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Commercial Internet eXchange Association
(CIX)

Internet Service Provider Survey

March 1997

Summary of Findings
Completed by
InfoPlex Corporation
Hayward, California

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Commercial Internet eXchange Association (CIX)

Internet Service Provider Survey

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I. EXECUTIVE SUMMARY

The rapid growth of the use of the Internet in the United States has led to questions about the national communications infrastructure of the future, and the effects of increased data traffic on the local public switched telephone network in the present.. But, to date, discussions of the role of ISPs, the Internet Service Providers, have often treated the industry as a homogenous entity. ISPs are a diverse group of companies that have chosen very different business strategies, with some focusing on service to corporate customers, some focusing on offering unique and highly customized bandwidth to corporations and governments, and other players -- both large and small -- pursuing the enormous potential of the residential consumer. It has becoming increasingly important to get a better picture of this important industry.

A total of 215 interviews were completed in February and March 1997 for this study. The survey universe was all Internet Service Providers (ISPs) in the United States. This was defined as any organization that uses the TCP/IP networking protocol and offers services to the general public; it did not include online service providers (OSPs) such as America Online, which use proprietary networking protocols.

The ISP industry is divided into markedly different segments when examined by size, as measured first by total organization revenues, and alternatively by revenues of the ISP portion of the organization.

- The **Very Small Business ISPs**, those ISPs earning less than $1 million per year (averaged over the last three years), constitute 64% of all ISPs. They cater mostly to residential customers. The median percentage (half are higher, half are lower) of residential customers for this group is 59%. (See Summary Table 1, below.)
- The **Medium-sized Business ISPs**, earning from $1 million to under $50 million, make up 27% of ISPs, and have more of a mixture of business, non-profit, and residential customers. The median percentage for residential customers is 37%.
- The **Large Business ISPs**, constituting 9% of the total population, is mostly business oriented, serving a median of only 5% residential customers.

Summary Table 1. Business/Non-Profit by Revenues.

	Median Bus./Non-Prof.	Median Residential
Very Small Bus. ISPs(n=123)	35%	59%
Mid-sized Bus. ISPs(n=53)	60%	37%
Large Business ISPs(n=17)	80%	5%
TOTAL	80%	30%

- The average years of service increases directly with revenues. The smallest ISP group has an average of 2.5 years, the middle group 3.3 years, and the largest 3.9 years. ISP service provision is a young industry.
- All groups expect rapid expansion over the next 12 months, with an expected growth of 111% overall. Even the smaller ISPs expect to grow by at least 100%.
- Most access is provided via dial-up connection. Dial-up is used for 94% of residential connections. Business/Non-profit accounts report dial-up at 74%, leased lines at 8%, ISDN at 7%, and Frame Relay at 6%.
- 83% of ISPs provide "hit counters," 79% help with HTML and CGI. 77% provide forms retrieval.

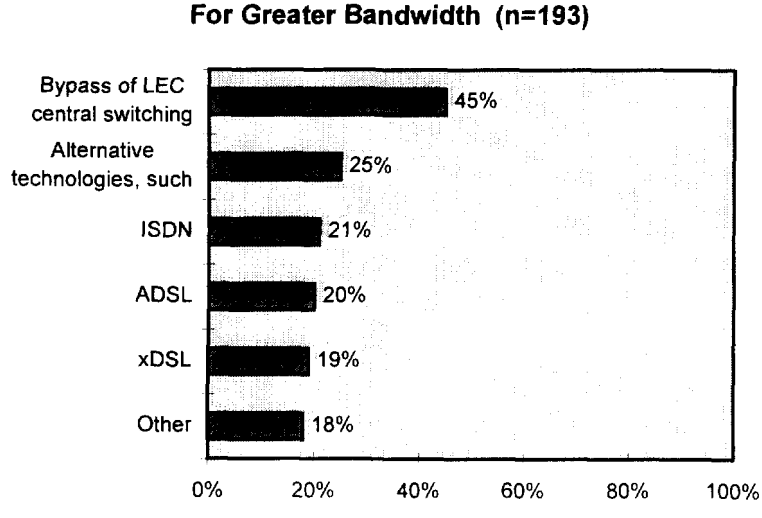
- Time online is essentially the same across all ISP groups, with an average of about 26 minutes. The number of log-ons averages 31 times, but for unknown reasons is fewer in the largest ISPs. See Summary Table 2.

Summary Table 2. Time online; Times log on.

	n=	Time Online (Average)	Times Log-on per Month (Average)
Organization Revenues			
- Very Small Bus. ISPs	122	26 min.	31.1
- Mid-sized Bus. ISPs	51	28 min.	34.1
- Large Business ISPs	15	25 min.	24.6
TOTAL	192	26 min.	31.5

- The number of points of presence (POPs) increases with revenue. The Very Small Business ISPs average 8 POPs, Mid-sized Business ISPs average 22 POPS, and the Large Business ISPs average 125 POPs.
- Many ISPs report problems associated with the incumbent Local Exchange Carrier services. Almost three-fourths of ISPs report installation delays, while more than half report repair delays (53%), and interruption of service (52%). These major difficulties, coupled with the fact that most ISPs are small operators, tend to suggest the problems mentioned are fairly widespread. Only one in five ISPs (21%) report no such problems.
- ISPs prefer a number of methods for increasing bandwidth. (See Summary Figure 1.)

