



NQ Library Reference

YNQ
YNQ-1.5.1

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Chapter 1

Module Index

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Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

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Chapter 3

Module Documentation

3.1 System Dependent

Modules

- [Time](#)
- [Threads](#)
- [Mutexes](#)
- [Semaphores](#)
- [Network](#)
- [Sockets](#)
- [Tasks](#)
- [Directories](#)
- [Files](#)
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- [File Locking](#)
- [Encoding](#)
- [Utils](#)

3.1.1 Detailed Description

3.2 Time

Macros

- #define [syGetTimeInSec\(\)](#) time(0)
- #define [sySleep\(_secs_\)](#) sleep(_secs_)
- #define [syUSleep\(_msecs_\)](#) usleep(_msecs_)

Functions

- NQ_TIME [syGetTimeInMsec](#) (void)
- NQ_TIME [syConvertTimeSpecToTimeInMsec](#) (void *val)
- NQ_UINT32 [syConvertTimeInMsecToSec](#) (NQ_TIME *timeMsec)
- NQ_INT [syGetTimeZone](#) (void)
- void [syDecomposeTime](#) (NQ_UINT32 time, SYTimeFragments *decomposed)
- NQ_UINT32 [syComposeTime](#) (const SYTimeFragments *decomposed)
- NQ_BOOL [syGmtToString](#) (NQ_BYTE *strTime, NQ_COUNT size, NQ_UINT32 t, const NQ_CHAR *fmt)

3.2.1 Detailed Description

Time functions

See Also

[syGetTimeAccuracy\(\)](#) in the platform-dependent sypltfm.h file

3.2.2 Macro Definition Documentation

3.2.2.1 #define [syGetTimeInSec\(\)](#) time(0)

System (Posix) time in seconds from 1-Jan-1970

3.2.2.2 #define [sySleep\(_secs_ \)](#) sleep(_secs_)

Wait a number of seconds.

3.2.2.3 #define [syUSleep\(_msecs_ \)](#) usleep(_msecs_)

Wait a number of milliseconds.

3.2.3 Function Documentation

3.2.3.1 NQ_TIME [syGetTimeInMsec](#) (void)

Get system time in POSIX format in milliseconds

Returns

The number of milliseconds elapsed since Jan 1, 1970 in milliseconds

3.2.3.2 NQ_TIME [syConvertTimeSpecToTimeInMsec](#) (void * val)

Convert the **Timespec** to time in milliseconds

Parameters

<i>val</i>	Timespec value format
------------	------------------------------

Returns

The converted time from **Timespec** to a time in milliseconds

3.2.3.3 NQ_UINT32 syConvertTimeInMsecToSec (NQ_TIME * *timeMsec*)

Convert time in milliseconds to seconds

Parameters

<i>timeMsec</i>	Time in milliseconds.
-----------------	-----------------------

Returns

Time in seconds

3.2.3.4 NQ_INT syGetTimeZone (void)

Get time zone difference in minutes

Returns

The number of minutes to be added to the local time to get GMT. This number is negative for GMT+ and positive for GMT-

3.2.3.5 void syDecomposeTime (NQ_UINT32 *time*, SYTimeFragments * *decomposed*)

Decompose system time into fragments

Parameters

<i>time</i>	System time
<i>decomposed</i>	Structure of file fragments

3.2.3.6 NQ_UINT32 syComposeTime (const SYTimeFragments * *decomposed*)

Compose system time from fragments

Parameters

<i>decomposed</i>	Structure of file fragments
-------------------	-----------------------------

Returns

Composed system time

3.2.3.7 NQ_BOOL syGmtToString (NQ_BYTE * *strTime*, NQ_COUNT *size*, NQ_UINT32 *t*, const NQ_CHAR * *fmt*)

This function converts system time into GMT time and prints it according to the format (*fmt*).

GMT-Y.m.d-H.M.S

Parameters

<i>strTime</i>	The buffer to return the string.
<i>size</i>	The buffer size.
<i>t</i>	Time in seconds from Jan 1, 1970 (Unix time).
<i>fmt</i>	The string format.

Returns

TRUE on success, *FALSE* on error.

Note

The format string in the example is currently the only one that need be supported.

3.3 Threads

Macros

- #define SYThread pthread_t
- #define sylvValidThread(_taskId_) TRUE
- #define syThreadGetCurrent pthread_self
- #define syThreadDestroy(_taskId_) pthread_cancel(_taskId_);

Functions

- void syThreadStart (NQ_BOOL isRT, NQ_INT priorityLevel, SYThread *taskIdPtr, void(*startpoint)(void), NQ_BOOL background)

3.3.1 Detailed Description

Threads

Thread management calls.

3.3.2 Macro Definition Documentation

3.3.2.1 #define SYThread pthread_t

TID - thread handle

3.3.2.2 #define sylvValidThread(_taskId_) TRUE

3.3.2.3 #define syThreadGetCurrent pthread_self

3.3.2.4 #define syThreadDestroy(_taskId_) pthread_cancel(_taskId_);

3.3.3 Function Documentation

3.3.3.1 void syThreadStart (NQ_BOOL isRT, NQ_INT priorityLevel, SYThread * taskIdPtr, void(*) (void) startpoint, NQ_BOOL background)

Create an internal thread

Parameters

<i>isRT</i>	Whether to set priority level according to priorityLevel
<i>priorityLevel</i>	The priority level of the thread
<i>taskIdPtr</i>	Pointer to a thread handle to create
<i>startpoint</i>	Pointer to the function to be used as the thread startpoint
<i>background</i>	TRUE if the thread should have low priority. FALSE if the thread should have normal priority.

3.4 Mutexes

Macros

- #define [SYMutex](#) pthread_mutex_t
- #define [syMutexTake](#)(*_m*) [syMutexTakeDebug](#)(*_m*, SY_LOG_FILE, SY_LOG_LINE)

Functions

- void [syMutexCreate](#) ([SYMutex](#) **_m*)
- void [syMutexDelete](#) ([SYMutex](#) **_m*)
- void [syMutexTakeDebug](#) ([SYMutex](#) **_m*, const NQ_CHAR **text*, const NQ_UINT *line*)
- void [syMutexGive](#) ([SYMutex](#) **_m*)

3.4.1 Detailed Description

3.4.2 Macro Definition Documentation

3.4.2.1 #define [SYMutex](#) pthread_mutex_t

3.4.2.2 #define [syMutexTake](#)(*_m*) [syMutexTakeDebug](#)(*_m*, SY_LOG_FILE, SY_LOG_LINE)

3.4.3 Function Documentation

3.4.3.1 void [syMutexCreate](#) ([SYMutex](#) * *_m*)

Create a mutual exception semaphore

Parameters

<i>_m</i>	Pointer to a semaphore variable to create
-----------	---

3.4.3.2 void [syMutexDelete](#) ([SYMutex](#) * *_m*)

Dispose a mutual exception semaphore

Parameters

<i>_m</i>	Pointer to a semaphore variable to dispose
-----------	--

3.4.3.3 void [syMutexTakeDebug](#) ([SYMutex](#) * *_m*, const NQ_CHAR * *text*, const NQ_UINT *line*)

Lock a resource protected by a mutex

Parameters

<i>_m</i>	Pointer to a mutex semaphore
<i>text</i>	File name for debug
<i>line</i>	Line number for debug

3.4.3.4 void [syMutexGive](#) ([SYMutex](#) * *_m*)

Unlock a resource protected by a mutex

Parameters

<code>_m</code>	Pointer to a mutex semaphore
-----------------	------------------------------

3.5 Semaphores

Macros

- #define SY_SEMAPHORE_AVAILABLE
- #define SYSemaphore sem_t
- #define sySemaphoreDelete(_s) sem_destroy(&_s)
- #define sySemaphoreTake(_s) sem_wait(&_s)
- #define sySemaphoreGive(_s) sem_post(&_s)

Functions

- NQ_STATUS sySemaphoreCreate (SYSemaphore *semId, NQ_UINT count)
- void sySemaphoreResetCounter (SYSemaphore *pSemID)
- NQ_INT sySemaphoreTimedTake (SYSemaphore *sem, NQ_INT timeout)

