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Chapter 1: The Nimbus API for C

Introduction
The NimBUS API can be grouped into the following groups. The pseudo code below does not show how to use these function calls, rather it shows the sequence in which they are typically used.

General
All NimBUS applications must start and end like this:

```c
nimInit(0)
...
nimEnd(0)
```

**nimLog**
Use NimBUS logging this way:

```c
nimLogSet()
nimLog()
nimLog()
```

**nimSession**
On the client side:

```c
nimNamedSession() nimSessionRequest() nimSessionFree()
```
On the server side:

```c
nimSessionNewList()
nimSession(NULL, port) nimSessionAddStdCallback() nimSessionAddCallback()
...
nimSessionAddList()
loop
    nimSessionDispatch()
end loop

nimSessionFreeList
nimSessionRemoveList
```

**nimQoS**

Here is a typical sequence when using the nimQoS methods:

```c
nimQoSCreate()
nimQoSSendValue()

or

nimQoSStart()
nimQoSStop()
nimQoSSTimer()
nimQoSFree()
```
Log Methods

nimLog

Signature
void nimLog(int level, char *format, ...);

Description
This function will print out an error message with date/time on the format of printf to a logfile. Logfile is set by nimLogSet.

Parameters

<table>
<thead>
<tr>
<th>int</th>
<th>level</th>
<th>Log level</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>format</td>
<td>The same format as printf</td>
</tr>
</tbody>
</table>

Returns
None

See also
N/A

nimLogClose

Signature
void nimLogClose(void);

Description
Closes the log file.

Parameters
N/A

Returns
N/A

See also
N/A

nimLogGetLevel

Signature
int nimLogGetLevel();
Log Methods

Description
Identify the current log level

Parameters
N/A

Returns
The current log level.

See also
N/A

nimLogInit

Signature
int nimLogInit(char *fname, char *prefix);

Description
This function will create a log file and set a “prefix” string. Fname can be a filename or the string “stdout”. Use nimLogSetLevel or nimLogSet to change the default log level, or to change the log file. Use nimLog to write to the log file.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>fname</th>
<th>The name of the log file (can be a file name or the string “stdout”.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>prefix</td>
<td>Typically the probe name</td>
</tr>
</tbody>
</table>

Returns
None

See also
N/A

nimLogModule

Signature
void nimLogModule (int iLevel, char *pchModule, char *pchFormat, ...);

Description
Logs messages to the log if the module as been initialized with nimLogSetModule. Logging is to the same file as set up by calls to nimLogSet.

Parameters

<table>
<thead>
<tr>
<th>int</th>
<th>iLevel</th>
<th>Log level for this message</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>pchModule</td>
<td>For module name logging</td>
</tr>
</tbody>
</table>
Log Methods

The Nimbus API for C

nimLogPDS

Signature
void nimLogPds(PDS *pds, char *print_name, int log_level, int flags);

Description
Write a PDS to the log.

Parameters

<table>
<thead>
<tr>
<th>PDS</th>
<th>pds</th>
<th>PDS to write to the log file</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>print_name</td>
<td>Log header</td>
</tr>
<tr>
<td>int</td>
<td>log_level</td>
<td>Log level</td>
</tr>
<tr>
<td>int</td>
<td>flags</td>
<td>Detail level</td>
</tr>
</tbody>
</table>

Returns
N/A

See also
nimLog

nimLogSet

Signature
int nimLogSet(char *fname, char *prefix, int level, int flags);

Description
This function will create a log file and set a “pre-” string and log level. Fname can be a file name or the string “stdout”. Use nimLog to write to the log file.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>fname</th>
<th>The name of the log file (can be a file name or the string “stdout”.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>prefix</td>
<td>Typically the probe name</td>
</tr>
<tr>
<td>int</td>
<td>level</td>
<td>Log level</td>
</tr>
<tr>
<td>int</td>
<td>flags</td>
<td></td>
</tr>
<tr>
<td>NIM_LOGF_NOTRUNCATE</td>
<td>flags</td>
<td>Do not truncate the log</td>
</tr>
<tr>
<td>NIM_LOGF_RESETATSTART</td>
<td>flags</td>
<td>Truncate the log file at the start of</td>
</tr>
<tr>
<td>NIM_LOGF_THREAD_ID</td>
<td>flags</td>
<td>Print the thread ID as part of the log.message.</td>
</tr>
</tbody>
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Log Methods

Returns
NIME_OK or NIME_INVAL

See also
N/A

nimLogSetLevel

Signature
int nimLogSetLevel(int level);

Description
Change the current log level

Parameters

| int       | level       | Set new log level |

Returns
Old log level

See also
N/A

nimLogSetModule

Signature
void nimLogSetModule(char *pchModule);

Description
Initialize logging for specific modules

Parameters

char * pchModule List of modules e.g. “A,B,C”

See also
N/A

nimLogSession

Signature
void nimLogSession(NIMSESS *nims, char *file)
**Description**  
Log information about the supplied session object.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *nims</td>
<td>Session object to log information for</td>
</tr>
<tr>
<td>char *file</td>
<td>File name to log to; overwriting if it exists</td>
</tr>
</tbody>
</table>

**See Also**  
N/A

**nimLogTruncate**

**Signature**

`void nimLogTruncate(void);`

**Description**

Truncate current log file now

**Parameters**

N/A

**Returns**

N/A

**nimLogTruncateSize**

**Signature**

`void nimLogTruncateSize(unsigned log bytes);`

**Description**

Truncate the log based on size bytes instead of the default 100KB. Overridden by time-based truncation if that has been set.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>unsigned log bytes</td>
<td>Log file can be made before it is truncated</td>
</tr>
</tbody>
</table>

**See Also**  
nimLogTruncateTime
**nimLogTruncateTime**

**Signature**

```c
void nimLogTruncateTime(time_t seconds);
```

**Description**

Truncate log based on age of file (in seconds) instead of file size. Will override size-based truncation.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>seconds</td>
<td>time_t</td>
<td>Age of file from probe startup or last truncation until the log should be truncated, regardless of size.</td>
</tr>
</tbody>
</table>

**See Also**

nimLogTruncateSize

---

**Communication Methods**

**nimAlarm**

**Signature**

```c
int nimAlarm(char *message, int pri, char *suppression, char *subsys, char *source, char **nimid);
```

**Description**

Used to send a NimBUS alarm. If you need to send more than one alarm within a short period of time use the nimSessionAlarm function instead.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>message</td>
<td>char *</td>
<td>Alarm message</td>
</tr>
<tr>
<td>pri</td>
<td>int</td>
<td>Severity (0-5) E.g. NIML_CRITICAL</td>
</tr>
<tr>
<td>suppression</td>
<td>char *</td>
<td>Suppression key</td>
</tr>
<tr>
<td>subsys</td>
<td>char *</td>
<td>Subsystem</td>
</tr>
<tr>
<td>source</td>
<td>char *</td>
<td>Set source, NULL = host name</td>
</tr>
<tr>
<td>nimid</td>
<td>char **</td>
<td>NimBUS identifier for the alarm</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK or an error code.

**See also**
nimSessionAlarm
nimCallbackReply

**Signature**

```c
extern int nimCallbackReply(NIMCB *cb, int status, PDS *dpds);
```

**Description**

Must be called in all session callbacks in order to send a reply to the caller of the command (nimRequest). The caller will receive the status and data that is set in the callback function. The data PDS must be freed in the callback before the function ends. Earlier versions of the API did not have this function; instead operated in this way: nimSendReply(cb->msg, status, dpds);

**Parameters**

<table>
<thead>
<tr>
<th>NIMCB *</th>
<th>cb</th>
<th>Callback handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>status</td>
<td>Command status</td>
</tr>
<tr>
<td>PDS *</td>
<td>dpds</td>
<td>Command result data</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK on success or an error code.

**See also**

nimSendReply

nimChangePassword

**Signature**

```c
int nimChangePassword(char *name, char *old_password, char *new_password);
```

**Description**

Change the password for the given user. Old password must be correct in order to change the password.

**Parameters**

<table>
<thead>
<tr>
<th>char *</th>
<th>name</th>
<th>User name</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>old_password</td>
<td>Old password</td>
</tr>
<tr>
<td>char *</td>
<td>new_password</td>
<td>New password</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK or an error code.

**See also**

N/A
nimChangeLogin

**Signature**

```c
int nimChangeLogin(char *sid);
```

**Description**

Can be used to switch between two or more different logins.

**Parameters**

| char | sid | A valid SID |

**Returns**

NIME_OK or an error code

**See also**

nimLogin

nimGetCurrentSid

**Signature**

```c
char *nimGetCurrentSid();
```

**Description**

Returns a pointer to the current SID in use by the NimBUS API. NB! Do not modify this value.

**Parameters**

N/A

**Returns**

Pointer to the current SID

**See also**

nimChangeLogin

nimEnd

**Signature**

```c
int nimEnd(int flag);
```

**Description**

Release all initialized NimBUS data. This should be the last NimBUS call in any application.

**Parameters**

| int | flag | Should be 0 |
Returns
NIME_OK

See also
nimInit

**nimError2Txt**

**Signature**

```c
const char *nimError2Txt(int errorcode);
```

**Description**

This function maps the nimbus errorcode to constant string. If errorcode is out of range, it will return the string "unknown error".

**Parameters**

<table>
<thead>
<tr>
<th>int</th>
<th>errorcode</th>
<th>NimBUS error code</th>
</tr>
</thead>
</table>

**Returns**

OK: The error string
Error: None

See also
N/A

**nimInit**

**Signature**

```c
int nimInit(int flag);
```

**Description**

Initialize the NimBUS API. On windows that includes the WinSock initializing. This should be the first NimBUS call in any application.

**Parameters**

<table>
<thead>
<tr>
<th>int</th>
<th>flag</th>
<th>Should be 0</th>
</tr>
</thead>
</table>

**Returns**

NIME_OK

See also
nimEnd
**nimLogin**

**Signature**

```c
int nimLogin(char *name, char *password, char **login_sid);
```

**Description**

Login to NimBUS with user name and password. The login is global and will affect all subsequently calls to NimBUS. You must free the SID when done with it.

**Parameters**

| char * name | NimBUS user name |
| char * password | Password |
| char ** login_sid | The Session Identifier (SID) |

**Returns**

NIME_OK or an error code.

**See also**

nimLogout

---

**nimLogout**

**Signature**

```c
void nimLogout();
```

**Description**

Log off the current user. All global user credentials will be removed.

**Parameters**

N/A

**Returns**

N/A

**See also**

nimLogin

---

**nimMsgFree**

**Signature**

```c
void nimMsgFree(NIMMSG *nmsg);
```

**Description**

For internal use; releases a message handle.
### Communication Methods

#### Parameters

| **NIMMSG** *nmsg | Pointer to a NimBUS message handle. |

#### Returns

N/A

#### See also

nimSessionGetMsg

### nimNamedRequest

#### Signature

```c
int nimNamedRequest(char *address, char *cmd, PDS *data, PDS **retData, int secWait);
```

#### Description

Send a NimBUS request to the probe address and wait for a reply.

#### Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>address</th>
<th>NimBUS address</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>cmd</td>
<td>NimBUS command</td>
</tr>
<tr>
<td>PDS *</td>
<td>data</td>
<td>Parameter PDS for the request</td>
</tr>
<tr>
<td>PDS **</td>
<td>retData</td>
<td>Reply PDS</td>
</tr>
<tr>
<td>int</td>
<td>secWait</td>
<td>Timeout</td>
</tr>
</tbody>
</table>

#### Returns

NIME_OK or an error code.

#### See also

nimNamedSession

### nimNamedSession

#### Signature

```c
NIMMESS *nimNamedSession(char *address);
```

#### Description

Create a session connected to the given NimBUS address. nimSessionRequest is used to issue requests to the probe when the connection is up.

#### Parameters

| char * | address | NimBUS address to which to connect the session |

**Returns**
NIMSESS or NULL on failure.

**See also**
nimSessionRequest, nimSessionFree

### nimPostMessage

**Signature**

```c
int nimPostMessage(char *subject, int pri, char *suppression, PDS *data, char **nimid);
```

**Description**

Post a message with a given subject to NimBUS. This is the generic method that is the basis for both nimAlarm and nimQoS messages.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>subject</td>
<td>Message subject</td>
</tr>
<tr>
<td>int</td>
<td>pri</td>
<td>Set to 0</td>
</tr>
<tr>
<td>char *</td>
<td>suppression</td>
<td>Suppression key, normally NULL</td>
</tr>
<tr>
<td>PDS *</td>
<td>data</td>
<td>Data to post</td>
</tr>
<tr>
<td>char **</td>
<td>nimid</td>
<td>NimBUS identifier for the message</td>
</tr>
</tbody>
</table>

**Returns**
NIME_OK or an error code.

**See also**
N/A

### nimRegisterProbe

**Signature**

```c
int nimRegisterProbe(char *probename, int port);
```

**Description**

This function will register the active session with nimbus name (probename/port) at the controller. You can get the portnumber for the active session by accessing nims->iPort.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>probename</td>
<td>The probe name</td>
</tr>
<tr>
<td>int</td>
<td>port</td>
<td>Port to register</td>
</tr>
</tbody>
</table>

**Returns**
NIME_OK or an error code.
See also
nimUnRegisterProbe.

nimRequest

Signature

int nimRequest(char *addr, int iPort, char *cmd, PDS *data, PDS **retData, int secWait);

Description
Send a NimBUS request to the probe address and wait for reply. This function is often used together with
nimGetNameToIp. We recommend that you use nimNamedRequest instead.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>addr</th>
<th>IP or host name to connect to</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>iPort</td>
<td>Port number to connect to</td>
</tr>
<tr>
<td>char *</td>
<td>cmd</td>
<td>NimBUS command</td>
</tr>
<tr>
<td>PDS *</td>
<td>data</td>
<td>Parameter PDS for the request</td>
</tr>
<tr>
<td>PDS **</td>
<td>retData</td>
<td>Reply PDS</td>
</tr>
<tr>
<td>int</td>
<td>secWait</td>
<td>Time out</td>
</tr>
</tbody>
</table>

Returns
NIME_OK or an error code.

See also
nimNamedRequest

nimSendReply

Signature

int nimSendReply(NIMMSG *nmsg, int status, PDS *dpds);

Description
For internal use; used to reply to a nimRequest.

Parameters

<table>
<thead>
<tr>
<th>NIMMSG *</th>
<th>nmsg</th>
<th>Pointer to a NimBUS message</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>status</td>
<td>Status</td>
</tr>
<tr>
<td>PDS *</td>
<td>dpds</td>
<td>Data</td>
</tr>
</tbody>
</table>

Returns
NIME_OK on success or an error code.
nimSession

**Signature**

```c
NIMSESS *nimSession (char *host, int port);
```

**Description**

Create a NimBUS session for client or server. This convenience function will create a server session on “port” if
the host parameter is set to NULL. If a hostname is passed on then a create client session is attempted.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>host</td>
</tr>
<tr>
<td>int</td>
<td>port</td>
</tr>
</tbody>
</table>

**Returns**

NIMSESS * on success
NULL if an error occurs.

**See also**

nimSessionNew, nimSessionServer, nimSessionConnect.

nimSessionAttachCallback

**Signature**

```c
void nimSessionAttachCallback (NIMSESS *nims, NIMCB *cb)
```

**Description**

Attach a callback object to the session specified.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
</tr>
<tr>
<td>NIMCB *</td>
<td>cb</td>
</tr>
</tbody>
</table>

See also nimSessionDetachCallback

nimSessionAddCallbackPds

**Signature**

```c
int nimSessionAddCallbackPds (NIMSESS *nms, char *cmd, int (*func)(NIMCB *cb, PDS *pdsArgs), char *fmt, int sec_rights)
```

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**Description**
This function replaces nimSessionAddCallback, and is the required function to use on 64-bit systems, which pass integer parameters. This is due to the way the callback dispatcher works, in that it cannot mix 32-bit and 64-bit parameters in the function call. This mechanism works around that by passing all parameters in a PDS, which the user is responsible to unpacking in the callback. The keys and types are listed in the format string. The function returns NIME_OK on success or an error code on failure.

