

M05

Using WebSphere MQ Everywhere in Wireless Solutions

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Agenda

- Positioning of MQ Everyplace as a product
 - Position in WebSphere family
 - Role in WebSphere Everyplace
 - Benefits for wireless users and user examples
 - Hardware constraints
- Wireless technology
 - Wireless LANs and Bluetooth
 - Cellular phone rollout
- Using MQ Everyplace for Wireless
 - Network choices and WebSphere Wireless Gateway
 - Using MQ Everyplace with WebSphere Wireless Gateway
 - Intermittent connection and Push technology
 - Link performance and Cost
 - Security considerations

Business Integration Styles

User Interaction

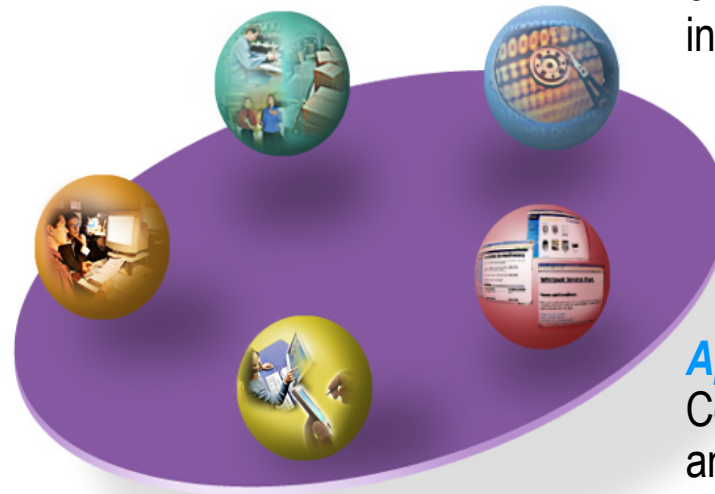
Creating a single interactive user experience across applications and devices

Information Integration

Enabling coherent search, access, replication, transformation and analysis of diverse forms of enterprise information

Process Integration

Changing how businesses run by integrating processes involving applications and people within and among enterprises



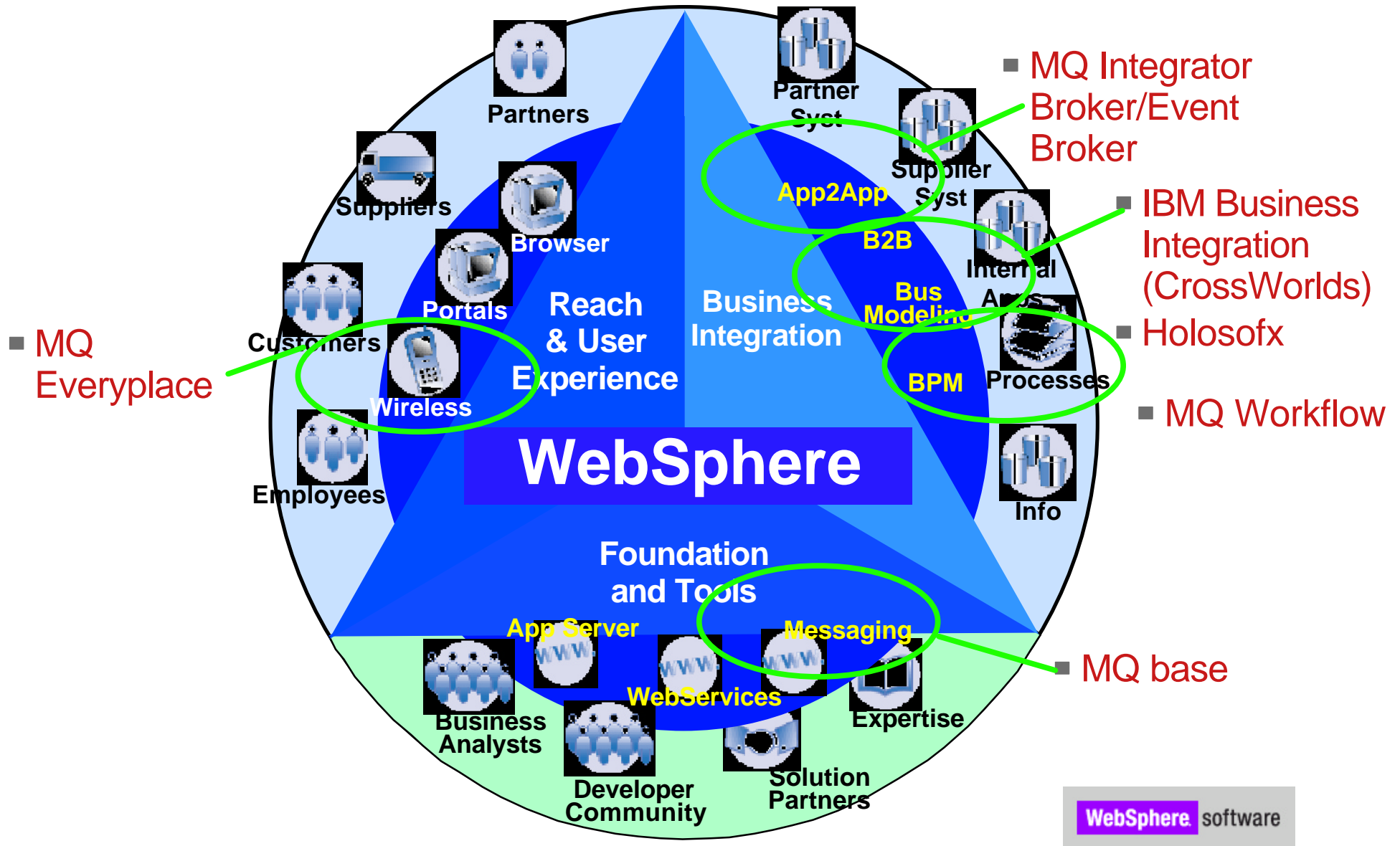
Build to Integrate

Building and deploying integration-ready applications that leverage Web Services and existing software assets

Application Connectivity

Connecting applications to share and leverage information across disparate systems throughout the enterprise

MQ Everyplace and WebSphere



- Where does MQ fit in WebSphere ?

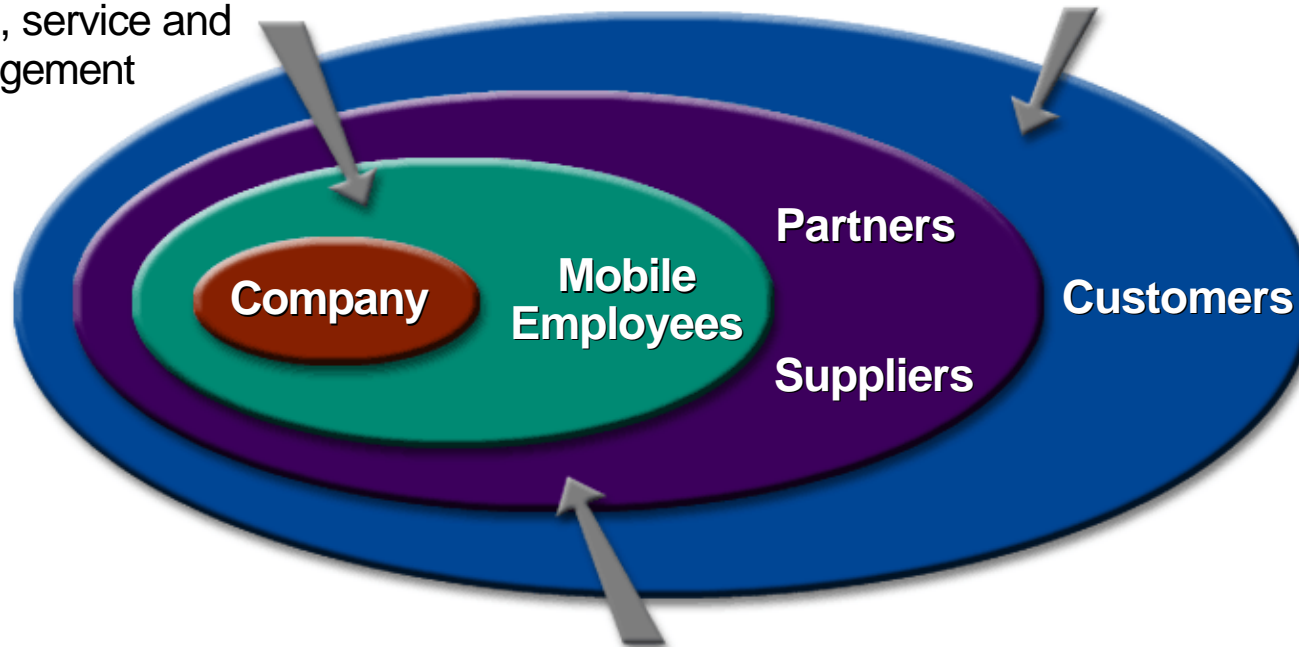
Connectivity on the Edge

Mobile Intranet

Mail, calendar, to-do
Content: customers,
products, directories
Sales, service and
management

Mobile Portals

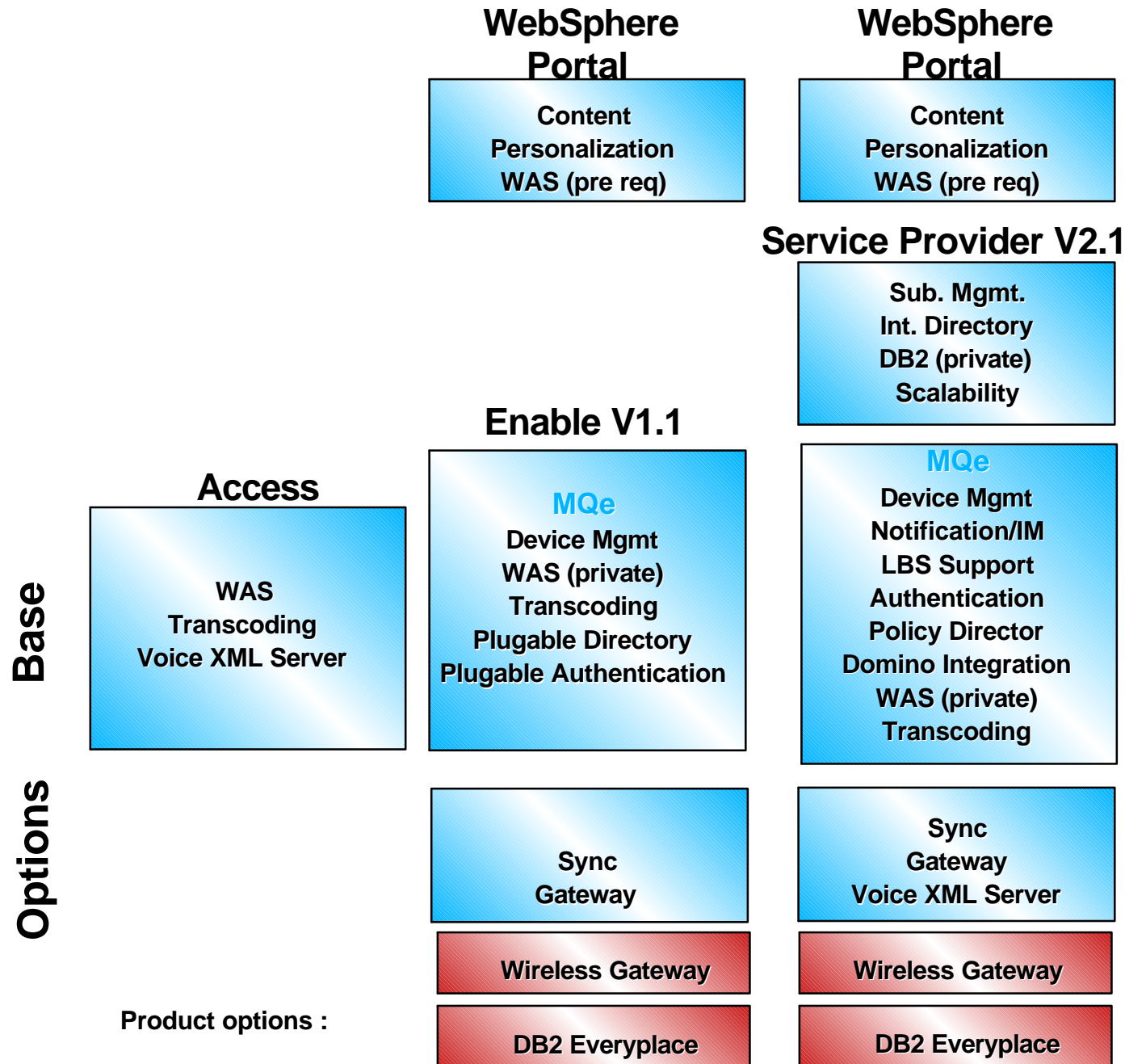
Consumer and SMB alerts
to best customers mobile
commerce



