WebSphere MQ Multi-Instance Queue Managers

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/

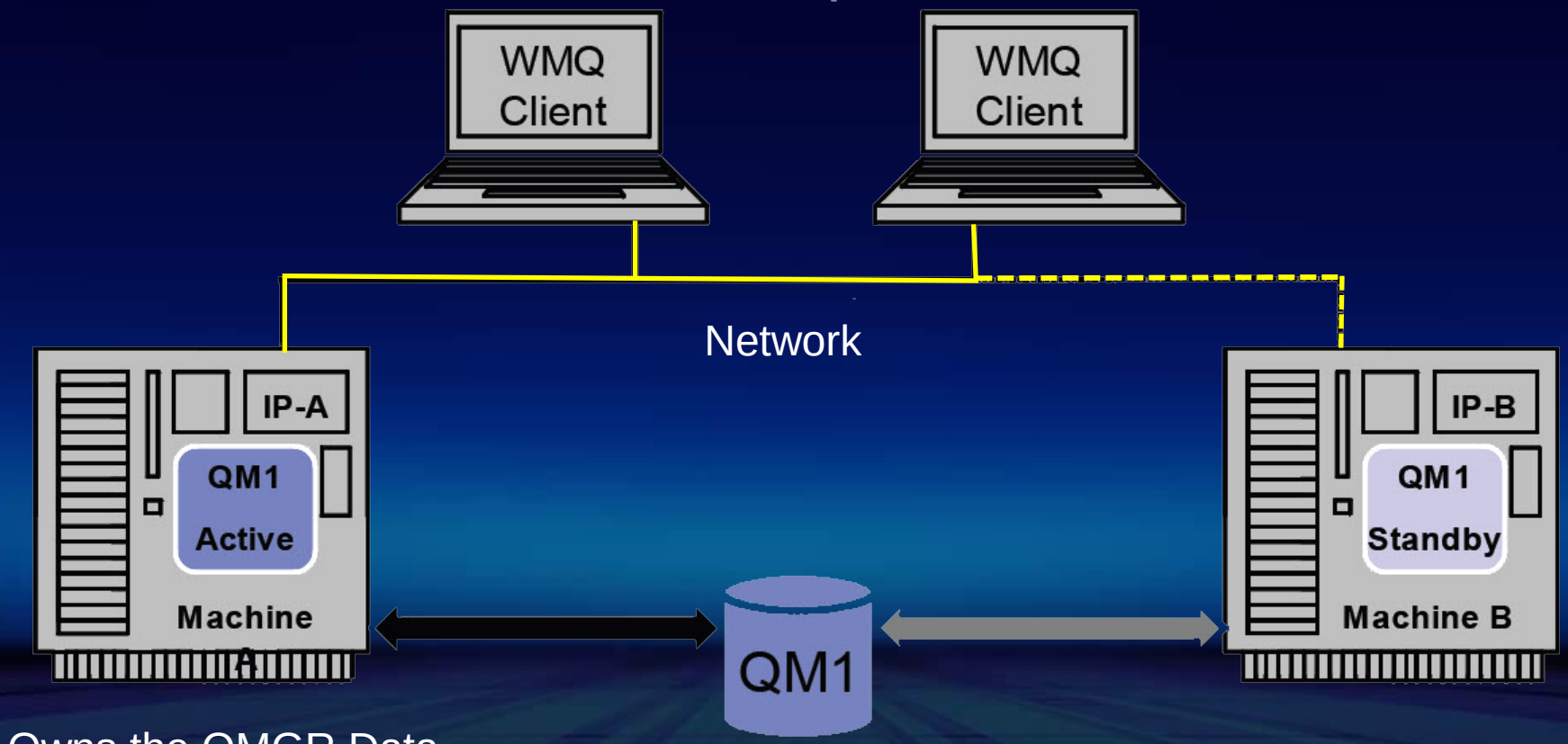
WebSphere MQ Multi-Instance QMGRS

Overview

- Basic failover support
- Not intended to replace HA coordinators
- Data retained on network storage
- Queue manager can be started on different machines
  - Active instance
  - Standby instance

WebSphere MQ Multi-Instance QMGRS

Basic Multi-Instance Operation



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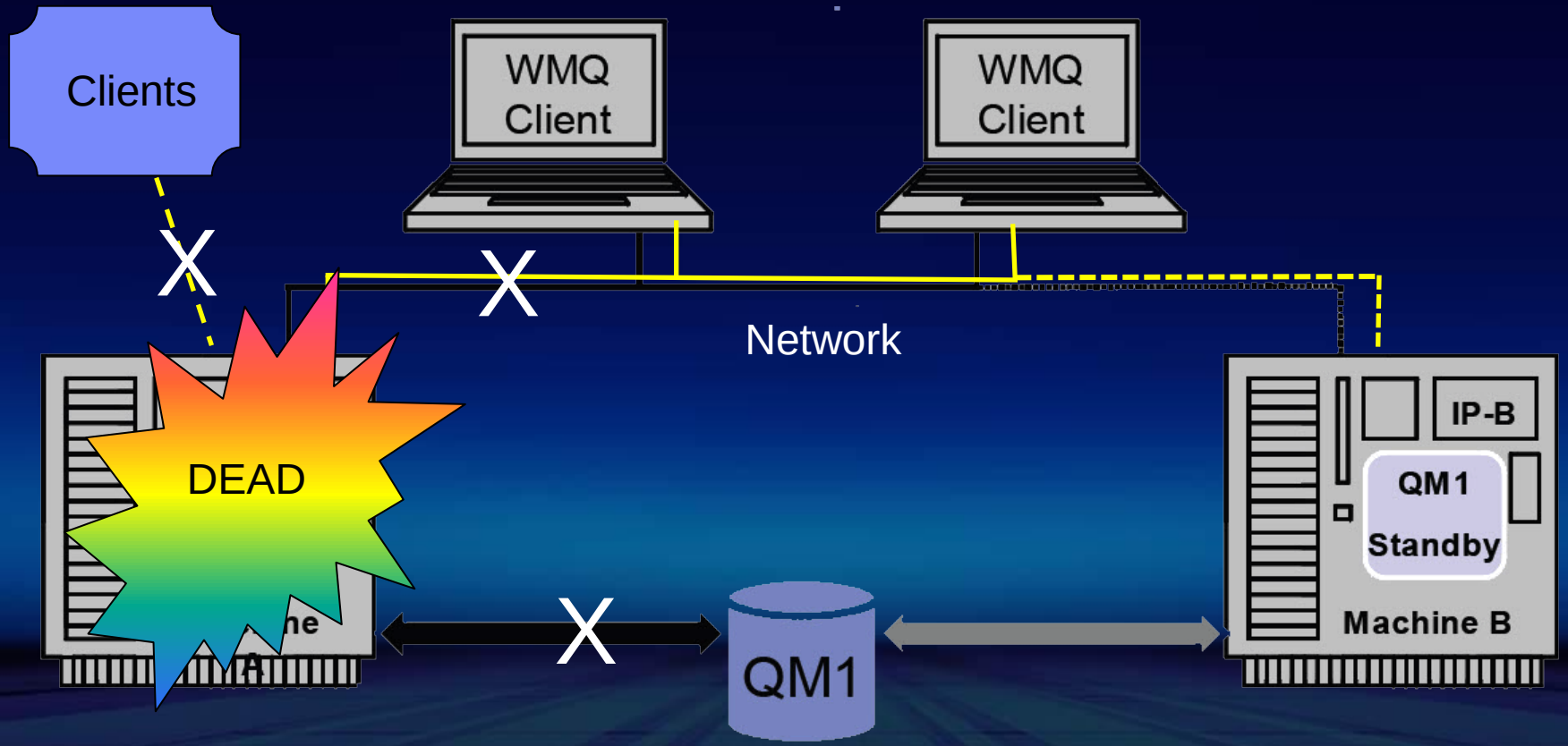
Basic Multi-Instance Operation



