DSL Worldwide Retail Directory

Edition 5, April 2002

Overview

Contents:

Point Topic Ltd
Cardinal Tower
12 Farringdon Road
London EC1M 3HS, UK
Tel +44 (0) 20 7551 9260
Fax +44 (20) 7551 9090
Email sales@point-topic.com

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Overview

John Bosnell

Tim Johnson

Leila Hackett

Objectives

The Point Topic *DSL Worldwide Retail Directory* aims to provide comprehensive profiles of retail DSL services and public trials around the world. In this 5th edition we cover 97 operators in 50 countries. The Directory focuses on the main DSL service providers in major markets, and looks at all aspects of their services. For the first time, the Directory includes broadband market overviews for many country markets. The overviews summarise the level of broadband development in each market, and give data on DSL penetration.

The information provided in the Directory will be valuable to the wide range of companies and other organisations seeking to participate in the new opportunities created by the arrival of DSL. They include:

- DSL service operators themselves

  the Directory provides the most comprehensive source of benchmarking data on the offerings of other DSL operators around the world

- DSL hardware and software vendors

  the Directory is a key sourcebook of DSL business opportunities

- Internet service providers (ISPs)

  the Directory shows the prices and offerings for a service which every ISP's customers will soon want to receive

- application service providers (ASPs)

  the Directory provides the basis for plans to offer broadband ASP services to business and consumers in every major market

- e-commerce providers

  the Directory shows where and when customers will be able to do business online at broadband speeds

- new media companies

  the Directory offers the first global picture of the DSL channels to market for new media using the broadband opportunity

- broadband content companies

  the Directory identifies opportunities for delivering content over the broadband Internet

Business and product planners, market researchers, investors, senior management and consultants for all these players, and many others, will be able to use the Directory as an essential source for the data they need.

DSL services are changing and developing very rapidly. A publication like this is inevitably out-of-date soon after it is published. Point Topic also provides a subscription service, which provides frequently updated versions of the profiles contained in this directory, as well as regular analysis of DSL developments, at www.point-topic.com.

1 DSL market worldwide

1.1 The outlook for 2002

Point Topic's *DSL Worldwide Retail Directory* is now in its fifth edition. Coverage of DSL providers around the world has been expanded, with 97 operator profiles, alongside our analysis of DSL developments during the last 24-30 months.

DSL has now been launched in all the major countries of the industrialised world and most of the smaller ones, and it is starting to appear in many less-developed countries as well, with broadband launches in India and China.

Although news of broadband developments during 2001 often concentrated on financial problems in the DSL industry, usually amongst competitive operators, the overall numbers of DSL subscribers continues to grow strongly. There were over 18.8 million customers at the end of December 2001, compared to 6.5 million 12 months earlier and 10.6 million on 30 June 2001. The number of DSL subscribers almost tripled during 2001, an impressive achievement for the industry, and a demonstration of the demand for broadband.

The benchmarking of worldwide DSL tariffs for this Directory shows the price sensitivity of broadband consumers. The analysis also shows that, in general, Europe remains the most expensive place to subscribe to DSL services, when installation and equipment charges are taken into account, although these become proportionately lower over time. Most European services cost from US$50 to $75 per month when up-front costs are taken into account, whereas US services cost around $50 per month, and many services in Asia Pacific cost between $20 and $50 per month.

In the European market, attention has been focused on unbundling as a means of bringing competition to the DSL marketplace. But Point Topic's recent research has highlighted the importance of wholesale or bitstream services as a far more realistic route to market for most competitive carriers. Point Topic has recently started producing analysis of wholesale DSL services, and this research is available to subscribers of its continuous online service from www.point-topic.com.

1.2 DSL rollout status

1.2.1 Launch dates

The rapid expansion of DSL deployments during the past two years has confirmed that DSL is a mass-market technology with substantial investment supporting it. Almost all the major countries and telcos in the world are now providing a public DSL service.

The terms 'DSL' and 'broadband' are gradually gaining brand recognition in both residential and business markets. The cable industry is strong in many large markets worldwide. Competition from the TV/high-speed Internet/telephony bundles that the cable industry can offer was a driver for these DSL rollouts, and remains the main form of competition for DSL service providers.

Americas

US and Canadian operators led the way in deploying DSL services, as shown in Figure 1. They are now increasing the proportion of their customer base that can connect to DSL, where that is profitable, and maximising revenue from existing customers and assets. South America

saw more ‘greenfield’ build-outs during 2001, as operators started to connect customers in the main metropolitan areas.

Europe

Services in Europe typically lagged behind their equivalents in America by one to two years. The US RBOCs (regional bell operating companies) mostly launched DSL in mid 1998; the major incumbents in Europe mostly launched in mid to late 1999. Regulatory problems held up the mass marketing of DSL services in France and Italy; the lack of regulator involvement is one reason for the strong early growth of Deutsche Telekom.

Unbundling has not yet delivered the number of competing operators that many had hoped for. All major European markets have seen competitive carriers complaining at the delaying tactics used by incumbents to slow access to central offices, although some countries have managed the process better than others.

Point Topic’s own research has shown that it is wholesale, rather than unbundled, DSL that is key to developing competition in high-speed local access (see section 1.2.2 below).

Asia Pacific

Significant recent launches in Asia Pacific include the introduction of DSL to the two most populous nations in the world, India and China. The Chinese market in particular has great growth potential, and the regional subsidiaries of China Telecom are beginning to equip key cities with DSLAMs, starting in Beijing and Shanghai. 2001-2 also saw several competitive carriers launch services in the fast growing Japanese market, including the low-priced Softbank-owned Yahoo Japan.

