USAF 46th Test Wing
Briefing

of

Cellular Tracking System (CTS)

for

28th National T&E Conference

Presented by:

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Background for CTS Development

• CTS Funding: ~ $1.25M from Congressional Initiatives for the Eglin Range

• Objectives:
  
  – First Year: Researched / identified options, selected a cellular option, and conduct limited test of Government-developed cost effective, non-proprietary, commercial standards-based solution – e.g., a CTS Proof of Concept – to track, cooperative, surface-based entities across entire Eglin Range Complex (~ 724 sq miles)
    • Eglin Range Firefighters – Jackson Guard – use Proof of Concept
  
  – Second Year+: Developing CTS to enhance functional capabilities of the Proof of Concept to include integration of emerging capabilities to meet dynamic requirements
    • Provide ground tracking for Central Control Facility (CCF) and Joint Test and Training Operations Control Capability (JTTOCC)
High Option Costs Led to Limited Test of Government-Developed Cellular Solution

Using Commercial Infrastructure / Government Owned CTS Software to Reduce Cost
Overview

CTS can track an entity anywhere there is sufficient cellular/Wi-Fi infrastructure to include Service /DoD / Interagency / State / Local and/or Community locations, and is not dependent on any specific cellular carrier. Other capabilities of CTS of potential value to the User include:

• Mobile Client Application for various cell phones and PDAs to allow entity tracking
• Entity Management Suite (EMS) for asset identity, tracking, control, and situational awareness
• Virtual GeoFence-type capability for selected areas to provide breach alerts, monitor entities in the GeoFence area, and provide time-stamped entrance and exit data for COP display and/or AAR
• Remote Access to CTS for Real-Time Situational Awareness for use by Leaders in their offices and authorized individuals not located on site
Cellular Tracking System (CTS) OV1
Cellular Tracking System (CTS)

OV1-1

CTS Local Govt

CTS State Govt

CTS Federal Govt
Eglin AFB Example

Local Govt
Shalimar, Ft. Walton, Niceville, Destin, etc.
- Fire
- Police
- EMS
- Other

CTS Federal Govt

State Govt
- Highway Patrol
- Other

Eglin AFB
- CE
- Fire
- Police
- Range
- Jackson Guard
- Other
## Cellular Phones Utilized

<table>
<thead>
<tr>
<th>Blackberry</th>
<th>HP Glisten</th>
<th>Samsung Focus</th>
<th>Motorola Atrix 4G</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIM OS 6</td>
<td>Windows Mobile 6.5</td>
<td>Windows Phone 7.1</td>
<td>Android 2.3</td>
</tr>
<tr>
<td>624 MHz / 256 MB</td>
<td>533 MHz / 256 MB</td>
<td>1 GHz / 8 GB</td>
<td>2 GHz / 16 GB</td>
</tr>
<tr>
<td>HSDPA, Edge, GPRS</td>
<td>HSDPA, Edge, GPRS</td>
<td>HSPA, Edge, GPRS</td>
<td>HSPA+, Edge, GPRS</td>
</tr>
<tr>
<td>BT 2.0 / 802.11 A/B/G</td>
<td>BT 2.0 EDR / 802.11 B/G</td>
<td>BT 2.1+EDR / 802.11 B/G/N</td>
<td>BT 2.1+EDR / 802.11 B/G/N</td>
</tr>
<tr>
<td>4.5 hours / 13.5 days</td>
<td>5 hours / 15 days</td>
<td>6.5 hours / 12.5 days</td>
<td>9 hours / 10.4 days</td>
</tr>
</tbody>
</table>
Extended Battery Life (Atrix)
First formal release


- To be followed by stream of releases focusing on World Wind Java (WWJ) SDK development of funded features for:
  - Mobile Tablets, Android OS, and possibly iPad
  - MIL-STD 2525B/C visualization set
  - Mechanism to group and de-clutter
  - Support Light Detection And Ranging (LIDAR)
  - COLLABorative Design Activity (COLLADA)
Examples of CTS Functional Capabilities

- **Entity Display Options**
  - Selectable / interchangeable Icon Sets
  - Track History, Colors Annotations, etc.

