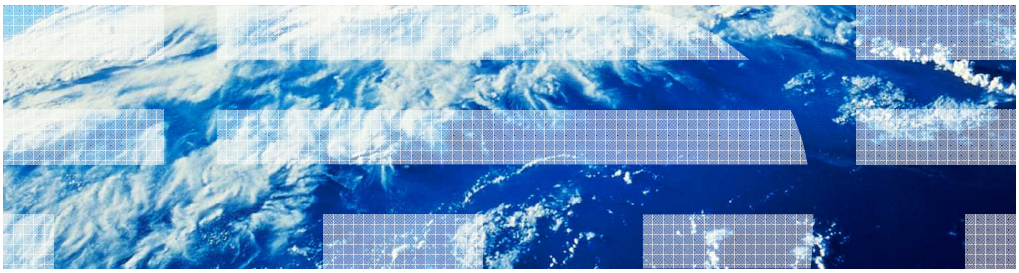
IBM WebSphere DataPower XC10 Version 2.0

Command line interface



This presentation will discuss the command line interface to the IBM WebSphere DataPower XC10 version 2 firmware.

Table of contents

This presentation will first cover the basics of the new command line interface and then cover the most significant commands that can be used for appliance management.

Section

Command line interface

This section will provide a high level overview of the DataPower XC10 command line interface.

Command line interface

- Command line interface to:
  - Configure appliance
  - Reset the appliance
  - Restart appliance
  - Shut down the appliance

IBM WebSphere DataPower XC10 version 2 firmware provides a command line interface you can use for various operations such as networking interface configuration, appliance configuration and reset, and diagnostics. There are also commands for restarting or shutting down the appliance, and even restoring the appliance to its default settings.

DataPower XC10 remote CLI interface

- Establish a connection with the appliance
  - Serial console interface
  - telnet
  - ssh
- Authenticate as “administrator” (xcadmin)

```
$ ssh xcadmin@myxc10.austin.ibm.com
Password:
Last login: Mon Jul 11 14:14:48 CDT 2011 from
dyn19216803.austin.ibm.com on pts/0
Welcome to WebSphere Datapower XC10 Appliance
Console>
```

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In order to make use the command line interface, you will need to establish a connection with the appliance and log in with the administrator user name xcadmin -- only xcadmin can use the command line interface. You can connect to the appliance through a direct serial connection or remotely using a Secure Shell (ssh) or telnet client.

After connecting through a serial connection to the DataPower XC10 version 1 firmware, users were directed to a simple menu with limited options. The version 2 firmware provides the same command line interface regardless of whether you connect through the serial console, ssh, or telnet.

Shown here is a connection to a DataPower XC10 appliance through the SSH interface. Telnet and console interfaces provide the same “Console>” prompt.

Section

Commands included in the XC10 V2 firmware

This section will show you some of the commands included in XC10 V2 firmware

CLI commands (1 of 2)

```
Console> help
Type "help <commands|show|status>" for a list of options

Console> show help
The following showable items are available:
        commandref -- reference list of all commands
        version -- appliance firmware version

Console> status help
The following status items are available:
        battery -- show battery information
        cpu-usage -- show average CPU use over some intervals
        fan -- show fan status
        flash -- show flash drive status
        intrusion -- show case integrity
        memory -- show memory usage
        netif -- show network interface (show all by default)
        raidphystatus -- show raid controller status
        temperature -- show temperature status
        uptime -- show uptime
        voltage -- show voltage status
        volume -- show storage volume status
```


At any time you can ask for help to see what commands are available. This shows the status commands available. You see examples of some of these in the later slides.

