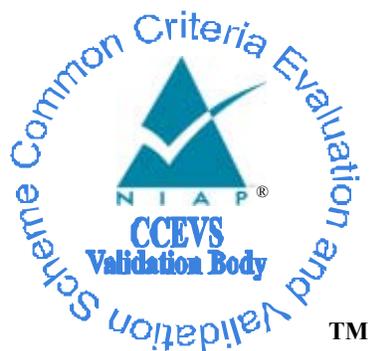


National Information Assurance Partnership



Common Criteria Evaluation and Validation Scheme Validation Report

Owl Computing Technologies Data Diode Network Interface Card Version 3

Report Number: CCEVS-VR-05-0120
Dated: September 28, 2005
Version: 1.1

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ACKNOWLEDGEMENTS

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Table of Contents

1	Executive Summary	1
1.1	Evaluation Details	1
1.2	Interpretations	2
1.3	Threats to Security	2
2	Identification	3
2.1	ST and TOE Identification	3
2.2	TOE Overview	3
2.3	IT Security Environment	4
2.3.1	Physical Boundaries	5
2.3.2	Logical Boundaries	5
3	Security Policy	7
4	Assumptions	7
5	Architectural Information	7
6	Documentation	7
7	IT Product Testing	8
7.1	Developer Testing	8
7.2	Evaluation Team Independent Testing	8
7.3	Evaluation Team Penetration Testing	9
8	Evaluated Configuration	9
9	Results of the Evaluation	9
10	Validator Comments/Recommendations	10
11	Annexes	11
12	Security Target	11
13	Glossary	12
14	Abbreviations	14
15	Bibliography	15

1 Executive Summary

The evaluation of Owl Computing Technologies Data Diode Network Interface Card version 3 was performed by Science Applications International Corporation (SAIC) in the United States and was completed on August 30, 2005. The evaluation was conducted in accordance with the requirements of the Common Criteria, Version 2.2 and the Common Methodology for IT Security Evaluation (CEM), Version 2.2.

The Target of Evaluation (TOE) identified in this Validation Report is a Hardware-Only TOE. It has been evaluated at an accredited testing laboratory using the Common Methodology for IT Security Evaluation (Version 2.2) for conformance to the Common Criteria for IT Security Evaluation (Version 2.2). This Validation Report applies only to the specific version of the TOE as evaluated. The evaluation has been conducted in accordance with the provisions of the NIAP Common Criteria Evaluation and Validation Scheme and the conclusions of the testing laboratory in the evaluation technical report are consistent with the evidence adduced. This Validation Report is not an endorsement of the Owl Computing Technologies Data Diode Network Interface Card version 3 product by any agency of the US Government and no warranty of the product is either expressed or implied.

The validation team monitored the activities of the evaluation team, observed evaluation testing activities, provided guidance on technical issues and evaluation processes, and reviewed the individual work units and successive versions of the ETR. The validation team found that the evaluation showed that the product satisfies all of the functional requirements and assurance requirements stated in the Security Target (ST). Therefore the validation team concludes that the testing laboratory's findings are accurate, the conclusions justified, and the conformance results are correct. The conclusions of the testing laboratory in the evaluation technical report are consistent with the evidence produced.

The SAIC evaluation team concluded that the Common Criteria requirements for Evaluation Assurance Level (EAL 4) have been met.

The technical information included in this report was obtained from the Evaluation Technical Report (ETR) Part 1 (non-proprietary) produced by SAIC.

1.1 Evaluation Details

Evaluation Completion: August 30, 2005

Evaluated Product: Owl Computing Technologies Data Diode Network Interface Card version 3

Developer: Owl Computing Technologies, Inc.
19 North Salem Road (2nd Floor)
P.O. Box 313
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CCTL: Science Applications International Corporation
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Evaluation Class: EAL 4

Completion Date: September 2, 2005

1.2 Interpretations

The Evaluation Team determined that the following CCIMB Interpretations were applicable to this evaluation:

International Interpretations

003	Unique identification of configuration items in the configuration list, 2002-02-11
043	Meaning of "clearly stated" in APE/ASE OBJ.1, 2001-02-16
084	Separate objectives for TOE and environment, 2001-02-16
085	SOF Claims additional to the overall claim, 2002-02-11
116	ADO_DEL.2-2 work unit deleted, 2001-07-31

The Validation Team concluded that the Evaluation Team correctly addressed the interpretations that it identified.

