IBM Software Group

CICS Tools – Extending Legacy Applications

Transform your CICS applications

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e business on demand software

Preface

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  - DB2
  - DFSMS/MVS
  - IBM
  - MQSeries
  - MVS/ESA
  - OS/390
  - RMF, Resource Measurement Facility
  - S/390, z/OS
  - WebSphere
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Portfolio Overview

Problem Determination Tools

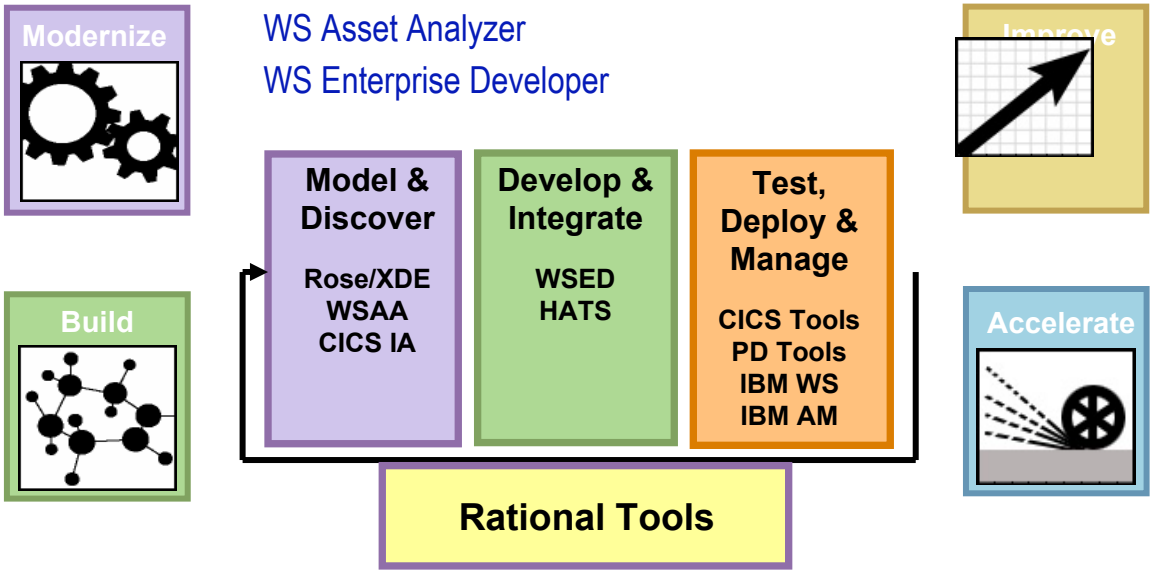
File Manager
File Export
Fault Analyzer
Debug Tool Utilities
TicToc
IBM Application Monitor
IBM Workload Simulator
Rational Functional Tester Extension

CICS Tools

CICS Interdependency Analyzer
CICS Performance Analyzer
CICS Business Event Publisher
CICS VSAM Transparency
CICS Batch Application Control
IBM Session Manager
CICS VSAM Recovery
CICS VSAM Copy
CICS OTTO
CICS Configuration Manager

WAS/z Tools

WS Application Monitor
WS Workload Simulator
WS Asset Analyzer
WS Enterprise Developer



Host Integration Tools

Personal Communications
Host Publisher
Host On Demand
Host Access Transformation Server

Runtimes

WebSphere Application Server
CICS, IMS, DB2
Enterprise COBOL/PL/I
Host Access Transformation Server

Transform your CICS applications

- **Extend and modernize CICS applications efficiently**
- **Improve end-user productivity**
- **Increase customer satisfaction**

CICS Application Transformation Tools

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CICS Application Transformation Tools

CICS Business Event Publisher for MQSeries®

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CICS Application Transformation Tools

CICS Business Event Publisher for MQSeries®

- Extend CICS applications and associated data to new environments using events, without changing the original application or data

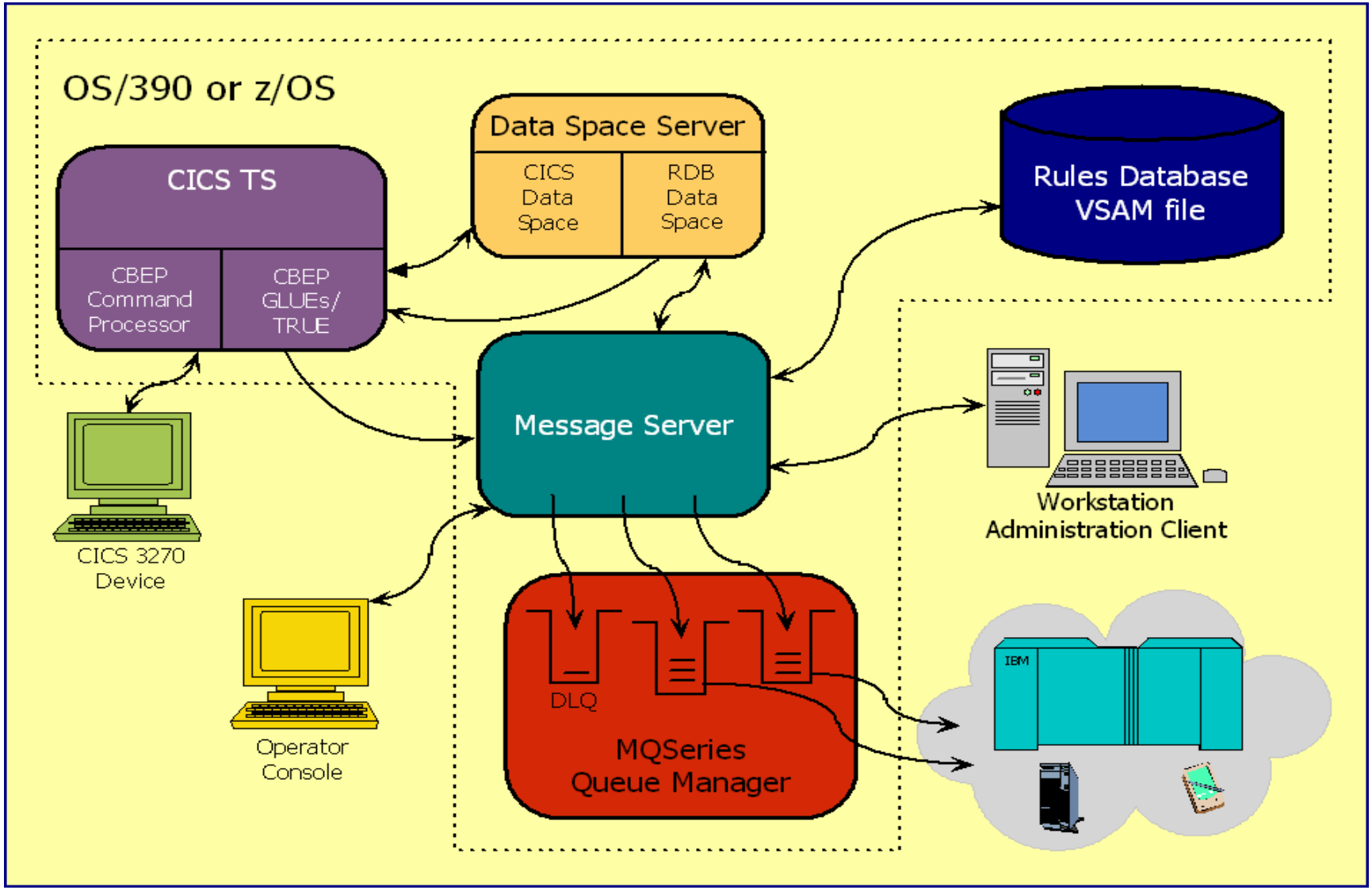
New release: CICS Business Event Publisher for MQSeries V1.2

- **Quick solution to get legacy customer applications to exploit MQSeries functions without the need for Application program changes**
- Integrate legacy applications and data to new environments (CICS, IMS and DB2 events)
- Creates MQPUT messages for MQSeries queue from events and associated information
- Based on user-specified message content rules, Queue names and MQPUT options
- Provides easy to use workstation GUI for selection and rules creation
- Real time action and results
- Offers low cost, low risk integration strategy

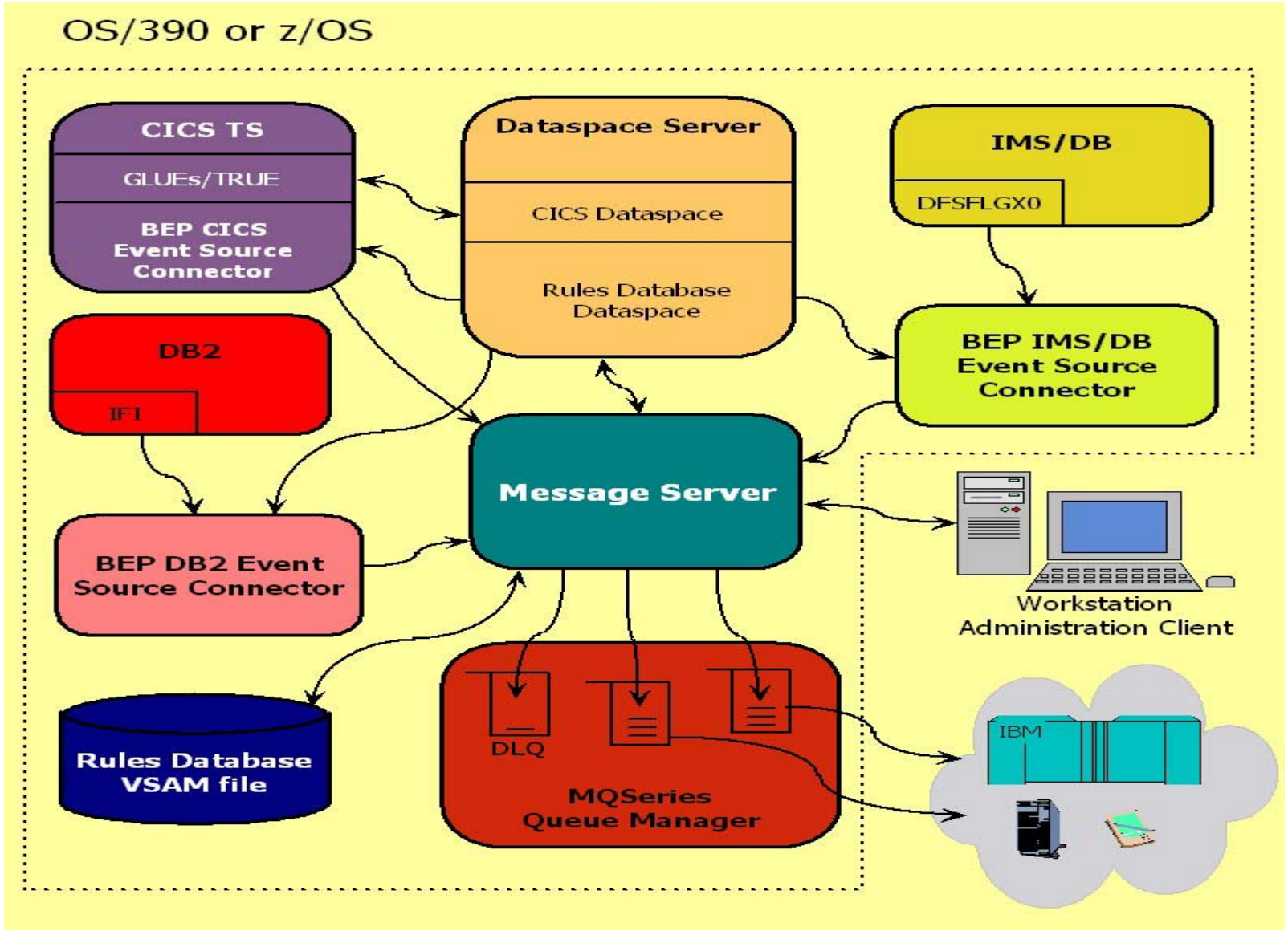
Value:
- No change to existing application programs or data
- Extends legacy to new environments

