WebSphere MQ
Best Practices
WebSphere MQ Best Practices

Who is this guy ???????????????????

- Bobbee Broderick (1970)
- Experience
  - Wall St Consultant 25+ years (z, CICS, DB2) (MQ, MQSI)
  - MQ/MQSI/WMB since 1998
- IBM – ISSW 8 years
  - Healthchecks
  - Crit Sits
  - Architecture, programming, etc
- Tech Lead for ISSW for MQ and MQFTE (MFT)
  Also for MQAMS/ WMB
- Star of “The Good Shepherd”
- BB Photography
  www.bb-photography.org
- Email – rkbroder@us.ibm.com
WebSphere MQ Industry Practices

Credits

- Talk to your IBM representative
- Talk to your colleagues
- Visit The Capitalware site

http://www.capitalware.biz/
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MQSeries Ten Commandments

1. Thou shalt not use a queue as a database.
2. Thou shalt backup your pagesets, filesystems, and logs.
3. Thou shalt routinely apply maintenance to your WebSphere MQ systems.
4. Thou shalt use MQCLOSE and MQDISC when terminating an application.
5. Thou shalt not use MQGET with WAIT UNLIMITED without specifying MQGMO_FAIL_IF_QUIESCING.
6. Thou shalt secure all client-channel connections to a queue manager.
7. Thou shalt create standard naming conventions.
8. Thou shalt provide systems management tools for administrators and users.
9. Thou shalt not create a WebSphere MQ network without mapping out all connections and object relations on paper first.
10. Thou shalt not attempt to apply asynchronous methods to all problems simply because WebSphere MQ is a wonderful product.
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MQSeries Ten Commandments - Amendments

- Thou shalt apply security to queue objects.
- Thou shalt have JMS applications capture and log the LinkedException for all JMSExceptions.
- Thou shalt have Unit Of Work (UOW) use the minimum amount of resources (short in duration).
- Thou shalt not use MQOPEN, MQGET or MQPUT without specifying MQ*O_FAIL_IF_QUIESCING (where MQ*O is MQOO or MQGMO or MQPMO).
- Thou shalt have triggered applications completely drain a queue before exiting.
- Thou shalt have applications transfer unknown or invalid messages to an application back-out queue.
- Thou shalt have client applications automatically reconnect to a queue manager after any type of failure.
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Best Practices?

What are they

- Building Blocks for an effective system
- Proven
- Reliable
- Value
- Proprietary
- Cost Effective
- IBM Accepted
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Areas of Concern

- Business Requirements
- Sizing
- Naming Standards
- Logging
- Application Design Standards
- High Availability
- Disaster Recovery
- Monitoring

- Roles
- Skill Development
- Process Approach
- Security
- Clustering
- Release Management
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Business & Project Requirements

➢ Define the requirements
➢ Document interfaces & Stakeholders
➢ Collect Interface Objects
➢ Document the interchange specifications
➢ Define the mappings
➢ Define the SLA requirements
➢ Testing
  ➢ Environments
  ➢ Requirements
  ➢ Implementation requirements
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Sizing - Server

- WebSphere MQ requires:
  - Memory
  - CPU
  - Fast Disk
  - Network
  - IBM Techline
  - Server Estimates
    - Memory, CPU, DISK
    - Workload Based
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Sizing - Queue Manager

- Queue Manager Sizing (Distributed)
  - Log File directory space
  - Log File Type
  - Log File Size - [http://tiny.cc/MQsizing](http://tiny.cc/MQsizing)
- Log File Placement
  - Data Directory Size
  - Queue Buffers
  - Queue Max Size
- Z/OS
  - Bufferpools
  - Logs
  - PageSets
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Naming Standards

- Define a naming standard that works
- More important, define a naming standard
- Select simple names, KISS it
- Avoid object identifiers
- Avoid location identifiers
- Define cluster naming standards
- Use Alias names for local Cluster Queue access
- Keep QMGR Names short
- SDLC identifier (i.e. MQDAPP01)
- Adhere to standards
- Support Pack
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Logging

- Reality
- Log Types – Circular vs Linear
- Log Sizing is important, for distributed, download and use the log file size estimator @ [http://tiny.cc/MQsizing](http://tiny.cc/MQsizing)
- running out of log space is bad.
- Keep logs on spindles separate from other file systems
- z/OS, alternate DASD
- z/OS keep dual logs separate
- DEV and SIT use Circular
- UAT, PROD and DR use linear
- Move archived logs off file system
- Delete after successful restart
- Usually 14 days on weekly restarts
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Application Design Standards

• Create Application programming standards
• Should work with Naming Standards
• Create patterns and detail QMGR interactions
  • Request/Reply
  • Triggering
  • Error Processing
  • Reconnection
  • Poison messages
• Audit / Logging
• Language Specific Interactions
• Create program specification templates
• Create Test Script Templates
• Perform Code Reviews prior to implementation
• Security
• Wrappers
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Application Coding

