



RMI Standards Document

Version 1.2

RMI's **RailConnect®** Transportation and Revenue Management Services operate on IBM iSeries systems. This suite of applications is designed to operate optimally under IBM's operating system, OS/400. There are many ways to access IBM iSeries systems from terminals, workstations, and personal computers. RMI offers Internet and AT&T Frame Relay access to RMI's iSeries Systems located at both of RMI's Data Centers.

There are other hardware and OS (Operating Systems) standards that exist for the desktop PC connectivity portion of any site configuration. Please refer to the following list of personal computer workstation providers and printers for general guidelines when reviewing the purchase of equipment. RMI also emphasizes the use of UPS and surge protection for all hardware at the customers' premises. If you have any questions regarding the use of protection equipment, please contact your RMI representative.

Communication Standards:

1. Access Methods Currently Supported by RMI:

- Frame Relay
 - Must use AT&T for disaster/recovery reasons
 - Customer will be responsible for an AT&T Frame Relay circuit and PVC from the customer location(s) to the data center where their iSeries is located. Bandwidth and CIR will depend on the amount of workstations and printers that will be attaching.
 - A 2nd (backup) Frame Relay PVC to the other RMI data center for communications disaster/recovery purposes is also required.
- Internet Access to RMI:
 - DSL / Cable Modem / T-1 / Wireless (using VPN)
 - Supported Hardware VPN Devices consist of Cisco, Linksys and other approved VPN devices
 - Jwalk (Browser access)

2. Naming / Technical Standards for WAN devices

- RMI's naming standards dictate that all configuration definitions (i.e. displays, printers, and server connections) must start with the customer's road mark.

3. iSeries Display Session Timeout

- Sessions will disconnect after 60 minutes of inactivity. The work left unsaved can be recovered by signing on and taking option 1 to recover the session job. However if the session is unused for an additional 60 minutes (2hrs. total) the session job will end.



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4. *Standard CPE (Customer Premises Equipment)*

- CISCO Router for AT&T Frame Relay connections: (with internal CSU/DSU)
- All connections to RMI's iSeries computers will be direct TCP/IP.

Customer LAN standards:

1. *Network Cabling Standards:*

- RMI strongly recommends that all network cabling meet or exceed category 5 specifications (CAT5, CAT5E, CAT6). All CAT 5 or CAT6 terminations should be made to AT&T 568B specifications.

2. *Network Type*

- Ethernet 10Base-T, 100Base-T, 1000Base-T

3. *Network Protocol Supported*

- Direct TCP/IP

Customer Hardware and Operating Systems

1. *Personal Computers – hardware:*

- RMI supports only IBM compatible PCs, to include
 - Dell
 - Gateway
 - IBM
 - HP

2. *Supported Personal Computers – Operating Systems:*

- Windows XP Professional
- Windows Vista (Ultimate, Business and Enterprise Versions)

NOTE:

*** RMI Follows Microsoft guidelines for supported Operating Systems ***.

Windows 95, Windows 98, Windows NT, Windows 2000 are no longer supported Operating Systems by Microsoft. Windows XP Home, Windows Vista Home or Windows Vista Home Basic is not RMI supported Operating Systems.

3. *DSL Router/Hub*

- RMI Has currently tested and approves Linksys and Cisco Hardware.

4. *Printers*

- HP LaserJet (PCL5) with Jet Direct card or Jet Direct External (multiple printer box not supported)

NOTE: Inkjet printers and multifunction printers (fax, Copiers) are not supported.



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Software Updates and Service Packs

- The customer will need to keep the Operating System of the PC, Client Access Express and Internet Browser software updated for optimum performance and reliability.

Terms and Definitions

10Base-T: An Ethernet network running 10mb/s implemented on twisted pair cabling.

- The maximum length of a segment is 100m
- The cable used is Category 5 unshielded twisted pair.
- Devices are connected to a central hub or Ethernet Switch.
- Hubs may be daisy chained to form larger networks

100Base-T: An Ethernet network running at 100mb/s implemented on Category 5 twisted pair cabling.

- Hubs or Ethernet Switch and Network cards capable of running 100mb
- The maximum length of a segment is 100m
- The cable used is Category 5E or Category 6 unshielded twisted pair.

1000Base-T: An Ethernet network running at 1 GB/s implemented on Category 5E twisted pair cabling.

- Hubs or Ethernet Switch and Network cards capable of running 1Gb/s
- The maximum length of a segment is 100m
- The cable used is Category 5E or Category 6 unshielded twisted pair.

