



Introduction to Mobility XE

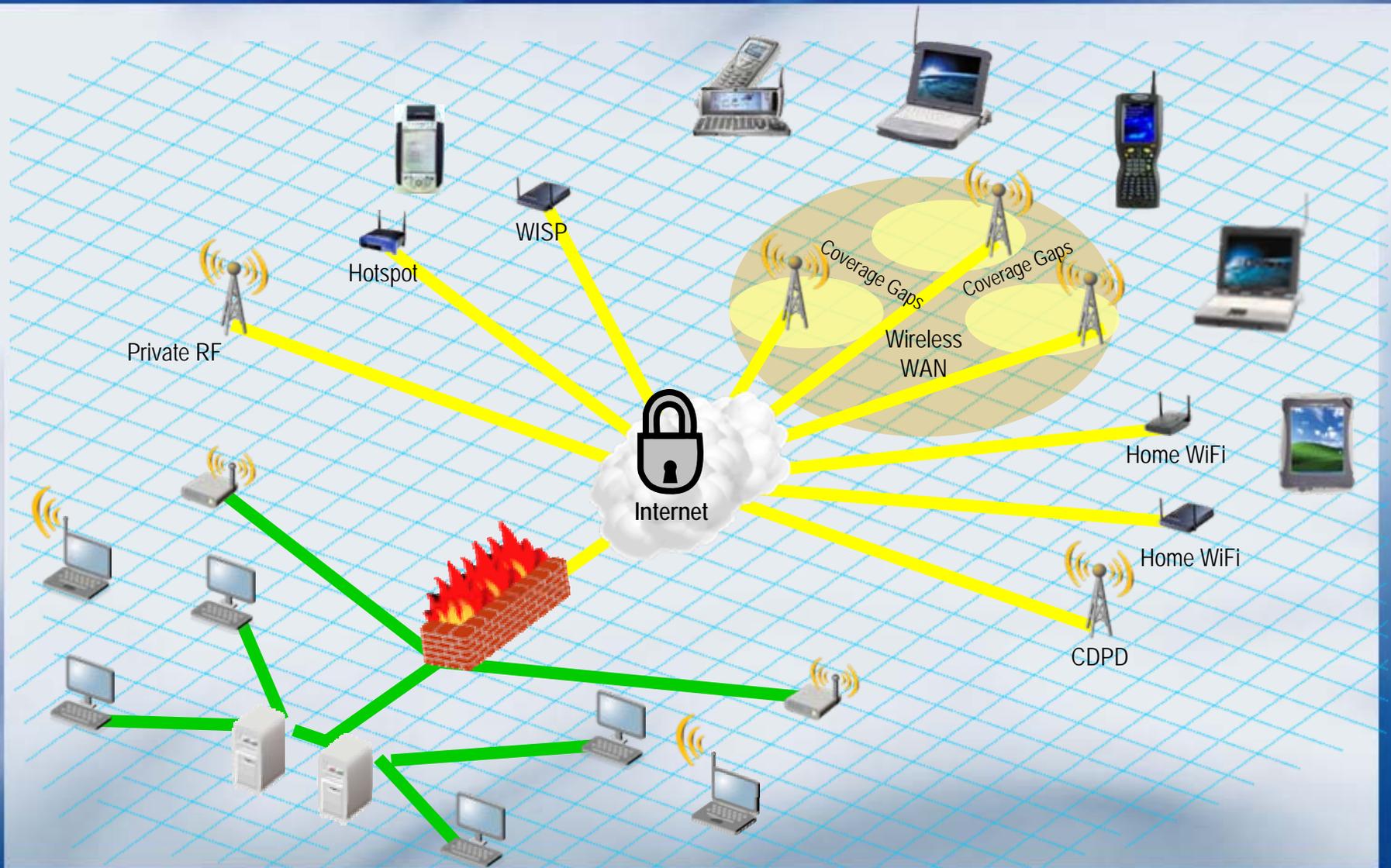
mobility_{XE}™

Itronix & NetMotion



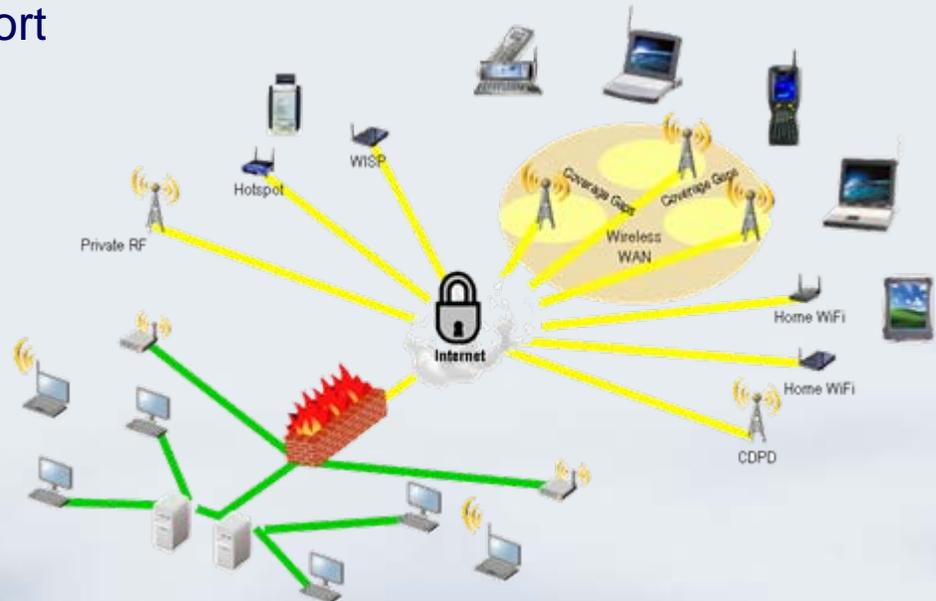
- Partners since May 2002
- Itronix with NetMotion Wireless Offer a Total Mobility Solution
 - **Single Vendor support**
 - **Hardware**
 - **Software**
 - **Wireless Networks**
- NetMotion has patents granted, additional patents pending
- Current Mobility release 6.1

