

Frost & Sullivan Award for Excellence in Technology

2006

FROST & SULLIVAN

Excellence in Technology Award

AWARD DESCRIPTION

Frost & Sullivan's Excellence in Technology Award is bestowed upon a company that has pioneered the development and introduction of an innovative technology into the market; a technology that has either impacted or has the potential to impact several market sectors. This award recognizes a company's successful technology development that is expected to bring significant contributions to the industry in terms of adoption, change, and competitive posture. It also recognizes the company's overall technical excellence and its commitment toward technology innovation.

RESEARCH METHODOLOGY

To choose the award recipient, Frost & Sullivan's analyst team tracks technology innovation in key hi-tech markets. The selection process includes primary participant interviews and extensive primary and secondary research via the bottom-up approach. The analyst team shortlists candidates on the basis of a set of qualitative and quantitative measurements. The analysts also consider the pace of technology innovation, and the potential relevance or significance of the technology to the overall industry. The ultimate award recipient is chosen after a thorough evaluation of this research.

MEASUREMENT CRITERIA

In addition to the methodology described above, there are specific criteria used to determine the final rankings. The recipient of this award has excelled based on one or more of the following criteria:

- Number of new technologies developed or introduced
- Significance of a technology/ technologies in the industry
- Competitive advantage of technology/technologies vis-à-vis competing technologies
- Ease of adoption of new technology/ technologies
- Potential of technology/ technologies to become an industry standard
- General impact of technology in terms of shifting R&D focus



AWARD RECIPIENT:

RUGGEDCOM

The Frost & Sullivan 2006 Award for Excellence in Technology in the field of Ethernet switches for substation automation goes to Canada-based RuggedCom, Inc. for designing and manufacturing ruggedized communication equipment for harsh electrical and climatic environments. RuggedCom is the first company to introduce IEC 61850-compliant Ethernet switches and also the first to qualify as an IEEE 1613 Class 2 device capable of error-free performance under electromagnetic interference (EMI) stress as defined by the prescribed IEEE 1613 suite of destructive type tests.

Devices in high voltage substations may experience high levels of EMI because of the nature of substations and interference of multiple phenomena in substations. This EMI environment can cause errors in electronic communications and has the potential to corrupt data memory, or, in a worst-case scenario, it may cause permanent equipment damage.

In addition, many existing substations are not designed to have environmentally controlled spaces and as a result the equipment used in these environments should withstand wide temperature variations (ranging between minus 40 degrees C and 85 degrees C). Also, internal fans are not allowed in industrial grade equipment since they lower the overall reliability of the device. In addition, these devices must also deal with high levels of humidity (for example, more than 95%)

and vibration not commonly found in office environments.

RuggedCom's Ethernet family, named RuggedSwitch, was introduced in 2002 and consists of fiberoptic-based switches that fully comply with IEC 61850 EMI and environmental requirements. EMI stress refers to the EMI phenomena that occur in substations. These switches incorporate a technology called Zero Packet Loss (ZPL) technology. ZPL ensures no data loss and no errors or delays when exposed to EMI stress.

IEC 61850 names two application domains such as station bus and process bus. The former one refers to an application domain where relays and RTUs would connect to the LAN. The latter refers to devices such as CT/VT merging units that provide sampled measured values of current and voltage through LAN. The company's switches meet the above two applications domains.

The family of products designed from RuggedCom has demonstrated its performance in the above challenging environments. Some of the unique features of the Ethernet family of switches include widest specifications for harsh environments (for example, wider temperature range, higher immunity to EMI); dual redundant and integrated power supplies for higher reliability, availability and uptime; and



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fastest network fault recovery with enhanced Rapid Spanning Tree Protocol (eRSTP) and less than 5 ms recovery for fault tolerant and mission critical systems.

The company also offers routers, serial servers, and media converters designed for the substation automation industry. It has the largest installed base of Ethernet switches in the utility market worldwide and is one of the preferred vendors for Siemens AG in the latter's IEC 61850 substation implementations.

The company foresees the substation automation and integration industry would move more toward IP-based communications within the substation and between substations (replacing older technologies such as SONET); and would adopt more wireless technologies (though currently there are too many types of wireless technologies or options, there is no clear choice among the industry participants as to what would be the right choice); and smart grid, which refers to the application of digital technology to the electric power infrastructure in order to create a smart self-healing grid with high reliability.

The North American market, undergoing a sizable investment in upgrading the electric power grid infrastructure, signifies the need for a reliable communications infrastructure that is required to enable substation communications. Electric utilities around the world have started using optical fiber-based communication systems as these offer high immunity to radio frequency interference and electrostatic

interference and also offers dielectric constructions. Utilities prefer fiberoptic cables, even though the initial cost of fiberoptic cables is higher than metallic wires as the shielding measures and labor involved provides a significant cost saving as compared to metallic wires. RuggedCom's switches would definitely help utilities meet their performance and reliability targets in communication equipment.

With many utilities exploring options to implement data loss and error-free communication technologies in order to have better control of the information they receive from many devices within substations, RuggedCom's Ethernet switches have not only excelled in surviving the harsh environments but have also demonstrated their performance in delivering the information without any data loss. In recognition of its performance in harsh environments and its technological potential in offering 'zero data loss' communication, RuggedCom, Inc. is considered a deserving recipient of the Frost & Sullivan 2006 Excellence in Technology Award.



RuggedSwitch™ RSG2100

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