RSA Security Analytics

Command Line Interface
for Version 10.6.4
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Security Analytics Command Line Interface

Security Analytics presents information in a web browser using dashboards and views. Most users configure and work with Security Analytics using the user interface, but some advanced users, such as administrators and developers, may have tasks that require command line access to Security Analytics. RSA Security Analytics Console, also known as NwConsole, is a multi-platform utility that provides the tools and command line access to Security Analytics Core services that Security Analytics users require.
RSA Security Analytics Console

RSA Security Analytics Console, also known as NwConsole, is a multi-platform terminal application that provides powerful tools and command line access to Security Analytics Core services, such as Decoder, Log Decoder, Concentrator, Broker, and Archiver. While most users complete their tasks and investigations through the Security Analytics user interface, some advanced users, such as Administrators and Developers, require direct access to the Security Analytics Core services without going through the UI. NwConsole enables you to enter commands from the command line or run multiple commands from a file.

All Security Analytics appliances have the RSA Security Analytics Console application installed. You can also install it on Windows, Mac, and CentOS to connect and interact with a Core service. To obtain the RSA Security Analytics Console application installer, contact RSA Customer Care.
Access NwConsole and Help

This topic describes how to access NwConsole and to view the internal help within NwConsole. Extensive help information is available within RSA Security Analytics console, also known as NwConsole. You can access this help from the Security Analytics command line.

Prerequisites

NwConsole is available from the command line on a Security Analytics appliance. If you are accessing a Core appliance remotely, you need to have the RSA Security Analytics Console application installed on a Windows, Mac, or CentOS machine. To obtain the RSA Security Analytics Console application installer, contact RSA Customer Care.

Access NwConsole

To run NwConsole from the command line on a Security Analytics appliance or on a terminal emulator, at the <$> prompt, type NwConsole (Linux) or nwconsole (Windows). The actual command is NwConsole, but Windows is not case sensitive. RSA Security Analytics Console is displayed as shown in the following example.

Last login: Thu Sep 24 14:00:42 on console
usxx<username>m1:~ <username>$ NwConsole
RSA Security Analytics Console 10.6.0.0.6105
Copyright 2001-2015, RSA Security Inc. All Rights Reserved.

Type "help" for a list of commands or "man" for a list of manual pages.
>

View Help

NwConsole provides help on individual commands as well as help on specific topics.

Caution: To get the latest information, view the command and help topics within NwConsole.

View a List of Commands

To view a list of available commands and their descriptions, at the (> prompt, type help. The following example shows a list of available commands.
> help
Local commands:
  avro2nwd - Convert AVRO files to NWD files
  avrodump - Display schema and contents of AVRO file (for debugging)
  blockspeed - Tests various write block sizes to determine best setting
  compileflex - Compile all flex parsers in a directory
  createflex - Create a flex parser that matches tokens read from a file
  dbcheck - Perform a database integrity check over one or more session, meta, packet, log or stat db files
  diskspeed - Measures the speed of the disk(s) mounted at a specified directory
  echo - Echos the passed in text to the terminal
  encryptparser - Encrypt all parsers in a directory
  feed - Create and work with feed files
  fmanip - Manipulate a file with XOR and check for embedded PEs
  hash - Creates or verifies hashes of database files
  help - Provides help information for recognized console commands
  history - Displays, erases or executes a command in the command history
  httpAggStats - Tests HTTP aggregation and reports statistics as it continues
  log - Perform operations on a log database
  logParse - Parse line delimited logs on stdin and post results to stdout
  logfake - Create a fake log pcap file
  lua - Execute a lua script
  makec3 - Generate C3 Test Data
  makepcap - Convert packet database files to pcap or log files
  man - Displays a list of topics or opens a specific manual page on a topic
  metaspeed - Tests read performance over an existing meta db
  netbytes - Display statistics on network interface utilization
  nwdstrip - Convert full NWD file into just session and meta file
  pause - Wait for user input when running a script file
  reindex - reindex a collection
  sdk - Execute SDK commands based on the C SDK library, type "sdk help" for more information
  sleep - Sleeps for the specified milliseconds
  timeout - Globally change the timeout for waiting for a response from a service
Command Line Interface

tlogin - Open a trusted SSL connection to an existing service

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topQuery - Returns the top N longest running queries from the audit
log (either a file or from the log API)
vslice - Validate index slices

Remote commands (executed on the connected service, see "login"):

login - Connect to a remote service. Once connected, type help to
see commands available for remote execution.

For detailed help, type "help <command>"

View Detailed Help on a Command

To view detailed information about a command, type help <command>. The following
example shows help for the logParse command after typing help logParse.

For detailed help, type "help <command>"

> help logParse
Usage: logParse {in=<pathname>} {indir=<pathname>} {out=<pathname>}
[content=<c2|c3>] [device=<device,[device...] >]
[path=<log-parsers-config-path> [metaonly] [srcaddr=<src
address>] [srcaddrfile=<filename,IP Address>]

Parse line delimited logs on stdin and post results to stdout

in - The input source file. "in=stdin" means interactive typing of log.
indir - The input source files parent directory
out - The output file or output file parent directory if input is
set by indir. If not specified, use stdout as output.
content - Content version, either c2 or c3. Default is c2.
device - Comma delimited device list specifying devices that is
enabled. Default enable all devices.
path - The logparsers configuration path. Default will find
configuration file like logdecoder.
metaonly - The output will only contains parsed meta, otherwise will
print log message after metas.
srcaddr - The source address of the all the logs
srcaddrfile - The source address for logs in one input file, in the format filename,ipaddress

View a List of Help Topics

To view a list of help topics, type man. The following example shows a list of help topics.

