

## **IPL 2.0 will include the following capabilities:**

### **GENERAL:**

Provide the core of the IPL functionality in an unclassified baseline: import, store, export, and manage imagery, image-based products, and associated metadata.

### **FORMATS:**

Import, export, store and catalogue imagery and image-based products formatted in National Imagery Transmission Format (NITF) (versions 1.1 and 2.0).

Import, export, store and catalogue digital video imagery formatted in Motion Picture Experts Group (MPEG-2). Cataloging will require metadata passed to IPL in the form of a UIP/GIAS DAG or an IPL datafile. Will be handled as opaque products with metadata parsing or manipulation provided.

Import, export, store and catalogue image-based products in non-NITF format (TIFF 6.0, Sun Raster, GIF, and Postscript) when accompanied with an associated IPL data file.

### **COMPRESSIONS:**

Import, export, store and catalogue imagery compressed using Adaptive Recursive Interpretive Differential Pulse Code Modulation (ARIDPCM) for NITF version 1.1 formatted imagery.

Import, export, store and catalogue imagery compressed using Joint Photographic Experts Group (JPEG) 8, 12, and 24 bit color for NITF version 2.0 formatted image-based products (for compatible formats).

Import, export, store and catalogue uncompressed imagery (TIFF 6.0, Sun Raster, GIF, and Postscript). Cataloging will require metadata passed to IPL in the form of a UIP/GIAS DAG or an IPL datafile.

Generate and store still image thumbnails in a GIF compressed format (for NITF 1.1, NITF 2.0, TIFF 6.0 Sun Raster, and GIF). For multi-image NITFS 2.0 products a thumbnail is generated for the first image.

### **CONVERSIONS:**

Support imagery file format conversions:

- from NITF 1.1 to NITF 2.0, TIFF 6.0, and Sun Raster

- from NITF 2.0 to TIFF 6.0 and Sun Raster

- from TIFF 6.0 to NITF 2.0 (12-bit conversion/compression excluded) and Sun Raster

- from Sun Raster to NITF 2.0 (12-bit conversion/compression excluded) and TIFF 6.0

### **DATA STORAGE:**

Capability to retain digital imagery data in on-line storage media.

Maintain a catalog populated with metadata of imagery and imagery product holdings.

### **METADATA MANAGEMENT SERVICES:**

Provide the functionality to populate metadata items.

Provide the capability to accept, parse, and index metadata.

Read and validate incoming metadata (validation based on LDM data elements).

Provision for moving products that fail validation to a problem product area.

Capability for the administrator to discard problem products.

Preserve NITF controlled and registered tags.

NOTE: Broadsword provides capability to access IESS independent of IPL 2.0.

#### RESOURCE MANAGEMENT SERVICES:

- Provide the IPL Manager the capability to monitor data on available storage space and manage it on-line.
- Provide the capability to partition/restrict access to metadata and images files.
- Provide the capability to compile statistics on library services.
- Provide for a unitary login for shared data.
- Provide the capability to automatically log-off inactive users.
- Provide for metadata database back-up and restore.

#### DATA MANGEMENT SERVICE:

- Provide the capability to allow for storage of imagery and image-based products into the IPL either manually (catalog through Broadsword Client) or automatically (auto-ingest).
- Provide the capability to import and archive images and image-based products from both CD and magnetic media.
- Support requests to copy an entire image or image-based product into a user-specified location.
- Provide the capability to remove imagery and related metadata from the IPL based on user selected descriptors.
- Provide the capability for users to submit Queries to local library or to search multiple libraries based on specific metadata attributes associated with the needed image products.
- Provide geospatial product support.
- Provide the capability for browsing with or without thumbnails.

#### BROKERED RETRIEVAL SERVICE:

- Provide the brokering capability between a user and multiple libraries that contain imagery and imagery products. (For 2.0 the user can select multiple data sources and the order to search the sources for products, i.e. a sequential query; this gives the user the capability to search many sources but get the product from the “best” source as defined by the user.)

