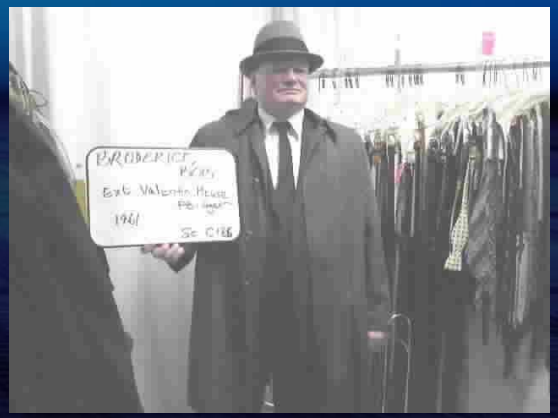
WebSphere MQ Best Practices

Smarter Process

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 collegues
- Visit The Capitalware site

http://www.capitalware.biz/

WebSphere MQ Best Practices

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.

WebSphere MQ Best Practices

Best Practices?

What are they

- Building Blocks for a effective system
- Proven
- Reliable
- Value
- Proprietary
- Cost Effective
- IBM Accepted

WebSphere MQ Best Practices

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

WebSphere MQ Best Practices

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

WebSphere MQ Best Practices

Sizing - Server

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

WebSphere MQ Best Practices

Sizing - Queue Manager

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

WebSphere MQ Best Practices

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

WebSphere MQ Best Practices

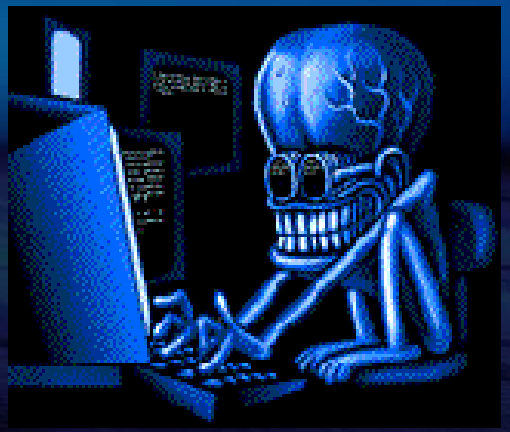
Logging

- Reality
- Log Types – Circular vs Linear
- Log Sizing is important, for distributed, download and use the log file size estimator @ **http://tiny.cc/MQsizing**
- 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

