

# **RTCM 10410.0 (RTCM Paper 200-2004/SC104-STD, Version 1.0), with Amendment 1, Standard for Networked Transport of RTCM via Internet Protocol (Ntrip)**

Networked Transport of RTCM via Internet Protocol (Ntrip) is an application-level protocol that supports streaming Global Navigation Satellite System (GNSS) data over the Internet. Ntrip is a generic, stateless protocol based on the Hypertext Transfer Protocol HTTP/1.1. The HTTP objects are extended to GNSS data streams.

Ntrip is designed to disseminate differential correction data or other kinds of GNSS streaming data to stationary or mobile users over the Internet, allowing simultaneous PC, Laptop, PDA, or receiver connections to a broadcasting host. Ntrip supports wireless Internet access through Mobile IP Networks like GSM, GPRS, EDGE, or UMTS.

Ntrip consists of three system software components: NtripClients, NtripServers and NtripCasters. The NtripCaster is the actual HTTP server program, while NtripClient and NtripServer act as HTTP clients.

Ntrip is meant to be an open non-proprietary protocol. Major characteristics of Ntrip's dissemination technique are the following:

It is based on the popular HTTP streaming standard; it is comparatively easy to implement when limited client and server platform resources are available.

Its application is not limited to one particular plain or coded stream content; it has the ability to distribute any kind of GNSS data.

It has the potential to support mass usage; it can disseminate hundreds of streams simultaneously for up to a thousand users when applying modified Internet Radio broadcasting software.

Regarding security needs, stream providers and users are not necessarily in direct contact, and streams are usually not blocked by firewalls or proxy servers protecting Local Area Networks.

It enables streaming over any mobile IP network because it uses TCP/IP.