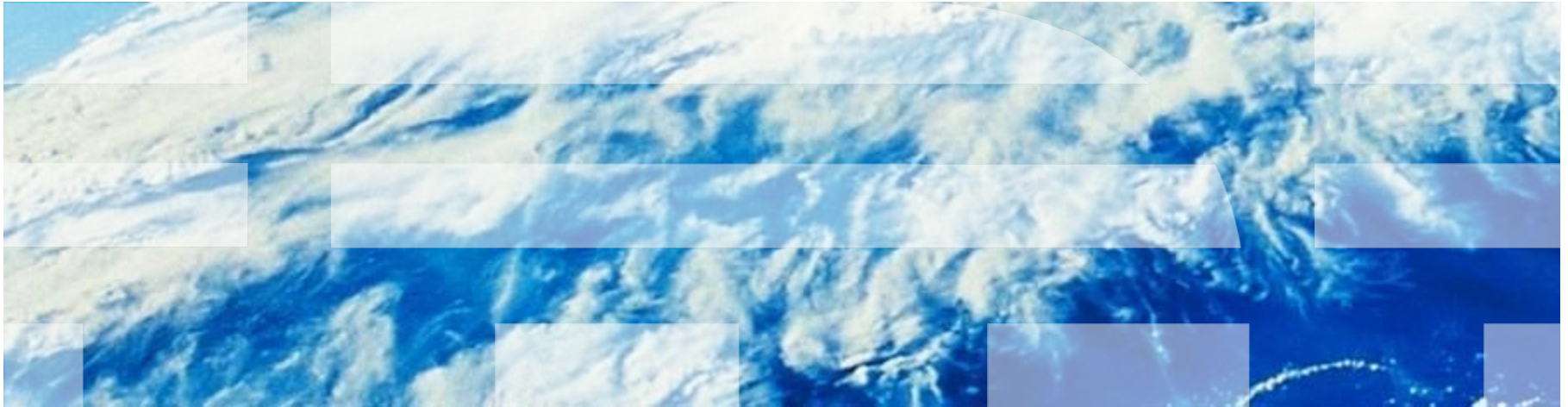
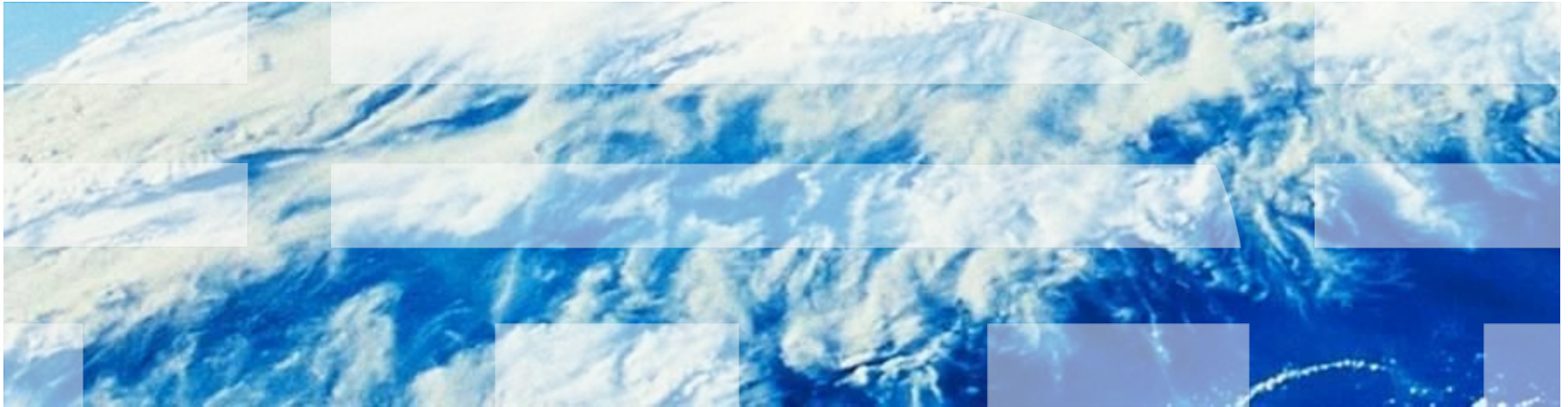


WebSphere MQ Family Update

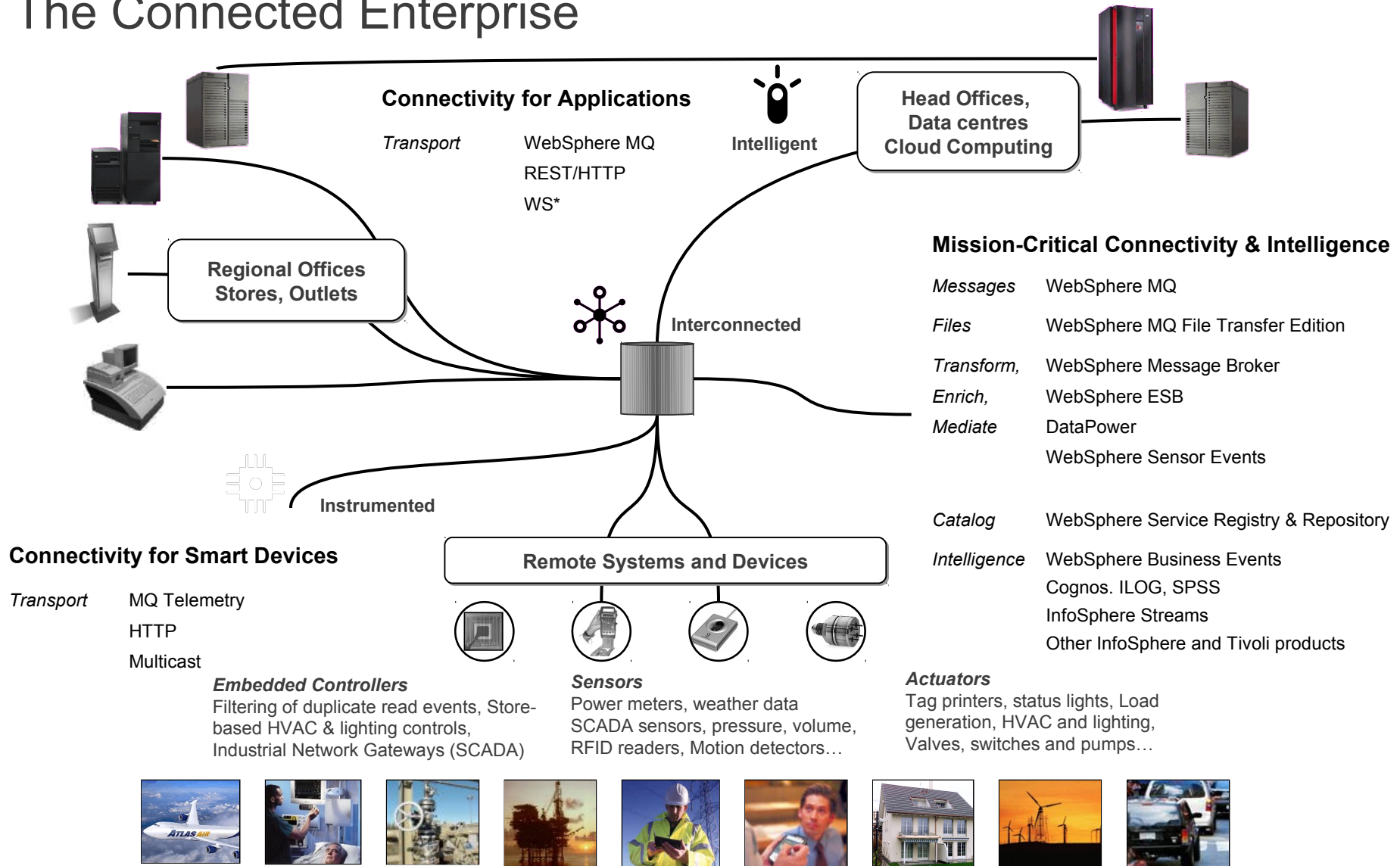


- **Context**
- **WMQ latest features**
- **File Transfer**
- **Advanced Message Security**
- **Telemetry**

