3.2.1.1 General synchronization requirements

[FBE-120] The I2BE to I2BE Synchronization Service shall exchange data between I2BE instances so that each I2BE instance has the same replica.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-121] It shall be possible, through configuration settings, to filter the type of data to be synchronized between I2BE instances (by IIE type, releasability/ dissemination constraints, location and time of information, etc.) and it shall be possible to constrain product files and attachment files that can be synchronized (typically by defining a maximum file size).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-122] The I2BE to I2BE Synchronization Service shall implement checks preventing circular replication situations (avoiding using unnecessary bandwidth), and it shall prevent creating duplicate entries in the repositories.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-123] The I2BE to I2BE Synchronization Service shall log information about data transferred between I2BE instances enabling full audit trail of dissemination of I2BE data.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.1.2 Direct synchronization

[FBE-124] The I2BE to I2BE Synchronization Service shall support different synchronization configurations including point-to-point, one-to many, many-to-one, many-to-many transfers.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-125] The synchronization service shall work over high-speed/ low-latency networks as well as over high latency SATCOM links where the latter may need special Transmission Control Protocol (TCP) tuning.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-126] The I2BE to I2BE Synchronization Service shall be able to handle cases where one of the I2BE instances is offline for a long period of time. The synchronization function shall identify the correct resume-point so that synchronicity can be achieved once the offline I2BE comes online. An example of a paused/ resumed synchronization could be when an I2BE instance is running on a ship with no network connection.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.1.3 Air-gapped synchronization

[FBE-127] The I2BE to I2BE Synchronization Service shall support air-gapped import/ export through configurable export “drop point” and import “pull point”. The exporting I2BE shall in this case keep track of what has previously been exported to the receiving I2BE such that each incremental export only contains previously un-exported data.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-128] The data that is exchanged through the synchronization shall be wrapped in an “electronic envelope” that contains metadata on the data set to be synchronized. The envelop metadata attributes shall include the highest security classification and the most restrictive releasabilty constraint of the data within the data set.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.2 Presentation-conditioning Service

3.2.2.1 API

[FBE-129] The Presentation-conditioning Service shall implement all the server-side functionality (i.e. anything not user-interface related) to fulfil the user stories [US 51] with backend-relevant acceptance criteria as defined in [INTEL-FS2-UserStories].

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-130] The Presentation-conditioning Service shall implement a function that - upon a client request - extracts the images and the associated metadata from STANAG 4545 files and return to the client the images in a browser-supported format (e.g. JPEG) and all the image metadata (in XML format). This functionality shall be available through a REST API.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-131] The Presentation-conditioning Service shall include (see Note below) a video conditioning service that implements Dynamic Adaptive Streaming over HTTP (DASH), i.e. MPEG-DASH (ISO/IEC 23009-1:2012) for streaming video and STANAG 4609 metadata to web browser client applications.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[76] Note: The software for this functionality will be provided as Purchaser Furnished Item (PFI) source code and the work will be to include and adapt this PFI to run within the Presentation-conditioning Service. The PFI source code could possible also be used in support of [FBE-31].

3.2.3 Data Analytics Service

3.2.3.1 API

[FBE-132] The Data Analytics Service shall implement all the server-side functionality (i.e. anything not user-interface related) to fulfil the user stories [US 53], [US 54], [US

56] and [US 57] with backend-relevant acceptance criteria as defined in [INTEL-FS2-UserStories].

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-133] The Data Analytics Service shall expose its functionalities though a REST API.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-134] The Data Analytics Service shall support common graph analytic functions by exposing a graph query language (preferably compliant with the emerging Graph Query Language (GQL) standard) through the REST API.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-135] The Data Analytics Service shall have support for saving and managing (create, read, update, delete, rename) graph query criteria as named queries. The named graph queries can be private to the client (security principal) or public (available to all users).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-136] The Data Analytics Service shall have support for saving and managing (create, read, update, delete, rename) specific analysis and the analysis results in containers file (e.g. zip file). The analysis file shall be able to store the queries and filters applied to the I2BE repository to define and constrain the data set to be used for the analysis, miscellaneous text segments/ reports (e.g. as Microsoft Word file) describing analysis findings, images/ screenshots, and other client requested files (e.g. layout information for analysis views). The analysis files shall be private to the client (security principal).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-137] The Data Analytics Service shall constrain the graph query result set to match the client's (security principal) privileges (e.g. the client shall never receive a graph query results that he/ she is not authorized for).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.3.2 Data analytics

[FBE-138] The Data Analytics Service shall have support for synonym searches using configurable synonym rules.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-139] The Data Analytics Service shall include centrality function, for a specified set of nodes (IIEs), to support calculation of Betweeness Centrality, Closeness Centrality, Degree Centrality, and Eigenvector Centrality.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-140] The Data Analytics Service shall include a shortest path function that for two nodes (IIEs) calculate the shortest path between them.
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-141] The Data Analytics Service shall include a nodes similarity function that compares a set of nodes based on the nodes they are connected to (i.e. two nodes are considered similar if they share many of the same neighbours).
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-142] The Data Analytics Service shall include a function for generating geo-referenced heat maps in a common format (e.g. in KML). The heat maps generation shall be possible for any IIE type with temporal and spatial attributes. Two types of heat maps shall be supported: frequency-based and concentration-based.
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-143] The Data Analytics Service shall have support for calculating intersections between one or many nodes and one or many Geospatial and Features and report whether nodes are inside or outside the specified areas. Supported area types shall include circles/ ellipse, rectangles, and polygons.
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.4 Collection Requirement (CR) Management (CRM) Service

[77] The information to be managed by this service is identified in the [INTEL-FS2-IM] in the NATO::JISR::Staff::IRMCM::CM:CRM package.

3.2.4.1 API

[FBE-144] The CRM Service shall through the OData REST API support all IIE access actions on CRM data (for an authorized client).
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-145] The CRM Service shall implement all the server-side functionality (i.e. anything not user-interface related) to fulfil the user stories [US 47], and [US 74] through [US 79] with backend-relevant acceptance criteria as defined in [INTEL-FS2-UserStories].
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-146] The CRM Service shall after a create, update or delete change to CRM data, post an event message to the SOA & IdM Platform as a notification that a change has occurred where the event message carry information on the type of IIE, identification of the changed IIE, and the type of change.
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-147] The CRM Service API shall enable clients to manage a distributed CR requesting process (through the underlying choreography tasking message mechanism) that

includes submitting and stopping a request, forwarding the request to other ONs for action (or for information), etc.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.4.2 Priority scheme calculation

[FBE-148] The CRM Service shall calculate the requirement ranking and scores for a set of CRs based on the chosen prioritization scheme. The ranking and score shall be available for clients through the OData client API.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.4.3 Transformation of CRs to NVG

[FBE-149] The CRM Services shall, upon a client request, transform a set of client specified CRs, transform the set of CRs with all relevant attributes to the [NVG] format and return the transformed data as a [NVG] file to the client.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.5 Collection Operations Management (COM) Service

[78] The information to be managed by this service is identified in the [INTEL-FS2-IM] in the NATO::JISR::Staff::IRMCM::CM:COM package.

3.2.5.1 API

[FBE-150] The COM Service shall through the OData REST API support all IIE access actions on COM data (for an authorized client).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-151] The COM Service shall implement all the server-side functionality (i.e. anything not user-interface related) to fulfil the user stories [US 82] through [US 87] with backend-relevant acceptance criteria as defined in [INTEL-FS2-UserStories].

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-152] The COM Service shall after a create, update or delete change to COM data, post an event message to the SOA & IdM Platform as a notification that a change has occurred where the event message carry information on the type of IIE, identification of the changed IIE, and the type of change.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-153] The COM Service API shall enable clients to manage a distributed COM tasking process (through the underlying choreography tasking message mechanism).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.6 JIPOE Service

[79] The information to be managed by this service is identified in the [INTEL-FS2-IM] in the NATO::JISR::Staff::JIPOE package and in the NATO::BMD::Staff::JIPOE package.

3.2.6.1 API

[FBE-154] The JIPOE Service shall through the OData REST API support all access actions on JIPOE-type IIEs (for an authorized client).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-155] The JIPOE Service shall implement all the server-side functionality (i.e. anything not user-interface related) to fulfil the user stories [US-36] through [US-46] with backend-relevant acceptance criteria as defined in [INTEL-FS2-UserStories].

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-156] The JIPOE Service shall after a create, update or delete change to any JIPOE-type IIE, post an event message to the SOA & IdM Platform as a notification that a change has occurred where the event message carry information on the type of IIE, identification of the changed IIE, and the type of change.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-157] The JIPOE services shall provide a service for creating and managing (update and delete) named multi-criteria comparison rule sets.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.2.7 Terrain & Mobility Analysis Service

[80] Note: Within this section the Terrain & Mobility Analysis Service is, for readability, generally referred to simply as “the Service”.

3.2.7.1 Generating terrain & mobility analysis overlays

[FBE-158] The Terrain & Mobility Analysis Service shall implement a Terrain Analysis function that upon a client request generates one or several overlays that depicts the areas where BM Units can reach and from which BM Units can operate. The service shall use the input parameters as defined in the table below and matching against geographical data calculate the possible operational areas (e.g. by greying out the no-go areas).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

Table 3-2 Parameters provided by client when requesting a Terrain Analysis

Input Parameter	Remarks
Coverage area	Geographical area defined by a BMOA to constrain the analysis
Vehicle weights, heights, and widths	Maximum vehicle weights, heights, and widths from BM TECHINT to be matched against road network constraints (e.g. bridges, tunnels, small roads, etc.)