Summary Figure 1. Preferred method for greater bandwidth (multiple response).



II. FINDINGS

A. INDUSTRY OVERVIEW

A total of 215 interviews were completed in February and March 1997 for this study. The survey universe was all Internet Service Providers (ISPs) in the United States. This was defined as any organization that uses the TCP/IP networking protocol and offers services to the general public; it did not include online service providers (OSPs) such as America Online, which use proprietary networking protocols.

A major value of this survey is to provide a snapshot of the ISP industry. The provision of Internet services is an industry undergoing rapid growth, and the services offered are rapidly evolving. This is the first in a series of market studies which attempts to describe the breadth and scope of the organizations offering Internet access and the services they are providing to customers..

An important finding is that the ISP industry is divided into markedly different segments when examined by size. Size, for this report, is tracked first by total organization revenues, and alternatively by revenues of the ISP portion of the organization. This latter value, the ISP portion, was answered only by a subset of the full sample. Another measure of size is the number of employees, and these too are tracked by total for the organization, and the ISP portion.

Q: Please describe your customer base.

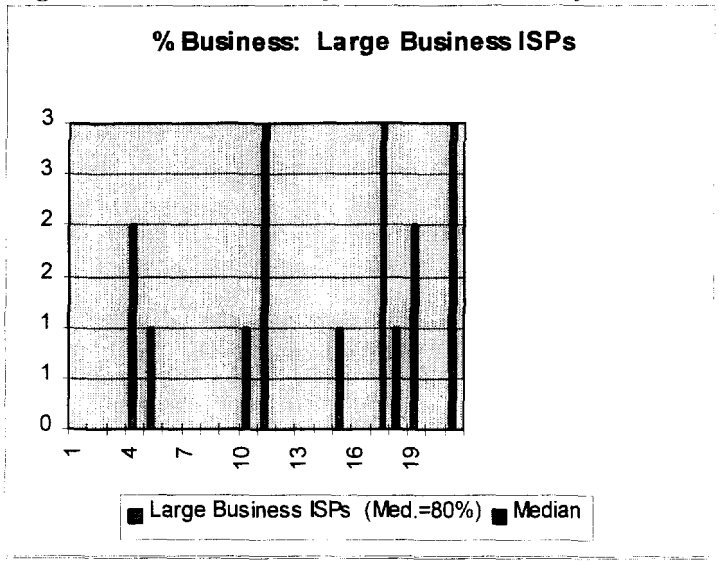
Most ISPs have a mixture of residential clients, and business/non-profit clients. This mixture increases towards the business side as revenues increase (Figures 1a, b, and c). If we look at the average percent business, the total sample is comprised of 51% business/non-profit and 49% residential (Table 1). The average residential portion decreases from 56% for Very Small Business ISPs, to 25% for Large Business ISPs. The average, however, may not be the best measure for this distribution of residential percentages. The median is the point where half of all ISPs are above that percentage and half below. The median business percentage and residential percentage for each revenue group appears on Table 1.

The median percentage of business customers increases from 35% for Very Small Business ISPs, and increases to 80% for Large Business ISPs. The small ISPs, therefore carry a disproportionate share of residential customers. In other words, the Large Business ISPs are essentially business oriented, and the smaller ones provide residential service.

Table 1. Average vs. Median Customer Base for Business/Non-Profit and Residential.

	Average Bus./Non-Prof.	Average Residential	Median Bus./Non-Prof.	Median Residential
Very Small Bus. ISPs(n=123)	44%	56%	35%	59%
Mid-sized Bus. ISPs(n=53)	61%	39%	60%	37%
Large Business ISPs(n=17)	74%	26%	80%	5%
TOTAL	51%	49%	80%	30%

Figure 1. Distribution of Business/Non-Profit Customer Base by Revenue. (n=210)