> man
List of topics:

Introduction
Connecting to a Service
Monitoring Stats
Feeds
Converting Packet DB Files to PCAP
Packets
Verifying Database Hashes
SDK Content
SDK Content Examples
Troubleshooting

Type "man <topic>" for help on a specific topic, partial matches are acceptable

View a Specific Help Topic

To view help about a specific topic, type man <topic>. The following example shows the Packets help topic after typing man Packets.

Type "man <topic>" for help on a specific topic, partial matches are acceptable

> man Packets

Packets
========

The "packets" command can be used to generate a pcap or log file based on a list of Session IDs, a time period or a where clause. The command is quite
Command Line Interface

flexible and can be used on any running service that has access to the raw data from a downstream component. Before running the command, you must first *login* to a service and then change directory to the appropriate sdk node, (e.g., "cd /sdk"). Unlike the *makepcap* command, which only works on the local file system, this command is meant to be used on a remote service.

```bash
login ...
   cd /sdk
   packets where="service=80 & & time='2015-03-01 15:00:00'- '2015-03-01 15:10:00'" pathnamen="/tmp/march-1.pcap"
Write 10 minutes of HTTP only packets from March 1st, to the file /tmp/march-1.pcap. All times are in UTC.

   packets time1="2015-04-01 12:30:00" time2="2015-04-01 12:35:00"
   pathname="/media/sdd1/packets.pcap.gz"
Write all packets between the two times to a gzip compressed file at /media/sdd1/packets.pcap.gz

   packets time1="2015-04-01 12:30:00" time2="2015-04-01 12:35:00"
   pathname="/media/sdd1/mylogs.log"
Write all logs between the two times to a plaintext file at /media/sdd1/mylogs.log. Any pathname ending with .log indicates that the format of the output file should be plaintext line-delimited logs.
>

**Caution:** To get the latest information, view the command and help topics within NwConsole.

**Quit NwConsole**

To exit the NwConsole application, type `quit` at the command line.
Basic Command Line Parameters and Editing

NwConsole is like a Swiss army knife; there are all kinds of tools buried underneath its command line interface. NwConsole is multi-platform; executables are available for CentOS (it already ships on appliances), Windows, and Mac.

Basic Command Line Parameters

Here are some basic command line parameters:

- To run a set of commands from a file:
  ```
  NwConsole -f /tmp/somefile.script
  ```

- To pass in a list of commands from the command line:
  ```
  NwConsole -c <command1> -c <command2> -c <command3>
  ```

  This is not necessarily recommended except for very simple scripts. The bash interpreter can make mincemeat out of quoted strings if you do not escape properly. If you are having non-obvious errors passing via command line, switch over to reading from a file to see if that fixes the issues.

- Normally, console exits after running commands passed via a file or command line, but if you want to keep the interactive prompt open after the commands are executed, pass `-i` on the command line.

- And of course, you can just run NwConsole and type the commands in the console window.

Line Editing

You can use the keys in the following table when editing a command.

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ctrl-U</td>
<td>Clears the current line</td>
</tr>
<tr>
<td>Ctrl-W</td>
<td>Deletes the word that the cursor is on</td>
</tr>
<tr>
<td>Ctrl-A</td>
<td>Moves the cursor to the beginning of the line</td>
</tr>
<tr>
<td>Ctrl-E</td>
<td>Moves the cursor to the end of the line</td>
</tr>
<tr>
<td>Up arrow</td>
<td>Displays the previously executed command</td>
</tr>
<tr>
<td>Key</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Down arrow</td>
<td>Displays the command executed after the current command (only valid if the up arrow has been pressed)</td>
</tr>
<tr>
<td>Left arrow</td>
<td>Moves the cursor to the previous character</td>
</tr>
<tr>
<td>Right arrow</td>
<td>Moves the cursor to the next character</td>
</tr>
<tr>
<td>Tab</td>
<td>Provides context sensitive completion of most commands and their parameters. The Tab key is very helpful for editing.</td>
</tr>
<tr>
<td></td>
<td>For example, to view the <em>Connecting to a Service</em> help topic, at the command line, you can type <code>man con</code> and then press the Tab key. NwConsole completes the command for you: <code>man Connecting to a Service</code> Press enter to run the command and view the topic.</td>
</tr>
<tr>
<td><code>history</code></td>
<td>Displays a numbered list of previous commands</td>
</tr>
<tr>
<td><code>history execute=#</code></td>
<td>Executes a previous command, which is also equivalent to typing <code>!#</code> For example, <code>!1</code> executes the previous command.</td>
</tr>
<tr>
<td><code>history clear</code></td>
<td>Clears all command history</td>
</tr>
<tr>
<td><code>history erase=#</code></td>
<td>Erases a specific command from the history buffer. History is automatically stored from one session to the next.</td>
</tr>
</tbody>
</table>
Connecting to a Service

To connect and then interact with a Security Analytics Core service (Decoder, Concentrator, Broker, Archiver, and so on), you must first issue the login command. You must have an account on that service. You can type help login at any time for more information. Here is the syntax of the login command:

```
login <hostname>:<port>[:ssl] <username> [password]
```

For example: `login 10.10.1.15:56005:ssl someuser`

If you do not include the password, it prompts you and does proper password masking.

If you have set up proper trust between NwConsole and the endpoint, you can use the tlogin command and avoid having to enter a password. Setting up trust is beyond the scope of this documentation, but it involves adding NwConsole's SSL cert to the endpoint via the send /sys peerCert op=add file-data=<pathname of cert> command. You must first use a normal login with the proper permissions before you can add a peer cert for subsequent trusted logins.

Once connected, you can interact with the endpoint service through a virtual file system. Instead of files, what you are looking at are the nodes of that service. Some nodes are folders and have child nodes, forming a hierarchical structure. Each node serves a purpose and all of them support a subset of commands like info and help. The help message returns information about the commands each node supports. When you first log on, you are on the root node, which is the path /, just like a Linux or Mac system. To see a list of nodes under /, type the ls command.

All services have nodes like sys and logs. To interact with the /logs API, you can first send the help command to the /logs node. To do this, you must use the send message, which has this syntax:

```
Usage: send {node pathname} {message name} [name=value [name=value]]

      [file-data=<pathname>] [string-data=<text>] [binary-data=<text>]
      [output-pathname=<pathname>] [output-append-pathname=<pathname>]
      [output-format={text,json,xml,html}]
```

Sends a command to a remote pathname. For remote help, use "send <pathname>help" for details.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pathname</td>
<td>The node pathname to retrieve information on</td>
</tr>
<tr>
<td>message</td>
<td>The command (message) to send</td>
</tr>
<tr>
<td>parameters</td>
<td>Zero or more name=value parameters for the command</td>
</tr>
<tr>
<td>file-data</td>
<td>Loads data from a file and send as either a BINARY</td>
</tr>
</tbody>
</table>
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<table>
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<tr>
<th>string-data</th>
<th>Sends text as a STRING message type</th>
</tr>
</thead>
<tbody>
<tr>
<td>binary-data</td>
<td>Send text as either a BINARY message type or as a</td>
</tr>
<tr>
<td></td>
<td>PARAMS_BINARY message type if other parameters exist</td>
</tr>
<tr>
<td>output-pathname</td>
<td>Writes the response output to the given pathname,</td>
</tr>
<tr>
<td></td>
<td>overwriting any existing file</td>
</tr>
<tr>
<td>output-append-pathname</td>
<td>Writes the response output to the given pathname,</td>
</tr>
<tr>
<td></td>
<td>will append output to an existing file</td>
</tr>
<tr>
<td>output-format</td>
<td>Writes the response in one of the given formats,</td>
</tr>
<tr>
<td></td>
<td>the default is text</td>
</tr>
</tbody>
</table>

So, to send a help message, you would send this:

`send /logs help`

And your response would look something like this:

```
description: A container node for other node types
security.roles: everyone, logs.manage
message.list: The list of supported messages for this node
ls: [depth:<uint32>] [options:<string>] [exclude:<string>]
mon: [depth:<uint32>] [options:<uint32>]
pull: [id1:<uint64>] [id2:<uint64>] [count:<uint32>] [timeFormat:<string>]
info:
help: [msg:<string>] [op:<string>] [format:<string>]
count:
stopMon:
download: [id1:<uint64>] [id2:<uint64>] [time1:<date-time>] [time2:<date-time>]
[logTypes:<string>] [match:<string>] [regex:<string>] [timeFormat:<string>]
[batchSize:<uint32>]
    timeRoll: [timeCalc:<string>] [minutes:<uint32>] [hours:<uint32>]
[days:<uint32>]
[date:<string>]
```

To get more information about a specific message or command, you can specify the `msg=<message name>` on the help command as a parameter. For example, look at the pull message help:

`send /logs help msg=pull`

```
pull: Downloads N log entries
security.roles: logs.manage
```
The built-in message help says that this command grabs the last N log entries if you leave off id1 and id2. To look at the last 10 log entries this service wrote:

```
send /logs pull count=10 timeFormat=simple
```

Almost all of the commands on the service follow this simple format. The only commands that do not are the ones that require more complicated handshaking, like importing a PCAP to a Decoder. To import a PCAP, use the NwConsole `import` command, which takes care of the complicated communication channel handshaking.

Some parameters are specific to NwConsole's `send` command and are not actually sent to the service. You can use these parameters to change the output format of the response, write the response to a file, or read a file from the local machine and send it to the service.

- **output-format** — This parameter changes the normal output of the command from plain text to one of these types: JSON, XML, or HTML.

- **output-pathname** — Instead of writing the output to the terminal, it writes it to the pathname specified (truncates any existing file).

- **output-append-pathname** — This is the same as `output-pathname` except that it appends the output to an existing file (or creates the file if it does not exist).

- **file-data** — Reads in a file and uses it as the command payload. This is useful for commands like `/sys fileEdit`. The following example shows how you can send an updated `index-concentrator-custom.xml` file using NwConsole:

```
send /sys fileEdit op=put filename=index-concentrator-custom.xml file-data="/Users/user/Documents/index-concentrator-custom.xml"
```

- **string-data** — Sends the command payload as a string instead of a list of parameters.

- **binary-data** — Sends the command payload as binary instead of a list of parameters.
Example Streaming Query to JSON file (could be a large result set):

```
send /sdk query size=0 query="select * where service=80 && time='2015-03-05 13:00:00'-'2015-03-05 13:59:59'" output-format=json output-path-name=/tmp/query.json
```

To navigate around the virtual node hierarchy of the service, you can use the `cd` command like you would on any command shell. This covers the basics of connecting and interacting with a service. Once you are connected, the `help` command lists all the commands that you can use to interact with the endpoint. These commands do not display when you are not connected to an endpoint.
Monitoring Stats

You can use NwConsole to watch statistics (stats) change on a service in real time. However, be warned that this can result in a LOT of output. If you are not careful and monitor too many nodes, the screen scrolls by too quickly to be useful.

As a simple example, if you log on to a Decoder, you can monitor the capture rate in real time. To do this, issue these commands after connecting to a Decoder:

```bash
decoder/stats
mon capture.rate
```

That is all you need to do! Now, any time the capture rate changes, it outputs into the console window.

You can add another monitor:

```bash
mon capture.avg.size
```

Now it watches those two stats and outputs those values when they change. You may have noticed that as you tried to type the second command, the output from the original monitor was messing up your display. This is the problem with monitoring stats. It is not really meant for doing more than just watching the stats after the first command is entered.

However, you can stop the monitoring by typing `delmons` and pressing `Enter`. Just ignore the output while you type and it returns you to a proper command prompt. If you want to monitor many stats at once, you can just give the path of the parent stat folder and it monitors all of the stats underneath it. For instance, typing `mon /decoder/stats` or `mon .` (they are equivalent) monitors everything. Be prepared for a lot of output! Remember to enter `delmons` if it is scrolling too fast.
Useful Commands

The following NwConsole commands are useful when interacting with Security Analytics Core services:

- **feed**: Enables you to create and work with feed files.
- **makepcap**: Converts Packet database (DB) files to PCAP.
- **packets**: Retrieves packets or logs from the logged in service.
- **hash**: Creates or verifies hashes of database files.

The following sections as well as the NwConsole help and topic information (man) pages, provide additional information.

**Feeds**

The `feed` command provides several utilities for creating and examining feed files. A feed file contains the definition and data of a single feed in a format that has been precompiled for efficient loading by a Decoder or Log Decoder. For a complete reference on feed definitions, see Feed Definitions File in the Decoder and Log Decoder Configuration Guide.

**create**

`feed create <definitionfile> [-x <password>]`

The `feed create` command generates feed files for each feed defined in a feed definition file. A definition file is an XML document that contains one or more definitions. Each feed definition specifies a data file and the structure of that data file. The resulting feed files will be created in the same directory as the definition file with the same name as the data file, but with the extension changed to `.feed` (for example, `datafile.csv` results in `datafile.feed`). Any existing files with the target name will be overwritten without a prompt.

```
$ ls
example-definition.xml  example-data.csv
$ NwConsole
RSA Security Analytics Console 10.5.0.0.0
Copyright 2001-2015, RSA Security Inc. All Rights Reserved.

Type "help" for a list of commands or "man" for a list of manual pages.
> feed create example-definition.xml
Creating feed Example Feed...
done. 2 entries, 0 invalid records
```
All feeds complete.
  > quit
  $ ls
  example-definition.xml  example-data.feed  example-data.csv
  $

 Optionally, feed files can be obfuscated using the option -x followed by a password of at least 16 characters (no spaces). This will be applied to all feeds defined in the definition file. In addition to the feed file, a token file will be generated for each feed file. The token file must be deployed with the corresponding feed file.

 feed create example-definition.xml -x 0123456789abcdef

 stats

 feed stats <feedfile>

 The feed stats command provides summary information for an existing, un-obfuscated feed file. Specifying an obfuscated feed file will result in an error.

 > feed stats example.feed
  Example Feed stats:
  version : 0
  keys count : 1
  values count: 2
  record count: 2
  meta key : ip.src/ip.dst
  language keys:
  alert  Text

 dump

 feed dump <feedfile> <outfile>

 The feed dump command generates a normalized, key-value pair listing of an un-obfuscated feed file. You can use the resulting file to validate a feed file or assist in determining which records were considered invalid when the feed was created. Specifying an obfuscated feed file will result in an error. If outfile exists, the command will abort without overwriting the existing file.

 feed dump example.feed example-dump.txt

 Converting Packet DB Files to PCAP

 You can use the makepcap command to quickly convert any Packet DB file to a generic PCAP file, preserving the capture time order. This command offers many options (see help makepcap), but is easy to use. All it really needs is the Packet DB directory (via the source=<pathname> parameter) to get started.
Command Line Interface

**Note:** You must stop the Decoder or Archiver service before running this command. If you want to generate a PCAP while the service is running, see the packets command.

