# Ethernet-over-Fiber Provider Grows RAN Backhaul Business

IP Networks, Inc. chooses Cisco Mobile Transport over Packet to deliver wholesale transport to Tier 1 providers.

## EXECUTIVE SUMMARY

**IP NETWORKS (IPN), INC.**

- Telecommunications
- San Francisco Bay Area
- 80 Employees

**BUSINESS CHALLENGE**

- Scale capacity within the existing carrier-class network
- Reduce operating costs to enable competitive access service
- Build in resiliencies required by contracts with service providers

**NETWORK SOLUTION**

- Extend Multiprotocol Label Switching out to the cell tower
- Introduce end-to-end Cisco Mobile Transport over Packet architecture
- Deploy multi-homing Carrier Ethernet mobile wireless routers at cell sites

**BUSINESS RESULTS**

- Lowered operating costs to one-tenth cost per bit of alternative
- Boosted performance to order of magnitude improvement in bandwidth for mobile transport
- Scaled capacity to support dedicated fiber to tens of thousands of cell sites

## Challenge

In 2008, mobile operators experienced skyrocketing traffic due to the wildly popular iPhones and other bandwidth-hungry mobile data devices and truly engaging application services for the power user on the go. However, most cell towers are still served by time-division multiplexing (TDM)/Plesiochronous Digital Hierarchy (PDH) (copper or microwave), which cannot scale to handle the demand. Mobile operators are turning to alternative access vendors (AAVs) to help them rapidly scale mobile backhaul capacity while avoiding huge capital expenditures and protecting investments in existing networks.

One leading AAV recognized this opportunity years ago, as the company set out to build the most valuable optical access networks in California. IP Networks, Inc. (IPN), headquartered in San Francisco, has been serving large enterprises, managed service providers, and government agencies throughout metro San Francisco and Silicon Valley since 2003. The company's unique relationships with key power utility companies such as Pacific Gas and Electric (PG&E) allow them to leverage embedded utility infrastructure to lower their fiber deployment costs and speed build-out and thus deploy the largest fiber access network in the region.

When it started working with mobile operators almost four years ago, IPN knew that long-term success would come down to successfully managing CapEx and OpEx. "Our business has always been about highly reliable, cost-effective Ethernet transport services," says Gary George, president of IPN. "Wireless operators and enterprises have millions of dollars of shareholder value relying on the integrity of our networks at any time. We needed a technology partner that could work with us to deploy an end-to-end mobile backhaul solution with the scalability and capacity to handle virtually unlimited bandwidth across a multiple customer base."

Cost is the other challenge. Mobile operators are experiencing rapidly increasing backhaul costs on their own networks, and look to IPN and its Carrier Supporting Carrier (CSC) network model to help them gain the cost efficiencies of IP/Multiprotocol Label Switching (MPLS) transport. "We wanted to evolve our infrastructure to deliver an optimal mobile transport solution, but it had to make financial sense while still offering a robust and scalable wireless service delivery platform," says Chuck Stewart, vice president of finance at IPN. "We needed a platform that could scale up to the demands of a 4G world."

## Solution

Working to increase capacity for its growing base of mobile operators, IPN evaluated mobile backhaul solutions from multiple vendors. With it's recently announced win with a Tier 1 mobile provider, scaling bandwidth has become a

top priority. The provider has signed an agreement with IPN for Carrier Ethernet backhaul services in the greater San Francisco and Silicon Valley areas.

Potentially spanning more than a thousand cell sites, this IPN agreement is among the largest for all-fiber backhaul in the United States. However, IPN had to look in Europe to find its mobile backhaul solution. It was from this mature 3G market that IPN learned about the Cisco® IP over Carrier Ethernet solutions for mobile carriers, including the Cisco Mobile Transport over Packet (MToP) solution. IPN recognized two major values of the Cisco MToP solution: its field-proven stability, and the ability to deliver a consistently high quality of experience to the customer. “When we saw Cisco’s success in the European arena, we were convinced that they could provide everything we needed in our market,” says George. “We felt Cisco was the right vendor for us with solutions that span the cell site, aggregation layer, and the mobility service center.”