Vehicle turning radius	
Vehicle off-road ability/ Land use	This should include information on type of terrain where the vehicles can go off-road (e.g. sand, snow, wetland, etc.)
Maximum off-road distance	E.g. measured in kilometers
Slope limitations (degrees)	Maximum slope the vehicles can travel from BM TECHINT to be matched against road network data and terrain elevation data (in case the vehicles can go off-road)

[81] A Mobility Analysis is a variant of the Terrain Analysis and will most likely involve similar calculations, but taking into account the relocation speed of the vehicle. The difference is that while the Terrain Analysis focus on where a BM Unit can travel (typically within a BMOA), the focus of the Mobility Analysis is to detect how far a BM unit can travel as a function of time.

[FBE-159] The Service shall implement a Mobility Analysis function that upon a client request generates one or several overlays that depicts how far the BM Units can reach for a set of time intervals (e.g. within 1 hour, within 1 day, within a week etc.) as illustrated in the figure below (in this example the ranges are in minutes). The function shall use the input parameters as defined in the table below and matching against geographical data calculate the mobility ranges. The coloured range areas shall only depict areas that is accessible by the vehicles from the starting position (e.g. if a bridge is not dimensioned to support the vehicles, the mobility analysis shall show that the vehicles cannot cross the bridge).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

Figure 3-1 Terrain and Mobility analysis with ranges

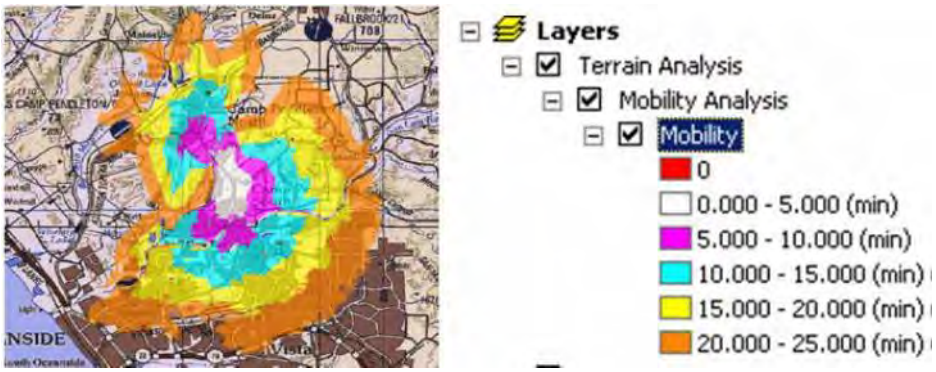

Table 3-3 Parameters provided by client when requesting a Mobility Analysis

Input Parameter	Remarks
Start position	Geographical location from which the BM Unit will start the movement
Time increments	In unit and extent (e.g. in 5 hour increments)
Vehicle relocation speed on roads	Average/ expected road speed of vehicle from BM TECHINT
Vehicle relocation speed off roads	Average/ expected off-road speed
Vehicle weights,	Maximum vehicle weights, heights, and widths from BM TECHINT

heights, and widths	to be matched against road network constraints (e.g. bridges, tunnels, small roads, etc.)
Vehicle off-road ability/ Land use	This should include information on type of terrain where the vehicles can go off-road (e.g. sand, snow, wetland, etc.)
Maximum off-road distance	E.g. measured in kilometers
Slope limitations (degrees)	Maximum slope the vehicles can travel from BM TECHINT to be matched against road network data and terrain elevation data (in case the vehicles can go off-road)

[FBE-160] The Service shall be implemented as OGC Web Processing Services (WPS).
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[82] Note: The Terrain Analysis WPS and the Mobility Analysis WPS should be implemented for being hosted within the NATO CoreGIS system

[FBE-161] The JIPOE services shall support collaboration on Courses of Action artefacts prior to these being approved and published.
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3 System Administration (SysAdm) tool

[83] For the operations and maintenance of the I2BE a System Administration (SysAdm) tool will be required.

[84] The SysAdm tool can include off-the-shelf and/ or customized applications with dedicated user interfaces for the administration tasks, and/ or include a number command line applications/ scripts.

[85] Note: In the current INTEL-FS Spiral 1, the usage of PowerShell scripts is often the preferred way to efficiently execute system administration/ maintenance tasks.

[GBE-81] The SysAdm tool shall be using English as language for all user interaction.
Verification: Demonstration

[GBE-82] The SysAdm tool shall comply with the NFRs as defined in the table below.
Verification: Demonstration

Table 3-4 Applicable NFRs (SysAdm tool)

Qualities	NFRs
Co-existence	[NFR-13]

3.3.1 Configurations and setup management functions

3.3.1.1 Manage data repositories

[FBE-162] The SysAdm tool shall enable an Authorized Administrator to create many data repositories where each repository is identified by a name (e.g., 'Exercise XYZ')).
Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-163] The SysAdm tool shall enable an Authorized Administrator to archive a data repository, be able to restore a previously archived data repository (without any data loss or data alteration), and be able to delete a data repository.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.1.2 Manage organizational nodes (ON)

[FBE-164] The SysAdm tool shall enable an Authorized Administrator to create ONs and to configure the ON Zulu offset to ensure that timestamps are correctly captured at the ON.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[86] The Zulu Offset will be used as required to compute the correct Zulu time (i.e., Greenwich Mean Time) from local time settings and to display the correct local time (as required) computed from the Zulu times recorded in the data.

3.3.1.3 Manage report templates

[FBE-165] The SysAdm tool shall enable an Authorized Administrator to create and update report templates to provide users with templates for producing reports.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-166] The SysAdm tool shall enable an Authorized Administrator to create, update, delete, and name global search criteria that will be accessible to users to use for their searches.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.1.4 Manage synonym rules

[FBE-167] The SysAdm tool shall enable an Authorized Administrator to update synonym rules used for searching and graph querying.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.1.5 Manage gazetteers

[FBE-168] The SysAdm tool shall enable an Authorized Administrator to add or delete a gazetteer for an ON, and to specify the default gazetteer for the ON.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-169] The SysAdm tool shall enable an Authorized Administrator to create, edit and maintain gazetteer information, including maintaining gazetteer entries (i.e. Place Name, Country, Region, Sub-region, Location).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-170] The SysAdm tool shall enable an Authorized Administrator to import a gazetteer from a file.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-171] The SysAdm tool shall enable an Authorized Administrator to configure the I2BE to use gazetteer with fictitious nation data sets, including fictitious country names and fictitious country codes.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.2 Domain-values management functions

[87] Note: The different ONs will have different needs for domain values and hence the domain value set is customized for each ON.

3.3.2.1 Create/ update domain values

[FBE-172] The SysAdm tool shall enable an Authorized Administrator to centrally manage domain tables and domain values for all ONs. This includes the ability to create new domain values, and configuring which domain values that shall be hidden/ unhidden for individual ONs.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-173] The SysAdm tool shall enable an Authorized Administrator to view all domain values in table views where the hidden/ unhidden state of each value for each of the ONs are displayed. The Authorized Administrator shall be able to sort and filter these table views, and be able to make changes to one or many values in the table in a single operation.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-174] The SysAdm tool shall enable an Authorized Administrator or Authorized Reference Data Manager to search for and filter domain values to ease the maintenance work (find and update).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.2.2 Import/ export of domain values

[FBE-175] The SysAdm tool shall enable an Authorized Administrator to import domain values from files in a structured file format and export domain values to files in structured file formats.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.2.3 Synchronization with Information Model

[FBE-176] The SysAdm tool shall have support for synchronizing updates to the domain tables and domain values with the Information Model (see [INTEL-FS2-IM]).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.3 Content management functions

3.3.3.1 Import from files

[FBE-177] The SysAdm tool shall enable an Authorized Administrator to import an ORBAT (e.g. an ISR ORBAT) consisting of Actors and Assets/ Systems with subordination information from a set of comma separated files (CSV), XML or JSON, into a specified data set (Operational Exercise, Training, etc.). The tool shall allow the System Administrator to map columns in the files to the appropriate IIE attribute and automatically extract the BSOs representing Units, the Assets/ Systems, and extract the relationships between the BSOs. Ultimately, the tool shall allow the System Administrator to verify that there is no conflict with the information already in the I2BE data set and subsequently “bulk import” the entire ORBAT and associated Units and Assets/ Systems. In case the validation of the data prior to import finds issue with the data, then the issues shall be identified and reported to the System Administrator to enable corrective actions.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-178] The SysAdm tool shall enable an Authorized Administrator to import BSO data, including relationships between the BSOs, and all BSRs associated with the BSOs from files in a structured data format into a specified data set (Operational Exercise, Training, etc.) The tool shall allow the System Administrator to map elements in the files to the appropriate IIE attribute and automatically extract the BSOs, their BSRs, and the relationships between the BSOs. Ultimately, the tool shall allow the System Administrator to verify that there is no conflict with the information already in the I2BE data set and subsequently “bulk import” all the BSOs with BSRs and also BSO-BSO relationships. In case the validation of the data prior to import finds issue with the data, then the issues shall be identified and reported to the System Administrator to enable corrective actions.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-179] The SysAdm tool shall enable an Authorized Administrator to import Products from comma separated files (CSV), XML or JSON, into a specified data set (Operational Exercise, Training, etc.). The tool shall allow the System Administrator to map columns in the files to the appropriate IIE attribute and automatically extract the Product. Ultimately the tool shall allow the System Administrator to verify that there is no conflict with the information already in the I2BE data set and subsequently “bulk import” a potentially large set of Products where also the Product attachments are fetched and pushed into the I2BE data set. In case the validation of the data prior to import finds issue with the data, then the issues shall be identified and reported to the System Administrator to enable corrective actions.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-180] The SysAdm tool shall include an “undo function” that restores the data repository to the state before the bulk upload was executed (i.e. completely removes all the bulk-uploaded items).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.3.2 Delete and undelete

[FBE-181] The SysAdm tool shall enable an Authorized Administrator to search and filter for soft-deleted entities, and then multi-select and hard-delete (permanently delete) such soft-deleted entities.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.3.3 Backup & restore

[FBE-182] The SysAdm tool shall enable an Authorized Administrator to configure automatic backup of the entirety of an I2BE instance. It shall be possible to configure the frequency of and/ or time of day incremental backups and full backups.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-183] The SysAdm tool shall enable an Authorized Administrator to manually command an incremental backup, and to manually command a full backup.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-184] The SysAdm tool shall enable an Authorized Administrator to fully restore an I2BE instance from backups.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.4 Diagnostics functions

3.3.4.1 Log files

[FBE-185] The SysAdm tool shall enable an Authorized Administrator to access log created by all I2BE produced Integration Services. (Note: This is particularly important for the audit trail checks of cross domain exchange between I2BE instances).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-186] The SysAdm tool shall enable the System Administrator to access and inspect/ analyse log data from all the I2BE services.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-187] The SysAdm tool shall enable an Authorized Administrator to configure the services logging functions (e.g. logging level, log file sizes, log file retention, etc.)

