

# StarDSL's Video-on-Demand Service

Text on this spread by Steve Mollman. The following two by Daniel Scuka. All diagrams by Andrew Potheary.

# How it works

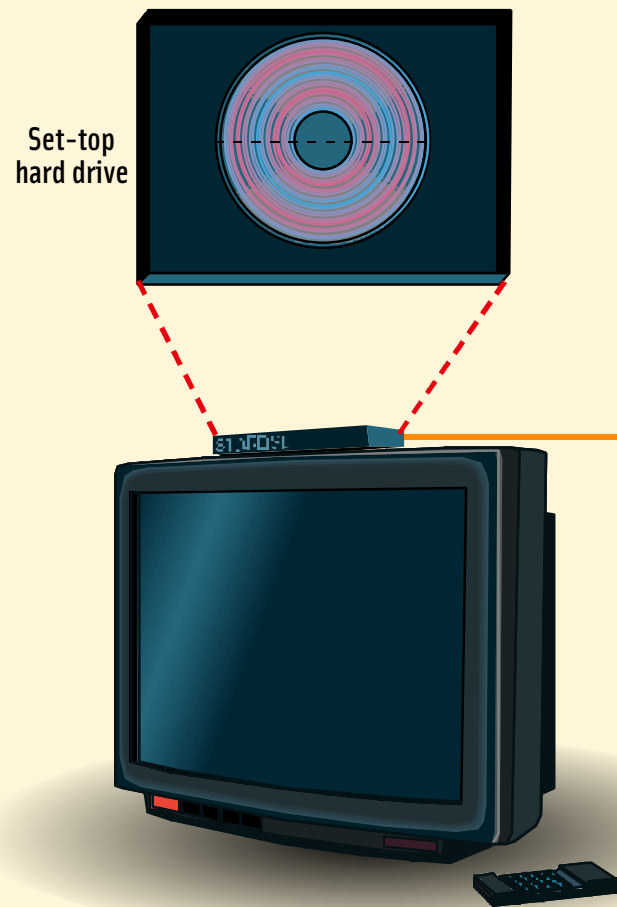
Sometimes the best way to convey an idea is by drawing it out. Indeed, one of the key advantages of magazines is that they can attractively combine words in pictures in interesting, informative ways. We figure if we make it impossible for our Web guys to post our stories without resorting to PDF files, we're doing our job. In that spirit, we present the following flowcharts. Each represents a complicated idea related to technology in Japan in a simple, easy-to-grasp format.

The first one, on the left, explains how a startup called StarDSL hopes to deliver video on demand via old-fashioned copper telephone wires. VOD through the Net has been a dream for years, but the way founder and CEO Yoichi Akase sees it, "through the Net" is just the problem. StarDSL's business model — under patent application at the JPO — calls for moving the video server into the local NTT substation and thus bypassing the Net altogether. No more having to share the fat pipes with everyone else or pay the telcos. Next it was just a matter of scrunching down the video to fit on a copper line using DSL. To that end, the company slightly modified the MPEG-4 protocol so that it's optimized for video and ... well, maybe we should just draw this out.

More ...

## 5. The set-top box

The movie is delivered to a StarDSL set-top box, which can work with either a TV or a PC. If you're just renting the film, it will stay on the StarDSL side of the drive and be deleted at the end of the rental period (the company sends a delete message). If you opt to buy it, it will be transferred to your side of the hard drive and fall under your control.

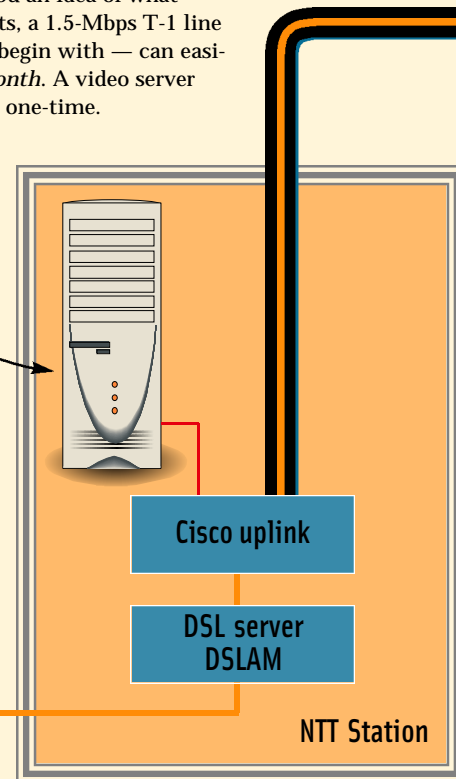


## 6. The consumers

Assuming this idea pans out, customers in StarDSL's service areas will be able to bypass the video store altogether. Rolling out any service — much less a telecom one — nationwide in Japan is a challenge, but that's one reason we like StarDSL's chances: it's devised a cheap, efficient system to offer VOD, the only kind of t-commerce people are likely to go *waku* over.