**Parameters**

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Session to add command to</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>cmd</td>
<td>Command name</td>
</tr>
<tr>
<td>int(*func)</td>
<td>(NIMCB<em>cb,PDS</em>pdsArgs)</td>
<td>Function pointer to callback function which takes a NIMCB pointer and a PDS pointer as parameters and returns int</td>
</tr>
<tr>
<td>char *</td>
<td>fmt</td>
<td>Callback’s parameter format string</td>
</tr>
<tr>
<td>int</td>
<td>sec_rights</td>
<td>Security level required to execute this callback command</td>
</tr>
</tbody>
</table>

**Note**
The function will exit with a no-restart code if you attempt to use it with integer parameters on 64-bit systems.

**See also**
nimSessionAddCallback, nimSessionNew, nimSessionServer

**nimSessionDetachCallback**

**Signature**

\[
\text{NIMCB} * \text{nimSessionDetachCallback}(\text{NIMSESS} * \text{nims}, \text{char} * \text{cmd})
\]

**Description**
Remove a callback command from the session.

**Parameters**

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Session to detach command from</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>cmd</td>
<td>Command to detach.</td>
</tr>
</tbody>
</table>

**See also**
nimSessionAttachCallback

**nimSessionNew**

**Signature**

\[
\text{NIMSESS} * \text{nimSessionNew}();
\]
Communication Methods

**Description**
This function will create a new NimBUS session. Default type is stream (TCP). Use nimSessionSetDatagram change type.

**Parameters**
N/A

**Returns**
Pointer to session (NIMSESS) on success.
NULL if an error occurred.

See also
nimSessionFree, nimSessionSetDatagram.

---

**nimSessionRequest**

**Signature**

```c
int nimSessionRequest(NIMSESS *nims, char *cmd, PDS *data, PDS **retData, int secWait);
```

**Description**
Send a request to a probe and wait for the answer. Request parameters and the reply are in the form of a PDS.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
<td>Pointer to a session</td>
</tr>
<tr>
<td>char *</td>
<td>cmd</td>
<td>Requested command</td>
</tr>
<tr>
<td>PDS *</td>
<td>data</td>
<td>Input to the command</td>
</tr>
<tr>
<td>PDS **</td>
<td>retData</td>
<td>Data returned from the command</td>
</tr>
<tr>
<td>int</td>
<td>secWait</td>
<td>Timeout</td>
</tr>
</tbody>
</table>

**Returns**
NIME_OK or an error code.

See also
nimRequest

---

**nimSessionFree**

**Signature**

```c
void nimSessionFree(NIMSESS *nims);
```

**Description**
This function will free resources allocated to this session and free itself.
Parameters

| NIMSESS * | nims | NimBUS session handle |

Returns
None.

See also
nimSessionNew

nimSessionGraceClose

Signature

Void nimSessionGraceClose (NIMSESS *nims, int nsec)

Description
Shut down a session and free it.

Parameters

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Session to close</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>nsec</td>
<td>At present not in use.</td>
</tr>
</tbody>
</table>

See Also
N/A

nimSessionNewList

Signature

NIMSESSLIST *nimSessionNewList(void);

Description
Create a new NimBUS session list. Session lists are typically used by server applications (probes) to handle multiple client sessions (nimSessionDispatch).

Parameters

N/A

Returns
NIMSESSLIST pointer or NULL on failure.

See also
nimSessionDispatch
nimSessionAddList

**Signature**

```c
void nimSessionAddList(NIMSESSLIST *listhead, NIMSESS *nims);
```

**Description**

Add a NimBUS session to a session list.

**Parameters**

<table>
<thead>
<tr>
<th>NIMSESSLIST *</th>
<th>listhead</th>
<th>Pointer to a session list</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
<td>Pointer to a session</td>
</tr>
</tbody>
</table>

**Returns**

N/A

**See also**

nimSessionNewList, nimSessionRemoveList

nimSessionRemoveList

**Signature**

```c
void nimSessionRemoveList(NIMSESSLIST *listhead, NIMSESS *nims);
```

**Description**

Remove a session from a session list. Does not free the NIMSESS so you must call nimSessionFree for the session after it has been removed from the list.

**Parameters**

<table>
<thead>
<tr>
<th>NIMSESSLIST *</th>
<th>listhead</th>
<th>Pointer to a session list</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
<td>Pointer to a session</td>
</tr>
</tbody>
</table>

**Returns**

N/A

**See also**

nimSessionAddList, nimSessionFree

nimSessionFreeList

**Signature**

```c
void nimSessionFreeList(NIMSESSLIST **listhead);
```

**Description**

Free a session list.
Parameters

<table>
<thead>
<tr>
<th>NIMSESSLIST **</th>
<th>listhead</th>
<th>A Session list</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
<td>Session to change</td>
</tr>
</tbody>
</table>

Returns

N/A

See also

NimSessionNewList

nimSessionGetNewCon

Signature

NIMSESS * nimSessionGetNewCon(NIMSESS *nims);

Description

Internal only. Get a new client connection (session) from the server session.

Parameters

| NIMSESS * | nims | NimBUS server session. |

Returns

Pointer to a new session or NULL if there is no new client session.

See also

nimSession

nimSessionGetMsg

Signature

NIMMSG * nimSessionGetMsg(NIMSESS *nims);

Description

Internal. Get a new message from a session. You must free the message after use.

Parameters

| NIMSESS * | nims | Pointer to a session |

Returns

Pointer to a new message or NULL if none is available.

See also

nimMsgFree
nimSessionSetData

**Signature**

```c
int nimSessionSetData(NIMSESS *nims, void *data);
```

**Description**

Used by server applications (probes) to attach session specific data to a client session. The server must free the data before the session is freed.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
</tr>
<tr>
<td>void *</td>
<td>data</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK

**See also**

nimSessionGetData

nimSessionGetLastError

**nimSessionGetLastError**

**Signature**

```c
int nimSessionGetLastError(NIMSESS *nims);
```

**Description**

Returns the last error code on the session.

**See also**

nimSessionSetData

nimSessionGetLastError

**nimSessionGetLastError**

**Signature**

```c
int nimSessionGetLastError(NIMSESS *nims);
```

**Description**

Returns the last error code on the session.
Parameters

| NIMSESS *  | nims          | Pointer to a session |

Returns

Last error code on the session.

See also

nimError2Txt

nimSessionConnect

Signature

int nimSessionConnect(NIMSESS *nims, char *szHost, int iPort, int secWait);

Description

Connect to a server (probe) with a given host name or IP address and on the given port number.

Parameters

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Pointer to a session</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>szHost</td>
<td>Host to connect to</td>
</tr>
<tr>
<td>int</td>
<td>iPort</td>
<td>Port to connect to</td>
</tr>
<tr>
<td>int</td>
<td>secWait</td>
<td>Timeout</td>
</tr>
</tbody>
</table>

Returns

NIME_OK or an error code.

See also

nimSessionNew

nimSessionServer

Signature

int nimSessionServer(NIMSESS *nims, int iPort);

Description

Create a server session on an existing session.

Parameters

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Pointer to a session</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>iPort</td>
<td>Port to listen on</td>
</tr>
</tbody>
</table>

Returns

NIME_OK or an error code
**nimSessionSetDatagram**

**Signature**
```c
int nimSessionSetDatagram(NIMSESS *nims, int defaultLocalPort);
```

**Description**
This function will set this session type to datagram. (UDP) for both sending and receiving.

Example of broadcasting:
```c
nims = nimSessionNew(); nimSessionSetDatagram(nims, 8000, 0);
nimSessionConnect(nims, "193.71.55.255", 8000) nimSessionSend(nims, "get hub", pds);
```

**Parameters**

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Pointer to a session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int</td>
<td>defaultLocalPort</td>
<td>Port to listen on</td>
</tr>
</tbody>
</table>

**Returns**
None

**See also**
nimSessionNew

**nimSessionGetOption**

**Signature**
```c
int nimSessionGetOption(NIMSESS *nims)
```

**Description**
Returns options for a session.

**Parameters**

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session to look up options from.</td>
<td></td>
</tr>
</tbody>
</table>

**nimSessionSetOption**

**Signature**
```c
void nimSessionSetOption(NIMSESS *nims, int iOption)
```

**Description**
Allows you to replace the options for a given session.
Communication Methods

Parameters

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Session to change</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>iOption</td>
<td>Options that are valid for this session after the function call</td>
</tr>
</tbody>
</table>

nimSessionIsConnected

Signature

```c
int nimSessionIsConnected(NIMSESS *nims);
```

Description
Check if a session is connected.

Parameters

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Pointer to a session</th>
</tr>
</thead>
</table>

Returns
NIME_OK or error code.

See also
nimSessionConnect

nimSessionSpooler

Signature

```c
NIMSESS *nimSessionSpooler();
```

Description
Create a session connected to the default spooler. This convenience function will create a session to the default spooler. Use this function when you expect to load many messages onto the spooler.

Parameters
N/A

Returns
NIMSESS * on success or a NULL if an error occurred.

See also
nimSessionNew, nimSessionAlarm, nimSessionPostMessage.
nimSessionController

Signature
NIMSESS *nimSessionController();

Description
Create a session connected to the default controller. This convenience function will create a session to the default controller.

Parameters
N/A

Returns
NIMSESS * on success or NULL if an error occurred.

See also
nimSessionNew.

nimSessionHub

Signature
NIMSESS *nimSessionHub(char *hubaddress);

Description
Create a session connected to the hub. This convenience function will create a session to the named hub. If 'hubaddress' is NULL, then the NIMV_HUBADDR is used.

Parameters

| char *           | hubaddress | The hub address, to which the session is to be opened. |

Returns
NIMSESS * on success or NULL if an error occurred.

See also
nimSessionNew.

nimSessionAlarm

Signature
int nimSessionAlarm(NIMSESS *nims, char *message, int pri, char *suppression, char *subsys, char *source, char **nimid);

Description
Send a NimBUS Alarm message on the session. This function behaves exactly like the nimAlarm function, except that a session is required prior to sending the alarm.
Parameters

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>A session connected to a spooler</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>message</td>
<td>The alarm message to be sent on the session.</td>
</tr>
<tr>
<td>int</td>
<td>pri</td>
<td>Severity</td>
</tr>
<tr>
<td>char *</td>
<td>suppression</td>
<td>Suppression key</td>
</tr>
<tr>
<td>char *</td>
<td>subsys</td>
<td>Subsystem (e.g. 1.1.3)</td>
</tr>
<tr>
<td>char *</td>
<td>source</td>
<td>Alarm source, NULL = hostname</td>
</tr>
<tr>
<td>char **</td>
<td>nimid</td>
<td>Identifier of the new alarm</td>
</tr>
</tbody>
</table>

Returns
NIME_OK or an error code.

See also
nimSessionNew, nimSessionSpooler, nimAlarm.

nimSessionDispatch

Signature
int nimSessionDispatch(NIMSESSLIST *list, int millisec, int breakOnTimeout);

Description
The session dispatcher is the engine of the probe. When you have prepared the session by setting up command callbacks (nimSessionAddCallback) and the standard callbacks (nimSessionAddStdCallback) most of the probe logic will be handled by the dispatcher with the exception of what is done on timeouts.

Parameters

<table>
<thead>
<tr>
<th>NIMSESSLIST *</th>
<th>list</th>
<th>Pointer to a session list</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>millisec</td>
<td>Timeout value</td>
</tr>
<tr>
<td>int</td>
<td>breakOnTimeout</td>
<td>Return from function on timeout?</td>
</tr>
</tbody>
</table>

Returns
NIMSW_TIMEOUT is returned on timeout if ‘breakOnTimeout’ is set. All other exit codes are error codes like: NIMSW_EXIT, NIMSW_RESTART and NIMSW_ERROR.

See also
nimSessionNewList, nimSessionAddCallback, NimSessionAddStdCallback

nimSessionAddStdCallback

Signature
int nimSessionAddStdCallback(NIMMESS *nims, NIMINFO *info, void *cbdata);


**Description**
Add session standard callback functions. This function will add the standard callback functions for status, list, stop and restart. The NIMINFO struct also contains name, version and company information that are returned by the `_status` command.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
</tr>
<tr>
<td>NIMINFO *</td>
<td>info</td>
</tr>
<tr>
<td>void *</td>
<td>cbdata</td>
</tr>
</tbody>
</table>

**Returns**
NIME_OK on success or an error code on failure.

**See also**
nimSessionAddStdCallback.

---

**nimSessionAddCallback**

**Signature**

```c
int nimSessionAddCallback (NIMSESS *nims, char *cmd, int (*func)(NIMCB *cb), char *fmt, int sec_rights);
```

**Description**
Add command callback function on session. This function will register a user-defined callback to the session (or session list) for the command 'cmd' provided by the caller. The callback function prototype is determined by the format 'fmt' parameter. The format string is defined by `pdsScanf(3)`, and enables the programmer to specify the parameter order and type to the callback function. A user specific 'cbdata' associated with the callback may be added by the nimSessionAddCbData.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
</tr>
<tr>
<td>char *</td>
<td>cmd</td>
</tr>
<tr>
<td>int *</td>
<td>func(NIMCB * cb)</td>
</tr>
<tr>
<td>char *</td>
<td>fmt</td>
</tr>
<tr>
<td>int</td>
<td>sec_rights</td>
</tr>
</tbody>
</table>

**Returns**
NIME_OK on success or an error code on failure.

**See also**
nimSessionNew, nimSessionServer.
nimSessionCallbackData

Signature

```c
int nimSessionCallbackData (NIMSESS *nims, char *cmd, void *cbdata);
```

Description

Add callback data to 'cmd' callback. This function will attach the data to the callback structure associated with 'cmd'.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
<td>Pointer to a session</td>
</tr>
<tr>
<td>char *</td>
<td>cmd</td>
<td>Command to add the data to</td>
</tr>
<tr>
<td>void *</td>
<td>cbdata</td>
<td>Pointer to callback data</td>
</tr>
</tbody>
</table>

Returns

NIME_OK on success. NIME_ERROR, NIME_INVAL if errors occur.

See also

nimSessionAddCallback.

nimSessionPostMessage

Signature

```c
int nimSessionPostMessage(NIMSESS *nims, char *subject, int pri, char *suppression, PDS *data, char **nimid);
```

Description

Does the same as nimPostMessage but requires a session connected to a spooler. Use nimSessionSpooler or nimSession to obtain the session.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>nims</td>
<td>Pointer to a spooler session</td>
</tr>
<tr>
<td>char *</td>
<td>subject</td>
<td>Message subject</td>
</tr>
<tr>
<td>int</td>
<td>pri</td>
<td>Use 0</td>
</tr>
<tr>
<td>char *</td>
<td>suppression</td>
<td>Suppression key, normally NULL</td>
</tr>
<tr>
<td>PDS *</td>
<td>data</td>
<td>Data to post</td>
</tr>
<tr>
<td>char **</td>
<td>nimid</td>
<td>NimBUS identifier for the posted message</td>
</tr>
</tbody>
</table>

Returns

NIME_OK or an error code.

See also

nimSessionSpooler, nimSession
nimSessionAddSessionCallback

**Signature**

```c
int nimSessionAddSessionCallback (NIMSESS *nims, int (*func)());
```

**Description**

Add reply callback function on session. This function will register a user-defined callback to the session for the any reply provided by the caller.

The callback function prototype is

```c
int func(NIMSESS *nims, void *data, int what, NIMMSG *nmsg)
```

Values for `what`:
- `NIMSW_REPLY` - reply is in `nmsg`
- `NIMSW_SCONNECT` - `nims` is connected
- `NIMSW_STIMEOUT` - request/connection timed out
- `NIMSW_ERROR` - error/disconnect

Valid return values are Zero

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>Pointer to a session</td>
</tr>
<tr>
<td>int *</td>
<td>(<code>(*func)</code>()</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK on success. NIME_ERROR if an error occurred.

