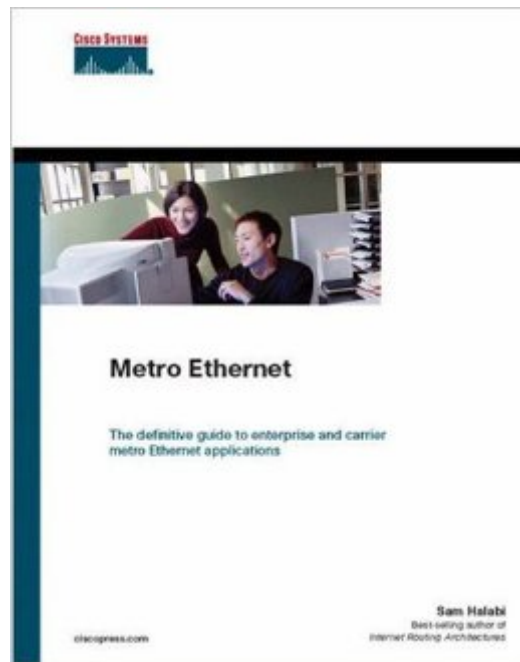# Metro Ethernet (Networking Technology)

Synopsis

The definitive guide to enterprise and carrier metro Ethernet applicationsEasy to read and understand, following the style of the best-selling Internet Routing ArchitecturesUnderstand emerging metro Ethernet services such as point-to-point packet-leased line services and multipoint-to-multipoint VPLSLearn to scale your Ethernet LAN beyond the enterprise wall and across a geographically dispersed virtual private campusUnderstand the drivers and the challenges that carriers face in transforming the metro to address data servicesUnderstand the different metro deployment models using SONET/SDH, next-generation SONET/SDH, Ethernet over SONET/SDH (EOS), virtual concatenation, Generic Framing Protocol (GFP), and Resilient Packet Ring (RPR).Examine the VPLS model and how MPLS can extend an L2 service across the MAN and the WANLearn about the characteristics of a GMPLS architectureMetro networks have emerged as an area of growth for the networking industry and represent a major shift in how data services are offered to businesses and residential customers. This is not only a technology shift but also a shift in the operational and business models that will allow incumbent carriers to transform the metro to offer enhanced data services.Ethernet has been the technology of choice for the enterprise and is now emerging as the access interface of choice for delivering data services in the metro. Emerging metro Ethernet services include packet-leased line services and virtual private LAN service (VPLS). These services are delivered over a wide mix of metro transport technologies such as SONET/SDH, next-generation SONET/SDH, Ethernet/WDM, and Resilient Packet Ring. With the simplicity, flexibility, and cost effectiveness of Ethernet networks comes the challenge of scaling Ethernet Layer 2 (L2) services over metro and WAN deployments. Metro Ethernet looks at the deployment of metro data services from a holistic view. It gives a description of the current metro, which is based on TDM technology, and discusses the drivers and the challenges to be faced in transforming the metro to address data services.Metro Ethernet discusses the mix of transport technologies deployed in the metro and the migration strategies that metro operators will adopt in moving from today's SONET/SDH network to an all-Ethernet network. You'll learn about the VPLS model and how you can use MPLS to extend an L2 service across the MAN and the WAN. You'll explore traffic engineering and how you can use RSVP TE to increase the reliability and availability of the metro service. Finally, you will examine an emerging MPLS technology called Generalized MPLS (GMPLS) and how it is used to facilitate the operation and deployment of metro networks. GMPLS presents a major shift in the operation and configuration of transport networks and will tremendously influence the future deployments of metro and WAN networks.This book is part of the Networking Technology Series from Cisco Press(r), which offers networking professionals valuable information

for constructing efficient networks, understanding new technologies, and building successful careers.

Book Information

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Customer Reviews

Sam Halabi's book is described on the cover as "the definitive guide to enterprise and carrier metro Ethernet applications". As you would expect from the author of the justly-celebrated "Internet Routing Architectures", Halabi does a superb job.Chapter 1 reviews traditional TDM ways of getting to the customer. With traditional SDH/SONET-based transmission, carriers pay a high price in operational complexity, cost and provisioning delay. Ethernet's advantages include fast provisioning, fine-grained bandwidth granularity (inherent in packet technologies) and a scalability from kbps to Gbps. The customer also expects a lower cost service, although carrier pricing remains volatile, partially from fear of cannibalising their existing connectivity revenues.Chapter 2 looks at metro Ethernet technologies. Carriers with already deployed SONET/SDH networks naturally consider how to use them efficiently to carry Ethernet. The problem of mapping continuously-scalable packet flows into the lumpy SONET/SDH bandwidth hierarchy is well-described. Generic Framing Procedure (GFP) is becoming an increasingly popular adaptation layer between Ethernet (and other packet protocols such as PPP, Fiber Channel, FICON/ESCON) and SDH/SONET, implemented via the evolution of SONET/SDH devices into Multi-Service Provisioning Platforms (MSPPs). The bandwidth mismatches are addressed via Virtual

Concatenation (VCAT) and Link Capacity Adjustment Scheme (LCAS).Ethernet-over-SONET/SDH as just described is a pure transport mechanism. To create an Ethernet analogue of add-drop multiplexing and to support traffic aggregation, L2 switching functionality needs to be added to the basic SDH/SONET box. (This is a well-worn path for transmission vendors - the same model was proposed for ATM).

I recently read the book titled "Metro Ethernet", authored by the legendary Sam Halabi. ISBN: 158705096X. Let me be the first to say that this title lives up to Mr. Halabi's high standards for delivering top quality information. Sam Halabi does an excellent job of taking away the smoke and mirrors of the often misunderstood world of Metro Ethernet. This book explains, in superb detail, every way to skin the Metro Ethernet cat. The author does it in a way that helps to give the reader a complete understanding of a particular application of Metro Ethernet without dropping the reader off the deep-end of this hybrid technology. The book is organized very well. The author has taken a crawl, walk, run approach to the layout of this book. The introduction alone gives the reader a great road map of the book, so the reader can pinpoint a given topic, rather quickly. In the past I've had to rely heavily on the Index to provide pointers to a given topic, but the Introduction of this book is a great reference. Along with the Authors previous book, "Internet Routing", the author waste little ink. Each topic is clear, concise and to the point. He's taken a lot of information from several sources and compiled the information in an easy to understand text. The illustrations help out a lot with capturing the complexity of the many different Metro Ethernet Architectures. One thing I liked about the book is that the Author gives the reader insight or background as to why a certain application of Metro Ethernet was designed and where it is likely to be applied. This book is best suited for Telco carrier personnel or Enterprise personnel at any level. Companies that are looking for different strategies for their Metro Area Networking requirements will find this title very useful.

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