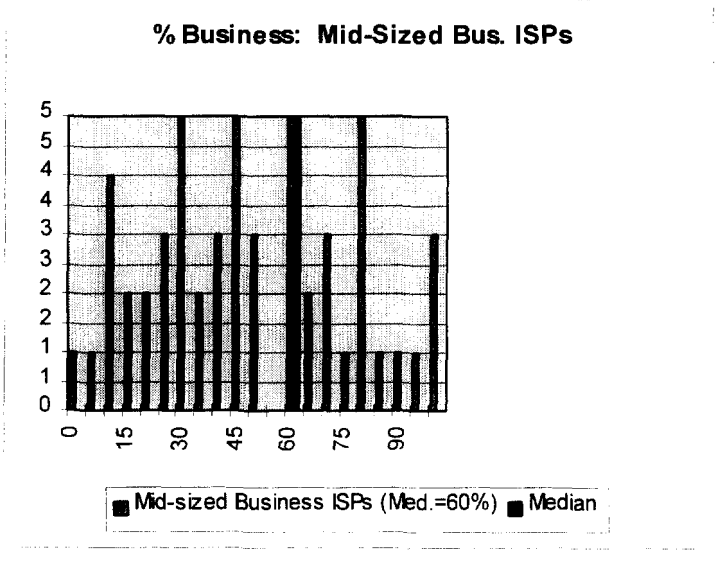
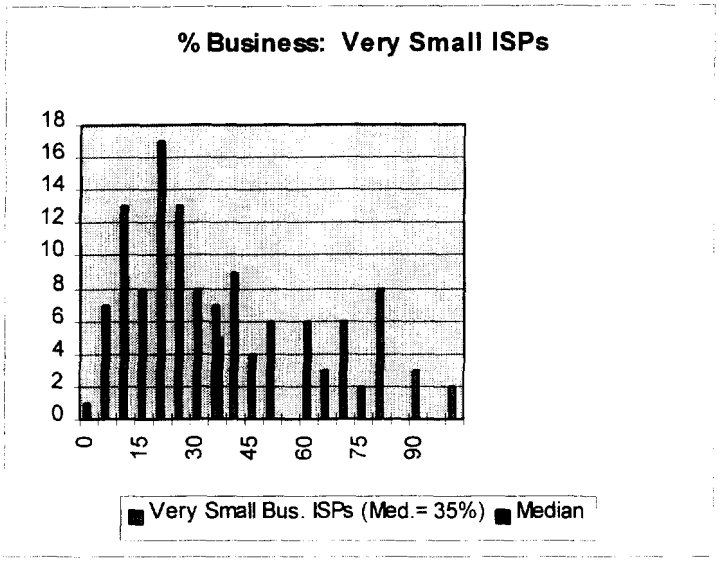


Figure 1c. Distribution of Business/Non-Profit Customer Base by Revenue.



Q: Does most of your revenue come from ISP provision?

As mentioned above, providing Internet access is only a portion of the business for many firms. As organizational revenues increase, the proportion of Internet service provision decreases (Table 2). The vast majority of ISPs have Internet service provision as their primary business. The largest however, provide such service only as an adjunct to other business.

Table 2. Most of Revenue from ISP Provision.

Organization Revenues	n=	Yes	No
- Very Small Bus. ISPs	121	85%	15%
- Mid-sized Bus. ISPs	54	57%	43%
- Large Business ISPs	16	31%	69%
TOTAL	191	73%	27%

Q: How many Points of Presence (POPs)?

Q: How many points of presence (POPs)does your network have in areas serving less than 5000 residential customers?

Most of the small companies have just a handful of Points of Presence (POPs) in the US, and this increases with size (Table 3). Many of the larger companies have hundreds of POPs.

Table 3. POPs in the United States in Areas Serving Less than 5000 Residential Customers.

		Number of POPs in US		POPs in Areas <5000
	n=	(Average)	n=	(Average)
Organization Revenues				
- Very Small Bus. ISPs	122	8.1	118	2.8
- Mid-sized Bus. ISPs	53	21.8	52	3.6
- Large Business ISPs	16	125.0	14	5.1
TOTAL	191	21.7	184	3.2

Q: How many years has your organization been providing Internet services?
Q: Over the coming year, what percentage increase do you expect in the number of dial-up access customers?

The largest firms (total revenues) also have been in business the longest (3.9 years), and, interestingly, expect the greatest growth in dial-up customers. For all respondents, dial-up growth is forecast to exceed 100% in the next year, but the largest companies expect 134% growth (Table 4). ISP providers are young, growing businesses.

Table 4. Years of Service, Growth in Dial-up Customers, by Revenue and Employees.

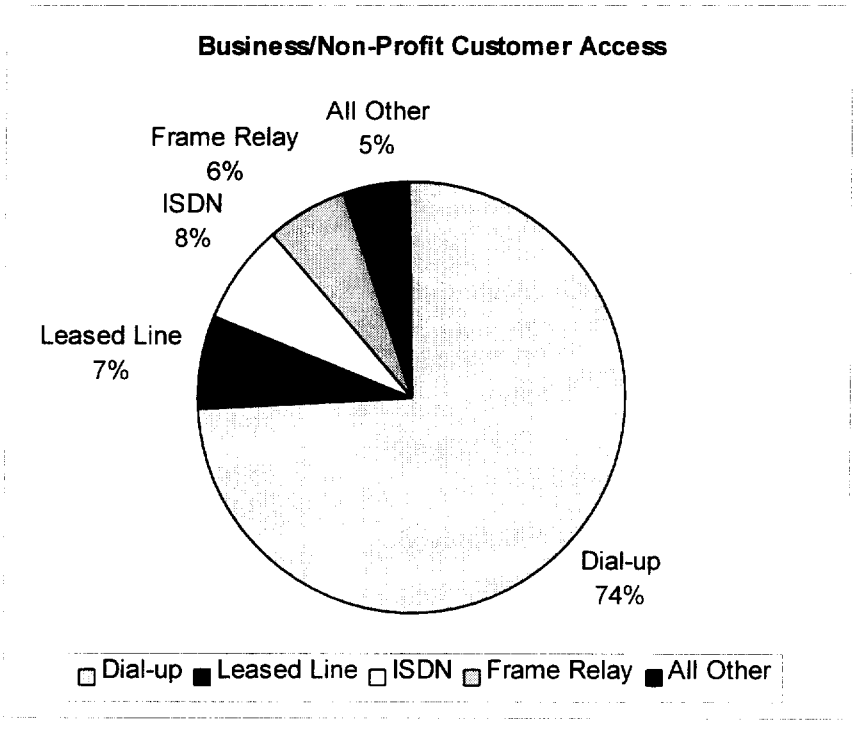
	n=	Years in Service	Growth in Internet Dial-up
		(Average)	(Average)
Organization Revenues			
- Very Small Bus. ISPs	123	2.5	108%
- Mid-sized Bus. ISPs	53	3.3	115%
- Large Business ISPs	16	3.9	134%
TOTAL	192	2.8	111%
ISP Revenues			
- Very Small Bus. ISPs	60	2.5	114%
- Mid-sized Bus. ISPs	18	3.5	101%
- Large Business ISPs	1	N/A	N/A
TOTAL	79	2.8	112%
Organization Employees			
- Under 6	68	2.1	108%
- 6 to 25	88	2.8	107%
- 26 to 99	28	3.4	135%
- 100 to 1,499	14	3.6	114%
- 1500 or more	8	4.2	162%
TOTAL	206	2.8	113%
ISP Employees			
- Under 6	34	2.2	106%
- 6 to 25	25	2.9	121%
- 26 to 99	14	3.1	126%
- 100 to 1,499	3	6.2	N/A
- 1500 or more	1	N/A	N/A
TOTAL	78	2.9	112%

