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# White Paper: Accedian EtherNID™ and QT-600

## Ensuring Quality of Service on Carrier-Grade Ethernet Networks

Version 1.5 (2007/05/18)

ETHERNET SERVICES DEMARCATION POINT

[accedian.com](http://accedian.com)

A low-angle, upward-looking photograph of several modern skyscrapers with glass facades, set against a bright blue sky with scattered white clouds. The perspective creates a sense of height and scale.

**DRAW THE LINE,  
DEMARCA  
YOUR  
NETWORK™**

## Ensuring Quality of Service on Carrier-Grade Ethernet Networks

The growing demand in IP-based services, such as Voice over IP (VoIP) and Internet Protocol Television (IPTV), is driving the need for affordable bandwidth while adhering to ever more stringent Service Level Agreements (SLA) and ensuring acceptable end-to-end Quality of Service (QoS).

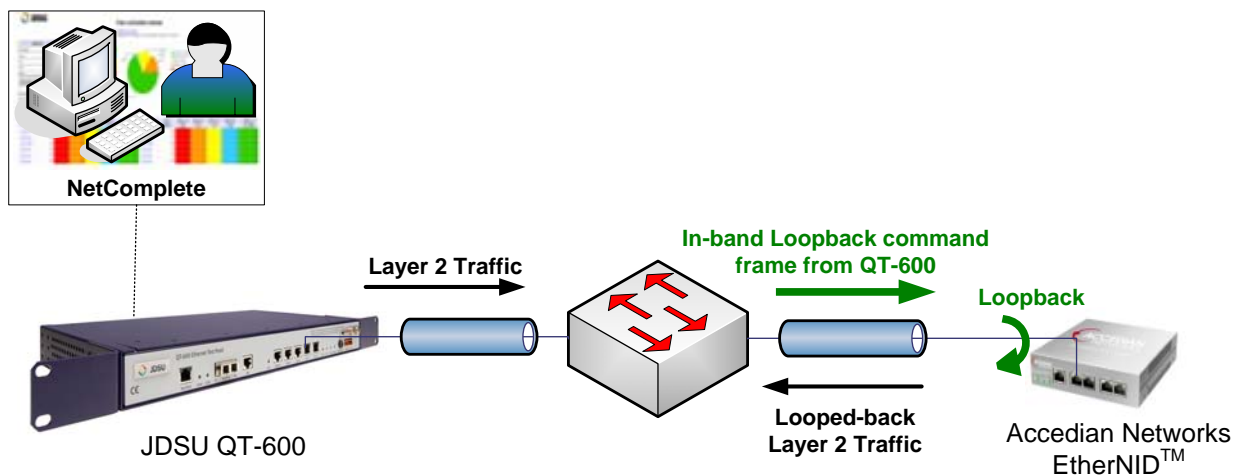
Carrier-Grade Ethernet Services come up as a very interesting technology to solve this equation, but operators are facing important challenges when the time comes to measure QoS and ensure SLAs. Traditional Ethernet was originally intended solely for LAN usage and lacks functionality in several aspects such as OAM, link level performance monitoring, manageability, demarcation, loopbacks and fault isolations.

Despite these shortcomings of traditional Ethernet, Carriers are confronted with an overwhelming customer demand and the need for Carrier-Grade Ethernet access devices and testing equipments is thus increasing rapidly.

### Teaming up JDSU QT-600 and Accedian EtherNID™

Accedian Network's EtherNID™ is an ideal companion to the QT-600 and NetComplete.

Capable of Wire-Speed Layer 2, Layer 3 and Layer 4 loopbacks, the EtherNID™ allows the QT-600 to perform point to point tests and benchmarks at the Ethernet Frame (layer 2) level.



The EtherNID™ will natively detect and process the QT-600's in-band loopback enable and disable (up/down) command frames, hence avoiding the need for additional remote logins and connections (console, telnet/ssh or web), remote operators and expensive truck-rolls. The entire testing procedure is automated and