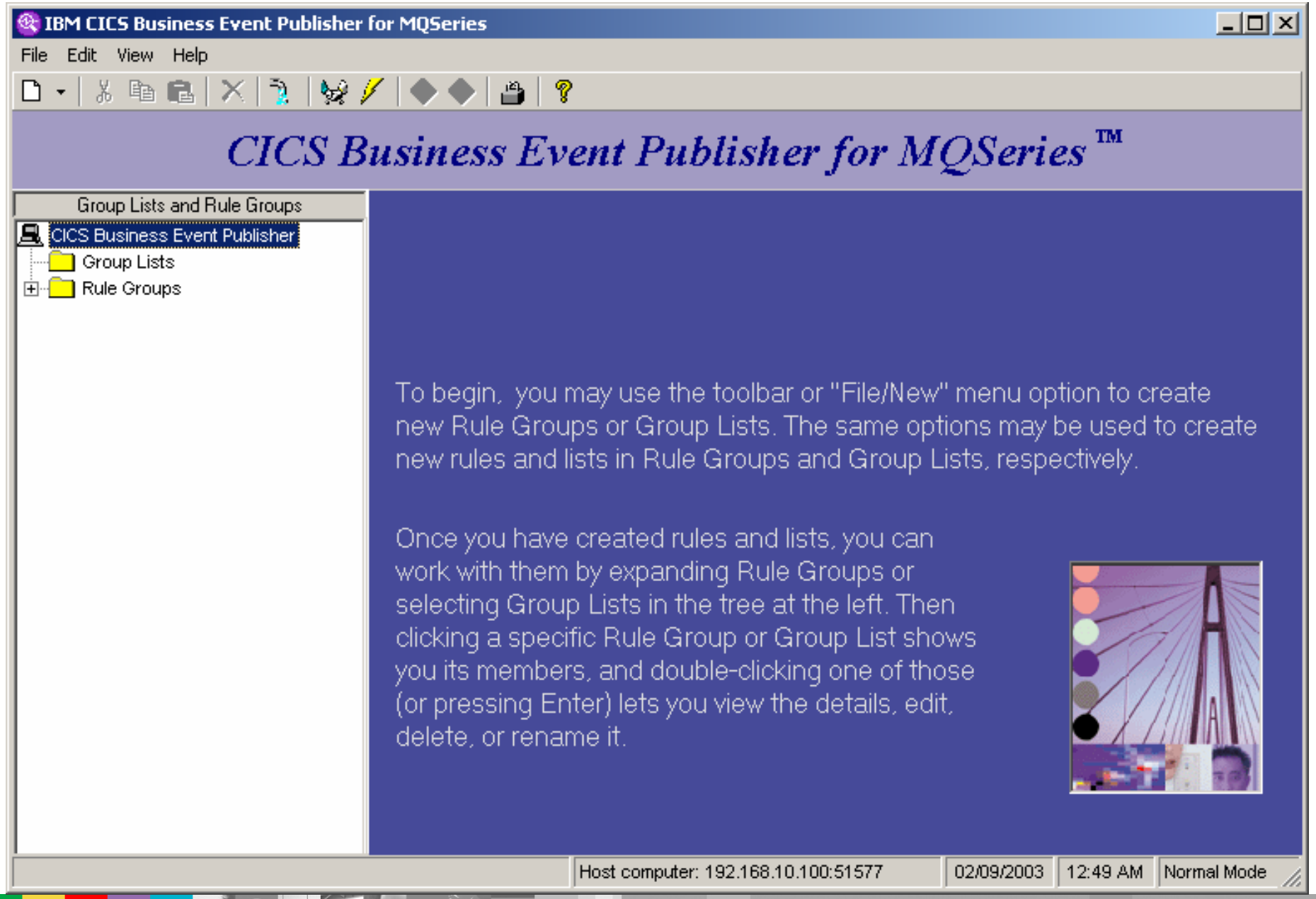
CICS BEP scenarios:
- Event notification – new customer added, account = zero
- Activity Audits – who, what, when is accessing the file?
- Error notification – create message when error detected
- Threshold notification – stock running low
- Automation – removal of manual or latency in business process
- Data source for Message Brokers
- Data transfer
- External logging or notification

