TRANSFORMING YOUR NETWORK WITH CARRIER ETHERNET

Four Incentives to Accelerate Your Transition

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EXECUTIVE SUMMARY

Communications service providers (CSPs) are increasingly phasing out their Time-Division Multiplexing (TDM) networks in favor of Carrier Ethernet. This network transformation enables them to maintain their competitive edge and keep up with increasing customer demands for bandwidth, speed, and quality of service. While numerous factors go into deciding when and how quickly to make the move to Carrier Ethernet, accelerating the transition presents four key advantages.

- Reduce costs of network operation and maintenance
- Expand market reach and acquire business from government and enterprise
- Improve customer experience and minimize churn
- Meet future technology demands on networks

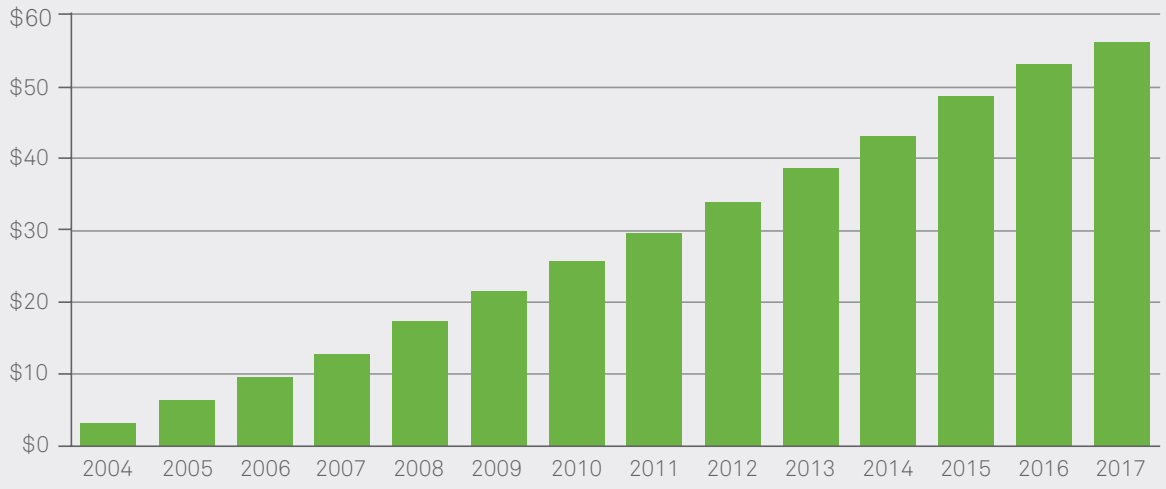
As a trusted, neutral partner to CSPs, Neustar provides solutions for CSPs to quickly transform their networks from legacy technology to Ethernet. Doing so allows them to take advantage of savings while advancing their networks to deliver next-generation services that give customers the communication experience they demand.

THE CURRENT LANDSCAPE

Communications service providers (CSPs) are entering an era of unprecedented change. The old business models no longer apply. Today's consumers view unlimited voice, data, and texting as table stakes in a bid to win their loyalty. The real market focus is on enhancing the consumer experience and delivering new services such as next-gen high-speed mobile networks, high-quality video, and mobile apps.

These services, however, place a huge and growing demand on existing networks, raising the cost of doing business. So if CSPs could increase the capacity and reduce the costs of their networks at the same time, they would jump at the opportunity. It's no wonder, then, that leading industry analysts are predicting that the Carrier Ethernet services market will grow to $50 billion in 2015 (see Figure 1). Ethernet, after all, provides that rare double payoff: it drives down the business operating costs for CSPs and meets the network bandwidth and performance needs of our digital world—now and in the future.

