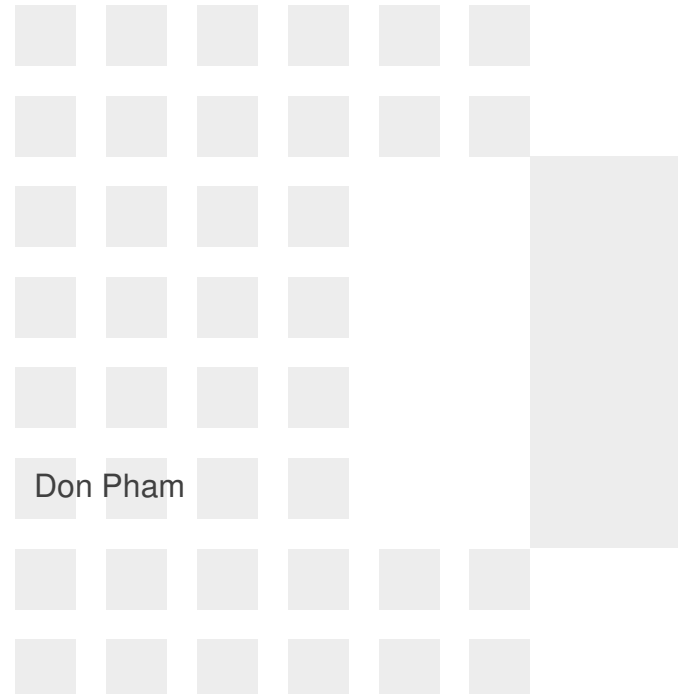




*Think Automation and beyond...*

CONFIDENTIAL

# FC6A Plus EtherNet/IP™



What is EtherNet/IP



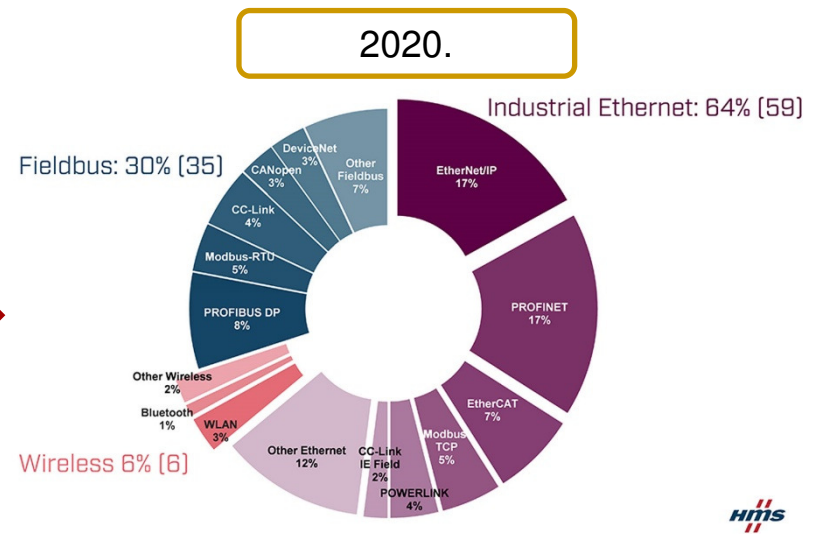
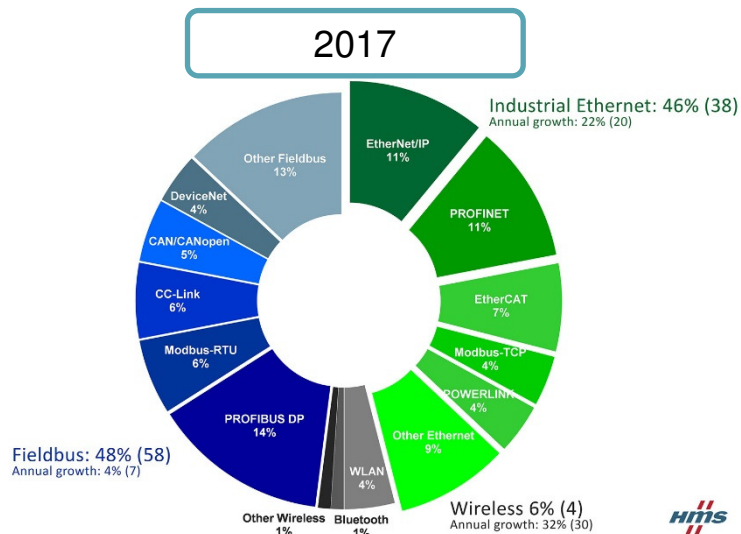
- EtherNet/IP - Ethernet Industrial Protocol
- EtherNet/IP is an industrial network protocol that adapts the Common Industrial Protocol (CIP)
- The EtherNet/IP and CIP technologies are managed by ODVA, Inc.
- The leading industrial protocols in the US with more than 30% market share
- EtherNet/IP makes use of TCP for explicit messaging and UDP for implicit messaging (FC6A supports both)
- Allows the FC6A to exchange I/O and data to other devices that support EtherNet/IP