B. ACCESS TO THE INTERNET

Q: In the list below, please indicate what percentage of your BUSINESS and NON-PROFIT customers connect using the following methods:
Q: In the list below, please indicate what percentage of your RESIDENTIAL customers connect using the following methods:

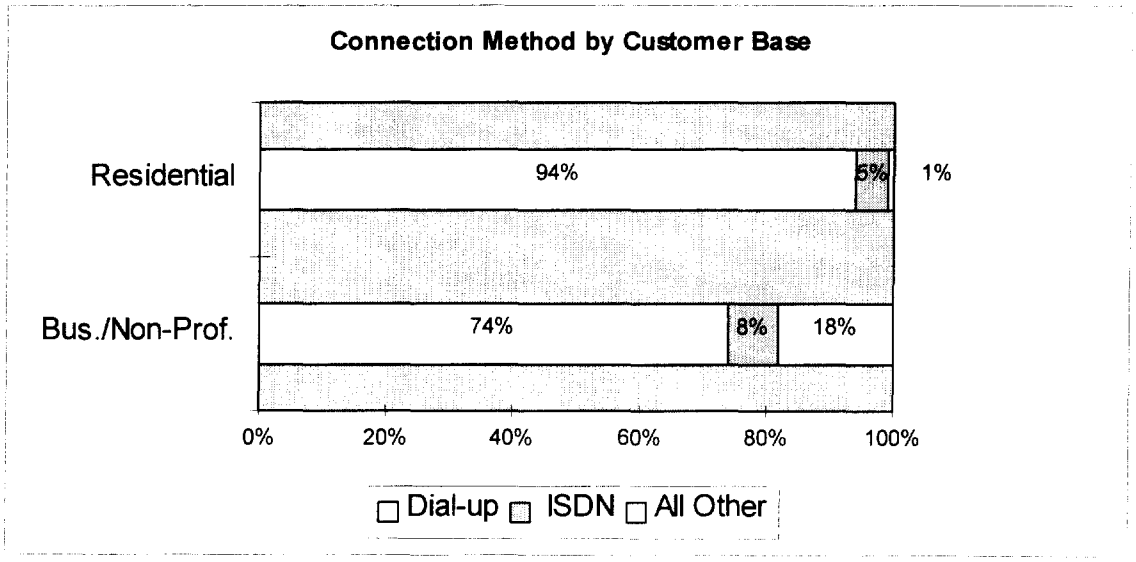
Dial-up customers constitute three quarters (74%) of business customers. This jumps to 94% of residential customers (Figure 2). ISDN is used for 8% of business customers, and this drops to 5% for residential customers. Frame relay and leased lines are significant only for business customers, 6% and 7% respectively.

Figure 2. Average Percent of Access Type: Business/Non-Profit. (n=205)



The percentage dial-up also varies by customer type. Dial-up is lowest for business/non-profit organizations, at 74% (Figure 3). ISDN usage is lower for residential users than for business/non-profit users. For purposes of comparison, the many advanced connection methods shown in Figure 2 are collapsed here into the "Other" category.

