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Defense & Space Electronic Systems

Military Data Link Integration Application

Military Data Link Integration Application (MDLIA)

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Military Data Link Integration Application (MDLIA)

A flexible, scalable, modular, low cost solution.

A unique integration approach providing a common solution to interface new tactical data link radios with legacy military equipment and systems.

An implementation that allows military users to customize message processing on each unique platform through user modifiable instructions.

The Problem

- **Network Centric Warfare Initiatives**
  - Driving standardization in C4ISR messaging
  - Link-16 has been designated as the primary tactical data link
  - Over 27,000 platforms are being upgraded
- **Joint Tactical Radio System**
  - Next generation data link terminal
  - Will be installed on numerous platforms
  - Will require integration with legacy subsystems (Displays, Communications, Mission Systems)
- **MIL-STD-6016B Message Set**
  - Defines the complete tactical data link J-Series message set
  - Numerous legacy platforms either
    - Don't implement any J-Series messages, or they
    - Implement a limited set of J-Series messages

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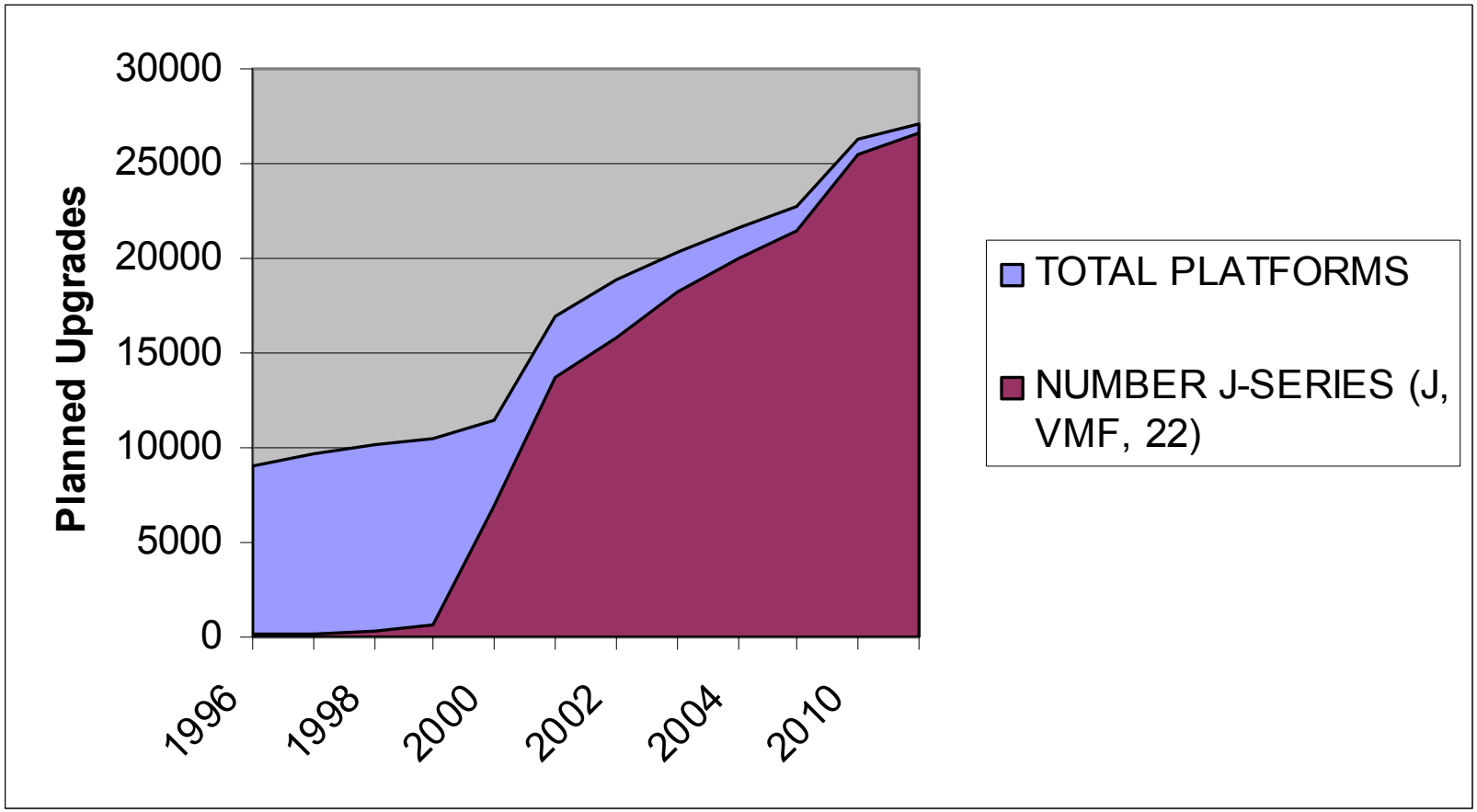
Bottom Line

