



Worldwide Telecommunications Fixed Public Network Services Guide

Gartner Dataquest Guide

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Table of Contents

	Page
1. Background and Overview.....	1
Market Statistics Methodology.....	1
Forecasting Methodology.....	2
Forecasting Goals	2
2. Worldwide Product Definitions and Segmentation.....	3
Worldwide Fixed Public Network Services Segmentation.....	3
Worldwide Fixed Public Network Services Definitions	4
Worldwide Summary and Ratios.....	4
Worldwide Retail Calls Revenue	5
Retail Telephone Rental and Connection.....	6
Retail Data Services and Internet / Public IP Services	6
Wholesale / Carrier Services	6
Associated Statistics	6
3. Asia / Pacific and Japan.....	7
Asia / Pacific and Japan Fixed Public Network Services Segmentation.....	7
Asia / Pacific and Japan Fixed Public Network Services Definitions	8
Market Summary and Ratios in Asia / Pacific and Japan	8
Telephony Services in Asia / Pacific and Japan	10
Circuit-Switched Telephone Rental and Connection Service and Packetized Voice Service in Asia / Pacific and Japan.....	11
Data Services in Asia / Pacific and Japan.....	12
Internet / Public IP Services in Asia / Pacific and Japan.....	14
Wholesale / Carrier Services in Asia / Pacific and Japan	15
4. Latin America	17
Latin America Fixed Public Network Services Segmentation	17
Latin America Fixed Public Network Services Definitions.....	18
Market Summary and Ratios in Latin America.....	18
Long-Distance Retail Services in Latin America	20
Local Retail Telephone Services in Latin America	21
Retail Data Services in Latin America.....	21
Internet Retail Services in Latin America	23
5. North America.....	25
North America Fixed Public Network Services Segmentation.....	25
North America Fixed Public Network Services Definitions	26
Market Summary and Ratios in North America	26
Long-Distance Retail Services in North America	27
Local Retail Telephone Service in North America.....	28
Retail Data Services in North America	29
Internet Retail Services in North America.....	33
Wholesale / Carrier Services in North America.....	34
6. Western Europe	37
Western Europe Fixed Public Network Services Segmentation	37
Western Europe Fixed Public Network Services Definitions.....	39
Market Summary and Ratios in Western Europe.....	39
Fixed Telephone Networks in Western Europe	42
Telephone Rental and Connection, VoIP and Total Voice Market in Western Europe	44
Public Data Services in Western Europe	44
Internet / Public IP Services in Western Europe	48
Wholesale / Carrier Services in Western Europe	49

Table of Contents (Continued)

	Page
7. Worldwide Geographic Regional Definitions	51
Asia / Pacific	51
Rest of Asia / Pacific	51
Western Europe	51
Rest of Western Europe	51
Eastern Europe	51
Rest of Eastern Europe	51
Latin America	51
Rest of Latin America	52
Middle East / Africa	52
Rest of Middle East / Africa	52
North America	52
8. Research Metrics	53
9. Exchange Rates	55

List of Tables

Table	Page
2-1 Worldwide Telecommunications Services Segmentation	3
3-1 Asia / Pacific Telecommunications Services Segmentation	7
4-1 Latin America Telecommunications Services Segmentation	17
5-1 North America Telecommunications Services Segmentation	25
6-1 Western Europe Telecommunications Services Segmentation	37
9-1 Prevailing Historical Exchange Rates	55

Chapter 1

Background and Overview

Each year, Gartner Dataquest surveys and holds ongoing interviews with telecommunications services providers to estimate annual revenue and develop market size assessments for the major markets worldwide. The survey covers all major carriers active in one or more of the Gartner Dataquest fixed public network services segments. In addition, Gartner Dataquest conducts primary research of consumers and business customers in key markets to further ensure the veracity of our statistics and trends and to develop more detailed segmentation granularity than is obtained through carrier interaction.

The information gathered through these sources enables Gartner Dataquest to maintain a dynamic database of fixed public network service data for each industry segment. This rigorous approach supported by a team of experienced industry analysts provides our clients with the most current and accurate picture of market data and trends.

The purpose of this Guide, then, is twofold:

- First, to describe the methodology and comprehensive segmentation scheme, used by Gartner Dataquest for its 2002 global and regional statistics of the telecommunications services market, those sectors for which Gartner Dataquest provides comprehensive segmentation in the form of statistical coverage
- Second, to provide in concise fashion the telecom services market definitions used by Gartner Dataquest in its 2002 global and regional statistics and trends publications to describe the telecommunications services market

This worldwide Guide has been organized into several sections to give our clients the most comprehensive view of Gartner Dataquest's segmentation scheme and definitions. The first section provides a description of the segmentation structure and those associated definitions that are global (that is, those that appear in the worldwide statistics / trends books). Regional sections follow the worldwide section. These sections provide those additional regional segmentation and definitions or statistics that are unique and particularly germane to our coverage of those specific regions.

Finally, this Guide also contains Gartner Dataquest's geographic segmentation of the global market and exchange rates.

Market Statistics Methodology

Gartner Dataquest's market statistics methodology combines primary and secondary sources to produce the Market Statistics and Trends documents. Gartner Dataquest continually interviews major participants within the fixed public network services markets in Asia / Pacific (including Japan), Central and Eastern Europe, North America, Latin America, Middle East and Africa, and Western Europe regions. This primary research is supplemented by additional research (primary and secondary) to verify market size, line / port totals and pricing information. Sources of data used by Gartner Dataquest include the following:

- Interviews with carriers and resellers
- Information published by major industry participants
- Estimates made by reliable industry representatives
- Government data or trade association data

- Published product literature and price lists
- Relevant economic data
- Articles in the general and trade press
- Published company financial reports
- Reports from financial analysts
- Information and data from online and CD-ROM data banks
- End-user surveys

Gartner Dataquest believes its Market Statistics data are the most accurate and meaningful available. Despite the care taken in gathering, analyzing and categorizing the data, careful attention must be paid to the definitions and assumptions. Various companies, government agencies and trade associations may use slightly different definitions of product categories and regional groupings, or they may include different companies in their summaries. These differences should be kept in mind when making comparisons between data and numbers provided by Gartner Dataquest and those provided by other research organizations.

Forecasting Methodology

Gartner Dataquest adheres to generic best-practice forecasting methodology guidelines that are supplemented as need be with specific methodology for each industry research area. Gartner Dataquest strongly believes that forecasting is the meeting ground for the qualitative art of intuition and the quantitative science of data analysis. A sound forecasting process incorporates art and science into a logical and coherent series of steps that, if conducted in an organized fashion, will ensure forecasting effectiveness, reliability and accuracy.

Forecasting Goals

Gartner Dataquest aims to provide clients with forecasts that are useful, credible and as accurate as possible. Because it is impossible to always be right, it is important to provide clients with details of the assumptions that built the forecast. Gartner Dataquest realizes that clients evaluate its credibility by evaluating the historical accuracy and the quality of written forecast assumptions. This is not to imply that a conservative approach is called for; where we fail to forecast a completely new market, we have failed to inform the client of the opportunity. Gartner Dataquest uses tools and processes that maximize its overall presence in the market research industry by sharing processes and time frames, so that a unified, coherent picture of the telecommunications market is built.

For several years, the process of developing telecommunications market forecasts has been undergoing continued refinement at Gartner Dataquest. Today, the process draws on Gartner Dataquest industry experts and client feedback to devise a forecast that is consistent internally and meets client expectations. The process assimilates vast amounts of disparate and aggregated data that are molded into a forecast that is scrutinized and scrubbed by many seasoned analysts. The completion of a typical long-term forecast takes about three to six weeks, depending on the product area, with several major steps.

The time and effort that go into a forecast varies from period to period and is also heavily dependent on the technology area being forecast. Generally, forecasts produced after the release of annual data are the most time-consuming and require the most attention. Also, unexpected economic developments can affect the complexity and duration of the forecasting process.

Chapter 2

Worldwide Product Definitions and Segmentation

The following definitions and segmentations are common to all world regions in Gartner Dataquest's coverage of the telecommunications fixed public network services market. Worldwide segmentation depth in some world regions is better than in others primarily for the following reasons:

- Market maturity
- Availability of baseline market data
- Client level of interest

Subsequent regional sections of this Guide illuminate those additional segmentations and definitions.

Worldwide Fixed Public Network Services Segmentation

Table 2-1 delineates the various metrics shown in all worldwide regions. Notes to these metrics germane to the coverage of fixed public network services worldwide follow, organized by relevant service area.

Table 2-1
Worldwide Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
PSTN Network				
Lines in Service		X	X	
Lines per 100 Population			X	
Internet Services Subscribers		X		
Total Public Fixed Services Revenue	X			
Per PSTN Line	X			
Voice / Calling Services	X	X		
Local Retail Calls	X	X		
National Long-Distance Retail Calls	X	X		
International Long-Distance Retail Calls	X	X		
VoIP Services	X			
Retail Telephone Rental and Connection	X	X		
Retail Data Services	X			
Retail Internet / Public IP Services	X			
Wholesale/Carrier Services Revenues	X			
Associated Statistics				
Population at Midyear				Millions

Source: Gartner Dataquest (January 2003)

Worldwide Fixed Public Network Services Definitions

The following definitions apply to all world regions and form the common denominator of Gartner Dataquest telecommunications public fixed services coverage. All terms listed represent line items or segments in the worldwide Market Statistics document (please see "Fixed Public Network Services: Worldwide, 2000-2006" [TCPS-WW-MS-0221]): Each term is briefly defined. This coverage is amplified in slightly differing fashion in certain world regions in response to client interest and variations in network service development. Subsequent sections of this Guide illuminate those additional segmentations and definitions.

For further information and detail, consult the following Gartner Dataquest publications:

- Fixed Public Network Services: Worldwide Overview, 2000-2006 (TCPS-WW-MT-0165)
- Fixed Public Network Services in Asia/Pacific and Japan, 2000-2006 (TCPS-WW-MS-0206)
- Fixed Public Network Services: Latin America, 2000-2006 (TCPS-WW-MS-0208)
- Fixed Public Network Services: North America, 2001-2006 (TCPS-WW-MS-0190)
- Fixed Public Network Services: Western Europe, 2000-2006 (TCPM-EU-MS-0182)

Worldwide Summary and Ratios

The following definitions reflect those that are in the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Worldwide, 2000-2006" (TCPS-WW-MS-0221).

- Total retail fixed telecommunications market revenue — The sum of retail calls, retail telephone rental and connection, retail data, and retail Internet services revenue
 - Total retail calls revenue — The sum of circuit-switched telephony calling and usage fees for all zones
 - Total retail telephone rental and connection revenue — Rental and right-to-use fees for circuit-switched calling services

Note: The sum of retail calls and retail telephone rental and connection revenue is sometimes referred to as "voice services."

- Total retail data service revenue — National and international end-user revenue for those dedicated/private line and packet/circuit-switched services that are managed end-to-end by public telecommunications operators or other carriers. Rental, connection and usage charges are included.
- Total retail Internet service revenue — End-user revenue for Internet and public Internet Protocol (IP) services, including use charges or subscription fees for Internet access, other Internet service provider (ISP) revenue, Web hosting, and value-added IP services
- Total wholesale/carrier service revenue — Carrier revenue from carrier-to-carrier service transactions

- **Public switched telephone network (PSTN)** — The PSTN describes the global infrastructure owned and operated by public carriers, which is used to provide fixed public network services to other carriers and end users. It does not encompass either private networks used for the provision of voice or data or mobile infrastructure network elements.
- **Lines in service / exchange lines (access lines)** — The number of lines in operation at calendar year-end that connect a customer's premises to the public network; the aggregate number includes Integrated Services Digital Network (ISDN) B-channel equivalents.
 - **Business lines in service** — Exchange lines connecting business customers to the public network, including PSTN (including basic business lines, PBX trunks and Centrex lines) and ISDN B-channels
 - **Residential lines in service** — Exchange lines connecting residential customers to the public network, including, PSTN (primary and additional residential access lines) and ISDN B-channels
- **Total fixed telecommunications retail service revenue per PSTN line** — Fixed public network services retail revenue divided by the number of lines in service
- **Lines per 100 population (teledensity)** — A measure of the development in a given national network, expressed as the number of lines in service per 100 population
- **Internet services consumer Internet subscribers** — The number of distinct residential subscribers paying for Internet access service
- **Internet services business Internet subscribers** — The number of distinct business subscribers paying for Internet access service

Worldwide Retail Calls Revenue

- **Call services** — Call services includes use fees for voice telephony services on the fixed public switched network.
 - **Local services** — Local services revenue includes local call, customized calling / custom local access signaling service (CLASS) or enhanced voice services, local rate, Centrex, and personal numbering. A local call is a call made to the same code zone.
 - **Long-distance services** — Long-distance services revenue includes national long-distance call, 800 / freephone, premium rate, virtual private network (VPN) and any other enhanced services such as shared toll or national rate. A national long-distance call is made to a different area code that is not an international call prefix.
 - **International services** — International services comprise end-user revenue for international long-distance outgoing calls only.
 - **Voice over Internet Protocol (VoIP) services** — VoIP services comprise end-user revenue for voice over public Internet and voice over private / carrier IP services. Includes IP calling card revenue.

Retail Telephone Rental and Connection

- Retail telephone rental and connection — Includes switched exchange line rental and connection fees charged to business and residential end users

Note: The sum of retail calls and retail telephone rental and connection revenue is sometimes referred to as "voice services."

- Voice services — Voice services revenue includes the provision of services related to voice and enhanced voice services. Voice services has two components; call services and retail telephone rental and connection. Income from the provision of equipment and nontelecommunications activities such as software and consultancy is excluded. Income from the overseas activities of operators is also excluded.

Retail Data Services and Internet/Public IP Services

- Data Services — Gartner Dataquest estimates national and international end-user revenue for public data services (that is, those dedicated / private line and packet / circuit-switched services that are managed end to end by public telecommunications operators or other carriers). Rental, connection and usage charges are included. This term as used herein refers to a specific set of services that are offered by telecom services providers to end users and resellers. It does not imply that the traffic carried by these services is necessarily "data" traffic. In fact, all types of transmissions, voice, image, video, fax, interactive services and other nonvoice traffic can be carried by these services regardless of whether the source format is analog or digital or whether it is transmitted as analog or digital information. No differentiation is made between the types of traffic that are carried by these services. No interconnection revenue is included in the worldwide rollup.
- Internet / public IP services — Gartner Dataquest estimates total end-user revenue for Internet and public IP services, including usage charges or subscription fees for Internet access, other ISP revenue, Web hosting and value-added IP services.

Wholesale/Carrier Services

- Wholesale / carrier services — Wholesale / carrier services reflect carrier revenue from carrier-to-carrier service transactions. These transactions represent a mix of end-user and intermediate IT transactions, whose precise composition cannot be readily determined at this point. Because of this, the associated revenue is not included in reported end-user telecom services spending to avoid double-counting. They are, nonetheless, reported here to provide insight into an important element of the telecom services market.

Associated Statistics

- Population at midyear — The number of inhabitants of a given country; the basis for computing lines per 100 population as given above.

