

IBM Hursley, MQSeries

What's new in MQSeries for OS/390 V2.1

Session:
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Announcement - 26th January 1999

- **The January 1999 MQSeries family announcement significantly improves the way enterprises and their partners can integrate their business processes.**
- **MQSeries administration is simpler, and dynamic workload distribution can provide extra capacity, or alternative network paths if a network component fails.**
- **IBM MQSeries Integrator provides intelligent message brokering.**
- **MQSeries Workflow for OS/390 extends workflow beyond distributed platforms to host systems.**

MQSeries for OS/390, V2.1

Cluster exploitation

ARM Support

Transaction coordination via RRS support

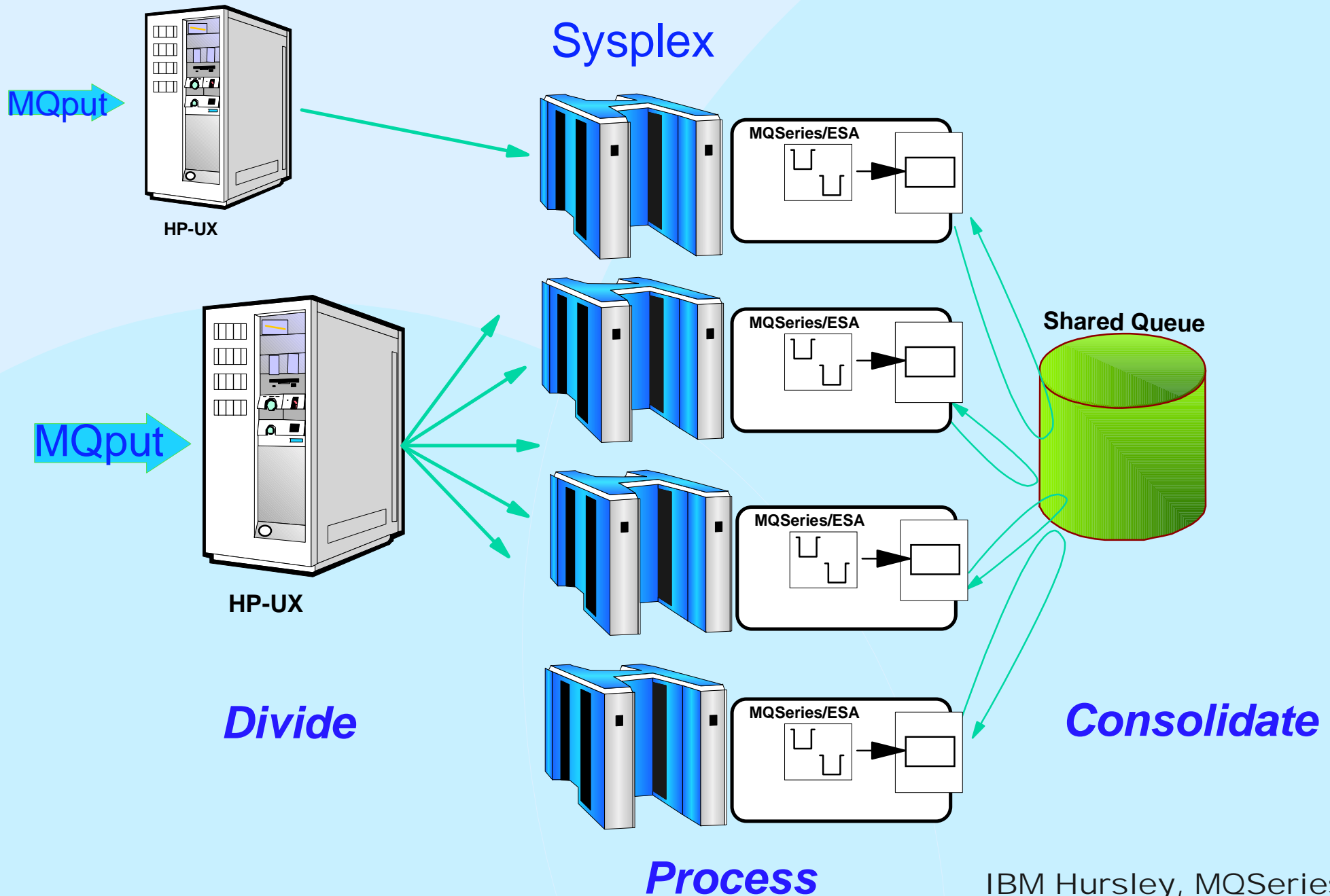
- OS/390 Resource Recovery Services

Communications

Other new features

Outlook

Sysplex Support



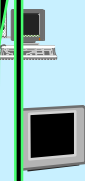
MQSeries Cluster support

- **Dynamic Workload Distribution**
- **The first stage of MQSeries on OS/390 SYSPLEX support**
- **The major feature of MQSeries for OS/390 V2.1 and MQSeries V5.1**
- **What is clustering.....**

