

Jason-1 Telemetry, Command and Communications Subsystem (JTCCS)



**GSAW 2003, Plenary Session
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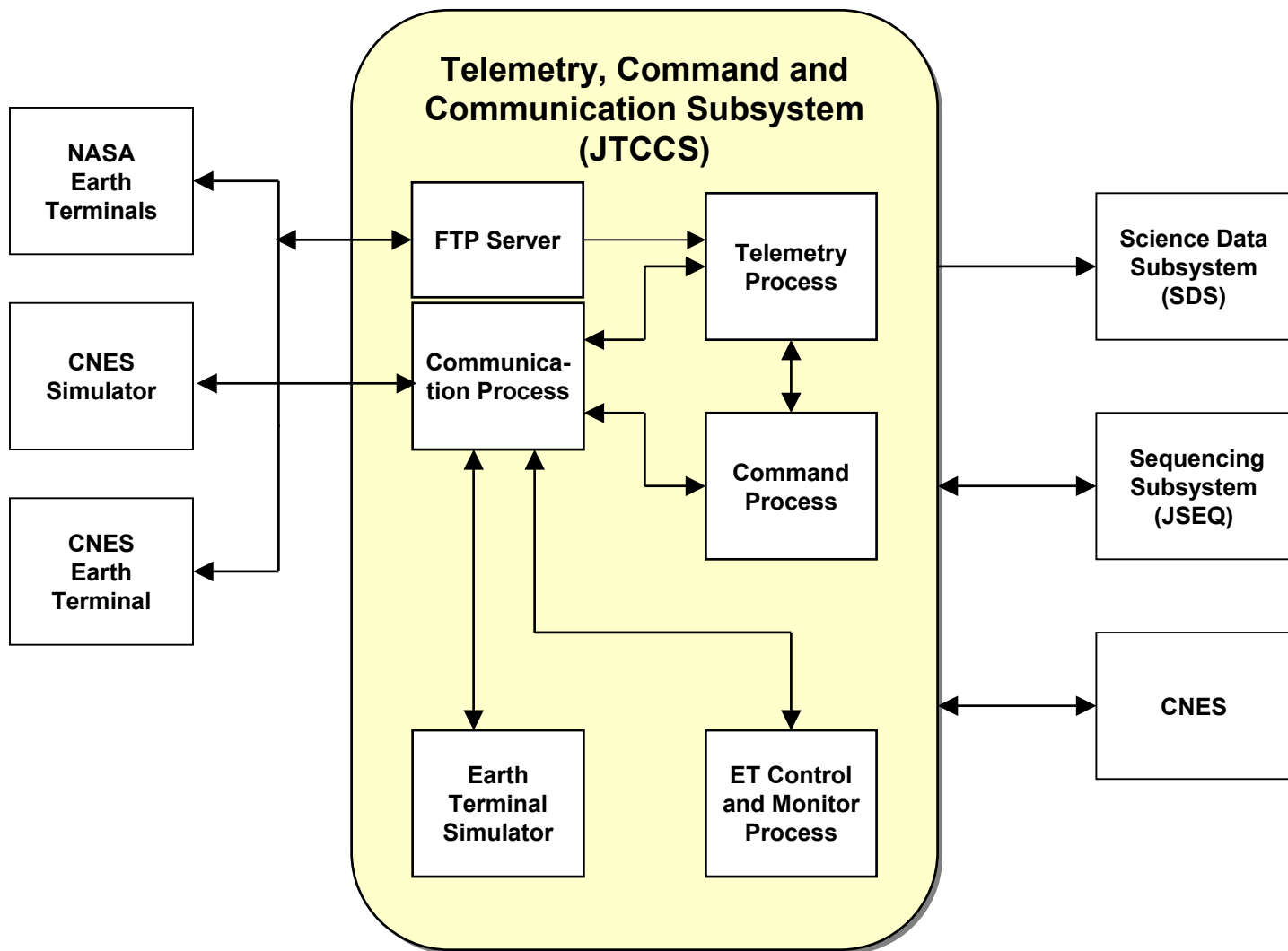
JTCCS Architectural Features

This Command and Control System is:

- Fully Operational
- Modular
- Plug and play
- Portable
- Distributable
- Open Architecture
- Easy to Use
- Very Easy to Learn (Low Cost Training)
- Ready for Lights Out Operation
- Very Low Cost

- Designed for a Twenty Year Lifetime
- Designed to Support Multiple Spacecraft
- Developed With a New Management Methodology

