



**ECI Telecom 1Net Wireless Backhaul  
Solution:  
Finding YOUR Right Path for Optimized  
Packet-based Backhaul**



Your Partner for Growth

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## Introduction

A backhaul network is a critical factor for any wireless network's future scalability and profitability. A properly optimized backhaul network creates the efficiency, performance, and manageability necessary to improve your top line, grow your bottom line and maximize customer satisfaction. But backhaul is a comprehensive topic with complex time-to-market issues, which means operators frequently need help with the task of designing a migration strategy for such an optimized network.

Wireless backhaul was once viewed as a necessary cost, but today backhaul has become a strategic asset with the potential to provide you with a "triple threat" capability in competitive advantage on efficiency, performance, and manageability. While everyone agrees that packet-based backhaul is the way to go, the question is how to get there in a cost-effective way. Backhaul optimization spans many technologies and topics, and as your network moves towards packet backhaul, issues like packet synchronization and the need for granular QoS become important. This increases complexity and presents relatively new challenges to operators of wireless networks. Overcoming these issues is critical.

Operators need to look for a solution that offers a breadth of platforms ranging from legacy, hybrid and packet microwave to SDH/SONET, WDM, and Carrier Ethernet. On top of that, efficient network management across layers, end-to-end MPLS, precise synchronization, and a robust OAM model are required to complete the solution.

Selecting the right vendor to help optimize the backhaul network is one of the most critical business decisions you can make today. Strong transport experience in mobile networks and a keen awareness of the transport requirements of 2G/3G/3G+/WiMAX and LTE are required of any vendor that will help you achieve a successful optimization and migration backhaul strategy

ECI Telecom's 1Net framework for wireless backhaul provides operators with a one-stop shop for all your wireless backhaul needs, providing a smooth migration path to a next-gen backhaul network. The 1Net wireless backhaul framework lets you leverage ECI's expertise in mobile transport networks, our thorough understanding of all the technologies and architectures involved, and our end-to-end portfolio spanning xDSL, PON, Microwave, Optical, SDH/SONET, Carrier Ethernet, and IP.

We take a consultative approach, as we see you as our partners, and bringing our experience to the table. We use that experience to create ideas and options for you to consider, and we take a "technology agnostic" approach, recommending what is best for your network according to your business strategy.

**With ECI as a partner, mobile and fixed/mobile operators can make wireless backhaul what it should be: a strategic asset and a key source of sustainable competitive advantage.**

## What Operators Need to Make Wireless Backhaul a Strategic Asset

A strategically-optimized network is one that:

- Is cost-effective and scalable
- Provides maximum investment protection and flexible options for migration, to cope with future needs
- Offers strongly differentiated performance, reliability and resilience
- Guarantees precise synchronization, granular QoS and end-to-end multi-layer management

The measure of optimization success resides on whether such optimization results in the quick, cost-effective scaling and profitable roll out of new revenue-generating services, and whether it also in an efficiently managed network with robust OAM and minimized total cost of ownership (TCO).

### Choosing the Right Solution

ECI's 1Net wireless backhaul solution offers you the following benefits:

- Maximum investment protection for your installed base, including future offerings
- A comprehensive 5-stage wireless backhaul migration path
- Unified management system to span microwave, optical and Carrier Ethernet transport and provide a single, correlated end-to-end view
- A robust OAM model applied to SDH/SONET as well as packet transport
- Complete support for the transport requirements of all generations of wireless technology (2G, 3G, 3G+, WiMAX, LTE)
- A broad portfolio including hybrid and packet microwave, xDSL, PON, optical and Carrier Ethernet platforms
- World-class packet synchronization technology across all transport products
- Cost-effective end-to-end MPLS including an MPLS/MPLS-TP gateway

## ECI's Backhaul Experience

### Extensive Transport Experience with Mobile Operators

ECI has long and field-proven experience in supporting mobile operators in the build out and in the evolution of their mobile networks. ECI is market leader in several emerging countries, including India and the former Soviet Union. We count the leading wireless operators as our customers, including Bharti (India), Tata (India), Vodafone (India), Viettel (Vietnam), Vimpelcom (Russia), and others.

