



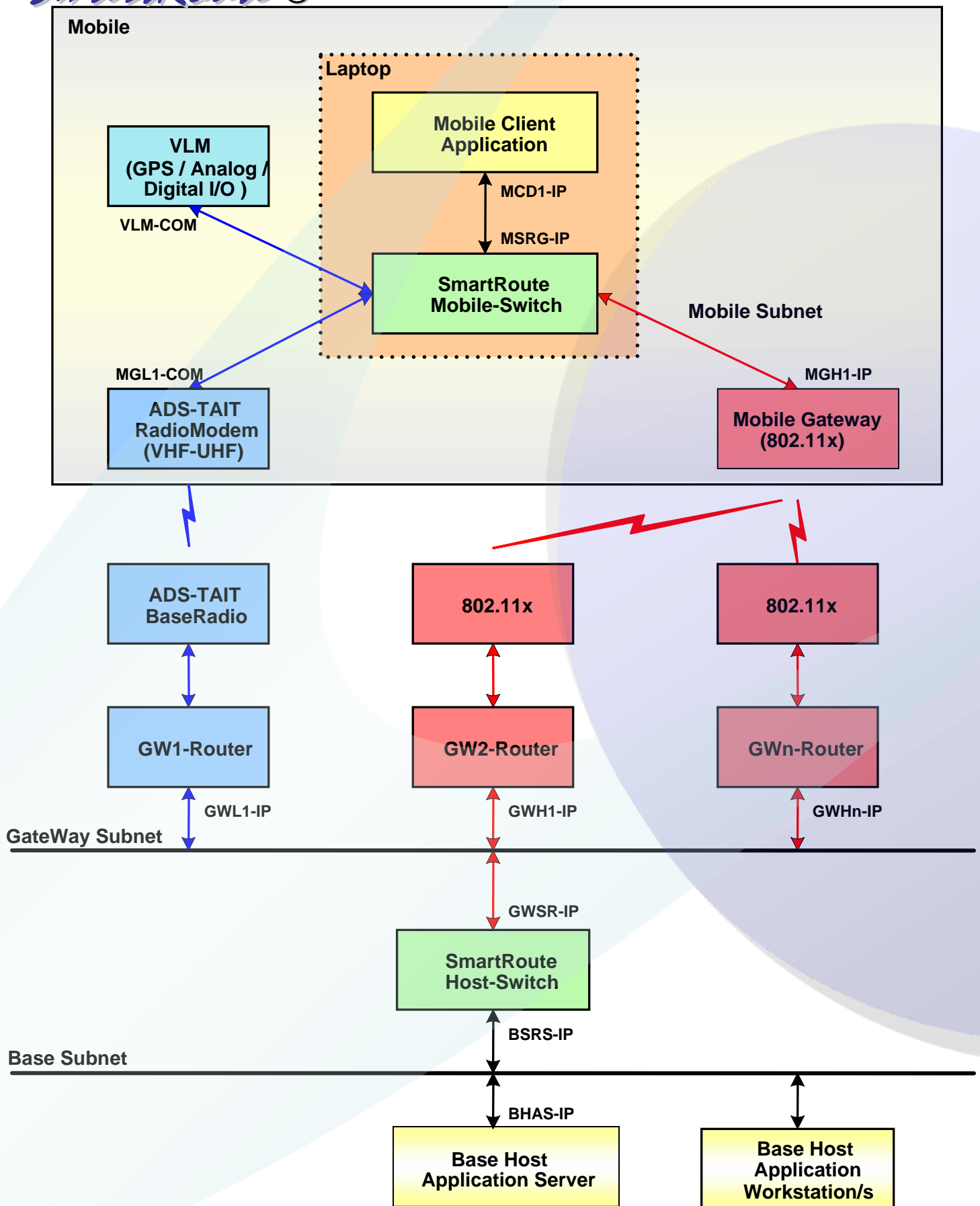
Product Description

SmartRoute wireless gateway software provides secure Ethernet connectivity between mobile to host and mobile to mobile software applications. SmartRoute software bridges TCP-IP connections over TAIT radio communications wide area narrow band THSD infrastructures and 802.11x (Hot-Spot) mobile gateways. SmartRoute eliminates the problems associated with protocol incompatibility and IP bridging of applications that are inherent to VHF and UHF two-way radio networks.

Systems using both ‘High-Speed’ and ‘Low-Speed’ wireless gateways have packets automatically routed to the fastest connections available. SmartRoute has automatic packet optimization that evaluates the type and amount of data in each packet; it then applies an appropriate compression technique to maximize effective data through put over the narrow band connection.

