LOGICORPS

CASE STUDY:
Core Network Implementation for ITCTransmission

EXECUTIVE SUMMARY:

In the spring of 2003 ITC*Transmission*, the first fully-independent for profit electric transmission company, was moving to a new headquarters location and needed a specific computer network to link together all of its operations facilities. Clinton Township based IT services firm, Logicorps, was given the task to configure, implement, test, and maintain ITC*Transmission's* **Supervisory Control and Data Acquisition** network, otherwise known as a SCADA network. The ITC*Transmission* SCADA network gathers information from hundreds of different data points across Southeast Michigan in order to monitor and control Michigan's power grid. Customized to the energy industry, the challenge for Logicorps was to not only implement and secure this highly specialized communication network, but to also build the network in order to guarantee 100% uptime. Because a SCADA network carries highly sensitive power system operations such as load data, voltage, conditions of substations, and other critical operational data, any outages in the communications system carry dire consequences. Logicorps completed the project on time and within budget with no network interruptions or outages experienced to date.

CASE STUDY:

INDUSTRY
Energy & Utilities

ORGANIZATION
ITC*Transmission* is the United States' first fully-independent for profit electric transmission company. Their business is transmitting high voltage electricity in bulk from power generating facilities in Michigan, the Midwest and Canada to the distribution facilities that serve customers in 13 southeast Michigan counties, including the metropolitan areas of Detroit and Ann Arbor.

SITUATION
In the spring of 2003 ITC*Transmission*, the first fully-independent for profit electric transmission company, was moving to a new headquarters location and needed a specific computer network to link together all of its operations facilities. Clinton Township based IT services firm, Logicorps, was given the task to configure, implement, test, and maintain ITC*Transmission's* **Supervisory Control and Data Acquisition** network, otherwise known as a SCADA network.

SOLUTION
Logicorps was tasked with building the infrastructure for the SCADA which included installation and configuration of all cables, switches, routers, security measures, and firewalls – referred to as network architecture. Simply, if all data transmitted across a network were cars, Logicorps was tasked with building the highway – and that highway can **never** be closed or impassable for any reason. Absolute redundancy was required in the SCADA network, it cannot go down.

RESULTS
Logicorps maintained a close collaboration with ITC*Transmission* throughout the course of the network architecture development. As a result of the successful SCADA core network implementation, ITC*Transmission* and Logicorps created and grew their successful partnership. Logicorps currently manages the majority of ITC*Transmission's* key IT systems including wireless communications.

PROJECT BACKGROUND:

Energy Deregulation

In 1996, the Federal Energy Regulatory Commission (FERC) issued an order directing utilities to file Open Access Transmission Tariffs, breaking the host utility's monopoly on the transmission system and allowing any electric marketer to use the host utility's transmission lines for a cost-based fee. As a result of this massive deregulation of the energy and utilities industry, in November 1999, ITC*Transmission* was created as an independently functioning business unit within Detroit Edison.

In May 2000, ITC*Transmission*, Detroit Edison, and DTE Energy filed a joint application with FERC, seeking permission to transfer all jurisdictional transmission assets from Detroit Edison to ITC*Transmission*. On June 1, 2001, ITC*Transmission* began operations as a wholly owned subsidiary of DTE Energy.

Becoming Fully Independent

On February 28, 2003, ITC*Transmission* became a stand-alone transmission company following the sale of transmission assets from DTE Energy and in April 2004, ITC*Transmission* became the country's first fully independent transmission company after they completed the transition by assuming construction and maintenance activities from DTE Energy and after "going live" in the Operations Control Room.

As a result of its independence from DTE Energy, ITC*Transmission* had an immediate need for a new facility to house its operations center. ITC*Transmission's* original headquarters were located in Ann Arbor, and called the Michigan Electric Power Coordination Center (MEPCC). The MEPCC controls and monitors the transmission grid for all of Michigan and the facility was quickly becoming too small for the growing company. A new site in Novi was chosen to become ITC*Transmission's* main center for business and control operations, and the MEPCC site in Ann Arbor was to remain a secondary back up facility.

The Need for Operational Connectivity

Despite its independence from DTE Energy, ITC*Transmission* still needed to communicate with DTE's power stations as part of the regular operations of the energy business. That made three separate and distinct locations that needed to be connected with absolute redundancy:

- MEPCC in Ann Arbor: the secondary back up facility
- ITC*Transmission* corporate and operational headquarters in Novi
- DTE's Systems Operations Center (SOC) located in Detroit

The sheer urgency of the project is where the Information Technology services firm, Logicorps, (at the time called The Multimedia Foundry), was brought into the project in the spring of 2003. Because the demand for power is critical, and outages carry dire consequences, it was critical that all 3 operating facilities be in constant communication with each other. The project was awarded to Logicorps and immediately put on the fast track.

PROJECT SCOPE: THE CHALLENGE OF ABSOLUTE REDUNDANCY

Energy and utility companies typically use a customized network called a SCADA, an acronym for **Supervisory Control and Data Acquisition**. A SCADA networking system is utilized for gathering and analyzing real time data and process control and is specific to industries such as water and waste control, energy, oil and gas refining and transportation. A SCADA system gathers information, such as where a leak on a pipeline has occurred or a potential power outage, transfers the information back to a central site, alerting the home station that an incident has occurred, carrying out necessary analysis and control, such as determining if the incident is critical, and displaying the information in a logical and organized fashion. The SCADA network built by Logicorps would link all three sites together and enable ITC*Transmission* to collect, store, and analyze data from hundreds of thousands of data points, pinpoint faults and preempt outages.