3.5.1 Detailed Description

Semaphores

1) We use mutex semaphores or simulate their behavior if the OS does not support pure mutex semaphores. 2) We use binary semaphores

3.5.2 Macro Definition Documentation

3.5.2.1 #define SY_SEMAPHORE_AVAILABLE

Enable this define when semaphores are supported on system

3.5.2.2 #define SYSemaphore sem_t

Counting semaphore

3.5.2.3 #define sySemaphoreDelete(_s) sem_destroy(&_s)

3.5.2.4 #define sySemaphoreTake(_s) sem_wait(&_s)

3.5.2.5 #define sySemaphoreGive(_s) sem_post(&_s)

3.5.3 Function Documentation

3.5.3.1 NQ_STATUS sySemaphoreCreate (SYSemaphore * semId, NQ_UINT count)

Create semaphore

Parameters

<i>semId</i>	Pointer to the semaphore id
<i>count</i>	Number of resources

Returns

NQ_SUCCESS when semaphore was created or NQ_FAIL on error

3.5.3.2 void sySemaphoreResetCounter (SYSemaphore * pSemID)

Reset semaphore counter

Parameters

<i>pSemID</i>	Pointer to the semaphore id
---------------	-----------------------------

3.5.3.3 NQ_INT sySemaphoreTimedTake (SYSemaphore * *sem*, NQ_INT *timeout*)

Lock a resource protected by a binary semaphore

Parameters

<i>sem</i>	Binary semaphore
<i>timeout</i>	Timeout in seconds to wait for lock

Returns

NQ_SUCCESS when the resource was locked or NQ_FAIL on error

3.6 Network

Modules

- [Direct Transfer](#)

Macros

- #define [SY_LOCALHOSTIP4](#) /*{0, 0} */ {0x7f00, 0x0001}
- #define [SY_LOCALHOSTIP6](#) {0, 0, 0, 0, 0, 0, 0, 1} /* {0, 0, 0, 0, 0, 0, 0, 0} */
- #define [SY_LINKLOCALIP](#) 0xfe80
- #define [SY_ANYIP4](#) {0, 0}
- #define [SY_ANYIP6](#) {0, 0, 0, 0, 0, 0, 0, 0}
- #define [SY_ZEROIP](#) {0, 0, 0, 0, 0, 0, 0, 0}
- #define [SY_ZEROIP4](#) 0L
- #define [syGetHostName](#)(_name, _nameLen) gethostname((_name), (_nameLen))

Functions

- NQ_UINT32 [syGetIPv6ScopeId](#) (const NQ_IPADDRESS6 ip)
- NQ_IPADDRESS4 [syGetHostByName](#) (const char *name)
- void [syGetDnsParams](#) (NQ_CHAR *domain, NQ_IPADDRESS *server)
- void [syGetMacAddress](#) (NQ_IPADDRESS4 ip, NQ_BYTE *macBuffer)
- NQ_STATUS [syGetAdapter](#) (NQ_INDEX adapterIdx, NQ_INDEX *osIndex, NQ_IPADDRESS4 *pIp, NQ_IPADDRESS6 *pIp6, NQ_IPADDRESS4 *pSubnet, NQ_IPADDRESS4 *pBcast, NQ_WCHAR *pWins, NQ_WCHAR *pDns)

3.6.1 Detailed Description

3.6.2 Macro Definition Documentation

3.6.2.1 #define [SY_LOCALHOSTIP4](#) /*{0, 0} */ {0x7f00, 0x0001}

3.6.2.2 #define [SY_LOCALHOSTIP6](#) {0, 0, 0, 0, 0, 0, 0, 1} /* {0, 0, 0, 0, 0, 0, 0, 0} */

3.6.2.3 #define [SY_LINKLOCALIP](#) 0xfe80

3.6.2.4 #define [SY_ANYIP4](#) {0, 0}

3.6.2.5 #define [SY_ANYIP6](#) {0, 0, 0, 0, 0, 0, 0, 0}

3.6.2.6 #define [SY_ZEROIP](#) {0, 0, 0, 0, 0, 0, 0, 0}

3.6.2.7 #define [SY_ZEROIP4](#) 0L

3.6.2.8 #define [syGetHostName](#)(_name, _nameLen) gethostname((_name), (_nameLen))

3.6.3 Function Documentation

3.6.3.1 NQ_UINT32 [syGetIPv6ScopeId](#) (const NQ_IPADDRESS6 ip)

Get IPv6 scope ID

Parameters

<i>ip</i>	The IPv6 address
-----------	------------------

Returns

0..n - The scope id to be used

Note

0 - Unknown network interface

3.6.3.2 NQ_IPADDRESS4 syGetHostByName (const char * *name*)

Find host IP by its name

Parameters

<i>name</i>	Host name
-------------	-----------

Returns

Host IP

3.6.3.3 void syGetDnsParams (NQ_CHAR * *domain*, NQ_IPADDRESS * *server*)

Returns the DNS initializations parameters

Parameters

<i>domain</i>	The default domain target belongs to
<i>server</i>	The DNS server IP address

3.6.3.4 void syGetMacAddress (NQ_IPADDRESS4 *ip*, NQ_BYTE * *macBuffer*)

Get MAC address by IP4

Parameters

<i>ip</i>	Next IP address
<i>macBuffer</i>	Buffer for mac address

3.6.3.5 NQ_STATUS syGetAdapter (NQ_INDEX *adapterIdx*, NQ_INDEX * *osIndex*, NQ_IPADDRESS4 * *plp*, NQ_IPADDRESS6 * *ip6*, NQ_IPADDRESS4 * *pSubnet*, NQ_IPADDRESS4 * *pBcast*, NQ_WCHAR * *pWins*, NQ_WCHAR * *pDns*)

Get adapter information

Parameters

<i>adapterIdx</i>	Adapter number (zero based)
<i>osIndex</i>	Buffer for adapter index as defined by the OS

<i>pIp</i>	Buffer for adapter IP in NBO
<i>ip6</i>	Buffer for adapter IPv6 in NBO
<i>pSubnet</i>	Buffer for subnet address in NBO
<i>pBcast</i>	Buffer for bcast address in NBO
<i>pWins</i>	Buffer for semicolon delimited list of WINS servers
<i>pDns</i>	Buffer for semicolon delimited list of DNS servers

Returns

NQ_FAIL when there is no adapter with the given index, NQ_SUCCESS when adapter information available

3.7 Sockets

Macros

- #define `SY_INTERNALSOCKETPOOL`
- #define `SYSocketHandle` `NQ_INT`
- #define `SYSocketSet` `fd_set`
- #define `syIsValidSocket`(`_sock`) (`_sock != ERROR`)
- #define `syInvalidSocket`() (`ERROR`)
- #define `syAddSocketToSet`(`_sock`, `_set`) `FD_SET((_sock), (_set))`
- #define `syIsSocketSet`(`_sock`, `_set`) `FD_ISSET((_sock), (_set))`
- #define `syClearSocketSet`(`_set`) `FD_ZERO((_set))`
- #define `syClearSocketFromSet`(`_sock`, `_set`) `FD_CLR((_sock), (_set))`
- #define `sySetDatagramSocketOptions`(`_sock`)
- #define `sySetStreamSocketOptions`(`_sock`)