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-188] The SysAdm tool shall enable an Authorized Administrator to archive log files from each of the I2BE services and I2BE provided Integration Services.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.4.2 Usage and performance indicators statistics

[FBE-189] The SysAdm tool shall enable an Authorized Administrator to analyse the usage of the I2BE services OData API by accessing usage statistics; e.g. which part of the API is heavily used, which parts are not used much, usage peaks, average number of activation calls, historical trends, etc. The statistical numbers must be separable by access operations (Create, Read, Update, and Delete) and by ONs.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-190] The SysAdm tool shall enable an Authorized Administrator to analyse the performance of the individual I2BE services. In particular, statistical data measuring the I2BE compliance with the NFR response time requirements shall be available for analysis through the SysAdm tool.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-191] The SysAdm tool shall enable an Authorized Administrator to specify relevant performance thresholds/ criteria for the services. I.e. thresholds that triggers corrective actions through the Enterprise SMC.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.4.3 Synchronization health check

[FBE-192] The SysAdm tool shall enable an Authorized Administrator to select any two I2BE instances and perform repository comparisons. It shall be possible check the entire repositories, and it shall be possible with more focussed comparisons limited by IIE type, time window, and other IIE filtering attributes. Any discrepancies in these checks shall be reported by the tool including the option to repair the discrepancy.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

3.3.5 Notification function

3.3.5.1 Broadcasting notification messages

[FBE-193] The SysAdm tool shall enable an Authorized Administrator to write messages (intended to be read by users) and broadcast them using the I2BE Notification Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4 Integration Service Requirements

4.1 Integration services - I2BE destination

[88] The focus of the deliverables described in this section is to implement a number of dedicated Integration Services for bringing information into I2BE.

4.1.1 Central Card Catalogue (CCC) Import Service

[89] The CCC is the mechanism by which the BICES nations are sharing intelligence data. Basically the CCC is a File Transfer Protocol (FTP) server that is exchanging library cards in the [IPIWG] format where the library cards are describing the intelligence products.

4.1.1.1 Extract, transform, load products

[FBE-194] The CCC Import Service shall at regular intervals (where the interval frequency shall be configurable), poll the CCC for new products (i.e. product metadata, product file, and other attachments). It shall be possible through a configurable filter setting to filter the products that are extracted from the CCC.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-195] The CCC Import Service shall transform the extracted product metadata into a format that is compliant with the OData REST API implemented by the Products Management Service and load the products (i.e. the metadata, the product file, and any attachments) into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-196] The CCC Import Service shall identify associations the extracted products are part of, collect additional information on these associations, and transform those associations into a format that is compliant with the OData REST API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.1.2 Extract, transform, load RFI data

[FBE-197] The CCC Import Service shall at regular intervals (where the interval frequency shall be configurable), poll the CCC for new RFI data. It shall be possible through a configurable filter setting to filter the RFI data that are extracted from CCC.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-198] The CCC Import Service shall transform the extracted RFI data into a format that is compliant with the OData REST API implemented by the IRM Service and load the transformed RFI data into the I2BE through the IRM Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-199] The Import Service shall identify associations the extracted RFI data are part of, collect additional information on these associations, and transform those

associations into a format that is compliant with the OData REST API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.2 ETEE Import Service

[90] In support of exercises the Education Training Exercise and Evaluation (ETEE) will at scripted times in the exercise provide products to be ingested into INTEL-FS. The expected mechanism for INTEL-FS to receive messages with pre-canned (prepared in advance) products will be through the SOA & IdM Platform.

4.1.2.1 Extract, transform, load products from ETEE

[FBE-200] The ETEE Import Service shall when receiving a ETEE message (dedicated for INTEL-FS), transform (if required) the information in the message into a format that is compliant with the OData REST API implemented by the Products Management Service and load the transformed products into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.3 NATO CSD IPL Import Service

[91] The NATO CSD ISR Product Library (IPL) will contain product type data of type documents/ reports, images, and video clips. The interfaces to the NATO CSD IPL are defined by [AEDP-17].

4.1.3.1 Extract, transform, load products

[FBE-201] The NATO CSD IPL Import Service shall at regular intervals (where the interval frequency shall be configurable), poll the NATO CSD IPL for products or product updates that are not already in the I2BE. It shall be possible through a configurable filter setting to filter the products to be extracted from NATO CSD IPL. Note: in this context ‘product’ means the product metadata, product file, and all attachments (e.g. related files).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-202] The NATO CSD IPL Import Service shall transform the extracted product metadata into a format that is compliant with the OData REST API implemented by the Products Management Service and load the products (i.e. the metadata, the product file, and any attachments) into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-203] The NATO CSD IPL Import Service shall identify associations the extracted products are part of, collect additional information on these associations, and transform those associations into a format that is compliant with the OData REST

API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.4 NATO CSD Geospatial and Features Import Service

[92] The purpose of this service is to import Geospatial and Features from the NATO CSD into INTEL-FS Spiral 2 (i.e. the I2BE) through an extract, transform, load (ETL) process.

4.1.4.1 Extract, transform, load geographical areas

[93] The NATO CSD implements an OData REST API for accessing its entities. This API (called the JIEService) is described in appendix A.2.1.9 in [NCSD-IWS-SDS].

[FBE-204] The NATO CSD Geospatial and Features Import shall be configurable so that it can be connected to multiple NATO CSD servers where each NATO CSD server contains a specific data set representing either OPERATIONAL, EXERCISE, or TRAINING data. Through the ETL process the NATO CSD Geospatial and Features Import Service shall load the transformed NATO CSD data into the corresponding data set {OPERATIONAL, EXERCISE, or TRAINING} in the I2BE.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-205] The NATO CSD Geospatial and Features Import Service shall be able to extract Geospatial and Features from the NATO CSD by polling the NATO CSD at regular intervals (where the interval frequency shall be configurable).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-206] The NATO CSD Geospatial and Features Import Service shall implement WS-Notification (see [AI 06.02.08] and [AI 06.02.10]) subscriptions for changes to geographic areas of interest (GAOI) in the NATO CSD and upon detecting a GAOI changes, extract the Geospatial and Features from the NATO CSD.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-207] It shall be possible through a configurable filter setting, to filter the geographic areas that shall be extracted from NATO CSD. The service shall be able to detect Geospatial and Features updates originating from the I2BE and not import those (to prevent export-import loops).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-208] The NATO CSD Geospatial and Features Import Service shall transform the extracted geographic areas into a format that is compliant with the OData REST API implemented by the Geospatial and Features Service and load the transformed Geospatial and Features into the I2BE through the Geospatial and Features Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-209] The NATO CSD Geospatial and Features Service shall identify associations the extracted geographic areas are part of, extract additional information on these

associations, and transform those associations into a format that is compliant with the OData REST API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.5 NATO CSD ISR Organizations Import Service

[94] The purpose of this service is to import ISR organization from the NATO CSD into INTEL-FS Spiral 2 (i.e. the I2BE) through an extract, transform, load (ETL) process.

4.1.5.1 Extract, transform, load ISR organizations

[95] The NATO CSD implements an OData REST API for accessing its entities. This API is described in appendix A.2.1.9 in [NCSD-IWS-SDS].

[FBE-210] The NATO CSD Organizations Import shall be configurable so that it can be connected to multiple NATO CSD servers where each NATO CSD server contains a specific data set representing either OPERATIONAL, EXERCISE, or TRAINING data. Through the ETL process the NATO CSD Organizations Import Service shall load the transformed NATO CSD data into the corresponding data set {OPERATIONAL, EXERCISE, or TRAINING} in the I2BE.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-211] The NATO CSD ISR Organizations Import Service shall be able to extract ISR organization data from the NATO CSD by polling the NATO CSD at regular intervals (where the interval frequency shall be configurable).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-212] The NATO CSD ISR Organizations Import Service shall implement WS-Notification (see [AI 06.02.08] and [AI 06.02.10]) subscriptions for changes to ISR organizations in the NATO CSD and upon detecting ISR organization changes, extract the ISR organization data from the NATO CSD.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-213] It shall be possible through a configurable filter setting, to filter the ISR organizations that shall be extracted from NATO CSD. The service shall be able to detect ISR organization data updates originating from the I2BE and not import that data (to prevent export-import loops).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-214] The NATO CSD ISR Organizations Import Service shall transform the extracted ISR organization data (with all its substructures including ORBAT, units, ISR systems, ISR asset status, command relationships, and locations) into a format that is compliant with the OData REST API implemented by the ISR Organizations Service and load the transformed ISR organization data into the I2BE through the ISR Organizations Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-215] The NATO CSD ISR Organizations Import Service shall identify associations the extracted ISR organization data are part of, extract additional information on these associations, and transform those associations into a format that is compliant with the OData REST API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.6 NATO CSD IRM Data Import Service

[96] The purpose of this service is to import IRM data from the NATO CSD into INTEL-FS Spiral 2 (i.e. the I2BE) through an extract, transform, load (ETL) process.

