

DLC Market

**DIGITAL LOOP CARRIER
MARKET STRATEGIES AND
FORECASTS, 2001-2006**



Picture by Meredith Green

Streaming Data, Voice, and Video

WinterGreen Research, Inc.
Lexington, Massachusetts

www.wintergreenresearch.com

CHECK OUT THESE KEY TOPICS

MARKET SHIFT WILL BRING UNITS INTO NEIGHBORHOOD NODES

DLC Market Strategies

DLC Market Positioning

DLC Market Growth Opportunities

Solutions for Voice, Video, and Data Services

DLC MARKET FORECASTS

WORLDWIDE MARKET SHARES

INTEGRATED PLATFORMS

MULTI-SERVICE DEPLOYMENT

AND A PATH TO PACKET BASED NETWORKS

xDSL, ADSL, SDSL DRIVE APPLICATIONS

OPTIMIZE INVESTMENT IN CIRCUIT SWITCHES

Integration Broker Markets Shares

DLC Cross Platform Market Shares

DIGITAL LOOP CARRIERS ARE CENTRAL TO REPLACEMENT OF CARRIER SWITCHES

YOU MUST HAVE THIS STUDY

DIGITAL LOOP CARRIER NODE ARCHITECTURE

DIGITAL LOOP CARRIERS GIVE SERVICE PROVIDERS A PRESENCE IN THE NETWORK NODES. WHILE MANY SYSTEMS ARE GOING INTO THE CENTRAL OFFICE, A MARKET SHIFT WILL MEAN THAT MORE UNITS GO INTO NEIGHBORHOOD NODES.

GROWING MARKET DEMAND FOR HIGH BANDWIDTH SERVICES IS FORCING TELECOM PROVIDERS TO REEVALUATE AND CHANGE NETWORK-PLANNING MODELS AND CREATE NEW ONES. NETWORK PLANNERS AND ENGINEERS RESPONSIBLE FOR THIS EMERGING NETWORK FACE A COMPLEX PROBLEM: HOW TO EFFECTIVELY IMPLEMENT A NETWORK THAT OPTIMIZES DIVERSE SIGNALS FROM VOICE, VIDEO, AND DATA SERVICES. DIGITAL LOOP CARRIERS PROMISE TO PROVIDE A SIGNIFICANT TECHNICAL SOLUTION.

OVERLAY NETWORKS AND DISCRETE NETWORK ELEMENTS ARE BEING REPLACED WITH INTEGRATED PLATFORMS. EXISTING INVESTMENT NEEDS TO BE PROTECTED WHILE MAINTAINING THE DESIGN REQUIREMENTS FOR A PACKET, DIGITAL NETWORK. AN INTEGRATED MULTI-SERVICE ACCESS PLATFORM BASED ON A DIGITAL LOOP CARRIER PROVIDES A FOUNDATION FOR MULTI-SERVICE DEPLOYMENT, WITH AN EVOLUTIONARY PATH TO PACKET BASED NETWORKS.

MARKET GROWTH

DIGITAL LOOP CARRIERS PROMISE TO HAVE A STRONG MARKET BECAUSE THEY GIVE THE RBOCs A WAY TO OPTIMIZE EXISTING INVESTMENT IN CIRCUIT SWITCHES, EXTENDING THE CURRENT SWITCH CAPABILITY WITH INCREASED CAPACITY TO MANAGE BROADBAND.

CLECS AND CABLE PROVIDERS USE DLCs TO ACHIEVE A POINT OF PRESENCE IN THE LAST MILE OF THE VOICE COMMUNICATIONS NETWORK. WITH THE CONVERGENCE OF VOICE AND DATA, THE POINT OF PRESENCE IN THE NETWORK MUST PROVIDE CONNECTIVITY TO THE CABLE TV NETWORKS, THE VOICE NETWORKS, AUDIO STREAMING, AND TO THE INTERNET.