Functions

- `NQ_BOOL` `syIsSocketAlive` (`SYSocketHandle` `sock`)
- `NQ_STATUS` `syShutdownSocket` (`SYSocketHandle` `sock`)
- `NQ_STATUS` `syCloseSocket` (`SYSocketHandle` `sock`)
- `NQ_STATUS` `syListenSocket` (`SYSocketHandle` `sock`, `NQ_INT` `backlog`)
- `SYSocketHandle` `syCreateSocket` (`NQ_BOOL` `stream`, `NQ_UINT` `family`)
- `NQ_STATUS` `syBindSocket` (`SYSocketHandle` `sock`, `const NQ_IPADDRESS` `*ip`, `NQ_PORT` `port`, `NQ_BOOL` `reuseAddress`)
- `NQ_STATUS` `syAllowBroadcastsSocket` (`SYSocketHandle` `sock`)
- `void` `sySetClientSocketOptions` (`SYSocketHandle` `sock`)
- `void` `syGetSocketPortAndIP` (`SYSocketHandle` `sock`, `NQ_IPADDRESS` `*ip`, `NQ_PORT` `*port`)
- `NQ_INT` `sySendToSocket` (`SYSocketHandle` `sock`, `const NQ_BYTE` `*buf`, `NQ_COUNT` `len`, `const NQ_IPADDRESS` `*ip`, `NQ_PORT` `port`)
- `NQ_STATUS` `syConnectSocket` (`SYSocketHandle` `sock`, `const NQ_IPADDRESS` `*ip`, `NQ_PORT` `port`)
- `NQ_INT` `sySendSocket` (`SYSocketHandle` `sock`, `const NQ_BYTE` `*buf`, `NQ_COUNT` `len`)
- `NQ_STATUS` `sySendSocketAsync` (`SYSocketHandle` `sock`, `const NQ_BYTE` `*buf`, `NQ_COUNT` `len`, `void(*releaseFunc)(const NQ_BYTE *)`)
- `NQ_INT` `sySelectSocket` (`SYSocketSet` `*pset`, `NQ_UINT32` `timeout`)
- `NQ_INT` `syRecvFromSocket` (`SYSocketHandle` `sock`, `NQ_BYTE` `*buf`, `NQ_COUNT` `len`, `NQ_IPADDRESS` `*ip`, `NQ_PORT` `*port`)
- `NQ_INT` `syRecvSocket` (`SYSocketHandle` `sock`, `NQ_BYTE` `*buf`, `NQ_COUNT` `len`)
- `NQ_INT` `syRecvSocketWithTimeout` (`SYSocketHandle` `sock`, `NQ_BYTE` `*buf`, `unsigned int` `len`, `unsigned int` `secs`)
- `SYSocketHandle` `syAcceptSocket` (`SYSocketHandle` `sock`, `NQ_IPADDRESS` `*ip`, `NQ_PORT` `*port`)
- `NQ_STATUS` `sySendMulticast` (`SYSocketHandle` `socket`, `const NQ_BYTE` `*buffer`, `NQ_COUNT` `length`, `const NQ_IPADDRESS` `*ip`, `NQ_PORT` `port`)
- `void` `sySubscribeToMulticast` (`SYSocketHandle` `socket`, `const NQ_IPADDRESS` `*ip`)

3.7.1 Detailed Description

Sockets

Most socket operations are BSD 4.x standard calls. However, a few very specific operations are OS-dependent. For a BSD-compliant system use definitions below

Definition of "loopback address". This may be different for different OS. The standard value is 127.0.0.1 for IPv4 and ::1 for IPv6 (in NBO), however, some OS require a value of 0.

3.7.2 Macro Definition Documentation

3.7.2.1 #define SY_INTERNALSOCKETPOOL

Define this parameter to use internal socket pool, comment for per-task pool

3.7.2.2 #define SYSocketHandle NQ_INT

3.7.2.3 #define SYSocketSet fd_set

3.7.2.4 #define syIsValidSocket(_sock) (_sock != ERROR)

3.7.2.5 #define syInvalidSocket() (ERROR)

3.7.2.6 #define syAddSocketToSet(_sock, _set) FD_SET((_sock), (_set))

3.7.2.7 #define syIsSocketSet(_sock, _set) FD_ISSET((_sock), (_set))

3.7.2.8 #define syClearSocketSet(_set) FD_ZERO((_set))

3.7.2.9 #define syClearSocketFromSet(_sock, _set) FD_CLR((_sock), (_set))

Remove a socket from a socket set.

Parameters

<code>_sock</code>	The socket to remove.
<code>_set</code>	: Socket set.

3.7.2.10 #define sySetDatagramSocketOptions(_sock)

3.7.2.11 #define sySetStreamSocketOptions(_sock)

3.7.3 Function Documentation

3.7.3.1 NQ_BOOL syIsSocketAlive (SYSocketHandle sock)

Detecting whether a socket is still alive

Parameters

<code>sock</code>	Socket id
-------------------	-----------

Returns

This method is said to work on any BSD socket system: issue select() with a zero timeout. on dead socket this should return error instead of zero

3.7.3.2 NQ_STATUS syShutdownSocket (SYSocketHandle sock)

Stop socket operations and disconnect the socket if it was connected

Parameters

<i>sock</i>	Socket id
-------------	-----------

Returns

NQ_SUCCESS or NQ_FAIL

Note

This method is said to work on any BSD socket system

3.7.3.3 NQ_STATUS syCloseSocket (SYSocketHandle *sock*)

Close socket

Parameters

<i>sock</i>	Socket id
-------------	-----------

Returns

NQ_SUCCESS or NQ_FAIL

3.7.3.4 NQ_STATUS syListenSocket (SYSocketHandle *sock*, NQ_INT *backlog*)

Listen on server socket

Parameters

<i>sock</i>	Socket id
<i>backlog</i>	Max number of requests in queue

Returns

NQ_SUCCESS or NQ_FAIL

3.7.3.5 SYSocketHandle syCreateSocket (NQ_BOOL *stream*, NQ_UINT *family*)

Create new socket

Parameters

<i>stream</i>	TRUE for TCP socket, FALSE for UDP socket
<i>family</i>	CM_IPADDR_IPV4 for IPv4, CM_IPADDR_IPV6 for IPv6

Returns

New socket or invalid socket handle

3.7.3.6 NQ_STATUS syBindSocket (SYSocketHandle *sock*, const NQ_IPADDRESS * *ip*, NQ_PORT *port*, NQ_BOOL *reuseAddress*)

Bind socket to IP and port

Parameters

<i>sock</i>	Socket handle
<i>ip</i>	IP to bind to in NBO
<i>port</i>	Port to bind to in NBO
<i>reuseAddress</i>	Whether to reuse address

Returns

NQ_SUCCESS or NQ_FAIL

3.7.3.7 NQ_STATUS syAllowBroadcastsSocket (SYSocketHandle sock)

Allow broadcasts on an UDP socket

Parameters

<i>sock</i>	Socket handle
-------------	---------------

Returns

NQ_SUCCESS or NQ_FAIL

3.7.3.8 void sySetClientSocketOptions (SYSocketHandle sock)

Tune new client socket

Parameters

<i>sock</i>	Socket handle
-------------	---------------

3.7.3.9 void syGetSocketPortAndIP (SYSocketHandle sock, NQ_IPADDRESS * ip, NQ_PORT * port)

Get IP and port the socket is bound to

Parameters

<i>sock</i>	Socket handle
<i>ip</i>	Buffer for IP address in NBO
<i>port</i>	Buffer for port number in NBO

3.7.3.10 NQ_INT sySendToSocket (SYSocketHandle sock, const NQ_BYTE * buf, NQ_COUNT len, const NQ_IPADDRESS * ip, NQ_PORT port)

Send a UDP message to a specific addressee

Parameters

<i>sock</i>	Socket handle
<i>buf</i>	Data to send
<i>len</i>	Number of bytes to send
<i>ip</i>	Number of bytes to send

<i>port</i>	Port number to send to in NBO
-------------	-------------------------------

Returns

Number of bytes sent or NQ_FAIL

3.7.3.11 NQ_STATUS syConnectSocket (SYSocketHandle *sock*, const NQ_IPADDRESS * *ip*, NQ_PORT *port*)

Connect to a remote server port

Parameters

<i>sock</i>	Socket handle
<i>ip</i>	IP address of the server in NBO
<i>port</i>	Port number of the server in NBO

Returns

NQ_SUCCESS or NQ_FAIL

3.7.3.12 NQ_INT sySendSocket (SYSocketHandle *sock*, const NQ_BYTE * *buf*, NQ_COUNT *len*)

Send bytes over a connected socket

Parameters

<i>sock</i>	Socket handle
<i>buf</i>	Data to send
<i>len</i>	Number of bytes to send