GLOBAL ETHERNET SERVICE REVENUE (US $ BILLIONS)[1]



[1] Infonetics Research

Figure 1

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Because of these compelling advantages, CSPs have been rapidly transitioning to Ethernet services, significantly advancing their networks and enabling them to:

- Expand their market presence quickly to acquire new customers, whether small, medium enterprises (SMEs), residential, or other types
- Offer digital IP services such as video and other bandwidth-heavy applications, which customers expect and demand
- Improve customer experience by providing faster and bigger pipes

The industry has been further transformed by recent and ongoing consolidation among CSPs, reshaping the rankings of the major players. By the end of 2014, for example, Level 3 displaced Verizon as the second largest provider of Carrier Ethernet services, with its $5.3 billion acquisition of tw telecom. Vertical Systems estimates that nearly three-quarters of all Ethernet services in the U.S. will now be delivered by AT&T, Level 3, and Verizon (see Figure 2). The remaining market is served by a mix of the larger cable/multi-system operators (MSOs), some with pending M&A deals, and wholesale carriers. The proposed acquisition of Time Warner Cable by Comcast threatens to shake this up further.

LEADERBOARD[2]

MID-YEAR 2014 | U.S. CARRIER ETHERNET SERVICES

1	AT&T
2	Verizon
3	tw telecom
4	CenturyLink
5	Time Warner Cable
6	Comcast
7	Cox
8	Level 3
9	XO

CHALLENGE TIER *(in alphabetical order)*
Charter, Cogent, Integra, Lightpath, Megapath, Windstream, Zayo

END-YEAR 2014 | U.S. CARRIER ETHERNET SERVICES

1	AT&T
2	Level 3
3	Verizon
4	CenturyLink
5	Time Warner Cable
6	Comcast
7	Cox
8	XO

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[2] Vertical Systems Group

Figure 2

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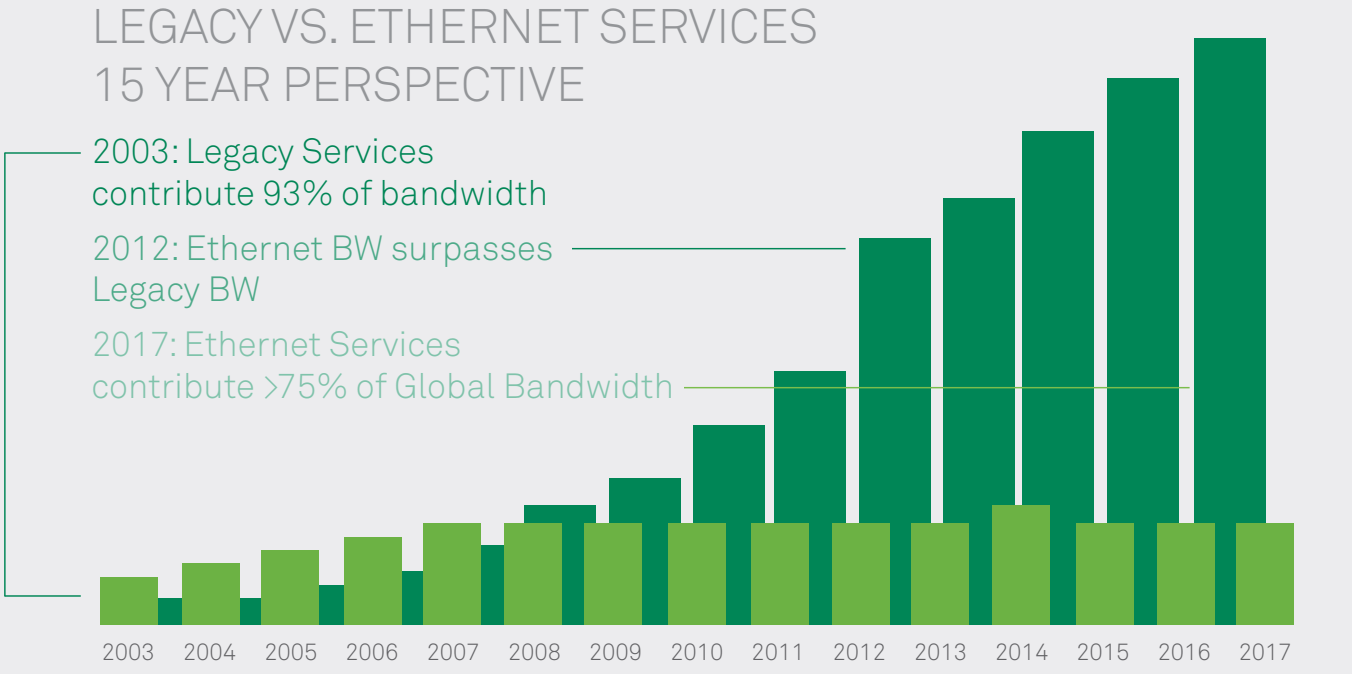
THE NETWORK OF TOMORROW

