

The Spectrum

Newsletter of the Rocky Mountain Chapter

November 2006

**Chapter Information
Rocky Mountain Chapter
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<http://chapters.scte.org/rockymtn>

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By agreeing to serve, the Board pledges to support the telecommunications industry and the participants of the Rocky Mountain Chapter of the SCTE.

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Mark Thompson	CommScope	303-773-3003	FOB
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UPCOMING SEMINARS and TESTING OPPORTUNITIES!

Nov 16th	Colorado Springs – Clarion Hotel Downtown 314 W Bijou St.	Advanced IP DOCSIS 3.0 and Video and Voice IP Networks defined – An all day event	Kyle Lindsey, System Engineer for Cisco
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Competitive Intelligence

The following article is reprinted with the permission of Telecommunications Magazine (www.telecommagazine.com) specifically for this edition of the RMSCTE newsletter.

Business Networks Architecting the Network of the Future

by Michael Kennedy
Tues, August 1, 2006

Both Ethernet and IP multimedia subsystem (IMS) are becoming important to the future of networking infrastructure, proving once again that innovation has many origins.

Ethernet is a grassroots technology whose original purpose was to make it possible to share resources among personal computers. It lacked most of the features — carrier-

grade performance, QoS, reliability and security — required by technologies used as infrastructure in large public networks.

Ethernet, however, has the advantage of simplicity, which yields lower-cost hardware as well as operations that are easy, fast and, consequently, low cost.

Recent product announcements by a wide range of equipment vendors suggest that Ethernet now has been transformed into a form suitable for deployment as part of public network infrastructure.

Juniper, for example, announced Ethernet service cards for its M and T series routers, moving Ethernet farther into the backbone network. Similarly, Ciena introduced Layer 2 Ethernet switching functionality to its CoreDirector multiservice switch that also is found deeper in the network.

Within the access network, ADVA and White Rock now provide support for Ethernet on SONET/SDH facilities. Lucent and Fujitsu are bringing out solutions that combine Ethernet switching, routing and optical transport in a single system aimed at residential and small enterprise triple-play applications.

This combination of switching, routing and transport in a single system is essential if the cost points needed for profitable residence and general business services are to be achieved.

Finally, the Metro Ethernet Forum (MEF) has certified Actelis and Alcatel's Carrier Ethernet products as compliant with the MEF No. 14 Technical Specification. Compliance is critical for Carrier Ethernet services to become standard service offerings rather than custom-built solutions suitable for only a few top-tier enterprises.

IMS began as a top-down industry effort to define 3G mobile phone systems. It achieved immediate success as a framework for rapidly creating value-added features for wireless operators.

This has led to the telecom industry's traditional large equipment vendors and most incumbent telcos backing IMS.

Service providers particularly are excited about the possibilities created through the concept of presence. Presence implies the network has some awareness of what application the customer is using, who and where the customer is, and what type of end-user device is being employed. This information has intrinsic worth that can be used to create value-added services to boost revenue and the services' underlying perceived value.

Wireline operators, which have seen the perceived value of their services lag behind wireless offerings, especially are interested in tapping into IMS' potential. Ericsson, with one of the larger number of IMS projects underway, reports that about two-thirds of its projects are for wireline carriers seeking to close the value gap with wireless operators.

IMS also is viewed as a vehicle for differentiating telco triple-play services from cable MSO offerings. Alcatel and Lucent, among others, have expended a great deal of marketing effort to show how video and entertainment services using IMS can be made to follow users from their home entertainment systems to mobile phones and to public hot spots. The rationale is that telcos will be able to create higher value offerings than their cable MSO competitors.

Another attractive aspect of IMS is that it can be used to accelerate the applications development process. The concept is analogous to the PC revolution in computing.

A vendor that is expert in a particular field can create an application that communicates through a standard interface to the rest of the networking system. The vendor need not possess knowledge of other networking disciplines and other network elements are unaffected by the success or failure of the new application.

Sonus is one such vendor. It has used its VoIP expertise to create rapidly new calling features such as parental controls for mobile phones, an announcement service, and click-to-dial infrastructure.

