



Why MCL-Net

Visualize...enterprise mobile communications

Realize...MCL-Net





Why MCL-Net

Mobilizing your workforce?

Thinking about networked, concurrent mobile users?

Do you want wired or wireless mobile user communications—LAN, WAN, WLAN, or WWAN?

Do you want real-time or on-demand operations?

Do you want continuously connected, casually connected, or occasionally connected mobile users?

If you answered “yes” to any of these questions, you need MCL-Net. MCL-Net gives you the flexibility to architect your network communications to maximize your mobile workforce’s productivity while ensuring your data integrity.

MCL-Net Application Examples

Continuously Connected Applications

Warehouse operations such as receiving, put-away, picking, and shipping; distribution center operations such as mail sorting; dockyard shipping; hub package tracking; cross-docking; inventory management; and grocery shelf price audits are typical continuously connected applications.

Operationally, these applications typically receive a task from a host application. A mobile worker performs the task, and submits a task completed transaction to the host.

Consider a warehouse put-away application. A mobile worker application receives, via MCL-Net, a task indicating that a received item should be put away at location X in the warehouse. The mobile worker puts the item in the designated location. To confirm that the operation is completed successfully, the worker scans the item identification, and then scans or says the location identification. The mobile application creates and transmits an operation completed transaction. MCL-Net delivers the confirmation transaction, in real-time, to the appropriate warehouse management system (WMS) or enterprise resource planning (ERP) system which, in turn, logically “moves” the given item into inventory.

Casually Connected Applications

Casually connected, wireless applications are typical in environments where some functional work areas do not have wireless coverage: airplane cargo holds, trucks, trucking containers, shipping containers, and freezers are commonly seen examples. Consequently, many transportation and logistics applications are designed deliberately to work as casually connected wireless applications.

These applications use a blend of real-time and batch communications.



Consider an air cargo transportation hub. Mobile workers are responsible for package tracking as parcels are put into the cargo hold of the airplane. The mobile worker performs some tasks in real-time in the hub where there is complete wireless coverage. However, when it is time to load the airplane, the worker may enter the cargo hold and scan parcels as they are placed in the hold. Without wireless coverage in the cargo hold, the mobile application enters a batch, data collection mode. When the worker exits the cargo hold, the mobile computer re-establishes a wireless connection. All the package tracking information collected in the cargo hold is automatically uploaded wirelessly, via MCL-Net, transaction by transaction, to the host database.

Via MCL-Net, each transaction can be posted to a couple of database tables: one table to associate the parcel with the mobile worker's identification, the time and date, the hub identification, the airplane, and the airplane's destination; and a second table to a customer service database for customers to see on-line the last known location of their parcel.

Occasionally Connected Applications

Proof of delivery in long haul trucking is a very typical occasionally connected application. In this case, long periods of mobile computer inactivity are separated by short periods of real-time transaction processing when the truck arrives at its delivery destinations.

As the coverage of wireless WAN networks like GSM and GPRS expands, the adoption of this technology for MCL mobile worker applications grows. Since WWAN usage costs are still relatively high, this technologically is very well suited to occasionally connected wireless applications.

In long haul trucking, a proof of delivery transaction must be recorded for each item delivered. Using MCL-Net, these transactions can be transmitted from the field, in real-time, to your enterprise database, WMS, or ERP system.

In fact, as an example, each proof of delivery transaction can be posted, in real time, to a couple of database tables: one table to associate the item delivered with the delivery location, the time and date, and the truck driver's identification; and a second table to a customer service database for customers to see on-line that their item is delivered.

Whether continuously, casually, or occasionally connected users, MCL-Net is flexible to support your mobile worker communications. Mix and match communications modes to support all your operations in one integrated environment.



What is MCL-Net?

Definitions

Network medium: Any IP-based network: LAN, WLAN, WAN, WWAN, GSM WWAN, or GPRS WWAN.

Communications mode: Real-time, on-demand, or batch communications. Continuously, casually, or occasionally connected communications sessions.

MCL-Net: Communications server that supports mobile workers operating concurrently in any/all network medium(s) employing any/all mode(s) of communication.

A component of MCL-Collection, MCL-Net handles all the communications of your MCL mobile worker applications. It is essential to the deployment of mobile computers in networked, concurrent user environments.

Depending upon your operations, you might want to update more than one system with your transactions. For example, based upon an SAP generated task, your mobile worker application might query your Oracle database and then update both your SAP and your Oracle systems with the resulting transaction.

System updates like this are possible with MCL-Net. MCL-Net interfaces with all MCL-Bridges enabling your mobile worker applications to integrate seamlessly with multiple enterprise systems simultaneously—BackOffice applications, ODBC compliant databases, WMS, or ERP systems.