For CSPs, the move to Carrier Ethernet from legacy Time-Division Multiplexing (TDM) networks can't come soon enough. By 2017, 75% of global enterprise traffic will run over Ethernet, according to market research conducted by Vertical Systems Group (see Figure 3). To expedite the adoption and transition of Ethernet, industry groups Alliance for Telecommunications Industry Solutions (ATIS) and Metro Ethernet Forum (MEF) have partnered to define standardized methods to provision and integrate Ethernet throughout the communications network fabric.

MEF has introduced Lifecycle Service Orchestration (LSO), a set of standardized functions to automate connectivity services within and across multiple carriers. LSO combines the performance and agility of Carrier Ethernet with the on-demand and ubiquitous Internet to deliver end-to-end automation of services, including fulfillment, control, performance, assurance, usage analytics, security, and policy.

ATIS's Ordering and Billing Forum (OBF) is incorporating ordering specifications into the Access Service Ordering Guidelines (ASOG) to support MEF-certified products and services. Collectively, these new guidelines and ordering standards for delivering the new IP reduce the complexity and delivery intervals for Ethernet service. Version 50 of this specification was released in September 2014 and includes guidelines for Ethernet Virtual Connections (EVC) and User Network Interface (UNI). Version 51, released in March 2015, includes guidelines for Operator Virtual Connections (OVC) and External Network to Network Interface (ENNI).

GLOBAL BUSINESS BANDWIDTH TRENDS[3]



[3] Vertical Systems Group

Figure 3

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ATIS and MEF have also partnered to create an international Ethernet ordering standard for the architecture and layers of interconnection for CSPs on both the buy and sell ends of the ordering process. This standardization is welcomed by CSPs who seek to improve the latency, efficiency, and accuracy of ordering and provisioning Ethernet services across operators. These standards help CSPs overcome issues of interoperability, order fall-out, and little-to-no transparency to track and monitor order status. With access orders routinely taking days, weeks, and even months to complete if facilities are not available, a standardized and automated approach to Ethernet ordering promises to further accelerate its adoption, increasing the opportunities for CSPs to save costs and generate revenue.

FOUR INCENTIVES TO ACCELERATE YOUR TRANSITION

Carrier Ethernet is arguably the proverbial silver bullet for CSPs: it grows their networks as it shrinks their costs. But CSPs will need to rethink their strategies for Ethernet ordering to take full advantage of its opportunities to increase revenue, reduce costs, and reach new customers in new markets. Adopting the strategies championed by ATIS and MEF can have a quick and profoundly positive effect on the ability of CSPs to integrate Ethernet services more efficiently into their networks.

At Neustar, we see four key incentives to adopting an automated, standards-based approach to Ethernet ordering:

INCENTIVE #1: REDUCE COSTS

The biggest incentive accelerating CSPs' transition to Carrier Ethernet is its sheer economics. In addition to meeting near- and longer-term bandwidth needs and performing more reliably than legacy TDM, Ethernet is simply less costly. ACG Research compared the monthly recurring costs of Ethernet versus TDM access for point-to-point, point-to-multipoint, and multipoint-to-multipoint network configurations and found that Ethernet services have 44 percent to 81 percent lower costs than TDM-based alternatives. In addition to reducing operating costs, there is the added benefit of reducing the amount of revenue paid to competitors for less efficient TDM circuits.