Figure 1: DSL service launch dates in the Americas, Europe, Asia Pacific

Date	Americas	EMEA	Asia Pacific
1996	SaskTel (Canada)		
1997	Ameritech, Covad, MTS (Canada)		Singapore Telecom
1998	BCTel (Canada), Northpoint, MTT (Canada), Pacific Bell, Rhythms, US West, BellSouth, NBTel (Canada), Telus (Canada), Bell Atlantic, MCI Worldcom		Hong Kong Telecom
Q1 1999	NAS		Korea Telecom
Q2 1999	Bell Canada	Belgacom (Belgium), Deutsche Telekom (Germany), Unidata (Italy), Telenor (Norway), Telia (Sweden)	Telecom New Zealand, Hanaro (S.Korea)
Q3 1999	AT&T, GTE	Telefonica (Spain)	Chunghwa (Taiwan)
Q4 1999		Tele Danmark (Denmark), Helsinki Telephone (Finland), Kingston (UK), France Telecom, Telekom Austria, Telecom Italia (wholesale), KPN (Netherlands), QSC (Germany)	
Q1 2000	CANTV (Venezuela)	Siminn (Iceland)	Tokyo Metallic (Japan)
Q2 2000	Telefonica de Brasil, Brasil Telecom	BT (UK), KPNQwest (Germany), VersaPoint (Netherlands)	
Q3 2000	Telocity (USA), Manquehue NET (Chile)	KPNQwest (Finland, Denmark, Norway, Sweden); Matav (Hungary)	Telstra (Australia), UBT (Thailand)
Q4 2000	Telefonica de Argentina, ENTEL Chile	Etisalat (UAE), Bezeq (Israel), Swisscom, Telecom Italia (retail)	NTT East, NTT West (Japan)
Q1 2001			DishNet (India)
Q2 2001		Saudi Arabian Telecom, Portugal Telecom	Sony Japan
Q3 2001	TelMex	TPSA (Poland)	Yahoo Japan; China Telecom provinces including Shanghai, Guangdong and Beijing; Philippines Long Distance (PLDT)
Q1 2002		Cesky Telecom (Czech Republic)	
Q2 2002 (planned)		Eircom (Ireland)	

1.2.2 Coverage and expenditure

Once a telco has taken the decision to offer DSL, it can be a relatively simple (if expensive) matter to install DSLAMs (DSL access multiplexers) in central offices across the network. All the users connected to those central offices can then be counted as "homes passed", or as having DSL service available.

Americas

Figure 2 "Homes passed" with DSL by major US ILECs

ILEC	Homes passed (millions)		
	End 2000	June 2001	End 2001
BellSouth	9.5	13.6	15.5
SBC	16	23.4	25.6
Qwest	~7.5	~8.7	~9 (346 COs)
Verizon	28.6	30.1 (March 2001)	32+ (October 2001)
Total	**61.6**	**75.8**	**82.1**

Figure 2 shows the situation in the United States at the end of December 2001. There are approximately 108 million households in the USA, but allowing for overlap between different central offices and operators in the same city, around 48% of these ILECs' 172 million lines are DSL-equipped.

BellSouth managed a 14% increase in the number of its lines DSL-equipped in the six months to 31 December 2001, whilst SBC reported 9.4% growth. BellSouth has led the way for the US ILECs, and claims that around 73% of its homes can access DSL services.

In contrast, SBC, which had set a target of 75 million homes passed during the broadband hype of 1999, has seen its DSL rollout steady. SBC had deployed only a third of this capacity by the end of 2001.

CLECs such as Covad are concentrating on maximising the number of subscribers connected to their existing central office colocations. The current financial climate makes it extremely difficult to raise money for building yet more network capacity.

So, much as in the last edition of the *DSL Worldwide Retail Directory* in September 2001, it is the US ILECs who are doing the most work in rolling out DSL. From the telcos' viewpoint, DSL enables competition with the cable companies. And from a customer point of view, following the collapse of CLECs during 2001, it is the ILECs who appear most reliable and 'easy'.

US regulator the Federal Communications Commission (FCC) looks set to remove some of the restrictions on ILECs providing access services outside their core geographic areas. This move will make it very difficult for all but the largest CLECs to compete, and the regulator is effectively putting faith in economies of scale and competition between cable and telephone companies to control broadband prices.

DSL continues to develop in South America. Sao Paulo-based Telefonica de Brasil reported a healthy 198,000 customers at the end of 2001, with over 66% of its lines DSL-enabled. Venezuela, Argentina and Chile also saw steady DSL development during 2001.

Figure 3: European DSL rollouts

Operator	Actual coverage	Target network coverage	Total fixed lines (000s)
Telekom Austria	70% homes passed (end-2001)	77% (end-2002), 98% urban	3,863
Belgacom (Belgium)	92% (July 2001)		5,142
Tele Danmark (Denmark)	83% (September 2001)	95% (July 2002)	3,638
Elisa (Finland)	Full Helsinki coverage end 1999	95% (end-1999)	2,850
France Telecom	60% of lines (November 2001)	66% (end-2002)	34,100
Deutsche Telekom (Germany)	90% (March 2001)		48,500
Matav (Hungary)	Budapest (end-2000)		3,726
Siminn (Iceland)	Reykjavik		
Telecom Italia	80% (end-2001)		26,506
KPN (Netherlands)	55% (June 2001)		9,610
KPNQwest (Europe)	155 COs (July 2000)		
Telenor (Norway)	6 cities (end-1999)		3,176
Telefonica (Spain)	87.6% (September 2001)	93%	16,480
Telia (Sweden)	70% (September 2001)	80% (January 2004)	5,889
BT (UK)	70% (September 2001)	75% (January 2003)	33,750
Kingston (UK)	155,000 lines (September 2000)	100%	0.15

Europe

Ownership of European DSL networks is dominated by the incumbents. Whilst local loop unbundling (LLU) has been ordered throughout Europe, most incumbents have not been troubled by unbundled operators. The incumbents' first mover advantage, and the unwillingness of financial institutions to lend to new broadband companies, has meant that new operators have not been able to compete strongly in DSL.

