The Space Dynamics Laboratory’s (SDL) Data Networking Group provides cost-effective data network systems and development services to government and military agencies. SDL’s network expertise ranges from low- to high-speed communication solutions, including technologies supporting up to 100 Gb data rates. SDL implements multiple platforms that support airborne- and ground-based data communications.

In addition to network interfaces, SDL’s systems typically include embedded processing capability for data analysis. SDL’s platforms leverage COTS components where possible and are readily adaptable to meet customer needs. A typical architecture implements a Linux OS running on multi-core central processing units (CPU) with high-speed memory, solid-state drive (SSD) storage, and FPGAs interfaced via multi-lane peripheral component interconnect express (PCIe). SDL’s networking devices exemplify years of experience in sophisticated digital design, high-speed networking, and hybrid embedded Linux/FPGA/PCIe architectures.

SDL couples deep data networking expertise with an excellent record of on-time, on-budget program execution. When needed, the group draws on the larger SDL organization for additional manpower and expertise. As a non-profit University Affiliated Research Center (UARC), all data is provided to the Government with unlimited use rights. SDL’s size enables straightforward contract communications and execution, and its ISO 9001 certification is indicative of a commitment to high-quality engineering practices.
AIRBORNE SENSOR RECEIVER, RECORDER & SIMULATOR

SDL's family of airborne network devices receive, record, and simulate various airborne reconnaissance sensors, including common data link (CDL) and asynchronous transfer mode (ATM) platforms such as Global Hawk and U2. SDL's systems translate these sensor protocols into a Gb Ethernet for ground station consumption, supporting up to 15 TB of memory for up to 30 days of mission storage and playback. Airborne network devices are built on a powerful and flexible Linux-based server, offering dual Intel CPUs in a 1U rack-mount configuration. Their PCIe sensor interface cards can be configured as needed to support multiple sensor types. Custom PCIe expansion cards can be implemented for full mission support.

NETWORK ANALYSIS

SDL develops state-of-the-art network analysis devices with the most up-to-date technologies to protect and manage critical communication channels. These devices provide data transfer prioritization, adaptation to network link speeds, and remote client command and control, all while achieving almost complete bandwidth utilization and meeting strict data security requirements. They can examine and analyze the baseline behavior of multi-layered networks to identify and flag out-of-character data transmissions.

Packaging options for SDL's network analysis devices include IBM BladeCenter™ blade, 1U or 2U rack mount, or conduction-cooled chassis. These devices implement high-powered CPUs connected to SDL's custom-designed network packet processor cards through a high-speed PCIe architecture. This processing power, along with a hardware-based CAM, combine for full line rate networking analysis capability. System command and control, status, and network analysis results are communicated via a programmatic application interface or remote graphical user interface.

FEATUERS

- Dual 2.6 GHz multi-core CPUs
- 1U rack-mount configuration
- CDL & ATM PCIe I/O boards
- Up to 15 TB storage capacity
- Sensor data record & playback
- Expansion using PCIe add-in cards
- Flexible system w/various expansion options

SENSORS SUPPORTED

- ATARS (CDL)
- Global Hawk (CDL)
- ASARS (ATM)
- SYERS (ATM)

FEATUERS

- 4 core 2 GHz CPU
- PCIe + FPGA architecture
- Blade, 1U/2U & conduction-cooled configurations
- 4 GB DDR3 & 512 GB SSD for storage
- Client/server system

PROTOCOLS SUPPORTED

- Up to OC-1092/STM-640 SONET/SDH
- OTN, PDH
- FEC, enhanced FEC
- 100 Gb Ethernet (optical)
- 10 Gb Ethernet (optical)
- 1 Gb Ethernet (copper)

SENSORS SUPPORTED

- ATARS (CDL)
- Global Hawk (CDL)
- ASARS (ATM)
- SYERS (ATM)