# EtherNet/IP™



## Worldwide market share 2017 vs 2020

		2017	2020
Fieldbus	Non-Ethernet networks such as Modbus RTU, Devicenet, Profibus, etc...	48%	30%
Industrial Ethernet	Ethernet networks such as Modbus TCP, Profinet, EtherCAT, EtherNet/IP	46%	64%
<b>EtherNet/IP</b>	New devices now equip with EtherNet/IP	11%	17%
Wireless	Bluetooth and other wireless	6%	6%



<https://www.hms-networks.com/ja/news-and-insights/news-from-hms/2020/05/29/industrial-network-market-shares-2020-according-to-hms-networks>

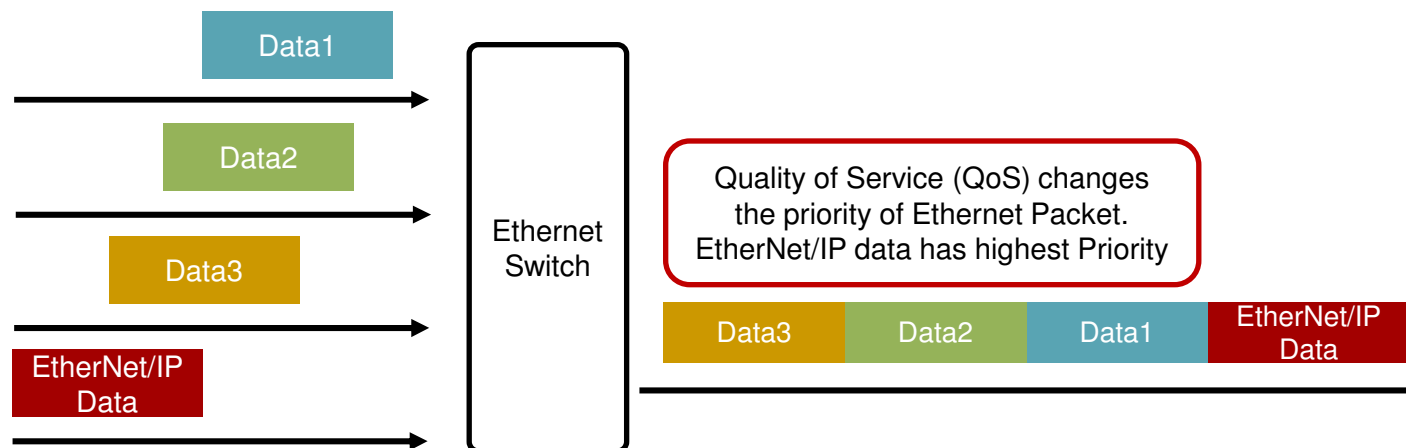
## Advantages of EtherNet/IP

- Real-time controls is possible, even when configured with other networks
- EtherNet/IP data can be prioritized when used with QoS (quality of services) industrial Ethernet switch
  - New 8port supports QoS later this year
- Modbus TCP is not suitable for real-time controls because its real-time communication is not guaranteed