4.1.6.1 Extract, transform, load IRM data

[97] The NATO CSD implements an OData REST API for accessing its entities. This API is described in appendix A.2.1.9 in [NCSD-IWS-SDS].

[FBE-216] The NATO CSD IRM Data Import shall be configurable so that it can be connected to multiple NATO CSD servers where each NATO CSD server contains a specific data set representing either OPERATIONAL, EXERCISE, or TRAINING data. Through the ETL process the NATO CSD IRM Data Import Service shall load the transformed NATO CSD data into the corresponding data set {OPERATIONAL, EXERCISE, or TRAINING} in the I2BE.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-217] The NATO CSD IRM Import Service shall be able to extract IRM data (ICP, RFIs, RFI choreography tasking information, and products associated with requirements and RFIs) from the NATO CSD by polling the NATO CSD at regular intervals (where the interval frequency shall be configurable).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-218] The NATO CSD IRM Import Service shall implement WS-Notification (see [AI 06.02.08] and [AI 06.02.10]) subscriptions for all types of changes to IRM data in the NATO CSD and upon detecting IRM data changes, extract the IRM data from the NATO CSD.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-219] It shall be possible through a configurable filter setting, to filter the IRM data that shall be extracted from NATO CSD. The service shall be able to detect IRM data updates originating from the I2BE and not import that data (to prevent export-import loops).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-220] The NATO CSD IRM Import Service shall transform the extracted IRM data into a format that is compliant with the OData REST API implemented by the IRM Service and load the transformed IRM data into the I2BE through the IRM Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-221] The NATO CSD IRM Import Service shall identify associations the extracted IRM data are part of, extract additional information on these associations, and transform those associations into a format that is compliant with the OData REST API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.7 NATO CSD CRM Data Import Service

4.1.7.1 Extract, transform, load CRM data

[98] The NATO CSD implements an OData REST API for accessing its entities. This API is described in appendix A.2.1.9 in [NCSD-IWS-SDS].

[FBE-222] The NATO CSD CRM Data Import shall be configurable so that it can be connected to multiple NATO CSD servers where each NATO CSD server contains a specific data set representing either OPERATIONAL, EXERCISE, or TRAINING data. Through the ETL process the NATO CSD CRM Data Import Service shall load the transformed NATO CSD data into the corresponding data set {OPERATIONAL, EXERCISE, or TRAINING} in the I2BE.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-223] The NATO CSD CRM Import Service shall be able to extract CRM data (CRs, ISR Requests, and ISR Request choreography tasking information) from the NATO CSD by polling the NATO CSD at regular intervals (where the interval frequency shall be configurable).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-224] The NATO CSD CRM Import Service shall implement WS-Notification (see [AI 06.02.08] and [AI 06.02.10]) subscriptions for all types of changes to CRM data in the NATO CSD and upon detecting CRM data changes, extract the CRM data from the NATO CSD.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-225] It shall be possible through a configurable filter setting, to filter the CRM data that shall be extracted from NATO CSD. The service shall be able to detect CRM data updates originating from the I2BE and not import that data (to prevent export-import loops).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-226] The NATO CSD CRM Import Service shall transform the extracted CRM data into a format that is compliant with the OData REST API implemented by the CRM Service and load the transformed CRM data into the I2BE through the CRM Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-227] The NATO CSD CRM Import Service shall identify associations the extracted CRM data are part of, extract additional information on these associations, and transform those associations into a format that is compliant with the OData REST API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.8 NATO CSD COM Data Import Service

4.1.8.1 Extract, transform, load COM data

[99] The NATO CSD implements an OData REST API for accessing its entities. This API is described in appendix A.2.1.9 in [NCSD-IWS-SDS].

[FBE-228] The NATO CSD COM Data Import shall be configurable so that it can be connected to multiple NATO CSD servers where each NATO CSD server contains a specific data set representing either OPERATIONAL, EXERCISE, or TRAINING data. Through the ETL process the NATO CSD COM Data Import Service shall load the transformed NATO CSD data into the corresponding data set {OPERATIONAL, EXERCISE, or TRAINING} in the I2BE.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-229] The NATO CSD COM Import Service shall be able to extract COM data (CXPs, collection tasks, exploitation tasks, and the choreography tasking information) from the NATO CSD by polling the NATO CSD at regular intervals (where the interval frequency shall be configurable).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-230] The NATO CSD COM Import Service shall implement WS-Notification (see [AI 06.02.08] and [AI 06.02.10]) subscriptions for all types of changes to COM data in the NATO CSD and upon detecting COM data changes, extract the COM data from the NATO CSD.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-231] It shall be possible through a configurable filter setting, to filter the COM data that shall be extracted from NATO CSD. The service shall be able to detect COM data updates originating from the I2BE and not import that data (to prevent export-import loops).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-232] The NATO CSD COM Import Service shall transform the extracted COM data into a format that is compliant with the OData REST API implemented by the COM Service and load the transformed COM data into the I2BE through the COM Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-233] The NATO CSD COM Import Service shall identify associations the extracted COM data are part of, extract additional information on these associations, and transform those associations into a format that is compliant with the OData REST API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9 APP11-D Reports Import Service

4.1.9.1 Extract, transform, load APP11-D reports

[FBE-234] The APP11-D Reports Import Service shall be able to receive/ obtain the set of ADatP-3 messages in APP11-D XML format defined in the table below as messages from the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

Table 4-1 ADatP-3 messages (in APP11-D XML format) to be received

Message	Description	XML message format definition
AEW_MISREP	Airborne Early Warning Mission Report	[APP11D-AEW_MISREP]
AIRINTREP	Air Intelligence Report	[APP11D-AIRINTREP]
ASSESSREP	Commanders Assessment Report	[APP11D-ASSESSREP]
BOMBWARN	Bomb Threat Warning	[APP11D-BOMBWARN]
CIINTREP	Counter-Intelligence and Security Report	[APP11D-CIINTREP]
CIINTSUM	Counter-Intelligence and Security Summary	[APP11D-CIINTSUM]
CISUPINTREP	Counter-Intelligence and Security Supplementary Report	[APP11D-CISUPINTREP]
ENSITREP	Enemy Land Forces Situation Report	[APP11D-ENSITREP]
EVENTREP	Events Report	[APP11D-EVENTREP]
FIRST_HOSTILE_ACT	First Hostile Act Report	[APP11D-FHOSTILEACT]
INCREP	Incident Report	[APP11D-INCREP]
INCSPOTREP	Incident Spot Report	[APP11D-INCSPOTREP]
INTREP	Intelligence Report	[APP11D-INTREP]
INTSUM	Intelligence Summary	[APP11D-INTSUM]
MARINTREP	Maritime Intelligence Report	[APP11D-MARINTREP]

MARINTSUM	Maritime Intelligence Summary	[APP11D-MARINTSUM]
MISREP	Mission Report	[APP11D-MISREP]
OWNSITREP	Own Land Forces Situation Report	[APP11D-OWNSITREP]
PWINTERREP	Prisoner of War Interrogation Report	[APP11D-PWINTERREP]
SUPINTREP	Supplementary Intelligence Report	[APP11D-SUPINTREP]

[100] As INTEL-FS will be one of the first NATO applications that will be hosted on the SOA & IdM Platform there most likely initially will not be any producers of ADatP-3 APP11-D report messages on the SOA & IdM Platform. To enable testing of the APP11-D Reports Import Services, it will be necessary to implement test functions that produces the ADatP-3 messages as defined in the table above.

[101] For each of the received APP11-D messages the service will transform the message into a readable report in a PDF file. To make these generated report documents intelligible the XML tags in the reports should be used as contextual labels in the report documents, e.g. <CountryCode>USA</CountryCode> in the message should be presented as “Country Code: USA”, etc. in the report PDF file.

4.1.9.1.1 AEW_MISREP

[FBE-235] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-AEW_MISREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-236] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-AEW_MISREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.2 AIRINTREP

[FBE-237] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-AIRINTREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-238] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-AIRINTREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.3 ASSESSREP

[FBE-239] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-ASSESSREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-240] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-ASSESSREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.4 BOMBWARN

[FBE-241] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-BOMBWARN] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-242] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-BOMBWARN] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.5 CIINTREP

[FBE-243] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-CIINTREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in

the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-244] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-CIINTREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.6 CIINTSUM

[FBE-245] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-CIINTSUM] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-246] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-CIINTSUM] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.7 CISUPINTREP

[FBE-247] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-CISUPINTREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-248] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-CISUPINTREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.8 DIR

[FBE-249] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-DIR] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant

with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-250] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-DIR] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.9 ENSITREP

[FBE-251] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-ENSITREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-252] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-ENSITREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.10 EVENTREP

[FBE-253] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-EVENTREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-254] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-EVENTREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.11 FIRST_HOSTILE_ACT

[FBE-255] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-FHOSTILEACT] message into a readable PDF file, and also map/

transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-256] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-FHOSTILEACT] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.12 INCREP

[FBE-257] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-INCREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-258] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-INCREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.13 INCSPOTREP Transform and Re-publish Integration Service

[FBE-259] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-INCSPOTREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-260] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-INCSPOTREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.14 INTREP

[FBE-261] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-INTREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-262] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-INTREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.15 INTSUM

[FBE-263] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-INTSUM] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-264] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-INTSUM] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.16 MARINTREP

[FBE-265] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-MARINTREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-266] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-MARINTREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.17 MARINTSUM

[FBE-267] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-MARINTSUM] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-268] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-MARINTSUM] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.18 MISREP

[FBE-269] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-MISREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-270] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-MISREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.19 OWNSITREP

