

Highly flexible, cost-effective platform designed specifically for cell sites and small hub sites

Aggregates and optimizes backhaul over TDM, ATM, Ethernet, and pseudowire transport

Serves as a cornerstone of Force10 Network's wireless backhaul solution

A Platform Design for Aggregating and Optimizing Wireless Backhaul Bandwidth

The Force10 Networks' MASTERseries platform is designed for aggregating and optimizing backhaul of cell site traffic over any TDM, ATM, Ethernet, and pseudowire transport network. Purpose-built for cell site and small hub site deployments, the highly flexible platform supports integrated pseudowire and layer 2 Ethernet switching capabilities, ATM inter-working, and advanced Abis transport optimization, as well as DS0 grooming/DCS, from a single compact shelf.

The MASTERseries platform is a cornerstone of the Force10 Networks' wireless backhaul solution, which enables cost-effective multi-generation service integration and evolution (2G/2.5G, 3G, LTE and 4G). The cost-effective product offers a multi-function, multi-service feature set to meet the challenging needs of networks in transition. Unlike single function network equipment, the MASTERseries enables wireless carriers to control transport costs, quickly provision new services, and use bandwidth more efficiently. It is the ideal solution for implementing next-generation wireless services over Ethernet networks.

Pseudowire Solutions for TDM Access and Transport

When deployed with the FM 16 (FM16) Module, the MASTERseries provides a compact, simple, and scalable solution for transporting TDM services over IP and Ethernet-based networks. Leveraging powerful PWE3 (Pseudowire end-to-end) software features, up to 16 T1 streams are converted into packets for transmission over the radio access network through the Fast Ethernet interface. In addition, the FM16 Module with Pseudowire enables sophisticated aggregation and service inter-working of disparate networks (TDM, ATM and IP) for cost-effective integration with edge routers and switches.

As a full-service alternative to standard T1 access, the FM16 Module maintains synchronization over any layer 2/3 packet switched network (Ethernet, IP and MPLS in the future), with or without a T1 circuit or external timing source. The FM16 module acts as a standard IP router device, supporting Static, RIPv1, RIPv2, OSPF v2 Routing, ICMP (ping), ARP, next hop, and default gateway capabilities. It complies with the CESoPSN, SAToP and ATM Pseudowire IETF RFCs.

Flexible Shelf Design

The MASTERseries platform is available in two different form factors, a 2-slot, 1RU-high shelf, and an 8-slot, 3RU-high shelf. The differently sized platforms share a common set of interface modules to simplify ordering and sparing while providing suitability for a range of applications in cell sites and small hub sites.

Key Features

- Supports advanced Ethernet and pseudowire features including CESoPSN, SAToP and traffic classification and prioritization
- Integrates Abis transport optimization and ATM inter-working
- Provides an adaptable T1/E1 backhaul networking solution to for networks in transition
- Improves backhaul network efficiency and lowers ongoing CAPEX and OPEX
- Minimizes new service introduction costs and reduces investment risk
- Supports optional DSU/CSU and 1/0 DCS functionality for maximum flexibility
- Available in 2-slot (1RU high) and 8-slot (3RU high) form factors
- Supported by OMC Companion Element Management, Performance Monitoring, Configuration, Upgrade and Alarm gathering, SSH support



Specifications: MASTERseries Wireless Backhaul Bandwidth Optimization Platform – R7.0



The Pseudowire software load for the MASTERseries FM16 Module is designed for extending up to 16 T1 circuits over Ethernet service networks. The solution fully supports TDM-based T1, ATM and IP traffic by maintaining synchronization over any packet-switched network.

Routing Features

PPP, Frame Relay (RFC 1490) Nx56/K64K WAN data rates
Static, RIPv1, RIPv2, OSPF v2 Routing
Un-numbered ports interface support
DHCP - Client, Relay and Server
Ping, Trace Route, DNS relay/resolver, Sntp, firewall

Ethernet Transport Features

Complies with the following IETF-PWE3 documents:

Structure-aware TDM Circuit Emulation Service over Packet Switched Network (CESoPSN) draft-ietf-pwe3-cesopsn-08.txt.
ATM Pseudo-wires.
Encapsulation Methods for Transport of ATM Over MPLS RFC 4717
SAtOP - Structure-Agnostic TDM over Packet (SAtOP) RFC 4553
TDM Circuit Emulation Service over Packet Switched Network (CESoPSN) RFC5086
Up to 32 pseudowires.

Performance

Low end-to-end processing delay using high-performance buffering and forwarding techniques with configurable IP packet size
Enhanced buffering mechanism compensates for packet delay variation (jitter)

QoS Support

Static pseudowire label assignments
2 Priority Queues (high = Pseudo-Wire, lower = Ethernet)
2 service categories based on network support
(1) Expedited Forwarding-1
(2) Best Effort
VLAN tagging support IEEE802.1q
Packet Classification, marking, and metering
Connection admission control

OSPF

Loopback interfaces in OSPF
Automatic BFD session establishment in OSPF neighbors
Support dropping OSPF adjacencies if BFD session indicates path failure

BFD

Asynch. BFD
BFD peer running in demand mode
BFD peer running in echo mode
BFD over single hop IPV4

BFD

Asynch. BFD
BFD peer running in demand mode
BFD peer running in echo mode
BFD over single hop IPV4

Timing Source

Internal Timing:
The internal oscillator provides the master clock
Loop Timing:
The transmit clock is derived from a T1/E1 port's receive clock
Adaptive Absolute Timing

SNMP Management

draft-ietf-pwe3-tdm-mib
draft-ietf-pwe3-atm-mib
draft-ietf-pwe3-pw-mib
draft-ietf-pwe3-mpls-mib
draft-ietf-pwe3-tc-mib
Performance Monitoring
Connection availability, delay, bandwidth
Packet/cell loss
Packed/cell errors

Performance Monitoring

Connection availability, delay, bandwidth
Packet/cell loss
Packed/cell errors



Force10 Networks, Inc.
350 Holger Way
San Jose, CA 95134 USA
www.force10networks.com

408-571-3500 PHONE
408-571-3550 FACSIMILE

© 2009 Force10 Networks, Inc. All rights reserved. Force10 Networks and E-Series are registered trademarks, and Force10, the Force10 logo, Force10 Reliable Networking, Adit, C-Series, EtherScale, FlexMedia, FTMS, FTOS, Hot Lock, MASTERseries, PowerSmart, P-Series, Reliable Business Networking, SFTOS, S-Series, StarSupport, TeraScale, Traverse, Traverse PacketEdge, TransAccess, TraverseEdge, TransNav, VirtualControl, VirtualScale, and VirtualView are trademarks of Force10 Networks, Inc. All other company names are trademarks of their respective holders. Information in this document is subject to change without notice. Certain features may not yet be generally available. Force10 Networks, Inc. assumes no responsibility for any errors that may appear in this document.

MSFDS01

209 v1.1