## 3. The clever move ...

StarDSL received permission from NTT East to place the video server inside the neighborhood telephone substations (no small feat). This is a considerably cheaper approach, as the fat pipe can be avoided altogether. To give you an idea of what renting a fat pipe costs, a 1.5-Mbps T-1 line — not all that fat to begin with — can easily cost \$5,000 *per month*. A video server costs around \$20,000 one-time.

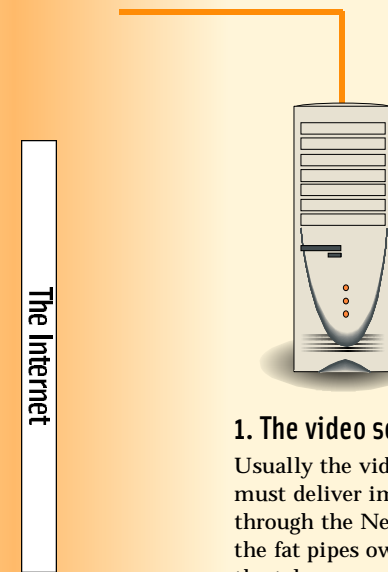


## 4. The copper phone wire

What you hook up to the back of your phone may be primitive, but at least it isn't shared. That means there's predictable bandwidth available, which is what's needed if you don't want *Godzilla* to pause for buffering right at the best part. StarDSL uses a modified version of MPEG-4 to compress the video.

## 2. The fat pipe

The fat pipe, owned by a big telco like NTT, Japan Telecom, or KDDI, carries traffic between the central station and the Net. It may offer high speeds, but since it's shared, it can't guarantee them. The server, StarDSL decided, was on the wrong end of the pipe.



## 1. The video server

Usually the video server must deliver images through the Net and over the fat pipes owned by the telcos.

## 7. The company

The company — a six-man startup based in California and targeting Japan — is an infrastructure play. It offers an upgrade package to ISPs, who in turn sell the co-branded VOD offering to consumers. The founders are two young Japanese who have been friends since high school: Founder and CEO Yoichi Akase and COO So Sano. They're a tiny company and they make no bones about that. In fact, they play it up. Cisco Japan is offering the startup free equipment and assistance. Trials of the service are underway now in three parts of Tokyo. If they go well, the official rollout begins in July. There's no guarantee this venture will survive, but it's definitely making bold moves and is worth watching.

BUILDING A BASIC, STATIC-content Web site is pretty simple; providing dynamic, real-time access to information and services is a different matter, and it's even more difficult on the mobile Internet (that screen is so damn tiny). Japanese financial houses that have mobilized their offerings for i-mode and other wireless networks here are some of the world's first mobile movers, and they've gained a significant lead in porting their online services to the wireless Web.

But a few overseas players are catching on fast. One of them is the Tokyo-Mitsubishi TD Waterhouse (TMTDW) brokerage joint venture, which launched on Japan's retail market in July 2000. TD Waterhouse is the world's second-largest discount broker; Tokyo-Mitsubishi is a major Japanese bank. A few years ago, such a move would have entailed a massive bricks-and-mortar investment and a long wait for profitability. Not so with wireless. TMTDW sees i-mode as one of the most effective ways to reach consumers (it also offers trading by call center, IVR, and the wired Web). COO Robert Strickland expects 50 percent of customer contact to occur on i-mode in 2001.

To launch its site, TMTDW had to jump through some significant regulatory and systems integration hoops. The firm claims to be the only online broker here to offer i-mode trading for both American stocks and Japanese equities. Key partner Bridge Information Systems provides bilingual news feeds; but to satisfy regulators, TMTDW had to find a way to provide basic disclosure information on US companies (balance sheet, ownership, et cetera) to Japanese customers *in Japanese*. The necessary data is pulled off a server in the US (owned by a Bridge affiliate) and served up via English- or Japanese-language Web templates. "It's really tough to get networks to talk," says David Turner, senior VP for systems and operations. The firm spent almost half a year and some \$1.5 million on its i-mode effort.

The payoff? In addition to launching a pretty cool service, the joint venture now knows how to do wireless systems integration (SI), and can leverage its experience when new channels come online (wireless Palm will start in Japan this summer). The mobile Web in Japan is going global (see chart on page 44), and the diagram at right shows how providing integrated, multilanguage content to mobile customers in Japan involves networks, servers, and databases operated by several companies on two continents.