[FBE-271] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-OWNSITREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently

load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-272] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-OWNSITREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.20 PWINTERREP

[FBE-273] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-PWINTERREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-274] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-PWINTERREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.9.1.21 SUPINTREP

[FBE-275] The APP11-D Reports Import Service shall transform the received/ extracted [APP11D-SUPINTREP] message into a readable PDF file, and also map/ transform the message metadata, to the maximum extent feasible, into a format that is compliant with the OData REST API implemented by the Products Management Service for APP-11 type of products (see NATO::JISR::Staff::Product::APP-11 in the [INTEL-FS2-IM]), and subsequently load the transformed message into the I2BE through the Products Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-276] To support testing, the ADatP-3 Integration Services shall include a test function that fully populates [APP11D-SUPINTREP] messages and publish/ send them on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.10 Air ORBAT Import Service

4.1.10.1 Extract, transform, load ORBATAIR

[FBE-277] The Air ORBAT Import Service shall when receiving a [APP11D-ORBATAIR] message on the SOA & IdM Platform, transform the message into a format that is compliant with the OData REST API implemented by the ORBAT Management Service and load the transformed Air ORBAT into the I2BE through the ORBAT Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-278] To support testing, the Air ORBAT Import Service shall also include a separate test function that fully populates and send [APP11D-ORBATAIR] messages on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.11 Land ORBAT Import Service

4.1.11.1 Extract, transform, load ORBATLAND

[FBE-279] The Land ORBAT Import Service shall when receiving a [APP11D-ORBATLAND] message on the SOA & IdM Platform, transform the message into a format that is compliant with the OData REST API implemented by the ORBAT Management Service and load the transformed Land ORBAT into the I2BE through the ORBAT Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-280] To support testing, the Land ORBAT Import Service shall also include a separate test function that fully populates and send [APP11D-ORBATLAND] messages on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.12 Maritime Task Organization Import Services

[102] Maritime C2 information is obtained through the Maritime C2 Information Exchange [MARIX] RESTful services.

[103] Note:

(1) The Maritime ORBAT is referred to as Task Organization.
(2) INTEL-FS2 will be the authoritative data source for the red ORBAT, but it will also need to import blue ORBAT data originating from C2 systems.

4.1.12.1 Extract, transform, load Maritime Task Organization

[FBE-281] The Maritime Task Organization Import Service shall at regular intervals (where the interval frequency shall be configurable), poll the [MARIX] services for updates to the maritime task organization. It shall be possible through a configurable filter

setting to filter the maritime task organization data to be extracted through the [MARIX] services.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-282] The Maritime Task Organization Import Service shall transform the extracted maritime task organization data into a format that is compliant with the OData REST API implemented by the ORBAT Management Service and load the transformed maritime task organization data into the I2BE through the ORBAT Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.13 NJTS Import Service

4.1.13.1 Extract, transform, load NJTS target data

[FBE-283] The NJTS Import Service shall at regular intervals (where the interval frequency shall be configurable), poll the NJTS for new target data (including target lists and target folders with all their content). In the case that NJTS publishes event messages to the SOA & IdM Platform whenever there is a change to its target data, then the NJTS Import Service shall subscribe to the NJTS messages to obtain the target data and/ or to trigger the polling of the target data. It shall be possible through a configurable filter setting to filter the target data to be extracted from NJTS.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[104] The NJTS system does not currently exist. According to NATO acquisition plans, the NJTS system will be delivered in the same timeframe as INTEL-FS Spiral 2. The NJTS interface is currently unspecified, but is expected to be implemented with a RESTful API.

[FBE-284] The NJTS Import Service shall transform the extracted target data into a format that is compliant with the OData REST API implemented by the Target Service and load the transformed target data into the I2BE through the Target Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-285] The NJTS Import Service shall identify associations to other IIEs in the extracted target data and transform those associations into a format that is compliant with the OData REST API implemented by the IIE to IIE Association Service and load the transformed IIE associations into the I2BE through the IIE to IIE Association Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.14 MIDB Import Service

[105] The Modernized Integrated Database (MIDB) contains different types of battlespace objects that after mediations will be imported into INTEL-FS2.

[106] Note: The MIDB interface to be used for this integration is not yet defined.

4.1.14.1 Extract, transform, load MIDB Unit and Equipment Holdings data

[FBE-286] The MIDB Import Service shall at regular intervals (where the interval frequency shall be configurable), or at discrete manually controlled points in time, poll the MIDB for new BSO data of type Units and Equipment Holdings. It shall be possible through a configurable filter setting to filter the BSO data to be extracted from MIDB (filtering options shall include timestamps, and location).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-287] The MIDB Import Service shall transform the extracted Unit and Equipment Holdings data into a format that is compliant with the OData REST API implemented by the BSO Management Service and load the transformed BSOs/ BSRs into the I2BE through the BSO Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.14.2 Extract, transform, load MIDB Places/ Facilities and Equipment Holdings

[FBE-288] The MIDB Import Service shall at regular intervals (where the interval frequency shall be configurable), or at discrete manually controlled points in time, poll the MIDB for new BSO data of type Places/Facilities and Equipment Holdings. It shall be possible through a configurable filter setting to filter the BSO data that are extracted from MIDB (filtering options shall include timestamps, and location).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-289] The MIDB Import Service shall transform the extracted Places/Facilities and Equipment Holdings data into a format that is compliant with the OData REST API implemented by the BSO Management Service and load the transformed BSOs/ BSRs into the I2BE through the BSO Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.14.3 Extract, transform, load MIDB Events

[FBE-290] The MIDB Import Service shall at regular intervals (where the interval frequency shall be configurable), or at discrete manually controlled points in time, poll the MIDB for new BSO data of type Event. It shall be possible through a configurable filter setting to filter the BSO data that are extracted from MIDB (filtering options shall include timestamps, and location).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-291] The MIDB Import Service shall transform the extracted Events data into a format that is compliant with the OData REST API implemented by the BSO Management Service and load the transformed BSOs/ BSRs into the I2BE through the BSO Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.14.4 Extract, transform, load MIDB Persons

[FBE-292] The MIDB Import Service shall at regular intervals (where the interval frequency shall be configurable), or at discrete manually controlled points in time, poll the MIDB for new BSO data of type Person. It shall be possible through a configurable filter setting to filter the BSO data that are extracted from MIDB (filtering options shall include timestamps, and location).

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-293] The MIDB Import Service shall transform the extracted Persons data into a format that is compliant with the OData REST API implemented by the BSO Management Service and load the transformed BSOs/ BSRs into the I2BE through the BSO Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.15 Asset Lists Import Service

4.1.15.1 Extract, transform, load asset lists

[FBE-294] The Asset Lists Import Service shall at regular intervals (where the interval frequency shall be configurable), poll the AirC2IS Asset List Services (see [AirC2IS ICD]) for updates to the asset lists. It shall be possible through a configurable filter setting to filter the asset list data to be extracted from AirC2IS.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-295] The Asset Lists Import Service shall transform the extracted asset list data into a format that is compliant with the OData REST API implemented by the JIPOE Service and load the transformed maritime task organization data into the I2BE through the JIPOE Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.16 Electronic Order of Battle (EOB) Import Service

[107] EOB and emitter TECHINT data is maintained by the NEDB-NG system. Information from NEDB-NG will be pulled at regular intervals and imported into INTEL-FS2 as encyclopaedic data (i.e. as “read-only” data).

[108] INTEL-FS will express EOB and emitter TECHINT data as specialised types of BSOs: Installations and facilities are specialisations of BSO places; electromagnetic emitters and platforms are specialisations of BSO equipment; electromagnetic parameters/ technical data (TECHINT) are specialisations of BSO equipment type

4.1.16.1 Extract, transform, load EOB data

[FBE-296] The EOB Import Service shall at regular intervals (where the interval frequency shall be configurable), poll the NEDB-NG system (see [CEOB-EF]) for new EOB

data. It shall be possible through a configurable filter setting to filter the EOB data that are extracted from NEDB-NG.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-297] The EOB Import Service shall transform the extracted EOB data into a BSO and BSO status report format that is compliant with the OData REST API implemented by the BSO Management Service and load the transformed EOB data into the I2BE through the BSO Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-298] The INTEL-FS Spiral1 BSO Migration Service shall through inspection of the extracted EOB data construct electronic ORBATs and transform the ORBAT data into a format that is compliant with the OData REST API implemented by the ORBAT Management Service and load the transformed electronic ORBAT into the I2BE through the ORBAT Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.1.17 BM Firing Event Import Service

[109] The Networked Interoperable Real-time Information Services (NIRIS) Web Services enables clients to access tactical data that NIRIS has obtained from tactical data link. Included in the NIRIS Web Services is a RESTful Track Service (see chapter 5 in [NIRIS-WS-ICD]) that provides tracks in JSON format via the HTTP REST protocol. The RESTful Track Service includes a track filtering mechanism implemented in a RESTful Query Language (RSQL).

4.1.17.1 Extract, transform, load NIRIS missile track data

[FBE-299] The BM Firing Event Import Service shall at regular intervals (where the interval frequency shall be configurable), poll the NIRIS RESTful Track Service for missile launch tracks, missile in-flight tracks, and missile impact tracks. It shall be possible through a configurable filter setting to filter the missile track data to be extracted from NIRIS.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-300] The BM Firing Event Import Service shall combine missile launch track data, missile in-flight track data, and missile impact data, and transform this combined data into a historical firing event format (see NATO::BMD::Battlespace::Action::Event::HFE in the [INTEL-FS2-IM]) that is compliant with the OData REST API implemented by the BSO Management Service and load the transformed missile track data into the I2BE through the BSO Management Service.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2 Integration services – I2BE

[309] The focus of the deliverables described in this section is to implement a number of dedicated Integration Services for exporting/ sharing information produced within I2BE to external applications and services.