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Queue Mana

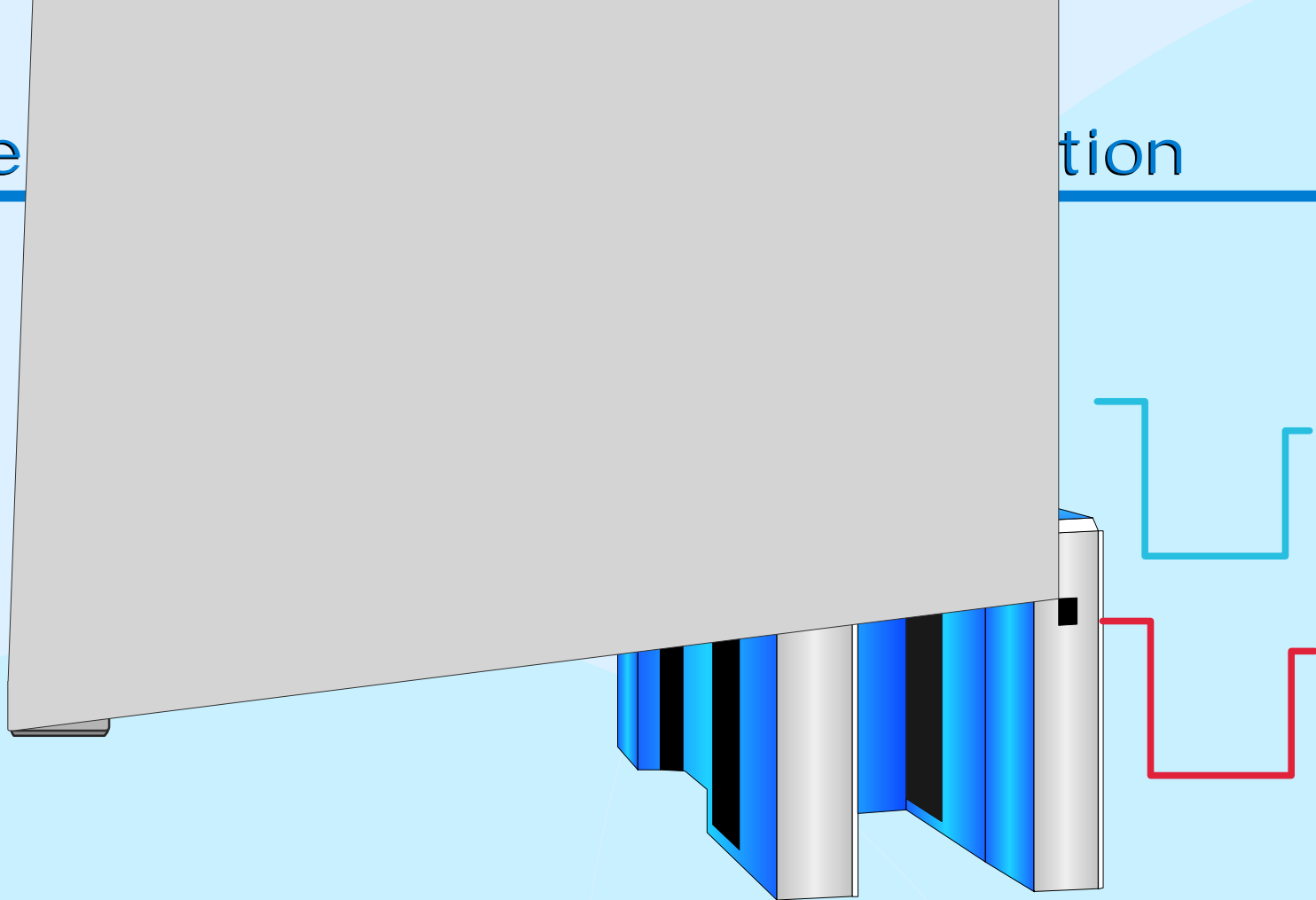
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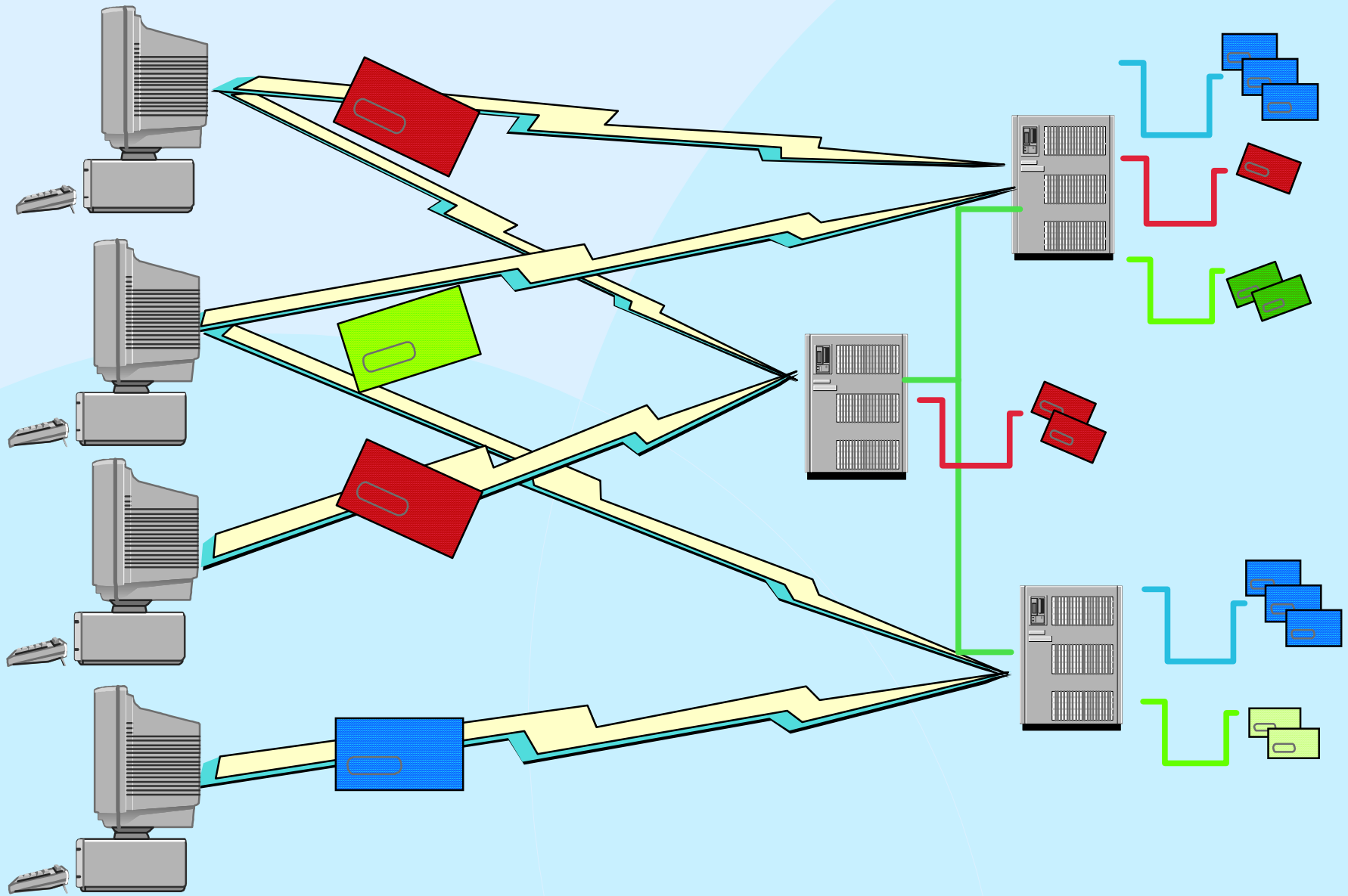
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Cluster Solution