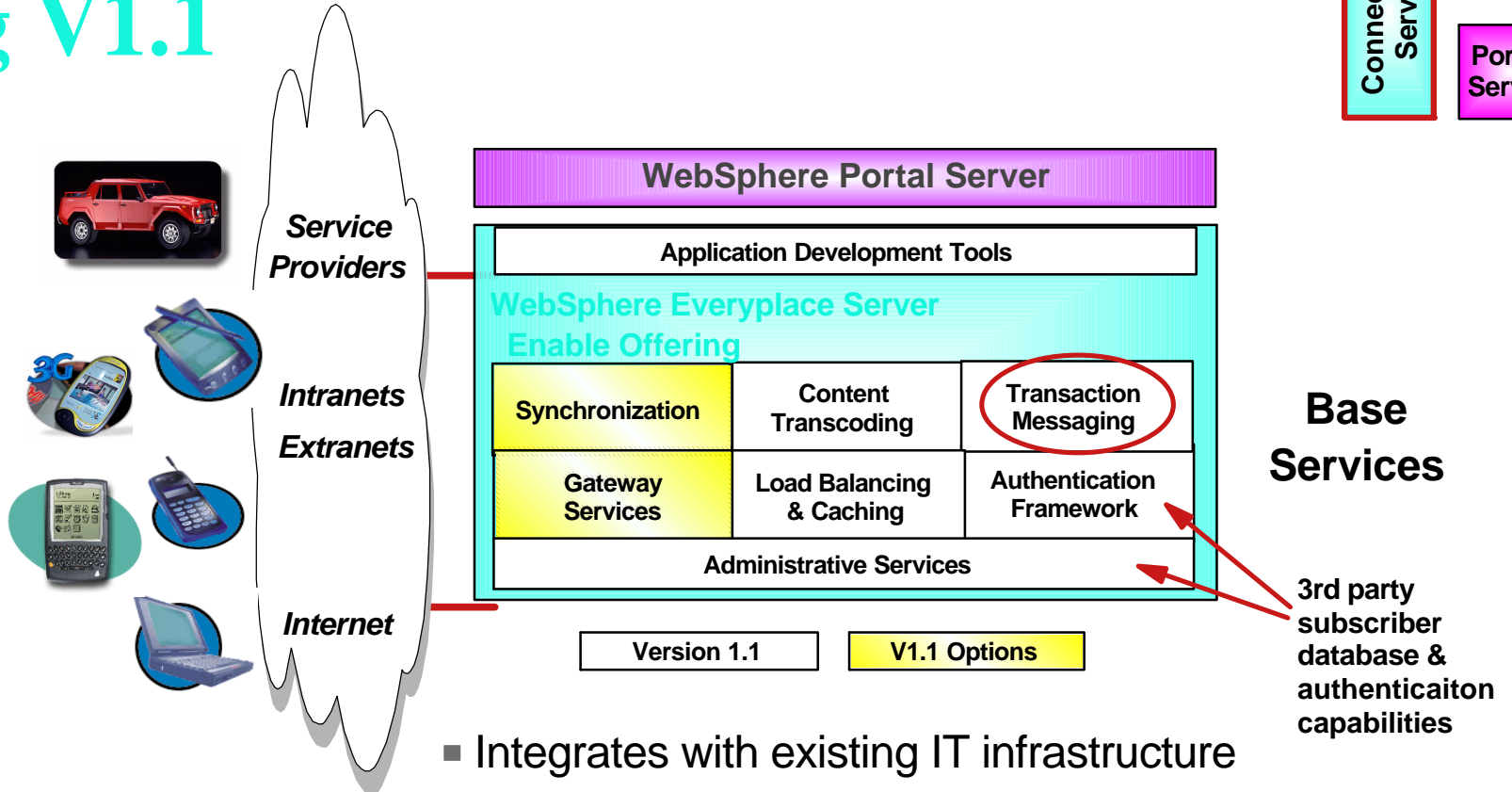
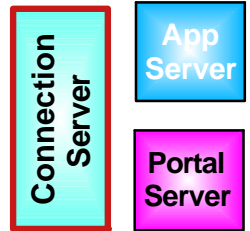
Mobile Extranet

Channel and franchise management
Content:
customers, products, directories

The WebSphere Everyplace Server family



WebSphere Everyplace Server Enable Offering V1.1

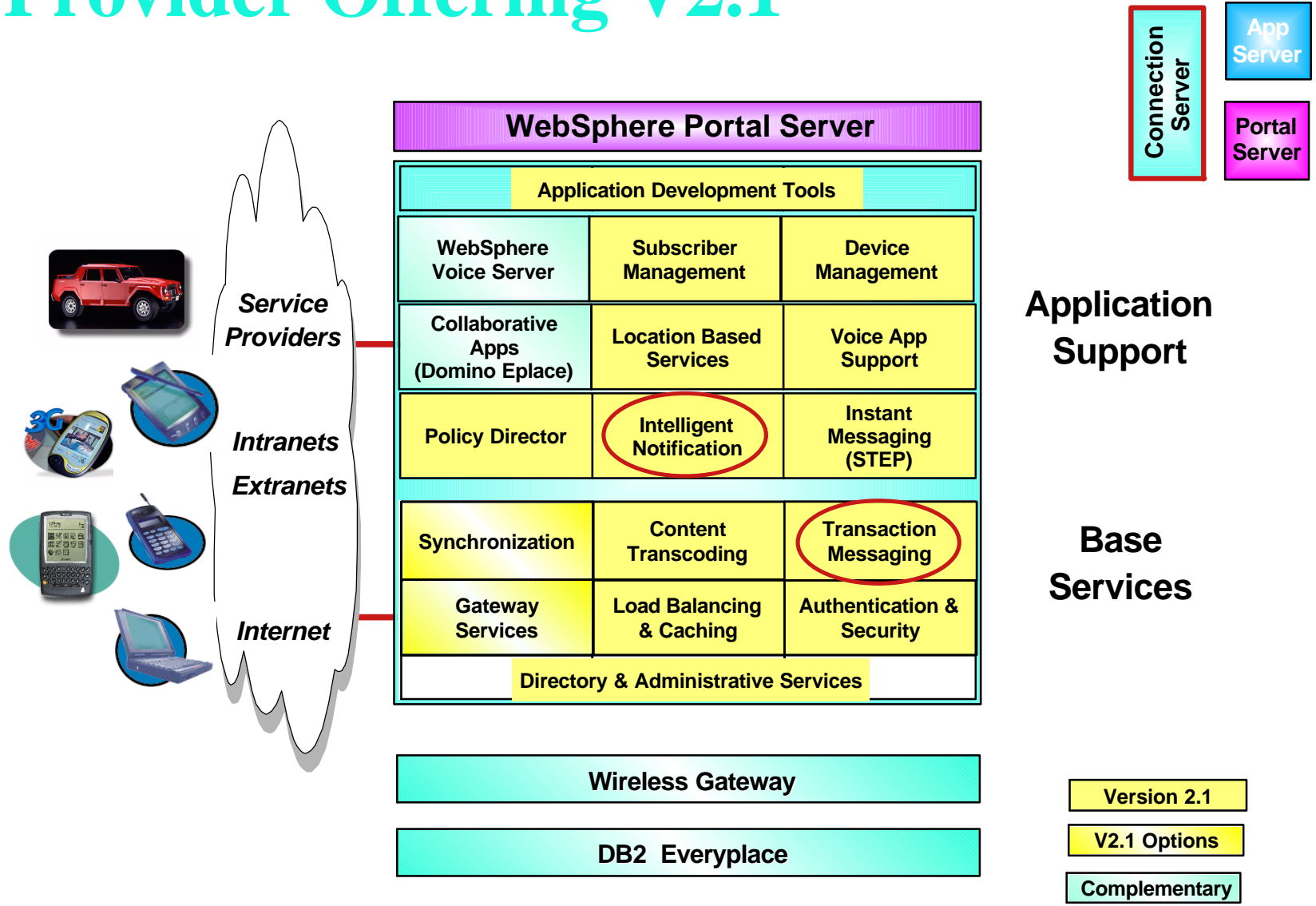


- Integrates with existing IT infrastructure
- Utilizes existing IBM or non-IBM
 - ▶ Application Servers
 - ▶ Subscription/User management services
 - ▶ Authentication Services
 - ▶ Wireless Gateways
- Expands platform options to 2000, AIX & Solaris
- Builds on IBM's MQ, DB2 and Websphere success

Enable Offering - Key features and their benefits

Feature	Function	Benefits
Pluggable User Subscriber Mgmt	Adds support for Netscape Directory Server	Eliminates the need for a separate User Subscriber Mgmt & Directory
Pluggable Authentication Services	Support for Netegrity's Siteminder Authentication Server and Tivoli's SecureWay Policy Directory	Eliminates the need for a separate Authentication service
Content Adaptation	Transcodes content from one format to another	Reduces effort to deliver information to pervasive devices
Secure Messaging	Asynchronous messages with guaranteed secure message delivery	Guarantees message delivery regardless of connectivity
Device Management	Software management for pervasive devices	Simplifies management of enterprise devices
Load Balancing	Load balancing, rules engine, with content-based routing	Optimizes performance
Cache Server	Forward and reverse proxy for improved performance and reduced network load	Improves response time for delivering content
Cookie Proxy for i-mode	Support for i-mode devices	Extends support for i-mode devices in Japan Streamlines transactions
Administration Console and Installer	Unified Administration and Install console	Simplifies the task to install and administer the product
Multi-platform: Intel and RISC processors	Runs on Windows 2000, AIX and Solaris Operating Systems	Offers freedom of choice

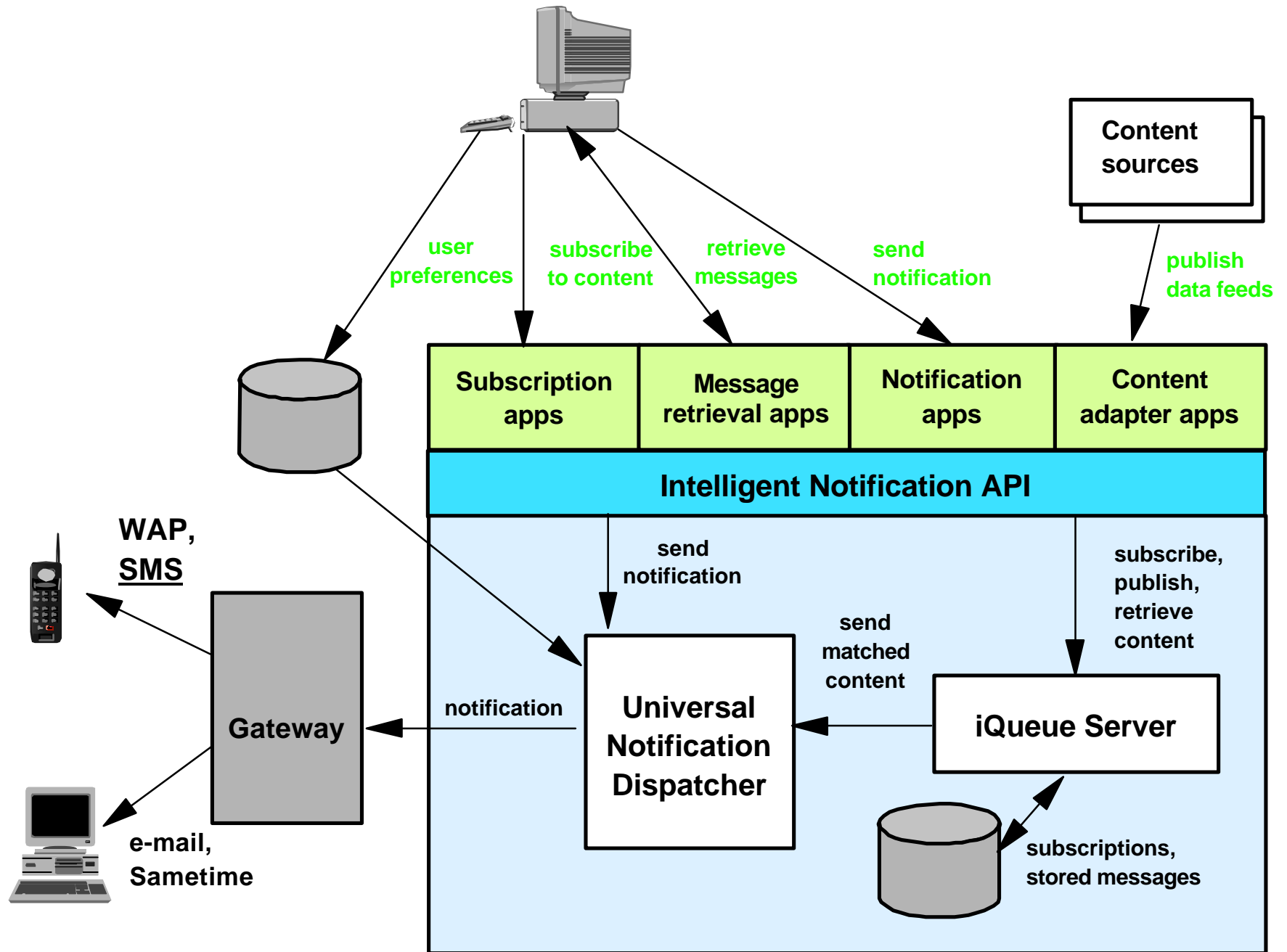
WebSphere Everyplace Server - Service Provider Offering V2.1



Service Provider Offering: Key features / benefits

Feature	Function	Benefits
Intelligent Notification	User configurable real-time event notification	Keeps users up-to-date when events occur and/or content is available.
Location based Services	Privacy-controlled capability to dynamically determine a user's device position	Delivers information to users when and where they need it
Instant Messaging	Technology First Look of integration with Lotus Sametime Everyplace	Opens up additional channels for communication by supporting instant awareness and real-time communications
Security	End to end encryption and authentication and integration with Policy Director for enhanced authorization and access control	Complete infrastructure for deploying security-rich applications
Content Adaptation	Transcodes content from one format to another	Reduces effort to deliver information to pervasive devices
Voice integration	Extends applications with integrated voice technologies	Offers hands-free access to applications
Secure Messaging	Asynchronous messages with guaranteed secure message delivery	Guarantees message delivery regardless of connectivity, once and only once
Load Balancing	Load balancing, rules engine, with content-based routing	Optimizes performance
High availability & Scalability	Optimizes data transmission across networks to make network usage more efficient and improve related usage-based network charges.	Allows for enterprise-wide as well service provider-sized deployments
Collaborative Applications	Integration with Domino application adapters in Domino Everyplace	Access to collaborative application content