Logicorps was tasked with building the infrastructure for the SCADA which included installation and configuration of all cables, switches, routers, security measures, and firewalls – referred to as network architecture. Simply, if all data transmitted across a network were cars, Logicorps was tasked with building the highway – and that highway can **never** be closed or impassable for any reason. Absolute redundancy was required in the SCADA network, it cannot go down. The network must be able to automatically troubleshoot and re-route all communications traffic in the event of any equipment failure. The blackout of August 2003 was just one example of how peoples' lives are seriously impacted when the power goes off as a result of equipment and communications failure. It was imperative that the core network, SCADA, stay operational 24/7/365.

For a relatively young company with just under 15 employees, much of the hands-on work was taken on and managed directly by Logicorps' Chief Operations Officer, Scott Wiederhold. Because a SCADA system is unique to the utilities industry, Wiederhold and his small team worked around the clock for 6 months to not only install, configure, and test all network architecture equipment, but also dive into intricacies of the energy delivery marketplace – all with the looming challenge of guaranteeing 100% network uptime.
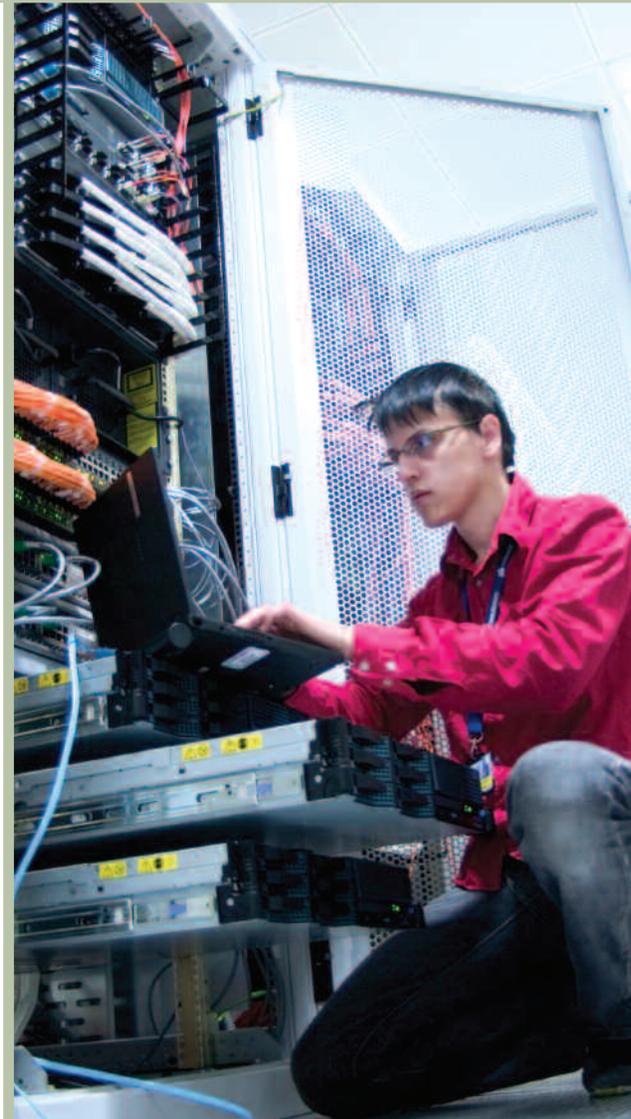
THE SECURITY CHALLENGE

Logicorps' role in keeping the lights on throughout Michigan offered a unique and challenging task. SCADA networks have been in use since the 1960's, but as new security threats and global terrorism have made the public and media concerned about the security of public utility companies' critical infrastructure and SCADA systems. Part of the unique challenge of implementing the SCADA network was to also guarantee its security against any cyber attacks. An in-depth understanding of the functions that the systems perform and the sensitivity of the stored information is critical. The Logicorps team tasked itself with becoming intimately familiar with the unique security challenges of the energy industry and developed customized security packages and firewalls to protect the network.

Logicorps established customized 24 hour incident monitoring which includes alerts of any malicious network activity originating from internal or external sources. Logicorps also assessed the level of security between the 3 locations the SCADA linked together and had to inventory and secure access points at each facility. Technical audits of SCADA networks are critical to ongoing security effectiveness. Due to rapidly changing technology and the emergence of new threats, ongoing maintenance processes are managed by Logicorps to ensure the network remains at peak performance and security measures in place remain effective.

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IMPLEMENTATION OF CORE NETWORK INFRASTRUCTURE BY LOGICORPS

SCADA network traffic is unique to the energy industry and moving that information across the network presents its own challenges. Each of the three locations had networks already in place, some containing incumbent legacy equipment. Logicorps not only made all the disparate equipment work together, but work together in a secure environment.

All points in the data communication network converge in ITC*Transmission's* control center located in Ann Arbor where the SCADA network feeds a giant graphical interface screen where operators can monitor at a glance, load data, current voltage and wattages, conditions of breakers and substations, transformers, and have the ability to shut down lines for maintenance or outages.

The project was given a 6 month implementation schedule and Logicorps completed the project on time and within budget.

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