### Optical, SDH/SONET, ATM, Ethernet and IP Expertise

ECI's vision for the backhaul network has consistently been validated over time, and we have been proactive in pushing important advances to this field. We integrated ATM and Ethernet/MPLS-TP switches into our MSPP line, obtaining cost-optimized MSPP solutions to support 2G TDM and 3G ATM and IP backhaul optimization. The Carrier Ethernet Switch Routers (CESR) product line supports both MPLS-TP and IP/MPLS including a MPLS-TP to IP/MPLS gateway to provide an end-to-end solution.

### Knowledge of 2G, 3G, 4G WiMAX and LTE Transport Requirements

As wireless backhaul evolves, a clear understanding of the specific transport requirements and resulting KPIs of each generation of wireless technology is essential for success. ECI is qualified to help you plan and deploy a migration strategy from TDM to packet backhaul.

### Direct Expertise in Implementing Broadband Access Alternatives

ECI's packet access solution enables us to offer you a comprehensive broadband access solution set, supporting basic access services (POTS and ISDN) and multiple flavors of DSL (ADSL/2/2+, SHDSL, and VDSL/2), as well as GPON.

### Consultative Approach

ECI is an impartial partner fully responsive to your needs, able to provide efficient solutions to meet your required business goals. ECI is able to propose in-house best-of-breed solutions in cooperation with 3<sup>rd</sup> party partners and is expert in planning and installing multi-technology and multi-vendor projects in complex network implementations. We take a technology-agnostic approach to build the right solution for your specific situation, and is adept at integrating its solutions into multi-vendor networks.

**Finding YOUR Right Migration Strategy**

ECI offers you a suite of migration options from TDM to packet-based backhaul. Our goal is to ensure that you take the most cost-effective and profitable route toward meeting your strategic and business objectives. The flexibility afforded by these options allows you to fully leverage your installed base wherever possible for as long as appropriate, while adding all the functionality needed to cost optimize the backhaul network for a growing mix of broadband traffic as the source of service revenues evolves. Our vision is of a customized and staged migration toward packet backhaul, letting you progress at your own pace based on your strategy, objective, opportunities, resources, service mix, and capital availability. By providing high degree of flexibility, ECI lets you respond to future changes in the market environment during this period of rapid evolution.

ECI supports staged migration path toward packet backhaul, which is shown in the following figure.

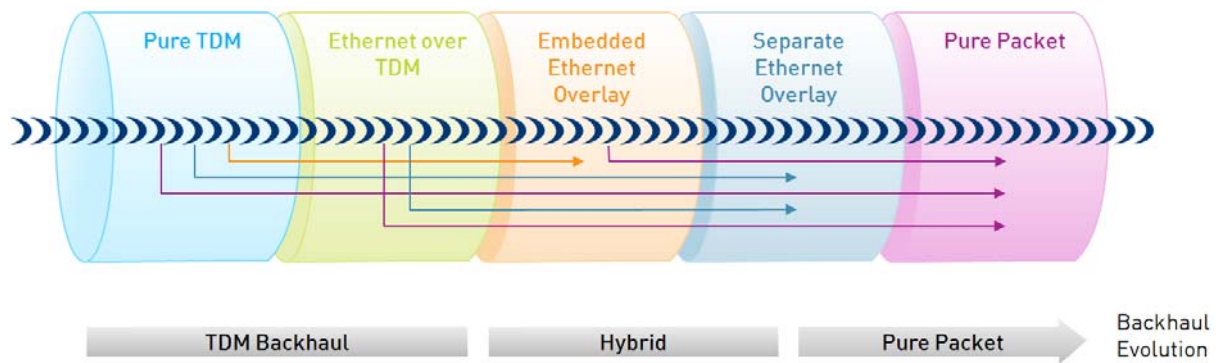


Figure 1: ECI's staged migration path to packet backhaul

Your migration path could be linear or not. You may bypass any stage of the migration path if desired; accelerate the pace of the network towards a pure packet backhaul paradigm; and enter the evolution path at whatever stage is appropriate given your installed base. Based on our expertise and a specific TCO analysis for your network, we help you determine the path and the pace of evolution.