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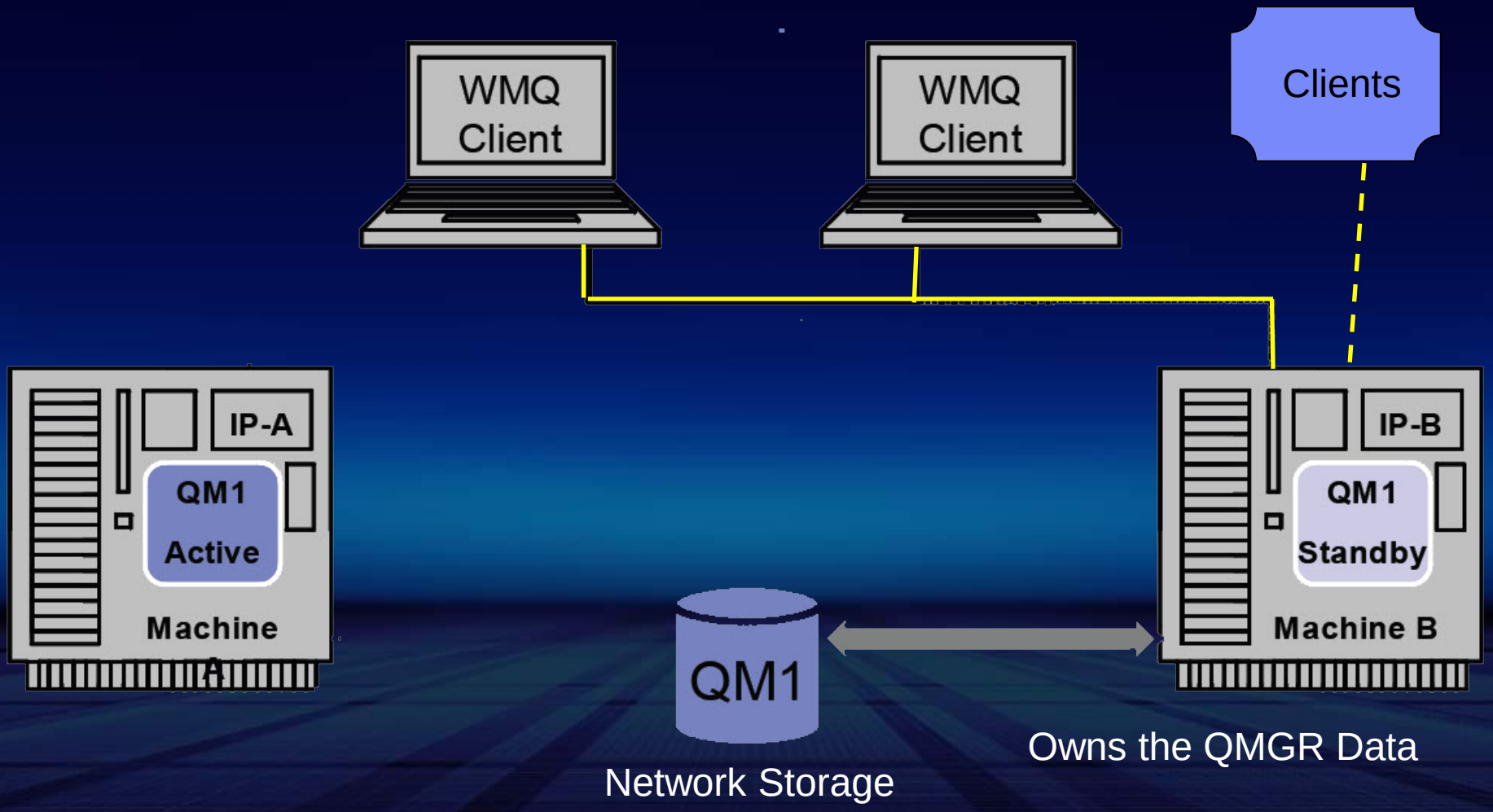
Basic Multi-Instance Operation



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Supported WebSphere MQ platforms

- Currently available at 7.0.1.0 for the following:
  - AIX
  - Linux® (Power, X86-32, X86-64, System z)
  - HP (both HP-UX Itanium and PA-RISC)
  - Windows®
  - Solaris
- Not available for z/OS

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Considerations

- Not intended to manage resources beyond MQ
- System IP address not assumed as part of failover
- Support for networked storage over modern network file system protocols
  - NFS V4 or a compliant POSX file system
  - Windows CIFS (Common Internet File System)
  - Must ensure that any caching is turned OFF to ensure data integrity

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New Commands

- Network storage validation command
  - amqmfsck (UNIX® only)
- Commands to modify mqs.ini
  - addmqinf
  - dspmqinf
  - rmvmqinf

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Updated Commands

- crtmqm
  - md – message data
  - ld – transaction log data
  - sax – create the queue manager
    start the queue manager
    set the queue manager to autostart
    start it with the ‘x’ flag (Windows)
- strmqm
  - x – starting of multi instance queue manager
  - f – rebuild queue manager objects

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Updated Commands (continued)

- endmqm
  - x – stop the standby instance
  - s – switch to failover instance
  - r – Start trying to reconnect reconnectable clients

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Updated Commands (continued)

- amqmdain (Windows)
  - alter /x <set | unset> - modify the start type of a multi-instance queue manager
  - end /s /r /x – same as endmqm
  - Registry operation is restricted for multi-instance queue managers.

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Updated Commands (continued)

- dspmq
  - n – display output in English
  - o standby – display standby state
  - x – display instance information
- Updates to runmqsc
  - DISPLAY QMSTATUS ALL

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UNIX walkthrough

- Ensure that matching user and group ids for mqm exist on both systems
- Test the network storage using amqmfsck
  - `amqmfsck /shared/qmdata`
    - Checks basic POSIX file locking behaviour
  - `amqmfsck -w /shared/qmdata`
    - Use on two machines at once to ensure that the locks are handed off correctly when a process ends.
  - `amqmfsck -c /shared/qmdata`
    - Use on two machines at once to attempt concurrent writes.

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UNIX walkthrough(continued)

- Create the queue manager on machine A

```
crtmqm -md /shared/qmdata -ld /shared/qmlog QM1
```

- Extract the QMGR information

```
dspmqinf -O Command QM1
```

- Define the queue manager on machine B (or edit mqs.ini)

```
addmqinf -v Name=QM2 -v Directory=QM1 -v
  Prefix=/var/mqm -v DataPath=/shared/qmdata/QM1
```

- **note that the above can be carried out on additional systems**

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UNIX walkthrough(continued)

- Start the active instance of the queue manager on machine A

```
strmqm -x QM1
WebSphere MQ queue manager 'QM1' started.
```

- Start the standby instance of the queue manager on machine B

```
strmqm -x QM1
WebSphere MQ queue manager 'QM1' started as a
  standby instance.
```

- Only one active and one standby instance operational at a time

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Observing a multi-instance queue manager

- On machine A:

```
dspmq -x -o standby -o status
  QMNAME(QM1)  STANDBY(Permitted)  STATUS(Running)
    INSTANCE(machineA)  MODE(Active)
    INSTANCE(machineB)  MODE(Standby)
```