**See also**

nimSessionNew, nimSessionServer.

nimSessionClearCallback

**Signature**

```c
int nimSessionClearCallback(NIMSESS *nims);
```

**Description**

This function will disconnect any callback information from this session.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMSESS *</td>
<td>Pointer to a session</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK on success. NIME_ERROR if an error occurs.

**See also**

nimSessionAddCallback
nimUnRegisterProbe

**Signature**

```c
int nimUnRegisterProbe(char *probename);
```

**Description**

This function will unregister probename at the controller.

**Parameters**

| char * | probename | Probe name to unregister |

**Returns**

NIME_OK or an error code.

**See also**

nimRegisterProbe.

nimSessTraceLevel

**Signature**

```c
int nimSessTraceLevel(NIMSESS *nims,int level);
```

**Description**

Sets the debug level for low level logging of the session.

**Parameters**

<table>
<thead>
<tr>
<th>NIMSESS *</th>
<th>nims</th>
<th>Session for which to set trace level</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>level</td>
<td>Trace level</td>
</tr>
</tbody>
</table>

**See Also**

N/A

nimSessErrorLevel

**Signature**

```c
int nimSessErrorLevel (NIMSESS *nims, int level)
```

**Description**

No longer used, but available for backwards compatibility.
nimSessResponseTimeout

**Signature**

```c
int nimSessResponseTimeout (NI_MESS *nms, int level)
```

**Description**

No longer used, but available for backwards compatibility.

## Header Functions

The following functions are defined in the header file, but are not for use outside the library:

- ```c
  int nimSessionWait(NI_MESS *nims, int millWait, NI_MESS **psnims);
  ```
- ```c
  int nimSessionWaitReply(NI_MESS *nims, int millWait, int *status, PDS **dpds);
  ```
- ```c
  int nimSessionWaitMsg(NI_MESS *nims, int secWait, NIMMSG **pnmsg);
  ```
- ```c
  NI_MESS* nimSessionGetNewCon(NI_MESS *nms);
  ```
- ```c
  int nimSessionAConnect(NI_MESS *nms, char *szHost, int iPort, int secWait);
  ```
- ```c
  int nimSessionARequest(NI_MESS *nims, char *cmd, PDS *data, int secWait);
  ```
- ```c
  int nimSessionSend(NI_MESS *nims, char *cmd, PDS *data);
  ```
- ```c
  int nimSessionSendRaw(NI_MESS *nms, char *buf, size_t nc);
  ```
- ```c
  int nimMsgGetRaw(NI_MSG *nmsg, void *buf, size_t *size);
  ```
- ```c
  void nimSetLocalIp (char *pchIp);
  ```
Miscellaneous Methods

nimFindAsTable

**Signature**

```c
int nimFindAsTable(PDS *pdsFilter, int iType, char ***pppchOut);
```

**Description**

This is a wrapper around nimFindAsFunc(). cslLineInsert() is used to fill pppchOut.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS * pdsFilter</td>
<td>Contains the &quot;filter&quot; used to specify the criteria. Available fields in the &quot;filter&quot; PDS are: domain, hubip, hubname, hubversion, robotip, robotname, robotversion, osmajor, osminor, osuser1, osuser2, probename, pkg_name, pkg_version, active. In addition the int &quot;timeout&quot; can be set for nimRequest (default=10).</td>
</tr>
<tr>
<td>int iType</td>
<td>Available types: NIMF_HUB, NIMF_ROBOT, NIMF_PROBE.</td>
</tr>
<tr>
<td>char *** pppchOut</td>
<td>Gets filled with a NULL terminated string table containing the NimBUS addresses requested. The string should be deallocated using cslTblFree().</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK, NIME_ERROR or NIME_NOENT (if nothing matches criteria).

**See also**

nimFindAsPd, nimFindCreateFilter

nimFindAsPd

**Signature**

```c
int nimFindAsPds (PDS *pdsFilter, int iType, PDS **pdsOut);
```

**Description**

This is a wrapper around nimFindAsFunc(). pdsPutTable() is used to fill pdsOut.
Miscellaneous Methods

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pdsFilter</th>
<th>Contains the &quot;filter&quot; used to specify the criteria. Available fields in the &quot;filter&quot; PDS are: domain, hubip, hubname, hubversion, robotip, robotname, robotversion, osmajor, osminor, osuser1, osuser2, probename, pkg_name, pkg_version, active. In addition the int &quot;timeout&quot; can be set for nimRequest (default=10).</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>iTYPE</td>
<td>Available types: NIMF_HUB, NIMF_ROBOT, NIMF_PROBE.</td>
</tr>
<tr>
<td>PDS**</td>
<td>pdsOut</td>
<td>Gets filled with a table of NimBUS addresses use pdsTableGet(*pdsOut,&quot;addr&quot;,&amp;myaddr) to read into (char *)myaddr. The PDS must be removed by the calling function.</td>
</tr>
</tbody>
</table>

Returns

RETURNS: NIME_OK, NIME_ERROR or NIME_NOENT (if nothing matches criteria).

See also
nimFindAsFunc(), nimFindCreateFilter() for list of available filters.

nimFindAsFunc

Signature

int nimFindAsFunc(PDS *pdsFilter, int iTYPE, void *vpOut, int (*pFunc)(char *, void *));

Description
Run a find on all NimBUS probes that returns all addresses matching the find filter. When an address matches the function will be called with the address as parameter one.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pdsFilter</th>
<th>Contains the &quot;filter&quot; used to specify the criteria.</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>iTYPE</td>
<td>Available types: NIMF_HUB, NIMF_ROBOT, NIMF_PROBE.</td>
</tr>
<tr>
<td>void *</td>
<td>vpOut</td>
<td>Used as second argument to pFunc if your function needs to fill in a block of data (use NULL if it does not).</td>
</tr>
<tr>
<td>int *</td>
<td>pFunc(char *, void *)</td>
<td>Function pointer. Allows you to specify your own function to be run upon every matched address.</td>
</tr>
</tbody>
</table>

Returns

NIME_OK, NIME_ERROR or NIME_NOENT (if nothing matches criteria).

See also
nimFindAsTable for list of available filters.
nimFindCreateFilter

Signature

PDS *nimFindCreateFilter(char *domain, char *hubip, char *hubname, char *hubversion,
                        char *robotip, char *robotname, char *robotversion, char *osmajor, char *osminor,
                        char *osuser1, char *osuser2, char *probaname, char *pkg_name, char *pkg_version,
                        char *group, char *active);

Description

Create a filter that is used in all the find functions to match the find criteria. Use NULL to if there is no match
criteria for the parameter.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>char * domain</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * hubip</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * hubname</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * hubversion</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * robotip</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * robotname</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * robotversion</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * osmajor</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * osminor</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * osuser1</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * osuser2</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * pkg_name</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * pkg_version</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * group</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
<tr>
<td>char * active</td>
<td>Corresponds to a filter possibility in the nimFind family of functions.</td>
</tr>
</tbody>
</table>

Returns

Pointer to a PDS containing the filter values.

See also

nimFindAsFunc(), nimFindAsPds(), nimFindAsTable(), nimFindSetTimeOut()
**nimFindSetTimeOut**

**Signature**

```c
int nimFindSetTimeOut(PDS **pdsFilter, int timeout);
```

**Description**

Set timeout value for the find in the filter PDS.

**Parameters**

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pdsFilter</th>
<th>Address of a PDS containing the filter for the nimFind functions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>timeout</td>
<td>Timeout used for nimRequest calls.</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK, NIME_ERROR

**See also**

nimFindAsFunc(), nimFindAsPds(), nimFindAsTable(), nimFindCreateFilter().

**nimFree**

**Signature**

```c
Void nimFree(void *f)
```

**Description**

Wrapper over the C function free() with a check to avoid NULL pointers.

**Parameters**

| void | f | Pointer to memory area to be freed |

**Returns**

N/A

**nimGetVarStr**

**Signature**

```c
int nimGetVarStr(int what, char *data, int dlen);
```

**Description**

Get the requested API value. Typically used for fetching the current hub, spooler or controller IP.
Parameters

<table>
<thead>
<tr>
<th>int</th>
<th>what</th>
<th>API value to get</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>data</td>
<td>Buffer to return value in</td>
</tr>
<tr>
<td>int</td>
<td>dlen</td>
<td>Buffer size</td>
</tr>
</tbody>
</table>

Returns
NIME_OK or error code.

See also
nimSetVarStr, nimGetVarInt

nimGetNameToIp

Signature

```c
int nimGetNameToIp(char *name, char *ip, int iplen, int *port);
```

Description
Look up a NimBUS address to find the IP address and port number to connect to, used together with nimSessionConnect or nimSession. Use nimNamedSession instead.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>name</th>
<th>NimBUS address</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>ip</td>
<td>IP address found for name</td>
</tr>
<tr>
<td>int</td>
<td>iplen</td>
<td>Size of IP buffer</td>
</tr>
<tr>
<td>int *</td>
<td>port</td>
<td>Port found for name</td>
</tr>
</tbody>
</table>

Returns
NIME_OK or an error code.

See also
nimNamedSession, nimSessionConnect, nimSession

nimGetVarInt

Signature

```c
int nimGetVarInt(int what, int *data);
```

Description
Return the requested API value. E.g. what = NIMV_SPOOLPORT returns the local spooler port.

Parameters

<table>
<thead>
<tr>
<th>int</th>
<th>what</th>
<th>API value to get</th>
</tr>
</thead>
<tbody>
<tr>
<td>int *</td>
<td>data</td>
<td>The value</td>
</tr>
</tbody>
</table>
Returns
NIME_OK or an error code.

See also
nimGetVarInt, Nimfree, NimGetVarStr

**nimPDS2section**

**Signature**
```c
int nimPDS2section(char *file, PDS *in);
```

**Description**
Write the content of a PDS with configuration data to a file. Use the file name from the PDS if ‘file’ is NULL.

**Parameters**

<table>
<thead>
<tr>
<th>Param</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>file</td>
<td>char</td>
<td>Output file name</td>
</tr>
<tr>
<td>in</td>
<td>PDS</td>
<td>PDS containing config data.</td>
</tr>
</tbody>
</table>

Returns
NIME_OK or an error code.

See also
nimSection2PDS

**nimSection2PDS**

**Signature**
```c
PDS *nimSection2PDS(char *file, char *section, PDS *inout);
```

**Description**
Converts the content of a NimBUS formatted configuration file to PDS. If the input PDS is NULL a new PDS is created, if it is not NULL data is appended to the existing PDS. This function is often used together with nimPDS2Section.

**Parameters**

<table>
<thead>
<tr>
<th>Param</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>file</td>
<td>char</td>
<td>Input file name</td>
</tr>
<tr>
<td>section</td>
<td>char</td>
<td>Section in configuration file (.cfg)</td>
</tr>
<tr>
<td>inout</td>
<td>PDS</td>
<td>Result PDS</td>
</tr>
</tbody>
</table>

Returns
The result PDS or NULL on failure.

See also
nimPDS2section
nimSetVarInt

**Signature**
```
int nimSetVarInt(int what, int data);
```

**Description**
Set the named API variable. Typically used to change the default spooler port.

**Parameters**

<table>
<thead>
<tr>
<th>int</th>
<th>what</th>
<th>API value to set</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>data</td>
<td>New value</td>
</tr>
</tbody>
</table>

**Returns**
NIME_OK or an error code.

**See also**
N/A

nimSetTrapHandler

**Signature**
```
void nimSetTrapHandler(int (*func)());
```

**Description**
Sets the terminate trap handler. The function will try to trap terminate interrupts and call `func`, so the application can clean up and exit. Only one function can be defined per process.

**Parameters**

| int * | (func)() | Callback function when a signal is trapped |

**Returns**
None

**See also**
N/A

nimSetVarStr

**Signature**
```
int nimSetVarStr(int what, char *data);
```

**Description**
Set a new API value. Typically used to change default spooler IP.
Parameters

<table>
<thead>
<tr>
<th>int</th>
<th>what</th>
<th>API value to set</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>data</td>
<td>New value</td>
</tr>
</tbody>
</table>

Returns
NIME_OK or error code.

See also
Nimfree, nimvarstr.

nimSuppToStr

Signature

```
char *nimSuppToStr(char *szSupp, int nBytes, int bHold, int iNumber, int iSeconds, char *szSuppressionKey);
```

Description
Create a suppression string for nimAlarm. The suppression buffer ('szSupp') must be at least 12 bytes ('nBytes'). The 'bHold' flag decides if the first 'iNumber' alarms should be suppressed before sending an alarm or if the first alarm should be sent before suppressing. 'iSeconds' is the time a suppression is valid. If the time is out, the next alarm will be sent and the suppression counter reset for that alarm.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>szSupp</th>
<th>Suppression string.</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>nBytes</td>
<td>Size of szSupp.</td>
</tr>
<tr>
<td>int</td>
<td>bHold</td>
<td>Send and then suppress.</td>
</tr>
<tr>
<td>int</td>
<td>iNumber</td>
<td>Suppress n messages.</td>
</tr>
<tr>
<td>int</td>
<td>iSeconds</td>
<td>Within n seconds.</td>
</tr>
<tr>
<td>char *</td>
<td>szSuppressionKey</td>
<td>Suppression key.</td>
</tr>
</tbody>
</table>

Returns
Pointer to szSupp on success. Pointer to NULL if an error occurs.

See also
nimAlarm.

nimNextTime

Signature

```
Time_t nimNextTime(const char *pchTimeSpecification)
```

Description
The function returns the time_t of the next matching time specification.

Parameters
See also
N/A

nimTimerStart

Signature

`Void nimTimerStart (NIMTIMER *t);`

Description

Sets the start time in the NIMTIMER object.

Parameters

| NIMTIMER  | *t          | Pointer to NIMTIMER object |

See also

N/A

nimTimerStop

Signature

`Void nimTimerStop(NIMTIMER *t);`

Description

Sets the stop time in the NIMTIMER object.

Parameters

| NIMTIMER  | *t          | Pointer to NIMTIMER object |

See also

N/A

nimTimerDiff

Signature

`Long nimTimerDiff(NIMTIMER *t);`

Description

Creates a lap-time (temporarily) if not stopped with nimTimerStop already, and computes the time difference in milliseconds between the start and stop (or current) time.
## nimTimerDiffSec

### Signature

```c
Double nimTimerDiffSec(NIMTIMER *t)
```

### Description

Creates a lap-time (temporarily) if not stopped with nimTimerStop already, and computes the time difference in seconds between the start and stop (or current) time.

### Parameters

<table>
<thead>
<tr>
<th>NIMTIMER</th>
<th>*t</th>
<th>Pointer to NIMTIMER object</th>
</tr>
</thead>
</table>

See also
N/A
Crypto methods

nimCheckPassword

Signature
int nimCheckPassword(const char *md5, const char *password);

Description
Check a password against the one-way encoded MD5 string.

Parameters

<table>
<thead>
<tr>
<th>const char *</th>
<th>md5</th>
<th>MD5 one-way string</th>
</tr>
</thead>
<tbody>
<tr>
<td>const char *</td>
<td>password</td>
<td>The password</td>
</tr>
</tbody>
</table>

Returns
NIME_OK on success or an error code on failure.

See also
nimNewPassword

nimDecryptString

Signature
char *nimDecryptString(const unsigned char *key, const int keylen, const char *data);

Description
The input string must be encrypted by nimEncryptString and the key must be the same. The result must be freed after use.

Parameters

<table>
<thead>
<tr>
<th>Const unsigned char*</th>
<th>key</th>
<th>Decryption key</th>
</tr>
</thead>
<tbody>
<tr>
<td>const int</td>
<td>keylen</td>
<td>Key length</td>
</tr>
<tr>
<td>const char*</td>
<td>data</td>
<td>String to decrypt</td>
</tr>
</tbody>
</table>

Returns
The decrypted data or NULL on failure.

