T2C3: The New Standard for Secure Command & Control Field Communications

The need for secure communications in the field has never been higher. In both battlefield and peacekeeping scenarios, command and control communication needs to be secure, mobile, and flexible. It has traditionally been difficult to install and maintain field-based communications facilities without compromising one factor or another. The new T2C3 platform for command and control communications addresses security, mobility, and flexibility in an integrated way, giving field commanders the ability to adapt their communications structure and profile to their ever-changing environments.

What is T2C3?

T2C3 stands for **T**actical **T**empest **C**ommand and **C**ontrol **C**enter. T2C3 is not just a single solution. It is a platform for secure, mobile, and flexible field-based command and control communication that can be adapted for a wide variety of scenarios and environments. In both battlefield and peacekeeping scenarios, for one war fighter or an entire battalion, the T2C3 platform can be used to conduct secure communications in a wide variety of non-secure peacetime to secure hostile environments.

A consortium of companies, all recognized as leaders in their respective fields, developed T2C3 as a best-of-breed commercial-off-the-shelf (COTS) solution. Each component of the T2C3 platform (whether information technology, communications equipment, telecommunications services, or military personnel equipment) is already a previously certified government product or solution – so the T2C3 platform can be sourced as a single unit, or individual parts can be sourced separately. The consortium behind T2C3 has certified and field-tested a number of standard configurations. Procurement personnel can find T2C3 standard configurations as well as all individual components on GSA Advantage.

The Requirement

Field-based military personnel, in wartime and peacekeeping scenarios, often need to conduct secure communications in unsecured environments. Such communications might consist of:

- Giving, receiving, or relaying orders in the chain of command
- Collecting, receiving, or analyzing intelligence information
- Conducting secure meetings with audio and videoconferencing

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Complicating matters, field personnel are often in remote or undeveloped areas with little or no infrastructure. There may be no secure physical facilities, let alone telecommunications or power. But no matter how primitive the conditions, the requirement for secure communications is still the same.

The Solution

The solution for this requirement is T2C3, a secure, mobile, and flexible platform for field communications. T2C3 consists of a number of commercial-off-the-shelf (COTS) standard components:

- Portable TEMPEST secure enclosures and tents for sensitive compartmentalized information facilities (SCIF)
- Standard laptops and servers in special rugged cases for harsh conditions (provided by Action Systems)
- Satellite reception, networking, and communications equipment (provided by SkyStream Networks)
- Secure satellite phone for two-way voice and data transmission (provided by Inmarsat)
- Satellite bandwidth and uplink facilities (provided by satellite operators such as G2 – PanAmSat)
- Security and conditional access technologies for DVB and IP transmissions (provided by Irdeto Access)

In tandem, these components form the T2C3 platform, addressing the needs for security, mobility, and flexibility that are demanded in the field.
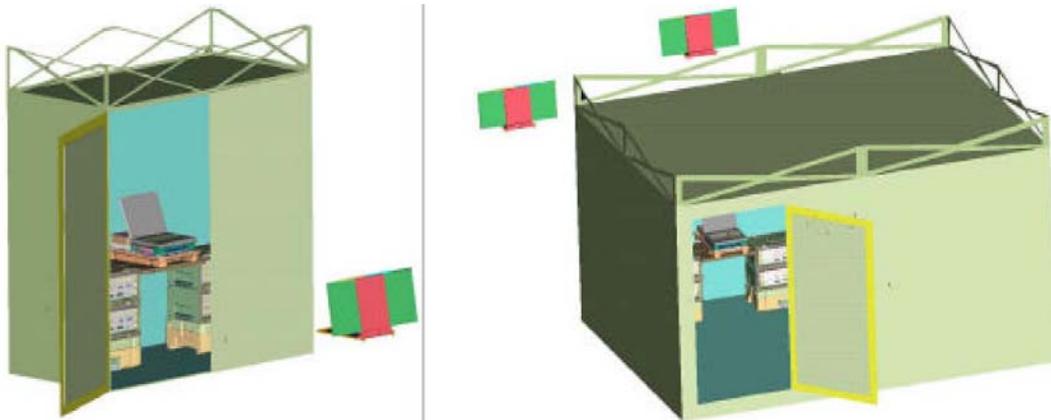

Figure 1: Team and Battalion TEMPEST Tent Enclosures

Security

Security is the hallmark requirement for sensitive military communications and operations. Four components of the T2C3 platform play an integrated part in providing security.