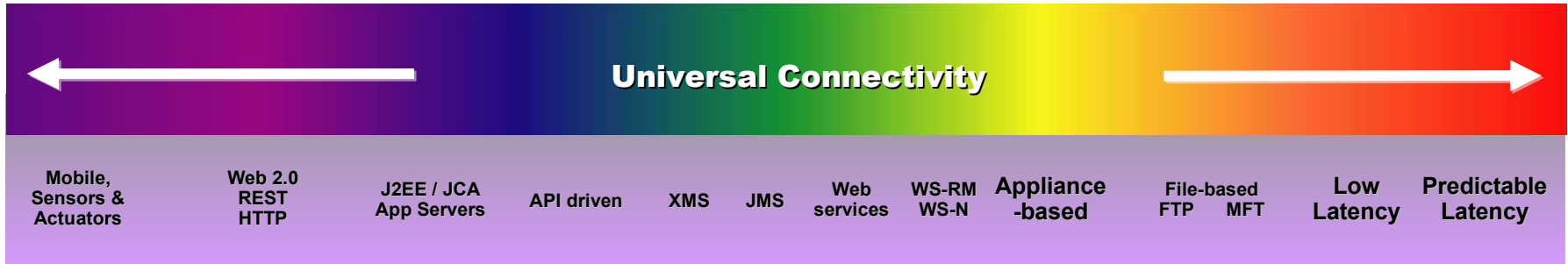
Context



The Connected Enterprise

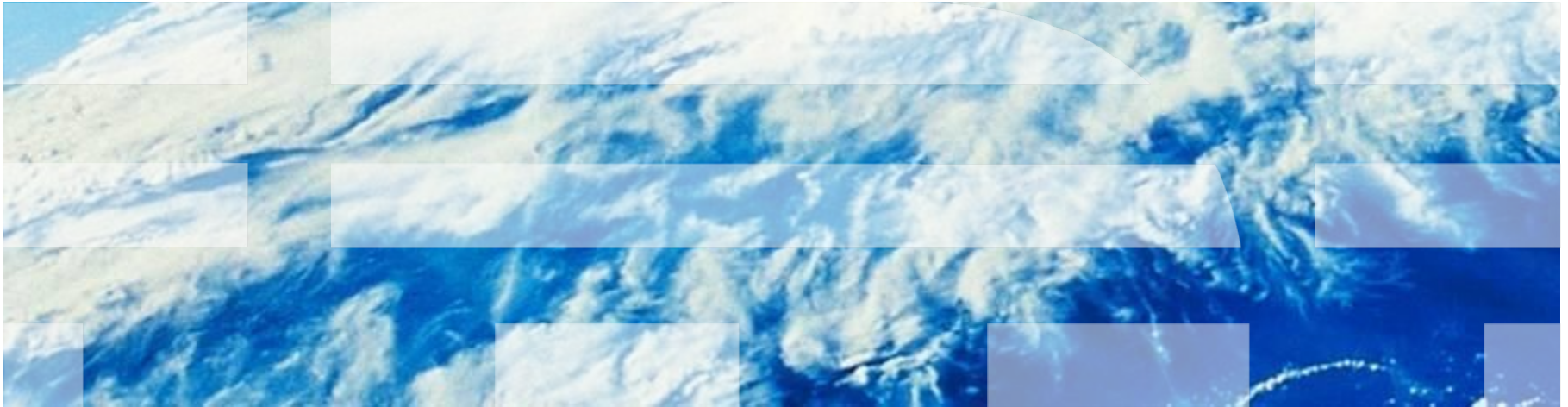


IBM's Messaging Vision



- Enhance IBM's messaging portfolio, expanding the range and extending the reach of transports offered
 - Deliver Universal Connectivity for Business data delivery for the entire enterprise (both Inter- and Intra-)
 - Interconnected transport protocols and Quality of Service levels to meet the varying business needs
 - Augment WMQ's transports beyond its classic rock-solid "back-end" messaging style
 - Underpin and extend ESB architectures

WebSphere MQ



WebSphere MQ V7.0 – Content Summary

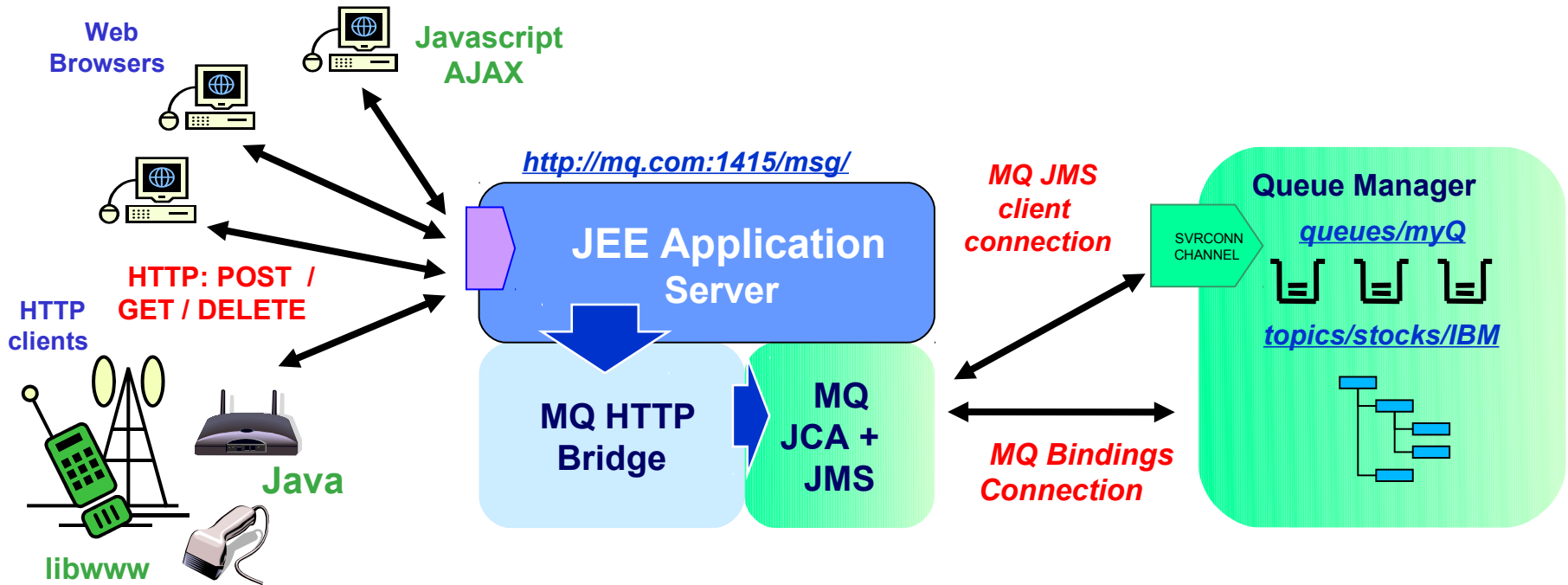
- Enhanced JMS
 - More applications being written to use this API
 - Underpins many SOA/ESB solutions needing access to messaging
 - Improved performance & ease-of-use
- Enhanced Publish-and-subscribe
 - Ease-of-use
 - New support for z/OS
 - Further stage of decoupling between applications
- Extended verbs and behaviors for MQI programming interface
- Enhanced MQ clients for increased throughput resilience and availability

- Web 2.0 support to help create richer user experience

- Evolutionary – if you know V6, you will know V7 – no need to “re-learn”

WebSphere MQ Bridge for HTTP

- Easy access to MQ resources from any device with an HTTP interface
- Extends the scope beyond traditional systems



Governance – MQ Applications are SOA Assets

- Web Services bring new expectations around application governance
 - It must be possible to treat traditional non-SOAP MQ applications as services

- WSDL gives a standard way to describe all MQ apps as SOA assets (services)
 - To be catalogued and governed in a Registry
 - To be queried at runtime for routing decisions
 - To be re-used as services in composite SOA applications
 - To be managed and traced with SOA tools

