

CROSS DOMAIN SOLUTIONS

SECURING DIGITAL ASSETS OF THE U.S. GOVERNMENT,
DoD, & INTELLIGENCE COMMUNITY



OWL CYBER DEFENSE

+1 (203) 894-9342

WWW.OWLCYBERDEFENSE.COM



TABLE OF CONTENTS

OWL CYBER DEFENSE SOLUTIONS, LLC	1
OWL CROSS DOMAIN ARCHITECTURE	2
GLOBAL COMPLIANCE & CERTIFICATIONS	4
NCDSMO APPROVED OWL CDS CONFIGURATIONS	5
OWL SPECIALIZED CDS PLATFORMS	9
OWL STANDARD CDS PLATFORMS	10
COMMUNICATION CARDS DUALDIODE TECHNOLOGY™	12
SOFTWARE APPLICATIONS WITH COMMUNICATION CARDS	13
OWL PERFORMANCE MANAGEMENT SERVICE (OPMS)	15
CROSS DOMAIN EMAIL, CHAT, & MDRS	16
ACCREDITATION PROCESS AND SUPPLY CHAIN	17



THE NEXT GENERATION OF CYBERSECURITY

OWL CYBER DEFENSE SOLUTIONS

Owl is the proven source for data diode cybersecurity, with solutions deployed globally in government, military, and critical infrastructure industry networks.

Owl solutions are key components of your network defense-in-depth security strategy. DualDiode Technology™ and Owl software applications integrate seamlessly into existing network infrastructures providing secure network connections into and out of sensitive networks while enabling operational efficiencies and mission results.

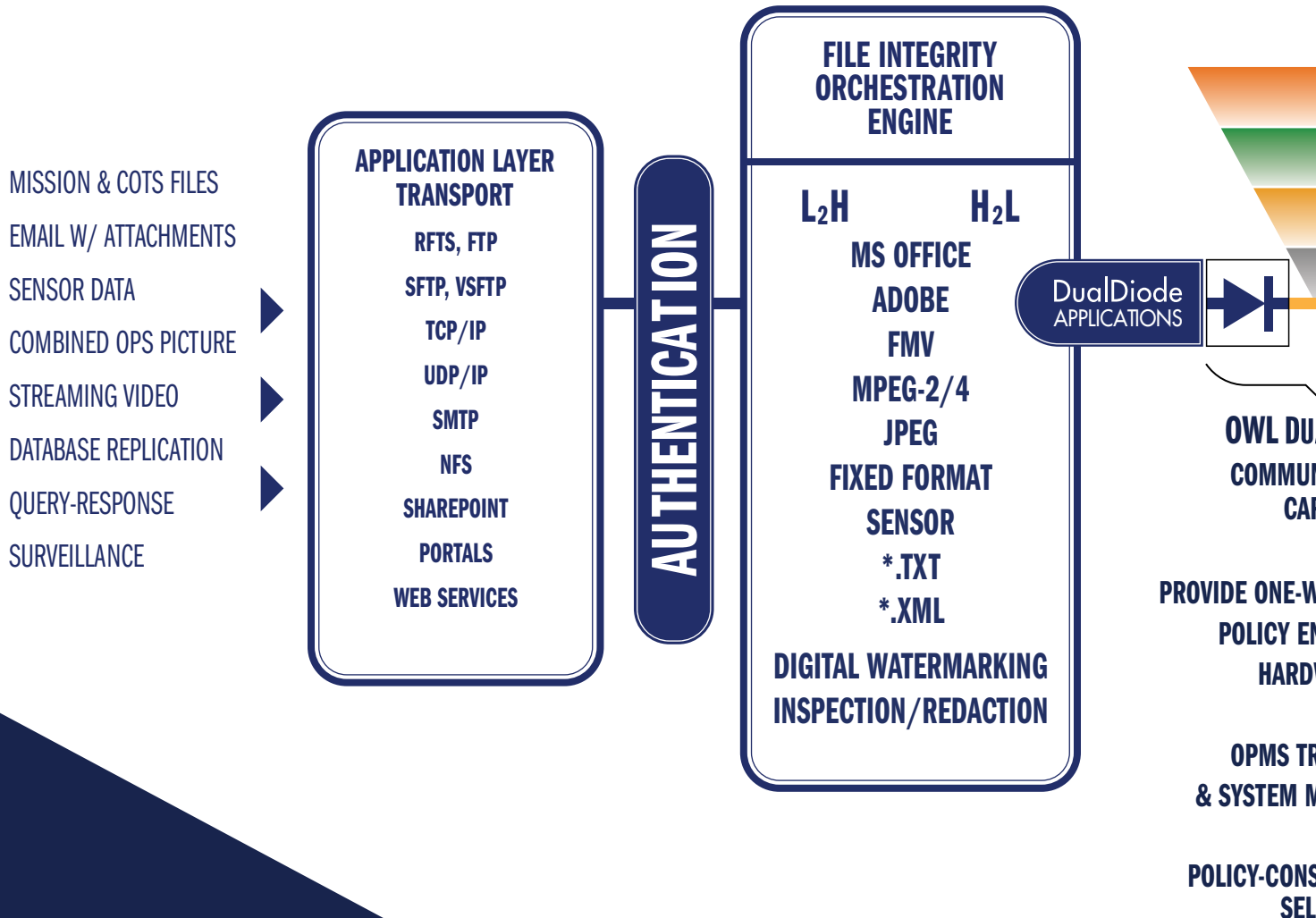
Owl DualDiode Technology™, a patented data diode, coupled with Owl transfer applications—for all data types—results in hardware-enforced, one-way non-routable communication, enabling secure and robust information sharing.

