

Carrier Ethernet's First Certification Report Cards are In - See Who Passes, and Who is Missing

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Module:
**Carrier Infrastructure
- Global**

► Summary

Issue

Carrier Grade Ethernet is one of the fastest growing market segments within the carrier infrastructure arena. Ethernet has in the past been spearheaded by inexpensive Layer 2 switches and multiplexers that have long been price leaders for enterprises and for service providers to provide best effort Ethernet aggregation within their access networks. Now in play is a movement to expand far beyond basic Ethernet aggregation and switching to enable service providers to leverage the cost and operational efficiencies of Ethernet to provide true carrier grade services worldwide over multiple vendors' equipment. Within a relatively short time frame, the industry, including vendors, service providers, as well as the standards community, has come together to insure Ethernet's success as a service delivery infrastructure. Beyond basic Ethernet interoperability, which has long been a non-issue, the industry is moving in a direction that will establish a framework whereby the delivery of consistent Carrier Ethernet services worldwide is a reality. The organization taking the leadership position in the movement is the Metro Ethernet Forum (MEF). The MEF launched the effort in April 2005 and quickly defined the first set of Ethernet services. The MEF has accomplished its second major milestone – the certification of the first 16 vendors that met the currently defined services. Off to a blazing start, how far will the effort go and will all vendors and service providers endorse the next steps?

Analytical Summary

The work performed by the MEF takes Ethernet standards to a new level to address the services and not just the interface and/or network level of interoperability. The MEF has done a good job defining what is meant by carrier Ethernet in terms of: Reliability, Hard QoS, TDM support, Service Management, and Scalability with the appropriate metrics associated with each. The MEF has accomplished this using a combination of its own newly developed standards supplemented with existing IEEE standards where appropriate. Both optical vendors and metro Ethernet vendors should become very active with the MEF as it is sure to become one of the de facto organizations for driving the standards that will form the basis for advanced Ethernet-based services. According to the MEF, from the vendors' perspective a single certificate can reduce the time and cost of conformance testing and accelerate the deployment of new systems, while end users can have greater confidence in their Ethernet services' consistency. The certification process will also accelerate a service provider's ability to evaluate multiple vendors' equipment, respond to new orders or upgrades, and focus on delivering the full benefits of Carrier Ethernet Services. One can still argue that any given standards-based solution may have flaws or may not be optimally architected for speed or efficiency, but the key with service levels is to have the hooks in the infrastructure to pass the needed information between the network elements.

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► Perspective

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Current Perspective

The announced results of the MEF's first round of systems to comply with its global Carrier Ethernet service definition sends a strong message to the market because this represents a first and major step towards the ability to provision a constant Carrier grade Ethernet service worldwide across a multitude of different vendor's equipment. This certification is expected to help fuel the global uptake of Carrier Ethernet that is already one of the fastest growing sectors in the industry.

The MEF announced in September that the first of sixteen companies had passed its Carrier Ethernet Certification program. The MEF, a global alliance comprised of seventy organizations of service providers and equipment manufactures, has adopted a charter to accelerate the worldwide adoption of Carrier-class Ethernet-based networks and services and is headed by Nan Chen. Iometrix is the company responsible for the initial conformance testing and is headed by Bob Mandeville - Iometrix holds the exclusive test rights through October 2005. Iometrix tested the first products for conformance to MEF's test plan for Ethernet services at the UNI. Specific services tested included: Ethernet Private Line (EPL), Ethernet Virtual Private Line (EVPL), and E-LAN (Ethernet multi-point-to-multipoint) compliant with MEF 9. MEF 9 defines a series of tests to verify that services delivered to the subscriber across the UNI are conformant. Sixteen companies with a total of 39 specific systems participated in the first round of certification testing. The results of the testing along with the products and types of services certified are listed in the table below. The list of participants includes established as well as emerging vendors, and describes which of the three classes of services in which each vendor's product obtained certification.

While conformance testing is not a complete guarantee of interoperability for all features and functions, it does help to establish an even base line that is helpful for the deployment of new services. The MEF's phase 2 program will further establish delivery options and SLAs for all traffic types. With the momentum that the MEF has garnered and its flagship membership, which consists of all the key players in this space, it will soon become the de facto testing and compliance organization for Ethernet-based network services. For carriers and service providers that need to build out infrastructures capable of supporting a variety of vendor technologies from which to offer Ethernet services, the MEF offers the promise to provide interoperation and the ability to provide a consistent level of operation using a large number of devices that must work together in harmony to produce an end-to-end solution. These services will be offered from, hopefully some day, a single converged multi-vendor Ethernet-based infrastructure.