Over the next few months, IPN’s highly scalable Ethernet-over-fiber network will be extended with a Cisco MToP solution.

“Tier 1 wireless operators always ask us the same question: are we going to have enough bandwidth in our network?” says George. “Our relationship with Cisco gives us the ability to confidently tell them yes. We also retain the operational flexibility we need as a market leader; we can combine the bandwidth advantages of dedicated fiber to the towers with the cost advantages of a shared IP transport network. No one is provisioning more cell sites than we are, and Cisco gives us a platform that can scale to keep up with the continuously growing demands of all wireless operators and enterprises.”

## Results

**PRODUCT LIST**

**Routing and Switching**

- Cisco Mobile Wireless Router (MWR) 2941-DC
- Cisco 7600 Series Router
- Cisco ONS 15454 Optical Switching Platform
- Network Management
- Cisco Mobile Wireless Transport Management (MWTM) system

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Transporting commercial traffic across its new Cisco end-to-end solution proves IPN can meet or exceed mobile operators’ operational requirements versus the incumbent local exchange carrier. “Our fiber-rich approach and the scalability of our Cisco solution allows us to offer exceptional service in our primary market, and to expand our focus into new markets,” says Mary-Lou Smulders, vice president, Strategy & Implementation, at IPN. “We are having varying degrees of discussions to provide fiber-based services to over 10,000 cell sites. The Mobile Transport over Packet solution is a key to managing this amount of bandwidth.”

With the deployment of a Cisco IP next-generation network (NGN) architecture that includes the Cisco MToP solution, IPN retains its position as a market leader. “We are pioneering new levels of resiliency for Carrier Ethernet, similar to what you’d see in a SONET network,” says George. “It was critical that we partner with a company that could mitigate the risks of being first to market. Cisco’s level of commitment has been great, at both technical and business levels. We’re thrilled with the relationship and with the capabilities that it is allowing us to bring commercially viable services to the market.”

Cisco recently became the first vendor to successfully complete IP/MPLS Forum’s Abstract Test Suite for Time Division Multiplexing (TDM) Services over MPLS. The Cisco 7600 Series and MWR 2941 routers both passed and underscore Cisco’s leadership in terms of industry standards and open, stable platforms. As announced in January 2009, the IP/MPLS Forum introduced its certification program to help customers identify standards-compliant technology for mobile networks.

Additionally, Cisco successfully passed a challenging any-play (i.e., quad-play) test with the European Advanced Networking Test Center (EANTC), a top-ranked independent testing house. EANTC evaluated Cisco IP NGN with MToP in a real-world test environment that included a convergence of second- and third-generation (2G/3G) and

LTE mobile traffic with triple-play (voice, video, and data) traffic. MPLS and Cisco's Hierarchical Quality of Service (H-QoS) enabled consistently highest quality of experience for the end users.