THE ABILITY TO CREATE A POP OUT IN THE LOCAL LOOP MEANS THAT MULTIPLE CARRIERS CAN SERVE THE LAST MILE CUSTOMERS, INTRODUCING REAL COMPETITION INTO THE MARKETS. FOR THE MOMENT, INTERNET CONNECTIVITY VIA xDSL, PARTICULARLY ADSL AND SDSL ARE THE DRIVING APPLICATIONS FOR DIGITAL LOOP CARRIERS.

DLC MARKET DRIVING FORCES

DIGITAL LOOP CARRIERS PROMISE TO REPRESENT AN INCREASINGLY SIGNIFICANT COMPONENT OF ACCESS IN THE LOCAL LOOP. DLC EQUIPMENT MARKETS ARE REACTING TO DEMAND FOR COMPETITIVE SERVICES PROVIDERS TO HAVE xDSL ACCESS IN NEIGHBORHOOD NODES.

ORDER FORM

Return To: WinterGreen Research, Inc.
6 Raymond Street
Lexington, MA 02421 USA
Phone: (781) 863-5078 --- Fax: (781) 863-1235

PLEASE ENTER MY ORDER FOR:

DIGITAL LOOP CARRIER (DLC) MARKET STRATEGIES AND FORECASTS, 2001-2006

-ALL REPORTS ARE AVAILABLE IN EITHER PRINT OR PDF -

____ ENCLOSED IS MY CHECK FOR \$2800
____ PLEASE BILL MY COMPANY USING P.O. NUMBER _____
____ PLEASE CHARGE MY MASTERCARD/VISA/AMERICAN EXPRESS--CARD NUMBER _____ EXP. DATE _____
____ ADDITIONAL COPIES, @ \$375 (EXTRA COPY PRICE IN EFFECT ONLY WITH INITIAL ORDER)

SIGNATURE X _____ DATE _____

NAME _____ TITLE _____

COMPANY _____ DIVISION _____

ADDRESS _____ CITY _____ STATE _____
ZIP _____

TELEPHONE _____
FAX _____

E-MAIL _____

PLEASE NOTE: RESIDENTS OF MASSACHUSETTS AND CONNECTICUT MUST INCLUDE APPROPRIATE SALES TAX
SUBSCRIBERS OUTSIDE THE UNITED STATES MUST PROVIDE PREPAYMENT IN U.S. FUNDS

REPORT METHODOLOGY

THIS IS THE FORTY FIRST REPORT IN A SERIES OF MARKET RESEARCH REPORTS THAT PROVIDE FORECASTS IN COMMUNICATIONS, TELECOMMUNICATIONS, THE INTERNET, COMPUTER, SOFTWARE, AND TELEPHONE EQUIPMENT. THE PROJECT LEADERS TAKE DIRECT RESPONSIBILITY FOR WRITING AND PREPARING EACH REPORT. THEY HAVE SIGNIFICANT EXPERIENCE PREPARING INDUSTRY STUDIES. FORECASTS ARE BASED ON PRIMARY RESEARCH AND PROPRIETARY DATA BASES. FORECASTS REFLECT ANALYSIS OF THE MARKET TRENDS IN THE SEGMENT AND RELATED SEGMENTS. UNIT AND DOLLAR SHIPMENTS ARE ANALYZED THROUGH CONSIDERATION OF DOLLAR VOLUME OF EACH MARKET PARTICIPATION IN THE SEGMENT. MARKET SHARE ANALYSIS INCLUDES CONVERSATIONS WITH MARKETING DIRECTORS, DISTRIBUTORS, LEADING MARKET PARTICIPANTS, AND COMPANIES SEEKING TO DEVELOP MEASURABLE MARKET SHARE. OVER 200 IN DEPTH INTERVIEWS ARE CONDUCTED FOR EACH REPORT WITH A BROAD RANGE OF KEY PARTICIPANTS AND OPINION LEADERS IN THE MARKET SEGMENT.