#### SYSTEM MANAGEMENT SERVICES:

- Provide administrators with the ability to monitor and effect the use and behavior of the IPL internal data, storage, and processing resources.
- Provide the ability to support system initialization, operation, and shutdown as well as to measure and optimize performance over time.
- NOTE: Broadsword provides Standing Query capability.

#### CENTURY ROLLOVER:

- Provide capability to accurately process date data from, into, and between the twentieth and twenty-first centuries; including leap year calculations.
- Provide capability to interpret and convert two-digit data based on the 00-59 (twenty-first century) 60-99 (twentieth century) rules.

#### AUTOMATED INTALLATION PROCESS:

- Support an automated installation and configuration process.
- Provide documentation, both hard copy and on-line, for the installation process.

#### ON-LINE ASSISTANCE:

Provide on-line documentation for IPL server.

Provide the System administrator with on-line display of IPL Operations parameters and server operational instructions.

#### BACKWARD COMPATABILITY:

Provide for backward compatibility to the previous version of IPL (NOTE: IPL 1.0 clients and applications written against the IPL 1.0 Client Server ICD will be able to access IPL 2.0 servers).

#### OPERATING SYSTEMS:

The IPL server will operate on the SUN platform with Operating System Solaris 2.5.1 with applicable Y2K patches applied.

#### COMMUNICATIONS SERVER INTERFACE:

Provide the capability to push imagery and image-based products to existing communications server interfaces that support TCP/IP protocol.

#### GLOBAL BROADCAST SYSTEM (GBS):

Provide the capability to generate required wrapper and aggregate product requests for products destined for GBS.

#### SECURITY:

Meet C2 System High and DoDIIS security accreditation criteria.

#### IDL COMPLIANCE:

Maintain USIGS interoperability methods utilizing Interface Definition Language (IDL) as specified in the USIGS Interoperability Profile (UIP), Geospatial and Imagery Access Services (GIAS) version 3.1.

## **IPL 2.1 will include the following capabilities:**

### **GENERAL:**

- Add support for TFRD 1.29 and 4.3 data formats.
  - Provide TFRD 1.29 and 4.3 decompression, RRI & thumbnail generation, conversion to (uncompressed) NITF 2.0 format and chipping capabilities.
  - Provide NITF 2.0 RRI generation capabilities.
  - Provide for indexing and query of classified NITF SDE data.
  - Provide Postscript thumbnail generation capabilities.
  - Add IPL IESS/NDS Interface (provided by Broadsword in 2.0).
  - Add SEM interfacing capabilities.
  - Add Profile capabilities (standing query and standing order).
  - Provide modifiable metadata validation capabilities.
  - Provide capability to manage near-line and off-line storage of data.
- NOTE: the 2.1 baseline will contain classified components, but will be available in an unclassified version without the classified functionality.

### **FORMATS:**

- Import, export, store and catalogue imagery formatted in the 1.29 and 4.3 Tape Format Requirements Document (TFRD) (per IF20D08P and S2025P).

### **COMPRESSIONS:**

- Import, export, store and catalogue imagery compressed using the 1.29 bpp Discrete Cosine Transfer (DCT) for DE 1.29 FTP formatted imagery.
- Import, export, store and catalogue imagery compressed using the 4.3 bpp Differential Pulse Code Modulation (DPCM) for IDEX 4.3 FTP formatted imagery.
- Support user requests to generate Reduced Resolution Image (RRI) files of stored, archived still image NITF 2.0, TRFD 1.29, and TFRD 4.3 products. (NOTE: all RRDS output formats will be NITF 2.0).
- Generate and store still image thumbnails in a GIF compressed format (for Postscript product).