Network Landscape



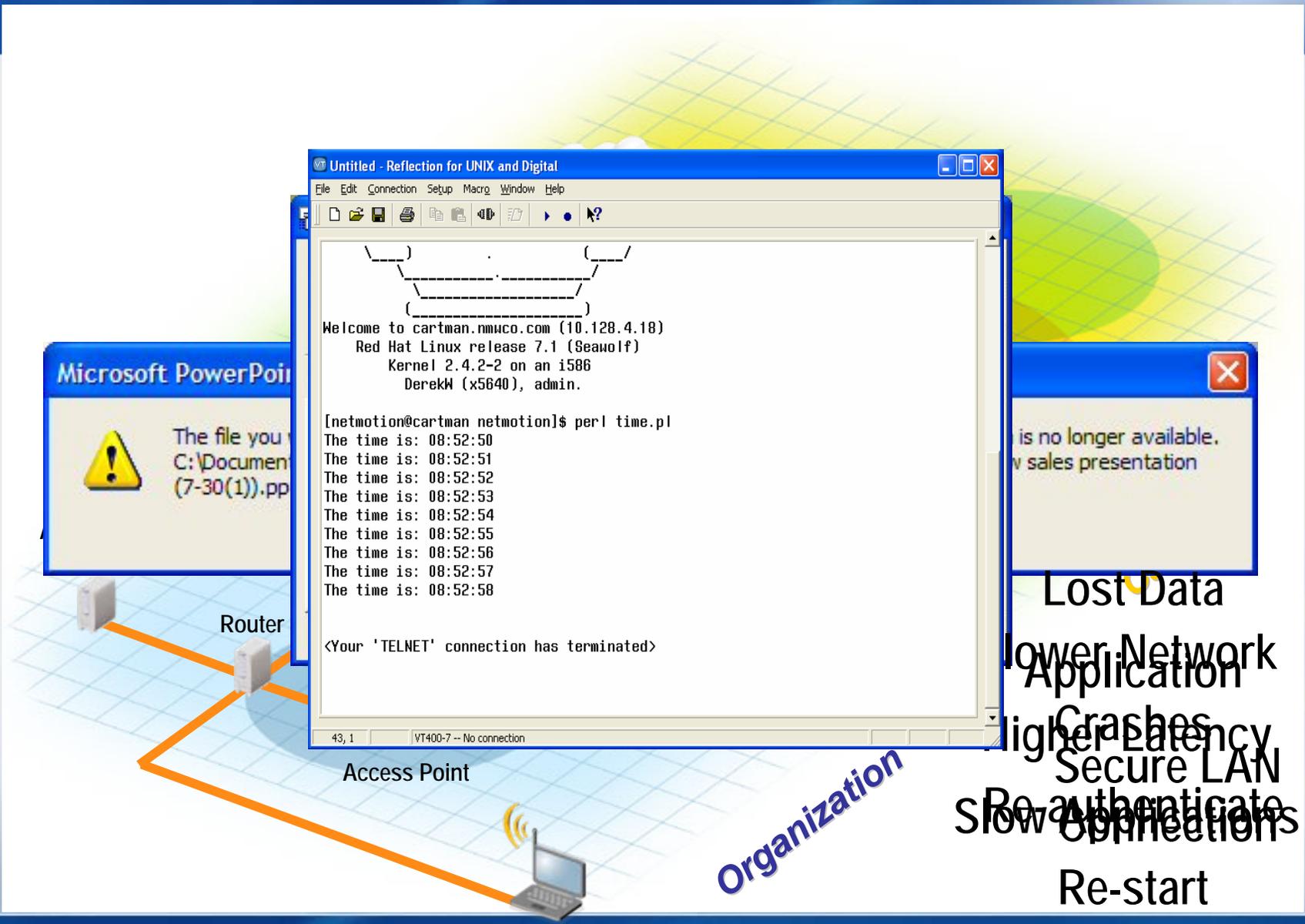
Mobility VPN

- Ensures data is secure no matter what network or devices mobile workers use.
 - 128-bit encryption (AES Rijndael) 56-bit DES, 112-bit DES (triple-DES), 128-bit Twofish,
 - IPSec & NAT traversal support
- Authentication:
 - No extra configuration or setup
 - Standard Windows logon credentials
 - Single sign-on for users



