DATA COMMUNICATIONS

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Data communications: what's happening within Asia?

Issues, trends

With digital networks, it is immaterial whether the bits and bytes flowing down a cable (or through the air) are voice or data, or fax, or e-mail, or video, or whatever. In the past, what has been important is the specific characteristics of data over voice, ie:

* data tends to go in one direction (as opposed to voice).
* data can broken up and sent via different routes and reassembled when it arrives; a bit of delay here usually causes no problems.
* data tends to be moved in far larger lumps—voice calls are quite short, data calls tend to be long.
* errors in the data sent are likely to cause more problems, unlike with voice, where line noise, unless it is excessive, tends not to be a problem.
* but problems with transmission of data can be checked, and any bits missing can be resent.

Largely because of these reasons, packet switching was developed. With it, a telecoms network can be used far more efficiently to move data around than by keeping a circuit open between two parties for the duration of a call - as is the case with a voice call. However, improvements in the speed of packet switching networks, especially the development of asynchronous transfer mode (ATM) networks, has closed the gap between voice and data. Soon everything will simply be packets of data moving between two locations. In other words, data communications will be no different from voice communication. This suggests it will be increasingly meaningless to talk about data communications as such; instead we should focus on the different types of communications that will be moving around digital telecommunications networks—some of which will be more clearly data than others. A voice will be a voice; credit card verification would probably be data—but an e-mail? Or a fax?

Rather than arguing over these sorts of distinctions, it makes far more sense to consider data communications in terms of who wants what, in particular from the point of view of governments and corporate users (predominantly foreign) operating in Asia.

Don't get hung up over definitions. In attempting to get to grips with what telecoms-related business should or should not be tradeable, governments, companies and international bodies have drawn up various distinctions, notably between:

* Facilities and services, ie between the physical infrastructure of a network and what is run over it.
* Basic and value-added services, ie between real-time voice services and other services.
* Value-added services and value-added network services, ie between services that are run over a public network and ones which are run over networks off the public network but which are linked via the public network.
* Value-added services and information services, ie between services that add value to telecommunications facilities (eg e-mail, which basically needs a network to move around

on) and services which take advantage of the existence of a telecoms network to offer themselves to a wider clientele (eg on-line databases).

Not surprisingly, different countries have different interests to protect, and so have different views on which categories to adopt and which services to put into which categories. Underlying all of them is a notion that countries have a right to hold onto various core services, usually to be operated by a national monopoly, but other services can, possibly even should, be subject to private competition.

All of this is understandable—but given the growing belief that telecoms-related industries (ie ones that used telecoms networks to move information around) will be doing a lot of the driving of economies in the next century, governments constantly have to balance a desire to protect the interests of their existing telecoms companies with the potential of far greater growth if they take the risk of opening their markets.

In making the decision of which services to open and which to keep restricted several other factors are involved, most notably:

* State-owned telecoms companies tend not to be the best organizations to provide the new services companies are demanding. (New, small companies are often better at taking risks: absolute failure may bring them down—end of story; a big failure at a state monopoly will hang around its neck for years to come, discouraging change and innovation.)
* Companies, especially big ones, make an enormous number of phone calls. According to the ITU, the top 2,500 multinational corporations account for around 12% of all telecommunications service revenues. Clearly, getting big users of data communications into a country and then allowing them to make international calls is very good for that country.
* Continuing to attract foreign investment. Foreign direct investment is particularly important as a source of capital, especially in the lesser developed countries of the region (China, Indonesia, the Philippines, and so on). If companies cannot get access to the facilities they need to move data around to operate their businesses they will go to where they can—hence Singapore's massive and continuing investment in telecoms infrastructure.

IVANS

International value-added network services ride on the back of large companies that go international, and the national telephone companies that follow them overseas. International companies have an incentive to by-pass public networks by virtue of the fact that they are international, and thereby can operate beyond the restrictions and tariffs of national jurisdictions. But the core business of most such companies is not telecoms and therefore the incentive is not over-riding. In cases where data communications is a core part of the business, for example airline reservation systems—eg, SABRE—or financial settlements systems—eg, SWIFT—or simply data communications—eg, IBM—the incentive to by-pass, to operate inhouse systems or to go one step further and offer resale of international private leased circuits (IPLCs) is considerable.