The decisions taken by competing operators are demonstrating the importance of wholesale DSL services in bringing competition to European DSL markets. As of 31 October 2001, DSL lines supplied on a retail basis by the incumbent's ISP accounted for 88.1% of the 2.7 million lines, with 3.1% of lines supplied on an unbundled basis (most in Denmark and Germany). However, a far larger proportion of lines, 8.9%, were supplied via an independent service provider on a wholesale basis. Point Topic's research suggests that European regulators should concentrate more on promoting the availability of wholesale or bitstream services during 2002, rather than concentrating on the complex process of unbundling. Wholesale provisioning minimises the capital expenditure on network infrastructure, and therefore lowers the barriers to market entry for competitive carriers.

However, Figure 3 does show that most of the major European markets can claim high availability of DSL, with up to 92% of homes passed in Belgium, 90% in Germany and 80% in Italy. For homes that are too remote to provision with DSL, BT has launched a broadband satellite service to cover the gaps in its network, although access is currently expensive.

Asia Pacific

Figure 4: Asia Pacific DSL rollouts

Operator	Actual coverage (mid-2001)	Target coverage
Telstra (Australia)	70% (May 2001)	90%
Hong Kong Telecom	80% of network (September 1999)	95%
Hanaro (Korea)	2.9m homes passed (mid-2001)	3m homes (end-2001)
Korea Telecom	Over 90%	98%
Telecom New Zealand	60% of lines	
Singtel (Singapore)	All Singapore (Q1 2000)	100%
Chunghwa (Taiwan)	All cities in Taiwan (August 1999)	Approx. 90%

In the Asia Pacific region, Hong Kong and Singapore were early adopters of DSL for video-on-demand and high-speed information access and can readily achieve very high availability levels. Cable and fibre are also important in these countries' broadband networks.

South Korea and Taiwan also achieved high levels of DSL availability early on. Operators signed aggressive deals with equipment suppliers, bringing down the cost of network construction. For example, Chunghwa agreed a price of US$170 per port for 1.26 million subscribers, signed in March 2001, covering both DSLAM and modem. Korea Telecom was able to use its bargaining power two months later to reach a reported price of US$125 per port for 600,000 lines, from its chief supplier Samsung. With high penetration of ADSL already achieved, the next stage could be the development of VDSL services, although several operators, including NTT in Japan, want to go direct to fibre-to-the-home.

The provincial subsidiaries of China Telecom began to deploy DSL to customers during 2001. 2002 and 2003 will see significant activity in DSL network building, with government targets of 60 to 80 million broadband Internet subscribers by 2005.

1.2.3 DSL subscriber numbers: the totals for 2001

According to Point Topic's research, the total number of DSL subscribers worldwide reached 18,846,000 at the end of 2001. This compares to 10,527,000 at the end of June 2001, and 6,458,000 one year earlier, representing an annual increase of 192%.

Asia Pacific overtook the North American market in terms of volume during the second quarter of 2001. It continues to be the largest DSL market in the world. The tremendous success of Korean operators in deploying and marketing broadband means that South Korea continues to be the largest single market for DSL, with over five million subscribers, and the country with the highest penetration of DSL, with 10.95 lines per 100 population.

Japanese companies finally delivered mass market DSL products, and the Japanese DSL market grew 100-fold during 2001 to over 1.5 million subscribers. Taiwan continued to grow strongly, with incumbent Chunghwa posting 570% growth over the course of 2001. China for the first time has posted significant DSL subscriber numbers. Point Topic estimates that there were 234,800 DSL users in China (not including Hong Kong) at the end of 2001.

In numerical terms, ILECs continue to dominate the North American market. Bell Canada, BellSouth, SBC, Qwest and Verizon continue to hold over three-quarters of the North American DSL market, with 78.9% of DSL lines at the end of 2001, up from 77.4% at the end of June 2001.. This compares to 80% at the end of March, and 73% at yearend 2000. Thus these big players, along with a handful of dominant cable operators, largely control the North American broadband market.

In Western Europe, Germany's Deutsche Telekom continues to be by far the largest DSL provider, with almost two million DSL customers at the end of 2001. Deutsche Telekom has squandered none of its first mover advantage in deploying DSL. It has made it easy for its large ISDN subscriber base to migrate to DSL and has used competitive pricing to attract new residential subscribers to broadband. Of the significant DSL operators (those with over 100,000 customers), Deutsche Telekom showed the strongest growth, increasing its customer base by 900% during 2001.

The other key European DSL providers also reported strong growth through 2001. France Telecom especially succeeded in adding large numbers from a comparatively low starting position, growing by 64% to 430,000 subscribers. Belgacom and Telefonica (Spain) both grew their DSL businesses by over 400%.

Residential and Business splits

For the first time, Point Topic is publishing business and residential breakdowns for DSL subscriber numbers by country. These numbers are based on operator information where available, or on our own estimates. In summary, countries with less mature broadband markets and higher DSL prices generally have a higher proportion of business lines than do more developed markets.