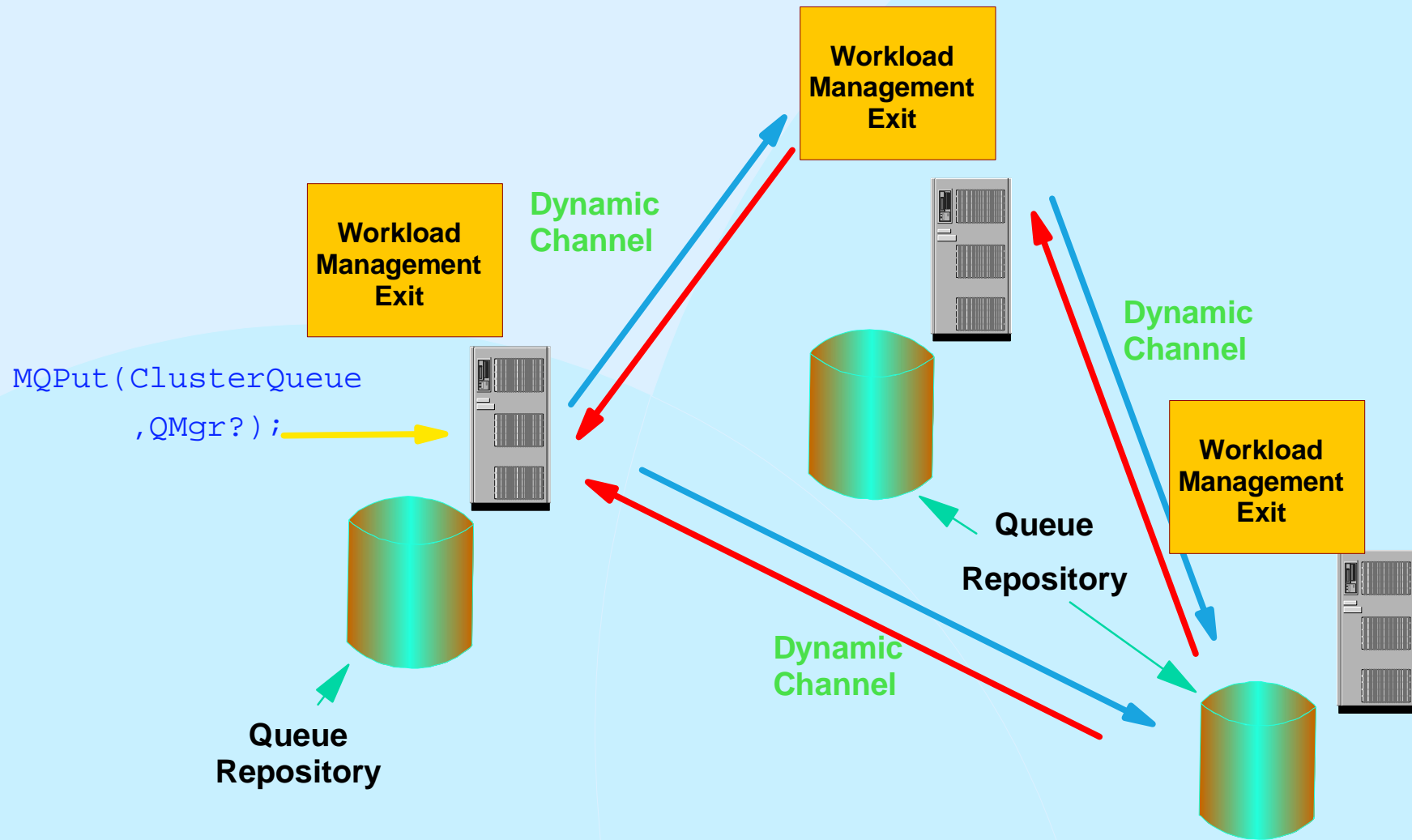


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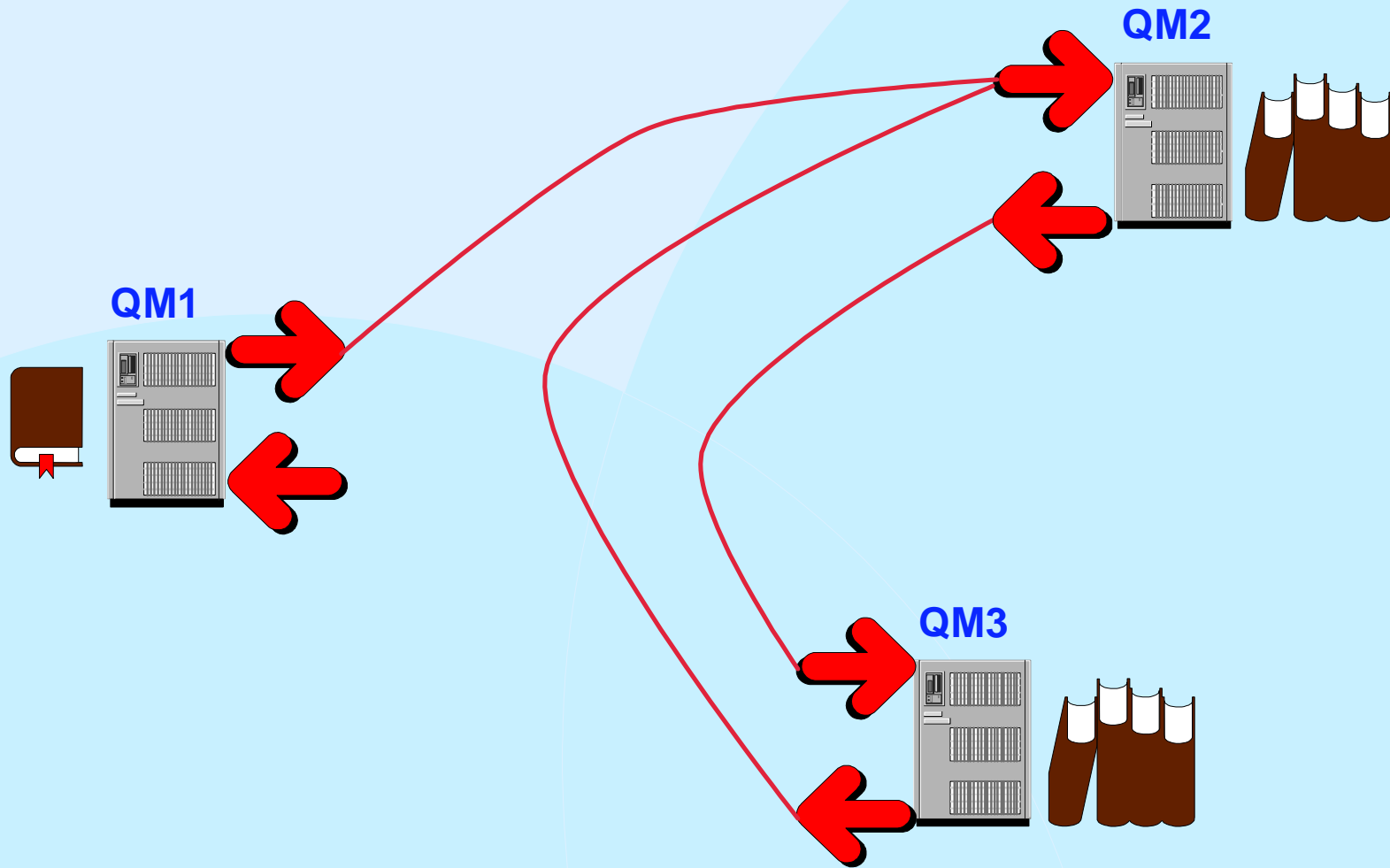
Components of the Cluster Enabler



