Application Note 17

Command Line Response Manipulation

Digi Technical Support

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Contents

1 INTRODUCTION

1.1 Outline

Occasionally applications send commands that are not required or understood by the TransPort's Command Line Interface (CLI). These commands could make unwanted changes to the TransPort's running configuration. They could also prevent the system from working, i.e. if the TransPort responds with "ERROR" when the application/terminal expects some other response. This Application Note (AN) explains several ways of configuring the TransPort to ignore certain command strings or respond to commands in a different way.

There are several ways to manipulate the interpretation of TransPort CLI commands. The following methods are outlined in this AN:

1. **Command Mapping**. Map one command to another command.

2. **Lock the S-Registers** so that AT commands will be unable to change the TransPort's S-Registers.

3. Apply **Command Filters** so some commands will reach the command interpreter and others will not.

1.2 Assumptions

This AN has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product, and of the requirements for their specific application.

This AN applies to:

Model used for testing: TransPort WR21.

Other Compatible Models: All TransPort models.

Firmware versions: All versions.

> **NOTE**: This AN has been specifically rewritten for firmware release 5.2.14.3 and later but the original AN was tested and working for routers running earlier firmware and the previous web interface GUI. TransPorts running earlier firmware may find that the screenshots do not accurately reflect what may be seen on units running older firmware.

Configuration: This AN assumes the devices are set to their factory default configurations. Most configuration commands are only shown if they differ from the factory defaults.

Users have access to the TransPort's local "ASY" serial port and web interface.

1.3 Corrections

Requests for corrections or amendments to this AN are welcome and should be addressed to:
tech.support@digi.com

Requests for new AN's can be sent to the same address.

1.4 Version

Version Number	Status
1.0	Published
1.1	Re-branded to Digi TransPort
1.2	Updated screenshots and instructions for new web interface, rebranding (Apr 2016)

2   CONFIGURATION

2.1   Command Mapping

Any command that is entered into the TransPort via the CLI can be transposed or mapped to a different command. This feature is normally used to allow attached devices to send invalid or unrecognized AT commands, but receive valid 'OK' responses. This will be applied to commands entered via remote command sessions (e.g. Telnet) as well as through the serial ports.

Using the TransPort's web interface, navigate to **Configuration – Network > Interfaces > Serial > Command Mappings**. Use this form to enter the command to map and the mapped command.

It's also possible to configure the TransPort to respond with any string of characters. This is achieved by mapping a command to the at%e[character string] command.

Control characters can also be included in the response by escaping the character with a ^. The control character is derived by subtracting 64 from the escaped character's ASCII number. For example, a space character may be entered as ^` in the input string

To configure the TransPort to respond with "<CR><LF><STX>HELLO WORLD<ETX>", map the command to "at%e^M^J^BHELLO^`WORLD^C".

NOTE: About the "Allow AT Responses" setting, if you were to map to an ATD dial string, the RING and CONNECT messages (for example) would not be relayed back to the ASY interface unless the setting was enabled to allow responses.

Click the **Apply** button after adding the mappings.

2.2   Lock S-Registers

Commands can be entered via the TransPort's ASY serial port to change settings in the S-Registers. After locking the S-Registers, any such commands will have no effect on the S-Registers settings.

S-Register settings usually control serial port behavior such as baud rate and echo.

NOTE: These commands are not available via the TransPort's web interface.

`cmd x sreglok 3` → Locks S-Register so changes cannot be made.

`cmd x sreglok 0` → Unlocks S-Register so changes can now be made.

The 'x' represents the number of the ASY port that you wish to turn the lock feature On or Off.

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2.3 Command Filters

When this feature is enabled, commands will not reach the TransPort's command interpreter unless they are defined in the Command Filters table. Terminal devices may send commands that the Transport will not necessarily understand but that require a basic 'OK' response.

With "Command Filtering" enabled, any command entered will be responded to with a modem like "OK" response unless the command is found in the Command Filters table.

Navigate to **Configuration - Security > Command Filters** and use the Command Filters table to add or delete entries. You can use the * wildcard to allow groups of commands to match. When command filtering is enabled, it's advisable to allow "cmd*" commands through. This is necessary so that the user can turn the command filter OFF.