Purpose

SmartRoute was developed by Advanced Digital Systems Inc. to meet the need of mobile fleets to communicate using standard (IP) internet protocol. SmartRoute permits mobiles in the field to communicate with base host applications over a diversity of wireless infrastructures in a manner that is transparent, efficient and secure.



SmartRoute - Network Architecture

Medium to long distance wireless communications over private networks often utilizes mobile data radio systems in the VHF and UHF bands that have relatively low bandwidth in the range of 4800 to 19200 bps. This low bandwidth is generally shared between multiple vehicles in the fleet and makes the use of TCP/IP Protocols problematic and inefficient. SmartRoute is a suite of software components that enables mobile fleets to efficiently and seamlessly utilize both long-distance / low bandwidth and short-distance / high-bandwidth (Hot spot) wireless infrastructures while maximizing the efficient use of the low bandwidth links.

SmartRoute has been designed to transport data packets the most efficient way possible over low bandwidth connections. IP packets sent from the application are reviewed by SmartRoute for certain parameters. The software then determines the most bandwidth efficient way to route and send the packet. For example, if only a low bandwidth connection existed, compression and packet optimization is applied versus shorter distance much higher bandwidth wireless technologies such as 802.11x (Wi-Fi). Data packets are seamlessly and automatically routed to their destination without any need for operator control. Data encryption an available option provides 128 bit AES private key encrypted data packets. All encryption complies with DOJ, Department of Justice standards.

ADS SmartRoute software is specifically designed to communicate over THSD radio infrastructures supplied by TAIT Radio Communications a world leader for high quality solutions

Applications / Features Hardware, system independent – Supports a large variety of existing data wireless infrastructures
Transparent operation to both Host and Mobile Applications
Automatic routing of packets to highest bandwidth wireless link available to mobile unit.

This will include narrow band as well as Wi-Fi networks. Supports TCP/IP and UDP/IP protocols
A uto Compression of data packets. Compression of TCP/IP headers on low-bandwidth links
Increased effective data throughput on 25Khz radio channels of 25 to 38Kbs depending on type of data packets being sent.

- **Functions of the Host Switch**
- **Maintain current status of all Wireless Gateways**
- **Maintain a database of available gateways for each mobile unit**
- **Maintain the status and location (optional) of each mobile unit**
- **Receive and validate all outbound traffic from host applications**
- **Compress / Encrypt / Encapsulate / Route outbound packets as required to validate / Un-encrypt / Un-encapsulate / Decompress / Route inbound packets.**

SmartRoute Mobile Switch

The Mobile-Switch is a software package that may be hosted as a service on a suitable Mobile Unit laptop computer or on a dedicated embedded CPU if no laptop is available. The Mobile-Switch performs similar functions to the Host-Switch but only for communications with its host Mobile Unit.

In addition, the Mobile-Switch will communicate with an optional Vehicle Logic Module (VLM) that can provide the additional functions of Vehicle tracking via GPS Vehicle function tracking and control via digital and analog interfaces

Optionally, a simple UDP based protocol can keep the Mobile application informed of the status of the communications links. A visual status is also provided in the tray area of laptops.

Typical Applications

A typical *SmartRoute* application may consist of the following elements: *SmartRoute* Base-Switch Mobile Units operating in a geographic area of 1000 sq miles equipped with VHF or UHF data radios, 802.11 transceivers and laptops supporting the client applications and *SmartRoute* Mobile-Switch license.

VHF, UHF 450MHz, 800 MHz / 19200 bps Wireless Base Stations (Low-Bandwidth Wireless Gateways) 802.11 / 20 Mbs Access Points (High-Bandwidth Wireless Gateways)

- Optional 128 or 256 bit AES encryption of data packets to DOJ standards.
- End-to-end data integrity checking Self monitoring and Status Reporting.
- May also be interfaced to public carrier wireless infrastructures.
- Operates on Windows XP operating systems
- Wireless Gateways

SmartRoute considers each discrete wireless infrastructure as a gateway. In the network diagram above, all the wireless gateways are on a common subnet although this is not a requirement as the gateways may be anywhere accessible by IP packets.

Each Wireless Gateway is designated as 'High-Speed' or 'Low-Speed' depending on its over-the-air bandwidth. Generally any Gateway with an over-the-air bandwidth of less than 56Kbs is designated as 'Low-Speed'. The distinction of High-Speed vs. Low-Speed bandwidth is used by *SmartRoute* to Determine which segment of the Gateway to use for the most efficient communication network should more than one be available (High-Speed takes priority) to utilize data and TCP-header compression.

SmartRoute Host Switch

The Host-Switch is a fault-tolerant PC Server and software package that logically Looks like a router to the Host application server (or any other authorized IP address).

All packets addressed to the mobile fleet subnet are routed to the Host-Switch. For security purposes only packets from specified IP addresses are forwarded.