USB-to-Serial Access

6330-MX

USB-to-Serial Access

Skill Level: *Moderate* (assumes familiarity with SSH sessions)

Goal

To enable serial out-of-band (OOB) access over SSH using the USB port.

Setup

A USB-to-Serial adapter will be required. Configuration varies depending upon the type of adapter -- single serial or a serial splitter.

USB-to-Serial Access

Serial out-of-band (OOB) access can be leveraged over SSH using the USB port. There are two types of USB-to-serial cables that can be utilized: single USB-to-Serial or a USB-to-Serial splitter. Purchasing options are available through Accelerated.

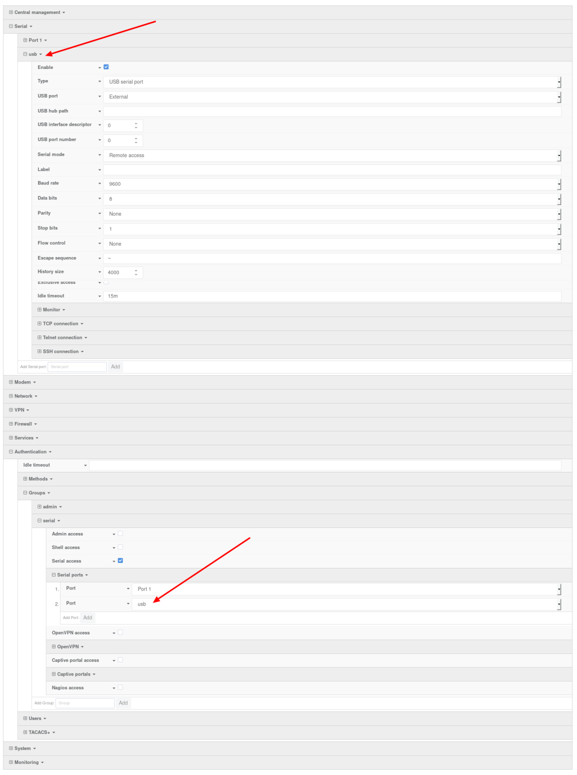
For assistance with enabling SSH, please refer to the following documentation:

- Enabling Shell Access: to enable full shell access to the device (as opposed to the admin CLI)
- Remote Access: to enable *external* SSH access
- Terminal on Unit: to enable SSH using the terminal available in aView.

Setup on firmware 18.8.14.122 or higher

This feature is now listed as an entry in the *Serial* section of the ACL router's configuration profile. Open the configuration profile for the ACL router and make the following changes:

1. Under *Serial*, type in a name in the *Add Serial port* entry, then click *Add*.
2. Set *Type* to *USB serial port*
3. Set *USB port* to *External*
4. Adjust the baud rage, data bits, and other serial parameters as needed to match those of the console being connected to the serial port.
5. Under *Authentication -> Groups -> serial -> Serial ports*, click *Add* and select the newly created serial entry.
6. Click *Save*


⊞ Central management
⊟ Serial
⊞ Port 1
⊟ usb

Enable	✓
Type	USB serial port
USB port	External
USB hub path	
USB interface descriptor	0
USB port number	0
Serial mode	Remote access
Label	
Baud rate	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None
Escape sequence	~
History size	4000
Exclusive access	☐
Idle timeout	15m

⊞ Monitor
⊞ TCP connection
⊞ Telnet connection
⊞ SSH connection
Add Serial port: Serial port Add
⊞ Modem
⊞ Network
⊞ VPN
⊞ Firewall
⊞ Services
⊟ Authentication
Idle timeout
⊞ Methods
⊟ Groups
⊞ admin
⊟ serial

Admin access	☐
Shell access	☐
Serial access	✓

⊟ Serial ports

1.	Port	Port 1
2.	Port	usb

Add Port: Add

OpenVPN access	☐

⊞ OpenVPN

Captive portal access	☐

⊞ Captive portals

Nagios access	☐

Add Group: Group Add
⊞ Users
⊞ TACACS+
⊞ System
⊞ Monitoring

After the configuration is applied to the ACL router, an option will be added to the selection menu when a user establishes an SSH session to the device, or accesses the Terminal of the ACL router. Below is an example SSH session showing the newly created serial entry to access the USB-to-serial adapter.

```
$ ssh root@192.168.2.1
Password:
X11 forwarding request failed on channel 0



Access selection menu:

    a: Admin CLI
    1: Serial: port1        (9600,8,1,none,none)
    2: Serial: usb          (9600,8,1,none,none)
    s: Shell
    q: Quit

Select access or quit [admin] : 2



Connecting to usb:
Settings: 9600, 8, 1, none, none
Type '~.' to disconnect from port
Type '~?' to list commands
```

Setup on firmware 18.4.54.41 or lower

This feature is currently supported by shell interactions in an SSH session. With shell access enabled, press 's' after authenticating to the device.

```
$ ssh root@192.168.2.1
$ password
Access selection menu:

    a: Admin CLI
    s: Shell
    q: Quit

Select access or quit [admin] : s
Connecting now, 'exit' to disconnect from shell ...
#
```

The relevant command(s) for USB-to-Serial access will depend on the type of adapter being used.