### Features and Benefits

- ✔ 10/100BaseT(X) (RJ45 connector)
- ✔ Compact size for easy installation
- ✔ QoS supported to process critical data in heavy traffic
- ✔ IP40-rated metal housing
- ✔ -40 to 75°C wide operating temperature range (-T models)

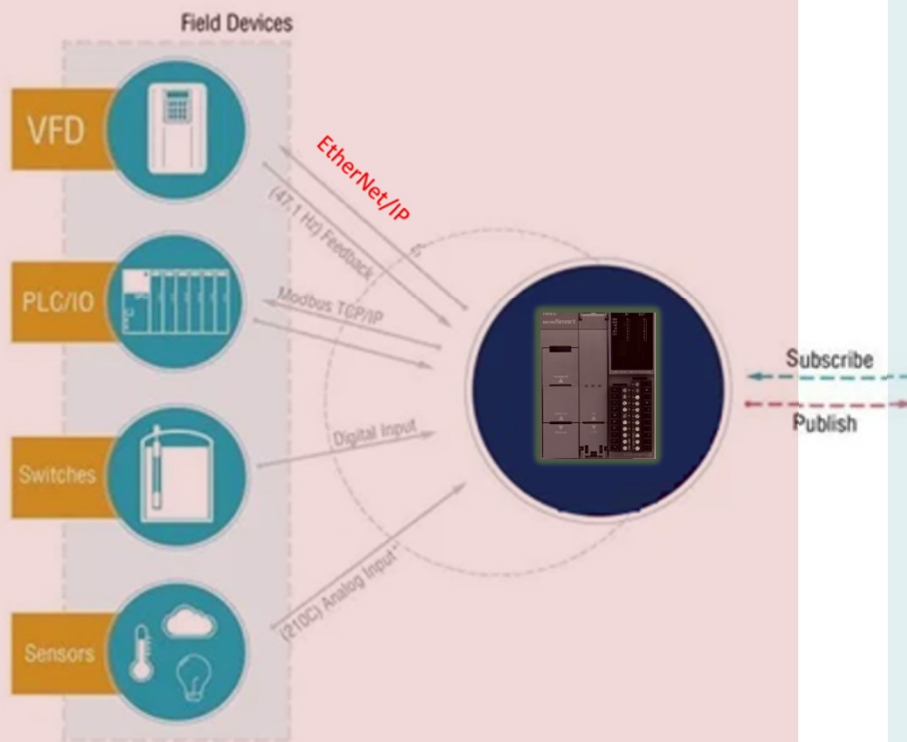


# EtherNet/IP™ and MQTT

## Industrial Protocols

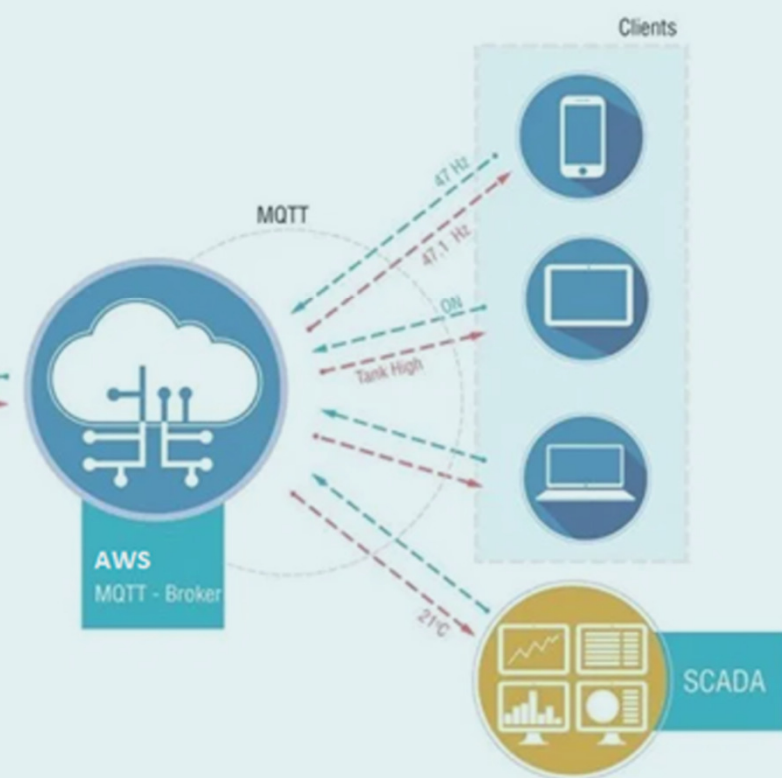