4.2.1 Central Card Catalogue (CCC) Export Service

4.2.1.1 Export of products to CCC

[FBE-301] The CCC Export Services shall detect new products and updates to existing products, and then read the product information through the Product Management Services OData REST API, transform the product information (that includes embedding product files) to the [IPIWG] format and post the information to the CCC.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-302] It shall be possible to specify and refine filters for which products to export from I2BE to the CCC. The filtering options shall include filtering on data set (operational, training, exercise, etc.), geographical coverage areas, temporal data, source/ publisher, and classification/ releaseability, etc.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.1.2 Export of RFI data to CCC

[FBE-303] The CCC Export Services shall detect new RFIs and RFI responses, and updates to existing RFI and RFI responses, and then read the RFI and RFI responses information through the RFI Management Services OData REST API, transform the information (that includes embedding any attachments) to the [IPIWG] format and post the information to the CCC.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-304] It shall be possible to specify and refine filters for which RFIs and RFI responses to export from I2BE to the CCC. The filtering options shall include filtering on data set (operational, training, exercise, etc.), geographical coverage areas, temporal data, source/ publisher, and classification/ releaseability, etc.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.2 NATO CSD Export Service

[110] The NATO Coalition Shared Data (CSD) contains two components that I2BE will export data to: the ISR Product Library (IPL) , and the ISR Workflow Service (IWS)

[111] The NATO CSD contains a third component, the ISR Streaming Service. The I2BE will not have any integration points with this service.

4.2.2.1 Export of products to NATO CSD IPL

[FBE-305] The NATO CSD Export Services shall detect new products and updates to existing products, and then read the product information through the Product Management Service OData REST API, transform the product information (that includes embedding product files and other attachments) into a format that is compliant with

the NATO CSD “IntelFS REST API” (see section 5.2.3.3 and appendix A.2.3 in [NCSD-IPL-SDS]), and upload the product to the NATO CSD IPL.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

[FBE-306] It shall be possible to specify and refine filters for which products to export from I2BE to the NATO CSD IPL. The filtering options shall include filtering on data set (operational, training, exercise, etc.), geographical coverage areas, temporal data, source/ publisher, and classification/ releaseability, etc.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.2.2 Export of IRM&CM workflow data to NATO CSD IWS

4.2.2.2.1 Export of geographical areas

[FBE-307] The NATO CSD Export Services shall detect new or updated Geospatial and Features where the change is originating in the I2BE. The service shall then read the Geospatial and Features through the Geospatial and Features Service OData REST API, transform the data into a format that is compliant with the NATO CSD JIEService (see [NCSD-IWS-SDS]) and create or update Geospatial and Features in the NATO CSD IWS.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.2.2.2 Export of ISR organization data

[FBE-308] The NATO CSD Export Services shall detect new or updated ISR organization data where the change is originating in the I2BE. The service shall then read the ISR organization data through the ISR Organization Service OData REST API, transform the data into a format that is compliant with the NATO CSD JIEService (see [NCSD-IWS-SDS]) and create or update ISR organization data in the NATO CSD IWS.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.2.2.3 Export of IRM data to NATO CSD IWS

[FBE-309] The NATO CSD Export Services shall detect new or updated IRM data where the change is originating in the I2BE. The service shall then read the IRM data through the IRM Service OData REST API, transform the data into a format that is compliant with the NATO CSD JIEService (see [NCSD-IWS-SDS]) and create or update IRM data in the NATO CSD IWS.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.2.2.4 Export of CRM data

[FBE-310] The NATO CSD Export Services shall detect new or updated CRM data where the change is originating in the I2BE. The service shall then read the CRM data through the CRM Service OData REST API, transform the data into a format that is

compliant with the NATO CSD JIEService (see [NCSD-IWS-SDS]) and create or update CRM data in the NATO CSD IWS.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.2.2.5 Export of COM data

[FBE-311] The NATO CSD Export Services shall detect new or updated COM data where the change is originating in the I2BE. The service shall then read the COM data through the COM Service OData REST API, transform the data into a format that is compliant with the NATO CSD JIEService (see [NCSD-IWS-SDS]) and create or update COM data in the NATO CSD IWS.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.3 APP11-D Reports Export Service

4.2.3.1 Auto-generate AIRINTREP messages

[FBE-312] The APP11-D Report Export Services shall detect updates to airfield BSOs (i.e. BSOs of type 'Place') and then subsequently interrogate the airfield BSO (through the I2BE OData REST API) to check the airfields status reports to see if there is any change to the Aircraft Equipment Lines. If there are changes to the Aircraft Equipment Lines then a message in [APP11D-AIRINTREP] XML format shall be automatically generated from the airfield BSO data and published/ sent on the SOA & IdM Platform.

Verification: Demonstration
Est. Cost[€]: Contractor to provide cost estimate

4.2.4 Emulated INTEL-FS Spiral 1 Web Services

[112] INTEL-FS Spiral 1 implements a number of Read-Only SOAP Web Services that enables external systems (e.g. TOPFAS and NCOP) to access its information.

[113] Through the implementation of INTEL-FS Spiral 1 WS Emulation Services the I2BE data will be made available through web services that mimics the legacy INTEL-FS Spiral 1 web services

4.2.4.1 INTEL-FS Increment 1 SOAP Web Services

[FBE-313] The Emulated INTEL-FS Spiral 1 Web Services shall implement the legacy I_INTEL-FS_SYSTEM_SERVICE (see table below) in accordance with [IFS1-ICD] as a façade for accessing the I2BE.

Verification: Demonstration, Integration with TOPFAS and NCOP
Est. Cost[€]: Contractor to provide cost estimate

Table 4-2 I_INTEL-FS_SYSTEM_SERVICE

Purpose	Methods
Enables the caller to access system objects or global values that can be used in the other services	GetAuthorisedOrganisationalNodeLogicalDatabaseCouples
	GetAuthorisedApplicationsTypes
	GetAuthorisedObjectTypes

[FBE-314] The Emulated INTEL-FS Spiral 1 Web Services shall implement the legacy I_INTEL-FS_DOMAINVALUE_SERVICE (see table below) in accordance with [IFS1-ICD] as a facade for accessing the I2BE.

Verification: Demonstration, Integration with TOPFAS and NCOP
Est. Cost[€]: Contractor to provide cost estimate

Table 4-3 I_INTEL-FS_DOMAINVALUE_SERVICE

Purpose	Methods
Enables the caller to access domain values definition and details	GetDomainValueTypes
	GetDomainValues
	GetDomainValueById

[FBE-315] The Emulated INTEL-FS Spiral 1 Web Services shall implement the legacy I_INTEL-FS_ENTITY_SERVICE (see table below) in accordance with [IFS1-ICD] as a facade for accessing the I2BE.

Verification: Demonstration, Integration with TOPFAS and NCOP
Est. Cost[€]: Contractor to provide cost estimate

Table 4-4 I_INTEL-FS_ENTITY_SERVICE

Purpose	Methods
Enables access to Intelligence Information Entities and their relationships.	Read
	GetLocation
	GetAttachments
	GetAttachmentsURL
	GetStatus
	GetAttachment
	GetAttachmentURL

[FBE-316] The Emulated INTEL-FS Spiral 1 Web Services shall implement the legacy I_INTEL-FS_ORBAT_SERVICE (see table below) in accordance with [IFS1-ICD] as a facade for accessing the I2BE.

Verification: Demonstration, Integration with TOPFAS and NCOP
Est. Cost[€]: Contractor to provide cost estimate

Table 4-5 I_INTEL-FS_ORBAT_SERVICE

Purpose	Methods
Enables provision of ORBAT information (i.e., identification, strength, command structure, and disposition of the staff, units, and equipment). Enables the requester to select the 'root' of the organisational hierarchy, the number of levels to be returned, and the type of command relationship (e.g., TACOM, TACON, OPCOM, OPCON, Co-ordinating authority) to be returned	GetSubordinateUnits
	GetSubordinatePersons
	GetSubordinateOrganisations
	GetSuperiorUnits
	GetSuperiorPersons
	GetSuperiorOrganisations

[FBE-317] The Emulated INTEL-FS Spiral 1 Web Services shall implement the legacy I_INTEL-FS_QUERY_SERVICE (see table below) in accordance with [IFS1-ICD] as a facade for accessing the I2BE.

Verification: Demonstration, Integration with TOPFAS and NCOP
Est. Cost[€]: Contractor to provide cost estimate

Table 4-6 I_INTEL-FS_QUERY_SERVICE

Purpose	Methods
Enables submission and provision of responses to queries to authorised users or systems. The queries can contain full text and structured constraints.	GetSearchTemplateFromApplication
	GetSearchTemplateFromType
	OpenSearch
	RelationshipSearch
	OwnedObjectSearch
	Query

5 Non-functional Requirements (NFR)

[114] NFR quality requirements is defined in accordance with ISO-25010 standard, and definitions in this section are based on ISO/IEC 25010:2011(E) - System and software quality models.

[115] For monitoring of quality characteristics, the definitions in the table below will be used:

Table 5-1 Definitions used for monitoring NFR quality characteristics

Error (or Fault)	A design or source code or hardware flaw or malfunction that causes a Failure of one or more Configuration Items. A mistake made by a person or a faulty Process that affects a CI is also an Error (human Error). For this System, Human Error is generally not taken into consideration in measuring the quality Performance
Fault:	see Error
Failure:	Loss of ability to Operate to Specification, or to deliver the required output. The term Failure may be used when referring to Services, Processes, Activities, or Configuration Items
Critical Failure:	it is a failure that causes an immediate cessation of the ability to perform the required function/service
Incident:	An unplanned interruption to a service or reduction in the quality of a service
Problem:	A cause of one or more Incidents. The cause is not usually known at the time the Incident happens

5.1 Functional Suitability

[116] ISO 25010: This characteristic represents the degree to which a product or system provides functions that meet stated and implied needs when used under specified conditions.

