

AROW Data Diode

High Availability One-way Network Cyber-security



Somerdatta's AROW Data Wormhole **provides a high-speed, reliable barrier between networks.**

Somerdatta's AROW Data Diode Optical Wormhole allows a high-security data network to receive data from a lower-security network with high-rate throughput and maximum data integrity while ensuring that no data can be transmitted to the lower- level network.

Redundant paths, connections and power units ensure that data is available at all times. The unit automatically switches network ports maintaining the same address, if a failure mode occurs in the equipment or network attachments.

Physical data separation is maintained by use of independent data paths connected only by single one-way optical links.

Traditional data pumps and diodes rely on converted Network interface cards in a pc or slow RS-232 half links and can suffer from high-side data loss and create network bottlenecks.

To overcome the unreliability, complex schemes that require a lot of processing, link tuning and data duplication are often used. This makes Data Diodes expensive to maintain and reduces the bandwidth of the link.

Somerdatta's **AROW** is designed to be a high availability, high bandwidth system which takes care of the hard work of reliably sending data in a single direction.

AROW operates on the principle of a unidirectional stream of data. This stream of data is fed on the low security side through a Ethernet Socket connection. On the high security side, a client can connect to this stream of data through a separate Ethernet socket.

Data from the low side stream is fed to the high side on a high reliability, high bandwidth unidirectional optical link.

This enables full bandwidth Gigabit Ethernet communication from low side to high side protocols.

AROW provides Copper and/or Optical Gigabit Ethernet connectivity, maintaining TCP/IP or UDP connectivity to existing networks while providing a one way path for data between networks. Internal gated data buffering controls network congestion with automatic failover to a back-up if a receiving server fails or is taken offline.

AROW includes internal watchdogs and separated control/status paths so that each side of the diode can remain independent.

AROW is a fully hardware solution and does not rely on pc platforms, operating systems or network interfaces for operation. The 1U rack mount configuration and simple connections ensure that deployment and operator commissioning is simple, minimising chances of mis-connection.

AROW High Availability versions include redundant power supplies and visual and network alarms to ensure maximum system up time.

AROW can accept TCP and UDP data, UDP port numbers are maintained across the link to provide seamless integration (not HA version)

Open-source network management software is provided to allow simple scripted control for Network Administrators, or existing pre-formatted TCP data streams can be connected, **AROW** acting as a one-way trapdoor for the data stream..

Typical Applications: High-security data protection, anti-phishing and Trojan control, discrete network monitoring, safe process control monitoring, secure network islanding

AROW is available in 3 configurations as single channel, independent dual channel or single redundant channel (High Availability) variants. In the High Availability version, hot-swappable modules ensure fast maintenance continuity of TCP data even under internal or external failure conditions.



What is an Optical Wormhole Data Diode?

Securing data networks requires a variety of measures including anti-virus, anti-Trojan, encryption and key-coding and even physical barriers. However if you have the highest level of data to secure, and you want to ensure that even if your network is compromised, no data can escape, then the answer is a Data Diode.

Data Diodes (after the electrical component that only allows current to flow in one direction), only allow data to flow in one direction, from a low level security, even public, network to a high security level network that must not be compromised but needs to be accessed.

Data diodes do not replace cyber-theft counter-measures but rather supplement them, so that even if a high-security network is compromised by stealth or sabotage, data within that network cannot be extracted.

How does an Optical Wormhole Diode work?

Dedicated hardware provides a secure and auditable bridge between networks. A proprietary protocol one-way optical fibre is used internally to connect the hardware network interfaces. This, together with a dedicated high-speed buffer allows the standard TCP/IP protocol to be used on both sides of the Wormhole with all the benefits of error control and network management. UDP data is also accepted, port assignment is maintained across the link allowing seamless connectivity to existing systems.

Open-source, platform independent software is provided that manages both sides of the link allowing System Administrators and Quality Auditors to both intimately control data that is passed across the wormhole and to demonstrate quantitatively that no data can leak from the high security side.

The software provides a faithful reconstruction of the low-side file structure so that to users on the high-side the diode is transparent, allowing normal receiver access to databases, mail systems, system updates and so on.

Additional software can be used to further filter and screen data before or after the Wormhole.

For existing TCP data streams, for example from Process Control stream aggregators such as Data Turbine, it is only necessary to connect directly to and from AROW using normal TCP/IP connections

Gating Technology

AROW's unique TCP handling is enhanced by internal gating that maintains normal TCP flow control, so that if the high side of the diode network becomes congested, the low-side is informed and invokes appropriate TCP flow control.

For those requiring the highest level of airgap security, AROW can be supplied in streaming mode only mimicking the operation of conventional Data Diodes.

High Availability

Somerdata's High Availability **AROW** extends TCP/IP functionality, incorporating hot-swap modules and redundant power supplies to maintain the highest MTBF and lowest MTTR in its class. A pair of modules form the low-side and another pair the high-side, performing live and back-up roles on each side. Communication between modules in a pair includes Somerdata's proprietary EtherClone technology to seamlessly transfer IP addresses in the event of data path failure either as the result of external or internal failures.

Each module also includes a separate data control and status port, allowing the module's condition to be monitored remotely.

