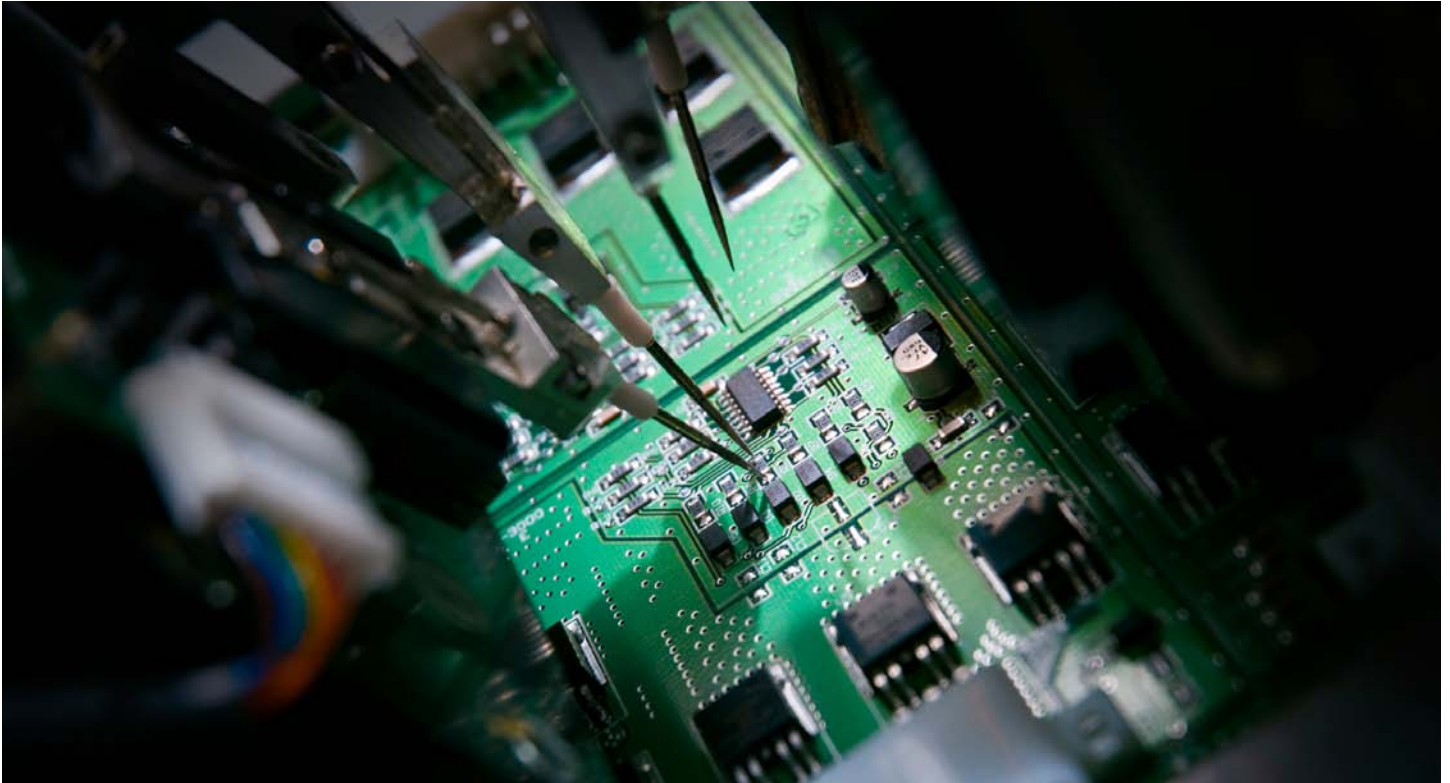


Metro Ethernet for manufacturing

Delivering secure, scalable connectivity across metro areas



As manufacturers become more reliant on technology to automate processes, improve efficiency and interconnect headquarters with data centers and manufacturing plants, one thing is clear – demand for secure, reliable, robust, high bandwidth connectivity continues to rise. Metro Ethernet is a flexible, highly-scalable solution that delivers switched Ethernet connectivity to enable organizations in the public sector to extend their local area networks to other metro sites for increased efficiency with traffic prioritization.

Metro Ethernet provides technical expertise, responsive account management and world-class services that exceed customers' expectations for quality, value and reliability.

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Introduction

Technology has changed the way manufacturing companies do business. ISO 90012 compliance influences the amount of data manufacturers must maintain to document processes. Yet a divide between enterprise systems and the factory floor still makes process improvement difficult. Secure, reliable high-bandwidth connectivity between systems and across the company-wide network can help manufacturers bridge that gap to become more efficient, more competitive and more profitable.

For example, CAD/CAM systems are a mature technology that has been prevalent in industry for more than a decade. Now, companies are sharing extremely large CAD drawing files in real time within the company and with partners and vendors. This makes follow-the-sun engineering changes in a production line possible. The data collected by manufacturing execution systems, used to automate processes within a plant, can now be shared across the company, along with the process applications to easily shift production from one plant to another to optimize use of production capacity and personnel.

Metro Ethernet offers a highly-scalable, secure and cost-effective solution to meet the connectivity demands between multiple locations and across metro areas. Metro Ethernet delivers greater service flexibility by organizations to obtain the exact amount of bandwidth required or upgrade their networks and increase capacity quickly.

Competing in a global economy

In a global economy, where manufacturing operations are outsourced or relocated to lower cost regions of the world while engineers are accessed wherever they might reside, companies must control costs and maximize efficiency to successfully compete. In this environment, IT managers in the manufacturing sector focus on 4 operational imperatives:

Supporting advanced technologies

Manufacturing companies are increasingly automating their systems and processes, collaborating online with their vendors, partners and customers and implementing systems that enable them to easily transfer production from one plant to another.

Rapidly adapting to change

Implementing running changes in a product line, without shutting down production, can dramatically improve manufacturing efficiency and profitability. This requires close communication between design, purchasing and the plant manager.

Integrating processes and documentation

Process integration can be a challenge because of the multiple sources of data in a typical manufacturing process. Sharing consolidated data with ERP systems and the supply chain securely adds to the difficulty.

Reducing operating costs

With ever increasing pressure to improve productivity and profitability, IT managers know that they must achieve the first 3 imperatives while reducing costs and improving resource productivity.

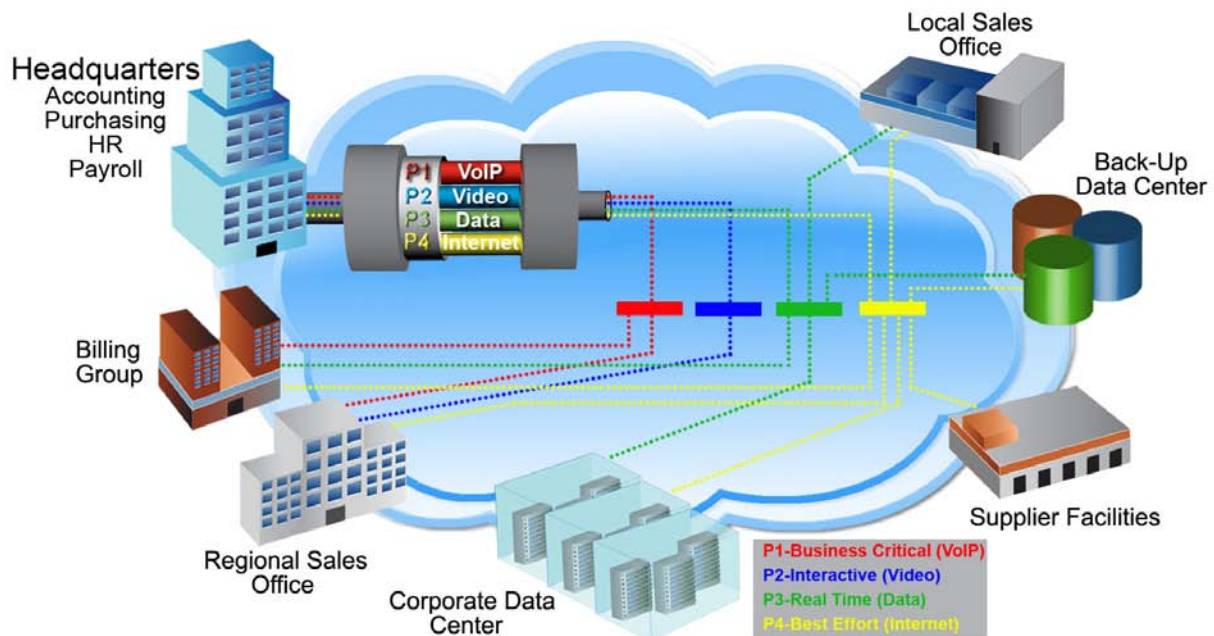
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Metro Ethernet overview

Metro Ethernet combines the simplicity and affordability of Ethernet with the speed and reliability of optical fiber to deliver flexible, highly-scalable connectivity between government offices and multiple public safety facilities across a metro area. Metro Ethernet is available in point-to-point and multipoint service configurations with bandwidth available in manageable increments from 10Mbps to 1Gbps. Traffic flows securely as Ethernet virtual circuits (EVCs) across a shared network infrastructure.

Metro Ethernet seamlessly provides privacy and security of data. Metro Ethernet can connect a police department to a video surveillance system to support public safety. At the same time, police, fire and EMT dispatch can all be connected to help coordinate the response to any situation that might arise. In addition to IP-centric applications, Metro Ethernet is ideal for converging voice, video and Internet traffic to eliminate network overlays.



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Quality of service

CenturyLink™ offers a quality of service (QoS) feature with Metro Ethernet that enables public sector organizations to prioritize and control network traffic by type to help ensure availability and efficiently manage network resources.

Recommendations for QoS strategies include:

- Priority 1 – used for mission-critical market data that require immediate connections
- Priority 2 – used for specific financial transactions and customer relationship management (CRM) applications
- Priority 3 – used for regular business data
- Priority 4 – used for communications that only require best effort service

CenturyLink can assist public sector employees with the design and deployment of customized solutions with our technical experts at our National System Design Center. Metro Ethernet solutions are highly-reliable and backed by a written service level agreement (SLA) that defines performance objectives. Our network operations center (NOC) continually monitors the network to support SLAs.

Benefits

- Securely connects multiple facilities across a metro area
- Point-to-point and multipoint service
- Supports adoption of online financial services applications
- Offers unparalleled scalability to precisely match bandwidth to requirements
- Delivers high availability – up to 99.9% SLAs
- Enables control over routing and traffic priority
- More cost-effective than Internet connectivity service options

Supporting secure online services

Network requirements	CenturyLink solution
ISO 9001 compliance and Business Continuity/Disaster Recovery ISO 9001 compliance requires that process documentation be available on demand while automated processes further complicate business continuity planning	
<ul style="list-style-type: none"> • Private, secure networking • Flexible capacity to accommodate large planned and unplanned data transmissions • High-availability and survivability 	<ul style="list-style-type: none"> • Metro Ethernet can include high-capacity, redundant trunk connections enabling switching if a failure occurs • Connectivity between plants can be designed through the CenturyLink Network Design Center to meet specific requirements
Manufacturing execution systems (MES) Manufacturing companies are adopting technologies that allow them to adapt rapidly to change – using MES to move production and processes from one plant to another to balance resources and demand	
<ul style="list-style-type: none"> • Private, secure networking • Network extensibility • Network storage and retrieval 	<ul style="list-style-type: none"> • Metro Ethernet supports most higher-layer applications • Preferred transport to connect data centers because of its large capacity

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Product lifecycle management, CAD/CAM and collaborative design Manufacturers are increasingly collaborating with partners that require transmitting large CAD drawings in real time	
<ul style="list-style-type: none"> • Real-time connections • Capacity to transport large CAD/CAM files • Scalable bandwidth • Quality of Service 	Metro Ethernet supports collaborative design through point-to-point EVCs capable of handling large frame sizes
MRP/ERP and supply chain management Adaptive manufacturing processes require tight integration with MRP and ERP systems and the extended supply chain to optimize inventories	
<ul style="list-style-type: none"> • High-network availability • Network flexibility to accommodate traffic prioritization • Quality of Service 	Quality of service features available with Metro Ethernet enable prioritization of traffic to update inventory systems cost-effectively
Radio frequency identification Radio frequency identification technology continues to expand from product ID tracking of complex shipments	
<ul style="list-style-type: none"> • Scalability to handle exponential growth in product and shipment tags • High-resiliency • High-network availability 	<ul style="list-style-type: none"> • Metro Ethernet is highly-scalable in flexible increments to adjust to increases in bandwidth • Traffic can be aggregated from many sites to a hub for further processing
Distance training video and other media is used for conferencing, online collaboration training and professional development	
<ul style="list-style-type: none"> • High-capacity network • Quality of service 	Metro Ethernet supports distance learning, video, data and voice in an environment with low latency and jitter, necessary for sensitive applications

Rapidly adapting to change

Implementing changes in a product line, without shutting down production, can dramatically improve manufacturing efficiency and profitability. This requires close communication between design, purchasing and the plant manager. Metro Ethernet keeps point-to-point and multipoint networks running, accessible and operating at peak performance.

High availability

The Metro Ethernet infrastructure uses carrier-grade network elements with stringent reliability requirements and resilient failure recovery mechanisms to optimize the service for minimal failover administration.

Flexibility/scalability

Metro Ethernet can support point-to-point and multipoint connections with bandwidth profiles up to 1Gbps. Unparalleled scalability with bandwidth is available in 10Mbps increments from 10Mbps to 100Mbps. Bandwidth in 100Mbps increments from 100Mbps to 1Gbps, (also at 150Mbps, complementing traditional private line speeds) allow firms to cost-effectively match Metro Ethernet to their requirements.

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Quality of service

Customer-selected QoS is an optional feature of Metro Ethernet that let IT professionals manage network resources more efficiently while ensuring the performance of critical applications.

Integrating processes and documentation

For optimal efficiency, multiple sources of data from the manufacturing process must be shared securely between plants and business systems in headquarters, between headquarters, supply chain partners and with remote data centers to support BCDR planning. Metro Ethernet is provided across a carrier-class optical network with secure facilities governed by the strict network policies.

Security

Data travels over the Metro Ethernet infrastructure as native Ethernet, so many of the security methods used in the local area network (LAN) can be extended across the metro area. Connections are made through Ethernet virtual circuits (EVCs) that partition traffic securely while maintaining connectivity across all devices. When complemented by firewalls, intrusion detection systems, anti-virus solutions, security can be efficiently maintained across the network.

Rapid response times

CenturyLink assists manufacturers with the design and deployment of customized network solutions, including BCDR through the CenturyLink Network Design Center. Whether it supports seamless integration of design and trading partners or helps ensure the survivability of mission-critical applications, Metro Ethernet is always backed by responsive account management and service delivery personnel,

Reducing operating costs

Succeeding in an era of global competition requires manufacturers to reduce costs wherever possible. IT managers in the manufacturing sector are still challenged to adopt new technologies to improve efficiency, productivity and competitiveness. Metro Ethernet supports a balance between lower costs and technology adoption through its unsurpassed flexibility and reliability.

Extended reach

Metro Ethernet can securely connect headquarters, branches and plants to improve productivity while enabling efficient collaboration and manufacturing process management. Plus, with Metro Ethernet, efficient BCDR and remote storage plans can be implemented with the security, availability and reliability that manufacturing companies require.

Lower IT management costs

In addition to eliminating LAN/WAN protocol conversions and the need to support multiple legacy WAN services, Metro Ethernet enables manufacturers to converge IP data and applications, voice, video and Internet traffic on a single network service. Metro Ethernet enables consolidation of servers and remote facilities, further reducing overhead and on-going management costs.

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More cost-effective overall

Metro Ethernet bandwidth costs are typically lower than traditional private line and synchronous optical networks. Unparalleled flexibility and scalability allows firms to better tailor bandwidth to their specific requirements.

Enabled by Alcatel-Lucent 7450 Ethernet Service Switch

With industry-leading density and performance the Alcatel-Lucent 7450 Ethernet service switch (ESS) router supports scalable, reliable and predictable SLA-based Ethernet services. The Alcatel-Lucent 7450 ESS router, part of the service routing platform, overcomes the limitations imposed by traditional Ethernet switches while minimizing operating expenses to reduce the total cost of ownership.

Benefits

- Dramatically improves network stability, scalability, availability and performance
- QoS management enables support for different traffic types
- Superior provisioning tools speed deployment of new Ethernet services

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