1.3 Threats to Security

The Security Target identified the following threat for the evaluated product.

T.WRONGWAY	An attacker may be able to cause Information to flow inappropriately from one attached host to another.
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2 Identification

2.1 ST and TOE Identification

ST: Owl Computing Technologies Data Diode Network Interface Card version 3 Security Target, version 1.0, dated July 20, 2005

TOE Identification: Owl Computing Technologies Data Diode Network Interface Card version 3

CC Identification – *Common Criteria for Information Technology Security Evaluation*, Version 2.2, January 2004, ISO/IEC 15408.

Protection Profile (PP) Identification – The TOE does not claim conformance to a PP.

CEM Identification – *Common Methodology for Information Technology Security Evaluation: Evaluation Methodology*, Version 2.2, January 2004, Revision 256, CCIMB-2004-01-004

2.2 TOE Overview

The Target of Evaluation (TOE) is a hardware only TOE. It includes two versions of the Data Diode NIC hardware card offered by Owl. The TOE is offered as a single Data Diode Network Interface Card (a Send-Only NIC or Receive-Only DDNIC) or as a pair of Data Diode Network Interface Cards. Any host that supports a PCI Bus is sufficient for the correct operation of the TSF; therefore the host is not part of the TOE.

Each card has two external interfaces. One external interface is the Peripheral Component Interface which connects to the PCI Bus of the host in which the DDNIC is installed. The other interface is the fiber optic network connection physically located on the card. The purpose of the Data Diode NIC is to provide assurance that one-way operation occurs at the physical interface between a network sender and receiver.

This Data Diode NIC was developed to support higher-level application software packages to provide secure one-way network communications. Owl markets and sells application programs that utilize the Data Diode Technology for specific data transfers; however the TOE is only the Data Diode NIC. The information flow policy enforced by the Data Diode NIC does not rely on passwords, authentication, or encryption to protect host data. Rather the physics of a photo-detector and light emitting diode enforce the TSP.

Each type Data Diode Network Interface Card allows information to move through it in only one direction, and therefore protects its Host System from information flow in the reverse direction. Data sent across the PCI Bus of sending host system are staged, queued, segmented and framed in the Send-Only DDNIC, and output through the Optical Transceiver of the Send-Only DDNIC. Data presented to the the Optical Transceiver of the Receive-Only DDNIC is reassembled into the original message in the Receive-Only DDNIC, and then transferred to the PCI Bus of the receiving host system.

Optical Data Transfer

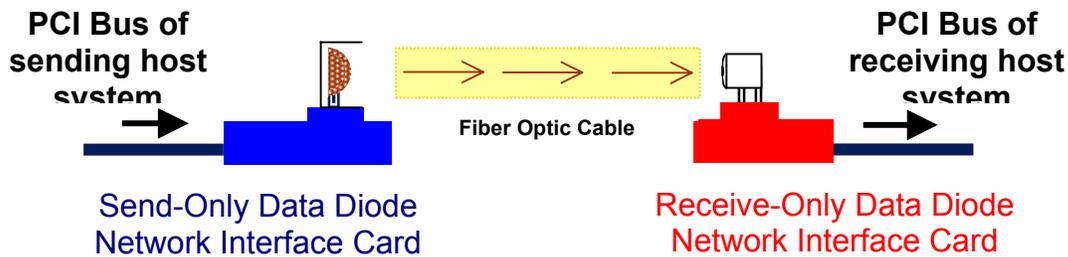


Figure 1 – High Level View of the Data Diode Interface

The Owl Data Diode System consists of a pair of Owl Computing Technologies, Inc. Data Diode Network Interface Cards (DDNICs) connected to each other through optical interfaces and a fiber optic cable, for unconditional and unidirectional information flow control between two separate host systems. The one-way information transfer occurs via an optical link consisting of one light source (at the source computer) and one light detector (at the destination computer) and using single one-way board component-level information paths in each DDNIC. No information of any kind, including handshaking protocols, (as in TCP/IP, SCSI, USB, Serial/Parallel Ports, etc.) travels from the destination computer back to the source computer.