- On machine B:

```
dspmq -x -o standby -o status
  QMNAME(QM1)  STANDBY(Permitted)  STATUS(Running as
       standby)
    INSTANCE(machineA)  MODE(Active)
    INSTANCE(machineB)  MODE(Standby)
```

- If defined on an additional system (machine C, D, etc....):

```
dspmq -x -o standby -o status
  QMNAME(QM1)  STANDBY(Permitted)  STATUS(Running elsewhere)
     INSTANCE(machineA)  MODE(Active)
     INSTANCE(machineB)  MODE(Standby)
```

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MQSC

•Queue manager status enhanced to show whether standby instances are permitted

DISPLAY QMSTATUS ALL
1 : DISPLAY QMSTATUS ALL

AMQ8705: Display Queue Manager Status Details.
QMNAME(QM1) STATUS(RUNNING)
CONNS(27) CMDSERV(RUNNING)
CHINIT(RUNNING) **STANDBY(PERMIT)**

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Windows mqm Group

- Members of the local mqm group of the primary (creating) node will have access
- Unlike UNIX systems, local groups on different nodes can not be made to match
- Modifying file permissions at failover is too costly – Different from MSCS
- Answer – create a mini-domain

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Defining Network Shares

- Defining Network Shares
- Universal Naming Convention (UNC) share names should be used to avoid session boundaries
- Queue Manager log path cannot be the same as the data path
- Read/Write access must be granted for :
  - SYSTEM ID
  - mqm Group
  - Administrators Group

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Configuration Data

- Queue manager configuration data can either be in the Windows registry or in INI files
- crtmqm /md flag indicates that the queue managers data is not in the default location (registry)
- DataPath attribute used to control location of queue manager configuration data - Windows registry or INI files
- Standard crtmqm will continue to use the Windows registry

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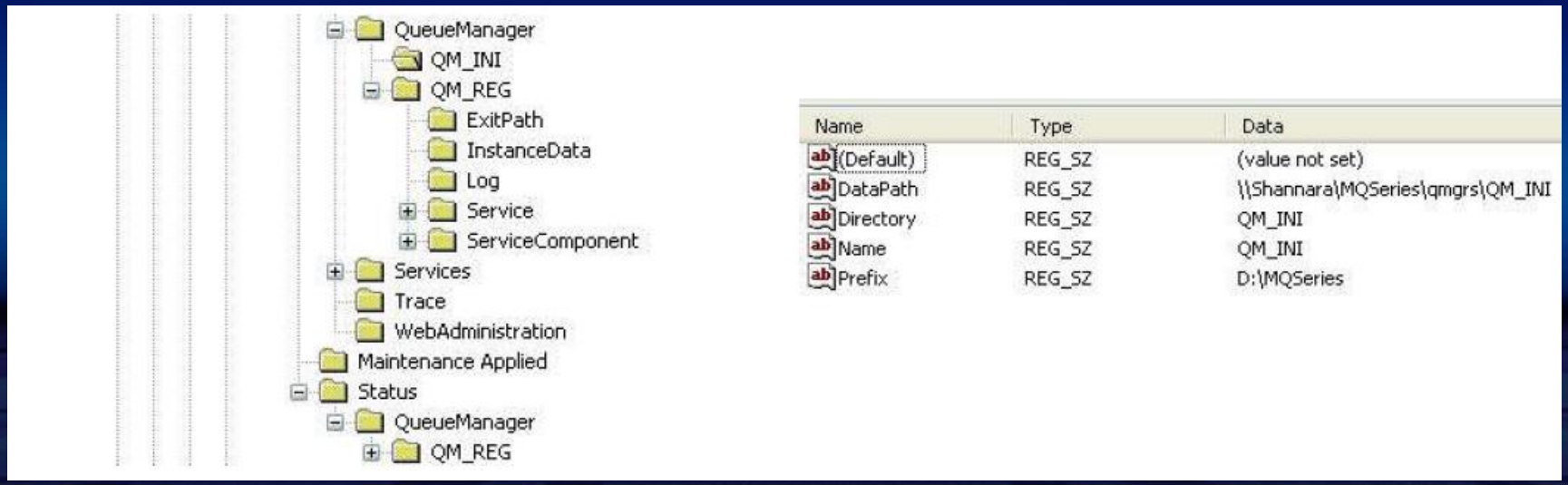
Configuration Data (continued)

Queue Managers Configuration	WebSphere MQ Release		
	V7.0	V7.0.1	
		Standard	Multi-Instance
mqs.ini	Registry	Registry	Registry
qm.ini	Registry	Registry	INI File
qmstatus.ini	Registry	Registry	INI File



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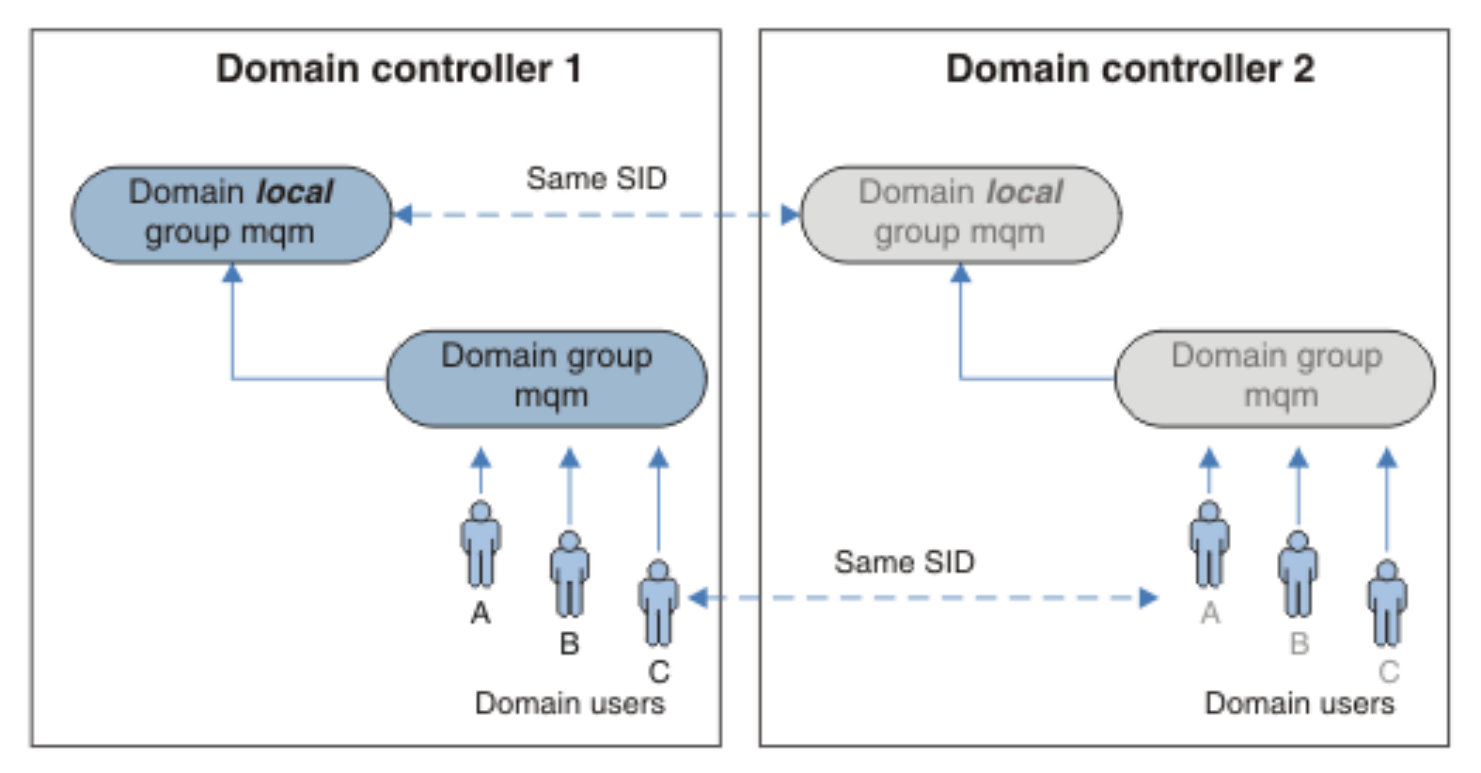
Windows Walkthrough