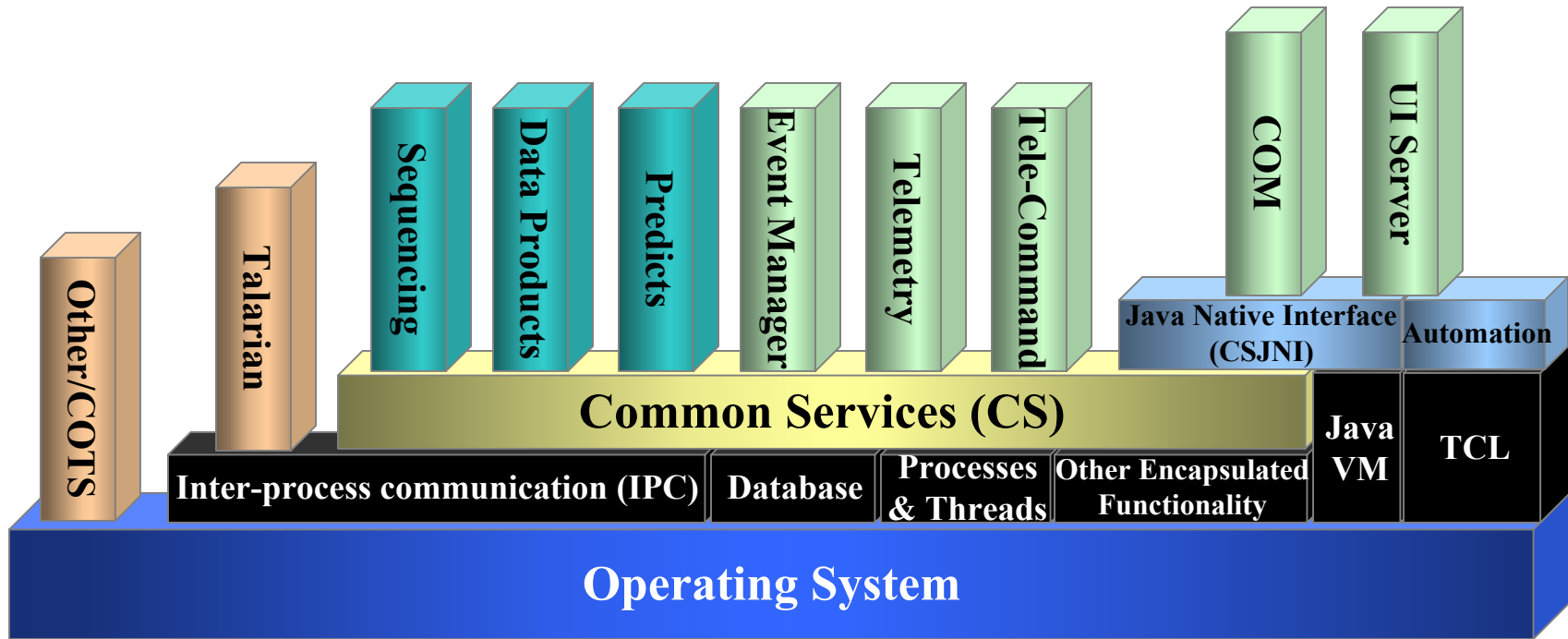
The JTCCS Subsystem



JTCCS Functional Tasks

- **Control and Monitor Earth Terminals**
- **Receive, Store, Process and Display Real-time and Recorded Telemetry Data.**
 - HKTMR - Onboard Housekeeping Recorded Telemetry Data
 - HKTMP - Real-time Housekeeping Telemetry Data (During Passes)
 - PLTM1 - Payload Telemetry Data One
 - PLTM2 - Payload Telemetry Data Two
- **Command and Monitor Satellite Status**
- **Translate and Transmit Commands**
- **Decommutate and Distribute Telemetry Data**
- **Manage and Archive Data Files**

JTCCS Pluggable Architecture



 = Potential Future Plug-ins

JTCCS System Elements

- **Size: 489,000 Lines of Code (LOC)**
- **Total cost: \$8.7 Million**
- **Fully Documented: 7000 pages (JPL-D-4000).**
- **Software Languages: Java, C++ and TCL**
- **Operational Modes: Manual, Automatic and Unattended**
- **Designed to Support Four Generations of Satellites Over a Twenty Year Life Cycle**
- **Wireless and Handheld Personal Digital Assistant Capability**

Impacts of Lifecycle Architecting Decisions



The Correct Application And Synthesis of Experiences In

- The Managers' Role as Systems Architect and Teacher
- Understanding Cognitive Dynamics
- The Importance of Verbal and Written Communications
- The Importance of Task Oriented Organization
- The Selection and Tailoring of Software Standards
- Understanding Inferential and Traditional Architectures
- Selecting The Proper Development Methodology
- Selecting The Correct Control Points For Production
- Project Management In Low Cost High Quality Systems
- The Impact of Leadership in Software Intensive Projects
- Estimating Software Development Cost

Common Software Service Architecture

