Usage of APORT's Windows Driver

1. Background:

APORT series IP serial device server box can exchange serial port's data to IP packet and transmit in network. Currently we may send data via connectionless UDP method or connection-oriented TCP method. Generally UDP packet can be sent as soon as possible, but you can not promise to be received in the other site. TCP packet can promise to be received in the other site, but you can not confirm when to receive. For Windows user we can use WinSocket to write application software to send/receive data via UDP or TCP packet. Then APORT box will handle such UDP or TCP packet from network and send/receive data in serial port. If the original application software in Windows system were based on COM port, then we need to have virtual COM driver in Windows to let each serial port as COM port. Such virtual COM driver will handle the TCP or UDP packet in network. APORT box may send/receive data in serial port just like in standard PC COM port.

Because UDP method and TCP method have different feature, so APORT box will support two types of Virtual COM port driver in Windows. The first one is UDP method and called APORT RTTY mode driver. The other one is TCP method and called TPORT TCP server mode driver.

2. What is virtual COM driver in Windows system:

Windows system will manage the COM port created and activity. Generally we need to create virtual COM port in Windows system, we will need to ask plug & play manager to get available COM port number. If you did not ask P&P manager to give the COM port number, then we may conflict with other existed COM port with same COM port number. Then we may have wrong function in application software. Right now some manufacturer's virtual COM driver may use the old NT system's driver rule. They just assign COM port number to one virtual COM port directly. Then such COM port number may be not seen in Windows system or conflict with other existed COM port. RAYON's virtual COM port driver will follow the rule for WIN2000 later system. We will ask to P&P manager to get one available COM port number for virtual COM port. Then we can promise no confliction with existed COM port and such COM port number will be

seen in Windows system. But our virtual COM is not real hardware to be found by P&P manager in Windows system. So we need to use "add new hardware" manually to install our virtual COM port driver.

3. APORT RTTY mode virtual driver installation procedure.

a) Firstly we need to tell Windows system to install how many number of virtual COM ports. Right now we can install 1--64 virtual COM ports.

b) Now we need to specify each virtual COM port's location. Generally we need to specify the IP address of target APORT box. Each APORT box may have 1--16 serial ports available. So we need to specify the target serial port (from 1 to 16) location.

c) For example we may have two APORT200 boxes to be used. Each APORT200 box may have IP address in 192.168.1.200 and 192.168.1.201. And each APORT box can have serial port 1 and 2.

d) Now we need to run "aport_ap" utility file to tell Windows system our environment. We will specify to install 4 virtual COM port. The first COM port will be "IP = 192.168.1.200" and serial port 1 (Port# = 1). The second COM port will be "IP = 192.168.1.200" and serial port 2 (Port# = 2). The third COM port will be "IP = 192.168.1.201" and serial port 1 (Port# = 1). The fourth COM port will be "IP = 192.168.1.201" and serial port 2 (Port# = 2).

e) Then we will consider APORT virtual COM port driver as multi-serial port card. And our four virtual COM port is the serial ports of this card. So we need to install driver for this APORT multi-serial port card hardware.

f) In control panel we can run "add new hardware" to install driver for APORT multi-serial port card manually. After this card's driver is installed and run. This driver will create four new serial ports hardware in Windows system. Then the P&P manager in Windows system will find such hardware and ask to install COM port driver. After COM's driver is installed, you will find four COM ports available in your control panel.

g) Now, some people may have following problem. We have four new COM ports in Windows system. And we have APORT box in our network. Why my application software in Windows

system can not send/receive data in target serial port of APORT box?

h) The is due to above procedure is just to set one agent program in Windows system to handle the data transmission task. Our virtual COM driver will handle the task from application software and exchange to UDP packet to transmit in network. But we still need to have target APORT box reachable. We also need to let APORT box to handle such UDP packet from Windows.

i) Because we have many operation mode for serial port in APORT box. Each serial port can be worked in RTTY mode, TCP server mode, TCP client mode, UDP send/receive mode. We need to set our target serial port to work in RTTY mode. Then APORT box can handle the UDP packet from Windows system. If we set the wrong mode for target serial port, then APORT box will not handle the UDP packet from Windows system. Of course you can not have target function available.

j) Now we can conclude the procedure to set one serial port as virtual COM port in Windows system. Firstly we need to set APORT box's target serial port in RTTY mode. Then we need to run "aport_ap" to tell Windows to install how many Virtual COM ports. And we need to set the information for each Virtual COM port's location. Finally we will install virtual COM driver manually.

k) Next time you find your target virtual COM application software do not have target function. Firstly you need to check this target serial port in APORT box is set to RTTY mode. Then you need to confirm such APORT box is reachable (sometimes you may have different IP segment and your gateway may not allow UDP packet to be sent). Finally you need to run "aport_ap" to confirm that you have correct IP and serial port location to specify in your Windows system.