- Military users are concerned about the high cost to upgrade legacy subsystems (based on existing stove-piped approaches and dependence on traditional primes)
- A modular and common upgrade approach will save money
- A solution that gives users control over changes will reduce the cost of future upgrades as military data link message sets evolve

Military Data Link Platform Impact



- Platform data based on DoD C4I Joint Tactical Data Link Management Plan
- An estimated 270 unique platform types
- Traditional point solution integration costs are very high
- A common integration solution (i.e. MDLIA) will result in an ~80% cost savings

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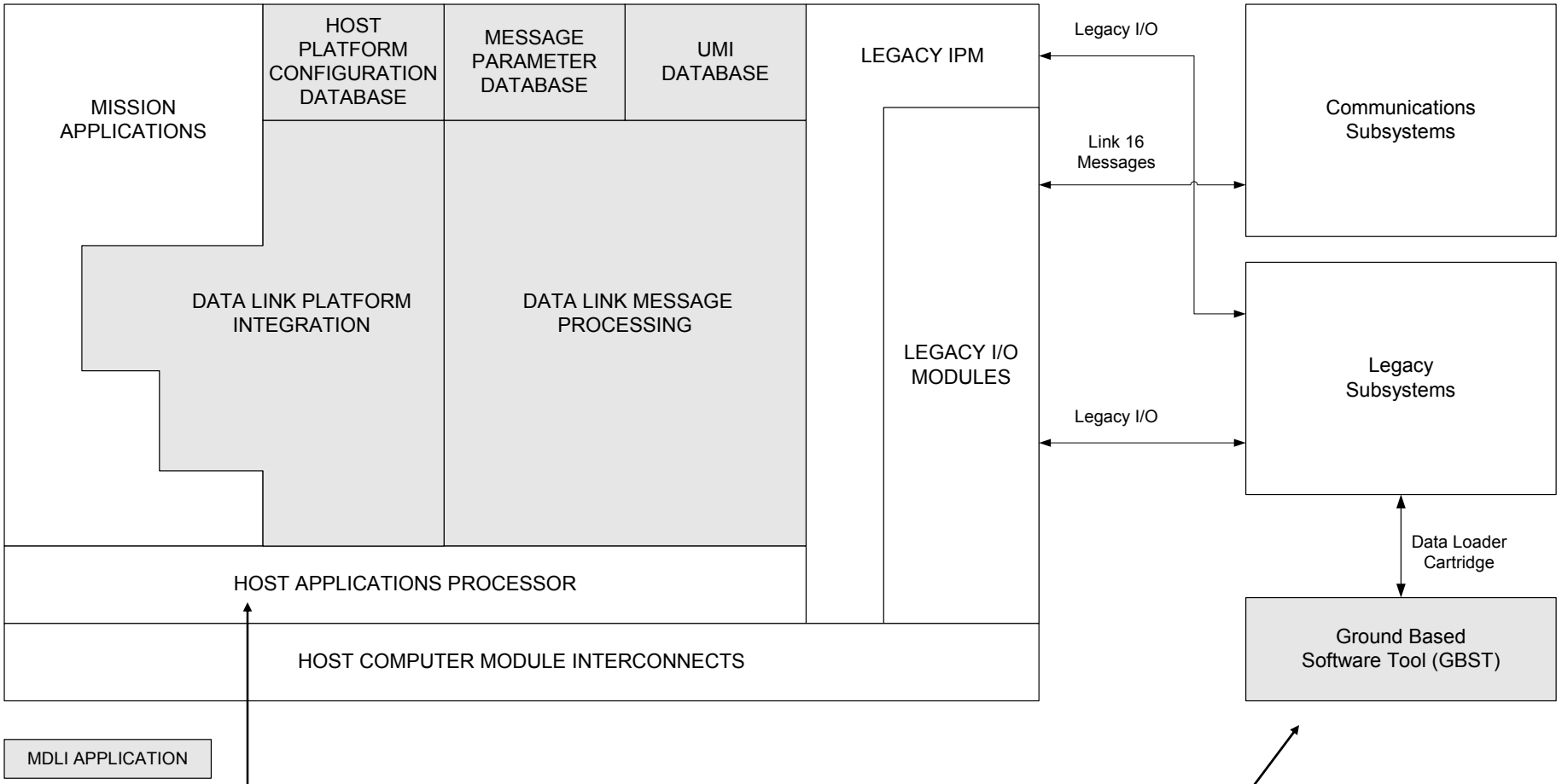
Common Solution Overview