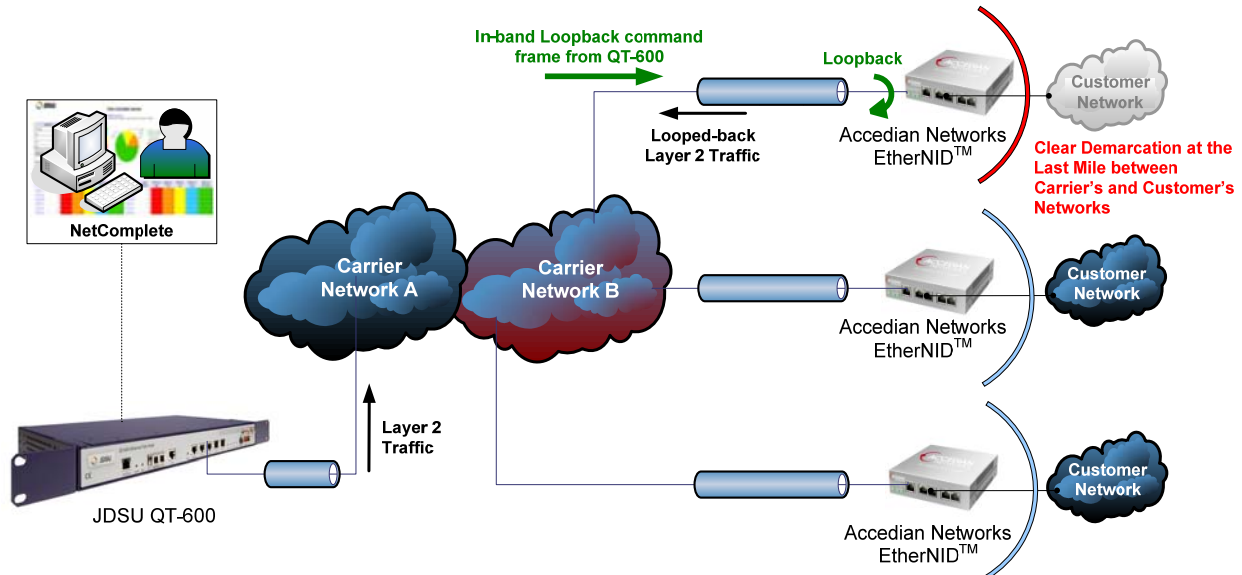
controlled directly through JDSU's QT-600 Ethernet & Triple-Play Probe and NetComplete software.

Using its unique *Fast-Thru™* engine, the EtherNID™ not only provides Wire-Speed throughput with zero packet loss but also operates without introducing any significant latency and jitter, thus allowing the QT-600 to provide accurate and unbiased test results. Furthermore, the EtherNID™ can be powered directly via Power over Ethernet (PoE) and has redundant power sources in order to be available in any conditions.

### Test everything up to the Last Mile

With current Ethernet solutions, a Service Provider can not test or diagnose the entire link, or ensure its SLA end-to-end. The Last Mile is invisible to operators' testing equipments, or will include the Customer's network.

Accedian Networks' innovative EtherNID™ creates a clear demarcation point between the Carrier's and the Customer's networks and in conjunction with the QT-600 and NetComplete software provides visibility all the way to the Customer's Premises. This solution allows the operator to effectively isolate the customer's network from the test and thus eliminate diagnostic errors.



In this scenario, an Access Service Provider would install a JDSU QT-600 in a strategic location in its network and place EtherNID™ products at the end point of each customer's link, as a Customer's Premises Equipment (CPE). Whether the service is E-Line, E-LAN, E-Tree (Hub & Spoke), Internet connection, the Ethernet Access Provider will be able to obtain precise measurements up to the Customer's

Premises using the QT-600 and NetComplete, and thus guarantee and troubleshoot the customer's Quality of Service appropriately.

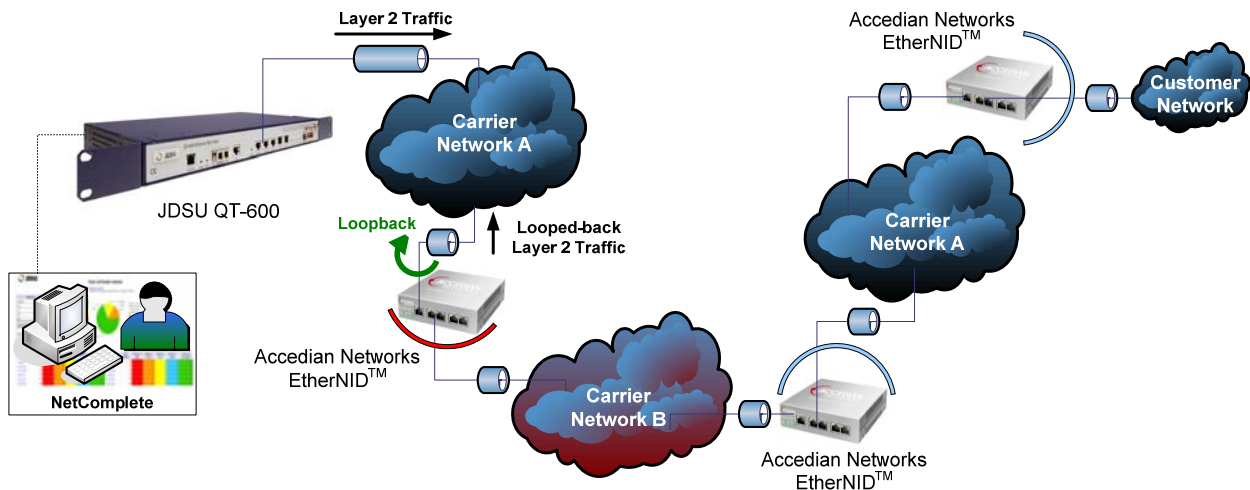
In addition to these clear benefits, Accedian Networks' EtherNID™ line of products allows the Service Provider to use the device as an Intelligent Media Converter (10/100/1000 Mbps, fiber or copper) using the EtherNID™ OE and GE's Small Form-factor Pluggable transceiver (SFP) receptacles.