Note: All product definitions in the Central and Eastern European region and Middle East and Africa region follow worldwide product segmentations.

Chapter 3

Asia/Pacific and Japan

Asia/Pacific and Japan Fixed Public Network Services Segmentation

Table 3-1 delineates the various metrics shown within Asia / Pacific and Japan. Notes to these metrics germane to the coverage of fixed public network services in this region follow, organized by relevant service area.

Table 3-1
Asia/Pacific Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
PSTN Network				
Lines in Service		X	X	
Lines per 100 Population			X	
Internet Services Subscribers	X			
Internet Data Center Floor Space				Square Feet
Fixed VoIP Ports			X	Equivalent IP Lines
Leased Lines				Digital
ISDN				BRI / PRI
Public Data Ports in Use				
X.25			X	
Frame Relay			X	
Native ATM			X	
DSL			X	
Ethernet			X	
Cable Modem			X	
Fixed Wireless			X	
Total Public Fixed Services Revenue	X			
Per PSTN Line	X			
Voice / Calling Services	X	X		
Local Retail Calls	X	X		Value-Added
National Long-Distance Retail Calls	X	X		
International Long-Distance Retail Calls	X	X		
VoIP Services	X			
Retail Telephone Rental and Connection	X	X		
Retail Data Services	X			
Public Data Services	X			
X.25	X			
Frame Relay	X			
Native ATM	X			
DSL	X			
Ethernet	X			
Cable Modem	X			
Fixed Wireless	X			
Managed Data Services	X			
Managed MAN-WAN	X			
VPN	X			
Leased Line Services	X			
Digital	X			
Analog	X			

Table 3-1 (Continued)
Asia/Pacific Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
Retail Internet / Public IP Services	X			
Internet Access Revenue	X			
Retail Web Hosting	X			
Colocation	X			
Managed, Dedicated Hosting	X			
Shared Hosting	X			
Value-Added IP Services	X			
Fax Over IP	X			
Unified Messaging	X			
IP Multicast	X			
ISP Other	X			
Wholesale/Carrier Services Revenue	X			
Voice Wholesale / Carrier Services	X			
Circuit-Switched National	X			
Circuit-Switched International	X			
VoIP	X			
Data Wholesale / Carrier Services	X			
Leased Lines / Private Line	X			
IP Transit	X			
Content Distribution / Caching	X			
IP Multicast	X			
Managed / Dedicated Web Hosting	X			
Shared Web Hosting	X			
Colocation	X			
Associated Statistics				
Population at Midyear				Millions

Source: Gartner Dataquest (January 2003)

Asia/Pacific and Japan Fixed Public Network Services Definitions

Market Summary and Ratios in Asia/Pacific and Japan

The following definitions reflect those that are in the market summary and ratios section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services in Asia / Pacific and Japan, 2000-2006" (TCPS-WW-MS-0206).

Fixed Network Size Data at Year-End

- Total fixed telecommunications retail service revenue per PSTN line — Fixed public network services retail revenue divided by the number of lines in service
 - Total lines in service — The number of lines in operation at calendar year-end that connect a customer's premises to the public network; the aggregate number includes ISDN B-channel equivalents
 - Business lines in service — Exchange lines connecting business customers to the public network, including PSTN (including basic business lines, PBX trunks and Centrex lines) and ISDN B-channels
 - Residential lines in service — Exchange lines connecting residential customers to the public network, including, PSTN (primary and additional residential access lines) and ISDN B-channels

- ❑ Lines per 100 population (teledensity) — A measure of the development in a given national network, expressed as the number of lines in service per 100 population
- ❑ IP ports in service — IP gateway port is a physical or electrical interface built into an IP gateway that enables IP packets to be sent to and from a device. This counts the number of ports that on the public network that has commercial traffic passing through them.
- ❑ Equivalent number of retail IP lines — The maximum number of simultaneous telephone conversations that can be supported, with compression by IP ports. This is a capacity measurement, not a traffic measurement.
- Digital leased lines — Total digital leased lines (in thousands), also known as dedicated access or point-to-point or multipoint circuits, includes those lines leased from carriers and not switched within a public network.
- ISDN — ISDN service forecasts include basic rate interface (BRI) and primary rate interface (PRI) installed circuits with subscribers and total installed ISDN B-channels in use
 - ❑ BRI circuits in use — Each ISDN BRI circuit has two B-channels of 64 Kbps and one D-channel of 16 Kbps, used mainly for signaling.
 - ❑ PRI circuits in use — Each ISDN PRI circuit has up to a maximum of 30 B-channels and one D-channel of 16 Kbps.

Public Data Ports in Use

- X.25 — This includes X.28 asynchronous and X.32 dial-up access and applications such as electronic data interchange and X.400 messaging. Includes permanent and switched virtual circuits
- Frame relay — This includes frame relay services, including frame relay encapsulated over X.25 and over asynchronous transfer mode (ATM). Includes permanent and switched virtual circuits
- Native ATM — Includes all access speeds and classes of service (for example, near real-time variable bit rate) from unbundled ATM ports. Includes permanent and switched virtual circuits
- DSL — Refers to the termination of the DSL at the end-user premises. It should be noted that each DSL line would have a modem attached at the end-user's and carrier's premises. DSL ports relate to the number of ports in use. The DSL ports for all Asia/Pacific countries (except Japan) represent DSL usage as an access service for corporate networks only.
- Cable modem access — The high-speed bi-directional transmission of data traffic over the hybrid fiber coaxial (HFC) cable network for Internet, remote LAN and branch office access. Cable modem ports refer to the termination of the cable line at the end-user premises. The cable ports for all Asia/Pacific countries (except Japan) represent cable modem usage as an access service for corporate networks only.
- Fixed wireless — Refers to local multipoint distribution service (LMDS), or point-to-multipoint fixed wireless systems

Internet/Public IP Services

- **ISP subscribers** — The total number of subscribers to access services provided by an ISP at calendar year-end. Consumer and business (including other organizations) subscribers are counted. These subscribers may pay for subscriptions, the subscriptions may be free or it may be included as part of a package with other services (such as cable telephony or a managed data service). Subscribers may have subscriptions with more than one ISP. Multiple business subscribers may work for the same company. Several consumer users may use the same consumer access subscription, and several subscriptions may use the same physical access connection. Only those who use the access regularly are included. Only retail (end-user) subscribers that use a PC for access are included in these figures.
- **Internet data center floor space (square feet)** — This is the measurement of available floor space for the location of racks holding computer servers used in the provision of hosting (retail and wholesale) and colocation services. It is a measure of the entire floor space that is available for use for those services. It does not include any space that is used for other purposes within the Internet data center, including office space or the housing of ancillary and support equipment.

Telephony Services in Asia/Pacific and Japan

The following definitions reflect those that are in the telephony services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services in Asia / Pacific and Japan, 2000-2006" (TCPS-WW-MS-0206).

Local Retail Calls

- **Total local call revenue** — PSTN / ISDN / cable telephony calls made to the same code zone, including dial-up calls to the Internet
 - **Business calls** — Circuit-switched outgoing call revenue paid by business customers to services providers
 - **Residential calls** — Circuit-switched outgoing call revenue paid by residential end users to services providers
 - **Value-added local services includes the following:**
 - **Centrex** — A service providing PBX facilities from a central office (CO) or "host" exchange to create a virtual PBX on a customer's site. Switching and routing internal and external calls, user features, and access to the public network are provided from the host exchange.
 - **CLASS** — Enhanced calling services such as voice mail and caller line ID provided by the operator on public switched telephone network lines and served by digital switches
 - **Local rate** — A type of toll-share service where the cost of the call is shared between the calling party and the called party. Here, the caller pays the equivalent tariff of a local call and the called party pays the remainder. (Internet access calls are included in local call revenue).
 - **Personal numbering** — Features include one number, one handset and user location search functionality. For these services, all associated revenue (setup, monthly charges and associated call charges) is included.
- **Total local call service revenue** — Revenue generated by local service providers from services sold within the basic service area to end users. Local services revenue includes local call revenue and value-added local services revenue.

National Retail Calls

- Total national call revenue — Revenue received by an operator for PSTN / ISDN / cable telephony calls to a location in a different area code that is not an international prefix
 - Business calls — Circuit-switched outgoing call revenue paid by business customers to services providers
 - Residential calls — Circuit-switched outgoing call revenue paid by residential end users to services providers

International Retail Calls

- Total international call revenue — Revenue paid for PSTN / ISDN / cable telephony calls from the country studied to other countries. Does not include international settlement payments made between carriers.
 - Business calls — Circuit-switched outgoing call revenue paid by business customers to services providers
 - Residential calls — Circuit-switched outgoing call revenue paid by residential end users to services providers
- Total business call services revenue — Circuit-switched outgoing local, national and international call revenue paid by business customers to services providers
- Total residential call services revenue — Circuit-switched outgoing local, national and international call revenue paid by residential customers to services providers

Total Call Services Revenue

Total call services revenue is the sum of all local, national and international call revenue.

Circuit-Switched Telephone Rental and Connection Service and Packetized Voice Service in Asia/Pacific and Japan

The following definitions reflect those that are in the circuit-switched telephone rental and connection service and packetized voice service section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services in Asia / Pacific and Japan, 2000-2006" (TCPS-WW-MS-0206).

Exchange Line Rental and Connection

- Total exchange line rental and connection — Revenue derived from rental and connection of exchange lines, whether PSTN, ISDN or cable telephony lines paid by all customers to services providers
 - Residential exchange line rental and connection revenue — Revenue derived from rental and connection of exchange lines, whether PSTN, ISDN or cable telephony lines paid by residential end users to services providers
 - Business exchange line rental and connection revenue — Revenue derived from rental and connection of exchange lines, whether PSTN, ISDN or cable telephony lines paid by business customers to services providers
- Total circuit-switched telephony service revenue — The sum of total call service and total exchange line rental and connection revenue

VoIP Revenue

Packetized voice services revenue includes the provision of services related to voice and enhanced voice services over the Global Open Internet and private carrier IP backbones. Income from the provision of equipment and nontelecommunications activities (such as software and consultancy) is excluded. Income from the overseas activities of operators is also excluded.

Total Fixed Voice Telephony Revenue

Total fixed voice telephony revenue is the sum of total circuit-switched telephony service and VoIP revenue

Data Services in Asia/Pacific and Japan

The following definitions reflect those that are in the data services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services in Asia / Pacific and Japan, 2000-2006" (TCPS-WW-MS-0206).

- **Port** — A port is the termination of a point-to-point or point-to-multipoint circuit at a public network interface, such as a carrier's CO or other point of presence (POP). Ports represent the cumulative in-service ports with customers at the calendar year-end rather than the installed capacity in a carrier's network.
- **Revenue** — Payment from a user to the service provider for a telecommunications service. Rental, connection and usage charges are included. All revenue reflects facilities-based service provider retail revenue generated from the business and residential end user of the service unless otherwise stated.
- **Data line** — A data line is a direct path between two termination points. Effectively, one end of these lines terminates in the public switched network, but is not necessarily directly associated with a specific terminating location.

Public Data Services

- **X.25** — This includes revenue from X.28 asynchronous and X.32 dial-up access but excludes income from applications such as electronic data interchange and X.400 messaging. Includes revenue from permanent and switched virtual circuits.
- **Frame relay** — This includes revenue from frame relay services, including frame relay encapsulated over X.25 and over ATM. Includes revenue from permanent and switched virtual circuits.
- **Native ATM** — Revenue from all access speeds and classes of service (for example, near real-time variable bit rate) from unbundled ATM ports. Includes revenue from permanent and switched virtual circuits.
- **DSL** — DSL service revenue is based on the yearly revenue paid by end users to carriers for services provided over DSL. This does not include installation charges or any rental or purchase costs for DSL modems. It is calculated using average monthly revenue per port. The DSL revenue for all Asia / Pacific countries (except Japan) represent DSL usage as an access service for corporate networks only. The service is bundled with Internet access at low rates, making it impossible to split between asymmetric DSL (ADSL) revenue and Internet access revenue. For DSL revenue for broadband Internet access, refer to the Gartner Dataquest Market Trends report "Asia / Pacific ISP Market Forecast, 2002-2006" (TCPS-WW-MT-0145).

- **Cable modem access** — The high-speed bi-directional transmission of data traffic over the HFC cable network for Internet, remote LAN and branch office access. The revenue relates to the monthly subscription an end user will pay for the service. It excludes the installation and the rental or purchase of the cable modem. ISP subscription revenue is not included. The cable revenue for all Asia / Pacific countries (except Japan) represent cable modem usage as an access service for corporate networks only. The service is bundled with Internet access at low rates, making it impossible to split between cable modem revenue and Internet access revenue. For cable modem revenue for broadband Internet access revenue, refer to the Gartner Dataquest Market Trends report "Asia / Pacific ISP Market Forecast, 2002-2006" (TCPS-WW-MT-0145).
- **Fixed wireless** — Refers to LMDS services, or point to multipoint fixed wireless systems
- **Total public data services revenue** — The sum of revenue from all categories listed

Managed Data Services

Managed data services includes services that extend the management and monitoring function of data services beyond the network interface device (NID) to cover customer premises edge equipment, routers, firewalls, VPNs and so on. This category includes:

- **Managed WAN services** — Complete core edge-to-edge network management capability based on a wide range of core Layer 2 transport technologies such as frame relay, ATM and leased line that support various network access technologies
- **IP VPNs (network)** — An IP service providing secure connections over managed IP networks. Standards-based approaches for providing such connections include Point-to-Point Tunneling Protocol (PPTP), Tunneling Protocol (L2TP) and IP security (IPSec). Features commonly include the IP-based access / WAN service, fault management, configuration management, edge-to-edge service-level agreements (SLAs), security management and limited network operations monitoring / reporting capabilities.

Leased Line Revenue

- **Leased lines** — Revenue from the provision of leased lines to end-users and other operators. Revenue is based on a revenue-per-line basis to include the basic connection and monthly rental of the line.
 - **Digital leased lines** — All metro, national and international digital leased lines at all speeds. Revenue is based on a revenue-per-line basis to include the basic connection and monthly rental of the line. Revenue from the provision of analog leased lines to end users and other operators
 - **Analog leased lines** — All metro, national and international analog leased lines at all speeds. Revenue is based on a revenue-per-line basis to include the basic connection and monthly rental of the line. Revenue from the provision of analog leased lines to end users and other operators.

Total Data Services Market

The total data services market is the sum of public data services, managed data services and leased line services revenue.

Internet/Public IP Services in Asia/Pacific and Japan

The following definitions reflect those that are in Internet / public IP services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services in Asia / Pacific and Japan, 2000-2006" (TCPS-WW-MS-0206).

- **ISP** — A provider of (retail) access accounts that allow end users to connect occasionally or permanently to the Global Open Internet (for Web browsing, e-mail and other services such as Web hosting), using a variety of access services such as ISDN, ADSL and frame relay. End users are consumers or users in businesses, including other organizations such as charities and educational establishments. Only retail access, that is, the business relationship between the ISP and the end user, and only services accessed via a PC are included in these figures.
- **ISP subscribers** — The total number of subscribers to access services provided by an ISP at calendar year-end. Consumer and business (including other organizations) subscribers are counted. These subscribers may pay for subscriptions or may be included as part of a package with other services (such as cable telephony or a managed data service), and may subscribe to more than one ISP, while multiple business subscribers may work for the same company. Only retail (end-user) subscribers that use a PC for access are included in these figures.