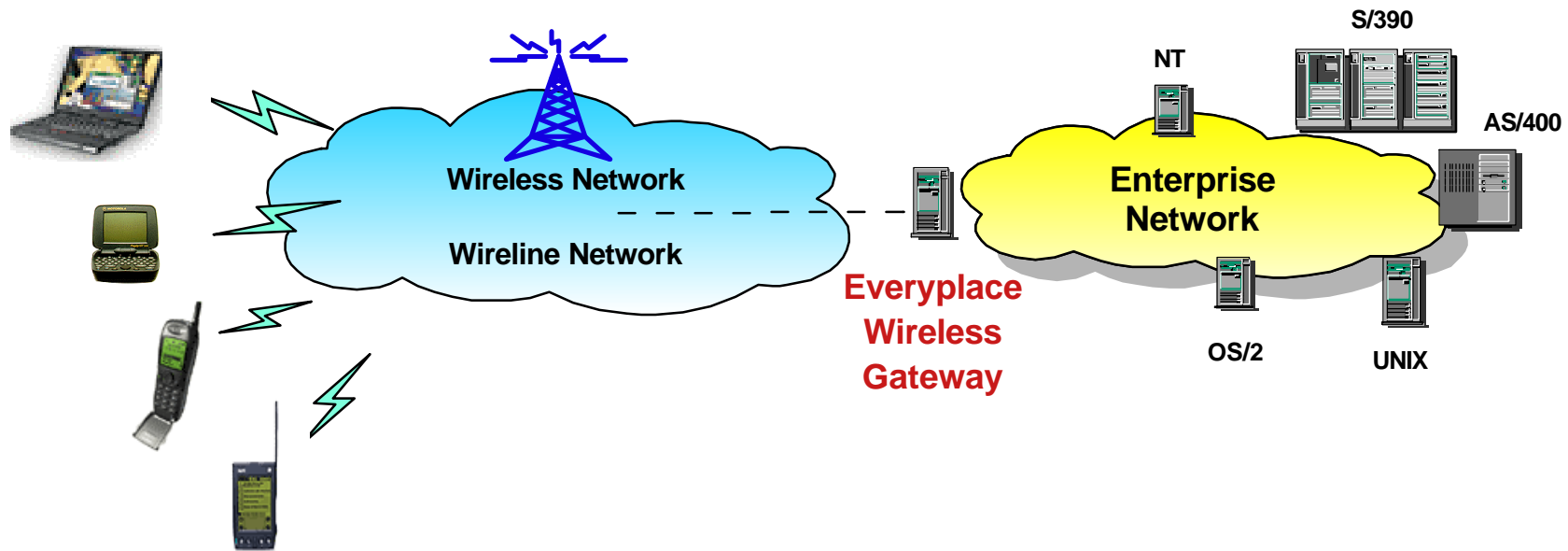
Intelligent Notification Services



DB2 Everyplace Features

- End-to-End solution
 - DB2 Everyplace database
 - DB2 Everyplace Personal Application Builder
 - DB2 Everyplace Sync Server
- Standards Application APIs (ODBC, JDBC)
- Same application runs on multiple devices
 - Palm OS, WinCE, Pocket PC, EPOC, Embedded Linux, Neutrino
- Standards Replication Protocols -- SyncML
- Extensible and Open Architecture with Adapter API
- High Availability: Minimize impact on production database by capturing changes from log (DPropR)
- Complementary with Websphere, Transcoding & Secureway Wireless
- Small (<150KB) footprint for engine and application (DLL)
- No runtime interpreter for PAB
- Smaller space used for tables than Oracle8ilite, no DLLsupport
- No shared library for Sybase SQL Anywhere Application
- Zero administration on device
- High performance and scalable database
- QBE for data browsing and manipulation without writing application

Everyplace Wireless Gateway



Public Packet-Radio Networks:

- CDPD and CS-CDPD
- DataTAC 4000 (US)
- DataTAC 5000 (Europe)
- Modacom (Germany)
- DataTAC 6000 (Asia)
- DataTAC/IP
- GPRS (GSM)
- Mobitex (Worldwide)
- Mobitex/IP (US)
- PDC-P (Japan)

Private Packet Networks:

- Dataradio
- Motorola Private DataTAC

Cellular Networks:

- AMPS and N-AMPS
- CDMA
- GSM
- iDEN
- PCS 1900
- PDC (Japan)
- PHS (Japan)
- TDMA

Satellite Network:

- Norcom

Application Protocols:

- HTTP
- WAP

Internet Connections:

- Cable Modem
- DSL
- ISP

DIAL Connections:

- DIAL/TCP
- ISDN
- PPP
- PSTN (POTS)

LAN Connections:

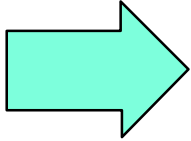
- Ethernet
- Token Ring
- Wireless LAN

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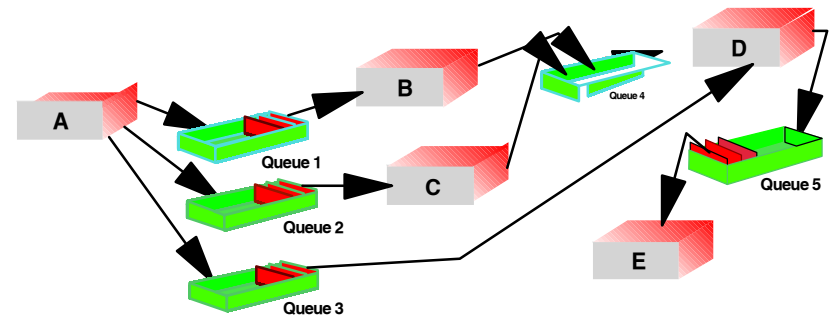
WebSphere MQ Family - Overview

- **Messaging and Queuing**

WebSphere MQ V5.3

WebSphere MQ

Everyplace V2.0 (Network and Retail Editions)

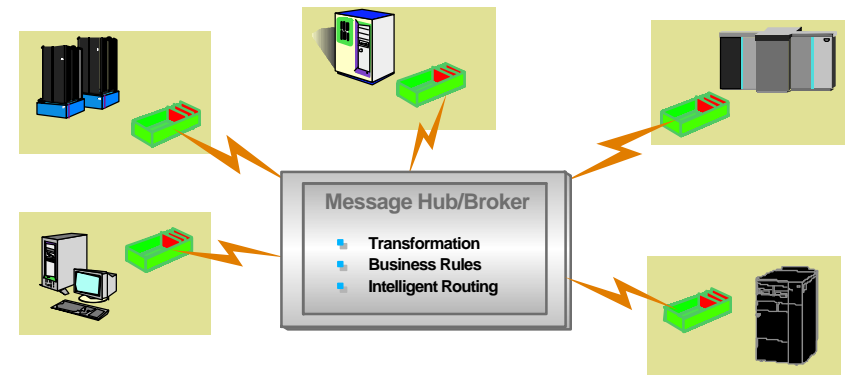


- **Message Broker**

MQ Integrator Broker V2.1

MQ Event Broker V2.1

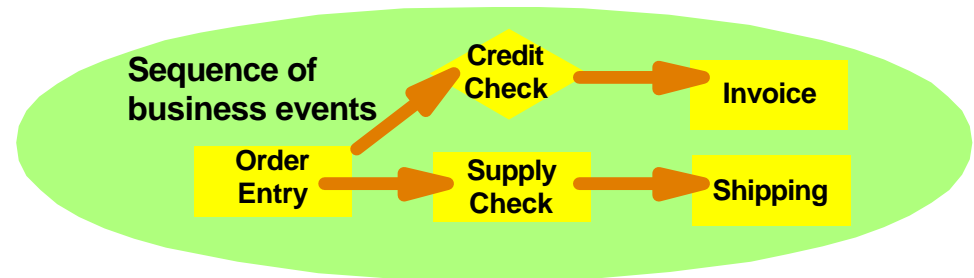
Telemetry Integration (SCADA)



- **Process Manager**

WebSphere MQ

Workflow



Value proposition - Lightweight & Retail

For Small & Medium businesses who want to integrate existing applications, MQ Everyplace is:

- Highly customizable
- Has minimal administration
- Robust transfer of business-critical transactions
- Firewall-friendly

For Retailers who want to be more responsive to their customers, MQ Everyplace:

- Exploits the power of the IBM 4690 store controller
- Provides ability to analyze data in real time
- Robust transfer of business-critical transactions
- Provides the foundation for mobile stock control and other store applications

Features of MQ Everyplace for mobile use

- Once-only assured delivery
- Object messaging
- Built-in security at sub-message, message and queue level
- Authentication, encryption and compression
- Direct and indirect routing
- Message push & message pull
- Pluggable queue adapters
- Pluggable comms. adapters
- 100% Java implementation
- JMS available in Version 2
- C available on some platforms
- Rule-based operations
- Access to local and remote queues
- Synchronous & asynchronous messaging
- Highly customizable
- Client-server and peer-to-peer support
- Automatic channel management
- Designed to pass through firewalls
- Full interoperability with "big" MQSeries and MQ Integrator
- Support for small devices

MQSeries vs MQ Everyplace Comparison

Common features:

- Assured message delivery
- Capability to run applications - even when disconnected
- Message compatibility
- JMS support
- Security features are built in
- Multi-platform/device support
- Legacy systems can be integrated into e-business solutions (via gateway*)
- Can connect to other MQ family members to allow e-business integration

* for MQ Everyplace

MQ Everyplace Advantages for mobile use:

- Designed for unreliable networks
- Data stream length is minimized
- Data can easily pass through firewalls
- Small footprint for lightweight devices
- Pure Java or C Implementation
- Mobile devices can exchange data without a server
- Simple channel set-up
- Synchronous mode available
- Rules-based operation
- Plug-in adapter interface
- Vendor XML screen-builder tool available

WebSphere Everyplace Development Styles

Different applications require different implementation scenarios

Browser with Content Adaptation

XML/XSL, WTP, client server model

Message Queuing

Uses WebSphere MQ on backend, MQE on client

Synchronization

Uses SyncML, async/sync connectivity

Notification/Push

Alerts, push, LBS, SMS

Gateway

WebSphere Everyplace gateway

Authentication

WES authorization server

Backend Integration

Business logic/process integration

Subscriber management

Tivoli Personalized Service Management

Three ways to exchange data

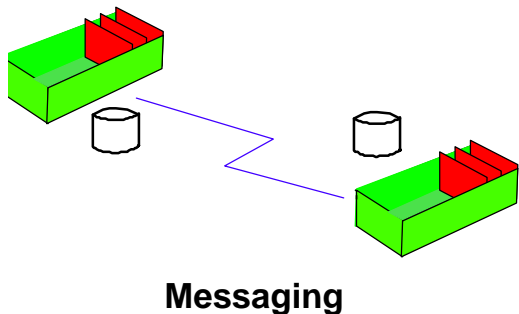
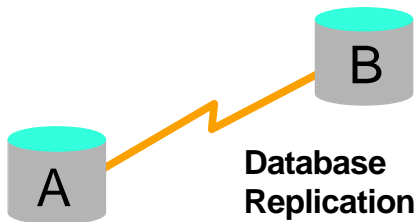
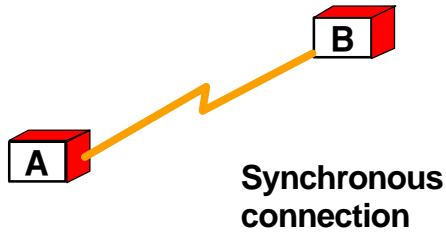
Sending and receipt of data

One of three basic models

1- Share it: web servers, centralized databases
No good for offline working

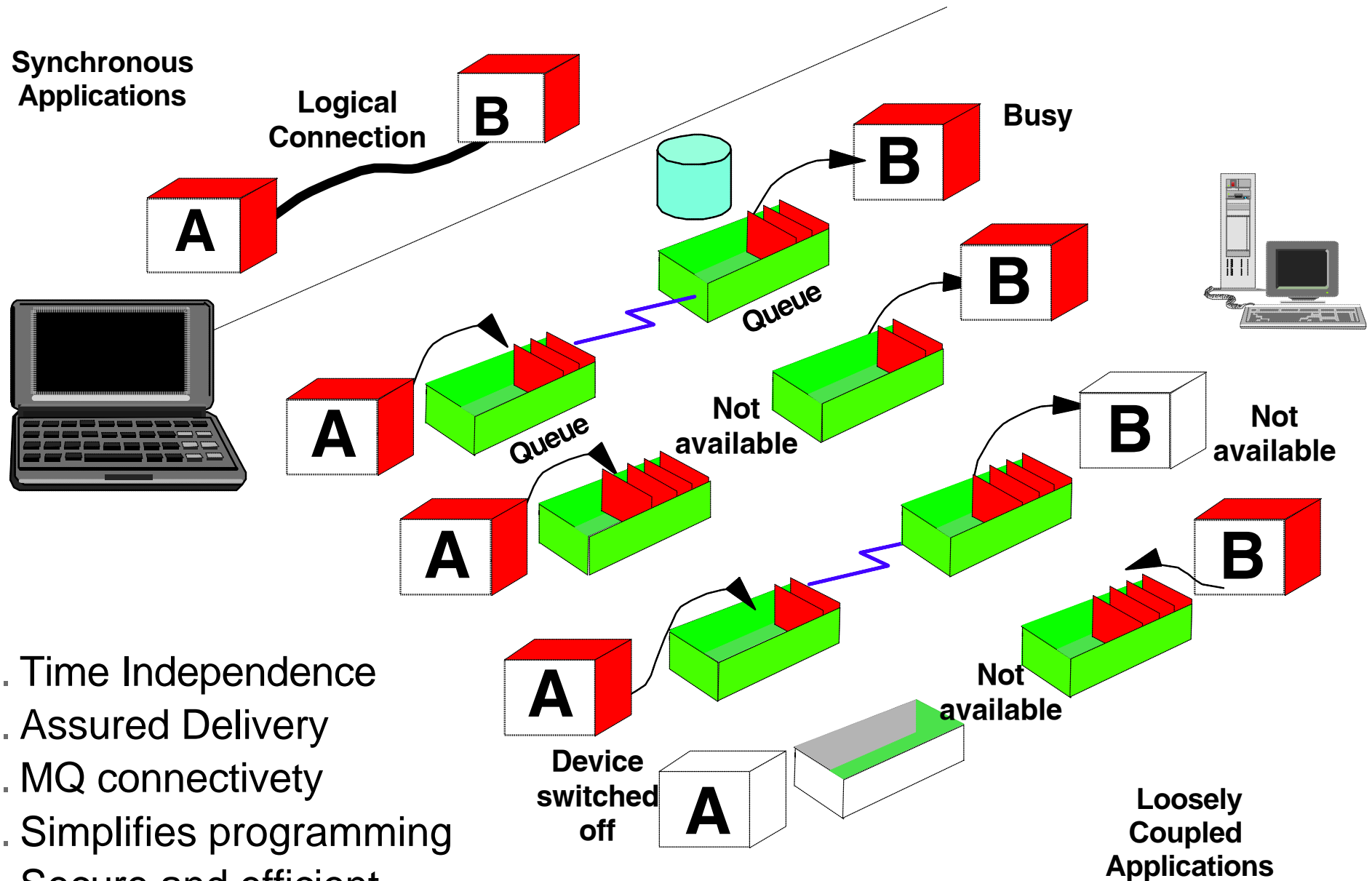
2- Copy it: data replication
Solves distributed & offline issues
Can send data needlessly