Equipment vendors have relied on implementation agreements and standards to guide the design and implementation of their equipment. Carriers and service providers have relied on recommendations, alliances, as well as those same implementation agreements to better describe how the individual pieces should work together on a network level to support profitable service delivery models. This process has created many forums and alliances that are focused on a particular part of the puzzle, generally within their area of expertise and sometimes somewhat self serving, as the vendor with the closest implementation to the final approved agreement can sometimes exploit a window of opportunity where they are clearly the first to market with a specific certified functionality. Carrier Ethernet certification will undoubtedly experience multiple vendor/service provider extensions to provide enhancements to the baseline services – many of which will later be incorporated into the service definitions.

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Table: Metro Ethernet Forum Carrier Grade Ethernet Test Results

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| Company Name | System Name | Service Type Certified | | |
|--------------------------------|--|------------------------|------|-------|
| | | EPL | EVPL | E-LAN |
| Actelis Networks | MetaLIGHT 50 | x | x | x |
| | MetaLIGHT 130 | x | x | x |
| Alcatel | Transport Service Swith | x | x | x |
| Atrica | A-2100 | x | x | x |
| | A-4100 | x | x | x |
| Cisco Systems | Cisco Catalyst 3750 Metro Series Switch | x | x | x |
| | Cisco Catalyst 4500 | x | x | x |
| | Cisco Catalyst 4948-10G | x | x | x |
| | Cisco Catalyst 6500 Series Switch - Supervisor 720 | x | x | x |
| | Cisco Catalyst 6500 Series Switch - Supervisor 32 | x | x | x |
| | Cisco 7600 Series Router - Cisco 7600 Series Supervisor Engine 720 | x | x | x |
| | Cisco ONS 15454 ML-Series | x | x | x |
| | Cisco ONS 15454 CE-Series | x | | |
| | Cisco ONS 15310 ML-Series | x | x | x |
| | Cisco ONS 15310 CE-Series | x | | |
| Extreme Networks | BlackDiamond 10808 | x | x | x |
| | Summit 450 | x | x | x |
| Fujitsu Network Communications | FLASHWAVE 4020 | x | | |
| | FLASHWAVE 4100 | x | x | x |
| | FLASHWAVE 4500 | x | | |
| Hatteras Networks | HN4000 and HN400-CP | x | x | x |
| Lucent Technologies | Metropolis DMX | x | x | x |
| | Metropolis DMXtend | x | x | x |
| Metrobility Optical Systems | R821 E-Services NID / Ethernet Demarcation Device | x | | |
| MRV | OptiSwitch Master 207 series - OSM207 | x | x | x |
| Nortel | Metro Ethernet Routing Switch 8600 | x | | |
| Riverstone | RS Ethernet Router | x | x | x |
| | Riverstone 15000 Ethernet Edge Router | x | x | x |
| Siemens | SURPASS hiD 6650 | x | x | x |
| | (SURPASS hiD 6670) | x | x | x |
| Tellabs | Tellabs 8800 MSR | x | x | x |
| Tpack | Millburn Metro Ethernet / MPLS Demonstration System | x | x | x |
| World Wide Packets | LightningEdge 311v | x | x | x |
| | LightningEdge 327 | x | | x |
| | (LightningEdge 311) | | | |
| | (LightningEdge 307) | | | |

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| | | | |
|---------------------|---|--|---|
| (LightningEdge 427) | x | | x |
| (LightningEdge 407) | x | | x |
| LightningEdge 46 | x | | x |

[Definitions: EPL – Ethernet private line service, EVPL – Ethernet virtual private line, E-LAN – Ethernet multipoint-to-multipoint.]

Of considerable note to vendors in this space is that once a service definition is cast in concrete, the compliance to a requirement becomes mandatory and hence a barrier to entry or competitive knock off for products that are non compliant. Following the October 2005 embargo where only one test lab was approved by the MEF to conduct the certifications, vendors can expect additional test organizations to come on line to facilitate additional certifications. Test labs are required to provide independent third party validation and have become an integral part of the equation. The amount of time required to certify a product may not be insignificant and the commitment to resources in terms of equipment, manpower, and dollars is also not insignificant and should be factored into a vendor's product development schedules. There will be a greater proliferation of test organizations available to drive these certifications and their geographic sphere of influence, scope, and level of definition is also a major consideration.