WebSphere MQ Best Practices

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

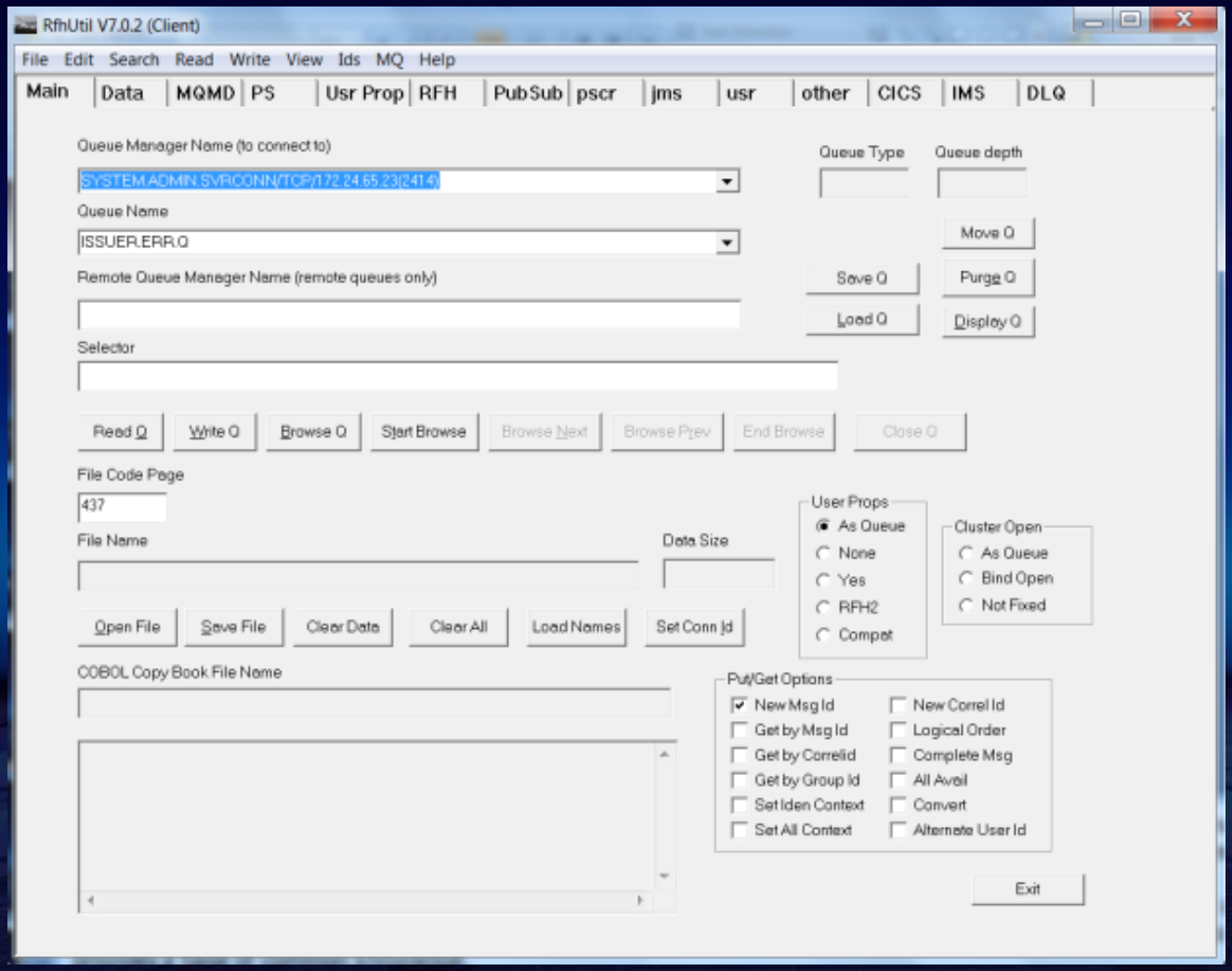
WebSphere MQ Best Practices

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

WebSphere MQ Best Practices

Tools - RFHUTIL



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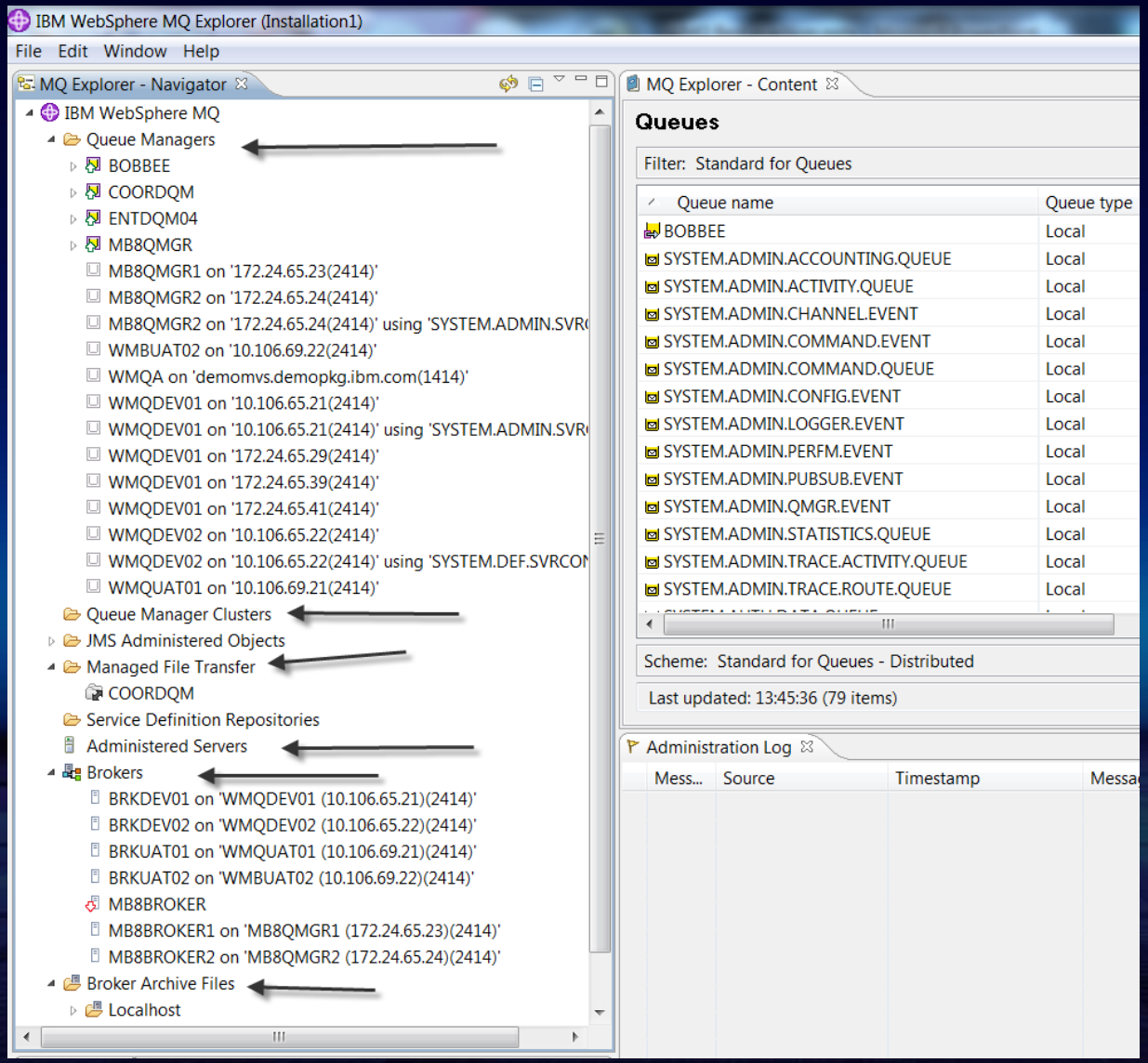
Tools - MQExplorer