3- Send it: messaging
Obvious choice for transactions



Benefits of Queuing

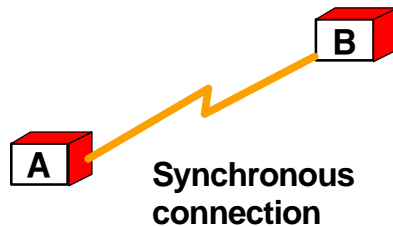
Synchronous Applications



1. Time Independence
2. Assured Delivery
3. MQ connectivity
4. Simplifies programming
5. Secure and efficient

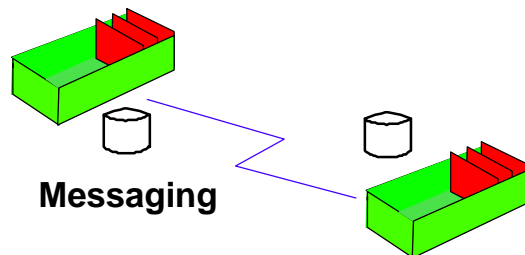
Web Browser Comparison

Web Browsers



- Standard interface
- Multimedia support
- **but...**
- May be slow and inefficient
- Uncertain status of data delivery
- Frustrating to use in poor conditions

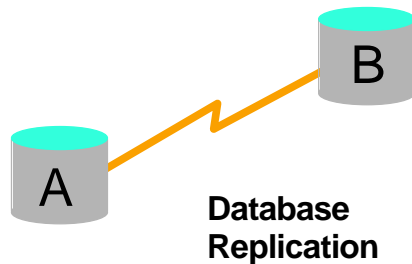
MQ Everyplace



- Assures delivery in any conditions
- Secure and efficient
- Can allow disconnected operation
- Allows message prioritisation
- Supports any data, including XML
- Simple to program (policy support)
- Can connect to "big" MQ on 30+ platforms
- Can connect directly to MQ Integrator Broker
- Can connect via MQ to other programs (e.g. WebSphere Business Integrator)

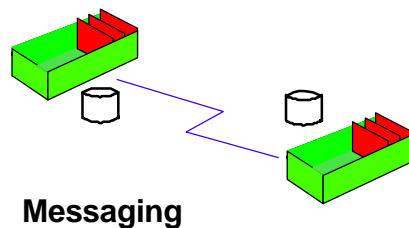
Data Replication Comparison

Mobile Data Replication



- Simple to program (GUI tooling)
- Fits well with host databases
- **but...**
- Not easy over unpredictable links
- May send unnecessary data
- Data in standard (database) format
- Needs additional programming to talk to back-end legacy applications or machine-to-machine comms.
- Cannot be used for dialogs

MQ Everywhere



- Makes good use of unpredictable links
- Sends only data needed by the program
- Can participate in e-business using WebSphere MQ family products
- Automatic transmission can provide up-to-the-minute data
- Suitable for business transactions
- Suitable for machine-to-machine comms.

Comparison of mobile Connectivity

	Web Browsers	Data Replication	MQ Everyplace
Suitable for conversational use	✓		✓
Suitable for disconnected use		✓	✓
High security available	✓	✓	✓
Can send data efficiently		?	✓
Gives assured once-only delivery			✓
Works in poor reception conditions		?	✓
Directly connects to legacy data and apps.		✓	✓
Can allow parallel operation	?		✓
Has visual builder interface	✓	✓	*
Suitable for unattended use		?	✓
Allows high priority data to be sent first			✓

* Vendor product available

Key indications to use MQ Everyplace



- ✓ Assured delivery
- ✓ Delivered only once
- ✓ Uses optimized data stream



- ✓ Delivers as soon as possible, but asynchronously



- ✓ Publish/Subscribe
- ✓ High security



Possible users of MQ Everywhere



Insurance agent connects to office for latest prices and to enter orders, **but can also enter data if no line is available.**

Gets workforce away from desks and in front of customer



Mobile workers report progress and receive new jobs. Could also request more information or assistance.

Enables scalability of solution

Scheduling and business optimization opportunities

Mobile device



Executive with PDA receives **high-priority** messages or **subscription** messages

Workflow and personal productivity



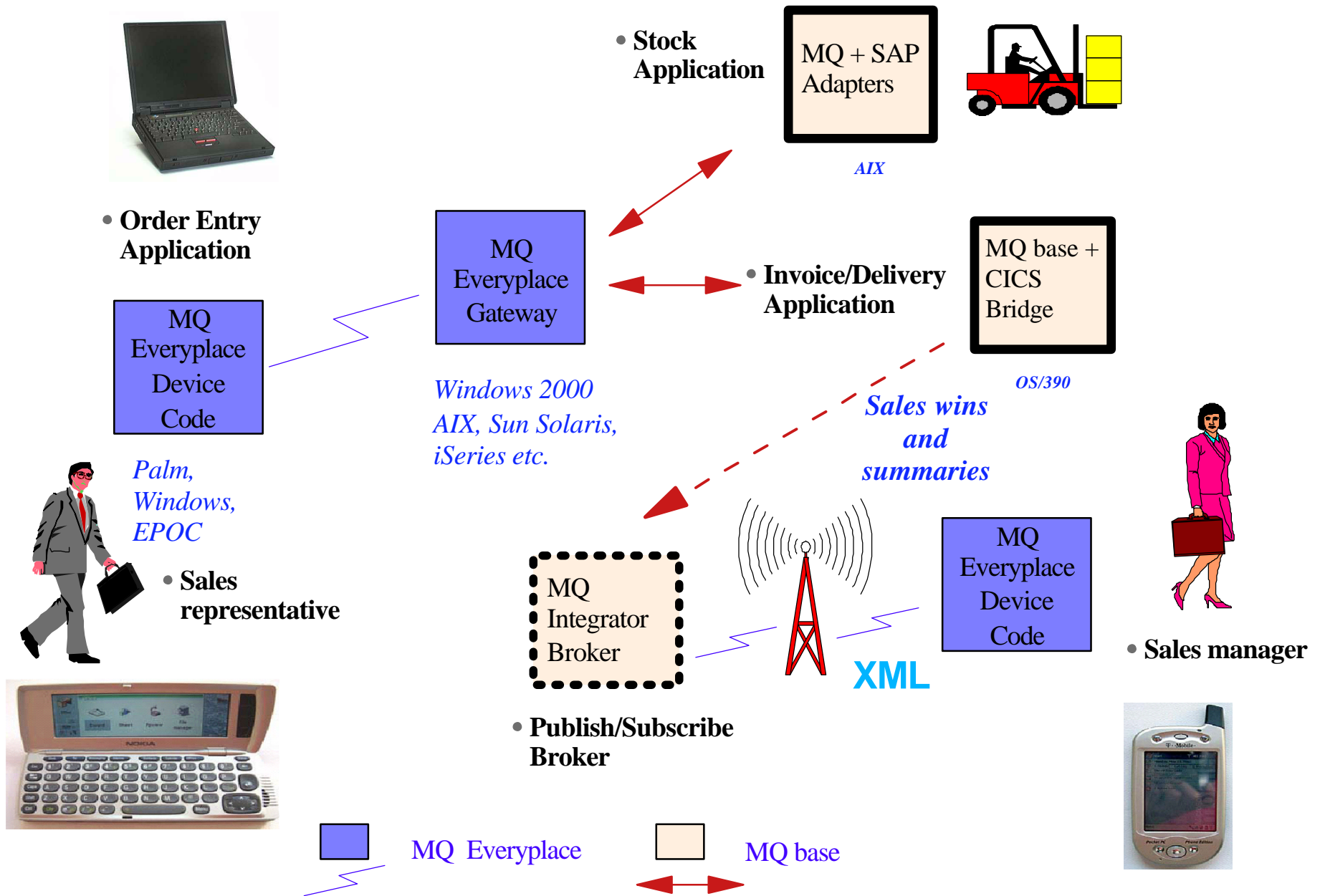
Efficient delivery of information to and from vehicles



Delivery driver gets new pick-ups and records deliveries

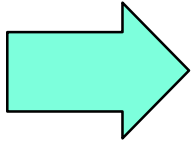
True Pervasive Opportunity

WebSphere MQ Everyplace Scenario



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MQe Environments and Code Size

About 1MB (excluding examples)

Programming Language	Operating System
Java	EPOC32 Pocket PC 2002 J2ME devices Windows 98, Me, NT, 2000, XP Any IBM Java platform Any Sun Certified JVM
C	PalmOS (subset) Pocket PC 2002 Windows (wrapper)

- MQeBase.jar - 230KB
 - ▶ Base classes used in a device
- MQeGateway.jar - 439KB
 - ▶ Gateway to interoperate with MQSeries
- MQeMidp.jar - 224KB
 - ▶ Midp support
- MQeSecurity.jar - 56KB
 - ▶ provides enhanced security
- MQeCore.jar - 84KB
 - ▶ provides the core services
- MQeJMS.jar - 67KB
 - ▶ JMS support (point-to-point)

Which portable device ?

Input/output (human)

- Display size, resolution
- Color ?
- Keyboard or stylus ?
- Speech in/out ?

Connectivity

- Replicate only
- Wired (plug-in)
- Bluetooth, Home LAN
- Wireless Office LAN
- Wireless WAN, GSM

Other human factors

- Fit in pocket, purse, briefcase ? Weight.
- Fashionable ?
- RF safety
- Battery life

Device design

- Operating system
- RAM available
- DASD, Plug-ins ?
- Processor, power
- Programming

Examples - IBM Thinkpad

Advantages

- Display size, resolution
- Color, movies, plugins
- Keyboard + pointer
- Windows or Linux
- Bluetooth, 802.11



Disadvantages

- Weight, size
- Short battery life
- No phone

iPAQ, Sony

Advantages

- Bluetooth
- Small size
- Pocket PC/Palm
- Color display, camera
- Removable media



Disadvantages

- No keyboard
- Limited display, performance
- No phone*

* Sleeve on Compaq

Examples - T-mobile

Advantages

- Phone
- Small size
- Color
- Pocket PC
- Dual Band
- GSM + GPRS



Disadvantages

- Limited display, no keyboard
- PIM market.

Psion Teklogix Netpad

Advantages

- Color display
- Rugged design
- Good battery life
- Symbian OS



Disadvantages

- No keyboard
- Limited storage
- Separate comms

Examples - Nokia 9290

Advantages

- Phone
- Symbian OS
- Keyboard
- Good display



Disadvantages

- Large for phone
- Needs flat surface
- No GPRS
- Single band

HandSpring Treo

Advantages

- Phone
- Small size
- Color
- Palm
- Dual Band
- GSM + GPRS-ready



Disadvantages

- Limited display, small keyboard

Supported devices

Thinkpad (etc.)
Java Windows 98/NT/2000/XP
Asynchronous/synchronous



Palm
Sony
J2ME



Psion
Nokia 9290 - Java - Symbian
Asynchronous/synchronous

HP Jornada
iPAQ - Pocket PC
C or Java
Asynchronous/synchronous

Supported platforms in Java (MQe V2.0)

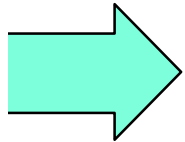
	Direct Install?	Direct support?	Price Group	Bridge** available?
AIX 4.3, 5.1	Yes	Yes	A	Yes
Sun 7 or 8	Yes	Yes	A	Yes
Windows	Yes	Yes	A	Yes
Linux(Intel)	Yes (ZIP)	Yes	A	Yes
Linux(390)	Yes	Yes	A	Yes
HP-UX 11	Yes (ZIP)	Yes	A	Yes
OS/2	No	No	A	Yes
iSeries	No	Yes	A	Yes
4690 OS	No	Yes	C	No

EPOC32	No	Yes	B	No
J2ME	No	Yes	B	No
QNX	No	No	B	No
Pocket PC	No	Yes **	B	No
PalmOS V3	No	Yes *	B	No

* Some restrictions ** C also available

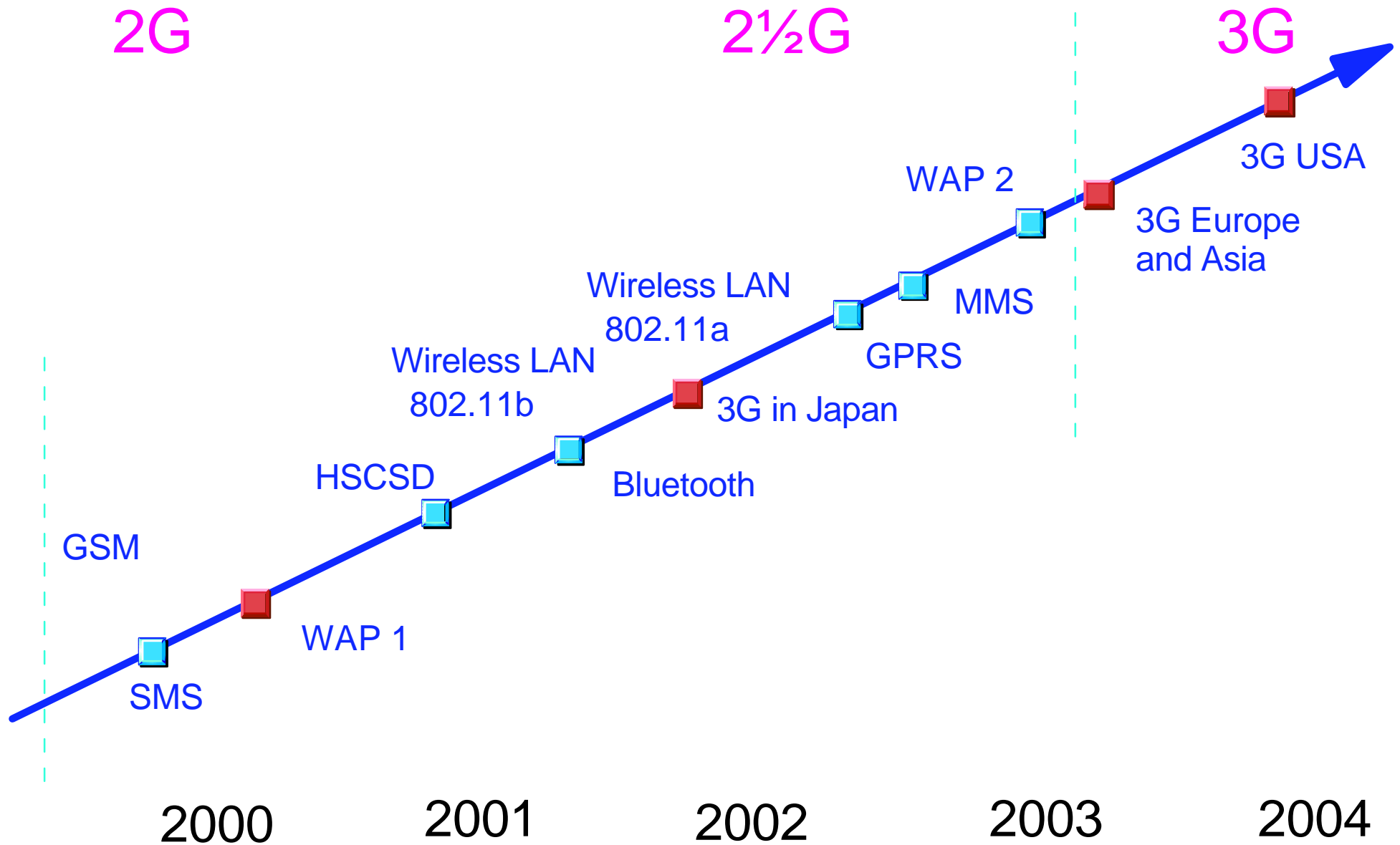
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Wireless and Cell Phone Evolution