ISP Access Revenue

ISP access revenue is an ISP's combined total revenue paid by businesses (including other organizations) and consumers for access to the Internet. Access revenue includes subscriptions, sums attributable to Internet access provision as part of bundled services (such as a managed IP-VPN service), and retained shares of DSL and cable modem charges. Only retail (end-user) access via a PC is included in these figures.

Retail Web-Hosting Revenue

Retail Web-hosting revenue is an ISP's revenue for Web hosting paid by businesses (including other organizations) and consumers. Only revenue from ISPs and Web-hosting companies is included in these figures. Only retail (end-user) Web-hosting services accessed via a PC are covered.

- **Colocation** — The provision of physical space within a facility for an enterprise or other end-user customer to install and maintain their own computer server(s). Revenue is that accrued by the Internet data center provider for the basic rental of the space occupied by the customer's computer server(s).
- **Managed, dedicated hosting revenue** — The leasing of one or more servers dedicated to a single retail end-user customer. Revenue is that accrued by the Internet data center provider for the basic rental of the server(s), plus minimal management costs necessary to keep the server(s) up and running.
- **Shared hosting revenue** — This revenue is composed of two separate revenue streams:
 - Revenue that is accrued by the Internet data center provider for the basic rental of the server disk space, plus minimal management costs necessary to keep the server up and running. This service is defined for the Internet data center market as including retail end-user customers leasing part of one or more servers on a shared basis with other users.
 - Revenue that is accrued by ISPs for Web hosting paid by businesses (including other organizations) and consumers. Only ISPs that provide Internet access as well as Web hosting are included in these figures. Only retail (end-user) Web-hosting services accessed via a PC are covered.
- **Total retail Web-hosting revenue** — The sum of colocation, managed, dedicated hosting and shared hosting revenue

Value-Added IP Services Revenue

Value-added IP services revenue is the sum of fax-over-IP, unified messaging-over-IP and IP multicast revenue.

- Fax-over-IP revenue — End-user revenue from a commercial tariffed service that transports fax traffic by translating T.38-based images into IP packets
- Unified messaging-over-IP revenue — End-user revenue from a commercial tariffed service that enables customer's IP-based access to any combination of fixed voice, mobile voice, e-mail, fax or any other network-based mailbox service. Includes subscription and call-based revenue.
- IP multicast revenue — End-user revenue from a commercial tariffed service that provides an IP-based point-to-multipoint one-way (unidirectional one to many) distribution of voice, video or data
- ISP other (services) revenue — An ISP's revenue from all retail (end-user) operations, except access and Web hosting. This revenue includes money for Web design, advertising, retained share of e-commerce transactions, and application and managed data services. Only ISPs that provide Internet access as well as other services to consumers or businesses are covered. Only services accessed via a PC are included in these figures.

Total Internet/Public IP Retail Revenue

Total Internet / public IP retail revenue is the sum of Internet access, retail Web hosting and value-added IP services revenue.

Wholesale/Carrier Services in Asia/Pacific and Japan

The following definitions reflect those that are in the wholesale / carrier services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services in Asia / Pacific and Japan, 2000-2006" (TCPS-WW-MS-0206).

Voice Wholesale/Carrier Services

- Circuit-switched revenue national — Carrier-to-carrier revenue from switched voice services (typically national long-distance), including inter-connect payments
- Circuit-switched revenue international — Carrier-to-carrier revenue from switched voice services, including settlement payments for termination of international calls
- VoIP revenue — Carrier-to-carrier revenue derived from VoIP carriers or the VoIP divisions of other operators selling VoIP minutes (by route) to other carriers, operators or ISPs. This may be to expand the coverage or products offered by a service provider or a straightforward wholesale transaction on existing routes.
- Total voice wholesale / carrier services — The sum of national, international and VoIP wholesale / carrier services revenue

Data Wholesale/Carrier Services

- Leased lines / private line revenue — Service provided by a wholesale carrier to another carrier for international or domestic bandwidth requirements. The service typically offers high-bandwidth circuits for the construction of back-bone networks or resale to corporate end users.
- IP transit revenue — Service provided by a wholesale carrier to a customer that has an international, regional or global requirement for bulk IP connectivity to multiple Internet network access points (NAPs) and peering points. Traffic is routed on the wholesale carrier's backbone in a managed way under the SLAs and service-level guarantees (SLGs) agreed in the contract.

Typical customers are ISPs or alternative operators. IP transit revenue does not include the revenue generated from the access bandwidth used to transport the packets between the customer's site(s) and the IP transit network port.

- **Content distribution / caching revenue** — Service provided to a customer that has international, regional or a global requirement for content distribution / managed caching to multiple ISPs on the Global Open Internet. The IP traffic, which is often more delay-sensitive than that transported by IP transit, is routed in a managed way under the SLAs and SLGs agreed to in the contract between the service provider and the customer. Operations / processes covered by these contracts include Web-site mirroring, smart caching, content adaptation and dynamic content updates. Typical customers are multinational corporations, software vendors and global content producers. Content distribution / caching revenue does not include the revenue generated from the access bandwidth used to transport the packets between the customer's site(s) and the service provider's network access port.
- **IP multicast revenue** — End-user revenue from a commercial tariffed service that provides an IP-based point-to-multipoint one-way (unidirectional one to many) distribution of voice, video or data
- **Managed / dedicated Web-hosting revenue** — This is the rental of one or more servers dedicated to a single carrier, ISP or application service provider (ASP). It is revenue that is accrued by the Internet data center provider for the basic rental of the server(s), plus management costs necessary to keep the server(s) up and running.
- **Shared Web-hosting revenue** — This is multiple carriers, ISPs or ASPs leasing a server on a shared basis. Revenue is that accrued by the Internet data center provider for the basic rental of the server disk space, plus management costs necessary to keep the server up and running.
- **Colocation revenue** — The provision of physical space within a facility for the carrier, ISP or ASP to install and maintain their own computer server(s). Service includes connectivity to the Internet. Revenue is that accrued by the Internet data center provider for the basic rental of the space occupied by the customer's computer server(s) or network equipment such as routers and switches.
- **Total data wholesale / carrier services** — The sum of the data services revenue shown

Total Wholesale/Carrier Services Revenue

- **Total wholesale / carrier services revenue** is the sum of total voice wholesale / carrier services and total data wholesale / carrier services revenue.

Chapter 4

Latin America

Latin America Fixed Public Network Services Segmentation

Table 4-1 delineates the various metrics shown within Latin America. Notes to these metrics germane to the coverage of telecommunications services in this region follow, organized by relevant service area.

Table 4-1
Latin America Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
PSTN Network				
Lines in Service		X	X	
Lines per 100 Population			X	
Leased Lines			X	Below E0/E0/E1+
ISDN				BRI/PRI
Public Data Ports in Use				
X.25			X	
Frame Relay			X	
ATM Access			X	
DSL Access			X	
Cable Modem			X	
Fixed Wireless			X	
Satellite Two-Way Data			X	
Internet Services Subscribers		X		
Total Public Fixed Services Revenue	X			
Per PSTN Line	X			
Voice/Calling Services	X	X		
Local Retail Calls	X	X		
Public Services	X			
Value-Added/Enhanced Services	X			
National Long-Distance Retail Calls	X	X		Circuit-Switched/VoIP/800
International Long-Distance Retail Calls	X	X		Circuit-Switched/VoIP
VoIP Services	X			
Retail Telephone Rental and Connection	X	X		
Public Services	X			
Value-Added/Enhanced Services	X			
Retail Data Services	X			
Public Data Services	X			
X.25	X			
Frame Relay	X			
Native ATM	X			
IP Access/Ethernet	X			
DSL	X			
Cable Modem Access	X			
Fixed Wireless	X			
Satellite Two-Way Data	X			
ISDN Access	X			

Table 4-1 (Continued)
Latin America Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
Managed Data Services	X			
Managed Network	X			
Managed IP-VPN	X			
Leased Line	X			
Below E0	X			
E0	X			
E1+	X			
Retail Internet / Public IP Services	X			
Internet Subscription	X	X		
Web Hosting	X			
Colocation / Managed / Dedicated Hosting	X			
Shared Hosting	X			
Value-Added IP Services	X			

Source: Gartner Dataquest (January 2003)

Latin America Fixed Public Network Services Definitions

Market Summary and Ratios in Latin America

The following definitions reflect those definitions that are in the market summary and ratios section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Latin America, 2000-2006" (TCPS-WW-MS-0208).

Fixed Network Size Data at Year-End

- Total fixed telecommunications retail service revenue per PSTN line — Fixed public network services retail revenue divided by the number of lines in service
 - Residential access lines — The first line is called a primary line and all other lines are called additional lines.
 - Business access lines — Includes basic business lines, PBX trunks, Centrex lines and ISDN
 - Total lines — These include plain old telephone service (POTS) and ISDN B-channels. These include the business and residential markets.

Leased Lines/Private Lines (Analog, Digital and Optical)

- Leased line / private line — For private lines, there is a port at each geographic end of the private line. An E0 port, an E1 and above port are all counted as a single port.
 - E0 — Service at speeds of 64 Kbps
 - E1, E3 and above — Service at speeds greater than 64 Kbps up through 2 Mbps (E1), 34 Mbps (E3) and greater
 - Below E0 — Service at speeds below 64 Kbps

ISDN

- ISDN — ISDN service forecasts include BRI and PRI installed circuits with subscribers and total installed ISDN B-channels in use.
 - BRI circuits in use (in thousands) — Each ISDN BRI circuit has two B-channels of 64 Kbps and one D-channel of 16 Kbps used mainly for signaling.

- ❑ PRI circuits in use (in thousands) — Each ISDN PRI circuit has up to a maximum of 30 B-channels and one D-channel of 16 Kbps.
- ❑ Total B-channels — The sum of all ISDN B-channels in service, counting each BRI circuit as three channels and each PRI circuit as 24 channels

Public Data Access Ports in Use

- Port—This is the termination of a point-to-point or point-to-multipoint circuit at a public network interface, such as a serving carrier's switching center or local exchange carrier's (LEC's) wire center.
 - ❑ X.25 access — X.25 is a packet service that offers data rates ranging from 64 Kbps and below. X.25 is also known as public packet switching (PPS). Ports in this context refer to end-user service subscriptions for public network service.
 - ❑ Frame relay access — Frame relay is a fast-packet service that offers data rates of 64 Kbps (DS-0), 1.544 Mbps (DS-1), fractional DS-1, 45 Mbps (DS-3) and fractional DS-3.
 - ❑ ATM access — Also known as cell relay, ATM is supplied to the end user's premises. ATM is a fast-packet service that offers data rates ranging from 1.5 Mbps (DS-1) to 622 Mbps (OC-12). However, the ports addressed in this report include only DS-1 through DS-3 speeds. ATM services have ATM equipment, such as an ATM switch or multiplexer/concentrator, located on the customer's premises. This service includes access to the ATM unbundled network interface (ATMUNI), connections to legacy LANs and point-to-point transport connections.
 - ❑ DSL access — xDSL services comprise all variants of DSL, including ISDN DSL (IDSL), ADSL, symmetrical DSL (SDSL), high bit-rate DSL (HDSL), single-pair high bit-rate DSL (S-HDSL) and very high-speed DSL (VDSL). Also included is the new sub-DS-1 rate services referred to as ADSL Lite or G.Lite.
 - ❑ Wireline cable modem access — Cable modem / HFC service forecast includes the number of subscriber modems deployed for business and residential cable modem services combined.
 - ❑ Fixed wireless access — Fixed wireless service comprises LMDS, multi-channel multipoint distribution service (MMDS) and lower / higher-frequency unlicensed spectrum / unbundled network element (UNE) group services. The forecast includes the number of subscriber transceivers / modems deployed for business and residential services combined.
 - ❑ Satellite two-way data access — Satellite data services (for example, two-way satellite, telephony upstream and very small aperture terminals [VSAT] services) have long been a viable niche business data service, but have begun to emerge in the residential market as a viable multicast system for point-to-multipoint data / video distribution and multimedia services delivering a shared data connection typically up to approximately 500 Kbps downstream. The satellite data service forecast includes the number of subscriber transceivers / dishes deployed for business and residential services combined.
- Total data ports in use — The sum of X.25, frame relay, ATM, DSL, wireline cable modem, fixed wireless and satellite two-way data ports in use

Internet Services

- **Consumer Internet subscribers** — The total number of consumer subscribers to access services provided by an ISP at calendar year-end. These subscribers may pay for subscriptions, the subscriptions may be free or they may be included as part of a package with other services (such as cable telephony or a managed data service). Subscribers may have subscriptions with more than one ISP. Several consumer users may use the same consumer access subscription, and several subscriptions may use the same physical access connection; only those who use the access regularly are included. Only retail (end user) subscribers that use a PC for access are included in these figures.
- **Business Internet subscribers** — The total number of business (including other organizations) subscribers to access services provided by an ISP at calendar year-end. These subscribers may pay for subscriptions, the subscriptions may be free or they may be included as part of a package with other services (such as cable telephony or a managed data service). Subscribers may have subscriptions with more than one ISP. Multiple business subscribers may work for the same company. Only retail (end-user) subscribers that use a PC for access are included in these figures.

Long-Distance Retail Services in Latin America

The following definitions reflect those that are in the long-distance retail services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Latin America, 2000-2006" (TCPS-WW-MS-0208).

National Long-Distance Retail Calls Revenue

National long-distance services revenue includes national long-distance call, 800/Freephone, premium rate, VPN, and any other enhanced services such as shared toll or national rate. A national long-distance call is made to a different area code that is not an international call prefix.

- **Circuit-switched outgoing calls revenue** — This is all circuit-switched long-distance service revenue other than inbound.
- **VoIP outgoing calls revenue** — VoIP services compose end-user revenue for voice over public Internet and voice over private/carrier IP services. Includes IP calling card revenue.
- **800 or inbound toll-free calls** — This is revenue generated for called-party-paid incoming long-distance service. Such inbound services can include toll-free calls to the caller or shared toll services in that the caller and called party pay.

International Retail Calls Revenue

International services compose end-user revenue for international long-distance outgoing calls only.

- **Circuit-switched outgoing calls revenue** — Outgoing international calls made via circuit-switched networks
- **VoIP business outgoing calls revenue** — Outgoing international calls made via Internet protocol networks
- **Total national and international calls revenue** — The sum of all national and international calling revenue
- **Total circuit-switched (national and international) calls revenue** — The sum of national circuit-switched and international circuit-switched calling revenue
- **Total VoIP (national and international) calls revenue** — The sum of national VoIP and international VoIP calling revenue

Local Retail Telephone Services in Latin America

The following definitions reflect those that are in the local retail telephone services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Latin America, 2000-2006" (TCPS-WW-MS-0208).