Returns

NQ_SUCCESS or NQ_FAIL

3.7.3.13 NQ_STATUS sySendSocketAsync (SYSocketHandle *sock*, const NQ_BYTE * *buf*, NQ_COUNT *len*, void(*) (const NQ_BYTE *) *releaseFunc*)

Send bytes asynchronously over a connected socket

Parameters

<i>sock</i>	Socket handle
<i>buf</i>	Data to send
<i>len</i>	Number of bytes to send
<i>releaseFunc</i>	Callback function for releasing the buffer

Returns

NQ_SUCCESS or NQ_FAIL

3.7.3.14 NQ_INT sySelectSocket (SYSocketSet * *pset*, NQ_UINT32 *timeout*)

Select on sockets

Parameters

<i>pset</i>	Pointer to the file set
<i>timeout</i>	Timeout in seconds

Returns

Number of sockets with data pending, zero on timeout or NQ_FAIL on error

3.7.3.15 NQ_INT syRecvFromSocket (SYSocketHandle *sock*, NQ_BYTE * *buf*, NQ_COUNT *len*, NQ_IPADDRESS * *ip*, NQ_PORT * *port*)

Receive a UDP message

Parameters

<i>sock</i>	Socket handle
<i>buf</i>	Receive buffer
<i>len</i>	Buffer length
<i>ip</i>	Buffer for sender IP address in NBO
<i>port</i>	Buffer for sender port in NBO

Returns

Number of bytes received or NQ_FAIL

3.7.3.16 NQ_INT syRecvSocket (SYSocketHandle *sock*, NQ_BYTE * *buf*, NQ_COUNT *len*)

Receive a UDP message from any sender

Parameters

<i>sock</i>	Socket handle
<i>buf</i>	Receive buffer
<i>len</i>	Buffer length

Returns

Number of bytes received or NQ_FAIL

3.7.3.17 NQ_INT syRecvSocketWithTimeout (SYSocketHandle *sock*, NQ_BYTE * *buf*, unsigned int *len*, unsigned int *secs*)

Receive from a datagram or a TCP stream or time out if no data on sockets.

Parameters

<i>sock</i>	Socket handle.
<i>buf</i>	Receive buffer.
<i>len</i>	Buffer size.
<i>secs</i>	Number of seconds to wait for data on sockets.

Returns

Number of bytes received or NQ_FAIL on error.

3.7.3.18 SYSocketHandle syAcceptSocket (SYSocketHandle *sock*, NQ_IPADDRESS * *ip*, NQ_PORT * *port*)

Accept client socket

Parameters

<i>sock</i>	Server socket handle
<i>ip</i>	Buffer for client IP address in NBO
<i>port</i>	Buffer for client port in NBO

Returns

New socket ID or invalid handle

3.7.3.19 `NQ_STATUS sySendMulticast (SYSocketHandle socket, const NQ_BYTE * buffer, NQ_COUNT length, const NQ_IPADDRESS * ip, NQ_PORT port)`

Send multicast datagram

Parameters

<i>socket</i>	Socket handle
<i>buffer</i>	Data to send
<i>length</i>	Number of bytes to send
<i>ip</i>	Destination IP
<i>port</i>	Destination port

Returns

NQ_FAIL or number of bytes sent

3.7.3.20 `void sySubscribeToMulticast (SYSocketHandle socket, const NQ_IPADDRESS * ip)`

Subscribe IP address to remote socket as a multicast

Parameters

<i>socket</i>	Remote socket handle
<i>ip</i>	Pointer to the IP address to subscribe. This value should be a multicast address in Network Byte Order (NBO).

Note

This function should analyze the IP address type (either IPV4 or IPV6) and builds IP address in the system format (e.g., -sockaddr_in/sockaddr_in6) accordingly before subscribe it.

3.8 Tasks

Macros

- #define `syGetPid()` `getpid()`

3.8.1 Detailed Description

Tasks

Task management calls. We assume that the target system answers the following generic model:

- a task has a unique id (PID) that may be mapped onto a unique 32 bit number

3.8.2 Macro Definition Documentation

3.8.2.1 #define `syGetPid()` `getpid()`

3.9 Directories

Macros

- #define SYDirectory DIR*
- #define syInvalidateDirectory(_pd) *(_pd) = NULL
- #define syIsValidDirectory(_d) (_d != NULL)

Functions

- NQ_STATUS syCreateDirectory (const NQ_WCHAR *name)
- NQ_STATUS syDeleteDirectory (const NQ_WCHAR *name)
- SYDirectory syOpenDirectory (const NQ_WCHAR *name)
- NQ_STATUS syFirstDirectoryFile (const NQ_WCHAR *name, SYDirectory *pDir, const NQ_WCHAR **fileName)
- NQ_STATUS syNextDirectoryFile (SYDirectory dir, const NQ_WCHAR **fileName)
- NQ_STATUS syCloseDirectory (SYDirectory dir)

3.9.1 Detailed Description

3.9.2 Macro Definition Documentation

3.9.2.1 #define SYDirectory DIR*

3.9.2.2 #define syInvalidateDirectory(_pd) *(_pd) = NULL

3.9.2.3 #define syIsValidDirectory(_d) (_d != NULL)

3.9.3 Function Documentation

3.9.3.1 NQ_STATUS syCreateDirectory (const NQ_WCHAR * name)

Create directory

Parameters

<i>name</i>	Full directory path
-------------	---------------------

Returns

NQ_SUCCESS or NQ_FAIL

3.9.3.2 NQ_STATUS syDeleteDirectory (const NQ_WCHAR * name)

Delete directory

Parameters

<i>name</i>	Full directory path
-------------	---------------------

Returns

NQ_SUCCESS or NQ_FAIL

3.9.3.3 SYDirectory syOpenDirectory (const NQ_WCHAR * *name*)

Open directory by name

Parameters

<i>name</i>	Full directory path
-------------	---------------------

Returns

Directory handle or invalid handle

3.9.3.4 NQ_STATUS syFirstDirectoryFile (const NQ_WCHAR * *name*, SYDirectory * *pDir*, const NQ_WCHAR ** *fileName*)

Open directory and read the first entry

Parameters

<i>name</i>	Full directory path
<i>pDir</i>	Buffer for directory handle
<i>fileName</i>	Buffer for a pointer to the file name

Returns

NQ_SUCCESS or NQ_FAIL

3.9.3.5 NQ_STATUS syNextDirectoryFile (SYDirectory *dir*, const NQ_WCHAR ** *fileName*)

Read next directory entry

Parameters

<i>dir</i>	Directory handle
<i>fileName</i>	Buffer for a pointer to the file name

Returns

NQ_SUCCESS or NQ_FAIL

3.9.3.6 NQ_STATUS syCloseDirectory (SYDirectory *dir*)

Close directory handle

Parameters

<i>dir</i>	Directory handle
------------	------------------

Returns

NQ_SUCCESS if the operation succeeded, NQ_FAIL if an error occurred.