MDLIA software hosted on an existing applications processor

User modifiable data prepared on a office computer

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Major Features

- A flexible, scalable & modular solution
- Common approach
  - Versus traditional stove-piped solutions (i.e. different solution for each platform)
  - Gives military control over each platform configuration and subsequent changes
- Integrates legacy subsystems
  - Can be integrated into legacy host computer as a module or software partition
  - Provides automated I/O configuration control through API database
  - Provides standard video output for flexible data link display formats

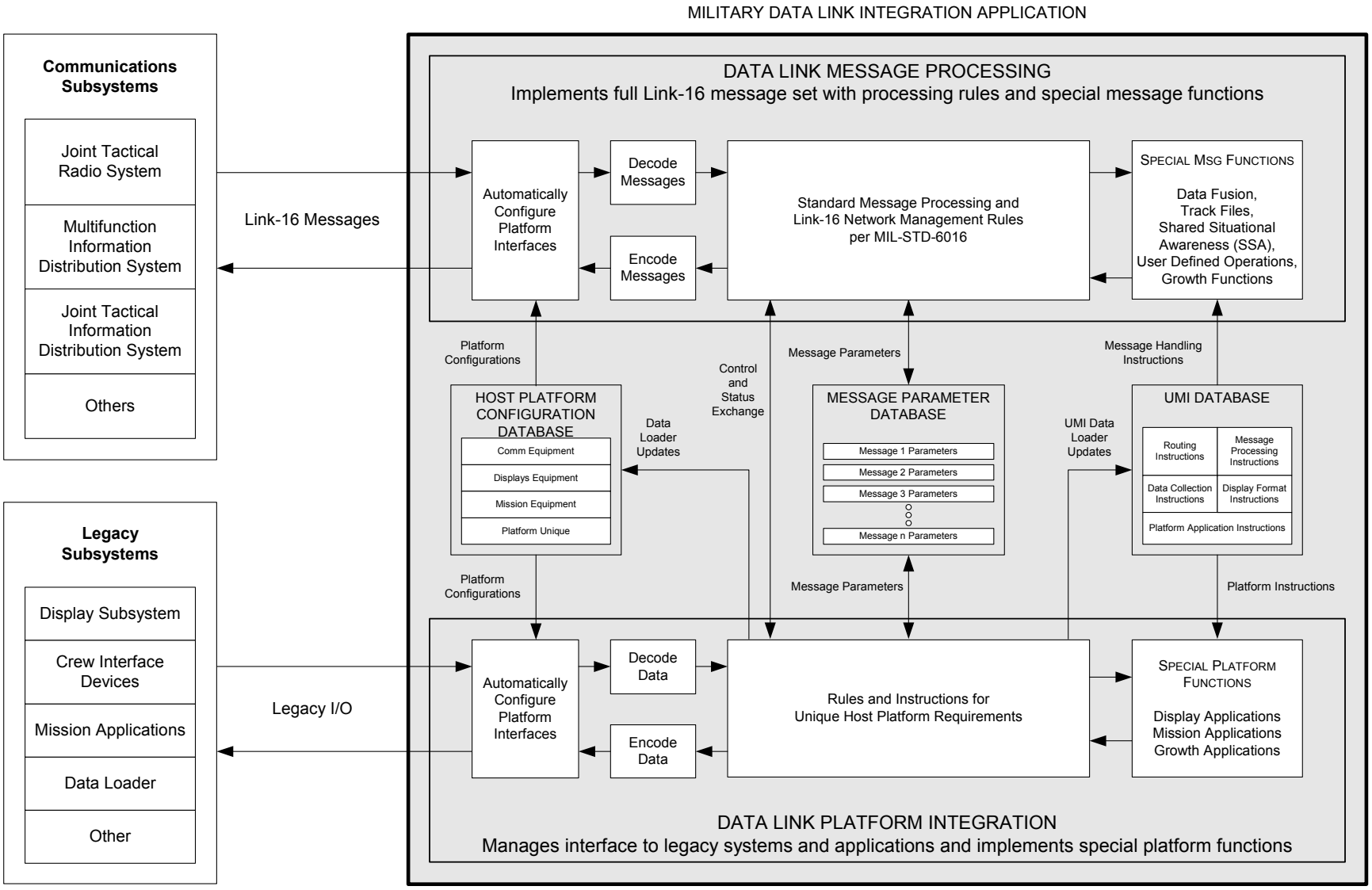
Major Features

- Is based on the current civil CMF software application
  - Model-based design and database-driven customization
  - Modified to implement the full data link message set and tactical data link terminal interfaces
  - Modified to implement tactical data link legacy I/O interfaces in a user modifiable database
  - Modified to to implement user customization capabilities for the data link message set in a user modifiable database
  - Expanded to add special message processing functions
  - Scalable for use in multiple configurations

Implements Full Data Link Message Sets

- Integrates message subset implemented by legacy applications
- Provides additional message processing for messages not implemented by legacy applications
- Allows users to define specific message processing with instructions database
- Allows users to create specific display data/formats with instructions database
- Allows users to specify specific message routing with instructions database

