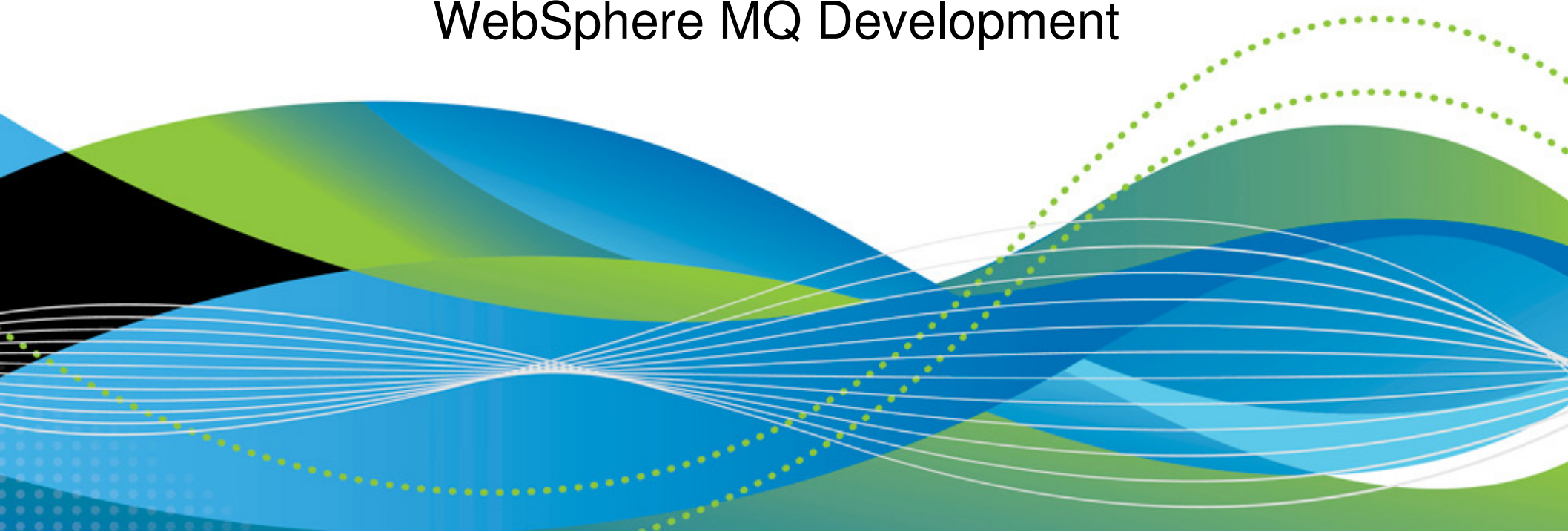


Introduction to the WebSphere MQ Product Family

Paul S Dennis
WebSphere MQ Development



Agenda

- Connectivity and WebSphere MQ Universal Messaging
- WebSphere MQ family – where we are today
- Summary

The value of WebSphere MQ - Connectivity to, from and within your Enterprise

Provides a Universal Message Bus for access to data wherever it exists to support your business

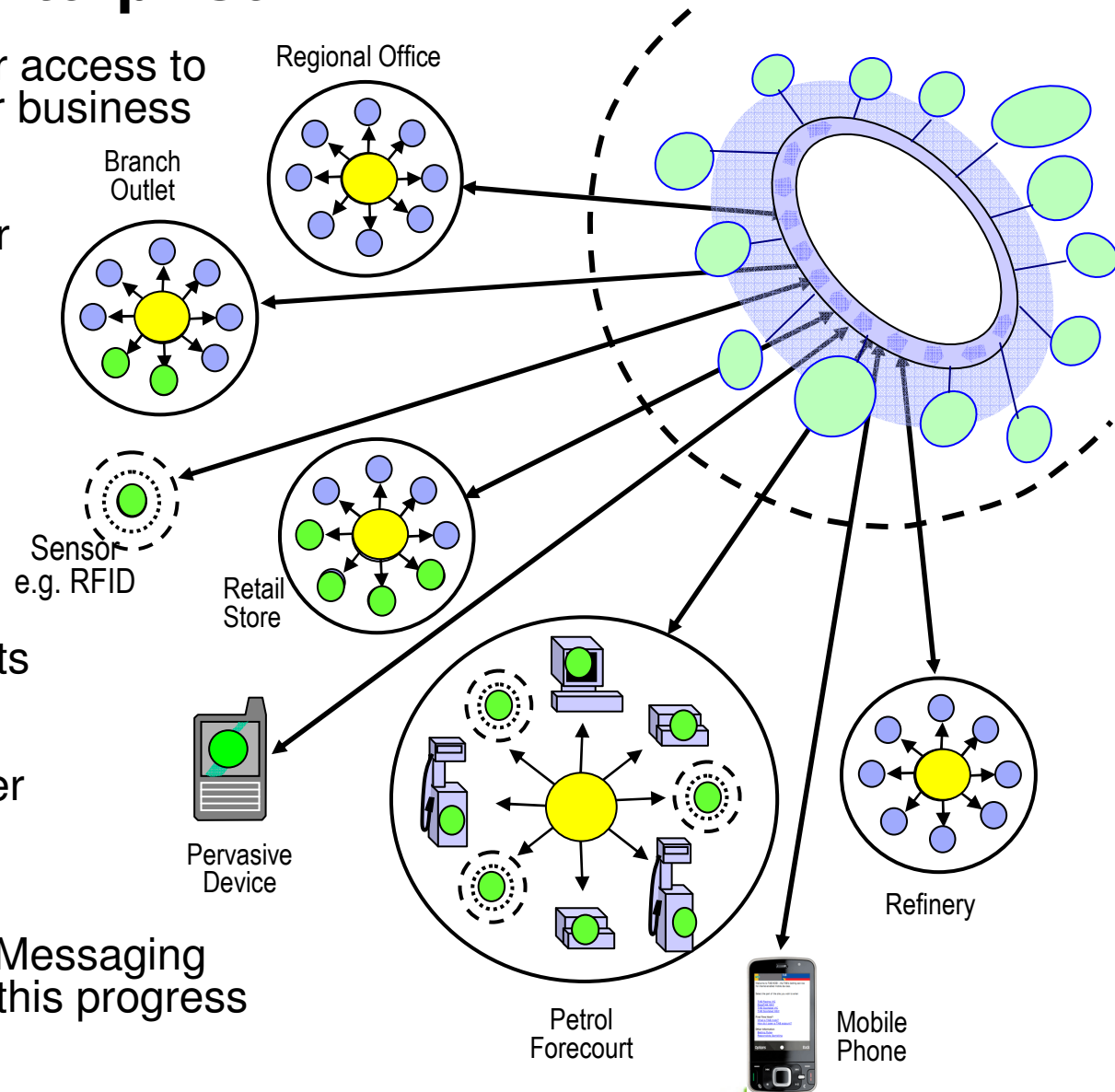
Provides a comprehensive range of Messaging capabilities to support your Business requirements for data integration –