- Public specification of the WSDL formats for MQ applications

- Support in WSRR

- Wizard delivered in WMQ V7.0.0.1 to simplify generation

WSRR Impact Analysis

WebSphere Service Registry and Repository

Perspective: Administrator Go Support | Help

Graphical View Page Help

Graph for: mq-binding.wsdl

mq-binding.wsdl
WSDL Document

Viewing Window

Impact Analysis for: QUEUEMGR.1

CONNECTQMGR
MQ Queue Manager

QUEUEMGR
MQ Queue Manager

QUERY.CUSTOMER.INPUTQ
MQ Queue

QUEUEMGR.1
MQ Connection

queryCustomerService
Service

queryCustomerPort
Port

mq_insurance_port
Extension Logical Object

mq_insurance_ops
Binding

mq_insurance_po
Type

Input

Name: mq_insurance_port
Type: Extension Logical Object
namespace: http://www.ibm.com/wmq/wsdl
version:
description:
bsrURI: 071d2107-8643-4344.a6c6.da114adac6f2

Options

Object Display Mode

- All Objects
- Derived Objects
- External Relationships

Graph Display Depth

- Automatic

List History

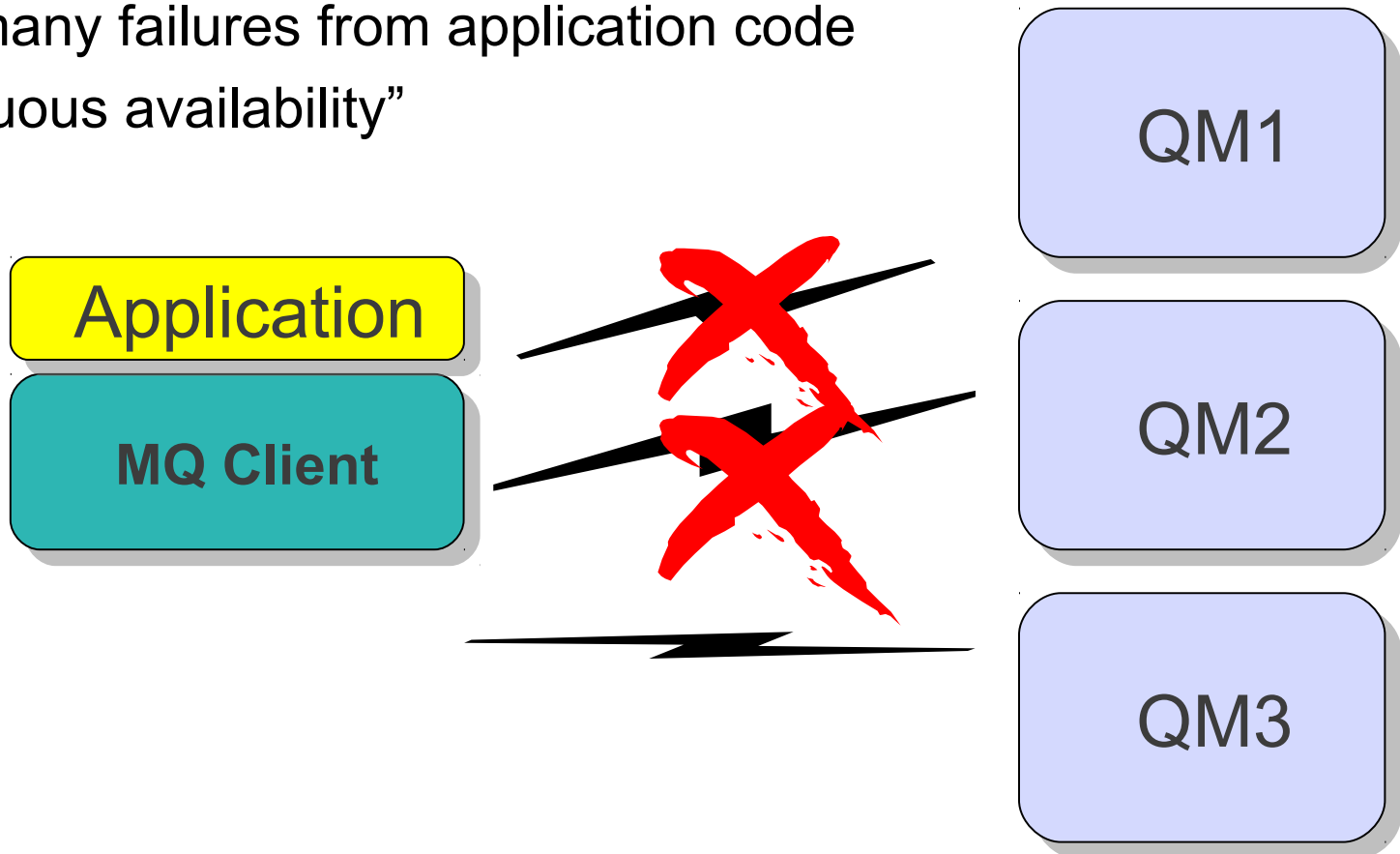
Multi-instance Queue Managers

- Extends availability options for the Distributed platforms (Unix, Linux, Windows)
- Basic failover support without a separate HA coordinator
- Faster takeover: fewer moving parts
- Cheaper: no specialised software or administration skills needed