Modbus TCP  
EtherNet/IP

CAN J1939  
BACnet/IP



## IIoT Protocol

MQTT



## How EtherNet/IP Works

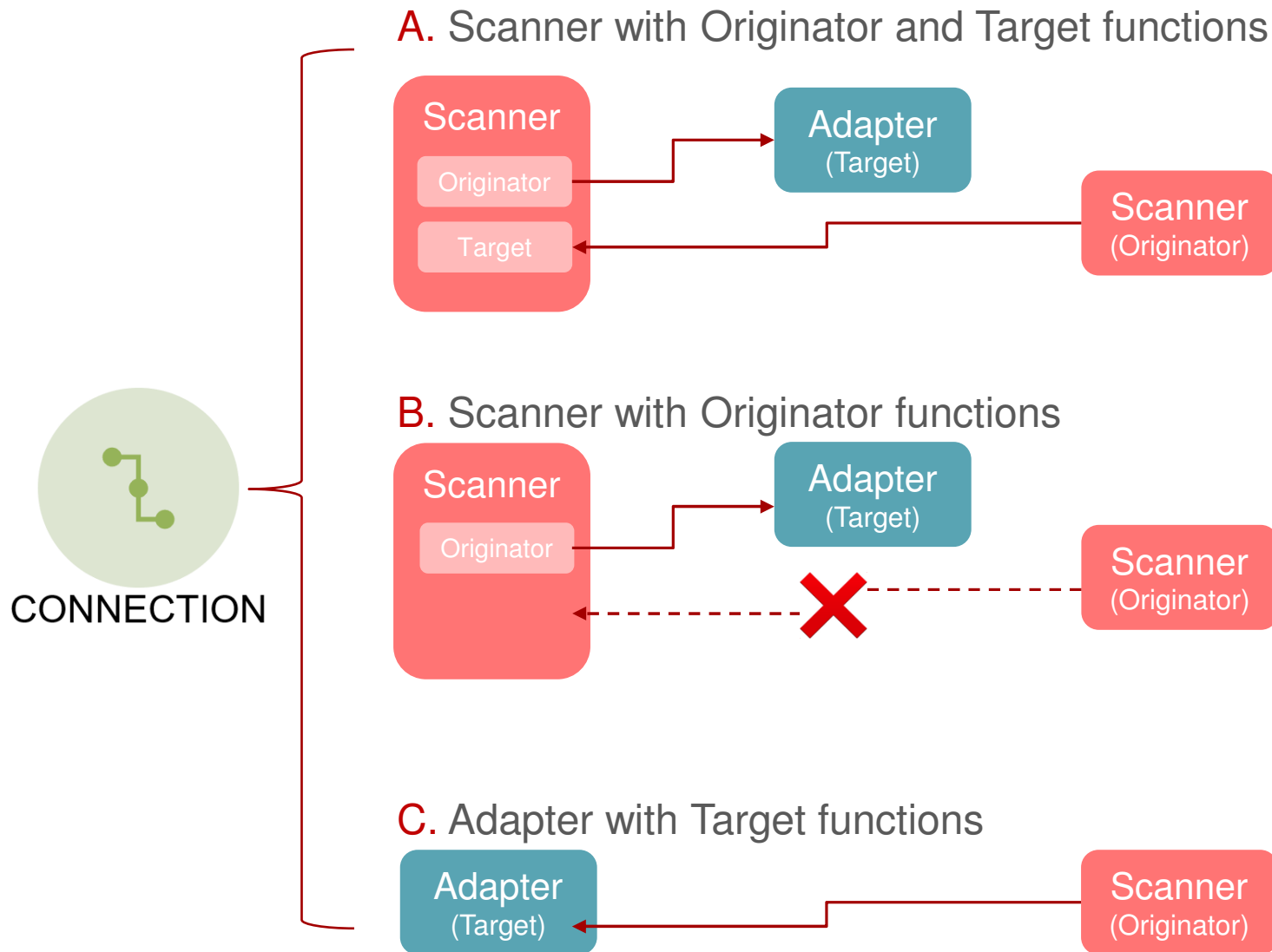
- An EtherNet/IP device can be a Scanner or Adapter
  - **Scanner**
    - A master device on the network
  - **Adapter**
    - A slave device on the network
  