CLI commands (2 of 2)

```
Console> help commands
The following commands are available:
     add-jvm-args
     alias [name [value]]
     clear-all
     clear-jvm-args
     clear-logs
     clear-tls-config
     collect-logs <logsfilename> [<PDfilename>]
     datetime <sub-command>...
     device <sub-command>...
     echo text...
     file <sub-command>...
     firmware <sub-command>...
     force-recycle
     get-dns-search
     get-dns-servers
     get-ntp-servers
     help [command]
     license <sub-command>...
     locale sub-command>...
     locate-led on|off
     net-test <sub-command>...
     netif <sub-command>...
     nodename <sub-command>...
     packet-capture <sub-command>...
     platform <sub-command>...
     raid <sub-command>...
     set-dns-search [domain...]
     set-dns-servers [server...]
     set-ntp-servers [server...]
     show <item>...
     source <input>
     sshkey <sub-command>
     start-progress
     status <item>...
     timezone <sub-command>...
     unalias <name>
     user <sub-command>...
     wizard <file>
     xml <sub-command>...
Type "help <command-name>" for details on a
specific command
```


The command “**help commands**” will provide a list of all commands provided by your version of the firmware. This slide shows the commands provided by the version 2 firmware.

Section

General commands

This section will show you some of the general commands provided in the WebSphere DataPower XC10 version 2 firmware.

File and data commands

- file get <*file_URL*> <*file_name_on_appliance*>
  - Retrieves a remote file and saves the file to the appliance
- file put <*file_name_on_appliance*> <*file_URL*>
  - Transfer files from the appliance to a remote location
- file list
  - List files stored on appliance
- file delete <*file_name_on_appliance*>
  - Delete file from appliance

The **file get** and **file put** commands transfer files to and from the appliance. The remote identifier is a URI. Currently only http, ftp and scp are supported. Note that **file put** does not support HTTP protocol. Copying can only happen between a (fixed) temporary directory on the appliance and a remote destination, and only simple file names are allowed on the appliance. When doing **file get**, you can specify "." as the local file name. The resulting local file will have the same name as the file on the remote server. Similarly, when doing file put, you can specify just the destination directory by ending the URL with a slash. The resulting remote file will have the same name as the local file.

The **file list** command will list the files currently in the appliances temporary directory, and the **file delete** command will remove files from this directory.

File and data command examples

```
# Expected HTTP URL
file get http://support.foo.com/support/xc10/rel2.scrypt new-release.scrypt

# Put file bar in ~admin/foo/bar
file put bar ftp://admin:mypass@ftp.example.com/foo/bar

# Get file from ~guest/myproj/test.scrypt
file get scp://guest@workstation.example.com/myproj/test.scrypt test-rel.scrypt

# Put file in /tmp/log2.zip
file put logs.zip scp://root@server.foo.com:/tmp/log2.zip

# Put file in ~operator/work/logs/log2.zip
file put logs.zip scp://operator@server.foo.com:work/logs/log2.zip
```


This slide shows some examples of transferring files to and from the appliance. The **get** operation copies files to the appliance, and the **file** put copies files from the appliance.

Setup commands

- If you need to run setup wizard again (not recommended):

```
wizard startup.xml
```

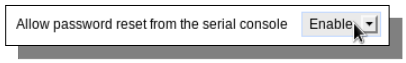
- To change IP address without going through the wizard:

```
netif set mgt0 IPAddress=n.n.n.n/n DefaultGateway=n.n.n.n
```

- If you have enabled the password reset option in the web console:

```
user password [ <oldpass> [ <newpass> ] ]
```

  – Appliance → Settings → Security



This slide shows commands that help with setup and maintenance of the appliance. If at some point you find you need to change the appliance's network address or perhaps you mistyped the management IP address or default gateway, you can easily correct this issue. Though not generally recommended (or necessary), you can correct it by issuing the **wizard** command with the 'startup.xml' parameter. Rather than go through the setup wizard again, however, you can instead change network configurations through the **netif** command as shown.

You can also change xcadmin's password if you have enabled the password reset option in the web console.

Firmware upgrade

- firmware upgrade <*firmware_file*>
  - Installs the specified firmware upgrade file
- show version
  - Displays the current version of appliance firmware that is installed
- start-progress
  - displays the percentage of the startup process that has completed
- firmware rollback
  - Roll back last firmware upgrade to previous version

You can upgrade the appliance firmware from the command line interface using the **firmware upgrade** command. You must first upload the new firmware file using the **file get** command

After the firmware upgrade process completes, you can use the **show version** command to display the current appliance firmware version.