Companies Profiled

ADC Telecommunications

Advanced Fibre

Communications (AFC)

Accelerated Networks

Alcatel

Cisco Systems

Copper Mountain Networks

Efficient Networks

Ericsson

Infinitec

Lucent

Lucent Acquisitions

Marconi / Reltec

Next Level Communications

Nortel Networks

Redback

Scientific Atlanta

Tellabs

EXECUTIVE SUMMARY DIGITAL LOOP CARRIER MARKETS

Market Condition

Telecom Markets

Telecommunications Industry Shifts

Point Of Presence

Evolution of the Last Mile

Distinct Access Systems

Combined Voice And Data

Reduced Complexity

Broadband Implementation By Incumbent Service

Providers

Upgrades to Existing DLCs

Integrated Multimedia Services

Integrated Video Services

Digital Loop Carrier product Positioning

RBOC Use of Digital Loop Carriers and XDSL

Bundled Services

DLC Functions

Design Solutions

Coaxial Cable Internet Competition

Copper Loop Conditioning

DIGITAL LOOP CARRIER MARKET FORECASTS

DLC Market Driving Forces
 Digital Loop Carrier Competitive Forces
 Digital Loop Carrier Customer Demands
 Digital Loop Carriers Market Shares
 Pricing
 DLC Pricing Variables
 Alcatel Pricing
 Lucent Pricing
 AFC pricing
 Digital Loop Carrier Market Forecasts
 Penetration Analysis
 Large Digital Loop Carriers
 Small Digital Loop Carriers
 digital loop carrier forecast
 replacement market
 Regional Analysis
 Digital Loop Carrier Market Partnering Issues
 Voice and Data Services Market
 Market Segmentation
 Business Markets
 Residential Markets
 Potential Customers / Target Market

Small Telco Target Markets
 The Internet And Digital Loop Carriers
 As A Market Force In Local Access
 Global Economy
 Intensifying Competition On A Global Scale
 Business Forces Driving Change
 Pace Of Technological Change
 Response To Change
 Circuit Networks Vs Packet Networks
 Convergence Of Voice And Data
 End-To-End Internet Solutions
 Rapid, Flexible Deployments
 E-Services
 E-Services Partnering
 Internet
 Web Based Supply Chain Exchanges
 Exchange Infrastructure Functionality
 Internet Explosion
 Internet Users
 Need For Digital Loop Carriers
 Web Lifestyle
 Time To Market Issue
 ATM Packet Networks

DIGITAL LOOP CARRIER PRODUCTS

Overview
 Multiservice Digital Loop Carriers
 Alcatel
 Integration of DSL into Litespan
 Higher Density On Voice And DSL
 Derived Voice over DSL
 NGDLC to NWDLC
 Alcatel Litespan Positioning
 Nortel AccessNode
 Nortel AccessNode Key Benefits
 Lucent AnyMedia® Access System
 Lucent Technologies AnyMedia Benefits
 COM101 Circuit Pack
 The Fibre-to-the-Curb, Building and Home
 Full Service Access Network
 AnyMedia Access System Application Packs
 Lucent AnyMedia
 Lucent SLC LineReach
 Lucent DDM-2000 FiberReach Narrowband Shelf
 Lucent / Copper Mountain Networks
 Lucent DLC Product Strategy
 Lucent AnyMedia Access System
 Advanced Fibre Communications (AFC)
 Products
 UMC 1000

Custom ASIC
 The UMC1000 Multi-Service Access Platform
 Design Philosophy
 AFC's ONX1012® Optical Network Access
 System
 UMC 1000 System Expansion
 UMC 1000 Remote Subscriber Terminal (RST)
 UMC 1000 Media Fiber Optic Transport
 Marconi / ReITec
 Fibex / Cisco
 Redback Networks
 Redback Subscriber Support System
 ASICS
 Redback SmartEdge Family
 ADC and Redback Networks
 SONET and IP Transport Solutions for
 Cable Market
 Next Level Communications
 Flexible-Integrated System.
 Broadband Digital Terminal
 Universal Service Access Multiplexer
 Broadband Network Unit.
 Accelerated Networks Switched VoDSL
 Multiservice Broadband Access
 Infinetec Inteleflex DLC System