[NFR-1] Location accuracy shall be better than 1 meter (i.e., sub-meter accuracy) for translation of values (UTM, Latitude/Longitudes, others).

Verification: Demonstration and Analysis

5.2 Performance Requirements

[117] ISO 25010: This characteristic represents the performance relative to the amount of resources used under stated conditions.

5.2.1 Response Times

[118] ISO 25010: Time Behaviour is the degree to which the response and processing times and throughput rates of a product or system, when performing its functions, meet requirements.

[NFR-2] The time from restarting until all services is restored and fully operational again shall be less than 5 minutes for at least 99.5% of the Operational Time.

Verification: Demonstration and Analysis

[NFR-3] Simple OData query operations against a repository containing 1 trillion entities shall be able to return results within 5 seconds for at least 99.5% of the Operational Time.

Verification: Demonstration and Analysis

[NFR-4] For 10 concurrent simple OData query operations against a repository containing 1 trillion entities, each OData query operation shall return results within 10 seconds for at least 99.5% of the Operational Time.

Verification: Demonstration and Analysis

[NFR-5] Any faceted search operation against a repository containing 1 trillion entities shall be able to return results within 2 seconds for at least 99.5% of the Operational Time.

Verification: Demonstration and Analysis

[NFR-6] For 10 concurrent faceted search operations against a repository containing 1 trillion entities, with any type of search criteria, each search operation shall return results within 3 seconds for at least 99.5% of the Operational Time.

Verification: Demonstration and Analysis

[NFR-7] Any graph-oriented query operation against a repository containing 1 million linked entities shall be able to return results within 5 seconds for at least 99.5% of the Operational Time.

Verification: Demonstration and Analysis

[NFR-8] For 10 concurrent graph-oriented query operations against a repository containing 1 million linked entities, with any type of graph-query criteria, each query operation shall return results within 10 seconds for at least 99.5% of the Operational Time.

Verification: Demonstration and Analysis

5.2.2 Capacity

[119] ISO 25010: Capacity. Degree to which the maximum limits of a product or system parameter meet requirements.

[120] Capacity parameters can include the number of items that can be stored, the number of concurrent users, the communication bandwidth, throughput of transactions, and size of database.

[NFR-9] The services shall be able to a handle trillion IIEs without any critical failure for at least 99.5% of its Operational time.

Verification: Analysis

[NFR-10] The services shall be able to serve 2000 concurrent users/ connections without any critical failure for at least 99.5% of its Operational time.

Verification: Demonstration and Analysis

[NFR-11] The services shall be able to receive 2 million new IIEs per day without any critical failure for at least 99.5% of its Operational time.

Verification: Demonstration and Analysis

[NFR-12] Pending sufficient network bandwidth, replication/ synchronization of 2 million IIEs between I2BE instances per day shall be possible without any critical failure for at least 99.5% of its Operational time.

Verification: Demonstration and Analysis

5.3 Compatibility

[121] ISO 25010: Compatibility. Degree to which a product, system or component can exchange information with other products, systems or components, and/or perform its required functions, while sharing the same hardware or software environment.

5.3.1 Co-existence

[122] ISO 25010: Co-existence. Degree to which a product can perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact on any other product.

[NFR-13] The implemented applications and services shall be capable of operating within the NS and MS WAN environment (including servers, network, services and workstations) in the presence of the latest approved NATO Security Settings without any critical failure for 99.5% of its operational time.

Verification: Demonstration

5.3.2 Interoperability Requirements

[NFR-14] Any new version of the I2BE application programming interfaces (API) exposed to client applications shall be fully backward compatible for a minimum of three releases/ versions, and for a minimum of 1 year in 99.5% of the time. To be fully backward compatible, a version of the API with no breaking changes must be available and functioning.

Verification: Test

5.4 Reliability

[123] ISO 25010: Reliability. Degree to which a system, product or component performs specified functions under specified conditions for a specified period of time.

[124] MTBF (Mean time between Failures) is defined as the mean time between two consecutive failures.

[125] MTBCF (Mean time between critical failures) is defined as the mean time between two consecutive CRITICAL failures.

5.4.1 Availability

[126] ISO 25010: Availability. Degree to which a system, product or component is operational and accessible when required for use.

[127] Inherent Availability (Intrinsic) assumes ideal support (i.e., unlimited spares, no delays, etc.); only design related Failures are considered.

[128] Mission Inherent Availability (Intrinsic) assumes ideal support (i.e., unlimited spares, no delays, etc.); only design related CRITICAL Failures are considered

[NFR-15] The Inherent Availability shall be better than 99.5%

Verification: Analysis, Using MTBF data

[NFR-16] The Mission Inherent Availability shall be better than 99.97%.

Verification: Analysis, Using MTBCF data

5.4.2 Fault Tolerance and Recoverability

[129] Fault Tolerance is the property that enables a system to continue operating properly in the event of the failure of some of its components. A fault-tolerant design enables a system to continue its

intended operation, possibly at a reduced level, rather than failing completely when some part of the system fails.

[130] Graceful Degradation is the ability of a computer, machine, electronic system or network to maintain limited functionality even when a portion of it has been destroyed or rendered inoperative (either by a fault or deliberately).

[131] Based on the principle of gracefully degradation the following recovery time have been defined:

Table 5-2 Recovery Time by Failure Criticality

Failure Type	Recovery Time
Failure	4 hours
Critical Failure	10 minutes

[132] ISO 25010: Fault Tolerance. Degree to which a system, product or component operates as intended despite the presence of hardware or software faults.

[133] ISO 25010: Recoverability. Degree to which, in the Event of an interruption or a Failure, a product or system can recover the data directly affected and re-establish the desired state of the system.

[NFR-17] For 99% of the possible Failures in any service, the service shall be recovered or be replaced by an alternative service, in no more than the amount of Recovery Time defined in the table above, without loss of data.

Verification: Test and Analysis

5.5 Security

[134] ISO 25010: Degree to which a product or system protects information and data so that persons or other products or systems have the degree of data access appropriate to their types and levels of authorization.

[135] ISO 27001 (Information Security): Information security is all about protecting and preserving information. It's all about protecting and preserving the confidentiality, integrity, authenticity, availability, and reliability of information.

[136] Security, within the context of Information Technology (IT), is defined as the capability of the software product to protect information and data so that unauthorised persons or systems cannot read or modify them and such that authorised persons or systems are not denied access to them.

[137] I2UA will operate in the "System High" mode of operation (see [AC/35-D/2004-REV3] for definitions of Security Modes of Operation). That is, all individuals with access to the system are cleared to the highest classification of the information stored, processed or transmitted within the system, but not all individuals with access to the system have a common need to know for the information stored, processed or transmitted within the system.

[NFR-18] The services shall implement relevant security techniques to protect against any security vulnerabilities as identified by Open Web Application Security Project (OWASP), see [OWASP], so that no such security vulnerabilities occurs for 99.5% of its Operational time.

Verification: Test

[NFR-19] The services shall implement protection mechanisms against data spillage between the different repositories (Operational, Exercise, Training, etc.) so that for 99.5% of its Operational time no spillage occurs (exempt from this will be operator error by-passing implemented security mechanisms).

Verification: Test

5.6 Maintainability

[138] ISO 25010: This characteristic represents the degree of effectiveness and efficiency with which a product or system can be modified to improve it, correct it or adapt it to changes in environment, and in requirements.

[139] The MTTR to be considered is the mean time needed to restore services after a failure in the operative condition, excluding administrative and logistics delay times.

[140] The MaxTTR to be considered is the maximum time needed to restore services in the operative condition, excluding administrative and logistics delay times.

Table 5-3 Maintainability by Failure Criticality

Failure Type	MTTR	MaxTTR
Critical Failure	1 hours	4 hours
Failure	2 hours	8 hours

[NFR-20] On the hypothesis of an operational time of 24/7/365 (24 hours per day, 7 days a week, 365 days per year), the MTTR and MaxTTR shall not exceed the time limits defined in the table above for each single maintenance action for 99.5% of its Operational Time.

Verification: Test and Analysis

[NFR-21] The applications and services shall be able to isolate any occurring Faults/Errors and provide error diagnostics reports that identifies the Error/Fault for 90% of its Operational Time.

Verification: Analysis and Inspection

[NFR-22] The developed source code shall exhibit a Technical Debt Ratio (TDR) lower than 5% when calculated using [SonarQube] in its default setting for TDR calculations.

Verification: Inspection

[NFR-23] Automated regression tests and Continuous Integration shall ensure that for 99% of the times the applications and services are modified, and a release candidate produced, the change does not adversely affected existing functionalities/ features.

Verification: Demonstration and Inspection

[NFR-24] The OData REST API and the Data Access Layer (DAL) shall be consistent with [INTEL-FS2-IM] 99% of all services releases.

Verification: Demonstration and Inspection

5.7 Portability, Installability, and Replaceability

[141] ISO 25010: Portability. Degree of effectiveness and efficiency with which a system, product or component can be transferred from one hardware, software or other operational or usage environment to another.

[142] ISO 25010: Installability. Degree of effectiveness and efficiency with which a product or system can be successfully installed and/or uninstalled in a specified environment.

[143] ISO 25010: Replaceability. Degree to which a product can replace another specified software product for the same purpose in the same environment.

[NFR-25] It shall be possible to run fully automated installation and/ or uninstallation of the applications and services for 99.5% of the times.

Verification: Demonstration

[NFR-26] It shall be possible to install replace a previous release with a new release in a fully automated way without loss of any user data and/ or configuration settings in 99.5% of the times.