NOTE: The fields in the Command Filters table are case sensitive.

Check the appropriate tick box for the serial port(s) that the Command Filters are applicable.

NOTE: It is advisable to edit the Command Filters table before enabling the Command Filtering function.

Configuration - Security > Command Filters

Enable Command Filtering on Serial interfaces

Interface	Enable	Return Error
Serial 0	✔	☐
Serial 1	☐	☐
Serial 2	☐	☐
Serial 3	☐	☐
Serial 4	☐	☐
Serial 5	☐	☐
Serial 6	☐	☐
Serial 7	☐	☐
Serial 8	☐	☐
Serial 9	☐	☐
Serial 10	☐	☐

CLI command to enable Command Filtering (checkmark above):

```
cmd x cfilton 1
```

CLI command to disable Command Filtering:

```
cmd x cfilton 0
```

The 'x' represents the number of the ASY serial port you wish to Enable or Disable the filter on.

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3.1   Testing the Command Mappings

Using the TransPort's web interface, enter the command or commands defined in 2.1. Now connect to the TransPort's CLI using the ASY serial port or a telnet session. Enter the AT+QWERTY command. Normally, this is an illegal command and would result in an ERROR response. The following example shows that the TransPort replies with OK, which is the correct response for the "AT" mapped command.

```
at
OK
at+qwerty
OK
```

To further test the response to the AT+TEST command, it is necessary to read the Analyser trace to check the HEX value of the CR (0D) LF (0A) STX (02) and ETX (03) highlighted in red below:

```
at+test
HELLO WORLD
OK
```

Check the Analyser trace (using the ASY serial port, tracing Serial Interface "ASY 0"):

```
-----   1-1-2000  21:39:37.590   -------
ASY 0 DTE to DCE:

61                                              a
----------
-----   1-1-2000  21:39:37.810   -------
ASY 0 DTE to DCE:

74                                              t
----------
-----   1-1-2000  21:39:38.130   -------
ASY 0 DTE to DCE:

2B                                              +
----------
-----   1-1-2000  21:39:38.300   -------
ASY 0 DTE to DCE:

74                                              t
----------
-----   1-1-2000  21:39:38.450   -------
ASY 0 DTE to DCE:

65                                              e
----------
-----   1-1-2000  21:39:38.600   -------
ASY 0 DTE to DCE:

73                                              s
----------
-----   1-1-2000  21:39:38.650   -------
ASY 0 DTE to DCE:
```

```
74                                                     t
----------
-----   1-1-2000  21:39:38.790   -------
ASY 0 DTE to DCE:

0D                                                     .
----------
   -----   1-1-2000  21:39:38.790   -------
   ASY 0 DCE to DTE:

   0D 0A 02 48 45 4C 4C 4F 20 57 4F 52 4C 44 03 0D     ...HELLO.WORLD..
   0A 4F 4B 0D 0A                                      .OK..
   ----------
```

3.2 Testing the S-Register Lock

Using the ASY serial port, view the S-Register values with the command `AT&V` for this example. Note the value assigned to 'e', echo. Try and change the echo value with the command `ATE 0` or `ATE 1`. Note that the echo value has changed.   Use the commands defined in 2.2 to lock the S-Register. Note that further attempts to change the echo value will not alter the current the S-Register values.

```
AT&V
CURRENT PROFILE:
&c1 &d2 &k1 &s1 &r0 e1 q0 v1 &y0
S0=0 S2=43 S12=50 S31=3 S45=5
states DTR:1 RTS:1

STORED PROFILE 0:
&c1 &d2 &k1 &s1 &r0 e1 q0 v1
S0=0 S2=43 S12=50 S31=3 S45=5

STORED PROFILE 1:
&c1 &d2 &k1 &s1 &r0 e1 q0 v1
S0=0 S2=43 S12=50 S31=3 S45=5
OK

ATE 0
OK

AT&V
CURRENT PROFILE:
&c1 &d2 &k1 &s1 &r0 e0 q0 v1 &y0
S0=0 S2=43 S12=50 S31=3 S45=5
states DTR:1 RTS:1

STORED PROFILE 0:
&c1 &d2 &k1 &s1 &r0 e1 q0 v1
S0=0 S2=43 S12=50 S31=3 S45=5

STORED PROFILE 1:
&c1 &d2 &k1 &s1 &r0 e1 q0 v1
S0=0 S2=43 S12=50 S31=3 S45=5
OK

CMD 0 SREGLOK 3
OK

ATE 1
OK
```

```
AT&V
CURRENT PROFILE:
&c1 &d2 &k1 &s1 &r0 e0 q0 v1 &y0
S0=0 S2=43 S12=50 S31=3 S45=5
states DTR:1 RTS:1

STORED PROFILE 0:
&c1 &d2 &k1 &s1 &r0 e1 q0 v1
S0=0 S2=43 S12=50 S31=3 S45=5

STORED PROFILE 1:
&c1 &d2 &k1 &s1 &r0 e1 q0 v1
S0=0 S2=43 S12=50 S31=3 S45=5
OK
```

