

*MQ "Golden Image"
Queue Managers*

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MQ “Golden Image” Queue Managers

Why a Golden Image?

Concept of the Golden Image

- “Golden Image” defined
 - Term used with slightly different meanings for different software.
 - Term refers to a standardized, repeatable, cloneable image of software.
 - Implication is that the image embeds “Best Practices”
 - Concept is the basis for emerging technologies such as the IBM Pure systems.

- Benefits of a Golden Image
 - Standardization
 - All Queue Managers look and behave as expected
 - All Queue Managers embed “Best Practices”
 - Automation
 - Standardized image enables automation
 - Standardization requires automation
 - Automation increases productivity
 - Standardization and automation increase build quality
 - **Continuous Improvement**
 - Scripts can be improved as errors are found or opportunities identified
 - Issues discovered can be institutionalized (“Find once, Fix many times”)
 - An essential part of the ISO 9001 process

Golden Image Constraints

■ Infrastructure Constraints

- Lack of a standardized metadata solution to store and deploy configuration information
- Vendors are driving towards this

■ Server Constraints

- Distributed Operating Systems have repositories.
 - It isn't possible to simply install directories and files
 - UNIX has Package Management
 - Windows has its Registry
- It isn't possible to install the software on every server
 - Disk Space
 - License issues
- The software can be pre-installed in images when new servers are built
 - IBM Pure systems do this
 - There is a limit to how many base images can be maintained

■ Skill Constraints

- Scripting capability; Both to create and to maintain the installation scripts
- Conceptualization; See the larger picture and long-term benefits

Caveats

- The remainder of this presentation presents a possible Golden Image
- The Image presented has been used successfully in multiple organizations
- However, there are multiple ways to do things in WMQ
 - Each approach has benefits and drawbacks
 - You must make your own choices and create your own organizations Golden Image
 - What is being presented is a base version for your consideration
- Content versus decisions
 - The most important part of your Golden Image is the decisions you make, and embed, in the Image
 - Consider all of the things covered in this Image, but **make your own decisions** for your own Image
 - The decisions illustrated in this presentation are my choices
- Style versus Substance
 - The style of administration is the least important part of the Golden Image
 - The substance of the choices and the consistency of the infrastructure are the important parts

What are you doing?



- **Do you have a Standard Image?**
 - Why not?
 - WMQ has been around over 20 years.
 - We know how to do this.
 - Reasons
 - Time constraints.
 - Too much up front work.
 - Too much personalization.
 - Personal preferences in admin style.
 - Changing personnel over time.
 - Changing preferences over time.
 - Mindset
 - Hands on Keyboard
 - Management
 - Quality difficult to measure, so often neglected
 - But
 - Our best customers are doing this.
 - Our best customers have doing this for a long time.

MQ “Golden Image” Queue Managers

Installing WMQ Software

WMQ Software Installation

- The process of installing WMQ software may be scripted and standardized
 - In some cases, this part of the Golden Image has the lowest ROI (Return on Investment)
 - Software installations are often one of the least frequent administration steps performed
 - However, this is not true for all organizations
 - If the installations are more frequent, the ROI increases
- In all cases, at least some parts of the installation should be standardized
 - The creation of the “mqm” User and Group IDs in UNIX
 - Ensuring that these are installed and have consistent UID and GID numbers
 - Modifying underlying system (e.g. UNIX) settings
 - Running the mqconfig program
 - Creating standard directories for administrative use
 - Scripts
 - Tools
 - Post Installation steps
 - Setting up the WMQ environment (setmqinst, setmqenv)
 - Automating WMQ startup with the server (e.g. /etc/init...)
 - Institutionalizing Fixes
 - IBM Technotes (e.g. TechNote 1442991)

Software Installation – What are you doing?



- **Group Feedback**

- Learn from your peers
- Think about the total number of years of MQ knowledge in this room!.

MQ “Golden Image” Queue Managers

Creating Queue Managers

Queue Manager Creation

- `crtmqm qmgr`
 - This simple command will get the job done, but is it what you want?
 - At a minimum, this command determines (forever)
 - The name of your Queue Manager
 - The type of logging your Queue Manager will use
 - The size of the log files (Log File Page Size)
- Things to consider standardizing
 - Logging Type (Circular vs Linear)
 - Possibly based upon environment
 - Number and size of Logs
 - TCP Port
 - Dead Letter Queue assignment & name
 - Default Queue Manager
- Standardization
 - Script that executes the “crtmqm” command
 - Put as little as possible in this script, only doing the essentials (e.g. Logging)
 - MQSC Commands are simpler and more flexible than scripts

Qmgr Creation – What are you doing?



- **Group Feedback**
 - Learn from your peers
 - Think about the total number of years of MQ knowledge in this room!.

MQ “Golden Image” Queue Managers

Automating Startup

Queue Manager Startup

- Queue Manager Startup
 - Queue Managers should be started when the Operating System boots
 - This was covered in the Software Installation portion of the Image
- What else should happen when a Queue Manager starts?
 - Channel Initiator: `alter qmgr schinit (qmgr)`
 - Command Server: `alter qmgr scmdserv (qmgr)`
 - Channel Listener: `define service (...) ... control (qmgr)`
 - Trigger Monitor: `define service (...) ... control (qmgr)`
- Dead Letter Queue Handler: `define service (...) ... control (qmgr)`
- Standardize the way all Queue Managers are started
 - There should be little need for specialized startup and shutdown commands
 - Exploit MQ services for all routine tasks
 - The UNIX startup command can be a simple “strmqm” command or loop
- Simplify and Standardize
 - Don’t forget to document!