IMS also is linked tightly to the evolution of the PSTN, a very large portion of which continues to be served by circuit switches. Manufacturers, however, are discontinuing circuit switches, indicating that the next generation of products will be based on IMS.

Still, circuit-switch manufacturers have not been very clear on what form that equipment will take. Incumbent telcos can be expected to move carefully toward new architectures as long as this ambiguity remains.

Circuit-switched voice services are the industry's cash cow and rapid or disruptive change could be fatal.

Sales of a next generation of PSTN infrastructure will remain inhibited until the business case and architectural direction for circuit-switch replacement is well established.

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Tech forum

Welcome back to “The Tech’s Forum”. This section of the SCTE newsletter features articles and tips for technical personnel of the CATV Industry. Ideas and articles for “The Tech’s Forum” are always welcome. If you would like to contribute please contact me at jim_stewart2@cable.comcast.com.

In the next several editions of “The Tech’s Forum”, the testing and analysis of digital signals in an HFC network will be discussed. The identification of a poor carrier to noise ratio using the constellation display of a digital analyzer will be covered in this edition.

Quadrature Amplitude Modulation is a widely used digital modulation technique in the CATV industry. 64 QAM and 256 QAM are used in the majority of downstream/forward path applications. QAM uses combinations of phase shifts and amplitude shifts to represent information. The constellation display is a graphical representation of those amplitude and phase combinations. 64 QAM has 64 different combinations as shown in Figure 1 while 256 QAM has 256.

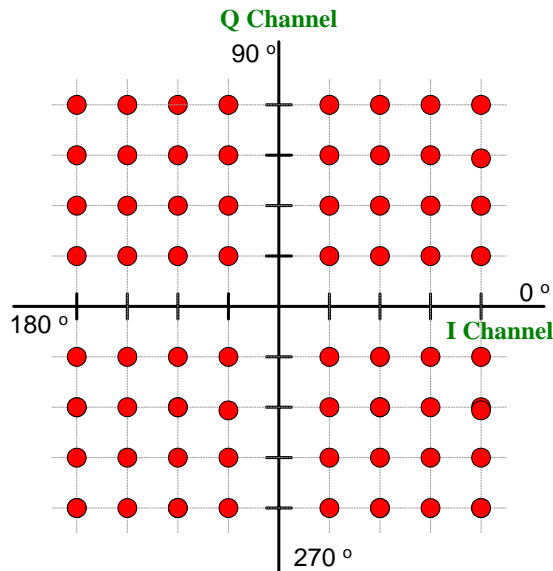


Figure 1: 64 QAM Constellation Display

The patterns of the dots in the constellation can be used to help diagnose digital signal transmission problems. Dots that are grouped together tightly in clusters that are equally distant from each other indicates a clean transmission.

A fuzzy circular pattern with dots that are not grouped together tightly in a cluster indicates a poor carrier to noise ratio as shown in Figure 2.

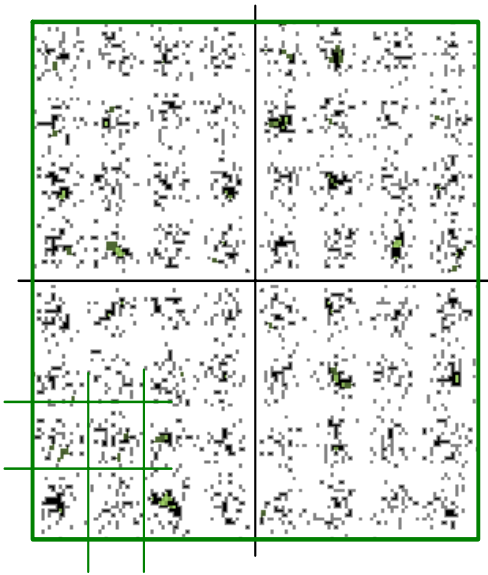


Figure 2: Constellation Display of a Poor Carrier to Noise Ratio

A poor carrier to noise ratio is generally caused by misalignment problems in the CATV network. Some items that can cause a poor carrier to noise ratio include improper modulator, laser or amplifier levels and damaged cable and/or devices.

In the next edition of “The Tech’s Forum”, we will discuss the identification of other digital transmission problems using the constellation display.