Glossary

- CCIR - Comité Consultatif International de la Radio
- CCITT - Comité Consultatif International du Téléphone et Télégraphe
- CDPD - Cellular Digital Packet Data
- FCC - Federal Communications Commission (US)
- GPRS - General Packet Radio Service
- GPS - Global Positioning System.
- GSM - Global System (Mobile)
- HSCSD - High Speed Circuit Switched Data
- HTML - Hypertext markup language
- IMT-2000 - International Mobile Telecommunications-2000
- IP and VoIP - Internet Protocol and Voice over Internet Protocol
- IRIDIUM® / GlobalStar satellite network
- MeXe - Mobile Execution Environment
- PCMCIA - Personal Computer Memory Card International Association
- PSTN - Public Switched Telephone Network
- QoS - Quality of Service
- SIM Toolkit - Subscriber Identity Module Application Toolkit
- SMS - Short Message Service
- TDMA - Time Division Multiple Access
- TIPHON - Telecommunications and Internet Protocol Harmonisation over Networks
- UMTS (3GSM) - Universal Mobile Telecommunications System
- WAP - Wireless Application Protocol
- WLAN - Wireless Local Area Network

Wireless Choices

Personal Connectivity

- Data, Voice, Entertainment
- Low Power cable replacement
- Very local (10 ft.)
- irDA
- Bluetooth 

802.11a

- up to 54 Mbps (secure)
- Roaming
- Local (1000ft.)
- Little Interference
- 802.11a (5GHz)

802.11b, HomeRF

- Data (11/22Mbps) also Voice on Home RF
- Local (1000ft.)
- Simple, secure, reliable, affordable
- 802.11 (2.4GHz)

Wide area network

- Public and private
- Data, Voice?
- Phones, PDAs
- "Worldwide" Roaming
- GSM, GPRS, Others

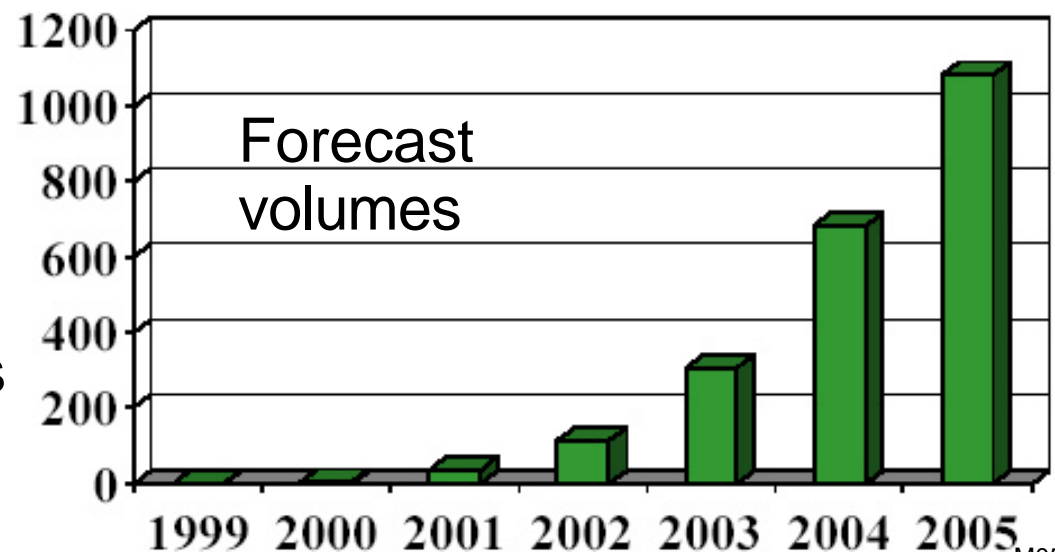
Bluetooth

Personal Connectivity

- Data, Voice, Entertainment
- Very local (10 ft.)
- Up to 8 participants
- ~~Plug and Play~~
- Depends on universal availability
- Always on (subject to battery)
- Replace Cables
- Low Power
- One-time cost



Millions
of units



Wireless Networks

Office/Home Network

- Data only (secure)
- Roaming possible
- Short Distance (1000ft.)
- Little Interference
- Always on
- Links to other LANs
- One-time cost
- 11/22 Mbps and 54Mbps
- WiFi Certification
- 802.11b (2.4GHz) and 802.11a (5GHz)



Wide Area Networks

Tunnelled networks

- Use existing Internet infrastructure to provide local access to company intranet via ISPs
- Either local wire phones or GSM
- Wireless is speed limited

Cellular networks

- GSM and HSCSD is dial in (2G)
- GPRS, UMTS always on (2½G, 3G)
- Charged by time or data volume



Other networks

- Private radio terrestrial networks
- Satellite

High Speed Circuit-Switched Data (HSCSD) - 2G

- Simple upgrade of all current GSM networks
- Non-voice services 3+ times faster
- 28.8 kbps currently being upgraded 43.2 kbps
- Uses multiple channels, allowing subscribers to enjoy faster e-mail, calendar and file transfer services.
- Currently available to 90 million subscribers across 25 countries
- International Roaming agreements in place
- Either voice terminals or via PCMCIA card, with a built in GSM phone

General Packet Radio Service (GPRS) -

2 1/2G

Key User Features of GPRS

- Always on
- 171 Kbits/s
- Internet accessible
- New Applications possible

Key Network Features of GPRS

- Packet Switching
- Spectrum Efficiency
- Internet Aware
- Supports TDMA and GSM

Applications of GPRS

- Chat
- Web Browsing
- Text and Visual Information
- Still or Moving Images
- Collaborative Working

Limitations of GPRS

- Limited Cell Capacity shared across users
- Speeds lower than theory predicts
- Transit delays
- No Store and forward
- Software download / reboot

- Audio
- Job Dispatch
- Home or Corporate eMail
- Vehicle Positioning
- Remote LAN access
- Home Automation

Universal Mobile Telecommunications System (UMTS) (3G)



1999 3G radio interface standardization
1.8 - 2.2 GHz.

2000 Formal approval of the IMT-2000 Recommendations
3G licenses are awarded by governments around Europe and Asia

2001 3G trials and integration commence
3G launched in Japan by NTT DoCoMo
First trial 3G services become available in Europe

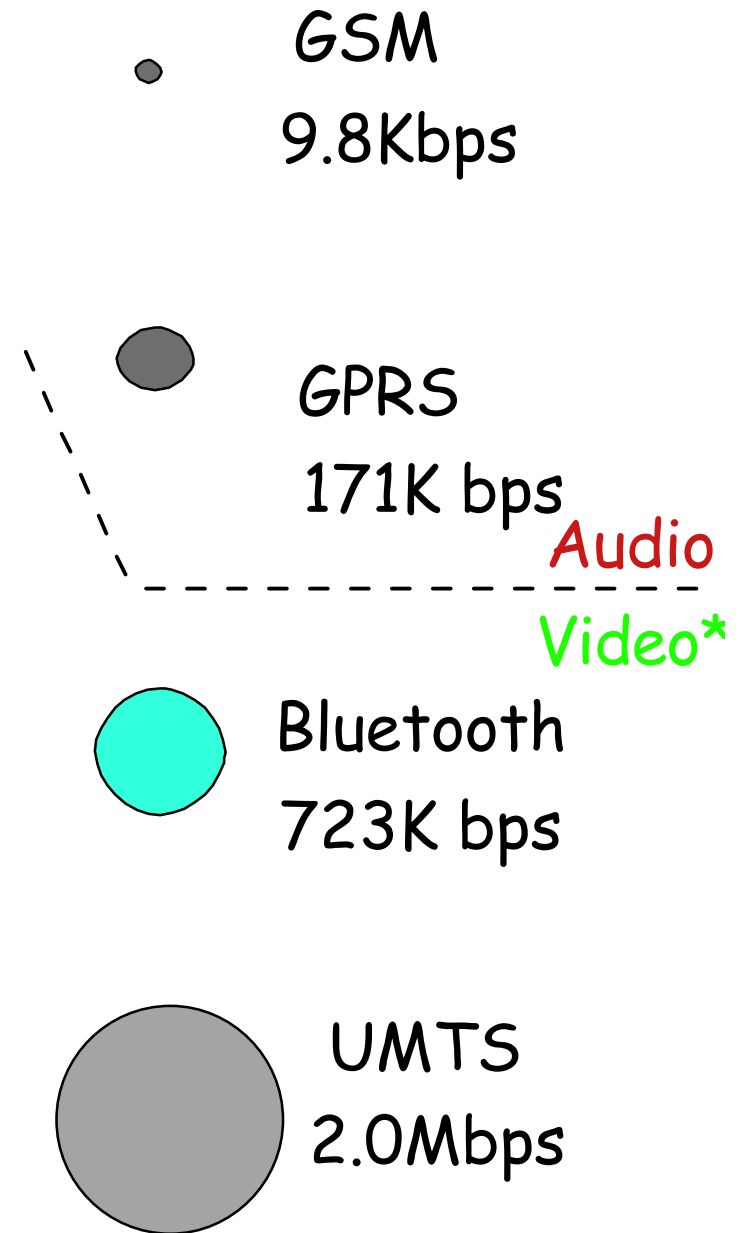
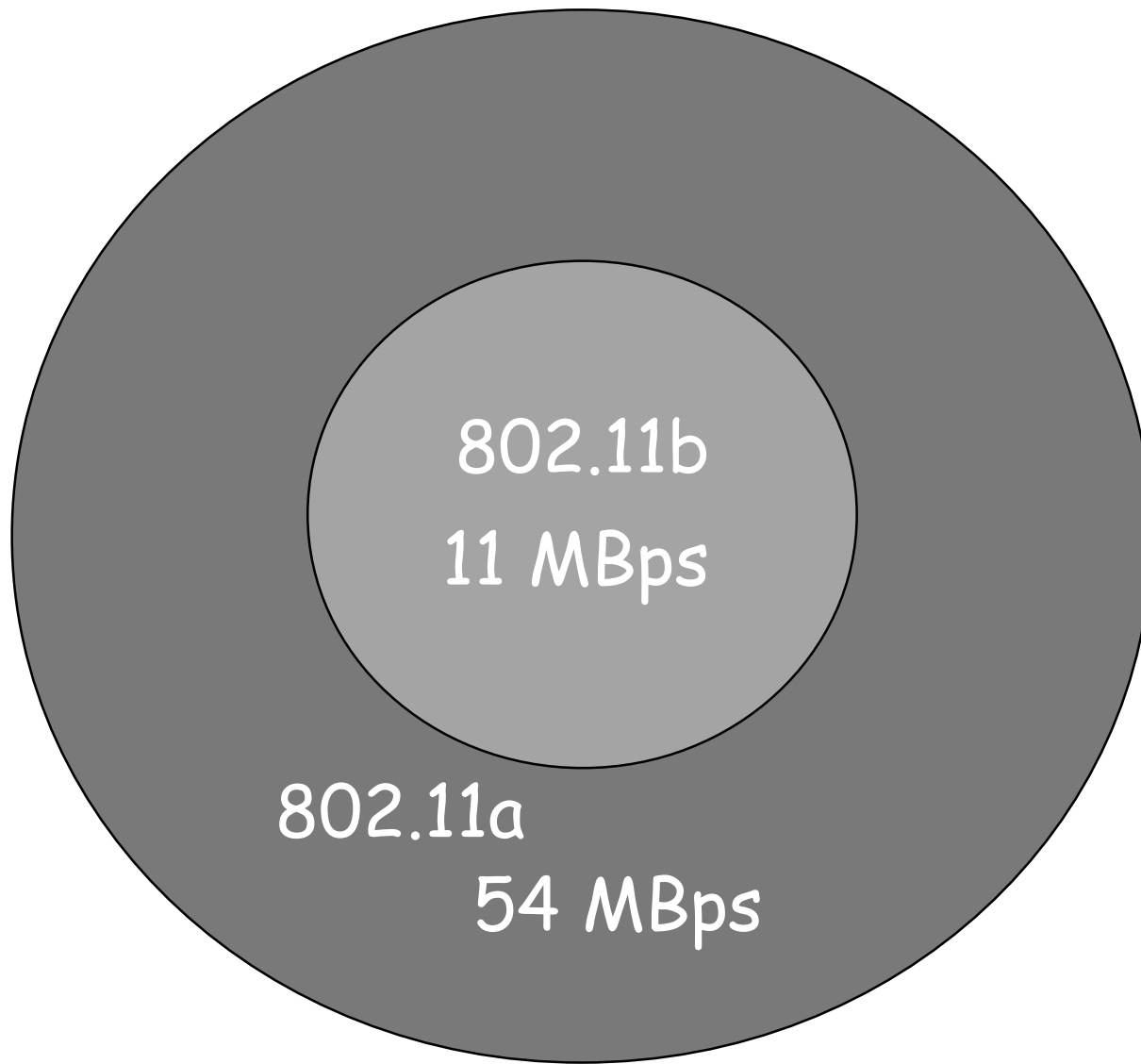
2002 First trial UTMIS call in Dallas, Tx
Network operators delay service launch in Europe

2004 Official launch in USA

2005 3G "arrives commercially"

- 2.0 Mbits/sec
- Fast Internet
- Portal service
- Video phone
- Movies/Games
- Shopping
- Downloads