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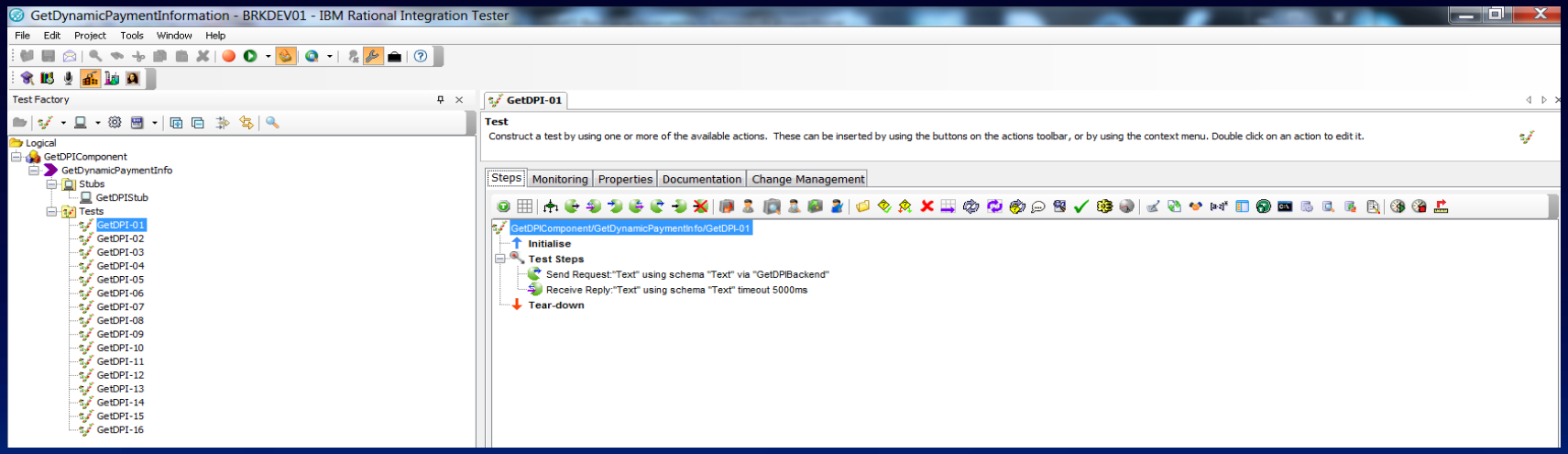
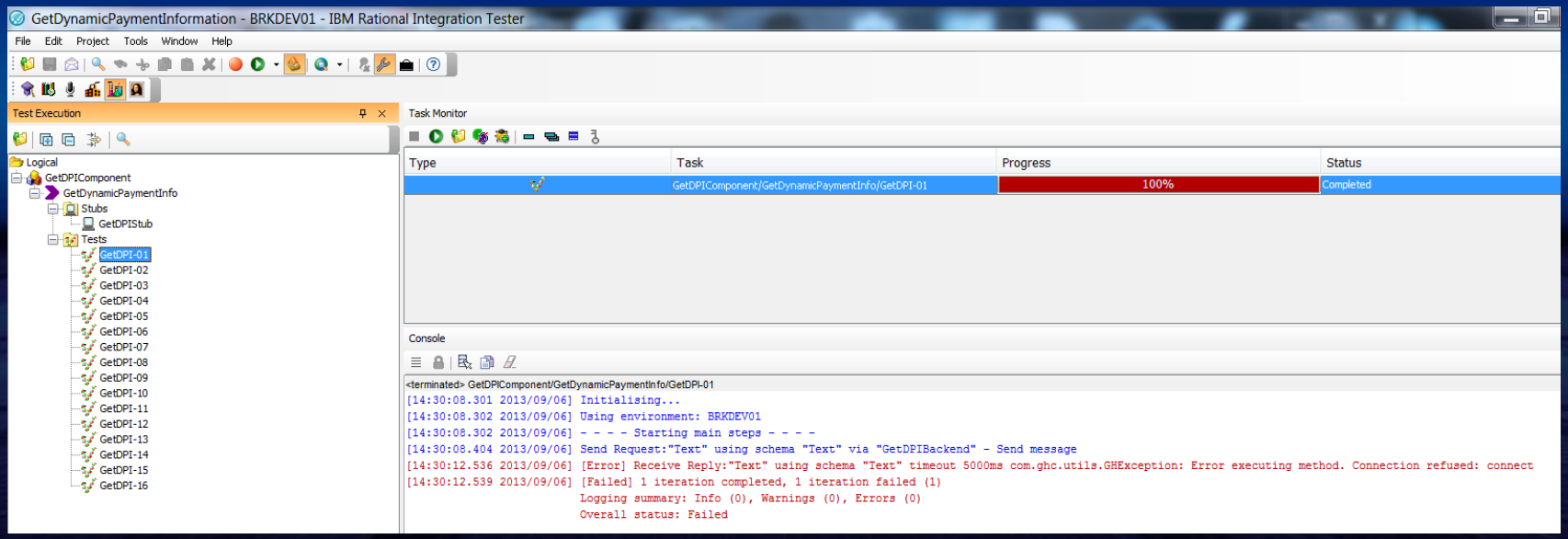
Testing