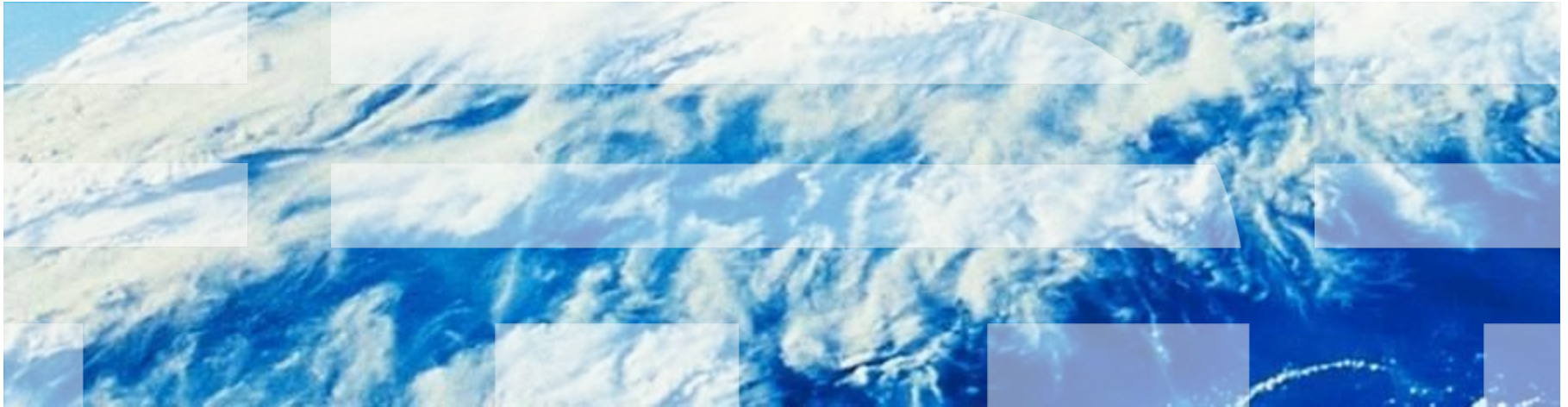


Automatic Client Reconnection

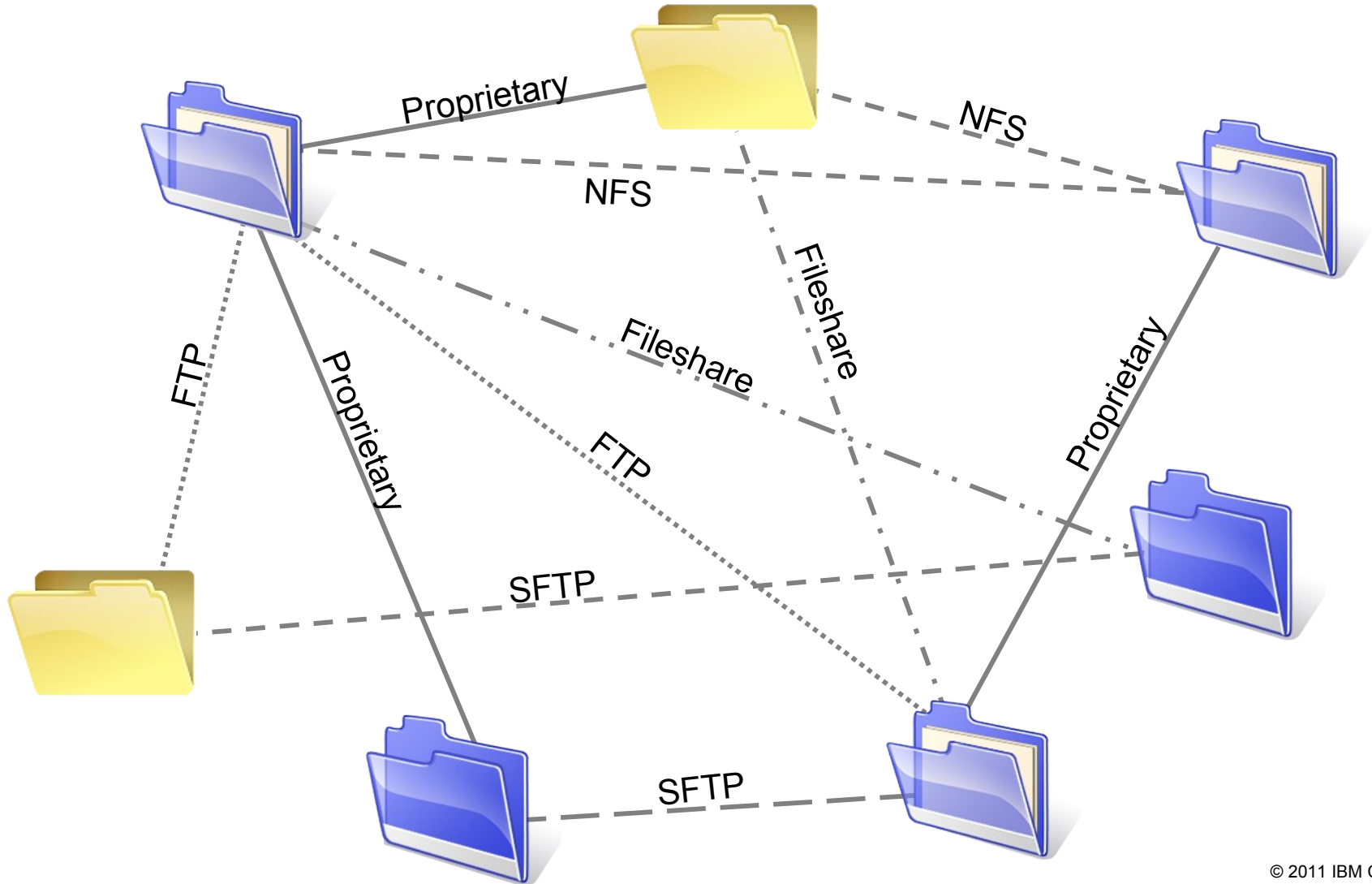
- Client library provides reconnection logic on detection of a failure
- Simplifies application programming
- Hides many failures from application code
- “Continuous availability”



File Transfer



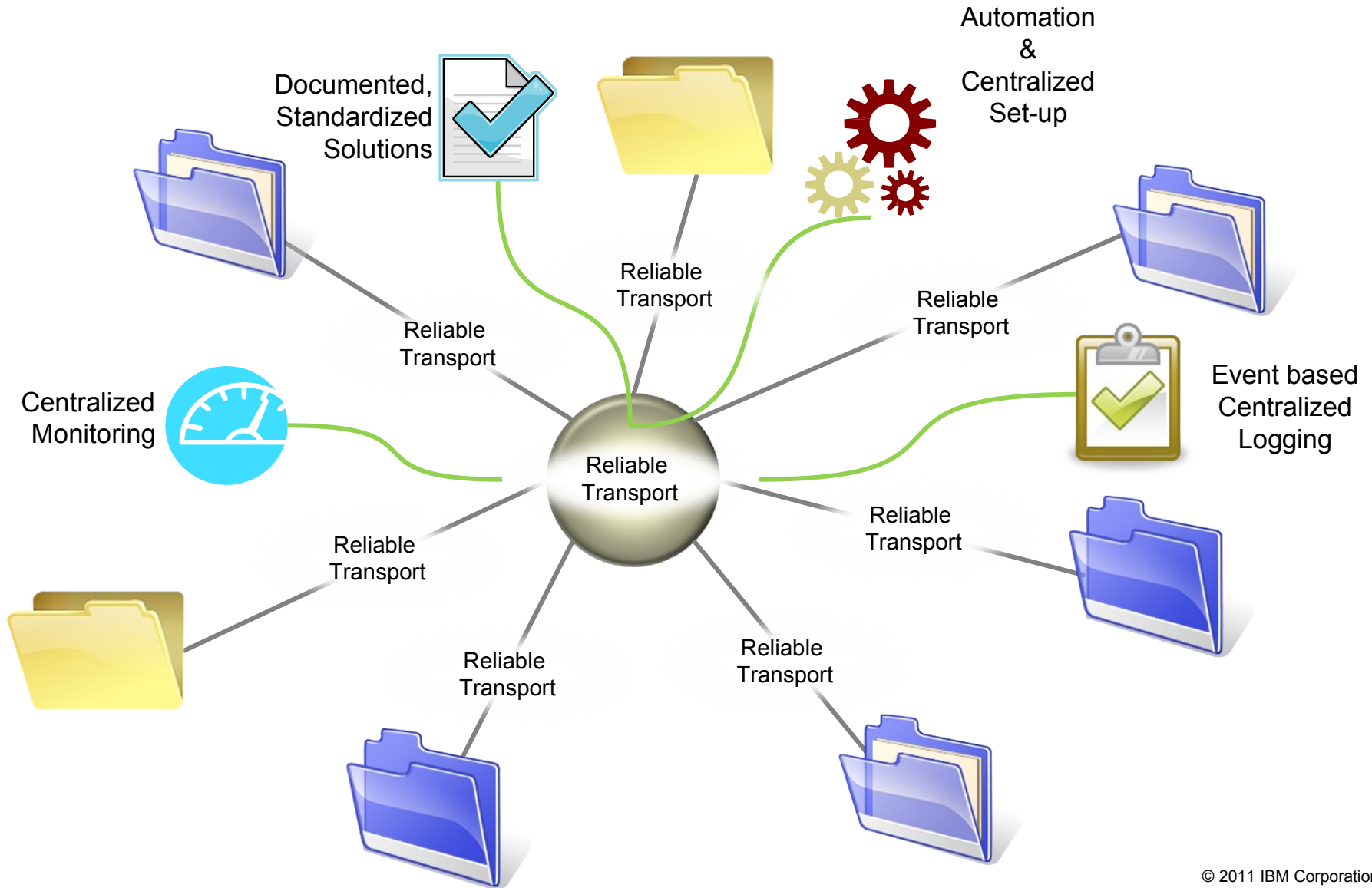
Typical File Movement Implementations



Typical File Movement Implementation **Issues!**

- ✘ Unreliable transport mechanisms
- ✘ No central set-up, logging or monitoring
- ✘ Poor documentation → Dependency on individuals
- ✘ Expensive, one-off solutions
- ✘ High maintenance costs (60 – 70% of a company's IT budget)
- ✘ Lack of business agility