See also
nimEncryptString
nimEncryptString

**Signature**

```c
char *nimEncryptString(const unsigned char *key, const int keylen, const char *string);
```

**Description**

Will encrypt the input string using the Twofish algorithm and the encryption key. The function returns a base64 encoded and encrypted string. The result must be freed after use.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>key</td>
<td>const unsigned char *</td>
<td>Encryption key</td>
</tr>
<tr>
<td>keylen</td>
<td>const int</td>
<td>Encryption key length</td>
</tr>
<tr>
<td>string</td>
<td>const char *</td>
<td>String to encrypt</td>
</tr>
</tbody>
</table>

**Returns**

A string or NULL on failure.

**See also**

nimDecryptString

nimMD5Sum

**Signature**

```c
int nimMD5Sum(const char *file, unsigned char *digest);
```

**Description**

Calculate the MD5 checksum for a given file. The digest must be of size MD5_DIGEST (16 bytes).

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>file</td>
<td>const char *</td>
<td>Input file</td>
</tr>
<tr>
<td>digest</td>
<td>char *</td>
<td>MD5 result</td>
</tr>
</tbody>
</table>

**Returns**

File size or 0 on error.

**See also**

N/A

nimNewPassword

**Signature**

```c
char *nimNewPassword(const char *password);
```
Description
Internal. Create a MD5 based one-way password entry that can be used for checking a password later.

Parameters

| const char * | password | A password |

Returns
The MD5

See also
nimCheckPassword

QoS methods

nimQoSCreate

Signature

NIMQOS *nimQoSCreate(char *pchQoS, char *pchSource, long lSampleRate, long lSampleMaxValue);

Description
Create a QoS handle for sending data sampled on regular interval. Used together with the nimQoSSend methods. You must call nimQoSFree to release all resources allocated in the handle when you are done.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>pchQoS</th>
<th>QoS name</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>pchSource</td>
<td>QoS source (NULL = hostname)</td>
</tr>
<tr>
<td>long</td>
<td>ISampleRate</td>
<td>Sample rate.</td>
</tr>
<tr>
<td>long</td>
<td>ISampleMaxValue</td>
<td>Max value if any (-1 = no max value).</td>
</tr>
</tbody>
</table>

Returns
NIMQOS handle on success or NULL on failure.

See also
NimQoSFree, nimQosSendValue

nimQoSCreateAsynch

Signature

NIMQOS *nimQoSCreateAsynch(char *pchQoS, char *pchSource, double dSampleMaxValue);

Description
Creates an asynchronous QoS object, which is one that is not collected on an interval like regular QoS objects.
QoS methods

Parameters

<table>
<thead>
<tr>
<th>char</th>
<th>*pchQoS</th>
<th>QoS name</th>
</tr>
</thead>
<tbody>
<tr>
<td>char</td>
<td>*pchSource</td>
<td>QoS source</td>
</tr>
<tr>
<td>double</td>
<td>dSampleMaxValue</td>
<td>Maximum value that is valid for this QoS</td>
</tr>
</tbody>
</table>

See also
nimQoSCreate, nimQoSFree

nimQoSDefinition

Signature

```c
int nimQoSDefinition(char *pchName, char *pchGroup, char *pchDescription, char *pchUnit, char *pchUnitShort, int bMax, int bBool);
```

Description
Send a new QoS definition that describes a new QoS type. Typically sent once when the probe starts.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>pchName</th>
<th>QoS name on the form QOS &lt;SOMETHING&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>pchGroup</td>
<td>QoS group on the form QOS &lt;SOMETHING&gt;</td>
</tr>
<tr>
<td>char *</td>
<td>pchDescription</td>
<td>QoS description</td>
</tr>
<tr>
<td>char *</td>
<td>pchUnit</td>
<td>QoS unit type. E.g. Milliseconds, Megabytes</td>
</tr>
<tr>
<td>char *</td>
<td>pchUnitShort</td>
<td>QoS unit short form. E.g. ms, MB</td>
</tr>
<tr>
<td>int</td>
<td>bMax</td>
<td>Has max value.</td>
</tr>
<tr>
<td>int</td>
<td>bBool</td>
<td>Is Boolean (reports 0 or 1 only)</td>
</tr>
</tbody>
</table>

Returns
NIME_OK on success or an error code on failure.

See also
nimQoSMessage

nimQoSSEndDefinition

Signature

```c
int nimQoSSEndDefinition(char *pchName, char *pchGroup, char *pchDescription, char *pchUnit, char *pchUnitShort, int iFlags);
```

Description
This function replaces the old nimQoSDefinition function, and sends a QOS_DEFINITION message to the NimBUS. The flags can be one of NIMQOS_DEF_NONE, NIMQOS_DEF_BOOLEAN, NIMQOS_DEF_HASMAX, NIMQOS_DEF_ASYNC, NIMQOS_DEF_REDEFINE.
QoS methods

Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Char</td>
<td>*pchName</td>
<td>The name of this QoS</td>
</tr>
<tr>
<td>Char</td>
<td>*pchGroup</td>
<td>The group this QoS belongs to</td>
</tr>
<tr>
<td>Char</td>
<td>*pchDescription</td>
<td>The description of this QoS</td>
</tr>
<tr>
<td>Char</td>
<td>*pchUnit</td>
<td>The unit of measurement this QoS value has (e.g. Megabytes)</td>
</tr>
<tr>
<td>Char</td>
<td>*pchUnitShort</td>
<td>The short version of pchUnit above, used in graphs (e.g. MB)</td>
</tr>
<tr>
<td>int</td>
<td>iFlags</td>
<td>Flags for different types of values.</td>
</tr>
</tbody>
</table>

Note
nimQoSDefinition should be modified to point to the new function and listed as deprecated!

nimQoSFree

Signature
void nimQoSFree(NIMQOS *Handle);

Description
Release the resources allocated in the handle.

Parameters

<table>
<thead>
<tr>
<th>NIMQOS *</th>
<th>Handle</th>
<th>QoS handle</th>
</tr>
</thead>
</table>

Returns
N/A

See also
nimQoSCreate

nimQoSGetSource

Signature
Char *nimQoSGetSource(NIMQOS *Handle);

Description
Returns the source field from the Handle.

Parameters

<table>
<thead>
<tr>
<th>NIMQOS *</th>
<th>Handle</th>
<th>QoS handle</th>
</tr>
</thead>
</table>
**QoS methods**

### nimQoSGetTimer

**Signature**

```c
unsigned long nimQoSGetTimer(NIMQOS *Handle);
```

**Description**

Get the number of milliseconds since nimQoSStart was called. Will return the number of milliseconds up to now even if nimQoSStop was not called.

**Parameters**

<table>
<thead>
<tr>
<th>NIMQOS *</th>
<th>Handle</th>
<th>QoS handle</th>
</tr>
</thead>
</table>

**Returns**

Time in milliseconds.

**See also**

nimQoSSetSampletime, nimQoSStart, nimQoSStop

### nimQoSMessage

**Signature**

```c
int nimQoSMessage(char *pchQoS, char *pchSource, char *pchTarget, long lSampleTime, double dSampleValue, double dSampleStdev, long lSampleRate, long lSampleMax);
```

**Description**

Send a raw QoS message. Use nimQoSCreate, nimQoSsendxxx and nimQoSFree instead.

**Parameters**

<table>
<thead>
<tr>
<th>char *</th>
<th>pchQoS</th>
<th>QoS name</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>pchSource</td>
<td>QoS source</td>
</tr>
<tr>
<td>char *</td>
<td>pchTarget</td>
<td>QoS target</td>
</tr>
<tr>
<td>Long</td>
<td>lSampleTime</td>
<td>Sample time (EPOC)</td>
</tr>
<tr>
<td>double</td>
<td>dSampleValue</td>
<td>Sample value</td>
</tr>
<tr>
<td>double</td>
<td>dSampleStdev</td>
<td>Sample standard deviation</td>
</tr>
<tr>
<td>long</td>
<td>lSampleRate</td>
<td>Sample rate in seconds</td>
</tr>
<tr>
<td>long</td>
<td>lSampleMax</td>
<td>Sample max value or –1 if not applicable</td>
</tr>
</tbody>
</table>

**Returns**

NIME_OK on success or an error code on failure.

**See also**

nimQosDefinition
nimQoSPostMessage

Signature

int nimQoSPostMessage(NIMQOS *Handle, char *pchTarget, double dSampleValue, double dSampleStdev);

Description
The nimQoSSend functions are wrappers to this function which does the sending of QoS messages.

Parameters

<table>
<thead>
<tr>
<th>NIMQOS *</th>
<th>Handle</th>
<th>QoS handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>char</td>
<td>*pchTarget</td>
<td>QoS target</td>
</tr>
<tr>
<td>double</td>
<td>dSampleValue</td>
<td>value of this QoS measurement</td>
</tr>
<tr>
<td>double</td>
<td>dSampleStdev</td>
<td>this QoS measurement’s standard deviation</td>
</tr>
</tbody>
</table>

See also
nimQoSSendValue, nimQoSSendNull, nimQoSSendTimer, nimQoSSendValueStdev

nimQoSSendTimer

Signature

int nimQoSSendTimer(NIMQOS *Handle, char *pchTarget);

Description
Send a QoS message with the time in milliseconds since nimQoSStart was called.

Parameters

<table>
<thead>
<tr>
<th>NIMQOS *</th>
<th>Handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>char</td>
<td>*pchTarget</td>
</tr>
</tbody>
</table>

Returns
NIME_OK on success or an error code on failure.

See also
nimQoSCreate, nimQoSCreate, nimQoSStop

nimQoSSendValue

Signature

int nimQoSSendValue(NIMQOS *Handle, char *pchTarget, long lValue);

Description
Send a QoS message with a given value.
QoS methods

Parameters

<table>
<thead>
<tr>
<th>NIMQOS*</th>
<th>Handle</th>
<th>QoS handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>char*</td>
<td>pchTarget</td>
<td>QoS target</td>
</tr>
<tr>
<td>long</td>
<td>lValue</td>
<td>Sample value</td>
</tr>
</tbody>
</table>

Returns
NIME_OK on success or an error code on failure.

See also
nimQoSSendValueStdev

nimQoSSendValueStdev

Signature

int nimQoSSendValueStdev(NIMQOS* Handle, char* pchTarget, double dValue, double dStdev);

Description
Send a QoS message with a given double value and the sample standard deviation if applicable.

Parameters

<table>
<thead>
<tr>
<th>NIMQOS*</th>
<th>Handle</th>
<th>QoS handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>char*</td>
<td>pchTarget</td>
<td>QoS target</td>
</tr>
<tr>
<td>double</td>
<td>dValue</td>
<td>Sample value</td>
</tr>
<tr>
<td>double</td>
<td>dStdev</td>
<td>Standard deviation. Typical 0</td>
</tr>
</tbody>
</table>

Returns
NIME_OK on success or an error code on failure.

See also
nimQoSSendValue

nimQoSSendNull

Signature

int nimQoSSendNull(NIMQOS* Handle, char* pchTarget);

Description
Send a QoS message with a NULL sample. Used to indicate that the target was unavailable for monitoring.

Parameters

<table>
<thead>
<tr>
<th>NIMQOS*</th>
<th>Handle</th>
<th>QoS handle</th>
</tr>
</thead>
<tbody>
<tr>
<td>char*</td>
<td>pchTarget</td>
<td>QoS target</td>
</tr>
</tbody>
</table>
Returns
NIME_OK on success or an error code on failure.

See also
nimQoSCreate

nimQoSSetSampletime

Signature
Void nimQoSSetSampletime(NIMQOS *Handle, time_t tSampleTime);

Description
Overrides the sampletime in the Handle object. The sampletime is normally set to when the handle object is created, however you may wish to override this to get more exact timing.

Parameters

<table>
<thead>
<tr>
<th>NIMQOS</th>
<th>*Handle</th>
<th>handle to QoS object</th>
</tr>
</thead>
<tbody>
<tr>
<td>time_t</td>
<td>t</td>
<td>SampleTime sampltime value set in Handle</td>
</tr>
</tbody>
</table>

nimQoSSourceIsSet

Signature
Int nimQoSSourceIsSet(void);

Description
(Internal function).

nimQoSHostname

Signature
Char *nimQoSHostname(char *pch, size_t len);

Description
(Internal function) Returns hostname used as source in QoS messages.

nimQoSStart

Signature
void nimQoSStart(NIMQOS *Handle);
QoS methods

**Description**
Start the internal timer.

**Parameters**

| NIMQOS * | Handle | QoS handle |

**Returns**
N/A

**See also**
nimQoSStop, nimQoSSendTimer

**nimQoSStop**

**Signature**

```c
void nimQoSStop(NIMQOS *Handle);
```

**Description**
Stop the internal timer.

**Parameters**

| NIMQOS * | Handle | QoS handle |

**Returns**
N/A

**See also**
nimQosSetSampletime, nimQosSourceIsNet,
Chapter 2: PDS (Portable Data Stream) library

The Portable Data Stream (PDS) library contains a set of functions meant to manipulate machine independent data represented by the PDS object. This object may in turn be used, for instance, to send network independent information from client to server. The data stream built by PDS is an ASCII stream containing elements built using the following format:

<table>
<thead>
<tr>
<th>KEY_NAME</th>
<th>PDS_TYPE</th>
<th>DATA_SIZE</th>
<th>DATA</th>
</tr>
</thead>
</table>

**pdsCopy**

**Signature**

PDS *pdsCopy(PDS *source, PDS **destination);

**Description**

Creates a copy of the Source PDS previously created with pdsCreate() by allocating new memory and copy the PDS contents.

**Parameters**

<table>
<thead>
<tr>
<th>PDS *</th>
<th>source</th>
<th>A pointer to the existing PDS you want to copy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS **</td>
<td>destination</td>
<td>The address of a PDS pointer, which will be set to point to the copy of the source PDS. This parameter is optional.</td>
</tr>
</tbody>
</table>

**Returns**

A pointer to the copy of the source PDS. On allocation error, NULL is returned and pdsError(Source) will return PDS_ERR_MALLOC.

**See also**

pdsCreate(), pdsPut(), pdsGet() and pdsDelete().

**pdsCount**

**Signature**

int pdsCount(PDS *pds);

**Description**

This convenience function will return the number of PDS elements in the specified PDS object.

**Parameters**

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>Pointer to an existing PDS.</th>
</tr>
</thead>
</table>
Returns
The number of elements found in \textit{pds}.

See also
\textit{pdsPut()}, \textit{pdsGet()} and \textit{pdsCreate()}.

\textbf{pdsCreate}

Signature
\begin{verbatim}
PDS *pdsCreate();
\end{verbatim}

Description
This function is a convenience function on top of \textit{pdsCreateSize()}, and will create a PDS with data size 1024 bytes.

Parameters
None

Returns
A pointer to the new PDS, or NULL.

See also
\textit{pdsPut()}, \textit{pdsGet()}, \textit{pdsDelete()} and \textit{pdsCreate()}.

\textbf{pdsCreateSize}

Signature
\begin{verbatim}
PDS *pdsCreateSize(int size);
\end{verbatim}

Description
This function creates a PDS object and allocates size space for data.

Parameters
\begin{tabular}{|l|l|}
\hline
PDS * & source & A pointer to the existing PDS you want to copy. \\
\hline
PDS ** & destination & The address of a PDS pointer, which will be set to point to the copy of the source PDS. This parameter is optional. \\
\hline
\end{tabular}

Returns
A pointer to the new PDS, or NULL.

See also
\textit{pdsPut()}, \textit{pdsGet()}, \textit{pdsDelete()} and \textit{pdsCreate()}.
pdsDelete

Signature
int pdsDelete(PDS *pds);

Description
This function will free the data related to the provided PDS handle previously created by pdsCreate().

Parameters

| PDS * | pds | A pointer to an existing PDS you want to delete. |

Returns
PDS_ERR_NONE on success and PDS_ERR if the pds pointer does not point to an existing PDS.

See also
pdsCreate()

pdsDump

Signature
int pdsDump(PDS *pds);

Description
This function will run through the PDS, element for element and print the name, type, size and some of the data of the current PDS.

Parameters

| PDS * | pds | A pointer to an existing PDS. |

Returns
PDS_ERR_NONE on success and PDS_ERR on error.