### Diagnose and pinpoint Multi-Carrier problems easily and precisely

In many cases, an end-to-end customer link spans across multiple Carriers and only the most limited diagnostic tools (none in layer 2, traceroute in layer 3) can be used to test and resolve connectivity problems.

By allowing a better sectionalization of the end-to-end link, Accedian's EtherNID™ can help operators diagnose Multi-Carrier situations when experiencing issues, and eliminate needless finger pointing between Carriers.

In regards to his customers, an operator is responsible for the entire end-to-end SLA, and not only has to be able to measure the entire performance, but also has to be able to pinpoint the exact location of potential problems in order to resolve these.

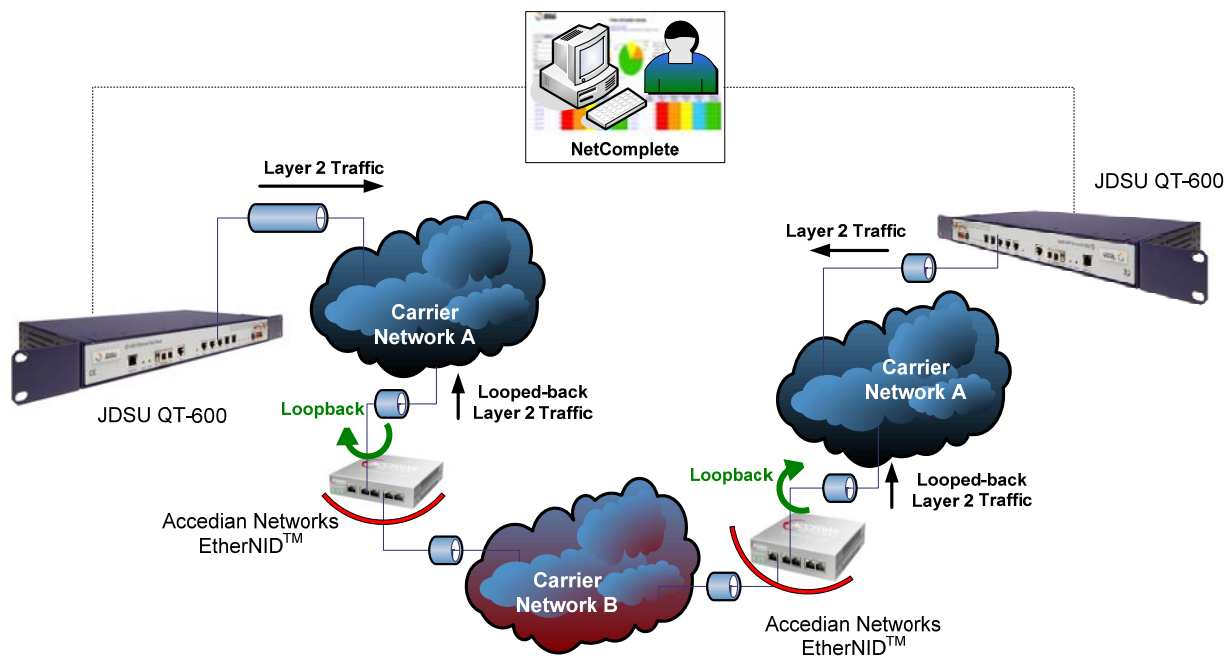


By placing an EtherNID™ between each Carrier Network, the QT-600 will be able to run tests using in-band loopback command frames for each section.

In the scenario above, assuming there is a performance issue with the Customer's connection, the operator would then connect to the QT-600 and use the NetComplete software to run a loopback test between the QT-600 and the first EtherNID™ in order to validate the first Carrier A Network's quality. He would then proceed to run a similar test between the QT-600 and the second EtherNID™,

encompassing both Carrier A and Carrier B Network's sections. Finally, a third test comprised of all three sections would provide measurements for the entire link, all the way up to the Customer's Premises, with the assistance of a clear demarcation point provided by the EtherNID, thus eliminating any potential problems in the Customer's own network in the process.