- Managed File Transfer
- messaging integration patterns
- reliability and availability QoS
- SOA foundation

Provides appropriate data access and data privacy controls to help meet audit and regulatory requirements

WMQ Telemetry is a step in extending the reach of WMQ to a wider world of data relevant to you business

Recently announced (at Impact 2011) technology demonstrator of MQ Web Messaging using HTML5 WebSockets continues this progress



How WebSphere MQ meets your Connectivity needs

*Dynamic network that delivers the **data** you require from wherever it resides to wherever you want it in whatever way you want it at whatever time you want it*

Universal Messaging

1. Anything Anywhere

- Any skills
- Any traffic
- Any language
- Any environment
- Any platform



2. Best Delivery

- Choice of service
- Resilience, Integrity, Security
- Throughput, Latency
- High availability



3. Scale Dynamically

- Start small
- Grow incrementally
- Stretch elastically
- Scale admin



Universal Messaging – Anything to and from Anywhere

Any skills

- Use the resources at hand
- Reduce dependency on specialists
- Leverage infrastructure throughout org



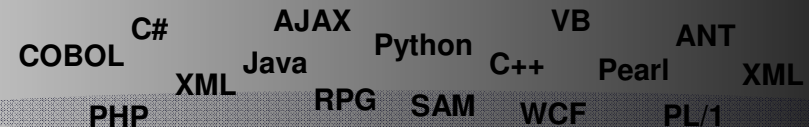
Any traffic

- Reduce maintenance by consolidation
- Unlock value of data
- Modernize infrastructure



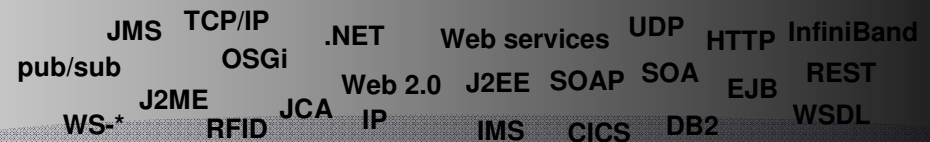
Any programming language

- Bridge the “new” with the “now”
- Protect existing investments



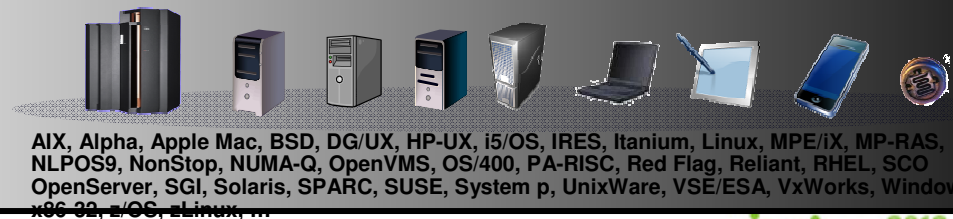
Any environment

- Connect new innovations
- Extend core investments
- Span independent departments



Any platform

- Virtually any commercial IT platform
- Over 80 platform configurations
- Native exploitation of IBM System z



Universal Messaging – Best Delivery

Meet wide range of business requirements within a common infrastructure

Choice of service

- Offer whole range over single network
 - From transactional to low latency
- Enable more granular optimization



Resilience, Integrity, Security

- Choice of persistence strategies
 - Message queue for high resilience
 - Message storing for high speed
- Granular security for data and transport



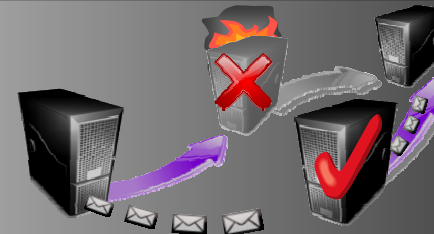
Throughput, Latency

- Daemon-less, Peer-to-peer, Shared memory
- Re-play for late joiners
- Re-ahead delivery for consuming apps



High Availability

- Choice of availability strategies
 - Software-only for ease (multi-instance)
 - Hardware-based for highest recovery
- Shared queues z/OS for continuous availability

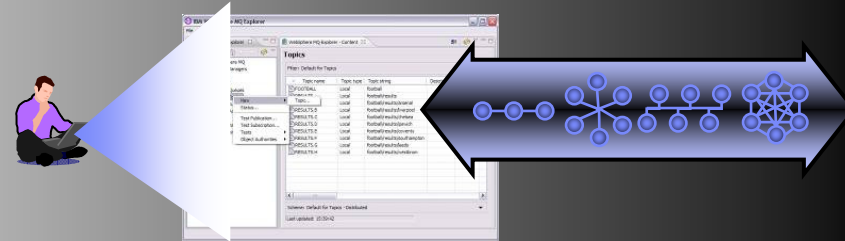


Universal Messaging – Scale dynamically

Grow at your speed while protecting your existing investments

Scale admin

- Manage larger networks with fewer resources
- Remote admin across entire network
- Self and zero admin clients and devices
- Leverage Tivoli to auto-generate topology view



Stretch Elastically

- Vertical scaling leveraging multi-processor, multi-core
- Horizontal scaling leveraging distributed clustering
- Shared queues leveraging System z parallel sysplex
- Cloud deployments



