Year-End 2017 U.S. Ethernet LEADERBOARD Report

Emerging Networks Service (*ENS*)
Research Release

February 2018

CenturyLink Vaults to Top of U.S. Ethernet LEADERBOARD

Surpasses longtime market leader AT&T after acquisition of Level 3

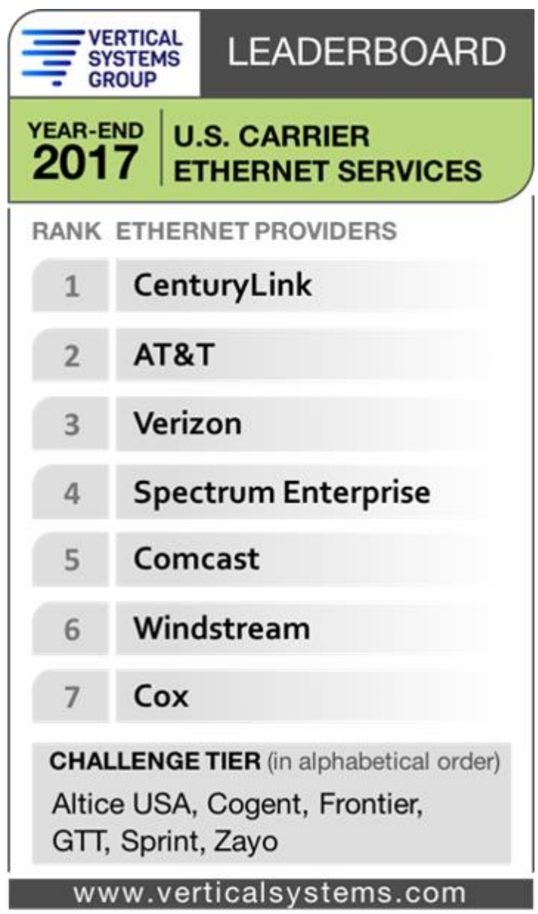
Vertical Systems Group's year-end 2017 analysis of the U.S. Carrier Ethernet services market shows that CenturyLink has captured the #1 LEADERBOARD position. It is the first time a network provider other than AT&T has led the benchmark ranking since 2005.

LEADERBOARD Roster

The U.S. Carrier Ethernet LEADERBOARD is the industry's foremost benchmark for measuring market leadership in the delivery of retail Ethernet services.

The top seven U.S. Ethernet service providers for 2017 are as follows (*in rank order based on retail port share*): **CenturyLink**, **AT&T**, **Verizon**, **Spectrum Enterprise**, **Comcast**, **Windstream** and **Cox**.

Each of these companies has attained a LEADERBOARD rank based on their year-end 2017 share of U.S. retail ports. To qualify for the LEADERBOARD, network providers must have a **port share of 4% or higher** of the U.S. Ethernet services market.



Challenge Tier

To qualify for the Challenge Tier requires a **port share between 1% and 4%**.

The following six companies have qualified for the 2017 Challenge Tier (*in alphabetical order*): **Altice USA**, **Cogent**, **Frontier**, **GTT**, **Sprint** and **Zayo**.

2017 LEADERBOARD & Challenge Tier Recap

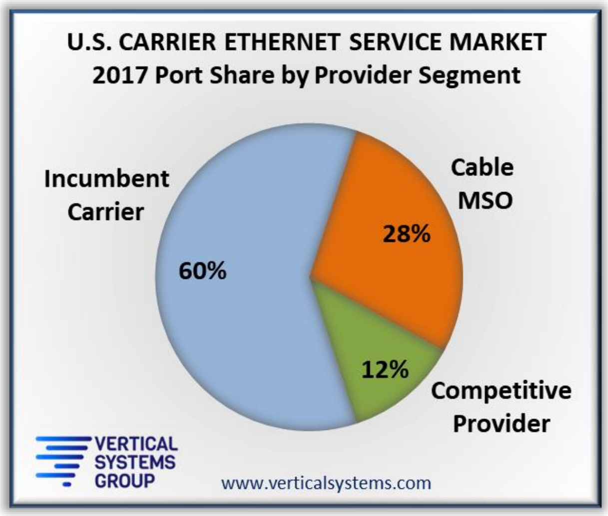
- **CenturyLink** advanced into the first LEADERBOARD position driven by its November 2017 merger with Level 3, along with continued growth in Ethernet port installations for both companies. Previously, Level 3 ranked second to AT&T and CenturyLink ranked fifth overall at the end of 2016.
- **AT&T** dropped from first into second position, after ranking first on the U.S. LEADERBOARD continuously since 2005.
- **Verizon** moved up to third position from fourth at the end of 2016 based on share results that included Ethernet ports from its XO acquisition in February 2017. XO was ranked seventh at the end of 2016.
- **Spectrum Enterprise** moved to fourth position from third at the end of 2016. The company shifted places with Verizon as a result of the XO acquisition.
- **Comcast** moved into fifth position, up from sixth in 2016 due to Level 3's exit. Comcast also had the highest organic growth rate of the top companies.
- **Windstream** rose to sixth position, from eighth rank in 2016 due to the exits of both Level 3 and XO.
- **Cox** similarly gained two positions, moving up to seventh from ninth position.
- In the Challenge Tier, **Frontier** and **GTT** were new entrants, advancing on Ethernet-related acquisitions to join **Altice USA**, **Cogent**, **Sprint** and **Zayo**.