Implementing the the cluster

- **Three pieces of underlying technology are needed to achieve clustering support.**
 - ▶ *1. Dynamic Channels*
 - A means of communicating between Queue Managers which does not require prior definition.
 - ▶ *2. Repository*
 - A means of containing the location of Queues and Queue Managers.
 - ▶ *3. Workload management exit*
 - A way to choose where to send the messages.

Definition Overview



Amount of definition - 3 Queue Managers

Number of definitions

	Clustering	Non Clustering
CHANNELS	6	9
QLOCAL	5	5
QREMOTE	0	6
XMIT QUEUE	0	6

Number of matching fields

	Clustering	Non Clustering
CHANNELS	6	18
QLOCAL	0	0
QREMOTE	0	8
XMIT QUEUE	0	6

All messages in the cluster are sent from the **SYSTEM.CLUSTER.TRANSMIT.QUEUE**

► defined during queue manager set up

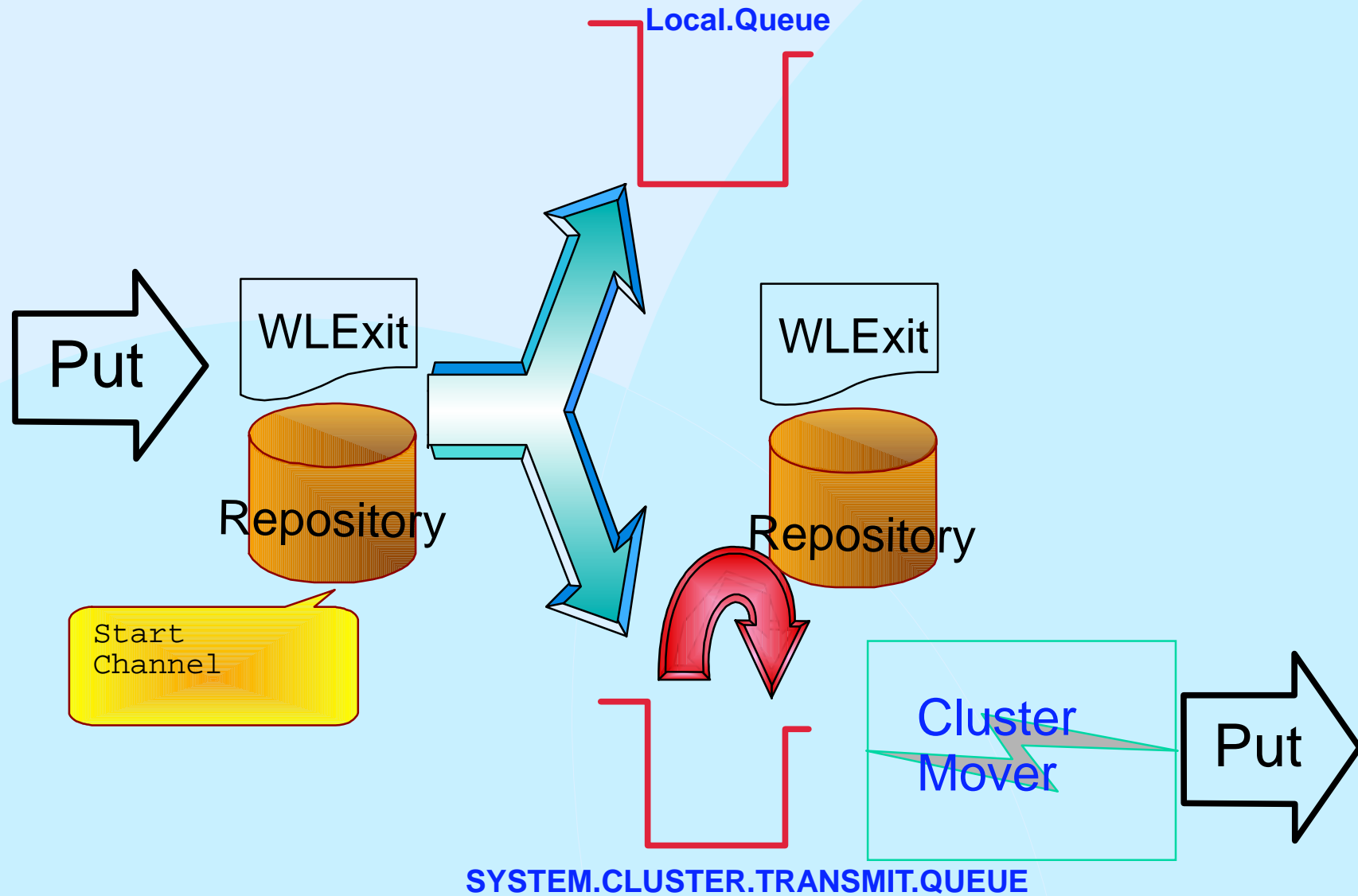
Repository

- **A collection of information about the queue managers in the cluster. The Information includes:**
 - ▶ *Queue manager names and locations*
 - ▶ *The queues they host*
 - ▶ *Channels to reach them, etc.*
- **Two types of repository**
 - ▶ *FULL*
 - A complete set of information about every queue manager in the cluster
 - Held by a repository queue manager
 - ▶ *PARTIAL*
 - The subset of information in which the particular queue manager is interested (cluster queues used and the queue managers which host them)

Repository information

- **Exchanged in PCF format**
 - ▶ *Sent to the SYSTEM.CLUSTER.COMMAND.QUEUE*
- **Held in memory**
 - ▶ *Hardened in the SYSTEM.CLUSTER.REPOSITORY.QUEUE*
- **Repository Queue Manager is told of all queue managers joining the cluster and new queues hosted by them**
 - ▶ *At least two per cluster recommended*
- **Other queue managers are told of any details relevant to queues which they use**
 - ▶ *Enough information for them to continue working if no repository queue manager is available*

Put processing



Using the Workload Exit

No need to code one.