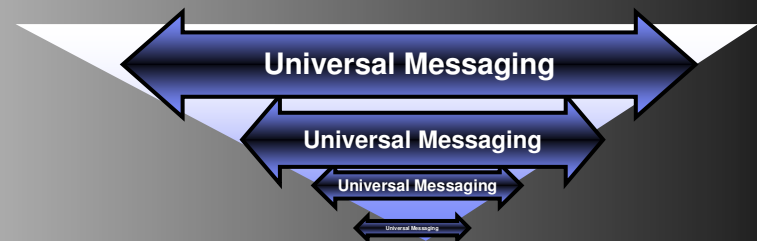
Grow incrementally

- Expand network one node at a time
- Share resources across departments
- Plug in services and apps as needed



Start small

- Easy to try, quick to start
- Reduce required IT resources
- Address needs of Growth markets



ALSTOM |

XEROX



BARCLAYS

IBM represents a 76% market share in the Market Orientated middleware market

90% of the Fortune 100 are WMQ customers

60% of the top 10 insurance companies in the Global 500 use WMQ

HBOS plc RAIFFEISEN

WebSphere. software

£400 billion worth of messages moved per day over Financial markets using WMQ



All of the top 10 banks in America are WMQ customers



EASTMAN



Prudential Financial
Growing and Protecting Your Wealth®

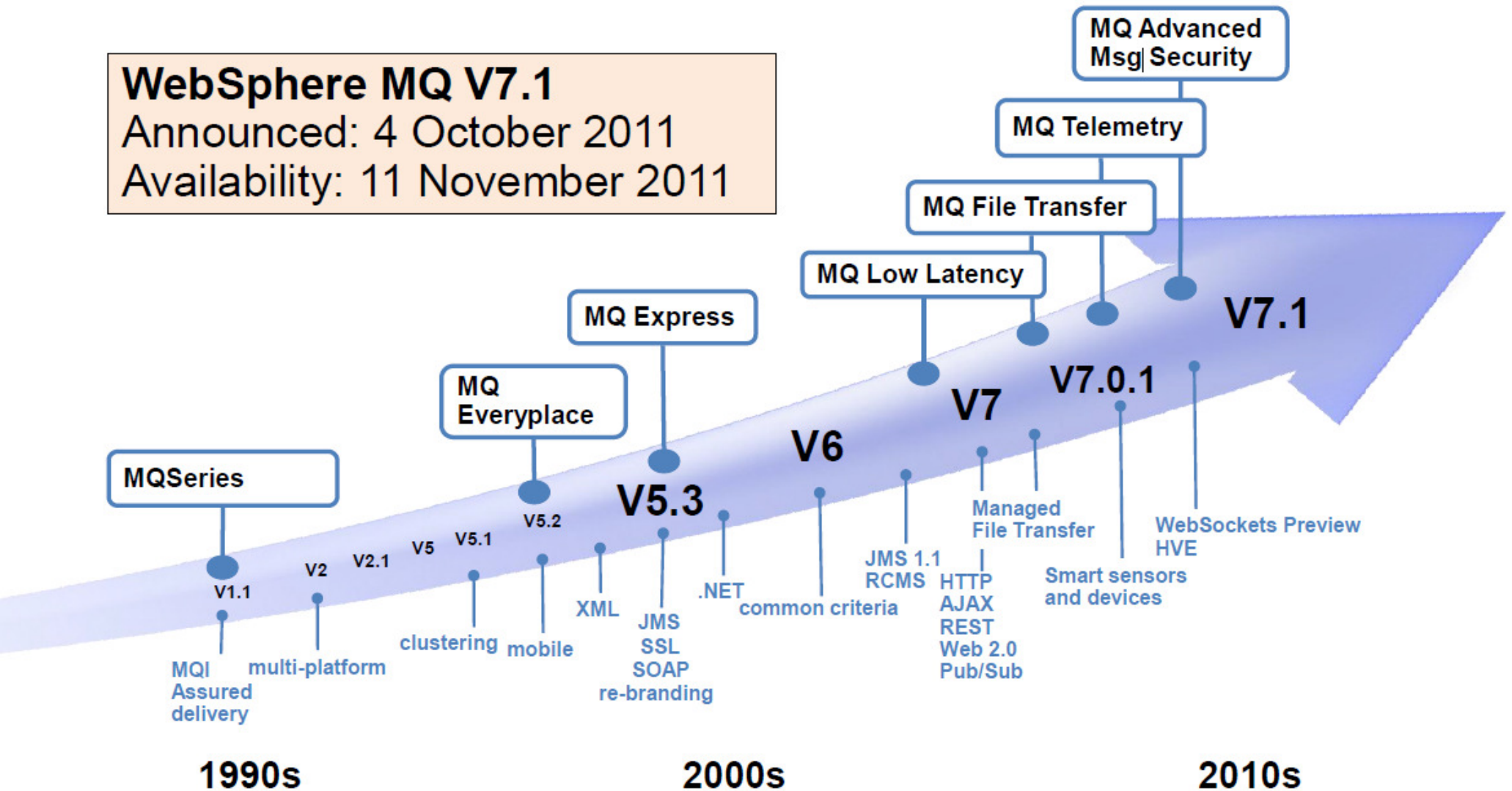


Agenda

- Connectivity and WebSphere MQ Universal Messaging
- **WebSphere MQ family – where we are today**
- Summary

IBM Messaging Continues to Evolve

WebSphere MQ V7.1
 Announced: 4 October 2011
 Availability: 11 November 2011



WebSphere MQ V7.1: Feature Summary

<i>New Feature</i>	<i>Benefits</i>	<i>Details</i>
Multi-Version Install capability on Distributed platforms	Makes it easier to deploy and upgrade systems and stage version to version operation	Unix and Windows support for multiple versions of MQ V7.x (AND one copy of MQ V7.0.1) down to fixpack levels. Relocatable installation support. Applications can connect to any Qmgr
Enhanced Security	Enhanced Configuration Enhanced Authorization and Auditing	IP address Authorisation capability Additional crypto algorithms More granular authorisation for non-local queues Application Activity Reports
Cloud Support	Simplifies and supports Cloud deployment	Additional HVE images, Integrated with IBM Workload Deployer
Enhanced Clustering	Improves ease-of-use	Authorisation on Cluster Q rather than XMIT Q on Dist. Platforms Bin-on-Group Support
Multicast capability	New messaging QoS provides low latency with high fan-out capability	MQ Pub/S Topic space can now map to multicast Group Addressed Provide direct interoperability with MQ LLM
Improved scalability and availability on z/OS	Further exploitation of z196 Customer control over CF storage use CF Connectivity Loss improvements	Code contention reduced to improve multi-processor linear scaling Use of MQ Datasets rather than DB2 significantly improves "large" message capability Structure rebuild capability for CF connectivity Loss scenarios
Improved Performance on Dist platforms	Improved multiprocessor exploitation	Various code improvements