See also
pdsCreate(), pdsPut() and pdsPrintf().

pdsExpand

Signature
char *pdsExpand(PDS *pds, char *format, ...);
    /* optional parameter: char *missing_value */

Description
This function will expand the variables prefixed by 'S' in the PDS stream.
QoS methods

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>format</td>
<td>String containing variable names prefixed with ‘S’.</td>
</tr>
<tr>
<td>char *</td>
<td>missing_value</td>
<td>Optional parameter.</td>
</tr>
</tbody>
</table>

Returns
On success, a pointer to an allocated buffer, and on error NULL.

pdsFreeTable

Signature

void pdsFreeTable(PDStype t, void **table);

Description
This function will free data allocated by the PDS library. Supported types: PDS_PPCH, PDS_PI, PDS_PL and PDS_PPDS.

Parameters

<table>
<thead>
<tr>
<th>PDStype</th>
<th>t</th>
<th>The type of data to be freed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>void **</td>
<td>table</td>
<td>The actual data to be freed.</td>
</tr>
</tbody>
</table>

pdsGet

Signature

int pdsGet(PDS *pds, PDStype t, char *key, void *d);

Description
This function will get the next element pointed to by the 'get' pointer within the PDS object.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDStype</td>
<td>t</td>
<td>The type of element to fetch.</td>
</tr>
<tr>
<td>char *</td>
<td>key</td>
<td>The name, which refers to the element being fetched.</td>
</tr>
<tr>
<td>void *</td>
<td>d</td>
<td>Address to a pointer, which will be set to the element.</td>
</tr>
</tbody>
</table>

Returns
The size will be returned for PDS_VOID and PDS_PDS, otherwise 0 on success and 1 on error. Use pdsError to get the actual error code.

The error code returned can be:
PDS_ERR_ILLTYPE - Protocol error (type error). PDS_ERR_ILLARG - Illegal input value.
PDS_ERR_MALLOC - Unable to allocate memory. PDS_ERR_BOUNDS - Data transmission error.
PDS_ERR_NOMATCH - No matching key in PDS.
Example:

```c
PDS *pds;
int i;

// ********************************************
// GET INTEGER FROM STREAM, NAMED/TAGGED VALUE. pdsGet(pds, PDS_INT, "value", i, 0);
// ***************************************************
// GET CURRENT INTEGER FROM STREAM, IGNORING THE NAME.
pdsGet(pds, PDS_INT, NULL, &i);

// Get next data in stream

All tables PI, PPI, PCH, PPCH, PF, PPF are Null terminated.

See also
pdsCount(), pdsCreate() and pdsCount().
```

### pdsGetData

**Signature**

```c
void *pdsGetData(PDS *pds, char *key, PDStype t);
```

**Description**

This function will extract the data acc. to key (or NULL if next element in PDS), and convert it according to the type parameter. The data returned must be freed by the caller. The following type specifiers will return:
- PDS_PCH - Pointer to null-terminated string
- PDS_INT - Pointer to number (int)
- PDS_FLOAT - Pointer to double (double)

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS * pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char * key</td>
<td>The name of the element to fetch.</td>
</tr>
<tr>
<td>PDStype t</td>
<td>The type of the element to fetch.</td>
</tr>
</tbody>
</table>

**Returns**

The element fetched or NULL. On NULL return, use pdsError() to get the error code.

**See also**

pdsPut() and pdsGet().
pdsGetNext

**Signature**

```c
int pdsGetNext(PDS *pds, char **key, PDStype *type, long *size, void **data);
```

**Description**

This function will use the current 'get' position as the starting point for element extraction. Please use the pdsRewind() function prior to the first pdsGetNext() call. Note that if no pdsGet() or any of the pdsGet convenience functions (e.g. pdsGet_INT) have been used, then the get pointer is initiated to the start of the PDS buffer.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pds</td>
<td>PDS *</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>key</td>
<td>char **</td>
<td>Pointer to the address to get the element key.</td>
</tr>
<tr>
<td>type</td>
<td>PDStype *</td>
<td>Pointer to a variable, which gets the element type.</td>
</tr>
<tr>
<td>size</td>
<td>long *</td>
<td>Pointer to a variable, which gets the element size</td>
</tr>
<tr>
<td>data</td>
<td>void **</td>
<td>Pointer to an address, which gets the actual element.</td>
</tr>
</tbody>
</table>

**Returns**

PDS_ERR_NONE on success or PDS_ERR on error. Use pdsError() to get the specific error code.

**See also**
pdsGet(), pdsScanf(), pdsCreate() and pdsRewind()

pdsCfgRead

**Signature**

```c
int pdsCfgRead(char *filename, PDS **pds);
```

**Description**

This function will parse a given .cfg file into a PDS structure where each section becomes a PDS with the full section path as its name. `pds` will be created, even if the configuration file is empty.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>filename</td>
<td>char *</td>
<td>The name of the configuration file to be read</td>
</tr>
<tr>
<td>pds</td>
<td>PDS **</td>
<td>The address of a PDS pointer, which will be set to the allocated PDS.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, on error PDS_ERR_IllARG – illegal arguments or PDS_ERR_NOMATCH – no such file.

**See also**
pdsCreate()
**pdsGet_PPDS**

**Signature**

```c
int pdsGet_PPDS(PDS *pds, char *key, PDS ***pppPds);
```

**Description**

This convenience function will extract the PDS table named key (or the next element if key is NULL), and return a pointer to an allocated table of PDS structures provided by this API.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS</td>
<td>pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>PDS ***</td>
<td>pppPds</td>
<td>A pointer to a PDS table pointer.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, on error PDS_ERR. The specific error code is returned with pdsError().

See also:
pdsGet(), pdsScanf() and pdsCreate()

**pdsGet_PDS**

**Signature**

```c
int pdsGet_PDS(PDS *pds, char *key, PDS **ppds);
```

**Description**

This convenience function will extract the PDS element named key (or the next element if key is NULL), and return a pointer to an allocated PDS structure provided by this API.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS</td>
<td>pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>PDS</td>
<td>ppds</td>
<td>A pointer to a PDS pointer.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, on error PDS_ERR. The specific error code is found with pdsError().

See also:
pdsGet(), pdsScanf() and pdsCreate().
### pdsGet_CPDS

**Signature**

```c
int pdsGet_CPDS(PDS *pds, char *key, PDS **ppds);
```

**Description**

This convenience function will extract the PDS element named key (or the next element if key is NULL), and return a pointer to an allocated PDS structure provided by this API.

**Parameters**

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>PDS **</td>
<td>ppds</td>
<td>A pointer to an existing PDS into which the PDS element is opened.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

**See also**

pdsGet(), pdsScanf() and pdsCreate().

### pdsGet_VOID

**Signature**

```c
int pdsGet_VOID(PDS *pds, char *key, void **data, long *size);
```

**Description**

This convenience function will extract the PDS element named key (or the next element if key is NULL), and return a pointer to a all ocated buffer provided by this API. The size of the data is returned in the address provided by the 'size' parameter.

**Parameters**

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>void **</td>
<td>data</td>
<td>A pointer to an address, which will get the address of, the data returned.</td>
</tr>
<tr>
<td>long *</td>
<td>size</td>
<td>The size of the data returned.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

**See also**

pdsGet(), pdsScanf() and pdsCreate().
pdsGet_RGCH

Signature
int pdsGet_RGCH(PDS *pds, char *key, char *pch, long size);

Description
This convenience function will extract the PDS element named key (or the next element if key is NULL), and
copy the contents into a preallocated buffer of length len, provided by the caller.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>char *</td>
<td>pch</td>
<td>A pointer to an existing character buffer.</td>
</tr>
<tr>
<td>long</td>
<td>size</td>
<td>The size of the character buffer.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsGet(), pdsScanf() and pdsCreate().

pdsGet_CPCH

Signature
int pdsGet_CPCH(PDS *pds, char *key, char **ppch);

Description
This convenience function will extract the PDS element named key (or the next element if key is NULL), and
return a pointer to the where the actual PDS buffer element is.
NOTE. Do not modify the contents of this data (unless you know what you're doing...)

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>char **</td>
<td>ppch</td>
<td>A pointer to the address of a character pointer.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsGet(), pdsScanf() and pdsCreate().
pdsGet_PCH

**Signature**

```c
int pdsGet_PCH(PDS *pds, char *key, char **ppch);
```

**Description**

This convenience function will extract the PDS element named key (or the next element if key is NULL), and return a pointer to an allocated buffer provided by this API.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS *</td>
<td>pds</td>
</tr>
<tr>
<td>char *</td>
<td>key</td>
</tr>
<tr>
<td>char **</td>
<td>ppch</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

**See also**

pdsGet(), pdsScanf() and pdsCreate().

pdsGet_PPCH

**Signature**

```c
int pdsGet_PPCH(PDS *pds, char *key, char ***pppch);
```

**Description**

This convenience function will extract the PDS element named key (or the next element if key is NULL), and return a pointer to an allocated buffer provided by this API. This buffer is a null-terminated string table.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS *</td>
<td>pds</td>
</tr>
<tr>
<td>char *</td>
<td>key</td>
</tr>
<tr>
<td>char ***</td>
<td>pppch</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

**See also**

pdsGet(), pdsScanf() and pdsCreate()
**pdsGet_INT**

**Signature**

```c
int pdsGet_INT(PDS *pds, char *key, int *pi);
```

**Description**

This convenience function will extract the PDS element named `key` (or the next element if `key` is NULL), and return the value of the integer in the address pointed to by `data`.

**Parameters**

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>int *</td>
<td>pi</td>
<td>An address of an integer pointer.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

**See also**

pdsGet(), pdsScanf() and pdsCreate()

**pdsGet_PI**

**Signature**

```c
int pdsGet_PI(PDS *pds, char *key, int **ppi);
```

**Description**

This convenience function will extract the PDS element named `key` (or the next element if `key` is NULL), and return a pointer to an allocated integer, in the address pointed to by `ppi`.

**Parameters**

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>int **</td>
<td>ppi</td>
<td>A pointer to a pointer to an allocated integer.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

**See also**

pdsGet(), pdsScanf() and pdsCreate().
pdsGet_LONG

Signature

```
int pdsGet_LONG(PDS *pds, char *key, long *pl);
```

Description

This convenience function will extract the PDS element named `key` (or the next element if `key` is NULL), and return the value of the long integer in the address pointed to by `pl`.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS * pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char * key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>long * pl</td>
<td>A pointer to a long.</td>
</tr>
</tbody>
</table>

Returns

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also

pdsGet(), pdsScanf() and pdsCreate()

pdsGet_PL

Signature

```
int pdsGet_PL(PDS *pds, char *key, long **ppl);
```

Description

This convenience function will extract the PDS element named `key` (or the next element if `key` is NULL), and return a pointer to an allocated long integer, in the address pointed to by `data`.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS * pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char * key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>long ** ppl</td>
<td>The address of a pointer to a long.</td>
</tr>
</tbody>
</table>

Returns

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also

pdsGet(), pdsScanf() and pdsCreate()
pdsGet_F

Signature
int pdsGet_F(PDS *pds, char *key, double *pd);

Description
This convenience function will extract the PDS element named key (or the next element if key is NULL), and return the value of the double in the address pointed to by pd.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key to the element to be returned.</td>
</tr>
<tr>
<td>double *</td>
<td>pd</td>
<td>The address of a double.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsGet(), pdsScanf() and pdsCreate()

pdsGet_SIZE

Signature
int pdsGet_SIZE(PDS *pds, char *key, size_t *ps);

Description
See description for other pdsGet functions.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>*pds</th>
<th>The PDS to read the value from</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>*key</td>
<td>The key that contains the size_t value we want to read.</td>
</tr>
<tr>
<td>size_t *</td>
<td>*ps</td>
<td>The address of a size_t variable to fill in with the value</td>
</tr>
</tbody>
</table>

See also
pdsPut_SIZE

pdsGet_TIME

Signature
int pdsGet_TIME(PDS *pds, char *key, time_t *pt);

Description
See description for other pdsGet functions.
**Parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS *pds</td>
<td>The PDS to read the value from</td>
</tr>
<tr>
<td>char *key</td>
<td>The key that contains the time_t value we want to read.</td>
</tr>
<tr>
<td>time_t *pt</td>
<td>The address of a time_t variable to fill in with the value.</td>
</tr>
</tbody>
</table>

**See also**

pdsPut_TIME

### pdsGetTable

**Signature**

```c
int pdsGetTable(PDS *pds, PDStype t, char *key, int index, void *value);
```

**Description**

This function is the companion function of pdsPutTable(). It will extract table elements according to the index. The index is incremented on each run, by pdsGetTable. If idx is -1, it cleans the static temporary PDS.

**Parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS *pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>PDStype t</td>
<td>The type of elements in the table. (PDS_CPCH, PDS_PCH, PDS_INT, PDS_PDS, PDS_CPDS)</td>
</tr>
<tr>
<td>char *key</td>
<td>The table name.</td>
</tr>
<tr>
<td>int index</td>
<td>Which element to get. The first element has index 0.</td>
</tr>
<tr>
<td>void *value</td>
<td>Pointer to an address, which will receive the table element.</td>
</tr>
</tbody>
</table>

**Returns**

On success: PDS_ERR_NONE, on error: PDS_ERR_ILLARG, PDS_ERR_ILLTYPE, PDS_ERR_NOMATCH or PDS_ERR_MALLOC.

**See also**

pdsPutTable()

### pdsMap

**Signature**

```c
PDS *pdsMap (PDS *pds, char *data, int size);
```

**Description**

This function will map an existing buffer into a PDS structure, and mark the data area as protected. If pds is NULL, a new PDS structure is allocated, and mapped with the buffer data. If a pds parameter is given with a PDS, which has been created by pdsCreate(), then its data is freed before the mapping. Note that the data is freed together with the PDS when pdsDelete() is called.
Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>Optional pointer to an existing PDS. If NULL is specified, a new PDS is created.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char*</td>
<td>data</td>
<td>The data section of the PDS is replaced with the given data.</td>
</tr>
<tr>
<td>init</td>
<td>size</td>
<td>Size of the data specified above.</td>
</tr>
</tbody>
</table>

Returns
Pointer to the updated PDS.

See also
pdsGet(), pdsCreate(), pdsPut() and pdsDelete()

pdsPrintf

Signature

```c
int pdsPrintf(PDS *pds, char *format, ...);
```

Description
This function is equivalent to fprintf, in terms of how data is stored into a stream. The parameters passed on to the function should map on a one-to-one basis with the elements in the formatting string. The formatting specifiers are the same as the ones in pdsScanf().

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char*</td>
<td>format</td>
<td>A text string describing the information you want to store. See below for a more detailed description.</td>
</tr>
</tbody>
</table>

Returns
PDS_ERR_NONE on success and PDS_ERR on failure. On failure, pdsError(pds) will give more information.

Example

```c
int i;
char *name;
PDS *pds;
If (pds=pdsCreate())
    pdsPrintf(pds, “name, age%d”, name, i);
```

See also
pdsScanf(), pdsCreate()
pdsPutTable

**Signature**

```c
int pdsPutTable(PDS *pds, PDStype t, char *key, void *value);
```

**Description**

This function will generate indexed elements, from zero (0) and upwards. The table equivalent of the type is used as the target PDS. For instance will a type of PDS_PCH give a table of type PDS_PPCH.

**Example**

```c
PDS *pds;
char *ppch;
pds = pdsCreate();
pdsPutTable(pds, PDS_PCH, "name", "Ole");
pdsPutTable(pds, PDS_PCH, "name", "Dole");
pdsPutTable(pds, PDS_PCH, "name", "Doffen");
pdsPutTable(pds, PDS_PCH, "name", "Donald");
pdsDump(pds);
pdsGet_PPCH(pds, "names", &ppch);
```

**Parameters**

<table>
<thead>
<tr>
<th><strong>Parameter</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS *pds</td>
<td>A pointer to an existing PDS into which the elements are to be inserted.</td>
</tr>
<tr>
<td>PDStype t</td>
<td>The type of table elements supplied. The supported types are PDS_PCH, PDS_INT and PDS_PDS.</td>
</tr>
<tr>
<td>char *key</td>
<td>The table name.</td>
</tr>
<tr>
<td>void *value</td>
<td>Pointer to an element to be added to the table.</td>
</tr>
</tbody>
</table>

**Returns**

On success: PDS_ERR_NONE, on error: PDS_ERR_I LLARG, PDS_ERR_I LLTYPE.