- The default behaviour is to use a local instance of the Queue if there is one.
- If there is no local queue an equal number of messages are sent to each available remote instance.
 - ▶ At the same channel priority
- If you have only one instance of a queue there is no choice to make.

Use the exit as a monitoring point.

- The workload exit can be used to monitor where messages are being sent. On entry you are given the current choice of destination.

Use third party code.

- The vendor community is planning to add value by supplying workload management exits. These might offer configurable policy based algorithms.

Data partitioning.

- Using knowledge of the message data to route messages.

Network knowledge.

- Using knowledge of the network or machine capabilities to choose target queue managers.

Benefits

AVAILABILITY

Workload balancing

Hot-standby systems

Planned maintenance easier

Graceful degradation after failures

ADMINISTRATION

Simple, scalable administration

Single name space to describe resources

Fewer resources to define

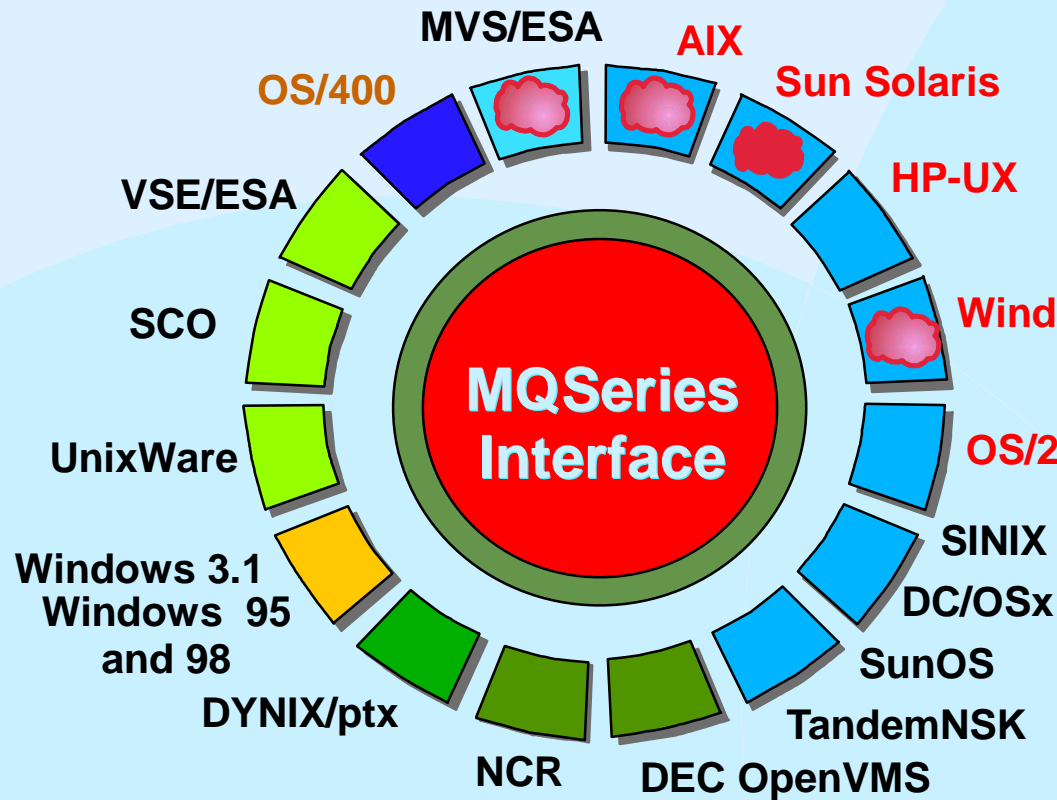
Single system to control and administer

Clustering performance

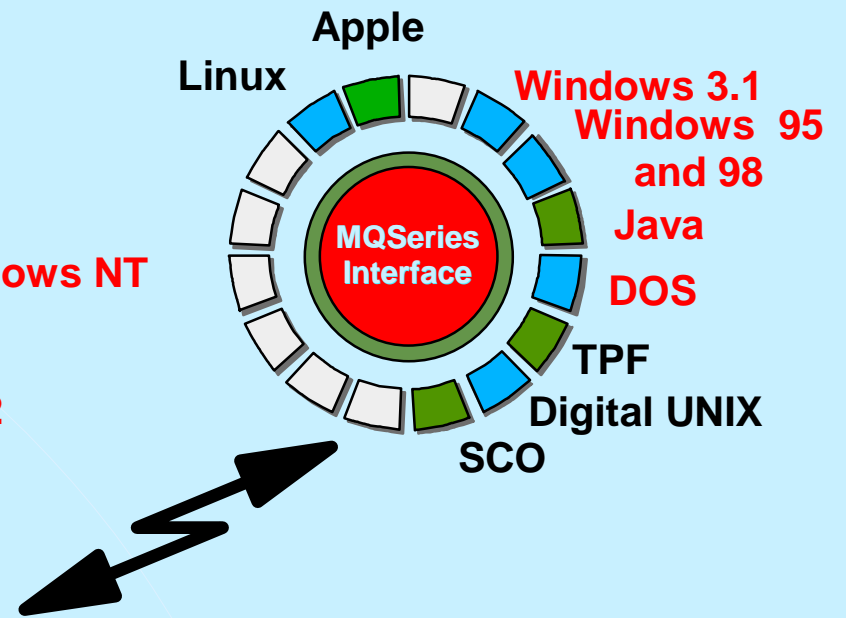
- **Very large message rates**
- **Very large numbers of messages**
- **In a typical queue manager to queue manager request/reply environment, where only the server queue and channels are clustered,**
 - ▶ *overall CPU usage increases by*
 - 2% for persistent messages
 - 5% for nonpersistent messages
 - compared to the equivalent non-clustered case.
- **Summary performance support pack available**
 - ▶ *MP18*
- **Fuller performance report planned for end Feb.99**
 - ▶ *Will be a support pack*

