Extending IBM WebSphere MQ and WebSphere Message Broker to the Clouds
5th February 2013
Session 12628

Ralph Bateman (ralph@uk.ibm.com)
STSM, Messaging and Integration Customer Support
IBM Hursley Lab
Topics

- Cloud Concepts
- Introduction to PureApplication System, IWD, and SCAS
- Patterns and Messaging
- Virtual System Pattern – WebSphere MQ Hypervisor Edition
- Virtual Application Pattern – Messaging Extension
- Virtual System Pattern – Message Broker
- Reference – Current Versions and Links
Cloud Deployment Models

- **Private**
  - Used solely by the owning organisation
  - Benefits include in-house storage of critical data

- **Community**
  - Owned by several organisations but supporting a specific community
  - Some of the benefits of public cloud whilst in a closed community

- **Public**
  - The consumer and provider of cloud services are separate enterprises
  - Benefits include low-cost and scalability

- **Hybrid**
  - Seamlessly combines services from public and private cloud
  - Combination of benefits, but requires careful placement of secure/regulated data and apps
Cloud Service Models

- Reflect the traditional computing layers
- **Software as a Service (SaaS)**
  - Provides access to hosted applications or services, which may themselves use PaaS and IaaS services
  - Usage based charging, per hour or per ‘transaction’
- **Platform as a Service (PaaS)**
  - Application Centric view - consumer’s application deployed into an environment hosted in the cloud
  - Platform takes care of application dependencies
  - Charging by licensed capacity or by usage
  - e.g.: IBM PureApplication System, Google App Engine
- **Infrastructure as a Service (IaaS)**
  - Access to compute and storage resources as a service
  - Virtualization speeds deployment of patterns of standardised images giving more control over software versions, reduced setup cost, faster time to value
  - Charging generally by (virtual) machine capacity
  - e.g.: IBM Workload Deployer, PureApplication System, VMWare, IBM SmartCloud, Amazon EC2
Topics

- Cloud Concepts

- IBM SmartCloud, PureApplication System, IWD and SCAS

- Patterns and Messaging

  - Virtual System Pattern – WebSphere MQ Hypervisor Edition

  - Virtual Application Pattern – Messaging Extension

  - Virtual System Pattern – Message Broker

- Reference – Current Versions and Links
IBM SmartCloud

An open, enterprise-class Cloud platform optimized to proven best practice patterns

- **Resilient to the velocity** of changing business needs
- **Choice & Flexibility** in hybrid delivery & consumption models
- **Built-in Expertise** enabling workload awareness & optimization
- **Secure & Scalable** smoothing evolution from existing environments
- **Integrated analytics** improving QoS and responsiveness
Virtual Application Patterns

• Highly automated deployments using expert patterns
• Business policy driven elasticity
• Built for the cloud environment
• Leverages elastic workload management services

Virtual System Patterns

• Automated deployment of middleware topologies
• Traditional administration and management model
• Application and infrastructure driven elasticity

Virtual Appliances

• Standard software installation and configuration on OS
• Images created through extend/capture
• Traditional administration and management model
• Infrastructure driven elasticity

Virtual Appliance

Software application
OS
Metadata

Virtual System

HTTP Server
Operating System
Metadata

HTTP Server
Operating System
Metadata

Application Server
Operating System
Metadata

Application Server
Operating System
Metadata
Patterns accelerate business value

*What the business wants...*  
Enterprise Application
Scaling Policy
Database

*What’s required...*
- HTTP Server
- Application Server
- WAR File
- Monitoring Lifecycle Management
- Caching Server
- Caching Server
- LDAP
- Database

Complete your sessions evaluation online at SHARE.org/SFEval
What will be needed tomorrow…
Scaling Type

Response Time Based

Scaling in/out when Web response time is out of threshold range (ms):

Range: 1000 - 5000

Instance number range of scaling in/out:

Range: 1 - 10

Minimum time (sec) to trigger add/remove:

120
Initiates a fully scalable Web Application
SmartCloud Family

IBM Workload Deployer

Deploy patterns into your existing infrastructure

Multiple Deployment Models

IWD UI / CLI / REST API

Accelerate deployments with expert integrated systems

Immediate access to managed services

Enterprise data center

Managed private cloud

Enterprise

Hosted private cloud

Enterprise

Shared cloud services

Existing Infrastructure
IBM Workload Deployer

- Hardware appliance
- Supports heterogeneous server, networking, storage & middleware
- Get started easily deploying to:
  - VMware ESX
  - PowerVM
  - zVM
IBM PureApplication System