Simplification

WebSphere MQ V7.1: Feature Summary

NOTES

- This page shows the highlights of the new release in one chart. The rest of this presentation goes into the details.
- A one-word summary of this summary is “simplification”: making it easier to own, run and work with MQ.
- One part of the MQ V7.0.1 rationale was to deliver new function via the service stream, without requiring a full new release and migration cycle. Lessons learned from that have fed into V7.1, which has been designed to be more capable and more flexible when adding function through this channel.
- These new functions can be optionally enabled. The default is that new function requires administrative action to enable it, so that there is no unasked-for change in behaviour when you install a fixpack

WebSphere MQ Telemetry Summary

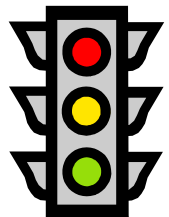
Extending the reach of WMQ – MQ Telemetry Transport (MQTT)

- Industrial control systems (aka SCADA) are well-suited to a messaging solution
 - Loose coupling, multi-protocol, separation of concerns...
- IBM developed a protocol designed for the constraints of the SCADA world
 - Later renamed MQ Telemetry Transport – (MQTT) due to broader telemetry adoption
 - Designed to expect and cater for frequent network disruption
 - Built for low bandwidth, high latency, unreliable, high cost networks
 - Tailored for resource-constrained client application environments
 - Published protocol for ease of adoption by device vendors and third-parties - <http://mqtt.org/>
- Traditional messaging qualities of service provided where environment allows

Multiple Business scenarios suitable for MQTT



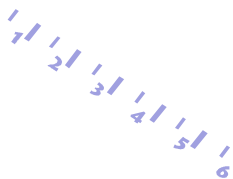
predict



alert



track



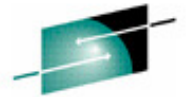
measure

Scenario	Key Industries	Benefits
Automated Metering	Chemical & Petroleum Energy & Utilities	<i>Smart metering of home energy to improve efficiency</i>
Distribution Supply Chain and Logistics	Retailers Distributors Consumer products Transportation	<i>Shipping company improves customer loyalty improvement through up-to-date tracking info.</i> <i>Transportation company improves customer safety and satisfaction with improved fleet tracking</i>
Industrial Tracking & Visibility	Automotive Industrial manufacturing Aerospace Defence	<i>Manufacturing company automates inventory checking to improve management of stock and optimize production rates</i>
Healthcare Personal & Resource Tracking	Pharmaceutical companies Health trials Hospitals Nursing Homes	<i>Medical organization increases safety and quality of patient care</i> <i>Hospital reduces waiting lists and improves efficiency with surgery equipment tracking</i>
Location Awareness and Safety	Chemical & Petroleum Energy & Utilities Homeland Defence	<i>Gas company improves pipeline monitoring and control</i> <i>Government improves early-warning capability by monitoring dams and flood-risk areas</i>
Executive Alerting	Insurance Banking	<i>Bank alerts Personal Account Managers when new clients open key accounts</i>

Multiple Business scenarios suitable for MQTT

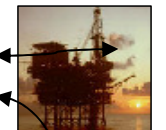
- And Facebook !
 - See <http://mqtt.org/2011/08/mqtt-used-by-facebook-messenger> which references a Facebook Blogpost at <http://www.facebook.com/notes/facebook-engineering/building-facebook-messenger/10150259350998920>

Extending the reach of WMQ with WMQ Telemetry



SHARE

Basic Telemetry Client



Backend Server

WebSphere MQ

MQ Telemetry Daemon for Devices

Advanced Telemetry Client

- Highly scalable
 - A single queue manager can handle up to 100K concurrently connected devices
 - Fully integrated / interoperable with WMQ
 - Publishers and subscribers can exchange messages with MQI and JMS applications
- Ships with two types of client:
 - Basic
 - direct connectivity from a device
 - Advanced:
 - Acts as a “concentrator/hub” for mini-networks of Telemetry devices
 - Can connect to multiple backend servers
 - Can failover to alternate backend server
 - Can buffer messages
- Provides rich security
 - Network: SSL
 - Authentication: JAAS
 - Authorisation: OAM
- In addition any 3rd party, open source or roll your own MQTT client can be used

WMQ V7.0.1 Telemetry improves Electricity Usage



Consert developing an Intelligent Utility Network offering for optimizing load on electricity grids



Business Partner Needs

- Needs robust middleware technology to connect to remote smart meters
- Needs to be able to rapidly scale solution nationwide

Real Results

- **Able to offer** daily energy savings of 15-20%
- **Enables** utilities to reduce peaks and avoid punitive charges
- **Helps save** electricity through better peak load management

WMQ V7.0.1 Telemetry transforms Patient Care



St Jude Medical created a remote pace-maker monitoring solution to provide better patient care



Client Pains

- Physicians needed better monitoring of cardiac patients
- Improve efficiency of checkups
- Meet Healthcare data capture standards

Real Results

- **Enables** higher level of patient care and peace of mind
- **Improves** administrative efficiency and maintenance
- **Helps** conform to standards and ease integration of data

Extending the reach of WMQ – B2C and B2E with MQ Web Messaging

- Connectivity for B2C & B2E with WebSockets
 - Tech preview at Impact
- MQ Web Messaging is designed with the following primary intentions:
 - 1st class web support built on web standards (IETF and w3C)
 - Aimed at the new class of Rich Internet Applications that run in web browsers
 - Works seamlessly on both Mobile and Fixed devices with a modern web browser.
 - Provides efficient message and event distribution to and from the web browser.
 - Unlike HTTP messages / events are “Pushed” each way.
 - A publish/subscribe messaging paradigm accessed via JavaScript API
 - Provide traditional messaging qualities of service in a modern way