- Configure a pair of Windows servers as domain controllers
- The WMQ service needs to run as a domain user who is a member of the mqm group



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Windows Walkthrough (continued)

- Create a shared directory for the queue manager data
- The network share must be within the domain
- Modify both the share and file permissions
- Create the queue manager using the appropriate flags, specifying the data and log path. Use UNC format for network locations

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Windows Walkthrough (continued)

Active Queue Manager Node	Standby Queue Manager Node
crtmqm /md \\host\share\data /ld \\host\share\log QM1	
	addmqinf /s QueueManager /v Name=QM1 /v Directory=QM1 /v Prefix="c:\mqm" /v DataPath=\\host\share\data
strmqm /x QM1	
	strmqm /x QM1
…	…

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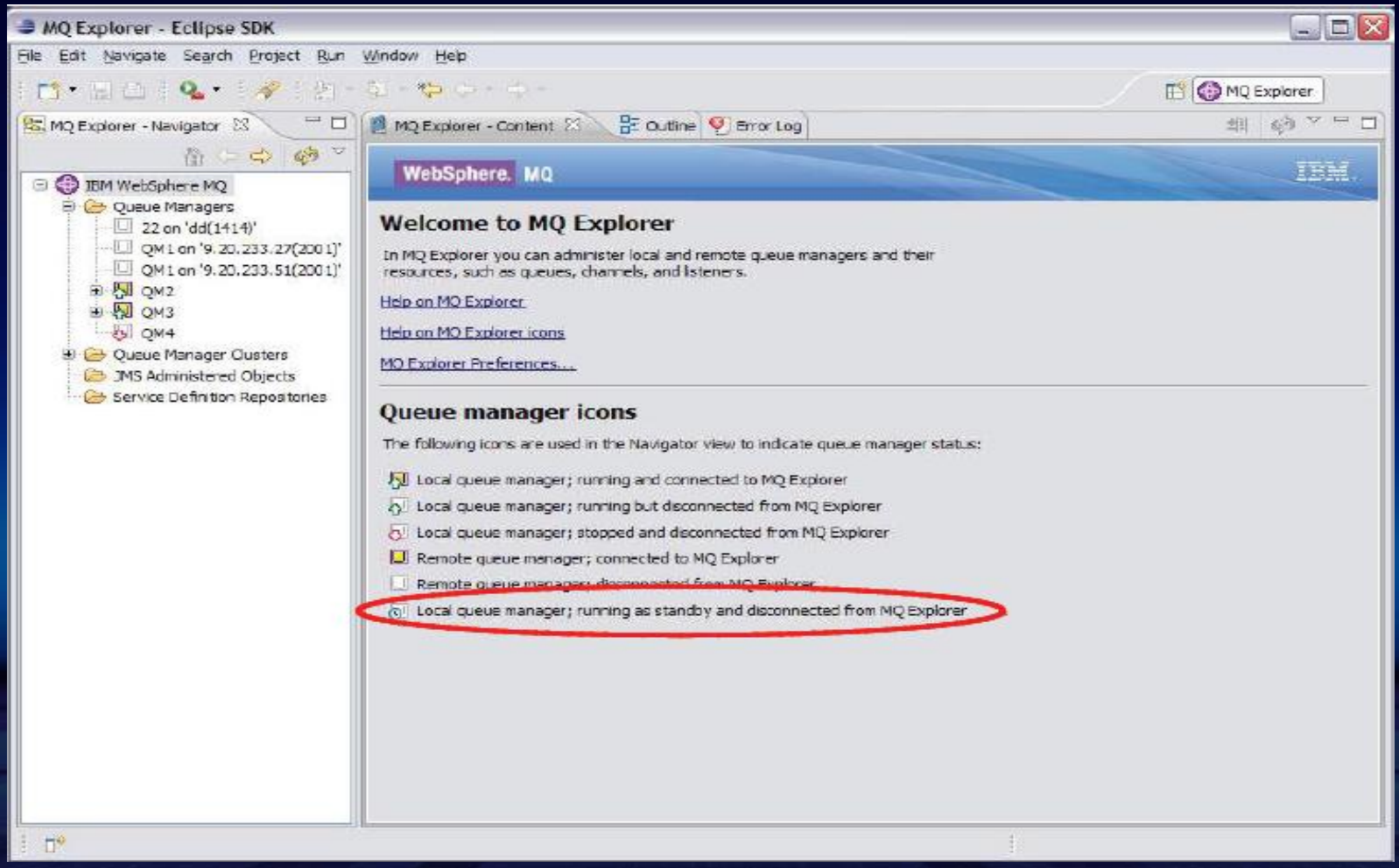
MQ Explorer



- only 1 new icon

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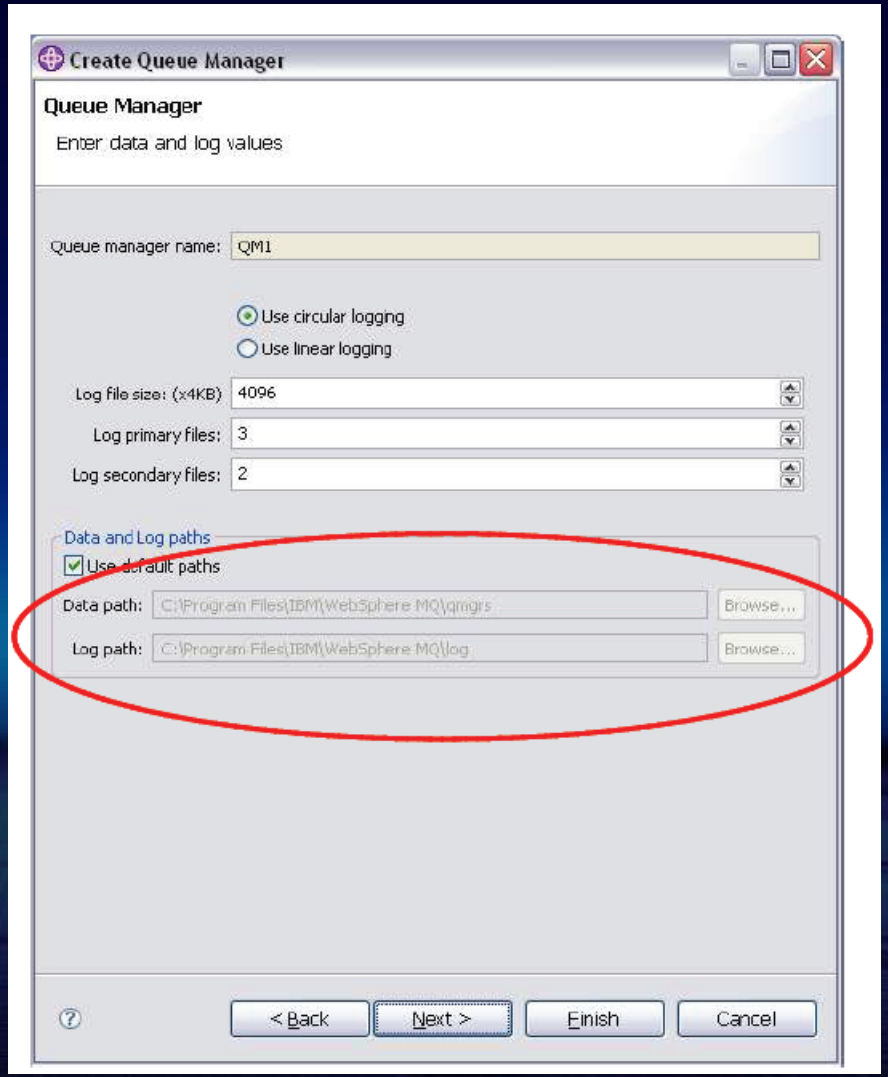
Create Queue Manager wizard (continued)

