E11
A Tour Around MQSeries with VSE/ESA

Welcome
Aboard the
MQSeries Special

VM VSE Technical Conference 2000
Orlando

Your Tour Guide for this trip will be Chris Sims
csims@us.ibm.com

RETURN TO INDEX

Sites of Interest

Highlights of the Tour	Introduction to MQ for VSE/ESA V2.1
Getting started	MQ Installation
The Route Map	Product Overview
The First Steps	MQ System Definitions
Starting and Ending the Journey	Initialization & Termination
Things for you to do!	Application Overview
Sites of Local Interest	Local Queue Operation
Sites of Remote Interest	Remote Queue Operation
The New Transport	TCP/IP Implementation & Clients
The Underground Scene	Queue & File Maintenance
What to do in an Emergency?	Problem Determination
Where did I go wrong?	Common Pitfalls

Introduction

- Essential Supplies and Equipment. Not to be forgotten.
- (Required software levels)

- VSE/ESA V2.3   * *   (5690-VSE)
- CICS/VSE V2.3   (5686-026)
- LE/VSE 1.4 Runtime   (5696-067)
- VTAM for VSE/ESA V4.2   (5666-363)

or

- TCP/IP for VSE/ESA V1.3   (5686-A04)

     L E Socket Support   +   PTFs

                    UQ26288 - for TCP/IP base

                    UQ22957 - for LE socket interface

    * * Recommended minimum of VSE V2.3.1

Introduction

- So you have been here before?
- What are the highlights this trip?

- Automatic VSAM file reorganization
- Maximum message size 4MB
- Message batching for channels
- Channel communication through TCP/IP
- Default Code page definition
- Support for C and PL/I programming languages
- Support for TCP/IP attached clients
- MQGET by MSGID / CORRELID

Introduction

- Historical Notes   Where it came from and why

The line items

   Items were selected from the MQ product requirements
   database. These requirements are created by customers.

The code

   - MQ/VSE V1.4
   - MQ/MVS V1.2
   - New code added

Introduction

- Future expeditions?

- Data Conversion for channels and MQGMO_CONVERT
- PCF Support
- 'MQSC' support
- Support for VSE V2.4 and TS V1.1
- No major migration from other code base is planned.

Getting Started   -MQ Installation   *

Before starting your journey please consider the following:

- MSHP

ICCF using V2 Stacked tape installation

Sample MSHP JCL [See System Management Guide (SMG) Page 11]

- CICS Requirements

CICS Sample jobs

MQJCSD.Z	for PPT, PCT definitions.
MQCICDCT.Z	for required DCT.
MQCICFCT.Z	for sample queue files.

CICS startup deck must reference MQ Install library in LIBDEF statement.

- TCP/IP Install
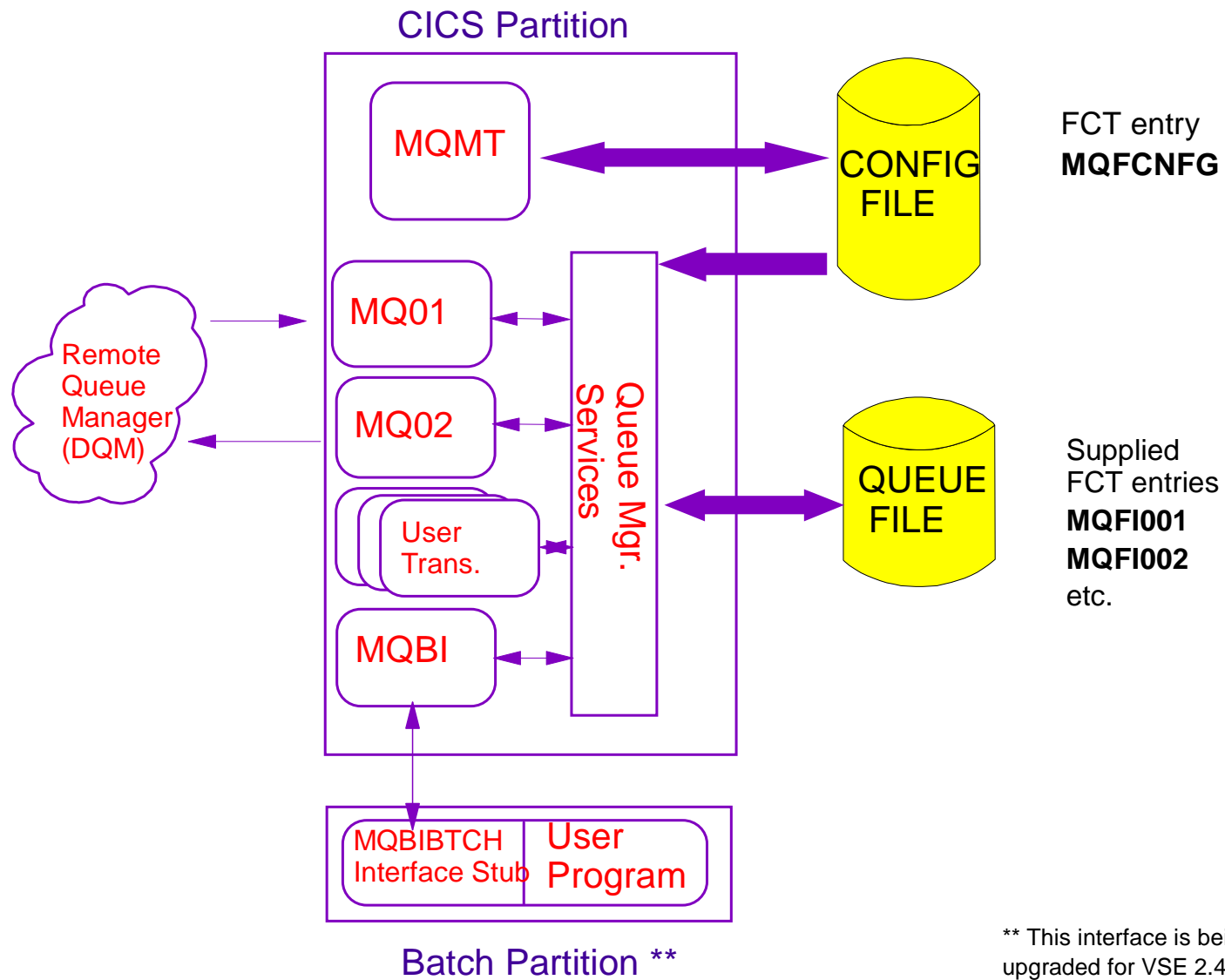
TCP/IP Product Access Key

Additional PCT for module ($EDCTCPV, language C)

Prerequisite PTFs.

The Route Map

MQ/VSE V2.1 Product Overview

CICS Partition

MQMT ⟷ CONFIG FILE

FCT entry **MQFCNFG**

Remote Queue Manager (DQM)

MQ01 ⟷ Queue Mgr. Services

MQ02 ⟷

User Trans.