Table 1: How Different Operator Profiles Fit Within ECI's Staged Backhaul Migration Path

Phase	Operator Profile	Backhaul Strategy Advantages	ECI's Solution advantages
Pure TDM	<ul style="list-style-type: none"> <li>Operators with voice-centric service mix</li> </ul>	<ul style="list-style-type: none"> <li>Very strong OAM model</li> <li>Inherent synchronization methods</li> <li>Very mature cost curve</li> <li>Minimal new capital investment</li> </ul>	<ul style="list-style-type: none"> <li>Diverse form factors and scalable MSPP</li> <li>Integrated ATM blades to support 3G ATM</li> <li>Future-proof through support of Native Ethernet/MPLS-TP switching, WDM and ROADM</li> <li>Unified management of TDM, Carrier Ethernet, Optics and microwave</li> </ul>



Phase	Operator Profile	Backhaul Strategy Advantages	ECI's Solution advantages
Ethernet over TDM	<ul style="list-style-type: none"> <li>Operators with voice-centric service model, with some broadband data</li> </ul>	<ul style="list-style-type: none"> <li>Carrier-class Ethernet services</li> <li>No need to change OAM model</li> <li>Fastest time-to-market for mobile broadband</li> <li>Minimal capital outlay</li> <li>Unified management of Ethernet and TDM</li> </ul>	<ul style="list-style-type: none"> <li>MSPP support of Ethernet within SDH/SONET through GFP and LCAS for a carrier-class solution</li> <li>E2E MPLS-TP support</li> <li>Unified management of TDM, Carrier Ethernet, Optics and microwave</li> </ul>
Embedded Ethernet Overlay (Native Ethernet and TDM support from the same network element)	<ul style="list-style-type: none"> <li>Operators that need to scale the broadband data roll-out for greater efficiency than offered by Ethernet over TDM</li> <li>Operators who would like to keep handling TDM-based services natively to minimize the risks and the cost of supporting them over packet based network</li> <li>Operators that lack the capital resources or level of mobile broadband demand to justify a separate Ethernet Overlay</li> </ul>	<ul style="list-style-type: none"> <li>Investment protection - Leverages SDH/SONET installed base</li> <li>Minimize risk of jeopardizing existing services while rolling out new packet-based services</li> <li>Accelerates time-to-market for efficiently aggregated data services</li> <li>Unified management of TDM and Carrier Ethernet networks</li> </ul>	<ul style="list-style-type: none"> <li>Native handling of both TDM and Ethernet from same network element</li> <li>Pay-as-you-grow solution</li> <li>Hybrid microwave product line</li> <li>Minimal and controlled CAPEX investment</li> <li>E2E MPLS-TP support</li> <li>Unified management of TDM, Carrier Ethernet, optics and microwave</li> </ul>
Separate Ethernet Overlay	<ul style="list-style-type: none"> <li>Operators that started to build their future packet-based backhaul without risking existing services</li> <li>Operators who expand to new geographic regions with 3G/LTE technologies</li> <li>Operators who leveraged their installed based infrastructure up to the point it is exhausted and expect that future growth will be packet centric</li> </ul>	<ul style="list-style-type: none"> <li>Native handling of TDM and Ethernet</li> <li>Greater scalability for packet based services</li> <li>Optimized cost-effective support for packet-centric traffic</li> <li>Optional L3 at the metro</li> </ul>	<ul style="list-style-type: none"> <li>End-to-end solution through Carrier Ethernet Switch Router portfolio</li> <li>Pure packet and hybrid Microwave product line</li> <li>End-to-end MPLS-TP or flexible mix of MPLS-TP and IP/MPLS including gateway functionality</li> <li>Packet optical integration</li> <li>Unified management of TDM, Carrier Ethernet, Optics and microwave</li> </ul>

Phase	Operator Profile	Backhaul Strategy Advantages	ECI's Solution advantages
Pure packet backhaul	<ul style="list-style-type: none"> <li>○ Greenfields that are deploying a new packet based network "from scratch"</li> <li>○ Carrier-of-carriers providing wholesale backhaul services to multiple operators</li> <li>○ Operators engaged in network sharing of a Carrier Ethernet mobile backhaul</li> <li>○ Operators migrating to fully converged fixed/mobile network</li> </ul>	<ul style="list-style-type: none"> <li>○ Most efficient bandwidth utilization and oversubscription</li> </ul>	<ul style="list-style-type: none"> <li>○ End-to-end solution through Broadband Access, Carrier Ethernet Switch Router and microwave portfolio</li> <li>○ End-to-end MPLS-TP or flexible mix of MPLS-TP and IP/MPLS including gateway functionality</li> <li>○ Unified management of TDM, Carrier Ethernet, Optics and microwave</li> <li>○ Packet optical integration</li> <li>○ Enhanced synchronization solutions</li> <li>○ Ability to leverage SDH/SONET assets for packet-based infrastructure using CES and WDM/ROADM capabilities</li> </ul>

At ECI, your path is the right path. ECI will help you identify the pros and cons of taking the various routes along the course of migration toward pure packet backhaul, and will help you weigh the alternatives. But whichever path you ultimately choose, ECI has the vision, technical expertise, and portfolio to make the journey a complete success.