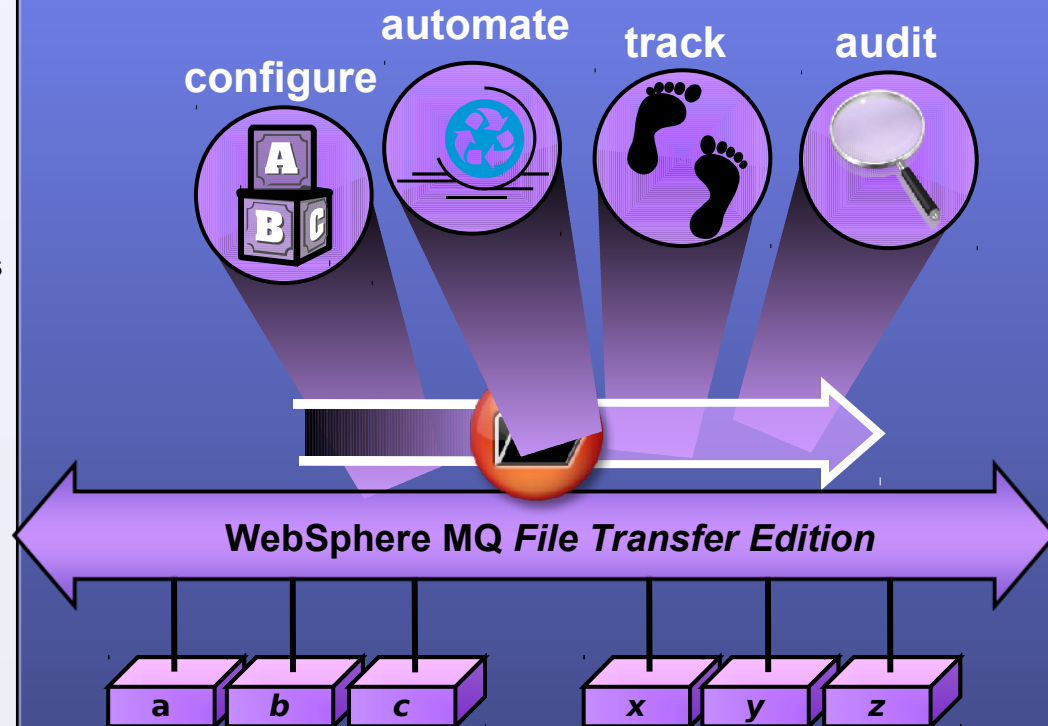
Ideal File Transfer Infrastructure



Introducing WebSphere MQ File Transfer Edition

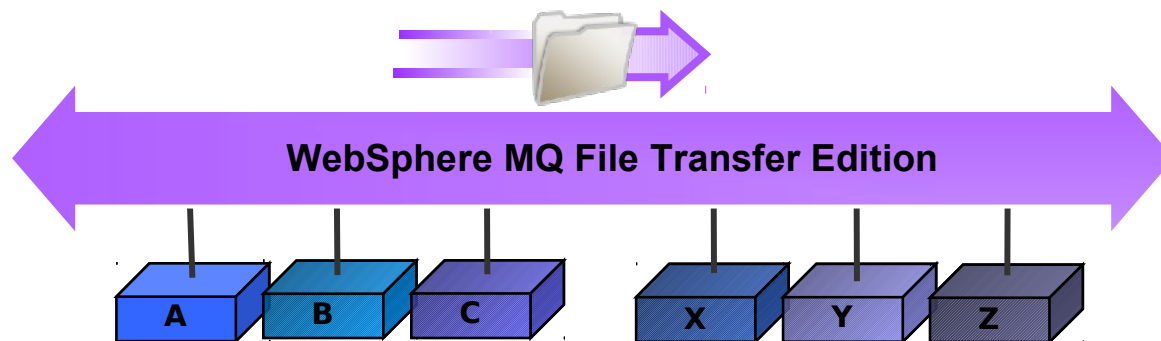
Adds file transfer services to WebSphere MQ to enable managed file movement
Multi-purpose solution combining file transfer and messaging on a single backbone

- ✓ **Reliable** – leveraging the WebSphere MQ transport
- ✓ **Multi-purpose** – transfers both messages and files
- ✓ **Auditable** – logging subsystem tracks transfer at source and destination for audit purposes
- ✓ **Centralized** – monitoring, control and configuration
- ✓ **No need to program** – no MQ skills required
- ✓ **Graphical tooling** – visual configuration and status
- ✓ **Moves Massive files** – no size limit, Kb, Mb, Gb...
- ✓ **Command line interface** – for advanced users
- ✓ **Scripting support** – enables automation via scripting of complex multi-step transfers in XML using Apache Ant
- ✓ **Flexible backbone** – moves files from anywhere to everywhere in network
- ✓ **Integration** with MQ-enabled apps and ESBs
- ✓ **Automatic** file character conversion
- ✓ **Security** of file payload using SSL
- ✓ Support a multiple range of Platforms and O/S



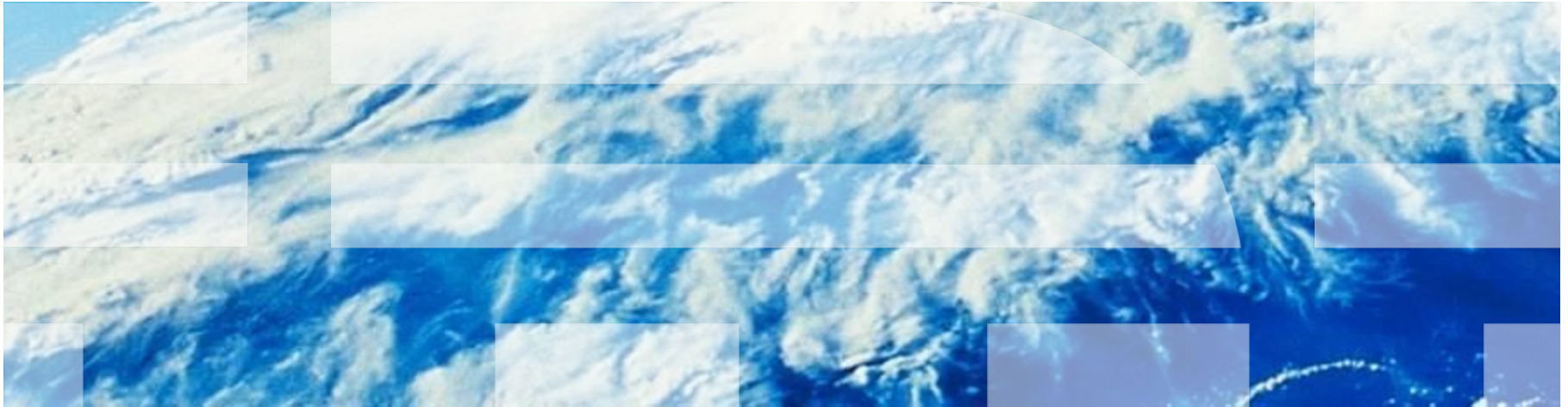
WebSphere MQ File Transfer Edition Capabilities

- Enables reliable, secure and traceable file transfers
- Replaces costly, home-grown solutions that lack management controls
 - Assured Delivery of Files
 - Guaranteed 100% Integrity
 - Any file size (Kb, Mb, Gb, Tb...)
 - Powerful graphical tooling
 - No need for programming
 - Reliable delivery leveraging MQ
 - Full logging for audit purpose
 - High performance
 - Character set conversion between platforms
 - Industry standard SSL security and other external security (PGP...)
 - Compression, Encryption
 - XML scripting for distributed Job Automation
 - Multi-purpose solution – transports both messaging and files
 - Supports many platforms



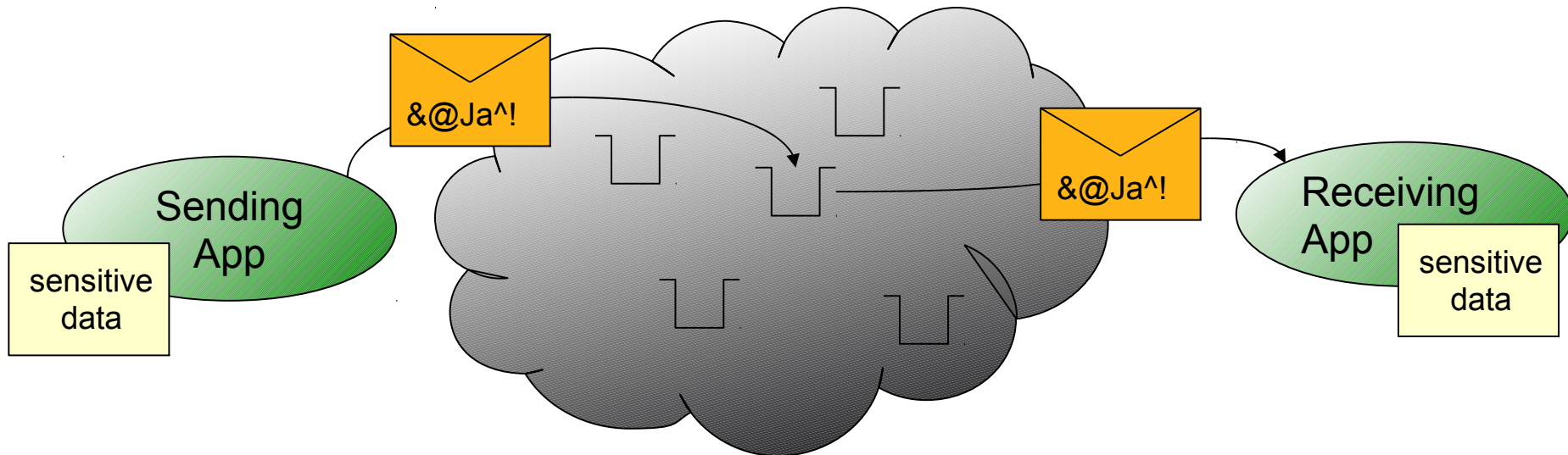
“Move files in a managed way from anywhere to everywhere”

Advanced Message Security



Snapshot: what is MQ Advanced Message Security?