MQBI ⟷

QUEUE FILE

Supplied FCT entries **MQFI001** **MQFI002** etc.

MQBIBTCH Interface Stub | User Program

Batch Partition **

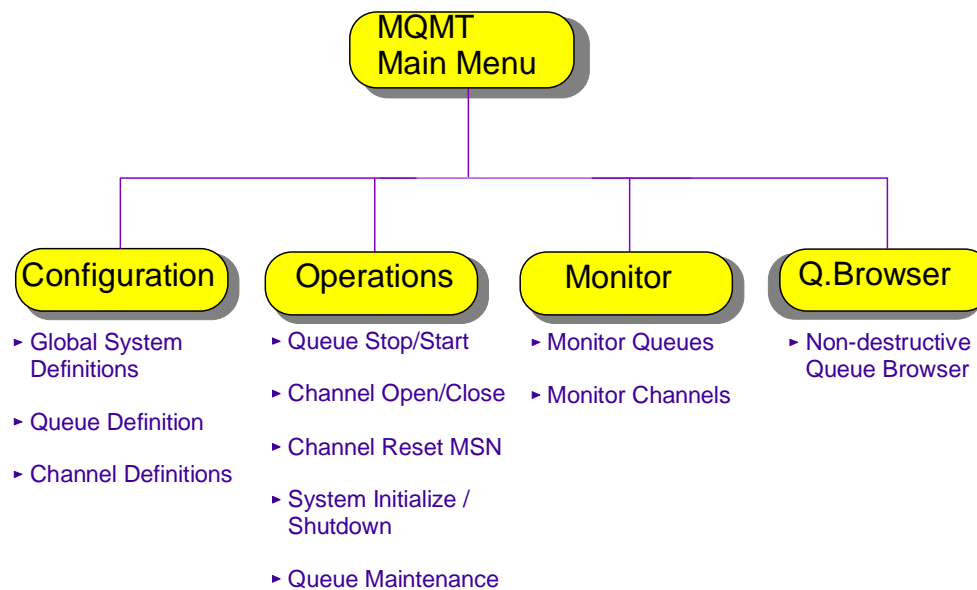** This interface is being upgraded for VSE 2.4

8

MQ System Definition

The first steps....and the basic equipment you will use.

- Introduction to MQMT System Adminstration Panels
- Global System Definition
- Sample local queue definition

Overview of MQMT System Administration Panels

MQ for VSE/ESA System Definition

- All queue and channel definitions are created using the **MQMT** control transaction panels

```
                        MQMT
                     Main Menu
                          |
    ┌──────────────┬──────┴───────┬─────────────┐
Configuration   Operations      Monitor      Q.Browser
```

Configuration
- ▸ Global System Definitions
- ▸ Queue Definition
- ▸ Channel Definitions

Operations
- ▸ Queue Stop/Start
- ▸ Channel Open/Close
- ▸ Channel Reset MSN
- ▸ System Initialize / Shutdown
- ▸ Queue Maintenance

Monitor
- ▸ Monitor Queues
- ▸ Monitor Channels

Q.Browser
- ▸ Non-destructive Queue Browser

A typical MQMT screen

```
 11/17/1998        ①    IBM MQSeries for VSE/ESA Version 2.1.0          IYBPZS01
 11:34:35                *** Master Terminal Main Menu ***               VSE1
 MQMMTP      ②                                                           SFC6
                            SYSTEM HAS BEEN SHUTDOWN

                               1. Configuration

                               2. Operations

                               3. Monitoring

                               4. Browse Queue Records


                      Option:




 Please enter one of the options listed.
    5686-A06 (C) Copyright IBM Corp. 1998       All Rights Reserved.
    CLEAR/PF3 = Exit                            ENTER=Select
```

1. Title Bar
2. BMS panel identifier

The Main Configuration Menu

```
 11/18/1998          IBM MQSeries for VSE/ESA Version 2.1.0         IYBPZR02
08:31:36            *** Configuration Main Menu ***                    SYSA
MQMMCFG                                                                SFC1
                            SYSTEM IS ACTIVE

                        Maintenance Options :
                            1. Global System Definition
                            2. Queue Definitions
                            3. Channel Definitions


                        Display Options     :
                            4. Global System Definition
                            5. Queue Definitions
                            6. Channel Definitions



                    Option:




Function terminated.
    5686-A06 (C) Copyright IBM Corp. 1998         All Rights Reserved.
 ENTER = Process            PF2 = Main Menu            PF3 = Quit
```

The Global System Definition Record

```
 011/17/1998              IBM MQSeries for VSE/ESA Version 2.1.0
IYBPZS01
 11:44:27                    Global System Definition                    VSE1
 MQMMSYS                     Queue Manager Information                    SFC6
  Queue Manager . . . . . . . .: VSEP
  Description Line 1. . . . .: VSE QUEUE MANAGER
  Description Line 2. . . . .: ON SYSTEM WINVSEP
                         Queue System Values
  Maximum Number of Tasks . .: 00000100      System Wait Interval : 00000010
  Maximum Concurrent Queues .: 00000100      Max. Recovery Tasks  : 0000
  Allow TDQ Write on Errors  : Y   CSMT      Allow Internal Dump  : Y
                         Queue Maximum Values
  Maximum Q Depth . . . . . .: 01000000      Maximum Global Locks.: 00001000
  Maximum Message Size. . . .: 04000000      Maximum Local Locks .: 00001000
  Maximum Single Q Access . .: 00000100      Checkpoint Threshold : 1000
                         Global QUEUE /File Names
  Local Code Page . . . : 01047              TCP/IP Listener Port :  01414
  Configuration File. . : MQFCNFG            Licensed Clients . . :  00051
  LOG Queue Name. . . . : SYSTEM.LOG
  Dead Letter Name. . . : SYSTEM.EXCEPT
  Monitor Queue Name. . : SYSTEM.MONITOR

 Requested record displayed.
  PF2 = Main Config    PF3 = Quit     PF4/ENTER = Read      PF6 = Update
```

The Local Queue Definition Record (1)

```
 11/18/1998              IBM MQSeries for VSE/ESA Version 2.1.0
IYBPZS01
 08:18:15                  Queue Definition  Record                        VSE1
MQMMQUE            QM - VSEP                                                 SFC1

                         LOCAL QUEUE DEFINITION

  Object Name. . . . . . . . : ANYQ
  Description line 1 . . . . :
  Description line 2 . . . . :

  Put Enabled  . . . . . . . : Y       Y=Yes, N=No
  Get Enabled  . . . . . . . : Y       Y=Yes, N=No

  Default Inbound status . . : A       Outbound .. :  A    A=Active,I=Inactive

  Dual Update Queue . . . . .:


  Automatic Reorganize (Y/N) : N

 Requested record displayed.

 PF2=Main Config PF3 = Quit  PF4/ENTER = Read   PF5 = Add          PF6 =
Update
                 PF9 = List  PF10= Queue        PF11= Reorg.       PF12=
Delete
```