Redback Subscriber Management System 10000
 Parallel Switch Fabric
 Direct Processing Architecture
 Carrier-Class Redundancy For Mission-Critical Networks
 Multiple Service Aggregation

Multiple Aggregation for the Mega-POP
 DLCCNetwork Management Systems
 Nortel Networks DLC Open Network Management System
 Next Level DLC Network Management Systems
 Alcatel Access Management System

DIGITAL LOOP CARRIER TECHNOLOGY

Project Pronto
 SBC Advanced Data Services
 SBC e-Tone
 SBC's DSL Service
 SBC Fiber
 SBC DSL
 SBC e-tone IBM and E*Trade Strategic Alliance
 SBC Aggressively Migrates To
 Converged Voice, Data, Video Network
 SBC Voice Trunking Over ATM

End-To-End Solutions
 Standards-Based, Open Architecture
 International NGDLC System
 Security
 Power Considerations
 Advanced Application Specific Integrated Circuits Architecture
 System Design And Integration
 Dense Wavelength Division Multiplexing Technology
 Sonet
 Standards-Based Architecture
 Software And Protocol Stacks
 Element Management System
 Equipment Issues / Digitizing Voice Signals
 Enclosures Outside Plant
 Indoor Cabinets

Qwest
 Qwest All-Optical Nationwide Network
 Switch Interfaces Include GR-303
 V5.2
 xDSL Infrastructure Issues
 Architecture Reduces Cost And Complexity

DLC COMPANY PROFILES

ADC Telecommunications
 Revenue
 ADC and PairGain Technologies
 Pairgain
 Advanced Fibre Communications (AFC)
 Advanced Fibre Communications (AFC)
 Advanced Fibre Communications /
 Marconi Communications
 Distribution
 Advanced Fibre Communications DLC Network
 Access System
 Platforms
 Global Presence
 Advanced Fibre Communications Revenues
 Industry Alliances
 Markets And Customers
 Revenue
 Accelerated Networks
 Alcatel
 Alcatel Acquisitions
 Alcatel
 Alcatel Organization / Internet Division
 Cisco Systems
 Cisco Sales Overview
 Copper Mountain Networks
 Efficient Networks
 Ericsson

Flexible Access Products
 Ericsson Makes Strategic Investment In
 Sarai de.Com
 Acquisitions And Investments
 Infinitec
 Inteleflex™ A New Generation Digital Loop Carrier
 Lucent
 Company Organization
 Outsourcing Portfolio
 Lucent Customer Base
 Lucent Acquisitions
 Acquisition Of Excel Switching
 Outsourcing Portfolio Expanded With INS
 Ascend Business Segments
 Nexabit Networks
 Spring Tide
 Lucent Divestiture Of Enterprise And
 Microelectronics
 Lucent AnyMedia Products
 Marconi / Reltec
 Global Presence
 Marconi
 Next Level Communications
 Next Level Communications From General
 Instrument
 Outsource Manufacturing
 Products

Nortel Networks
Strategies
Lines Of Business
Redback
Products
Differentiation

Customers
Distribution And Partners
Scientific Atlanta
Tellabs
Tellabs Advanced Switch Interfaces

DLC COMPANY STRATEGIC ALLIANCES AND STRATEGIC POSITIONING

Alcatel Technology Agreements With ADC And Adtran
Lucent Anymedia Access System
AFC EMAX Applications
AFC Multi-Year Supplier Contract
With France Telecom For Access
Equipment
Next Level Communications / Verizon / GTE

Next Level Communications / Independent Telephone Companies
VERIZON / ALCATEL'S ADSL
Cisco
Fujitsu / AFC
DLC Support Services
Preferred Vendor Strategy
Phased Expansion Of A Network

