addvalue communications

WHITE PAPER

Introducing an Addvalue Based VSAT Backup Solution over Inmarsat BGAN

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This document introduces a simple to implement and cost effective backup solution for VSAT network terminals to mitigate the effect of a communications breakdown between a remote VSAT terminal and its hub.

VSAT networks are in common use in thousands of applications from corporate networks, to point of sale nodes, to telemetry and SCADA applications. Many of these VSATs are located at difficult and expensive to reach remote unmanned locations. In all of these applications the reliability and stability of the VSAT communications link is essential. Addvalue offers a simple, extremely cost effective solution to ensure the continuity of connection between remote VSAT terminals and their related hub via the Inmarsat BGAN satellite network. In addition, this backup connection can carry out diagnostic and reconfiguration functions on the remote VSAT without the assistance of on-site personnel.

Backup Solution Components

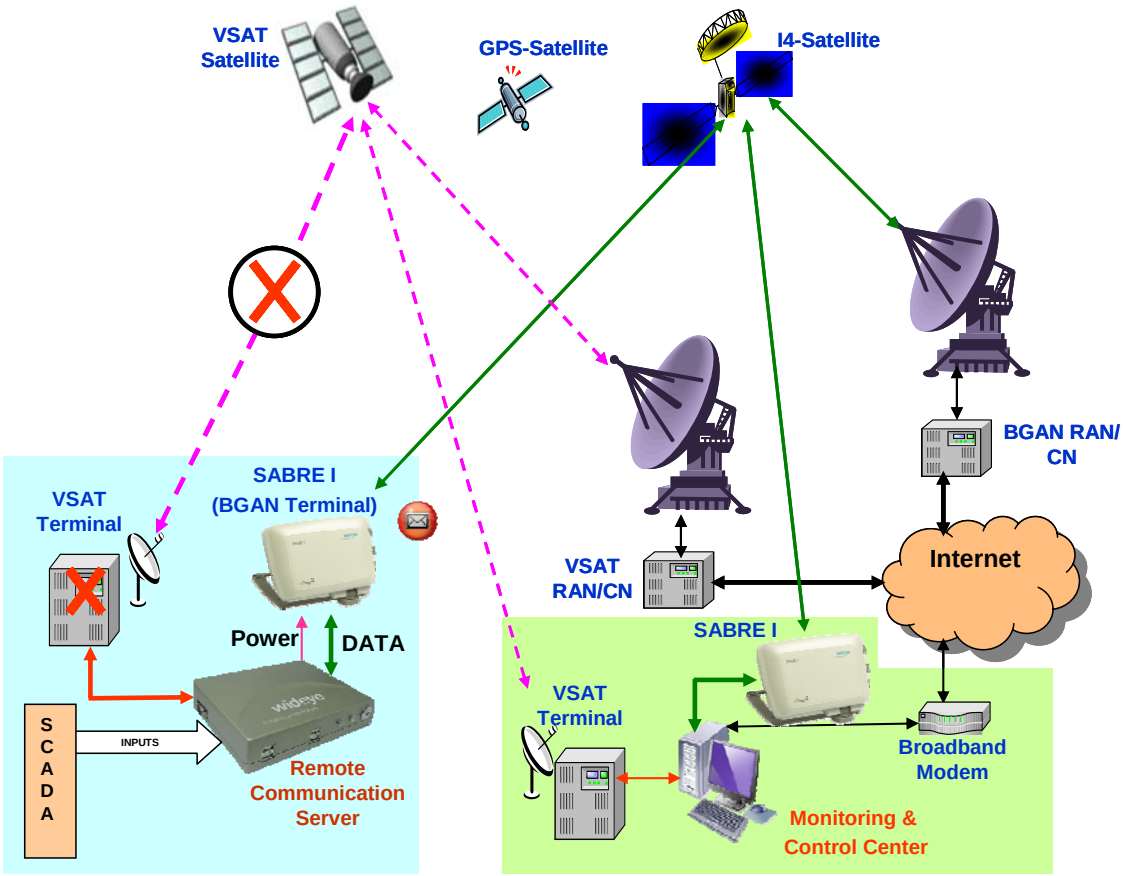
The VSAT backup solution over the Inmarsat BGAN network is enabled by two small and inexpensive off-the-shelf pieces of Addvalue produced equipment – a remotely controllable SABRE 1 BGAN Terminal (SABRE 1R) and the IOTA Machine-to-Machine application enabler.