An appliance restart can take several minutes to complete. Use the **start-progress** to monitor the startup process.

If an upgraded firmware level does not work properly, you can use the **firmware rollback** command to return to the previous level.

Firmware upgrade example

```
Console> help firmware
 The following firmware commands are available:
  firmware pristine-install <image>
  firmware rollback
  firmware upgrade <image>
```

- Updating firmware
  - First need to get the image:

```
Console> file get http://<URL>/XC10-2.0.0.1.scrypt2 newFirmware.scrypt2
```

  - List files to see what is there:

```
Console> file list
newFirmware.scrypt2 569984391 bytes created 2011-06-14 13:33:52-0500
```

  - Issue upgrade:

```
Console> firmware upgrade newFirmware.scrypt2
```


This slide shows the firmware commands available to you in the command line. The primary sub-commands are **rollback** and **upgrade**. An upgrade is shown here.

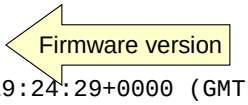
In order to do a firmware upgrade, you first need to load scypt2 image file that contains the new firmware onto the appliance using the file get command. In this example, the image is stored with the local file name ‘newFirmware.scrypt2’. Use the file list command to verify that the image is available on the appliance. Then issue the **firmware upgrade** command as shown.

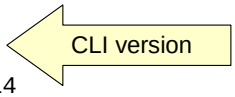
You can also upgrade the appliance firmware from the web console. The web console will use your browser to upload a local file to the appliance, eliminating the need for a server process.

Show version

- Console> **show version**

```
XC10 2.0.0.1-cf31124.67080
Installation date:   2011-06-17 19:24:29+0000 (GMT)
Installation date:   2011-06-17 14:24:29-0500 (Fri Jun 17 14:24:29
  2011 CDT)
Platform version:    3.0.0.3
Platform build ID:   20110607-1814
Platform build date: 2011-06-07 22:33:01+00:00
Machine type/model:  719992X
Serial number:       68A0512
```





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Use the **show version** command to verify the firmware level running on your DataPower XC10 appliance. As shown here, in addition to the firmware version, it shows you the command line interface version, the date the current firmware version was installed, and the appliance model number and serial number.

Device commands

- `Console>` **`help device`**

```
The following device commands are available:
        device RESET
        device battery-replaced
        device clear-intrusion
        device restart
        device shutdown
```

- `device RESET`
  - Undo all configuration and make the appliance look like "factory new" again
  - Does *not* change firmware level
- `device restart`
  - restart appliance
- `device shutdown`
  - shutdown appliance

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The **device** command can be useful if you cannot get to the web console and you need to issue a restart (or shutdown).

The **device RESET** command takes the place of the ‘Reset Installation’ menu option from the XC10 V1 serial console. It resets the appliance to factory settings for the network, licensing, and default user IDs. All the data in the data grids is deleted. You must reinitialize the appliance after running this command; as such it should only be used as a last resort when the appliance is in an unrecoverable state.

The **device battery-replaced** command is used to indicate that the onboard battery has been replaced. This command restarts the battery life cycle clock.

The **device restart** command performs a controlled reboot of the appliance hardware. The appliance and data grid configurations and user data is saved before the device shuts down, and is available when the appliance restarts.

device shutdown performs a controlled shut down of the appliance hardware. All configuration and user data is saved before the device shuts down.

Miscellaneous commands

- clear-all
  - Resets the configuration data for the appliance
  - does not require re-start of the appliance
- clear-tls-config
  - Resets the Transport Layer Security (TLS) configuration
- force-recycle
  - Restarts the WebSphere DataPower XC10 caching services without saving any data
- start-progress
  - displays the percentage of the startup process that has completed
- Locate-led [on | off]
  - Illuminate a LED on the appliance front panel

The **clear-all** command resets the cache configuration for the appliance. It removes all data grids and users (except for xcadmin). Network and locale settings are preserved. All of the cache services are restarted but the appliance does not reboot.