OWL FOCUS

- *Data Transfer Applications Integrate Seamlessly Using Transport Layer Protocols*
- *Mission-Specific Enterprise Solutions Delivered Ready for Use*
- *U.s. Personnel and Subject Matter Experts*
- *U.S. Controlled Supply Chain, Research, Development, and Manufacturing*
- *Known Costs with no Operations and Maintenance Cost Creep*
- *Cage Code: 1RZZØ*

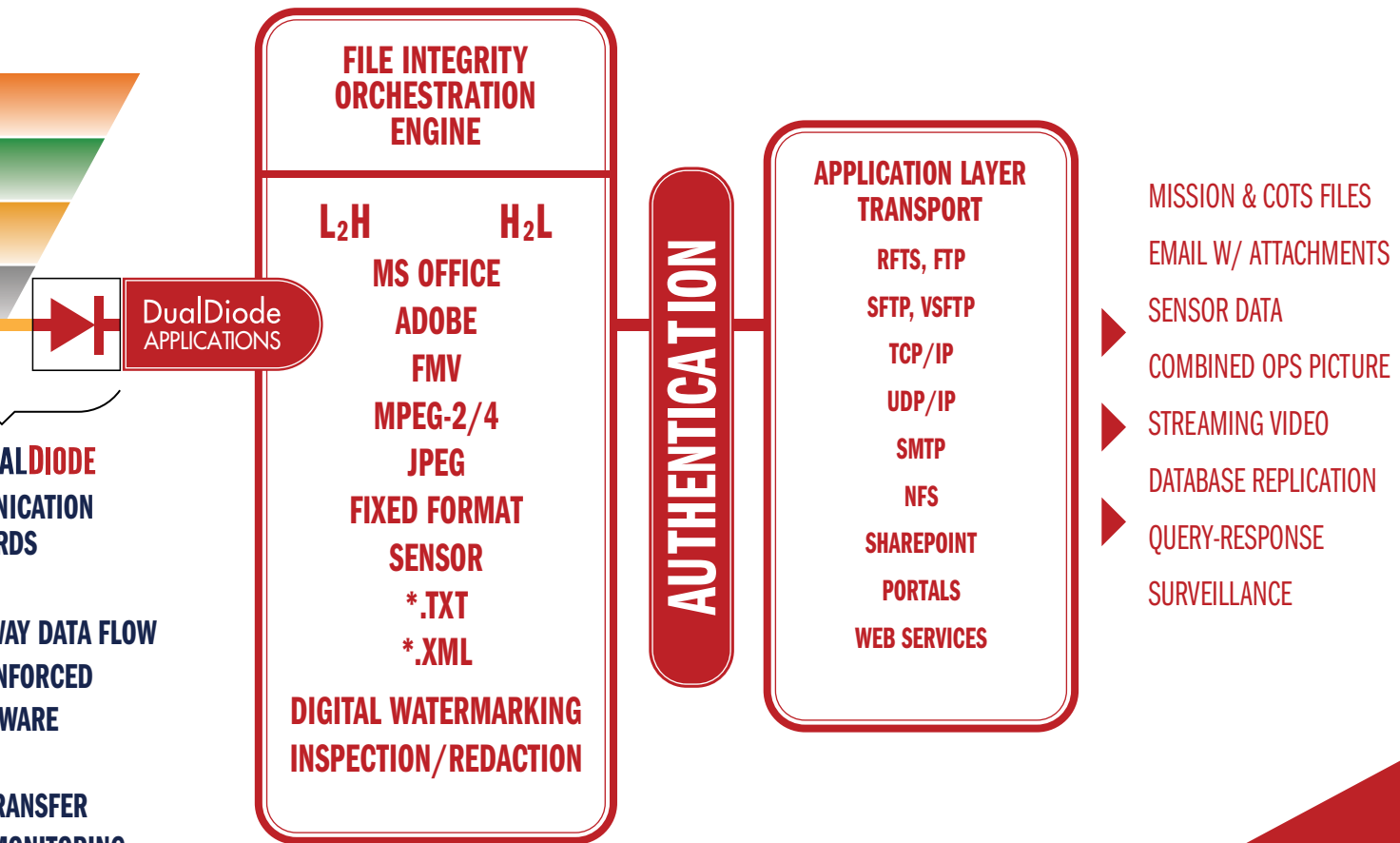
OWL CROSS DOM

*Employing this modular architecture, Owl CDS m
classification and transfer data to net*



MAIN ARCHITECTURE

may be connected to networks of differing security
network of higher or lower classification.