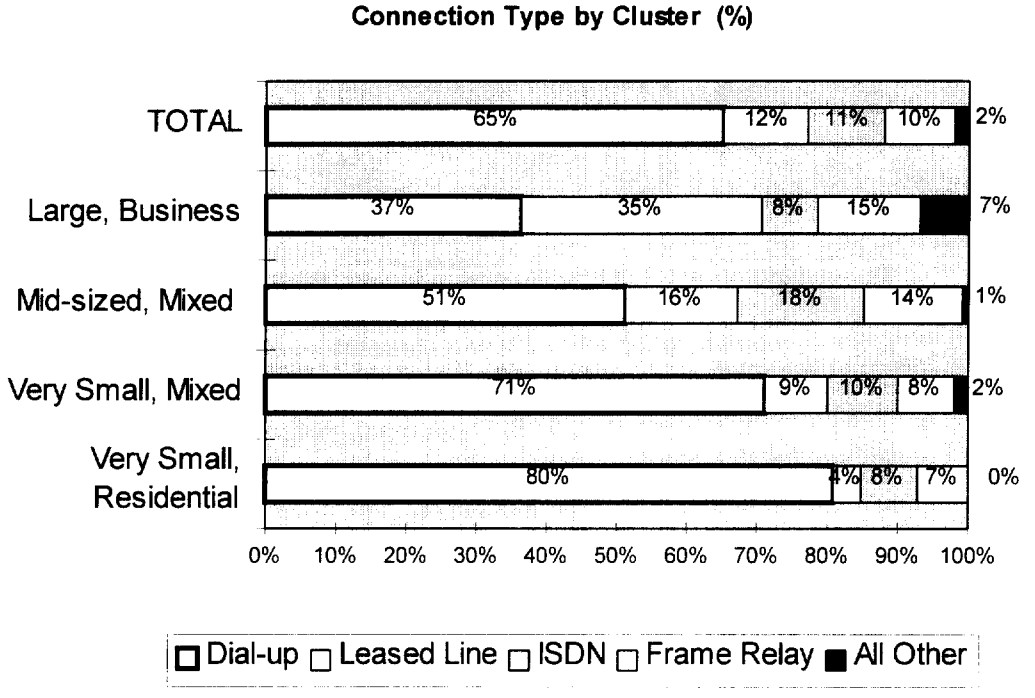
Figure 3. Average Percent of Access Type: Residential. (n=154)



Another means of looking at this data employs a statistical tool called cluster analysis. Cluster analysis reveals that there are four distinct groups among ISPs: Small ISPs with mostly residential customers; small with mixed customer base, large with mixed customer base, and large, mostly business-oriented ISPs.

Looking at the above makeup by ISP cluster reveals the differences in these populations. They are summarized in Figure 4 below. The percentage of dial-up customers decreases as the size of the ISP grows and it becomes more business based. The number of leased lines, and frame relay increases as well. The use of ISDN is fairly consistent across each group, except for large ISPs with a mixed customer base, where ISDN constitutes 18 percent of users, about double the norm. The "Other" category includes cable, xDSL, ATM, etc.

Figure 4. Connection Type by Cluster (with corresponding table).



	Small, Residential	Small, Mixed	Large, Mixed	Large, Business	TOTAL
Dial-up	80%	71%	51%	37%	65%
Leased Line	4%	9%	16%	35%	12%
ISDN	8%	10%	18%	8%	11%
Frame Relay	7%	8%	14%	15%	10%
All Other	0%	2%	1%	7%	2%

Q: For your dial-up users, what is the average time on-line per dial-up user PER MONTH? (Your total number of dial-up users divided by total on-line time.)

Q: How many times does the average user log on per month? (Your total number of dial-up sessions per month divided by total users.)

ISPs report the average time online for dial-up customers is about 26 minutes, (Table 5). This usage is essentially the same, regardless of the ISP's size. The number of log-ons is also about the same by company size, except that the largest companies have fewer log-ons. This may be due to the high number of leased lines and ISDN connections, which do not require repeated log on.

Table 5. Time Online; Times Log-on per Month.

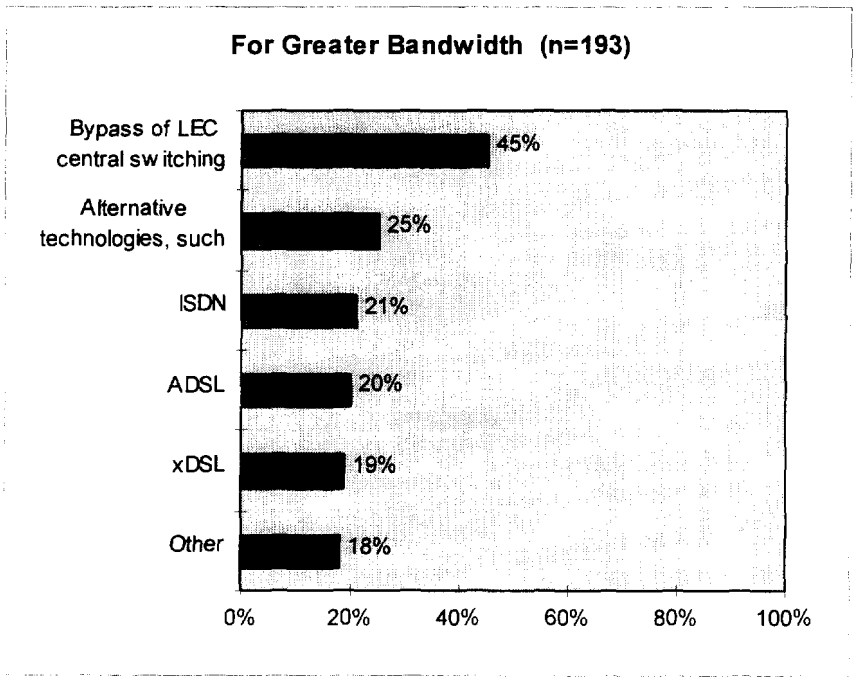
	n=	Time Online	Times Log-on per Month
		(Average)	(Average)
Organization Revenues			
- Very Small Bus. ISPs	122	26 min.	31.1
- Mid-sized Bus. ISPs	51	28 min.	34.1
- Large Business ISPs	15	25 min.	24.6
TOTAL	192	26 min.	31.5
ISP Revenues			
- Very Small Bus. ISPs	58	26 min.	29.2
- Mid-sized Bus. ISPs	14	32 min.	38.0
- Large Business ISPs	0	N/A	N/A
TOTAL	72	27 min.	30.9