- Default data and log paths can be changed (previously just log path)
- Checks for valid directory
- Checks for same path name



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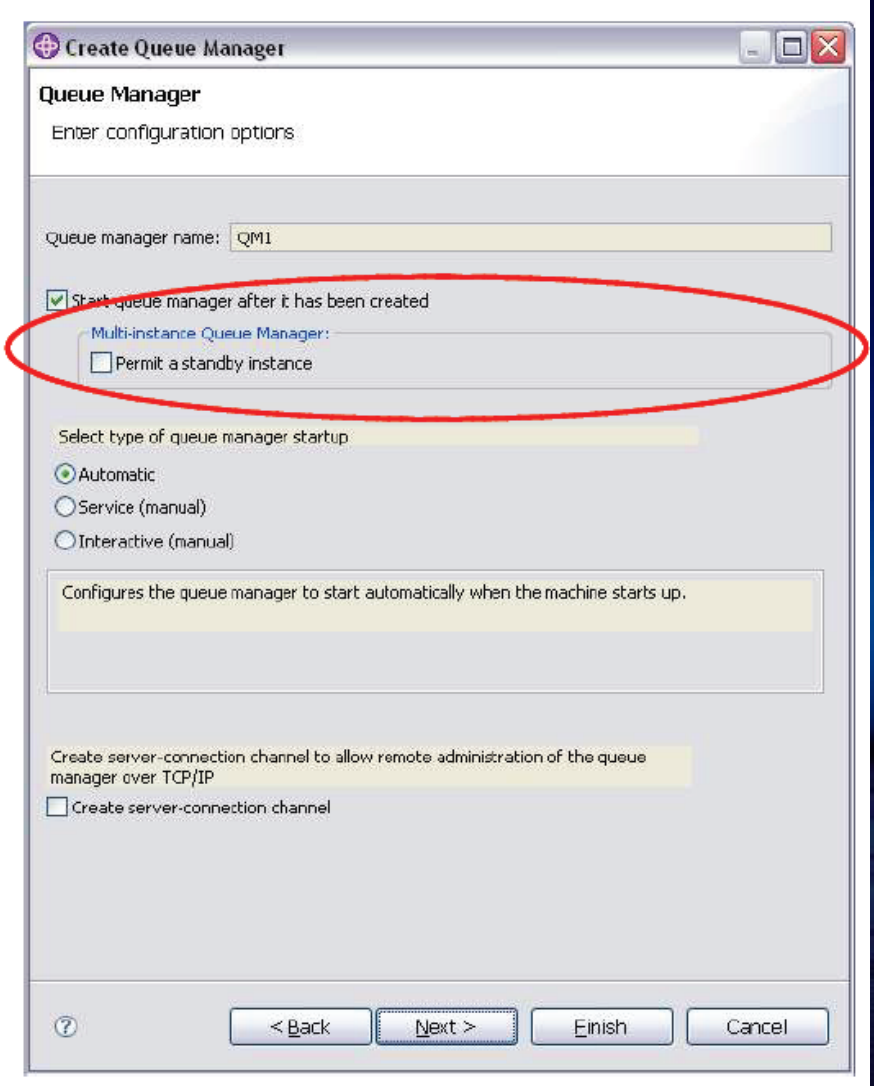
Create Queue Manager wizard (continued)

- Queue manager can be started to permit failover
- Automatic and Permit standby will use “–sax” option



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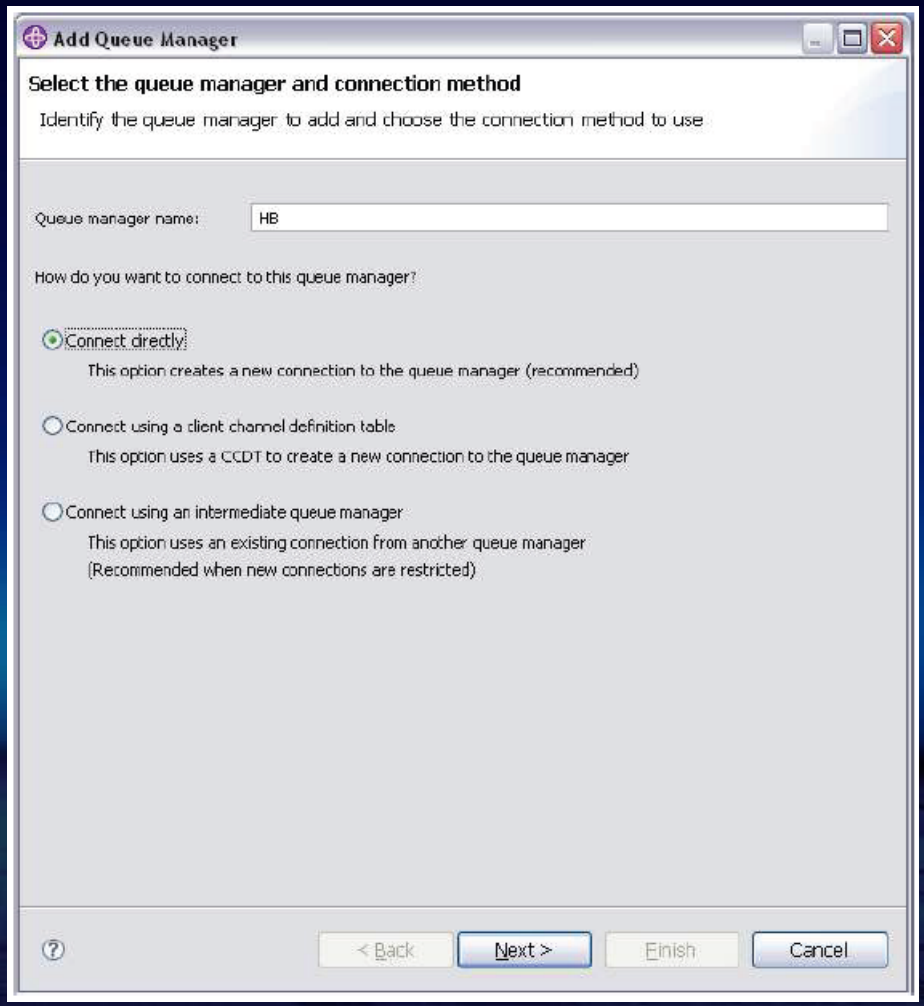
Add Remote Queue Manager wizard

- Connect to single or multi instance queue manager using "Connect directly"
- Using a Client Channel Definition Table (CCDT) used to be on second page



