

November 09, 2011

# Enterprise Ethernet Service Enables Distributed Data Centers



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Carrier Ethernet services are clearly the optimum way of transporting vast amounts of data center traffic at seriously high speeds. Data rates up to 100 Gigabit have been standardized and services scale in 500 MB increments. [Tata Communications](#), a recognized leader in the Ethernet space, has a global data center footprint as well as 24 Ethernet nodes. In addition, the company is the first to deploy a Carrier Ethernet (CE) network based on Provider Backbone Bridging (PBB), which is a next-generation technology (see sidebar). Impressive bragging rights, but what is really interesting is the way that the combination — providing Ethernet services along with a global network — can be used by mid-sized multinationals.


For example, a mid-sized company that operates globally may prefer to employ several private centers instead of a hosted service. However, by deploying Carrier Ethernet connections to a local Tata node, they can create a network of virtual data centers that function as a seamless cloud-computing resource. This is a more efficient way of employing the company's resources, e.g. servers in different locations and time zones can be mixed and matched when workloads peak. This is one of the *raison d'être*s of the cloud-computing concept, but now the resources are not centralized, they're distributed. One could also imagine that a hosted facility could be used as a synchronized, backup service.

I spoke with James Walker, Tata Communications' ([News](#) - [Alert](#)) VP of Managed Network Services, at NetEvents and he was talking about the interconnection of data centers, which would enable zillions of servers that are geographically distributed to function as one colossal data center. This appears to be a unique concept right now and he went on to say that “hand on my

heart, after 20 years in the industry I have never had such a high level of positive customer feedback.”


Tata Communications has a comprehensive portfolio that used to include a converged Ethernet and MPLS (Multiprotocol Label Switching) network. This architecture has been widely deployed by carriers for some years; however, it compromised the Ethernet service, e.g. scalability (in terms of endpoints and maximum data rates). The company therefore decided to decouple MPLS and create a separate, independent Ethernet core.

## LARGE CENTERS & GREEN SERVICES

Virtual data center networks are an interesting concept, one that matches the need of multinational enterprises and organizations like banks that want to operate private clouds on a regional basis. However, right now the action is taking place in very large data centers that employ a huge number of servers. Google ([News](#)  [Alert](#)), for example, currently runs about 900,000 servers in different locations to power its empire.

Lots of servers equates to lots of energy: it's needed to run the computers and the air conditioning systems. Conventional cooling can account for 70 percent of the energy bill and data centers are a competitive business, so the energy needs to be cheap and preferably it should be green. Data centers are set to exceed airlines as CO2 culprits by 2020, so the industry is under pressure to both reduce its carbon footprint as well as its electricity bill.

Iceland has the cleanest, greenest electricity in the world. It generates 100 percent from renewable sources: about 75 percent from hydropower; 25 percent from geothermal. As an added investment incentive, the country is prepared to freeze prices for up to 20 years.

The location that best fits that bill is Iceland. Ambient ([News](#)  [Alert](#)) temperatures are low, so little -- if any -- money is needed to cool their servers, but best of all is the fact that the energy couldn't be greener. It comes from the country's dual-sourced renewable energy power grid. Iceland is also well placed geographically. It's linked with Europe and North America via a number of fiber-optic submarine systems and Carrier Ethernet runs over fiber.

## Carrier Ethernet

Ethernet is a layer 2 data transport technology that has become the most popular and widely deployed local area network technology in the world. Extending Ethernet to run across the world instead of just around the LAN makes business as well as technical sense. Carrier Ethernet was developed and refined in order to overcome the limitations of the original LAN-centric design. It allows carriers to transport Ethernet frames over long distance networks, using different technologies, PBB being the latest. PBB allows carriers to commit to SLAs that deliver the end-to-end performance characteristics needed for voice, video and data traffic.

The ability to extend LANs over the WAN is the key application. It enables the creation of a “transparent LAN” that connects enterprise locations such as headquarter buildings, data centers, R&D sites and contact centers. All the connected sites can then act as a single physical site in

networking terms: they are logically connected and have high-speed, LAN-like behavior. The [MEF](#), which is the defining body for Carrier Ethernet, develops technical specifications for the interoperability and management of Carrier Ethernet networks.

PBB provides a way to emulate connection-oriented TDM networks by providing "nailed-up" trunks through a packet-switched network, thereby providing predictable latency between endpoints, which is needed for financial trading, voice and video applications. It also allows a single enterprise network that have thousands or even hundreds of thousands of Ethernet addresses (MACs), which in turn enables huge virtual datacenters spanning multiple physical locations around the world.

## BUILD A CENTER IN FOUR MONTHS

[Verne Global](#), a UK-based developer has built a data center campus in Keflavik, Iceland, and the company recently announced the availability of a colocation service. The 18-hectare (45-acre) facility is situated on a site that was a NATO base for over 50 years, chosen for its extremely low risk of natural disaster. It's also well to the west of all of Iceland's volcanic activity, i.e. the Gulf Stream will push volcanic effects away from the site.

I also spoke with Jeff Monroe, Verne Global's CEO, at NetEvents and he claims to have created a solution that redefines the data center. "We have designed a flexible, dynamic solution that answers the need for both high capacity computing and cost management." The company employed [Colt's](#) modular data center design and this enabled an innovative, power-efficient, large-scale facility to be built in just four months. The design is based on standardized manufacturing techniques whereby components are fabricated and tested on a production line in a factory environment,

Colt manufactures the modular data center modules. They are configured in such a way that they can be transported to the docks and put on a ship. Some two to three weeks later they arrived in Iceland, where they were assembled at the data center campus. Normally data centers are created as customized, one-offs, which takes time: up to 18 months.

## CONCLUSIONS

Disruptive developments such as cloud computing get overhyped and then when issues surface fear, uncertainty and doubt is generated. "Fear of the unknown is a powerful emotion. But when you're an IT exec, fear of the unknown – particularly when you're talking about moving into the cloud - really comes down to fear of making a costly mistake." Those words come from [Logicalis](#).

To clear things up, Logicalis ([News - Alert](#)) analyzed more than 35,000 online forum and social media posts from CIOs and CTOs over the past 60 days, and found their comments to be overwhelmingly in favor of cloud computing. "Positive" and "very positive" comments outweighed "negative" and "very negative" comments by a dramatic 23:1. One can therefore conclude that this development is on a roll: the market wants it and a sweet spot has emerged.

Enterprises can optimize the benefits of cloud computing by employing the services of data centers that are located in relatively cold environments like Iceland and Finland. Google recently launched a center in Hamina, Finland, whose cooling system uses cold water from the Baltic Sea to save electricity.

Centers can be built in short time frames using Colt's modular design concept. This also allows extra capacity to be added easily and quickly. And to round out the picture, Carrier Ethernet services have been extended to remote locations that employ cost-efficient, renewable energy.

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