Cost-cutting is fundamental, yet many CSPs are unaware or mistaken about the true amounts of money they are paying for TDM circuits. The factors of evolution—time, transition, and M&A—result in lost or poorly maintained records. It is not uncommon for CSPs to lose track of details about the circuits they're leasing, including the origin and costs of those leases. Audits of circuit inventory and circuit leasing agreements can identify assets that are not in use, but are still being invoiced—and paid—each month. Audits also prove invaluable in helping CSPs prioritize migration efforts to focus on circuits that will deliver the greatest savings and transition those circuits first.

Transitioning to Ethernet services also reduces the costs of network maintenance. One reason for this is that digital networks are largely monitored and managed remotely, enabling CSPs to increase or decrease the available bandwidth without having to send a technician on site. Another reason is that Ethernet networks have self-healing properties that detect and resolve service issues before customers are impacted, which in turn reduces the number and frequency of technicians dispatched to the field. As a result, CSPs realize substantial cost savings and increases in customer satisfaction because of fewer instances of service disruption and faster resolution.

INCENTIVE #2: EXPAND MARKET REACH

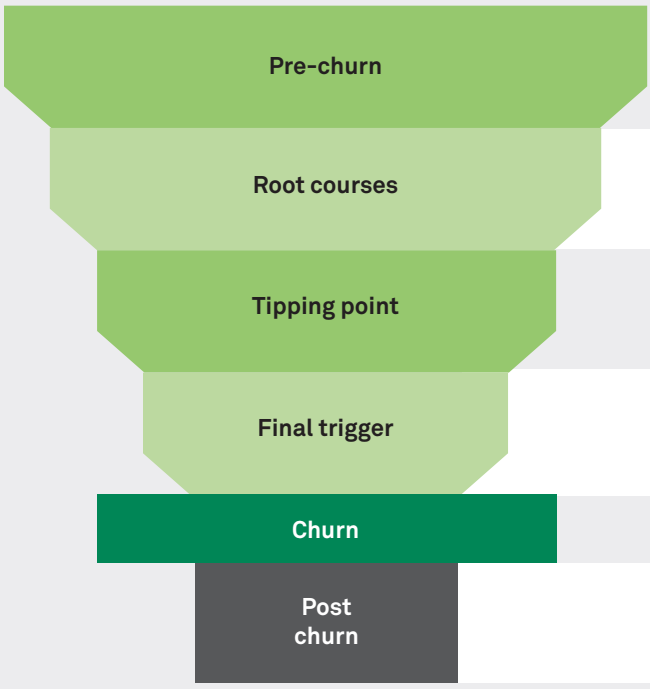
Carrier Ethernet affords CSPs renewed opportunities to market and acquire business from government and enterprise, including small and medium enterprises (SMEs) in locations beyond their network footprint. These customers, once primarily served

by the large incumbent providers, are now being marketed to by multiple service providers, including MSOs, who are leveraging their existing Ethernet infrastructure. This added competition brings new revenue opportunity for all CSPs, often including new choices and lower prices for customers.

Since no CSP has full coverage in every geographic or physical location, the practice of leasing access for backhaul and for last mile connectivity is common. Most CSPs are both buyers and sellers, depending on the circumstances of location, time, and service offerings. This marketplace of buyers and sellers is comprised of the carriers themselves, conducting business through network interconnection that is accompanied by the familiar complexities: manual processing, provisioning errors, and high fall-out rates that delay order completion, reduce revenue, and cause frustration for customers.

Ethernet ordering has the added complication of being inherently time consuming, with a much greater impact on revenue than when onboarding an individual subscriber. The work of ATIS, MEF, and innovative partners will help to overcome these challenges so CSPs can optimize their expansion strategies.