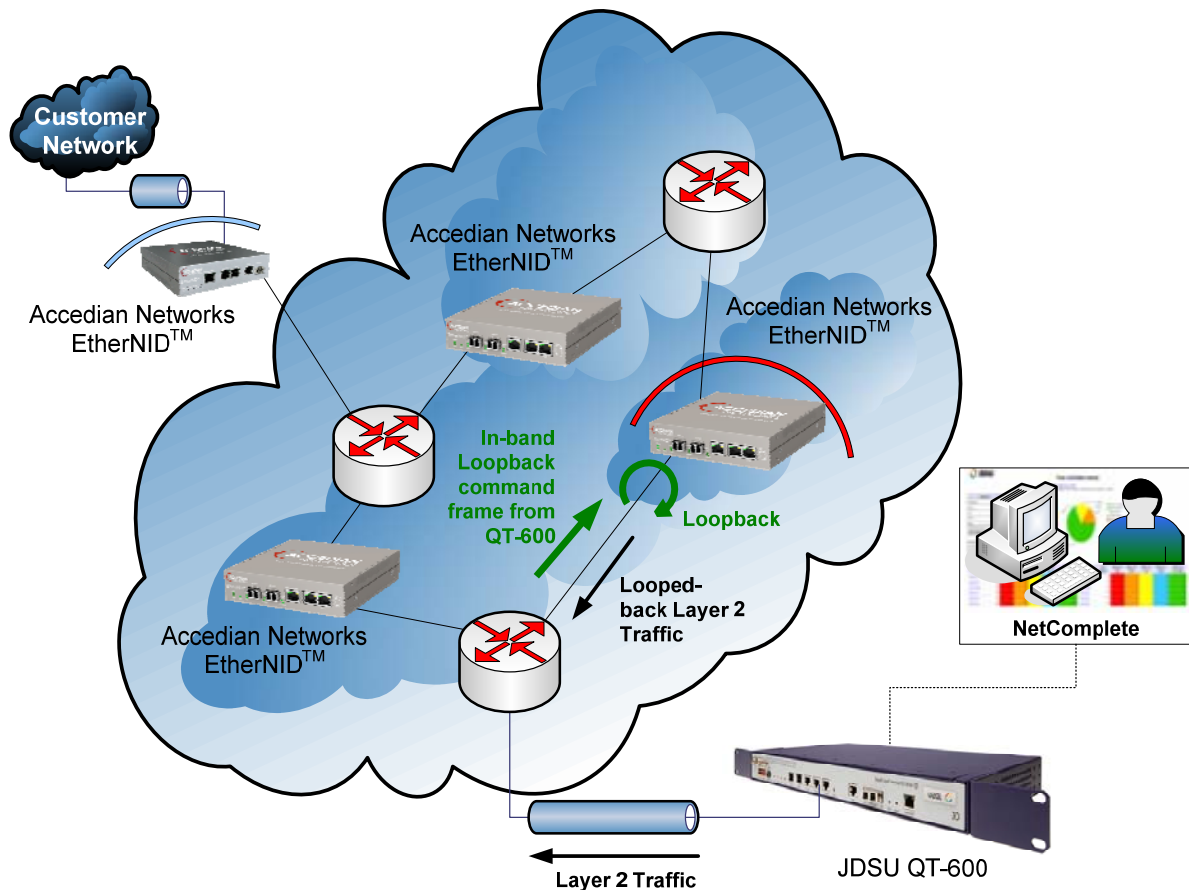
In cases where the problem occurs on two (or more) networks, a more advanced diagnostic test may be used. In the example above, the second and third section tests may return measurements indicating a problem with both Carrier B's network and Carrier A's (close to the customer) network, but the operator at the QT-600 may be unable to pinpoint the exact problem.



Two QT-600's may then be used to run tests in bi-directional incremental sections, as depicted in the figure above, and allow the operator to easily pinpoint the exact source of the service failure.

### Improve your Ethernet network's performance and fault detection using Accedian EtherNID™

A QT-600 and a number of EtherNID™ products is also an ideal solution to diagnostic problems inside a Carrier's network. Because of its affordable price-point and ultra-low latency and jitter, EtherNID™ products may be deployed at large within the Carrier's network and allow operators to easily and automatically use sub-sections of the network for testing and diagnostics.



With a strategically located QT-600, the operator will then be able to test multiple sections or paths in his own network, in order to ensure the network's performance is up to the SLA, pinpoint exact locations of equipment failures, and even run end-to-end tests all the way up to the Customer's Premises.

## Conclusion

In the growing environment of Carrier-Grade Ethernet Networks and IP-services such as VoIP and IPTV, ensuring Service Level Agreements and assuring the best Quality of Service possible evolved from being a competitive advantage to an absolute necessity. In order to achieve the expected performance, operators need enhanced test equipments and capabilities, as well as devices used to actually measure performance of their own network as well as end-to-end links while disregarding the customer's own network. The combination of JDSU's QT-600 and multiple Accedian Networks' EtherNID™ products forms an ideal team to address all these needs.