Total Local Telephony Services Revenue

- Local services — Local services revenue includes local call, customized calling / CLASS or enhanced voice services, local rate, Centrex, and personal numbering. A local call is a call made to the same code zone.
- Circuit-switched local services retail revenue — The local service revenue derived from calls placed via circuit-switched networks
 - Residence local telephony services — Local service revenue derived from residential end users
 - Business local telephony services — Local service revenue derived from business end users
 - Public services lines — Local service revenue derived from the use of payphones
- Value-added / enhanced services — Local service revenue for services such as caller ID, custom calling features and voice messaging. This category also excludes ISDN revenue (that is shown in data services), but ISDN lines are included in business and residential access line counts.

Rental and Connection

Retail telephone rental and connection includes switched exchange line rental and connection fees charged to business and residential end users.

- Business — Retail telephony rental and connection revenue from business end users
- Residence — Retail telephony rental and connection revenue from business end users
- Public services — Retail telephony rental and connection revenue from payphones
- Value added — Retail telephony rental and connection revenue from value-added services

Retail Data Services in Latin America

The following definitions reflect those that are in the data services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Latin America, 2000-2006" (TCPS-WW-MS-0208).

Total Retail Data Services Market

Total retail data services is the sum of total packet data / cable modem / DSL services, total managed data services and total leased line services revenue.

Total Packet Data/Cable Modem/DSL Services Market

- X.25 — X.25 is a packet service that offers data rates ranging from 64 Kbps and below. X.25 is also known as PPS. This service includes revenue from X.28 asynchronous and X.32 dial-up access, but excludes revenue generated from applications such as electronic data interchange and X.400 messaging. Ports in this context refer to end-user service subscriptions for public network service.

- **Frame relay** — Frame relay is a fast-packet service that offers data rates of 64 Kbps (DS0), 1.544 Mbps (DS-1), fractional DS-1, 45 Mbps (DS-3) and fractional DS-3. Includes revenue from all types of network configurations used to deliver frame relay services, even if encapsulated in an ATM backbone network. In all cases, the end-user access line / transport facility (DS0, T1, T3 and so on) used to deliver frame relay and half PVC is included in the revenue forecast numbers.
- **Native ATM** — Also known as cell relay, ATM is supplied to the end user's premises. ATM is a fast-packet service that offers data rates ranging from 1.5 Mbps (DS-1) to 622 Mbps (OC-12). However, the ports addressed in this report include only DS-1 through DS-3 speeds. ATM services have ATM equipment, such as an ATM switch or multiplexer / concentrator, located on the customer's premises. This service includes access to the ATMUNI, connections to legacy LANs and point-to-point transport connections.
- **IP access / Ethernet** — The revenue included in this category combines native IP access and transport service without a managed service component (for example, IP VPN), as well as unmanaged Ethernet service provided to end users. Native IP access predominantly involves providing access and WAN connections or IP transit over the public Internet or purpose-built IP networks with at least two carrier-owned routers involved in the IP service provided to the customer. Unmanaged Ethernet service is any Layer 2 public network carrier service that extends the Ethernet protocol-based LAN, interconnecting two or more LANs or sites. This includes services traveling on ATM and SONET that provide Ethernet connections. Ethernet is typically offered in the 10 / 100-Mbps and gigabit bandwidths and marketed as transparent or native LAN, Ethernet, Gigabit Ethernet or metropolitan / MAN Ethernet services, whether ATM-based in the network core or using Ethernet-over-fiber architecture.
- **DSL access** — This includes all types of DSLs other than ISDN (whose revenue and line counts are shown separately). In Latin America, ADSL predominates.
- **Cable modem access** — Cable modem / HFC service forecast includes revenue and the number of subscriber modems deployed for business and residential cable modem services combined. The revenue forecast includes the cable modem lease cost in the monthly service rental charge. Installation and provisioning charges are also included in the revenue forecast for businesses or residential subscribers.
- **Fixed wireless access** — Fixed wireless service comprises LMDS, MMDS and lower / higher-frequency unlicensed spectrum / UNE group services. The forecast includes revenue and the number of subscriber transceivers / modems deployed for business and residential services combined. The revenue forecast includes the customer premises equipment (CPE) lease cost in the monthly service rental charge. Installation and provisioning charges are also included in the revenue forecast for businesses or residential subscribers.
- **Satellite two-way data access** — Satellite data services (for example, two-way satellite and VSAT services) have been a viable niche business data service. The revenue forecast excludes the cost of CPE, which is assumed to be purchased by the end user. Installation and provisioning charges are included in the revenue forecast for businesses and residential subscribers.
- **ISDN access** — ISDN service forecasts include BRI (128 Kbps / 144 Kbps) and PRI (1.544 Mbps) installed circuits and total installed ISDN B-channels. ISDN service includes the ability to transmit circuit-switched voice, circuit switched data and X.25-switched data. In-service lines in this context refer to end-user service subscriptions for public network service. ISDN revenue as reported in this forecast includes only flat-rate / fixed recurring fees per in-service line and excludes usage-based fees.

- **Total managed data services retail revenue** — The sum of managed network, managed IP-VPN and managed WAN / MAN services revenue
- **Managed network (fully outsourced / LAN)** — Services based on the extension of managed MAN-WAN / IP-VPN services, providing complete end-to-end management of the core MAN-WAN, network interface / edge device, LAN and potentially the CPE / hardware, software and even some applications. This type of service provides essentially a complete outsourced data networking solution controlled by the carrier. This class of service may include limited professional services, network design and engineering, and managed network applications. This service is capable of hosting / supporting a comprehensive mix of vertical network applications supplied by the carrier or an ASP, such as unified messaging, integrated voice / data, e-mail / fax / X.400 messaging, e-commerce / e-business templates, automated call distribution (ACD) systems, Internet / Web hosting, and video / videoconferencing. Forecasts include revenue from access and transport elements of service.
- **Managed IP-VPN** — Managed IP-VPN is an IP service providing secure connections over the public Internet or purpose-built IP networks. Standards-based approaches for providing such connections include PPTP, L2TP and IPSec. Public IP-VPNs have an edge-to-edge network topology that typically excludes edge device management but may also provide some limited professional services. Features commonly include the IP-based access / WAN service, fault management, configuration management, edge-to-edge SLAs, security management and limited network operations monitoring / reporting capabilities. Forecasts include revenue from access and transport elements of service.
- **Managed MAN-WAN** — A service offering complete core edge-to-edge network and network interface / edge device (router, channel service unit [CSU] / data service unit [DSU], integrated access device [IAD], frame relay assembler / disassembler [FRAD] and so on) management capability, which are based on a wide range of core Layer 2 transport technologies such as frame relay, ATM, IP, Ethernet and private line that support various network access technologies. Forecasts include revenue from access and transport elements of service.

Total Leased Line Retail Revenue

Also known as dedicated or point-to-point or multipoint circuits, total leased line retail revenue includes those lines leased from carriers and not switched within a public network. Primary data speeds for these services range from E0 and lower (DS-0 digital and analog services) to 2 Mbps (E1), 34 Mbps (E3) and SONET OC-n (currently OC-3, OC-12, OC-48 and OC-192). Total leased line retail revenue is the sum of E0, E1, E3 and above and below E0 revenue.

- **E0** — Service at speeds of 64 Kbps
- **E1, E3 and above** — Service at speeds greater than 64 Kbps through 2 Mbps (E1), 34 Mbps (E3) and greater
- **Below E0** — Service at speeds below 64 Kbps

Internet Retail Services in Latin America

The following definitions reflect those that are in the Internet retail services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Latin America, 2000-2006" (TCPS-WW-MS-0208).

- **Total Internet retail services revenue** — The sum of retail Internet subscription, retail Web-hosting and value-added IP services revenue

Retail Internet Subscription Revenue

- Retail Internet subscription revenue is an ISP's combined total revenue paid by businesses (including other organizations) and consumers for access to the Internet. Access revenue includes subscriptions, sums attributable to Internet access provision as part of bundled services (such as a managed IP-VPN service), and retained shares of DSL and cable modem charges. Only retail (end-user) access via a PC is included in these figures.
- Consumer Internet subscription revenue — Internet subscription revenue from service provided to consumer end users
- Business Internet subscription revenue — Internet subscription revenue from service provided to business (including other organizations) end users

Retail Web-Hosting Revenue

- Retail Web-hosting revenue is an ISP's revenue for Web hosting paid by businesses (including other organizations) and consumers. Only revenue from ISPs and Web-hosting companies are included in these figures. Only retail (end-user) Web-hosting services accessed via a PC are covered. Includes colocation / managed / dedicated hosting revenue and shared hosting revenue.
- Colocation / managed / dedicated hosting revenue — The sum of colocation revenue and managed / dedicated hosting revenue
 - Colocation — The provision of physical space within a facility for an enterprise or other end-user customer to install and maintain their own computer server(s). Revenue is that accrued by the Internet data center provider for the basic rental of the space occupied by the customer's computer server(s).
 - Managed / dedicated hosting — This is the leasing of one or more servers dedicated to a single retail end-user customer. Revenue is that accrued by the Internet data center provider for the basic rental of the server(s), plus minimal management costs necessary to keep the server(s) up and running.
- Shared hosting revenue — This revenue is composed of two separate revenue streams:
 - Revenue is that accrued by the Internet data center provider for the basic rental of the server disk space, plus minimal management costs, necessary to keep the server up and running. This service is defined for the Internet data center market as including retail end-user customers leasing part of one or more servers on a shared basis with other users.
 - Revenue that is accrued by ISPs for Web hosting paid by businesses (including other organizations) and consumers. Only ISPs that provide Internet access as well as Web hosting are included in these figures. Only retail (end-user) Web-hosting services accessed via a PC are covered.
- Value-added IP services revenue — The sum of revenue from services such as fax-over-IP, unified messaging-over-IP and IP multicast

Chapter 5

North America

North America Fixed Public Network Services Segmentation

Table 5-1 delineates the various metrics shown within North America. Notes to these metrics germane to the coverage of telecommunications services in this region follow, organized by relevant service area.

Table 5-1
North America Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
PSTN Network				
Lines in Service		X	X	ILEC / CLEC
Total Market Retail Revenue				
Long-Distance Retail Services				
Circuit Switched Long-Distance	X	X		
Inbound Toll-Free	X			
Outbound Calls	X			
National Long-Distance	X			
International Long-Distance	X			
VoIP Retail Services	X			
Local Retail Services		X		ILEC / CLEC
Basic Local	X			
Value-Added / Enhanced	X			
Subscriber Line Charge	X			
Public	X			
Retail Data Services				
Packet Data				
X.25	X		X	
Frame Relay	X		X	
SMDS	X		X	
ATM	X		X	
IP	X		X	
Ethernet	X		X	
High-Speed Data Access				
DSL	X		X	
Cable Modem	X		X	
Fixed Wireless	X		X	
Satellite (Two-Way)	X		X	
ISDN BRI	X		X	
ISDN PRI	X		X	
Total ISDN	X		Channels	
Managed Data Retail Services				
Managed LAN	X			
Managed IP-VPN	X			
Managed Network ó Fully Outsourced LAN	X			
Managed WAN / MAN	X			

Table 5-1 (Continued)
North America Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
Leased Line Retail Services				
Broadband OC-n	X		X	
Broadband T3 ó Above T1 / E1, Including 45 Mbps	X		X	
Wideband ó Above 64 Kbps, Including 1.54 Mbps	X		X	
Narrowband ó 64 Kbps and Below	X		X	
Internet Retail Services				
Subscription Services				
Internet Subscription	X	X		Subscribers
Web Hosting				
Colocation / Managed / Dedicated	X			
Shared	X			
Value-Added IP Services	X			
Wholesale/Carrier Services				
Voice Wholesale / Carrier				
Long-Haul Circuit Switched	X			
Long-Haul VoIP	X			
Local Resold Voice	X			
Leased / Private Line Wholesale / Carrier				
Long-Haul Private Line	X			
Special Access	X			
Other Data Wholesale / Carrier				
Internet Transport Access	X			
Packet Data	X			
Other Wholesale / Carrier				
Switched Access	X			
Content Distribution / Caching	X			
Inbound International Settlements Received	X			

Source: Gartner Dataquest (January 2003)

North America Fixed Public Network Services Definitions

Market Summary and Ratios in North America

The following definitions reflect those that are in the market summary and ratios section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: North America, 2001-2006" (TCPS-WW-MS-0190).

PSTN Network

- Network access lines — Include POTS and ISDN B-channels
 - Residential access lines — Lines connecting residential customers to the PSTN (including ISDN channels)
 - Business access lines — Lines connecting business customers to the PSTN (including ISDN channels)
 - Other lines — Primarily public telephone lines
- Leased / private lines — Also known as dedicated access and point-to-point circuit, it includes those lines / ports that are not switched within the public network. Data speed ranges are 64 Kbps and lower (narrowband), between 64 Kbps to 1.544 Mbps (wideband), between 1.544 Mbps to 45 Mbps (broadband), and broadband OC-n (OC-3 / OC-12 / OC-48 and so on).

- ISDN lines / channels — ISDN BRI has three channels or line equivalents that can be used for transmission: two for voice and one, two or three for data. ISDN PRI, 24 channels or line equivalents can be used for voice or data over a DS-1 conditioned line.
- Public data ports and high-speed data access lines — The termination at the carrier's CO or POP of X.25, ATM, switched multimegabit data service (SMDS) and IP (one port reflects one end-to-end circuit count), termination at the carrier's CO or POP for frame relay (one port reflects the one CO termination, access and half-PVC), and DSL, cable modem, two-way data satellite, and fixed-wireless facilities (reflects in-service access line or subscriber facilities)
- Internet access subscribers— The total number of subscribers at a specific point in time. Typically, these subscribers make periodic payments or upfront payments, although unique subscribers of subscription-free services are also included to complete the picture of the addressable market.
 - Consumer Internet access — Internet access for personal use in a home setting. Such products are intended for a single user or for a family, are intended for personal use only, and may have specific acceptable-use policy restrictions preventing them from being used for business purposes. A subscription represents a household.
 - Business Internet access—Internet access used in a business or at a business site. Some business products will be used in a residential setting, such as a small office based in a home. A subscription represents a single PC. There can be more than one subscription per circuit; for example, a dozen PCs may share a single business DSL in a small office.
- Internet data center floor space (square feet) — The measurement of floor space for the location of racks holding computer servers used in the provision of hosting (retail and wholesale) and colocation services
 - Internet data center floor space (gross) — A measure of the entire floor space that is available for use for those services. It does not include any space that is used for other purposes within the Internet data center, including office space or the housing of ancillary and support equipment.
 - Internet data center floor space (used) — A measure of the floor space that is presently in use for those services. It does not include any space that is used for other purposes within the Internet data center, including office space or the housing of ancillary and support equipment.

Long-Distance Retail Services in North America

The following definitions reflect those that are in the long-distance retail services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: North America, 2001-2006" (TCPS-WW-MS-0190).