Wireless channel capacity

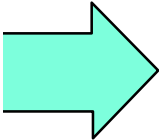


Wireless Data - The "Pipe" Analogy

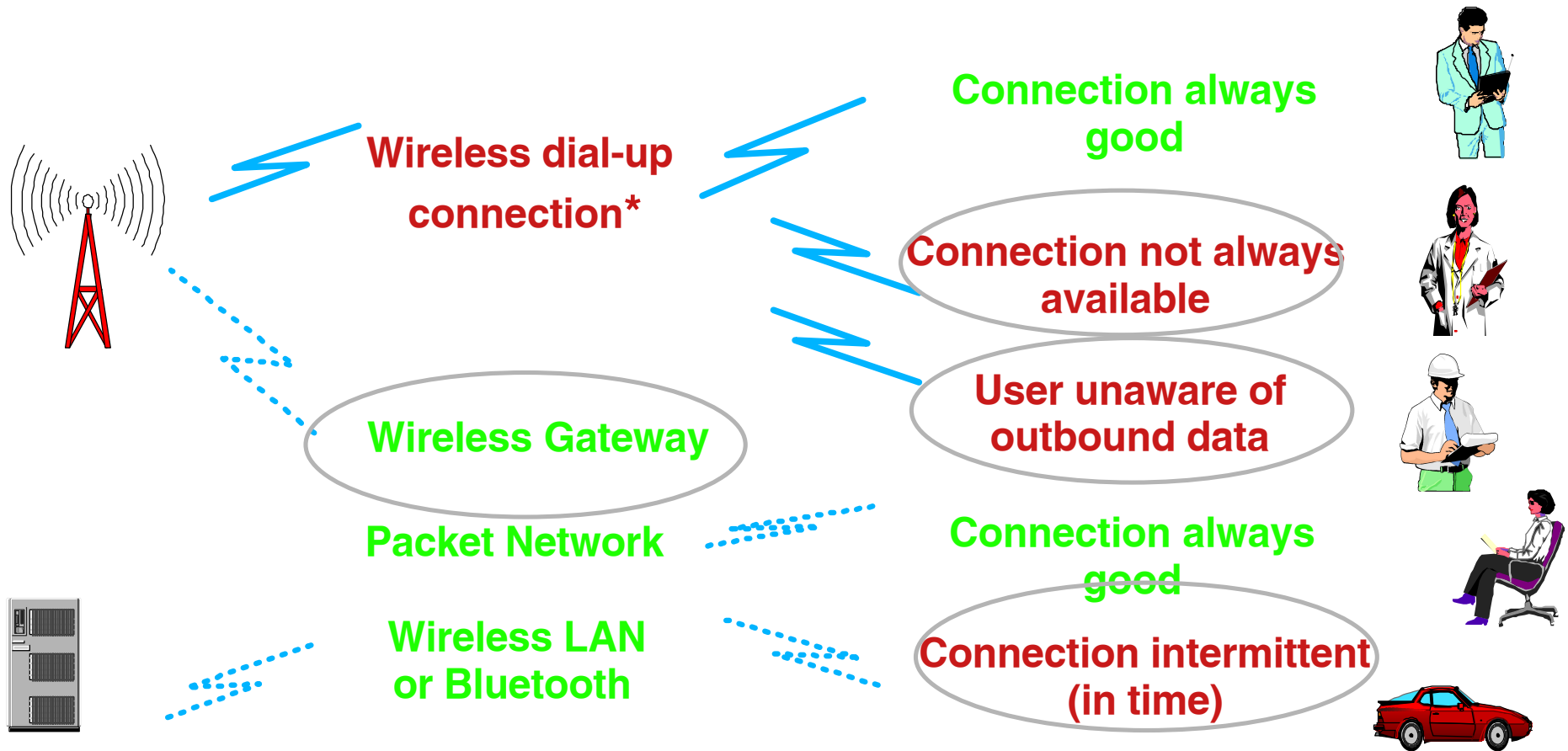
© IBM Corporation 2003

* DVD Video = 2-5Mbps
Transaction & Messaging Technical Conference

Agenda

- Positioning of MQ Everyplace as a product
 - Position in WebSphere family
 - Role in WebSphere Everyplace
 - Benefits for wireless users and user examples
 - Hardware constraints
- Wireless technology
 - Wireless LANs and Bluetooth
 - Cellular phone rollout
-  Using MQ Everyplace for Wireless
 - Network choices and WebSphere Wireless Gateway
 - Using MQ Everyplace with WebSphere Wireless Gateway
 - Intermittent connection and Push technology
 - Link performance and Cost
 - Security considerations

Connectivity



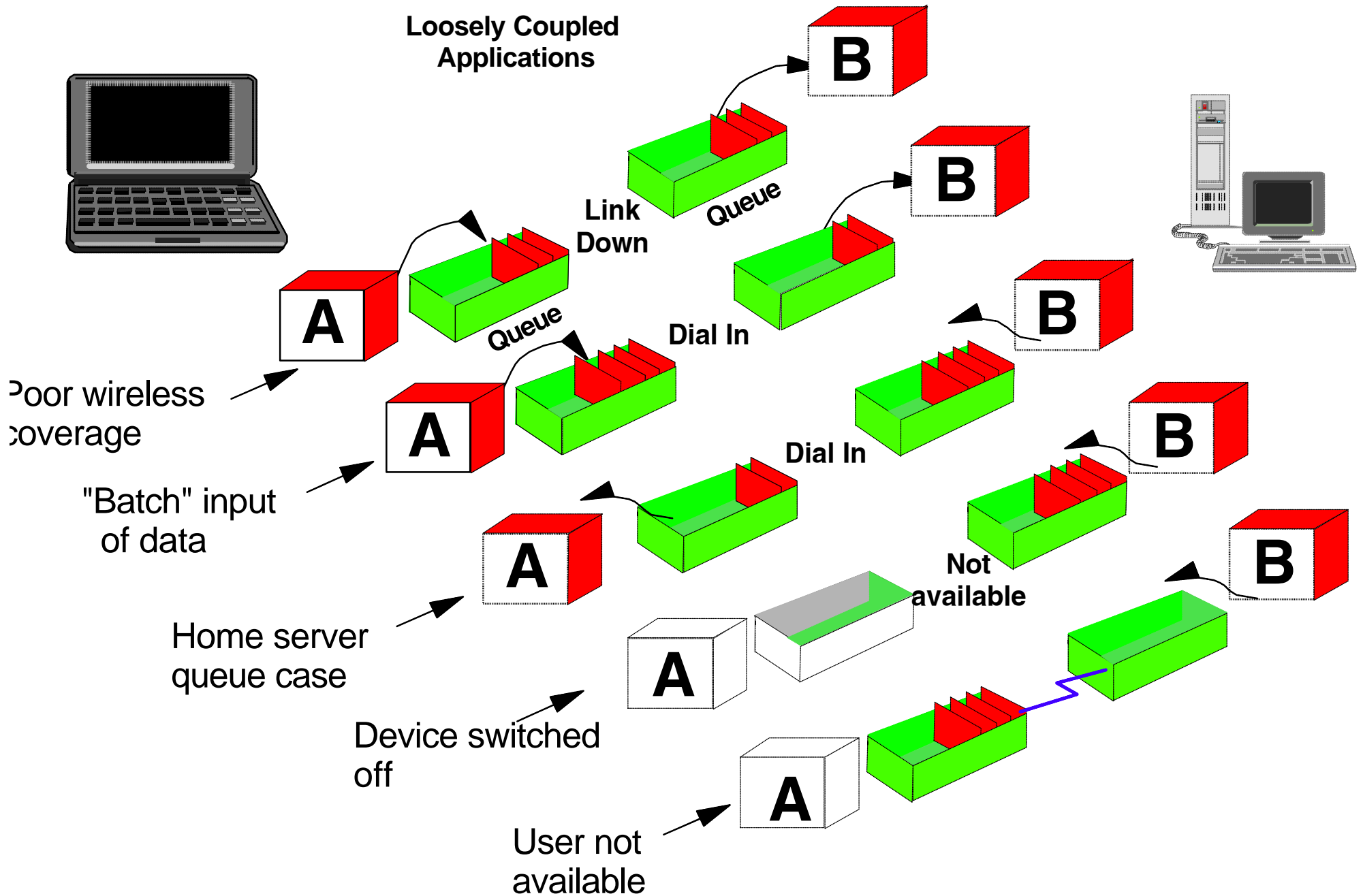
*** Dial up required - push not available directly**

Choice of transports

Transport	Advantages	Disadvantages
Wired LAN	Low cost, very fast	Fixed (300 ft)
Wired ADSL line	Low cost, fast	Fixed (3 miles)
Wired PSTN line	Low cost, available	Fixed (during use)
Bluetooth	Wireless, cheap	Very limited (10ft.)
Wireless LAN	Wireless, cheap	Limited range (100ft.)
GPS phone	Widely available	Slow, circuit switched
HSCSD	Faster than GPS	Circuit switched
GPRS	Packet-based, fast	Quite expensive
UMTS	Very fast	Not yet available
Satellite phone	Universally available	Expensive, slow
Private network	Secure, available	Very Expensive

-- Wired --
Local
- Cellular -
Other

Intermittent connection - Benefits of Queuing



Everyplace Wireless Gateway

Platforms:

- AIX or Sun Solaris server
- Palm, Windows CE (or larger) client
- Any client supporting PPP

Networks

- **Cellular Networks:**
AMPS and N-AMPS, CDMA, TDMA, **GSM**, iDEN, PCS 1900, PCD (Japan), PHS (Japan), **WAP**, **SMS**
- **Public Packet-Radio Networks:**
CDPD and CS-CDPD, DataTAC 4000/5000, Modacom (Germany), DataTAC 6000 (Asia), DataTAC/IP, **GPRS (GSM)**, **Mobitex** (Worldwide)
- **Internet Connections:**
Cable Modem, DSL, ISP, DIAL/TCP, ISDN etc.
- **Private Packet Networks:**
Dataradio, Motorola Private, DataTAC
- **Satellite Networks:** Norcom
- **Wireless Lans:** WiFi - 802.11b (and a)

Features:

- Multiprotocol support for wireless and dial networks via one Gateway
- Cost-effective data transfer derived from TCP/IP header reduction, data compression, and packet filtering
- Security via encryption and two-party authentication
- New client architecture enabling users to configure modems and connections through standard operating system features
- SecureWay Wireless Gatekeeper, a user-friendly graphical administrator
- "Push" API available for SMS

IBM Wireless Gateway V2.1 supports:

Cellular networks —Advanced Mobile Phone Service (AMPS) and N-AMPS; Code-division Multiple Access (CDMA); Time Division Multiple Access (TDMA); Global System for Mobile Communication (GSM); Integrated Digital Enhanced Network (iDEN); Personal Communications Services (PCS) 1900; PCD and PHS (Japan)

Public packet-radio networks —Cellular Digital Packet Data (CDPD) and CS-CDPD; DataTAC/IP, DataTAC 4000 (U.S.), DataTAC 5000 (Europe) and DataTAC 6000 (Asia); Modacom (Germany); General Packet Radio Services (GPRS); Mobitex (worldwide) and Mobitex/IP (U.S.); PDC-P (Japan)

Private packet networks —Data radio; Motorola Private DataTAC

Internet connections —Cable modem; Digital subscriber line (DSL); Internet service provider (ISP)

Dial connections —DIAL/TCP; Integrated services digital network (ISDN); Point-to-Point Protocol (PPP); Public-switched telephone network (PSTN); Plain old telephone service (POTS)

Satellite networks —Norcom

LAN connections —Ethernet ; Token ring; Wireless LAN

Software requirements for IBM AIX and Sun Solaris operating environments

- IBM AIX®, Version 4.3.3 or IBM AIX, Version 5.1 plus AIXLink 1.1.3.0 or higher to use an X.25 adapter

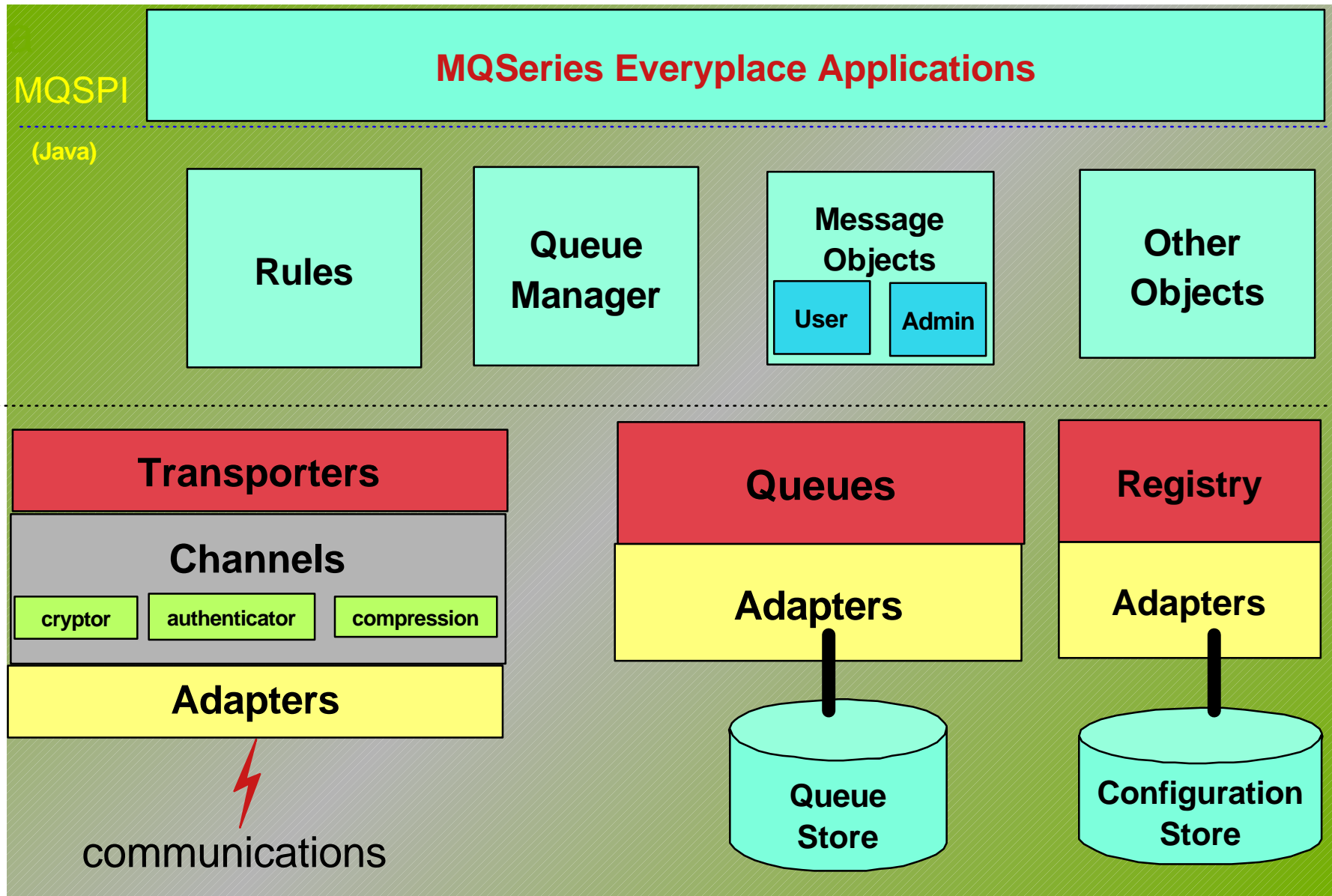
- Sun Solaris operating environment, Version 7 or higher