**See also**

pdsGet_TIME, odsGetTable, pdsDump.

pdsPut

**Signature**

```c
int pdsPut(PDS *pds, PDStype t, char *key, void *d, long l);
```
**Description**  
This function will put the data \( d \) of size \( l \) into the PDS stream pointed to by the supplied PDS handle. The data that is packed into the PDS stream, may be extracted by calling pdsGet() or any of the pdsGet_ macros defined in pds.h.

You may use the following types:

- **PDS_I** - integer
- **PDS_PI** - integer pointer
- **PDS_PPI** - pointer to integer pointer
- **PDS_RGI** - pointer to an existing integer
- **PDS_RGPI** - pointer to an integer array
- **PDS_CH** - character
- **PDS_PCH** - 0-terminated string
- **PDS_PPCH** - pointer to 0-terminated string
- **PDS_RGCH** - pointer to a character buffer
- **PDS_RGPCH** - pointer to a character array buffer
- **PDS_F** - floating point number
- **PDS_PF** - floating point number pointer
- **PDS_PPF** - pointer to point number pointer
- **PDS_RGF** - pointer to a floating point number
- **PDS_RGPF** - pointer to a floating point number array
- **PDS_VOID** - raw byte data
- **PDS_SEP** - no data

The following convenience functions are available:

- `pdsPut_PCH (pds, pch)`
- `pdsPut_PPCH (pds, ppch)`
- `pdsPut_INT (pds, i)`

**Parameters**

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS into which to add the element.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDSTYPE</td>
<td>t</td>
<td>Type of element to be added</td>
</tr>
<tr>
<td>char *</td>
<td>key</td>
<td>The key to use to refer to the element.</td>
</tr>
<tr>
<td>void *</td>
<td>d</td>
<td>The element to be added.</td>
</tr>
<tr>
<td>long *</td>
<td>l</td>
<td>The size of the element to be added.</td>
</tr>
</tbody>
</table>

**Returns**

0 on success and 1 on error. Use pdsError to get the actual error code.

**See also**

pdsGet(), pdsCreate() and pdsPut().

**pdsPut_PDS**

**Signature**

```c
int pdsPut_PDS(PDS *pds, char *key, PDS *dpds);
```
**Description**
This convenience function will add a PDS element to an existing PDS. The element can later be referenced with the *key*.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS</td>
<td>pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>PDS</td>
<td>dpds</td>
<td>A pointer to a PDS.</td>
</tr>
</tbody>
</table>

**Returns**
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate() and pdsPut()

**pdsPut_PPDS**

**Signature**

```c
int pdsPut_PPDS(PDS *pds, char *key, PDS *dpds);
```

**Description**
This convenience function will add an encapsulated PDS table to an existing PDS. The element can later be referenced with the *key*.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS</td>
<td>pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>PDS</td>
<td>dpds</td>
<td>The encapsulated PDS table to be added.</td>
</tr>
</tbody>
</table>

**Returns**
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate() and pdsPut()

**pdsPut_VOID**

**Signature**

```c
int pdsPut_VOID(PDS *pds, char *key, void *d, long size);
```

**Description**
This convenience function will add byte data to an existing PDS. The data can later be referenced with the *key*. 
Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>void *</td>
<td>d</td>
<td>A pointer to the byte data to be added.</td>
</tr>
<tr>
<td>long</td>
<td>size</td>
<td>The size of the data to be added.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate() and pdsPut()

**pdsPut_RGCH**

Signature

```c
int pdsPut_RGCH(PDS *pds, char *key, char *pch, long size);
```

Description
This convenience function will add a string to an existing PDS. The string can later be referenced with the `key`.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>char *</td>
<td>pch</td>
<td>The string to be added.</td>
</tr>
<tr>
<td>long</td>
<td>size</td>
<td>The size of the string to be added.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate() and pdsPut()

**pdsPut_PCH**

Signature

```c
int pdsPut_PCH(PDS *pds, char *key, char *pch);
```

Description
This convenience function will add a 0-terminated string to an existing PDS. The string can later be referenced with the `key`. 
Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>char *</td>
<td>ppch</td>
<td>The 0-terminated string to be added.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate() and pdsPut()

pdsPut_PPCH

Signature

```
int pdsPut_PPCH(PDS *pds, char *key, char **ppch);
```

Description
This convenience function will add a string table to an existing PDS. The string table can later be referenced with the key.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>char **</td>
<td>ppch</td>
<td>The string table to be added.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate, pdsPutTable

pdsPut_INT

Signature

```
int pdsPut_INT(PDS *pds, char *key, int i);
```

Description
This convenience function will add an integer to an existing PDS. The integer can later be referenced with the key.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>int</td>
<td>i</td>
<td>The integer to be added.</td>
</tr>
</tbody>
</table>
Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate() and pdsPut()

**pdsPut_PPI**

Signature
```c
int pdsPut_PPI(PDS *pds, char *key, int *pi);
```

Description
This convenience function will add an integer table to an existing PDS. The integer table can later be referenced with the `key`.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>int *</td>
<td>pi</td>
<td>The integer table to be added.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate, pdsPutTable

**pdsPut_LONG**

Signature
```c
int pdsPut_LONG(PDS *pds, char *key, long l);
```

Description
This convenience function will add a long to an existing PDS. The long can later be referenced with the `key`.

Parameters

<table>
<thead>
<tr>
<th>PDS *</th>
<th>pds</th>
<th>A pointer to an existing PDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>long</td>
<td>l</td>
<td>The long to be added.</td>
</tr>
</tbody>
</table>

Returns
On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

See also
pdsCreate() and pdsPut()
**pdsPut_PPL**

**Signature**

```c
int pdsPut_PPL(PDS *pds, char *key, long *pl);
```

**Description**

This convenience function will add a long table to an existing PDS. The long table can later be referenced with the `key`.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS *</td>
<td>pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>long *</td>
<td>pl</td>
<td>The long table to be added.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

**See also**

pdsCreate, pdsPutTable

**pdsPut_F**

**Signature**

```c
int pdsPut_F(PDS *pds, char *key, double f);
```

**Description**

This convenience function will add a double to an existing PDS. The double can later be referenced with the `key`.

**Parameters**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS *</td>
<td>pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>char *</td>
<td>key</td>
<td>The key of the element to be added.</td>
</tr>
<tr>
<td>double</td>
<td>f</td>
<td>The double to be added.</td>
</tr>
</tbody>
</table>

**Returns**

On success PDS_ERR_NONE, and on error PDS_ERR. The specific error code is found with pdsError().

**See also**

pdsCreate() and pdsPut()

**Put_SIZE**

**Signature**

```c
int pdsPut_SIZE(PDS *pds, char *key, size_t s);
```
QoS methods

Description
See the descriptions for other pdsPut functions.

Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS</td>
<td>*pds</td>
<td>The PDS to insert the new key/value pair into.</td>
</tr>
<tr>
<td>char</td>
<td>*key</td>
<td>The name of the key.</td>
</tr>
<tr>
<td>size_t</td>
<td>t</td>
<td>The size_t value to insert into the PDS.</td>
</tr>
</tbody>
</table>

Put_TIME

Signature

int pdsPut_TIME(PDS *pds, char *key, time_t t);

Description
See description for other pdsPut functions.

Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS</td>
<td>*pds</td>
<td>The PDS to insert the new key/value pair into.</td>
</tr>
<tr>
<td>char</td>
<td>*key</td>
<td>The name of the key.</td>
</tr>
<tr>
<td>time_t</td>
<td>t</td>
<td>The time_t value to insert into the PDS.</td>
</tr>
</tbody>
</table>

pdsRemove

Signature

int pdsRemove(PDS *pds, char *key);

Description
This function will remove the element named key from the PDS stream.

Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS</td>
<td>*pds</td>
<td>A pointer to an existing PDS.</td>
</tr>
<tr>
<td>Char</td>
<td>*key</td>
<td>The name of a key existing in the given PDS.</td>
</tr>
</tbody>
</table>

Returns
PDS_ERR_NONE if the element is successfully removed, and PDS_ERR if it is not found.

See also
pdsCreate() and pdsSet()
**pdsRewind**

**Signature**

```c
int pdsRewind(PDS *pds);
```

**Description**

This function will reinitialize the get pointer within the PDS object. This function is used when you want to perform multiple gets on the PDS.

**Parameters**

| PDS * | pds | A pointer to an existing PDS. |

**Returns**

PDS_ERR_NONE on success, PDS_ERR if the PDS does not exist.

**See also**

pdsCreate(), pdsPut(), pdsGet() and pdsReset()

---

**pdsReset**

**Signature**

```c
int pdsReset(PDS *pds);
```

**Description**

This function will reinitialize the PDS object, to an empty buffer, and initial pointer settings. If you wish to reset the get pointer please use the pdsRewind() function. This function will wipe out your data. The buffer is not reallocated.

**Parameters**

| PDS * | pds | A pointer to an existing PDS. |

**Returns**

PDS_ERR_NONE on success, PDS_ERR if the PDS does not exist.

**See also**

pdsCreate(), pdsPut(), pdsGet() and pdsRewind()

---

**pdsSet**

**Signature**

```c
PDS *pdsSet(char *data, int size);
```

**Description**

This function will create a new PDS stream just like pdsCreate(), but it will set the provided data as the data
stream. It is useful when a stream has been stored in for instance a database and extracted for dissection. Note that a new memory area is allocated, into which the data specified is copied.

**Parameters**

<table>
<thead>
<tr>
<th>char *</th>
<th>data</th>
<th>The data, which will be set in the PDS that was created.</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>size</td>
<td>The size of the above data.</td>
</tr>
</tbody>
</table>

**Returns**

A pointer to a new PDS, or NULL.

**See also**

pdsCreate(), pdsPut(), pdsGet() and pdsDelete()

**pdsScanf**

| Signature | int pdsScanf(PDS *pds, char *format, ...); |

**Description**

This function will extract (and convert) data from the provided PDS, using the format string. In other words, you may extract a PDS_PCH as an integer, long or double using the formatting codes. You may only extract / convert the following types: PDS_PCH, PDS_RGCH, PDS_I, and PDS_F.

The following formatting codes are supported:

<table>
<thead>
<tr>
<th>%s</th>
<th>string</th>
<th>stored in char **</th>
</tr>
</thead>
<tbody>
<tr>
<td>%b</td>
<td>string</td>
<td>copied to buffer pointed to by char *</td>
</tr>
<tr>
<td>%d</td>
<td>decimal</td>
<td>stored in int *</td>
</tr>
<tr>
<td>%l</td>
<td>decimal</td>
<td>stored in long *</td>
</tr>
<tr>
<td>%f</td>
<td>float</td>
<td>stored in double *</td>
</tr>
<tr>
<td>%T</td>
<td>PDS data type</td>
<td>stored in int *</td>
</tr>
<tr>
<td>%L</td>
<td>PDS data length</td>
<td>stored in int *</td>
</tr>
</tbody>
</table>

In addition to the formatting specifier, you may indicate the length of the storage area as done with scanf().
Example

```c
PDS *pds;
int iAge;
char *pchName, szAge[20];

pds = pdsCreate();
pdsPut_PCH(pds, "name", "Test user");
pdsPut_INT(pds, "age", 35);

pdsScanf(pds, "name,age%10b,age%d", pchName, szAge, &iAge);
pdsDelete(pds);
```

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS *</td>
<td>A pointer to an existing PDS from which you want to extract information.</td>
</tr>
<tr>
<td>char *</td>
<td>A text string describing the information you want to extract. See below for a more detailed description.</td>
</tr>
</tbody>
</table>

Returns

PDS_ERR_NONE on success and PDS_ERR on failure. On failure pdsError(pds) will give more information.

See also

pdsPrintf(), pdsGet()

CFG - The configuration library

cfgClose

Signature

```c
int cfgClose(cfgHandle *cfgh);
```

Description

If the contents of the configuration have changed then these changes are written back to the configuration file, if it was no opened as read-only. Memory allocated to the cfgHandle structure is freed.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle *</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
</tbody>
</table>

Returns

TRUE on success
FALSE if an error occurred.

See also
cfgOpen

cfgOpen

Signature
cfgHandle * cfgOpen(char *pchFile, int bReadOnly);

Description
cfgOpen opens a configuration file and reads the contents of that file into a cfgHandle structure. If bReadOnly is FALSE the file is opened in read-write mode. If the user does not have read-write access to the call will fail. If the user does not have read access to the file, or the file does not exist, the call will fail.

The pointer to the cfgHandle structure, which is returned, is used by the rest of the configuration handling functions.

Parameters

<table>
<thead>
<tr>
<th>char * pchFile</th>
<th>String containing the name of the file that should be opened. The path will be relative to the program location unless a full path is specified.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int bReadOnly</td>
<td>Opens the file in read mode if TRUE, in read-write mode if FALSE.</td>
</tr>
</tbody>
</table>

Returns
A pointer to a cfgHandle structure is returned if the file is read successfully. A NULL pointer is returned if an error occurs.

See also
cfgClose

cfgKeyWrite

Signature
int cfgKeyWrite(cfgHandle *cfgh, char *sec, char *key, char *val);

Description
cfgKeyWrite will insert or change a value in a section. If the section does not exist it is created. If the key exists the value is changed otherwise the key and value are added to the section. If value (val) is NULL the key is created with out a value. If key is NULL only the section is created.

Parameters

<table>
<thead>
<tr>
<th>cfgHandle* cfgh</th>
<th>A pointer to a structure containing the configuration data.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char * sec</td>
<td>The section name that the key belongs to.</td>
</tr>
</tbody>
</table>
### cfgKeyWriteInt

#### Signature
```c
int cfgKeyWriteInt(cfgHandle *cfgh, char *sec, char *key, int val);
```

#### Description
`cfgKeyWriteInt` is a convenience function on top of `cfgKeyWrite`. Since `cfgKeyWrite` takes a `char *` as the value a conversion routine was required. This function does the conversion for you and then calls `cfgKeyWrite`.

#### Parameters
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cfgHandle*</code></td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td><code>char *</code></td>
<td><code>sec</code> The section name that the key belongs to.</td>
</tr>
<tr>
<td><code>char *</code></td>
<td><code>key</code> The name of the key.</td>
</tr>
<tr>
<td><code>int</code></td>
<td><code>val</code> The value of the key.</td>
</tr>
</tbody>
</table>

#### Returns
TRUE on success
FALSE if an error occurred.

#### See also
`cfgOpen`, `cfgKeyRead`, `cfgKeyWriteInt`, `cfgKeyRename`, `cfgKeyWriteDouble`

### cfgKeyWriteLong

#### Signature
```c
int cfgKeyWriteLong(cfgHandle *cfgh, char *sec, char *key, long val);
```

#### Description
`cfgKeyWriteLong` is a convenience function on top of `cfgKeyWrite`. Since `cfgKeyWrite` takes a `char *` as the value a conversion routine was required. This function does the conversion for you and then calls `cfgKeyWrite`.

#### Parameters
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cfgHandle*</code></td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td><code>char *</code></td>
<td><code>sec</code> The section name that the key belongs to.</td>
</tr>
<tr>
<td><code>char *</code></td>
<td><code>key</code> The name of the key.</td>
</tr>
<tr>
<td><code>long</code></td>
<td><code>val</code> The value of the key.</td>
</tr>
</tbody>
</table>

#### Returns
TRUE on success
FALSE if an error occurred.

#### See also
`cfgOpen`, `cfgKeyRead`, `cfgKeyWrite`, `cfgKeyWriteLong`, `cfgKeyWriteDouble`
Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>cfgh</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char *</td>
<td>sec</td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td>char *</td>
<td>key</td>
<td>The name of the key.</td>
</tr>
<tr>
<td>long</td>
<td>val</td>
<td>The value of the key.</td>
</tr>
</tbody>
</table>

Returns
TRUE on success
FALSE if an error occurred.