Long-Distance Services Market Definitions

- Total retail long-distance revenue — The sum of retail circuit-switched long-distance revenue and retail VoIP long-distance revenue
 - Retail circuit-switched long-distance revenue — Revenue paid by end users for inbound and outbound, national and international toll circuit-switched PSTN services. The sum of inbound and outbound calling follows:
 - Inbound toll revenue — Toll-free called party-paid calling, using specialized access codes for this purpose, such as 800, 888 and 877; includes international toll-free services
 - Outbound revenue — Long-distance toll revenue, national and international, other than inbound toll free. Includes caller-paid and operator services / card calling

- VoIP long-distance revenue — Revenue paid by end users for long-distance (national or international) service marketed as VoIP or sold by a carrier generally known to exclusively or primarily be in the business of selling VoIP services
 - National revenue — Long-distance toll revenue paid for PSTN calls between locations within the national markets of the United States and Canada
 - International revenue — Long-distance toll revenue paid to carriers for PSTN calls from the United States or Canada to other countries. Does not include international settlement payments made between carriers. Does not include calls made between third countries and billed in the United States or Canada (for example, country-direct). Does not include calls made from foreign countries to the United States or Canada and billed in the latter country, except for toll-free and collect calls; does not include "callback" except for calls from the United States or Canada to other countries
 - Residential revenue — Long-distance, circuit-switched services revenue paid by residential end users to toll services providers
 - Business revenue — Long-distance circuit-switched services revenue paid by business customers, including for business to business (B2B), business-to-residential and residential-to-business toll-free communication

Local Retail Telephone Service in North America

The following definitions reflect those that are in the local retail telephone service section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: North America, 2001-2006" (TCPS-WW-MS-0190).

Local Services Retail Revenue

This is revenue generated by local service providers (incumbent LECs [ILECs] or competitive LECs [CLECs]) from services sold within the basic service area to end users. This category excludes all toll and ISDN revenue, which are included in the long-distance and data service revenue, respectively. General local revenue is segmented into the following categories:

- Basic local service revenue — Includes nonrecurring charges and recurring monthly access line charges and message revenue for local calls
- Value-added / enhanced services — Revenue generated from vertical services and secondary features such as touch-tone, custom-calling features, enhanced services, and nonregulated local services such as inside wire services and voice messaging. This category also includes advanced CLASS features such as caller ID, call block, call trace and return call, among others.
- End-user subscriber line charge (SLC) — Revenue generated from the recurring monthly Federal Communications Commission (FCC)-mandated charges (for example, SLC) paid by end users to the provider of their local service
- Public services — Revenue generated from the use of public payphones
- Residence local retail revenue — Revenue generated by all local services provided to residential end users
- Business local retail revenue — Revenue generated by all local services provided to business end users

Retail Data Services in North America

The following definitions reflect those that are in the retail data services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: North America, 2001-2006" (TCPS-WW-MS-0190).

Data Services

Data services include dedicated / private line, packet and circuit-switched access services (for example, frame relay, ATM, IP, ISDN, DSL and so on) that transport data to end users. Data services are monitored for traffic, quality, line conditioning, signaling, continuity, performance and so on by the carrier through the network interconnection point or device on the customer's premises.

No differentiation is made in this report by type of traffic or application carried by these services. All types of transmissions — voice, image, video, fax, interactive services, as well as other nonvoice traffic — can be carried by these services regardless of whether the source format is analog or digital. All revenue reflects service provider annualized retail revenue, paid for by business and residential end users of the service. The number of in-service ports / lines is cumulative deployment at the end of each year.

Packet/Circuit-Switched Data Services Market Definitions

Following are packet / circuit-switched data services market definitions:

- **Data line**— A data line is a direct path between two termination points. In the case of circuit-switched access lines such as ISDN BRI, ISDN PRI and DSL, the number of in-service lines is equal to the number of in-service ports. Effectively, one end of these lines terminates in the public-switched network but is not necessarily directly associated with a specific terminating location.
- **Data port** — The data port is the termination at the carrier's CO or POP of X.25, ATM, SMDS and IP (one port reflects one end-to-end circuit count) and termination at the carrier's CO or POP for Ethernet and frame relay (one port reflects the one CO termination, access and half PVC); for cable modem, satellite two-way data and fixed wireless services reflect in-service subscriber access facilities.
- **Channel** — A channel is a single DS-0 (64 Kbps) speed path or DS-0 circuit and may have more than one port (for example, two ports are associated with a simple DS-0 point-to-point scenario and are regarded as a single channel). A DS-1 circuit comprises 23 or 24 channels. A DS-3 circuit comprises 672 channels.
- **X.25**— X.25 is a packet service that offers data rates ranging from 64 Kbps and below. X.25 is also known as PPS. This service includes revenue from X.28 asynchronous and X.32 dial-up access, but excludes revenue generated from applications such as electronic data interchange and X.400 messaging. Ports in this context refer to end-user service subscriptions for public network service.
- **Frame relay**— Frame relay is a fast-packet service that offers data rates of 64 Kbps (DS0), 1.544 Mbps (DS-1), fractional DS-1, 45 Mbps (DS-3) and fractional DS-3. Includes revenue from all types of network configurations used to deliver frame relay services, even if encapsulated in an ATM backbone network. In all cases, the end-user access line / transport facility (DS0, T1, T3 and so on) used to deliver frame relay and half the PVC is included in the revenue forecast numbers.
- **SMDS** — Revenue and ports from all access classes for connectionless broadband data service (CBDS) and SMDS, regardless of platform technology, are included in the forecast.

- **ATM** — Also known as cell relay, ATM is supplied to the end user's premises. ATM is a fast-packet service that offers data rates ranging from 1.5 Mbps (DS-1) to 622 Mbps (OC-12). However, the ports addressed in this report include only DS-1 through DS-3 speeds. ATM services have ATM equipment, such as an ATM switch or multiplexer / concentrator, located on the customer's premises. This service includes access to the ATMUNI, connections to legacy LANs and point-to-point transport connections.
- **Ethernet service**— Unmanaged Ethernet service is any Layer 2 public network carrier service that extends the Ethernet protocol-based LAN, interconnecting two or more LANs or sites. This includes services traveling on ATM and SONET that provide Ethernet connections. Ethernet is typically offered in the 10/100 Mbps and gigabit bandwidths and marketed to date as transparent or native LAN, Ethernet, Gigabit Ethernet, or metropolitan / MAN Ethernet services, whether ATM-based in the network core or using Ethernet-over-fiber architecture.
- **IP service** — The revenue included in this category is native IP access and transport service provided to end users without a managed service component (for example, IP VPN). It predominantly involves providing access and WAN connections or IP transit over the public Internet or purpose-built IP networks with at least two carrier-owned routers involved in the IP service provided to the customer.
- **DSL** — xDSL services comprise all variants of DSL, including ISDN (IDSL), ADSL, SDSL, HDSL, S-HDSL and VDSL. Also included is the new sub-DS-1 rate services referred to as ADSL Lite or G.Lite. DSL revenue includes only the DSL modem lease cost, installation and provisioning charges, not the ISP subscription costs, which are usually bundled with the DSL service.
- **Wireline cable modems service** — Cable modem / HFC service forecast includes revenue and the number of subscriber modems deployed for business and residential cable modem services combined. The revenue forecast includes the cable modem lease cost in the monthly service rental charge. Installation and provisioning charges are also included in the revenue forecast for businesses or residential subscribers.
- **Fixed wireless service** — Fixed wireless service comprises LMDS, MMDS and lower / higher-frequency unlicensed spectrum / UNE group services. The forecast includes revenue and the number of subscriber transceivers / modems deployed for business and residential services combined. The revenue forecast includes the CPE lease cost in the monthly service rental charge. Installation and provisioning charges are also included in the revenue forecast for businesses or residential subscribers.
 - **LMDS (23, 24, 28 / Digital Electronic Messaging Service [DEMS], 31, 38 and 60GHz-band service)** — Fixed wireless LMDS comprises licensed and unlicensed spectrum enabling two-way broadband microwave point-to-multipoint communications services primarily providing high-speed data network access (potentially up to 10 Mbps downstream) predominately to businesses, campuses and multidwelling units (MDUs) in dense metro areas.
 - **MMDS (2.4 and 2.5GHz-band service)** — Fixed wireless MMDS service is a two-way multichannel multipoint microwave data transport service. This licensed and unlicensed spectrum is utilized in omni-directional fashion from a central antenna and may be cellularized. Current MMDS systems using cable modem technology deliver 10 Mbps to 30 Mbps downstream and 32 Kbps to 10 Mbps upstream data rates.

- **Satellite data service** — Satellite data services (for example, two-way satellite, telephony upstream and VSAT services) have long been a viable niche business data service, but have begun to emerge in the residential market as a viable multicast system for point-to-multipoint data/video distribution and multimedia services delivering a shared data connection typically up to approximately 500 Kbps downstream. The satellite data service forecast includes revenue and the number of subscriber transceivers/dishes deployed for business and residential services combined. The revenue forecast excludes the cost of CPE, which is assumed to be purchased by the end user. Installation and provisioning charges are included in the revenue forecast for businesses and residential subscribers.
- **ISDN** — ISDN service forecasts include BRI (128 Kbps/144 Kbps) and PRI (1.544 Mbps) installed circuits and total installed ISDN B-channels. ISDN service includes the ability to transmit circuit-switched voice, circuit-switched data and X.25-switched data. In-service lines in this context refer to end-user service subscriptions for public network service. ISDN revenue as reported in this forecast includes only flat-rate/fixed recurring fees per in-service line and excludes usage-based fees.

Managed Services Definitions

Managed network services includes managed LAN, managed IP-VPN, managed network fully outsourced LAN, and managed WAN/MAN services:

- **Managed LAN services** involve the management of LAN systems/servers elements only as limited to the client's premises, as provided by carriers, systems integrators, managed service providers (MSPs) and outsourcers. The service bundle may extend to include the network interconnection device (NID)/edge device. Service IT capability may include fault management, configuration/change management, auditing/asset management, performance management and security management (firewall, intrusion detection, vulnerability scanning and so on).
- **Managed VPNs (IP VPN and MPLS)** emulate the full range of private MAN/WAN functionality using existing, underlying access and backbone transport technology to fully exploit the economies of scale of the underlying network infrastructure by segregation of communications over a shared (public) IP network (Internet) or private IP-based network (MPLS).
 - **Managed IP VPNs** are edge-based/edge-device hardware or software/CPE and are viewed exclusively as the implementation of secure end-to-end connection through the shared, public IP network or through an Internet connection to an MPLS network. Standards-based approaches for providing IP VPN connectivity currently include PPTP, L2TP and IPSec. Public IP VPNs have an edge-to-edge network topology that typically includes edge device management, limited systems monitoring/status reporting and may bundle some professional services.
 - **MPLS VPNs** are a network-based label-swapping framework with Layer 3 routing using several vendor-specific protocols. MPLS improves private IP network traffic engineering by streamlining the traffic pathway (traffic isolation) and permitting the establishment of traffic classes for tiered levels of service quality — optimizing traffic paths and minimizing congestion. MPLS allows overlaying protocols (such as Layer 2-ATM/Layer 3-IP) and the migration of many functions of the ATM control plane to Layer 3, simplifying network management and complexity and eliminating the ATM "cell-tax" with carrying IP traffic. VPNs can be built on-demand by creating IP "tunnels" through a MPLS network with or without using security encryption (IPSec), depending on the level of data security required for a specific traffic type. MPLS supports multiple protocols. However, each end point must be MPLS-enabled and must be in the same service provider's network.

- Managed full network outsourcing services are based on the extension of managed MAN-WAN/VPN services, providing complete end-to-end management of the core MAN-WAN, network interface/edge device, LAN, and potentially the CPE equipment/hardware, software and even some applications — essentially a completely outsourced data networking solution managed by the carrier. Managed network service will typically include some professional services during the initial design and provisioning phases, and may provide vertical network applications. Forecasts include revenue from LAN, edge device, access and transport and management elements of service.
- Managed MAN/WAN services offer complete core transport network service and typically now include bundled network interface/edge devices (router, CSU/DSU, IAD) — time division multiplexing (TDM) IADs, FRAD, ATM concentrator/switch and so on) managed capability — varying quality of service (QoS) and dynamic bandwidth management. This class of managed services is based on a wide range of core Layer 2 transport technologies such as frame relay, ATM, IP, Ethernet, X.25 and private line that support various network access technologies. Typically, managed intranet (typically IP-based) and bandwidth-on-demand services fall within this managed service category because they are highly dependent on automated processes to deliver on customer demands. Managed edge device services may be sold separately or, increasingly, bundled with managed MAN/WAN services (which would be included in the managed WAN category). The carrier is responsible for the edge device operation, monitoring and maintenance, and guarantees the performance/reliability through SLAs. Security may be end-user provided and controlled through a firewall (internally managed or through an externally managed service/option). Forecasts include revenue from edge device, access and transport, and management elements of service.

Private-Line Market Definitions

Following are private-line market definitions:

- Private/leased-line services — Also known as dedicated or point-to-point or multipoint circuits, includes those lines leased from carriers and not switched within a public network. Primary data speeds for these services include the following ranges:
 - Broadband OC-n (also known as SONET) — Currently OC-3, OC-12, OC-48 and OC-192)
 - Broadband T3 — Above T1/E1, including 45 Mbps (including T3)
 - Wideband — Above 64 Kbps, including 1.54 Mbps (including T1)
 - Narrowband — 64 Kbps and below (DS0 digital and analog)
- "Fractional" private-line services — When fractional services are provided in the form of contiguous bandwidth, they are included in the next-higher bandwidth level (for example, 256 Kbps of continuous bandwidth is included in the wideband T1 category). However, if such fractional T1 were a marketing label to sell multiple DS0 channels that are not contiguous bandwidth, those services would be counted in the DS0 category. Similarly, fractional T3 supplied as contiguous bandwidth in the 1.544 Mbps-45 Mbps range is counted in the broadband T3 category; if supplied as multiple channelized T1s, it is counted as wideband T1.

Internet Retail Services in North America

The following definitions reflect those that are in the Internet retail services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: North America, 2001-2006" (TCPS-WW-MS-0190).

Total Internet Retail Services Revenue

Total Internet retail services revenue is the sum of retail Internet subscription, retail Web-hosting and value-added IP services revenue:

- Retail Internet subscription revenue — An ISP's combined total revenue paid by businesses (including other organizations) and consumers for access to the Internet. Access revenue includes subscriptions, sums attributable to Internet access provision as part of bundled services (such as a managed IP-VPN service), and retained shares of DSL and cable modem charges. Only retail (end user) access via a PC is included in these figures.
- Internet access subscribers — The total number of subscribers at a specific point in time. Typically, these subscribers make periodic payments or upfront payments, although unique subscribers of subscription-free services are also included to complete the picture of the addressable market.
 - Consumer Internet access — Internet access for personal use in a home setting. Such products are intended for a single user or for a family, are intended for personal use only, and may have specific acceptable use policy restrictions preventing them from being used for business purposes. A subscription represents a household.
 - Business Internet access—Internet access used in a business or at a business site. Some business products will be used in a residential setting, such as a small office based out of a home. A subscription represents a single PC. There can be more than one subscription per circuit; for example, a dozen PCs may share a single business DSL in a small office.
- Retail Web-hosting revenue — An ISP's revenue for Web hosting paid by businesses (including other organizations) and consumers. Only revenue from ISPs and Web-hosting companies are included in these figures. Only retail (end user) Web-hosting services accessed via a PC are covered. Includes colocation / managed / dedicated hosting revenue and shared hosting revenue.
- Colocation / managed / dedicated hosting revenue — The sum of colocation revenue and managed / dedicated hosting revenue
 - Colocation — The provision of physical facilities within a data center for an enterprise or other end-user customer to install and maintain their own network or server equipment. Revenue is accrued by the Internet data center provider for this rental, typically by the square foot or rack of space.
 - Managed / dedicated hosting — This is the leasing of one or more servers dedicated to a single retail end-user customer. Revenue is that accrued by the Internet data center provider for the basic rental of the server(s), plus minimal management costs necessary to keep the server(s) up and running.
- Shared hosting revenue — This revenue is composed of two separate revenue streams:
 - Revenue is that accrued by the Internet data center provider for the basic rental of the server disk space, plus minimal management costs necessary to keep the server up and running. This service is defined for the Internet data center market as including retail end-user customers leasing part of one or more servers on a shared basis with other users.