- **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**

WebSphere MQ Best Practices

Testing – Rational Integration Tester





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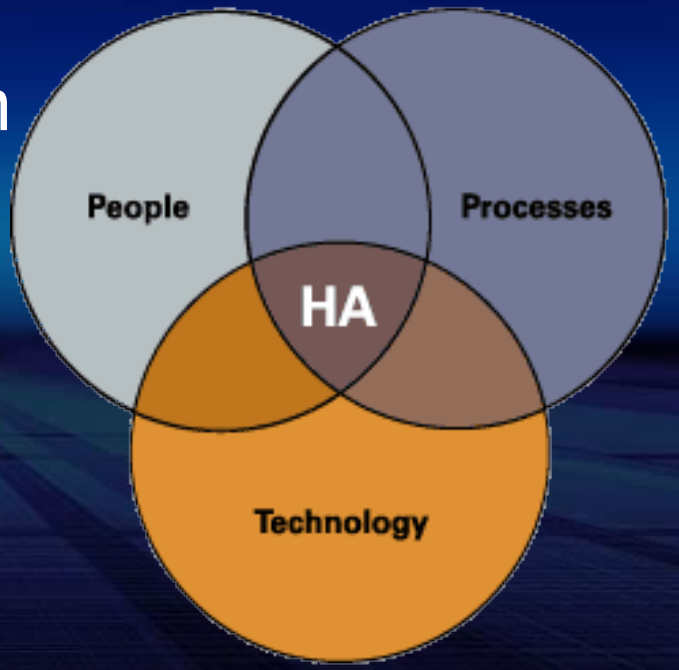
High Availability