MANY OF THESE KEY TOPICS HAVE PHENOMENAL SUBCATEGORIES

LIST OF TABLES AND FIGURES

Market Forecasts 2001-2006

Market Shares 2000

Telecommunications Industry Shifts
Significant Technological And Architectural Advances
Market Environment Driving Increased Use of DLCs
Digital Loop Carrier Product Positioning
DLC Market Driving Forces
Principal Competitive Factors In Digital Loop Carrier Market
Competitive Product Positioning For Digital Loop Carrier Markets
Digital Loop Carrier Market Success Factors
Digital Loop Carrier Customer Demands
Digital Loop Carrier Market Positioning
DLC Competitors
Worldwide Digital Loop Carrier Market Shares, 2000
Digital Loop Carrier (DLC) Market Penetration
Unit Shipment Analysis, United States, 2000-2006
Digital Loop Carrier (DLC) Data Line Size Market Penetration
2000-2006
Large Digital Loop Carrier Market Forecasts, 2000-2006
Large Digital Loop Carrier Large System
Shipments, Units and Dollars, 2000-2006
Small and Mid Size Digital Loop Carrier Market Forecasts, 2000-2006
Digital Loop Carrier Small and Mid Size System
Shipments, Units and Dollars, 2000-2006
Digital Loop Carrier Market Forecasts, 2000-2006
Digital Loop Carrier Market Dollar Shipment Analysis,
United States, 2000-2006
Worldwide Digital Loop Carrier Regional Market Shares, 2000
Worldwide Digital Loop Carrier Regional Market Shares, 2006

LIST OF TABLES AND FIGURES (CONTINUED)

Market Forecasts 2001-2006

Market Shares 2000

Regional Market Forecasts, 2000-2006
Digital Loop Carrier Market Partnering Issues
Internet Access Services Market Forecasts, 2000-2006
Market Forces For Global Economy
Factors Impacting The Level Of Price And Product Competition
Response To Competition
Business Forces Driving Change
Digital Loop Carrier Provider Response To Change
E-Services Partnering Strategy
Internet Market Driving Forces
Web Based Supply Chain Exchanges
Major Factors Driving Local Access Value Added Services Markets
Key Strategies Of The Internet Digital Loop Carrier Providers
ATM Market Impact
Attributes of a DLC System
Nortel AccessNode Key Benefits
Nortel DLC Service Adaptive Access Technology
Nortel Networks Universal Edge portfolio
Nortel Integrated DLC Services Supported
Lucent Technologies AnyMedia Benefits
Lucent AnyMedia Access System Building Blocks.
Lucent Application Pack Services
Unique Design Features of UMC Terminals
Next Level Communications Network Elements
Redback Subscriber Management System I/O modules Supported
SMS Carrier-Class Mission-Critical Network Features
Redback Subscriber Management System
SMS 10000 Features and Functions
Redback Subscriber Functions
Redback Subscriber Management Protocols
Redback Subscriber Management System Security
Redback Subscriber Management
System Accounting and Network Management
Redback Subscriber Management System Advanced Features
Software License Configurations
SBC Broadband Strategies
SBC Broadband Strategic Alliances
SBC Corporate Strategy for Data
SBC Broadband Applications
SBC Advanced Broadband-Powered Services
SBC IBM, PeopleSoft, and E*Trade Strategic Alliance
V5.2 Benefits And Capabilities
Advanced Fiber Communications EMAXT

Equipment Maximization System
Copper Line Direct Connect Vs. Shared
Cable Coax Technology And Issues
MDLC Power Issues
Application Specific Integrated Circuit Categories

LIST OF TABLES AND FIGURES (CONTINUED)