V1R1 architecture



V1R2 architecture




IBM CICS Business Event Publisher for MQSeries
File Edit View Help
CICS Business Event Publisher for MQSeries™
Group Lists and Rule Groups
CICS Business Event Publisher
Group Lists
Rule Groups
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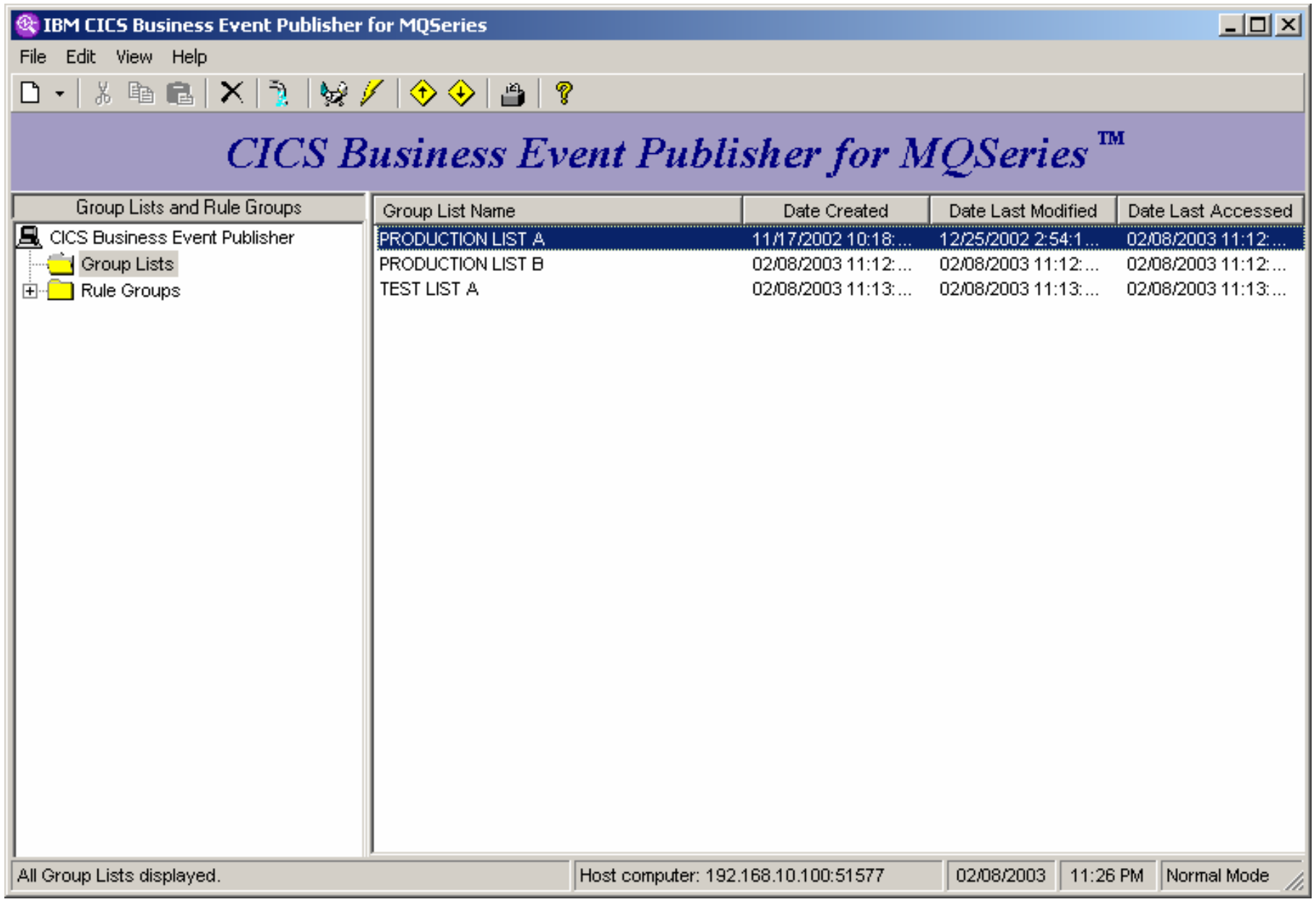
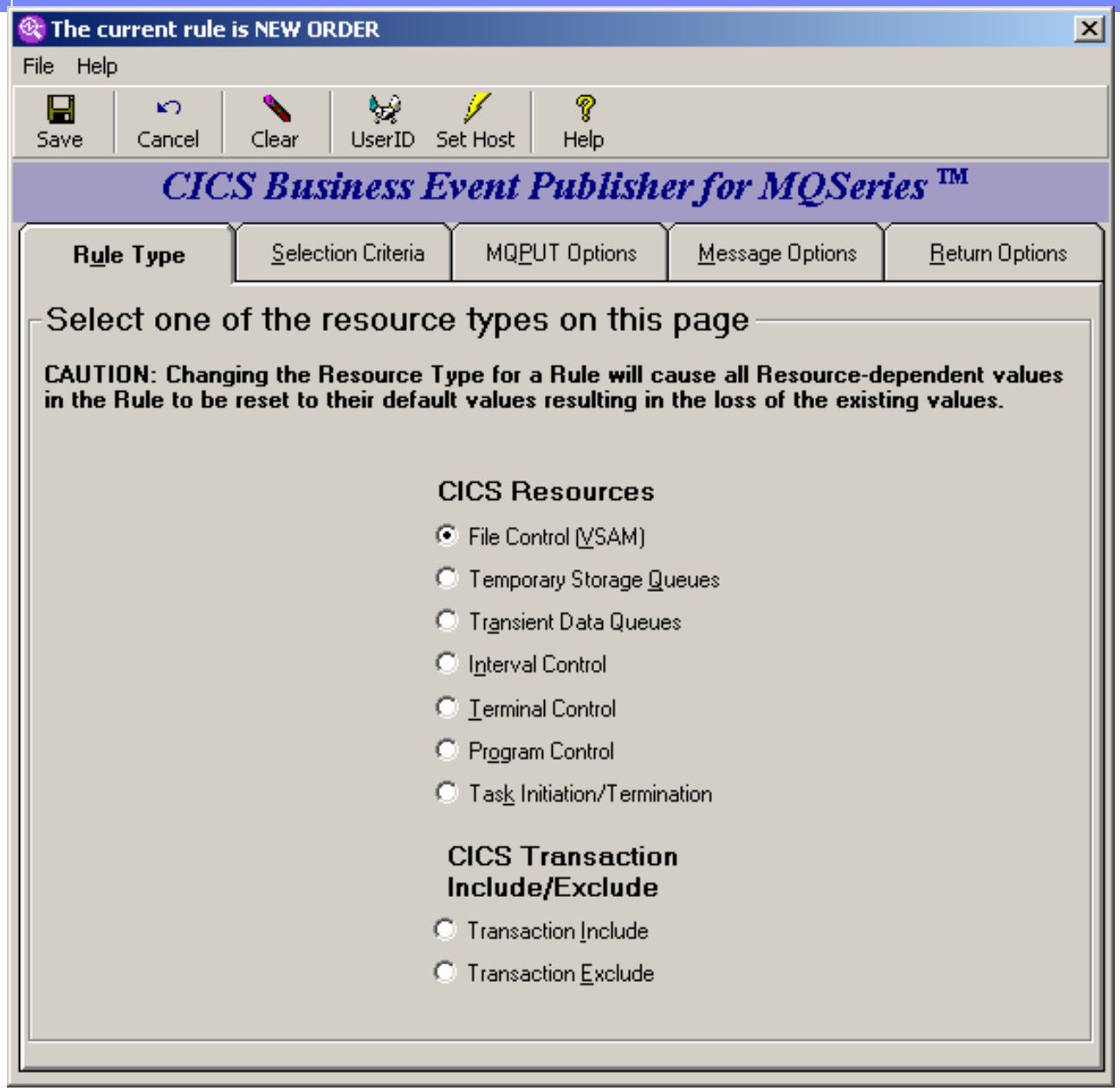
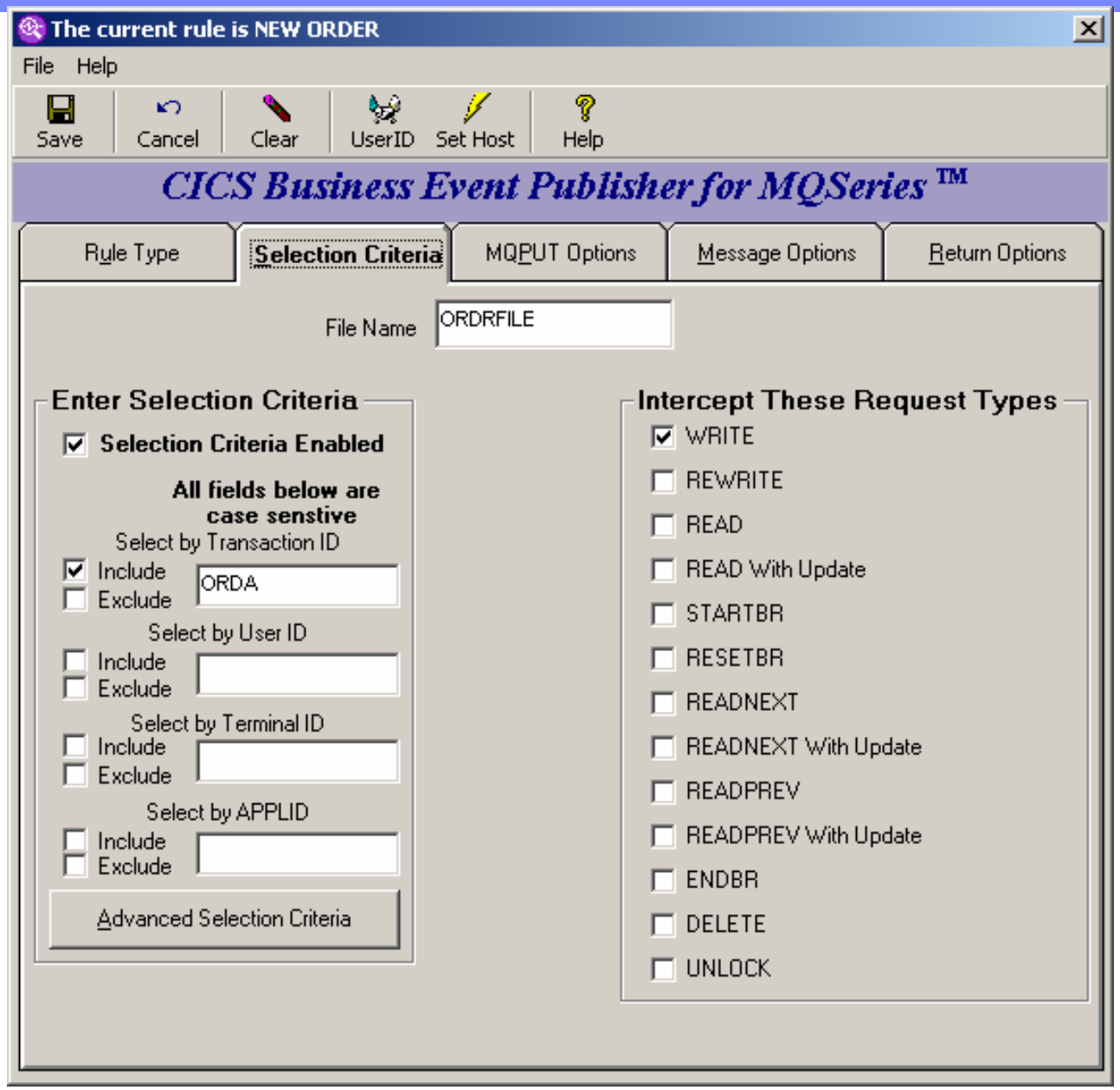
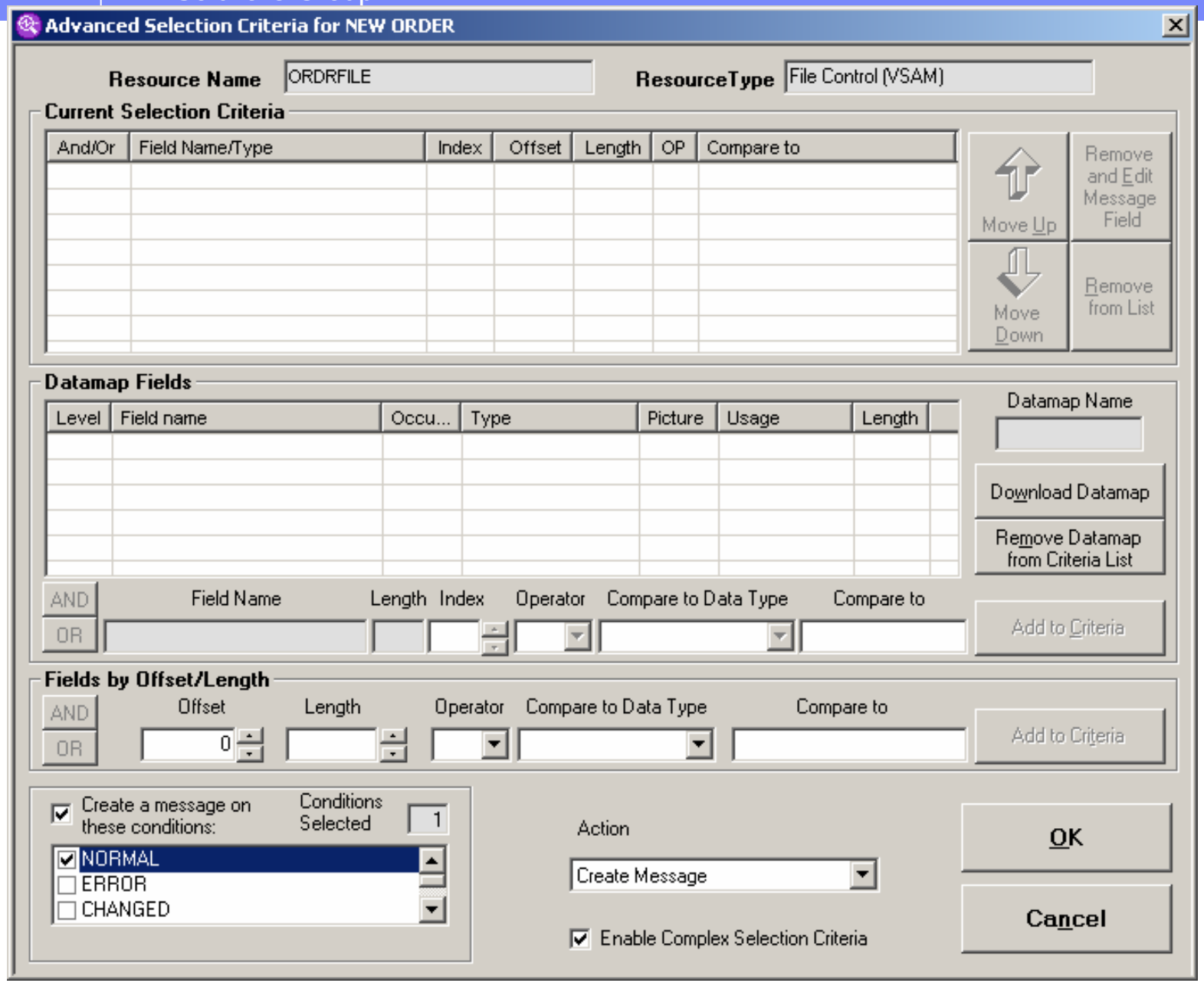
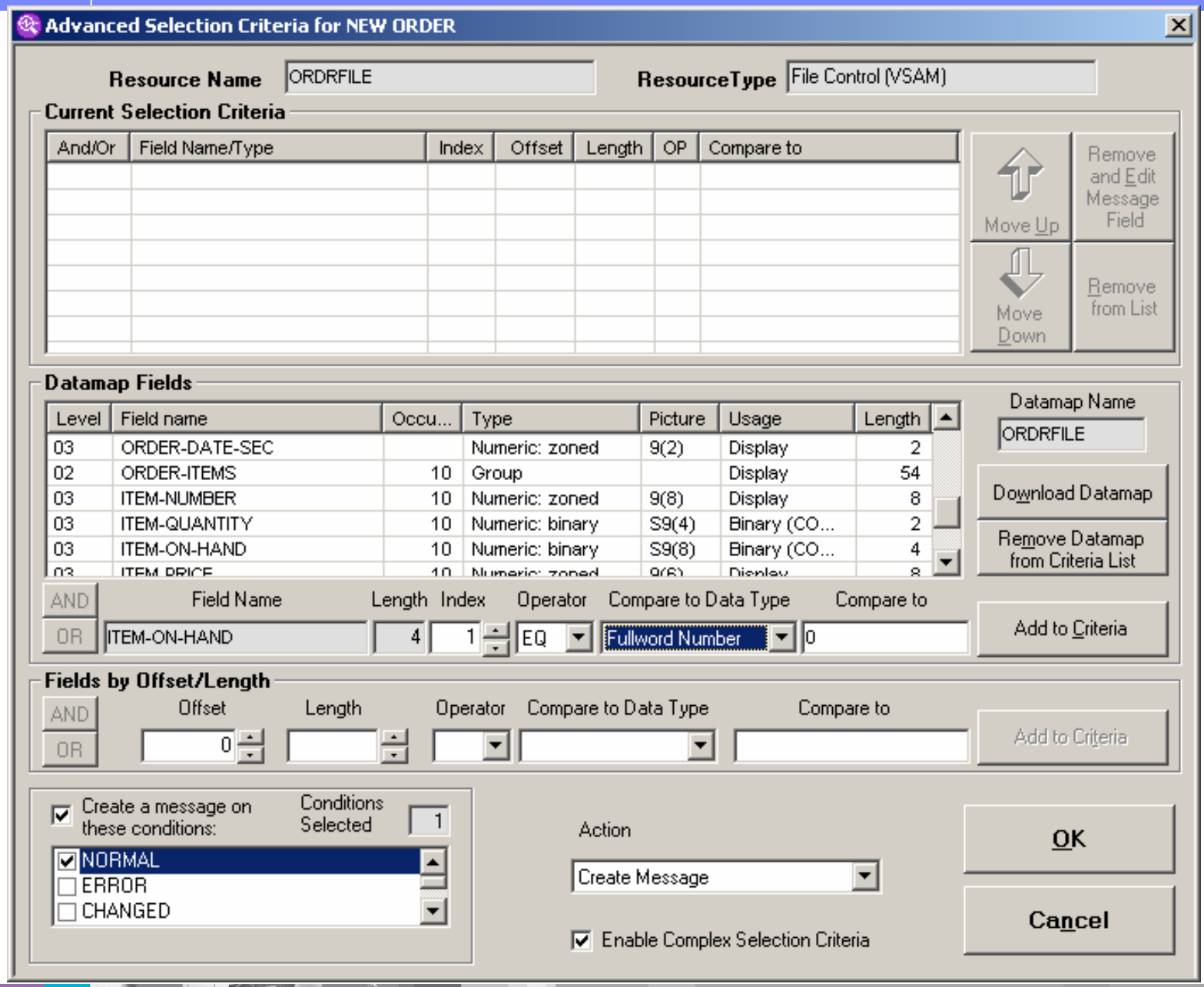
02/09/2003
12:49 AM
Normal Mode