- Furthermore, a scanner or adapter have roles as Originator and Target
  - **Originator**
    - Has the ability to request and connect to the Target
    - Feature can only be found in Scanner device
  - **Target**
    - Waiting for the Originator to connect
    - Feature can be found in Adapter or Scanner device

## Scanner and Adapter

- An EtherNet/IP device can be categorized as:
  - A. Scanner with Originator and Target functions
  - B. Scanner with Originator functions
  - C. Adapter with Target functions

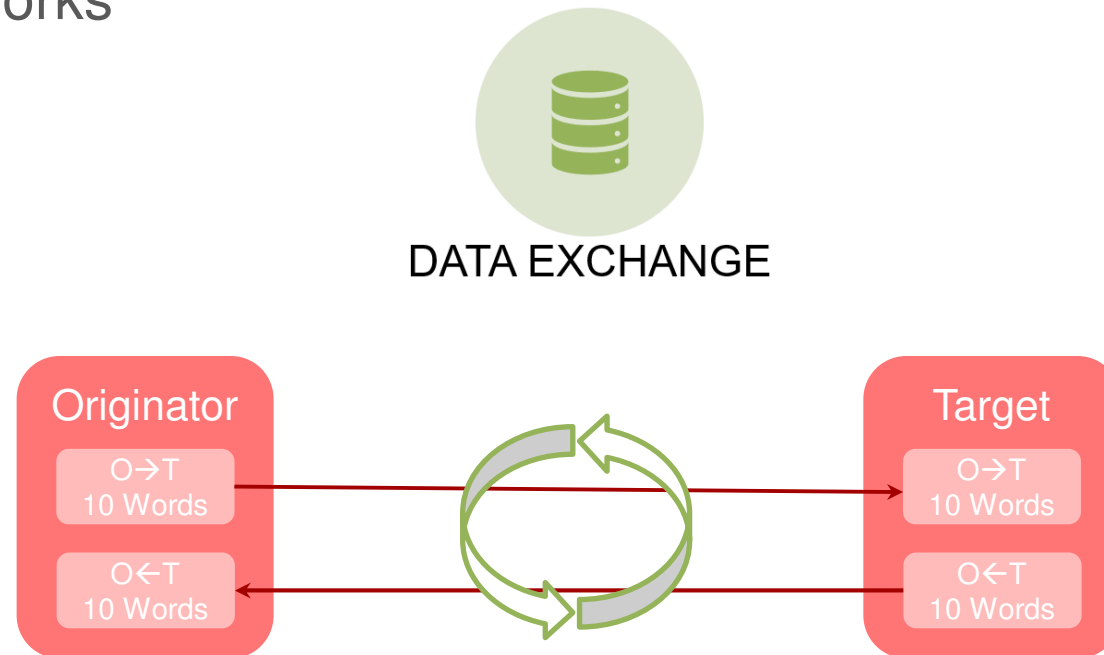
	Originator	Target
Scanner	Available	Optional
Adapter	-	Available

## How It Works





## How It Works

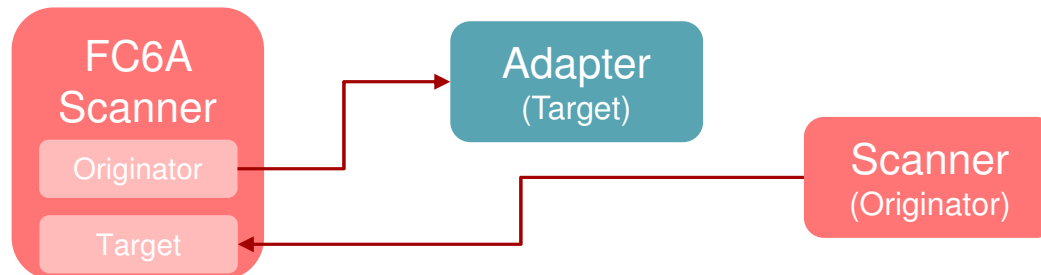


- The Originator/Target copies the data periodically in a cycle known as Requested Package Interval (RPI, 10-10,000ms) through implicit messaging
- For example
  - RPI = 50ms
  - 10 Words of data from Originator copies to Target every 50ms
  - 10 Words of data from Target copies to Originator every 50ms