Implementation - Link-16 Example



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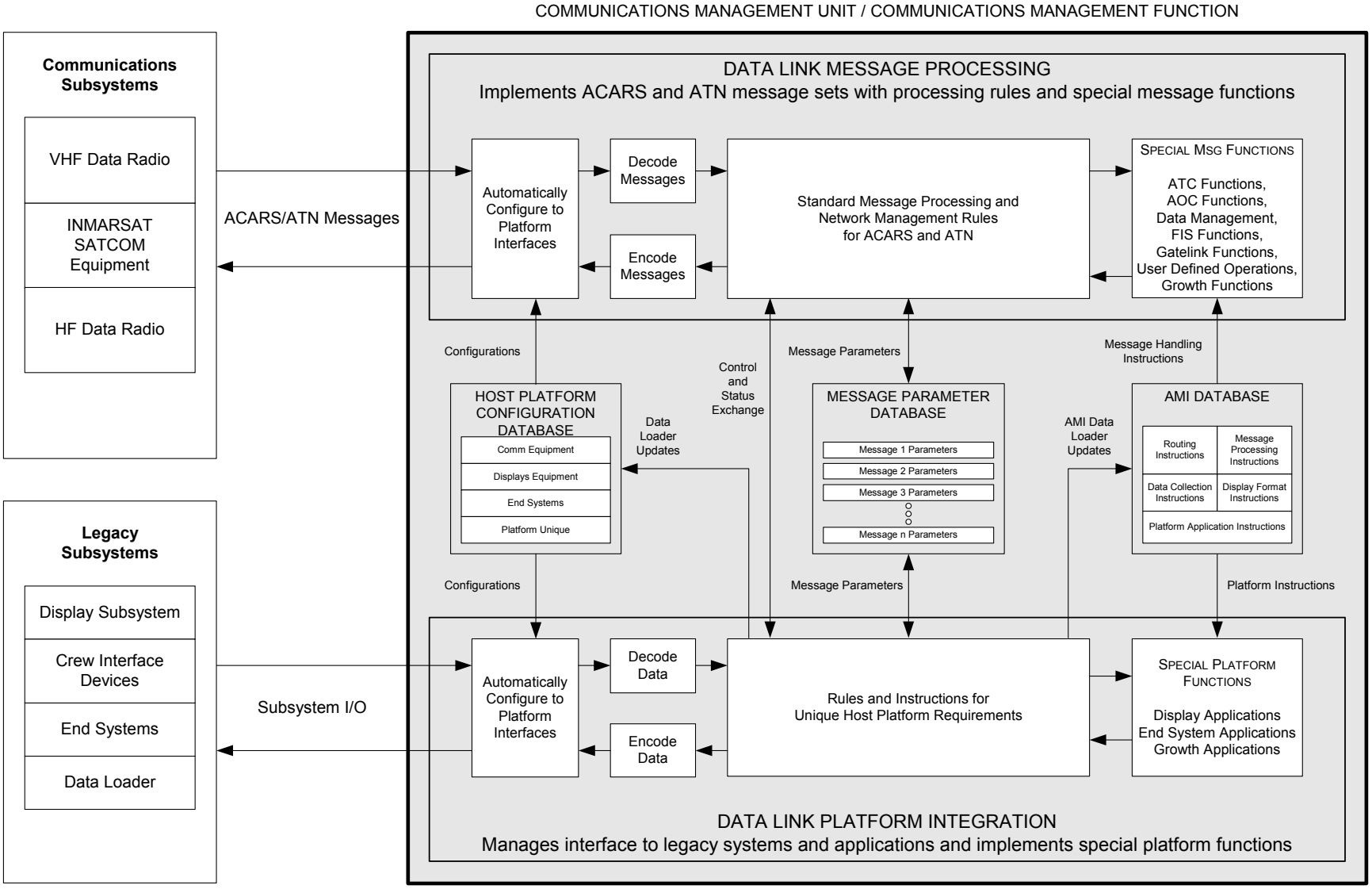
Civil CMU (ARINC 758) Implementation