IBM CICS Business Event Publisher for MQSeries
File Edit View Help
CICS Business Event Publisher for MQSeries™
Group Lists and Rule Groups
CICS Business Event Publisher
Group Lists
Rule Groups
Group List Name
Date Created
Date Last Modified
Date Last Accessed
PRODUCTION LIST A
11/17/2002 10:18:...
12/25/2002 2:54:1...
02/08/2003 11:12:...
PRODUCTION LIST B
02/08/2003 11:12:...
02/08/2003 11:12:...
02/08/2003 11:12:...
TEST LIST A
02/08/2003 11:13:...
02/08/2003 11:13:...
02/08/2003 11:13:...
All Group Lists displayed.
Host computer: 192.168.10.100:51577
02/08/2003
11:26 PM
Normal Mode


The current rule is NEW ORDER
File Help
Save Cancel Clear UserID Set Host Help
CICS Business Event Publisher for MQSeries ™
Rule Type
Selection Criteria
MQPUT Options
Message Options
Return Options
Select one of the resource types on this page
CAUTION: Changing the Resource Type for a Rule will cause all Resource-dependent values in the Rule to be reset to their default values resulting in the loss of the existing values.
CICS Resources
File Control (VSAM)
Temporary Storage Queues
Transient Data Queues
Interval Control
Terminal Control
Program Control
Task Initiation/Termination
CICS Transaction Include/Exclude
Transaction Include
Transaction Exclude


The current rule is NEW ORDER
File Help
Save Cancel Clear UserID Set Host Help
CICS Business Event Publisher for MQSeries ™
Rule Type
Selection Criteria
MQPUT Options
Message Options
Return Options
File Name
ORDRFILE
Enter Selection Criteria
Selection Criteria Enabled
All fields below are case senstive
Select by Transaction ID
Include
Exclude
ORDA
Select by User ID
Include
Exclude
Select by Terminal ID
Include
Exclude
Select by APPLID
Include
Exclude
Advanced Selection Criteria
Intercept These Request Types
WRITE
REWRITE
READ
READ With Update
STARTBR
RESETBR
READNEXT
READNEXT With Update
READPREV
READPREV With Update
ENDBR
DELETE
UNLOCK


Advanced Selection Criteria for NEW ORDER
Resource Name
ORDRFILE
ResourceType
File Control (VSAM)
Current Selection Criteria
And/Or
Field Name/Type
Index
Offset
Length
OP
Compare to
Move Up
Remove and Edit Message Field
Move Down
Remove from List
Datamap Fields
Level
Field name
Occu...
Type
Picture
Usage
Length
Datamap Name
Download Datamap
Remove Datamap from Criteria List
AND
OR
Field Name
Length
Index
Operator
Compare to Data Type
Compare to
Add to Criteria
Fields by Offset/Length
AND
OR
Offset
Length
Operator
Compare to Data Type
Compare to
0
Add to Criteria
Create a message on these conditions:
Conditions Selected
1
NORMAL
ERROR
CHANGED
Action
Create Message
Enable Complex Selection Criteria
OK
Cancel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Compare to
Move Up
Remove and Edit Message Field
Move Down
Remove from List
Datamap Fields
Level
Field name
Occu...
Type
Picture
Usage
Length
03 ORDER-DATE-SEC Numeric: zoned 9(2) Display 2
02 ORDER-ITEMS 10 Group Display 54
03 ITEM-NUMBER 10 Numeric: zoned 9(8) Display 8
03 ITEM-QUANTITY 10 Numeric: binary S9(4) Binary (CO... 2
03 ITEM-ON-HAND 10 Numeric: binary S9(8) Binary (CO... 4
Datamap Name
ORDRFILE
Download Datamap
Remove Datamap from Criteria List
AND
OR
Field Name
Length
Index
Operator
Compare to Data Type
Compare to
ITEM-ON-HAND
4
1
EQ
Fullword Number
0
Add to Criteria
Fields by Offset/Length
AND
OR
Offset
Length
Operator
Compare to Data Type
Compare to
0
Add to Criteria
Create a message on these conditions:
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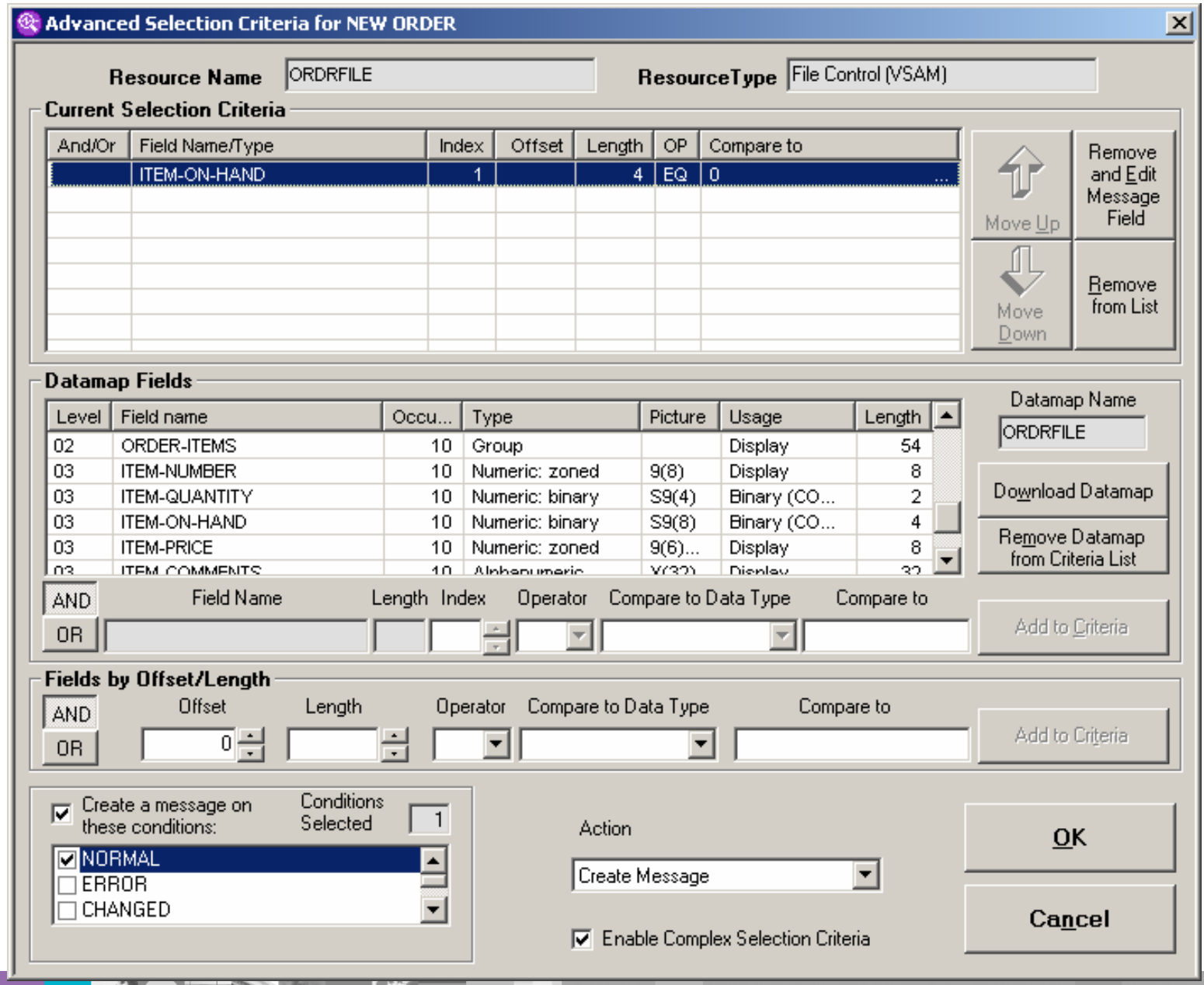
Action
Create Message
Enable Complex Selection Criteria
OK
Cancel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And/Or
Field Name/Type
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Offset
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Compare to
ITEM-ON-HAND
1
4
EQ
0
Move Up
Move Down
Remove and Edit Message Field
Remove from List
Datamap Fields
Level
Field name
Occu...
Type
Picture
Usage
Length
02
ORDER-ITEMS
10
Group
Display
54
03
ITEM-NUMBER
10
Numeric: zoned
9(8)
Display
8
03
ITEM-QUANTITY
10
Numeric: binary
S9(4)
Binary (CO...
2
03
ITEM-ON-HAND
10
Numeric: binary
S9(8)
Binary (CO...
4
03
ITEM-PRICE
10
Numeric: zoned
9(6)...
Display
8
Datamap Name
ORDRFILE
Download Datamap
Remove Datamap from Criteria List
AND
OR
Field Name
Length
Index
Operator
Compare to Data Type
Compare to
Add to Criteria
Fields by Offset/Length
AND
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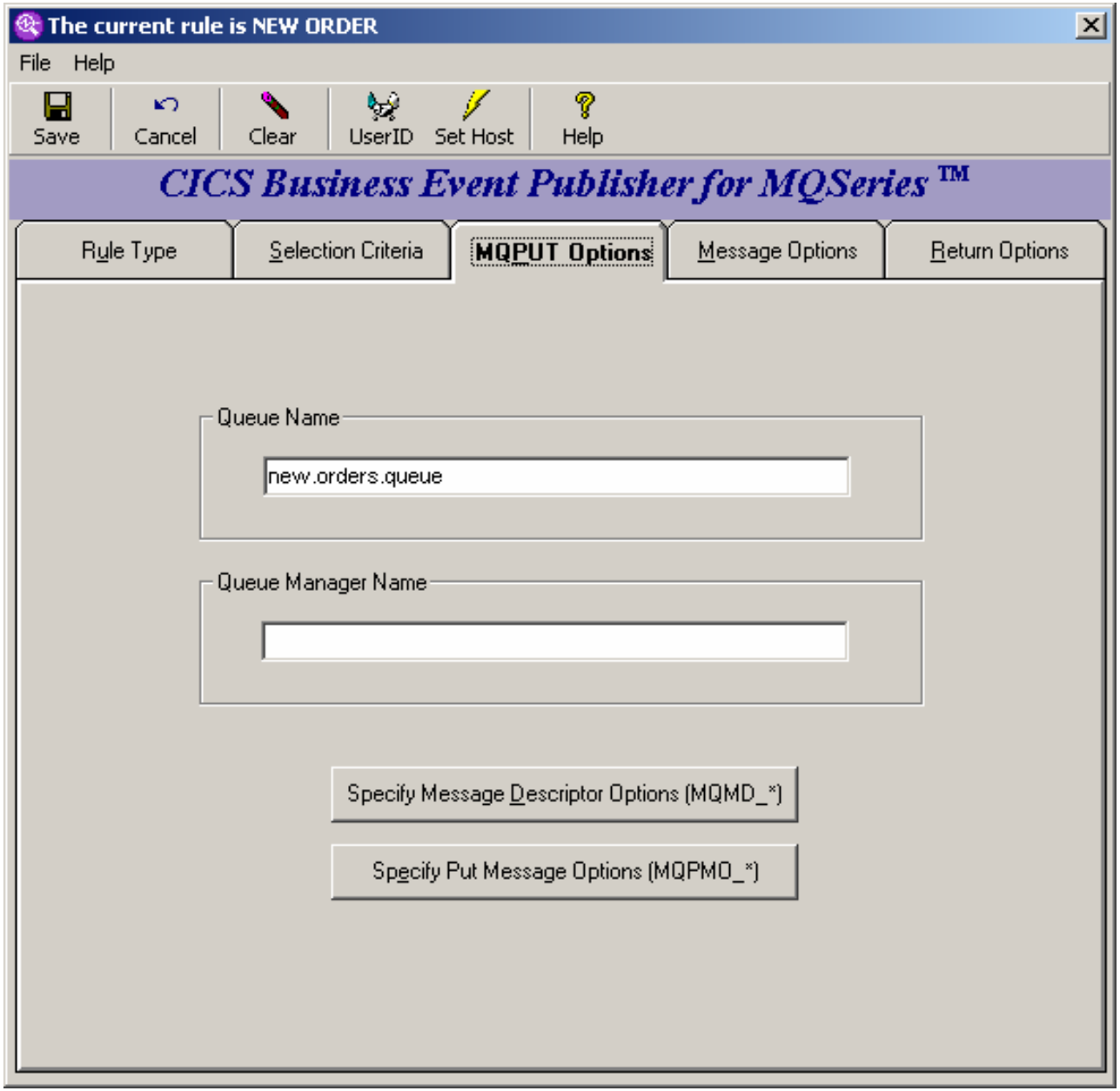
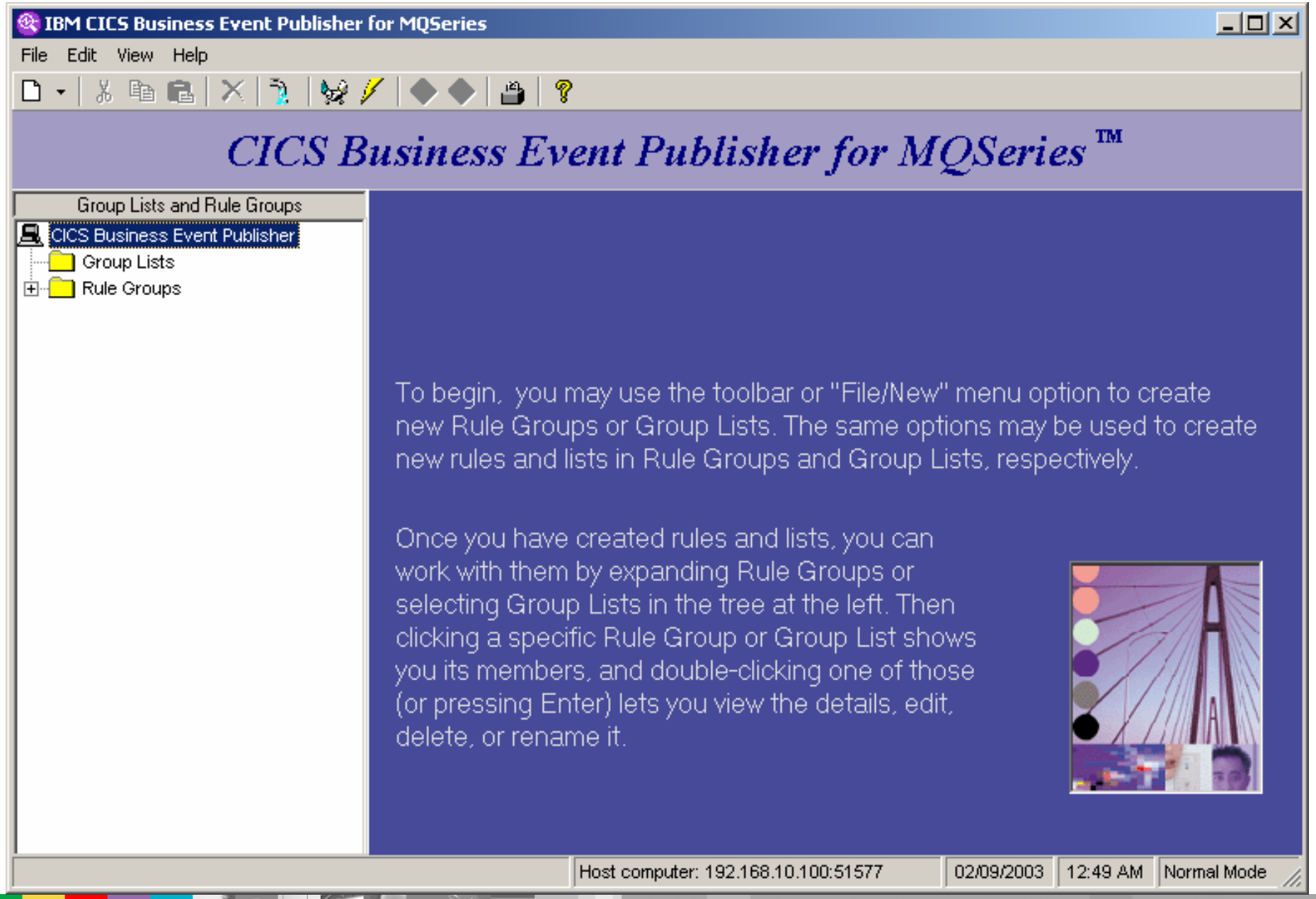