Security is only the beginning of Mobility

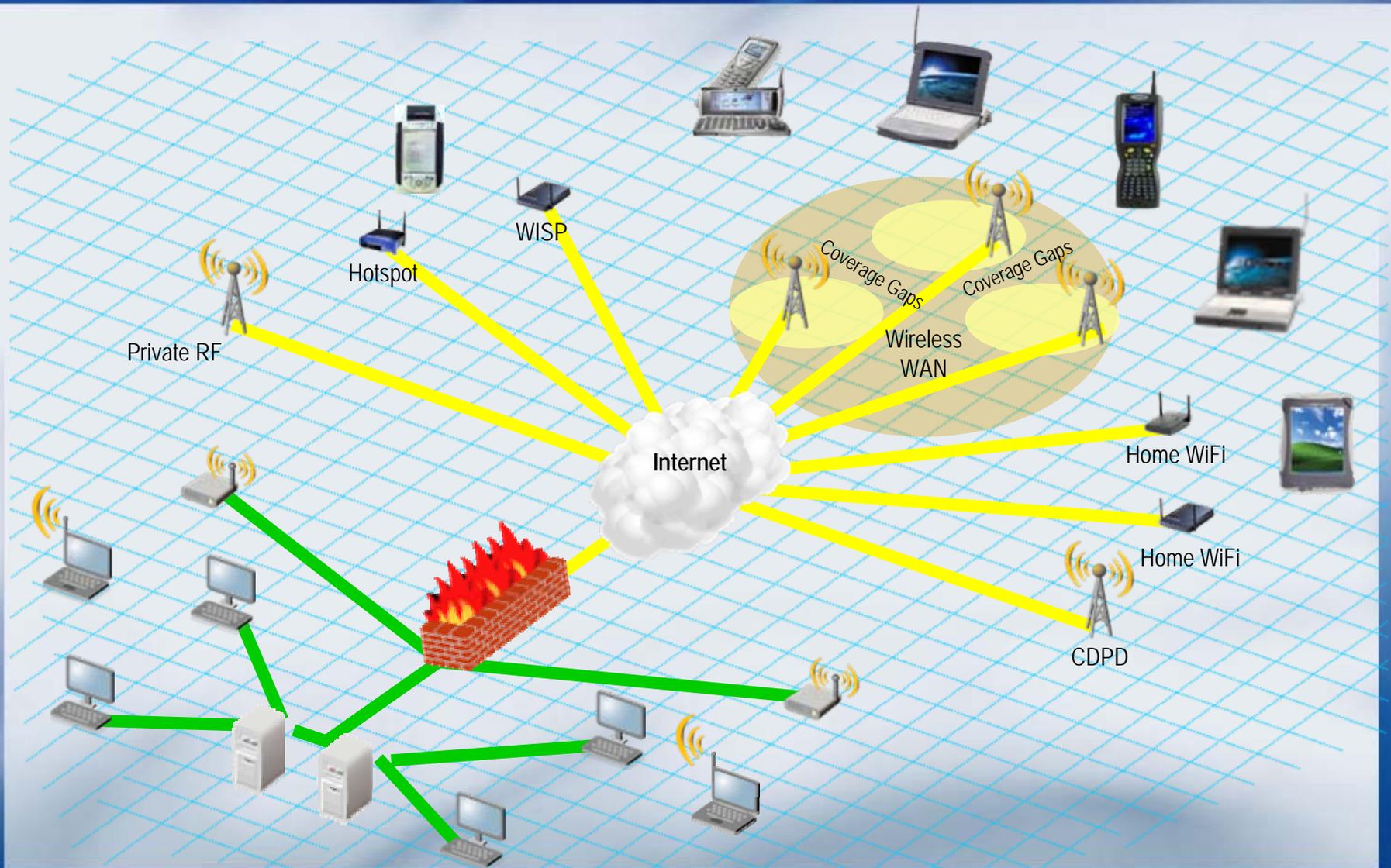
Mobile Challenges



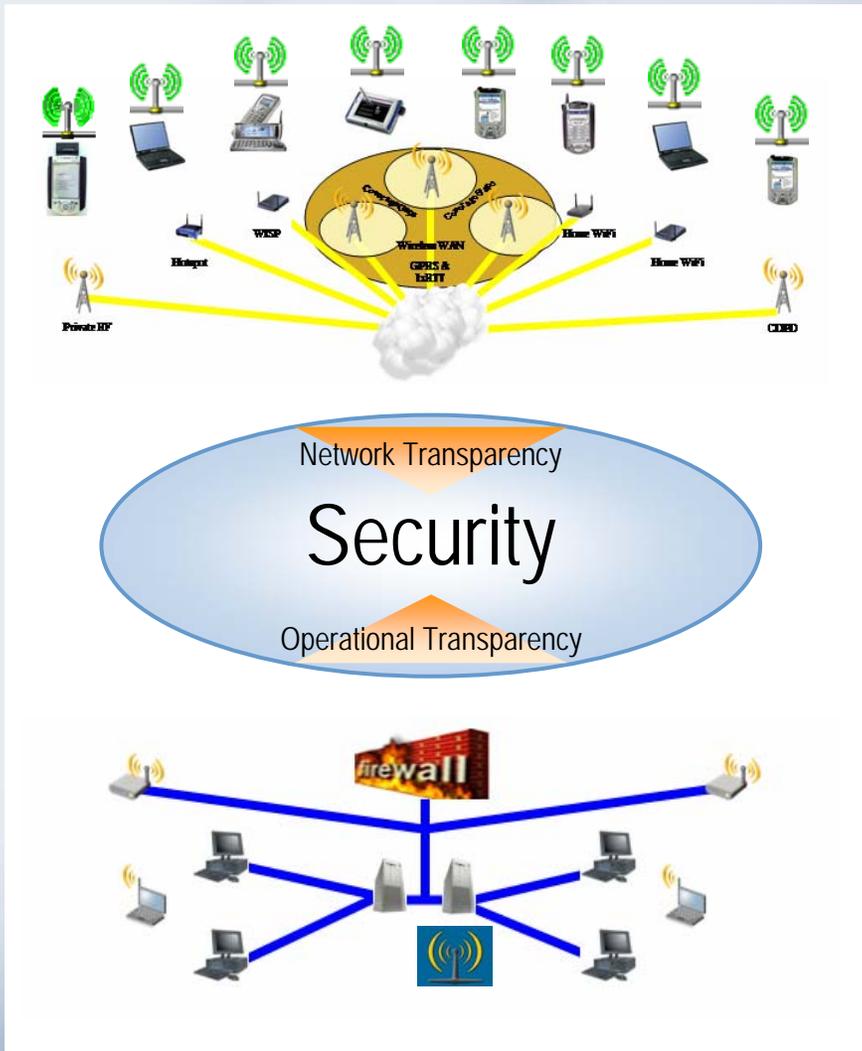
- Lost Data
- Lower Network Application
- Crashes
- Higher Latency
- Secure LAN
- Re-authenticate
- Slow Applications
- Re-start