Verification: Demonstration

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INTEL-FS SPIRAL 2 ABBREVIATIONS AND ACRONYMS
BOOK II - PART V

ABBREVIATIONS AND ACRONYMS

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Abbreviations and Acronyms

AAR	areas at risk
ABAC	attribute-based access control
ABL	Allocated Baseline
AD	Active Directory
ADS	Application Data Set; and authoritative data source
AFPL	Approved Fielded Product List
ANB	Analyst Notebook
AOI	area of Interest
AOII	area of intelligence interest
AOIR	area of intelligence responsibility
AOO	area of operations
AOP	aspect-oriented programming
API	application programming interface
AQAP	Allied Quality Assurance Publication
ASCOPE	Areas, Structures, Capabilities, Organizations, People and Events
ATDD	Acceptance Test Driven Development
BDA	battle damage assessment
BDD	Behaviour Driven Development
BE (number)	Basic Encyclopaedia (number)
Bi-SC	Bi-Strategic Command
Bi-SC AIS	Bi-Strategic Command Automated Information System
BICES	Battlefield Information Collection and Exploitation System
BLUEFOR	blue force
BM	ballistic missile
BMD	ballistic missile defence
BMOA	ballistic missile operating area
BOE	Basis of Estimate
BSO	battlespace object
BSR	BSO report
BVT	build verification test
C-IED	counter improvised explosive device
C4ISR	command, control, communications, computers, intelligence, surveillance and reconnaissance
CBRN	chemical, biological, radiological and nuclear
CCB	Change Control Board
CCC	Central Card Catalogue

CD	Compact Disc; and continuous delivery
CDAR	Continuous Delivery Assessment Report
CDE	collateral damage estimates
CI	configuration item; and continuous integration
CLIN	Contract Line Item Number
CLS	Contractor Logistics Support
CM	collection management; and configuration management
CMDB	Configuration Management Database
CMP	Configuration Management Plan
COA	course of action
COI	Community of Interest
COINS	Communications and Information Systems
COM	collection operations management
CONOPS	concept of operations
COTS	commercial off-the-shelf
CR	clarification request; and collection requirement
CRL	collection requirements list
CRM	collection requirements management
CRUD	create, read, update, delete
CSA	Configuration Status Accounting
CSD IPL (CIPL)	Coalition Shared Data ISR Product Library
CSD IWS (CIWS)	Coalition Shared Data ISR Workflow Service
CSS	cascading style sheets
CSV	comma-separated values
CTL	collection task list
CTM	choreography task message
CXP	collection and exploitation plan
DAL	data access layer
DAR	Deliverable Acceptance Report
DASH	Dynamic Adaptive Streaming
DAST	Dynamic Application Security Testing
DDD	Domain Driven Design
DDP	Delivery Duty Paid
DFPTR	Deliverable Functional and Performance Test Report
DIR	Dynamic Intelligence Report

DMS	Degrees-Minutes-Seconds
DNS	Domain Name System
DRTM	Deliverable Requirements Traceability Matrix
DSDM	Dynamic System Development Method
ECP	Engineering Change Proposal
EDC	Effective Date of Contract
EDMS	Enterprise Document Management System
EEI	essential elements of information
EO	electro-optical
EOB	electronic order of battle
ETEE	Education Training Exercise and Evaluation
ETL	extract, transform, load
FBL	Functional Baseline
FCA	Focussed Collection Activity
FMECA	Failure Modes, Effects and Criticality Analysis
FMV	full motion video
FOSS	free and open source software
FPA	Functional Production Areas
FPIF	Fixed Price Incentive Fee
FSA	Final System Acceptance
FTP	File Transfer Protocol
GAOI	geographic area of interest
GEOINT	geospatial Intelligence
GIS	geographic information system
GPO	Group Policy Object
GQL	Graph Query Language
HFE	historical firing event
HMI	Human Machine Interface
HQ	headquarter
HTML	Hypertext Markup Language
HTTP	HyperText Transfer Protocol
HUMINT	Human Intelligence
HWCI	Hardware Configuration Item
I2BE	INTEL-FS Spiral 2 Backend
I2UA	INTEL-FS Spiral 2 User Applications
IAM	Identity and Access Management
ICB	International Competitive Bidding
ICP	Intelligence Collection Plan

ICWG	Interface Control Working Group
IDE	integrated development environment
IdM	identity management
IEC	International Electrotechnical Commission
IED	improvised explosive device
IFB	Invitation for Bid
IIE	intelligence information entity
ILS	integrated logistic support
ILSP	Integrated Logistic Support Plan
INCREP	Incident reports
INTEL-FS	Intelligence Functional Services
INTEL-FS2	INTEL-FS Spiral 2
INTREP	intelligence report
INSUM	intelligence summary
IP	Internet Protocol
IPIWG	Intelligence Project Implementation Working Group
IR	infrared; and intelligence requirement
IRM	intelligence requirements management
ISO	International Organization for Standardization
ISR	intelligence, surveillance and reconnaissance
ISSP	In Service Support Plan
ITIL	Information Technology Infrastructure Library
IV&V	Independent Verification and Validation
JCMB	Joint Collection Management Board
JEMM	Joint Exercise Management Module
JIPOE	joint intelligence preparation of the operating environment
JISR	Joint Intelligence, Surveillance, and Reconnaissance
JPEG	Joint Photographic Experts Group
JPTL	Joint Prioritised Target List
JTL	Joint Targeting List
KML	Keyhole Markup Language
KMZ	KML zipped
LIMDIS	Limited distribution
LOB	line of bearing
LOE	Level-of-Effort
LSA	Logistics Support Analysis
LTIOV	latest time information is of value

MAM	Maintenance and Administration Manual
MaxTTR	maximum time needed to restore
MCDA	multi-criteria decision analysis
MCOO	modified combined obstacle overlay
MGRS	Military Grid Reference System
MIDB	Modernized Integrated Database
MOE	measure of effectiveness
MOP	measure of performance
MoSCoW	Must have, Should have, Could have, and Will not have (at this time)
MPEG	Moving Picture Experts Group
MTBCF	mean time between critical failures
MTTR	mean time needed to restore
MTBF	mean time between failures
MS	Microsoft
N/A	not applicable
NAI	named area of interest
NAMIS	NATO Automated Meteorological Information System
NATO	North Atlantic Treaty Organization
NCOP	NATO Common Operating Picture
NCS	NATO Command Structure
NEDS	NATO Enterprise Directory Services
NFR	non-functional Requirement
NGO	non-governmental organisation
NIRIS	Networked Interoperable Real-time Information Services
NJTS	NATO Joint Targeting System
NMAPI	NATO Map API
NR	NATO RΞSTRICTED
NS	NATO SΞCRET
NSTR	nothing significant to report
NVG	NATO Vector Graphics
OASIS	Organization for the Advancement of Structured Information Standards
OCE	Officer Conducting the Exercise
OData	Open Data Protocol
OE	operating environment
OEM	original equipment manufacturer
OGC	Open Geospatial Consortium
OIDC	OpenID Connect
ON	organizational node

ONA	ON Administrator
OPFOR	opposing force
ORBAT	order of battle
OWASP	Open Web Application Security Project
PAP	policy administration point
PBL	Product Baseline
PDF	Portable Document Format
PDP	policy decision point
PEP	policy enforcement point
PFI	purchaser furnished items
PHS&T	packaging, handling, storage, and transportation
PIR	prioritized intelligence requirements
PM	project manager
PMESII	Political, Military, Economic, Social, Information, and Infrastructure
PMO	Project Management Office
PMP	Project Management Plan
PNG	Portable Network Graphics
POC	Point of Contact
PoL	Pattern of Life
PRP	policy retrieval point
PTL	Prioritised Target List
QA	Quality Assurance
QC	Quality Control
QP	Quality Plan
RACI	Responsible, Accountable, Consulted and Informed
RAM	Reliability, Availability, and Maintainability
RAMT	Reliability, Availability, Maintainability and Testability
RBD	Reliability Block Diagram
REST	representational state transfer
RFD	Request for Deviation
RFI	request for information
RFW	Request for Waiver
RSQL	RESTful Query Language
SAML	Security Assertion Markup Language
SAST	Static Application Security Testing
SATP/R	Site Activation Test Plan and Report
SCRR	Source Code Review Report
SDD	Solution Description Document

SDK	software development kit
SecTR	Security Test Report
SHAPE	Supreme Headquarters Allied Powers Europe
SIGINT	signals intelligence
SIR	specific intelligence requirements
SIT	System Integration Tests
SITR	System Integration Tests Report
SLC	Standby Letter of Credit
SLOC	Source lines of code
SM&C	Service Management and Control
SNA	social network analysis
SOA	service-oriented architecture
SOI	system of interest
SOW	Statement of Work
SPOTREP	Spot report
SQALE	Software Quality Assessment based on Lifecycle Expectations
SQM	Service Quality Management
SQMR	Software Quality Metrics Report
SRA	Scope and Requirements Analysis
SRS	System Requirement Specification
SSO	single sign-on
SSS	Schedule of Supplies and Services
STANAG	Standardization Agreement
SW	software
SWDL	Software Distribution List
TCO	Total Cost of Ownership
TCM	Theatre Collection Manager
TCP	Transmission Control Protocol
TCPED	tasking, collection, processing, exploitation, and dissemination
TDR	Technical Debt Ratio
TECHINT	technical intelligence
TNL	Target Nomination List
TP/R	Test Plan and Reports
TT	Trouble Ticket
TTP	tactics, techniques and procedures
UI	user interface
URL	Uniform Resource Locator
UTF-8	8-bit Unicode Transformation Format

UTM	Universal Transverse Mercator
UX	user experience
VC	Visualization Component
WBS	Work Breakdown Structure
WGS 84	World Geodetic System 1984
WMS	Web Map Service
WP	Work Package
WPS	Web Processing Service
XACML	eXtensible Access Control Markup Language
XML	eXtensible Markup Language


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