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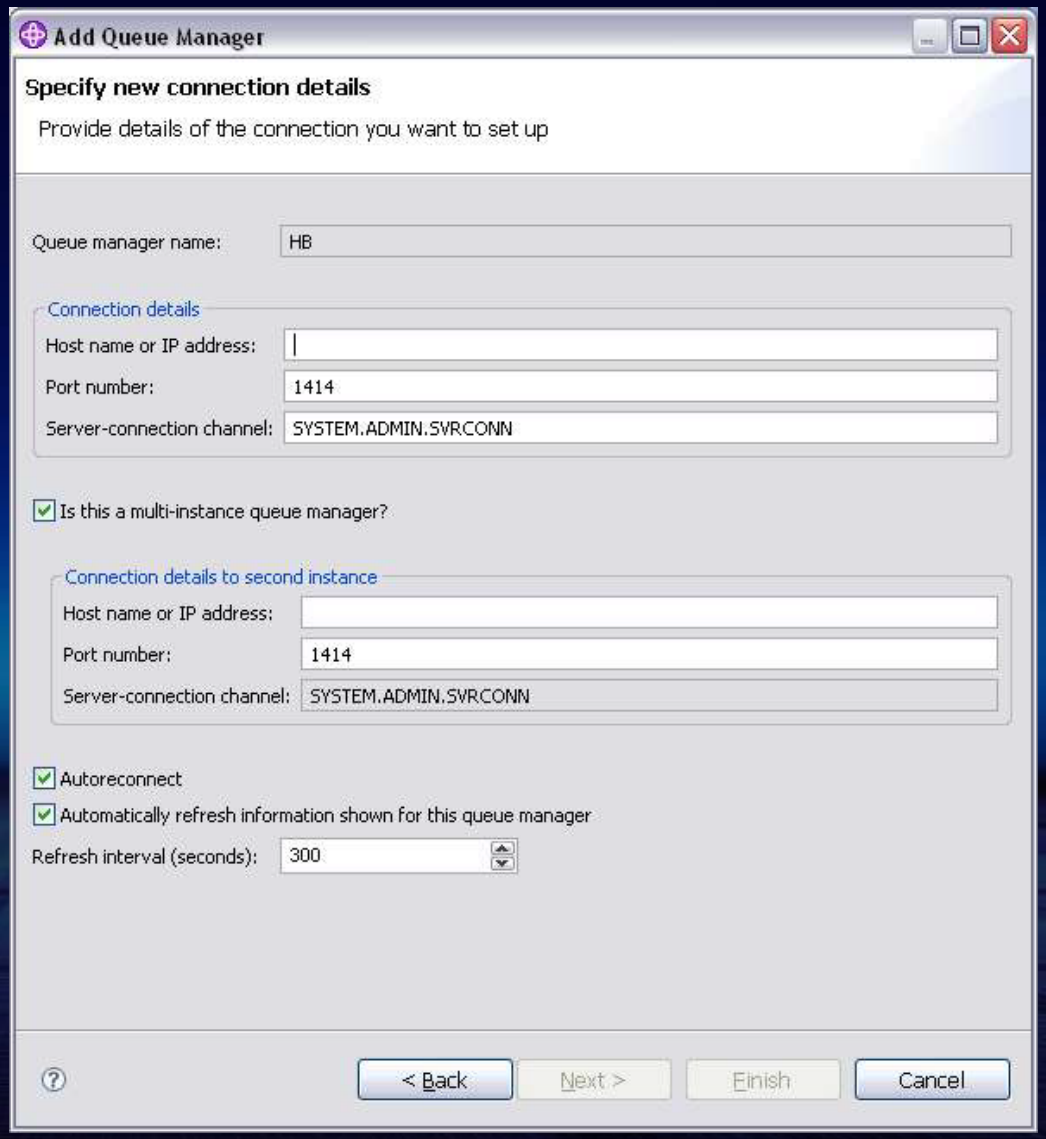
Add Remote Queue Manager wizard (continued)

- CCDT details moved to own page
- Use for single or multi instance
- Multi instance
  - same channel name used for each instance
  - auto-reconnect enabled (can be reset)
  - further instances can be added using the Manage Instances dialog



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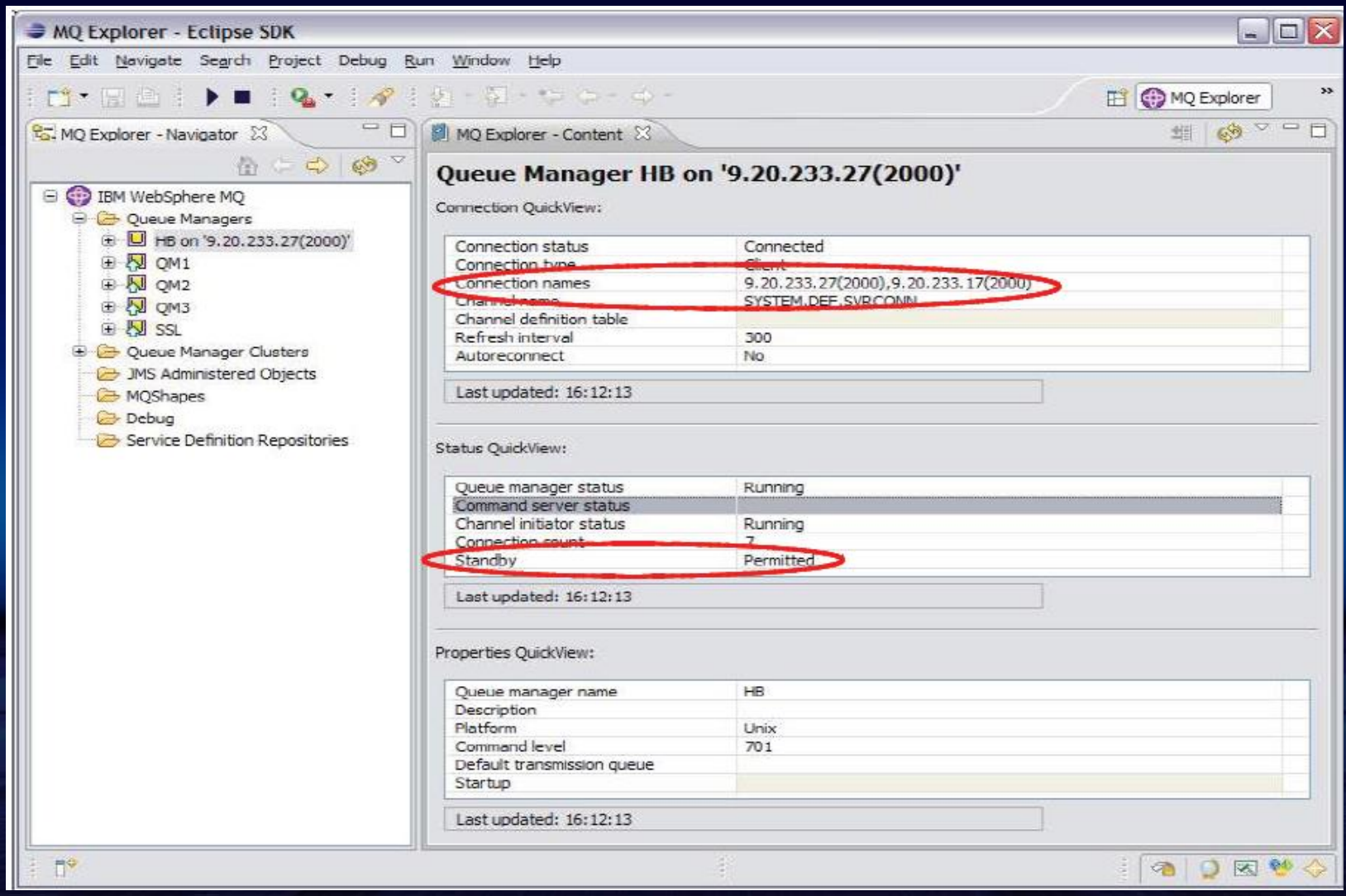
Queue Manager content page