Globally, there are nearly five times as many residential as business lines. In the large markets of South Korea, Germany, Canada and Taiwan, DSL services have sold in bulk to the consumer residential market, with eight or ten times the number of subscribers. In contrast, the UK, with historically higher DSL tariffs, boasted 70% more business than residential subscribers at the end of 2001.

Figure 5: DSL numbers worldwide (thousands of lines at 1 January 2002)

DSL numbers worldwide

	Thousands of lines at 1 January 2002		
Country	**Total**	**Residential**	**Business**
World total	**18,825.2**	**15,575.4**	**3249.8**
North America	**5,509.5**	**4,267.4**	**1,242.1**
Canada	1,145.6	950.8	1,94.8
USA	4,363.9	3,316.6	1,047.3
Latin America	**407.2**	**290.9**	**116.3**
Argentina	122.6	73.5	49.0
Brazil	232.7	186.2	46.5
Chile	17.8	10.7	7.1
Mexico	4.0	2.4	1.6
Peru	7.2	4.3	2.9
Venezuela	17.9	10.7	7.2
Rest of Latin America	5.0	3.0	2.0
Western Europe	**4,245.0**	**3,535.4**	**709.6**
Austria	115.0	92.0	23.0
Belgium	280.0	269.1	10.9
Denmark	151.8	99.4	52.4
Finland	86.0	60.2	25.8
France	430.0	408.5	21.5
Germany	1,837.9	1,654.1	183.8
Italy	390.0	222.3	167.7
Luxembourg	2.0	1.6	0.4
Netherlands	146.0	116.8	29.2
Norway	50.0	40.0	10.0
Portugal	2.5	1.5	1
Spain	375.8	300.7	75.2
Sweden	194.0	182.9	11.1
Switzerland	40.0	32.0	8.0
UK	142.0	52.7	89.3
Rest of Western Europe	2.0	1.6	0.4

Eastern Europe	**33.1**	**19.9**	**13.3**
Croatia	0.2	0.1	0.1
Estonia	17.0	10.2	6.8
Hungary	10.0	6.0	4.0
Latvia	2.5	1.5	1.0
Lithuania	0.6	0.4	0.2
Poland	1.8	1.1	0.7
Russia	1.0	0.6	0.4
South and East Asia	**633.8**	**455.1**	**178.7**
China	234.8	140.9	93.9
Hong Kong	374.0	299.2	74.8
India	20.0	12.0	8.0
Rest of South and East Asia	5.0	3.0	2.0
Asia-Pacific	**7,948.7**	**6,970.0**	**978.7**
Australia	51.0	30.6	20.4
Indonesia	10.0	6.0	4.0
Japan	1,524.6	1,219.7	304.9
Malaysia	4.0	2.4	1.6
New Zealand	32.5	26.0	6.5
Philippines	10.0	6.0	4.0
Singapore	56.0	45.4	10.6
South Korea	5,178.3	4,660.5	517.8
Taiwan	1,075.6	968.0	107.6
Thailand	6.7	5.4	1.3
Middle East and Africa	**47.9**	**36.9**	**11.0**
Israel	40.6	32.5	8.1
Saudi Arabia	1.0	0.6	0.4
Turkey	4.3	2.6	1.7
United Arab Emirates	2.0	1.2	0.8

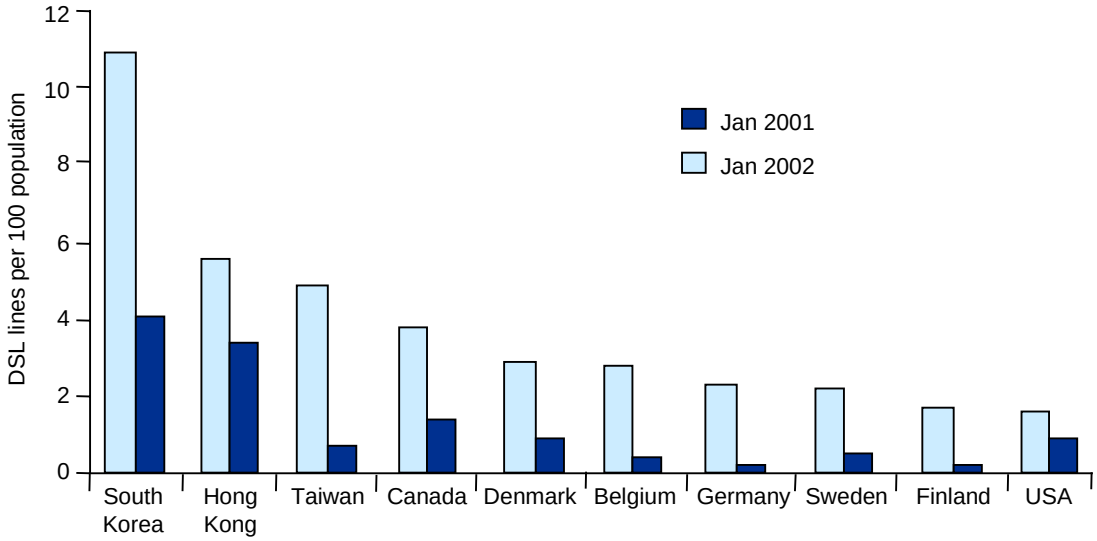
1.2.4 DSL Penetration by country

Looking at the number of DSL lines per 100 people gives a good indication of the take-up of DSL in a given country market. As Figure 6 clearly shows, countries in Asia Pacific lead the world in

DSL penetration, with South Korea and Hong Kong retaining the highest DSL densities, and Taiwan growing strongly during 2001 to have the third highest DSL penetration in the world.