The Local Queue Definition Record (2)

```
 11/18/1998            IBM MQSeries for VSE/ESA Version 2.1.0            IYBPZS01
08:22:19                    Queue Extended Definition                    VSE1
MQMMQUE           QM - VSEP                                              SFC1
Object Name. . . . . . . . : ANYQ
                              Physical Queue Information
Usage Mode . . . . . . . . : N     N=Normal, T=Transmission
Share Mode . . . . . . . . : Y      Y=Yes, N=No
Physical File Name . . . . : MQFI002    MQSERIES.TWO.DEVELOP.MQFI002
                              Maximum Values
Maximum Q Depth. . . . . . : 01000000     Global Lock Entries . : 00001000
Maximum Message Length . . : 02000000     Local Lock Entries. . : 00001000
Maximum Concurrent Accesses: 00000100     Checkpoint Threshold  : 0001


                              Trigger Information
Trigger Enable . . . . . . : N     Y=yes, N=No
Trigger Type   . . . . . . :       F=First, E=Every
Maximum Trigger Starts . . : 0001
Allow Restart of Trigger   : N     Y=Yes, N=No
Trans ID   :                              Term ID:
Program ID :                              Channel Name:


Requested record displayed.
PF2=Main Config PF3 = Quit PF4/ENTER = Read   PF5 = Add          PF6 = Update
                PF9 = List PF10= Queue        PF11= Reorg.       PF12= Delete
```
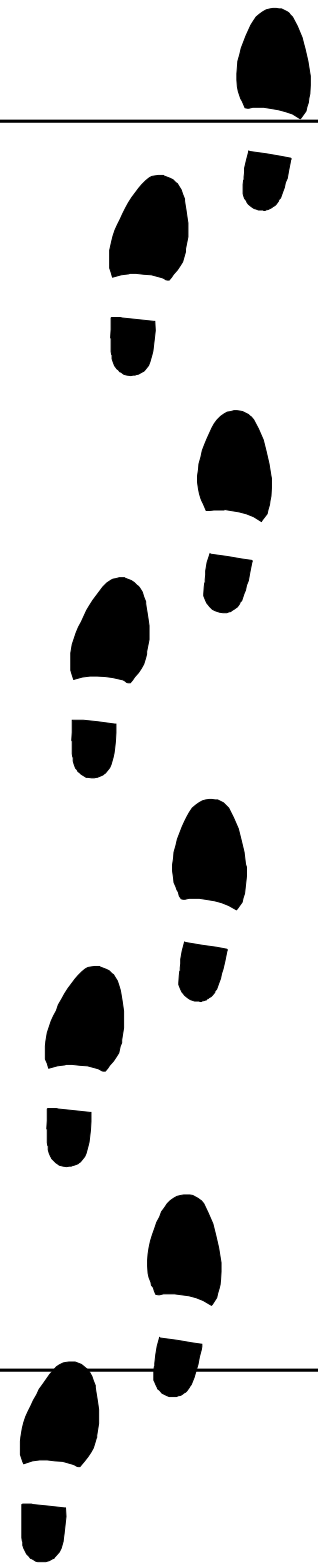
Starting and Ending the Journey

MQ Initialization & Termination

- One time only initialization
- Conversion from V1.4
- CICS and MQ startup
- MQ Runtime initialization
- MQ termination

Starting the Journey....

MQ Initialization.   One time only.

- Sample JCL MQJSETUP.Z
  Used to copy system messages into ESDS file MQFSSET.

- Sample JCL MQJCONFG.Z
  Used to allocate user configuration file MQFCNFG.

- Sample JCL MQJQUEUE.Z
  Used as sample for allocation of user queue files.

- MQSU transaction
  Initializes and populates the MQFCNFG file.
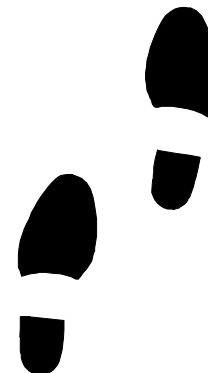
Where are you coming from?
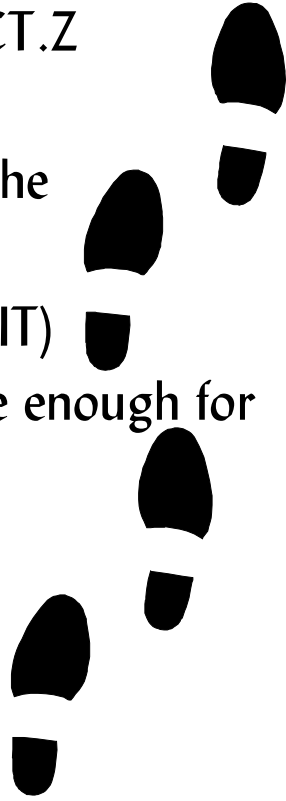
Conversion from V1.4 systems

- Sample JCL MQJMIGR1.Z
  Copies existing configuration file records to a flat VSAM file.

- Sample JCL MQJMIGR2.Z
  Uses IDCAMS 'REPRO' to copy old configuration records into the new configuration file.

Starting the Journey...

CICS startup

- Ensure new DCT entry is created from sample MQCICDCT.Z
- Load CICS group 'MQM' created by sample MQJCSD.Z
- CICS startup deck should reference PRD2.MQSERIES in the //LIBDEF *,SEARCH.... statement
- CICS logging should be set on (JCT = xx or YES in DFHSIT)
- CICS journalling (JCT) should ensure the BUFSIZE is large enough for maximum record length specified in sample FCTs

Starting the Journey…(more)

MQ startup

- Initial once only MQSU transaction
- Set MQ environment active using MQSE transaction
- Start MQ manager using MQIT or
  using MQT panel option 2.4
- Steps can be combined using 'MQSE I'
- MQ start can be executed in CICS PLTPI processing
  using programs 'MQPSENV' and 'MQPSTART'
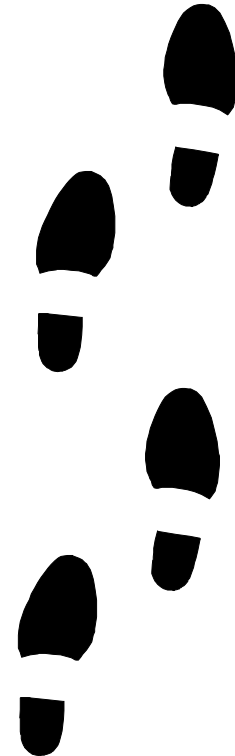
Starting the Journey... (still more)