STAGES OF CUSTOMER CHURN[4]



Circumstances that open the funnel, such as poorly set expectations during the sales process or a latent installation problem

Interactions that build frustration

One or more events that predispose a customer to churn

Event that triggers the decision to defect, such as a move within a service area, a competitive marketing brochure or a recommendation from a friend

Interactions with the company that make customers more or less likely such as the equipment return process or marketing materials

[4] Bain & Company

Figure 4

INCENTIVE #3: DELIVER THE BEST CUSTOMER EXPERIENCE

Retaining customers and minimizing churn is an ongoing challenge for CSPs, reaching as high as 2.5% per month for some segments of the industry. Churn can be tied to the customer experience—a combination of factors that if good, increases the retention of customers or if bad, increases their loss. While pricing is often cited as the reason for customer defections—providers would not engage in the all-out pricing wars of recent times if they weren't effective—price is often just one of many contributing factors (see Figure 4). For many customers, individual and enterprise, the thought of moving to another provider begins with a point of contention that may or may not be price-related: a poor customer service experience, service performance issues, or the lure of new services offered by competitors.

Offering new services and devices contributes to customer retention, but CSPs must mitigate disruption during its transition and ensure a positive and seamless customer experience. This means uninterrupted delivery of voice, text, and multimedia services; device interoperability; and accurate billing. With proper planning and coordination, customers should benefit from new service offerings, greater reliability, improved performance, and new devices—all as a direct result of implementing Carrier Ethernet.

INCENTIVE #4: MEET FUTURE NETWORK DEMANDS

Innovation and change in telecommunications over the past 30 years has brought rapid development and adoption of new technologies, devices, and expectations for communicating—all of which overtax a network designed for voice services over 100 years ago. Voice usage today is flat, and in many cases even declining. At the same time, demand is growing for digital services—including bandwidth-heavy live streaming— to be available at any time, from anywhere, and on any number of devices.

Mobile technology has advanced to cope with these increasing demands, with a new generation emerging about every ten years:

- **1980s:** 1G (handled basic voice calls between subscribers)
- **1990s:** 2G (greatly increased capacity to handle a growing number of users; enabled text messaging)
- **2000s:** 3G (provided higher data speed, greater voice capacity, mobile broadband)
- **2010:** 4G/LTE (transformed to all-IP packets switched with higher data speeds)
- **2020:** 5G expected

But Carrier Ethernet, according to Steve Lawson of IDG Group, is about much more than increasingly faster speeds. It's the unifying technology that's empowering CSPs to meet the future demands of cloud data centers, Wi-Fi access points, and in-vehicle electronics. The Ethernet Alliance, an industry group that promotes IEEE Ethernet standards, is charting a path for the ubiquitous networking protocol and is looking at several new versions to serve a variety of applications, including standards for 400-Gigabit Ethernet for use in service provider networks.

STRATEGIC PLANNING WITH A STRATEGIC PARTNER

A network is more than a collection of switches and servers. It also consists of people, processes, pricing plans, and business support systems. Planning and executing the transformation of your network from legacy technologies to Carrier Ethernet requires partnering with experienced professionals who will advise and guide you and align with your business goals.

Neustar has served as a trusted, neutral partner to CSPs, working to create a more forward-thinking networked world. We can help you see the big picture of network transformation, beyond the bits and bytes to the subscribers and the services that make up the most important part of your network. But we also bring years of technical expertise to that vision in order to find solutions to your most technical problems, from signaling system migrations to least cost routing.

Neustar plays a leading role in the Metro Ethernet Forum, Cloud Ethernet Forum, and ATIS NFV and OBF Committees and is dedicated to helping CSPs optimize their networks and their businesses. When you consider a technical partner for your transition to Carrier Ethernet, consider that Neustar has successfully managed some of the world's largest and most time-sensitive CSP network migrations. We understand that each CSP's network and environment is unique and that no two projects are implemented and progress exactly the same way.

We understand telecommunications networks as few companies do, from signaling mediation to data integration, from IP security and routing to risk management. And we know how to connect calls and collect on them as well with the industry's most comprehensive order management solutions. It's why CSPs trust Neustar to help navigate their journey.

To learn more about Neustar and how we can help you optimize your Carrier Ethernet strategy, visit us at **www.neustar.biz.**