

What's a Data Diode?

You may know what a “Diode” is and you may have come across the expression “Data Diode” during the recent years. But what is a Data Diode really? And how can you benefit from it? Let's take a look into the concept and find out.

The rectifier

Anyone familiar with electronics knows that a diode rectifies alternating current into direct current. It simply cuts the negative part of the cycle and leaves the positive part to go on. You may say it's like closing your ears and open the mouth and speak. The current of human language just goes one-way. You may also find it's the same function as a **check valve** in your house, at home, where water should flow one way but not the other. That's the basics of rectifying and that's the core function of a diode.

The first electronic diodes were made from vacuum tubes a hundred years ago. After WWII the element of Germanium (Ge) became the material of choice later to be replaced by the famous Silicon (Si) which in turn is the base for all modern electronics in our digital world.

So, the diode has a long history and nowadays it's a commodity.

But how can the function of a Diode be applied to **Data**? You'll see!

***”A check valve
where water
should flow one
way but not the
other”***

Rectifying Data?

Why would one ever like to rectify data? Isn't the flow of data the base for communication? Well, you're right. It is! But the flow is also the **threat** for harmful data to enter your systems and interfere with your correct and secured data. Sure you want to protect from this. You want data to be transferred to the user but not the other way around. And here's where the Data Diode comes into place.

A Data Diode guarantees a safe **one way** data transfer by only allowing data to travel in one direction. Like the electronic diode above did with the current. The Data Diode separates your secured side where your systems are and the not so secure side where your users may be.

The Data Diodes perform this separation by isolating the secure side from the not so secure side galvanic, which means there are no electronic connections between the two side. No copper cables, no steel cables, no iron cables. The Data Diode uses **fiber optics** to enable flow of data from the secure side to the not so secure side.

So, you see we've made a Data Diode and it rectifies data exactly as you want it to, to protect your secured data and your secure systems.

But what about communication then?

Now you may wonder; But aren't the systems designed for communication and in need of responses? And how should they get responses if the data flow is rectified?

Well, you're perfectly right. Many systems need some kind of response, some kind of acknowledgement that the data sent is received correctly. But there are systems not so demanding and those systems rely upon the communication protocol **UDP** (User Datagram Protocol).

When using UDP the communication is said to be stateless, meaning that there is no acknowledging communication between the sender and the receiver. The flow of data goes on in one direction without any receipt from the receiver to the sender that the data has arrived. This is perfect for **streaming** of video and sound for example and as the quality of the transmission network increases the error rate of data transfer decreases and the need for error correction also decreases. A Data Diode in these cases is **the most protective action** you can take.

For other systems where there's need for more intense communication between the user and the systems, UDP is not enough. UDP doesn't fill the requirements so we need **TCP** (Transmission Control Protocol). But since the rectifier, the Data Diode, doesn't provide two way communication we need to enable this communication in another way as secure as the Data Diode. And here's where the Data Diode Middle Ware (**DDMW**) fills the gap and which we will talk about in the next White Paper.

***”This is perfect
for data streaming
of i.e. video and
sound”***

Summing up

Now you know more about the basis and the concept of Data Diode. As we launched our first Data Diode in 2006 we've seen an increasing demand for cyber security. First was the Defense industry followed by the Energy industry and now we see the Financial industry, Medical industry, well almost all industries paying interest in the concept of Data Diodes. And as the concept develops continuously we look forward into new appliances as for example **USB Data Diode, Ethernet Data Diodes, RS-323 Data Diodes** etc.

In short – we will see more Data Diodes!

So, to learn more about our Data Diode products, please visit <https://www.fibersystem.com/> or give us a call as we are happy to listen to your requests and tell you more about the concept of Data Diode.

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