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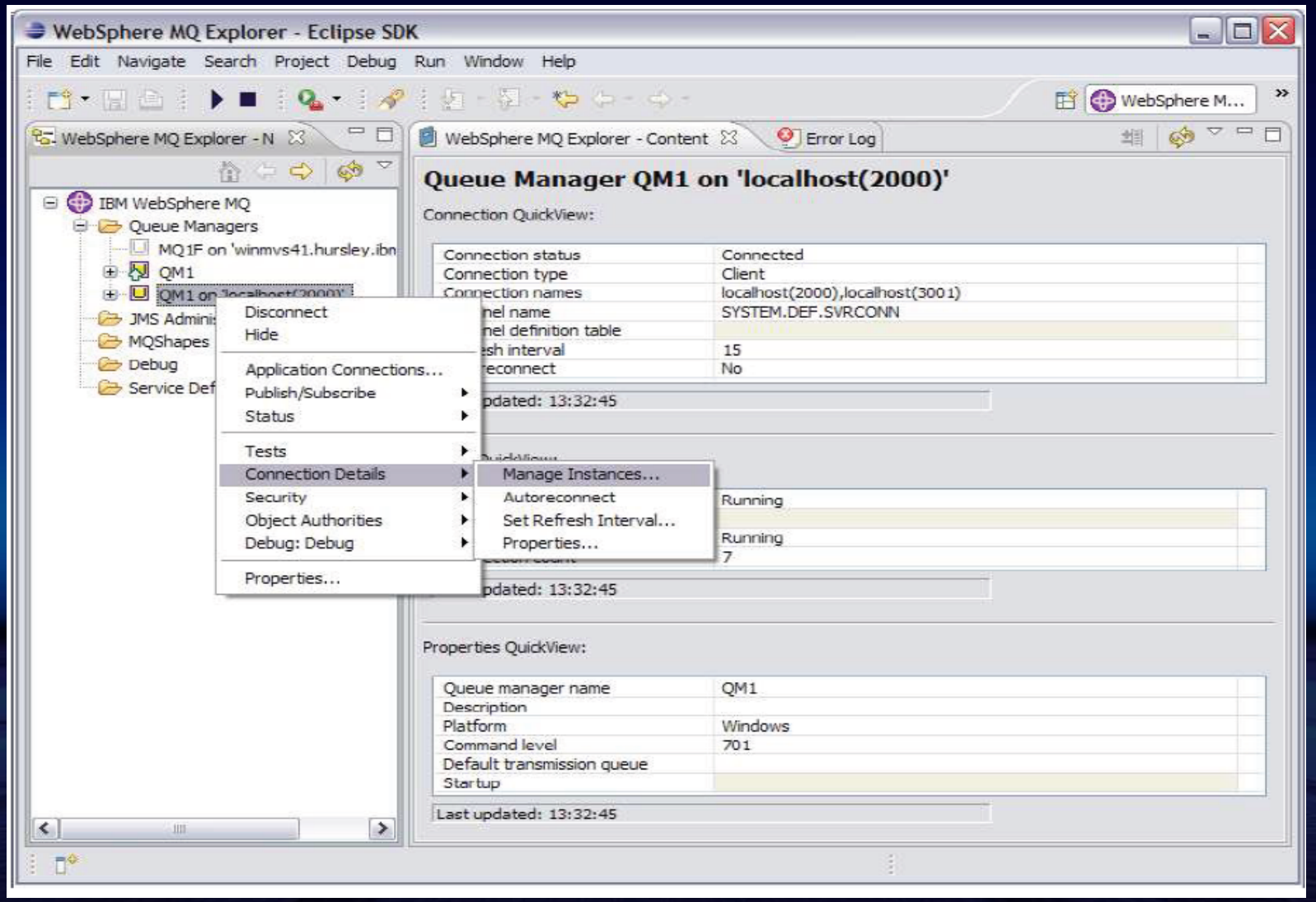
Manage Instances



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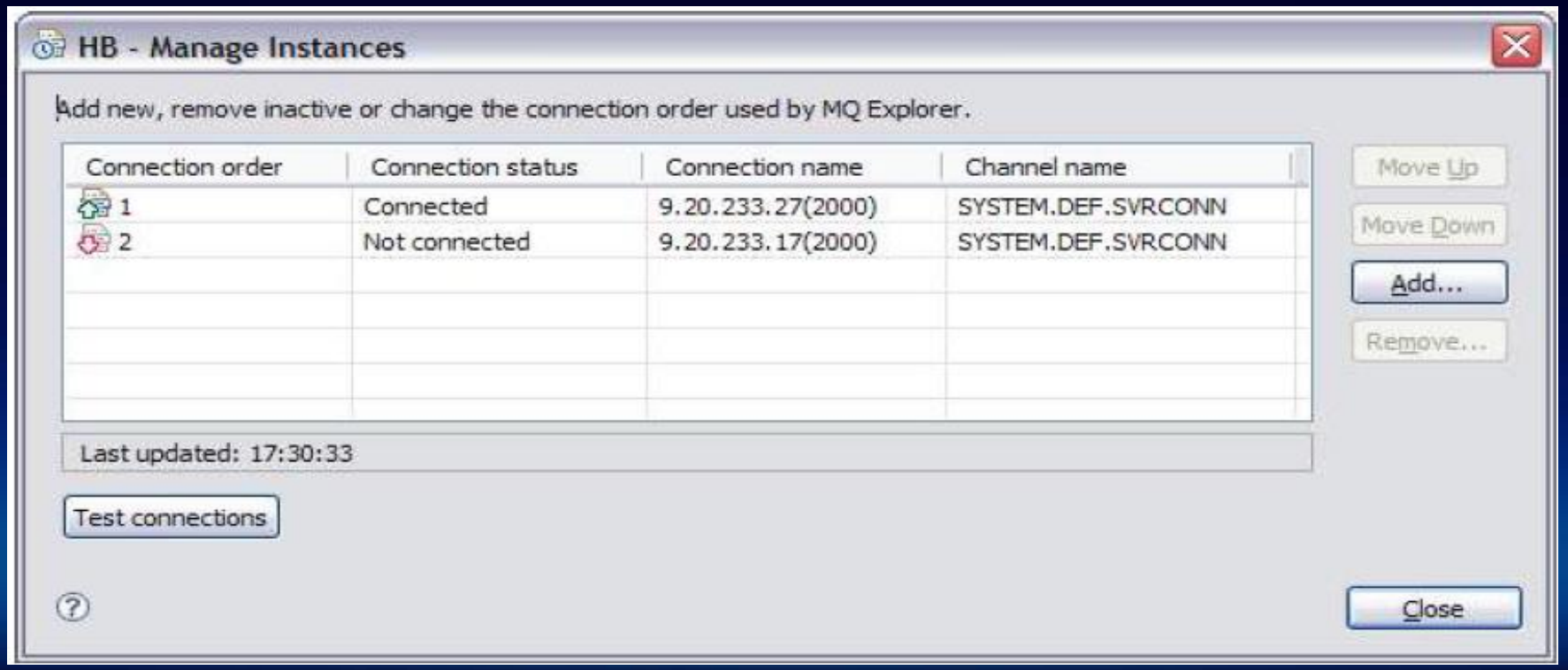
Manage Instances dialog



- Connection order used by MQ Explorer
  - cannot remove connected instance details