Organization

Network Landscape



NetMotion Mobility



- Enables applications to work over wireless without modification
- Eliminates lost data and application crashes
- Creates a single, unified network
- Provides excellent IT control
- Simple and easy to install and use



More than 600 Customers

- Diamond Cluster International
- Raytheon
- San Jose PD
- Colorado Springs PD
- City of Aurora
- Winnipeg PD
- Utah Transit Authority
- St. Luke's Episcopal Hospital
- Washington Hospital
- Foxwoods Casino
- York International

“Under tremendous political deadline pressure for a solution, I mounted a concerted search and found NetMotion.

It runs on everything, is inexpensive, and really does exactly what it promises. We were literally able to install it and bring it live in less than an hour. It has been running our wireless enterprise ever since.”

Craig F. Feied, MD, FACEP, FAAEM
Director of Informatics, Washington
Hospital Center, Dept. of Emergency
Medicine

Policy Management

Status Monitor | **Client Policies** | Event Viewer | About

NETMOTION WIRELESS

Logoff Help

< Back Edit Rule - Example rule

Conditions Targets Other

Choose the condition(s) for this rule:

Interface

- All interfaces
- When the interface name contains keyword
- When the interface speed is less than speed

Rule description (click on an underlined value to edit it):

Apply this rule for all interfaces
block network traffic for [application\(s\)](#)
iexplorer.exe, then
allow all network traffic