The current rule is NEW ORDER
File
Help
Save
Cancel
Clear
UserID
Set Host
Help
CICS Business Event Publisher for MQSeries ™
Rule Type
Selection Criteria
MQPUT Options
Message Options
Return Options
Queue Name
new.orders.queue
Queue Manager Name
Specify Message Descriptor Options (MQMD_*)
Specify Put Message Options (MQPMO_*)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Host computer: 192.168.10.100:51577
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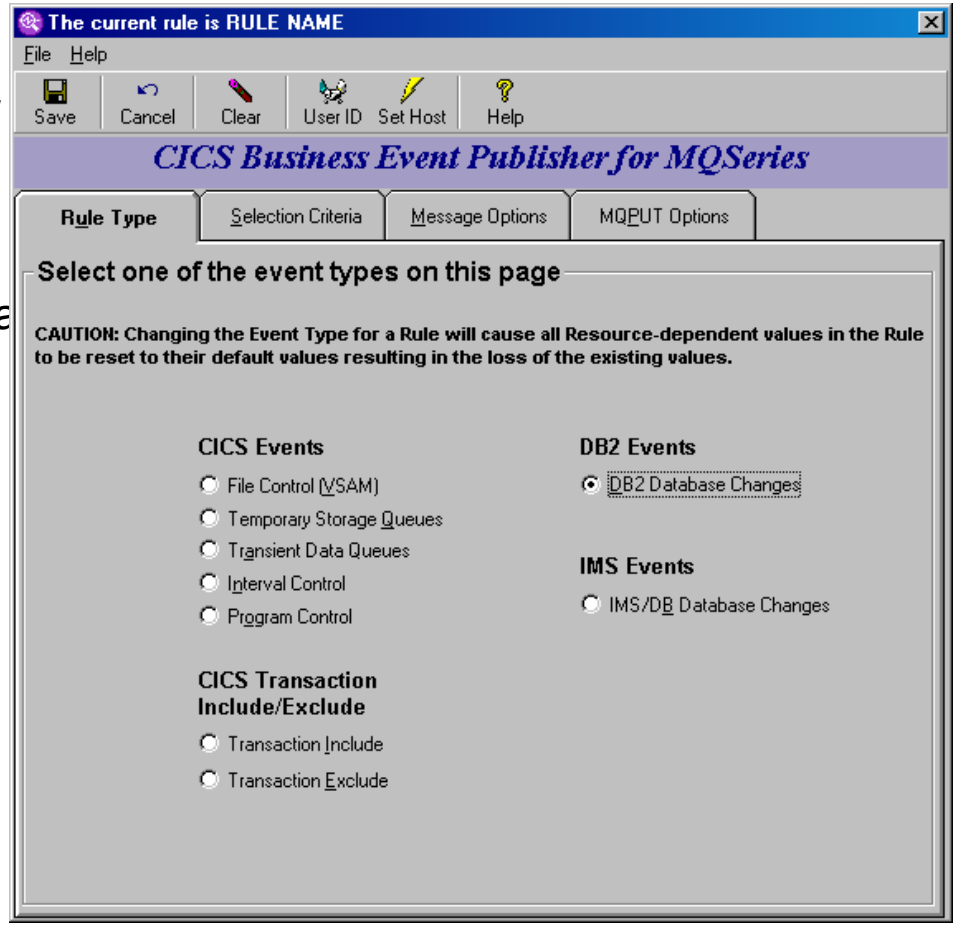
Normal Mode

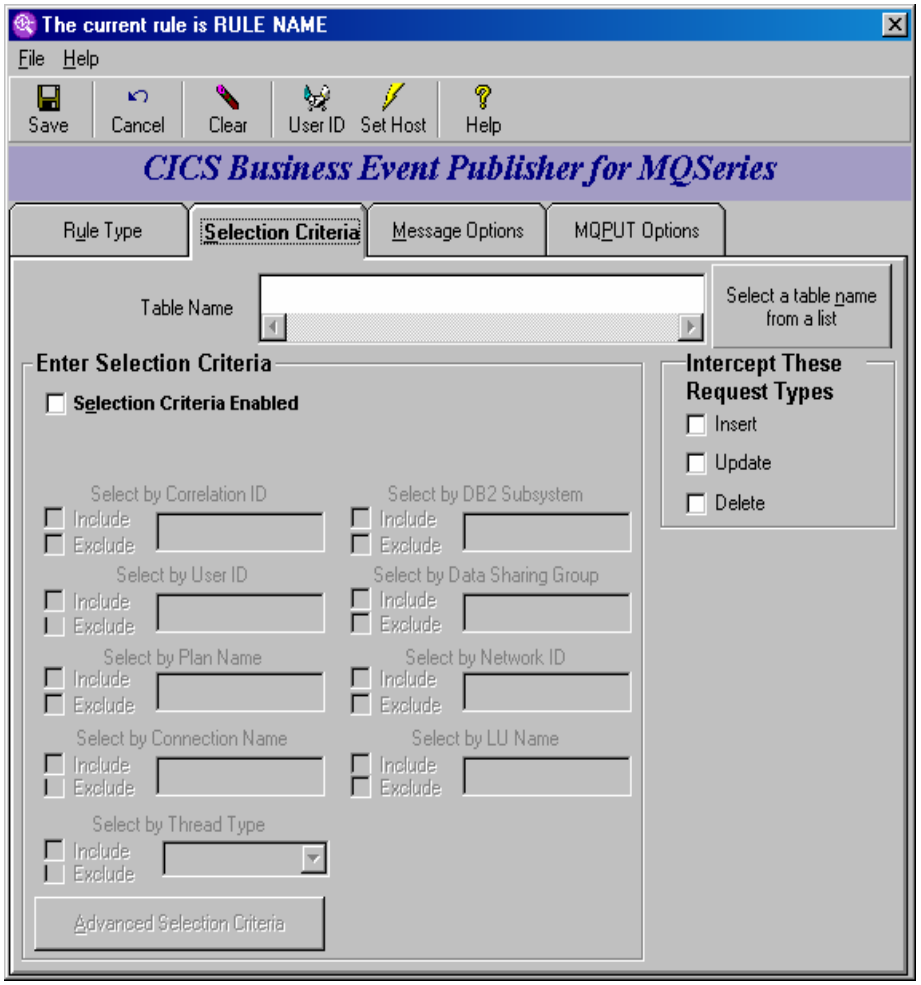
Rule Type Tab

- DB2 and IMS show up as new categories
- User should select DB2 Database Changes
- Then click on Selection Criteria tab

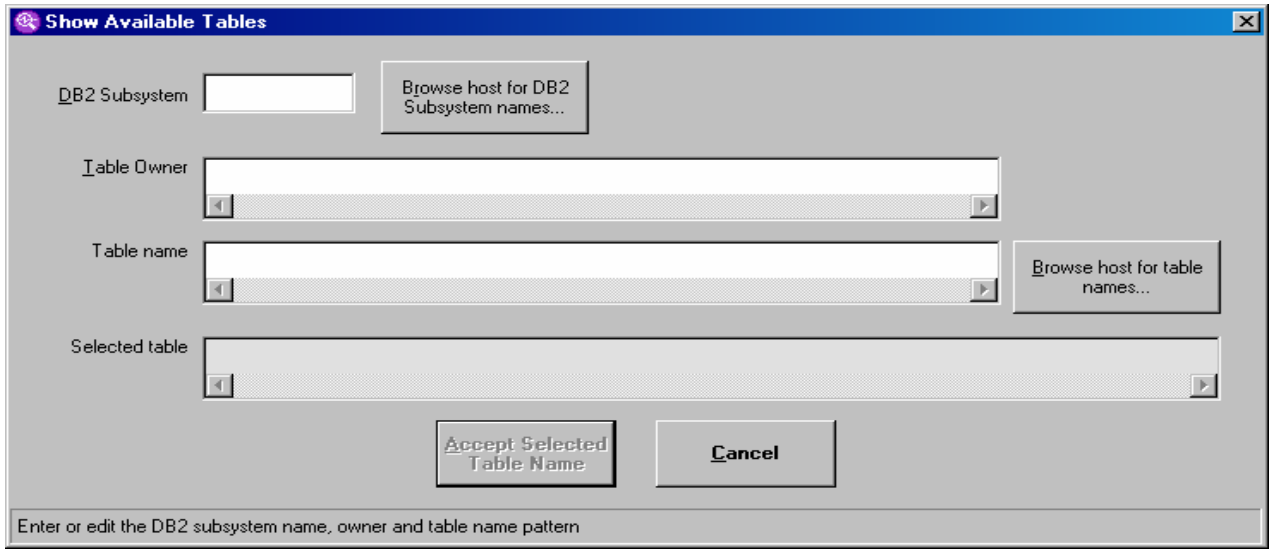


Selection Criteria Tab

- Selection Criteria is DB2 specific
- Can target INSERT, UPDATE and/or DELETE statements
- User may enter table name or click on Select a table name from a list