Multiple Configurations

Although designed and fully equipped for redundant operation **AROW's** modular design means that it can also be supplied as an entry-level single channel unit or as a dual-channel giving twice the bandwidth in one package.

Additionally industry-standard plug-in SFP data ports allow fibre or copper connections to be specified, or even changed after installation.

Specifications

Versions

Single, Dual, High-availability in standard Gated mode or optional Streaming mode

Data Interfaces

Gigabit Ethernet/1000 Base-T, LC Optical or RJ-45 Copper

Protocols:
Single and Dual Versions
TCP/IP, UDP

HA Version
TCP/IP Only

Transmission Buffer failover (HA Version)

Up to 5 seconds

Control Interfaces

Independent Control Ports for each plug-in card
10/100 Ethernet

Monitoring and control functions include:

Data port status, data port address configuration, internal buffer status

Physical

Depth: 341 mm required rack depth minimum 350mm to allow for standard connector cables
Width: 444 mm
Height: 44 mm (1U)

Power

Single Channel –single high MTBF AC to DC converter, 30VA
Dual-redundant- independent high MTBF AC to DC Converters, 105V to 235V AC with automatic failover,

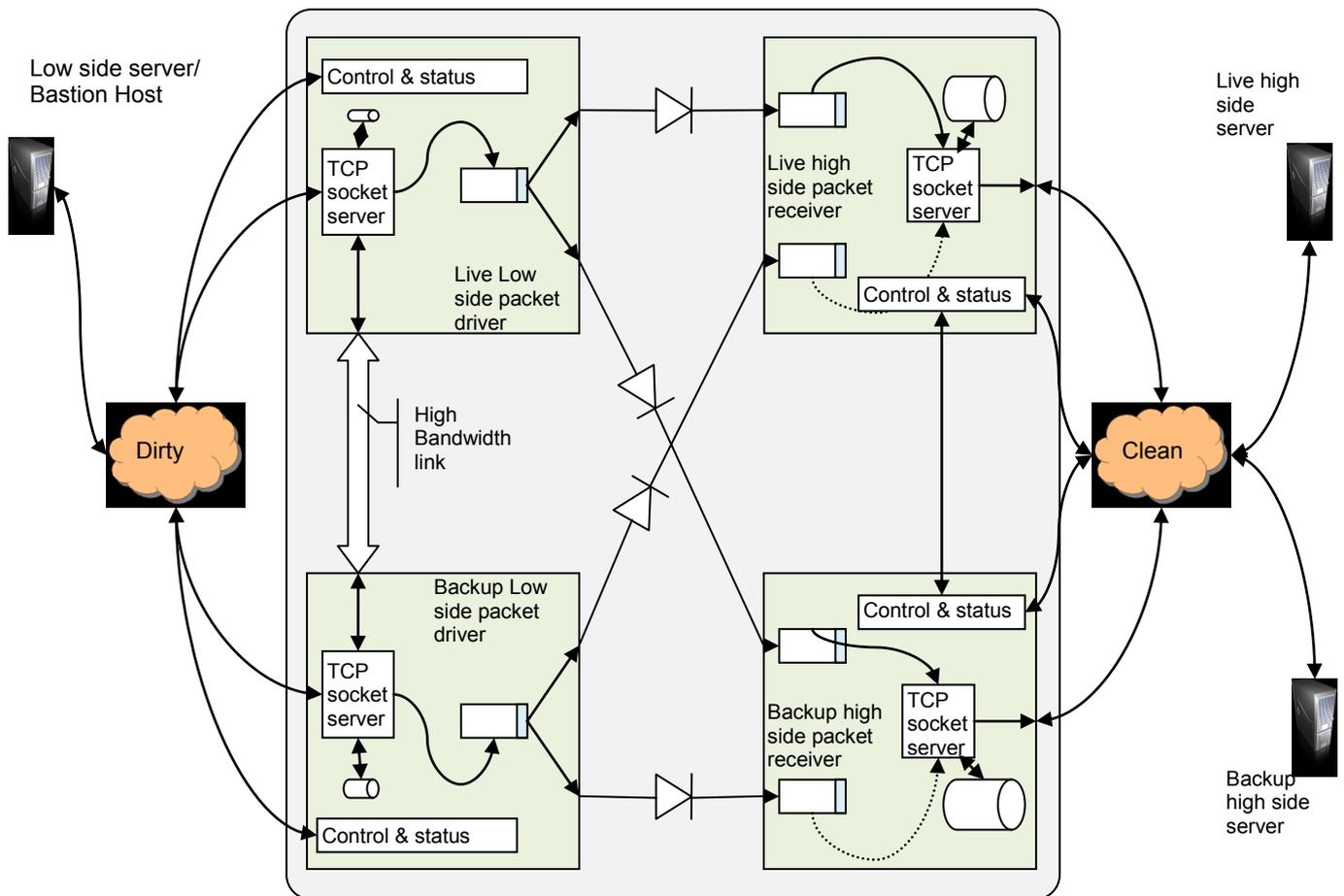
Maintenance

Hot-swappable data modules

Country of Origin

United Kingdom

Functional Block Diagram (HAVersion)



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