The Owl Data Diode System moves packet data directly between a Send-Only DDNIC and a Receive-Only DDNIC via the optical interfaces of the DDNICs. Data sent across the PCI Bus of sending host system are staged, queued, segmented and framed in the Send-Only DDNIC, and output through the Optical Transceiver of the Send-Only DDNIC. The output of the Send-Only DDNIC is sent through a fiber optic cable connected to the Optical Transceiver of the Receive-Only DDNIC. The data is then reassembled into the original message in the Receive-Only DDNIC, and then transferred to the PCI Bus of the receiving host system.

2.3 IT Security Environment

The TOE is designed for environments where a one-way flow of information is required between attached host computing systems. Given that the TOE is hardware only and has been evaluated at Evaluation Assurance Level 4 (EAL 4), the TOE is suitable for environments that are subject to a broad range of logical attacks, regardless of attack potential, since the TOE is subject only to physical type attacks. Hence, the TOE is essentially as strong as the physical environment into which it is placed.

2.3.1 Physical Boundaries

The non-TSF portions of the Send-Only DDNIC and the Receive-Only DDNIC are identical. They each include three functional components, the Asynchronous Transfer Mode (ATM) Segmentation and Reassembly Controller (SAR), the ATM Physical Interface Device (PHY), and the ATM Multimode Fiber Transceiver. The SAR connects directly to the PCI bus of the host system and to the PHY. Note that although both the Send-Only DDNIC and the Receive-Only DDNIC have the same Optical Transmitter, the Optical Transmitter in the Send-Only DDNIC has the photo detector disabled, and the Optical Transmitter in the Receive-Only DDNIC has the LED disabled. These disablings are not part of the TSF enforcing mechanism, but are considered to aid the TSF enforcement.

Each Owl DDNIC has an internal TSF Module. The TSF Module provides a single one-way data path for information travel within each DDNIC. The path is physical in nature and consists of components at the board level. The components of the TSF module provide an impedance-matched electrically conductive path between the Physical Interface Device and the Optical Transceiver. The path between the PHY and the Optical Transceiver provided by the TSF Module in each DDNIC is the only impedance-matched electrically conductive path available between the two devices, and therefore cannot be bypassed.

In addition to providing an impedance-matched electrically conductive path between the PHY and the Optical Transceiver for information transfer, the TSF module provides an electrically conductive path between the host-system power and one side of the Optical Transceiver (either the transmitter side or the receiver side).

Each Owl DDNIC has two external interfaces. One interface is the Peripheral Component Interface (PCI). The PCI of the DDNIC interfaces to the host system PCI bus. The PCI allows the exchange of information between the host system and its DDNIC. Information exchanged at the PCI consists of information to be transferred through the DDNIC and control and operation information used within a DDNIC and between DDNIC and its host system. The other interface of the DDNIC is the optical interface. The optical interface is used to connect the DDNIC to a fiber optic network. Typically in the Owl Data Diode System, the fiber optic network consists of a fiber optic cable connected to another DDNIC. These interfaces of the DDNIC do not enforce the TSF and cannot be used to modify the TSF, as the TSF are physically enforced by each DDNIC at the board-component level.

2.3.2 Logical Boundaries

The logical boundaries of the TOE can be described in the terms of the security functions that the TOE provides.

User Data Protection: A Data Diode NIC physically can only provide network traffic flow in one direction over any single network connection and this TSP is enforced at the physical level. One send-only Data Diode NIC communicating with a receive-only Data Diode NIC is required for communication between them over the ports that they are exporting.

If a host attempts to send traffic over a receive-only Data Diode NIC, buffers of data may be sent through the host device driver over the PCI Bus to the receive-only Data Diode NIC. The receive-only NIC will process the buffer, and convert binary to voltage, and voltage into light impulses. But when transceiver goes to transmit the light impulses, there is no light source since it has been physically disconnected. Also the send port has been physically blocked so that no light impulses can be transmitted. When the host does not receive a response from a connection request, it is up to the host protocol to deal with no response to the connection request. The user data protection policy is maintained even though the host has attempted to send information through a receive-only Data Diode NIC.