C. INTERNET PROVISION

Q: Given your business model, what would be your preferred method of developing greater bandwidth in the local loop?

As the demand for service grows, ISP are looking for ways to increase bandwidth. Several options were presented to respondents, and the percentage to selected each is shown in Figure 5, below. The most favored method is bypassing the Local Exchange Carrier, with 45% of respondents selecting this choice (multiple choice). Twenty-five percent choose "Other technologies" such as wireless and satellite, and about one out of five also select ISDN, ADSL, and xDSL.

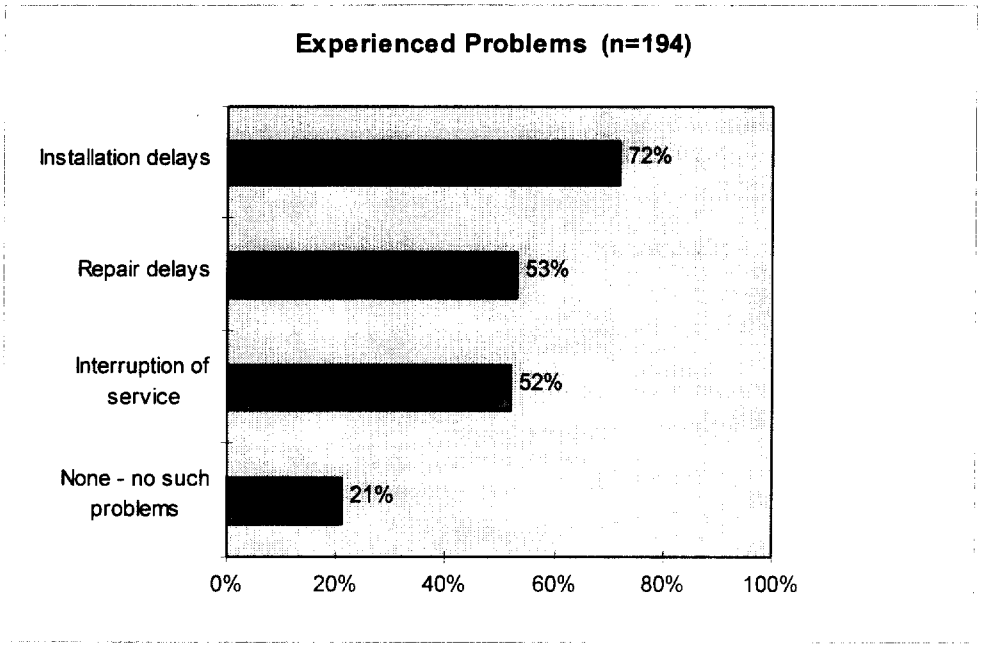
Figure 5. Preferred method for greater bandwidth (multiple response).



Q: Have you experienced any of the following problems with incumbent LECs or RBOCs that you attribute to anti-competitive behavior? (Check all that apply)

Respondents were also asked if they have ever experienced problems with access. Almost three-fourths reported installation delays, while more than half report repair delays, and interruption of service (Figure 6). These are major difficulties for ISPs. This coupled with the fact that most ISPs are small operators, tends to suggest the problems mentioned are fairly widespread. Only one in five customers report no such problems.

Figure 6. Problems Experienced. (n=194)



