned to bring to market,” says Akulshin.

### Metro Ethernet at the Core and Beyond

The first phase of the new network went on stream in Spring 2003 in the Vasilyevsky Island district of St Petersburg. The new network is the first in Russia to use Cisco Dynamic Packet Transport (DPT), a new-generation transport technology, which is optimised for packet-based optical transport.

The PeterStar network operates at 2.5Gbit/s in the core and comprises two counter-rotating fibre rings. Each optical ring can be used at the same time to pass both data and control packets, doubling the effective bandwidth. The DPT ring is self-healing and has a recovery time of less than 50 milliseconds. In addition, it uses Intelligent Protection Switching (IPS)/Layer 2 Path Restoration and enhanced IPS and scalability to deliver unrivalled performance and efficiency.

Principally designed for metropolitan-area applications, Cisco DPT solutions enable service providers to cost-effectively scale and distribute Internet and IP services. DPT combines the bandwidth-efficient and service-rich capabilities of IP routing with the bandwidth-rich, self-healing capabilities of fibre rings to deliver fundamental cost and functionality advantages over existing solutions.

DPT is based on the Spatial Reuse Protocol (SRP), a Cisco developed MAC-layer protocol for ring-based packet internetworking. Cisco SRP technology uses Synchronous Digital Hierarchy (SDH) framing to allow inter-working with SDH or Wavelength-Division Multiplexing (WDM), and offers the high capacity and low overhead inherent in SDH architectures in an IP environment.

The backbone is made up of four core nodes and six access nodes formed by Cisco 10720 Internet Routers, another Cisco advanced technology used for the first time in Russia to meet PeterStar's needs. Each router has a DPT OC-48/STM-16 port for access to the core network while twenty-four 10/100 Ethernet ports are used to provide direct connections to customers or—more typically—to Cisco Catalyst 3550 Series Intelligent Ethernet Switches.

The Cisco Catalyst 3550 Series Intelligent Ethernet Switches are stackable, multilayer switches that provide high availability, quality of service (QoS), and security to enhance network operations from 10Mbits/ through to 100Mbit/s and even to 1Gbit/s if required. Embedded in the Catalyst 3550 Series is Cisco Cluster Management Suite (CMS) software, which allows PeterStar to simultaneously configure and troubleshoot multiple Catalyst switches using a standard Web browser.

The breadth and flexibility of Cisco's metro Ethernet portfolio is underlined by the use of the Cisco Catalyst 2950 Long-Reach Ethernet networking solution, to deliver high-performance broadband access over existing telephone lines for small and medium size enterprise environments and multi-tenant buildings. Long-Reach Ethernet thereby eliminates the need for costly infrastructure upgrades by dramatically extending Ethernet distances over existing copper wiring up to 5000 feet at speeds from 2Mbit/s to 15Mbit/s.

The second phase of the network will see a further 10 core nodes coming on stream in July 2003, with a further 30 access nodes going live by the end of the year, providing coverage across the entire city for a growing range of advanced services.



Corporate Headquarters  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 526-4100

European Headquarters  
Cisco Systems International BV  
Haarlerbergpark  
Haarlerbergweg 13-19  
1101 CH Amsterdam  
The Netherlands  
www-europe.cisco.com  
Tel: 31 0 20 357 1000  
Fax: 31 0 20 357 1100

Americas Headquarters  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-7660  
Fax: 408 527-0883

Asia Pacific Headquarters  
Cisco Systems, Inc.  
Capital Tower  
168 Robinson Road  
#22-01 to #29-01  
Singapore 068912  
www.cisco.com  
Tel: +65 6317 7777  
Fax: +65 6317 7799

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