The next step is for these multinational organizations to get into the IVANS business themselves as direct competitors to the telcos. The telcos's response is the close down this opportunity as quickly as possible. One way is to resist liberalizing the telecoms markets first by opposing the shared use of IPLCs, then opposing entry into the IVANS market by foreign telcos, then opposing resale of IPLCs, and finally by opposing simple resale of IPLCs—that is where the IPLC is connected to the PSTN at either end. Each step has been tried. In Hong Kong, semi-simple resale is permitted—so long as (a) there is bilateral reciprocity agreement with the regulator in the country at the other end

of the IPLC, and (b) the IPLC is not connected to the PSTN in the other country—and therefore no by-pass of the international PSTN can take place.

Policing that arrangement can be a problem. The 'leaky' corporate PABX in the far country cannot be regulated from Hong Kong. Now that self-provisioning is permitted by Vsat from Hong Kong the same problem could arise.

Another way for telcos—or at least the handful of telcos large enough to go international—is to dominate the world market themselves by offering a range of international managed data networks, virtual networks and services. This is what the alliances between AT&T and its Worldpartners including Singapore Telecom and KDD, BT and MCI in Concert, US Sprint, France Telecom and Deutsche Telekom in Global One, are all about. The merger talks (current at the time of writing) between BT and Cable & Wireless would bring C&W's Global Network into the fold, although HongKong Telecom is a member of Worldpartners.

There are six types of IVAN services:
1. Electronic mail
2. Database access
3. Information processing
4. Packet switched
5. Gateway
6. Private corporate networks

In each market the number of competing players grows as the capacity of the infrastructure—optical fibre submarine cable and satellite Vsat circuits—grows and as technologies allow an ever growing number of bytes travelling at various speeds to be stuffed through the switches and down the transmission medium. But while there are forces compelling countries to open their telecoms networks to cross border services, there are also forces pushing in the opposite direction:

* Data networking standards are very far from inter-operable, especially in the use of applications. For example, while the official world of telecoms—at the ITU in Geneva—was busy designing protocols consistent with ISO/OSI standards, TCP/IP—the Internet Protocol—was suddenly knocking on the door like an uninvited guest. While ISDN was heralded as the be all and end all of narrowband—and later broadband—communications, the development of CCSS7 signalling—a protocol necessary for the widespread deployment of ISDN-based services —has also opened the way for broadband applications over optical fibre cables and—with modern multiplexing and digital

compression techniques—over coaxial and twisted copperwire pairs. The more things change the more they stay the same. Certainly, if integrated services digital networks spread they could offer a big threat to national control over telecoms networks because of the potential they offer for companies and other organizations to run networks seamlessly across national borders. But this is to assume that ISDN standards could ever be widely applied. In the meantime telecos can benefit from being the only large-scale organizations with complete inter-operability.

* The Internet. With widespread Internet usage people are starting to hog huge parts of public telecoms networks. This has the potential to create major problems in jurisdictions where local phone calls are free or negligible in cost (for example, Hong Kong). The development of Internet telephony takes this issue a step further—it could start depriving telecom companies of

  revenue from calls that would otherwise be made on their systems. (Though it is also worth pointing out that many, probably even most, of the calls will be ones that would not have been made otherwise.) This kind of usage is certain to generate a backlash—at the very least in the form of changes in tariff rates (hence the recent debate in Hong Kong over different forms of tariff for local calls, currently free, engendered not least by the heavy usage of Internet subscribers).
* Changes in cost base. Much—arguably even most—of Asia's economic success has stemmed from developing export-oriented manufacturing industry predicated (initially at least) on cheap labour. Could it repeat this with telecoms services built around data communications? Possibly, but by no means certainly. A handful of companies have moved back office data processing operations from Hong Kong across the border to Guangdong. Some firms, however, are going in the opposite direction. One company relocated its data-processing operations back to the eastern seaboard of the USA precisely because it no longer needed this process to be done in the region; and although staff were more expensive in the USA, productivity because of their skills and the widespread understanding of computer systems made if more cost-efficient to be there. Distance insensitivity can work both ways.

