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Intelligent Traffic Management Solutions

Leveraging Your Current Infrastructure

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Intelligent Traffic Management Data Transmission Solutions



Coordinated, IP-based Communication Now A “Must-Have”

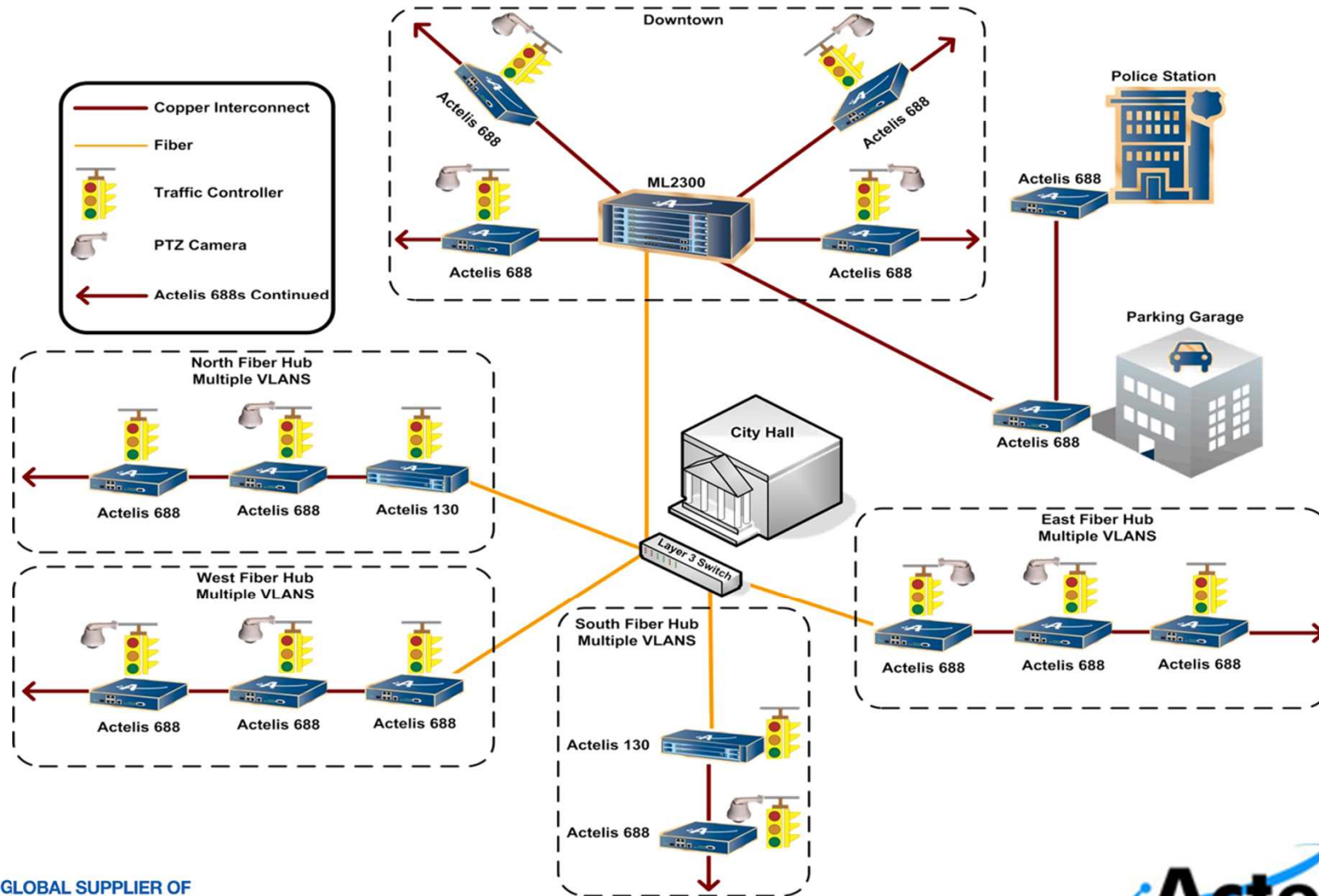


Understanding Goals and Initiatives

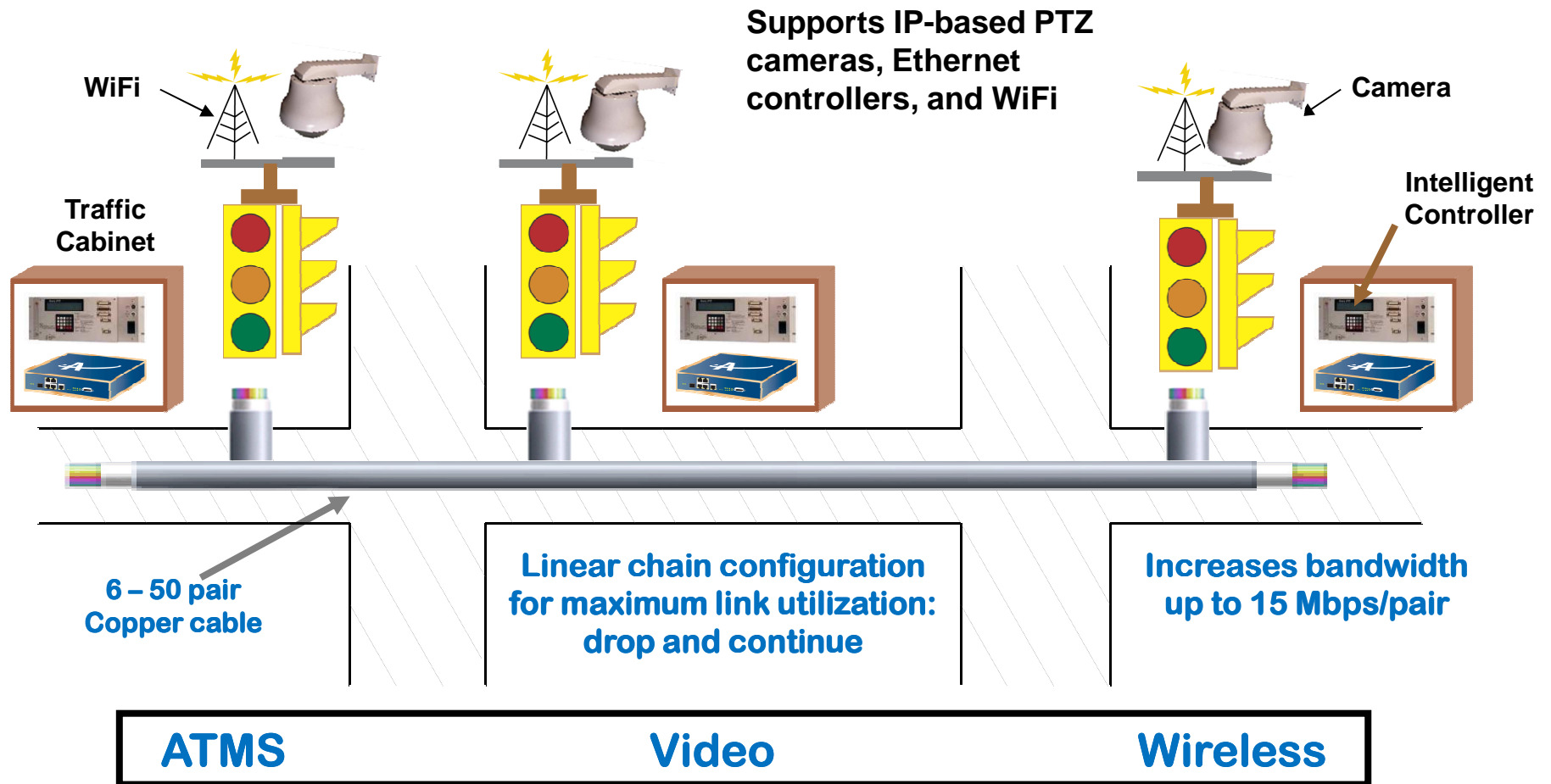


Goals	Initiatives
“Go Green”	<ul style="list-style-type: none">• Reduce energy consumption• Reduce emissions• Improve traffic flow
Reduce Congestion	<ul style="list-style-type: none">• Improve traffic flow• Real-time traffic information
Increase Transportation Efficiency	<ul style="list-style-type: none">• Reducing delays by ensuring smoother traffic flow• Real-time traffic information• Dynamic message signs• CCTV Cameras