- TEMPEST secure tents and enclosures – the TEMPEST secure tent is a low-profile lightweight and portable enclosure that provides a SCIF in a mobile environment. The shielded tent technology provides a high degree of radio frequency (RF) attenuation to eliminating the possibility of electronic eavesdropping from outside the enclosure.
- Secure satellite phone and link terminal – the T2C3 platform uses leading two-way satellite communications technologies from Inmarsat that provide up to NSA Type 1 secure voice and data traffic to even the most remote locations.
- Satellite reception, networking, and communications equipment – for burst and broadcast traffic, the SMR and EMR satellite routers from SkyStream Networks provide the highest standards of reliability and security in satellite communications.
- Security and conditional access technologies from Irdeto Access – Irdeto Access provides the most advanced and adaptive technologies for DVB and IP scrambling, providing additional layers of security for the most sensitive data and video traffic. Irdeto's technology is FIPS-140-compliant and meets the standard for NSA Type 2 encryption.

These components, all working together, form the basis for T2C3's coverage of all the security aspects required in a field communication station.

Figure 2: Integrated T2C3 Secure Communications Workstation

Mobility

The T2C3 platform is mobile. Each of the different configurations is designed for portability in harsh mobile conditions.

- Rugged, airtight, and watertight cases from Action Systems ensure that sensitive communications equipment can withstand travel over uneven terrain.
- TEMPEST secure tents and enclosures are designed for rapid assembly and disassembly a minimum number of personnel. One person can assemble a TEMPEST secure environment in most cases in twenty minutes or less.
- The entire T2C3 platform (equipment, cases, and tents) is designed to fit, even in its largest configuration, on a single pallet or in the rear of one Humvee, for compact and rapid deployment to any theater of operation.

Figure 3: Fully Deployed T2C3 Battalion System and Enclosure

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Figure 4: T2C3 Battalion System Packed for Transportation

These features ensure that a T2C3 system is ready for rapid deployment to almost any environment, requiring a minimum number of personnel for setup, operation, and breakdown.

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Figure 5: Rugged field cases with communications hardware

Flexibility

The T2C3 platform is designed for flexibility. Although it comes in a number of standard configurations (Team, Battalion, and Outdoor are 3 of the standard configurations), components can be added or subtracted given the requirements of a particular situation. A few of the flexible parameters:

- TEMPEST secure tents are available in a number of different sizes depending on the operational and personnel needs. HVAC systems are available depending on the environmental conditions anticipated. These configurations can be customized to specific user requirements.
- Server, laptop, router, and networking equipment can be customized to the needs of a particular deployment, depending on the amount of audio, video, data, and telephone traffic that needs to be served to a particular location.
- The amount and type of security and enc ryption can be customized to the needs of a particular deployment, depending upon the security requirements. Broadcast and voice traffic security are guaranteed in all configurations, with options for additional layers of video and IP security, depending on the requirement.

These are just a few of the flexible options that are available in the T2C3 platform. Customers can start with a standard configuration and customize as they go, or build a custom configuration from the ground up using individual components.

Additional Considerations

The T2C3 platform is designed with redundancy such that there is no single point of failure for a T2C3 system. Should one of the modules fail in the field, the other modules will remain up and running; modules are independent from each other.

Each T2C3 system comes with its own battery and is designed to accept power from any available field source. In addition, some T2C3 systems ship with a power generation module.

Deployment Scenarios

There is no "typical" deployment scenario for the T2C3 platform – since it is customizable to a wide variety of applications. Some example deployment scenarios could be:

- Command and control for secured forward positions on the battlefield
- Field communications in a foreign peacekeeping or domestic policing action
- Disaster recovery first-response field operations and data collection

In an actual deployment, the first 2 or 3 individuals on site could carry with them the base equipment needed to establish a T2C3 command center in two or three airline carry-on sized cases. The equipment could be carried by the personnel, loaded on a pallet, or carried on a single Humvee. This would be the servers, router, workstation, and communications equipment to provide the initial voice, data, and video connectivity to military HQ, or State, Local, and Federal agencies.

Then, as more personnel arrive onsite, they could bring other modules, to build more services. Such equipment might be part of the T2C3 platform, or not; the T2C3 platform is designed to support third-party equipment that might be needed for specialized operations. Such equipment might consist of additional servers, enhanced satellite communications, additional telephone communications, video surveillance, biometric identification or badge systems, GPS systems for real time situational awareness, or maybe a SECNET 11 wireless bridge and access point so that all personnel in the area can connect to the network to share information; the list goes on and on. Security can be maintained with NSA Type 1, Type 2, or commercial encryption, smart cards, and/or biometrics.