Runtime initialization

- Performed by MQIT transaction (program MQPINIT1)
- Build in-core tables for queue and channel definitions from MQFCNFG
- Start MQ housekeeping monitor transaction (MQSM)
- Start MQ TCP/IP listener transaction (MQTL)
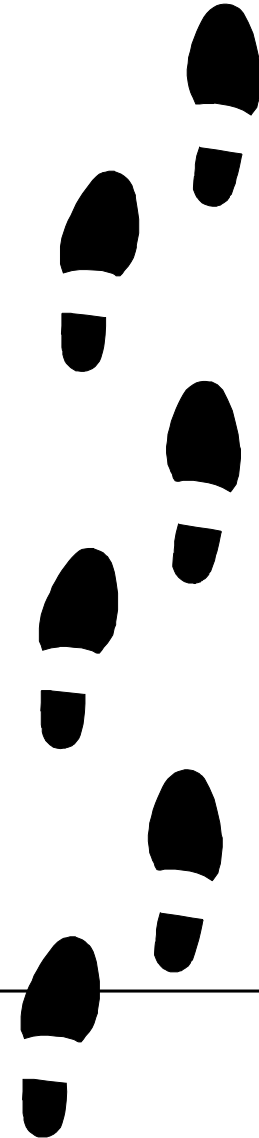
...ending the Journey   *

MQ Termination

- Performed using MQST transaction (program MQPSTOP)
- Use the MQMT utility option 2.4
- Ends MQ housekeeping monitor transaction (MQSM)
- Ends MQ TCP/IP listener transaction (MQTL)
- Terminates in flight channel activity
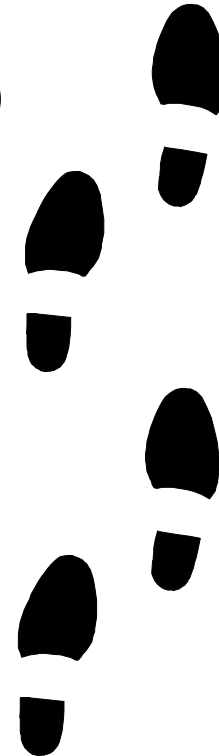
Things for you to do!

What you will be doing on the trip.

- Flows of MQ API operations
- Sample COBOL fragment
- C and PL/I programs

What you ought to do...

MQ Call and Sequence of Operations

- Once per program

- Once per queue

- Multiple times

- Once per queue

- Once per program

MQCONN

MQOPEN

MQPUT

MQGET

MQINQ

MQCLOSE
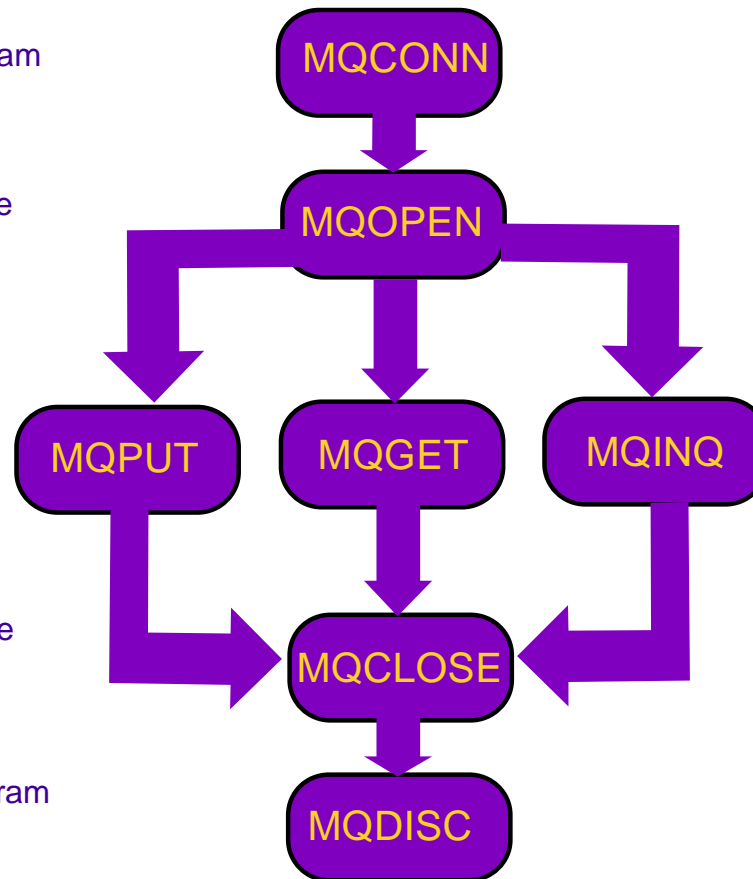
MQDISC

MQPUT1

MQPUT1 is a special operation equivalent to a MQOPEN, MQPUT and MQCLOSE but it still requires the MQCONN and MQDISC.

A Typical MQ Application

```
      PROCEDURE DIVISION.
          :
          :
          :
          :
  *-- Establish a link with MQ.
    SET WS-HCONN-VALUE  TO NULL.
    CALL 'MQCONN'  USING  WS-QM-NAME-AREA
                   WS-HCONN-ADDR-AREA
                   WS-CCODE-ADDR-AREA
                   WS-RCODE-ADDR-AREA
    END-CALL
          :
  *-- Open the queue.
    SET WS-HOBJ-VALUE   TO   NULL.
    CALL 'MQOPEN' USING  WS-HCONN-ADDR-AREA
                   WS-Q-NAME-AREA
                   WS-Q-OPEN-OPTIONS
                   WS-HOBJ-ADDR-AREA
                   WS-CCODE-ADDR-AREA
                   WS-RCODE-ADDR-AREA
     END-CALL
          :
          :
  *-- Put and message and check status
     CALL 'MQPUT'   USING  WS-HCONN-ADDR-AREA
                   WS-HOBJ-ADDR-AREA
                   WS-MSG-DESCRIPTOR
                   WS-PUT-OPTIONS
                   WS-BUFFER-L-AREA
                   WS-BUFFER-AREA
                   WS-CCODE-ADDR-AREA
                   WS-RCODE-ADDR-AREA
        END-CALL
```

```
  *
     IF WS-CCODE-VALUE   NOT EQUAL  ZERO
       THEN
          :
       END-IF
          :
  *-- Close queue and check status
      CALL 'MQCLOSE' USING  WS-HCONN-ADDR-AREA
                    WS-HOBJ-ADDR-AREA
                    WS-Q-OPEN-OPTIONS
                    WS-CCODE-ADDR-AREA
                    WS-RCODE-ADDR-AREA
      END-CALL
  *
     IF WS-CCODE-VALUE   NOT EQUAL  ZERO
       THEN
          :
     END-IF
   * Disconnect and free handle
     CALL 'MQDISC'  USING
                    WS-HCONN-ADDR-AREA
                    WS-CCODE-ADDR-AREA
                    WS-RCODE-ADDR-AREA
      END-CALL
          :
```

Sites of Local Interest   Local Queue Operation

Customer Application Program

| Main Code | MQxxxx | MQPAIP0 | ←→ | MQPAIP1 | ←→ | MQPQUE1 | (Queue Manager) |

- MQxxxx are the MQ API object modules (MQxxxx.OBJ)
- MQAPI0 is the MQ API stub used to invoke all API functions