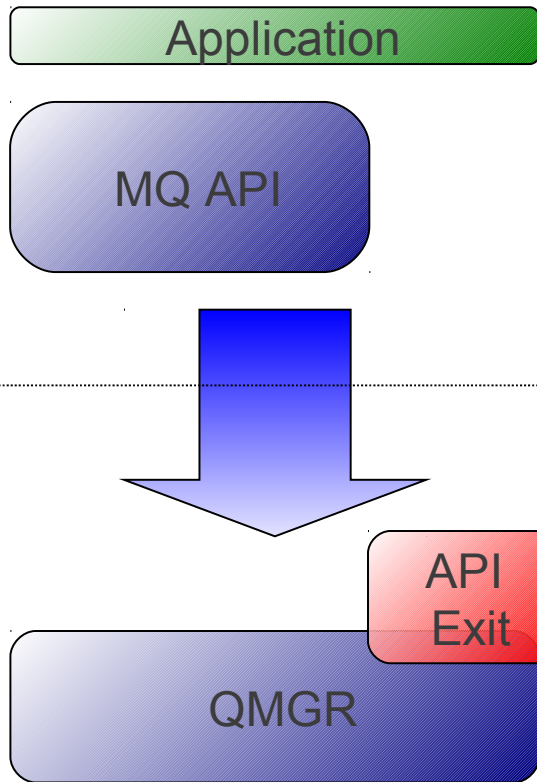
- Adds **message-level security** to existing WebSphere MQ (V6 & V7)
- Protects data application-to-application, at rest on queue & in transit
- Drops in to existing MQ & Broker networks without change to applications
- Simplifies regulatory compliance (PCI, HIPAA, SOX, et al.) for audit & privacy



MQ & JMS apps use it transparently: no changes!

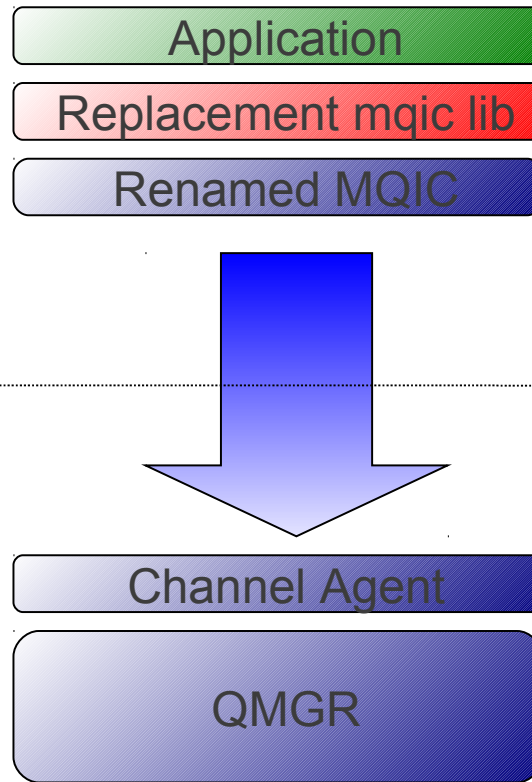
Server

- API Exit



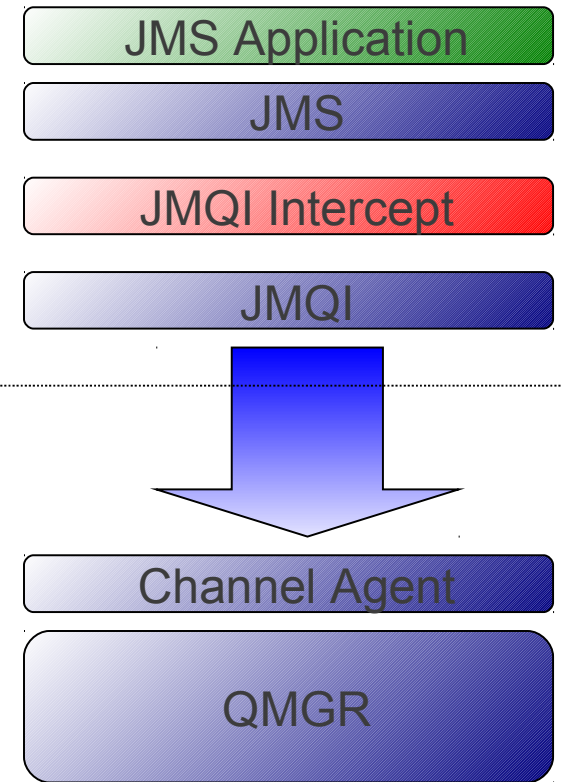
Client

- Library Replacement



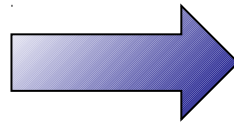
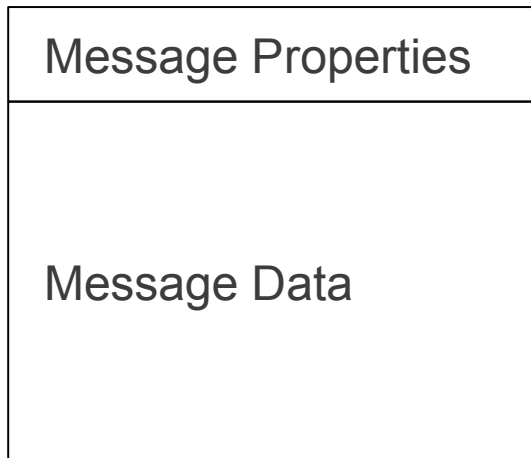
JMS