3.3 Testing the Command Filter feature

Disable Command Filtering as defined in 2.3, enter some general CLI commands, and then note the expected responses.

```
cmd 0 hostname ?
digi.router
OK
time
18:51:55, 02 Jan 2000
system time: 18:51:54, 02 Jan 2000
type 'time ?' for help
OK
qwerty
ERROR
```

Now, enable Command Filtering as defined in 2.3. Try entering commands that are not populated in the Command Filters table and notice that they are responded to with an OK.

```
cmd 0 hostname ?
digi.router
OK
time
OK
qwerty
OK
```

4 FIRMWARE VERSION

```
ati5
Digi TransPort WR21-U81B-DE1-XX Ser#:273094 HW Revision: 1201a
Software Build Ver5.2.14.3.  Mar  8 2016 10:31:12  WW
ARM Bios Ver 7.56u v43 454MHz B987-M995-F80-O0,0 MAC:00042d042ac6
Power Up Profile: 0
Async Driver            Revision: 1.19  Int clk
Ethernet Port Isolate Driver Revision: 1.11
Firewall                Revision: 1.0
EventEdit               Revision: 1.0
Timer Module            Revision: 1.1
(B)USBHOST              Revision: 1.0
L2TP                    Revision: 1.10
PPTP                    Revision: 1.00
TACPLUS                 Revision: 1.00
MODBUS                  Revision: 0.00
RealPort                Revision: 0.00
MultiTX                 Revision: 1.00
LAPB                    Revision: 1.12
X25 Layer               Revision: 1.19
MACRO                   Revision: 1.0
PAD                     Revision: 1.4
X25 Switch              Revision: 1.7
V120                    Revision: 1.16
TPAD Interface          Revision: 1.12
GPS                     Revision: 1.0
TELITUPD                Revision: 1.0
SCRIBATSK               Revision: 1.0
BASTSK                  Revision: 1.0
PYTHON                  Revision: 1.0
CLOUDSMS                Revision: 1.0
TCP (HASH mode)         Revision: 1.14
TCP Utils               Revision: 1.13
PPP                     Revision: 5.2
WEB                     Revision: 1.5
SMTP                    Revision: 1.1
FTP Client              Revision: 1.5
FTP                     Revision: 1.4
IKE                     Revision: 1.0
PollANS                 Revision: 1.2
PPPOE                   Revision: 1.0
BRIDGE                  Revision: 1.1
MODEM CC (GOBI UMTS)    Revision: 5.2
FLASH Write             Revision: 1.2
Command Interpreter     Revision: 1.38
SSLCLI                  Revision: 1.0
OSPF                    Revision: 1.0
BGP                     Revision: 1.0
QOS                     Revision: 1.0
PWRCTRL                 Revision: 1.0
RADIUS Client           Revision: 1.0
SSH Server              Revision: 1.0
SCP                     Revision: 1.0
SSH Client              Revision: 1.0
CERT                    Revision: 1.0
LowPrio                 Revision: 1.0
Tunnel                  Revision: 1.2
OVPN                    Revision: 1.2
```

```
TEMPLOG              Revision: 1.0
QDL                  Revision: 1.0
OK
```