Platform Coverage

Queue Managers



Clients only



Automatic Restart Manager (ARM)

- **Purpose**

- ▶ *Restart a failed queue manager or mover in place*
- ▶ *Move MQ and related subsystems from a failed MVS to a good MVS*

- **Defined in an ARM policy**

- ▶ *Qmgr and mover register with ARM at start-up*
- ▶ *Deregister during shutdown*
- ▶ *Policy determines order of start and where restart can occur*

- **Recommendations**

- ▶ *Set CSQINP2 so qmgr starts mover*
- ▶ *Set CSQINPX so mover starts listeners*
- ▶ *Set ARM policy so mover only restarts if MVS stays up*

Automatic Restart Manager (ARM) *(continued)*

- **Network reconnect**

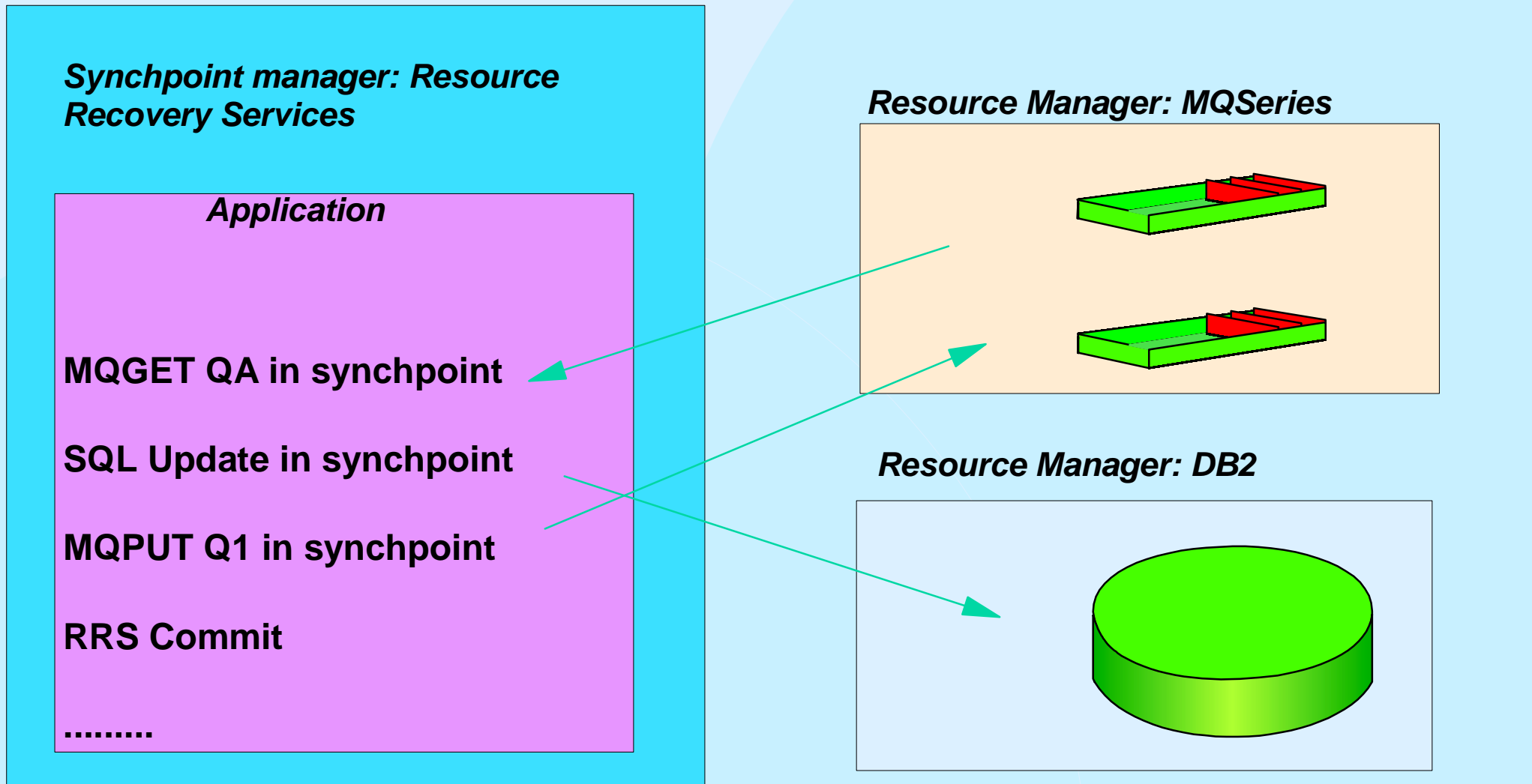
- ▶ *Can restart on different MVS and reconnect if....*
- ▶ *... mover does not use TCP/IP*
- ▶ *... mover only uses TCP/IP to cluster enabled remote QMgrs*

- **Stopping the queue manager**

- ▶ *Operation of STOP QMGR MODE(FORCE | QUIESCE)*
 - unchanged
- ▶ *New option STOP QMGR MODE(RESTART)*
 - causes qmgr to be restarted by ARM

OS/390 Resource Recovery Services

Batch and TSO applications can participate in two-phase commit protocols with other RRS-enabled products, such as DB2 or multiple MQs.



OS/390 Resource Recovery Services, cont...

- **Full 2-phase commit for MQ and other RRS compliant resource managers**
- **Unit of work can span address spaces and TCB's**
 - ▶ *eg: Multiple DB2 stored procedures each using MQ*
- **Two new RRS adapters to link edit with the MQ application**
 - ▶ *CSQBRSTB*
 - Requires MQ application to use SRRCMIT and SRRBACK
 - SRRCMIT and SRRBACK are the RRS-supplied verbs used for commit and backout in applications.
 - ▶ *CSQBRRSI*
 - Converts MQCMIT and MQBACK to SRRCMIT and SRRBACK
 - Enables migration of existing applications
- **Reason 00C12831 if MQCONN with RRS stub to v1.2 queue manager**
- **Security connection to MQ is controlled by ssid.BATCH in RACF class MQCONN**

Communications support

OE sockets support

- Performance improvements of up to 40%

TCPIP and APPC channel reconnect

- Including Listener reconnect
- No longer have to restart Channel Initiator when TCPIP recycled if using OE sockets

More clients supported

Improved channel security

- New PUTAUT options
- Give user more choice of Userid's checked

Servicability enhancements

Supported TCP/IP Interfaces

- New TCPTYPE XPARAM (in CSQ6CHIP):
 - ▶ TCPTYPE=OESOCKET (*2.1 default*)
 - Required for OS/390 R5 or later.
 - ▶ TCPTYPE=IUCV
 - For TCP/IP V3R2 on OS/390 R4 or Interlink TCPAccess V4.1 or later.
 - ▶ TCPTYPE=SNSTCPACCESS
 - For Interlink TCPAccess V4.1 or later (but use not recommended!)