How EtherNet/IP is supported

- EtherNet/IP is supported on ethernet port 2 of the FC6A Plus CPU (FC6A-D%)
- FC6A Plus supports EtherNet/IP Scanner with Originator and Target functions

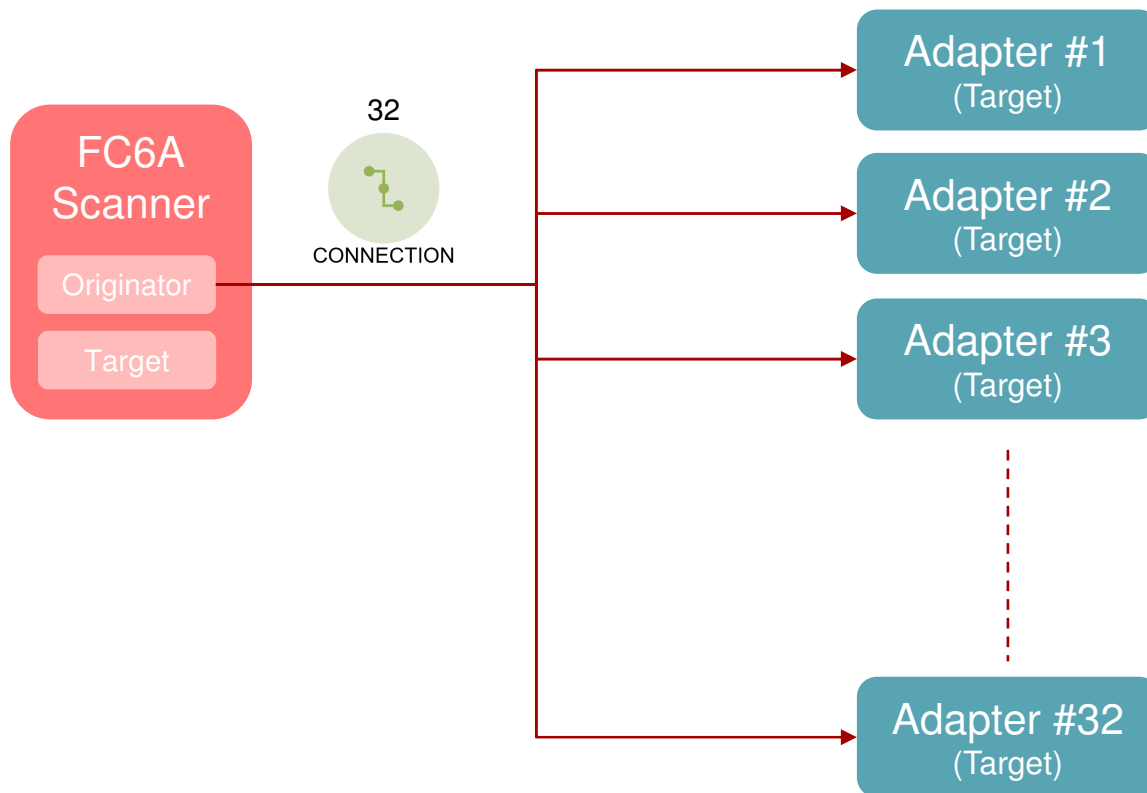
A. Scanner with Originator and Target functions



- Available as firmware upgrade (No cost, No hardware)
- Available in AO version 3.19.0 or later (WindLDR 8.15.0)

## Scanner as Originator

- Maximum number of connections is 32



## Scanner as Target

- Maximum number of connection points is 8