4. TPORT TCP server mode virtual driver installation procedure.

a)TPORT virtual COM port driver will use TCP packet to work with APORT box.

b) Firstly we need to tell Windows system to install how many number of virtual COM ports. Right now we can install 1--64 virtual COM ports.

c) Now we need to specify each virtual COM port's location. Generally we need to specify the IP address of target APORT box. Each APORT box may have 1--16 serial

ports available. We need to have dedicated TCP port number for each serial port. So we need to specify such TCP port number for target serial port.

d) For example we may have two APORT200 boxes to be used. Each APORT200 box may have IP address in 192.168.1.200 and 192.168.1.201. And each APORT box have serial port 1 assigned to use TCP port number 10001 and serial port 2 assigned to use TCP port number 10002.

e) Now we need to run "tport_ap" utility file to tell Windows system our environment. We will specify to install 4 virtual COM port. The first COM port will be "IP = 192.168.1.200" and TCP port number 10001. The second COM port will be "IP = 192.168.1.200" and TCP port number 10002. The third COM port will be "IP = 192.168.1.201" and TCP port number 10001. The fourth COM port will be "IP = 192.168.1.201" and TCP port number 10002.

f) Then we will consider TPORT virtual COM port driver as multi-serial port card. And our four virtual COM port is the serial ports of this card. So we need to install driver for this TPORT multi-serial port card hardware.

g) In control panel we can run "add new hardware" to install driver for TPORT multi-serial port card manually. After this card's driver is installed and run. This driver will create four new serial ports hardware in Windows system. Then the P&P manager in Windows system will find such hardware and ask to install COM port driver. After COM's driver is installed, you will find four COM ports available in your control panel.

h) Now, some people may have following problem. We have four new COM ports in Windows system. And we have APORT box in our network. Why my application software in Windows system can not send/receive data with target serial port in APORT box?

i) The is due to above procedure is just to set one agent program in Windows system to handle the data transmission task. Our virtual COM driver will handle the task from application software and exchange to TCP packet to transmit in network. But we still need to have target APORT box reachable. We also need to let APORT box to handle such TCP packet from Windows.

j) Because we have many operation modes for serial port in APORT box. Each serial port can be worked in RTTY mode, TCP server mode, TCP client mode, UDP send/receive

mode. We need to set our target serial port to work in TCP server and TCP mode (TCP server can have TCP or Telnet mode). We also need to specify the TCP port number for this serial port. Generally we need to specify different TCP port number for all serial ports in the same APORT box. It means that we must have unique IP address and TCP port number for each serial port. Then APORT box can handle the TCP packet from Windows system. If we set the wrong mode for target serial port, then APORT box will not handle the TCP packet from Windows system. Of course you can not have target function available.

k) Now we can conclude the procedure to set one serial port as virtual COM port in Windows system. Firstly we need to set APORT box's target serial port in TCP server and TCP mode. Then we need to run "tport_ap" to tell Windows to install how many Virtual COM ports. And we need to set the information for each Virtual COM port's location. Finally we will install virtual COM driver manually.

l) Next time you find your target virtual COM application software do not have target function. Firstly you need to check such target serial port mode in APORT box is set to TCP server and TCP mode. Then you need to confirm such APORT box is reachable (sometimes you may have different IP segment and your gateway may not allow TCP packet to be sent). Finally you need to run "tport_ap" to confirm that you have correct IP and TCP port number to specify in your Windows system.

m) Generally TCP method is connection oriented. When we connect with other device. How can we know the connection is disconnected? How can we know to connect again or not? It is not easy to handle such condition. When we have one connection to be disconnected purposely. Then we need to reconnect in new object. If we still waited to reconnect in same object again, then we may have hung condition. Because we may wait different object in both site and we never connect again. When we have one connection to be disconnected temporarily. If we tried to connect in new object, then we may have hung condition. Because we may wait different object in both site and we never connect again. When you use APORT in TPORT virtual COM port driver and find such hung condition. You may need to power OFF/ON this APORT box to default condition. Or you may need to enter APORT WEB setup mode to reset TCP server. If we used APORT power OFF/ON process, then we need to wait Linux boot period. If we used WEB setup to reset TCP server, then we can reconnect immediately.

5. Conclusion:

Because UDP and TCP have different feature, so RAYON's APORT series product line support two types of virtual COM port driver. APORT RTTY type driver is based on UDP method. User can have low latency time between Windows system's COM port application software and serial port in APORT box. But it is not suitable for UDP not friendly environment (You need to send over gateway). Because UDP can be discarded in some condition, so we may have data lost and resend condition. It is only suitable for local area network environment. TPORT TCP server mode driver is based on TCP method. We can have promise to send data without error. But we can not confirm the latency time between Windows system's COM port application software and serial port in APORT box.