The flexibility of MCL-Net and MCL-Bridges give your mobile worker applications the ability to share business data between multiple systems while ensuring system coherency and data integrity across your entire enterprise.

Advanced Features

MCL-Net offers many advanced features designed to maximize your mobile workforce productivity while minimizing your operating costs.

Ease of Installation

MCL-Net is very easy to install. It may even be deployed remotely. You can take a very hands-off approach to MCL-Net and simply install it with its default settings. Alternatively, if you want to take advantage of MCL-Net's more sophisticated features, you can configure it to suit your environment.

Minimal training is required to install and manage MCL-Net.

Minimum Network Traffic



MCL-Net provides exchange for MCL applications, data files, images, label formats, and data records between host systems and mobile computers. Since only data and applications are ever exchanged, MCL-Net minimizes network traffic.

MCL-Net has minimal impact on your existing system resources.

Version Control

MCL-Net offers application updating for mobile computers. Individual mobile computers, groups of mobile computers, or all mobile computers on the MCL-Net network may be identified as target devices to receive a new version of an application.

MCL-Net ensures that you have the correct version of your mobile worker application running on your mobile computers.

Scalability

MCL-Net is extremely scalable. Each instance of MCL-Net can handle up to 250 mobile computers, and each server can launch up to 250 instances of MCL-Net. From a minimum configuration that handles up to only 5 mobile computers, to a maximum configuration of up to 62,500 mobile computers per server, your MCL-Net configuration can expand over time to suit your business' growth.

MCL-Net can handle the mobile worker transactions of any enterprise—small or large.

Flexible Network Architecture

Servers running instances of MCL-Net may be co-located or geographically distributed. Geographically separated MCL-Net servers may be connected over your corporate LAN or over the internet. Your MCL-Net may even be at a completely different physical location than your mobile computers. One instance of MCL-Net can handle your WLAN communications; another can handle your GPRS or GSM WWAN mobile worker communications.

You architect your communications network for maximum benefit to your business.

Optimization

MCL-Net is optimized to minimize resource usage, give very fast response times, and minimize communications latencies.

MCL-Net maximizes worker productivity while minimizing its impact on your existing systems.

Guaranteed Data Delivery

MCL-Net uses several layers of communications protocols to provide exceptionally fast and guaranteed data delivery between your mobile computers and your host



systems. It uses an ACK/NAK protocol with packet level retries and checksums over UDP/IP communications.

MCL-Net brings you the best of both worlds—the efficiency of a connectionless transport protocol while ensuring your data integrity with guaranteed data delivery.

Extremely Low Resource Usage

One customer's load test exemplifies MCL-Net's efficiency. The load test was performed at the customer site. The customer requirement was to handle, at peak times, 4 million transactions in a 24 hour period from 2500 mobile computers. A load test was set up to simulate 1000 mobile computers generating 3 million transactions in a 24 hour period. The result was that MCL-Net used 1% of the CPU time while the customer's Oracle database used 80% of the CPU time to handle the *same* transactions.

MCL-Net easily handles millions of business transactions daily.

Very Fast Response Times

MCL has conducted tests to measure the time to handle two consecutive transactions. MCL-Net's processing is so fast that the interval can not be measured by MCL's server's system clock. According to the system, 0% CPU time is spent by MCL-Net to process the two transactions.

Whether your business requires real-time or on-demand transaction handling, MCL-Net delivers.

Minimum Latency

MCL-Net is designed to handle a variety of network mediums such as wired, wireless, and satellite, or more specifically, Ethernet LAN, Internet, WLAN, GSM WWAN, and GPRS WWAN. Each of these mediums has different inherent communications delays. MCL-Net is optimized to minimize communications latency on whichever network medium you use.

MCL-Net maximizes worker productivity regardless of the network mediums you use.

Resiliency

MCL-Net is designed to protect your data and your work flow. Consider the case where you have two servers running MCL-Net. You have designed your network such that each MCL-Net manages only one half of your mobile computers. In this case, if one server goes down, for any reason, all the mobile computers running on that server can automatically/transparently switch to the second server. Your mobile workers continue to operate without having to make any changes or experiencing any delays.

MCL-Net keeps your workforce working even in the event of a server going off-line.



Load Balancing

MCL-Net provides several levels of load-balancing:

- ❖ MCL-Net helps you load balance your population of mobile computers. If your network architecture involves multiple servers running multiple instances of MCL-Net, your mobile computers can be distributed across the MCL-Net instances/servers via random instance selection by the mobile computers.
- ❖ MCL-Net load balances your network traffic. Consider a case when MCL-Net is managing 100 mobile computers and has 10 communications pipes open to your database to handle your operational transactions. MCL-Net automatically places the latest mobile computer transaction in the queue with the least to do.
- ❖ MCL-Net also helps you load balance traffic to your hosts. If your system architecture has multiple hosts handling operational transactions, and a host goes off-line for any reason, MCL-Net can automatically redistribute the mobile computer traffic to the existing live hosts.