- 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

WebSphere MQ Best Practices

Monitoring

- DO NOT WAIT TILL THE LAST MINUTE.
- Pick you 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

WebSphere MQ Best Practices

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 liabillity
- 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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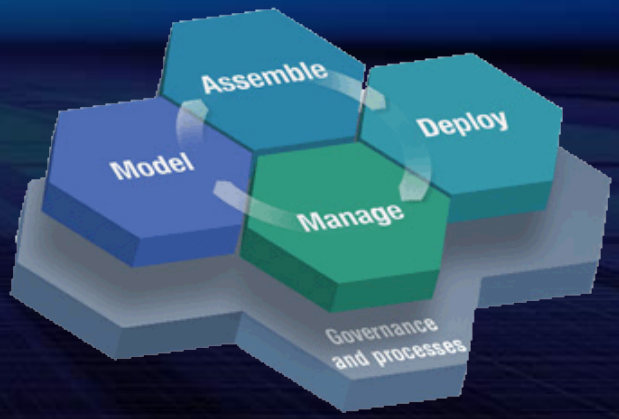
The SOA Process Approach

- Simplify
- Accelerate
- Secure
- Govern



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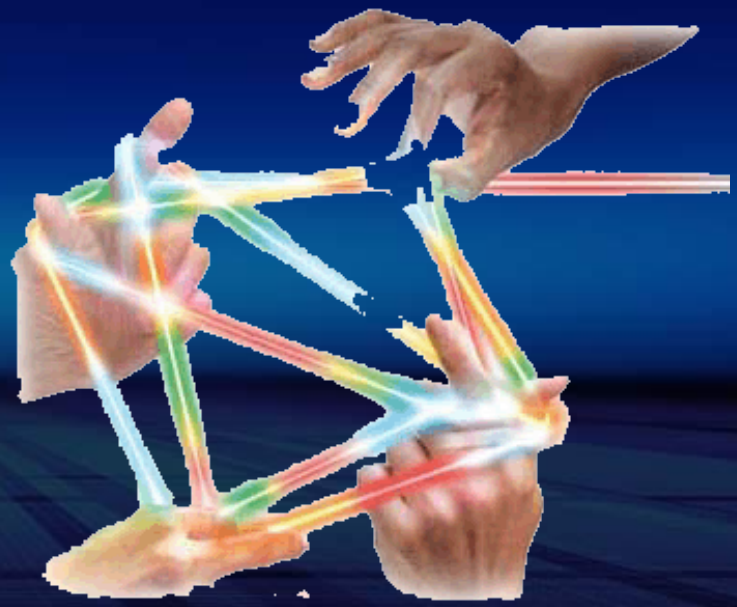
Security

- 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, SETMQAUT, AUTHREC

WebSphere MQ Best Practices

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



WebSphere MQ Best Practices

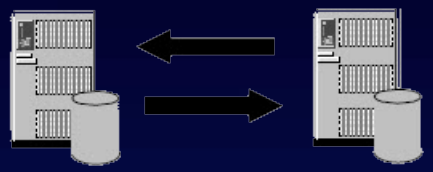
Clustering

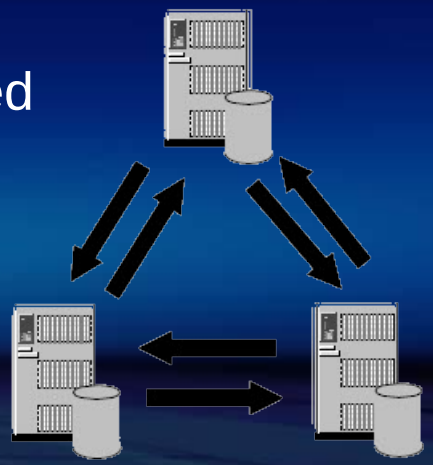
- Don’t have too many cooks
  - Treat a single cluster as a single point of administration
  - Have well defined policies for the gateway queue managers
- Treat all overlapping clusters as a single Namespace
  - Channel names, and therefore queue manager names, should be unique throughout.