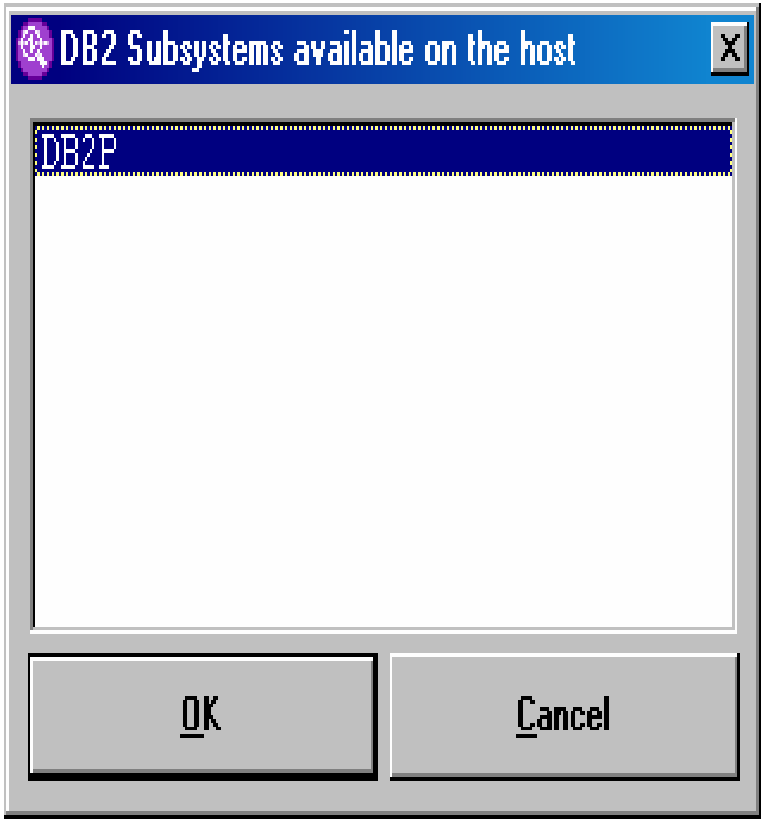
Show Available Tables



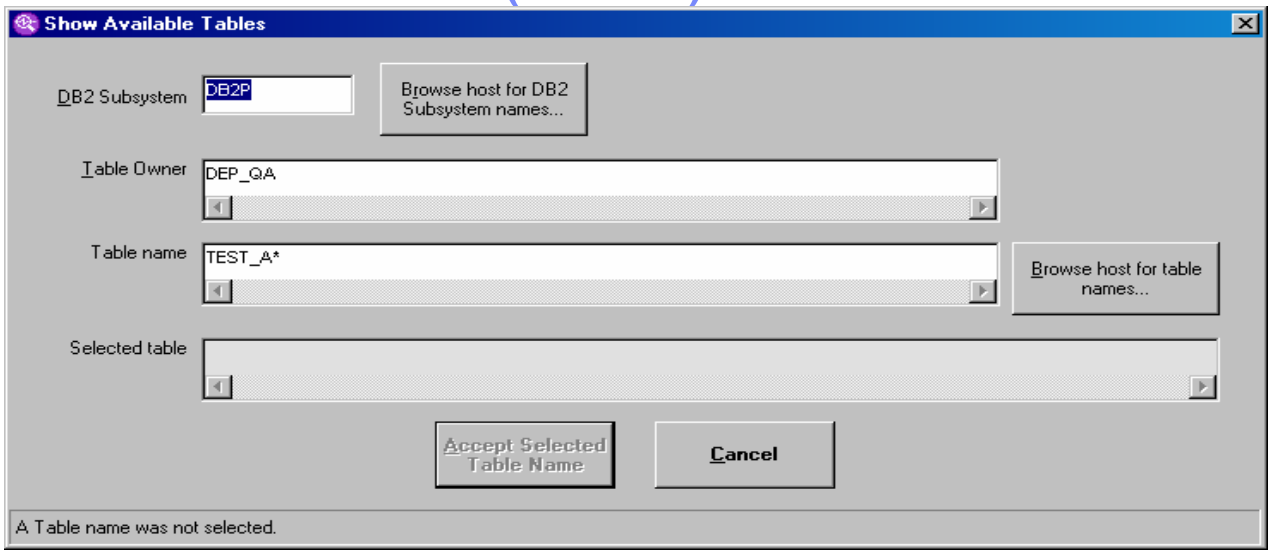
- User can enter patterns to list possible candidates
- User can manually enter DB2 subsystem name or click on Browse host for DB2 subsystem names

DB2 subsystems available on host

- This presents the available DB2 subsystems which are being monitored by an Event Processor
- Select the desired entry and click OK



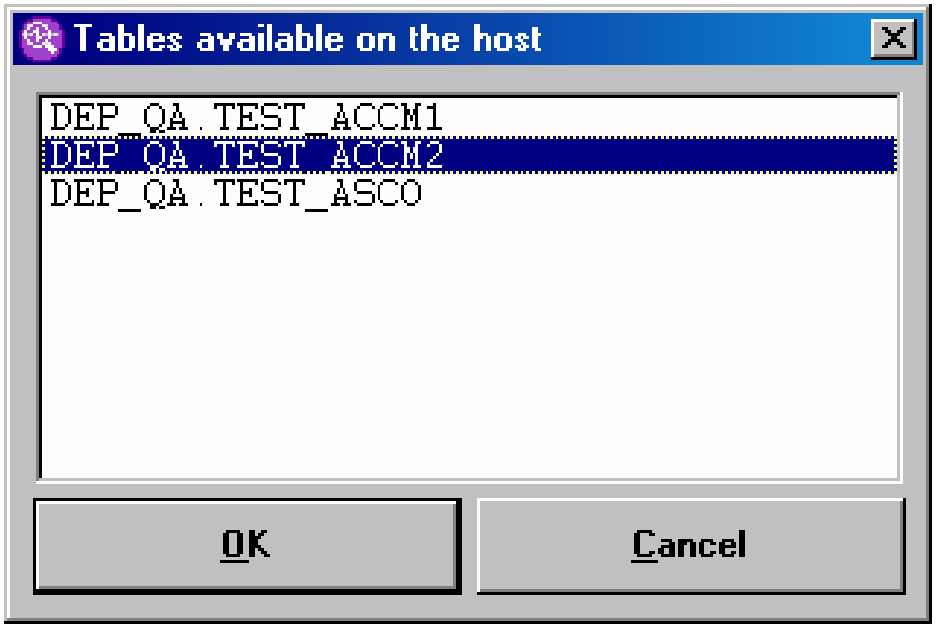
Show Available Tables (cont.)



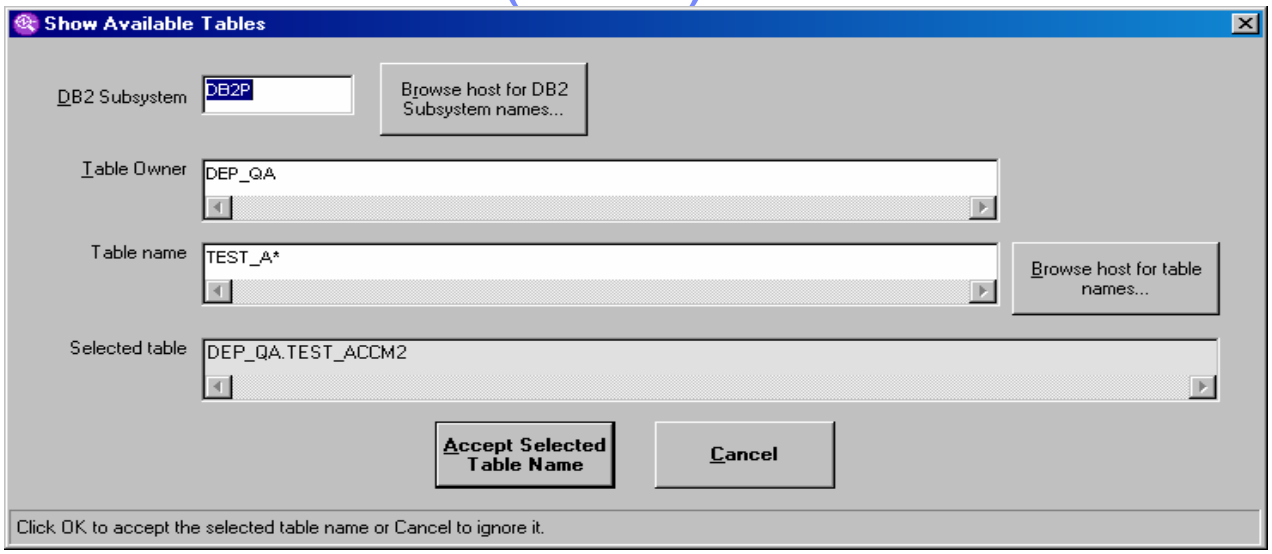
- Owner ID and table name accepts wildcards
  - ? for single character match
  - * for trailing character match
- Click on Browse host for table names

Tables available on the host

- This lists the tables which match the specified pattern
  - Limited to first 200 matches
- Select the desired table name and click OK



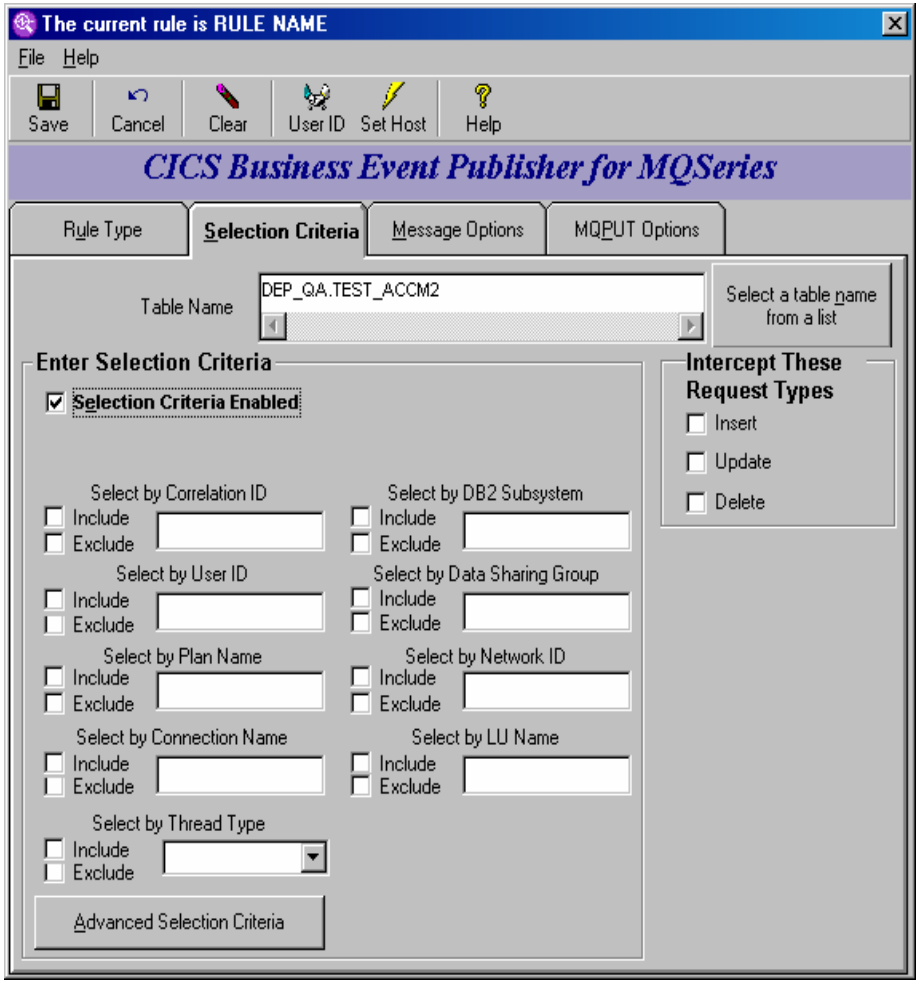
Show Available Tables (cont.)



