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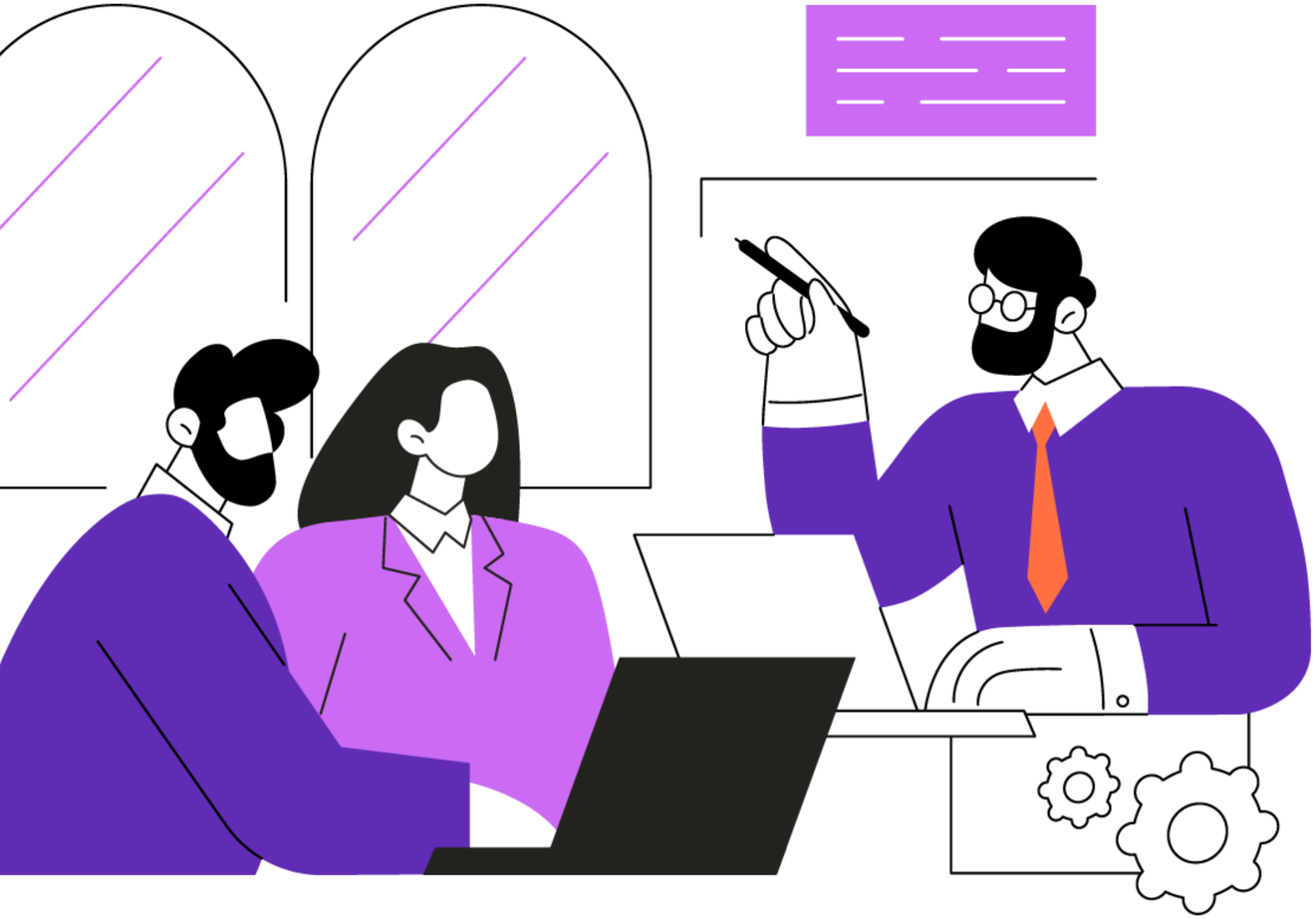


Technical and Commercial Proposal

Government of Canada

Provision of a SaaS Solution for Fuel Monitoring
Automatic Identification Technology (AIT)

ID da Proposta GDN001-25 | Versão 1.0 | Data da Proposta 05/06/2025 | Validade 15 dias

Project Summary and Objetive

This technical proposal outlines a solution designed to meet the needs of the Government of Canada, specifically the Department of National Defence (DND), for a Fuel Monitoring (FM) Enterprise Middleware Solution.