TCP/IP Reconnect

- ▶ Often requested customer feature!
- ▶ Now implemented for OESockets TCP interface **only**.
- ▶ CHINIT no longer needs re-cycling along with TCP/IP
- ▶ APPC comms no longer affected by TCP/IP failure.

TCP/IP Reconnect - Mode of Operation

- ▶ When A TCP call fails with OE reason *JrTcpNotActive*, we flag comms as 'not ready' and report this to the console.
- ▶ For any subsequent TCP requests we attempt them as normal.
- ▶ Once calls stop failing with *JrTcpNotActive*, we flag comms as 'ready' again.
- ▶ Listener will retry and eventually restart.
- ▶ Channel retry drives the channel reconnect.

Listener Retry

- ▶ Following comms failure, APPC and OE TCP listeners will automatically restart.
- ▶ Function is part of TCP reconnect but benefits APPC users too.
- ▶ MQSeries for OS/390 can now survive APPC & TCP comms failures without operator intervention when the comms address space is recycled.
- ▶ New LSTRTMR XPARM specifies duration between listener reconnect attempts in seconds.

Channel Security changes

- New PUTAUT options
 - Gives users more choice as to user IDs they can use for checks
- Changed
 - **The naming and definition of userids used !**
 - **The user IDs checked in each case !**

The long term benefits are that channel initiator security for TCP/IP, LU6.2 and Client-Server will be easier to understand

Channel Security changes, cont...

● PUTAUT Options

- ▶ *Specify which user identifiers should be used to establish authority to put messages to the destination queue (for messages channels) or to execute an MQI call (for MQI channels).*
- ▶ **DEF**
 - The default user ID is used. On OS/390 this might involve using both the user ID received from the network and that derived from MCAUSER.
- ▶ **CTX**
 - The user ID from the UserIdentifier field of the message descriptor is used. This might involve also using the user ID received from the network or that derived from MCAUSER, or both.
- ▶ **ONLYMCA**
 - The default user ID is used. Any user ID received from the network is not used. This

Channel Security changes, cont...

- **Extract from:**

- ▶ MQSeries for OS/390 System Management Guide Version 2 Release 1
 - Chapter 4. Migrating from previous versions of MQSeries for MVS/ESA

- *"Channel initiator user ID checking has been changed and some new facilities added. See "User IDs used by the channel initiator" on page 433 for details, and review your channel definitions to ensure that you are getting the security control you want."*

Channel Security changes, cont...

Example: New TCP/IP Channel Table

User ID's checked for TCP/IP channels								
Profile Name	PUTAUT option specified on receiver or requester channel							
	DEF		CTX		ONLYMCA		ALTMCA	
	1 check	2 checks	1 check	2 checks	1 check	2 checks	1 check	2 checks
ssid.Alternate.User.userid	---	---	CHL	CHL+MCA	---	---	MCA	MCA
ssid.Context	CHL	CHL+MCA	CHL	CHL+MCA	MCA	MCA	MCA	MCA
ssid.localresourcename	CHL	CHL+MCA	CHL	CHL+ALT	MCA	MCA	MCA	MCA+ALT

Key:
 ALT Alternate User ID
 CHL Channel User ID
 MCA MCA User ID

MQSeries for OS/390, V2.1, other new features

C++ Support

National Language Support

- All current MQSeries products are Year 2000 ready
- Euro currency symbol codepage support

Performance improvements

- Faster MQOPEN with lots of queues
- Faster indexed MQGET if all messages have same priority
- Fast browse on Indexed queues
- See support pack MP18

Installation simplified

- Fewer jobs and FMIDs
- CICS mover now an optional FMID

Protection against MQ log RBA wrap

Internet Gateway

MQSeries for OS/390, V2.1, other new features, cont....

