Agenda

• Introduction to solutions powered by the GXP Platform™
• Summary of new Activity Reporting Tool (ART) module for SOCET GXP® for Structured Observation Management (SOM) workflows
• Live software demonstration of SOCET GXP ART
• Summary of new GXP WebView® SOM tools for enabling web based SOM workflows
• Live software demonstration of SOCET GXP ART
• Live software demonstration of GXP WebView SOM
The GXP product suite

- GXP Xplorer® for data catalog, discovery, and dissemination
  - Web and mobile clients
- GXP WebView for image streaming, data visualization, SOM workflows, Movement Intelligence (MOVINT) exploitation, Precision Point Mensuration, and product publishing in a Web browser
- GXP InMotion™ Video Server and Video Desktop applications for video mission management and exploitation
- SOCET GXP for advanced imagery exploitation, product generation, MOVINT and geospatial production
- SOCET GXP Workflow Improvement Module (WIM) for a direct GXP Xplorer connection inside of SOCET GXP enabling rapid data discovery and review
- Tracking Analytic Software Suite (TASS) for creating and analyzing MOVINT from Full Motion Video (FMV), Wide Area Motion Imagery (WAMI), and Ground Moving Target Indicator (GMTI) sources
GXP product suite: built on the GXP Platform
Activity Reporting Tool (ART) in SOCET GXP
Object Based Production with Structured Observation Management (SOM)

- **Workflow**
  - Create, view, and analyze object-based observations
  - Record observations in a SOM database
  - Exploit imagery and observations in a single user interface
  - Exploit and analyze in a web or desktop client
  - Use for order of battle analyses and other investigations

- **Benefits**
  - Integrates SOM (collection) and Object Based Production (analysis)
  - Supports highly transactional continuous enrichment of knowledge about objects
  - Enables analysts at all levels to view SOM data and authorized users to build content
  - Facilitates building useful Ontologies and Knowledge Layers from SOM content

- **Technology**
  - Based on production COTS software currently in use (GXP Xplorer, GXP WebView, SOCET GXP)
  - Software and data can both be hosted by Amazon Web Services® (AWS®) or GovCloud (US)
  - Metadata consistent with standards base schema
SOCET GXP Activity Reporting Tool (ART)

- ART provides capability for analysts to efficiently track, record, and report activities of interest, such as vessels in a port, recording changes over time
- Integrated with exploitation capabilities of SOCET GXP and GXP WebView
- Systematically step through collection process, or make observations whenever needed
- Graphically update information to reflect changes that have occurred over time, and visually verify that all changes have been reported correctly
- Outputs include a Feature Object Database (FODB) of objects and activities for change analysis and machine analytics
- Several FODBs are compatible

Image courtesy of DigitalGlobe®.
ART in SOCET GXP

Whenever new images are available, view the graphics of previous objects and activities and update them to record change.

Image courtesy of Airbus®.
GXP WebView Structured Observation Management and Object Based Production
View existing observations in image exploitation client GXP WebView

- Observations are graphically displayed on streamed image being exploited
- Structured metadata obtained via the SOM Geodatabase is viewed by clicking an observation graphic
- Observations are filterable spatially, temporally, and contextually

The ability to visualize and filter observations right in the exploitation client provides views to assess potential patterns and form conclusions.
Create new observations

- Structured metadata for observations is auto-populated from image metadata where possible
- Pick-lists based on allowed values and previous entries reduce time and maintain consistency
- Observations are published to the FODB via the SOM DB REST API
- Objects and relationships can also be created

Analysts can create new observations using standards-based metadata attributes, filtered pick-lists, and auto-complete text fields. Enabling rapid visualization of change and knowledge build-up over time in space

Image courtesy of DigitalGlobe.
ART in GXP WebView

Visualize objects observed across the enterprise right on the exploitation image to assess potential patterns and support new observations.

Filter by time, location, attributes, context, and relationships for clearer understanding of relevant information.

Create observations of activities in database with structured metadata attributes, auto-population, filtered pick-lists, cloning, and auto-complete fields. Enables rapid recording of change and knowledge build-up.

Image courtesy of DigitalGlobe.
Latest enhancements: GXP WebView SOM tool

- Disseminate observations collected in SOCET GXP ART to others using GXP WebView
- See locations of objects observed over time overlaid graphically on the image
- Visualize changes in the scene with time slider
- See metadata about the activities observed
- Observations can also be inserted through the GXP Xplorer API by developers and viewed in GXP WebView
- GXP WebView dynamically reflects all attributes stored with the observations, without pre-configuration
For SOM databases with relationships: review history and relationships of objects

- Open a link relationship view for deeper analysis
- Review the history of observations about an object both spatially and temporally
- See relationships between objects, such as when a ship was in various ports

The buildup of knowledge is readily visualized. This approach directly supports highly transactional continuous enrichment of knowledge about objects.
Future release: review spatio-temporal history and relationships in textual detail

- Review the current status of an object
- Analyze details of the history of observations and relationships about an object in time and space

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Details of observations and relationships can be analyzed to discern patterns and test hypotheses.
Future release: review data analytics and ask questions

- Review graphs and charts of derived analytics that are frequently requested
- In future, ask specific questions to build and run analytics on-the-fly

How often was ship Alvan in Karachi in the past year?

Which days of week was Alvan in Karachi?

What was the maintenance schedule of Alvan?

When were Alvan and Liravi in same port +/- 2 days?
Future release: review objects auto-detected by Machine Learning

- Machine Learning (ML) detections rendered in SOCET GXP Multiport, possibly as shown at left
- Toggle detections on/off in digital overlay
- Functionality depends on ML (Artificial Intelligence) tool outputs for example:
  - Could display attributes such as score in graphic or in text box
  - User could filter by attributes
  - User could confirm/deny/edit ML detections and send back to ML tool to train it

UAV image with 3.5 CM GSD, courtesy of Palomar College, San Diego. Used with permission.
Imagery and data providers

BAE Systems would like to thank the following organization for providing data used in this webinar:

• DigitalGlobe®: WorldView-1, WorldView-2, and QuickBird, GeoEye-1
Questions?

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