———— ■ Language 'CALL'

←→ ■ CICS 'LINK'

Queue File   (VSAM Dataset)

26
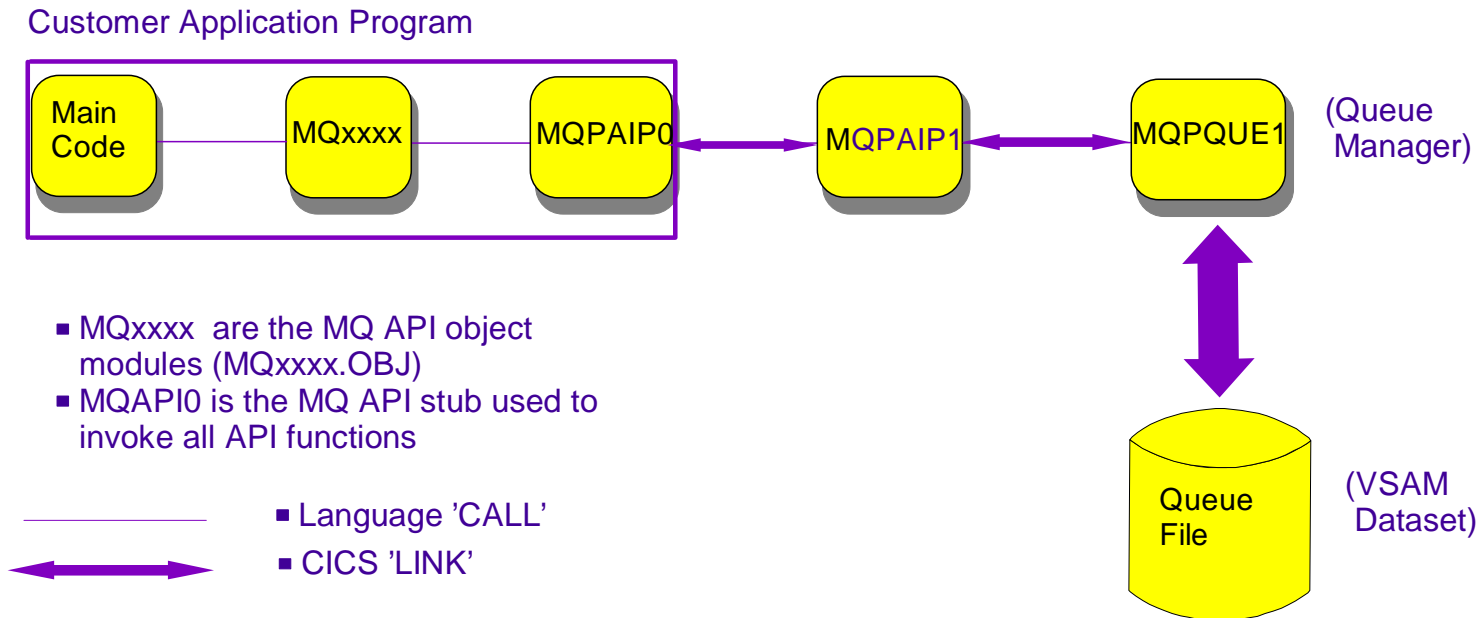
Sites of Remote Interest

- Inbound MQ request mechanism
- Outbound MQ request mechanism

Remote Queue Mechanism (1)

■ Inbound Requests

SNA Remote

Request

CICS/VSE

TCP/IP Listener MQTL | Port # (1414)

TCP/IP Remote

Request

Start TX MQ01

MQ01 MQPRECV

TCPIP Client Server

Dead Letter Queue

Local Queue
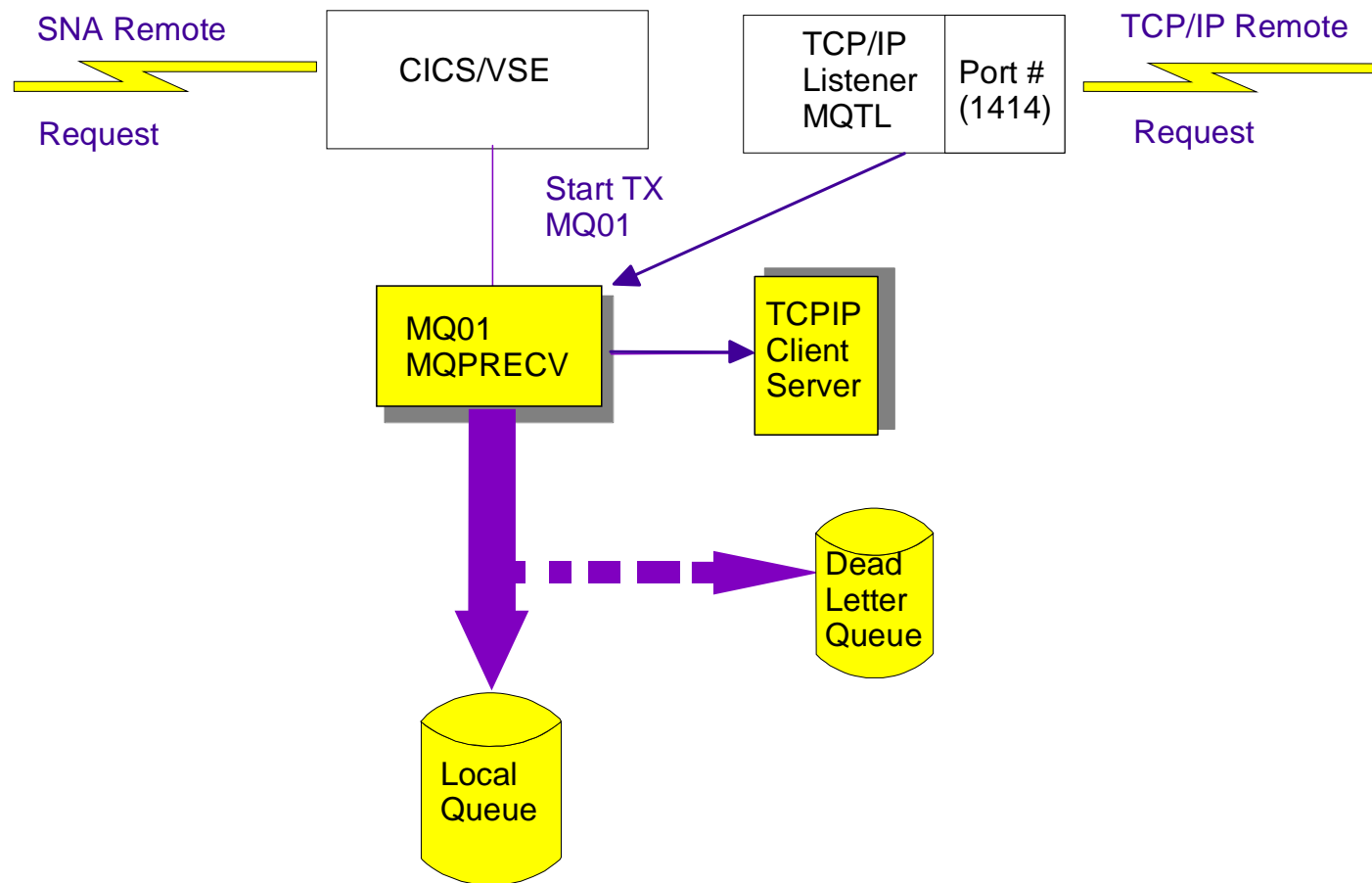
Remote Queue Mechanism (2)

