SNTP Server and Client Test Plan Documentation

Version 1

This document contains information on the testing specification for Simple Network Time Server (v1.1) and Simple Network Time Client (v1.1).

The software source contains a unit testing suite to aid in determining a passing build, these tests are intended to build on the unit tests, providing coverage where simulated use cannot.

SNTP Client Test Plan

Test documentation for the client software.

Test	Description	Expected outcome
./sntp-client	Client returns formatted time with no arguments provided and exits with code 0	"2016-11-30 18:40:19.1306 (+0000) + 0.017796 +/- 0.006552 0.uk.pool.ntp.org(176.58.109.199) s2 no-leap Process finished with exit code 0"
./sntp-client -help	Client returns usage information and exits with code 0.	"Usage: -multicast Enables broadcasting on a multicast group -port Use requested port -host Use requested hostname Process finished with exit code 0"
./sntp-client -port	Client takes an input from the user to determine the port number, provides a formatted time and exits with code 0.	"Enter port number: 123 2016-11-30 18:50:04.479796 (+0000) + 0.903466 +/- 0.010193 0.uk.pool.ntp.org(5.152.207.79) s2 no-leap Process finished with exit code 0"
./sntp-client -host	Client takes an input from the user to determine the server hostname/IP address, provides a formatted time and exits with code 0.	"Enter hostname: ntp.exnet.com 2016-11-30 18:53:39.472299 (+0000) + 0.002926 +/- 0.021284 ntp.exnet.com(79.135.97.70) s2 no-leap Process finished with exit code 0"
./sntp-client -multicast	Client checks for the -multicast argument, if present the program broadcasts on multicast group 224.0.1.1 and returns the first time received from a unicast response.	"Broadcasting on multicast channel 224.0.1.1 2016-11-30 18:53:39.472299 (+0000) + 0.002926 +/- 0.021284 ntp.exnet.com(79.135.97.70) s2 no-leap Process finished with exit code 0"
Timeout	Client retries the request after a certain timeout period has elapsed.	Client retries after 5 seconds with no response received.

Stratum check	Client analyses the stratum value of the response.	Client drops packet if stratum is greater than 15 and requests another. Client displays returned 'Kiss of Death' code if stratum is 0 Client displays formatted time stamp if stratum is > 0 & <= 15
Leap indicator check	Client analyses the leap indicator of the response.	Client displays formatted timestamp if LI is 0 Client displays adjusted time stamp + 1 second if LI is 1 Client displays adjusted time stamp - 1 second if LI is 2 Client polls the server for a new response if LI is 3 and displays error

SNTP Server Test Plan

Test documentation for the server software.

Test	Description	Outcome
./sntp-server	Server spins up and listens for incoming requests.	"Online... Reference update succeeded Listening..."
./sntp-server -help	Server returns usage information and exits with code 0.	"Usage: -multicast Enables listening on a multicast group -port Use requested port Process finished with exit code 0"
./sntp-server -port	Server takes an input from the user to determine the port number to listen on and starts listening for incoming requests.	"Enter port number: 123 Online... Reference update succeeded Listening…"
./sntp-server -multicast	Server takes an input from the user to determine multicast mode and starts to listen on multicast group 224.0.1.1 if present.	"Joining multicast group 224.0.1.1 Online... Reference update succeeded Listening..."

Reference synchronise	The server synchronises with another	When starting up, the server contacts its reference server and updates
Unicast response	The server responds to a well formed unicast request	"Response received from <IP ADDRESS> Response sent to <IP ADDRESS>"
Multicast response	The server responds to a well formed multicast request	"Response received from <IP ADDRESS> Response sent to <IP ADDRESS>"
Reference update	Server updates reference if most recent update is one minute old on last response	"Response received from <IP ADDRESS> Response sent to <IP ADDRESS> Reference update succeeded"
Reference timeout	Server will gracefully fail reference update/synchronise, won't set LI to 3 if one update has already succeeded	"Online... <ERROR OUTPUT> Failed to update reference time Listening…"

Additional tests can be run from the application source by running the unit tests contained in the checks.cpp file.