**Complete, Ready-to-Go Systems**
- Pre-integrated, up and running in <4 hours
- Pre-optimized for enterprise application workloads

**Simplify Ongoing Tasks**
- Single point of platform and application management
- Repeatable self service application provisioning

**Built for Cloud**
- “Platform as a Service”
- Elastic application runtimes
IBM SmartCloud Services

- Includes IBM hosted Enterprise PaaS with unprecedented choice in app development, deployment and management

- The PaaS is hosted on IBM IaaS, with enterprise-class governance, administration, and management control

- The most complete set of automated and integrated services to support enterprise applications

- Real business-centric SLAs that align IBM accountability to your business

- Multiple IBM hosted delivery models allow clients to optimize against economics, integration, security and control
Topics

- Cloud Concepts
- Introduction to PureApplication System, IWD, and SCAS
- Patterns and Messaging
  - Virtual System Pattern – WebSphere MQ Hypervisor Edition
  - Virtual Application Pattern – Messaging Extension
  - Virtual System Pattern – Message Broker
- Reference – Current Versions and Links
MQ Hypervisor Editions allow automation and standardisation of the traditional approach to provisioning messaging systems, which combined with IWD/PureApp gives many benefits:

- Standardization of software images reduces risk and uncertainty
- Automated provisioning reduces errors and speeds time to value
  - Repeatable configuration across sets of machines is quicker and less error-prone
- Applying software maintenance is simpler and quicker using IWD/IPAS GUI or CLI
- Comprehensive history/audit is maintained
- License tracking is integrated
# Comparison of MQ Hypervisor Edition and Messaging Extension for Web App Pattern

<table>
<thead>
<tr>
<th>Pattern type</th>
<th>MQ Hypervisor Edition</th>
<th>IBM Messaging Extension for Web App Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audience</td>
<td>• System admins&lt;br&gt;• MQ administrators&lt;br&gt;• MQ developers</td>
<td>• JEE app developers&lt;br&gt;• JEE app testers&lt;br&gt;• JEE app deployers</td>
</tr>
<tr>
<td>MQ knowledge required</td>
<td>Medium / High</td>
<td>Low</td>
</tr>
<tr>
<td>Pattern dependencies</td>
<td>None</td>
<td>• Web Application pattern 2.0&lt;br&gt;• OS pattern</td>
</tr>
<tr>
<td>Intended use:</td>
<td>• Rapid provisioning of standardised middleware in virtual environments.&lt;br&gt;• Repeatable automated configuration; Simplified maintenance; Audit trail and License tracking.&lt;br&gt;• MQ HVE adds virtual image&lt;br&gt;• Traditional MQ admin model.</td>
<td>• Quick and simple modelling and rapid deployment of applications&lt;br&gt;• Cloud automatically provisions and configures middleware prerequisites&lt;br&gt;• MQ adds rapid provisioning of black-box messaging server for JEE environments&lt;br&gt;• Little/No MQ knowledge required</td>
</tr>
</tbody>
</table>
Topics

- Cloud Concepts
- Introduction to PureApplication System, IWD, and SCAS
- Patterns and Messaging
- Virtual System Pattern – WebSphere MQ Hypervisor Edition
- Virtual Application Pattern – Messaging Extension
- Virtual System Pattern – Message Broker
- Reference – Current Versions and Links
WebSphere MQ Hypervisor Edition 7.0.1 Updates

- Two MQ Hypervisor products (HVEs) were delivered in 2011
  - WebSphere MQ Hypervisor Edition for Red Hat Enterprise Linux
    • RHEL 5.5, WMQ 7.0.1.4
  - WebSphere MQ Hypervisor for AIX
    • AIX 6.1 TL5, WMQ 7.0.1.6

- Can be deployed as Virtual System Patterns from IBM Workload Deployer and IBM PureApplication System
  - MQ HVE for RHEL can also be deployed direct to VMware ESX

- The HVEs were updated in June 2012 as follows:
  - MQ HVE for RHEL - RHEL 6.2, WMQ 7.0.1.8
  - MQ HVE for AIX – AIX 6.1 TL6, WMQ 7.0.1.8
WebSphere MQ Hypervisor Edition 7.5

