Carrier Ethernet

Group:

- Carrier Ethernet Project – Final Report [1]
- Carrier Ethernet technology introduction [2]
- Emerging Carrier Ethernet Technologies. Technical Overview [3]. The document has 37 pages and includes:
    - Technical description of PB, PBB, PBB-TE, VPLS (EoMPLS) technologies;
    - Metro Ethernet Forum specifications describing Carrier Ethernet as a service
    - Glossary
- The Janet Carrier Ethernet project [4]
- Call for Participation in the project [5]
- Lightpath Extensions through Regional Networks [6]. Overview of issues and Enabling Technologies

Carrier Ethernet technology introduction

'Carrier Ethernet' is an umbrella term covering different emerging services and technologies. To understand the place and role of each technology, it is necessary to distinguish between Carrier Ethernet as a **transport servic**e and as an internal **carrier transport technology**

Carrier Ethernet as a transport service

Carrier Ethernet as a transport service represents a service from the user's point of view. It means that a carrier network has an Ethernet User Network Interface (UNI) which connects user sites on Layer 2. At the same time, within the Service Provider Network, a service can be based on different transport technologies e.g. Ethernet itself, IP/ MPLS or SDH/OTN/DWDM.

The service, defined by the Metro Ethernet Forum (MEF), specifies the type of service a user can request from a provider, in terms of the topology for connectivity between the user's sites and the parameters of such a service. The main service parameters include:

- Committed bandwidth limits
- QoS metrics
- Preservation of VLAN tags
- Security filters.

IETF and ITU-T are focused on providing an Ethernet service by using particular non-Ethernet technologies within a carrier network. IETF deals with IP/MPLS core while ITU-T focuses on SDH/OTN/DWDM.

Carrier Ethernet as an internal carrier transport technology
(Carrier Ethernet Transport, CET)

Carrier Ethernet as an internal carrier transport technology covers a range of

activities/scenarios where Ethernet is used within a service provider network as the main bearer mechanism. Because classical Ethernet was developed as a pure LAN technology it could not be used as a carrier transport technology. Several standards bodies and vendors have been developing standards to allow the use of Ethernet over a wide area network, with an initial focus on: Ethernet manageability (OAM); scalability; traffic engineering; resilience; and strong QoS support. This work is mostly being carried out by the IEEE with the ITU-T and the IETF. The IEEE have finalised two standards in the area: Provider Bridges (PB) and Provider Backbone Bridges (PBB). A third standard – Provider Backbone Bridges Traffic Engineering (PBB TE) – is currently under development and is expected to be finalised in 2009.

A <u>technical overview of different Carrier Ethernet technologies</u> [7] is available.

The Janet Carrier Ethernet project

There is currently a lot of effort made within Industry and the standards bodies to transform Ethernet into a carrier grade technology. How will this benefit the Janet community?

To explore this area further, Janet has established a project to investigate the features/functionality and maturity of two major strands of ?arrier Ethernet technology: Ethernet over MPLS (EoMPLS) from the IETF and Provider Backbone Bridges (PBB)/Provider Backbone Bridges Traffic Engineering (PBB-TE) from the IEEE.

The project will consist of a number of funded practical and theoretical activities. To help facilitate the practical activities, a Janet-wide testbed will be deployed.

From responses received to the <u>Call for Participation</u> [5] to members of the Janet community, four were selected to participate in the project practical trials and one for the theoretical activities. The project term will be approximately two years, divided into two stages.

The project participants are:

- University of Manchester (Net North West Ltd)
- University of Essex (School of Computer Science and Electronic Engineering)
- CANLMAN and Lancaster University ISS
- University of Oxford (OUCS)

The stage 1 trials of the project test plan were successfully completed during the first quarter of 2010. Three end-to-end connections were established between the project participants' testbeds over a multi-technology and multi-domain environment.

The test plan for the Stage 2 trials was discussed and agreed at a face-to-face meeting with the project participants on 15 April 2010 in London. Stage 2 tests involve investigating different advanced features for Carrier Ethernet connections, such as bandwidth guarantees and QoS, resilience and multipoint-to-multipoint connectivity. The Stage 2 trials are planned to finished by the end of 2010; the results and recommendations of the trials will be made available in the first half of 2011.

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Links

[1] http://www.ja.net/documents/development/carrier-ethernet/CE-Final-Report.pdf
[2] http://www.ja.net/development/optical-networking/carrierethernetproject.html#intro
[3] http://www.ja.net/documents/development/EmergingCarrierEthernettechnologiesv.1.3.pdf
[4] http://www.ja.net/development/optical-networking/carrierethernetproject.html#project
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