Clear-tls-config resets the Transport Layer Security (TLS) configuration. Run this command if **clear-all** is not an option because you do not want to lose all configuration data, but TLS configuration becomes corrupted or you want to restore the default TLS values. In most situations you should use the web console for TLS changes.

Run the **clear-tls-config** command on each appliance in the collective. After running the command on each appliance, restart the processes in each appliance in the collective. If the collective is successfully communicating, use the device restart command. The collective is communicating properly when all appliances in the collective are accessible through the web console and can be seen as started in the Collective panel. However, if the TLS configuration is preventing the collective from communicating and the device restart command does not bring the appliance back up, you can use the **force-recycle** command to forcibly stop and start all the processes on an appliance without saving any data.

Force-recycle restarts the WebSphere DataPower XC10 Appliance processes without saving any data. Because data loss can occur, run this command only if you are not worried about data loss or you have tried the device restart command and the appliance did not become available.

You can then **start-progress** command when the startup is in progress. The command displays the percentage of the startup process that has completed.

The **locate-led** command will illuminate a blue light on the front panel of the appliance you are connected to. This can make it much easier to find a specific machine in a data center containing dozens or even hundreds of machines.

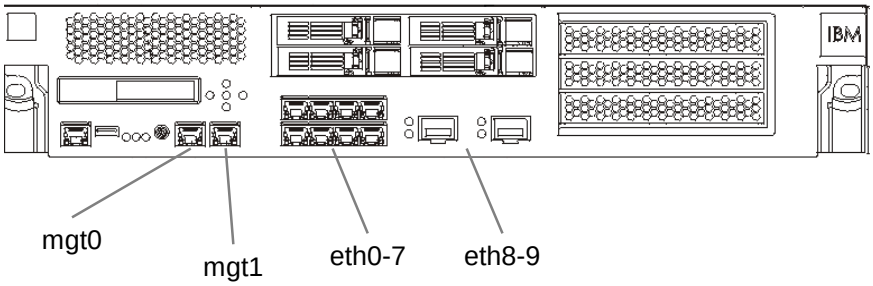
Section

Network management commands

This section addresses network management commands provided by the IBM WebSphere DataPower XC10 appliance.

Available ethernet connections on 9005 appliance

- Additional ethernet connections available



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This diagram shows the front panel of the DataPower XC10 V2 9005 appliance. The red boxes highlight the available ethernet connections. Starting on the left, the first box is where you connect your management interfaces,with mgt0 being the only required interface.

The next box, moving right, includes eight additional ethernet ports which correspond to ETH0 to ETH7. The DataPower XC10 V1 9004 appliance had a total four ethernet connections available, one being labeled as MGMT.

The 9005 appliance also has two 10 Gigabit small form-factor pluggable (SFP+) ports labeled as eth8-9 on the diagram.

The management ports provide remote management access to the device and cannot be used as data ports. The remaining ethernet interfaces can handle data traffic and logging functions to and from the various DataPower XC10 services.

The remaining interfaces can also be used for management access, but best practice is to use only the dedicated management interface for system-wide management functions including incoming SNMP, remote command line, and web console functions.

Network interfaces

- Console> **netif show**
  Network interfaces:
  eth0
  eth1
  ...
  eth8
  eth9
  mgt0
  mgt1
- Console> **show status netif**

```
mgt0    generic MTU:1500 flags:UP BROADCAST RUNNING MULTICAST
        inet addr:9.3.75.158 mask:255.255.255.0
        inet6 addr: fe80::20b:abff:fe4f:e134 mask: ffff:ffff:ffff:ffff::
        ethernet Link:on MAC: 00:0b:ab:4f:e1:34 autoneg:on duplex:Full
            port:TP speed:100Mbps
        statistics collisions:0 multicast:0 rx_bytes:50478479300
            rx_compressed:0 rx_crc_errors:0 rx_dropped:0 rx_errors:0
            rx_fifo_errors:0 rx_frame_errors:0 rx_length_errors:0
            rx_missed_errors:0 rx_over_errors:0 rx_packets:94614982
            tx_aborted_errors:0 tx_bytes:191986033431 tx_carrier_errors:0
            tx_compressed:0 tx_dropped:0 tx_errors:0 tx_fifo_errors:0
            tx_heartbeat_errors:0 tx_packets:142793984 tx_window_errors:0
mgt1    offline
        ethernet Link:off MAC: 00:0b:ab:4f:e1:35
```