- WebSphere MQ Hypervisor Edition V7.5 for Red Hat Enterprise Linux Server available August 21st 2012
  - RHEL 6.2, WMQ 7.5.0.0
- Deploy in virtual system patterns from IBM Workload Deployer and IBM PureApplication Systems
  - Can also be deployed direct to VMware ESX
- Extends the 7.0.1 HVE with:
  - MQ 7.5 core MQ runtime and clients
  - MQ Telemetry Server and Clients (server needs entitlement)
  - FTE and AMS install packages included in VM and available to install (subject to license entitlement)
  - VM hardened out-of-the-box with additional deploy-time security options

- Command line scripts to simplify image loading to IWD / PureAS appliance
WebSphere MQ Hypervisor Edition comes with simple parts, patterns, and script packages

- When deployed a MQ part creates a VM containing a configured queue manager
- Primarily intended to be composed with other system images in more complex patterns

MQ 7.5 deployment parameters

MQ 7.5 script packages
Topics

- Cloud Concepts
- Introduction to PureApplication System, IWD, and SCAS
- Patterns and Messaging
- Virtual System Pattern – WebSphere MQ Hypervisor Edition
- Virtual Application Pattern – Messaging Extension
- Virtual System Pattern – Message Broker
- Reference – Current Versions and Links
In 2011 MQ delivered initial set of messaging plugins for the IWD web application pattern

- No charge additions to Web Application Pattern
- Enables a web application to connect to an external queue manager
- Appears on palette as Queue, Topic and “Existing Messaging Service” plugins
- Automatically configures the JNDI JMS resources bound into the WAS namespace

In July 2012 the plugins were:
- Enhanced to support Message Driven Beans (IWD 3.1.0.2 and later)
- Included in IBM PureApplication System V1.0
Messaging Extension For Web Application Pattern V2.0

- New Messaging pattern type for IBM Workload Deployer and IBM PureApplication System
  - Separate product which extends Web Application Pattern V2.0
  - Loaded as PatternType to IWD/IPAS
  - Available on PPA from 2012/07/31
- Simplifies Web application deployment by:
  - Provisioning a new virtual machine containing a queue manager for each deployment
  - Creating queues and topics in queue manager
  - Linking new resources to JNDI objects used by application
- Can still connect to existing queue managers, where queues or topics are hosted inside or outside the cloud
- Also supports MDBs
Messenger Extension For Web Application Pattern

1 – New node

2 – Used in Sample App. Can be wired to Web Applications, Enterprise Applications and OSGi Business Applications and is interchangeable with the ‘Existing Messaging Service’.
Messaging Extension For Web Application Pattern

3 – Deployed Application

Virtual Machine Status

Middleware Status

Health status

Web Application

WebSphere MQ

Server with MDB

Simple monitoring

Web

Application Server with MDB

WebSphere MQ

Message Queues

Dead-letter Queue

Client Connections

Channel Activity

Messaging Operations

Enterprise_Application-was. 11338366624275

10.1.31.7

Running Log

May 30, 2012 9:30:31 AM

WAS Endpoint

Messaging_Service-mq. 11338366624276

10.1.31.5

Running Log

May 30, 2012 9:30:31 AM

MQ Endpoint

Web Application 11338366624274

10.1.31.8

Running Log

May 30, 2012 9:30:31 AM

WAS Endpoint

Complete your sessions evaluation online at SHARE.org/SFEval
Topics

- Cloud Concepts
- Introduction to PureApplication System, IWD, and SCAS
- Patterns and Messaging
- Virtual System Pattern – WebSphere MQ Hypervisor Edition
- Virtual Application Pattern – Messaging Extension
- Virtual System Pattern – Message Broker
- Reference – Current Versions and Links
What Is The WMB HvE Pattern?

