

World's first field trial of 10Gbit/s-100km class high speed and wide area optical access

March 7 2012

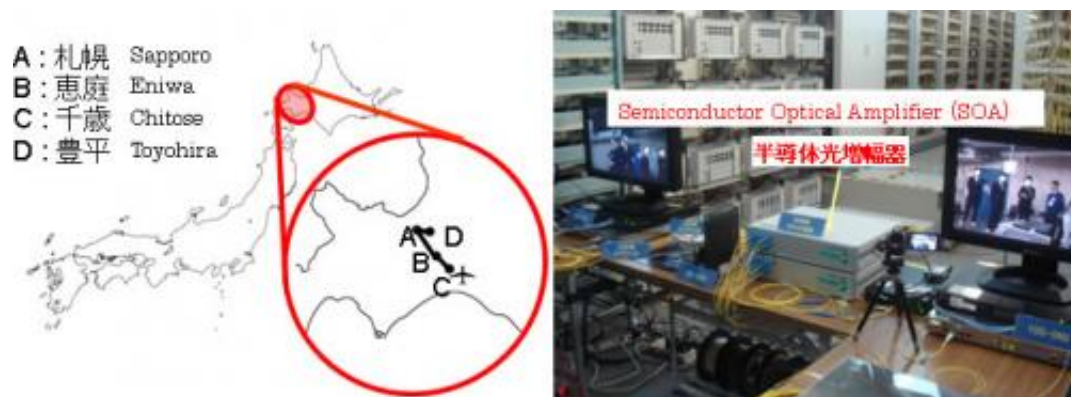


Figure 1 Place of field trial and semiconductor optical amplifiers

Nippon Telegraph and Telephone Corporation has succeeded in the field trial of an optical amplification technology that realizes 10Gbit/s-100km class high speed and wide area optical access networks.

We have been advancing this technology under the research contract titled “Research and development of wide area optical access networks” by National Institute of Information and Communications Technology.

A part of these results will be presented on March 8 (PST) at the international conference OFC/NFOEC held in Los Angeles.

To develop access systems for the next generation that offer efficient

network configuration and stable and variable service provision, strong research efforts are needed to increase communication speed, expand transmission length, reduce power consumption of transmission equipment, etc. Given the importance of expanding the transmission length, which enables the efficient accommodation of subscribers and the potential reduction in power consumption, we targeted this goal.

NTT Access Network Service Systems Laboratories (NTT labs.) have been through their research efforts to resolve this issue; the result is the establishment of an optical amplification technology that provides inexpensive wide dynamic range optical amplifiers and can handle burst signals generated in Ethernet PON systems.

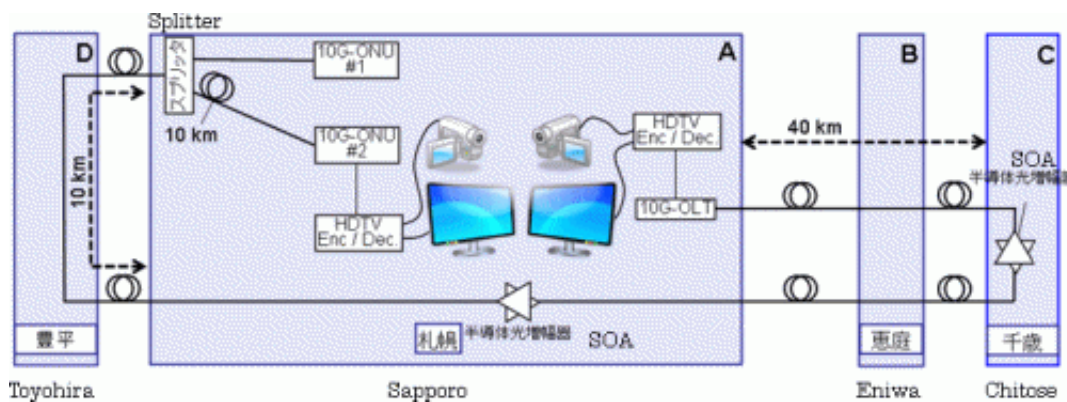


Figure 2 Configuration of field trial

The [field trial](#) was carried out in a testbed configured in Hokkaido prefecture, the north part of Japan, by connecting NTT East buildings in Sapporo, Toyohira, Eniwa and Chitose by optical fibers with total length over 100km. (Figures 1 and 2)

The [optical amplification](#) technology developed by NTT labs. includes

an automatic level control (ALC) technology that can assess the input burst signals and, at high speed, adjust them to a constant level by controlling optical attenuators. For downsizing, reducing cost, and matching wavelengths of optical signals used for access systems, semiconductor optical amplifiers (SOA) are adopted as the gain medium.

Combining SOAs with ALC and Ethernet PON systems based on IEEE 802.3av standards, we conducted transmission experiments with total span lengths of over 100km and confirmed good transmission characteristics at the communication speed of 10Gbit/s. In addition we demonstrated the real-time bidirectional transmission of uncompressed high definition video and confirmed excellent [transmission](#) characteristics.

We will realize optical amplifiers that offer more performance in smaller packages. We will also develop environmentally-robust and highly reliable optical amplifiers.

Source: NTT DOCOMO

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