The WebSphere DataPower XC10 V2 hardware allows you to configure all 12 network interfaces: eth0 to eth9 and mgt0 to mgt1. To list the available devices, run netif show. To get details on all the network devices, run the command **show status netif**. This slide shows the partial output of that command. You see that mgt1 is not currently configured and the ‘health’ of the mgt0 connection which is the one ethernet port that is required to be configured.

Modifying network settings

- List properties available for an interface:

```
Console> netif show eth0

         name=eth0 enabled=false DefaultGateway= IPAddress= MTU=1500
  UseARP=true UseDHCP=false Mode=Auto IPv6Address= DefaultIPv6Gateway=
  IPv6MTU=1500 UseIPv6=false

Unset/default parameters:

         userdata Auto 10baseT-FD 10baseT-HD 100baseTx-FD 100baseTx-HD
  1000baseTx-FD
```

- Modify network settings

```
netif set <interface> <param>=<value>...

Console> netif set eth0 IPAddress=9.3.75.159/24  DefaultGateway=9.3.75.1

Console> netif set eth0 enabled=true
```


You can use the command line to change network interface details. The command **netif show eth0** command shows the current configuration of the specified interface. In this case the interface is not enabled. You can change any of the shown configuration parameters using the **netif set** command. This example sets the eth0 ip address then enables it. Note that the IPAddress must be in slash notation containing the IP and net mask, and if you change the IPAddress of the interface you are connected to you will lose connectivity.

Private interfaces

- List properties available for an interface:

```
Console> netif show mgt0

         name=mgt0 userdata={"private_ip":"true"} enabled=true
  DefaultGateway=9.42.139.129 IPAddress=9.42.139.215/25 MTU=1500 UseARP=true
  UseDHCP=false Mode=Auto

Unset/default parameters:

        IPv4GwMetric IPv6Address DefaultIPv6Gateway IPv6GwMetric UseIPv6
  UseSLAAC DADTransmits DADRetransmitTimer

         userdata Auto 10baseT-FD 10baseT-HD 100baseTx-FD 100baseTx-HD
  1000baseTx-FD
```

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As stated earlier, the mgt ports provide remote management access to the device and cannot be used as data ports. This is indicated in the status by the userdata parameter *private_ip=true*. This is different from the V1 firmware where the mgmt port was also used as a fourth data port.

Network diagnostic commands

- net-test
  - provides some diagnostics to test the network
- net-test ping <*host*>
  - Ping the specified machine specified with its name or IP address

```
Console> net-test ping aimcp158.austin.ibm.com
  Ok
```

- net-test dns <*host*>
  - Does a DNS lookup of the specified host and returns it IP address

```
Console> net-test dns aimcp140.austin.ibm.com
  9.3.75.140
```

- net-test tcp <*host*> <*port*>
  - Tries to open a TCP connection on the specified port number to the host

```
Console> net-test tcp aimcp140.test.ibm.com 9060
  Ok
  Console> net-test tcp aimcp140.test.ibm.com 9061
  connection failed:  Connection refused
```

- net-test available
  - Tests if any NIC sees carrier

```
Console> net-test available
  Network available
```

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The DataPower XC10 V2 command line interface provides **net-test** commands which provide diagnostics to test the network and connectivity of the appliance.

The **ping host** subcommand pings the specified host name or IP address.

The DataPower XC10 must be able to resolve client host names through DNS lookups. The **net-test dns** subcommand performs a DNS lookup of the specified host and returns its IP address.

The subcommand **net-test tcp** will attempt to open a socket to the specified host and port. This command can be useful to find out if a firewall is blocking communication between appliances in a collective.

The subcommand **net-test available** tests if any of the enabled network interface cards see a carrier.