- A Virtual System Pattern on IBM Pure Application System
- A product to simplify provisioning MB (and MQ)

1. Simplify initial system deploy resulting in quicker time to solution
2. Simplify fix pack deploy to reduce recurring maintenance cost for existing systems

- Pre-built image
  - RHEL 6.2 x86-64
  - Includes all MQ & MB components
  - Includes regular PureAS image & VMWare image

- Configuration Patterns
  - PureAS Patterns
  - PureAS Script Packages
WebSphere Message Broker Components

Deployment using broker Archive (BAR) file
WMB HvE Configuration – PureAS Patterns

- WebSphere Message Broker 8.0.0.1 (Basic)
  - Basic configuration parameters
  - VM specific configuration parameters
  - No specific MB or MQ configuration

- WebSphere Message Broker 8.0.0.1 (Advanced)
  - Extensive configuration parameters
  - MB and MQ
  - Defaults provided

- Four images
WMB HvE Configuration – Script Packages

- Used for additional configuration

- Drag and Drop onto pattern
  - Same script can be dropped multiple times onto a pattern

- Eight pre-defined script packages
  - WMB: Create Configurable Service
  - WMB: Create Execution Group (Advanced)
  - WMB: Create Execution Group (Basic)
  - WMB: Deploy Bar Files
  - WMB: Run MQSC scripts
  - WMB: mqsichangeproperties
  - WMB: mqsisetdbparms
  - WMB: Configure MQ Clustering

- Allows the appropriate properties to be configured directly on the script package residing on the pattern

- Pre-fixed with ‘WMB:’ to separate / group script packages

- User can create own script packages to perform additional tasks
  - Additional configuration
  - Installation of additional applications
Topics

- Cloud Concepts
- Introduction to PureApplication System, IWD, and SCAS
- Patterns and Messaging
- Virtual System Pattern – WebSphere MQ Hypervisor Edition
- Virtual Application Pattern – Messaging Extension
- Virtual System Pattern – Message Broker
- Reference – Current Versions and Links
Reference

- WMQ in Pure Application Systems – Pure System Centre

- WebSphere MQ Hypervisor Editions
  - V7.5 Infocenter
  - System Requirements (V7.0.1) (V7.5)
  - V7.0.1 Announcement Letters: RHEL (211-088), AIX (ZP11-0439)
  - V7.5 Announcement Letter: RHEL (212-277)

- IBM Messaging Extension for Web Application Pattern Type V2.0
  - Infocenter
  - System Requirements
  - Announcement letter: (ZP12-0178)
  - “Existing Messaging Service” plugin documentation
Further Reading

- **Preparing for IBM PureApplication System: Article series on onboarding your applications**

- **Manage the topology with virtual system patterns**

- **Developing script packages for IBM Workload Deployer Virtual System patterns**

- **High availability topologies for IBM PureApplication System**
  - (Not MQ specific but same principles apply)

- **IBM Workload Deployer: Pattern-based Application and Middleware Deployments in a Private Cloud** (Redbook)
Questions?
<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td>Are you running too many queue managers or brokers?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:30</td>
<td></td>
<td>What's New in WebSphere Message Broker</td>
<td></td>
<td></td>
<td>Diagnosing Problems for MQ</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WMQ - Introduction to Dump Reading and SMF Analysis - Hands-on Lab</td>
<td>BIG Data Sharing with the cloud - WebSphere eXtreme Scale and WebSphere Message Broker integration</td>
<td>CICS and WMQ - The Resurrection of Useful</td>
</tr>
<tr>
<td>11:00</td>
<td><strong>Extending IBM WebSphere MQ and WebSphere Message Broker to the Cloud</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01:30</td>
<td>Introduction to MQ</td>
<td>MQ on z/OS – Vivisection</td>
<td>Migration and maintenance, the necessary evil</td>
<td>The Dark Side of Monitoring MQ - SMF 115 and 116 Record Reading and Interpretation</td>
<td></td>
</tr>
<tr>
<td>03:00</td>
<td>First Steps With WebSphere Message Broker: Application Integration for the Messy</td>
<td>BIG Connectivity with WebSphere MQ and WebSphere Message Broker</td>
<td>WebSphere MQ CHINIT Internals</td>
<td>Using IBM WebSphere Application Server and IBM WebSphere MQ Together</td>
<td></td>
</tr>
<tr>
<td>04:30</td>
<td>WebSphere MQ application design, the good, the bad and the ugly</td>
<td>What’s New in the WebSphere MQ Product Family</td>
<td>MQ &amp; DB2 – MQ Verbs in DB2 &amp; Q-Replication</td>
<td>WebSphere MQ Channel Authentication Records</td>
<td></td>
</tr>
<tr>
<td>06:00</td>
<td></td>
<td></td>
<td>Clustering - The Easier Way to Connect Your Queue Managers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thank You!

Extending IBM WebSphere MQ and WebSphere Message Broker to the Clouds