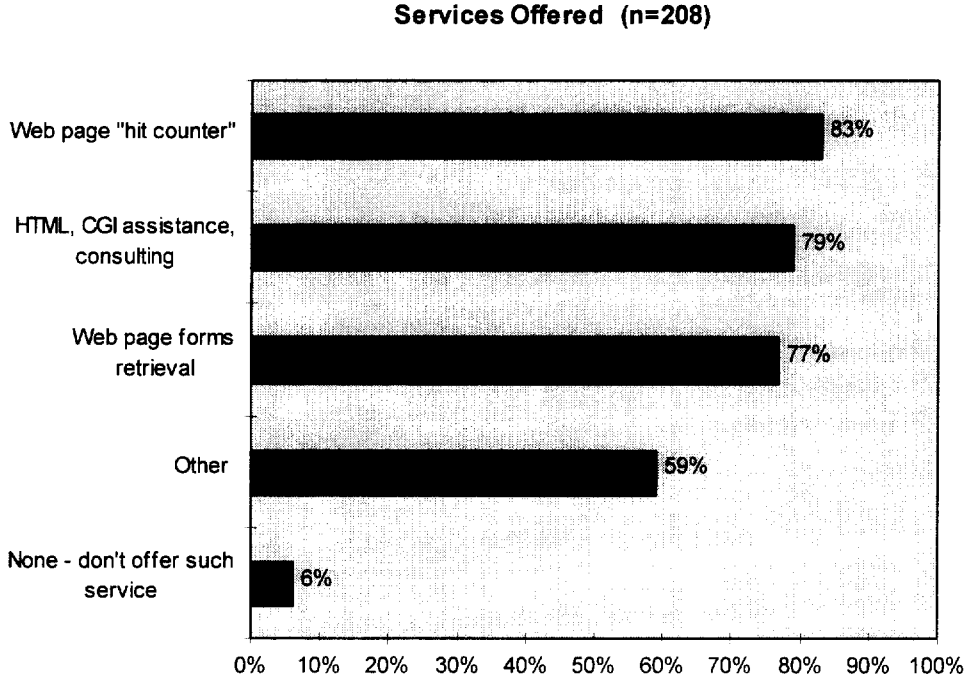
D. STANDARD SERVICES

Q: Which services are included in your basic Web Hosting Service offering? (Check all that apply.)

A glance at the back pages of any Internet magazine shows a host of ISP advertisements. There is no known "standard" of value for ISPs, and the present survey asked some service-related questions. Results appear in Figure 7 below. The most common services offered are a Web page hit counter, HTML and CGI assistance, and Web page forms retrieval. These have become essential selling points for many ISPs.

In Figure 7, "Other" services include Electronic Commerce, audio products, such as RealAudio, and telephony products.

Figure 7. Other Services Offered.



III. METHODS

A. BACKGROUND

The objective of the survey was to measure demographic variables, perceptions and experiences of Internet Service Providers (ISPs) in the United States. The Commercial Internet eXchange (CIX) retained InfoPlex Corporation of Hayward, California, a full service market research firm, to conduct the survey.

This survey represent one of the first attempts to survey the ISP industry in the United States. InfoPlex (as Trish Information Services) has a long history of conducting Internet-related research, having pioneered Internet demographic research with "Defining the Internet Opportunity" with publishers O'Reilly & Associates, the first statistically projectable attempt to quantify the US Internet population.

The current survey occurs at a time of continued growth for both the Internet and ISPs. The goal of the survey is to collect and analyze significant information on the makeup of ISPs. A related issue is the controversy involving ISP access charges; the telephone companies have indicated their desire to end the exemption ISPs enjoy from certain connection charges.

B. SAMPLING METHOD

The data collection method chosen was an online e-mail survey. This was considered most appropriate for the target population, using the media being surveyed, and maximizing inclusion. It is also cost effective.

The survey universe is all ISPs in the United States. This is defined as any organization that provides a public TCP/IP protocol address for its users; it does not include online service providers (OSPs) such as America Online, which use proprietary networking protocol. The list contained 2,343 listings with usable e-mail addresses. It was provided by CIX, and was compiled from multiple sources.

Prior to the survey, a notification letter was sent to all the addresses on the list. This provided both an alert to recipients, and a means of checking the contact list. Sending the notification letter to everyone on the list generated a large number of "bounced" e-mail messages. The categorized results for the notification mailing appears in Table 6 below. The total valid listings were 1749, resulting in 215 completed interviews.

This completion rate provides a sample reliability that meets the industry standard of a sampling error of +/-5%. This means that if the same survey were conducted repeatedly, then 95 times out of 100, the survey results would yield percentages that are within 5% of their present values.

Table 6. Results of Mailing Introductory Letter

Count	Pct.	Result of Intro Letter	Status
265	11%	Bounced	Marked "Invalid" - Not mailed questionnaire
11	-	Duplicates	Second marked "Dup" - Not mailed questionnaire
303	13%	Auto-responder	Marked "Auto" - Not mailed questionnaire, unless they eventually did respond
15	1%	Refused	Marked "Ref" - Not mailed questionnaire
1616	69%	Non-Response	Left Blank - Mailed questionnaire
133	6%	Positive Response	Edited where necessary - Mailed questionnaire
2,343	100%	TOTAL	

C. DATA PROCESSING

A copy of the questionnaire appears in the Appendix. The instrument was designed to solicit required information while maintaining a logical flow.

The survey instrument is comprised essentially of check boxes for response categories. It is often helpful to compute an average for a category response. In computing the average, or mean, for such categories, the standard procedure is to use the midpoint of the category. For example, "100 to 200%" category, uses 150% for all those who checked it. The open-ended category, "Over 200%," uses one half the interval of the previous category. In this case, half of the 100 to 200% category is added to the Over 200% category, to make it 250% for calculation purposes.

This techniques for estimating the averages of response categories is, obviously, simply an estimate of the true mean. With a large number of responses however, the error of the estimate is fairly minor. For the largest companies, the open ended scale was supplemented by using known values for number of employees and revenues, in order to establish a more accurate profile.

The present report includes only a portion of the total findings. The remainder of the findings are the property of CIX.

IV. SURVEY

ISP ACCESS CHARGES SURVEY

The following is an urgent study being conducted by InfoPlex Corp. of Hayward, California (formerly Trish Information Services) for the Commercial Internet eXchange (CIX). You may respond by e-mail reply, or print and fax results to InfoPlex at (510) 732-3474.