Application Server

Mobil

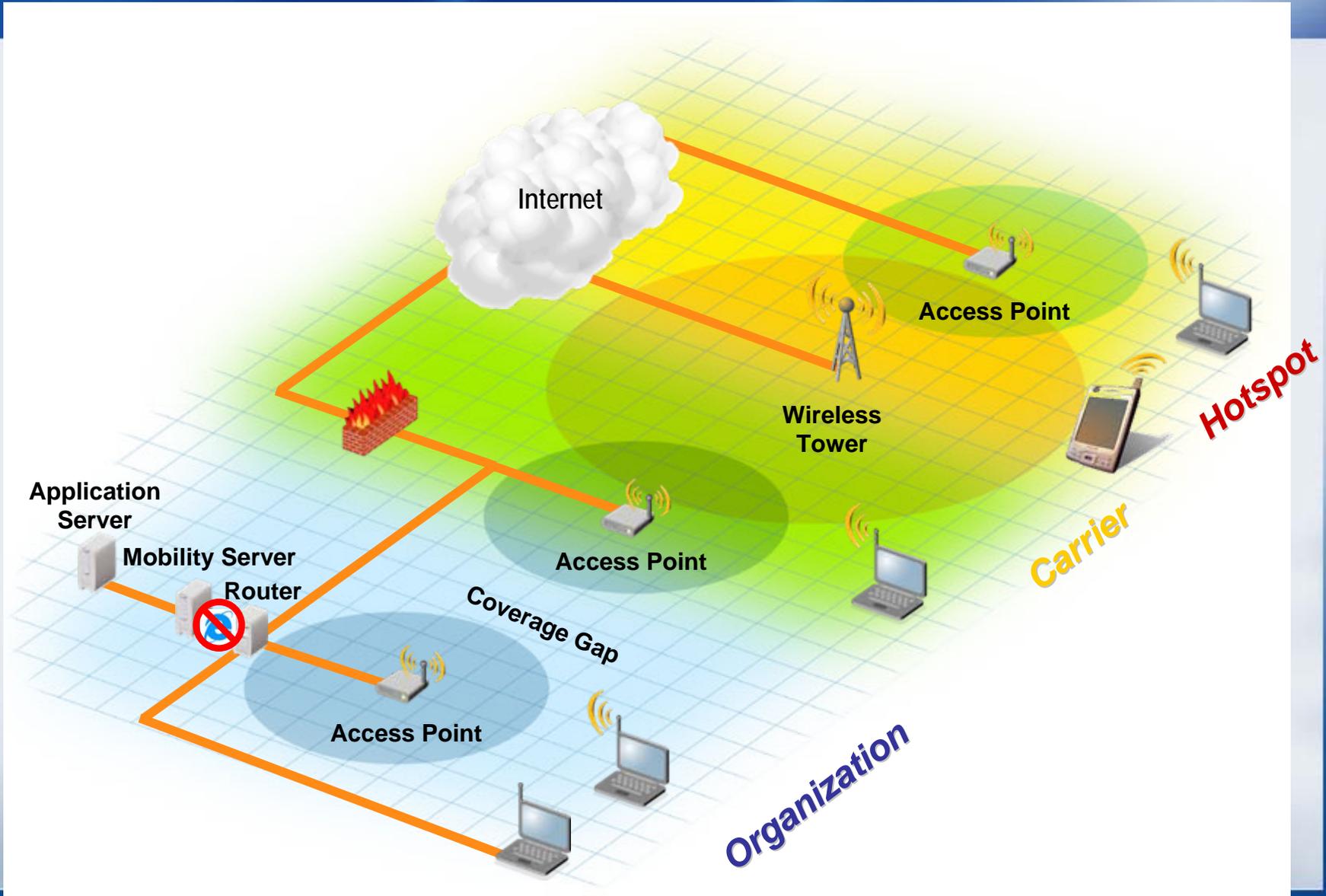
Access Point

Organization

carrier

Hotspot

Policy Management



Recognition

“NetMotion is key to fulfilling all the promise of wireless networking.” --- Internet Week



“This unique product solves critical problems associated with deployment of wireless applications.”
--- Network Computing



“Without Mobility, the use of wireless networking is both risky and less convenient than it should be.”
--- PC Magazine

“Mobility’s primary functions are crucial to enterprises that want to move business-critical applications to existing wireless networks”
--- InfoWorld



Summary

- **Software solution that delivers security and reliability that enterprises require**
- **Mobility makes wireless more like a “wired” experience**
- **Transparent to networks, applications and hardware**
- **Field proven, award winning product**
- **Install and deploy in hours**

MOBILITY XE COMPATIBILITY

Itronix GoBook Computers

Q200	fex21	Tablet	GoBook II	GoBook Max
				
Client		Server	Network Type	
Itronix GoBooks & fex21 Windows Laptops Windows Handhelds		Windows 2000 Windows Server 2003	Any IP Based Network Wired or Wireless	
Windows 98,2K,XP Windows HPC-2000 Windows CE 3.0 Windows PocketPC 2002 Windows PocketPC 2003		May coexist on servers already installed.	802.11a,b,g, xDSL, Cable Ethernet (LAN), Dial-up CDPD, CDMA/1xRTT, GSM/GPRS, EDGE, UMTS Nextel, CDMA/1xEVDO	



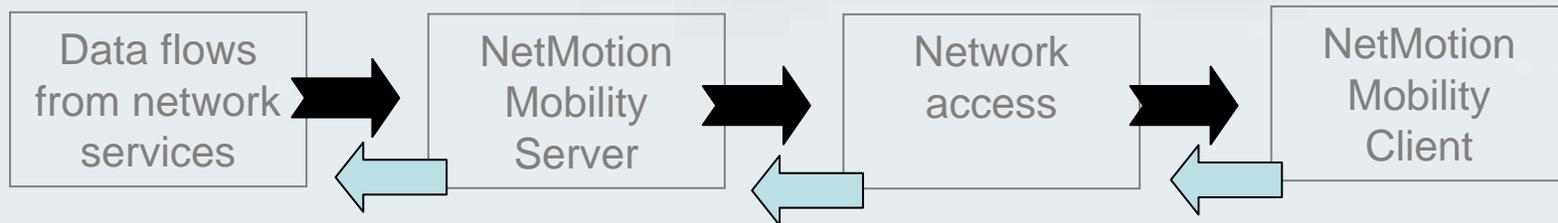
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NETMOTION

WIRELESS

NetMotion System Components



⌋ Network services

- Terminal and database servers
- File and print resources using TCP/IP
- Internet, Web, FTP servers

⌋ NetMotion Mobility Server

⌋ Network access

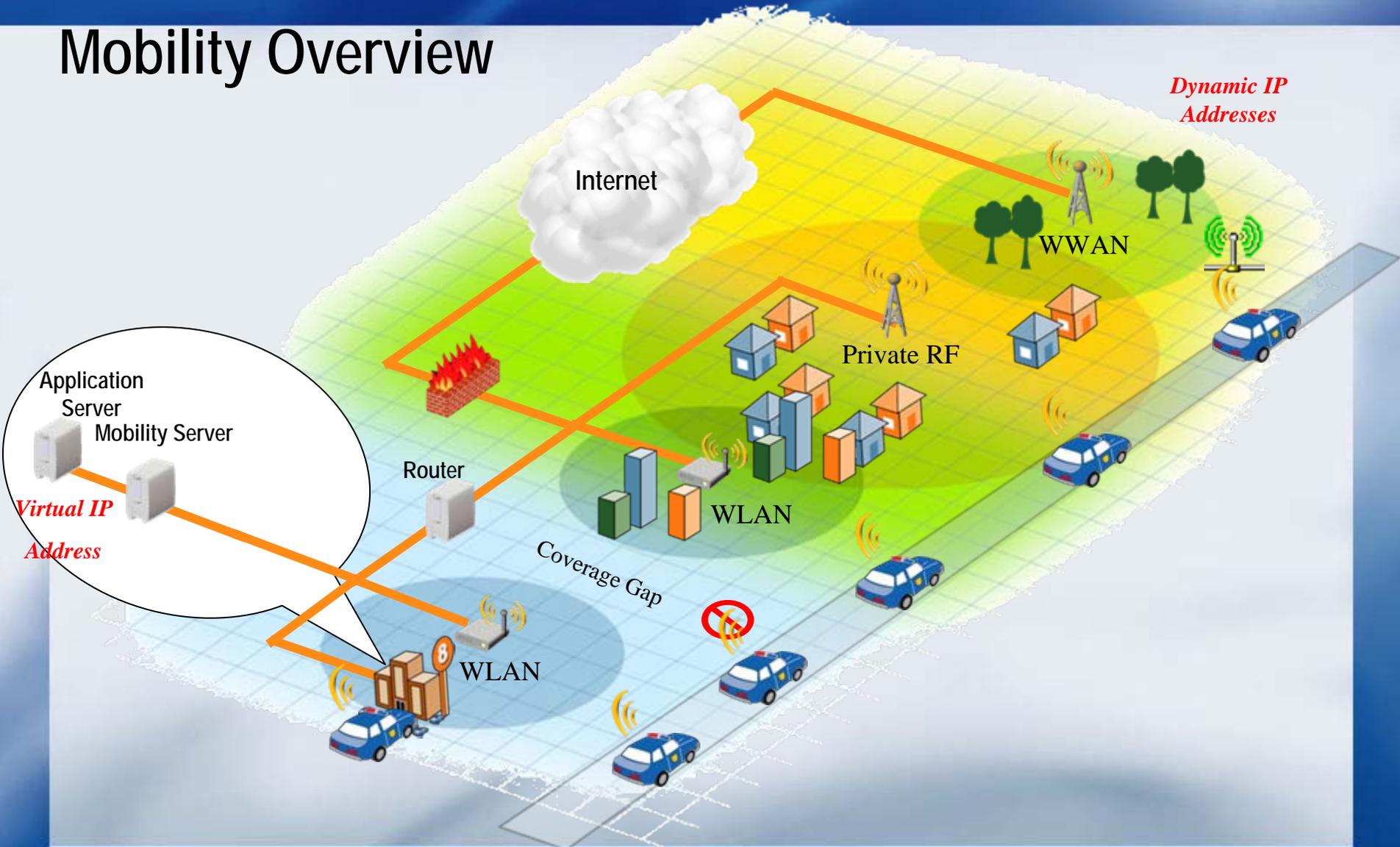
- Wireless LAN, wireless WAN, wired
- Local area access point or wide area service