Market Player Tier

All other providers selling U.S. retail Ethernet services with **port share below 1%** are in the Market Player tier. The 2017 Market Players (*in alphabetical order*):

Alaska Communications, Alpheus Communications, American Telesis, Birch Communications, BT Global Services, Cincinnati Bell, Consolidated Communications, Crowne Castle, DQE Communications, Expedient, FiberLight, FirstLight, Global Cloud Xchange, Great Plains Communications, Hawaiian Telecom, Logix Fiber Networks, LS Networks, Lumos Networks, Masergy, MegaPath, Midco, NTT America, Orange Business, RCN Business, Tata, TDS Telecom, Telstra, TPx Communications, Unite Private Networks, US Signal, WOW!Business and others.

Ports by Service Provider Segment



- **Incumbent Carrier** is the largest Service Provider segment in the U.S. Ethernet market, accounting for 60% of total customer ports installed at the end of 2017. The LEADERBOARD companies in this segment are CenturyLink, AT&T, Verizon and Windstream.
- **Cable MSO** is the second largest Service Provider segment, contributing 28% of ports. The LEADERBOARD companies in this segment are Spectrum Enterprise, Comcast and Cox.
- **Competitive Provider** companies represent the remaining 12% of the2017 U.S. port installations. The top Competitive Providers in the Challenge Tier are as follows (*in alphabetical order*): Cogent, GTT, Sprint and Zayo. No companies in the Competitive Provider segment qualified for the 2017 LEADERBOARD.

MEF Certifications

Each of the 2017 LEADERBOARD companies has attained MEF CE 2.0 Ethernet services certification. Additionally, each company employs MEF Carrier Ethernet Certified Professionals (MEF-CECPs). MEF (www.mef.net) is a leading industry association that is driving the framework for defining and certifying agile, assured and orchestrated Ethernet and other communications services.

- Companies on the U.S. Ethernet LEADERBOARD plus Challenge Tier employ more than one-third of the 5,500+ MEF-CECPs worldwide.
- Spectrum Enterprise leads with greater than 800 MEF-CECPs employed, followed by CenturyLink with more than 500 MEF-CECPs.

Summary of U.S. Ethernet Port Installations & Market Trends

The U.S. retail **Ethernet port base grew 13% in 2017**. With this rate of growth, the installed base of Ethernet customer installations exceeded **more than one million ports** at year-end.

> ***"In addition to the shakeup at the top of the LEADERBOARD, U.S. Ethernet installations exceeded the milestone of one million ports in 2017."***
>
> Rick Malone, principal
> Vertical Systems Group

- Driven by **digital transformation**, customers are deploying Ethernet services to support secure, high performance connectivity for company sites, cloud-based applications, private data centers and business partners.
- The fastest growing Ethernet deployments in 2017 were **cloud connectivity** and **access to Dedicated IP VPNs.**
- A primary driver for Ethernet purchases is the **need for speed**. Customers are migrating their lower speed legacy network services to higher speed, more scalable **Ethernet connectivity** at a lower bandwidth cost per bit.
- In 2017, **100 Mbps and gigabit speed services** comprised more than half of all Ethernet customer port installations in the U.S. market, and generated more than three-quarters of U.S. Ethernet services revenue.
- Nearly two-thirds of U.S. Ethernet access connections are delivered to customers over **direct optical fiber**. Other access technologies used to deliver Ethernet services include Ethernet over Copper or DS1, SONET, Coax/HFC, PON/GPON, DS3 and other alternatives.
- Service providers cite **price compression** as a continuing challenge to revenue growth.
- Another challenge is that new Ethernet purchase decisions are being delayed as customers evaluate **SD-WAN** solution alternatives.

2017 Ethernet Market Share Calculations

Market shares for the year-end 2017 U.S. Carrier Ethernet LEADERBOARD analysis were measured by the number of billable retail Ethernet customer ports in service as tracked by Vertical Systems Group.

Port share calculations use the Ethernet port base total as of December 31, 2017. Share figures include billable retail ports only (*i.e., no wholesale services*). All ports are counted equally for share calculations, regardless of the access rate of the port (i.e., 10+ Gbps, 1 Gbps, 100 Mbps, 10 Mbps, Sub-10 Mbps).

Vertical Systems Group defines six Carrier Ethernet service types from a market perspective based on what network service providers are offering and enterprise customers are purchasing. The Ethernet service segments included in this analysis are Dedicated Internet Access (DIA), Ethernet Access to IP/MPLS VPNs, Ethernet Private Lines (EPL), Ethernet Virtual Private Lines (EVPL), Metro LAN and WAN VPLS (Virtual Private LAN Service).

About Vertical Systems Group

Detailed Ethernet statistics and port share results that power the ***Year-End 2017 Carrier Ethernet LEADERBOARD*** are available through subscription to Vertical Systems Group's ENS (Emerging Networks Service) Research Programs.

Vertical Systems Group is recognized worldwide as a leading market research and strategic consulting firm specializing in defensible quantification of the networking industry.

Contact us for more information at www.verticalsystems.com.