```
makepcap source=/var/netwitness/decoder/packetdb
dest=/media/usb/sde1
```

This command converts every Packet DB file into a corresponding PCAP file in the same directory. If the disk is almost full, see the next command.

```
makepcap source=/var/netwitness/decoder/packetdb
dest=/media/usb/sde1 filenum=4-6
```

This command only converts the files numbered 4 thru 6 and skips all other files. In other words, it converts the Packet DB files: `packet-00000004.nwpdb`, `packet-00000005.nwpdb`, and `packet-00000006.nwpdb`.

```
makepcap source=/var/netwitness/decoder/packetdb time1="2015-03-01 14:00:00" time2="2015-03-01 15:10:00" filetype=pcapng
```

This command only extracts packets with a timestamp between March 1st, 2015 at 2 PM and March 2nd, 2015 before or on 7:30 AM. It writes the file as pcapng in the same directory as the source. All timestamps are UTC.

### Packets

You can use the `packets` command to generate a PCAP or log file based on a list of Session IDs, a time period, or a where clause. This command is very flexible you can use it on any running service that has access to the raw data from a downstream component. Before running the command, you must first login to a service and then change directory to the appropriate sdk node (for example, `cd /sdk`). Unlike the makepcap command, which only works on the local file system, you use this command for a remote service.

```
login ...

packets where="service=80 && time='2015-03-01 15:00:00'-'2015-03-01 15:10:00'"
```

This command writes 10 minutes of HTTP only packets from March 1st to the file `/media/sdd1/packets.pcap.gz`. All times are in UTC.

```
packets time1="2015-04-01 12:30:00" time2="2015-04-01 12:35:00"
```

This command writes 10 minutes of HTTP only packets from March 1st to the file `/tmp/march-1.pcap`. All times are in UTC.
This command writes all packets between the two times to a GZIP compressed file at /media/sdd1/packets.pcap.gz.

packets time1="2015-04-01 12:30:00" time2="2015-04-01 12:35:00"
pathname=/media/sdd1/mylogs.log

This command writes all logs between the two times to a plaintext file at /media/sdd1/mylogs.log. Any pathname ending with .log indicates that the format of the output file should be plaintext line-delimited logs.

**Verifying Database Hashes**

By default, Archiver writes an XML file for every DB file that is written. This XML file ends with the extension .hash and contains a hash of the file along with other pertinent information. You can use the hash command to verify that the DB file has not been tampered with by reading the hash stored in the XML file and then rehashing the DB file to verify that the hash is valid.

hash op=verify
hashfile=/var/netwitness/archiver/database0/alldata/packetdb/packet-000004880.nwpdb.hash

This command verifies that the Packet DB file packet-000004880.nwpdb still matches the hash in the XML file packet-000004880.nwpdb.hash. For proper security, the hash file should be stored somewhere else to prevent the XML file from being tampered with (like write once only media), but the hash command itself does not care where it is stored.
SDK Content Command

One of the powerful commands in NwConsole is `sdk content`. It contains numerous options to do just about anything, at least as far as extracting content from the Security Analytics Core stack. You can use it to create PCAP files, log files, or extract files out of network sessions (for example, grab all of the pictures from email sessions). It can append files, have a max size assigned before creating a new file, and automatically clean up files when the directory grows too large. It can run queries in the background to find new sessions. It breaks queries into manageable groups and performs those operations automatically. When the group is exhausted, it does a requery to get a new set of data for further operations. The list of options for the `sdk content` command is very extensive.

Because the command has so many options, this document provides examples of commands for different use cases.

Before you can run `sdk content`, there are a few commands (like logging into a service) that you need to run first. Here are some examples:

- First connect to a service:
  ```
  sdk open nw://admin:netwitness@10.10.25.50:50005
  ```

- If you need to connect over SSL, use the nws protocol:
  ```
  sdk open nws://admin:netwitness@10.10.25.50:56005
  ```

- Keep in mind that you are passing a URL and must URL encode it properly. If the password is `password`, the URL looks like this: `sdk open nw://admin:p%40ssword@10.10.25.50:50005`  
  This also applies to username.

- Once you log in, you can set an output directory for the commands: `sdk output <some pathname>`

- For command line help, type: `sdk content`

Before you try some example commands, it is important to understand the `sessions` parameter. This parameter is very important and controls how much or how little data you want to grab (the where clause is also important). The sessions parameter is either a single session id or a range of session ids. All Security Analytics Core services work with session ids, which start at 1 and increase by 1 for every new session added to the service (network or log session). Session ids are 64-bit integers, so they can get quite large. To keep it simple, assume we have a Log Decoder that has ingested 1000 logs and parsed them. On the service, you now have 1000 sessions with session ids from 1 to 1000 (session id 0 is never valid). If you want to operate over all 1000 sessions, you pass `sessions=1-1000`. If you only want to operate over the last 100 sessions, you pass `sessions=901-1000`. Once the command finishes processing session 1000, it exits back to the console prompt.
Many times, however, we do not care about specific session ranges. We just want to run a query over all of them and process the sessions that match a query. Here are some shortcuts that simplify this:

- The letter \( l \) (lowercase L) means lower bound or the lowest session id.
- The letter \( u \) means the highest session id. In fact, it actually means the highest session id for future sessions as well. In other words, if you pass \( \texttt{sessions}=l-u \), this special range means operate over all the current sessions in the system, but also do not quit processing, and as new sessions enter the system, process those, too. The command pauses and waits for new sessions once it reaches the last session on the service. To summarize, the command never exits and goes into continuous processing mode. It runs for days, months, or years, unless it is killed.
- If you do not want the command to run forever, you can pass \( \texttt{now} \) for the upper limit. This determines the last session id on the service at the time the command starts and processes all sessions until it reaches that session id. Once it reaches that session id, the command exits, regardless of how many sessions may have been added to the service since the command started. So, for the example Log Decoder, \( \texttt{sessions}=200-\texttt{now} \) starts processing at session 200 and goes all the way to session 1000 and quits. Even if another 1000 logs were added to the Log Decoder after the command started, it still exits after processing session 1000.
- The parameter \( \texttt{sessions}=\texttt{now}-u \) means start at the very last session and continue processing all new sessions that come in. It does not process any existing sessions (except the last one), only new sessions.

For example commands and what they do, type \texttt{man sdk content examples} or see \texttt{SDK Content Command Examples}. 
SDK Content Command Examples

The first NwConsole sdk content command example below is simple and shows all of the commands that you need to enter. After that, the examples show only the sdk content commands. The first example creates a log file and grabs the first 1000 logs out of a Concentrator aggregating from a Log Decoder:

```
sdk open nw://admin:netwitness@myconcentrator.local:50005
sdk output /tmp
sdk content sessions=1-1000 render=logs append=mylogs.log fileExt=.log
```

This script outputs 1000 logs (assuming sessions 1 thru 1000 exist on the service) to the file /tmp/mylogs.log. The logs are in a plain text format. The parameter fileExt=.log is necessary to indicate to the command that we want to output a log file.

```
sdk content sessions=1-1000 render=logs append=mylogs.log fileExt=.log includeHeaders=true separator="",""
```

This command grabs the same 1000 logs as above, but it parses the log header and extracts the log timestamp, forwarder, and other information, and puts them in a CSV formatted file.

**Example CSV:**

```
1422401778,10.250.142.64,10.25.50.66,hop04b-LC1,%MSISA-4:
81.136.243.248...
```

The timestamp is in Epoch time. The includeHeaders and separator parameters can only be used on Security Analytics installs 10.4.0.2 and later.

```
sdk content sessions=l-now render=logs append=mylogs.log fileExt=.log includeHeaders=true separator=""," where="risk.info='nw35120'"
```

This command writes a log file across the current session range, but only logs that match risk.info='nw35120'. Keep in mind that when you add a where clause, it performs a query in the background to gather the session ids for export. The query should be run on a service with the proper fields indexed (which is typically a Broker or Concentrator). In this case, since you are querying the field risk.info, double-check the service where you run the command to make sure it is indexed at the value level (IndexValues, see index-concentrator.xml for examples). By default, most Decoders only have time indexed. If you use any field but time in the where clause, you need to move the query from the Decoder to a Concentrator, Broker, or Archiver with the proper index levels for the query. You can find more information on indexing and writing queries in the Security Analytics Core Database Tuning Guide.

```
sdk content sessions=l-now render=logs append=mylogs.log fileExt=.log includeHeaders=true separator=""," where="threat.category exists && time='2015-01-05 15:00:00'- '2015-01-05 16:00:00'"
```
This command is the same as above, but it only searches for matching logs between 3 PM and 4 PM (UTC) on Jan 5, 2015 that have a meta key threat.category. Again, because this query has a field other than time in the where clause (threat.category), it should be run on a service with threat.category indexed at least at the IndexKeys level (the operators exists and !exists only require an index at the key level, although values work fine, too).

sdk content sessions=l-now render=logs append=mylogs fileExt=.log where="event.source begins 'microsoft'" maxFileSize=1gb

This command creates multiple log files, each one no larger than 1 GiB in size. It prepends the filenames with mylogs and appends them with the date-time of the first packet/log timestamp in the file. Some example filenames: mylogs-1-2015-Jan-28T11_08_14.log, mylogs-2-2015-Jan-28T11_40_08.log and mylogs-3-2015-Jan-28T12_05_47.log. On versions older than Security Analytics 10.5, the T separator between date and time is a space.

sdk content sessions=l-now render=pcap append=mypackets where="service=80,21 && time='2015-01-28 10:00:00'-'2015-01-28 15:00:00'" splitMinutes=5 fileExt=.pcap

This command grabs all packets in between the five-hour time period for service types 80 and 21 and writes a PCAP file. Every 5 minutes, it starts a new PCAP file.

sdk content time1="2015-01-28 14:00:00" time2="2015-01-28 14:15:00" render=pcap append=mydecoder fileExt=.pcap maxFileSize=512mb sessions=l-now

Pay attention to this command. Why? It works for both packets and logs and is extremely fast. The downside is that you get everything between the two time ranges and you cannot use a where clause. Again, it starts streaming everything back almost immediately and does not require a query to run first on the backend. Because everything is read using sequential I/O, it can completely saturate the network link between the server and client. It starts creating files prepended with mydecoder and splits to a new file once it reaches 512 MiBs in size.

sdk tailLogs

or (the equivalent command):

sdk content render=pcap console=true sessions=now-u

This is a fun little command. It actually uses sdk content behind the scenes. The purpose of this command is to view all incoming logs on a Log Decoder. That is it. It is very simple. As logs come into the Log Decoder (you can run it on a Broker or Concentrator, too), they are output on the console screen. It is a great way to see if the Log Decoder is capturing and what exactly is coming into the Log Decoder. This command runs in continuous mode. Do not use it if the Log Decoder is capturing at a high ingest rate (this command cannot keep up with it). However, it is helpful for verification or troubleshooting purposes.

sdk tailLogs where="device.id='ciscoasa'"
pathname=/mydir/anotherdir/mylogs
This command is the same as above, except it only outputs logs that match the where clause and instead of outputting to the console, it writes them to a set of log files under /mydir/anotherdir that do not grow larger than 1 GiB. Obviously, you can accomplish this with the sdk content command as well, but it is a little less typing with this command if you like the default behavior.

