

# Time Synchronization with The Network Time Protocol (NTP)

## **Definition: Network Time Protocol (NTP):**

NTP is an internet standard for time synchronization. The technology was developed at the University of Delaware, responsible is Mr. David Mills [1].

The different roles that are designated to the servers and computers, allow a type of Top-Down-Time synchronization. Time servers from level 1 (Primary Time Server form stratum 1) are synchronized by higher state-run clocks, mostly via GPS or modem.

These “primary” time servers from level 1 also can synchronize time servers or time clients from subnets, which are located in the so called “secondary” level (Secondary Time Server from stratum 2). Server and client cooperate in one master/slave mode (see Figure1). The Network Time Protocol is described more detailed in RFCs [2].

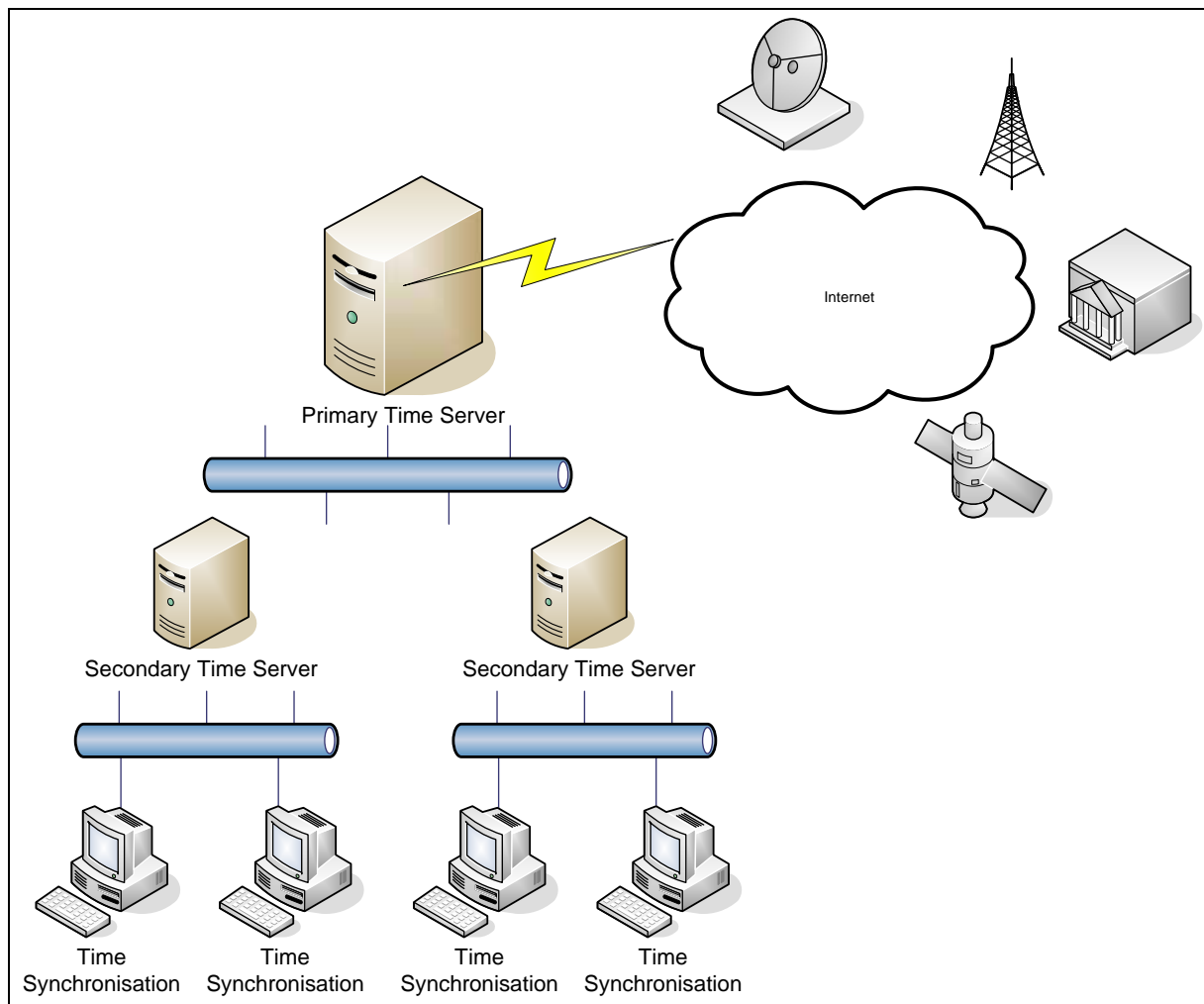


Figure1: Network Time Protocol Prinzip

## **NTP and MSX-Box**

Two programs are available for the MSX-Box: “ntpd” and “ntpdate”

### **Ntpd: Network Time Protocol Daemon**

The “ntpd” program is a service (daemon [3]) with which you can equate the system time of a device (for example of a computer) with a master time server and synchronize it. This program realizes the Network Time Protocol (as described in the RFCs [2]).