The primary goal of this project is to develop and implement a robust, scalable Software as a Service (SaaS) solution. This solution will act as a central hub, collecting, converting, and transmitting fuel monitoring data from various existing commercial FM solutions to the DND's Electronic Data Exchange (EDE) system. The aim is to ensure the consistency, accuracy, and availability of crucial fuel data, which is vital for effective defence resource management. It will integrate information from Bulk Fuel Tanks (BFTs), Highway Tanks (HTs), and monitoring kits for Fuel Supply Distribution Systems (FSDS) located at bases and facilities both within Canada and internationally. By implementing this middleware, the information flow will be standardized, regardless of the monitoring technology used at the source. This will facilitate seamless integration with the Defence Resource Management Information System (DRMIS) and significantly enhance DND's fuel inventory monitoring and control capabilities.

Solution and Project Scope

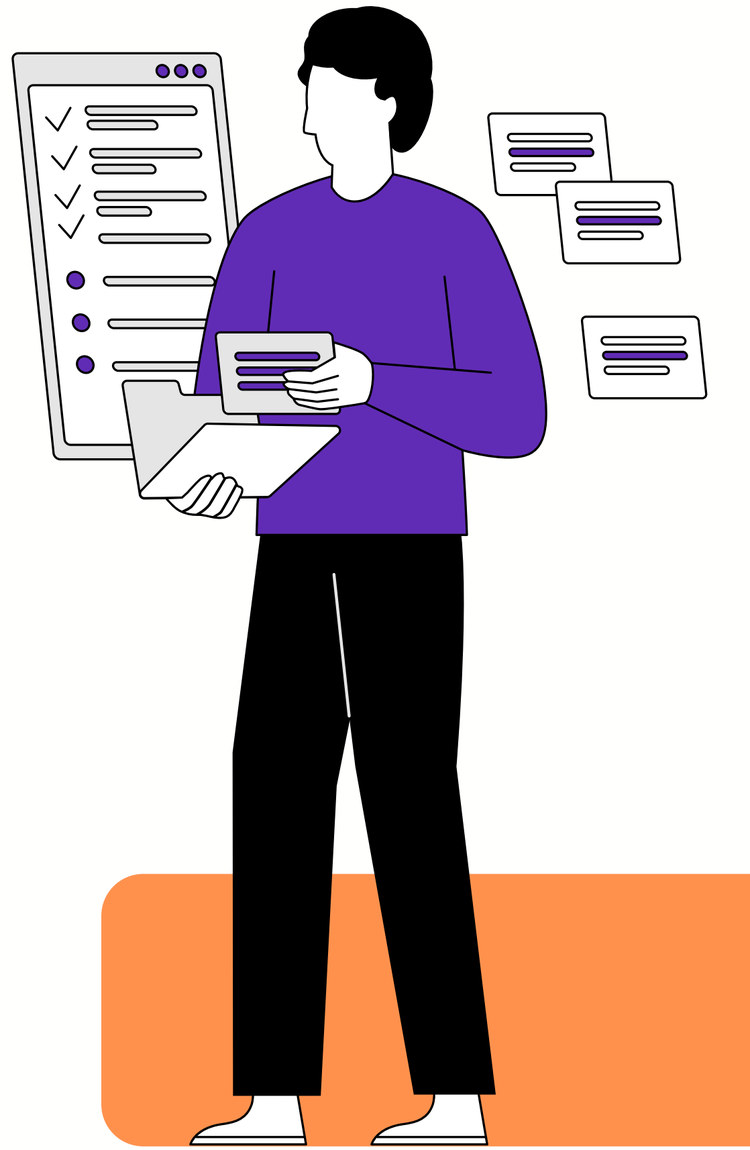
This proposal encompasses the development, implementation, and ongoing maintenance of a Fuel Monitoring (FM) Enterprise Middleware Solution delivered as a Service (SaaS) for the Department of National Defence (DND) of the Government of Canada. The solution will be engineered as a centralized, cloud-hosted platform. Its core function will be to mediate communication between the diverse existing Fuel Monitoring Solutions (FM Solutions) currently in use by DND across various locations and the central DND Electronic Data Exchange (EDE) system

Key Inclusions in Scope

1. **SaaS Middleware Development:** This involves creating a robust and secure web application that will form the core of the middleware. This includes developing the business logic necessary for data collection, processing, conversion, aggregation, and transmission.

2. **Graphical User Interface (GUI):** An intuitive web interface will be implemented, allowing authorized DND users to view fuel data from FM Solutions, monitor transmission status to the EDE, and access basic monitoring and reporting functionalities.

3. **Integration Mechanism:** Development of connectors and adapters capable of receiving data from various existing FM Solutions (specific technical details to be provided by DND). This data will then be consolidated, standardized, and transmitted to the DND EDE using the SOAP protocol over a secure Mutual SSL/TLS connection.

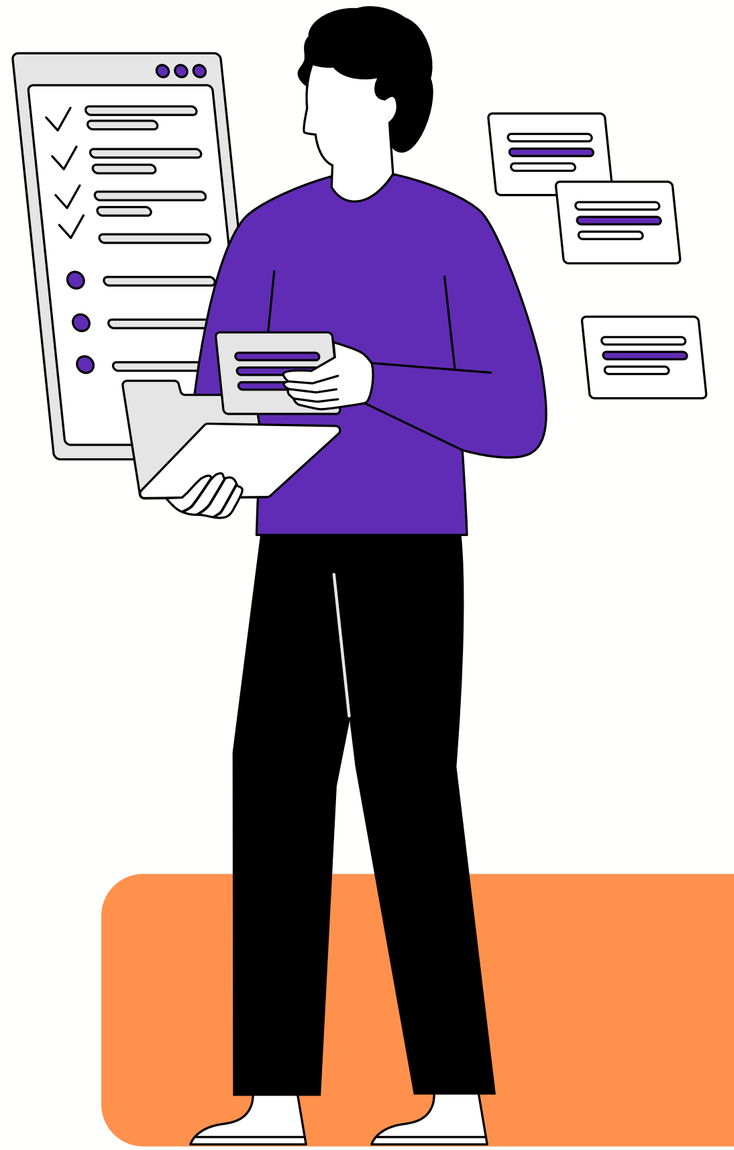


Key Inclusions in Scope

4. **Data Processing and Standardization:** Routines will be implemented to convert received data (in various formats) into a standard DND-defined format (including XML), ensuring information consistency and quality. This includes converting timestamps to UTC/ZULU.

5. **Data Aggregation:** The solution will have the capability to aggregate data from multiple sources before transmission to the EDE, as required and at pre-defined (e.g., every 12 hours) or configurable intervals.

6. **Monitoring and Logs:** Implementation of comprehensive runtime, session, and database monitoring functionalities, alongside a detailed logging system for auditing and troubleshooting.



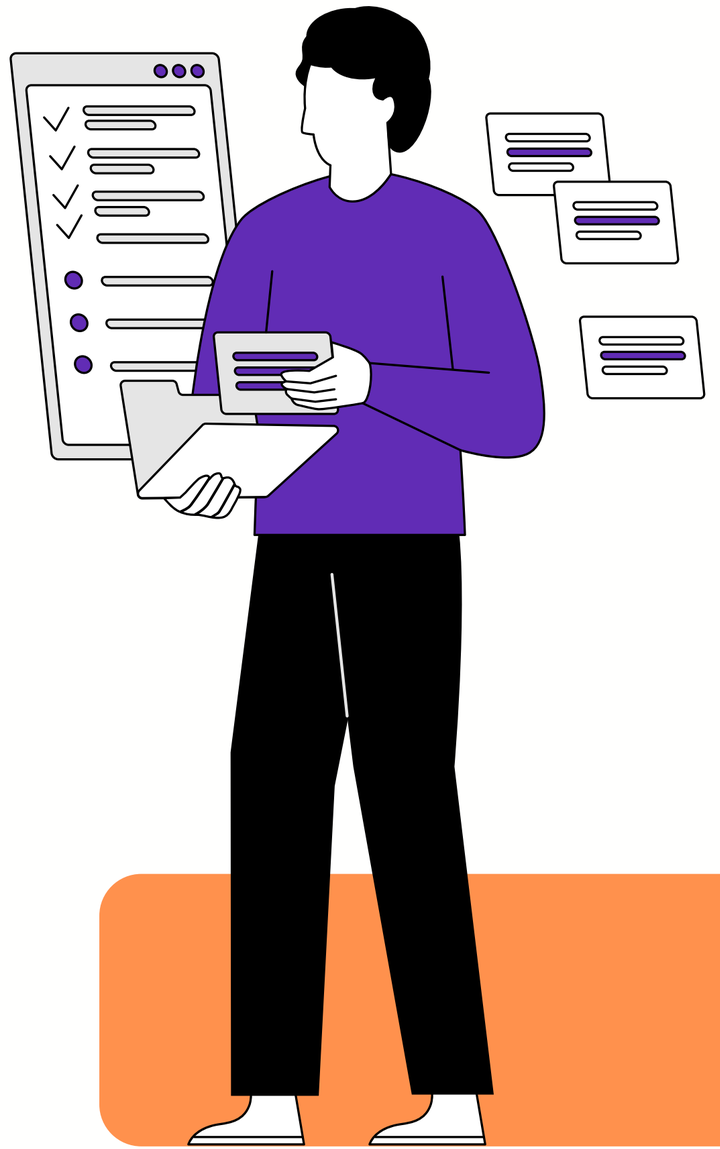
Key Inclusions in Scope

7. **Security:** Robust security measures will be applied in compliance with Government of Canada requirements, including PAMM profile, encryption, authentication, access control, and virus scanning for uploads.

8. **Scalability and Availability:** The architecture is designed for high availability (99.9% uptime) and scalability, capable of supporting increased data volume and a growing number of integrated FM Solutions.

9. **Documentation:** Detailed technical and user documentation will be provided.

10. **Support and Maintenance:** Ongoing technical support and maintenance services for the SaaS solution will be provided throughout the contract period.



Exclusions from Scope

1. **Provision or Modification of Existing FM Solutions:** This scope does not include the acquisition, installation, configuration, or modification of third party fuel monitoring solutions (sensors, local hardware, local software). The middleware solution assumes these existing solutions are operational and capable of providing data.

2. **Local Physical Infrastructure:** Any physical infrastructure required at DND facilities to operate existing FM Solutions.

3. **Modifications to DND EDE or DRMIS:** The scope does not include the development or modification of DND's EDE or DRMIS systems. Integration will occur solely through the interfaces and protocols defined by DND.

4. **End-User Hardware:** This proposal does not cover the provision of computers, mobile devices, or network infrastructure for users to access the solution's GUI.

5. **Historical Data Migration:** Migration of historical fuel monitoring data prior to the middleware solution's deployment is not included, unless specifically agreed upon in a later phase.

6. **Extensive On-Site Training:** Training will primarily focus on the use of the middleware solution, delivered through documentation and remote sessions. Extensive on-site training can be negotiated separately.

Proposed Solution Architecture

The FM Enterprise Middleware Solution's architecture will be built upon a modern Software as a Service (SaaS) model. It will be hosted on a secure and scalable cloud infrastructure, ensuring high availability and compliance with Government of Canada requirements. The architecture is designed to be modular, f lexible, and robust, facilitating seamless integration with various data sources and the target system (DND EDE).

Main Components

1. **Data Ingestion Layer:** This component is responsible for receiving data from the various existing Fuel Monitoring Solutions (FM Solutions). Specific adapters or configured endpoints (such as REST/SOAP APIs, SFTP, etc., depending on each FM Solution's capabilities) will be developed to collect data securely and efficiently. The ingestion layer will incorporate initial validation and queuing mechanisms to ensure that received data is processed asynchronously and is resilient to failures.

2. **Processing and Transformation Core:** This is the central hub of the solution, where raw received data undergoes processing, cleaning, validation, and transformation. This layer will apply necessary business rules, including unit conversion, format standardization (such as XML generation as specified), and timestamp conversion to the UTC/ZULU standard. Data aggregation logic will also be implemented here, allowing for the consolidation of information from multiple tanks or readings before transmission.

3. **Data Repository:** A secure and optimized database will be utilized for the temporary storage of processed data, audit logs, system configurations, and status information. The choice of database will prioritize performance, scalability, and security requirements (compliance with PROTECTED A).

Main Components

4. **Data Transmission Layer:** This layer is responsible for sending the processed and standardized data to the DND EDE system. It will implement communication via the SOAP protocol, utilizing mutual SSL/TLS authentication to ensure secure connections as required. Retry mechanisms and communication error handling will be incorporated to guarantee reliable message delivery.

5. **Graphical User Interface (GUI):** A secure and responsive web application, accessible through supported browsers (Edge, Chrome, Safari LTS) without the need for additional plugins. The GUI will enable authorized users to view near real-time monitoring data, check the status of integrations and transmissions, access basic logs, and manage permitted configurations. The interface will be developed in adherence to accessibility guidelines (EN 301 549).

6. **Monitoring and Alerting Module:** An integrated system designed to monitor the solution's health and performance, including runtime, resource usage (CPU, memory, database), connection status, and message flow. Automatic alerts will be configured to notify the support team of any anomalies or potential failures, ensuring the maintenance of 99.9% availability.

Main Components

7. **Security Layer:** This layer will encompass all architectural components, implementing role-based access controls (RBAC), data encryption in transit (TLS) and at rest, strong authentication, security auditing, and compliance with Government of Canada security policies (including the Contract Security Manual and ITSP requirements). Virus scanning for uploaded files (if applicable) will be integrated.

8. **Cloud Infrastructure:** The solution will be hosted on a Cloud Service Provider (CSP) that meets the security and data sovereignty requirements of the Government of Canada (Protected B Cloud Profile). The infrastructure will be designed for automatic scalability, redundancy, and disaster recovery, ensuring business continuity (BCP). This modular and service-based architecture ensures the solution is adaptable to future changes in requirements or technologies of the FM Solutions and DND EDE, while providing a centralized, secure, and efficient platform for fuel monitoring.

Integrations

The ability to integrate is fundamental to the success of the FM Enterprise Middleware Solution. The solution will be designed to connect transparently and securely with both the various existing Fuel Monitoring Solutions (FM Solutions) and the centralized Electronic Data Exchange (EDE) system of the Department of National Defence (DND).

Integration with FM Solutions (Data Input)

The middleware solution will be flexible enough to accommodate different data export methods from existing FM Solutions. The specific approach for each FM Solution will depend on its technical capabilities, but the platform will support multiple common protocols and formats, including:

- Web APIs: Connection via RESTful or SOAP APIs, should the FM Solutions expose endpoints for data querying.
- File Transfer: Reception of data files (e.g., CSV, XML, JSON) via secure protocols like SFTP.
- Direct Database Access (Conditional): In specific scenarios and with appropriate security approvals, the solution could connect to FM Solution databases to extract information, although this approach is less preferred due to potential security implications and coupling.

Integrations

The data ingestion layer will be configurable for each FM Solution, defining the connection method, secure access credentials, collection frequency (aiming for Near Real-Time synchronization, with a maximum delay of 1 minute, as per requirement 19 of Table 8), and the initial data mapping.

Integration with DND EDE (Data Output)

Communication with the DND EDE system will adhere strictly to the specifications provided in the RFP. The middleware solution will function as a client, sending processed and standardized data to the EDE.

- **Protocol:** Message exchange will occur exclusively via the SOAP (Simple Object Access Protocol), as per requirement 13 of Table 8.

- **Security:** The connection will be protected using Mutual SSL/TLS Authentication (to establish TLS Encryption), ensuring the confidentiality, integrity, and authenticity of communication between the middleware and the EDE, as per requirement 6 of Table 9. Applicable security certificates will be managed by the solution.

Integrations

- **Data Format:** Data will be formatted in XML, following the schema and structure defined by DND. The solution will ensure that all mandatory fields, such as Tank ID, Net Fuel Volume (liters), Net Fuel Volume Change, and Fuel Type (requirement 14 of Table 8), are present and correctly formatted.

- **Frequency and Aggregation:** The solution will send individual or aggregated messages to the DND EDE at pre-agreed intervals (e.g., every 12 hours, as per requirement 5 of Table 8) or based on specific events, ensuring timely delivery of the necessary information for DRMIS.

- **Error Handling:** Robust error handling mechanisms will be implemented to manage communication failures with the EDE, including automatic retries and notifications to the support team, aligned with the System Support Plan (SSP - CDRL-AITILS-SSP-001).

This integration architecture ensures that the middleware functions as a reliable central hub, decoupling the FM Solutions from the EDE system and providing an essential layer of standardization and security for the fuel monitoring data flow.

Technical Requirements

The FM Enterprise Middleware Solution will be developed in strict compliance with the technical requirements detailed in RFP W6381-180019/H, ensuring a robust, secure, interoperable, and user-friendly platform.

Technical Requirements

Firstly, the solution will be delivered as Software as a Service (SaaS), adhering to the definition established by the National Institute of Standards and Technology (NIST) in special publication 800-145. This means that DND will access the functionality over the network using a standard web interface, without needing to manage the underlying infrastructure (cloud, servers, operating systems, storage), which will be the responsibility of the solution provider. We guarantee that we possess all necessary intellectual property rights or licenses to offer the proposed solution.

In terms of accessibility and interface, the solution's GUI will be compatible with the Long Term Support (LTS) versions of Microsoft Edge, Google Chrome, and Apple Safari browsers. Full access and use of the interface will not require the installation of any additional software, plugins, or modules by the end-user, ensuring a simplified and standardized user experience. The interface will also follow the ICT accessibility guidelines established in Annex L of the RFP, based on the EN 301 549 standard.

Regarding communication and data exchange, the solution will support both synchronous and asynchronous communications, allowing flexibility in integrating with different systems and managing information flow. Message exchange with the DND EDE system will be performed using the SOAP protocol over a secure connection established via Mutual SSL/TLS Authentication, as specified in requirements 6 and 13 (Tables 9 and 8, respectively). The solution will also implement the capability to synchronize data with FM Solutions in Near Real-Time, with a maximum delay of 1 minute.

Technical Requirements

Security is a fundamental pillar. The solution will have the capability to scan uploaded documents (if applicable) for viruses before sending them to the DND EDE, rejecting infected files and notifying the user responsible for the upload. The security architecture will adhere to Government of Canada guidelines, including the implementation of secure network protocols (as per ITSP.40.062) and approved cryptographic algorithms for PROTECTED A/B information (as per ITSP.40.111). Responsibilities for security controls between the solution provider and DND will be clearly delineated.

The solution will be designed for high availability, aiming for 99.9% uptime, operating 24 hours a day, 7 days a week, 365 days a year, and accessible throughout Canada and abroad. The architecture will be scalable to accommodate increased data flow as more locations and FM Solutions are integrated. Robust runtime, session, and database monitoring capabilities will be implemented to ensure platform performance and stability.

Finally, the solution will include a comprehensive error handling mechanism, as detailed in the System Support Plan (SSP), ensuring that failures are detected, logged, and handled appropriately, thereby minimizing operational impact.

Estimated Timeline and Project Team

Based on a detailed analysis of the functional, technical, and security requirements extracted from RFP W6381-180019/H, and considering the need to develop the FM Enterprise Middleware Solution as a robust and scalable SaaS product, we present an estimated timeline and the composition of the dedicated project team.

Estimated Timeline and Project Team

The development and deployment of the solution will be conducted using an agile methodology, allowing for flexibility and incremental deliveries. We estimate a total effort of approximately 2880 hours, distributed over a period of 24 weeks (about 6 months) from the effective start of the project until the go-live of the first stable version. This estimate considers the following main phases:

1. **Planning & Detailed Design**	Requirements refinement, architecture design, and PoC validation	480h	4 Weeks
2. **Development & Impementation**	Core development (backend, frontend, security)	1680h	14 Weeks
3. **Integration & Testing**	Integration, security, and performance testing	480h	4 Weeks
4. **Deployment & Go-Live**	Production deployment and hypercare	240h	2 Weeks

Total:

24 Weeks

2880 hours

Testing, Validation, and Acceptance

Ensuring the quality and compliance of the FM Enterprise Middleware Solution with the specified requirements is essential. We will implement a comprehensive testing process, covering all phases of the development lifecycle, from unit testing to final validation in conjunction with the Department of National Defence (DND).

Testing Strategy

Our testing approach will be multifaceted, including:

1. **Unit Testing:** Each developed software component or module will undergo automated unit tests to verify its correct isolated functioning.

2. **Integration Testing:** We will verify the interaction between the different components of the middleware solution (ingestion, processing, transmission, GUI, database) and also the integration with external systems. This will include specific tests of the communication with the DND EDE, actively participating in the Preliminary Integration Testing (PIT) and Joint Integration Testing (JIT) phases conducted by DND, to validate connectivity and the exchange of SOAP messages over mTLS.

3. **Functional Testing:** We will validate that the solution meets all functional requirements described in Table 8 of the RFP, including correct data conversion, aggregation, application of business rules, and GUI functionalities.

Testing Strategy

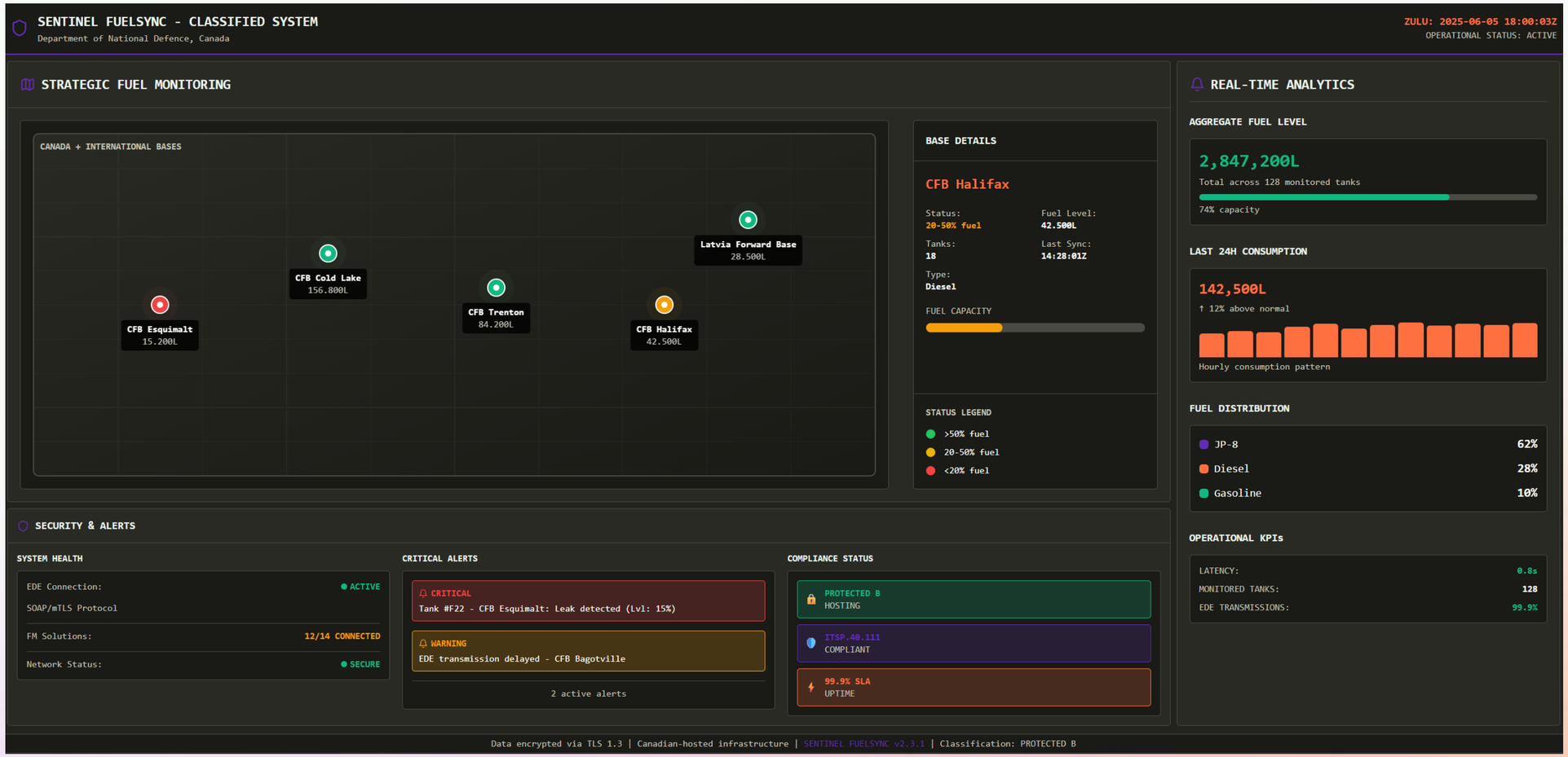
4. **Security Testing:** We will conduct dedicated security tests, including vulnerability analysis, penetration testing (as agreed), and verification of compliance with Government of Canada security requirements (SRCL, ITSG-33, PAMM profile).

5. **Performance and Load Testing:** We will evaluate the solution's performance under different workloads to ensure it meets scalability and response time requirements, even with an increase in data volume or the number of connected FM Solutions.

6. **Usability and Accessibility Testing:** The graphical interface will be evaluated for ease of use and compliance with accessibility guidelines (EN 301 549).

7. **Validation and Acceptance:** The final validation of the solution will be a collaborative process with DND. We will actively support the Customer Acceptance Testing (CAT) phase, providing stable test environments, support documentation, and prompt resolution of any identified defects. The goal is to ensure that the delivered solution fully meets DND's needs and expectations before final acceptance and production deployment. We will maintain detailed records of all tests performed, results obtained, and defects corrected, providing full transparency throughout the quality assurance process.

Strategic Fuel Monitoring Dashboard



This prototype showcases a comprehensive system for strategic fuel monitoring, providing real-time analytics, operational insights, and alerts regarding fuel levels across various bases. The aim is to offer a clear overview of the system's capabilities and its potential for enhancing fuel management efficiency and security.

https://fuelsentinel.mosten.com/

Commercial Proposal

Investment Model

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Commercial Terms

Below are the commercial and financial terms:

- The hours consumed in the current month will be billed, with payment due in the following month;
- Submission of the respective allocations with the invoice (NF) issued between the 1st and 10th of the month following the services rendered and validated by the CLIENT, with payment due within 20 days of the invoice submission in the current month;
- In case of late payment, a 10% penalty fee will be applied, plus 5% monthly interest calculated pro-rata;
- All taxes are included;
- If there is an interest in terminating the service contract, it can be done at any time with prior notice via email at least 30 days in advance, including a penalty fee of 50% of the remaining contractual period.

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Company Details

Company Name:
Mosten Negócios & Tecnologia Ltda

Trade Name:
Mosten

Registration Date: 08/07/2015

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Municipal Registration: 1032433

Bank Datails

Bank: 341 – Itaú Unibanco SA

Branch: 0268

Account: 40818-4

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Negócios e tecnologia

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