- Open database connectivity (ODBC)-compliant relational database

- IBM DB2® Universal Database®, Version 7.1 or Oracle, Version 8.1.5 or Oracle, Version 8.1.6

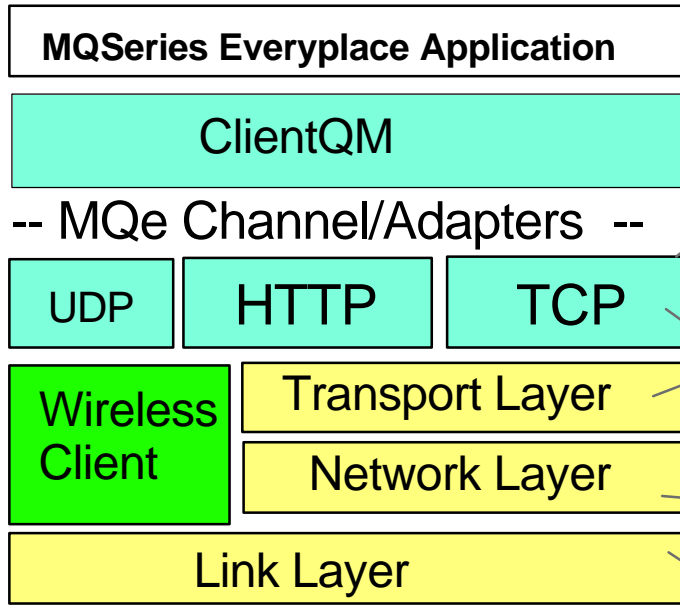
Client: Support for Win95/98/NT/2000 and WinCE 2.0 / 3.0, Palm, Neutrino, EPOC-32

High level Components of MQ Everyplace



Working with Everyplace Wireless Gateway - 1

Device



MQeTcpipAdapter.Timeout,
MQeTcpipAdapter.Packet.Size,
MQeTcpipAdapter.Retry

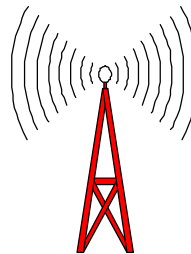
Data Encryption,
compression,
authentication

TCP retransmission
suppression

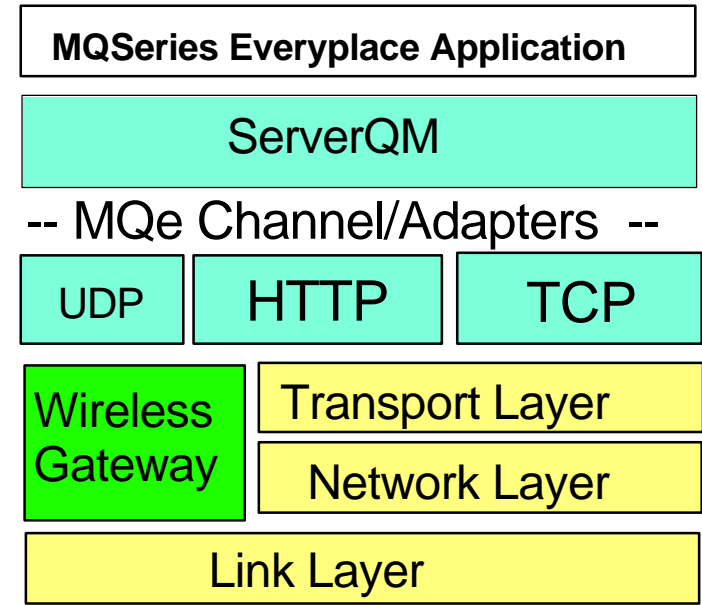
MTU size

IP header
reduction

DataTAC
Mobitex,
etc.



Server

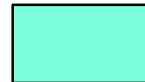


KEY

Wireless Gateway



WebSphere MQ
Everyplace

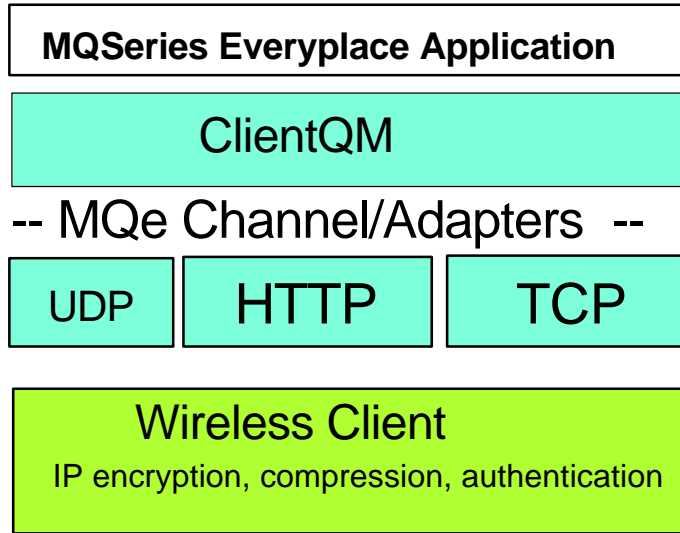


Operating System
and drivers



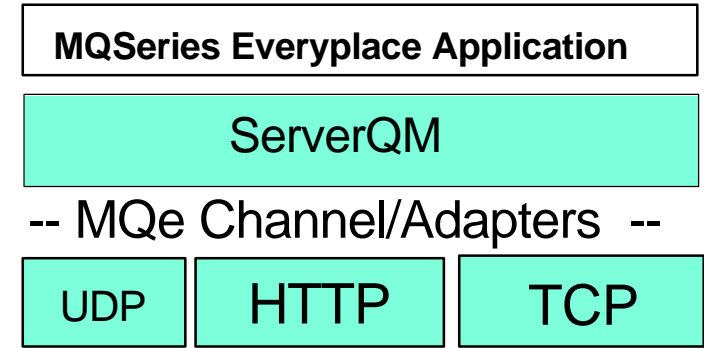
Working with Everyplace Wireless Gateway - 2

Device



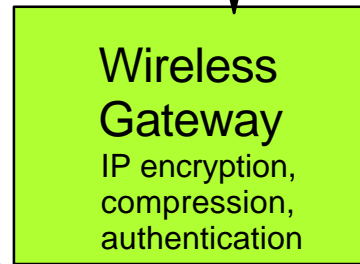
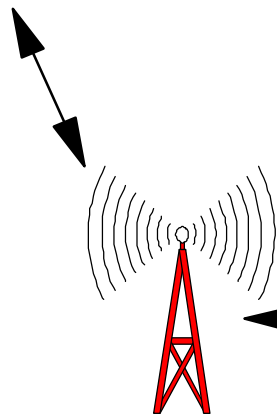
Client on virtual IP subnet

Server



Server on normal IP address

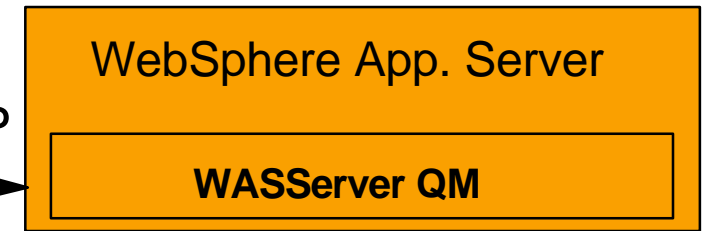
TCP/IP or HTTP



Gateway on normal IP address

TCP/IP

TCP/IP

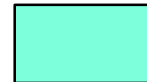


KEY

Wireless Gateway



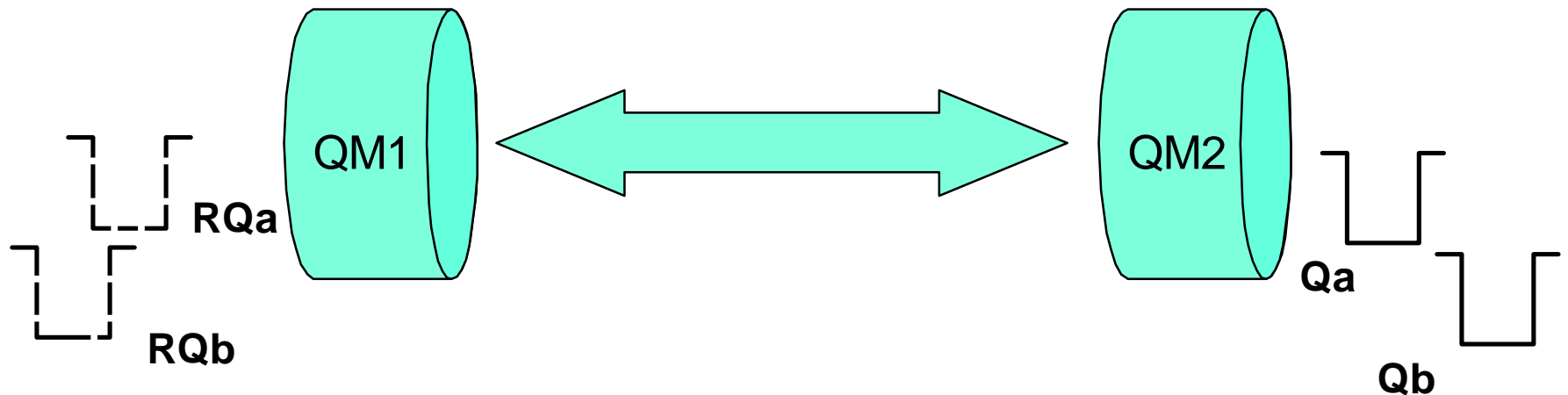
MQSeries Everyplace



Operating System

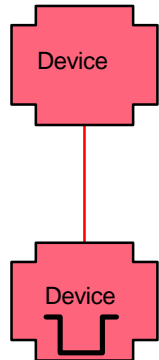


Intermittent Connection - Asynchronous messaging

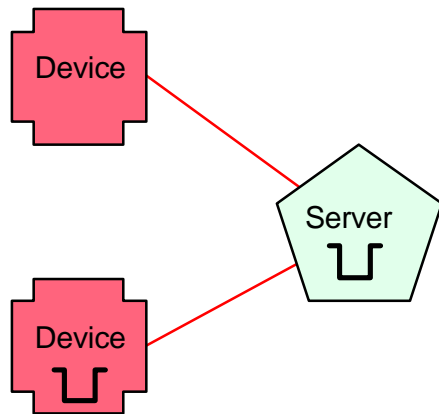


- Asynchronous messaging allows applications to continue working even when the device on which they are running is off-line.
- No special APIs required.
- Assured message delivery handled internally.
- **Transmission rules** allow flexibility in how/when messages are transmitted (use to reduce **costs**)
- Client devices can collect their messages from a 'HomeServer'

Push Technology - Queue Manager Roles



(a) Peer - peer devices



(b) Device cluster



Device (client)

- ▶ Optional local resources
- ▶ **Can initiate communications**

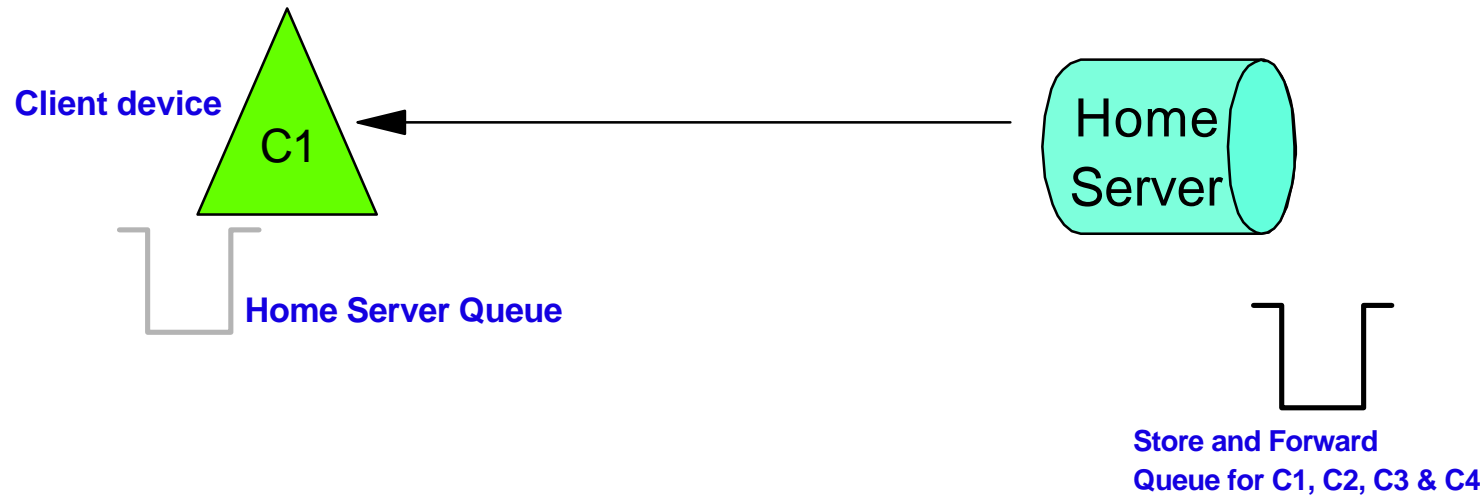
Peer

- ▶ Optional local resources
- ▶ Can listen for communication from a single peer
- ▶ **Can initiate communications**

Server (Gateway)

- ▶ Contains local resources
- ▶ Can listen for communication from multiple clients
- ▶ May contain Gateway functions e.g. Bridge to MQSeries

Home Server Queues - "Dial-in problem"



- Home Server Queue is a 'virtual' queue - it stores no messages
- When Home Server Queue is activated it will automatically connect to the Home Server and 'pull' any messages for the device
- Subsequently, the Home Server Queue checks for messages at a configurable time interval
- Depending on the type of connection available, there may be no provision to "wake up" the clients in between times

Solutions to the "dial in" problem

Support possible via Everyplace Wireless Gateway

- Set session parameters to hold virtual connection open
- Needs power on the device

Wake up client using SMS message or telephone call

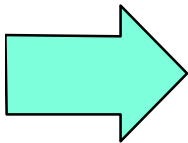
- Device then dials in normally
- Needs power on the phone/modem

Use packet-based protocol

- Needs power on the device

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Protocols and performance

CP/IP Protocol

- Works with most TCP/IP stacks
- Can be supported by devices directly or by Wireless G/way
- Automatically recovers session after link failure
- Addressing based on IP address via PPP session

ITTP Protocol

- Regular HTTP - for firewalls
- Extra header per message

UDP Protocol

- Can optimise packet count
- Can run over Wireless G/w

You can also write your own adapters !