Single USB-to-Serial Cable

Refer to the following command to bring up a single serial connection over USB.

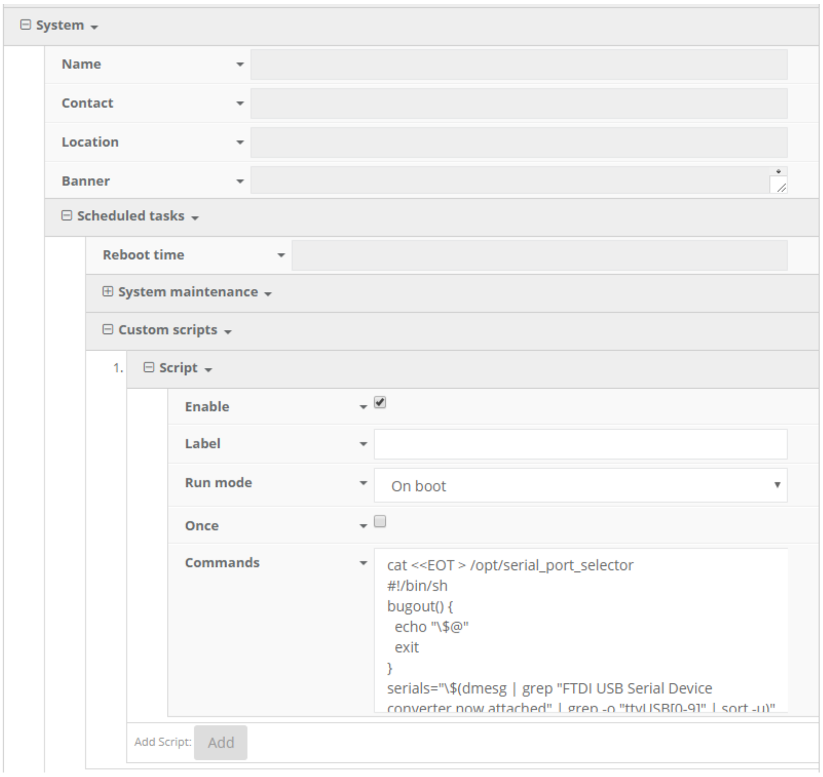
```
tip -l "$(dmesg | grep "FTDI USB Serial Device converter now attached" | grep -m 1 -o
"ttyUSB[0-9]")" -c -s 9600
```

Pressing '~.' followed by ENTER will close the serial connection; note that this does not end the console session on the device being accessed over serial.

USB-to-Serial Splitter

To conveniently access multiple serial connections over SSH using this adapter, enter the following script into router's *Custom Script* field, setting its *Run mode* to "On boot." This field is nested under *System > Scheduled Tasks > Custom Script*.

```
cat <<EOT > /opt/serial_port_selector
#!/bin/sh
bugout() {
  echo "\$@"
  exit
}
serials="\$(dmesg | grep "FTDI USB Serial Device converter now attached" | grep -o
"ttyUSB[0-9]" | sort -u)"
[ "\$serials" ] || bugout 'no serial-to-USB converters found'
serial_count=\$(echo "\$serials" | wc -l)
echo "Found \$serial_count USB-to-serial converters."
for i in \$serials; do
  echo "\$i"
done
echo "Type the number of the USB port you wish to open a console connection to"
echo "(e.g. for ttyUSB2, type '2'), followed by ENTER:"
read port_num
serial_port=\$(echo "\$serials" | grep "\$port_num")
[ "\$serial_port" ] || bugout "Port number \$port_num is not available, please re-run
and specify a diffrent port."
echo "Opening connection to USB-to-serial port \$serial_port."
echo "Press '~.' followed by ENTER to close connection."
tip -l "\$serial_port" -c -s 9600
EOT
chmod +x /opt/serial_port_selector
```



Name	
Contact	
Location	
Banner	
Reboot time	
Enable	✓
Label	
Run mode	On boot
Once	☐
Commands	

```
cat <<EOT > /opt/serial_port_selector
#!/bin/sh
bugout() {
  echo "\$@"
  exit
}
serials="\$(dmesg | grep "FTDI USB Serial Device
converter now attached" | grep -o "ttyUSB[0-9]" | sort -u)"
```

With the script enabled, SSH onto the device and enter the following command from the shell to bring up the available serial connections:

```
/opt/serial_port_selector
```

This will list all available connections. Enter the number of the USB port to proceed. For example:

```
Access selection menu:
    a: Admin CLI
    s: Shell
    q: Quit
Select access or quit [admin] : s
Connecting now, 'exit' to disconnect from shell ...
# /opt/serial_port_selector
Found 4 USB-to-serial converters.
ttyUSB0
ttyUSB1
ttyUSB2
ttyUSB3
Type the number of the USB port you wish to open a console connection to
(e.g. for ttyUSB2, type '2'), followed by ENTER:
3
Opening connection to USB-to-serial port ttyUSB3.
Press '~.' followed by ENTER to close connection.
Connected.
```