Qmgr Startup – What are you doing?



- **Group Feedback**
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MQ “Golden Image” Queue Managers

Customizing Queue Managers

Queue Manager Customization Scripts

- Use MQSC Scripts
 - Scripts may have parameters substituted through a simple mechanism like *sed*
- Two basic scripts
 - Script that is common to all Queue Managers and requires no customization
 - Script that contains Queue Manager specific parameters (e.g. CONNAME)
- Queue Manager settings that change across builds and require parameterization
 - Queue Manager Name
 - Queue Manager Port
 - Queue Manager Installation Path
 - Queue Manager Connection Name
- Communication settings that change across builds and require parameterization
 - Cluster name
 - Full Repository Queue Manager Name
 - Full Repository Queue Manager Connection Name
 - Full Repository Queue Manager Port

Queue Manager Customization Settings #1

- Queue Manager Settings

- Dead Letter Queue
- Channel Authorizations (Enabled) (Channel Authorization Security)
- ChAD (Disabled) (Channel Auto Definition)
- DefCIXQ (Default Transmission Queue)

- Maximum Message Sizes

- Queue Manager
- Channels
- Queues

- Monitoring

- MonQ
- MonChl
- MonACIs (Monitor Auto-defined Cluster Sender Channels)

- Accounting & Statistics

- Events

Queue Manager Customization Settings #2

- Message Monitoring
 - ActivRec
 - RouteRec
- System Default Queues
 - Maximum Message Size
 - Maximum Depth
 - Monitoring
 - Default Persistence
 - Default Bind
- System Default Channels
 - Maximum Message Size
 - Monitoring
- Security
 - Channel Authorizations
 - MCAUSER settings on all “SYSTEM” receiving channels

Queue Manager Customization Settings #3

■ MQ Administration

- Server Connection Channels (WMQ.ADMIN.***)
 - Administrative use
 - MQExplorer, etc. (all client based Administrative tools)
- Queues
 - Administrative use (WMQ.ADMIN.***)
 - “Ping” queues
 - “Trace Route” queues
- Services
 - Move messages
 - Clear queues
 - Any routine functions
 - Service (or any MQSC command) can be executed from your desktop to any Queue Manager
 - Use the MO72 SupportPac (Thank you Paul Clarke)

■ Channel Definitions

- The MQSC template doesn't change
- Remote Queue Manager name and connection Information change
- Scripts can also be used to define Cluster and Point-to-Point channels

Qmgr Customization – What are you doing?



- **Group Feedback**

- Learn from your peers
- Think about the total number of years of MQ knowledge in this room!.

MQ “Golden Image” Queue Managers

Tools

Administrative Tools

- Standard Tools can be deployed to each Queue Manager
 - SupportPacs
 - Scripts

- SupportPacs
 - MA01 (“q”)
 - Move messages from/to queues and/or files
 - May be invoked as a Service for routine activities
 - Moving messages from a queue to the file “/dev/null” will clear a queue with open handles!
 - MO06 (Log Summary)
 - Analyze error logs for more easily identify issues
 - MH03 (Queue Statistics - xmqqstat)
 - Monitor queues and record activity statistics

Administrative Tools – What are you doing?



- **Group Feedback**
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MQ “Golden Image” Queue Managers

Application Configuration

Application Configuration

- Applications require the same objects on each Queue Manager
 - Queues
 - Server Connection channels
 - Processes and Trigger Monitors
 - Hopefully the object names do not change across Queue Managers
 - If they do, this can be handled in the same way that Queue Manager changes are handled
- Application configuration can be scripted
 - MQSC scripts for each type of server
 - Front-end Web Server
 - Message Broker
 - Back-end Application Server

App Configuration – What are you doing?



- **Group Feedback**

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MQ “Golden Image” Queue Managers

Summary

“Golden Image” Queue Manager Summary

- Fully realized Queue Managers require many configuration actions
 - The number of different configuraton commands run from the Scores to the Hundreds!
 - This does not count Application configuration!
 - Queue Managers frequently support multiple Applications,
- If manual configuration is performed
 - Standardization is virtually impossible
 - Build quality is unacceptably low
 - Improvement is difficult
- Defining a standard configuration is the first step
 - This should be done even/especially if the builds are done manually!
- Automation (Scripting) can provide significant results
 - Productivity
 - Build quality
- Each of these steps supports Continuous Improvement
 - If you don't automate the easy stuff, you'll never have time for the real engineering!

Questions & Answers



Presenter

- Glen Brumbaugh
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- Computer Science Background
 - Lecturer in Computer Science, University of California, Berkeley
 - Adjunct Professor in Information Systems, Golden Gate University, San Francisco
- WebSphere MQ Background (20 years plus)
 - IBM Business Enterprise Solutions Team (BEST)
 - Initial support for MQSeries v1.0
 - Trained and mentored by Hursley MQSeries staff
 - IBM U.S. Messaging Solutions Lead, GTS
 - Platforms Supported
 - MVS aka z/OS
 - UNIX (AIX, Linux, Sun OS, Sun Solaris, HP-UX)
 - Windows
 - iSeries (i5OS)
 - Programming Languages
 - C, COBOL, Java (JNI, WMQ for Java, WMQ for JMS)

MQ “Golden Image” Queue Managers

Thank
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