



SUCCESS STORY

LAN Modernization at the Irkutsk Aviation Plant

The IRKUT Corporation is a major holding company that owns several leading Russian aircraft designers and manufacturers (the Irkutsk Aviation Plant (IAP), the Yakovlev Aircraft Development Group and the Beriev Aircraft R&D group in Taganrog, to name a few). As a dynamic group of diverse companies aimed at boosting the manufacturing of civil and military aircraft in Russia, IRKUT has always been pursuing modernization and innovation.



OBJECTIVES

The switched Ethernet fiber optic LAN installed in 2000 connected six plant facilities located at three separate sites. After seven years in operation the network became rather obsolete. Users complained about frequent failures. Business applications were often sluggish or hard to access. The configuration of the network could barely accommodate new components or sites.

Under its business continuity program, IRKUT management decided to overhaul the network. The tender was won by Jet Infosystems. Its experts were requested to:

- optimize the use of existing cable systems and active network hardware;
- build a LAN that would comply with modern requirements to the quality of voice, data and video traffic;
- ensure appropriate application performance;
- make the LAN fully scalable;
- improve the network's manageability and fault tolerance.

The new LAN was to support all the hardware and about 4500 users.

For reasons of business continuity, all the modernization was to be carried out without powering down the current network.

SOLUTION

Based on the preliminary analysis of the existing network, Jet Infosystems experts developed a project for the new LAN in line with customer requirements as to bandwidth, reliability and scalability. They also estimated the significance of each stage of the proposed incremental upgrade and its impact on the rest of the network. These data were used to prepare a detailed work schedule, allocate appropriate time slots for work (nighttime, daytime, weekends and holidays) and calculate the amount of necessary resources. The project also covered connections between the old and the new network, and described procedures for rerouting network segments, server resources, external connections and users.

Andrei Samsonov, head of the network design group, Network Solutions Center: *«In any network overhaul, we are always keen to ensure a smooth transition to the new infrastructure. This goal calls for careful prior analysis of technical details, as well as risk analysis to minimize possible perils. Thanks to the detailed work plan prepared by Jet Infosystems the customer had a full idea of all the project work, and IT downtime was avoided.»*

The upgraded LAN has a modular design for scalability. It consists of three hierarchical levels: the core (backbone) level, the distribution level and the user level. To eliminate single points of failure, the network architecture is based on the double-center star topology, i.e. hardware at the core level and at the server connection level is 100% redundant. The LAN uses active network equipment from Nortel Enterprise Solutions (acquired by Avaya in December 2009), particularly ERS 8610 switches.





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Since its inception in 1932 the Irkutsk Aviation Plant has manufactured over 20 models of aircraft developed by virtually every aircraft design group in the USSR and later Russia. These machines, with cutting edge innovations unique at that time, were exported to 37 countries worldwide. In 1997 IAP became the first Russian aircraft manufacturer to achieve compliance with the ISO 9002 international management quality standard.

A primary production facility of the IRKUT Corporation and a powerful R&D center, IAP also provides full after-sales maintenance services for civil as well as military aircraft.

The LAN backbone was converted to 10 Gigabit Ethernet with distributed and split multi-link trunking (DMLT and SMLT) to increase core bandwidth, improve reliability and allocate traffic to idle channels and hardware.

The Irkutsk Aviation Plant uses a variety of network applications (particularly business software such as SSA ERP LN v.6.1 (BAAN), Teamcenter engineering, DBMS ORACLE and BOSS-Human relations manager), an IP telephone system, a videoconferencing system and more. Some of them are more mission-critical than others and have higher requirements to quality of service (QoS). Jet Infosystems therefore used the differentiated services code point (DSCP) approach, whereby LAN switches assign different levels of service to network traffic depending on the application.

Troubleshooting in large networks has always been a problem that can, however, be alleviated by proactive monitoring and management. To this end, Jet Infosystems experts have designed an integrated system based on Cisco Enterprise Policy Manager, an application that prioritizes traffic and manages network access security for business software.

The overhauled LAN has two server farms connected to both the main and the redundant data center via Gigabit Ethernet; 10Gigabit Ethernet and SMLT are used to connect the farms to the core. The SMLT technology ensures communication between data centers at the second layer of the ISO OSI model by creating distributed switch clusters.

OUTCOME

The project has resulted in a state-of-the-art scalable network serving about 4500 users.

Aleksei Zakharov adds: *«The plant now has a fault-tolerant LAN powerful enough to support IP-telephony and videoconferencing. Core and network distribution incidents caused by hardware malfunctioning have virtually stopped, since the system has no single point of failure.*

The ENMS and EPM-based management system promptly informs network administrators about any failures for an instant response. Telephone calls for service from users are becoming a thing of the past. With a powerful network management tool such as EPM there is no need to change settings for each individual switch – EPM will apply the necessary policies to all appropriate devices.

IAP LAN users have already appreciated the effect of network policies that bar the use of unauthorized software and boost the productivity of business applications.

During on-site project work some users were wondering whether the presence of a system administrator meant the network was down or that they should log out. Most often they had no reason to worry. The overhaul proceeded smoothly, according to schedule and in line with high quality standards. Our plant now has a new generation, forward-looking LAN that can support modern services such as unified communications, as well as meet the ever-changing data security requirements.»