- Pattern process can be repeated until desired table is found
- Once the desired table name has been selected, simply click Accept Selected Table Name

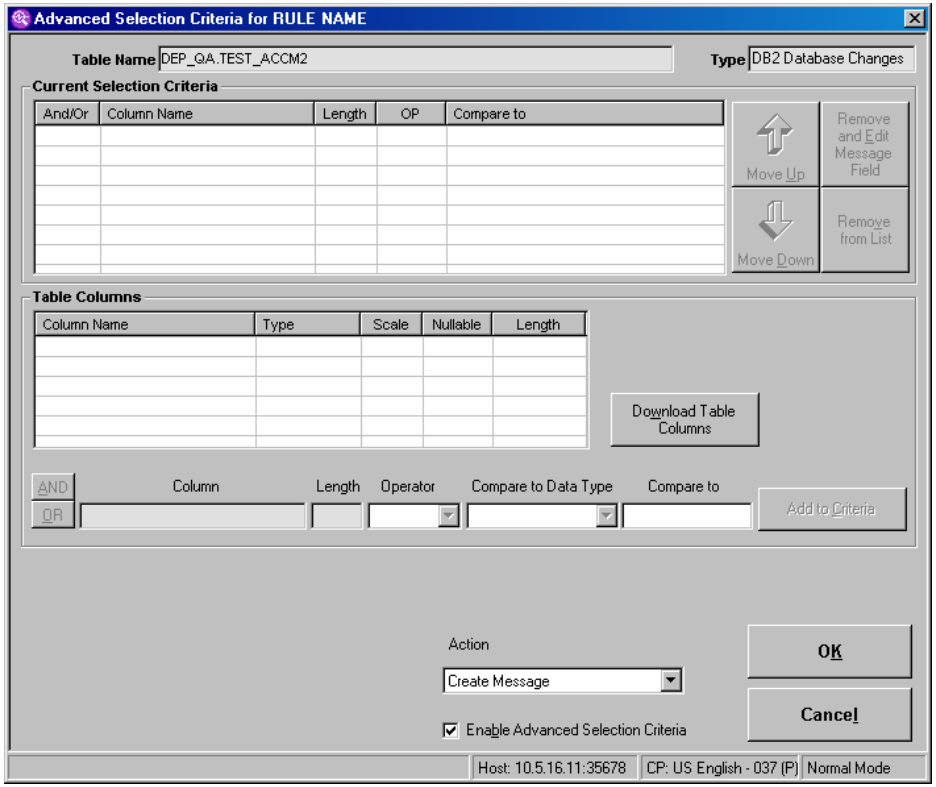
Selection Criteria Tab (cont.)

- Selecting Selection Criteria Enabled allows specification of DB2 specific qualifiers
  - Include/Exclude is the same as for CICS
  - ? and * are valid wildcards
- Click Advanced Selection Criteria to specify column level checks

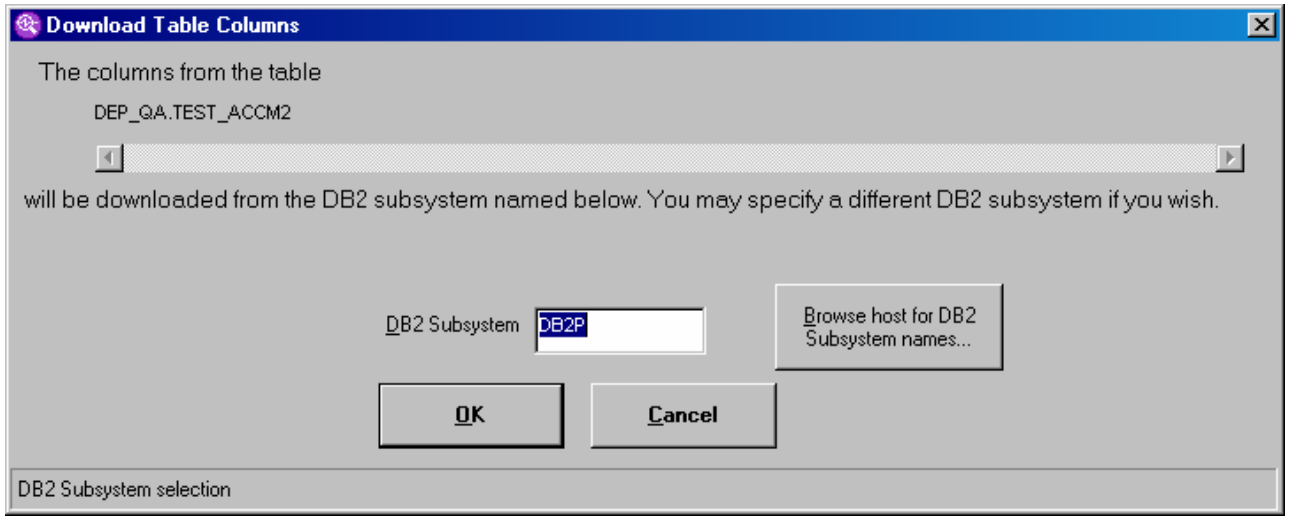


Advanced Selection Criteria

- Looks similar to CICS
- Data maps replaced by columns for selected table
- Click on Download Table Columns to populate the column list



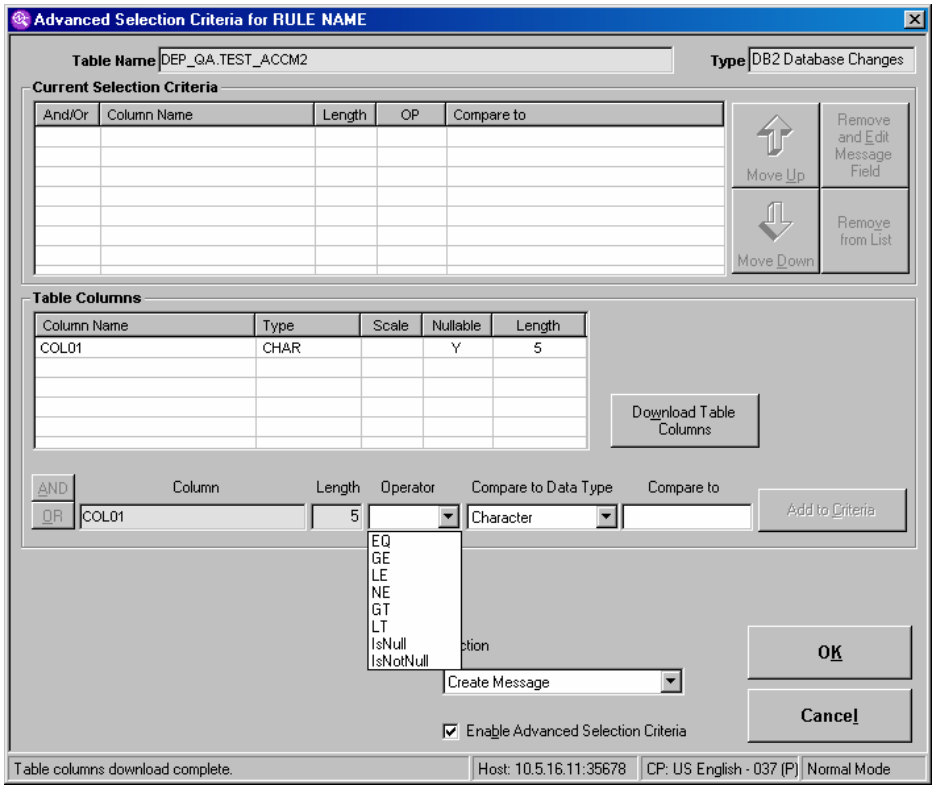
Download Table Columns



- This allows the selection of the DB2 from which the column list is to be obtained
- The rule is not DB2 specific unless specified as such in the Selection Criteria
- Click OK to use the indicated DB2 subsystem

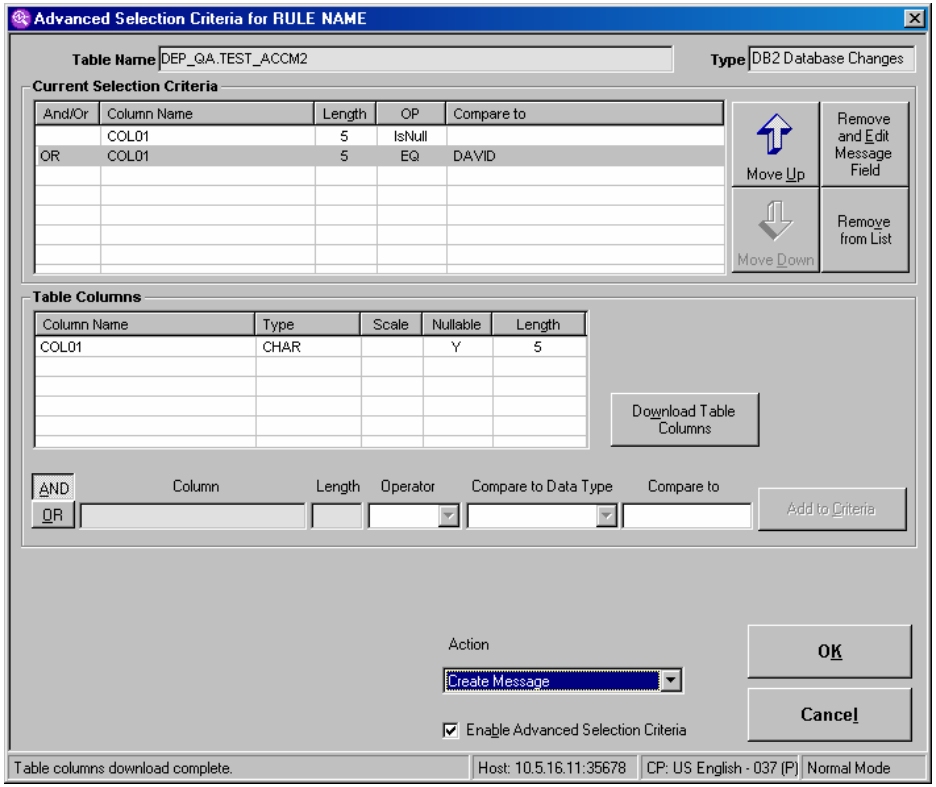
Advanced Selection Criteria (cont.)

- Selecting a column allows an entry to be built for that column
- Note the additional DB2 specific operators
  - IsNull
  - IsNotNull
  - Only allowed if the column has a Y in the Nullable column



Advanced Selection Criteria (cont.)