GLOBAL COMPLIANCE & CERTIFICATIONS

- U.S. NRC and NERC-CIP Compliant
- Common Criteria EAL Certified
- NCDSMO Approved Configurations
- OPC Certified
- EU-TUV Compliant

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION



1500+
**SECURITY
SOLUTIONS
DEPLOYED**

- Nuclear, Fossil & Hydro generation
- Oil, Gas, & Mining Industries
- U.S. National Intel Community
- U.S. Department of Defense
- Telecommunications
- European & Asian Ministries of Defense

NCDSMO-APPROVED OWL CDS CONFIGURATIONS

Enterprise Cross Domain Solution - File Transfer (ECDS-FT01)

A robust solution for high volume file transfer & multiple customer support.

ECDS-FT01 is a two-server platform, with send and receive servers functioning in a security policy-hardened Linux operating system environment. Both mandatory access and Owl role-based access controls are enabled. The Owl ScanFile Management System (OSMS™) application is installed in each server to ensure the integrity of files from the lower-security sending network to the higher-security receiving enclave. Candidate files are vetted with ClamAV® and ASCII filters before transfer and with mission message specific filters after transfer. The ECDS-FT01 solution architecture allows for ease of alternative filters for mission specific data transfer requirements.

This Baseline CDS employs Owl 2500 DualDiode Communication Cards (connected via fiber-optic cable) as the absolute data confidentiality component of the CDS one-way transfer. Aggregate link speed is 2.5 Gbps. A primary application is bulk file transfer, with the deployed version rated at transfer of 50,000 files per hour. ECDS-FT01 deploys this capacity in eight (8) discrete channels, each channel containing three (3) separate data flows -- ClamAV and ASCII filtering on Send server and customer-specific filtering on Receive server.

Accredited ECDS-FT01 Variants

The Owl ECDS-FT01, a Validated Product, has been tailored to meet the CDS needs of other programs. These variants have been accredited, deployed, and are operational. They offer new clients proven CDS solutions, with shorter paths and lower costs to client program accreditation than fully customized CDS solutions.

- **ECDS-FT01 (Unclassified to Secret Network)**

SABI low-to-high file transfer, with 2 discrete channels across the 2.5 Gbps DualDiode link. ClamAV and ASCII filters on Send server; customer-specific filter on Receive server.

- **ECDS-FT01 8x3 (Unclassified to Secret Network)**

SABI low-to-high file transfer, with 8 channels (each containing 3 discrete data flows) across the 2.5 Gbps DualDiode link. ClamAV and ASCII filters on Send server and mission-specific filter on Receive server.

*Owl uses a pair of Dell PowerEdge servers or equivalent.



NCDSMO-APPROVED OWL CDS CONFIGURATIONS

Owl Cross Domain Solution - File Transfer (OCDS-FT01)

Non Site-specific Baseline Solution

OCDS-FT01 is a certified, one-way solutions with a base set of capabilities – configurable as enabled or disabled – as dictated by changing mission and security requirements. This flexibility leads to re-use among programs that require similar capabilities and processes. This Owl offering supports cross domain file transfer primarily from secret to top secret networks. Operating in an Oracle® environment with Owl 155 Communication Cards and OSMS software, OCDS-FT01 enforces an unconditional one-way data flow security policy in hardware. Filtering may be applied on either or both the Send and Receive servers.

Accredited OCDS-FT01 Variants

In addition to the Validated Products List, Owl OCDS-FT01 has been tailored to meet the CDS needs of other programs. These variants have been accredited, deployed, and are operational. They offer new clients proven CDS solutions, with shorter paths and lower costs to client program accreditation than fully customized CDS solutions.

- **OCDS-FT05**

Unclassified to Top Secret networks (TSABI) XML file transfer, with Owl Secure Network Transfer System (SNTS) software in a Solaris environment. Commercial, ASCII, XML, and executable filters on the send server. Owl Performance Management Service (OPMS™) embedded.



*Owl uses a pair of Dell PowerEdge servers or equivalent.

NCDSMO-APPROVED OWL CDS CONFIGURATIONS

Owl Cross Domain Solution - File Transfer (OCDS-FT15)

In intelligence and defense operations, files must sometimes flow from networks of lower security levels to networks of higher security. Specifically, files often must be transferred low-to-high (L2H) from unclassified networks into classified networks, up to Top Secret. In these cases, a reliable and accredited cross domain solution (CDS) must be utilized to ensure validation of the files and the protection of the higher security network.

The **OCDS-FT15** is a certified and accredited cross domain solution, which has passed NCDSMO testing and has received authorization to operate (ATO). It was designed as a one-way data transfer solution moving files from unclassified domains to Top Secret networks. The OCDS-FT15 features two servers packaged in a single 1U rackmount enclosure – the OCDS-1000 hardware platform.

Features

The OCDS-FT15 is certified to transfer over 70 different file types. It supports up to five concurrent file transfer paths and presents a modular design that facilitates further tailoring to satisfy changing mission requirements and expedited delta-certification (regression testing) processes. Machine-to-machine file transfer interfaces implement source authentication and encryption using Owl Remote File Transfer Service (RFTS) software. CDS administration is local via KVM console or remote via SSH interface.

Operating on a locked-down RHEL OS, the OCDS-FT15 features a closed hardware architecture, and trusts no outside connection. It is deployed with a STIG-compliant Certifiable Linux Integration Platform-based (CLIP) operating system with SE Linux in enforcing mode, which does not permit any backchannel communication.



NCDSMO-APPROVED OWL CDS CONFIGURATIONS

Owl Cross Domain Solution – UDP Video Streaming Transfer (OCDS-ST06)

In the tactical theatre, video and other UDP-based intelligence data is often accumulated in unclassified environments (sensors, vehicles, UAVs, vessels). To reach classified-level analysts, the data must securely cross network domain boundaries. This requires a proven, high-bandwidth Cross Domain Solution (CDS) that transfers streaming full-motion video and metadata at real-time from the field to secure enclaves.

The **OCDS-ST06** transfers UDP packets containing MPEG-TS video from Unclassified to Secret network domains with minimal latency and without data loss. Tested in deployment and fully operational, the OCDS-ST06 is NCDSMO baseline-listed and received ATO (Authorization to Operate) in February, 2015. The OCDS-ST06 presents a configurable number of UDP inlet sockets to the source network. UDP payload content is restricted to MPEG-TS packets containing full-motion video and KLV metadata. The Owl MPEG data filters explicitly check MPEG-TS packet framing, MPEG-TS protocol, and KLV metadata conformance to MISB standards.

Remotely collected Unclassified video and the corresponding meta data is first filtered by OCDS-ST06. The Owl MPEG data filters explicitly check MPEG-TS packet framing, MPEG-TS protocol, and KLV metadata conformance to MISB standards. The incoming full-motion video UPD streams are then multiplexed into one stream for transfer across the domain boundaries to the Secret enclave.

Available in an all-in-one 1U (1.75 inches high) rack-mountable chassis, OCDS-ST06 delivers total network isolation and discrete domain separation at bandwidth rates from 26 Mbps to 1000 Mbps. Providing an ideal CDS solution when smaller size, weight and power (SWaP) is necessary.

Accredited Variants

Developed to meet the strict transfer requirements of the US military and intelligence agencies, the OCDS-ST06 is NCDSMO baseline-listed, and may be included within cross domain solutions that require accreditation in operational deployment. It offers clients a proven CDS with shorter paths and lower costs associated with accreditation. In addition, Owl offers accreditation services to create accredited variants by tailoring existing solutions, to meet evolving mission or program requirements.



OWL SPECIALIZED CDS PLATFORMS

Owl Cloud-to-Cloud (C2C)

The Owl Cloud-to-Cloud (C2C) cross domain solution is a proprietary, data diode-based cybersecurity solution, designed for secure, extremely high-volume, high-bandwidth file transfers from one cloud environment to another. C2C operates on a two-server platform, with a blue “send” server and a red “receive” server, each with embedded send and receive Owl data diode communication cards and specialized software. Utilizing a sophisticated traffic management and threading mechanisms processing files in parallel, the C2C has been tested and verified to transfer multiple terabytes per hour.

For increased security, C2C employs a manifest-based architecture to verify the appropriate files are being passed through the data diode. File verification is performed in-process, and the C2C is fully compatible with off-board preserver or edge filtering tools and processes.

Operational Overview

From a high level, the C2C operates on a manifest-based transfer system and utilizes isolated independent elements throughout each stage in the process, for increased security. The administrator places files and a manifest file containing a list of authorized files on a pre-defined endpoint in the source cloud. Owl software on the blue “send” server then processes the manifest (identifies which files are to be transferred, makes sure they exist and that they match the profile in the manifest), after which separate software on the blue server separates and transfers files over the data diode to the red “receive” server. The red server then delivers the files to the destination cloud.

Features

- Secure, High-Speed Transfer of Files From a Source Cloud to a Destination Cloud
- Enables Transfer of Files from One Cloud to Another Cloud of Differing Security Classification
- Manifest-Based File Validation System for Increased Security
- Traffic Management with Threaded Processing Enables Extremely High Throughput for Large Numbers of Files
- Fully Compatible with Off-Board Preserver or “Flanking” Edge Filtering Tools and Processes
- Validated Transfer Rates of Multiple Terabytes Per Hour



*Owl uses a pair of HP servers or equivalent.

OWL STANDARD CDS PLATFORMS

Owl Cross Domain Solution – Multi-Purpose (OCDS-MP)

OCDS-MP is designed to deliver robust one-way transfer functionality in an all-in-one, small form-factor integrated package. Featuring low size, weight and power (SWaP) requirements, this 1U, single box solution is capable of transferring data between networks of varying security levels and security policies. Whether the CDS requirement is for an enterprise data center, a field-forward combat position or perhaps even in a mobile vehicle, the OCDS-MP offers the flexibility to meet each of these needs.

The OCDS-MP is a one-way data transfer solution, supporting multiple data types, formats and data streams concurrently across a single rack-mountable chassis. Within the 1U chassis is the proprietary Owl DualDiode Technology™. Designed to provide deterministic one-way only data transfers, the DualDiode has fully integrated Send-only and Receive-only communication cards connected via an internal fiber optic link operating at speeds of 26 Mbps – 155 Mbps

- *A One-Way Data Transfer Solution Supporting Multiple Data Types & Formats Concurrently Across a 1U Rack-Mountable Chassis*
- *Complete Integration of Send-Only and Receive-Only Server Engines Connected by a Fiber-Optic Link*
- *One-Way Data Flow Policy Enforced in Hardware Utilizing Owl's Patented DualDiode Technology™*
- *Total Network Isolation/Discrete Domain Separation*



OWL STANDARD CDS PLATFORMS

Owl Cross Domain Solution – 1000 (OCDS-1000)

OCDS-1000 is a high performance cross domain solution in an all-in-one, 1U form factor, designed for real-time one-way data transfers. This single box solution is capable of transferring multiple concurrent data streams or file transfers between networks of higher or lower security levels, including Secret and Top Secret networks. Whether deployed at a data center, ground station, or even in a field-forward mobile vehicle or UAV, the OCDS-1000 offers the power and versatility to meet the even the most demanding electronic warfare requirements.

Featuring proprietary DualDiode Technology™, the OCDS-1000 includes fully integrated Send-only and Receive-only communication cards connected via an internal fiber optic link. It is designed to provide deterministic, high throughput one-way data transfers at speeds of 104 Mbps up to 1,000 Mbps (1 Gbps), and features easy bandwidth upgrades through a simple software license key mechanism. The OCDS-1000 is capable of transferring real-time streaming data, such as UDP sensor data or video, and files of nearly any type or size, and can transfer through multiple independent channels simultaneously.

- *A One-Way Data Transfer Solution Supporting Multiple Data Types & Formats Concurrently Across a 1U Rack-Mountable Chassis*
- *Complete Integration of Send-Only and Receive-Only Server Engines Connected by a Fiber-Optic Link*
- *One-Way Data Flow Policy Enforced in Hardware Utilizing Owl's Patented DualDiode Technology™*
- *Total Network Isolation/Discrete Domain Separation*



COMMUNICATION CARDS

DUALDIODE TECHNOLOGY™

A pair of Owl Communication Cards (Send-only and Receive-only), with Owl internally-developed drivers, forms a patented dual in-line diode; the circuitry of each card is specifically designed to permit one-way-only data transfer. Security for the one-way transfer is enforced at both the Send and Receive nodes in this exclusive Owl design -- neither diode requires a trusted state with the other. Application-specific software (for files, TCP packets, etc.) completes the individual Owl product offering.

As a non-routable protocol break, Owl one-way DualDiode Technology™ securely protects the Send- and Receive-network domains. No information of any kind, including handshake protocols (TCP/IP, SCSI, USB, serial/parallel ports, etc.), pass across the DualDiode transfer path from the destination back to source. Owl one-way transfer is a dedicated point-to-point link and requires no additional machine configuration (such as IP). This “trust-nothing” design ensures that data residing on each isolated network is fully protected through multiple independent channels simultaneously.



Owl 10G v7

Throughput 10 Gbps clear channel, or up to 32 channels; PCIe form factor.

Owl 2500 v6

Throughput 2.5 Gbps clear channel, or up to 8 channels; PCIe form factor.

Owl 1250 v6

Throughput 1.25 Gbps clear channel, or up to 8 channels; PCIe form factor.

Owl 155 v4

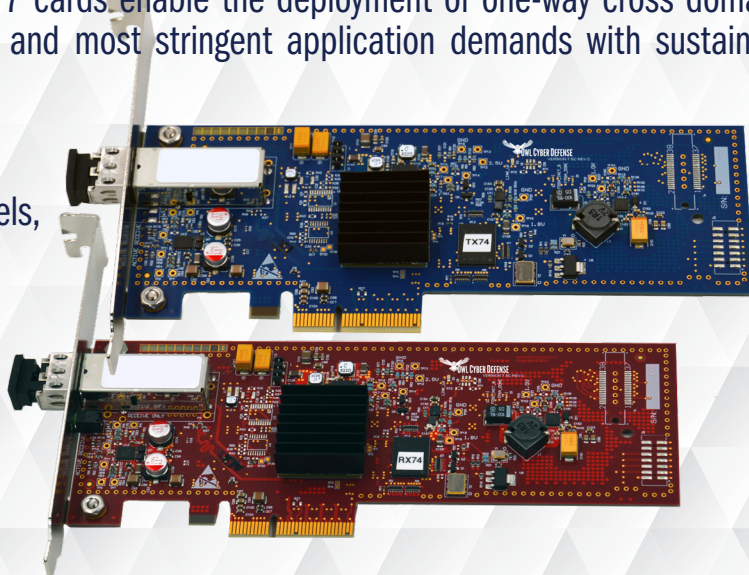
Throughput 155 Mbps in either PCIe or PCIx form factors.

DUALDIODE V7 COMMUNICATION CARDS

High Capacity Data Transfer

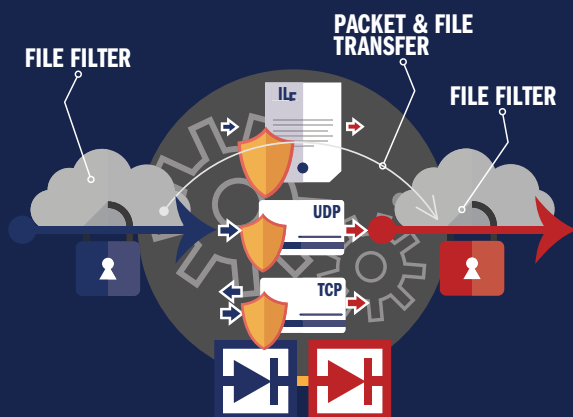
Owl V7 card sets establish a new application-enabling platform for Owl Cross Domain Solutions. Coupled with Owl user application-specific software, V7 cards enable the deployment of one-way cross domain solutions that meet and exceed the largest, and most stringent application demands with sustained transfer rates up to 10 Gbps.

Consolidating Enterprise CDS services, Owl V7 cards can support up to 32 discrete channels, each with its own security policy profile.



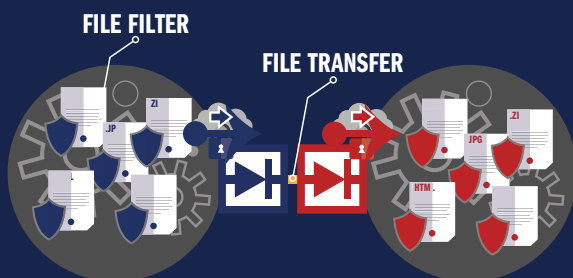
SOFTWARE APPLICATIONS *WITH COMMUNICATION CARDS*

Software applications run in Security-Enhanced Linux and are also available in Oracle Solaris, Microsoft Windows®, and Android™ OS environments. The applications are installed with DualDiode Communication Card sets meeting user throughput capacity requirements.



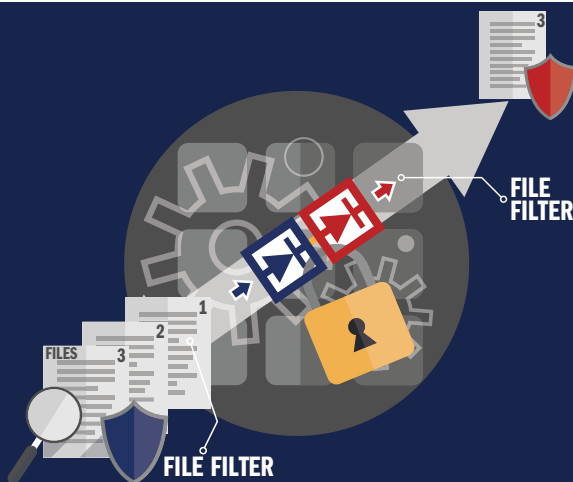
SECURE NETWORK TRANSFER SYSTEM (SNTS) *ALL DATA TYPE TRANSFER*

SNTS supports concurrent transfer of multiple data types (specifically UDP, TCP, and files) through a single installed pair of Owl's one-way data transfer communication cards. SNTS provides seamless TCP and UDP socket-based network connectivity with Owl's Common Criteria EAL-certified one-way DualDiode data transfer hardware, and is the product of choice for customers who handle dissimilar data types concurrently.



REMOTE FILE TRANSFER SERVICE (RFTS) *FILE TRANSFER VIA TCP/IP*

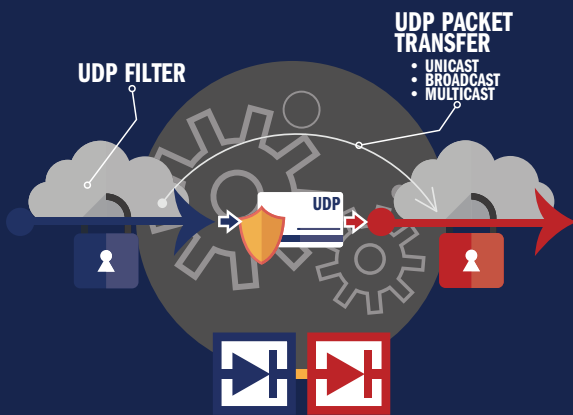
RFTS is the Owl file transfer application, enabling multiple end users to transfer files and other forms of information via TCP/IP packets to known destinations via a client-server relationship. RFTS employs configurable TCP sockets for communication, transferring files, and remotely replicating entire directory structures – to and from desktops and servers – operating in conjunction with Cross Domain Solution deployments. It ensures end-to-end file integrity through endpoint message digests and hash code validation.



OWL SCANFILE MANAGEMENT SYSTEM (OSMS) *LOW-TO-HIGH MANAGED FILE TRANSFER*

OSMS processes document malware scanning and quarantine subsystems and efficiently reports the results -- exceptions and transaction audit information.

DUALDIODE
TECHNOLOGY



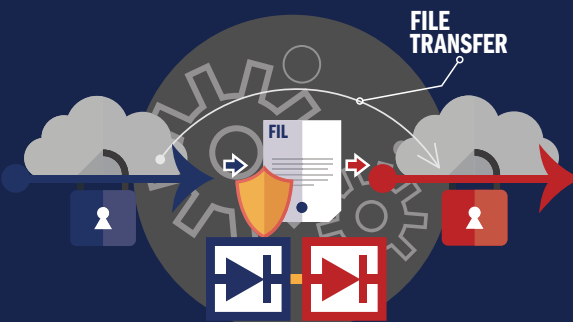
UDP PACKET TRANSFER SYSTEM (UPTS) *DATAGRAM TRANSFER*

Secure UDP unicast / broadcast / multicast technology for streaming video, syslog, and SNMP. UPTS is capable of operating in unicast/broadcast mode and in multicast mode. UPTS provides a UDP application-level protocol bridge across Owl's patented, hardware-based security to support one-way communications.



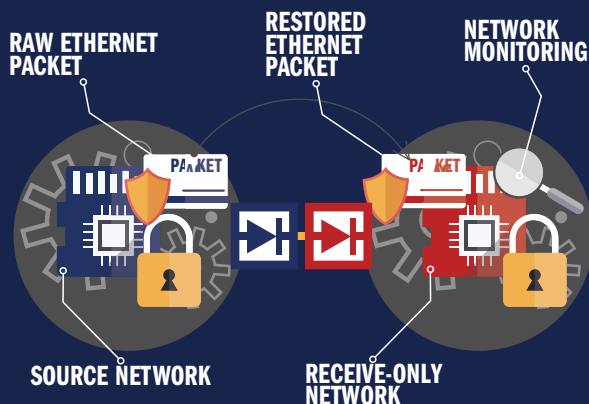
TCP PACKET TRANSFER SYSTEM (TPTS) *SOCKET DATA TRANSFER*

TPTS provides a TCP application-level protocol bridge across Owl's patented, hardware-based security to support one-way communications. Secure TPTS hardware uses custom device drivers for the communication cards and the low-level Asynchronous Transfer Mode (ATM) communication protocol to support high-speed, one-way transmission.



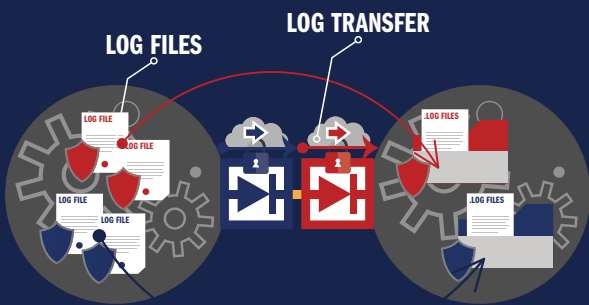
SECURE DIRECTORY FILE TRANSFER SYSTEM (DFTS) *FILES AND DIRECTORIES TRANSFER*

DFTS supports secure and reliable one-way file-based communications. The secure DFTS consists of intuitive send and receive application programs built on Owl's exclusive DualDiode Technology™ to support reliable, high-speed, one-way transmissions.



NETWORK PACKET TRANSFER SYSTEM (NPTS) *ETHERNET SNIFFER TRANSFER*

NPTS provides secure one-way transfer for network monitoring or sniffing. NPTS Send-only software "listens for" and processes all raw Ethernet packets on the source network, sending them across the DualDiode one-way path. On the Receive-only server, NPTS restores the traffic to native Ethernet packet format for processing by a client intrusion detection system (IDS).



OWL LOG FORWARDING SERVICE (OLFS)

Owl Log Forwarding Service (OLFS™) is a software application that allows privileged administrators to collect and monitor log information from Owl Cross Domain Solution (CDS) and electronic perimeter defense platforms. The logs provide information on one-way data transfer activity, system performance and health, and a wide range of alerts such as error conditions and admin keyword notifications. Using OLFS, operators can oversee the health and effective throughput of a single one-way system, multiple application instances on a single system, or multiple discrete systems.

OWL PERFORMANCE MANAGEMENT SERVICE (OPMS) WEB-BASED REMOTE MONITORING

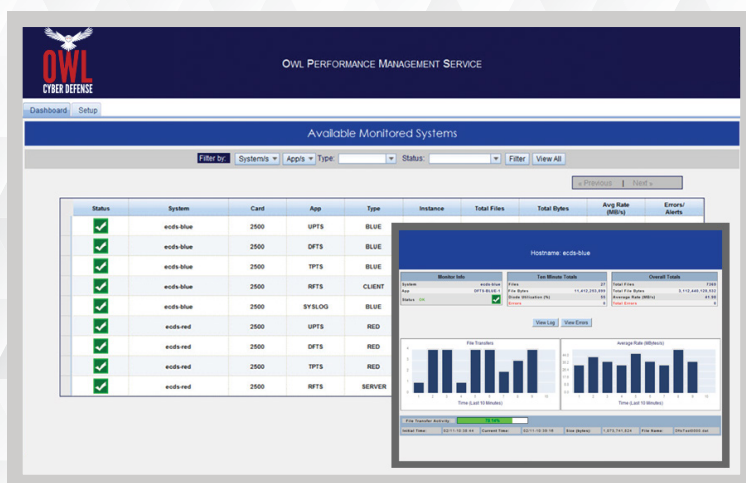
Cross Domain Solution Administration & File Reconciliation

OPMS monitors log files produced by various Owl applications and presents a global view of monitored systems and systems' status. It provides a browser-based monitoring system. Security features include user authentication and data encryption. OPMS will display the connections made during the viewing period specified (real-time, last 10 minutes, or continuous).

In addition to monitoring log files, **OPMS** provides system-level monitoring that includes:

- Load average on Send and Receive servers
- CPU Utilization
- Total Memory (used and available)
- Disk Availability

OPMS can be configured to generate email and/or SMS text alerts based on user-defined system parameters.



OWL ECDS-EMAIL ENABLES HIGH-CAPACITY CROSS DOMAIN ELECTRONIC MAIL (ECDS-EMAIL)

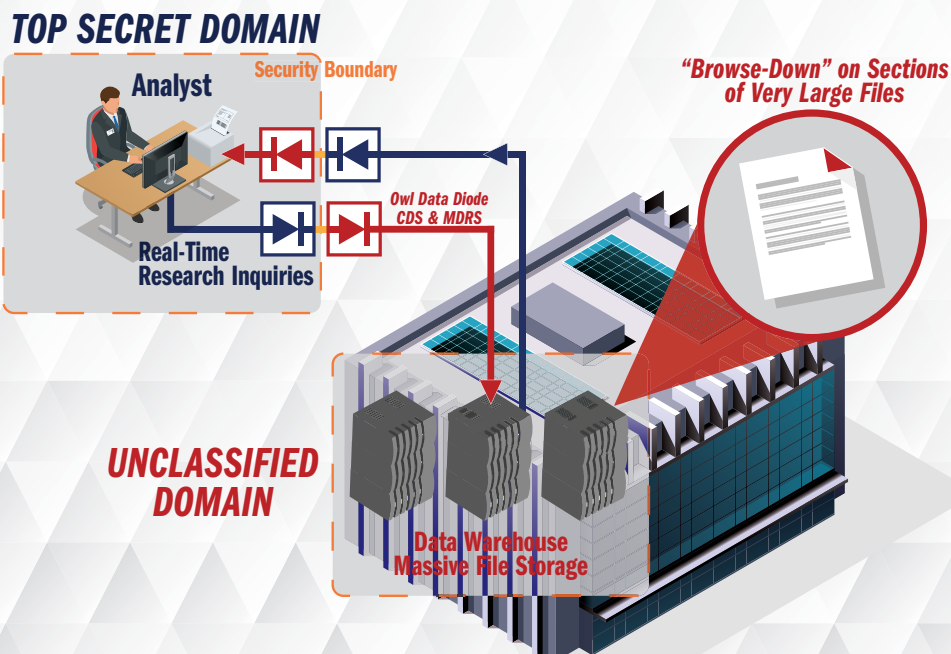
The Owl email architecture employs Simple Message Transfer Protocol (SMTP) and its own mail transfer agent to support the secure one-way transfer of emails (and their defined attachments) across the Owl DualDiode hardware-enforced cross domain platform with a link speed of 2.5 Gbps. ECDS-Email integrates with a wide range of email security gateways via SMTP, supports encryption and public key functionality, occupies minimal data center footprint, and delivers enterprise-scale network services with remote monitoring and management. The Owl File Integrity Orchestration Engine manages the filtering and examination of email and attachment contents.

Enterprise Cross Domain Chat

Owl Cross Domain Chat Solution permits multiple analysts to communicate via “chat” between separate/unique security domains. Instant messages are securely transferred between separate domains, with transverse xmpp labeling features allowed to pass. Presence of Low User on the High Side is available, as well as no presence of the High User on Low Side. The Owl Cross Domain Chat Solution permits multiple analysts to communicate via chat on one network crossing point.

MULTI-LEVEL DATA RETRIEVAL SERVICE (MDRS) *PATENTED DUAL-PATH DUALDIODE ONE-WAY COMMUNICATION*

MDRS provides a seamless NFS proxy service across a dual-path transfer platform, with each path containing an Owl DualDiode Communication Card set. Using patented Owl MDRS technology, it enables integrated dual-data paths in a single Owl Cross Domain Solution instance. Each DualDiode card set acts as the data confidentiality element for each integrated one-way path. Certain access-and-retrieve actions may be explicitly authorized; others, denied. CDS security is maintained with hardened OSEL operating systems and strictly defined Owl role-based access controls (RBAC).





ACCREDITATION PROCESS ASSISTANCE

Owl assistance to customers facing accreditation challenges is primarily in the form of documentation. Owl provides a full suite of documentation to support the accreditation process, starting with a CDS requirements document that captures functional and security objectives, and proceeding to details of technical implementation and operation.

- **Owl CDSs are Easily Accredited**
- **Owl Subject Matter Experts Guide Customer Through the Accreditation Process**
- **Owl High-Quality Documentation Speeds CDS Active Deployments**
- **High Level Design (Which Also Serves as an Executive Overview Document)**
- **Low Level Design (Which Maps CDS Security Features to Security Controls)**
- **Administration Manual (User Guidance)**
- **Functional Test Report (QA Testing)**
- **Configuration Management Plan (Lifecycle Support)**
- **Training Materials**

U.S. Managed Supply Chain

Owl Cyber Defense is the leading source for next generation cybersecurity. Owl's DualDiode Technology™, a proprietary data diode, has been successfully deployed in solutions across government, military, and critical infrastructure networks. Owl's hardware-enforced technology enables secure, reliable, and robust information sharing for streaming data files of all sizes and data types.

As a privately owned US company, Owl maintains a domestically-controlled supply chain that delivers NIAP Common Criteria EAL4 certified and government approved data diode products. Owl is the source for secure network connections enabling the operational efficiencies from information sharing.



+1 (203) 894-9342
www.owlcyberdefense.com