



## FORT FOX DATA DIODE: FFDD

### HARDWARE-BASED DATA DIODE

IN MANY CASES A NETWORK WILL BE CONNECTED TO AN EXTERNAL SOURCE, LIKE ANOTHER NETWORK, TO TRANSFER ELECTRONIC DATA. IN HIGH-SECURITY ENVIRONMENTS, IT IS OFTEN FORBIDDEN TO MAKE A PHYSICAL CONNECTION BETWEEN DIFFERENT NETWORKS. THE PRESENT FORM OF DATA TRANSFER (USING A USB STICK, CD, HUMANS) IS NEVER REAL-TIME AND, MORE IMPORTANT, CREATES SECURITY RISKS. HOWEVER, IT IS USED IN ORDER TO PREVENT DATA LEAKAGE FROM THE RED (HIGH SECURITY LEVEL) NETWORK TO THE BLACK (LOW SECURITY LEVEL) NETWORK (A SO CALLED 'AIR GAP'). THE RECEPTION OF EMAIL OR BROWSING THE INTERNET ON THE RED NETWORK IS ALSO IMPOSSIBLE. THE DATA DIODE CONNECTS TWO NETWORKS WITH DIFFERENT SECURITY LEVELS PROVIDING A ONE-WAY DATA PATH. IT PREVENTS INFORMATION FROM BEING TRANSFERRED (INCLUDING COVERTLY) FROM THE HIGH LEVEL NETWORK TO THE LOW LEVEL NETWORK.

### APPROACH

A common Data Diode setup consists of two servers. One of the servers is placed in the black network (which can be directly connected to the Internet). The other server is placed in the red network. A one-way physical connection is made between the two servers to prevent data leakage and guarantee the security of the red network. Each server has an easy-to-use web interface that allows authorized users to configure what is to be transferred from where (black side) to where (red side). A transfer can contain files, but also a mirror of frequently used Websites, a print job or incoming email. This can greatly increase the possibilities of people working on the red network.

### USE

The Data Diode was primarily developed for use by governmental organizations, especially those that have to assure a certain security

level. The Data Diode is used in environments that require state secret security solutions. Commercial organizations that want to perform one-way transfers between two physically separated networks can make excellent use of the Data Diode. Fox-IT is able to add (custom made) 'connectors' for other (proprietary) protocols, whereby one-way dataflow is guaranteed under all circumstances.

### SECURE

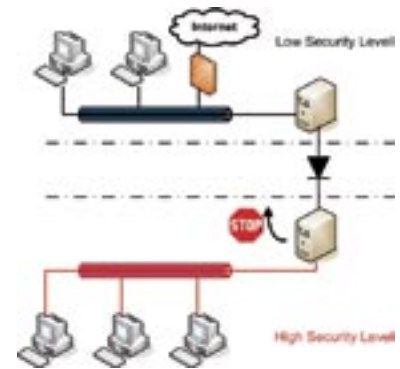
As the physical connection between the red and black network is one-way (hardware), software malfunction (possible bug or tampering) will never compromise the security of the red network. In addition, the data transmitted from the black to the red network is optionally encrypted in order to prevent data injection, data tampering and data eavesdropping. All transfers are logged. Error detection and correction will further enhance data integrity and security.



## FEATURES

In brief, the use of FFDD has the following features:

- Designed for Top Secret environments
- Approved and certified by NLNCSA/AIVD\* (Stg. Geheim)
- Unique hardware based one-way communication
- Error detection/correction
- Line encryption
- Easy-to-use web interface
- Different possibilities for employees in 'red' network
  - Receiving e-mail in red network (no sending)
  - Website/FTP mirroring (browsing much used websites/FTP servers)
  - No need for physical transport media to get data to the red network
  - Receiving print jobs in the red network from a computer in the black network



Configuration:	Easy to use Web interface for users, administration and auditing Automated/scheduled jobs for Web mirroring, 'Configure & audit'
Physical interfaces:	100BaseT (RJ45) towards the Black and Red network, other interfaces upon request Gigabit optical towards the physical 'data diode'
<b>PROTOCOLS SUPPORTED</b>	
Black server:	HTTP (client), SMTP (server), FTP (server), Microsoft Windows print server, others upon request
Red server:	HTTP local cache, SMTP forwarder, FTP forwarder, Print Forwarder, others upon request
Between servers:	Proprietary protocol with strong error detection and correction algorithms to prevent data corruption
Servers:	Intel compatible hardware (according to hardware compatibility list)
Operating system:	FoxBSD
Encryption:	256 bit AES between servers (optional)
Configuration:	Stored locally on each server for optimal security
Approvals:	Secret (Stg. Geheim)*; designed and acceptable for Top Secret environments Up to and including NATO SECRET (NS)
'Physical' diode:	AMSG720B approved
Dimensions:	Black & Red server: industry standard 19" 1U or 2U housing Physical diode: 19" 1U rack
Power usage:	Servers: double PSU 230V 200W (other voltages upon request) Physical diode: double 75-230V 12W (other voltages upon request)
<b>TEMPERATURE</b>	
Operating:	5 °C - 50 °C (non-condensing)
Storage:	-10 °C - 60 °C (non condensing)