*

■ **Outbound Requests**

Customer Application
(MQPAIP1+MQPQUE1)

MQPUT to remote Queue

■ Negotiate Channel
■ Send request
■ Until Queue empty *

Local XMIT Queue

MQPSEND

MQPAIP2

TX - MQ02

Message Channel Agent
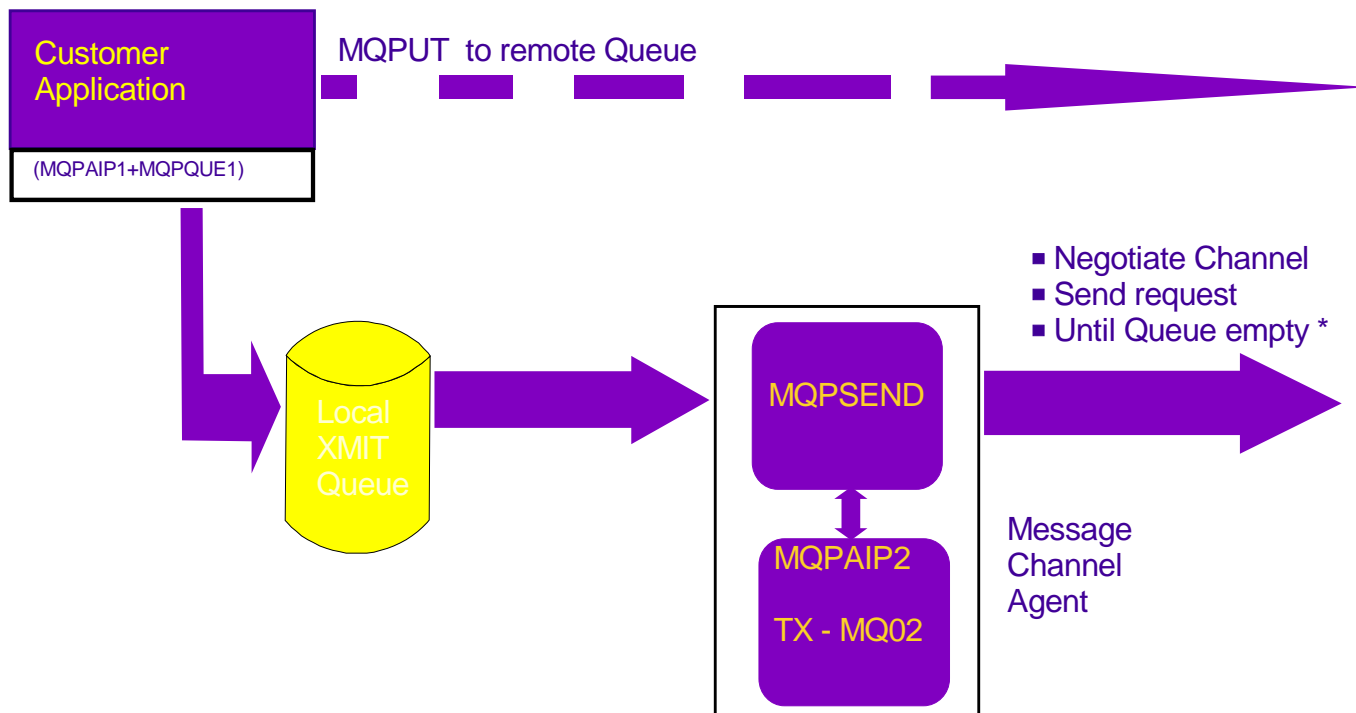
The New Transport TCP/IP Implementation and Clients

- The Previous MQ Implementation
- The New Implementation with TCP/IP

SNA/APPC
request

VTAM

CICS/VSE
Partition

Starts CICS
task

APPC Calls

APPC Calls

MQ/VSE Receiver
MCA (MQ01)

MQ API

MQ/VSE Sender*
MCA (MQ02)

MQ API

*Triggered after
MQPUT from
application.

MQ/VSE Queue Manager

VSAM/VSE
File System

KSDS

KSDS

31

Port #
(1414)

SNA/APPC
request

read ( )
socket#
from MQTL

Port #
from
Channel
Definition

VTAM

Starts CICS
task

CICS/VSE
Partition

APPC Calls

TCP/IP
API Calls

MQ/VSE
TCP/IP Server

(MQPTCPSV)

APPC Calls

TCP/IP
API Calls

MQ/VSE Sender*
MCA (MQ02)

MQ/VSE
Listener
(MQTL)

MQ/VSE Receiver
MCA (MQ01)

MQ API

MQ API

MQ API

*Triggered
after
MQPUT from
application.

MQ/VSE Queue Manager

VSAM/VSE
File System

KSDS

KSDS

KSDS

The Underground Scene

Or how to save time on the journey!

- User Controlled File Maintenance Utilities
- Automated File Maintenance

User Controlled File Maintenance (1)

```
03/05/1997            IBM MQSeries for VSE/ESA Version 1.4.0          IYZMZSI2
14:19:01              Maintain Queue Message Records                  VSE2
MQMMDEL                                                               0001

                          System Information
          System Status    : System is active.
          Queue  Status    : Queuing system is active.
          Channel System   : Channel system is active.
                       Queue Information
          Queue Name       : USER.LOCAL.QUEUE
          Function         : A A=Delete all, D=Delete to date/time exclusive
                               R=Reset from date/time inclusive

          Date (yyyymmdd)  :
          Time (hhmmss)    :

                        Results of Request
          Number Processed :
          Number of Bypass :
          New Last Read QSN:
          Process Time     :

Please enter a Queue name.
PF2 = Oper Main Menu           PF3 = Quit                 PF6 = Update
                                                          PF12= Retry
```

34

User Controlled File Maintenance (2)