Market Forecasts 2000-2005

Market Shares 1999

Carriers Issues for Deploying Fiber Optic
Communication Standards
Types of Telecommunications Platform Software
Element Management System Solutions
DLC Equipment Issues Regarding
Digitizing Analog Voice Signals
Multiplexing Equipment Issues
T-1 Transmission Defined
T-1 vs. DS-1
T-1 Evolution
Fractional T-1
SONET
DLC Competitors
Advanced Fibre Communications Strengths and
Challenges in DSL Market
AFC Strategic Technology Alliances
Alcatel Strengths And Challenges in DLC Market
Ericsson Portfolio
Lucent Acquisitions
Selected RelTec Customers
Redback Key Customers
Lucent DLC Customers
Principal Functions Of A Cisco Access Network
DLC Strategic Positioning
DLC Platform Positioning

ABOUT THE COMPANY

WinterGreen Research, founded in 1985, provides strategic market assessments in telecommunications, communications equipment, health care, and advanced computer technology. Industry reports focus on opportunities that will expand existing markets or develop major new markets. The reports assess new product and service positioning strategies, new and evolving technologies, and technological impact on products, services, and markets. Market shares are provided.

Reports concentrate on analysis of the overall size of budgets for equipment as well as market trends. Leading market participants are profiled, and their marketing strategies, acquisitions, and strategic alliances are discussed. The

principals of WinterGreen Research have been involved in analysis and forecasting of international business opportunities in telecommunications and advanced computer technology markets for over 30 years.

ABOUT THE PRINCIPAL AUTHORS

Ellen T. Curtiss, Technical Director, co-founder of WinterGreen Research, conducts strategic and market assessments in technology-based industries. Previously she was a member of the staff of Arthur D. Little, Inc., for 23 years, most recently as Vice President of Arthur D. Little Decision Resources, specializing in strategic planning and market development services. She is a graduate of Boston University and the Program for Management Development at Harvard Graduate School of Business Administration. She is the author of recent studies on worldwide telecommunications markets and the Top Ten Telecommunications market analysis and forecasts.

Susan Eustis, President, co-founder of WinterGreen Research, has done research in communications and computer markets and applications. She holds several patents in microcomputing and parallel processing. She has patents on the first electronic voting machine, and has patent applications for new voting machines, new multi-processors, the operating system for the Internet, and has developed an new n-dimensional mathematics. She is the author of recent studies of the Regional Bell Operating Companies' marketing strategies, Internet equipment, a study of Internet Equipment, Worldwide Telecommunications Equipment, Top Ten Telecommunications, Digital Loop Carrier, Web Hosting, and Application Integration markets. Ms. Eustis is a graduate of Barnard College.

ORDER FORM

Return To: WinterGreen Research, Inc.
6 Raymond Street
Lexington, MA 02421 USA

Phone: (781) 863-5078 --- Fax: (781) 863-1235

PLEASE ENTER MY ORDER FOR:

DIGITAL LOOP CARRIERS (DLC) MARKET STRATEGIES AND FORECASTS, 2001-2006

-ALL REPORTS ARE AVAILABLE IN EITHER PRINT OR PDF -

___ ENCLOSED IS MY CHECK FOR \$2800

___ PLEASE BILL MY COMPANY USING P.O. NUMBER _____

___ PLEASE CHARGE MY MASTERCARD/VISA/AMERICAN EXPRESS--CARD NUMBER _____ EXP. DATE _____

___ ADDITIONAL COPIES, @ \$375 (EXTRA COPY PRICE IN EFFECT ONLY WITH INITIAL ORDER)

SIGNATURE **X** _____ DATE _____

NAME _____ TITLE _____

COMPANY _____ DIVISION _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

TELEPHONE _____ FAX _____

E-MAIL _____

PLEASE NOTE: RESIDENTS OF MASSACHUSETTS AND CONNECTICUT MUST INCLUDE APPROPRIATE SALES TAX
SUBSCRIBERS OUTSIDE THE UNITED STATES MUST PROVIDE PREPAYMENT IN U.S. FUNDS

REPORT # S80310009519 300 PAGES 125+ TABLES AND FIGURES 2000 \$2,800