Solution Architecture

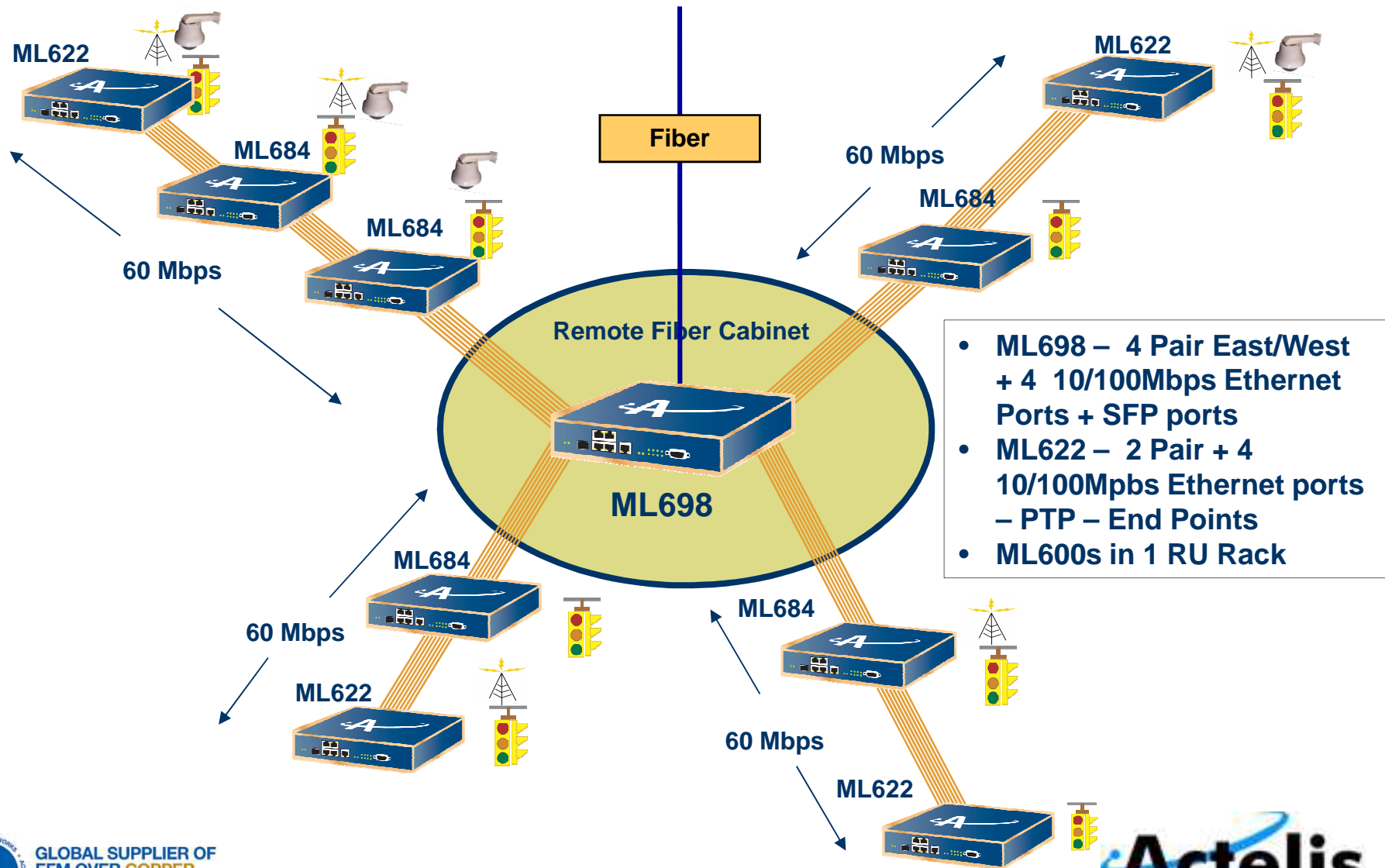


Enabling ITS Traffic Networks Today



Remote Fiber Cabinets

Fiber, Copper Mixed Environments



New: ML684 Mini U-Mount Version 24/48 VDC Add & Drop - Fiber & Copper - High Availability



Ethernet (Network/User) - 8 port switch

- 10/100Base-T: 6 ports, Connector: RJ45, Auto-MDIX
- 100/1000Base-FX: 2 ports Connector: SFP Based, MSA compliant

High Speed Link (HSL) - Bonded copper pairs

- Protocol: IEEE 802.3ah 2Base-TL
- Line code: ITU-T G.991.2 rev. 2
- Number of copper pairs: 4, Connector: RJ45 x 2
- Number of HSLs: One 1 HSL- up to 4 pairs, 2 HSLs East/West, 2 pair each
- Bandwidth per HSL: 1 HSL - up to 30 Mbps; 2 HSLs up to 60Mbps
- End-to-end Delay: 2-4 ms (typical)
- Spectral Compliance: ITU-T G.991.2 annex A, B, F, G, ETSI TS 101 524 annex E, ANSI T1.417, T1.426
- Per country regulatory compliant spectral modes
- Sealing Current: 48 VDC/1.5mA nominal (sink)

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LAN Protocols

- Dynamic Bridging: IEEE 802.1, 8K MAC addresses
- Discovery Mechanisms: LLDP
- VLAN Tagging: IEEE 802.1Q
- Double Tagging: Q-in-Q
- RSTP, STP: IEEE 802.1d
- Link Aggregation: IEEE 802.3ad
- Provider Bridges: IEEE 802.1ad
- IGMP snooping: IGMP V1/V2
- OAM: IEEE 802.3ah clause 57 (EFM OAM), IEEE 802.1ag, ITU Y.1731, Ethernet loopback with MAC swap

Advanced Service Provisioning and Traffic Management Quality of Service

- Classes of Service: 4
- Scheduler: WFQ, SP
- Classification: L2 802.1p/Q priorities, L3 ToS/Diff Serv



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Management



Management Applications

- EMS: MetaASSIST EMS
- Craft GUI: MetaASSIST View

Protocols

- SNMP: SNMP V3, V2C, V1
- IP addresses: IPV4 and IPV6
- Command Line Interface: TL1, CLI
- Remote Access: Telnet
- Secure Access (option): SSH v2
- Time Synchronization: SNTP v3
- Web Access: HTTP
- File transfer: FTP, TFTP
- IEEE 802.3ah EFM OAM: Dying Gasp
- User Authentication: RADIUS and/or local passwords

New: Industrial Ethernet Portfolio ML684D ML684DT, ML684DTP, ML622D, ML624D, ML604D



Type	Platform	Description	High Level Details
Ethernet Aggregation Switch	ML2300	Point-to-Multipoint scenarios using bonded copper (G.SHDSL) as well as fiber	Large aggregation platform, Modular, plug in cards Up to 256 pairs and 128 links Equipment Redundancy for high availability
	ML230		Medium aggregation platform, Modular, plug in cards Up to 128 pairs and 128 links Equipment Redundancy for high availability
All-In-One Ethernet Switches and Extenders with Drop and Continue	ML684D ML684DT ML684DTP	Drop-and-continue, Fast Healing ERPSv2 ring and Full Mesh RSTP topologies on any interfaces - bonded copper (G.SHDSL) or/and fiber Din Railing	ML684Dxx: drop and continue over copper (2+2) or fiber ML680DFxx: fiber only, No bonded copper extension Very compact, Fanless DIN railing unit. 24/48V or AC 6 x Ethernet 10/100BaseT; 2 x Fiber SFPs 100/1000BaseFX DT / DFT: 1x Serial interface RS232/V.24/RS-422/RS485 DTP/DFTP: Serial Interface (as above) + 2 x Passive PoE ML622D: 2 x 10/100BaseT, (1+1 / 2 pair bonded), Up to 20M per link ML624D: 2 x 10/100BaseT, (2+2) up to 20M per link ML604D - Extender only bonding 4 pairs - Up to 60Mbps
	ML680DF ML680DFT ML680DFTP		
	ML622D ML624D		
	ML604D		
	ML680		Drop-and-continue over bonded copper (G.SHDSL) or fiber
ML690	Small Aggregation. PTMP or drop-and-continue over copper (G.SHDSL) or fiber	½ 19", 1U high unit. 48 VDC or AC ML698: 8 pairs, up to 4 links 5 x Ethernet 10/100BaseT; 1 x Fiber SFPs 100/1000BaseFX	

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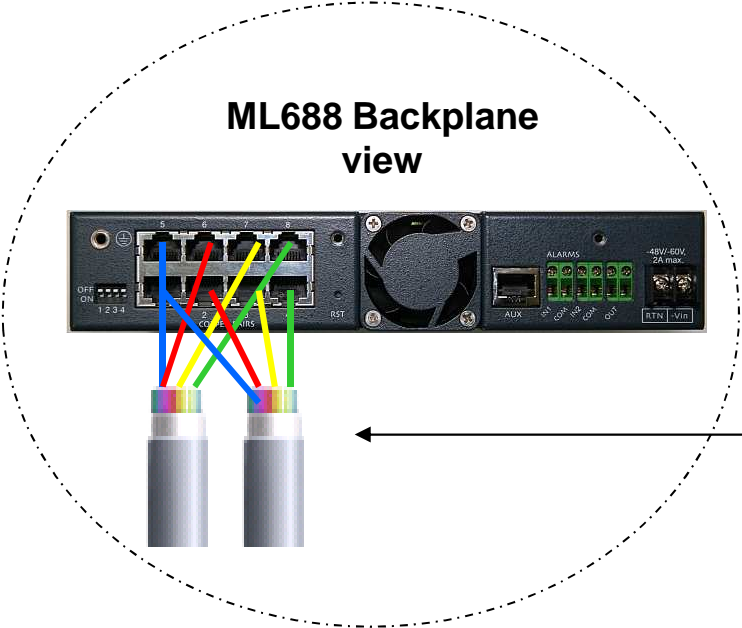
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Surveillance & Video Solutions

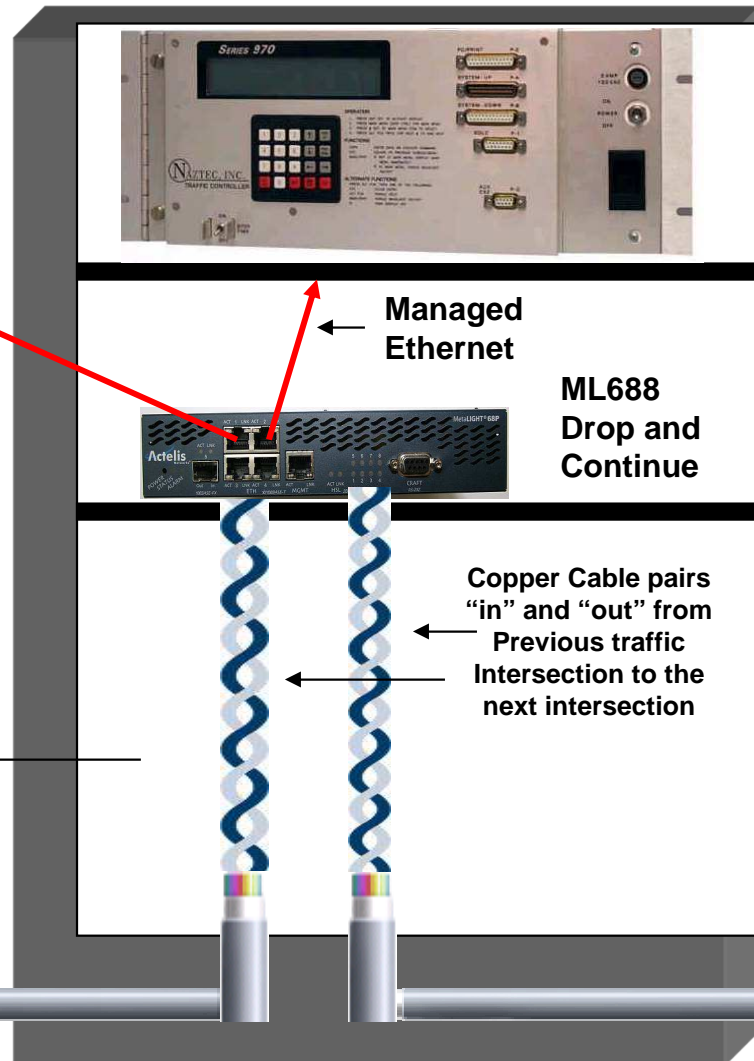




Managed Ethernet



ML688 Backplane view



Managed Ethernet

ML688 Drop and Continue

Copper Cable pairs "in" and "out" from Previous traffic Intersection to the next intersection

Typical Cabinet Configuration



Rack Mount Slide Kit



Flexible mounting

1. Wall mount
2. Rack Mount
3. Slide Kit



GLOBAL SUPPLIER OF
EFM OVER COPPER





Thank you !

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