Summary

The T2C3 platform is designed for secure, mobile, and flexible command and control field communications in a wide variety of applications and deployment scenarios. It consists of COTS standard technology, available in standard or custom configurations, from experienced and trusted suppliers to the U.S. government. The T2C3 platform is available now for ordering from the GSA Advantage website, and demonstration units can be arranged for specific opportunities.

For more information please visit the T2C3 web site at **http://www.t2c3.com**, or contact:

- Action Systems, (505) 526-6606 (www.goaction.com)
- SkyStream Networks, (408) 616-3300 (www.skystream.com)
- Irdeto Access, (858) 668-4800 (www.irdetoaccess.com)

• Additional Information about T2C3

Typical T2C3 Applications

While the T2C3 platform can be applied to a number of military and civilian field applications, there are a few for which it is especially well suited, and for which the T2C3 consortium of companies has built custom solutions.

Battlefield Command and Control Communications

The T2C3 platform is well suited for battlefield command and control communications.

- The entire platform is built into rugged and environmentally sealed hard cases, designed for loading into military transportation vehicles. Equipment is well protected for harsh travel and weather conditions, and yet can be deployed and running by the team in less than an hour.
- The T2C3 platform has secure integrated satellite telecommunications, including broadcast video services, two-way data services, voice telephony, and video conferencing.
- The TEMPEST enclosures are designed to provide a mobile SCIF environment for command-level briefings, intelligence gathering, and communications.
- The T2C3 platform is designed such that there is no single point of failure. Should one module become unavailable, services can be maintained on other modules.

For these scenarios, the T2C3 Battalion Enclosure and configuration are suggested.

Foreign Internal Defense and Peacekeeping Operations

The T2C3 platform is adaptable to peacekeeping and policing scenarios.

- A typical platform can be assembled and disassembled, on the move, in less than an hour, by 1-3 individuals, and is ideal for situations where temporary facilities need to be established and moved on short notice.
- The T2C3 platform is adaptable for satellite, terrestrial wireless, and fixed communications which may be available in more urban scenarios.

For these scenarios, either the T2C3 Battalion or Team Enclosures may be appropriate.

First-Response Disaster Management & Field Operations

The T2C3 platform is also ideal for disaster management and data collection.

- The T2C3 platform has its own internal batteries and is suited for field operations where there are not stable or reliable power sources – or it can take whatever type of power is available from any source.
- Additional modules to the T2C3 platform will be available for data collection and other disaster management functions.
- The T2C3 platform can uses commercial-off-the-shelf (COTS) technology that is familiar to both military and civilian personnel.

For such scenarios, the T2C3 Team Enclosure is suggested.

Intelligence and Counter-Intelligence Operations

Intelligence officers have specific requirements for mobility and security in hostile environments. They need to perform the simultaneous functions of data collection and analysis, requiring access to communications and information that has not traditionally been available to field operatives.

- Modules can be chosen to fit the specific mission – data collection, analysis, and secure communications are a few of the modules that will be standard to this application.
- Special security measures can be implemented on all aspects of the T2C3 platform, from data communications, to physical access, ensuring that intelligence operations are secured.

For such scenarios, the T2C3 Team Enclosure is suggested.

T2C3 Technical and Materials Overview

The T2C3 platform consists of a number of items, located in the field sites where a T2C3 system is physically deployed, as well as at the communications uplink from which T2C3 communications services are deployed.

T2C3 Communications Uplink Components

To communicate with T2C3 systems deployed in the field, satellite communication services must be established. Branches and agencies may use their own uplink and head-end facilities, or may contract services with a trusted government satellite communication services provider such as G2, a division of PanAmSat. For two-way satellite telephony, systems and services may be procured from Inmarsat.

Uplink components will usually consist of:

1. SkyStream Networks Source Media Router (SMR) – the SMR is an Internet Protocol (IP) encapsulator, designed for injecting IP data into a DVB satellite carrier. It thus allows traditional IP services to be carried over a satellite link, increasing the speeds of data throughput and enabling the injection of scrambling and conditional access protocols.
2. SkyStream Networks zBand software platform – zBand manages the scheduling, targeting, and delivery of all information over the T2C3 system. zBand is a server-client platform that manages all digital assets (files, databases, streaming content, web pages, and video), manages network attributes, handles scheduling and targeting of assets, effects reliable transmission and reception, and manages all logging and diagnostic information with respect to data services in the T2C3 platform.
3. Irdeto Access Cyphercast – Cyphercast is an Internet Protocol Conditional Access System (IPCAS). Cyphercast enables both the broadcast and targeted encryption of IP data, and is fully compliant with NSA Type 1 and Type 2 encryption standards.

