

Decentralization of UTC(NICT) system

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In the NICT, we generate UTC(NICT) using cesium atomic clocks and hydrogen masers by UTC(NICT) system in Tokyo Japan. We currently advance a project to decentralize UTC(NICT) system in the various parts of Japan. The purpose of the decentralization is mainly to prepare for future disasters and to improve reliability and precision of UTC(NICT). The decentralization consists of the following operations.

- 1) Decentralization of atomic clocks: Atomic clocks, which are used as frequency source and standard time, are dispersed and utilized in the various parts of Japan.
- 2) Construction of time transfer link: The link of all our atomic clocks in Japan is constructed by time transfer system. This time transfer is carried out mainly using GPS and/or TWSTFT for redundancy.
- 3) Construction of database for clock data, status of atomic clocks and measurement system: We construct a database server to record clock data (time differences data) of all atomic clocks and status of the clocks and system.
- 4) Installation of standard time generation system: In the various parts of Japan, we set up the standard time generation system which consists of a frequency adjuster, an atomic clock as frequency source and NET (NICT Ensemble Time) data from the clock database server.

As a result of the decentralizations, if all atomic clocks in Tokyo are halted by a natural disaster with power failure for a long time, it is possible that the standard time is continuously kept using the atomic clocks in other place. Since NET is calculated using the database server, the number of atomic clocks used for NET can be increased and improvement of frequency stability of NET is expected. Furthermore, the generated times in the various parts of Japan are used as backup standard times and/or supplied as the time synchronized with original standard time by various ways.

Advancing the decentralization so far, we have installed atomic clocks and measurement system in Kobe and two LF frequency standard transmission stations (see fig.). Moreover we will generate standard time from each place in this year.

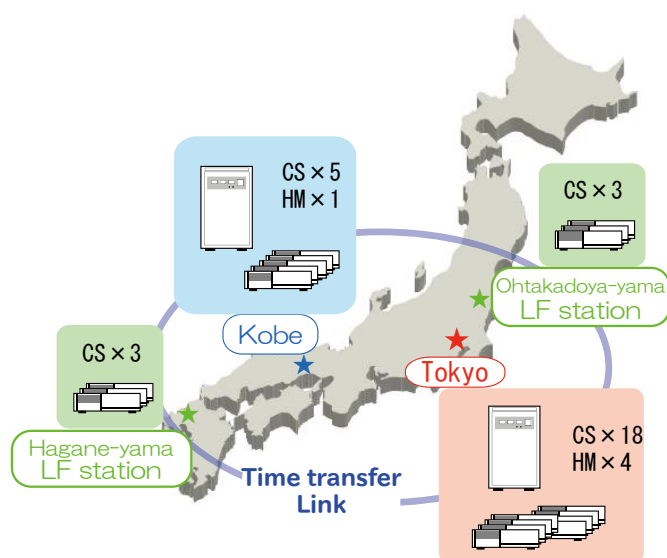


Fig. Outline of the decentralization of atomic clocks and the time transfer link.