Sample JCL MQJREORG.Z allows physical deletion and reorganization

- All records associated with a queue may be deleted
- Records may deleted after a specified time
- All records associated within a VSAM file may be deleted

```
// DLBL INPUTQ,'MQSERIES.MQFI002',,VSAM,CAT=MQMCAT
// DLBL OUTPUTQ,'MQSERIES.WORK.QUEUE',,VSAM,CAT=MQMCAT
// EXEC IDCAMS,SIZE=AUTO
 /*              VERIFY VSAM FILE                */
        VERIFY FILE(INPUTQ)
        IF MAXCC > 0 THEN CANCEL   /* This means Cluster in use  */

        DELETE   (MQSERIES.WORK.QUEUE)              -
            CL ERASE PURGE CAT(?cat?)
        SET MAXCC = 0
        DEFINE CLUSTER                -
            (NAME (MQSERIES.WORK.QUEUE)          -
            CYLINDERS (10 10)                -
            VOLUMES (?volid?)              -
            NONINDEXED)                -
          DATA                    -
            (NAME (MQSERIES.WORK.QUEUE.DATA)       -
            RECORDSIZE (57   32703)             -
            CISZ (8096))                -
            CAT (?cat?)
    /*
// IF £MRC GT 0 THEN
// GOTO WRAPUP
// LIBDEF PHASE,SEARCH=(PRD2.MQSERIES,PRD2.SCEEBASE)
// EXEC MQPREORG,SIZE=AUTO
OS2_LOCAL 19980921000000
/*
```

Automated File Maintenance

```
 11/18/1998           IBM MQSeries for VSE/ESA Version 2.1.0
IYBPZR02
 08:28:27                                                         SYSA
 MQMMQUE            QM - DC01                                      SFC1
 VSAM Name. . . . . . . . . . : IYBPZR02.MQSERIES.MQFI001

 VSAM Catalog . . . . . . . : MQSERIES.VSEP.SYSTEST.CATALOG

 VSAM File. . . . . . . . . : MQFI001

 VSAM Volume. . . . . . . . : VSEP24     Start Time :  0800

 Records. . . . . . . . . . : 000300     Interval   : 1440

 Avg. Record Size . . . . . : 000200     Job Class  : 8

 Max. Record Size . . . . . : 005120

 CI Size. . . . . . . . . . : 008096



 Requested record displayed.
     PF2 = Options PF3 = Quit PF4/Enter = Read       PF6 = Update
                                 PF10= Queue                      PF12=
Delete
```

36

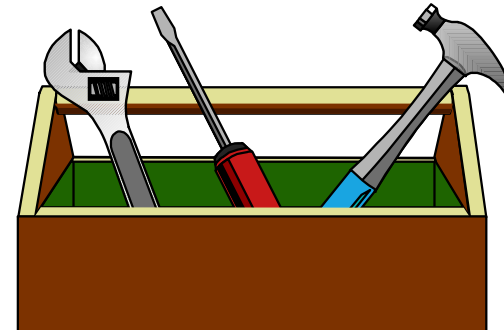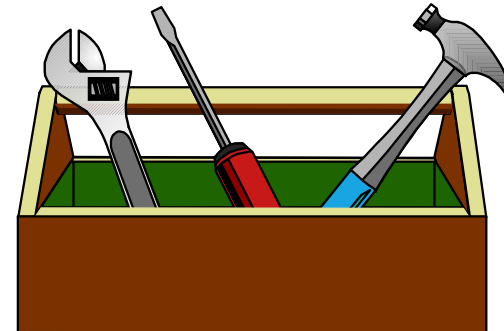# What to do in an Emergency?

Where to go for help

- Console Messages and CICS log
- Application problems and the SYSTEM.MONITOR queue messages
- SYSTEM.LOG queue messages
- VSAM File Fragmentation
- Documentation for problems

Problem Determination

Application Problems

- MQ API Monitor
- Each API call is logged in SYSTEM.MONITOR

System Monitor Queue Information

```
11/13/1998              IBM MQSeries for VSE/ESA Version 2.1.0          IYZMZSI2
18:11:37                      Browse Queue Records                      VSEP
MQMDISP                        SYSTEM IS ACTIVE                         0002

    Object Name: SYSTEM.MONITOR
    QSN Number : 00000006        LR-        0, LW-        8, DD-MQFO002
                          Queue Data Record
Record Status : Written.        PUT date/time  : 19970313180036
Record Size   : 00000428        GET date/time  :
Queue line.
TST20002..._              01                   OPEN    ........................ 0000
EEEFFFFF0006444444444444FF4444444444444DDCD4444036243000362430000000000
32320002000D00000000000001000000000000006755000000076863C0076864C00000000
          VSE2                                        GEGE              0048
444444444444EECF44444444444444444444444444444444444444444444444CCCC44444444
000000000000525200000000000000000000000000000000000000000000000757500000000
                                        GEGE                        0090
44444444444444444444444444444444444444CCCC44444444444444444444444444444444
0000000000000000000000000000000000000075750000000000000000000000000000000000

Information displayed.
    5686-A06 (C) Copyright IBM Corp. 1993, 1997  All Rights Reserved.
 ENTER = Process  PF2 = Main Menu    PF3 = Quit   PF4 = Next     PF5 = Prior
 PF7 = Up      PF8 = Down    PF9=Hex/Char   PF10=Txt/Head         PF12 = Monito
```

```
01  MQ-MONITOR-RECORD.
    05  MQ-MON-TRAN-ID              PIC X(4) VALUE SPACES.
    05  MQ-MON-TERM-ID              PIC X(4) VALUE SPACES.
    05  MQ-MON-CICS-TASKN      PIC S9(8) COMP VALUE ZERO.
    05  FILLER                 PIC X(12) VALUE SPACES.
    05  MQ-MON-SYSTEM-NUM      PIC 99   VALUE 01.
    05  FILLER                 PIC X(14) VALUE SPACES.
    05  MQ-MON-FUNCTION        PIC X(4) VALUE SPACES.
    05  FILLER                 PIC X(4) VALUE SPACES.
```

```
    05  MQ-MON-START-ABSTIME  PIC S9(15) COMP-3 VALUE ZERO.
    05  MQ-MON-END-ABSTIME    PIC S9(15) COMP-3 VALUE ZERO.
    05  MQ-MON-CCODE          PIC S9(8)  COMP VALUE ZERO.
    05  MQ-MON-RCODE          PIC S9(8)  COMP VALUE ZERO.
    05  FILLER                PIC X(12) VALUE SPACES.
    05  MQ-MON-QM-NAME        PIC X(48).
    05  MQ-MON-Q-NAME         PIC X(48).
    05  MQ-MON-RESOLVED-Q     PIC X(48).
    05  FILLER                PIC X(200).
```

System Monitor Queue (cont)

```
11/14/1998            IBM MQSeries for VSE/ESA Version 2.1.0              IYZMZSI2
09:44:46                    Browse Queue Records                         VSEP
MQMDISP                      SYSTEM IS ACTIVE                             0002

    Object Name: SYSTEM.MONITOR
    QSN Number : 00000014         LR-        0, LW-        36, DD-MQFO002
                        Queue Data Record
Record Status : Written.        PUT date/time  : 19970314093743
Record Size   : 00000428        GET date/time  :
Queue line.
TST20002....              01              OPEN    ........................ 0000
EEEFFFFF000C444444444444FF4444444444444DDCD4444036316700363167000000002
32320002000F000000000000010000000000000067550000007 2032C0072033C00020085
                                                                          0048
44444444444444444444444444444444444444444444444444444444444444444444444
00000000000000000000000000000000000000000000000000000000000000000000000
                                                                          0090
44444444444444444444444444444444444444444444444444444444444444444444444
00000000000000000000000000000000000000000000000000000000000000000000000

Information displayed.
    5686-A06 (C) Copyright IBM Corp. 1993, 1997  All Rights Reserved.
 ENTER = Process  PF2 = Main Menu    PF3 = Quit   PF4 = Next    PF5 = Prior
 PF7 = Up     PF8 = Down    PF9=Hex/Char   PF10=Txt/Head        PF12 = Monito
```

MQ-MON-CCODE = X'00000002' = MQCC-FAILED
MQ-MON-RCODE = X'00002085' = MQRC-UNKNOWN-OBJECT-NAME

40

Problem Determination
The SYSTEM.LOG

The system log queue is the primary source of information for debugging MQ VSE problems. It is a normal message queue which is used by the internal VSE MQ facilities to post messages. Typical messages have details of system initialization, queue start and stop events and inbound and outbound communications. The default name for this queue is SYSTEM.LOG but this is configurable by the user using the Global System Definition panel MQMMSYS.

A typical message would may look like the following if browsed using the MQMT utility:

```
MQI001000  PRG: MQPMSS   TRN: MQMA TRM: 0003 TSK: 00505 02/17/1987 17:04:39
FUNCTION DONE
QUEUE ID  :   SYSTEM.LOG


QUEUE  STARTED.                 BOTH DIRECTIONS.


EIBFN:  1206          EIBRCODE: 000000000000  EXEC LINE: 000000
EIBRESP: 00000000  EIBRESP2:  00000000        EIBRSRCE:          ABCODE:
```

The message codes, which in the example above is highlighted in bold text above, are documented in full in Appendix A of the **User's Guide** (GC34-5364-00). If you are using the MQMT message browser expanded help can be obtained using the PF12 key.

```
Message Code 001000  Extended LOG  Description
FUNCTION DONE
Reason      : The requested function has been completed
User Action  : --none --
System Action:  Function is completed.
```

Notice that many fields may not be used depending on the type of log entry and that the EIBFN field contains the last CICS function performed which may not always be the function which caused the problem. The example above shows the message displayed after a queue has been successfully started. The EIBFN in this case is the last one issued before the message was displayed and is not indicative of a specific error.

Problem Determination

The SYSTEM.LOG

- Many new messages have been added especially to the MQVSE MCAs.

- These are to produce additional diagnostic messages during negotiation and error handling.

- Hopefully you will not see these!
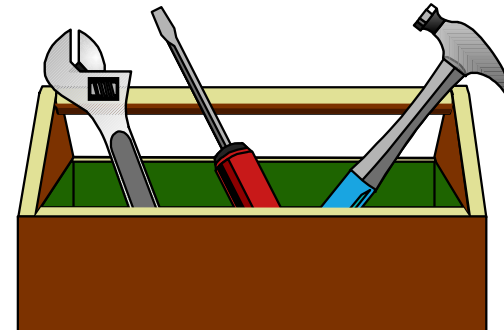
Problem Determination

Documentation fo problems

In order to have a good chance of identifying and correcting a problem when it is first reported it is important to have good quality documentation for the problem. This will vary depending on the nature of the problem.

- All Problems
  - Simple clear problem description.
  - Step by step description to recreate the problem

- Local Queue Problems
  - System and Queue definitions. This can be done using screen dumps of the MQMT transaction or using the MQPUTIL program
  - VSAM file descriptions. The IDCAMS definitions used to create the queue files.
  - System log messages If any.
  - CICS trace.
  - Sample source program to recreate problem

- Remote Queue Problems
  - System, queue and channel definitions. From both platforms
  - Log messages from both platforms.
  - CICS trace and communications trace.

What did I do wrong?

SNA Setup problems

Preprocessor XOPTS(COBOL2) (LENGTH OF error)

Messages waiting in Xmit Q

CICS logging must be active.

Known problems

What did I do wrong?   Common Pitfalls
SNA Setup problems 1

The problem must be during the initial exchange of headers between the two systems. If there is no obvious error message within the system log then we must look to other places for the causes.

It is possible that the local system cannot allocate a session. This is certainly one of the commonest faults.

► Check to see if the link to the remote system is active. This can be done by using CEMT.

```
CEMT INQUIRE CONN()
      in conn
      STATUS:  RESULTS - OVERTYPE TO MODIFY
       Conn(ISC2) Net(IYZFZSI2)        Ins Rel
       Conn(MVS2) Net(IYALZCBI)        Ins Acq
       Conn(SD01) Net(IYAIT040)        Ins Acq
       Conn(SD02) Net(IYAIR004)        Ins Rel
       Conn(VSE1) Net(IYZMZSI1)        Ins Rel
```

MQ is unable to force this link active as this can only be done by CICS. The connections must be in the aquired state as in the example shown above.

► Also check the SNA 'mode' used for this connection to ensure it has sufficient free sessions to use.

```
CEMT INQUIRE MODE
      in mode
       STATUS:  RESULTS - OVERTYPE TO MODIFY
        Mod(SNASVCMG) Con(SD01) Max(002) Ava( 002 ) Act(001)
        Mod(#INTER  ) Con(SD01) Max(012) Ava( 012 ) Act(006)
        Mod(SNASVCMG) Con(VSEM) Max(002) Ava( 000 ) Act(000)
        Mod(        ) Con(VSEM) Max(012) Ava( 000 ) Act(000)
```

What did I do wrong?

Common Pitfalls

SNA Setup problems 2

► Check the remote system log for error messages. If there are no messages in the remote system log then it is possible that the problem is confined to the local system. i.e. The message is not leaving the local system. The location of the message log is platform dependent but for most it is in a sub-directory

DISK:\MQM\QMGRS\queuemgrname\errors

and the log messages cane be displayed using the 'type' or 'more' facility again depending on the platform

TYPE AMQERR0n.LOG

There may be several versions of the remote system error log available so ensure that you select the latest copy.

Common Pitfalls

CICS pre-processor
- MUST use XOPTS(COBOL2) when compiling samples.

Messages waiting in XMIT queue
- Check the 'System Wait Interval' is approx. 10 - 15
- Check that channel is set Enabled = Y

CICS logging MUST be active
- See page 14 of SMG. If not MQ results may be unpredictable.

What did I do wrong?

Maybe it wasn't you!

Known problems

- MQ Initialization in CICS PLTPI error.
    Test fix is available and confirmed as working.

- MQ Termination abend 4039 during MQST or MQSTOP program.
    PTF available

- Channel retry timeout error.
    PTF available

- Error during TCP/IP session. Request misinterpreted as client request.
    PTF available

Summary of our Tour

- New Features
- Installation and setup
- Up and Running
- Application Programming
- Mechanisms of queues (local and remote)
- Queue maintenance
- Problem determination