- JMQUI Intercept

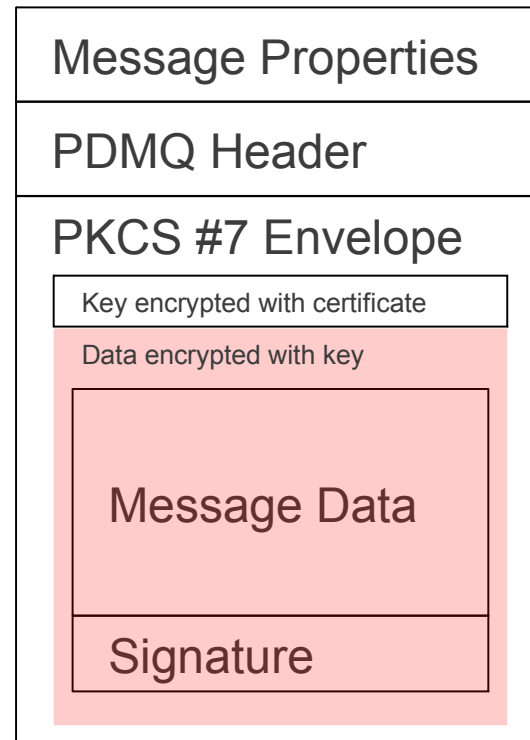


MQ AMS puts your sensitive data in a secure envelope

Original Message

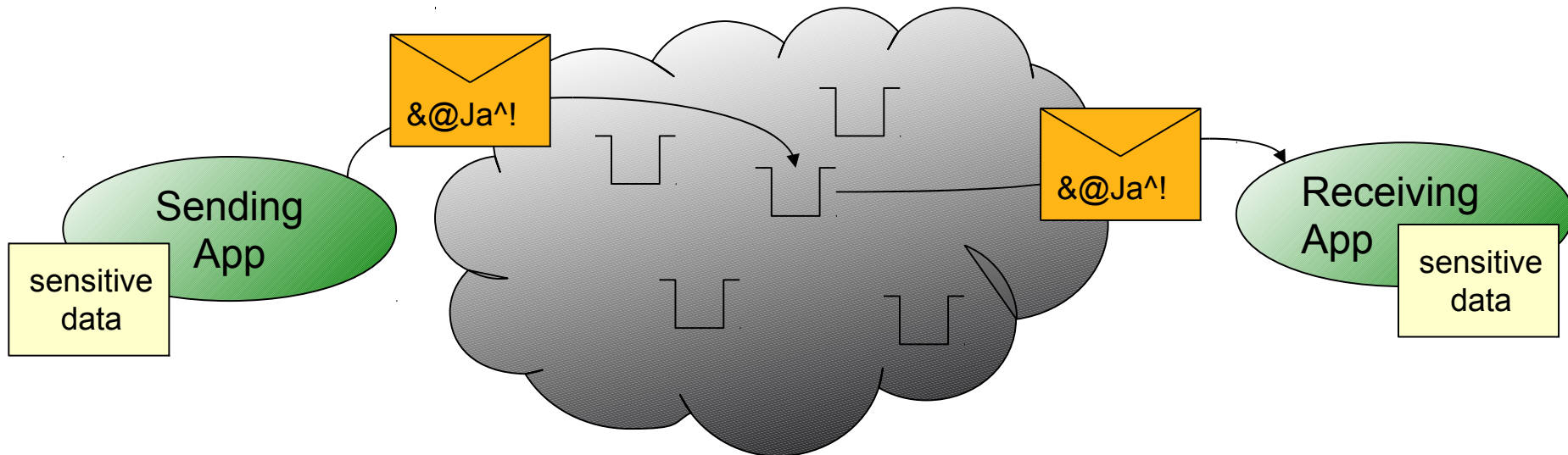


AMS Protected Message



Then drops it into your MQ network

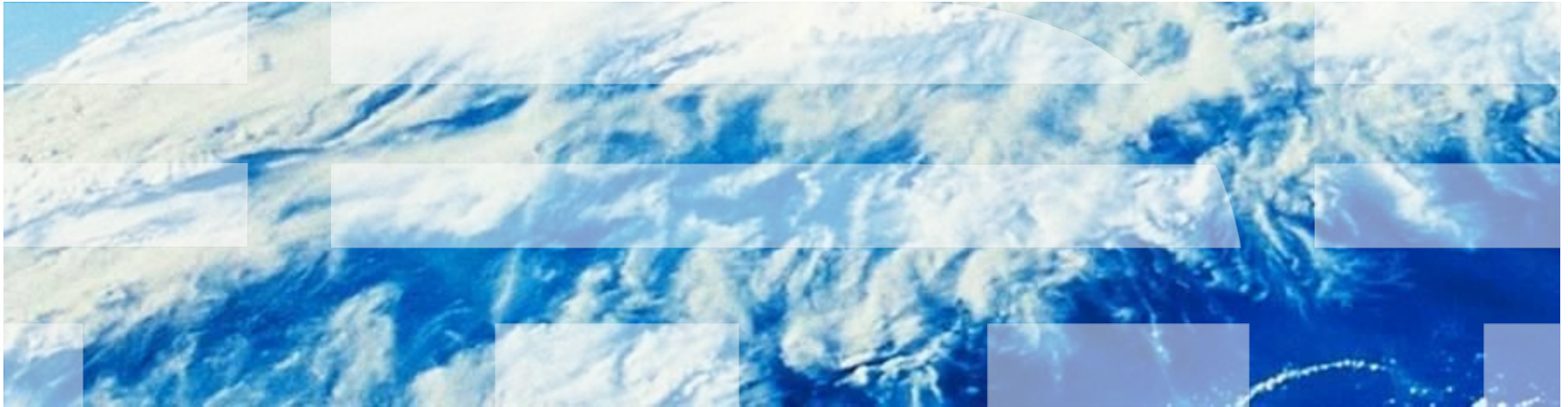
- Application-to-Application secure message transfers
 - Privacy & integrity protected in transit AND at rest in queues (unlike SSL)
- Assurance that messages have not been altered in transit
 - When issuing payment information messages, ensure the payment amount does not change before reaching the receiver
- Assurance that messages originated from the expected source
 - Receiver validate sender's X.509 signature. Rejects rouge messages
- Assurance that messages can only be viewed by intended recipient(s)
 - When sending confidential information, even MQ admin can't see it



Protecting files transferred with WMQ FTE

- AMS plugs in on top of / alongside WebSphere MQ File Transfer Edition, enabling file data to be encrypted in transit through the MQ network
- Apply AMS protection to your WMQ FTE agent data queue
- ... it's that simple!

Telemetry



The Internet of Things

Trillions of smart devices **instrument** our world today

Interconnecting these smart devices creates a **Central Nervous System**

Design principles of MQTT

- Publish/subscribe messaging paradigm as required by the majority of SCADA and sensor applications.
- Minimise the on-the-wire footprint.
- Expect and cater for frequent network disruption – built for *low bandwidth, high latency, unreliable, high cost* networks
- Expect that client applications may have very limited processing resources available.
- Provide traditional messaging qualities of service where the environment allows.
- Publish the protocol *royalty-free* for ease of adoption by device vendors and third-party client software.



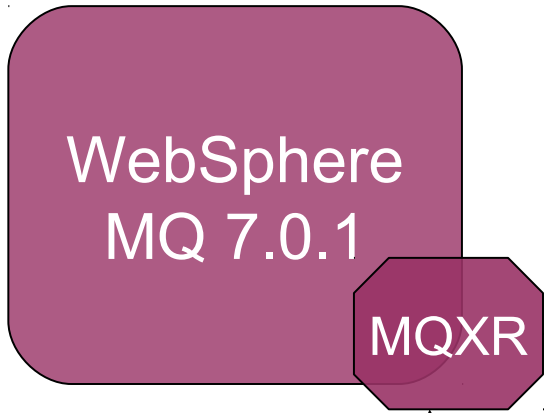
Key facts about MQTT

- Reduced complexity and footprint
- Simple, minimal pub/sub messaging semantics
 - Asynchronous (“push”) delivery of messages to applications
 - Simple verbs: connect, publish, (un)subscribe, disconnect
- Minimised on-the-wire format
 - Plain byte array message payload
 - No application message headers
 - Protocol compressed into bit-wise headers and variable length fields
 - Smallest possible packet size is 2 bytes
- In-built constructs to support loss of contact between client and server
 - “Last will and testament” to publish a message if the client goes offline
 - Stateful “roll-forward” semantics and “durable” subscriptions



Topology example: "advanced" clients

WebSphere MQ Telemetry



Sensors



Mobile, smart meters



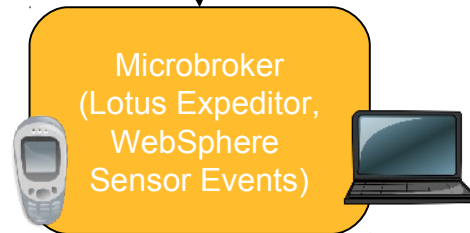
Applications



WebSphere MQ Telemetry Daemon for Devices



Rich clients requiring buffering, remote management capabilities, or advanced data handling



WebSphere software

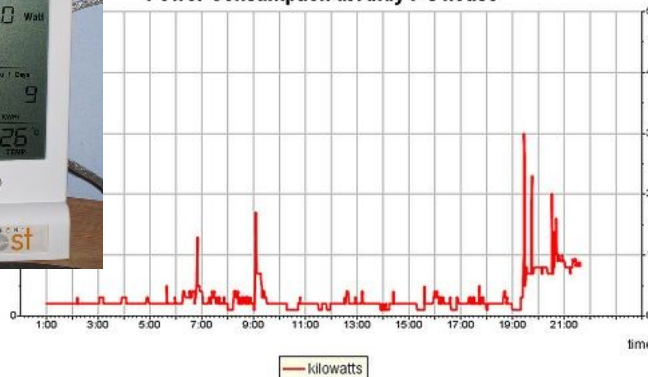
Lotus software

Broader integration

Simple
 Lightweight (CPU, Mem, **Net)
 Data-centric
 Distribution (pub/sub)
 Range of QoS
 => developer/community interest!