Remotely Controllable SABRE 1R: The SABRE 1R is a variation of a commercially available standard Addvalue SABRE 1 with additional features that allow for remote connection to monitoring and control equipment at the VSAT network hub.. This is supported by the Inmarsat BGAN network and thus can operate independently of the VSAT network satellite link. The SABRE 1R responds to specially formatted SMS's sent from the monitoring and control equipment at the VSAT hub to trigger a PDP context activation or deactivation.

IOTA Machine-to-Machine Application Enabler: The IOTA is a WinCE.NET v4.2, ARM 9 processor based compact computing device that can be used in place of a bulky PC/laptop to function as the remote communication server at the remote VSAT. It is compact and can be easily housed in virtually any installation fixture at the remote site. The IOTA acts as a communication controller between three sets of equipment, namely the site payload, for example Telemetry/SCADA equipment, the SABRE 1R and the VSAT terminal.

Operational Descriptions

The figure below shows a typical remote monitoring setup using VSAT terminals as part of a SCADA network where Addvalue BGAN terminals are used to implement a backup link.



In the above illustration, the VSAT terminals are used as the standard focal point for collecting Telemetry/SCADA data and delivering them to the network hub based Monitoring and Control Center (MCC) that may be located far away from the remote VSAT. The IOTA functions as a Remote Communication Server (RCS) and it monitors the status of the VSAT. When the VSAT or its satellite link has an outage, the IOTA will turn on the BGAN link via the Addvalue SABRE1R terminal and takes over control of the Telemetry/SCADA equipment to transmit the data to the MCC. The IOTA has several interfaces for it to connect to the VSAT, the Telemetry/SCADA equipment and the SABRE 1R BGAN terminal. With its WinCE platform, VSAT network operators can write their own applications for execution on the IOTA.

Remote Activation

In many applications periodic feedback of data by the remote server may not be necessary. The MCC issues requests for data as and when it is required. In this type of application, the IOTA based RCS can be configured to feedback data upon request by the MCC. Hence, when the VSAT communication channel has an outage, the IOTA can be programmed not to automatically activate the data connection via BGAN. In this case, the MCC can activate a data connection via the BGAN network to retrieve data from the remote location. The user at the MCC may send a triggering (specially formatted) SMS to the SABRE 1R which will in turn trigger a PDP context activation. The MCC could then use “telnet” or any other remote login application to connect to the RCS and collect (pull) the appropriate data.

Remote Diagnostics

Apart from retrieving data from the remote location, the MCC can also perform diagnostics and reconfiguration on the faulty VSAT terminal via the Addvalue based BGAN communication channel. This can provide significant cost savings as there is no need for the rapid dispatch of a technician to the remote site.

Technical Summary:

Remotely Controllable SABRE 1R, special features

Feature	Description
Remote Activation of Data Connection	Supported
Remote power cycling	Supported
Power ON Control (programmable)	Automatic/Manual
Registration Control (programmable)	Automatic/Manual

IOTA

Feature	Description
CPU	32bit ARM9 processor operating at 200 MHz
Operating System	WinCE.Net 4.2 version
Memory	64MB SDRAM, 64MB NAND Flash
Interfaces	3 x 3-wire RS-232 ports 4 x USB Host interface (v1.1) 1 x USB Slave interface (v1.1) 1 x Ethernet interface (10/100base T) Analog VGA output DC-Jack (DC Input) 2-Way terminal Block (DC output) 2 x 8-Way Terminal Block (Optically isolated GPIO)
Power Switch	Push Button to turn the system ON and OFF
Input voltage	15V DC ± 10%
Power Consumption (max)	5W
Environmental specifications	Operating temperature: -20°C to +60°C Storage temperature: -10°C to 70°C. Operating humidity: 20% to 90% (non-condensing)
Weight	420g
Dimensions	187mm x 156mm x 42mm

Advantages of having BGAN as a backup System

- Easy to setup end-to-end connections
- Ability to remotely trigger of backup connections
- Low setup cost with standard off-the-shelf hardware
- Operating cost is usage based and useage is on demand
- Global Coverage (with Inmarsat's 3rd I-4 Satellite launch in mid 2008)

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