⌋ NetMotion Mobility Client

- A mobile device with NIC

Architecture

Mobility Overview



The NetMotion Mobility Client Software

- « **System Tray Icon** – Indicates the current Mobility connection status and provides access to the NetMotion Client Properties Application
- « **NetMotion Client Properties Application** – Allows a client user to enable or disable Mobility, set Mobility options, and review NetMotion Mobility Client statistics
- « **NetMotion Event Viewer** – Displays and logs errors and network events

The NetMotion Mobility Server Software

- ☞ **Mobility console** – A web-based configuration and management utility that an administrator can use to configure settings, create and apply client policies, monitor server status and client connection, load activity and troubleshoot problems.
- ☞ **Mobility Warehouse** – A distributed directory server based upon Lightweight Directory Access Protocol (LDAP), which stores Mobility XE configuration setting and client policies.
- ☞ **Startup settings** – A utility that you can use to change the Mobility warehouse and server pool configuration after initial installation.
- ☞ **Event viewer** – Displays a log of errors and network events. This windows based utility is available for troubleshooting even if the Mobility console is inaccessible.

Server Pooling

- **Defined**
- Mobility servers that share the same instance of the Mobility Warehouse function as a server pool.
- Client connections are distributed among the server pool.
- Each load balancing server periodically communicates its load and status.

Server Pooling

- **Mobility XE assesses server load based upon:**
 - Available memory
 - CPU utilization
 - Available network bandwidth

- **Server selection does not depend directly upon the current client connections.**

- **Client load balancing only occurs at the initial connection.**

Server Failover

- **If a Mobility server fails:**
 - Clients can automatically try to connect to an alternative server in the server pool.
 - Does not provide session persistence, though allows the client to easily reconnect with user intervention.

- **By default, all server in a pool function a failover servers.**



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Wireless Optimizations

Wireless Optimizations

- « Selective acknowledgements
- « Data and acknowledgement bundling
- « Message coalescing
- « Reduced and synchronized retransmissions
- « Fragmentation optimizations
- « Data compression