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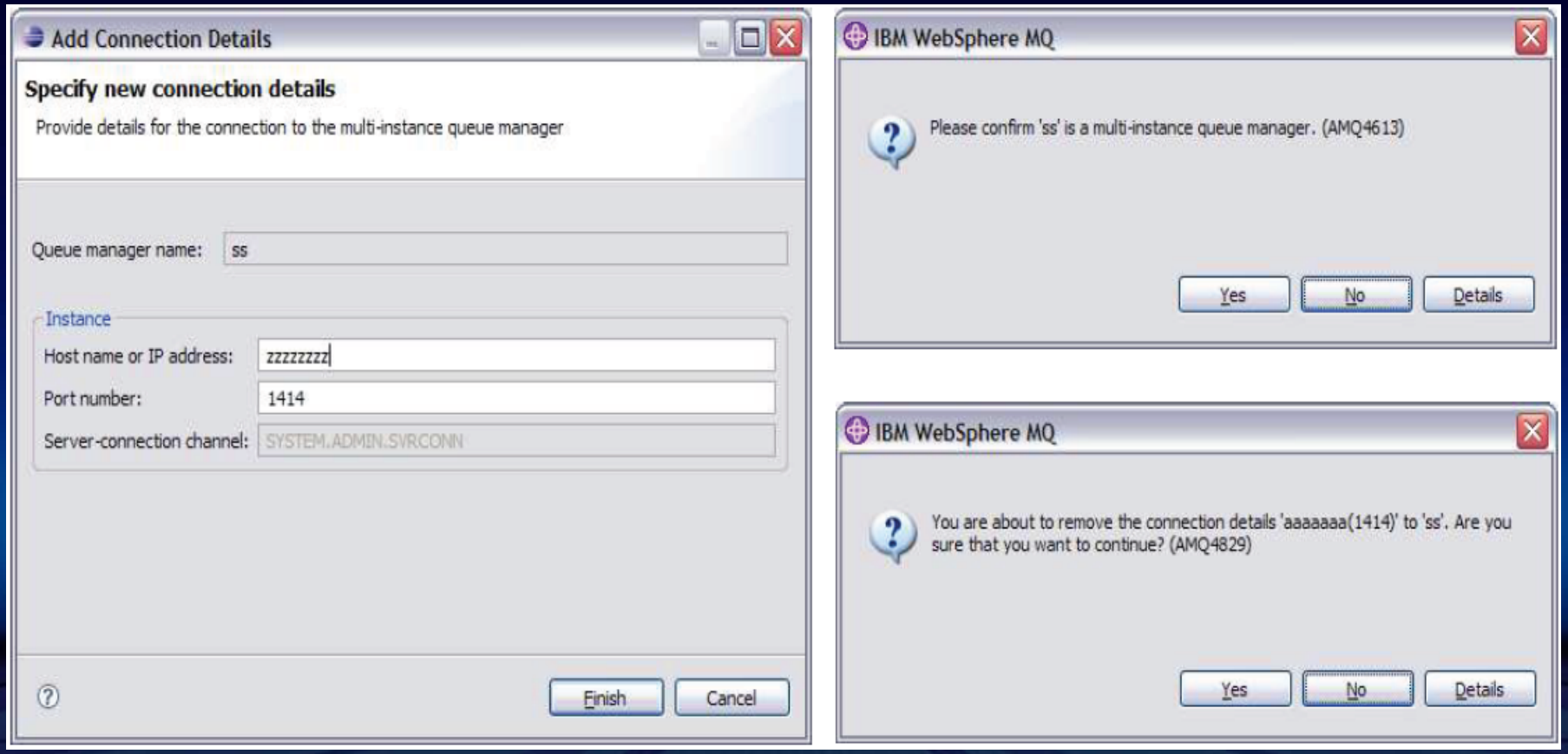
Manage Instances – connection details



- Single page wizard for adding new connection details

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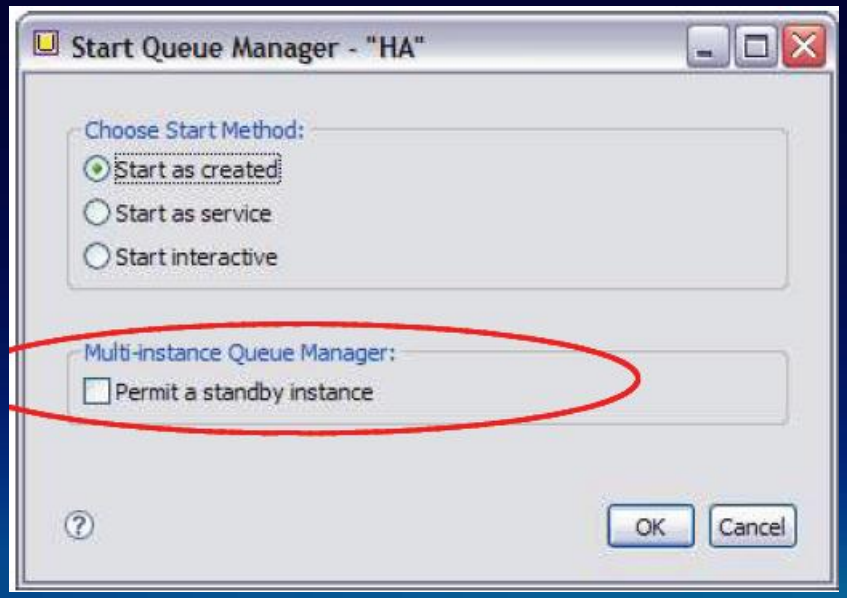
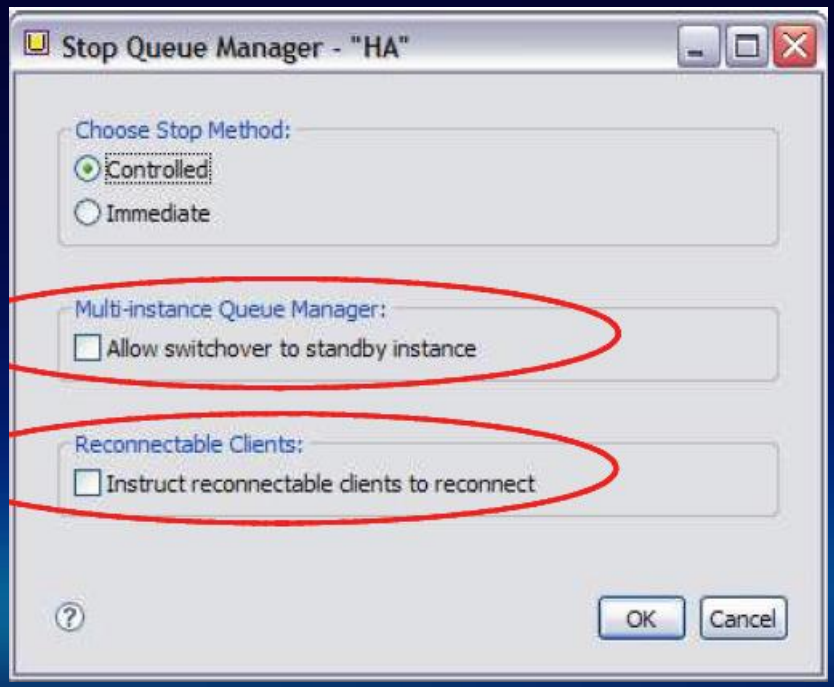
Start/Stop Queue Manager dialogs





- Windows/Linux start dialog slightly different
- New control command flags “-x”, “-s”, “-r”

WebSphere MQ Best Practices

Good Bye, So Long and Thanks for the Fish !!!!!!!!!!!