3.10 Files

Macros

- `#define SY_EXTENDFILENOTSUPPORTED`
- `#define SY_PATHSEPARATOR '/'`
- `#define SYFile int`
- `#define syInvalidateFile(_f) *_f = ERROR`
- `#define syIsValidFile(_file) (_file!=ERROR)`
- `#define syInvalidFile() (ERROR)`
- `#define SY_CP_FIRSTILLEGALCHAR {0xe5}`
- `#define SY_CP_ANYILLEGALCHAR {0x7c, 0x5c}`
- `#define syFlushFile(_file) ((fsync(_file)==OK)? NQ_SUCCESS:NQ_FAIL)`
- `#define syGetSecurityDescriptor(_f, _i, _b) udGetSecurityDescriptor(_f, _i, _b)`
- `#define sySetSecurityDescriptor(_f, _i, _b, _l) udSetSecurityDescriptor(_f, _i, _b, _l)`

Functions

- `SYFile syCreateFile` (const NQ_WCHAR *name, NQ_BOOL denyread, NQ_BOOL denyexecute, NQ_BOOL denywrite)
- `NQ_STATUS syDeleteFile` (const NQ_WCHAR *name)
- `NQ_STATUS syRenameFile` (const NQ_WCHAR *oldName, const NQ_WCHAR *newName)
- `SYFile syOpenFileForRead` (const NQ_WCHAR *name, NQ_BOOL denyread, NQ_BOOL denyexecute, NQ_BOOL denywrite)
- `SYFile syOpenFileForWrite` (const NQ_WCHAR *name, NQ_BOOL denyread, NQ_BOOL denyexecute, NQ_BOOL denywrite)
- `SYFile syOpenFileForReadWrite` (const NQ_WCHAR *name, NQ_BOOL denyread, NQ_BOOL denyexecute, NQ_BOOL denywrite)
- `NQ_STATUS syTruncateFile` (SYFile file, NQ_UINT32 offLow, NQ_UINT32 offHigh)
- `NQ_INT syReadFile` (SYFile file, NQ_BYTE *buf, NQ_COUNT len)
- `NQ_INT syWriteFile` (SYFile file, const NQ_BYTE *buf, NQ_COUNT len)
- `NQ_STATUS syCloseFile` (SYFile fd)
- `NQ_UINT32 sySeekFileCurrent` (SYFile file, NQ_INT32 off, NQ_INT32 offHigh)
- `NQ_UINT32 sySeekFileStart` (SYFile file, NQ_UINT32 off, NQ_UINT32 offHigh)
- `NQ_UINT32 sySeekFileEnd` (SYFile file, NQ_INT32 off, NQ_INT32 offHigh)
- `NQ_STATUS syGetFileInformation` (SYFile file, const NQ_WCHAR *fileName, SYFileInformation *fileInfo)
- `NQ_STATUS syGetFileInformationByName` (const NQ_WCHAR *fileName, SYFileInformation *fileInfo)
- `NQ_STATUS syGetFileSize` (SYFile file, NQ_UINT64 *size)
- `NQ_STATUS sySetFileInformation` (const NQ_WCHAR *fileName, SYFile handle, const SYFileInformation *fileInfo)
- `NQ_STATUS syGetVolumeInformation` (const NQ_WCHAR *name, SYVolumeInformation *info)

3.10.1 Detailed Description

3.10.2 Macro Definition Documentation

3.10.2.1 `#define SY_EXTENDFILENOTSUPPORTED`

On some platforms `ftruncate()` might not support extending file. In this case open this define to simulate extending files

3.10.2.2 `#define SY_PATHSEPARATOR '/'`

Path separator character

3.10.2.3 #define SYFile int

File handle

3.10.2.4 #define syInvalidateFile(_f) *_f = ERROR

Set invalid file handle

3.10.2.5 #define syIsValidFile(_file) (_file!=ERROR)

Check file handle

3.10.2.6 #define syInvalidFile() (ERROR)

3.10.2.7 #define SY_CP_FIRSTILLEGALCHAR {0xe5}

Characters which are not acceptable by the file system as a file name

3.10.2.8 #define SY_CP_ANYILLEGALCHAR {0x7c, 0x5c}

Characters which are not acceptable by the file system as a file name

3.10.2.9 #define syFlushFile(_file) ((fsync(_file)==OK)? NQ_SUCCESS:NQ_FAIL)

3.10.2.10 #define syGetSecurityDescriptor(_f, _i, _b) udGetSecurityDescriptor(_f, _i, _b)

This function is actually user-defined. These macros are used for properly redefining file descriptors

3.10.2.11 #define sySetSecurityDescriptor(_f, _i, _b, _l) udSetSecurityDescriptor(_f, _i, _b, _l)

This function is actually user-defined. These macros are used for properly redefining file descriptors

3.10.3 Function Documentation

3.10.3.1 SYFile syCreateFile (const NQ_WCHAR * *name*, NQ_BOOL *denyread*, NQ_BOOL *denyexecute*, NQ_BOOL *denywrite*)

Create and open new file

Parameters

<i>name</i>	File name
<i>denyread</i>	True - to deny sharing for read
<i>denyexecute</i>	True - to deny sharing for execute
<i>denywrite</i>	True - to deny sharing for write

Returns

File handle or invalid handle

3.10.3.2 NQ_STATUS syDeleteFile (const NQ_WCHAR * *name*)

Delete file

Parameters

<i>name</i>	File name
-------------	-----------

Returns

NQ_SUCCESS or NQ_FAIL

3.10.3.3 NQ_STATUS syRenameFile (const NQ_WCHAR * *oldName*, const NQ_WCHAR * *newName*)

Rename file

Parameters

<i>oldName</i>	File name
<i>newName</i>	New file name

Returns

NQ_SUCCESS or NQ_FAIL

3.10.3.4 SYFile syOpenFileForRead (const NQ_WCHAR * *name*, NQ_BOOL *denyread*, NQ_BOOL *denyexecute*, NQ_BOOL *denywrite*)

Open file for reading

Parameters

<i>name</i>	File name
<i>denyread</i>	True - to deny sharing for read
<i>denyexecute</i>	True - to deny sharing for execute
<i>denywrite</i>	True - to deny sharing for write

Returns

File handle or invalid handle

3.10.3.5 SYFile syOpenFileForWrite (const NQ_WCHAR * *name*, NQ_BOOL *denyread*, NQ_BOOL *denyexecute*, NQ_BOOL *denywrite*)

Open file for writing

Parameters

<i>name</i>	File name
<i>denyread</i>	True - to deny sharing for read
<i>denyexecute</i>	True - to deny sharing for execute
<i>denywrite</i>	True - to deny sharing for write

Returns

File handle or invalid handle

3.10.3.6 SYFile syOpenFileForReadWrite (const NQ_WCHAR * *name*, NQ_BOOL *denyread*, NQ_BOOL *denyexecute*, NQ_BOOL *denywrite*)

Open file for reading and writing

Parameters

<i>name</i>	File name
<i>denyread</i>	True - to deny sharing for read
<i>denyexecute</i>	True - to deny sharing for execute
<i>denywrite</i>	True - to deny sharing for write

Returns

File handle or invalid handle

3.10.3.7 NQ_STATUS syTruncateFile (SYFile file, NQ_UINT32 offLow, NQ_UINT32 offHigh)

Truncate file

Parameters

<i>file</i>	File handle
<i>offLow</i>	Offset low
<i>offHigh</i>	Offset high

Returns

NQ_SUCCESS or NQ_FAIL

3.10.3.8 NQ_INT syReadFile (SYFile file, NQ_BYTE * buf, NQ_COUNT len)

Read bytes from file

Parameters

<i>file</i>	File handle
<i>buf</i>	Buffer for data
<i>len</i>	Number of bytes to read

Returns

Number of bytes read, zero on end of file, or NQ_FAIL

3.10.3.9 NQ_INT syWriteFile (SYFile file, const NQ_BYTE * buf, NQ_COUNT len)

Write bytes into file

Parameters

<i>file</i>	File handle
<i>buf</i>	Bytes to write
<i>len</i>	Number of bytes to write

Returns

Number of bytes written or NQ_FAIL

3.10.3.10 NQ_STATUS syCloseFile (SYFile fd)

Close opened file

Parameters

<i>fd</i>	Handle of the file
-----------	--------------------

Returns

NQ_SUCCESS if the file was close or NQ_FAIL on error

3.10.3.11 NQ_UINT32 sySeekFileCurrent (SYFile file, NQ_INT32 off, NQ_INT32 offHigh)

Position file relatively from the current position

Parameters

<i>file</i>	File handle
<i>off</i>	Low 32 bits of the offset
<i>offHigh</i>	High 32 bits of the offset

Returns

New file position or NQ_FAIL

3.10.3.12 NQ_UINT32 sySeekFileStart (SYFile file, NQ_UINT32 off, NQ_UINT32 offHigh)

Position file from the beginning

Parameters

<i>file</i>	File handle
<i>off</i>	Low 32 bits of the offset
<i>offHigh</i>	High 32 bits of the offset