WebSphere MQ Low Latency Messaging Summary

IBM WebSphere MQ Low Latency Messaging

- Peer-to-peer messaging transport optimized for ultra low latency, high-throughput delivery
- Capable of over 90 million messages per second over native InfiniBand
- Can bridge to MQ networks with DataPower XM70
- WMQ LLM is also included in WebSphere Front Office for Financial Markets

•Low Latency capabilities

- Less than 10 microsecond latency at high throughput rates
- Stream failover for high availability
- Dynamic congestion traffic control
- Flexible message filtering
- Multicast & Unicast distribution
- Message store for reliable delivery
- Highly configurable API
- Ordered (FIFO) delivery
- Infiniband & 10GbE support



WMQ LLM V2.6 Performance

- Setting the Bar for Throughput

98 million messages per second on Native Infiniband and Shared Memory

75 million messages per second on 10 Gigabit Ethernet

- Industry Leading Latency

1 microsecond for shared memory

2 microseconds over Native InfiniBand

4.5 microseconds over Ethernet (10 GbE*)

System Configuration

- IBM HS22 blades: 2 x Quad core Intel Xeon E5570 2.93GHz 14GB RAM. Linux RHEL 5 update 3 (x86_64 64 bit)
- Voltaire 40 Gb IB Switch Module / BNT 10Gb Ethernet Switch Module
- Mellanox ConnectX MT26428 HCAs / Chelsio T320 Dual Port 10GbE Adapter
- * 10GbE using RoCEE

High Throughput 10 Gigabit Ethernet

Message size (bytes)	Message Rate (msgs /sec)
12	75,914,578
45	25,253,255
120	9,724,107
1200	985,846
12,000	98,225

Low Latency Single hop Average

Network	Message size (bytes)	Transmission rate (msgs /sec)	
		10K	100K
1 GbE Ethernet	120	29 μ s	34 μ s
10GbE Ethernet*	120	4.5 μ s	4.5 μ s
InfiniBand	120	2 μ s	3 μ s
Shared Memory	120	1 μ s	1 μ s

Responding faster with WMQ LLM



Bolsa de Comercio de Santiago dramatically accelerate their trading rates and throughput



Customer Needs

- Needed to better integrate with international financial markets
- Needed to support higher volumes of traffic and fulfil more of its customers' transactional requirements

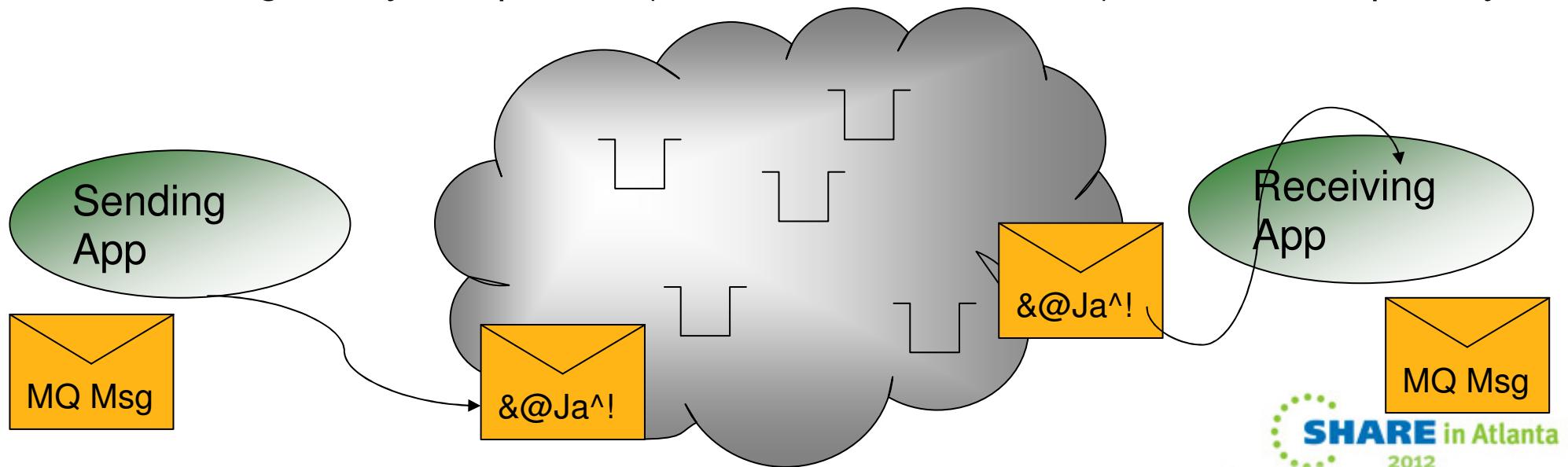
Real Results

- ***Able to scale 100 times to millions of messages per second***
- ***Reduced latency from 2 secs to milliseconds per transaction***
- ***Increased customer access to additional market data sources***

WebSphere MQ Advanced Message Security Summary

Extended data security and integrity with WMQ AMS

- Adds message-level security to existing MQ V6 and V7 networks
 - Protecting customer data application-to-application, at rest (queues, logs) and in transit
- Provides message-level integrity
 - Assuring that the data has not been changed in transit
- End-to-end secure delivery
 - Receiver validation of sender; only the intended recipient(s) can view data
- Assists regulatory compliance (PCI, HIPAA, SOX, et al.) for audit and privacy



WebSphere MQ V7.0.1 Advanced Message Security

- End-to-End Message Security - Secures application data even before it is passed to MQ
- Extension to base MQ – No changes to existing