In defined time periods the program exchanges messages with the above mentioned master time server in order to check the adjustment of the system clock and, if necessary, to synchronize this clock with the server time.

### **Ntpdate: Setting date and time with NTP**

Like with the well-known command “date”, “ntpdate” can be used to set the date and time of the MSX-Box manually or in a script. A calibrated master time server synchronizes the data.

Both programs (ntpd and ntpdate) use a configuration file that contains for example the network address of the time server.

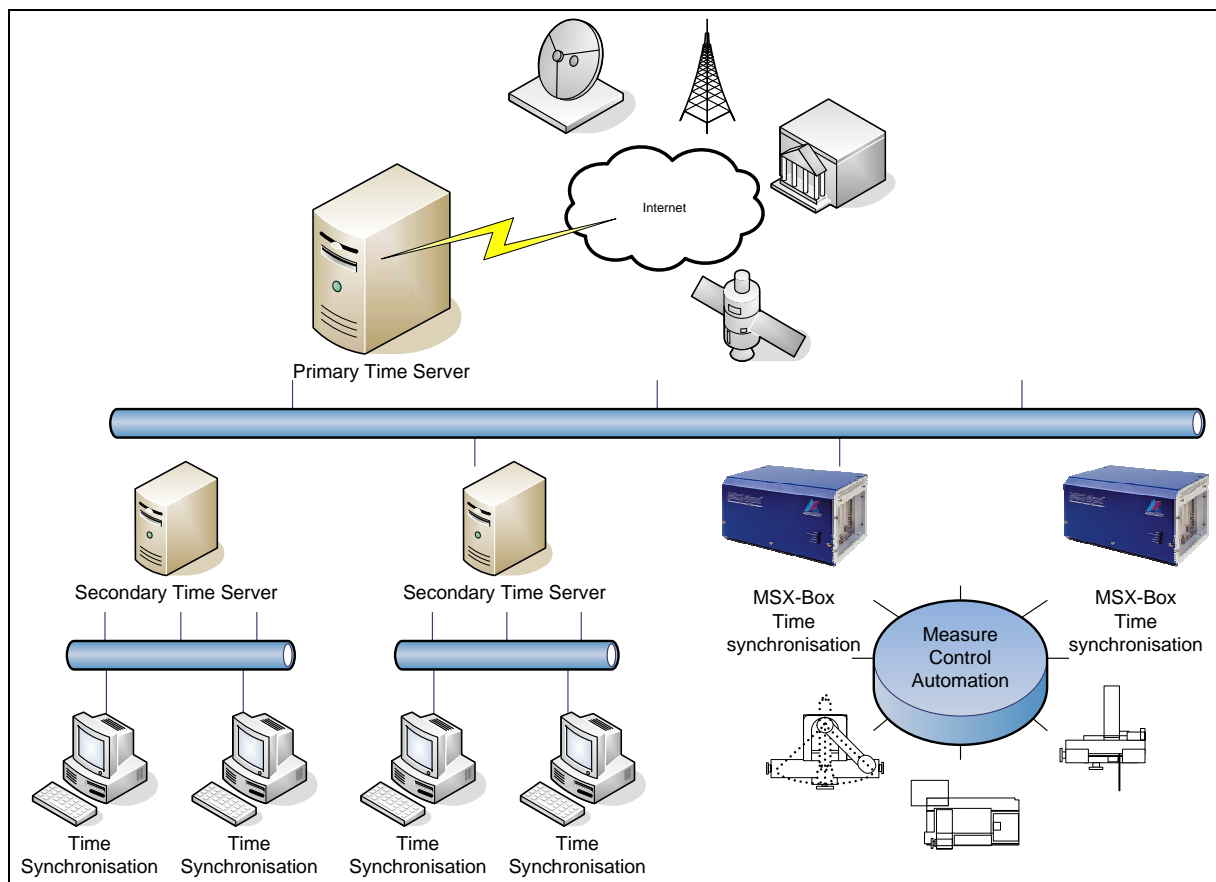


Figure2: MSX-Box Time Synchronization

### **The benefits of time synchronization for the MSX-Box**

If you use various MSX-Boxes to realize different measurement jobs (or MSR jobs), the time synchronization between the MSX-Boxes is a crucial factor. As herewith, the internal clocks are synchronized periodically.

With the Network Time Protocol (NTP) the time synchronization can be installed easily.

### **Remarks**

**[1]:** More information about NTP <http://www.eecis.udel.edu/~mills/ntp.html>

**[2]:** Network Time Protocol RFCs: RFC-1305/RFC-1059/ RFC-1119

RFC (Request For Comments) Definition

Abbreviation for "Request for Comment": IETF (Internet Engineering Task Force) is an open international organisation, which defines in RFCs documents open internet standards. Under <http://www.faqs.org/rfcs/> oder <http://www.hio.hen.ne/rfc/> you can learn more about the protocol details TCP/IP, SMTP, NTP etc. via the RFC documents.

**[3]:** Daemon Definition

Description for a background process that is indefinitely available in order to react to requests or events.