

Consolidated Voice and Data Services for Secure Mobile Networking

The need exists for a “one-stop” solution for Type 1 secure voice and data services between deployed mobile elements and a fixed site connected to a wired infrastructure. TCS, Inc. and ViaSat, Inc. have demonstrated a COTS-based architecture to provide robust performance in this operational environment.



ViaSat KIV-21 Type 1 In-line Network Encryptor

TECHNICAL APPROACH

TeleCommunications Systems, Inc. (TCS), a provider of network applications and communications engineering for wireless and wired networks, was asked by the Product Manager - Communications Intelligence Support Service (a component of the U. S. Army's Program Executive Office command) to investigate possible solutions for the operating environment depicted in Figure 1.

TCS quickly defined desirable characteristics for the solution architecture:

- Internet Protocol (IP)-based networking: A proven, robust protocol to consolidate voice and data services
- Integrated Services Digital Network (ISDN): An international telecommunications standard for transmitting voice, video and data over digital lines running at 64 Kbps
- INMARSAT-B SATCOM link between the Main and Deployed elements: World-wide satellite coverage
- RF Line-of-Sight (LOS) link between Deployed and Mobile elements: Reliable medium for short-range communications

TCS identified key commercial-off-the-shelf (COTS) products to implement the proposed architecture:

- Cisco Routers and FastHubs: Robust IP networking features; support of Unicast and Multicast protocols; ability to support voice transmission via Voice Over IP (VoIP)
- Adtran ISDN Service Units (ISUs): High-speed, multi-port ISDN support
- Breezecom Wireless LAN products: a complete line of plug-and-play wireless Ethernet products that enable mobile computing while eliminating the trouble and expense of cabling
- ViaSat KIV-21 Type 1 In-line Network Encryptors

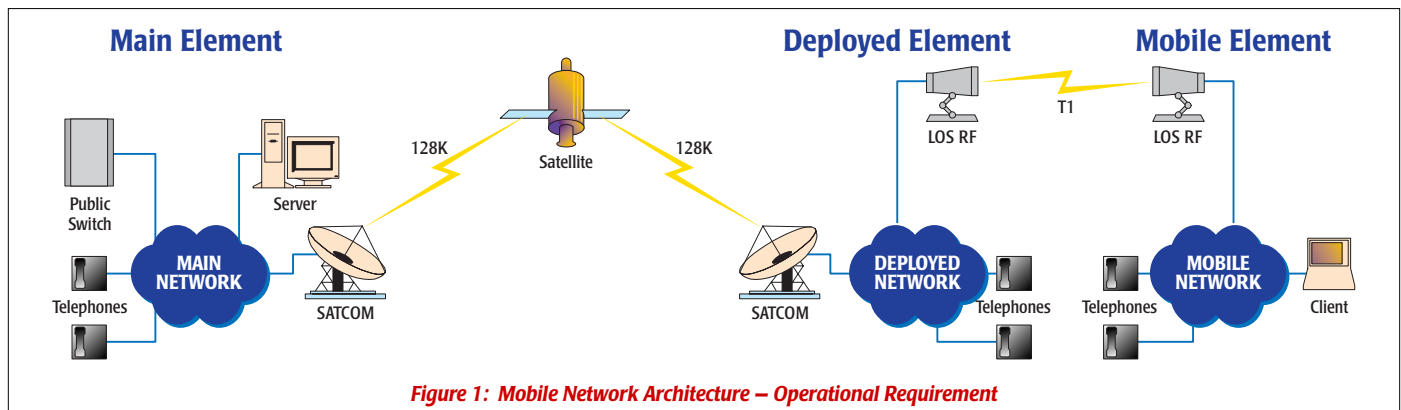


Figure 1: Mobile Network Architecture – Operational Requirement

KIV-21: TYPE 1 SECURITY FOR PRIVATE NETWORKS

For the security component of the architecture, TCS turned to the KIV-21. This product, manufactured by ViaSat, Inc., is a “plug and play” Type 1 in-line network encryptor (INE) for IP-based networks. Certified by the National Security Agency (NSA) to pass traffic up to SECRET level (TOP SECRET with NSA approval), the KIV-21 can be used to build secure

virtual private networks using private or public network infrastructure.

Most of today's secure networks rely on point-to-point extensions to build hub-and-spoke style networks, or use static configuration tables to build multi-point networks. The KIV-21 is the first Type 1 encryptor to address the costs of managing,

installing and maintaining large scale, meshed networks, and overcomes these problems to provide the full benefit of secure virtual private networks. Its full-mesh connectivity improves network performance and reliability, while reducing network management.

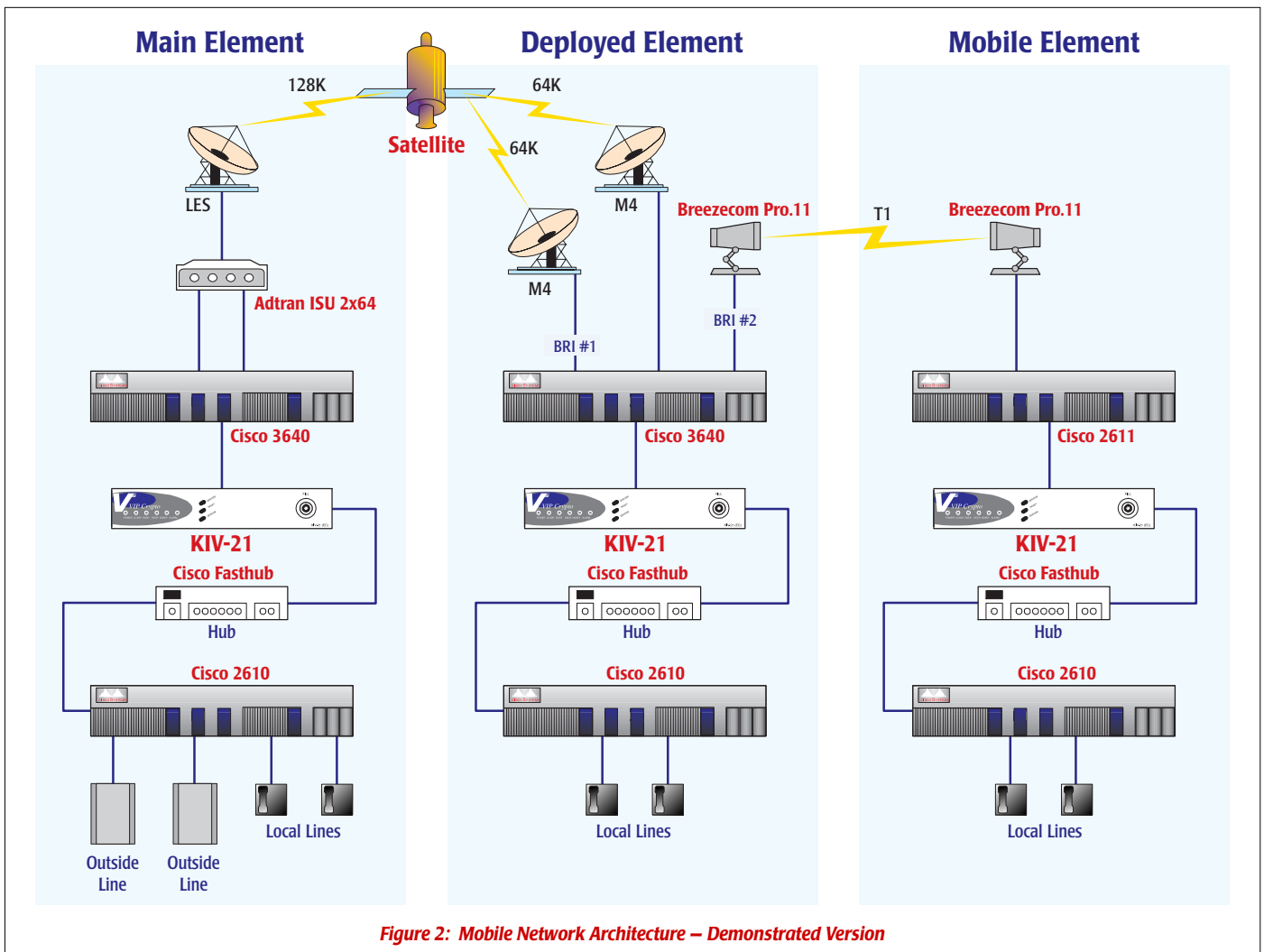


Figure 2: Mobile Network Architecture – Demonstrated Version

RESULTS

Highlights of testing demonstrate the feasibility and performance of the solution:

- **Performance:** The prototype configuration was able to support up to 3 simultaneous telephone calls (one in-network, two out-of network), plus simultaneous Web browsing from the Mobile client to the Main's server and additional network processing, while maintaining near-toll voice quality
- **Mobility:** All of the equipment can be transported and used within shipping containers with no loss in performance capabilities. This offers maximum mobility for "shoot and scoot" missions or any other operating scenario where rapid deployment or displacement is a consideration.

In addition, the following benefits are also realized from this architecture:

- **Expandability:** The scalable architecture can be tailored to meet operational requirements by adding resources to meet increasing bandwidth requirements.
- **Flexibility:** The INMARSAT-B link can be replaced by Commercial SATCOM products (e.g., ViaSat's Starwire products) if needed, and the LOS link can be replaced by other wireless connection media to meet specific mission requirements. Repeaters can also be used to extend the operational range of the Mobile Element.

CONCLUSIONS

The architecture implemented by TCS successfully extends network infrastructure in a package combining COTS networking and Type

1 security products. The robust performance of this architecture makes it the ideal solution for scenarios where deployed elements must maintain connectivity with their home base with minimal impact or configuration.

For More Information

TeleCommunications Systems, Inc. develops network applications and provides communications engineering for wireless and wireline networks. TCS corporation headquarters is located in Annapolis, Maryland. For more information contact Steve Anspach, 813-831-6353
 ViaSat, Inc. develops and produces advanced digital communications equipment for Government and commercial markets. Our products address information security, satellite telecommunications, wireless signal processing, tactical communications and communication simulators. Corporate headquarters and Government services are located in Carlsbad, California, with the ViaSat Satellite Networks division located in Norcross, Georgia and branch offices in Boston, MA and Washington, D.C. For more information contact Bill Menter, 760-476-2523.

Because ViaSat engineers are continually striving to improve our products, specifications are subject to change without notice.

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