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Network Technology for your Dome

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1. Preface

As we introduced Information Technology to Yamanashi Prefecture Science Center since 1999, citizens in Yamanashi prefecture have experienced the live broadcast of telescope images. We had video conferencing among the pupils and teachers, and the visitors to the science center watched video images projected onto the planetarium dome.

The prefecture of Yamanashi strongly encourages introducing the IT system to homes as well as offices, schools, universities, and museums. People enjoy its possibilities and new experiences using the IT system.

Today I would like to introduce you the applications of Yamanashi Prefecture Science Center including the planetarium dome system.

2. Progress of the Network

We built the live broadcast system for 20cm coude telescope by Goto Optical Mfg.,Co. at the science center connecting to the Giga-bits fiber-optic network in 1999 by the support of Toshi-Com (The Experimental System for Development of the Urban Community System) ran by TAO^[1] under Somu-sho (Ministry of Public Management, Home Affairs, Posts and Telecommunications) of Japan. We relayed celestial body images in real-time to pupils, students and citizens in Yamanashi.

Until now users of FTTH (Fiber to the Home) and ADSL (Asynchronous Digital Subscribers Line) have increased nearly 15 million^[2] in Japan. That means that number of people have the circumstance of broadband and regular connection to the Internet while the capability of ADSL in Japan became from 1.5Mbps to 45Mbps maximum.

Also Japanese government and local governments enthusiastically encourage introducing high-speed network to administrative

offices, schools, universities and museums. The policy is called "e-Japan Strategy". We expect that many science centers and museums would connect to the network via the broadband access lines under this policy.

3. Remote Telescope System – CATS-III / CATS-i

We developed remotely operational observatory system called "CATS-III / CATS-i"^[3] with Goto Optical Mfg.,Co., AstroArts Inc. and Hitachi Cable, Ltd. in 2000. The system was installed to the science center in January 2001 and started operation. The 20cm coude telescope can be operated over the network. And from 2002 the system was also connected to the Internet, so you can use the telescope wherever you are.

The CATS-i system is also installed to Kazo Miraikan in Kazo, Saitama, Osaka Kyoiku University in Osaka and The Science Museum Tokyo in Tokyo. Especially the system in Tokyo^[4] has a joint program with HOU (Hands-on-Universe) and the telescope is often used from people abroad.

4. Network Observation at Shimobe Schools

Shimobe town is about 3 km south from Kofu city where the science center is built in Yamanashi prefecture. The science center staffs carried telescopes and laptop computers to the Shimobe primary school and demonstrated the network observation using CATS-III and the video conferencing system.

We had network observation events since 1999 between Shimobe primary and junior-high school and the science center. Pupils, students and their parents had participated to those events and observed celestial bodies via the network. They could also take lectures from the science center staffs and/or guest lecturers. They could ask questions and get answers over the video conferencing system.

5. Conclusion

As the science center experienced using IT System for providing services we faced several problems. For example the science center staffs must have skills to operate the network system and study about the network technology while they are doing their daily jobs.

However with the growing network infrastructure we would like to make the most of

it including the remoteness education. Also we plot the international cooperation such as sharing telescope time.

Now pupils, students, teachers and ordinal people can use telescopes remotely. You can show how it works and demonstrate real-time observation in your planetarium. I believe the science center have a strong tool and the circumstance to show the vivid science world and deliver information to the people.

Special Thanks to...

These companies and the local government helped us to make this system work.

Hitachi Cable, Ltd.
Goto Optical Mfg.,Co.
AstroArts Inc.
Yamanashi Prefecture

- [1] TAO represents Telecommunication Advancement Organization. TAO has been reorganized as NiCT (National Institute of Information and Communications Technology) joining with CRL (Communications Research Laboratory) in April 2004.
- [2] "The total contractors of ADSL till February 2004" according to the Ministry of Public Management, Home Affairs, Posts and Telecommunications.
- [3] CATS represents Computer Aided Telescope System. CATS-i is the registered service mark of Goto Optical Mfg.,Co. in Japan.
CATS-III is the development version for Yamanashi Prefectural Science Center. CATS-i is the product of Goto Optical Mfg.,Co.
The CATS-III system is patent pending in 2000 and 2002 in Japan. (P2002-23064A; P2003-298915A)
- [4] The system is called KIT – Kitanomaru Internet Telescope.
http://jahou.riken.go.jp/kit/KIT_Home.html

[notice] Goto Optocal Mfg.,Co. changed the corporate name as Goto Inc in May 2004.