Figure 6 also shows how some European countries, such as Germany, Finland, Sweden and Belgium have grown rapidly during 2001. By contrast, the USA with only 1.6 DSL lines per 100 people is failing to build on its early start in the technology.

Figure 6 DSL World "Top Ten"



Source: point-topic.com

Figure 6: Ten highest ranking countries for DSL penetration, Jan 2001 and Jan 2002

	DSL lines per 100 population			
Country	**Jan 2002**	**Jan 2001**	**Ranking 2002**	**Ranking 2001**
South Korea	10.95	4.03	1	1
Hong Kong	5.56	3.42	2	2
Taiwan	4.83	0.70	3	7
Canada	3.73	1.43	4	3
Denmark	2.85	0.94	5	4
Belgium	2.76	0.42	6	9
Germany	2.23	0.23	7	12
Sweden	2.18	0.45	8	8
Finland	1.66	0.16	9	13
USA	1.59	0.89	10	5

Several factors are the cause of US underperformance. The Telecommunications Act of 1996 was supposed to stimulate the take-up of new technologies by opening the market to competition but it is proving ineffective in practice. It has not been vigorously enforced, leaving the ILECs comfortably in control of the DSL market. On the other hand there have been no significant government measures to promote the development of broadband as there have been in most of the countries with high levels of penetration.

The US is falling behind partly because of the effects of the telecoms crash. New competitors offering DSL services have had severe financial problems and many have gone out of business. This has allowed the RBOCs to rein back their DSL programs, and increase prices in many cases, rolling out to new customers at a relatively slow rate. Another factor is that many US homes use the competing broadband technology, cable modems. But even when this is taken into account the US is still well down the broadband league table.

Other major economies are also lagging in the broadband race. Japan started serious DSL rollout only in 2001 but it is already thirteenth in terms of DSL lines per 100 population. France and Italy are nineteenth and twentieth respectively and the UK trails well behind at twenty-sixth, with only 0.24 lines per 100 people at the beginning of 2002.

What are the lessons from this analysis? The world's leading DSL nations, Korea, Hong Kong and Taiwan, have competitive markets with several competing national broadband operators, which gives subscribers low DSL pricing. They were early adopters of DSL, trialling services in 1998 and 1999. And they paid close attention to 'back-office' service provisioning functions, helping to minimise large waiting lists and damaging headlines. They also have not suffered the high profile CLEC collapses that the US has seen.

1.2.5 Performance against target in 2001

Figure 7: US DSL targets and performance 2001

Operator	**Number of DSL subscribers (000's)**	
	Actual end-2001	**Target end-2001**
BellSouth	621	600
Qwest	448	500
SBC	1,333	~1,500
Verizon	1,190	1,250
Total	**3,592**	**3,850**

North America

Since the March 2001 edition of this Directory, North American operators have not changed their target figures for DSL subscribers at the end of 2001.

In September 2001, we estimated that on their current performance the US ILECs would end the year with 3.47 million customers. As can be seen from Figure 7 above, the ILECs improved on this slightly, but did not manage to make up the gap with the target set at the beginning of the year.

Only BellSouth has reported a target for 2002, aiming to total 1.1 million by year end - a 77% increase for 2002, easily manageable if BellSouth continues the rate of growth it achieved during 2001.

Europe

Actual yearend figures for European operators also fall short of targets set earlier, although much of the disparity is due to the very high number published by Deutsche Telekom in early 2001, as shown in Figure 8. However, Telefonica and Belgacom both exceeded their targets. As Point Topic predicted in September 2001, France Telecom failed to meet its ambitious 600,000 target from a relatively low starting point.

For 2002, France Telecom is aiming for 1.2 million DSL subscribers, with Telefonica looking to sign up an additional 625,000 people to its service.

Figure 8: European DSL targets and performance 2001

Operator	**Number of DSL subscribers (000's)**	
	Actual end-2001	**Target end-2001**
Belgacom	230	200
Deutsche Telekom	1,800 (2,200 contracts)	2,600
France Telecom	430	600
Telefonica	375	300

Figure 9: Asia Pacific DSL targets and performance 2001

Operator	**Number of DSL subscribers (000's)**	
	Actual end-2001	**Target end-2001**
China Telecom	234.8	~300
Hanaro	1,010	
Korea Telecom	3,340	~3,500
Taiwan	1,076	1,000
SingTel	80 (est.)	~200
Japan	1,500	2,000

Asia Pacific

Asia Pacific operators were less likely than their European counterparts to publish targets for subscriber numbers.

However, Korea Telecom's performance is in line with its statements on the developing broadband market in Korea. KT said in May 2001 that it wants to have around half of a total broadband market of nine million by the end of 2001. Given that most of these would be served by

DSL, alongside KT's LAN access service, this meant at least 3.5 million DSL subscribers, a figure that KT nearly matched.

12 months ago, some of the yearend targets coming from Japan looked astonishing, considering the country had a total of around 15,000 DSL lines at the beginning of 2001. However, the constituent parts of NTT, along with DSL start-ups like Softbank/Yahoo BB, did add significant numbers, although order provisioning was a bottleneck. This is not surprising, given the high rate of growth and the low starting level, but it shows that provisioning a complex service to a mass market is more complicated than launching a one-off consumer product, where stockpiles can be built up prior to launch.