All data is analyzed and aggregated by InfoPlex, and all responses are confidential. The executive summary of the results of this survey will be available after 28 February at the CIX web site, www.cix.org. The CIX comment to the FCC Notice of Inquiry will also be available at the CIX web site. Responses are due by 5 March, 1997.

1. How many years has your organization been providing Internet services?

[ ] Less than one year
[ ] 1 - 2 years
[ ] 2 - 5 years
[ ] More than 5 years

2. Over the coming year, what percentage increase do you expect in the number of dial-up access customers?

[ ] Decrease
[ ] 0 - 25%
[ ] 26 - 99%
[ ] 100 - 200%
[ ] Over 200%
[ ] N/A - don't provide service

3. Please describe your customer base.
Of your customer base (revenues) what percent is:

___ % Business customers
___ % Residential customers
___ % Non-profit customers (schools, government, etc.)
100% Total

4. In the list below, please indicate what percentage of your BUSINESS customers connect using the following methods:

___ % Leased line
___ % ISDN
___ % Frame Relay

___ % SMDS
___ % Dial-up
___ % Other (ATM, cable, xDSL, etc.)
100% Total

5. In the list below, please indicate what percentage of your RESIDENTIAL customers connect using the following methods:
___ % Dial-up
___ % ISDN
___ % Other (dedicated, cable, xDSL, etc.)
100% Total

6. In the list below, please indicate what percentage of your NON-PROFIT customers connect using the following methods:
___ % Dial-up
___ % ISDN
___ % Other (dedicated, cable, xDSL, etc.)
100% Total

7. How many dial-up customers (not ISDN), both consumer and business, do you have in the Unted States?
[ ] Under 100
[ ] 100 - 499
[ ] 500 - 999
[ ] 1,000 - 4,999
[ ] 5,000 - 9,999
[ ] 10,000 - 49,999
[ ] 50,000 - 99,999
[ ] 100,000 - 1 million
[ ] Over 1 million

8. For your dial-up users, what is the average time on-line per dial-up user PER MONTH? (Your total number of dial-up users divided by total on-line time.)
[ ] Under 10 hours per month
[ ] 10 - 20 hours per month
[ ] 20 - 40 hours per month
[ ] More than 40 hours per month
[ ] N/A - don't provide service

9. How many times does the average user log on per month? (Your total number of dial-up sessions per month divided by total users.)
[ ] Under 10 times per month

[ ] 10 - 25 times per month
[ ] 25 - 50 times per month
[ ] More than 50 times per month
[ ] N/A - don't provide service

10. How many points of presence(POPs)does your network currently have in the United States?
[ ] 0 (none)
[ ] 1
[ ] 2 - 5
[ ] 6 - 25
[ ] 26 - 99
[ ] 100 or more

11. How many points of presence (POPs)does your network have in areas serving less than 5000 residential customers?
[ ] 0 (none)
[ ] 1
[ ] 2 - 5
[ ] 6 - 25
[ ] 26 - or more

12. What percentage of your dial-up customers pay a flat rate for unlimited access?
[ ] None - don't offer flat rate pricing
[ ] All - offer only flat rate pricing
[ ] 1% - 24%
[ ] 25% - 49%
[ ] 50% - 75%
[ ] Over 75%
[ ] N/A - don't offer dial-up access

13. Please check the category that best describes the average total annual revenues of your entire organization (all divisions, parents, subsidiaries) for the past three years.
[ ] Under $250,000 per year
[ ] $250,000 - $500,000 per year
[ ] $500,000 - $1 million per year
[ ] $1 - $5 million per year
[ ] $5 - $25 million per year
[ ] $25 - $50 million per year
[ ] Over $50 million per year

14. If your ISP is part of a larger company which provides other services, please estimate the the average

total annual revenues of the ISP portion for the last three years.

[ ] Under $250,000 per year
[ ] $250,000 - $500,000 per year
[ ] $500,000 - $1 million per year
[ ] $1 - $5 million per year
[ ] $5 - $25 million per year
[ ] $25 - $50 million per year
[ ] Over $50 million per year

15. What is the number of full time employees of your entire organization (all divisions)?

[ ] 0 - 5
[ ] 6 - 25
[ ] 26 - 100
[ ] 100 - 1,500
[ ] Over 1,500

16. If your ISP is part of a larger company which provides other services, please estimate the number of full-time employees of the ISP part of your organization.

[ ] 0 - 5
[ ] 6 - 25
[ ] 26 - 100
[ ] 100 - 1,500
[ ] Over 1,500
[ ] N/A - provide only ISP service

17. What is the overbooking ratio of your ISP? (Overbooking is customer bandwidth divided by backbone bandwidth.)

[ ] 4:1 or less
[ ] 6:1
[ ] 8:1
[ ] 10:1
[ ] 15:1
[ ] 20:1 or more

18. Which services are included in your basic Web Hosting Service offering? (Check all that apply.)

[ ] HTML, CGI assistance, consulting
[ ] Web page "hit counter"
[ ] Web page forms retrieval