WebSphere MQ Best Practices

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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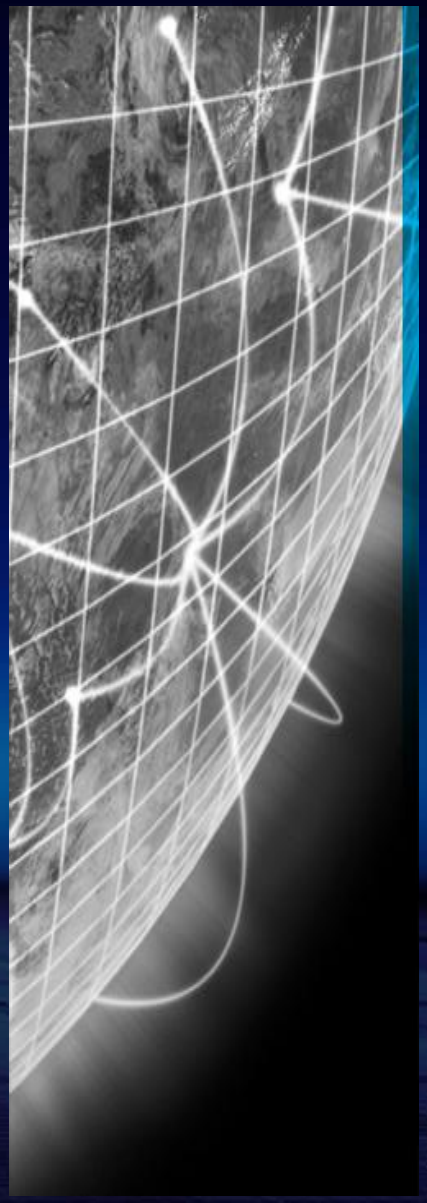

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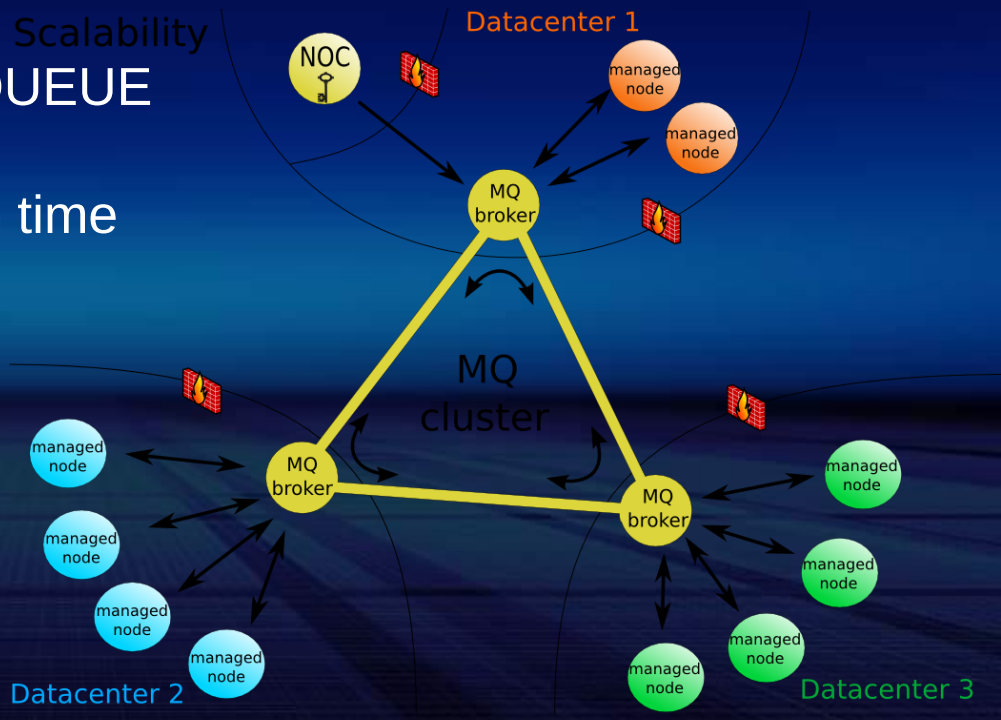
Clustering – Cluster History

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



WebSphere MQ Best Practices

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?