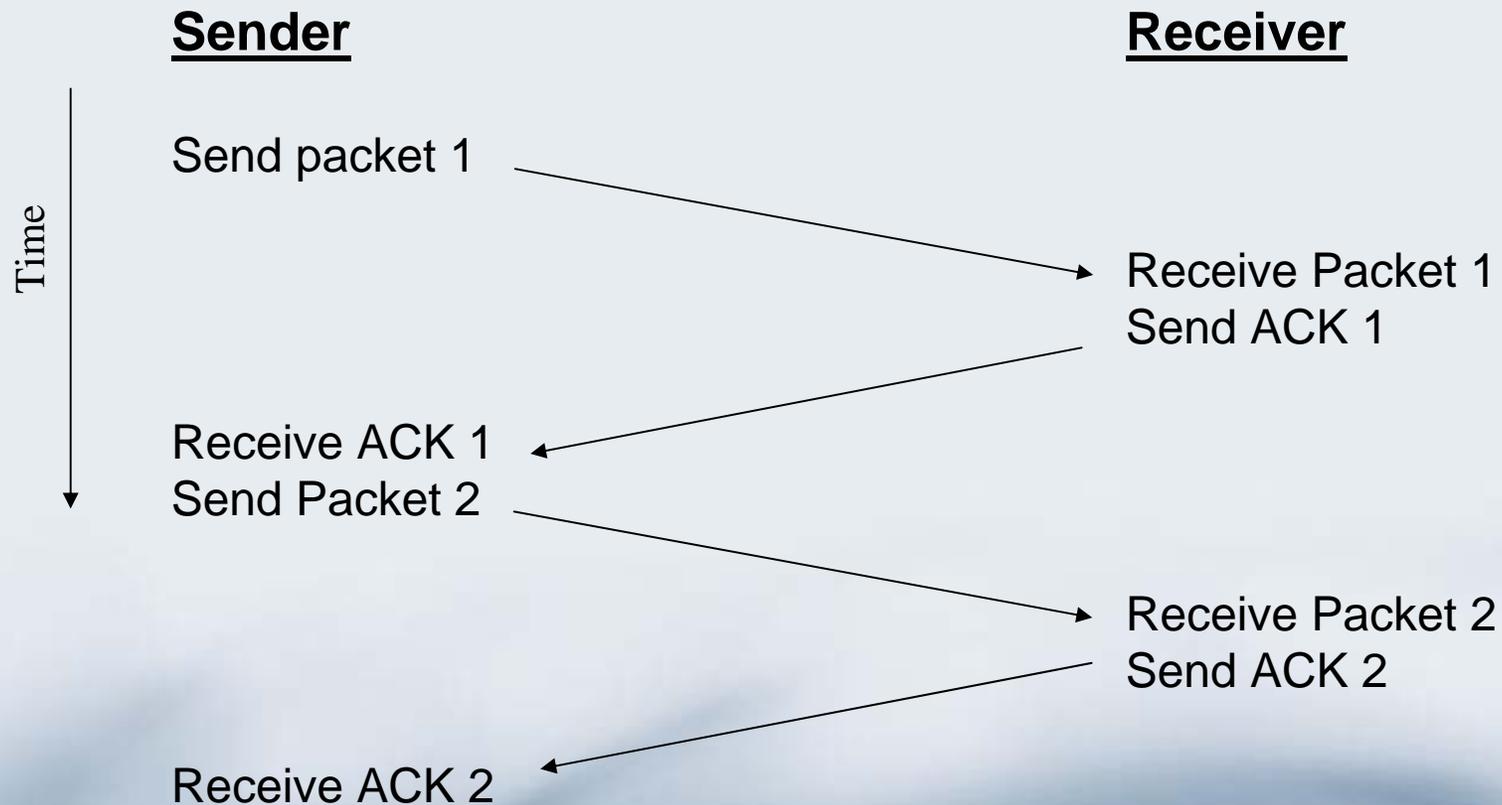
Wireless Optimizations

- « TCP & wireless? The reality is:
 - TCP is not suited for mobile environments
 - TCP has high protocol overhead

- « UDP is optimal for wireless with NetMotion Mobility
 - Selective acknowledgements
 - Use sequence numbers
 - Detects when frames are out of order
 - Request retransmission of missed frames