Sample T2C3 System Case Components

Individual case contents vary depending on requirements. For most cases there are multiple items and configurations listed and these are just some of the possibilities.

1. Power/UPS Case
    a. 2200 series Battery case
    b. 3U – APC CyberFort UPS.
    c. 1U – Power distribution//surge suppressor panel.
2. Network Connectivity Case.
    a. 1U – Cisco 1760 Modular Access Router..
    b. 1U – A tray with cut foam for Router WICs and VICs(Modules).
    c. 1U – Cisco 2950 Catalyst Switch.
    d. 1U – SecNet 11 Bridge/Access point.
3. SkyStream Case.
    a. 1U -SkyStream EMR-5500 Series Edge Media Router- 5500 series is a versatile and powerful satellite networking platform that receives and manages content at the network edge.
    b. 2U -SkyStream EVR-7000 Series Edge Video Router designed for delivering live and pre-recorded BusinessTV.
    c. 2-U zBand Manages the reception, packaging, and presentation of web, file, and streaming Internet and Intranet content.
4. Communications Case.
    a. 2100TS M4/STE Case. M4, STE.
    b. INMARSAT Gemini 128.
    c. Encryption device.
        i. KIV-7.
        ii. Omni XI.
        iii. Sectera.
    d. Terminal Adapter

i. KLAS TA.

ii. Adtran.

iii. IWAY Hopper.

5. Server Case
    a. 1U – CF-48, Panasonic Notebook computer.
    b. 1U – CF-50, Panasonic Notebook computer.
    c. 1U – Westek Technology compact server.
    d. 1U – Westek Technology rack mount display and KVM switch.

6. Data Storage Case.
    a. SNAP Server 1100 120 GB.
    b. Netforce 800 400 GB to 2 TB.

7. Workstation case. (CRISP, 2200TL etc)
    a. Computer, CF-48, CF-34, or CF-72.
    b. Printer/Scanner BJC-85
    c. USB video camera (VTC).

8. Multiple workstations (5 or 10) case
    a. Computers, CF-48, CF-34, or CF-72.
    b. Powerdock for each computer.
    c. SecNet 11 PCMCIA cards.
    d. SecNet 11 access point.

9. Storage Case
    a. Extra Cables.
    b. Manuals for all items.
    c. Consumables.
    d. Equipment that will not fit into any of the other 5 cases.

10. Other Cases can be added to the base unit to add functionality where needed.
    a. Identification system – ID cards etc.
    b. GPS system – MediaMapper etc.
    c. Photography and Video.
    d. Fiber Optics equipment
    e. Telephone switching equipment.
    f. Projector for briefings, maps etc.
    g. Additional communications systems.
    h. Additional hubs and switches.
    i. Additional power requirements.
    j. Additional servers.
    k. Additional consumables.
    l. Additional storage.

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T2C3 Team Members

About Action Systems

Action Systems, a Division of V&A Incorporated, is an innovator and world leader in mobile computing and communications products. For over 12 years Action Systems has created unique products that enable persons in a very mobile work force to create valuable work product – literally anywhere in the world, then communicate this product back to a designated location.

About SkyStream Networks

SkyStream Networks is a trusted leading provider of video and IP networking solutions. Since the company was founded in 1996, SkyStream has been delivering the highest quality hardware and software products to service providers, Fortune 500 enterprises, and federal government agencies.

SkyStream has more than 150 customers worldwide. Headquartered in Sunnyvale, California, the company also has sales and support personnel in Atlanta and Denver, to support major satellite and telecommunications providers, as well as in the Washington, D.C. metropolitan area to support federal government customers.

About Irdeto Access

Irdeto Access is a world leader in content protection technologies for digital video and IP networks. For over 30 years, Irdeto Access has pioneered encryption and conditional access technology and standards, now used around the globe to protect the world's most valuable content.

Each day, more than eight million people watch TV, surf the Internet, or access secured content with Irdeto Access-enabled systems. At January 2003 Irdeto Access had over 91 customers totalling more than 8 million users throughout 60 countries.

Irdeto Access is a subsidiary of the international subscriber platform group MIH Limited, which is a subsidiary of Naspers (NASDAQ: NPSN and JSE: NPN) a multi-national media group.