With the dust still very much unsettled, the MEF is proceeding with the same time-compressed pace to define and develop the next level of certification test suites which will deal with the traffic management parameters for the currently defined Ethernet services. Phase 2 of the testing includes test cases related to Ethernet virtual circuit performance attributes such as frame relay delay, variance, and loss of service. In addition, the next phase will include bandwidth profiles to define rate enforcement, per ingress UNI, per EVC (Ethernet virtual circuit), per class of service, and for multiple profiles at the UNI. With applications such as IPTV, triple play, and an explosion of VoIP, these further tests will insure that end users receive a high quality of Ethernet services from their providers – regardless of the equipment that powers the underlying infrastructure.

► Recommended Actions

Vendor Actions

- The MEF should proceed full speed ahead in the development of the next phase of conformance testing for traffic management. The MEF in conjunction with Iometrix should start work on the test cases that will form the basis for traffic management.
- The MEF needs to certify or approve additional Labs to perform the certification testing in a timely manner. The current single west coast facility should be supplemented with an east coast one as well as locations in Europe and Asia in order to provide all vendors the opportunity to gain access and quick turnaround on their test results. Iometrix should work with the other certification Labs that will become sanctioned by the MEF after the end of its exclusivity to ensure consistency between the organizations. Since Iometrix has the inside track on testing, it should obviously be involved with future testing programs and in the certification of other test organizations.

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- Vendors not passing all levels that their equipment was designed to support should quickly correct any deficiencies and resubmit their products for re-test as soon as possible so they do not lose any market traction and momentum they may have. The lack of a certification can quickly derail a deployment or slow down a project until the certification is obtained.
- Vendors with multiple product lines should insure that they receive certifications for all models or petition the MEF to grant certifications for derivative products if they can show that they provide the same services or are built from the same system software. Once the certifications become mature, the MEF should work out a process whereby vendors can self certify new products and models without incurring the expense and time impact to achieve a new certification.
- All vendors should openly work with the MEF and test their traffic management capabilities in an effort to reduce the time required to obtain certification once the phase 2 test suites are available for execution. Member vendors should provide input into the test definitions.
- Vendors of test equipment should take the initiative to capitalize on the growing demand of automated test suites that a vendor can leverage during their design and test process to self-insure that they will readily pass all tests (services and service quality) once submitted to an approved test facility for certification. As new phase 2 is defined, the level and rigor of the testing will only increase and become more complex – any automated assistance that can be delivered will be welcomed by most all vendors.

Target Markets

CLECs, Global 2000, Global Carriers, ILECs, IOCs, ISPs, IXCs, Large Enterprises, MSOs, Systems Integrators

User Actions

- Carriers and service providers should evaluate the rigor of tests and provide their own level of assessment regarding the completeness of the standard test suites. Since these test scenarios are relatively new, there is no way they can be comprehensive enough to cover all the scenarios for all service types. End users also need to know where to supplement and perhaps complement the tests to adequately cover their requirements.
- Companies that have now passed the conformance testing at some revision level should incorporate this test scenario or as much of it as practical into their internal testing processes. All vendors should have pre-release and regression test plans for products of this nature. This will avoid bugs creeping into future releases and causing potentially embarrassing situations where something stopped working when the new software release is loaded.
- Service providers should place an emphasis and premium on products that have earned the MEF's carrier Ethernet certification, since the test suites have been developed with input from all parties. Without a level of commitment from service providers, the true value of the process will not be realized.

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- Service providers should provide feedback to the MEF as well as vendors related to their experiences with MEF certified products. Continued feedback will insure that the test suites receive enhancements that address any deficiencies and are continually enhanced.
- Service providers should engage in the next phase of test suites that address the traffic management aspects of carrier Ethernet. In many aspects, phase 2 will insure the quality of the delivery of advanced services such as IPTV and main stream scalable VoIP.
- Service providers should press the test equipment vendor community to automate as much of the Ethernet service certifications as possible in order for them to incorporate these devices into their network operational centers for troubleshooting and for quality assurance purposes.

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