Returns

New file position or NQ_FAIL

3.10.3.13 NQ_UINT32 sySeekFileEnd (SYFile file, NQ_INT32 off, NQ_INT32 offHigh)

Position file from the end

Parameters

<i>file</i>	File handle
<i>off</i>	Low 32 bits of the offset
<i>offHigh</i>	High 32 bits of the offset

Returns

New file position or NQ_FAIL

3.10.3.14 NQ_STATUS syGetFileInformation (SYFile file, const NQ_WCHAR * fileName, SYFileInformation * fileInfo)

Read file information structure by file handle

Parameters

<i>file</i>	File id
<i>fileName</i>	File name
<i>fileInfo</i>	File information structure

Returns

NQ_SUCCESS or NQ_FAIL

3.10.3.15 NQ_STATUS syGetFileInformationByName (const NQ_WCHAR * *fileName*, SYFileInformation * *fileInfo*)

Read file information structure by file name

Parameters

<i>fileName</i>	File name
<i>fileInfo</i>	File information structure

Returns

NQ_SUCCESS or NQ_FAIL

3.10.3.16 NQ_STATUS syGetFileSize (SYFile *file*, NQ_UINT64 * *size*)

Read file size by file handle

Parameters

<i>file</i>	File id
<i>size</i>	File size

Returns

NQ_SUCCESS or NQ_FAIL

3.10.3.17 NQ_STATUS sySetFileInformation (const NQ_WCHAR * *fileName*, SYFile *handle*, const SYFileInformation * *fileInfo*)

Update file information by either file name or file handle

Parameters

<i>fileName</i>	File name
<i>handle</i>	File handle
<i>fileInfo</i>	File information structure

Returns

NQ_SUCCESS or NQ_FAIL

3.10.3.18 NQ_STATUS syGetVolumeInformation (const NQ_WCHAR * *name*, SYVolumeInformation * *info*)

Query volume information

Parameters

<i>name</i>	Volume name
<i>info</i>	Buffer for information

Returns

NQ_SUCCESS or NQ_FAIL

3.11 Input Output

Macros

- #define [syPrintf](#) printf
- #define [syFprintf](#) fprintf
- #define [sySprintf](#) sprintf
- #define [sySnprintf](#) snprintf
- #define [syVsnprintf](#) vsnprintf
- #define [sySscanf](#) sscanf
- #define [syScanf](#) scanf
- #define [syGetchar](#) getchar
- #define [syFlush](#) fflush

3.11.1 Detailed Description

3.11.2 Macro Definition Documentation

3.11.2.1 #define [syPrintf](#) printf

3.11.2.2 #define [syFprintf](#) fprintf

3.11.2.3 #define [sySprintf](#) sprintf

3.11.2.4 #define [sySnprintf](#) snprintf

3.11.2.5 #define [syVsnprintf](#) vsnprintf

3.11.2.6 #define [sySscanf](#) sscanf

3.11.2.7 #define [syScanf](#) scanf

3.11.2.8 #define [syGetchar](#) getchar

3.11.2.9 #define [syFlush](#) fflush

3.12 File Locking

Macros

- #define `syUnlockFile`(`_file`, `_offsetHigh`, `_offsetLow`, `_lengthHigh`, `_lengthLow`, `_timeout`) ((`_file`==ERROR)? NQ_FAIL:NQ_SUCCESS)
- #define `syLockFile`(`_file`, `_offsetHigh`, `_offsetLow`, `_lengthHigh`, `_lengthLow`, `_lockType`, `_oplockLevel`) ((`_file`==ERROR)? NQ_FAIL:NQ_SUCCESS)

3.12.1 Detailed Description

File locking

The default implementation is mere a placeholder

3.12.2 Macro Definition Documentation

3.12.2.1 #define `syUnlockFile`(`_file`, `_offsetHigh`, `_offsetLow`, `_lengthHigh`, `_lengthLow`, `_timeout`) ((`_file`==ERROR)? NQ_FAIL:NQ_SUCCESS)

3.12.2.2 #define `syLockFile`(`_file`, `_offsetHigh`, `_offsetLow`, `_lengthHigh`, `_lengthLow`, `_lockType`, `_oplockLevel`) ((`_file`==ERROR)? NQ_FAIL:NQ_SUCCESS)

3.13 Direct Transfer

Functions

- NQ_STATUS [syDtStartPacket](#) (SYSocketHandle sock)
- void [syDtEndPacket](#) (SYSocketHandle sock)
- NQ_STATUS [syDtFromSocket](#) (SYSocketHandle sock, SYFile file, NQ_COUNT *len)
- NQ_STATUS [syDtToSocket](#) (SYSocketHandle sock, SYFile file, NQ_COUNT *len)

3.13.1 Detailed Description

3.13.2 Function Documentation

3.13.2.1 NQ_STATUS syDtStartPacket (SYSocketHandle sock)

Start fragmented packet

Parameters

<i>sock</i>	Socket handle
-------------	---------------

Returns

NQ_FAIL when this operation is not available NQ_SUCCESS when operation succeeded

3.13.2.2 void syDtEndPacket (SYSocketHandle sock)

End fragmented packet

Parameters

<i>sock</i>	Socket handle
-------------	---------------

3.13.2.3 NQ_STATUS syDtFromSocket (SYSocketHandle sock, SYFile file, NQ_COUNT * len)

Transfer bytes from socket to file

Parameters

<i>sock</i>	Socket handle
<i>file</i>	File handle
<i>len</i>	Number of bytes to transfer, OUT bytes transferred

Returns

NQ_FAIL on error or NQ_SUCCESS when operation succeeded

3.13.2.4 NQ_STATUS syDtToSocket (SYSocketHandle sock, SYFile file, NQ_COUNT * len)

Transfer bytes from file to socket

Parameters

<i>sock</i>	Socket handle
<i>file</i>	File handle
<i>len</i>	Number of bytes to transfer, OUT bytes transferred

Returns

NQ_FAIL on error or NQ_SUCCESS when operation succeeded

3.14 Encoding

Macros

- `#define SY_UNICODEFILESYSTEM`

Functions

- void `syUnicodeToUTF8N` (NQ_CHAR *outStr, NQ_UINT outLength, const NQ_WCHAR *inWStr, NQ_UINT inLength)
- void `syUTF8ToUnicodeN` (NQ_WCHAR *outWStr, NQ_UINT outLength, const NQ_CHAR *inStr, NQ_UINT inLength)
- NQ_BOOL `initCodePageUTF8` (void)

3.14.1 Detailed Description

3.14.2 Macro Definition Documentation

3.14.2.1 `#define SY_UNICODEFILESYSTEM`

Whether the filesystem supports Unicode. Otherwise all filenames will be converted to ANSI even if CIFS is supporting UNICODE

3.14.3 Function Documentation

3.14.3.1 void `syUnicodeToUTF8N` (NQ_CHAR * *outStr*, NQ_UINT *outLength*, const NQ_WCHAR * *inWStr*, NQ_UINT *inLength*)

Convert Unicode string to UTF8

Parameters

<i>outStr</i>	Pointer to the result string in UTF8
<i>outLength</i>	Length of the result buffer
<i>inWStr</i>	Pointer to string in UNICODE to be converted
<i>inLength</i>	Length of string to be converted

3.14.3.2 void `syUTF8ToUnicodeN` (NQ_WCHAR * *outWStr*, NQ_UINT *outLength*, const NQ_CHAR * *inStr*, NQ_UINT *inLength*)

Convert UTF8 string to Unicode

Parameters

<i>outWStr</i>	Pointer to the result string in UNICODE
<i>outLength</i>	Length of the result buffer
<i>inStr</i>	Pointer to input string in UTF8
<i>inLength</i>	Length of string to be converted

3.14.3.3 NQ_BOOL `initCodePageUTF8` (void)

Check whether conversion is available on the platform

Returns

TRUE on success, *FALSE* on error.