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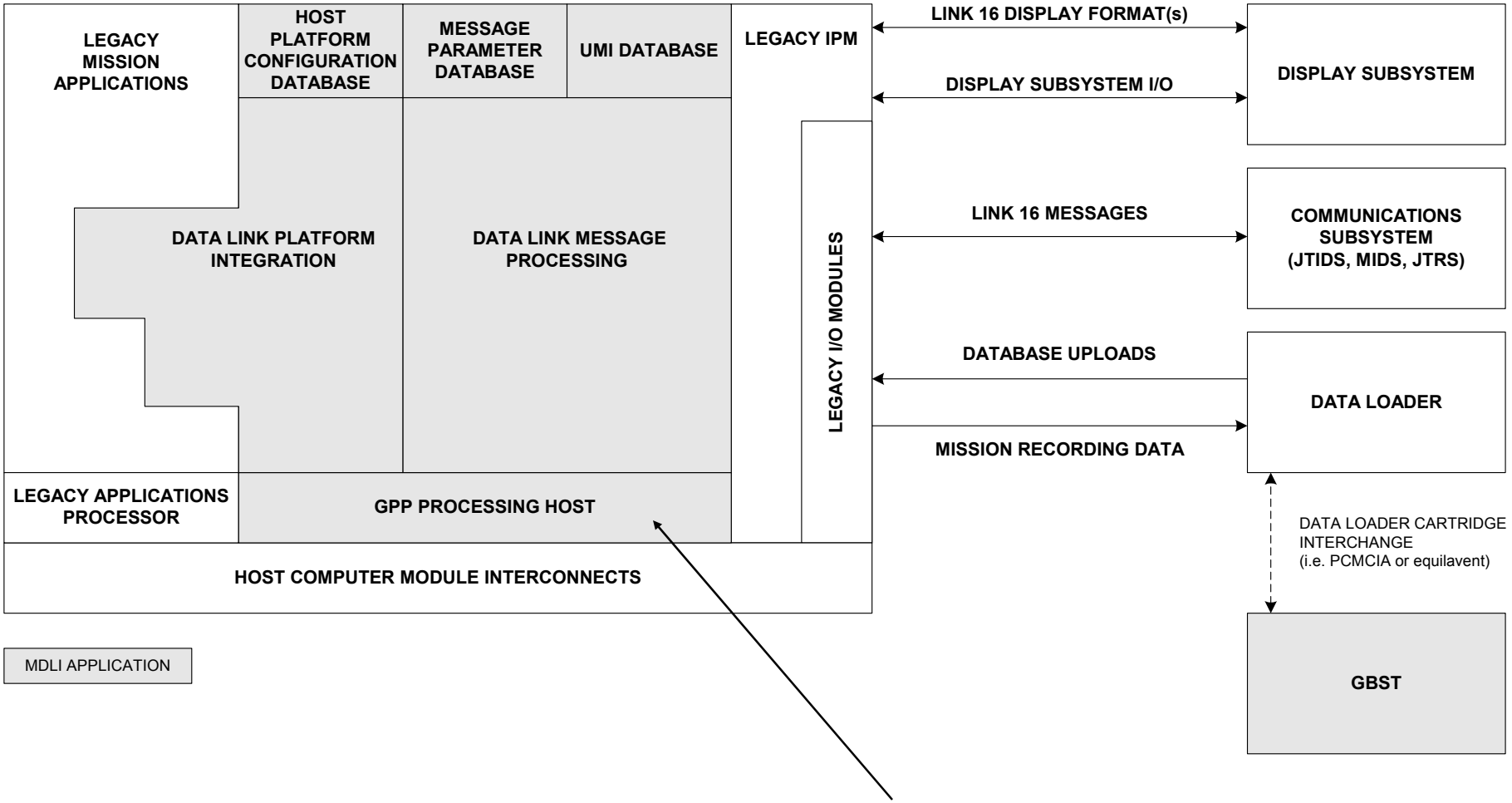
Multiple Implementation Configurations