### **CONVERSIONS:**

- Support imagery file format conversions:
  - from TFRD 1.29 to NITF 2.0 (uncompressed)
  - from TFRD 4.3 to NITF 2.0 (uncompressed)

### **DATA STORAGE:**

- Capability to retain digital imagery data in near-line storage media.
- Capability for image data transfer, and retrieval, to/from an external near-line storage device.
- Maintain a catalog populated with metadata of archived imagery to include on-line and near-line.
- Provide Software Capability to allow for image transfer, and retrieval, to and from off-line tape and CD media.

### **METADATA MANAGEMENT SERVICES:**

- Permit users to create validation tables against global and specific metadata elements to allow filtering of products input to the server.
- Provide the capability to save and transfer filter tables.

Capability to utilize the Host Data Base (HDBS) data to auto-populate metadata for user-specified imported imagery products (IPL 2.0 sever implementation).  
Provide for indexing and query of classified NITF SDE data.  
Provide a Metadata Update Service to update the metadata index upon storage state changes

#### DATA MANGEMENT SERVICE:

Support requests to copy an entire image or image-based product as a file or an image subset as file-based image extraction (chip) from a TRFD 1.29 or TRFD 4.3 product as defined in the UIP/GIAS.

#### PROFILE SERVICE:

Provide the capability for creation of notification and/or retrieval profiles in accordance with the UIP/GIAS and consistent with available query capabilities.

Provide the capability for profiles to be created or modified by a user or the IPL manager.

Provide capability to specify an activation/deactivation time periods for profiles.

NOTE: Broadsword provides Standing Query capability.

#### INTERFACE WITH HDBS:

Support Softcopy Exploitation Management (SEM) tasking and staging in concert with the Host Data Base System (HDBS)

## **IPL 2.5 will include the following capabilities:**

### **GENERAL:**

Add support for TFRD 2.3 data formats.

Provide TFRD 2.3 decompression, RRI & thumbnail generation, and conversion to NITF 2.0 format and chipping capabilities.

Provide NITF 2.0 chipping capabilities.

Provide for selective image retrieval and individual thumbnail generation for multiple-image NITF files.

Provide NITF 2.0 12-bit JPEG compression capabilities.

Provide system on SGI platform.

NOTE: the 2.5 baseline will contain classified components, but will be available in an unclassified version without the classified functionality.

### **FORMATS:**

Import, export, store and catalogue imagery formatted in the 2.3 Tape Format Requirements Document (TFRD) (per IF20D08P and S2025P).

### **COMPRESSIONS:**

Import, export, store and catalogue imagery compressed using the 2.3 bpp Discrete Cosine Transfer (DCT) for continuous FTP formatted imagery.

Support user requests to generate Reduced Resolution Image (RRI) files of stored, archived still image TFRD 2.3 products. (NOTE: all RRDS output formats will be NITF 2.0).

### **CONVERSIONS:**

Support imagery file format conversions:

from TIFF 6.0 to NITF 2.0 (12-bit conversion/compression)

from Sun Raster to NITF 2.0 (12-bit conversion/compression)

from TFRD 1.29 to NITF 2.0 (12-bit conversion/compression)

from TFRD 2.3 to NITF 2.0 (12-bit conversion/compression)

from TFRD 4.3 to NITF 2.0 (12-bit conversion/compression)

### **DATA STORAGE:**

Provide the capability to catalog all metadata transferred to the IPL as stand alone files from external library sources. Cataloging will require metadata passed to IPL in the form of a UIP/GIAS DAG or an IPL datafile.

Provide capability to place the entire product Database off-line.

### **METADATA MANGEMENT SERVICE:**

Support requests to copy an entire image or image-based product as a file or an image subset as file-based image extraction (chip) from a NITF 2.0 or TFRD 2.3 product as defined in the UIP/GIAS.

### **SYSTEM MANAGEMENT SERVICES:**

Provide remote diagnostics and maintenance capability and ability for remote downloading of software updates through Tivoli COTS software (NOTE: dependent on connectivity and system access to sites)

**OPERATING SYSTEMS:**

The IPL server will operate on the SGI platform with Operating System IRIX 6.3 with applicable Y2K patches applied.