3.15 Utils

Macros

- #define `sySetRand()` `srand((unsigned int)time(0))`
- #define `syRand()` `rand()`

Functions

- int `syUnixMode2DosAttr` (int mode)
- NQ_UINT32 `syGetLastSmbError` (void)
- void `sySetLastNqError` (NQ_STATUS nqErr)

3.15.1 Detailed Description

3.15.2 Macro Definition Documentation

3.15.2.1 #define `sySetRand()` `srand((unsigned int)time(0))`

Take seed from the system time

3.15.2.2 #define `syRand()` `rand()`

Next (pseudo)random value

3.15.3 Function Documentation

3.15.3.1 int `syUnixMode2DosAttr` (int *mode*)

Convert UNIX file permissions to DOS file attributes

Parameters

<i>mode</i>	UNIX file permissions
-------------	-----------------------

Returns

Matching DOS file attributes

Note

- DOS read only is represented in UNIX by removing everyone's write bit.
- DOS archive is represented in UNIX by the user's execute bit.
- DOS system is represented in UNIX by the group's execute bit.
- DOS hidden is represented in UNIX by the other's execute bit.
- DOS directory is represented in UNIX by UNIX 's directory bit.

3.15.3.2 NQ_UINT32 `syGetLastSmbError` (void)

Convert last system error to SMB error

Returns

SMB error

3.15.3.3 void sySetLastNqError (NQ_STATUS *nqErr*)

Convert NQ error into system error

Parameters

<i>nqErr</i>	NQ error
--------------	----------

Chapter 4

File Documentation

4.1 syopsyst.h File Reference

```
#include "sycommon.h"
```

Macros

- `#define MUTEX_DEBUG`
- `#define SY_OSNAME "RedHat Linux"`
- `#define syAssert(_stat_) assert(_stat_)`
- `#define syGetTimeInSec() time(0)`
- `#define sySleep(_secs_) sleep(_secs_)`
- `#define syUSleep(_msecs_) usleep(_msecs_)`
- `#define SYThread pthread_t`
- `#define syIsValidThread(_taskId_) TRUE`
- `#define syThreadGetCurrent pthread_self`
- `#define syThreadDestroy(_taskId_) pthread_cancel(_taskId_);`
- `#define SYMutex pthread_mutex_t`
- `#define syMutexTake(_m) syMutexTakeDebug(_m, SY_LOG_FILE, SY_LOG_LINE)`
- `#define SY_SEMAPHORE_AVAILABLE`
- `#define SYSemaphore sem_t`
- `#define sySemaphoreDelete(_s) sem_destroy(&_s)`
- `#define sySemaphoreTake(_s) sem_wait(&_s)`
- `#define sySemaphoreGive(_s) sem_post(&_s)`
- `#define SY_LOCALHOSTIP4 /*{0, 0} */ {0x7f00, 0x0001}`
- `#define SY_LOCALHOSTIP6 {0, 0, 0, 0, 0, 0, 0, 1} /* {0, 0, 0, 0, 0, 0, 0, 0} */`
- `#define SY_LINKLOCALIP 0xfe80`
- `#define SY_ANYIP4 {0, 0}`
- `#define SY_ANYIP6 {0, 0, 0, 0, 0, 0, 0, 0}`
- `#define SY_ZEROIP {0, 0, 0, 0, 0, 0, 0, 0}`
- `#define SY_ZEROIP4 0L`
- `#define SY_INTERNALSOCKETPOOL`
- `#define SYSocketHandle NQ_INT`
- `#define SYSocketSet fd_set`
- `#define syIsValidSocket(_sock) (_sock != ERROR)`
- `#define syInvalidSocket() (ERROR)`
- `#define syAddSocketToSet(_sock, _set) FD_SET((_sock), (_set))`
- `#define syIsSocketSet(_sock, _set) FD_ISSET((_sock), (_set))`

- #define [syClearSocketSet](#)(_set) FD_ZERO((_set))
- #define [syClearSocketFromSet](#)(_sock, _set) FD_CLR((_sock), (_set))
- #define [sySetDatagramSocketOptions](#)(_sock)
- #define [sySetStreamSocketOptions](#)(_sock)
- #define [syGetPid](#)() getpid()
- #define [SYDirectory](#) DIR*
- #define [syInvalidateDirectory](#)(_pd) *(_pd) = NULL
- #define [syIsValidDirectory](#)(_d) (_d != NULL)
- #define [SY_EXTENDFILENOTSUPPORTED](#)
- #define [SY_PATHSEPARATOR](#) '/'
- #define [SYFile](#) int
- #define [syInvalidateFile](#)(_f) *_f = ERROR
- #define [syIsValidFile](#)(_file) (_file != ERROR)
- #define [syInvalidFile](#)() (ERROR)
- #define [SY_CP_FIRSTILLEGALCHAR](#) {0xe5}
- #define [SY_CP_ANYILLEGALCHAR](#) {0x7c, 0x5c}
- #define [syFlushFile](#)(_file) ((fsync(_file)==OK)? NQ_SUCCESS:NQ_FAIL)
- #define [syGetSecurityDescriptor](#)(_f, _i, _b) udGetSecurityDescriptor(_f, _i, _b)
- #define [sySetSecurityDescriptor](#)(_f, _i, _b, _l) udSetSecurityDescriptor(_f, _i, _b, _l)
- #define [syPrintf](#) printf
- #define [syFprintf](#) fprintf
- #define [sySprintf](#) sprintf
- #define [sySnprintf](#) snprintf
- #define [syVsnprintf](#) vsnprintf
- #define [sySscanf](#) sscanf
- #define [syScanf](#) scanf
- #define [syGetchar](#) getchar
- #define [syFlush](#) fflush
- #define [syUnlockFile](#)(_file, _offsetHigh, _offsetLow, _lengthHigh, _lengthLow, _timeout) ((_file==ERROR)? NQ_FAIL:NQ_SUCCESS)
- #define [syLockFile](#)(_file, _offsetHigh, _offsetLow, _lengthHigh, _lengthLow, _lockType, _oplockLevel) ((_file==ERROR)? NQ_FAIL:NQ_SUCCESS)
- #define [syGetHostName](#)(_name, _nameLen) gethostname((_name), (_nameLen))
- #define [SY_UNICODEFILESYSTEM](#)
- #define [sySetRand](#)() srand((unsigned int)time(0))
- #define [syRand](#)() rand()

Functions

- NQ_TIME [syGetTimeInMsec](#) (void)
- NQ_TIME [syConvertTimeSpecToTimeInMsec](#) (void *val)
- NQ_UINT32 [syConvertTimeInMsecToSec](#) (NQ_TIME *timeMsec)
- NQ_INT [syGetTimeZone](#) (void)
- void [syDecomposeTime](#) (NQ_UINT32 time, SYTimeFragments *decomposed)
- NQ_UINT32 [syComposeTime](#) (const SYTimeFragments *decomposed)
- NQ_BOOL [syGmtToString](#) (NQ_BYTE *strTime, NQ_COUNT size, NQ_UINT32 t, const NQ_CHAR *fmt)
- void [syThreadStart](#) (NQ_BOOL isRT, NQ_INT priorityLevel, [SYThread](#) *taskIdPtr, void(*startpoint)(void), NQ_BOOL background)
- void [syMutexCreate](#) (SYMutex *_m)
- void [syMutexDelete](#) (SYMutex *_m)
- void [syMutexTakeDebug](#) (SYMutex *_m, const NQ_CHAR *text, const NQ_UINT line)
- void [syMutexGive](#) (SYMutex *_m)
- NQ_STATUS [sySemaphoreCreate](#) (SYSemaphore *semId, NQ_UINT count)
- void [sySemaphoreResetCounter](#) (SYSemaphore *pSemId)