## How it's possible to trade US and Japanese stocks on an i-mode phone in Japan

### Mobilized brokerage

Customers access the TMTDW site (there's an English one and a Japanese one) via the i-mode Menu List to trade US stocks and Japanese equities. It costs about ¥1,900 per trade, depending on the type.

### Base stations

DoCoMo claims to offer i-mode throughout most of Japan's inhabited areas. The company is also placing stations in some major buildings and subway stations.

### Handsets

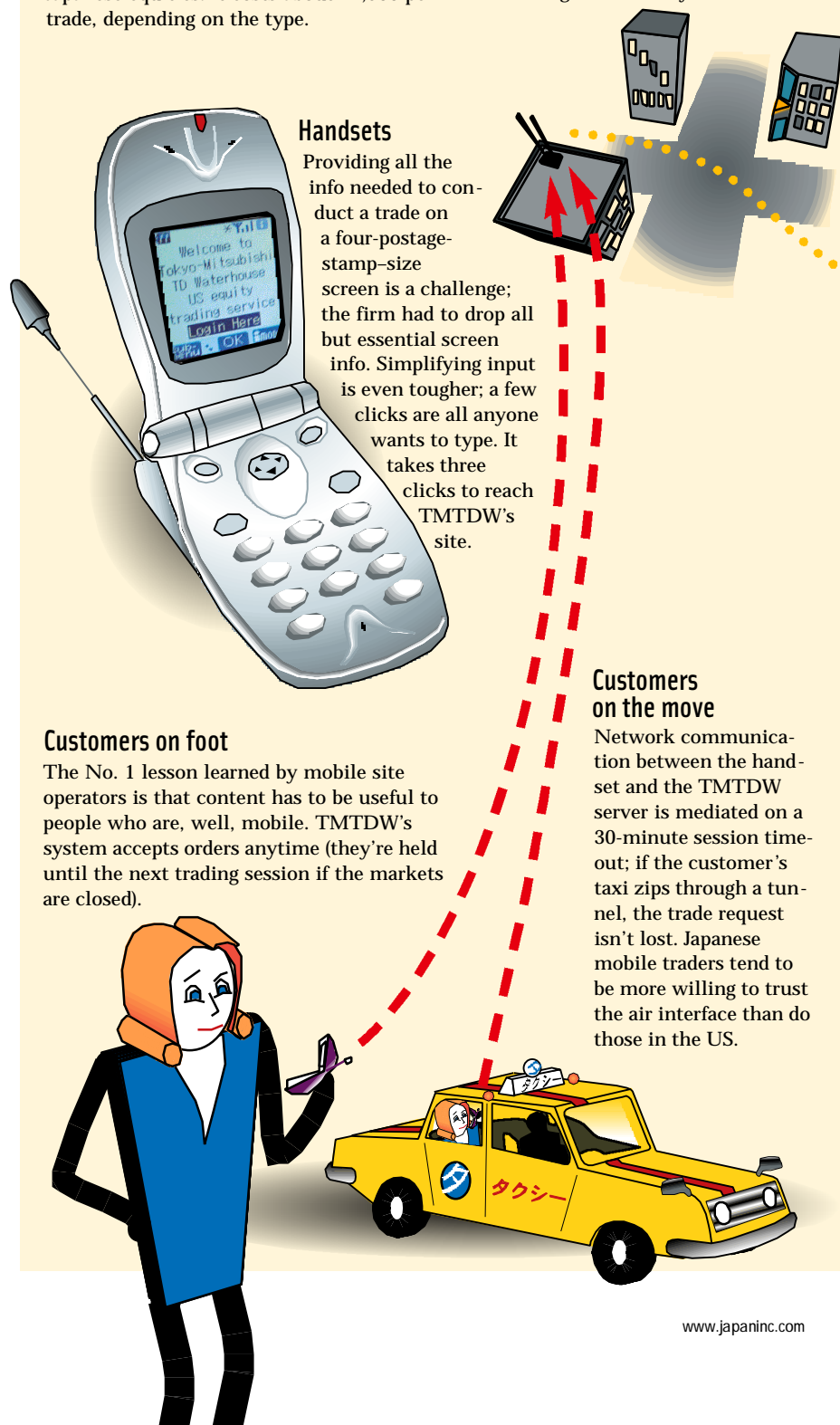
Providing all the info needed to conduct a trade on a four-postage-stamp-size screen is a challenge; the firm had to drop all but essential screen info. Simplifying input is even tougher; a few clicks are all anyone wants to type. It takes three clicks to reach TMTDW's site.