Cost

- Use compression to reduce packet costs
- Use transmission rules to optimize link usage

Protocols available in MQe

MQeTcpipHistoryAdapter

This adapter provides the best TCP performance by chaching recently used data

MQeTcpipLengthAdapter

Provides support for reading and writing to the network using the TCP protocol for single messages, not in a group

MQeTcpipHttpAdapter

Provides support for reading and writing to the network using the HTTP 1.0 protocol and support for passing HTTP requests through proxy servers

MQeUdpipBasicAdapter

Provides support for reading and writing to the network using the UDP protocol. This adapter uses only one port on the server. The behaviour of this adapter is particularly sensitive to various Java property settings

MQeWESAAuthenticationAdapter

Provides support for passing HTTP requests through WebSphere MQ Everyplace authentication proxy servers and transparent proxy servers.

Security and Compression

Authenticators:

- Userid and Password logon using file registry on server (source example)
- NT/2000 logon
- WTLS Mini-Certificate server (SupportPac ES03)

Cryptors

- XOR - simple xor encoding (source Example)
- DES (56 bit)
- 3DES
- RC4 (128 bit)
- RC6 (128 bit)
- MARS

Compressors:

- RLE
- GZIP
- LZW
- (with Field XOR applied first)

Example of XOR compression:

```
<FIRSTNAME>Jill</FIRSTNAME>  
<SECONDNAME>Robinson</SECONDNAME>  
</PERSON>  
  
<FIRSTNAME>Bill</FIRSTNAME>  
<SECONDNAME>Robinson</SECONDNAME>  
</PERSON>
```

Convert XML with SupportPac EA01

Rules - activateQueues()

Activating the queues means that an attempt is made to transmit any messages that they contain. This behavior is configurable with the activateQueues() rule:

```
public Boolean activateQueues()
```

```
{
```

```
    if (timeToTransmit())
```

```
        return true;
```

```
    else
```

```
        return false;}
```

```
protected Boolean timeToTransmit()
```

```
{
```

```
    /*get current time */
```

```
    long currentTimeLong =System.currentTimeMillis();
```

```
    Date date =new Date(currentTimeLong );
```

```
    Calendar calendar =Calendar.getInstance();
```

```
    calendar.setTime(date );
```

```
    /*get hour */
```

```
    int hour =calendar.get(Calendar.HOUR_OF_DAY );
```

```
    if (hour >=cheapRatePeriodStart ||hour <cheapRatePeriodEnd )
```

```
        return true;/*cheap rate */
```

```
    else
```

```
        return false;/*not cheap rate */}
```


Rules - triggerTransmission(), transmit()

This rule decides whether to transmit the messages awaiting delivery. It is called in Java every time a message is put on a remote queue:

```
public void triggerTransmission(int noOfMsgs,MQeFields msgFields )
{
    if (noOfMsgs >=10 )/*if more than 10 msgs are waiting */
        return true;/*then transmit */
    else
        return false;
}
```

The transmit() rule is only called if the triggerTransmission() rule allows for transmission. It is called for every remote queue definition that holds messages awaiting transmission:

```
public Boolean transmit(MQeQueue queue )
{
    if (queue.getDefaultPriority())>5)
        return true;
    else
        return false;
}
```

Security with MQ Everywhere

Queue-based security:

Synchronous

- uses local remote queue defs
 - if unavailable retrieves from target
- if channel exists
 - may re-negotiate dynamically, subject to rules
- otherwise creates new channel, flows data securely etc.
- stores data in correct encoding
- gives end-to-end authentication
 - may route through intermediates (application to target queue)

Asynchronous

- encrypts data on Xmit queue
- QM-to-QM authentication

Message-based security:

(used at application level)

Simple

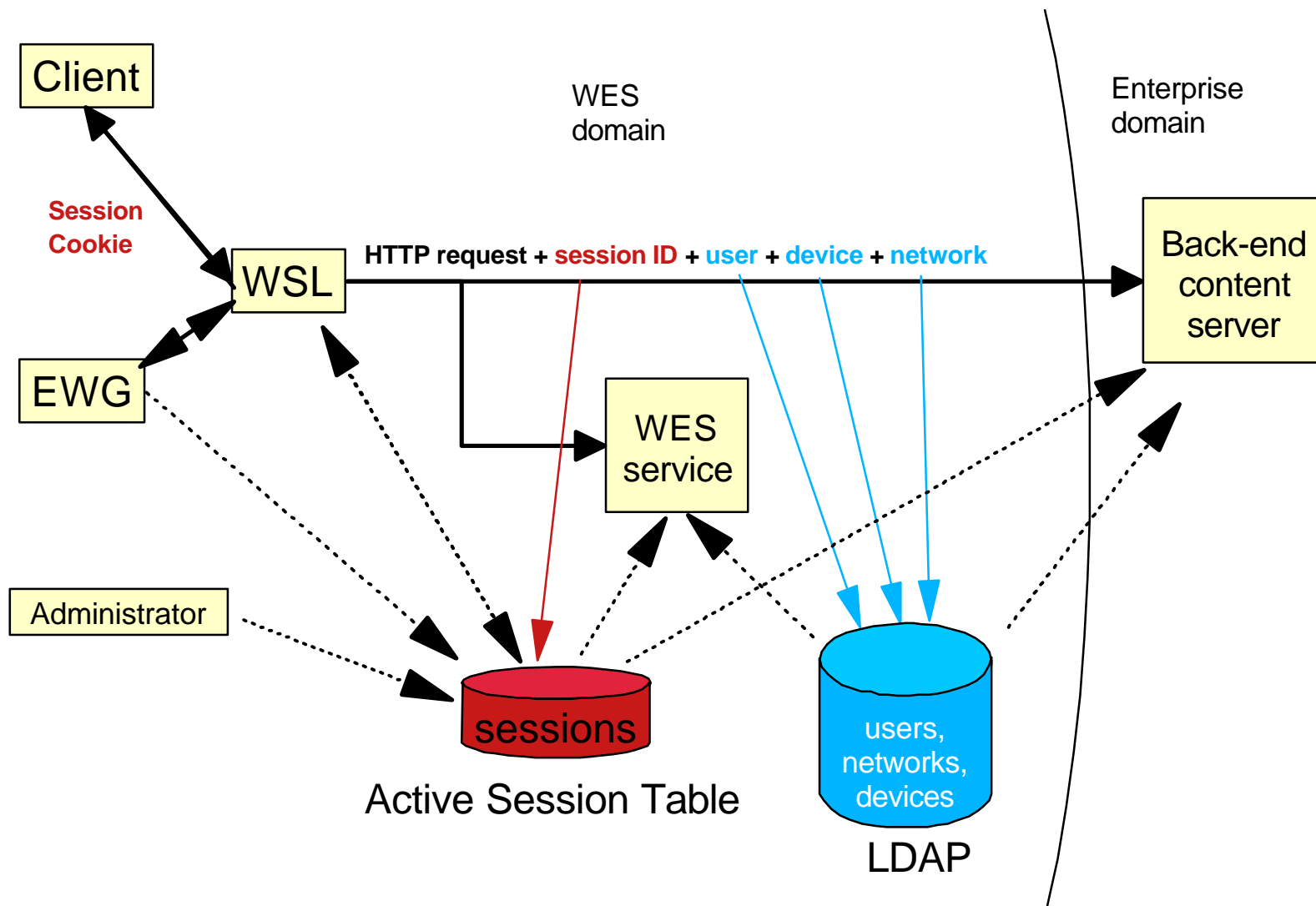
- use attribute object on field objects
- exploit cryptors & compressors
- organisation handles symmetric cryptor keys

Complete

- exploit public key infrastructure
- uses RSA encryption & digital signatures
- provides
 - proof of sender
 - decrypt by receiver only
 - message protection
- uses asymmetric keys

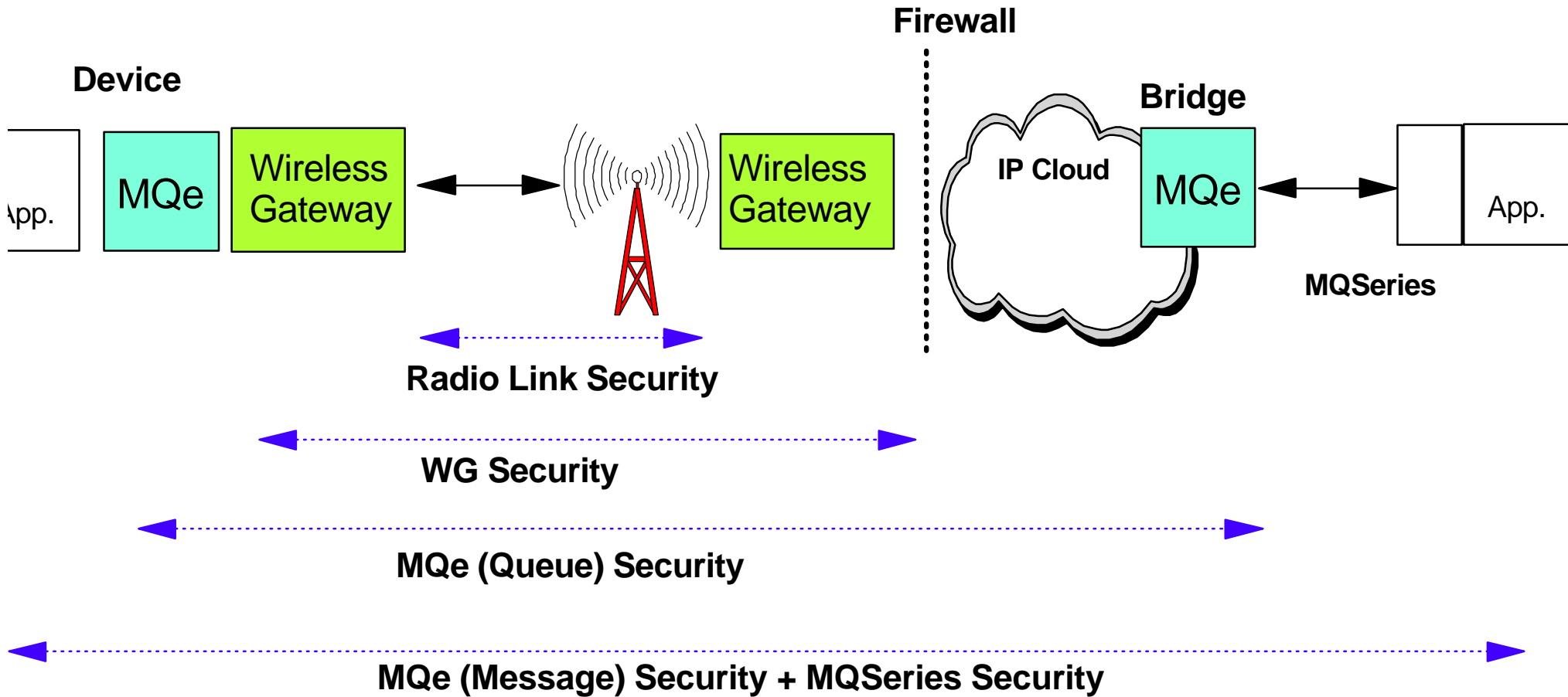
Security

Session Tracking and Single-Signon



- ✓ Logoff message to WSL supported
- ✓ A normal installation has at least two AST servers

Security with Wireless Gateway

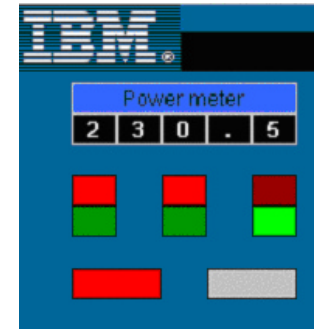


Summary

Unique features of messaging and queuing

- Information gets to the user as fast as possible
 - Delivered without asking for it
 - Delivered as soon as link is available
 - Users need not be on the system at the same time
- Parallel use of resources is trivial to implement
 - Ask for several services at once
 - Subscribe to multiple information sources
- Peer-to-peer interaction is possible
 - Send personal messages, play games, etc.
 - Use device to remotely control home appliances
- Transfer of assets (e.g. cash) is possible
 - Once-only assured delivery means that value is not lost (or duplicated)

Gas station demonstration

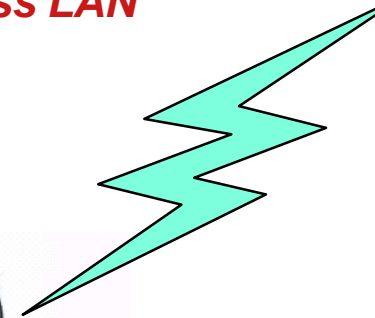


XML- Run Display



Mobile status PDA

MQe over Wireless LAN



SCADA unit



Broker



Docked entry PDA

MQe over wired LAN

Further information

- WebSphere Servers

- www.ibm.com/software/info1/websphere/

- MQ Everyplace:

- www.ibm.com/software/mqseries/everyplace

- Sessions M04, M06 Jane Porter

- www.ibm.com/software/mqseries/txppacs

- SupportPacs EA01, ED02, ID03

- *Business Integration zone:*

- <http://www.software.ibm.com/wsdd/zones/businessintegration/>

- Using IBM MQSeries Everyplace for Multiplatforms with WebSphere Everyplace Wireless Gateway*

- GSM

- <http://www.gsmworld.com/>

- Stands in Expo: