JUMPING AIR GAPS

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AIR GAPS – WHERE NO NETWORK EXISTS
LIGHT
ULTRASONIC
RADIO FREQUENCY (RF)
“THE THING”
IMPRACTICAL
BETTER SOLUTION
Traffic passes through an unsecured system to an optical transmitter.

Optical transmitter transmits over an air gap to an optical receiver.

A warning is presented if the data is corrupt or determined to be malicious.

Accepted Data then transfers to a secured computer.
UNIDIRECTIONAL GATEWAY

Figure 1
Disclosed is a data diode, arranged to permit a flow of data in one direction only, from a transmitter to a receiver, comprising: a data path, comprising an optical emitter and a photoreceptor, **physically housed in a common optocoupler**, wherein data from the transmitter is used to energise the optical emitter to create an optical signal and the photoreceptor is arranged to generate an electrical signal in response to the optical signal, whereby the generated electrical signal is arranged to be passed to the receiver; and first and second power supplies, whereby the first and second power supplies are isolated from each other, the first power supply is arranged to supply a receive portion of the data diode and the second power supply arranged to supply a transmit portion of the data diode and wherein the first and second power supplies are internal power supplies, each generated from a single external power supply.
AN OPTOCOUPLER IMPLEMENTATION
Implementation

Figure 1
IMPLEMENTATION
IMPLEMENTATION
NORMAL DEMO
HACK DEMO
HACK DISCUSSION
THIS IS NOT A “BREAK” OF ANY PARTICULAR PRODUCT
- These are examples of multiple techniques to jump air gaps
- This is an exploration of tradecraft with the goal of education and generating additional research
- This is an interesting application of technical resources available
- It is only a proof-of-concept in a generically representative system

RF SHIELDING IN THE PRESENCE OF INTENTIONAL MISUSE

THE POTENTIAL USE OF EXISTING NEARBY HARDWARE
- Particularly in the same physical case

THE POTENTIAL TO USE GENERIC HARDWARE AS AN SDR RECEIVER
- Part selection
- PCB layout
- RF shielding

DISTANCE COMBINED WITH THE USE OF FIBER AS THE CONNECTOR
WRAP UP
QUESTIONS?

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