See also
cfgOpen, cfgKeyRead, cfgKeyWrite, cfgKeyWriteInt, cfgKeyWriteDouble

cfgKeyWriteDouble

Signature
int cfgKeyWriteDouble(cfgHandle *cfgh, char *sec, char *key, double val);

Description
cfgKeyWriteLong is a convenience function on top of cfgKeyWrite. Since cfgKeyWrite takes a char * as the value a conversion routine was required. This function does the conversion for you and then calls cfgKeyWrite.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>cfgh</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char *</td>
<td>sec</td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td>char *</td>
<td>key</td>
<td>The name of the key.</td>
</tr>
<tr>
<td>double</td>
<td>val</td>
<td>The value of the key.</td>
</tr>
</tbody>
</table>

Returns
TRUE on success
FALSE if an error occurred.

See also
cfgOpen, cfgKeyRead, cfgKeyWrite, cfgKeyWriteInt, cfgKeyWriteLong

cfgKeyRead

Signature
char * cfgKeyRead(cfgHandle *cfgh, char *sec, char *key);

Description
cfgKeyRead returns an allocated string with the value of the key. Returns NULL if the key or the section does not exist. The user must free the string after use.
Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>char</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char * sec</td>
<td>char</td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td>char * key</td>
<td>char</td>
<td>The name of the key.</td>
</tr>
</tbody>
</table>

Returns

A pointer to an allocated string is returned on success.
A NULL pointer is returned on error.

See also

cfgOpen, cfgKeyWrite, cfgKeyReadInt, cfgKeyReadLong, cfgKeyReadDouble, cfgSectionExist.

cfgKeyReadStr

Signature

char * cfgKeyReadStr (cfgHandle *cfgh, char *sec, char *key, char *def);

Description

Wrapper function for cfgKeyRead which saves you the trouble of doing the conversion from char * to double yourself. Specify the value 'def' which is returned if the key cannot be found.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>char</td>
<td>A pointer to a structure containing the configuration data returned by cfgOpen.</td>
</tr>
<tr>
<td>char * sec</td>
<td>char</td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td>char * key</td>
<td>char</td>
<td>The name of the key to read.</td>
</tr>
<tr>
<td>char * def</td>
<td>char</td>
<td>The default value to use if key does not exist or is blank.</td>
</tr>
</tbody>
</table>

Returns

String with the value of the variable key or def if key does not exist or is blank. NULL if def is not set.

See also

cfgOpen, cfgKeyWrite, cfgKeyReadInt, cfgKeyReadLong, cfgKeyReadDouble, cfgKeyRead.

cfgKeyReadInt

Signature

int cfgKeyReadInt (cfgHandle *cfgh, char *sec, char *key, int def);

Description

cfgKeyReadInt is a convenience function on top of cfgKeyRead. Since cfgKeyRead returns an allocated string conversion needed to be done. This function does the necessary conversion for you and frees the memory allocated in cfgKeyRead automatically.
### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cfgHandle* cfgh</code></td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td><code>char* sec</code></td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td><code>char* key</code></td>
<td>The name of the key.</td>
</tr>
<tr>
<td><code>int def</code></td>
<td>The default value to assign if reading the value of key fails.</td>
</tr>
</tbody>
</table>

### Returns

The value of the key as an integer on success, or the default value `def`.

### See also

`cfgOpen`, `cfgKeyWrite`, `cfgKeyRead`, `cfgKeyReadLong`, `cfgKeyReadDouble`

---

### `cfgKeyReadLong`

**Signature**

```c
long cfgKeyReadLong(cfgHandle* cfgh, char* sec, char* key, long def);
```

**Description**

`cfgKeyReadLong` is a convenience function on top of `cfgKeyRead`. Since `cfgKeyRead` returns an allocated string conversion needed to be done. This function does the necessary conversion for you and frees the memory allocated in `cfgKeyRead` automatically.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cfgHandle* cfgh</code></td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td><code>char* sec</code></td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td><code>char* key</code></td>
<td>The name of the key.</td>
</tr>
<tr>
<td><code>long def</code></td>
<td>The default value to assign if reading the value of key fails.</td>
</tr>
</tbody>
</table>

**Returns**

The value of key as a long on success, or the default value `def`.

### See also

`cfgOpen`, `cfgKeyWrite`, `cfgKeyRead`, `cfgKeyReadInt`, `cfgKeyReadDouble`

---

### `cfgKeyReadDouble`

**Signature**

```c
double cfgKeyReadDouble(cfgHandle* cfgh, char* sec, char* key, double def);
```

**Description**

`cfgKeyReadDouble` is a convenience function on top of `cfgKeyRead`. Since `cfgKeyRead` returns an allocated string conversion needed to be done. This function does the necessary conversion for you and frees the memory allocated in `cfgKeyRead` automatically.
Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char * sec</td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td>char * key</td>
<td>The name of the key.</td>
</tr>
<tr>
<td>double def</td>
<td>The default value to assign if reading the value of key fails.</td>
</tr>
</tbody>
</table>

Returns

The value of the key as a double on success, or the default value def.

See also
cfgOpen, cfgKeyWrite, cfgKeyRead, cfgKeyReadInt, cfgKeyReadLong.

cfgKeyReadYesNo

Signature

#include <string.h>

int cfgKeyReadYesNo(cfgHandle *cfgh, char *sec, char *key, int def);

Description

cfgKeyReadYesNo is a convenience function on top of cfgKeyRead. Since cfgKeyRead returns an allocated string conversion into an integer value (0 or 1) needs to be done. The function will return true (1) if the value is one of the following: yes, true, on, enable, 1. Any other value will return 0. If the function fails to read a value for the given key then the default value is returned.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char * sec</td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td>char * key</td>
<td>The name of the key.</td>
</tr>
<tr>
<td>int def</td>
<td>The default value to assign if reading the value of the key fails.</td>
</tr>
</tbody>
</table>

cfgKeyDelete

Signature

#include <string.h>

int cfgKeyDelete(cfgHandle *cfgh, char *sec, char *key);

Description

cfgKeyDelete will delete a key and its value from a section. The key and the section must exist.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char * sec</td>
<td>The section name that the key belongs to.</td>
</tr>
<tr>
<td>char * key</td>
<td>The name of the key.</td>
</tr>
</tbody>
</table>
Returns
TRUE on success.
FALSE if an error occurred.

See also
cfgOpen, cfgKeyRename, cfgSectionExist.

cfgKeyRename

Signature
int cfgKeyRename(cfgHandle *cfgh, char *sec, char *old_key, char *new_key);

Description
cfgKeyRename will change the name of an existing key, keeping its value unchanged. The section and old_key
must exist, and new_key must not exist. The name of the section cannot be changed with this function. If you
wish to change the name of the section as well as the name of the key then you must use cfgKeyWrite to create
the new section and key, and cfgKeyDelete to remove the existing key.

Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char *</td>
<td>sec</td>
</tr>
<tr>
<td>char *</td>
<td>old_key</td>
</tr>
<tr>
<td>char *</td>
<td>new_key</td>
</tr>
</tbody>
</table>

Returns
TRUE on success.
FALSE if an error occurred.

See also
cfgOpen, cfgKeyWrite, cfgKeyReadYesNo

cfgKeyList

Signature
char ** cfgKeyList(cfgHandle *cfgh, char *sec);

Description
cfgKeyList returns a list of keys found in the specified section as a string table. You can loop through the string
table until you encounter a NULL pointer. It is up to the caller to free the string table after use (both the contents
of the table and the table itself must be freed).

Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>cfgh</td>
</tr>
<tr>
<td>char *</td>
<td>sec</td>
</tr>
</tbody>
</table>

A pointer to a structure containing the configuration data.
The name of the section to list all keys in.
Returns
An allocated string table containing the keys found in the section sec.

See also
cfgOpen, cfgKeyRead, cfgSectionExist, csTblFree.

cfgListWrite

Signature
intcfgListWrite(cfgHandle *cfgh, char *sec, char *key, char **list);

Description
cfgListWrite will replace a section with the contents of the stringtable list. Each entry in the string table will be treated as a value. The key names are generated in such a way that if e.g. key is “file” then the first entry in the string table will have the key “file_0”, the second entry will have the key “file_1” and so on.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char *</td>
<td>sec The name of the section to add the table values to</td>
</tr>
<tr>
<td>char *</td>
<td>key The basis name for the keys that are generated.</td>
</tr>
<tr>
<td>char **</td>
<td>list The string table containing values that are to be added.</td>
</tr>
</tbody>
</table>

Returns
TRUE on success.
FALSE if an error occurred.

See also
cfgOpen, cfgListRead, cfgKeyRead, cfgSectionExist.

cfgListRead

Signature
char **cfgListRead(cfgHandle *cfgh, char *sec);

Description
cfgListRead reads the section specified and returns the list of values as a string table. The user must free the string table after use, both the values and the table itself.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>cfgh A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char *</td>
<td>sec The name of the section to add the table values to</td>
</tr>
</tbody>
</table>

Returns
An allocated string table containing the values found in the section sec. A NULL pointer is returned if the section does not exist or is empty.
See also
cfgOpen, cfgListWrite, cslTblFree.

cfgSaveAs

Signature
int cfgSaveAs(cfgHandle *cfgh, const char *newfile);

Description
cfgSaveAs will save the contents of the configuration to a new file, storing the new file name in the cfgHandle structure. The old filename is discarded.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>const char*</td>
<td>The name of the file that the configuration data should be saved as.</td>
</tr>
<tr>
<td>newfile</td>
<td></td>
</tr>
</tbody>
</table>

Returns
TRUE on success.
FALSE if an error occurred.

See also
cfgClose, CfgSectionMoveLast

CfgSectionMoveLast

Signature
int CfgSectionMoveLast(cfgHandle *cfgh, char *sec);

Description
cfgSectionMoveLast will move the specified section to the end of the configuration. Note that the cfgh handle must have been opened with write permissions.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char*</td>
<td>The name of the section to move within the configuration data.</td>
</tr>
<tr>
<td>sec</td>
<td></td>
</tr>
</tbody>
</table>

Note
There are several functions in the header file that begin with _cfg and which are internal functions not for use outside the library.
cfgSectionDelete

**Signature**

```c
int cfgSectionDelete(cfgHandle *cfgh, char *sec);
```

**Description**

Deletes a section in the configuration file. Returns an error if the section does not exist.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgh</td>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>sec</td>
<td>char *</td>
<td>The name of the section to delete.</td>
</tr>
</tbody>
</table>

**Returns**

TRUE on success
FALSE if an error occurred.

**See also**

cfgOpen, cfgKeyReadYesNo

cfgSectionRename

**Signature**

```c
int cfgSectionRename(cfgHandle *cfgh, char *from_sec, char *to_sec);
```

**Description**

cfgSectionRename will change the name of a section. It will return an error if the section does not exist. You must specify the full section path in the from_sec parameter, but only the section name in the to_sec. NOTE: You can get two sections with the same name if you change to a section name that already exists at the same level.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgh</td>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>from_sec</td>
<td>char *</td>
<td>The old name of the section.</td>
</tr>
<tr>
<td>to_sec</td>
<td>char *</td>
<td>The new name of the section.</td>
</tr>
</tbody>
</table>

**Returns**

TRUE on success
FALSE if an error occurred.

**See also**

cfgOpen, cfgSectionDelete, cfgSectionCopy, cfgSectionExist.
cfgSectionCopy

Signature

int cfgSectionCopy(cfgHandle *cfgh, char *from_sec, char *to_sec);

Description

cfgSectionCopy will copy a section to a new name at the same level. You must specify the full section path in the from_sec, but should only use the section name in to_sec. NOTE: You can get two sections with the same name if you copy to a section name that already exists at the same level.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char *</td>
<td>from_sec</td>
</tr>
<tr>
<td></td>
<td>The old name of the section.</td>
</tr>
<tr>
<td>char *</td>
<td>to_sec</td>
</tr>
<tr>
<td></td>
<td>The new name of the section.</td>
</tr>
</tbody>
</table>

Returns

TRUE on success.
FALSE if an error occurred.

See also

cfgOpen, cfgSectionDelete, cfgSectionRename, cfgSectionExist

cfgSectionExist

Signature

int cfgSectionExist(cfgHandle *cfgh, char *sec);

Description

cfgSectionExist checks that the section exists.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CfgHandle*</td>
<td>cfgh</td>
</tr>
<tr>
<td>char *</td>
<td>sec</td>
</tr>
<tr>
<td></td>
<td>The name of the section to delete.</td>
</tr>
</tbody>
</table>

Returns

TRUE if section sec exists
FALSE if the section does not exist

See also

cfgKeyRead, cfgListRead, cfgSectionDelete, cfgSectionRename, cfgSectionCopy
cfgSectionList

Signature
char ** cfgSectionList(cfgHandle *cfgh, char *in_sec, int bRecurse);

Description
cfgSectionList creates a list of all sections in a file if 'sec' is NULL. If a 'sec' is given only sections within that
section is listed. The sections are given with full section path. If bRecurse is TRUE then all sections contained in
sections below the current section are included in the string table as well. The caller must free the string table
(both the strings it contains and the table itself).

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle*</td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
<tr>
<td>char *</td>
<td>in_sec</td>
</tr>
<tr>
<td>int</td>
<td>bRecurse</td>
</tr>
</tbody>
</table>

Returns
An allocated string table of sections on success. A NULL pointer if an error has occurred.

See also
cfgOpen, cfgKeyList, cslTblFree

cfgSectionMoveLast

Signature
int cfgSectionMoveLast(cfgHandle *cfgh, char *sec);

Description
cfgSectionMoveLast will move the specified section to the end of the configuration. Note that the cfgh handle
must have been opened with write permissions.

Note: There are several functions in the header file that begin with _cfg and which are internal functions not for
use outside the library.

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgHandle</td>
<td>*cfgh</td>
</tr>
<tr>
<td>char</td>
<td>*sec</td>
</tr>
</tbody>
</table>

A pointer to a structure containing the configuration data.

The name of the section to move within the configuration data.
**cfgSync**

**Signature**

```c
int cfgSync(cfgHandle *cfgh);
```

**Description**

cfgSync will write all changes in the configuration to the open file without closing the handle.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cfgHandle*</code></td>
<td>A pointer to a structure containing the configuration data.</td>
</tr>
</tbody>
</table>

**Returns**

- TRUE on success.
- FALSE if an error occurred.

**See also**

cfgOpen, cfgClose, cfgSaveAs

---

**CSL - The common string library**

**cslConvertBase**

**Signature**

```c
Char *cslConvertBase(long number, int base);
```

**Description**

Convert a number to a different base, like 16 (hexadecimal) or 8 (octal).

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>long number</code></td>
<td>Number to convert</td>
</tr>
<tr>
<td><code>int base</code></td>
<td>Base to convert to (e.g. 16=HEX)</td>
</tr>
</tbody>
</table>

---

**cslFileWrite**

**Signature**

```c
int cslFileWrite(FILE *fp, char **ppch);
```

**Description**

cslFileWrite will write the contents of the string table `ppch` to file. Line shifts are added to the lines if they are not already present.
Parameters

<table>
<thead>
<tr>
<th>FILE *</th>
<th>Fp</th>
<th>Pointer to a file that has been opened for writing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char **</td>
<td>ppch</td>
<td>A NULL terminated string table which is to be written to the file.</td>
</tr>
</tbody>
</table>

Returns
Number of lines written or 0 if a failure has occurred.

See also
cslFileRead

cslFileRead

Signature
char ** cslFileRead(FILE *fp);

Description
cslFileRead returns a NULL terminated string table created from an open ASCII file. Line shift is stripped from each line. The calling function must free the string table.

Parameters

| FILE * | fp       | Pointer to a file that has been opened for writing. |

Returns
An allocated string table containing the contents of the file is returned on success. A NULL pointer is returned and errno is set if an error occurred.

See also
cslFileWrite, cslTblFree

cslLineDelete

Signature
char ** cslLineDelete(char **ppch, int pos);

Description
cslLineDelete removes the line at offset pos from the string table. The rest of the strings are moved to fill the hole in the table.

Parameters

<table>
<thead>
<tr>
<th>char **</th>
<th>ppch</th>
<th>A NULL terminated string table from which a line should be removed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>pos</td>
<td>Offset in the string table of the line to be deleted.</td>
</tr>
</tbody>
</table>
Returns
The ppch with the line at offset pos removed. A NULL pointer is returned on error.

See also
cslLineInsert, cslLineReplace, cslTblFree

cslLineInsert

Signature
char ** cslLineInsert(char **ppch, char *line, int pos);

Description
cslLineInsert adds a line to the string table ppch at the given position. The position 0 is the start of the table, and
the position –1 is the end of the table. All necessary memory is allocated by the function, and must be freed by the
calling function.

Parameters

<table>
<thead>
<tr>
<th>char **</th>
<th>ppch</th>
<th>A NULL terminated string table from which a line should be removed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>line</td>
<td>String to be inserted into the table.</td>
</tr>
<tr>
<td>int</td>
<td>pos</td>
<td>Offset in the string table of the line to be inserted.</td>
</tr>
</tbody>
</table>

Returns
The ppch with the new line inserted at offset pos. A NULL pointer is returned on error.

See also
cslLineDelete, cslLineReplace, cslTblFree

cslLineReplace

Signature
char ** cslLineReplace(char **ppch, char *line, int pos);

Description
cslLineReplace will replace the existing string at offset pos in the ppch string table with the new line. The
position 0 is the start of the table, and the position –1 is the end of the table. All necessary memory is allocated
by the function, and must be freed by the calling function.

Parameters

<table>
<thead>
<tr>
<th>char **</th>
<th>ppch</th>
<th>A NULL terminated string table from which a line should be removed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>line</td>
<td>String to replace what is in the table at offset pos.</td>
</tr>
<tr>
<td>int</td>
<td>pos</td>
<td>Offset in the string table of the line to be replaced.</td>
</tr>
</tbody>
</table>
Returns
The ppch with the new line replacing the old one at offset pos. A NULL pointer is returned on error.

See also
cslLineInsert, cslLineDelete, cslTblFree

cslTblFree

Signature
char ** cslTblFree(char **ppch);

Description
cslTblFree will free the memory allocated to a NULL terminated string table. Both the memory used by the strings and the table itself are freed.

Parameters

| char | ppch | A NULL terminated string table from which a line should be removed. |

Returns
A NULL pointer.

See also
cslFileRead, cslLineInsert, cslLineDelete, cfgSectionList, cfgKeyList, cfgListRead

cslTblToStr

Signature
Char *cslTblToStr(char **a, char *eol);

Description
Converts a string table into a string, optionally inserting an end-of-line string after each entry. The string grows by 1k blocks to fit the text in the string table. This function allocates memory which it is the callers responsibility to free.

Parameters

| char | **a | An array of strings to concatenate into a single string. |
| char | *eol | An optional end-of-line string to insert between elements of the array |

See also
cslStrTokTable, cslLineInsert, cslFileRead
cslPatternToRegExp

**Signature**

```c
void cslPatternToRegExp(const char *pattern, char *reg_exp);
```

**Description**

cslPatternToRegExp will build a regular expression from pattern and place it into the buffer pointed to by regexp. Make sure that the buffer contains enough space.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>char * pattern</td>
<td>A string to be compiled into a regular expression</td>
</tr>
<tr>
<td>char * reg_exp</td>
<td>Buffer in which the compiled regexp is stored.</td>
</tr>
</tbody>
</table>

**Returns**

Nothing, the regular expression is placed in the buffer `reg_exp`.

**See also**

cslMatchRegExp, cslRegExpCompile

---

cslRegExpCompile

**Signature**

```c
void * cslRegExpCompile (const char *reg_exp);
```

**Description**

cslRegExpCompile will compile the string representation of the regular expression into a format suitable for use in the cslRegExpMatch function. Please note that care must be taken not to feed the compiled regular expression to cslMatchRegExp, as this takes an uncompiled regexp and compiles it before attempting to match it. If the input can be a pattern as well as a full regular expression the cslPatternToRegExp function should be called first, to ensure that the string fed to cslRegExpCompile is a valid regular expression.

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>const char * reg_exp</td>
<td>A string containing a regular expression that is compiled into a native representation for the regexp matching engine.</td>
</tr>
</tbody>
</table>

**Returns**

A compiled regular expression suitable for passing directly to the regular expression matching engine.

**See also**

cslTblToStr, cslPatternToRegExp, cslRegExpMatch
cslRegExpExec

Signature
int cslRegExpExec (const char *str, void *pattern, int *offsets, int offsetcount);

Description
Check a regular expression against a string and extract the beginning and end of any grouped matches into the offsets array. The size of the array must be ((1 + maximum number of matches supported) *3), so an array size (offsetcount) of 99 will support up to 32 matches.

The function returns 1+number_of_matches on successful match and -1 on failure to match the regex. The offsets start at offsets[match_number * 2] and end at offsets[(match_number * 2) +1]. Thus the first match ($0 in many parsing tools) begins at offset[0] and ends at offset[1] into the string, the second match ($1) is found between offset[1] and offset[2].

This is a highly specialized function, to be used to extract parts of a string using regular expressions. Normal usage in most probes would be to simply see if a string matches, and for that you should see the cslRegExpMatch and cslMatchRegExp functions!

Parameters

| const char | *str         | String to match regexp against. |
| void       | *pattern     | Regular Expression pattern to match. |
| int        | *offsets     | Array to keep offsets where matches are found. |
| int        | offsetcount  | Number of elements in the offsets array . |

cslRegExpMatch

Signature
int cslRegExpMatch (const char *string, void *pattern);

Description
cslRegExpMatch will check the contents of string against the compiled regular expression in pattern. If the regexp matches then TRUE is returned. This function should be used if the same regular expression is to be used several times, as the overhead of compiling the regexp is incurred only once (at the price of having to store the compiled regexp in memory).

Parameters

| const char * | string        | The string that the compiled regexp pattern is matched against. |
| void *       | pattern       | A compiled regular expression. |

Returns
TRUE if the compiled regexp in pattern matches the contents of string.
FALSE otherwise.
See also
cslTblToStr, cslPatternToRegExp, cslRegExpCompile.

cslMatchRegExp

Signature
int cslMatchRegExp (const char *str, const char *reg_exp);

Description
cslMatchRegExp is a convenience routine that will process the string in reg_exp, compile the resulting regexp and attempt to match it against str. This routine must not be confused with cslRegExpMatch, which takes a compiled regular expression as a parameter! This function can be used if the overhead of having to compile the regular expression every time a match is attempted is acceptable.

Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>const char *</td>
<td>str - The string that the pattern or regular expression in reg_exp is matched against.</td>
</tr>
<tr>
<td>void *</td>
<td>reg_exp - A pattern or full regular expression.</td>
</tr>
</tbody>
</table>

Returns
TRUE if the string contains a match for reg_exp. FALSE otherwise.

See also
cslTblToStr, cslRegExpCompile, cslRegExpMatch

cslYesOrNo

Signature
int cslYesOrNo (char *str, int freeMem);

Description
cslYesOrNo will check the string str and see if it contains either “yes”, “enable” or “1”. The flag freeMem specifies if the string should be freed by this function.

Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>str - The string that is to be evaluated as containing Yes or No.</td>
</tr>
<tr>
<td>int</td>
<td>freeMem - A flag that specifies if the string should be freed. TRUE will free the memory in str.</td>
</tr>
</tbody>
</table>

Returns
TRUE if the string contains Yes, Enable or 1 (in any CaSe) FALSE otherwise.

See also
cfgKeyRead
### cslStrToSec

**Signature**

```c
int cslStrToSec (char *str);
```

**Description**

`cslStrToSec` will evaluate the time specification as follows and convert it to seconds. Only the first letter of the spec is evaluated.

- `number[ ]<spec> [[.,] number[ ]<spec>]`
- `where spec is: s,sec,seconds,secundo.. - seconds`
- `m,min,minutes,minuti... - minutes`
- `h,hours,hour(s)... - hours`
- `d,day,days,.. - days`

**Example**

```c
int s = cslStrToSec("10d,2hours,5min");
```

**Parameters**

| char * | str | The time specification that is to be evaluated. |

**Returns**

Number of seconds, or 0 on error.

### cslStrExpand

**Signature**

```c
char * cslStrExpand (const char *cpchIn, char *(*Func)(const char *));
```

**Description**

`cslStrToSec` will evaluate the time specification as follows and convert it to seconds. Only the first letter of the spec is evaluated.

- `number[ ]<spec> [[.,] number[ ]<spec>]`
- `where spec is: s,sec,seconds,secundo.. - seconds`
- `m,min,minutes,minuti... - minutes`
- `h,hours,hour(s)... - hours`
- `d,day,days,.. - days`

**Example**

```c
int s = cslStrToSec("10d,2hours,5min");
```

**Parameters**

| const char * | cpchIn |
| char * | freeMem |


Returns
Number of seconds, or 0 on error.

cslStrExpandEx

Signature
char * cslStrExpandEx (const char *cpchIn, char *(*Func)(const char *, const void *), void *pData);

Description
cslStrExpandEx takes the parameter cpchIn and uses the function specified in the second parameter to expand the variables. Variables begin with ‘$’. If a data block is needed to expand variables from (typically a PDS), then the void *pData should be used to send the data into the function. If the function Func returns a NULL if a variable cannot be expanded then the variable is re-inserted into the output string, otherwise the returned string is used (even if it is empty)

Parameters

<table>
<thead>
<tr>
<th>const char *</th>
<th>cpchIn</th>
<th>The string that is to be expanded.</th>
</tr>
</thead>
<tbody>
<tr>
<td>char *</td>
<td>freeMem</td>
<td>Pointer to a function that takes a char * and a void * and returns a char *.</td>
</tr>
<tr>
<td>void *</td>
<td>pData</td>
<td>The data structure which is used to expand the variables.</td>
</tr>
</tbody>
</table>

Returns
An allocated copy of string cpchIn with all $variables expanded. If a variable cannot be expanded it is up to the function specified whether the variable should be left in place or replaced with a blank space.

See also
cslStrExpandEnv.

cslStrExpandEnv

Signature
char * cslStrExpandEnv (const char *cpchIn);

Description
cslStrExpandEnv takes the parameter cpchIn and uses the getenv system call to expand variables. Variables start with a ‘$’. If a variable cannot be expanded it is replaced with an empty string.

Parameters

<table>
<thead>
<tr>
<th>const char *</th>
<th>cpchIn</th>
</tr>
</thead>
<tbody>
<tr>
<td>The string that is to be expanded.</td>
<td></td>
</tr>
</tbody>
</table>

Returns
An allocated copy of the string cpchIn with all $variables expanded using the getenv function call.
See also
cslStrExpandEx

cslStrTokTable

Signature
char ** cslStrTokTable (char *str, int size, char *token);

Description
cslStrTokTable takes a string (str) and splits it up into pieces based on which tokens are defined. To split a sentence into its separate words you would use a token “ “ (space) and get a string table with each word as an element of that table returned. Since the returned string table is allocated the calling function must the memory.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>str</th>
<th>The string that is to be split into a string table.</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>size</td>
<td>The length of the string in the first parameter.</td>
</tr>
<tr>
<td>char *</td>
<td>token</td>
<td>The tokens used to split the string.</td>
</tr>
</tbody>
</table>

Returns
An allocated string table of the input string having been split up where tokens were encountered or NULL if an error occurred.

See also
cslTblFree

cslToUpper

Signature
char * cslToUpper(char *str);

Description
cslToUpper changes a string to all uppercase letters. It changes the string in place, so if the original string is required then a copy must be made before calling cslToUpper.

Parameters

| char * | str     | The string that is to be changed to uppercase. |

Returns
A pointer to str after it has been changed to uppercase letters, or NULL if an error has occurred.

See also
cslToLower
**cslToLower**

**Signature**

```c
char * cslToLower(char *str);
```

**Description**

cslToLower changes a string to all lowercase letters. It changes the string in place, so if the original string is required then a copy must be made before calling cslToLower.

**Parameters**

| char * | str  | The string that is to be changed to lowercase. |

**Returns**

A pointer to str after it has been changed to lowercase letters, or NULL if an error has occurred.

**See also**

cslToUpper

**cslIsNumeric**

**Signature**

```c
char * cslIsNumeric(char *str);
```

**Description**

cslIsNumeric checks if a given string is a numeric value. It supports either comma or period separator when the number is a float and a leading minus.

**Parameters**

| char * | str  | The string you want to check if is a number. |

**Returns**

0 if `str` is numeric, 1 if it is not, -1 if an empty string or NULL value is passed.

**See also**

N/A
CslPrintf

Signature

char * cslPrintf(char *fmt);

Description
The cslPrintf function expands the string in fmt which can have printf() value formatters like %s for string %d for integer etc. The function returns a string containing the expanded string, which is allocated. The caller is responsible for freeing the allocated memory.

Parameters

<table>
<thead>
<tr>
<th>char *</th>
<th>fmt</th>
<th>String with variables in printf() format.</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>Variable argument list</td>
<td></td>
</tr>
</tbody>
</table>

Returns
String from fmt containing the expanded variables defined on success, NULL if an error occurs.

See also
printf, free
Examples - Programming in the SLM Environment using C

Your first step in the development process is to decide which SDK you should acquire. The SDK is packed and shipped as a probe package, therefore available on the CA Nimsoft download page. Install the package on the system where you intend to develop the software. The package contains a code-generator (code wizard); please note that this is installed on Windows systems only.

The SDK contains the necessary library, and header files (depending on the language).

Header Files and Libraries

As with all Nimsoft probes written in C, you need to add the following two lines at the top of your code:

```c
#include <nimbus.h>
#include <nim.h>
```

The linker needs references to the nim.lib (on windows) and libnim.a (UNIX).

The following are internal to the library and should not be called even though they are in the header file:

```c
Char *cslStrTok(char *str, char *tokens);
Char *cslStrTokDup(char *str, char *tokens);
```

Sending a QoS Definition

The probe should always initialize itself by assuming that the Data Engine has no knowledge of the QoS data it is about to receive; therefore we need to send a QOS_DEFINITION message. Providing the nimQoSDefinition function with a correct and valid parameter list generates this message.

```c
nimQoSDefinition ("QOS_NET_CONNECT", /* QOS Name*/
"QOS_NETWORK", /* QOS Group */
"Network Connectivity Response", /* QOS Description*/
"Milliseconds","ms",0,0); /* Unit info*/
```
Sending Quality of Service Data

The probe should only initialize itself during startup by sending QOS_DEFINITION, however, it must report the collected data every time it runs. This instructs the Data Engine to insert the collected sample value into the database. The following code packs the QoS message into a function:

```c
void publishQoS (char *target, long sampleval ue)
{
    NIMQOS *qos = NULL;
    Char *source = NULL; /*QoS origin (dhost)*/
    int interval = 300; /*Check interval (in seconds)*/

    if (!(qos = nimQoSCreate("QOS_NET_CONNECT",source,interval)))
    {
        nimLog(0,"(publishQoS) failed to create NIMQOS");
        return;
    }
    if (sampleval ue < 0)
    {
        nimQoSSendNull (qos,target);
    }
    else
    {
        nimQoSSendValue(qos,target,sampleval ue);
    }
    nimQoSFree(qos);
}
```
The following code illustrates how you may wrap your data collection code with stopwatch functionality—useful when doing response time measurements.

```c
void checkMissionData ()
{

    NIMQOS *qos = NULL;
    char *source = NULL; /*QoS origin (dhost) */
    char *target = "bandwidth_utilization";
    int interval = 300;  /*Check interval (seconds)*/

    if (!(qos = nimQoSCreate("QOS_NET_CONNECT",source,interval)))
    {
        nimLog(0,"(publishQoS) failed to create NIMQOS")
        return;
    }

    nimQoSStart(qos);

    nimQoSStop(qos);
    nimQoSStop(qos);
}
```