Online Journal of Space Communication

Volume 6
Issue 12 *The Role of Satellites in Distance Education (Spring 2007)*

Article 5

IPSTAR and Education in Thailand

Taksin Uppalakom

Issue 12: Thailand - IPSTAR

The satellite communication project called IPSTAR was first developed in 1997 by Shin Satellite of Thailand. The project's aim was to deliver an inexpensive broadband satellite better suited to consumer markets. This project included a broadband satellite with more advanced ground system capabilities. The model for the IPSTAR ground system was first field deployed in the year 2000 using IPSTAR first generation services on conventional satellites. These first generation services are still available in various countries on Thaicom, INSAT, APSTAR and ST-1 satellites.

Fig. 1: IPSTAR Terminal

IPSTAR (also known as Thaicom-4), the world largest broadband satellite, was launched from the space port in Kourou, French Guiana, South America in late 2005,. The satellite is now located at 119.5 degrees east, providing its 45 gigabits per second capacity through 94 beams, covering all of the Asia Pacific Region. This satellite and its ground systems is being used for digital high-speed Internet services, and can support all-IP applications. Even though IPSTAR is designed for IP applications, it is not used just in broadband markets. It is applicable to other telecom infrastructures such as rural telephony, e-government, e-medicine and distance learning. As of 2007, there were almost eighty thousand dishes deployed in the Asia Pacific region addressing those markets.

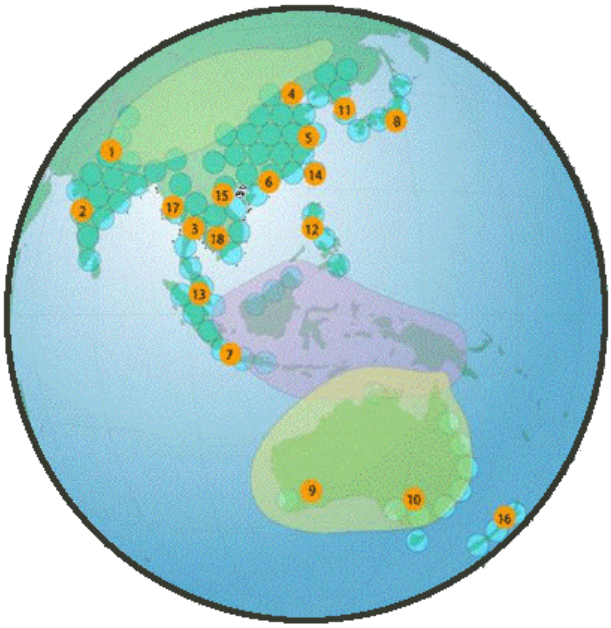

Fig. 2a: IPSTAR Footprint

Fig. 2b: Thailand gateway

The idea of distance learning on IPSTAR was first explored in Cambodia around year 2002. Shin Satellite donated 3 initial sets of IPSTAR equipment to schools in a remote area of Cambodia. Without electricity, the IPSTAR terminals were fed by a diesel generator and solar panels. These terminals provided education to poor children, but they also provided connections between a local hospital and the capital city, even linking in Harvard Medical School for consultation. This project was the result of a cooperative effort between Shin Satellite and Media Lab of the Massachusetts Institute of Technology (MIT) that followed a child-centered approach to education allowing children to learn how to work in the real world, using appropriate technology, and by experimenting themselves.

Fig. 3: IPSTAR initiative in Cambodia

In Thailand, "Schoolnet" was established by the Government of Thailand in 1995 in raise the education level of children, and enable teachers to access and exchange knowledge, news and information and share intellectual activities on a common network. Schoolnet also enabled teachers and students to access the global Internet. The project had as its target to connect 45,000 schools in 2005.

Schoolnet activities include constructing Thai and English content web sites. These are intended to create centers for such learning activities as quizzes, games, digital libraries, course tool kits and lesson plans that will enhance the work of instructors and students.

Initially, the required infrastructure was expected to provide basic Internet access and voice services to schools nationwide. The bandwidth would be upgraded for each school to support such future e-learning applications as video conferencing, multicasting, e-library searches and distribution, and online courseware.

Fig. 4: IPSTAR in Thailand's Schoolnet project

Due to its nationwide coverage, fast deployment and low cost equipment, IPSTAR was selected and commissioned by the Ministry to provide Internet access and voice services in a large project that would include more than 10,000 schools.

The Thai Schoolnet network expanded from a small network with a few schools in 1995 to more than 10,000 schools in 2005, and was reaching over 35,000 primary, secondary and vocational schools nationwide by 2006. Schoolnet supports a mix of infrastructures that include dial up, ADSL, WiFi and two-way satellite depending on which technologies are most accessible and appropriate for a specific area or school.

The strength of IPSTAR is not only in providing Internet access at broadband speeds, but also in providing multicast and broadcast features, which are characteristic of satellite communication. With multicast capabilities, the satellite enables the broadcasting of e-learning content from central locations to all schools and communities at one time, content that can be cached in local servers. These cache servers often take care of the majority of bandwidth demand while what is not cached can then be downloaded via (relatively bandwidth-expensive) point-to-point transmission.

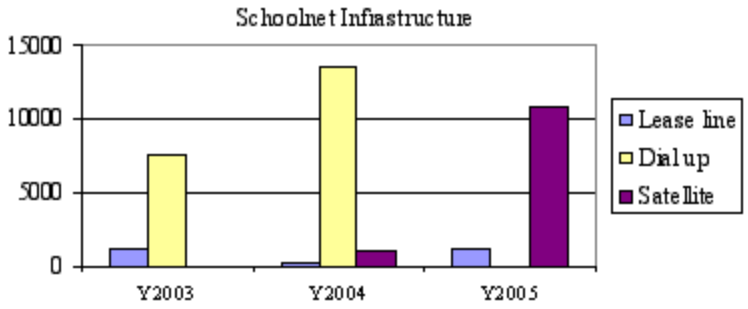

Fig. 5: Type of infrastructure

Compared with other access technologies serving education, like lease line and dial up, the growth of IPSTAR has extremely high in the Asia Pacific region due to the fact that it can serve the bandwidth demand and technical requirement of e-learning activities. This major involvement of IPSTAR in the education sector demonstrates a successful use of broadband satellite communication.

In summary, even though using IPSTAR as education infrastructure requires an economic investment, it is also clear that its ultimate success depends on the creation of appropriate content, the training of teachers and system maintenance on the ground. This caution can also be given when the satellite is used for community development. Governments can also use the e-schools broadband infrastructure to connect rural communities as a way to widen people's knowledge and lift their living standard while also raising the economy of the country. Attention must also be given to the appropriateness of the infrastructure for the desired applications on the ground.

REFERENCES

1. Shin satellite marketing material and presentation: http://www.ipstar.com.
2. Thailand's Schoolnet project website: http://www.school.net.th/