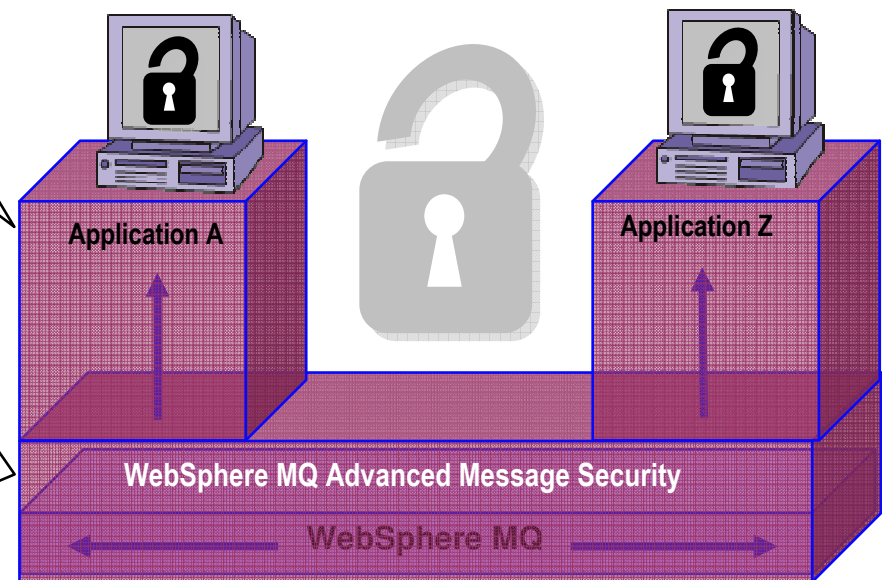
WebSphere MQ standard security:

- Message data can be encrypted in transport (SSL) but not when it resides in the queues
- Authentication is based on Operating System identifier of local process

WebSphere MQ Advanced Message Security

Supplements WMQ's security features:

- + Assurance that messages have not been altered in transit
- + Assurance that messages originated from the expected source
- + Assurance that messages can only be viewed by intended recipient(s)
- + Administered using queue based policies created from the WMQ Explorer or command line tooling.



*Securing the data and
the applications*

Securing private customer information with WMQ AMS

A large North American life insurance provider, delivers high quality customer service, in support of growing membership



Client Pains

- Negative exposure due to loss of customer personal insurance information and credit card data
- Securing large volumes of personal data traversing multi-channels

Solution Benefit

- Standardize governance and lower total cost of ownership with little or no changes to existing applications
- Simplified installation and maintenance to prevent operational downtime
- Limits access to secure data, reducing opportunities to compromise data

WebSphere MQ File Transfer Edition Summary

Shortcomings of Basic FTP (or “Why do we treat file data differently ?”)

Limited Reliability

- ❌ Unreliable delivery – Lacking checkpoint restart – Files can be lost
- ❌ Transfers can terminate without notification or any record – corrupt or partial files can be accidentally used
- ❌ File data can be unusable after transfer – lack of Character Set conversion

Limited Flexibility

- ❌ Changes to file transfers often require updates to many ftp scripts that are typically scattered across machines and require platform-specific skills to alter
- ❌ All resources usually have to be available concurrently
- ❌ Often only one ftp transfer can run at a time
- ❌ Typically transfers cannot be prioritized

Limited Security

- ❌ Often usernames and passwords are sent with file – as plain text!
- ❌ Privacy, authentication and encryption often not be available
- ❌ Non-repudiation often lacking

Limited visibility and traceability

- ❌ Transfers cannot be monitored and managed centrally or remotely
- ❌ Logging capabilities may be limited and may only record transfers between directly connected systems
- ❌ Cannot track the entire journey of files – not just from one machine to the next but from the start of its journey to its final destination



What is Managed File Transfer?

“Reliable, controlled, auditable movement of files around an organization”

<input checked="" type="checkbox"/> Auditable	<p>Records complete and detailed audit log of entire file journey “What went where, when and to whom”</p>
<input checked="" type="checkbox"/> Reliable	<p>File contents not corrupted or partially transmitted Files only appear at destination whole and intact</p>
<input checked="" type="checkbox"/> Secure	<p>Files content encrypted during transmission File access authenticated and controlled</p>
<input checked="" type="checkbox"/> Automated	<p>Eliminates need to manually detect problems and restart transfer Providing scheduling and triggering for event-driven transfers</p>
<input checked="" type="checkbox"/> Centralized	<p>Remote control and monitoring of file progress from anywhere</p>
<input checked="" type="checkbox"/> Flexible	<p>Able to deploy and re-configure file transfers instantaneously from anywhere Managing transfers end-to-end across a network – not just between 2 points</p>
<input checked="" type="checkbox"/> Any file size	<p>No upper limit on the size of file than can be moved</p>
<input checked="" type="checkbox"/> Integrated	<p>With SOA infrastructure: Messaging, ESBs, Governance, B2B and BPM</p>
<input checked="" type="checkbox"/> Cost Effective	<p>Provides a consolidated transport for moving both Files and Messages</p>

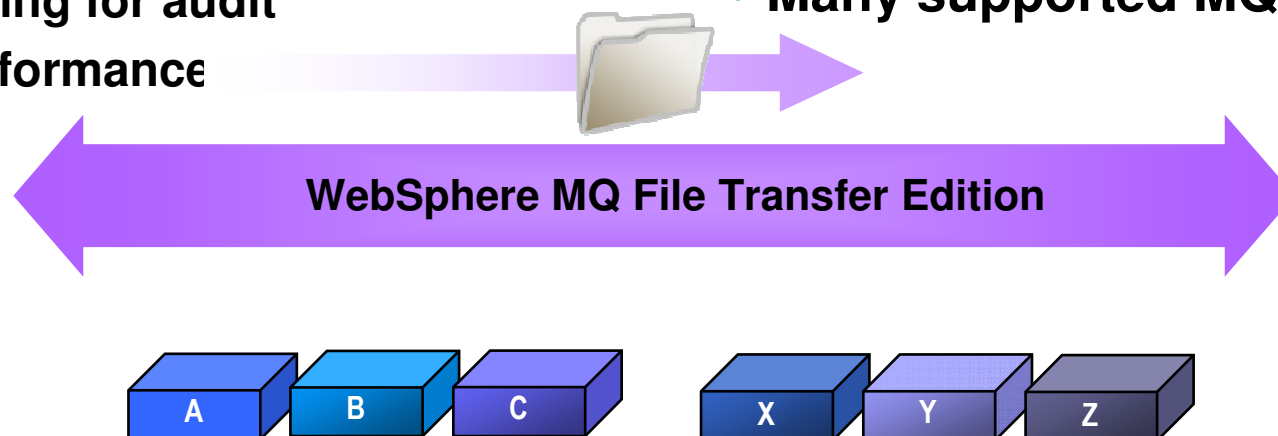
WebSphere MQ File Transfer Edition

- WMQ FTE adds managed file transfer services to WMQ V6 & V7 networks
- Enables reliable, secure and traceable file transfers
- Replaces costly, ad hoc solutions that lack management controls

