DDC-I

INDUSTRY OVERVIEW

Deos for Defense

Real-Time Operating System (RTOS) Enables Rapid Upgrades for the Warfighter

Deos™ is a dual-use technology first developed for commercial aerospace safety- and mission-critical systems. Deos offers military platforms a robust, tested solution with more advanced capabilities than legacy RTOS products.

Military platforms can leverage Deos for modular design and to speed agile software deployment. New functionality can be implemented quickly providing faster upgrades for the warfighter and enabling platforms to adapt to ever-evolving threats.

Example Applications

- **Avionics**
- **Autonomous systems**
- **ISR and sensor fusion**
- **Missile guidance**
- **Space**

Deos RTOS for Embedded Military Systems

- Faster upgrades and agile development
- Conformant with MOSA, FACE®, GCIA & PYRAMID
- Ultra-fast boot times
- Secure and modular boot for security
- Millions of flight hours on tens of thousands of aircraft
- DO-178 DAL A certifiable when safety is required
- Portability and scalability across product lines: autonomous, crewed, and weapons systems

Move Beyond Legacy RTOS Products

Many legacy defense RTOS solutions carry inherent development and maintenance costs. They compile into a monolithic binary image that requires a cumbersome and lengthy process to field new capabilities. Defense developers are often forced to sacrifice critical qualification and testing steps to deploy upgrades in a timely manner.

The modular Deos kernel architecture provides a building block binary component structure that enables:

- The ability to isolate and re-use software modules across platforms
- Deployment of incremental updates and capabilities rapidly to systems
- A secure infrastructure

Key Value Deliverables

- Scalable
  - Microprocessors (MMU-less) to multiprocessors (ARM, x86, PPC)
  - Mission-critical deterministic systems to strict safety critical requirements (e.g., DAL A)
- Supports RMS, ARINC-653, and POSIX
- Real-time/deterministic
  - Accurate/low jitter

Fast context switch times, low overhead

- Ultra-fast boot
- Minimal OS overhead/interference
- Robust
  - Time & space partitioning that provides fault tolerance and security
  - Designed with DAL-A processes
- Hypervisor integrations
  - Deos as guest OS on Xen and seL4
- Paravirtualization for other OS environments
- Middleware
  - I/O Infrastructure (IOI) provides data conversion & I/O handling
  - UDP, lwIP, DVMS, CFFS
- Device drivers
- Security – minimal attack surface
  - DO-178 DAL A & static analysis processes, DO-326A
  - Partitioning, down to the cache level, isolates applications and the OS
  - Secure boot
  - Application & OS obfuscation
- Significant 3rd party support
  - Enable AI algorithm deployment in deployed, embedded systems
  - Robust testing tools
  - COTS hardware BSPs
  - Communication networks (TSN, UDP)