```
sdk content sessions=now-u render=pcap where="service=80"
append=web-traffic fileExt=.pcap maxFileSize=2gb
maxDirSize=100gb
```

This command starts writing PCAPs of all web traffic from the most recent session and all new incoming sessions that match service=80. It writes out PCAPs no larger than 2 GiBs and if all the PCAPs in the directory grow larger than 100 GiBs, then it deletes the oldest PCAPs until the directory is 10% smaller than the max size. Keep in mind that the directory size checking is not exact and it only checks every 15 minutes by default. You can adjust the number of minutes between checks by passing cacheMinutes as a parameter, but this only works with Security Analytics 10.5 and later.

```
sdk content sessions=79000-79999 render=nwd
append=content-%1%.nwd metaFormatFilename=did
```

This is a poor person’s backup command. It grabs 1000 sessions and outputs the full content (sessions, meta, packets, or logs) to the NWD (NetWitness Data Format) format. NWD is a special format that can be re-imported to a Packet or Log Decoder without reparsing. So essentially, the original parsed session imports without changes. The timestamp does not change as well, so if it was originally parsed 6 months ago, the timestamp upon import will be retained as 6 months ago.

**Note:** Do not expect great performance with this command, especially with packets. Gathering the packets for a session involves a lot of random I/O and can drastically slow down the export. Logs do not suffer as much from this problem (only one log per session), but behind the scenes this command uses the /sdk content API and this is not a performance minded streaming API like /sdk packets. So again, do not expect great performance.

The `metaFormatFilename` parameter is very helpful in this command. If this command is run on a Concentrator with more than one service, the NWD filenames will be created with the `did` meta for each session (the `%1%` in the append parameter is substituted with the value of `did`). Each filename will indicate exactly which Decoder the data came from.

```
sdk content session=l-u where="service=80,139,25,110"
render=files maxDirSize=200mb cacheMinutes=10
```

**SDK Content Command Examples**
This is another fun little command. It works very similar to our old Visualize product if you pair the output directory with something like Windows Explorer in Icon mode. It extracts files from all web, email, and SMB traffic. This includes all kinds of files, such as images, zip files, videos, PDFs, office documents, text files, executables, and audio files. If it extracts malware, your virus scanner will flag it. Do not worry, nothing will be executed by the command, so it does not infect the machine (unless you try to execute it yourself). However, it can be useful because if you do find malware, the filename indicates the session id where it was extracted. You can then query that session id and see what host the malware possibly infected and take action. You can filter what gets extracted with the parameters includeFileTypes or excludeFileTypes (see the command help). For instance, adding excludeFileTypes=".exe;.dmg;.msi" prevents executables and installers from being extracted. This command just runs nonstop extracting files from all existing and any new sessions. After the directory gets littered with more than 200 MiBs of files, it automatically starts cleaning up the files every 10 minutes.

Note: This command only makes sense for packet sessions, not logs.

```
sdk content session=1-now where="time='2015-01-27 12:00:00'-'2015-01-27 13:00:00' && (service=25,110,80)" subdirFileTypes="audio=.wav;.mp3;.aac; video=.wmv;.flv;.mp4;.mpg;.swf; documents=.doc;.xls;.pdf;.txt;.htm;.html images=.png;.gif;.jpg;.jpeg;.bmp;.tif;.tiff archive=.zip;.rar; other=*" renameFileTypes=".download|.octet-stream|.program|.exe|.jpeg|.jpg" render=files maxDirSize=500mb
```

This command extracts files from HTTP and email sessions from a one-hour period and then groups the extracted files into directories specified by the subdirFileTypes parameter. For instance, any extracted audio file with the extension .wav, .mp3 or .aac will be placed into the subdirectory audio, which will be created under the specified output directory. The same goes for all the other groups specified in that parameter. Some files will also be automatically renamed based on their file extension. This is handled by renameFileTypes. Any file with an extension .download, .octet-stream or .program will be renamed to .exe. Files with the extension .jpeg will be renamed .jpg. Once the top-level directory exceeds 500 MiBs, the oldest files get cleaned. This command stops at the last session at the time the command started.

```
sdk search session=1-now where="service=80,25,110" search="keyword='party' sp ci"
```

This command searches all packets and logs (the sp parameter) for the keyword party. If party is found anywhere in the packets or logs, it outputs the session id along with the text it found and the surrounding text for context. The where clause indicates that it only searches web and email traffic. The ci parameter means that it is a case insensitive search. You can substitute regex for keyword and it performs a regex search.

```
sdk search session=1-now search="keyword='checkpoint' sp ci" render=log append=checkpoint-logs.log fileExt=.log
```
This is an interesting command example. It searches all logs (or it could be packets) for the keyword checkpoint and if that keyword is seen, it extracts the log to a file checkpoint-logs.log. There are all kinds of possibilities with this command. Essentially, when a hit is detected, it hands off the session to the content call. So any parameters you pass to sdk search that it does not recognize, it just passes along to the content call. This allows the full capabilities of the sdk content call, but only working on those sessions with content search hits. With great power comes great responsibility!
Commands used for Troubleshooting

NwConsole provides the following commands that are helpful when troubleshooting Security Analytics:

- **whatIsWrong**: Provides a snapshot of a service's configuration, stats, and failure and warning logs for a specified past period of time.
- **dbcheck**: Performs consistency checking of database files.
- **topQuery**: Helps pinpoint queries that are taking an excessively long time to run.
- **netbytes**: Troubleshoots the network connections on the current host
- **netspeed**: Troubleshoots the connection between the host computer running NwConsole and the remote computer connected to it using the `login` command.

The following sections as well as the NwConsole help and topic information (man) pages, provide additional information.

**whatIsWrong**

When a service is not working correctly, the reason is usually somewhere in the logs that the service has written. You can use the `whatIsWrong` console command to obtain a snapshot of a service's configuration, stats, and failure and warning logs (with surrounding context logs) for a specified past period of time, which defaults to the previous seven days. You can save the results of running `whatIsWrong` into a specified plain text file. The output of this command can be a useful starting point to help determine what is currently wrong with a service.

To use the `whatIsWrong` console command, log on to the service to troubleshoot using the `login` command, and run the `whatIsWrong` command.

**Hint**: Use `help whatIsWrong` to see all of the available parameters, including the number of days/hours to look back for events, the pathname to store results, whether or not to append or overwrite the results file, and the delimiter to use for log fields. You can also limit the number of most recent logs used to find context, and you can specify how many context logs per warning/failure log to retrieve.

Whenever you receive a request for logs for a Core service, you should run the `whatIsWrong` command first and use the results collected as a starting point.
**dbcheck**

The `dbcheck` command is used to perform consistency checking of database files (session, meta, packets, logs, stats, and so on). This might be necessary when a service cannot start because of errors in the consistency of the database files. Normally a service would automatically recover and correct any consistency issues on startup, but there are times when this does not occur. When a service starts (like Decoder), it typically does not read or open most database files in order to start quickly. It assumes most files are in a consistent state and only does a cursory check of the most recently written files. If there are problems, `dbcheck` can perform those consistency checks, but ONLY if the service is not running.

**Caution:** Do not attempt to run this command while a service is running.

For example, you can check a single file:

dbcheck /var/netwitness/decoder/packetdb/packet-00000001.nwpdb

You can also use wildcards to check multiple files:

dbcheck /var/netwitness/decoder/metadb/meta-00000002*.nwmdb

**topQuery**

The `topQuery` command can help pinpoint queries that are taking an excessively long time to run. This command parses the audit logs of a service and returns the top N longest running queries for the specified time period.

The easiest way to run it is to log on to the service (usually a Broker or Concentrator) and type `topQuery`. The default behavior is to return the top 100 longest running queries for the last seven days.

Type `help topQuery` for the list of parameters. Here are some additional examples with explanations:

topQuery hours=12 top=10

This command returns the top 10 queries for the last 12 hours.

topQuery time1="2015-03-01 00:00:00" time2="2015-03-14 00:00:00"

This command returns the top 100 queries between March 1, 2015 and March 14, 2015. Times are in UTC, not local.

topQuery input=/var/log/messages output=/tmp/top20.txt top=20 user=sauser1

Instead of connecting to a service, it parses the syslog audit messages for the top 20 queries in the last 7 days, but only for queries executed by user sauser1. It writes the top 20 queries to /tmp/top20.txt instead of the console screen. The parameter user is a regex, so you can specify multiple usernames by writing something like `user="(sauser1|sauser2)"`. 
netbytes

The netbytes command is very useful for troubleshooting the network connections on the current host. It displays continuous send and receive statistics for all network interfaces. Once executed, you must press Ctrl-C to exit this command, which also exits NwConsole.

netspeed

The netspeed command is used to troubleshoot the connection between the host computer running NwConsole and the remote computer connected to it through the login command. You must supply the amount of bytes to transfer and it will time the speed of the connection. The netspeed command is very useful for troubleshooting Aggregation performance issues that might be network related.

```
login someword:50007 admin ...
```

```
netspeed transfer=4g
```

To troubleshoot the connection between a Concentrator and a Decoder, SSH into the Concentrator, run NwConsole, and then log on to the Decoder and run netspeed. The output from the command gives you an indication of the maximum network throughput. If it is much less than the standard 1 Gbps interface, it could indicate a network issue.