### Customers on the move

Network communication between the handset and the TMTDW server is mediated on a 30-minute session timeout; if the customer's taxi zips through a tunnel, the trade request isn't lost. Japanese mobile traders tend to be more willing to trust the air interface than do those in the US.

### Customers on foot

The No. 1 lesson learned by mobile site operators is that content has to be useful to people who are, well, mobile. TMTDW's system accepts orders anytime (they're held until the next trading session if the markets are closed).



### i-mode gateway

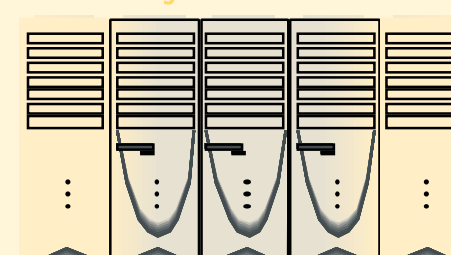
This gateway dishes up content to 18-plus million subscribers. DoCoMo has rigid specs for interfacing official content provider servers with the i-mode gateway. It has to: the mobile operator is mediating some 1,000 official sites, and at least 25,000 unofficial sites are also feeding data through the gate. TMTDW warns clients that DoCoMo server outages can and do occur.

### NTT DoCoMo i-mode gateway in Tokyo

### Newslink host site

This serves as the de facto TMTDW service gateway. Customers access screens for trading, price look-up, portfolio summary, Bridge news, email-alert sign-up, company disclosure information, and help. Bridge news is reformatted for i-mode phone screens (narrow text, preset file size), and produced separately in English and Japanese.

### TD Waterhouse servers in New Jersey



### US stock trading

Runs off of TD Waterhouse's US servers and allows trading for NYSE, Nasdaq, and AMEX listings, though not Japanese ADRs (American depository receipts) or EFTs (shares listed on other electronic exchanges).

### Bridge News

This is the first time Bridge has provided its usually proprietary newsfeed to the public. It provides 20-minute-delayed headlines to i-mode users, and the full story in real time to TMTDW customers.

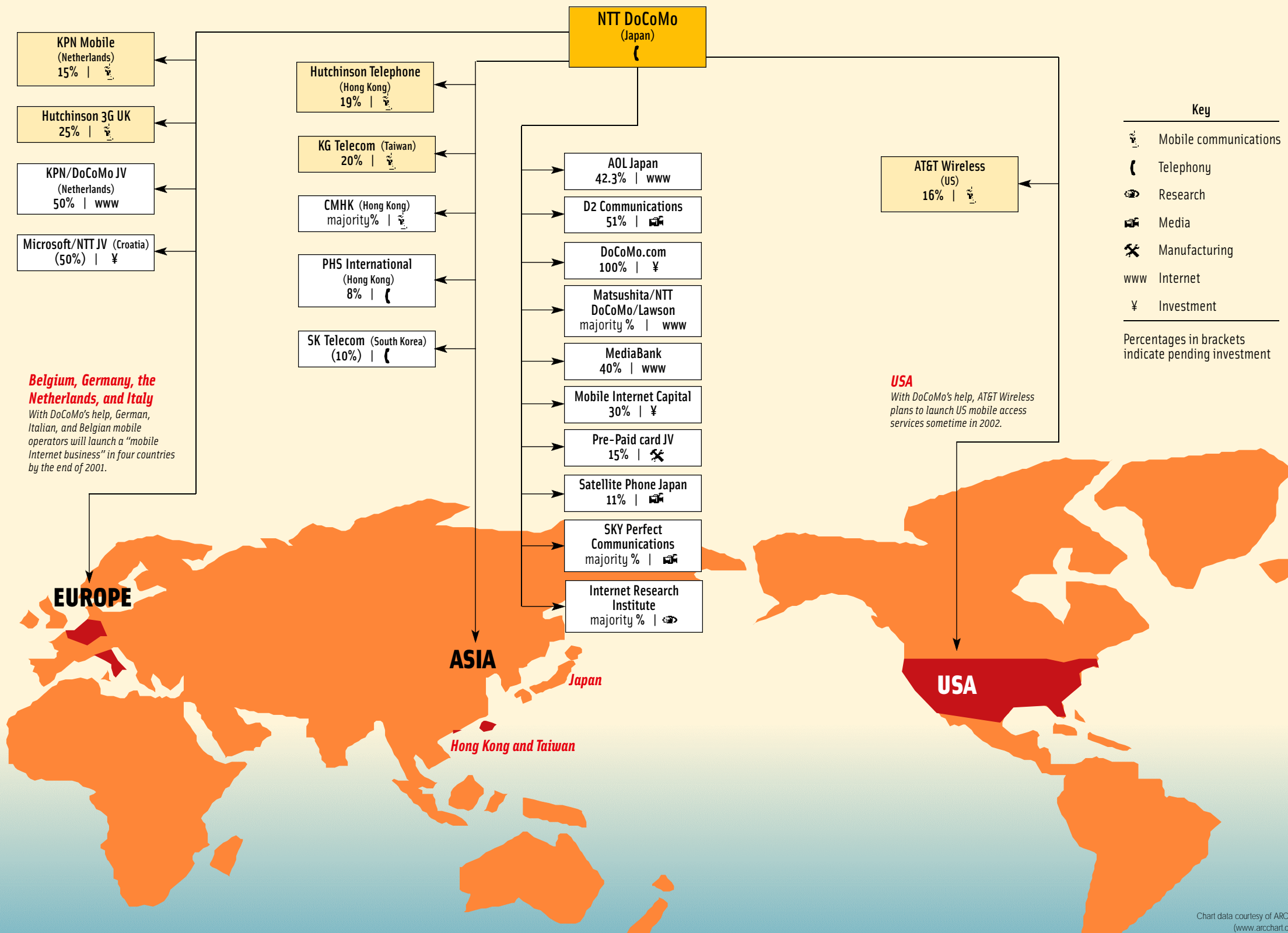
### Bridge Information Services in St. Louis and Tokyo