- This definition will create a message when COL01 is NULL or when COL01 is equal to ‘DAVID’
- Click OK when finished with Advanced Selection Criteria



Transform your CICS applications

- **Extend and modernize CICS applications efficiently**
- **Improve end-user productivity**
- **Increase customer satisfaction**

CICS Application Transformation Tools

CICS Business Event Publisher for MQSeries®

- Extend CICS applications and associated data to new environments using events, without changing the original application or data

CICS VSAM Transparency

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•Improve end-user productivity

•Increase customer satisfaction

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CICS VSAM Transparency

- Enable VSAM to DB2 migration without rewriting applications

Customer business issue

- Strategic decision made to migrate VSAM to DB2
  - Modernise existing CICS applications
  - Build new apps that need that data in a RDMS
  - Compliance with Corporate or legal requirements

BUT

- Project on hold
  - CICS applications need to be rewritten to talk to DB2
  - time
  - resource
  - $$
- Pain!!
  - project delivery schedule not met
  - Project costs spiral – hire AD resource

VSAM based applications

- VSAM is not designed for open data access (i.e. management reporting, analytics)
- VSAM data does not easily integrate with data from DB2 and other systems
- VSAM is not easily accessible from other platforms
- VSAM is not designed to support 24*7 mixed online and batch workloads
- Maintenance and re-organization tools are lacking the richness of DBMS tools

Why migrate data to DB2?

- 24x7 availability – batch and online sharing
- Integration with new applications based on DB2 technology, such as online and e-business systems
- Running ad hoc queries
- Ability to perform data analysis
- Creating visual information, such as executive dashboards
- Exploitation of database maintenance tools

IBM's solution – CICS VSAM Transparency

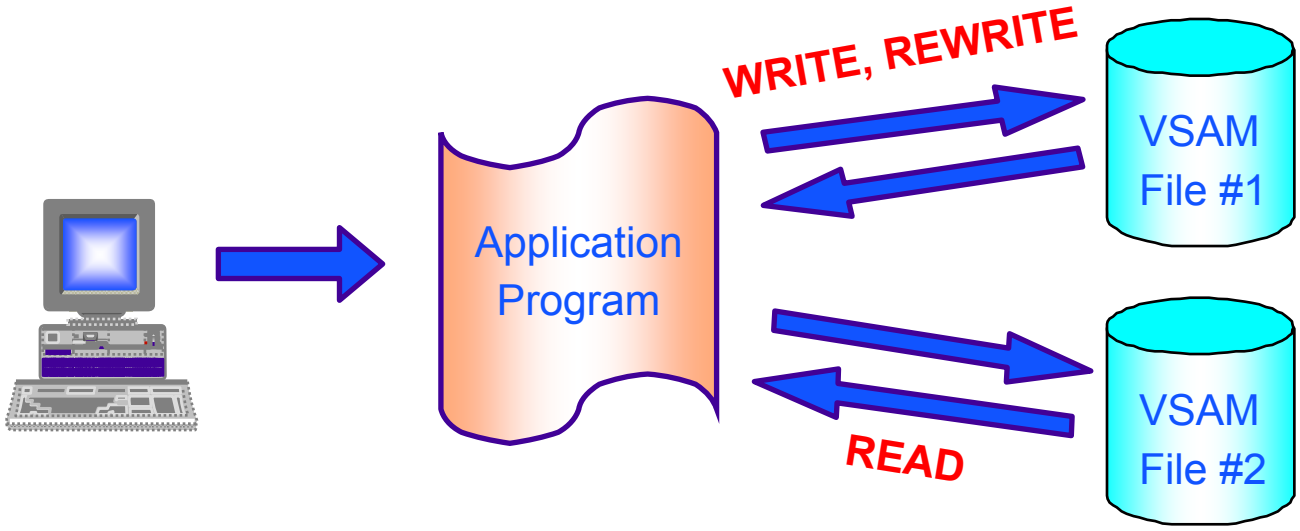
A tool which allows migration of data from VSAM to DB2 without the need to rewrite CICS/VSAM applications

What is CICS VT?

- **Quick solution to get legacy customer applications to exploit DB2 functions without the need for Application program changes**
- Migrates legacy VSAM files to DB2 without changing application programs
- Completely separate from application program
- Transparent access to data in DB2
- CICS and batch programs access data in DB2 under the control of CICS VT
- Migrated data can be accessed by SQL by new programs
- Existing programs enhanced using SQL
- Lower risk migration strategy
- Migration of individual VSAM files as required
- Enabling new applications to be fully DB2 technology-based
- Preserving investments

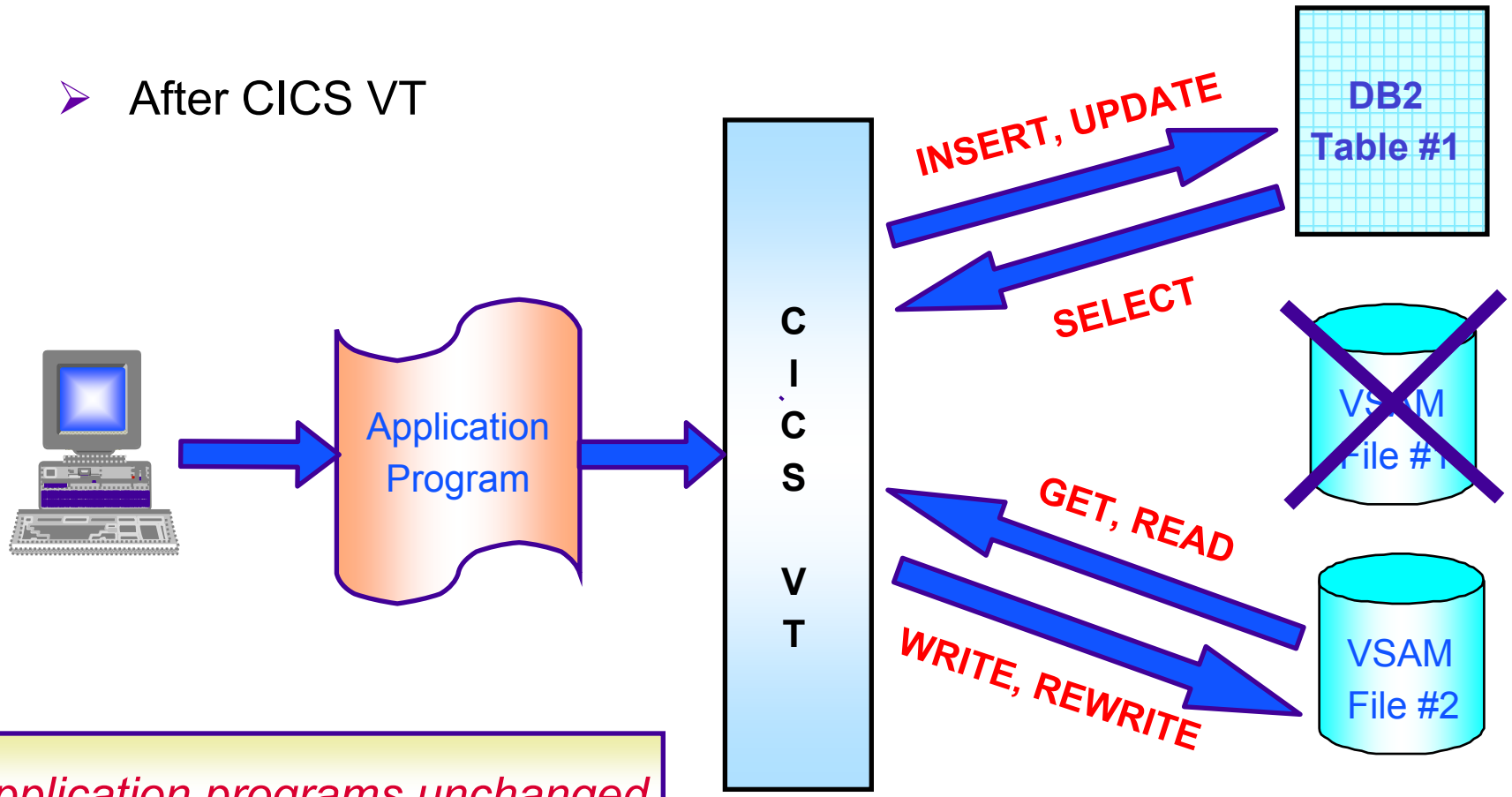
How does CICS VSAM Transparency works?

- Before CICS VT



How does CICS VSAM Transparency works *(continued)*?

- After CICS VT



Application programs unchanged

CICS VT HIGHLIGHTS

- Completely separate from application program
- Transparent access to data in DB2
- 100% static SQL
- Migrate on a file by file basis
- Single copy of data
- Data can be re-engineered
  - Same data returned to VSAM programs
  - Enhanced data available using SQL

CICS VT COMPONENTS

- Mapping component
  - Establishes relationship between VSAM record layout and DB2 row
- Data migration component
  - Utilities to migrate data to DB2 and re-engineer if required
- Run time component
  - Intercepts application calls to VSAM data sets migrated to DB2

TYPICAL DB2 TABLE DESIGN

```
02  ITEM-NUMBERPIC X(6).
02  ITEM-NAME                PIC X(12).
  03 ITEM-COLOUR              PIC X(6).
  03 ITEM-WEIGHT PIC X(4).
  03 ITEM-COST     PIC S99999V99 COMP-3.
02  ITEM-REORDER-QUANTITY  PIC S999.
02  ITEM-SUPPLIER-CODE     PIC X(3).
02  ITEM-DATE-FIRST-SHIP PIC S9(9) COMP-3.
02  ITEM-SHELF-LIFE            PIC X(2).
02  ITEM-DESCRIPTION           PIC X(35) .
```

```
CREATE TABLE VID_ITEM
 (ITEM_NUMBER       CHAR(6)
 ,ITEM_NAME         CHAR(12)
 ,ITEM_COLOUR       CHAR(6)
 ,ITEM_WEIGHT       CHAR(4)
 ,ITEM_COST         DEC(7,2)
 ,ITEM_REORDER_NO    SMALLINT
 ,ITEM_SUPP_CODE     CHAR(3)
 ,ITEM_DATE_FSHIP    DATE
 ,ITEM_SHELF_LIFE    CHAR(2)
 ,ITEM_DESCRIPTION   CHAR(35)
```

- Numeric fields re-engineered
- Date field re-engineered

WHY USE CICS VT ?

- Lowest risk migration methodology
  - One file at a time
  - No application program changes
  - Extensive re-engineering capabilities
  - Complete set of migration tools
  - Automated mapping facility

CICS VT investment case scenario

Assumptions:

Typical application consists of 100 programs
The application calls 10 VSAM files
Rewrite and test a CICS program = 3 days
Map and migrate VSAM file to SQL/DB2 = 3 days

Without CICS VT

Customer wants to migrate a CICS/VSAM app to CICS/DB2
(100 x 3) + (10 x 3) = **330 days** of AD time for one application
Other knock on costs e.g. app downtime
Customer will have done total costing of VSAM to DB2 migration

With CICS VT

Customer wants to migrate VSAM data to DB2 but leave CICS app untouched
Assume 50% of application rewrite is testing = 150 days
Assume 7 of the 10 VSAM files are single record and the rest have 3 records each…mapping/migration takes one day per single record view and 3 days per multiple record view file – therefore 16 days of mapping/migration (7 + 9)
So with CICS VT it's **166 days** effort in total
Assuming customer wants to test *everything*

Conclusion

Saving of 164 days = c. $84K of AD effort
CICS VT could pay for itself after just 1 app
Could be even quicker if user decides not to test everything

Further Info on CICS VT

- CICS VT web page
  - *www.ibm.com/cics/vt*

- Publications
  - *www.ibm.com/cics/library*
  - CICS VT data sheet – G244-7285
  - CICS VT user guide – SC34-6343

Transform your CICS applications

- **Extend and modernize CICS applications efficiently**
- **Improve end-user productivity**
- **Increase customer satisfaction**

CICS Application Transformation Tools

CICS Business Event Publisher for MQSeries®

- Extend CICS applications and associated data to new environments using events, without changing the original application or data

CICS VSAM Transparency

- Enable VSAM to DB2 migration without rewriting applications