China

China's moves towards the development of a national information infrastructure (NII)—its "Golden Projects"—illustrate some of the issues being thrown into the evolution of data communications in Asia.

First, one of the most significant features of China's NII roll-out is the difference in purpose between what it sees as the final outcome of establishing a series of nation-wide data communications networks. Whereas in the West the focus is normally on content—what people/organizations will be able to do once they have access to information—in China it is how the government will be able to regain the control it has lost over the last decade-and-a-half as the provinces, especially in the south and along the coast, have increasingly taken their economic destinies into their own hands.

Second, the distinction between basic services and data communications has been both used to advantage by organizations trying to establish a foothold in telecoms while simultaneously being abandoned because of the essential lack of ways of distinguishing between such services. Traditionally, telecommunications has been the preserve of the Ministry of Posts and Telecommunications (MPT), which was the monopoly operator of all public telephone networks. To break this monopoly, the Ministry of Electronics Industry (MEI) argued that while the MPT could be allowed to run voice telecommunications services, data communications, being handled by computers, should fall into its domain.

The MEI won its argument, which led to the setting up of two companies—Jitong Communications and China United Communications (Unicom, also known sometimes by its Chinese name, Liantong). Unicom was established as a "second network operator". So far it has managed to get four GSM mobile networks up and running, with more to come this year. This clearly has little to do with data communications. Jitong, by contrast, has restricted itself largely to data communications-related operations. It has embarked on the building of a nation-wide backbone network, the Golden Bridge, on which other data applications can be run. The most significant of these applications to

have emerged so far are the Golden Card and Golden Gate projects, the former to establish what is looking more and more like a credit card verification network through which banks and the government can control and monitor spending, the latter to link all China's customs outposts so the government can monitor imports and exports.

Jitong, however, is looking more and more like a successful, but relatively small engineering company. Unicom, while definitely not a massively successful company so far, has succeeded in using a data communications argument to establish itself as a competing network operator. This in itself is significant; even more so is the galvanizing effect it has had on the MPT. Once a backwater ministry, the MPT is growing increasingly powerful because it is having to respond to the threat of competition. Clearly it would not like to be put out of business by the MEI or any of the latter's offspring—nor would it want to see itself shrunk to the comparatively minor position of being nothing more than a regulatory body. But it equally as clearly no longer sees itself as just a supplier of telephone services—hence, for example, its investment in the development of Internet services in China, and its possible partnership with NTT to develop a postal savings service based on the Japanese model. Third, investment is flowing in via the "data communications" route, while still being banned from network operations. While most conventional telecoms operators have found all routes to establishing footholds in China remain barred, companies such as IBM, Visa and Tandem have found joint ventures coming their way far more fruitfully by participating in projects aimed at developing ways of moving data around; it is only when voice or communications between individuals (ie paging) are included that the Chinese authorities seem to get wary.

Fourth, while wanting to attract as much business in services from abroad, would it be able to tolerate firms moving large amounts of information in and out of the country—information which for very sound commercial reasons would have to be absolutely confidential and secure—which it could not access or control? If the answer is to be found in China’s recent restrictions on Internet usage, it seems to be that, following the Singapore approach, the authorities will seek ways to restrict anything they view with suspicion even as they realize that such restrictions are impossible to enforce in the longer run. Their most subtle instrument is the licensing procedure. If a foreign operator requires a licence they will be careful to police themselves to safeguard that licence. In the meantime the licence conditions force the foreign operator to share revenues with a Chinese entity. Foreign companies, such as banks, entering the China market, may therefore discover that, unlike their Chinese counterparts they are not allowed to run their own wide area data communications networks, but must outsource domestic long-distance and international. But all this means is that the MPT, like telcos in the West over the past forty years, is putting up resistance to an inevitable trend.