DNS and time server commands

- “get" commands display the configured servers
  - get-ntp-servers
  - get-dns-servers
  - get-dns-search
- Corresponding set commands
  - set-dns-servers <*valid DNS server*>
  - Sets the Domain Name System (DNS) server for the appliance
    - set-ntp-servers 10.1.2.3 192.43.244.18
    - set-dns-servers 10.1.0.1 8.8.8.8
- set-dns-search ibm.com aimcp.ibm.com

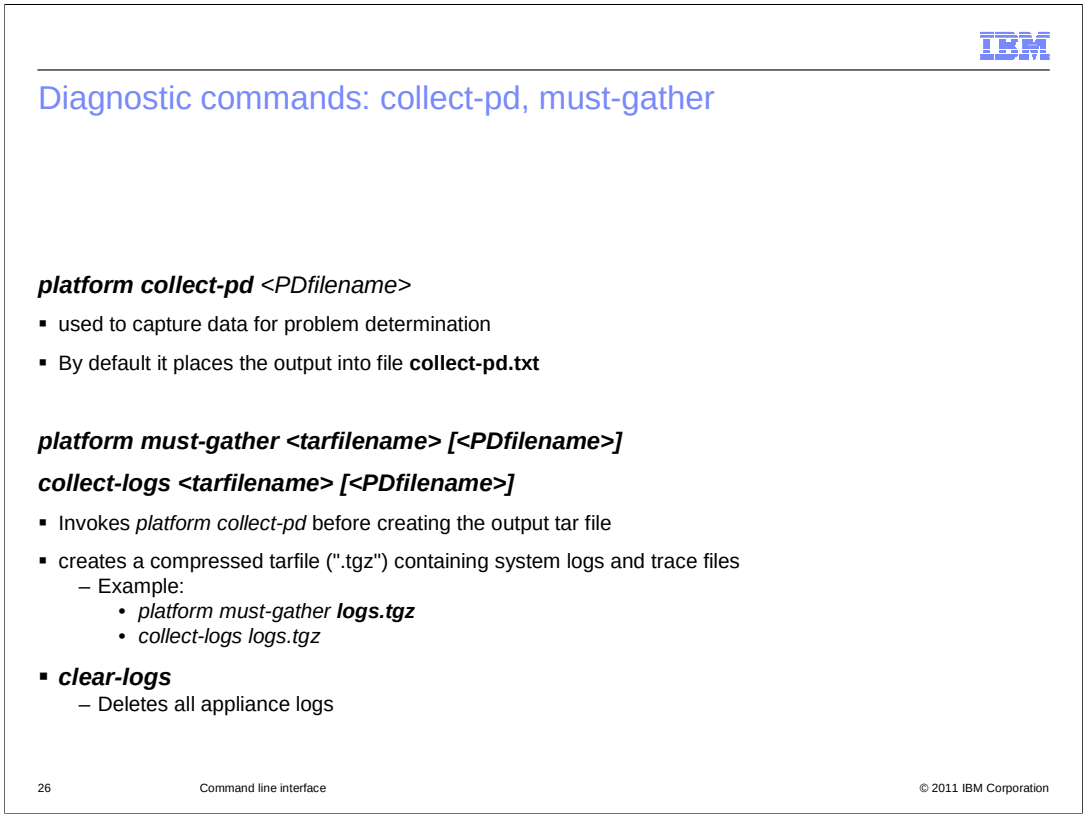
The DataPower XC10 command line interface provides “get” and “set” commands to configure DNS (nameservers) and NTP (time servers) . The "get" commands display the configured servers and take no arguments. The "set" commands take a list of one or more servers separated by spaces. DNS servers should be specified as IP addresses; NTP servers can be specified by IP address or host name.

In addition, you can specify the DNS search path using the **set-dns-search** subcommand, which takes a list of domains to try in turn.

Section

Problem determination commands

This section addresses problem determination commands.



The **platform collect-pd** command creates a text file containing appliance configuration and status information. By default it places the output into a file called *collect-pd.txt*, but you can specify a different file name on the command invocation. This file contains output from appliance status commands and network configuration details. Some information in the generated file represents internal operational details and is intentionally obfuscated.

