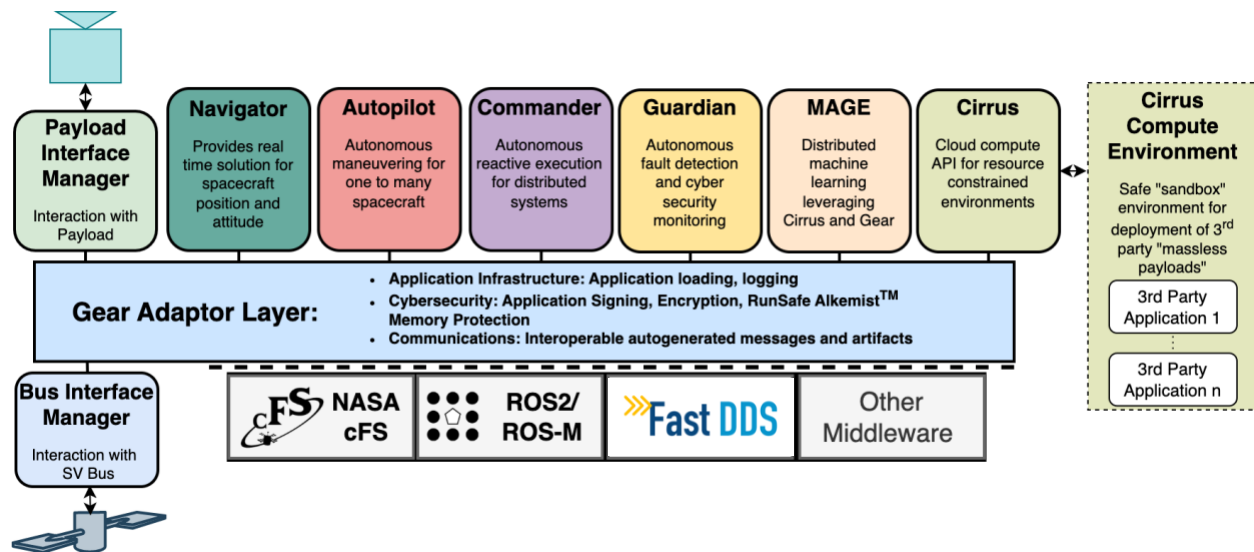


Adapt to Your Solution

The space industry has been rapidly moving toward proliferated commodity Space Vehicles (SVs) for future missions. These SVs must be customized to achieve your mission objectives. Gear is the flight software infrastructure solution that adapts to the various commoditized SV flight computers, operating systems and middleware to achieve cross-platform deployment of mission flight software applications.

Gear is a flight software framework that enables rapid deployment of applications to current and future software platforms. Embracing the diversity of hardware and software solutions on the market, it expedites new deployments. Gear applications are portable to middleware cFS, ROS-2/ROS-M, Fast DDS, and other middleware. The design adheres to a modular, open system architecture (MOSA) where message definitions are shared among performers and enables quick upgrade of existing applications and new application deployment.



Modules/Components

Gear includes a set of applications that implement useful services for space flight software integration, application development, remote operations, and data management.

SV Bus Interface Manager

A communications protocol adapter to a space vehicle bus or flight computer.

Payload Interface Manager

A communications protocol adapter to flight hardware including sensors and mission payloads. Example payload types include electro-optical, infrared, and RF.

Telemetry Logger

A service that logs a configurable set of messages from traffic on the message bus to files on the disk. Operations procedures support downloading and analyzing the stored telemetry files.

App Loader

A service that manages uploads and performs attestation prior to execution of Gear applications developed with the Gear SDK. Attestation is the verification of Gear application integrity using certificates and package hashes to protect from tampering and malicious activities.

Gear SDK

Software developer's kit that makes it easy for third party developers to build and test Gear compatible applications.

Specifications

- Runs on Linux-based OS
- Uses x86_64, ARM32, and ARM64 processors
- Written in C++
- Integrates natively with multiple publish-subscribe message-oriented middleware
- Provides interfaces for communication with other processors and flight hardware
- Integrates seamlessly with Ascent multi-spacecraft modeling, simulation, and analysis system for rapid development, integration, and test
- Integrates with RunSafe Security's Alkemist:Code product for memory protections (e.g., buffer overflows, run/jump-oriented programming, zero-day exploits) on Gear application executables; More 70% of all security vulnerabilities are tied to memory safety issues

About Emergent

Emergent Space Technologies, Inc. researches, develops, integrates, and tests advanced systems and software solutions for civil, military and commercial space missions. We are industry leaders in the development of flight software for multi-spacecraft missions, including constellations, formations and clusters of small satellites. Our core competencies are systems engineering, integration and test; guidance, navigation and control; orbital mechanics; positioning, navigation and timing; advanced modeling and simulation; and SW architecture, design, development and test. Our domain expertise and experience, combined with our knowledge of current and emerging technology, make Emergent the team of choice in the aerospace industry.