MCL-Net's flexible deployment architecture maximizes system performance and worker productivity.

Net Manager with Data Encryption

MCL-Net includes a module called Net Manager. In addition to a traffic monitor, this module includes an encryption function which secures your data from the mobile computer all the way to the MCL-Net server, and not just across the wireless RF backbone.

MCL-Net's encryption protects your business data.

Back-up MCL-Net Servers

Any operational down time is costly to your business. It is worth investing in an MCL-Net back-up server to continue operations without interruption in the event of a primary server going down for any reason:

- ❖ Planned outage for server maintenance, server backup, or server upgrade.
- ❖ Hardware failure, virus attack, or any other unfortunate event.

MCL-Net's flexible deployment architecture keeps your business running.

Why MCL-Net?

With the capacity to handle up to 62,500 simultaneously connected mobile computers running MCL mobile worker applications, MCL-Net is designed for enterprise deployments of mission critical and on-demand applications.

Optimized for large distributed system deployments, MCL-Net is also efficient for small, localized deployments of mobile workers.



Top Reasons to Use MCL-Collection

- ❖ Core competency in development tools for data capture, mobile workforce applications development, deployment, and management.
- ❖ High productivity development environment to create applications that integrate data capture technologies, wireless communications, and mobile computing.
- ❖ Development environment to create multimodal applications combining technologies such as barcode scanners, touch screens, keyboards, signature capture, imagers, radio frequency identification, displays, printers, and voice recognition.
- ❖ Flexible, modular deployment architecture:
 - Building blocks to customize host access, network size, and communications modes.
 - Easy concurrent access to host applications, ODBC compliant databases, warehouse management systems (WMS), and enterprise resource planning (ERP) systems.
 - Scalable deployments from 1 to 62,500 concurrent mobile terminals per server.
 - Efficient for small system deployments.
 - Powerful and optimized for large distributed system deployments.
 - Real-time, on-demand, or batch data communications.
 - Seamless, transparent transitions back and forth between these modes of communication.
 - Continuously, casually, or occasionally connected users.
 - Seamless, transparent transitions back and forth between states of connection.
- ❖ Framework so you can focus on functional business issues, and not on implementation issues and constantly changing low-level technologies such as operating systems, wireless infrastructures, and data capture methods.
- ❖ A focus on minimizing your total cost of application ownership:
 - High-productivity development environment.
 - Multimodal approach.
 - Low on-going maintenance effort.
 - Modular, flexible architecture.
 - Easy application deployment and management.
 - Cross-platform compatibilities.
 - Forward migration paths.
 - Future-proofed applications.
 - Investment preservation.
- ❖ Benefits to your organization from data capture, mobile worker applications created using MCL-Collection:
 - A mobilized workforce.
 - Workforce productivity improvements.
 - Cost reductions.
 - Competitive advantages



- ❖ **MCL-Designer**
High-productivity, horizontal development environment to create enterprise-ready, multimodal, data capture applications.

- ❖ **MCL-Link**
Batch/ Point-to-Point, Serial:
 - Direct Connect RS-232
 - Modem

- ❖ **MCL-Net**
Real-Time/ Concurrent Users:
Wireless
 - WLAN: WiFi, 802.11
 - WWAN: GSM, GPRS, Wired Ethernet

- ❖ **MCL-Bridges**
 - Host Applications
 - Back Office Applications
 - ERP: SAP
 - Warehouse Management (WMS)
 - ODBC: Oracle, Access, FoxPro, DB2, Excel, Sybase, SQL

- ❖ **MCL-Collection with Vocollect Voice™**
Voice Recognition, Voice Synthesis

- ❖ **MCL Technologies Headquarters**
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About MCL Technologies

MCL Technologies is a recognized leader in delivering high-productivity software development tools for mobile workforce application development, deployment, and management. Its enterprise-ready, standards-based software suite, MCL-Collection, seamlessly integrates the latest technologies with mobile computer, multi-manufacturer, cross-platform compatibility. Through the integration of mobile computing, wireless infrastructures, and data capture technologies like barcode scanners, radio frequency identification, and voice recognition, MCL-Collection helps organizations deploy mission critical and on-demand multimodal applications to improve workforce productivity, reduce costs, and achieve competitive advantage. Since 1992, MCL-Collection has been implemented in thousands of locations around the world by large and small organizations with sectors of activities as varied as retail, banking, healthcare, government, transportation and logistics, warehousing, field service, and manufacturing. More information is available at <http://www.mcl-collection.com>.