5250: Common IBM midrange data entry and display system that incorporates control units, display terminals, printer, and other equipment to interface with the IBM midrange system.

AT&T 568B: One of the most common cabling standards for termination of RJ45 connectors (male and female). Wo/ Or/ Wg/ Bl/ Wbl/ Gr/ Wbr/ Br pinout standard.

Category 5E: A cabling standard for UTP (Unshielded twisted Pair) running for network access. Used for speeds up to 1 Gigabyte.

CPE: Customer Premises Equipment

CSU/DSU: (Channel Service Unit): A digital DCE used to terminate digital circuits, such as, 56k and T1. It conditions lines and ensures proper bit transmitted streams.

FRAME RELAY: Simply put, frame relay is a way of sending information over a wide area network (WAN) that divides the information into frames or packets. Each frame has an address that the network uses to determine the destination of the frame. The frames travel through a series of switches within the frame relay network and arrive at their destination. Frame relay employs a simple form of packet switching that is well-suited to PCs, workstations and servers that operate with intelligent protocols, such as TCP/IP. As a result, frame relay offers high throughput and reliability that is perfect for a variety of today's business applications.



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PVC: (Permanent Virtual Circuits) are two-way, software defined data paths between two ports that act as private line replacements in the network.

Usage PVC: These are used to back up your primary circuit. You're billed a low monthly maintenance fee, if the circuit is needed you will then be charged for bandwidth usage.

TCP/IP: (Transmission Control Protocol/Internet Protocol): A layered set of protocols that allow sharing of applications among multiple platforms in a high-speed communications environment.

VPN: (Virtual Private Network) enables you to create networks using the Internet as the medium for transporting data. These systems use encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.

DSL: (Digital subscriber Line): This technology uses copper pair wiring that exists in almost every home and office. Special hardware attached to both the user and switch ends of line allows data transmission over the wires at far greater speed than the standard phone wiring. Because connection speeds can vary, many people prefer the fixed speed of an ISDN or a T1. In addition, DSL is not available in many areas because of distance from a Central Office or because the local telephone companies have not yet introduced this product. But with DSL technology developing rapidly, we expect that many telephone companies will be introducing it and that efforts will be made to improve the transmission over greater distances.

IPSec: (IP Security) a set of protocols developed by the IETF to support secure exchange of packets at the IP layer. IPSec has been deployed widely to implement Virtual Private Networks (VPN's). IPSec supports two encryption modes: Transport and Tunnel. Transport mode encrypts only the data portion (payload) of each packet, but leaves the header untouched. The more secure Tunnel mode encrypts both the header and the payload. On the receiving side, an IPSec-compliant device decrypts each packet. For IPSec to work, the sending and receiving devices must share a public key. This is accomplished through a protocol known as Internet Security Association and Key Management Protocol/Oakley ISAKMP/Oakley), which allow the receiver to obtain a public key and authenticate the sender using digital certificates.

SNMP: (Simple Network Management Protocol) a set of protocols for managing complex networks. The first versions of SNMP were developed in the early 80s. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters. SNMP 1 reports only whether a device is functioning properly. The industry has attempted to define a new set of protocols called SNMP 2 that would provide additional information, but the standardization efforts have not been successful. Instead, network managers have turned to a related technology called RMON that provides more detailed information about network usage.



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Customer Checklist

Customer Name: _____

Location Name: _____

The following is necessary for determining the equipment needed for a new client to connect to RMI by Frame Relay.

Computer / Network survey:

How many computers need access to RMI's iSeries for *RailConnect*® TMS or RMS at this location? _____

What operating system are the existing computers on? _____
Example: Windows 2000, Windows XP

Are the current computers connected to a Network? Yes, No

If yes, what is the Network operating system? _____
Example: Novell, Windows XP, Unix, Other

What is the version of the Network operating system? _____
Example: Windows 2000, Windows 2003

What type of cabling is used to connect the computers to the Network? _____
Example: Cat5, Cat5E, Cat6

What type is this Network? _____
Example: Ethernet, Token Ring, Other

What protocol is used on this Network? _____
Example: IPX (Novell), TCP/IP

If TCP/IP what is the range of IP addresses in use? _____

iSeries System Sizing:

In total, how many carloads per year are being processed? _____

In total, how many waybills per year are settled in ISS? _____

In total, how many freight invoices are sent to customers per year? _____



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Additional Locations:

Please prepare Checklist for each additional location.