### Newslink host site in Tokyo

### Tokyo-Mitsubishi Japan Servers from Tokyo

Japanese equity trading operates off of T-M affiliate brokerage servers and allows trading for TSE, OSE, OTC, and Nasdaq-J listings. (Japanese equity trades do not occur over the public Net.)

# DoCoMo: Taking over the world, or just saving some money?



NTT DOCOMO'S foreign equity investments over the past 12 months have been staggering in scope. Few if any Japanese companies have ever made such massive and widespread investments in so little time. The firm has poured a total of ¥1.78 trillion into Hutchison (Hong Kong), KPN Mobile (Holland), Hutchison 3G (UK), AT&T Wireless (US), and KG Telecom (Taiwan) in the space of just one year. Why so much so fast? i-mode royalties, for one. Publicity and a global interest in the company's stock are also nice. But an often overlooked reason is ... hardware costs. This takes some explaining:

At home, NTT DoCoMo is facing a growing bandwidth crunch on its current-generation (2G) PDC\* wireless network. Japan is the only country in the world to use this standard, which keeps the infrastructure costs (base stations, handsets) high, since there are no economies of scale for manufacturers. Remember that last part. Now DoCoMo is moving to the next-generation (3G) W-CDMA\* network standard, because it promises greatly increased speeds and bandwidth (accommodating almost twice as many subscribers as PDC) and is a global standard (meaning compatible handsets made by any maker should be usable, with little modification, on any network). DoCoMo is the world's first mover on W-CDMA, and will launch its 3G network in Tokyo next month, with other Japanese operators following later this year.

But W-CDMA infrastructure costs are proving to be higher than expected (¥167,000 per subscriber versus ¥72,000 for PDC), partly because W-CDMA requires all-new hardware. If European and American operators were moving to W-CDMA as fast as DoCoMo is (and demanding that hardware makers produce more and cheaper compatible equipment), the problem would be less severe. But they're not. The Europeans have just emerged from a brutal round of 3G license auctions; German and UK operators coughed up \$43.2 and \$32.4 billion, respectively, and have little cash left for new infrastructure investment. American operators remain balkanized across a huge market with competing network standards and territories, high subscriber churn rates, and modest customer demand.

So DoCoMo is giving them (and itself) a hand. Its strategy is to use i-mode's revenue-boosting magic as a hook to get other operators on the W-CDMA bandwagon. It's a good hook: back home DoCoMo is enjoying huge and rising i-mode packet fee revenues (some ¥127 billion for the first half of FY01, versus almost zero the year before), and content provider fees, banner ad income, and e-commerce commissions promise to add significantly to this. Can using i-mode do the same for other operators? That's what DoCoMo's telling them, because if they adopt its model they'll also have to adopt W-CDMA, and that will drive down infrastructure costs for compatible equipment.

Can DoCoMo really save that much money back home through this strategy? Some estimates place DoCoMo's W-CDMA capital expenditure savings through an active campaign of promoting overseas partnerships based on i-mode at some ¥600 billion.

Not a small hunk of change ... @

\*PDC: Portable Digital Cellular, W-CDMA: Wideband Code Division Multiple Access.