- **Display Control Options**
  - Selectable Terrain / Map Data
  - Grid Overlays (Range Map, MGRS, Road Centerline, Power Grid, Imported GIS data, etc.)
Examples of CTS Functional Capabilities (Continued)

- Display Control Options
  - Selectable Terrain / Map Data
  - Grid Overlays
    - Range Map
    - MGRS
    - Road Centerline
    - Power Grid
    - Imported GIS data
    - Other
• Other Display Options

– Mouseover an Entity for Quick Look Information

– Right Click to Activate Menu Items

– GeoFences (aka Airspaces)
  - Breached GeoFence shown in Red
  - Labels Display with Mouseover
Evaluating Use of GeoFence Capability with Hazard Prediction M&S Tools for CTS

National Oceanic and Atmospheric Administration (NOAA)’s Area Locations of Hazardous Atmospheres (ALOHA)
Example of CTS Prototype Capability to Record / Replay Data for Use in Exercise

Recorded Tracking Data during preparation for Mighty Guardian Exercise at Whiteman AFB
Defense Threat Reduction Agency (DTRA)
Nimble Elder Exercise: 28 Nov – 2 Dec 2011

- **4 Oct 11**: CTS was demonstrated in Kingstown, VA, to Dr. Andrew Wiedlea, Deputy Assistant Analysis Branch Chief, Information and Systems Engineering Office, DTRA and other DTRA officials
- **DTRA requested CTS support prior to and during a field exercise – Nimble Elder – to be conducted at Fort Belvoir, VA**
  - CTS infrastructure was made available and DTRA funded CAI support prior to and during Nimble Elder
- **28 Nov-2 Dec 11**: CAI provided on-site support to:
  - Demonstrate CTS ability to track forces in real time using wireless tracking capabilities
  - Use CTS capabilities to transmit results of Live, Virtual and Constructive radiation detection results to Live exercise participants in real time
Remote Control Gate Access Monitoring

- Closed and Locked
- Closed and Unlocked
- Open and Unlocked
- Open and Locked
Remote Control Gate Access Monitoring System
Powered Installation – Control, Status, Network, Video
Remote Control Gate Access Monitoring System
Non-Powered Installation – Control, Status, Solar, Cellular
CTS - Remote Control Gate Access Monitoring System Displays
Remote Control Gate Access Monitoring System Display
Current and Potential Benefits to Users with Development of CTS Prototype

• Flexible implementation options
• Displays and functions can be customized to meet User requirements
• Remote Access viewing for real-time situational awareness / control
• Tracking information / data stored for future review, replay, and AAR use
• CTS in other locations can cooperatively share information
• Multiple map layers and overlays for terrain and infrastructure display
• Virtual GeoFence can be created to cordon geographic areas
• Flexibility for Entity grouping and display to reduced screen clutter
• Portable Cellular Device Application for ease of installation and operation
• Tracked entity can generate notification to alert COP of unusual conditions
• Option for tracking with insufficient cellular coverage and/or no coverage
Integrated Cellular / Satellite Device

Fill Gaps in Cellular Coverage, Damaged Cellular Infrastructure, or No Coverage
QUESTIONS
DO 31 Update

- Extended Life Battery Testing

- Testing over 6 runs shows average battery life of:
  - 10.5 hrs @ 1 sec rate
  - 12 hrs @ 5 sec rate

- Constant pwr on average:
  - 6.75 hrs @ 1 sec rate
  - 13.5 hrs @ 120 sec rate
Test 12 120 Second
18 Jan 2012
DO 31 Update

- Test 2: Eglin Range – 17 Jan 2012
DO 31 Update

- Test 2: Eglin Range – 17 Jan 2012