ECI supports all five of the phases of backhaul evolution illustrated in Figure 1.

## Scope of ECI's Products and Services

ECI offers a comprehensive set of product lines for solutions covering the entire network scenario from customer premises equipment to regional long haul infrastructure. ECI's portfolio as it relates to wireless backhaul is shown in Table 2.

Table 2: ECI's Wireless Backhaul Portfolio

Product Type	Product Line	Role in Wireless Backhaul	Differentiation/Value Proposition
Carrier Ethernet Switch Router (CESR)	9000 series	Ethernet overlay or full packet network build migration strategies	<ul style="list-style-type: none"> <li>Support L2/L3 with end-to-end MPLS-TP/IP-MPLS</li> <li>Provides legacy support with CES and fixed/mobile support with PWE3</li> <li>Carrier grade (resiliency, OAM, ease of management)</li> </ul>
MSPP/Optical/Packet Optical	XDM <sup>®</sup> Series	SDH-based backhaul with embedded ATM and packet switching, or for use with an external Ethernet overlay	<ul style="list-style-type: none"> <li>Supports all mobile generations (TDM, ATM, Ethernet) within the same platforms</li> <li>Optional ATM and Ethernet/MPLS-TP switching</li> <li>Optional WDM and ROADM provide further scalability</li> <li>Native handling of TDM and Ethernet</li> </ul>
Micro-MSPP	BroadGate <sup>®</sup> (BG) Series	SDH-based backhaul with embedded packet switching, or for use with an external Ethernet overlay	<ul style="list-style-type: none"> <li>Support of Ethernet over TDM, native Ethernet and TDM and TDM over Ethernet makes BG suitable for every phase of backhaul migration</li> </ul>
Microwave	BG-Wave Multiservice Radio Node (MRAN)	Cell site access integrating transport and microwave	<ul style="list-style-type: none"> <li>Cost-effective integration of microwave, Ethernet/MPLS-TP switching SDH/SONET, Add Drop Multiplexer (ADM) and TDM Digital Cross Connect (DXC) in a single chassis</li> <li>Unified management as an integral part of the backhaul network</li> </ul>
Broadband Access	Hi-FOCuS MSAN	Mobile data offload applications, or converged fixed/mobile backhaul networks.	<ul style="list-style-type: none"> <li>Supports access over any media (xDSL, PON)</li> </ul>

## SCOPE OF ECI'S PRODUCTS AND SERVICES

Product Type	Product Line	Role in Wireless Backhaul	Differentiation/Value Proposition
Management	LightSoft® Management System	End-to-end management spanning BG-Wave, XDM, BroadGate, and 9000 CESR products	<ul style="list-style-type: none"> <li>Unified multi-layer management extending across microwave, optical, and Carrier Ethernet transport</li> </ul>
Professional Services	Integrated Programs (turnkey services) Consultancy Software Services	End-to-end professional services in the realization of any mobile backhaul migration project	<ul style="list-style-type: none"> <li>Best-of-breed in-house and 3<sup>rd</sup> party solutions</li> <li>Technical, commercial, business and operational solutions</li> <li>Network design, planning and installation of multi-technology and multi-vendor projects</li> </ul>

## Summary

ECI's INet wireless backhaul solution provides you with a comprehensive, end-to-end solution for backhaul optimization, and options for multi-stage migration from TDM to packet at your preferred pace.

Our consultative, technology agnostic approach allows you to benefit from custom-tailored solutions that leverage our experience and adapts it to your specific situation and objectives.

INet brings you:

- An effective migration path for backhaul networks serving any and all generations of wireless technology
- A broad portfolio spanning broadband access, microwave, optical, and Carrier Ethernet
- Unified management across all transport products
- Clear understanding of all transport requirements needed to optimize transport for 2G, 3G, and 4G / LTE networks
- Significant experience in designing and deploying mobile transport networks

We do backhaul your way.

**With ECI as your partner, your wireless backhaul network will be what it should: a strategic asset and a key source of sustainable competitive advantage.**