• Avoid the excessive use of MQCONN and MQDISC
• Trigger on first, read till 2033
• Smaller messages are preferred
• Batching of messages provides performance
• Provide reconnection logic, CCDT or JNDI
• Values
  • Avoid Hard Coding values, parameterize
• Use Persistent messages were needed, not ALWAYS
• Avoid large LUW
• Separate Request Response processing where possible
• Capture Errors
• When finished, Close and disconnect. Even during unexpected termination
• Use MQ for Checkpoint Restart
• Use Properties or Enterprise Headers
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Tools

- What tools do you need
- Do you standardize or give free hand
- Do you buy or borrow?
- What Tools do your application programmers use
- What tools do your administrators use
- What tools do your Business users use
- What tools do your support team use
- Support Packs
- MQ out-of-the-box
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Tools - RFHUTIL
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Tools - MQExplorer
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Testing

- SDLC Cycles
  - Development – Developer testing, initial test script creation
  - System Integration Testing – Integration testing with endpoint. Shakeout of integration specifications. Increased testing script
  - Quality Assurance/User Acceptance Test – Formal Process, Independent group, Secure, isolated, Production ‘like’

- Types
  - Load testing
  - Performance
  - Break
  - Sustained
  - Manual
  - Automated

- Tools
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Testing – Rational Integration Tester
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High Availability

- What does High Availability mean to you and your business?
- Different people, different requirements.
- What is the driving force for the availability of a system?
- Levels - Silver, Gold, Platinum
- What is my approach?
- How do I implement it.
- What am I really getting.
- Active/Passive
- Active/Active
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Disaster Recovery

- End of the world approach
- COB or Real Time
- SLA’s again as determining factor
- Placement of datacenter is key.
- A lot of activity after 9/11 and power grid loss
- File systems are replicated to a secondary datacenter
- Primary activity can be sync or async
- Secondary can be passive or active
- Moving data?
- Dark sites? Resource reduction
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Monitoring

- DO NOT WAIT TILL THE LAST MINUTE.
- Pick your Monitoring Approach.
  - simple or complex
  - Feature rich or basic
- Decide the key factors that provide enterprise wide capabilities
- Centralize your Monitoring Console
- Know what to monitor
- MQ Monitoring - http://tiny.cc/MQMonitoring
Role Definition

- Who are the actors
- What groups control what
- Who do you turn to
- Clear definition
- Multiple Hats
- Training
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Skill Development

- Skilled employees are an asset not a liability
- Training is important for the health of the system
- Changing technologies require training
- In-house, remote, Self Paced
- IBM offers training in all features and components of their software
- External sites are available for training
- Hire vs Train
- Certification Testing
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The SOA Process Approach

- Simplify
- Accelerate
- Secure
- Govern
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Security

- What should be done
  - When you start thinking about security, you need to decide exactly what it is you want to achieve, determine what your objectives are.
  - Ensure each user is uniquely identified
  - Prove that a user is who they say they are
  - Limit Access to authorized users only
  - Track who does what to what and when
  - Protect your sensitive data from unauthorized viewing
  - Check unauthorized changes have not been made to data
  - Ensure a message really is associated with whom it claims

- How
  - SSL
  - MQAMS
  - CHLAUTH, SETMQAUTH, AUTHREC
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Clustering – Why do we use it

- Simplified administration
  - Large WMQ networks require many object definitions
    - Channels
    - Transmit queues
    - Remote queues
- Workload balancing
  - Spread the load
  - Route around failures
- Flexible connectivity
  - Overlapping clusters
  - Gateway Queue managers
- Pub/sub Clusters
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Clustering

• Don’t have too many cooks
  • Treat a single cluster as a single point of administration
  • Have well defined policies for the gateway queue managers
• Treat all overlapping clusters as a single Namespace
  • Channel names, and therefore queue manager names, should be unique throughout.
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Clustering – Full Repositories

- FRs should be highly available
  - Avoid single point of failure - have at least 2
  - Recommended to have exactly 2 unless you find a very good reason to have more
  - Put them on highly available machines
- FRs must be fully inter-connected
  - Using manually defined cluster sender channels
- If at least one FR is not available or not fully connected
  - Cluster definition changes via FRs will not flow
  - User messages between Partial Repositories over existing channels will flow
- Should applications run on full repositories?
  - Best Practice hat on: No
- What if I need to take them down for maintenance?
  - Use the fact that you have two!
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Refresh Cluster and the History Queue

- REFRESH CLUSTER considered harmful?
  - Sledgehammer approach
  - Review processes first and see if step missed
- SYSTEM.CLUSTER.HISTORY.QUEUE
  - Version 7.0.1
  - Snapshot captured at refresh time
  - Serviceability enhancement
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Release Management

- MQ releases Fix Packs frequently
- MQ releases interim fixes between Fix Packs
- Fix Pack are cumulative
- Organizations typically lack planning
- Upgrades are not planned and troublesome
- System Outages
- Plan for upgrades
- Proactive vs Reactive
Thank you for your attention
Any questions?