Taiwan's target for 2001 was an ambitious one million ADSL subscribers, and this total was reached, with a reported 1.076 million Taiwanese ADSL subscribers at the end of 2001. Low pricing and high levels of competition between both DSL and cable operators have enabled this high level of broadband penetration.

Figure 10: Low-end residential DSL service price comparisons (in US$)

Operator	Service	Installation cost (US$)	Equipment cost (US$)	Rental/ month (US$)	Amortised cost (US$)	Max Downstream data rate	Exchange rate used (per US$)	Notes	Cost March 2001	Change since March 2001
Yahoo Japan	ADSL	68.64	0.00	17.78	**23.50**	2 Mbps	129.05		N/A	-
Bell Canada	Sympatico High Speed	15.75	0.00	28.32	**29.64**	1 Mbps	1.59		27.76	1.88
Korea Telecom	ADSL Lite	0.00	0.00	31.29	**31.29**	up to 2 Mbps	1,323.00	Inc. 10,000 Won monthly equipment rental	34.23	-2.94
Chunghwa	HiFly Residential	48.65	0.00	37.18	**41.23**	512 Kbps	34.99		17.22	24.01
Belgacom	Turbo Line Starter Go	16.67	78.07	34.68	**42.58**	750 Kbps	1.13		50.9	-8.32
Deutsche Telekom	T-DSL Flat from T-Online, T-Net DSL access	45.24	0.00	39.46	**43.23**	768 Kbps	1.13		47.58	-4.35
Telecom Italia	Flat rate ADSL	135.79	0.00	35.04	**46.36**	256 Kbps	1.13		48.33	-1.97
NTT	FLETs	29.91	0.00	44.86	**47.35**		129.05	Inc. 550 Yen monthly equipment rental	N/A	
Verizon	Online DSL Package 1	0.00	0.00	49.95	**49.95**	768 Kbps	1.00		39.95	10.00
France Telecom	Wanadoo ADSL Xtense	132.39	0.00	39.85	**50.88**	500 Kbps	1.13		69.49	-18.61
SBC/ Ameritech	Speedpath 768	50.00	0.00	49.95	**54.12**	up to 768 Kbps	1.00		49.95	4.17
KPN	Planet ADSL Comfort	29.85	122.81	44.01	**56.73**	512 Kbps	1.13		N/A	
BT	Openworld Home	91.81	120.06	42.36	**60.01**	500 Kbps	0.70		77.19	-17.18
Telefonica	Linea ADSL 512	134.44	0.00	65.77	**76.98**	512 Kbps	1.13		53.38	23.60

1.3 DSL pricing and marketing

1.3.1 Price Comparisons: residential

Figure 10 shows a comparison of prices for low-end residential DSL retail services. In order to aid comparison, the table averages initial installation and equipment costs over a 12 month period, to produce the amortised cost figure in US dollars per month. Prices assume a 12 month term commitment and self-installation where available, and do not include telephone line rental. Prices are inclusive of sales tax, and include ISP bundled access. Exchange rates used were correct on 18 March 2002. All prices in the section are in US dollars, and the services featured are 500 Kbps ADSL, or the closest otherwise available.

The 'Change since March 2001' column shows how prices have varied in the last 12 months, where data is available. A negative figure represents a price reduction, a positive figure a price rise.

DSL prices began to stabilise during 2001, and Figure 10 shows that many of the tariffs have changed by relatively small amounts. Chunghwa in Taiwan has raised its prices significantly from an unsustainable level 12 months ago, although at the time of going to press the operator was hinting that it would lower its prices again.

Telefonica's current 500 Kbps service is considerably more expensive than the entry-level 256 Kbps service that was listed in previous editions of the Directory, which accounts for the large change in price. Although the majority of Telefonica's customers use a 256 Kbps service that retails at $44/month, Figure 10 compares prices for 500 Kbps services wherever possible.

BT has cut its monthly tariff by a quarter since the last edition of this Directory, although high up-front installation and equipment costs make the service appear expensive when amortised over 12 months.

This price cut, coupled with the introduction of a self-installation option, caused a significant increase in subscriber numbers amongst the previously under-represented consumer market, giving yet more evidence of the price-sensitivity of broadband consumers.

Figure 10 shows this clearly. Canada and South Korea are amongst the leaders in DSL penetration per head of population, and have some of the lowest prices in the world. Customers in Japan, which enjoyed spectacular DSL growth in 2001, can benefit from Softbank/Yahoo Japan's very competitive $18/month tariff, the lowest in major DSL markets. Japanese and Korean consumers also enjoy a fast 2 Mbps service at the entry level, with a decent 1 Mbps service in Canada, much better than the 768 Kbps common in the USA or the 500 Kbps common in Europe. Until compelling new services are launched, such as video over VDSL, residential DSL is competing with dial-up Internet access, and there is a limit to consumers' willingness to pay for a faster version of the same service.

Following SBC's price rise to $49.95 per month in early 2001, other US operators increased their prices to a similar level. Verizon and BellSouth both cost $49.95/month, although Qwest offers a 256 Kbps service for $39.95. Prices have remained at the $50/month level in the USA for over a year now, and DSL numbers continue to grow. So have the high prices led to a slowdown in the growth of DSL subscribers? The similarity of prices across the country makes it difficult to separate the impact of pricing from other factors. The fast-developing nature of the market means that historical comparisons, based on the previous year's growth rates, are unreliable. One useful comparison is with neighbouring Canada. BellSouth grew at a slightly faster rate than lower-priced Bell Canada, although Verizon, SBC and Qwest grew at a slower rate.

1.3.2 Marketing offers

Service providers are offering a multitude of incentives to sign up for DSL.

- Dedicated broadband portals

  Telcos have increased their efforts to provide dedicated content to their broadband subscribers, such as mymuch.com in Taiwan. These portals provide access to audio, video and multimedia material, as well as banking, stock trading and other services, and should provide extra incentive to subscribe to DSL. Video-on-demand is an obvious example of a premium service that could be delivered over VDSL through a broadband portal. There are some examples at work already, such as "HomeChoice" in the UK, but realising this dream more generally will require more investment in VDSL equipment, and video servers will have to move nearer to the customer.

- Gaming

  Gaming is popular and interactive, and uses broadband in a compelling way that works with today's ADSL technology. Broadband allows large numbers of role-playing gamers to play against each other wherever they are on the network. Software downloads offer a fast and cost-effective channel for distributing action games. Companies such as Bell Canada and Telecom New Zealand have developed online gaming portals to support this market.

- Discounts for term commitments

  Since the first edition of this directory in March 2000, offering a reasonable price for entry-level services has been the focus of operators' attentions. Waiving, halving or discounting the activation fee, equipment charge or installation fee for customers who sign up for a 12 month contract is common practice. In many cases these 'special offers' are almost always available. However, SBC's price increase in early 2001 is a significant change against this trend. Although self-install is free, technician installation is expensive, and for long term customers, the $10 per month rise will be significant. Korea Telecom offers a sliding scale for modem rental charges, with rental becoming free after three years.

- Free DSL-enabled computers

  Starhub in Singapore recently offered SMEs a broadband-ready PC for one Singapore dollar. The SMEs have to sign a two-year ADSL contract, and pay three months' subscription up-front. 512 Kbps ADSL access costs S$338/month (US$193). Over two years, the customer would pay US$4,632. In summer 2000, SBC offered a bundled DSL/PC package: for a two year commitment and an extra $20 per month, customers were supplied with a DSL-equipped PC.

- Discounts for existing telephony customers

  Some US and Canadian operators offer discounts of between 5% and 20% on monthly DSL connection charges to existing long distance telephony customers. European incumbents considering this would be likely to come up against regulatory restrictions. With the low margins and low growth of the voice telephony market, many North American operators see bundling as a way of maintaining profitability.

- Bundling access with the ISP

Many operators bundle DSL access with subscription to their own ISP. This can either be sold at 'full price' as a portal optimised for DSL access, or at a 'value price' as an easy way to get DSL.

- Self installation

  Providing easy-to-configure hardware and software to enable self-installation will be a must for mass rollout of DSL.This reduces installation costs to the consumer, and frees up DSL teams from routine installations. Customers who choose self-installation can invariably save money where their service provider allows it.

Sample Entry

Belgacom

Belgacom's Turbo Line ADSL service officially moved to full commercial operation on 1 April 1999. Initially it covered 30% to 35% of telephone customers and was intended to be available to 75% of customers by the end of 2000. It was one of the first services in Europe to provide a published tariff and to be aimed at ordinary residential and SME customers.

At the beginning of April 2002, Belgacom had 312,000 ADSL subscribers. Key to reaching these numbers is a self-install kit, used by 75% of customers as of July 2001, and 90% by December 2001. The kit is designed to enable installation in 15 minutes, and features a single page instruction card, similar to that found with printers.

Belgacom thinks that DSL must provide more than fast Internet access to generate worthwhile margins. The operator is therefore launching a video-on-demand trial in early 2002 which will offer TV email, TV banking, digital TV and gaming.

Belgacom is also launching a range of SDSL services in April 2002, initially in 100 COs, building up to 250 COs. There will be three SDSL services: SDSL LAN2LAN, SDSL BiLAN Access, and Skynet SDSL.

www.belgacom.be

Belgacom DSL services	
Operator	**Service name**
Belgacom	Turbo Line
www.belgacom.be	www.turboline.be
Sources	[145] [152] [172] [471] [522]
Research	Raymond Chen

Belgacom Turbo Line coverage and users				
Type of project	Public service	**Target market**	Business and residential	
Areas covered			**Rollout date**	**Possible users**
Launched as 6 month commercial pilot in January 1998 in Antwerp, Brussels, Leuven, Liège, Mechelen, Gent and Charleroi. Extended to pre-commercial phase in October 1998			January 1998	1,000 user pilot
At launch the service covered the above areas plus Namur and Hasselt. Other areas to be added include Anderlecht, Boitsfort/Bosvoorde, Drogenbos, Evere, Ixelles/Elsene, Molenbeek, Schaarbeek, Tervuren, Uccle/Ukkel, Woluwe, Berchem, Hemiksem, Wilrijk, Diepenbeek, Turnhout, Jambes			From 1 Apr 1999	55% of Belgacom's customers by end-1999
			End-2000	75% of customers
450 Exchange areas			July 2001	92% of customers
All Central Offices			End-2001	90% of customers
Users				
Current	1,000		**Date**	March 1998
	1,000		**Date**	End-1999
	25,000		**Date**	November 2000
	Total broadband (ADSL and cable) 121,600 residential; 5,000 business		**Date**	November 2000
	43,810		**Date**	31 Dec 2000
	63,670		**Date**	31 Mar 2001
	72,000		**Date**	30 Apr 2001
	94,000		**Date**	1 Jul 2001
	Over 100,000		**Date**	August 2001
	113,000		**Date**	30 Sep 2001
	200,000		**Date**	1 Dec 2001
	225,000		**Date**	20 Dec 2001
	312,000		**Date**	31 Mar 2002
Current and future projections	200,000 (projection confirmed August 2001)		**Date**	End-2001

Belgacom Turbo Line services and tariffs			
Grades of service			
Name	**Upstream**	**Downstream**	**Features**
Turbo Line Starter Go	128 Kbps	750 Kbps (max)	Includes 10 GB usage/month. 5 email addresses
Turbo Line Starter Plus	128 Kbps	Up to 1 Mbps	Includes 15 GB usage/month. 5 emails
Turbo Line ADSL Pro	128 Kbps	Up to 1 Mbps	Includes 20 GB of usage/month. Up to 10 users
Turbo Line Office	128 Kbps	1 Mbps	Unlimited. Supports a LAN
Turbo Line Premium	512 Kbps	1 Mbps	Unlimited access. Guaranteed speeds of 64 Kbps up, 256 Kbps down. Supports a LAN
DSL standards	ADSL, with splitters		

Belgacom Turbo Line services and tariffs				
Tariffs	In Euros (US$1 = 1.132 EUR)			
Grade of service	**Installation**	**Equipment**	**Connection/ month**	**Usage**
Turbo Line Go	Self install - 19, 25, or 33 Euros (depending on equipment); technician install - 111.55 basic, or 210.71 full*	Modem between 89 -219 Euros. Ethernet card 36.94	39.54	0.12/MB for additional usage. Includes Skynet ISP subscription
Turbo Line Plus	Self install - 19, 25, or 33 Euros (depending on equipment); technician install - 111.55 basic, or 210.71 full*	Modem between 89 -219 Euros. Ethernet card 36.94	54.41	0.12/MB for additional usage. Includes Skynet ISP subscription
Turbo Line Pro	247.89	Router rental included	74.37	20 GB volume free; then 0.1/MB Excl. VAT
Turbo Line Office	371.84	Router rental included	92.96	Unlimited usage Excl. VAT
Turbo Line Premium	619.73	Router rental included	225.58	Unlimited usage Excl. VAT
Tariff notes	*Belgacom offers an 'all-in-one' solution for Go and Plus customers, including modem, self-install kit and contract to fill in. These are available for 99, 119, and 229 Euros, depending on the modem chosen. Prices are inclusive of Belgacom's Skynet ISP. Without Internet access, the Go service costs 30.37 EUR/month, and the Plus service costs 39.65 EUR/month. For customers who exceed their monthly traffic volume, Belgacom asks them to move to a higher volume package, although few customers are in this position. The company does not actually bill customers who exceed their volume limit, for reasons of cost and complexity.			

Belgacom Turbo Line marketing and partnerships	
Equipment	
	Alcatel: combined ADSL modem and IP router using ATM for Turbo Line Pro. In September 2001, Alcatel also announced that its 7670 Routing Switch Platform (RSP) had been selected by Belgacom to aggregate DSL traffic.
	In mid-2001, Belgacom ordered modems from Eicon.
	October 2001 saw Redback Networks announce Belgacom's plan to deploy its SMS platform SMS10000 to speed up the provisioning process.
	In December 2001, it was announced that Belgacom is using Spirent Communications' SmartBits Traffic Generator and Analysis units in testing and deploying ADSL. Belgacom uses the Spirent solution to forecast potential problems, such as the consequence of a high number of subscribers logging on simultaneously.
Business partners	The pre-commercial service was supported by 11 of Belgium's leading ISPs; Skynet, Euronet, Infonie, UUnet, Eunet, Ping, PSInet, Interweb, Belnet, Win and XS4all. Commercial service is supported by Win, EDPNet, OpenWeb, Cybernet, Belgacom Skynet, Belnet, Easynet, Euronet/Wanadoo, and Infonie.
Content offerings	Belgacom demonstrated the 'TurboZone' portal at the TM@B Telecom trade fair in Brussels in summer 2000. Only available to fair goers, the portal featured video and audio content. Launching a video-on-demand trial in early 2002 offering TV email, TV banking, digital TV and gaming.
Earlier trials	Turbo Line was originally launched as a 6 month commercial pilot in January 1998 with 1,000 users in the Antwerp, Brussels, Leuven, Liège, Mechelen, Gent and Charleroi areas, and was extended into a pre-commercial phase in October 1998. According to Belgacom, the targets set for the Turbo Line pilot trials were met. Customer satisfaction: 80% of testers said they would recommend the service
Operator profile	Belgacom is the incumbent carrier in Belgium, which is one of the more competitive European telecoms markets. Belgium is also the home of Alcatel's main DSL development group which was closely involved in the Turbo Line trials. Belgacom is half-owned by the Belgian state and half by ADSB Telecommunications, an international consortium.

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Covad Communications

DirecTV Broadband (Telocity)

MCI Worldcom

Mpower Communications

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Verizon

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Telecom Argentina

Telefonica de Argentina

Brazil

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Brasil Telecom

CTBC

Embratel

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Chile

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Mexico Broadband Overview

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Lithuania

Lietuvos Telekomas

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Norway

Norway Broadband Overview

Telenor

Portugal

Portugal Broadband Overview

Portugal Telecom

Spain

Spain Broadband Overview

Telefonica

Sweden

Sweden Broadband Overview

Telia

Switzerland

Switzerland Broadband Overview

Swisscom

United Kingdom

UK Broadband Overview

UK Unbundling Situation

UK ISPs offering DSL

BT

Kingston Communications

Asia Pacific

Australia

Australia Broadband Overview

C&W Optus (XYZed)

Telstra

China

China Broadband Overview

Beijing Telecom

China Telecom

Gansu Telecom

Guangdong Telecom

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