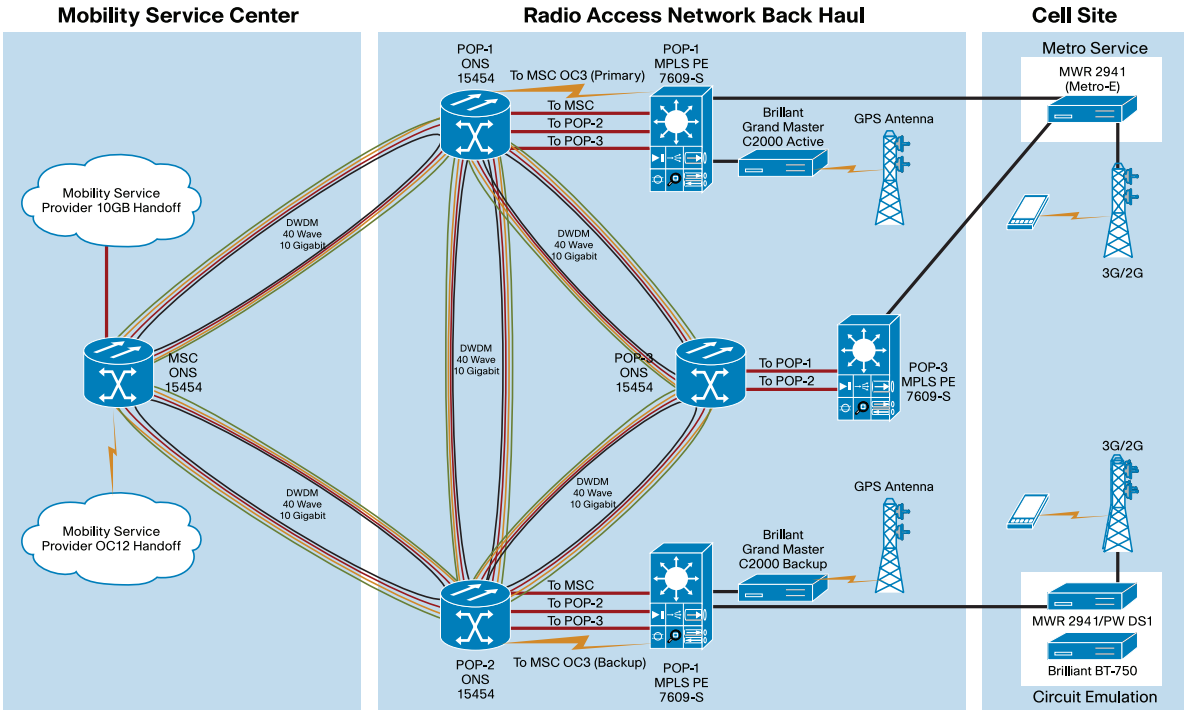
Mobile carriers are already taking advantage of IPN's mobile backhaul network to avoid the expense of alternative E1 or T1 access lines. For one-tenth of the cost per bit, the MToP solution offers an order of magnitude increase in bandwidth. The end-to-end open MPLS infrastructure enables high levels of traffic grooming and network management that are required for wholesale transport, and the Cisco MToP solution also offers IPN's customers the advantage of a variety of technologies that promote high availability and IP security.

## Technical Implementation

As shown in Figure 1, the solution includes:

- **Multi-homing Carrier Ethernet,** from the newly launched Cisco Mobile Wireless Router (MWR) 2941-DC, located at cell sites. The new MWR 2941-DC router is the most powerful and flexible cell site router in a single 1U height chassis that is perfect for cell site locations. The Cisco MWR 2941-DC router is fully capable of supporting both 3GPP (GSM/UMTS/HSPA) and 3GPP2 (CDMA/EVDO) over pseudowires as well as Native IP as found in WiMAX and Long-Term Evolution (LTE). The MWR 2941 router will work with third-party timing sources like Brilliant Telecom, which IPN has deployed for phase one of its project.
- **Radio Access Network (RAN) backhaul,** over Cisco 7600 Series Routers. Each Cisco 7600 Series Router is equipped with circuit emulation over packet (CEoP) shared port adapter (SPA) cards that provide the intelligence to allow IPN to support both Pseudowires over Ethernet (PWE3) as well as native IP. Pseudowires are virtual circuit "tunnels" that aggregate and transport multiple types of traffic between the RAN and the network core. This true zero-touch deployment feature for MToP reduces installation costs.
- **Increased core capacity,** with Cisco ONS 15454 optical switching platforms and the Cisco 7600 Series Routers equipped with the new Cisco Ethernet Services Plus (ES+) card. With the ES+ card, the Cisco 7600 Series Router supports IP over dense wavelength-division multiplexing (IPoDWDM). The Cisco core solutions offer high resiliency and generous end-to-end bandwidth.
- **Management.** Cisco Mobile Wireless Transport Management (MWTM) system will help IPN give its customers consistently high-quality service and carrier-class reliability.

**Figure 1.** IP Network's Mobile Transport Network




## For More Information

To find out more about the Cisco Mobile Transport over Packet service provider solutions, visit: http://www.cisco.com/en/US/netsol/ns675/networking_solutions_solution_category.html.

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