Power Consumption at Andy P's house



Clients

Note: although there is a range of options available for developers interested in MQTT, not all of the client APIs listed below support for all of the features of the latest MQTT specification. Some are at an early or experimental stage of development, mature. Check with the provider for the current status of your preferred language implementation.

C

- WebSphere MQ Telemetry provides a C client API
- Lotus Expeditor micro broker includes a C client API
- [IA93](#) – a WebSphere Message Broker SupportPac
- [libmosquitto](#) – a C client library provided with the mosquitto server
- [liblwmqtt](#) – a very lightweight C client

Java

- WebSphere MQ Telemetry provides a Java client API
- Lotus Expeditor micro broker includes two Java client APIs
- [IA92](#) – a WebSphere Message Broker SupportPac

.NET

- Lotus Expeditor micro broker includes a .NET client API.
- [MqttDotNet](#)
- [nMQTT](#)

Delphi

- [MQTT Client Library for Delphi](#)

C++

- [libmosquitto.cpp](#) – a C++ client library provided with the mosquitto server

Ruby

- [ruby-mqtt](#) – a pure Ruby gem

Python

- [libmosquitto-python](#) – a Python client module provided with the mosquitto server

PHP

- [phpMQTT](#) – an open source PHP implementation of MQTT
- [Simple Asynchronous Messaging \(SAM\)](#) – Includes support for MQTT and WebSphere MQ

Perl

- [net-mqtt-perl](#)
- [anyevent-mqtt-perl](#) – Perl modules for MQTT using AnyEvent
- [WebSphere-MQTT-Client](#)

Erlang

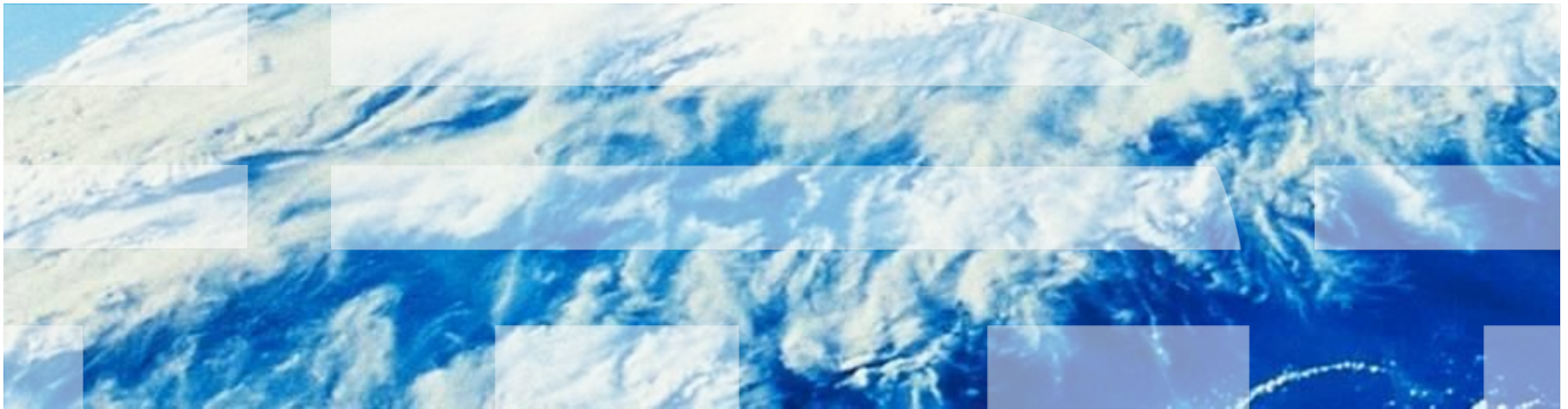
- [mqtt4erl](#)

Other

- [Arduino Client for MQTT](#)
- [mbed client for MQTT](#)



Examples



Smarter Healthcare

Medical organization 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

Enables higher level of patient care and peace of mind

Improves administrative efficiency and maintenance

Helps conform to standards and ease integration of data

Improving Energy Usage

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



Business Partner

Needs robust middleware technology to connect to remote smart meters

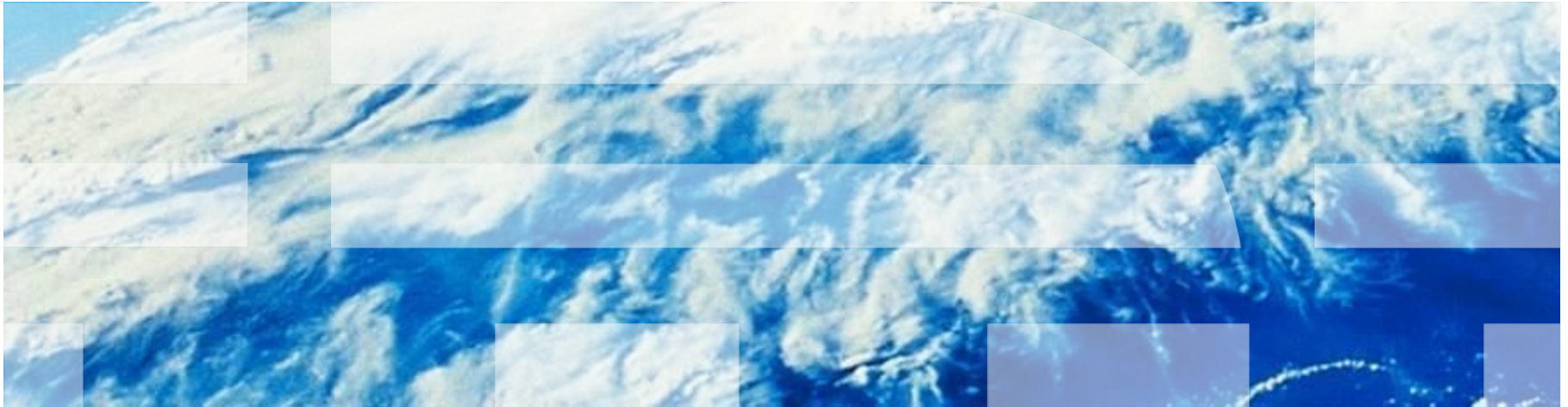
Needs to be able to rapidly scale solution nationally

Able to offer daily energy savings of 15-20%

Enables utilities to reduce peaks and avoid punitive charges

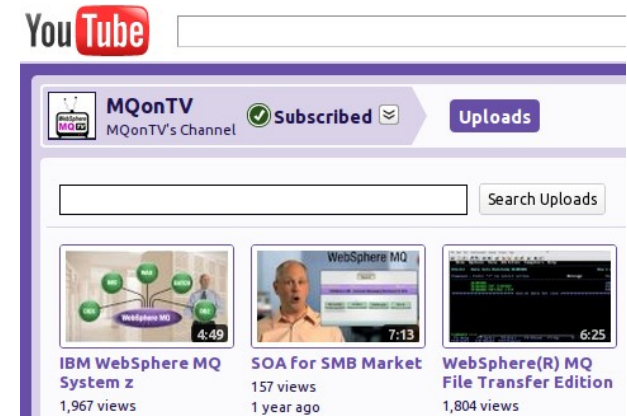
Helps save electricity through better peak load management

Community



We love our users!

- developerWorks
- MQSeries.net community
 - <http://mqseries.net/>
- MQTT – <http://mqtt.org>
- IBMer's Blog on Messaging on developerWorks
- Twitter - @IBM_WMQ and @IBM_Broker
- Store and Forward – T.Rob's WMQ Security blog
 - <http://t-rob.net/>
- Open, vibrant ecosystem
 - e.g. PyMQI, mosquito, etc. etc.



Thank you!

Contact: Andy Piper andy.piper@uk.ibm.com
<http://twitter.com/andypiper> | <http://andypiper.co.uk>