- Revenue that is accrued by ISPs for Web hosting paid by businesses (including other organizations) and consumers. Only ISPs that provide Internet access as well as Web hosting are included in these figures. Only retail (end user) Web-hosting services accessed via a PC are covered.
- Value-added IP services revenue — The sum of revenue from services such as fax-over-IP, unified-messaging-over-IP, and IP multicast

Wholesale/Carrier Services in North America

The following definitions reflect those that are in the wholesale / carrier services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: North America, 2001-2006" (TCPS-WW-MS-0190).

Wholesale/Carrier Services Market Definitions

Following are wholesale / carrier services market definitions:

- Total wholesale / carrier revenue — The total of the subcategories voice, leased line, other data access and other wholesale / carrier revenue. (Note: The term "carrier" as used here includes ISPs in terms of the latter's backbone and large-scale purchases.)
- Voice wholesale carrier services — Inter-carrier revenue for voice services, including the following three subcategories:
 - Wholesale / carrier long-haul circuit-switched calls — Inter-carrier revenue for long-haul, domestic or international, circuit-switched calling, generally paid by the minute
 - Wholesale / carrier long-haul VoIP calls — Inter-carrier revenue for VoIP service, either marketed as VoIP or sold by a carrier generally known to be in the business of primarily or exclusively selling VoIP service
 - Local wholesale / carrier voice services — Inter-carrier sales of local voice services, typically from an ILEC to a CLEC or between CLECs, typically sold in the form of resold lines or UNEs
- Leased / private-line wholesale / carrier services — The sum of the following subcategories:
 - Long-haul leased / private-line wholesale / carrier services — Inter-carrier leases of long-haul leased capacity (leased / private lines or wavelengths). Sales of indefeasible rights of use (IRUs) are counted on an amortized, generally accepted accounting principles (GAAP) basis rather than a "cash" basis (for example, only a fraction of revenue is realized annually over the life of the 10- or 20-year contract, rather than all revenue being realized when cash is transferred). It does not include revenue for final sales or for any transfers of dark fiber.
 - Special access revenue — Revenue paid by carriers to LECs for the provision of a special access line, which is a private line that connects end-user premises to the POP of a long-distance carrier. (Revenue paid to LECs under special access tariffs designed for such lines but used for private lines not connecting with IXC POPs is included under leased / private-line retail revenue rather than special access.)
 - Carrier interconnection / others (Canada only) — Revenue in connection with services provided to other telecommunications service providers, such as colocation, and other services provided associated with the provision of dial tone and so on

- Other data access wholesale / carrier services — Inter-carrier revenue paid for the provision of data services other than leased / private lines:
 - Internet access transport revenue — Inter-carrier revenue for DSL, ISDN (BRI and PRI) and satellite services
 - Packet data revenue — Inter-carrier revenue for packet services including frame relay, ATM, IP, Ethernet and X.25
- Other wholesale / carrier services— The sum of the following subcategories:
 - Switched access revenue — Revenue paid to LECs by carriers for the provision of access to the LEC's local switched network
 - Content distribution / caching services — Revenue for the integrated delivery of storage, computing power and transport services at the edge of the network as a fully managed service
 - Inbound international settlement payments — Settlement payments paid or credited by non-U.S.-based carriers to U.S.-based carriers for termination of international calls in the United States

Chapter 6

Western Europe

Western Europe Fixed Public Network Services Segmentation

Table 6-1 delineates the various metrics shown within Western Europe. Notes to these metrics germane to the coverage of telecommunications services in this region follow, organized by relevant service area.

Table 6-1
Western Europe Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
PSTN Network				
Lines in Service		X	X	
Lines per 100 Population			X	
Lines per Carrier Employee			X	
Residential Lines per 100 Households			X	
Internet Services Subscribers	X			
Internet Data Center Floor Space				Square Feet
Fixed VoIP Ports			X	Equivalent IP Lines
Digital Leased Lines			X	64k / 2M / 34M+
ISDN				BRI / PRI
Total Public Fixed Services Revenue	X			
Per PSTN Line	X			
Per Carrier Employee	X			
Per Capita	X			
As Percent of GDP	X			
Voice / Calling Services	X	X		
Local Retail Calls	X	X		
Local Value-Added Services	X			
National Long-Distance Retail Calls	X	X		
Freephone Services	X			
Premium Rate Services	X			
Voice VPN Services	X			
Other Value-Added Long Distance Services	X			
Fixed-to-Mobile Calls	X	X		
International Long-Distance Retail Calls	X	X		
VoIP Services	X			
Retail Telephone Rental and Connection	X	X		
Retail Data Services	X		X	
Packet Data Services				
X.25	X		X	
Frame Relay	X		X	
CBDS / SMDS	X		X	
Native ATM	X		X	
ADSL	X		X	
SDSL	X		X	
Cable Modem	X		X	

Table 6-1 (Continued)
Western Europe Telecommunications Services Segmentation

Fixed Telecommunications Services	Revenue	Residential/Business	Lines/Ports	Others
Managed Data Services	X			
Managed X.25 Services	X			
Managed Frame Relay Services	X			
Managed SMDS Services	X			
Managed ISDN Services	X			
Managed ATM Services	X			
Managed Intranet Services	X			
Managed IP Services	X			
Managed IP VPN	X			
Managed Multiprotocol Services	X			
Managed Bandwidth Services	X			
Leased Line Services	X			Analog / Digital
64k	X			
2M	X			
34M	X			
Greater Than 34M	X			
Retail Internet / Public IP Services	X			
ISP Access	X	X		
Retail Web Hosting	X			
Internet Server Colocation Revenue	X			
Managed, Dedicated Hosting Revenue	X			
Simple / Shared Hosting Revenue	X			
Value-Added IP Service	X			
Fax Over IP Revenue	X			
Unified Messaging Revenue	X			
IP Multicast Revenue	X			
ISP Other Revenue	X			
Wholesale/Carrier Services Revenue	X			
Voice Wholesale / Carrier Services	X			
Circuit-Switched Revenue National	X			
Circuit-Switched Revenue International	X			
VoIP Revenue	X			
Data Wholesale / Carrier Services	X			
Leased Lines / Private Line Revenue	X			
IP Transit Revenue	X			
Content Distribution / Caching Revenue	X			
IP Multicast Revenue	X			
Managed / Dedicated Web-Hosting Revenue	X			
Simple / Shared Web-Hosting Revenue	X			
Internet Server Colocation Revenue	X			
Associated Statistics				
Population at Midyear (K)				
Households at Midyear (K)				
Average Population / Household				
GDP				

Source: Gartner Dataquest (January 2003)

Western Europe Fixed Public Network Services Definitions

Gartner Dataquest uses the following definitions in the development of market statistics and projections for fixed network voice, data, Internet and wholesale / carrier services in Western Europe.

Revenue from international data services are allocated to the country in which the contract was signed, and therefore the country to which the service provider allocates the revenue using standard accounting practices. International voice revenue is allocated to the country of call origin.

Some revenue, infrastructure and services are split by consumer and businesses applications. Gartner Dataquest defines each user type based on who pays the rental and service fees.

- A business user is defined as a person or company that pays for a service that is intended to be used primarily for commercial purposes. This includes governments, educational establishments, small office / home office (SOHO) as well as the traditional enterprise market. A teleworker whose company pays the rental fee for a telecommunications service, for example ISDN or ADSL, would be considered a business user.
- A consumer user is a user who pays for a service that is intended to be for primarily leisure or social purposes.

Market Summary and Ratios in Western Europe

The following definitions reflect those that are in the market summary and ratios section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Western Europe, 2000-2006" (TCPM-EU-MS-0182).

Fixed Telecommunications Ratios

- Total fixed telecommunications retail service revenue per PSTN line — Fixed public network services retail revenue divided by the number of lines in service
 - Per carrier employee — Fixed public network services retail revenue divided by the number of carrier employees
 - Per capita — Fixed public network services retail revenue divided by the number of inhabitants in the polity
 - As a percentage of GDP — Fixed public network services retail revenue expressed as a proportion of the GDP in the polity
- Total employees in five main carriers — The sum of all employees in the five largest telecommunications carriers in the polity

Fixed Network Size Data at Year-End

- Total lines in service — The number of lines in operation at calendar year-end that connect a customer's premises to the public network; the aggregate number includes ISDN B-channel equivalents.
 - Business lines in service — Exchange lines connecting business customers to the public network, including PSTN (including basic business lines, PBX trunks and Centrex lines) and ISDN B-channels
 - Residential lines in service — Exchange lines connecting residential customers to the public network, including PSTN (primary and additional residential access lines) and ISDN B-channels
- Lines per 100 population (teledensity) — A measure of the development in a given national network, expressed as the number of lines in service per 100 population

- **Lines per carrier employee** — A measure of the development in a given national network, expressed as the number of lines in service per carrier employee
- **Residential lines per 100 households** — A measure of the development in a given national network, expressed as the number of residential lines in service per household in the polity

Fixed VoIP Ports

- **IP ports in service** — IP gateway port is a physical or electrical interface built into an IP gateway that enables IP packets to be sent to and from a device. This counts the number of ports on the public network that have commercial traffic passing through them.
- **Equivalent number of retail IP lines** — The maximum number of simultaneous telephone conversations that can be supported with compression by IP ports. This is a capacity measurement, not a traffic measurement.

Digital Leased Lines

Also known as dedicated access or point-to-point or multipoint circuits, digital leased lines include those lines leased from carriers and not switched within a public network. Digital leased lines are divided into the following categories:

- **Above 34 Mbps**
- **Above 2 Mbps, including 34 Mbps**
- **Above 64 Kbps, including 2 Mbps**
- **64 Kbps and below**
- **Total digital leased lines** — The sum of all leased lines with the speeds previously denoted

ISDN

ISDN service forecasts include BRI and PRI installed circuits with subscribers and total installed ISDN B-channels in use.

- **BRI circuits in use** — Each ISDN BRI circuit has two B-channels of 64 Kbps and one D-channel of 16 Kbps, used mainly for signaling.
- **PRI circuits in use** — Each ISDN PRI circuit has up to a maximum of 30 B-channels and one D-channel of 16 Kbps.
- **Total B-channels** — The sum of all BRI and PRI B-channels

Public Data Ports in Use

- **X.25** — This includes X.28 asynchronous and X.32 dial-up access and applications such as electronic data interchange and X.400 messaging. Includes permanent and switched virtual circuits.
- **Frame relay** — This includes frame relay services, including frame relay encapsulated over X.25 and over ATM. Includes permanent and switched virtual circuits.
- **CBDS/SMDS** — This includes ports in use for all access classes for both CBDS and SMDS, regardless of platform technology.
- **Native ATM** — Includes all access speeds and classes of service (for example, near real-time variable bit rate) from unbundled ATM ports. Includes permanent and switched virtual circuits.

- **ADSL** — Includes standardized G.992.2 ADSL and prestandard versions of ADSL such as G.Lite, splitterless discrete multitone (DMT), DMT Lite, splitterless ADSL and xDSL Lite. ADSL ports refer to the termination of the ADSL at the end-user's premises. It should be noted that each ADSL line would have a modem attached at the end user's and carrier's premises. ADSL ports relate to the number of ports in use.
- **SDSL** — Includes symmetrical high-bit-rate DSL (G.SHDSL), the rate-adaptive xDSL technology based on the International Telecommunications Union (ITU) G.991.2 standard, which was ratified 11 February 2001. Speeds range from 192 Kbps to 2.3 Mbps. SDSL Ports refer to the termination of the SDSL service at the end-user premises. Each SDSL line would have a modem attached at the end-user and carrier premises. SDSL ports relate to the number of ports in use.
- **Cable modem access** — The high-speed bi-directional transmission of data traffic over the HFC cable network for Internet, remote LAN and branch office access. Cable modem ports refer to the termination of the cable line at the end-user premises.
- **Total data ports in use** — The sum of ports from all services previously denoted.

Internet/Public IP Services

- **Total ISP subscribers** — The total number of subscribers to access services provided by an ISP at calendar year-end. Consumer and business (including other organizations) subscribers are counted. These subscribers may pay for subscriptions or the subscriptions may be free or may be included as part of a package with other services (such as cable telephony or a managed data service). Subscribers may have subscriptions with more than one ISP. Multiple business subscribers may work for the same company. Several consumer users may use the same consumer access subscription, and several subscriptions may use the same physical access connection. Only those who use the access regularly are included. Only retail (end-user) subscribers that use a PC for access are included in these figures.
- **ISP consumer subscribers** — The number of consumer subscribers to access services provided by an ISP at calendar year-end. These subscribers may pay for subscriptions, or the subscriptions may be free or may be included as part of a package with other services (such as cable telephony), and each may subscribe to more than one ISP. Typically, there will be just one consumer subscriber for each account relationship with an ISP but multiple consumer subscribers may use the same consumer access subscription, and several subscriptions may use the same physical access. Only those who use the access regularly are included. Only retail (end user) subscribers who use a PC for access are included in these figures.
- **ISP business subscribers** — The number of business (including other organizations) subscribers to access services provided by an ISP at calendar year-end. These subscribers may pay for subscriptions, or the subscriptions may be free or may be included as part of a package with other services (such as a managed data service), and may subscribe to more than one ISP. Often, multiple business subscribers work for the same business that has a common account relationship with the ISP; only those individuals that use the access regularly are included. Only retail (end-user) subscribers who use a PC for access are included in these figures.

- Internet data center floor space (square feet) — The measurement of available floor space for the location of racks holding computer servers used in the provision of hosting (retail and wholesale) and colocation services. It is a measure of the entire floor space that is available for use for those services. It does not include any space that is used for other purposes within the Internet data center, including office space or the housing of ancillary and support equipment.

Fixed Telephone Networks in Western Europe

The following definitions reflect those that are in the fixed telephone networks section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Western Europe, 2000-2006" (TCPM-EU-MS-0182).

Local Retail Calls

- Local services revenue — This is revenue generated by local service providers from services sold within the basic service area to end users. Local services revenue is segmented into the following categories:
 - Local calls — PSTN / ISDN / cable telephony calls made to the same code zone, including dial-up calls to the Internet
 - Residential local call revenue — Circuit-switched outgoing call revenue paid by residential end users to services providers
 - Business local call revenue — Circuit-switched outgoing call revenue paid by business customers to services providers
- Value-added local services, including:
 - Centrex — A service providing PBX facilities from a CO or "host" exchange to create a virtual PBX on a customer's site. Switching and routing of internal and external calls, user features and access to the public network are provided from the host exchange
 - CLASS — Enhanced calling services such as voice mail and caller line ID provided by the operator on PSTN lines, served by digital switches
 - Local rate — A type of toll-share service where the calling and the called party share the cost of the call. Here, the caller pays the equivalent tariff of a local call and the called party pays the remainder. (Internet access calls are included in local call revenue.)

National Retail Calls

Long-distance services revenue is segmented into the following categories:

- National calls — Revenue received by an operator for PSTN / ISDN / cable telephony calls to a location in a different area code that is not an international prefix
 - Residential national call revenue — Circuit-switched outgoing call revenue paid by residential end users to services providers
 - Business national call revenue — Circuit-switched outgoing call revenue paid by business customers to services providers
- National value-added service revenue — These consist of the following categories:
 - Freephone — Calls made to a specific number at no cost to the caller. The freephone customer, who is usually the called party, pays the cost of this call. There are national, international and universal freephone numbers.

- ❑ Premium rate — Calls made to a specific number at more than the standard charge to reflect the additional value provided in the form of entertainment or information. The operator then returns a portion of this revenue to the organization providing the content. Gartner Dataquest Market Statistics include all associated service revenue except for the premium content revenue.
- ❑ VPN — A closed user group service implemented over public-switched networks that allows intracompany voice calls to be passed over the public-switched network instead of over private infrastructure. The intelligence within the public network is used to route calls to either another number within the private dial plan or to the PSTN. This definition of VPN does not include any VPN-type services carrying data. Gartner Dataquest's VPN revenue associated with the service includes that from on-net and off-net calls.
- ❑ Other value-added long-distance services include the following:
 - National rate — Provides a single, location-independent number for all calls to an organization, with callers paying the full cost of the call at national rates; the called party pays any remaining portion.
 - Postpaid calling cards — Allows calls to be made on a post-pay basis, usually through the use of a card number and associated personal identification number (PIN). The calls are then billed to an account for later payment.
 - Prepaid calling cards — Cards that are paid in full before use, which provides credits that are then used up as the caller makes calls
 - Network-based call center services — A network-based service offered by a carrier that provides call-handling capabilities and automated call distribution, combined with a high degree of sophistication in dynamic call traffic management

Fixed-to-Mobile Retail Calls

- Fixed-to-mobile calls — Calls originating on a fixed network and terminating on a mobile network
- ❑ Residential fixed-to-mobile call revenue — Circuit-switched outgoing call revenue paid by residential end users to services providers
- ❑ Business fixed-to-mobile call revenue — Circuit-switched outgoing call revenue paid by business customers to services providers

International Retail Calls

- International outgoing call revenue — Revenue paid for PSTN / ISDN / cable telephony calls from the country studied to other countries. Does not include international settlement payments made between carriers.
- ❑ Residential international call revenue — Circuit-switched outgoing call revenue paid by residential end users to services providers
- ❑ Business international call revenue — Circuit-switched outgoing call revenue paid by business customers to services providers
- Total business call service revenue — The sum of all business local, national and international calling revenue
- Total residential call service revenue — The sum of all residential local, national and international calling revenue

Total Call Services

Total call services is the sum of all local retail calls, national retail calls, fixed-to-mobile retail calls and international retail call revenue.

- Residential exchange line rental and connection revenue — Revenue derived from rental and connection of exchange lines whether PSTN, ISDN or cable telephony lines paid by residential end users to services providers
- Business exchange line rental and connection revenue — Revenue derived from rental and connection of exchange lines whether PSTN, ISDN or cable telephony lines paid by business customers to services providers

Telephone Rental and Connection, VoIP and Total Voice Market in Western Europe

The following definitions reflect those that are in the telephone rental and connection, VoIP and total voice market section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Western Europe, 2000-2006" (TCPM-EU-MS-0182).

Exchange Line Rental and Connection

Exchange line rental and connection is the revenue derived from rental and connection of exchange lines whether PSTN, ISDN or cable telephony lines paid by end users to service providers.

- Residential exchange line rental and connection revenue (residential) — Revenue derived from rental and connection of exchange lines whether PSTN, ISDN or cable telephony lines paid by residential end users to service providers
- Business exchange line rental and connection revenue (business) — Revenue derived from rental and connection of exchange lines whether PSTN, ISDN or cable telephony lines paid by business customers to service providers

Total Circuit-Switched Telephony Service Revenue

Total circuit-switched telephony service revenue is the sum of total call services and total exchange line rental and connection revenue.

Fixed Packetized Voice Service Revenue

End-user revenue for voice over public Internet and voice over private / carrier IP services. Includes IP calling card revenue.

Total Fixed Voice Telephony

Total fixed voice telephony is the sum of total circuit-switched telephony service and fixed packetized voice service revenue.

Public Data Services in Western Europe

The following definitions reflect those that are in the public data services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Western Europe, 2000-2006" (TCPM-EU-MS-0182).

Data Services

Gartner Dataquest estimates national and international end-user revenue for data services (that is, those dedicated / private line and packet / circuit-switched services that are managed end-to-end by public telecommunications operators or other carriers). This term as used herein refers to a specific set of facilities-based services that are offered by telecom services providers to end users and resellers. It does not imply that the traffic that is carried by these services is

necessarily "data" traffic. In fact, all types of transmissions, voice, image, video, fax, interactive services and other nonvoice traffic can be carried by these services regardless of whether the source format is analog or digital or whether it is transmitted as analog or digital information. No differentiation is made between the types of traffic that are carried by these services.

- **Port** — A port is the termination of a point-to-point or point-to-multipoint circuit at a public network interface, such as a carrier's CO or other POP. Ports represent the cumulative in-service ports with customers at the calendar year-end rather than the installed capacity in a carrier's network.
- **Revenue** — Payment from a user to the service provider for a telecommunications service. Rental, connection and usage charges are included. All revenue reflects facilities-based service provider retail revenue generated from the business and residential end user of the service unless otherwise stated.
- **Data line** — A direct path between two termination points. Effectively, one end of these lines terminates in the public switched network, but is not necessarily directly associated with a specific terminating location.

Switched Data Services — Packet Switched

- **X.25** — This includes revenue from X.28 asynchronous and X.32 dial-up access but excludes income from applications such as electronic data interchange and X.400 messaging. Included is revenue from permanent and switched virtual circuits.
- **Frame relay** — This includes revenue from frame relay services, including frame relay encapsulated over X.25 and over ATM. Includes revenue from permanent and switched virtual circuits.
- **SMDS** — This includes revenue from all access classes for CBDS and SMDS, regardless of platform technology.
- **Native ATM** — This category includes revenue from all access speeds and classes of service (for example, near-real-time variable bit rate) from unbundled ATM ports. It includes revenue from permanent and switched virtual circuits.

Dedicated Data Services

- **ADSL** — Includes standardized G.992.2 ADSL and prestandard versions of ADSL such as G.Lite, splitterless DMT, DMT Lite, splitterless ADSL and xDSL Lite. ADSL ports refer to the termination of the ADSL at the end-user premises. It should be noted that each ADSL line would have a modem attached at the end-user and carrier premises. ADSL ports relate to the number of ports in use. ADSL service revenue is based on the yearly revenue paid by end users to carriers for services provided over ADSL. This does not include any rental or purchase costs for ADSL modems. It is calculated using average monthly revenue per port, including connection charges and monthly rental. ISP subscription revenue is not included.
- **SDSL** — SDSL ports refer to the termination of the SDSL service at the end-user premises. It should be noted that each SDSL line would have a modem attached at the end-user and carrier premises. SDSL ports relate to the number of ports in use. SDSL service revenue is based on the yearly revenue paid by end users to carriers for services provided over SDSL. This does not include any rental or purchase costs for SDSL modems/routers. It is calculated using average monthly revenue per port, including connection charges and monthly rental. ISP subscription revenue is not included.

- **Cable modem access** — The high-speed bi-directional transmission of data traffic over the HFC cable network for Internet, remote LAN and branch office access. Cable modem ports refer to the termination of the cable line at the end-user premises. The revenue relates to the monthly subscription an end user will pay for the service. It excludes the rental or purchase of the cable modem. ISP subscription revenue is not included.

Managed Data Services (Revenue Only)

Gartner Dataquest's managed data services revenue is the sum of the revenue from managed data services such as managed IP services and Gartner Dataquest's evaluation of the managed services components of outsourced data networks. Services may include systems administration, security, performance monitoring, router management, technical diagnostics/troubleshooting, configuration management, system repair management and generation of management reports. Gartner Dataquest's managed data services figures include management and transport revenue, as follows:

- **Managed frame relay and ATM services** — The ports (whether frame relay or ATM) are bundled with a carrier-managed router or other access device, which offers additional features to the unbundled service. Equivalent to a frame relay / ATM VPN service.
- **Managed X.25, SMDS and ISDN services** — The ports (whether X.25, SMDS or ISDN) are bundled with a carrier-managed router or other access device, which offers additional features to the unbundled service.
- **Managed intranet services** — Provision and management of an intranet service, typically over the LAN and WAN, including browser management and extranet services. It is equivalent to an outsourced intranet/extranet. Typical feature sets include a network service, secure connectivity, migration and integration, closed user group functionality, one-time log-on, tailored search engine, design, build, and configuration.
- **Managed IP services** — Provision and management of IP LAN / WAN services, such as MPLS services, including a carrier-managed router or other access device
- **Managed IP VPN** — Provision and management of VPNs on IP, including using IPSec. These include remote access IP VPNs that use the Global Open Internet. Also included are VPNs on IP over frame relay, ATM, MPLS and other IP-capable networks.
- **Managed multiprotocol services** — Provision and management of multiprotocol LAN / WAN services, including a carrier-managed router or other access device. Includes protocols such as Systems Network Architecture (SNA).
- **Managed bandwidth service** — Leased lines are bundled with a carrier managed router or other access device, which offers additional features to the unbundled private-line service.

Leased Line Revenue

Also known as dedicated access or point-to-point or multipoint circuits, private/leased line services include those lines leased from carriers and not switched within a public network.

- **Digital leased lines** — All metro, national and international digital leased lines are split into the following speed classifications:
 - Above 34 Mbps (broadband)
 - Above 2 Mbps, including 34 Mbps (broadband)
 - Above 64 Kbps, including 2 Mbps (wideband)
 - 64 Kbps and below (narrowband)

Revenue is based on a revenue-per-line basis to include the basic connection and monthly rental of the line. When "fractional" services are provided, these are included in the next-higher bandwidth level. For example, 256 Kbps of continuous bandwidth would be included in the E1 2-Mbps category. Revenue is from the provision of digital leased lines to end users and other operators.

- **Analog leased lines** — This category includes all metro, national and international analog leased lines at all speeds. Revenue is based on a revenue-per-line basis to include the basic connection and monthly rental of the line. Revenue is from the provision of analog leased lines to end users and other operators.

Managed Data Services

Managed data services revenue is the sum of the revenue from managed data services such as managed IP services and Gartner Dataquest's evaluation of the managed services components of outsourced data networks. Services may include systems administration, security, performance monitoring, router management, technical diagnostics/troubleshooting, configuration management, system repair management and generation of management reports. Gartner Dataquest's managed data services figures include management and transport revenue.

- **Managed intranet services** — Provision and management of an intranet service, typically over the LAN and WAN, including browser management and extranet services. It is equivalent to an outsourced intranet/extranet. Typical feature sets include a network service, secure connectivity, migration and integration, closed user group functionality, one-time log-on, tailored search engine, design, build, and configuration.
- **Managed IP services** — Provision and management of IP LAN/WAN services such as MPLS services, including a carrier-managed router or other access device.
- **Managed multiprotocol services** — Provision and management of multiprotocol LAN/WAN services, including a carrier-managed router or other access device. Includes protocols such as SNA.
- **Managed IP-VPN** — Provision and management of VPNs on IP, including using IPSec. These include remote access IP VPNs that use the Global Open Internet. Also includes VPNs on IP over Frame Relay, ATM, MPLS and other IP-capable networks.
- **Managed frame relay and ATM services** — Where the ports (whether frame relay or ATM) are bundled with a carrier-managed router or other access device, which offers additional features to the unbundled service. Equivalent to a frame relay/ATM VPN service.
- **Managed X.25, SMDS and ISDN services** — Where the ports (whether X.25, SMDS or ISDN) are bundled with a carrier-managed router or other access device, which offers additional features to the unbundled service.
- **Managed bandwidth service** — Where leased lines are bundled with a carrier-managed router or other access device, which offers additional features to the unbundled private-line service.

Internet/Public IP Services in Western Europe

The following definitions reflect those that are in the Internet / public IP services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Western Europe, 2000-2006" (TCPM-EU-MS-0182).

- **ISP** — A provider of (retail) access accounts that allow end users to connect occasionally or permanently to the Global Open Internet (for Web browsing, e-mail and other services such as Web hosting) using a variety of access services such as ISDN, ADSL and frame relay. End users are consumers or users in businesses, including other organizations such as government, charities and educational establishments. Only retail access — that is, the business relationship between the ISP and the end user — and only services accessed via a PC are included in these figures.

ISP Access Revenue

ISP access revenue refers to an ISP's combined total revenue paid by businesses (including other organizations) and consumers for access to the Internet. Access revenue includes subscriptions, sums attributable to Internet access provision as part of bundled services (such as a managed data service), and retained shares of call and traffic charges. Only retail (end-user) access via a PC is included in these figures.

- **ISP access revenue (business environment)** — This category refers to an ISP's revenue paid by businesses (including other organizations) for access to the Internet. Access revenue includes subscriptions, sums attributable to Internet access provision as part of bundled services (such as a managed data service), and retained shares of call and traffic charges. Only retail (end user) access via a PC is covered.
- **ISP access revenue (consumer environment)** — This category refers to an ISP's total revenue paid by consumers for access to the Internet. Access revenue includes subscriptions and retained shares of call and traffic charges. Only retail (end-user) access via a PC is covered.

Retail Web-Hosting Revenue

The revenue is that generated by the Internet data center or ISP (either carrier-owned or carrier-independent) for the provision of retail hosting services. In the case of Internet data center providers, all revenue includes basic services such as physical security of the site, customer access to the computer server, environmental controls (heat, light, humidity and so on) and provision of a reliable power supply source (though not necessarily the actual cost of the power). It does not include the capital cost of any server hardware or software. For Internet data center providers and ISPs, revenue does not include any charges made by a network provider for connection, rental, or call charges to the Internet or other network. Revenue also excludes that generated by any value-added services, such as Web design, consulting, security services and so on. Hosting services are subdivided into the following three segments:

- **Simple / shared Web hosting** — This revenue is composed of two separate revenue streams:
 - Revenue is that accrued by the Internet data center provider for the basic rental of the server disk space, plus minimal management costs necessary to keep the server up and running. This service is defined for the Internet data center market as including retail end-user customers leasing part of one or more servers on a shared basis with other users.
 - Revenue is that accrued by ISPs for Web hosting paid by businesses (including other organizations) and consumers. Only ISPs that provide Internet access as well as Web hosting are included in these figures. Only retail (end-user) Web-hosting services accessed via a PC are covered.

- **Managed / dedicated Web hosting** — This category refers to the leasing of one or more servers dedicated to a single retail end-user customer. Revenue is that accrued by the Internet data center provider for the basic rental of the server(s), plus minimal management costs necessary to keep the server(s) up and running.
- **Internet server colocation** — This refers to the provision of physical space within a facility for an enterprise or other end-user customer to install and maintain its own computer server(s). Revenue is that accrued by the Internet data center provider for the basic rental of the space occupied by the customer's computer server(s).

Value-Added IP Services

The following categories refer to revenue only:

- **Fax-over-IP revenue** — End-user revenue from a commercial tariffed service that transports fax traffic by translating T.38-based images into IP packets
- **Unified-messaging-over-IP revenue** — End-user revenue from a commercial tariffed service that enables a customer's IP-based access to any combination of fixed voice, mobile voice, e-mail, fax or any other network-based mailbox service. Includes subscription and call-based revenue.
- **IP multicast revenue** — End-user revenue from a commercial tariffed service that provides an IP-based point-to-multipoint one-way (unidirectional one-to-many) distribution of voice, video or data
- **ISP other revenue** — This category includes an ISP's revenue from all retail (end-user) operations, except access and Web hosting. This revenue includes money for design and consulting services, advertising services and retained shares of e-commerce transactions. Only ISPs that provide Internet access as well as other services to consumers or businesses are covered. Only services accessed via a PC are included in these figures.

Total Internet/Public IP Retail Revenue

Total Internet / public IP retail revenue is the sum of ISP access, retail Web hosting and value-added IP services revenue.

Wholesale/Carrier Services in Western Europe

The following definitions reflect those that are in the wholesale / carrier services section of the Gartner Dataquest Market Statistics report "Fixed Public Network Services: Western Europe, 2000-2006" (TCPM-EU-MS-0182).

Voice Wholesale/Carrier Services

- **Circuit-switched revenue, national** — Carrier-to-carrier revenue, including interconnect payments and other services such as number translation, free-phone and voice-in-a-box solutions
- **Circuit-switched revenue, international** — Carrier-to-carrier revenue, including settlement payments paid to carriers in that country for termination of international calls and for international transit services
- **VoIP revenue** — Carrier-to-carrier revenue derived from VoIP carriers or the VoIP divisions of other operators selling VoIP minutes (by route) to other carriers, operators or ISPs. This may be to expand the coverage or products offered by a service provider or be a straightforward wholesale transaction on existing routes

Data Wholesale/Carrier Services

- **Leased line/private line** — This category refers to revenue from leased lines/private lines (also known as dedicated access or point-to-point or multipoint circuits) that are provided by one carrier to another carrier, either to be used in the customer carriers' own network or resold to end-user customers
- **IP transit** — Service provided by a wholesale carrier to a customer who has an international, regional or global requirement for bulk IP connectivity to multiple Internet NAPs and peering points. Traffic is routed on the wholesale carrier's backbone in a managed way under the SLAs and SLGs agreed to in the contract. Typical customers are ISPs, alternative operators or multinational corporations. IP transit revenue does not include the revenue generated from the access bandwidth used to transport the packets between the customers' site(s) and the IP transit network port.
- **Content distribution/caching** — This refers to service provided to a customer that has an international, regional or global requirement for content distribution/managed caching to multiple ISPs on the Global Open Internet. The IP traffic, which is often more delay-sensitive than that transported by IP transit, is routed in a managed way under the SLAs and SLGs agreed to in the contract between the service provider and the customer. Operations and processes covered by these contracts include Web site mirroring, smart caching, content adaptation and dynamic content updates. Typical customers are multinational corporations, software vendors and global content producers. Content distribution/caching revenue does not include the revenue generated from the access bandwidth used to transport the packets between the customer's site(s) and the service provider's network access port.
- **IP multicast** — The revenue that is generated by carriers providing wholesale multicast services where IP multicast is a commercial tariffed service that provides an IP-based point-to-multipoint one-way (unidirectional one-to-many) distribution of voice, video or data

Hosting Services

Hosting services revenue is the revenue generated by the Internet data center provider (either carrier-owned or carrier-independent) for the provision of wholesale hosting services. All revenue includes basic services such as physical security of the site, access for the customer to the computer server, environmental controls (heat, light, humidity and so on) and provision of a reliable power supply source (though not necessarily the actual cost of the power). It does not include any charges made by a network provider for connection, rental, or call charges to the Internet or other network. It does not include the capital cost of any server hardware or software. It does not include any value-added services such as Web design, consulting, security services and so on. Hosting services is subdivided into the following three segments:

- **Managed/dedicated Web hosting** — This is the leasing of one or more servers dedicated to a single carrier, ISP or ASP. Revenue is that accrued by the Internet data center provider for the basic rental of the server(s), plus minimal management costs necessary to keep the server(s) up and running.
- **Simple/shared Web hosting** — This is multiple carriers, ISPs or ASPs leasing one or more servers on a shared basis. Revenue is that accrued by the Internet data center provider for the basic rental of the server disk space, plus minimal management costs necessary to keep the server up and running.
- **Internet server colocation** — The provision of physical space within a facility for the carrier, ISP or ASP to install and maintain their own computer server(s). Revenue is that accrued by the Internet data center provider for the basic rental of the space occupied by the customer's computer server(s).

Chapter 7

Worldwide Geographic Regional Definitions

The following regional hierarchy and definitions are used for all Gartner Dataquest's geographic segmentation. Not all product categories and Gartner Dataquest services have the entire segmentation. Some may have a greater level, and some may have less.

Asia/Pacific

The Asia / Pacific region includes Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, Singapore, South Korea, Taiwan and Thailand.

Rest of Asia/Pacific

The Rest of Asia / Pacific region includes American Samoa, Ashmore and Cartier Islands, Baker Island, Bangladesh, Bhutan, Bouvet Island, Brunei, Cambodia, Christmas Island, Cocos (Keeling) Islands, Cook Islands, Coral Sea Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Kiribati, Laos, Macau, Maldives, Marshall Islands, Midway Islands, Mongolia, Myanmar (Burma), Nauru, Nepal, New Caledonia, Niue, Norfolk Island, Northern Mariana Islands, North Korea, Pakistan, Palau, Palmyra Atoll, Papua New Guinea, Paracel Islands, Philippines, Pitcairn Islands, Solomon Islands, Spratly Islands, Sri Lanka, Tokelau, Tonga, Tuvalu, Vanuatu, Vietnam, Wake Island, Wallis and Futuna, and Western Samoa.

Western Europe

The Western Europe region consists of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Rest of Western Europe

The Rest of Western Europe region includes Andorra, Cyprus, Faroe Islands, Gibraltar, Greenland, Guernsey, Iceland, Isle of Man, Jersey, Liechtenstein, Luxembourg, Malta, Monaco, San Marino and Svalbard.

Eastern Europe

The Eastern Europe region consists of the Czech Republic, Hungary, Poland, Russia and Slovakia.

Rest of Eastern Europe

The Rest of Eastern Europe region includes Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Romania, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan and Yugoslavia (Serbia and Montenegro).

Latin America

The Latin America region consists of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela.

Rest of Latin America

The Rest of Latin America region includes Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Cayman Islands, Clipperton Island, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Falkland Islands (Islas Malvinas), French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Montserrat, Navassa Island, Netherlands Antilles, Nicaragua, Panama, Paraguay, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Tortola (British Virgin Islands), Trinidad and Tobago, Turks and Caicos Islands, Uruguay, and Virgin Islands (St. John, St. Croix and St. Thomas).

Middle East/Africa

The Middle East and Africa region consists of Algeria, Egypt, Iran, Israel, Morocco, South Africa and Turkey.

Rest of Middle East/Africa

The Rest of Middle East / Africa region includes Afghanistan, Angola, Bahrain, Bassas da India, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Europa Island, Gabon, Gambia, Ghana, Glorioso Islands, Guinea, Guinea-Bissau, Iraq, Jordan, Juan de Nova Island, Kenya, Kuwait, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mayotte, Mozambique, Namibia, Niger, Nigeria, Oman, Qatar, Reunion, Rwanda, Saint Helena, Sao Tome and Principe, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Somalia, Sudan, Swaziland, Syria, Tanzania, Togo, Tromelin Island, Tunisia, Uganda, United Arab Emirates, Western Sahara, Yemen, Zaire, Zambia and Zimbabwe.

North America

The North America region consists of the United States and Canada.

Chapter 8

Research Metrics

The following describes the research metrics Gartner Dataquest uses for reporting market revenue, market size, and market share:

- **Compound annual growth rate (CAGR)** — The annualized rate of revenue or unit shipment growth between two given years, assuming growth takes place at an exponentially compounded rate. The CAGR between years X and Z, where $Z - X = N$ is the number of years between the two given years, is calculated as follows:

$$\text{CAGR Year X to Year Z} = \left[\frac{\text{Value in Year Z}}{\text{Value in Year X}} \right]^{(1/N)} - 1$$

For example, the CAGR for 2001 to 2006 is calculated as follows:

$$\text{CAGR 2001 to 2006} = \left[\frac{\text{Value in 2006}}{\text{Value in 2001}} \right]^{(1/5)} - 1$$

- **End user** — This is the final user of a public network service or the final purchaser of a public network service or a managed network. The final purchaser may or may not be the actual end user, but the outflow of the product stops at the end user.
- **Carrier** — This is any company that provides telecommunications services to either end users or to other carriers (including resellers).
- **Revenue** — This is the gross sales generated by a manufacturer, vendor or carrier/service provider, measured in unit currency.
- **Installed base** — This is the total number of lines, ports, circuits or channels in active use.
- **Retirements** — This is the total number of units that are removed from active use at a specified point in time.

Chapter 9

Exchange Rates

Gartner Dataquest makes use of currency exchange rate data provided by WEFA to make its calculations. Country-level data, compiled in local currency, are converted to U.S. dollars in that fashion. Thus, it is entirely possible for the market growth rate of a given national market to vary when expressed in local currency compared with U.S. dollars. More information can be obtained through examination of the relevant regional and country-level reports. Table 9-1 provides details of exchange rates applied.

Table 9-1
Prevailing Historical Exchange Rates (Foreign Currency per U.S. Dollar)

	2000	2001	2002	Foreign Currency Appreciation vs. U.S. Dollar (%) 2000-2001
North America				
Canada (Dollar)	1.49	1.55	1.58	-1.89
Latin America				
Argentina (Peso)	1	1	1	0
Brazil (Real)	1.83	2.35	2.36	-0.44
Chile (Peso)	539.56	635.41	666.9	-4.72
Colombia (Peso)	2,090.06	2,300.68	2,304.58	-0.17
Mexico (Peso)	9.46	9.34	9.16	2.01
Peru (New Sole)	3.49	3.51	3.44	2.08
Venezuela (Bolívar)	680.47	724.34	753.64	-3.89
Western Europe				
Austria (Schilling)	14.94	15.38	NA	NA
Belgium (Franc)	43.81	45.08	NA	NA
Denmark (Krone)	8.09	8.33	8.35	-0.28
Economic and Monetary Union (ECU/Euro)	1.09	1.12	1.12	-0.41
Finland (Markka)	6.46	6.64	NA	NA
France (Franc)	7.12	7.33	NA	NA
Germany (Mark)	2.12	2.19	NA	NA
Greece (Drachma)	365.86	380.77	NA	NA
Iceland (Krona)	78.88	97.74	104.48	-6.45
Ireland (Punt)	0.86	0.88	NA	NA
Italy (Lira)	2,102.77	2,163.67	NA	NA
Netherlands (Guilder)	2.39	2.46	NA	NA
Norway (Krone)	8.81	8.99	8.97	0.24
Portugal (Escudo)	217.72	224.03	NA	NA
Spain (Peseta)	180.69	185.93	NA	NA
Sweden (Krona)	9.18	10.34	10.58	-2.19
Switzerland (Franc)	1.69	1.69	1.66	1.9
United Kingdom (Pound)	0.66	0.69	0.69	0.11

Table 9-1 (Continued)
Prevailing Historical Exchange Rates (Foreign Currency per U.S. Dollar)

	2000	2001	2002	Foreign Currency Appreciation vs. U.S. Dollar (%) 2000-2001
Central and Eastern Europe				
Bulgaria (Lev)	2.1	2.18	2.18	-0.1
Czech Republic (Koruna)	38.63	38.02	36.34	4.62
Hungary (Forint)	282.16	286.46	276.98	3.42
Poland (Zloty)	4.34	4.09	4.02	1.88
Romania (Lev)	21,422.64	28,900.57	31,319.68	-7.72
Russia (Ruble)	27.97	29.09	30.2	-3.66
Slovakia (Koruna)	46.21	48.33	48.29	0.09
Ukraine (Hryvna)	5.48	5.38	5.36	0.41
Japan				
Japan (Yen)	107.82	121.52	127.59	-4.76
Asia/Pacific				
Australia (Dollar)	1.73	1.94	1.95	-0.53
China (Yuan)	8.28	8.28	8.28	0.01
Hong Kong (Dollar)	7.79	7.8	7.8	0.01
India (Rupee)	45	47.23	47.93	-1.47
Indonesia (Rupiah)	8,373.70	10,189.44	10,273.11	-0.81
Malaysia (Ringgit)	3.8	3.8	3.8	0
New Zealand (Dollar)	2.2	2.38	2.41	-1
Philippines (Peso)	44.26	51.01	51.77	-1.49
Singapore (Dollar)	1.72	1.79	1.84	-2.48
South Korea (Won)	1,131.38	1,291.67	1,292.29	-0.05
Sri Lanka (Rupee)	76.98	89.62	93.19	-3.84
Taiwan (Dollar)	31.27	33.83	34.68	-2.46
Thailand (Baht)	40.22	44.51	43.95	1.26
Rest of World				
Egypt (Pound)	3.53	4.04	4.42	-8.76
Israel (New Shekel)	4.08	4.21	4.28	-1.61
South Africa (Rand)	6.95	8.63	11.68	-26.13
Turkey (Lira)	624,177.48	1,204,238.09	1,455,568.42	-17.27

Notes: Effective 1 January 2002, euro became common currency of Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain. ECU converted to euro on 1 January 1999 at parity. Exchange rates for reported euro participants fixed as follows: Austria, 13.7603 schillings/euro; Belgium, 40.3399 francs/euro; Finland, 5.94573 markka/euro; France, 6.55957 francs/euro; Germany, 1.95583 marks/euro; Ireland, 0.787564 pints/euro; Italy, 1,936.27 lire/euro; Netherlands, 2.20371 guilder/euro; Portugal, 200.482 escudos/euro; and Spain, 166.386 pesetas/euro. Greece converted to euro on 1 January 2001 at 340.75 drachmas/euro. Bulgarian lev revalued in July 1999; 1 revalued lev equal to 1,000 original leva.

Source: Gartner Dataquest (January 2003)