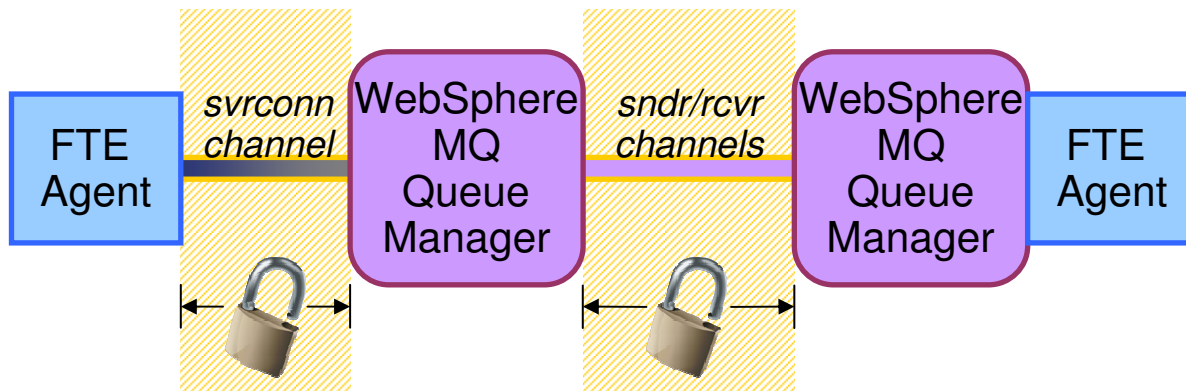
File transfer capabilities

- Any file size (KB, MB, GB...)
- Powerful graphical tooling
- No need for programming
- Reliability leveraging MQ
- Full logging for audit
- High-performance

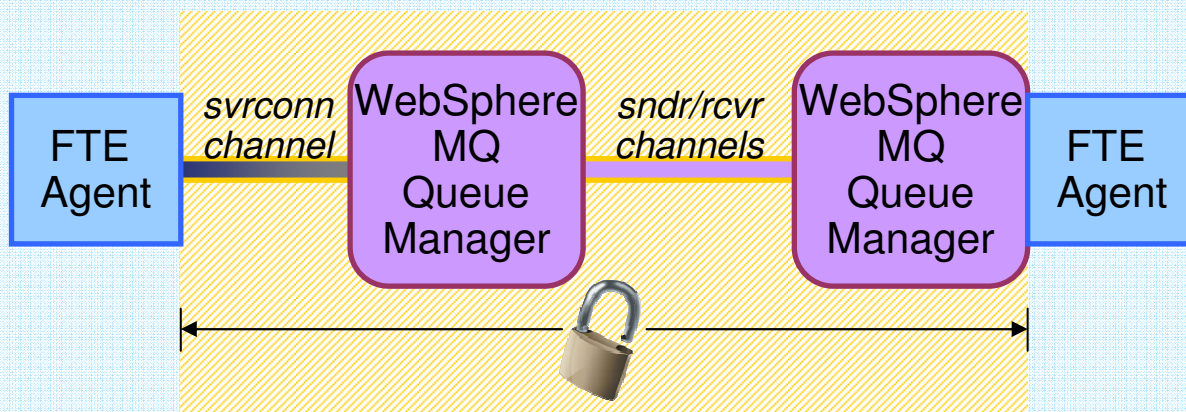
- Code page conversion
- SSL security
- Distributed job automation
- Multi-purpose solution – transports both messaging and files
- Many supported MQ environments



End-to-end encryption using WebSphere MQ Advanced Message Security

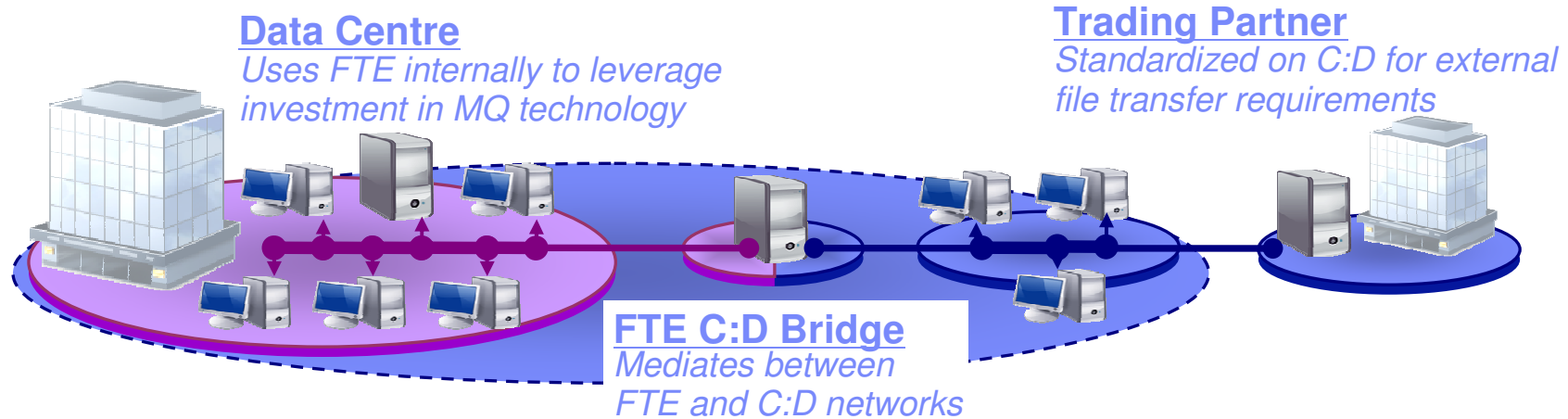


- WMQ FTE already supports transport level encryption using SSL
- Data is encrypted before it is sent over a channel and decrypted when it is received



- V7.0.3 (when combined with WMQ AMS v7.0.1) allows file data to be encrypted at the source system and only decrypted when it reaches the destination system
 - This helps reduce encryption costs
 - Data is secure even when at rest on a queue

FTE V7.0.4 – MQ File Transfer Edition and Connect:Direct



- Leverage WebSphere MQ File Transfer Edition to move files around your MQ network
- Develop a protocol standard for trading partner exchanges over the security and strength of Connect:Direct
- This new integration feature allows organizations to leverage their combined investments in both their WebSphere MQ and Connect:Direct infrastructure for mission-critical managed file transfer throughout their organization.