- NQ_INT [sySemaphoreTimedTake](#) ([SYSemaphore](#) *sem, NQ_INT timeout)
- NQ_UINT32 [syGetIPv6Scopeld](#) (const NQ_IPADDRESS6 ip)
- NQ_BOOL [syIsSocketAlive](#) ([SYSocketHandle](#) sock)
- NQ_STATUS [syShutdownSocket](#) ([SYSocketHandle](#) sock)
- NQ_STATUS [syCloseSocket](#) ([SYSocketHandle](#) sock)
- NQ_STATUS [syListenSocket](#) ([SYSocketHandle](#) sock, NQ_INT backlog)
- [SYSocketHandle](#) [syCreateSocket](#) (NQ_BOOL stream, NQ_UINT family)
- NQ_STATUS [syBindSocket](#) ([SYSocketHandle](#) sock, const NQ_IPADDRESS *ip, NQ_PORT port, NQ_BOOL reuseAddress)
- NQ_STATUS [syAllowBroadcastsSocket](#) ([SYSocketHandle](#) sock)
- void [sySetClientSocketOptions](#) ([SYSocketHandle](#) sock)
- void [syGetSocketPortAndIP](#) ([SYSocketHandle](#) sock, NQ_IPADDRESS *ip, NQ_PORT *port)
- NQ_INT [sySendToSocket](#) ([SYSocketHandle](#) sock, const NQ_BYTE *buf, NQ_COUNT len, const NQ_IPADDRESS *ip, NQ_PORT port)
- NQ_STATUS [syConnectSocket](#) ([SYSocketHandle](#) sock, const NQ_IPADDRESS *ip, NQ_PORT port)
- NQ_INT [sySendSocket](#) ([SYSocketHandle](#) sock, const NQ_BYTE *buf, NQ_COUNT len)
- NQ_STATUS [sySendSocketAsync](#) ([SYSocketHandle](#) sock, const NQ_BYTE *buf, NQ_COUNT len, void(*releaseFunc)(const NQ_BYTE *))
- NQ_INT [sySelectSocket](#) ([SYSocketSet](#) *pset, NQ_UINT32 timeout)
- NQ_INT [syRecvFromSocket](#) ([SYSocketHandle](#) sock, NQ_BYTE *buf, NQ_COUNT len, NQ_IPADDRESS *ip, NQ_PORT *port)
- NQ_INT [syRecvSocket](#) ([SYSocketHandle](#) sock, NQ_BYTE *buf, NQ_COUNT len)
- NQ_INT [syRecvSocketWithTimeout](#) ([SYSocketHandle](#) sock, NQ_BYTE *buf, unsigned int len, unsigned int secs)
- [SYSocketHandle](#) [syAcceptSocket](#) ([SYSocketHandle](#) sock, NQ_IPADDRESS *ip, NQ_PORT *port)
- NQ_STATUS [sySendMulticast](#) ([SYSocketHandle](#) socket, const NQ_BYTE *buffer, NQ_COUNT length, const NQ_IPADDRESS *ip, NQ_PORT port)
- void [sySubscribeToMulticast](#) ([SYSocketHandle](#) socket, const NQ_IPADDRESS *ip)
- NQ_STATUS [syCreateDirectory](#) (const NQ_WCHAR *name)
- NQ_STATUS [syDeleteDirectory](#) (const NQ_WCHAR *name)
- [SYDirectory](#) [syOpenDirectory](#) (const NQ_WCHAR *name)
- NQ_STATUS [syFirstDirectoryFile](#) (const NQ_WCHAR *name, [SYDirectory](#) *pDir, const NQ_WCHAR **fileName)
- NQ_STATUS [syNextDirectoryFile](#) ([SYDirectory](#) dir, const NQ_WCHAR **fileName)
- NQ_STATUS [syCloseDirectory](#) ([SYDirectory](#) dir)
- [SYFile](#) [syCreateFile](#) (const NQ_WCHAR *name, NQ_BOOL denyread, NQ_BOOL denyexecute, NQ_BOOL denywrite)
- NQ_STATUS [syDeleteFile](#) (const NQ_WCHAR *name)
- NQ_STATUS [syRenameFile](#) (const NQ_WCHAR *oldName, const NQ_WCHAR *newName)
- [SYFile](#) [syOpenFileForRead](#) (const NQ_WCHAR *name, NQ_BOOL denyread, NQ_BOOL denyexecute, NQ_BOOL denywrite)
- [SYFile](#) [syOpenFileForWrite](#) (const NQ_WCHAR *name, NQ_BOOL denyread, NQ_BOOL denyexecute, NQ_BOOL denywrite)
- [SYFile](#) [syOpenFileForReadWrite](#) (const NQ_WCHAR *name, NQ_BOOL denyread, NQ_BOOL denyexecute, NQ_BOOL denywrite)
- NQ_STATUS [syTruncateFile](#) ([SYFile](#) file, NQ_UINT32 offLow, NQ_UINT32 offHigh)
- NQ_INT [syReadFile](#) ([SYFile](#) file, NQ_BYTE *buf, NQ_COUNT len)
- NQ_INT [syWriteFile](#) ([SYFile](#) file, const NQ_BYTE *buf, NQ_COUNT len)
- NQ_STATUS [syCloseFile](#) ([SYFile](#) fd)
- NQ_UINT32 [sySeekFileCurrent](#) ([SYFile](#) file, NQ_INT32 off, NQ_INT32 offHigh)
- NQ_UINT32 [sySeekFileStart](#) ([SYFile](#) file, NQ_UINT32 off, NQ_UINT32 offHigh)
- NQ_UINT32 [sySeekFileEnd](#) ([SYFile](#) file, NQ_INT32 off, NQ_INT32 offHigh)
- NQ_STATUS [syGetFileInformation](#) ([SYFile](#) file, const NQ_WCHAR *fileName, [SYFileInformation](#) *fileInfo)
- NQ_STATUS [syGetFileInformationByName](#) (const NQ_WCHAR *fileName, [SYFileInformation](#) *fileInfo)
- NQ_STATUS [syGetFileSize](#) ([SYFile](#) file, NQ_UINT64 *size)

- NQ_STATUS [sySetFileInformation](#) (const NQ_WCHAR *fileName, [SYFile](#) handle, const SYFileInformation *fileInfo)
- NQ_STATUS [syGetVolumeInformation](#) (const NQ_WCHAR *name, SYVolumeInformation *info)
- NQ_IPADDRESS4 [syGetHostByName](#) (const char *name)
- void [syGetDnsParams](#) (NQ_CHAR *domain, NQ_IPADDRESS *server)
- void [syGetMacAddress](#) (NQ_IPADDRESS4 ip, NQ_BYTE *macBuffer)
- NQ_STATUS [syGetAdapter](#) (NQ_INDEX adapterIdx, NQ_INDEX *osIndex, NQ_IPADDRESS4 *pIp, NQ_IPADDRESS6 *ip6, NQ_IPADDRESS4 *pSubnet, NQ_IPADDRESS4 *pBcast, NQ_WCHAR *pWins, NQ_WCHAR *pDns)
- NQ_STATUS [syDtStartPacket](#) ([SYSocketHandle](#) sock)
- void [syDtEndPacket](#) ([SYSocketHandle](#) sock)
- NQ_STATUS [syDtFromSocket](#) ([SYSocketHandle](#) sock, [SYFile](#) file, NQ_COUNT *len)
- NQ_STATUS [syDtToSocket](#) ([SYSocketHandle](#) sock, [SYFile](#) file, NQ_COUNT *len)
- void [syUnicodeToUTF8N](#) (NQ_CHAR *outStr, NQ_UINT outLength, const NQ_WCHAR *inWStr, NQ_UINT inLength)
- void [syUTF8ToUnicodeN](#) (NQ_WCHAR *outWStr, NQ_UINT outLength, const NQ_CHAR *inStr, NQ_UINT inLength)
- NQ_BOOL [initCodePageUTF8](#) (void)
- int [syUnixMode2DosAttr](#) (int mode)
- NQ_UINT32 [syGetLastSmbError](#) (void)
- void [sySetLastNqError](#) (NQ_STATUS nqErr)

4.1.1 Macro Definition Documentation

4.1.1.1 #define MUTEX_DEBUG

When defined each mutex create, take, destroy will be logged

4.1.1.2 #define SY_OSNAME "RedHat Linux"

Operating system name

4.1.1.3 #define syAssert(_stat_) assert(_stat_)

Assert macro

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