The **platform must-gather** command creates a compressed tar file which includes appliance trace and log files. The name of the output tar file must be specified on the command invocation. This command issues the platform **collect-pd** command before creating the tar file, and the generated problem determination information is included in the tar file. The V1 firmware command **collect-logs** is deprecated and replaced by **platform must-gather**.

If an appliance has been running for a long period of time the logs files can be extremely large. Even compressed the must gathers can exceed one gigabyte in size. The DataPower XC10 V2 firmware includes the command **clear-logs** which resets all of the log files to zero length.

Collecting logs

- Collect logs

```
Console> platform must-gather logsTest.tgz
```

- List generated files

```
Console> file list
  logsTest.tgz 1810748334 bytes created 2011-06-08 08:22:17-0500
  collect-pd.txt 17477 bytes created 2011-06-08 08:18:34-0500
```

- Copy logs off of appliance

```
Console> file put logsTest.tgz scp://root@linux010.myco.com:/opt/cp/logsTest.tgz
  Password:*******
```


This slide shows an example which collects logs using the **platform must-gather** command, and copies them off of the appliance using **file put**.

PD file contents

- collect-pd.txt

```
================================================================================
Tue Jul 12 10:52:33 CDT 2011 - PD data collection starting
================================================================================
1. Console> show version
XC10 2.0.0.1-cf31124.67080
Installation date:   2011-06-17 19:24:29+0000 (GMT)
Installation date:   2011-06-17 14:24:29-0500 (Fri Jun 17 14:24:29 2011 CDT)
Platform version:    3.0.0.3
Platform build ID:   20110607-1814
Platform build date: 2011-06-07 22:33:01+00:00
Machine type/model:  923572X
Serial number:       68A0512
================================================================================
2. Console> status intrusion
Case has not been opened and is secure
================================================================================
3. Console> status cpu-usage
CPU utilization over time:
  1% over 60 seconds
  1% over 300 seconds
```

1. Console> show version
2. Console> status intrusion
3. Console> status cpu-usage
4. Console> status memory
5. Console> status flash
6. Console> status raidphystatus
7. Console> netif show
8. Console> netif status
9. Console> nodename get
10. Console> get-dns-servers
11. Console> get-dns-search
12. Console> get-ntp-servers
13. Console> platform log-level get
14. Console> file list
15. Console> status battery
16. Console> status fan
17. Console> status temperature
18. <operational details (IBM suppor)>
19. <operational details (IBM support)>
20. <operational details (IBM support)>
21. Console> datetime get
22. <operational details (IBM support)>

Looking at what is in the file generated by the **collect-pd** command you will find detailed appliance status and network configuration information. This information can give you a picture of the appliance's health. This slide shows partial output from a few of them. The table on the right lists all the commands that are included in the PD file. These commands are also available individually at the command line.

Some commands provide low-level operational details intended for IBM support purposes. These details are obfuscated in the output.

Status command options

```
Console> status help
The following status items are available:
        battery -- show battery information
        cpu-usage -- show average CPU use over some intervals
        fan -- show fan status
        flash -- show flash drive status
        intrusion -- show case integrity
        memory -- show memory usage
        netif -- show network interface (show all by default)
        raidphystatus -- show raid controller status
        temperature -- show temperature status
        uptime -- show uptime
        voltage -- show voltage status
        volume -- show storage volume status
```


As a reference, here is a list of available status commands. These commands provide detailed status of the hardware components of the appliance. Most of these are included in the output from the collect-pd command.

This section contains a summary of this presentation.

Summary

- Command line interface adds a wealth of commands for appliance configuration
- There are commands for
  - configuration
  - collecting logs
  - problem determination

IBM WebSphere DataPower XC10 version 2 firmware provides a command line interface accessible from an ASCII terminal connected directly to the appliance's serial port, or remotely from ssh or telnet clients. The command line interface allows you to perform operations such as diagnostics, networking interface configuration, and appliance and data reset.

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