Improved File Transfer with WMQ FTE



Meijer replaces aging home-grown file transfer tool increasing reliability and visibility of transfers



Customer Needs

- Needed to overcome file size limitations & increase reliability
- Remove bottlenecks slowing delivery of pricing & PoS data
- Replace difficult to maintain, time-consuming and costly tools

Real Results

- **Timely delivery** of critical file data without size limitations
- **Improved visibility & audit** of files transfers across business
- **Reduced admin costs** through automation, detection and resending failed transfers due to network outages

Agenda

- Connectivity and WebSphere MQ Universal Messaging
 - WebSphere MQ family – where we are today
- **Summary**

Why WebSphere MQ ?

Over 17 years of proven experience

Leader in Messaging technology innovation

Connect virtually anything

Broad coverage of platforms, technologies, languages
Draw skills from a larger pool – use who you have today
Over 9,300 certified developers for IBM Messaging alone

Most widely deployed Messaging Backbone

Over 10,000 customers using IBM Messaging Backbone
Over 90% of the Fortune 50 and 9 of the Fortune 10
Over 80% of the Global 25 and 7 of the Global 10

Entrusted with Tens of billions of messages each day

Government client sends 675 million messages per day*
Banking client handles over 213 million messages per day on z/OS alone*

Relied upon as the mission-critical Backbone

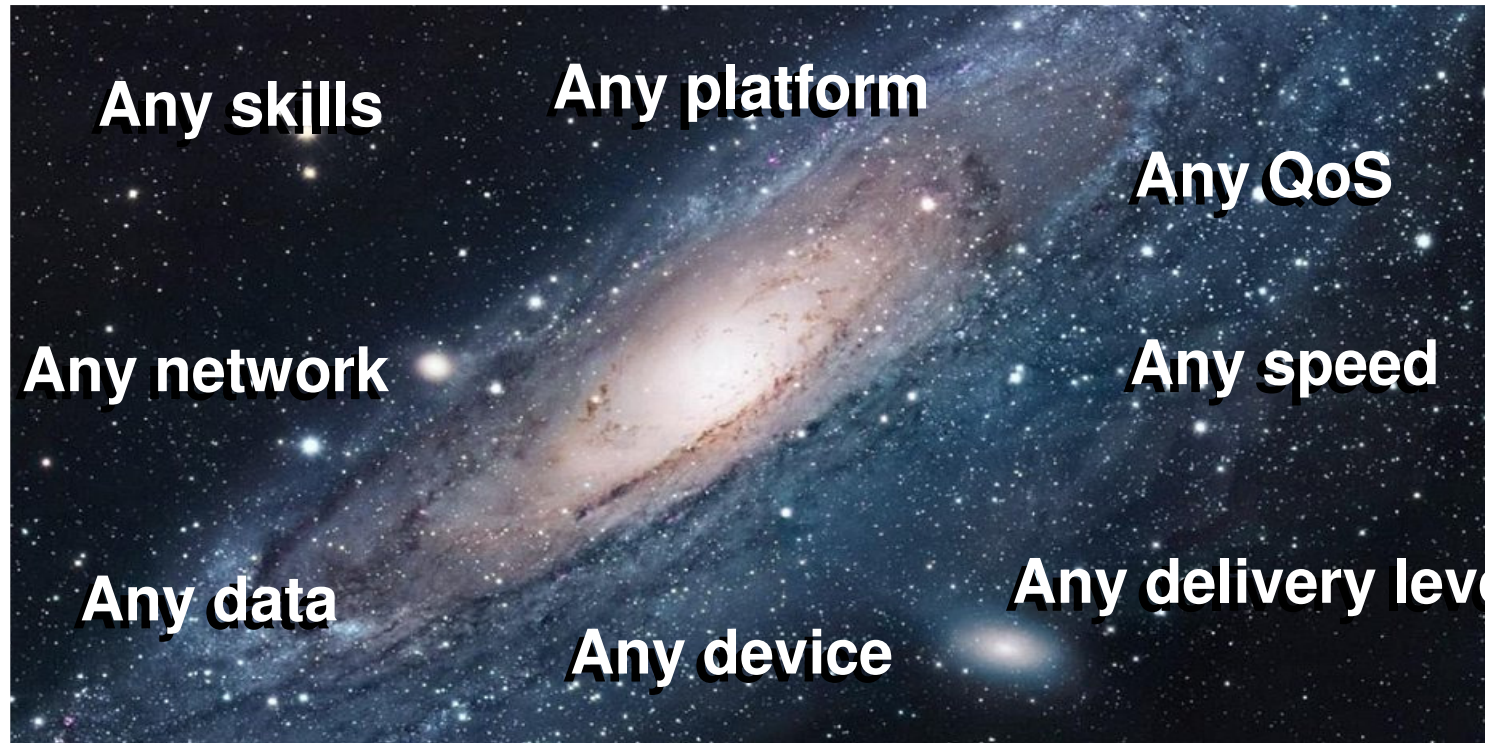
Financial Markets client handles \$1 trillion worth of traffic per day on one MQ network*
Banking client sends \$7-\$35 trillion worth of traffic per day on just one MQ-based SWIFT gateway*

Continuously Investing and Innovating

Over 120 patents and filings within messaging space
New WebSphere MQ family products
Regular enhancements, updates and new releases

* **Results reported from actual WMQ implementations**

Universal Messaging with WebSphere MQ



Questions?



As a reminder, please fill out a session evaluation

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