If a host attempts to listen for traffic over a send-only Data Diode NIC, no signals/bits/buffers/voltage will be received by the device driver listening on the PCI Bus, for data from the send-only Data-Diode NIC. The send-only Data Diode NIC has had the photodiode physically disconnected. Also the receive port has been physically blocked so that no light impulses can be received. When the host does not receive a response while listening for data from the send-only Data Diode NIC, it is up to the host protocol to deal with no data. The user data protection policy is maintained even though the host has attempted to receive information through a send-only Data Diode NIC.

Given the assumption that all relevant data must pass through the TOE, and all information received by the TOE is unconditionally subject to its unidirectional information flow policy, there is no possibility to bypass this security mechanism. There is only one path for information flow through each Owl Data Diode Network Interface Card, and that path only allows unidirectional information flow across the card. As there is physically only one path available for information flow, that path cannot be bypassed.

For the unidirectional flow to occur across a given DDNIC, the DDNIC must function correctly. If a DDNIC is not functioning or is malfunctioning, only unidirectional information flow is permitted, or no information flow occurs. The Send-Only DDNIC only allows information to flow from the host system across the card to the external optical interface. The Receive-Only DDNIC only allows information to flow from the external optical interface across the card to the host system.

TSF Protection: The Data Diode NIC protects itself by not exporting any interface that can be used to modify the TOE. The only interfaces exported are the PCI Bus interface and the network fiber optic interface. Each DDNIC protects itself by not exporting any interface that can be used to modify the TOE and thereby the Target Security Functions (TSF) of the TOE. The only interfaces exported are the PCI and the optical interface of the DDNIC, which are not relevant to the TSF. Furthermore, no interface is exported which can alter the operation of the TOE since the TOE has been manufactured to physically enforce its policies and would have to be physically modified to change its behavior and violate the TSF. Since the TOE environment is assumed to provide adequate physical protection it is essentially impossible to modify the TOE.

Logically, the Data Diode NIC is protected largely by virtue of the fact that its interface is limited to primarily only support network traffic. The TOE operates at the physical level which is below the level of protocols or binary logic, so it is unaffected by buffer content or network traffic.

3 Security Policy

The Security Target identified the following Security Policies for the evaluated product:

P.ONEWAY Information must be able to flow only in a single direction between attached hosts.

4 Assumptions

The following assumptions are identified in the Security Target:

A.ADMIN The administrator will properly adhere to the TOE guidance.

A.CONNECTION The TOE will be installed such that all relevant network traffic will flow through the TOE and hence be subject to its information flow policy.

A.PHYSICAL The TOE will be physically protected to a degree commensurate with the value of the information it is intended to protect.

5 Architectural Information

The Owl Computing Technologies, Incorporated (Owl) Data Diode System provides an absolute one-way connection between a sending host system or network and a receiving host system or network. Information is permitted to flow from the sending host system or network to the receiving host system or network. Data, information, or communications originating at the receiving host system or network are not allowed to flow to the sending host system or network via the Owl Data Diode System.

The Target of Evaluation (TOE) is comprised of two Owl Data Diode Network Interface Cards (DDNICs). The DDNICs are manufactured to Owl's specifications using commercial-off-the-shelf (COTS) Asynchronous Transfer Mode network interface card components. Each Data Diode NIC connects to a standard PCI slot in a host system and each is connected to each other using fiber optic network interfaces and a fiber optic cable. One Data Diode Network Interface Card (DDNIC) is used only for sending information, the Send-Only DDNIC. The other DDNIC is used only for receiving information, the Receive-Only DDNIC. The Send-Only DDNIC exports light pulses converted by the Optical Transceiver from electrical voltages. The Receive-Only DDNIC imports light pulses received at the photo detector of the Optical Transceiver of the Receive-Only DDNIC and converts the light pulses to electrical voltages.

6 Documentation

Purchasers of Owl Computing Technologies Data Diode Network Interface Card version 3 will receive the following documentation:

- Secure Directory File Transfer System OEM Install User's Manual.

7 IT Product Testing

This section describes the testing efforts of the developer and the Evaluation Team.

7.1 Developer Testing

Owl's approach to security testing for Owl Computing Technologies Data Diode Network Interface Card version 3 involved tests of interfaces identified in the Functional Specification and the High-Level Design. Each test is directly mapped to the security function tested. The vendor tested both of the TOE Security Functions Information Flow and TOE Self Protection.

The vendor's tests completed successfully and the vendor archived all test results in the Configuration Management repository.

The developer's test configuration consisted of two machines with an ATM network between them. The test configuration included both versions of the TOE.

SAIC and the vendor consider the detailed test configuration to be proprietary information. However, the Evaluation Team has included a description of the vendor's test configuration in the ETR, Part 2.

The Evaluation Team determined that the vendor's actual test results matched the vendor's expected results.

7.2 Evaluation Team Independent Testing

The evaluation team followed the procedures in the OEM Installation Manual and User Guide, Version 1m to install the TOE. The evaluation team installed one send and one receive card using the procedures provided. The evaluation team later installed a two-way card as directed in the test procedures.

The evaluation team executed the entire vendor test suite consisting of five manual tests. They completely analyzed the results from the completed vendor test suite run. This ensures that the Evaluation Team adequately addressed all security functions. The Evaluation Team used the developer's test configurations to perform the tests.

7.3 Evaluation Team Penetration Testing

For its penetration tests, the Evaluation Team conducted a brainstorming session to identify penetration test cases based on the vendor's vulnerability assessment documentation. The Evaluation Team used the vendor's test configuration to successfully perform its penetration tests.

The Evaluation Team's ETR, Part 2, provides a detailed description of the tests, the results, and the effects, if any, on the information presented in the ST or other evaluation evidence

8 Evaluated Configuration

The team executed the tests in the following test configuration:

- One computer with a send-only card was used to transmit data over an ATM network,
- One computer with a receive-only card was used to receive data over an ATM network,
- An unmodified card was supplied for inspection, and
- Two Solaris workstations were provided in which to store the test cards.
- One version of the TOE was tested: Version 1 (3.SO.3 .3 and 3.RO.3.3)
- One two-way DDNIC: 3.SR.3.3
- Driver Software (V1.4)

9 Results of the Evaluation

The Evaluation Team conducted the evaluation based on the Common Criteria (CC) Version 2.2 and the Common Evaluation Methodology (CEM) Version 2.2 and all applicable National and International Interpretations in effect.

The Evaluation Team assigned a Pass, Fail, or Inconclusive verdict to each work unit of each EAL 4 assurance components. For Fail or Inconclusive work unit verdicts, the Evaluation Team advised the developer of the issue that needed to be resolved or the clarification that needed to be made to the particular evaluation evidence.

The Evaluation Team accomplished this by providing Notes, Comments, or Vendor Actions in the draft ETR sections for an evaluation activity (e.g., ASE, ADV) that recorded the Evaluation Team's evaluation results and that the Evaluation Team provided to the developer. The Evaluation Team also communicated with the developer by telephone and electronic mail. If applicable, the Evaluation Team re-performed the work unit or units affected. In this way, the Evaluation Team assigned an overall Pass verdict to the assurance component only when all of the work units for that component had been assigned a Pass verdict. Verdicts were not assigned to assurance classes.

The rationale supporting each CEM work unit verdict is recorded in the "Evaluation Technical Report for Owl Computing Technologies Data Diode Network Interface Card version 3 Part 2, dated 25 August 2005" which is considered proprietary.

Section 6.2, Conclusions, in the Evaluation Team's ETR, Part 1, states:

“The verdicts for each CEM work unit in the ETR sections included in Section 15 are each “PASS”. Therefore, when configured according to the following guidance documentation:

- Owl Computing Technologies, Inc., Secure Directory File Transfer System Cross Platform Interface (CPI), OEM Installation Manual and User Guide, Windows 2000/2003, Version 3 Hardware – Card Type 234, Part number DFTS-W2-HO-08, Document Release 1k, 7/5/2005
- Owl Computing Technologies, Inc., Secure Directory File Transfer System Cross Platform Interface (CPI), OEM Installation Manual and User Guide, Sun™ Solaris™ 8/9, Version 3 Hardware – Card Type 234, Part number DFTS-S8-HO-08, Document Release 17k, 7/5/2005

The Data Diode TOE satisfies the – Owl Computing Technologies, Inc. Data Diode Network Interface Card (NIC) Security Target, Version 1.0, July 20, 2005. ”

The validation team followed the procedures outlined in the Common Criteria Evaluation and Validation Scheme (CCEVS) publication number 3 for Technical Oversight and Validation Procedures. The validation team has observed the evaluation and all of its activities were in accordance with the Common Criteria, the Common Evaluation Methodology, and the CCEVS. The validation team therefore concludes that the evaluation and its results of pass are complete.

The evaluation team's assessment of the evaluation evidence demonstrates that the claims in the ST are met. Additionally, the evaluation team's performance of a subset of the vendor test suite, the independent tests, and the penetration test also demonstrates the accuracy of the claims in the ST.

10 Validator Comments/Recommendations

The validator had no recommendations concerning the TOE.

NOTE: This is a Hardware-Only TOE consisting of 2 Data Diode Network Interface Cards (NIC). The computer system or network in which the Data Diode NIC is installed provides the power to the Data Diode NIC. The Data Diode NIC is digitally connected to the host via the Peripheral Component Interface (PCI). The PCI Bus is an open architecture bus structure to control devices, composed of a PCI BIOS, CPU, CPU cache, system cache, system memory, PCI Bridge, and Peripheral bus. The PCI Bus is not part of the TOE.

11 Annexes

Not applicable.

12 Security Target

The Security Target is identified as Owl Computing Technologies Data Diode Network Interface Card version 3 Security Target, Version 1.0, 20 July 2005.

The document identifies the security functional requirements necessary to implement Information Flow Protection and TOE Self Protection security policies. Additionally, the Security Target specifies the security assurance requirements necessary for EAL 4.

13 Glossary

The following definitions are used throughout this document:

- ATM PHY:* The Asynchronous Transfer Mode (ATM) Physical Interface Device (ATM PHY or PHY) is a high performance physical layer interface device on the Data Diode Network Interface Cards that generates and receives high-speed data streams. The ATM PHY receives 53-byte ATM cells from the SAR and produces analog signals that are passed to the transceiver. The interface into the ATM PHY from the SAR uses the UTOPIA protocol and the interface to the transceiver is SONET over analog power pins.
They are the Segmentation and Reassembly Controller, the Asynchronous Transfer Mode (ATM) Physical Interface Device, and the ATM Multimode Fiber Transceiver.
- Data Diode Network Interface Card (DDNIC):* A network interface card consisting of three functional components; the Segmentation and Reassembly Controller (SAR), the ATM Physical Interface Device (PHY), and the ATM Multimode Fiber Transceiver. The DDNICs are manufactured to Owl's specifications and use commercial-off-the-shelf (COTS) Asynchronous Transfer Mode network interface card components. One Data Diode Network Interface Card (DDNIC) is used only for sending information, the Send-Only DDNIC. The other DDNIC is used only for receiving information, the Receive-Only DDNIC. The Send-Only DDNIC exports light pulses converted by the Optical Transceiver from electrical voltages. The Receive-Only DDNIC imports light pulses received at the photo detector of the Optical Transceiver of the Receive-Only DDNIC and converts the light pulses to electrical voltages.
- Data Diode Host:* A computer system or network in which a Data Diode is installed. The host system or network is the system that provides power to the Data Diode. The Data Diode is digitally connected to the host via the Peripheral Component Interface (PCI).
- Gateway:* Also called a router, a gateway is a program or a special-purpose host that transfers network traffic with an identifiable network address from one network to another until the final destination is reached.
- Host:* A general term for a computer system. Once specific application software or hardware is installed on a host it assumes the role of Data Diode Host, gateway, receiving Host, Sending Host.
- NIC:* Network Interface Card that provides the physical interface to a network.
- PCI:* The Peripheral Component Interface connects to the PCI Bus of the host

system.is the device driver interface into the TOE from the host computer. The PCI Bus is an open architecture bus structure to control devices. Composed of a PCI BIOS, CPU, CPU cache, system cache, system memory, PCI Bridge, and Peripheral bus.

- Receive-Only DDNIC:* The Receive-Only DDNIC only allows information for transfer to flow from its optical interface across the Receive-Only DDNIC and to the host system. All information presented for transfer to the Receive-Only DDNIC is subject to the unconditional unidirectional information flow. No information is able to flow from the host system across the Receive-Only DDNIC and through the optical interface of the Receive-Only DDNIC. This non-bypassability of the TOE is enforced at the physical level.
- Receiving Host:* A host system or network in which a Receive-Only DDNIC is installed. The Receiving Host is to receive information through the Receive-Only Data Diode Network Interface Card.
- SAR:* The Segmentation and Reassembly Controller (SAR). The SAR is a functional component of the Data Diode Network Interface Card. The SAR connects directly to the PCI bus of the host system and to the PHY. When transmitting, the SAR segments the data into 48 byte ATM data payloads or "cells." The SAR then frames each cell with AAL5 headers for complete 53-byte ATM cells, which are then sent on for framing and serialization. When receiving, ATM data cells are transferred and reassembled directly into host memory by the SAR into pre-allocated memory buffers.
- Sending Host:* A host system or network in which a Send-Only DDNIC is installed. The Sending Host is to send information through the Send-only Data Diode Network interface Card.
- Send-Only DDNIC:* The Send-Only DDNIC only allows information for transfer to flow from the host system across the DDNIC through the optical interface. All information presented to the Send-Only DDNIC is subject to the unconditional unidirectional information flow. No information is able to flow from outside the Send-Only DDNIC through the optical interface across the Send-Only DDNIC and into the host system. This non-bypassability of the TOE is enforced at the physical level.
- SONET Protocol:* The interface between the ATM PHY and the transceiver provides both Transmission Convergence (TC) and Physical Media Dependent (PMD) sub-layer functions of an ATM PHY suitable for ATM networks.
- UTOPIA Protocol:* The UTOPIA (Universal Test and Operations PHY Interface for ATM) interface is the protocol used between the SAR and the ATM PHY. UTOPIA is a standard data path handshake protocol.

14 Abbreviations

Abbreviations	Long Form
ACL	Access Control List
CC	Common Criteria
CCEVS	Common Criteria Evaluation and Validation Scheme
CCIMB	Common Criteria Interpretations Management Board
CEM	Common Evaluation Methodology
CM	Configuration Management
DDNIC	Data Diode Network Interface Card
EAL	Evaluation Assurance Level
ETR	Evaluation Technical Report
IATF	Information Assurance Technical Framework
IT	Information Technology
ITSEC	IT Security Evaluation Criteria
I&A	Identification and Authentication
NIAP	National Information Assurance Partnership
NIST	National Institute of Standards and Technology
NSA	National Security Agency
OR	Observation Report
OS	Operating System
OSP	Organizational Security Policy
PP	Protection Profile
QA	Quality Assurance
SF	Security Function
SFP	Security Function Policy
SFR	Security Functional Requirement
SOF	Strength of Function
ST	Security Target
TOE	Target of Evaluation
TSC	TSF Scope of Control
TSE	TOE Security Environment
TSF	TOE Security Function
TSFI	TOE Security Function Interface
TSP	TOE Security Policy
TSS	TOE Summary Specification
TTAP/CCEVS	Trusted Technology Assessment Program / Common Criteria Evaluation and Validation Scheme

15 Bibliography

The Validation Team used the following documents to produce this Validation Report:

- [1] Common Criteria for Information Technology Security Evaluation – Part 1: Introduction and general model, dated January 2004, Version 2.2.
- [2] Common Criteria for Information Technology Security Evaluation – Part 2: Security functional requirements, dated January 2004, Version 2.2.
- [3] Common Criteria for Information Technology Security Evaluation – Part 2: Annexes, dated January 2004, Version 2.2.
- [4] Common Criteria for Information Technology Security Evaluation – Part 3: Security assurance requirements, dated January 2004, Version 2.2.
- [5] Common Evaluation Methodology for Information Technology Security – Part 2: Evaluation Methodology, dated January 2004, version 2.2.
- [6] Evaluation Technical Report for OWL Computing Technologies Data Diode Network Interface Card.
- [7] OWL Computing Technologies Data Diode Network Interface Card Security Target, Version 0.5, 20 July 2005.
- [8] NIAP Common Criteria Evaluation and Validation Scheme for IT Security, Guidance to Common Criteria Testing Laboratories, Version 1.0, March 20, 2001.