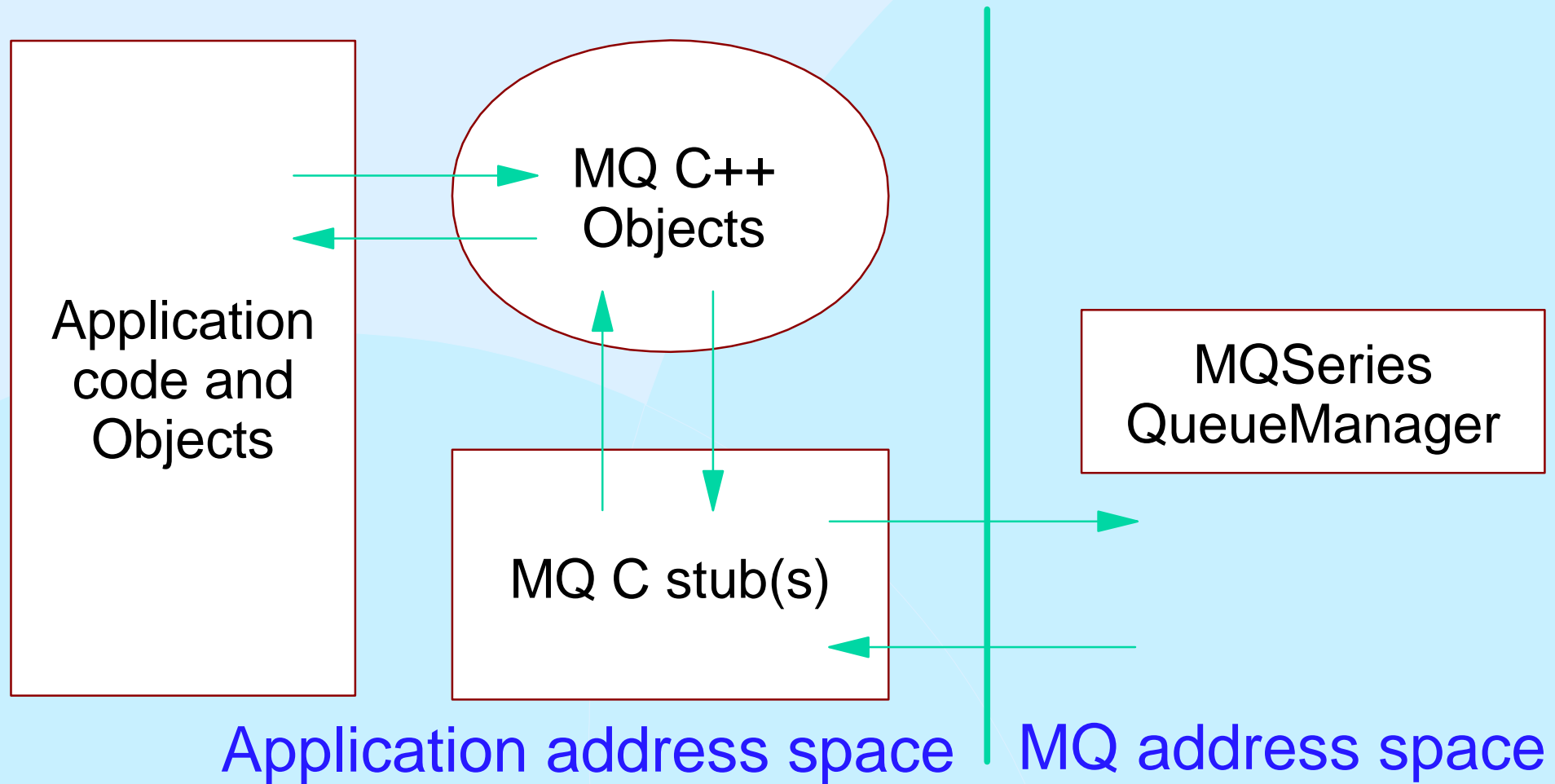
MQSeries Workflow support

- A new MQ trigger monitor enables MQSeries Workflow queues to be managed by OS/390 Work Load Manager (WLM).
 - ▶ WLM prioritizes messages which drive the MQSeries Workflow applications.
 - ▶ WLM schedules required OS/390 resources before triggering the MQSeries Workflow application.
 - ▶ Intended for use with OS/390 V2.6 and MQSeries Workflow 3.1
- MQSeries messages are committed or rolled-back under control of OS/390 RRS.

C++ Overview

- C++ bindings composed of
 - ▶ Header files
 - ▶ DLLs
 - ▶ DLL Side-decks
- Application built by including header files, and pre-linking against DLL side-decks
- DLLs are loaded at runtime
- Header files
 - ▶ C++ headers contained in SCSQHPPS
 - Contains the object definitions, and inline methods
 - ▶ C headers contained in SCSQC390
 - imqtype.h contains some platform specific definitions

C++ Application Architecture



Queue Manager cannot tell the difference between a C application and a C++ one

Availability

- **MQSeries for OS/390 V2.1**
 - GA 2/99
- **MQSeries for NT V5.1**
 - GA 4/99
- **MQSeries for HP-UX, Solaris (Intel), OS/2 and AIX V5.1**
 - GA 6/99
- **MQSeries Publish/Subscribe SDK**
 - GA 1/99 on Windows NT
 - GA 2/99 on HP-UX, Solaris, and AIX
- **MQSeries on DIGITAL UNIX, incl. SAP R/3 link (PRPQ)**
 - GA 1/99, SAP Link 1Q99

MQSeries for OS/390 V2.1 Publications

- **New Books**

- ▶ *MQSeries Queue Manager Clusters, SC34-5349-00*
- ▶ *MQSeries using C++, SC33-1877-02*

- **Changed Books**

- ▶ *MQSeries for OS/390 System Management Guide, SC34-5374-00*
- ▶ *MQSeries for OS/390 Messages and Codes, SC34-5375-00*
- ▶ *MQSeries for OS/390 Problem Determination Guide, GC34-5376-00*

MQSeries for OS/390 V2.1 Publications (*continued*)

- **Changed books**

- ▶ *MQSeries Planning Guide, GC33-1349-07*
- ▶ *MQSeries Intercommunication, SC33-1872-02*
- ▶ *MQSeries Clients, GC33-1632-96*
- ▶ *MQSeries Command Reference, SC33-1369-10*
- ▶ *MQSeries Programmable Systems Management, SC33-1482-07*
- ▶ *MQSeries Application Programming Guide, SC33-0807-09*
- ▶ *MQSeries Application Programming Reference, SC33-1673-05*
- ▶ *MQSeries Application Programming Reference Summary, SX33-6095-04*

Outlook for MQSeries for OS/390, V2.x

Parallel Sysplex Related:

→ Shared queues

- Use coupling facility to store messages
- Message length restricted
- Non-pervasive messages best supported
- Support for dual logging for reliability

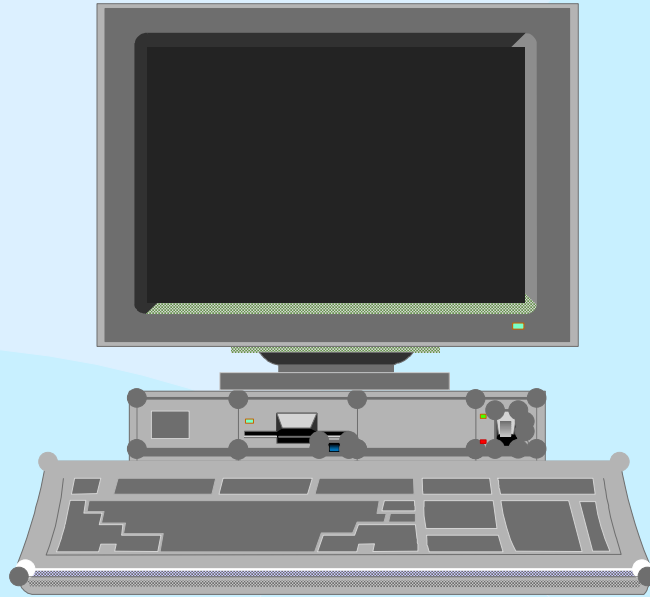
→ Shared data

- Use DB2 to store message objects
- Access to queue definitions from a Sysplex machine

MQSeries Family consistency items

- Large messages (Partial Get/Put)
- Distribution lists
- Reference messages

Find Us At.....



The MQSeries Home Page

<http://www.software.ibm.com/ts/mqseries/>