DDC-I 40 1986 2026 Years

Safety Critical Software Solutions
For Mission Critical Systems

Booth #4-113

Deos RTOS Brief

Safety and mission critical Real Time Operating System (RTOS)
- DO-178 DAL-A, certified & flying in over 10,000 aircraft
  - Time & space partitioning
  - Allows mixed levels of criticality
- Fault isolation
- Scalable from simple LRUs to complex IMA systems (DO-297)

Flexible scheduling & APIs
- Optional FACE® profiles
- ARINC-653, POSIX, and/or rate monotonic scheduling
- Optionally hosted hypervisors
- Aligned with Pyramid and MOSA requirements

Software & artifact reuse, data decoupling
- Binary modularity reuse
- Run time on-target linking
- Reduces scope of change, quicker time-to-market
  - Leverages prior certification credits
- Publish/subscribe DO-178 DAL A IPC
  - Abstracts data from applications

Performance
- Context switch times in µs
- Very fast boot time (ms)
- Patented slack scheduling for 100% CPU utilization
- Multi-core with AC/AMC 20-193 compliance
  - Safe scheduling (BMP)
  - Memory pooling and (application level) cache partitioning
  - Safety nets (e.g., resource throttling)

Security
- Partitioned environment
- Non-dynamic operation (e.g., cannot start executables or modify registry)
- Optional static code analysis, pin testing, etc. (e.g., DO-326A)
- Optional secure transport, cryptography, application obfuscation, etc.
- DAL-A secure boot optional

Target support
- Wide processor coverage - Arm, PowerPC, X86
- COTS cards and systems
- Design reference cards

Development environment
- Linux (Docker), MS-Windows hosts
- C/C++ with Ada & Rust optional
- Eclipse IDE
- Profiler & configuration tools
  - WCE & resource use logged by DAL-A kernel
- QEMU processor emulator included
- Code coverage MC/DC at object level
- DO-330 qualified, where applicable

Use cases: Safety and mission critical
- Aviation (e.g., controls, IMA, display, mission systems etc.)
  - Avionics –air transport, eVTOL, military, etc.
  - Ground control systems
- Ground/Sea
  - Vehicle control
  - Weapons/fire control
  - Autonomous vehicles
- Space
  - Satellite control & communications
  - Engine and launch control

Business advantages
- Leverages best in class commercial technology
- Implement AI models in embedded systems
- Modular design enables rapid updates
- Streamlined RTOS & tooling – no product fragmentation for FACE, 653, multi-core or processor type
- Open/industry standards based
- No RTOS customization or (re)compiling needed
  - Binary identicality between customers & applications
  - Low risk, low LoE to deploy
- Mature, stable & low risk product
- TAA conformant US supported product
- Simple & flexible business models

Support
- On-site training
- Turn-key BSP & device drivers
- Off the shelf DO-178C DAL A artifacts
- Certification artifact defense

Networking & file system options
- TCP/IP, TSN
- UDP – high performance optional H/W acceleration
- ARINC-664/AFDX, TTE, TSN, ARINC-429, 1553, CAN
- Multiple file systems optional ex-FAT, journalling

DDC-I offers complete solutions for embedded software developers with a primary focus on safety-critical applications. For over 40 years, DDC-I has worked closely with an impressive who's who list of aerospace and defense contractors, providing innovative products and reliable engineering expertise. The Deos Real-Time Operating System is the most deployed COTS RTOS in avionics history.

Deos™ was built from the ground up with plans and procedures created to the guidance of DO-178DAL A starting with its requirements for its first line of code. In fact, Deos was the first time and space partitioned RTOS certified for flight on aircraft by the FAA, EASA, and most other certification authorities world-wide. It is the overwhelming dominate COTS RTOS for commercial aircraft avionics.

Deos is an ideal platform for all embedded systems developers, with or without DO-178 requirements.

- **If you need safety-critical performance, the choice is DDC-I.**
- **The Deos RTOS is powering a growing number of eVTOL platforms as well as mission-critical space applications.**
- **Deos for defense enables rapid updates to the warfighter**

NOTES

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