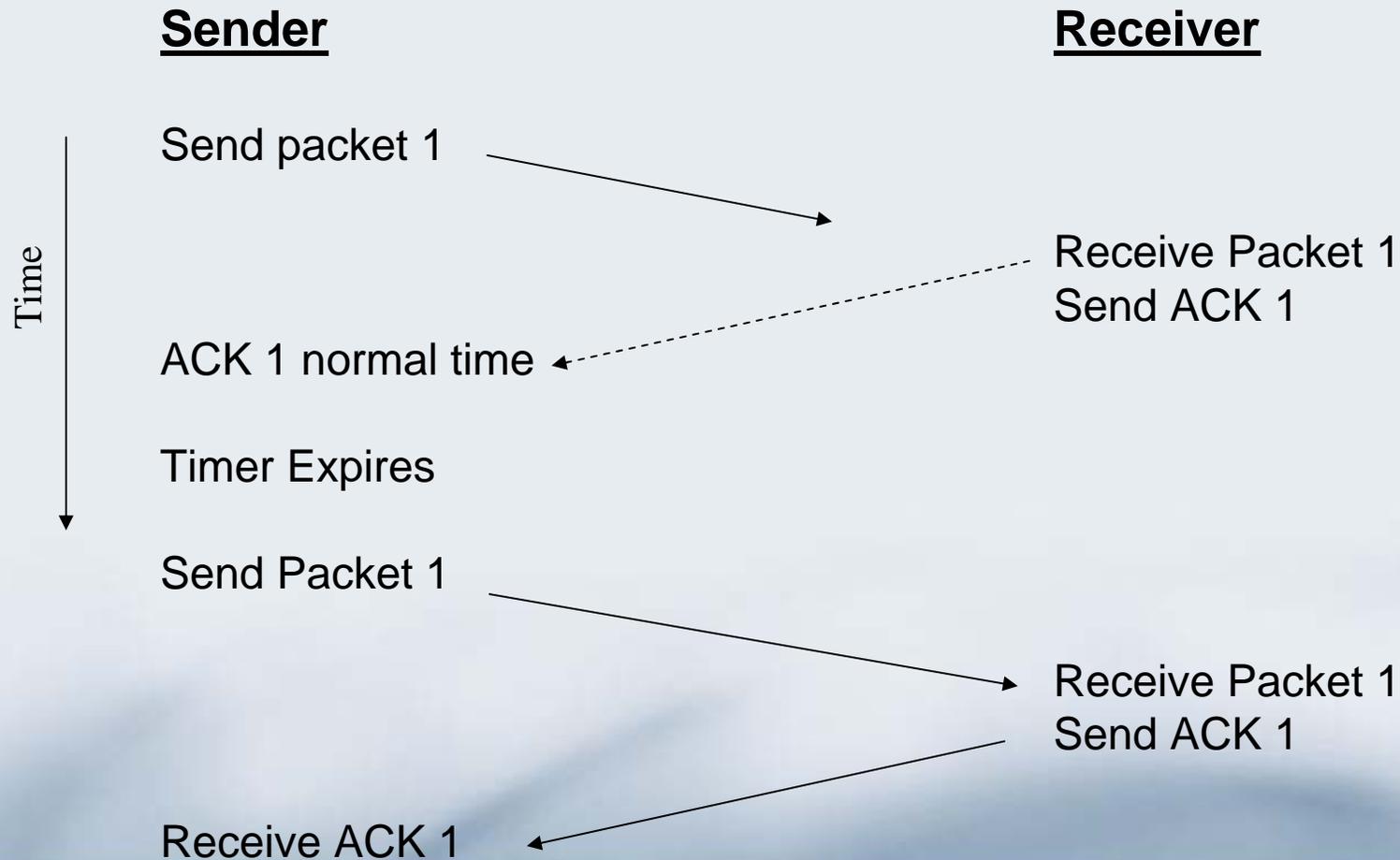
TCP/IP

Show single window acknowledgement



TCP/IP

Show single window packet loss and resend



Wireless Optimizations

Data bundling & message coalescing

- ⌚ Both control and application data from multiple distinct message streams are passed in the same frame.

Let's take a look.....

Wireless Optimizations

Data bundling & message coalescing (Standard Implementation)

- ⌚ Application A sends 100 bytes of data to its peer, and application B sends 500 bytes to its peer.
- ⌚ This normally generates two separate frames, one with 100 bytes of data (plus protocol overhead), and one with 500 bytes (plus protocol overhead). Each frame then requires a separate acknowledgment from the peer stating that it was received.
- ⌚ In this simple example, four frames are required to move the 600 bytes of data over the wireless link.

Wireless Optimizations

Data bundling & message coalescing

Here's what happens with NetMotion Mobility:

- « The data from application A (100 bytes) and application B (500 bytes) traverse the link in one 600-byte packet (plus protocol overhead).
- « Only one acknowledgment is generated.
- « This is at least a 50 percent decrease in frame processing, and the larger size frames use the network bandwidth more efficiently. Mobility becomes even more efficient as more applications transmit data.

Wireless Optimizations

Reduced and synchronized retransmissions

- « WWANs have over-aggressive retransmission policies. Most IP implementations have been tuned for high-bandwidth environments.
- « NetMotion uses many heuristics beyond the standard round-trip calculation to determine latency.

3 Examples.....

Wireless Optimizations

Reduced and synchronized retransmissions

« NetMotion Mobility's

- Mobility retains the learned information; if an application starts another new connection, it starts out using the tuned parameter settings.
- Furthermore, when Mobility roams from one network interconnect to another, the new characteristics are applied to all active connections at once. Each connection does not need to go through the exercise of recalculating these values, possibly causing more retransmissions and further affecting throughput.

Fragmentation optimizations

- ⦿ When roaming from one network interconnect to another (with a possible change in the maximum frame size), fragmentation might be necessary, and Mobility optimizes it:
 - There is a maximum message size that can be transferred across a link, and Mobility knows what that size is. If the application submits a request to send data that is too large to fit in a single message, it fragments it before passing it to the underlying network layer. The benefit to this is that the data traverses the network as "normal" (unfragmented) frames and does not cause any extra overhead on intermediary systems.

Data compression

- « [RFC 1951](#) (LZ77 deflate/inflate)
- « Application payload only
- « Allows seamless operation through firewalls and NATs
- « No modification or configuration of applications is necessary



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WIRELESS

Policy Management

Policy defined

- A policy comprises a rule or set of rules that control client network behavior.
- A rule specifies a system state or network interface condition that must be satisfied for the rule to become active.

Policy configuration tool

- Requires a separate license in addition to the basic Mobility server license.
- Enable web management first.
- Client Policies (start, programs, NetMotion)

Policy – Three steps

- **Create rule(s)**
- **Add rule(s) to a policy**
- **Subscribe users or devices to a policy**

Policy triggers

■ Triggers -> Target -> Action

■ **3 Triggers**

- All network interfaces
- An interface with matching string (use client Mgr.)
- An interface that reports a speed less than a specified value

Policy targets

Trigger -> Target

■ Target

- Application
- Network
- IP address
- Port

Policy actions

Trigger -> Target -> Action

■ Action

- Allow
- Pass through
- Block
- Disconnect

- **Subscribe the policy to a user, device, device group or globally.**
- **Policies a pushes the a client when it connects to the Mobility server.**
- **Confirm that the policy is running on the client by checking the client properties.**

MERCI

Reduced and synchronized retransmissions #2

« The standard transport implementation operates:

- When each application creates a connection to a peer, the transport mechanism needs to go through some gyrations to determine the characteristics of the link.
- Once this information is gathered, performance will increase. But it takes time for enough application data (possibly upwards of 64k) to be passed through the link.
- When the connection is terminated, all the learned information is lost.

Wireless Optimizations

Reduced and synchronized retransmissions #1

⌚ Standard retransmission policy

- When a frame is transmitted, a timeout is set for when an acknowledgment for the frame should be received.
- If the acknowledgment has not been received, some transports blindly submit another copy of the frame.

⌚ NetMotion Mobility's retransmission policy

- Mobility checks to see if the underlying network layer has processed the previous copy of the frame.
- If not, it delays submitting another copy.