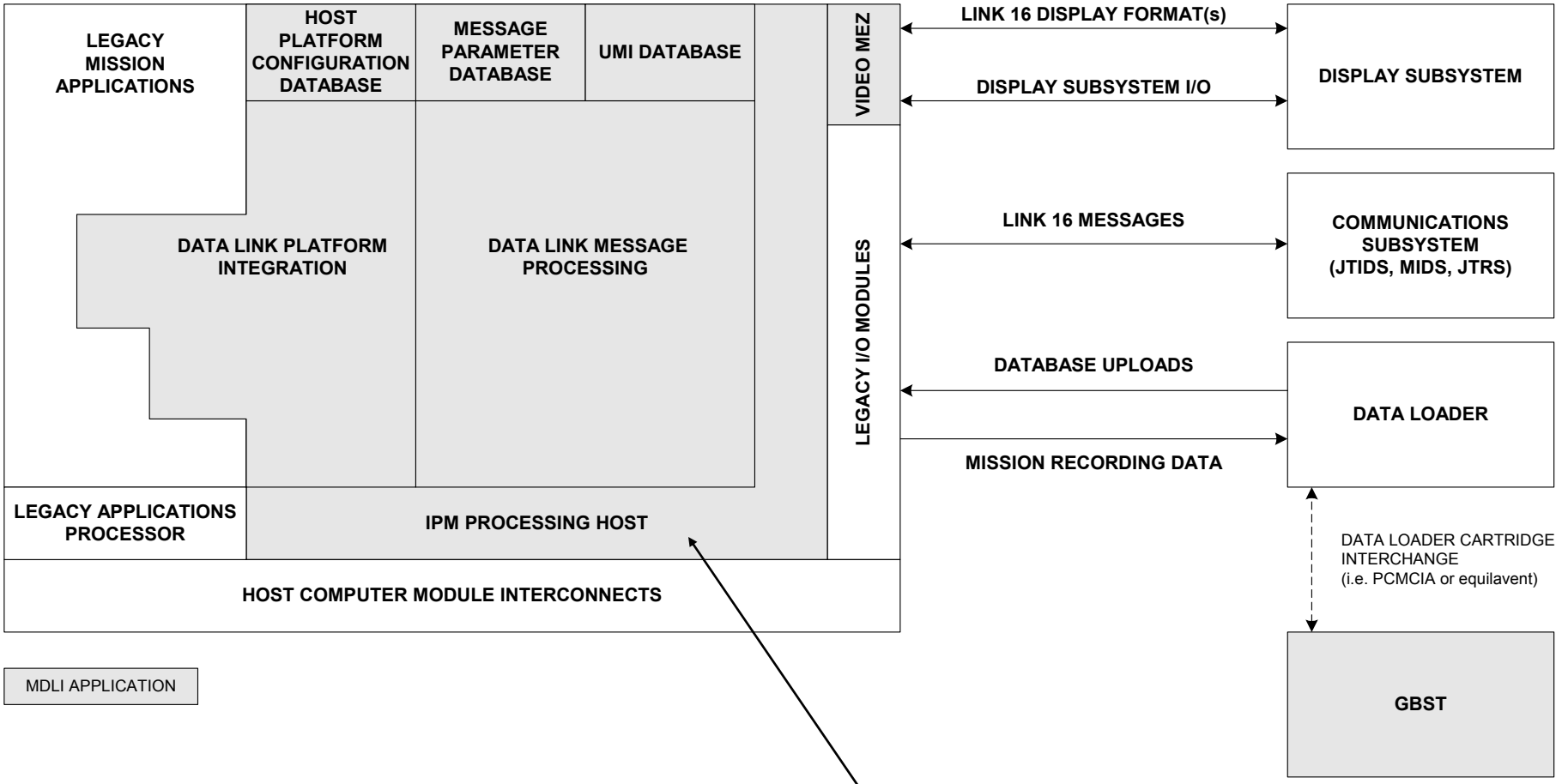
- Can be hosted as a software partition in a legacy host processor
- Can be provided on a GPP and hosted in a legacy host computer
- Can be provided on an IPM and hosted in a legacy host computer
- Can be provided in an integrated system

MDLIA with GPP Host



Hosted on a General Purpose Processor (GPP) module

MDLIA with IPM Host



Hosted on a Image Processing Module (IPM) module

Benefits

- Common scalable design that can be used on multiple unique platform types to reduce integration costs by ~80%
- Data link message set is user programmable without the need to modify/recompile the operational software
- API database allows I/O re-configuration to legacy subsystems without the need to recompile the operational software
- Implements full message sets where each message can be activated or deactivated within the MDLIA, or allocated to legacy applications (if implemented previously) through the instructions database
- Provides standard display system interfaces and video outputs to support flexible and user programmable data and/or display formats
- Utilizes ground based software tool to create the message set instruction database

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