B56

IMS V8 Operations Management with the Common Service Layer

Bill Stillwell

IMS Advanced Technical Support

IMS

Technical Conference

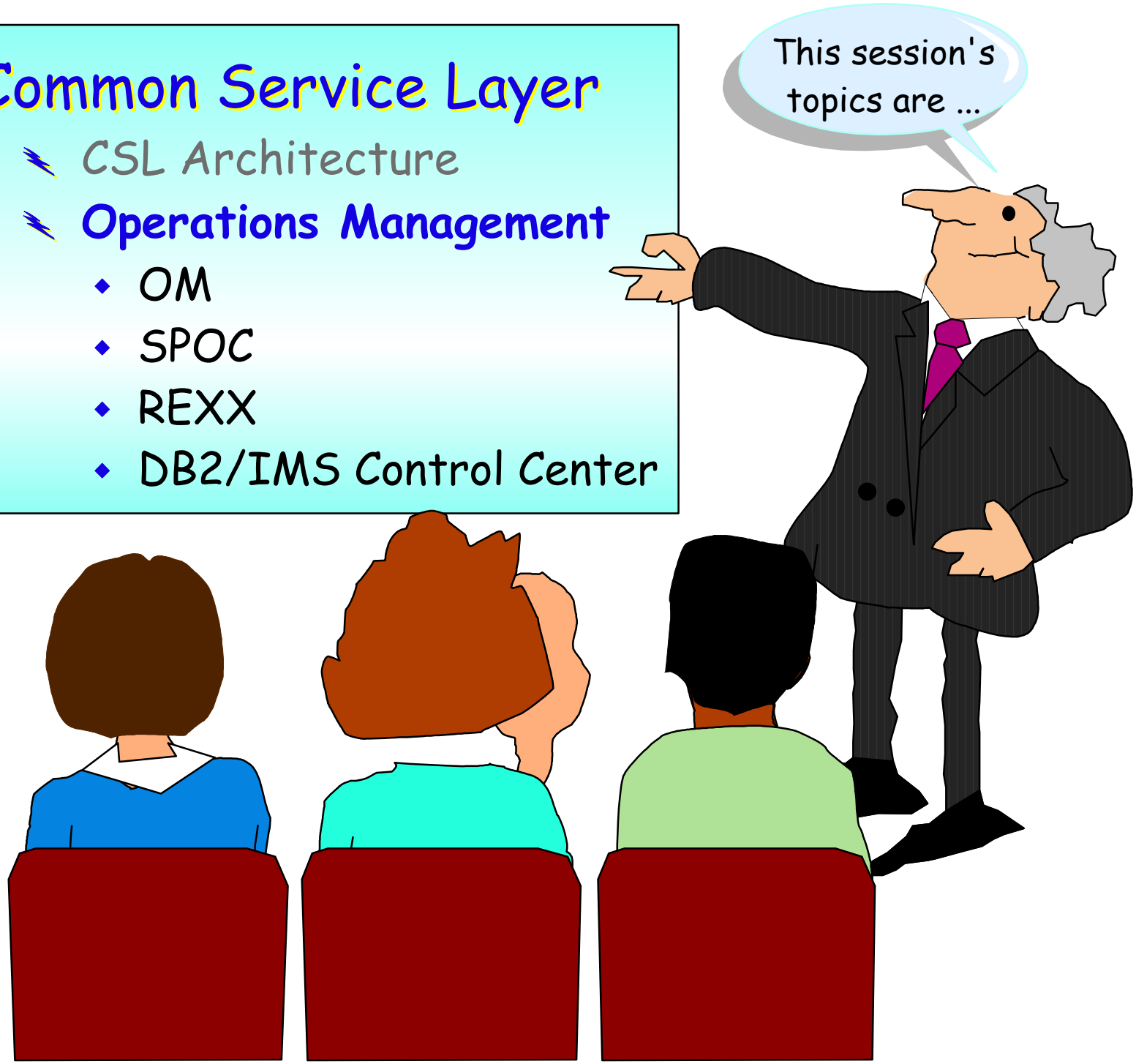
Sept. 27-30, 2004

Orlando, FL

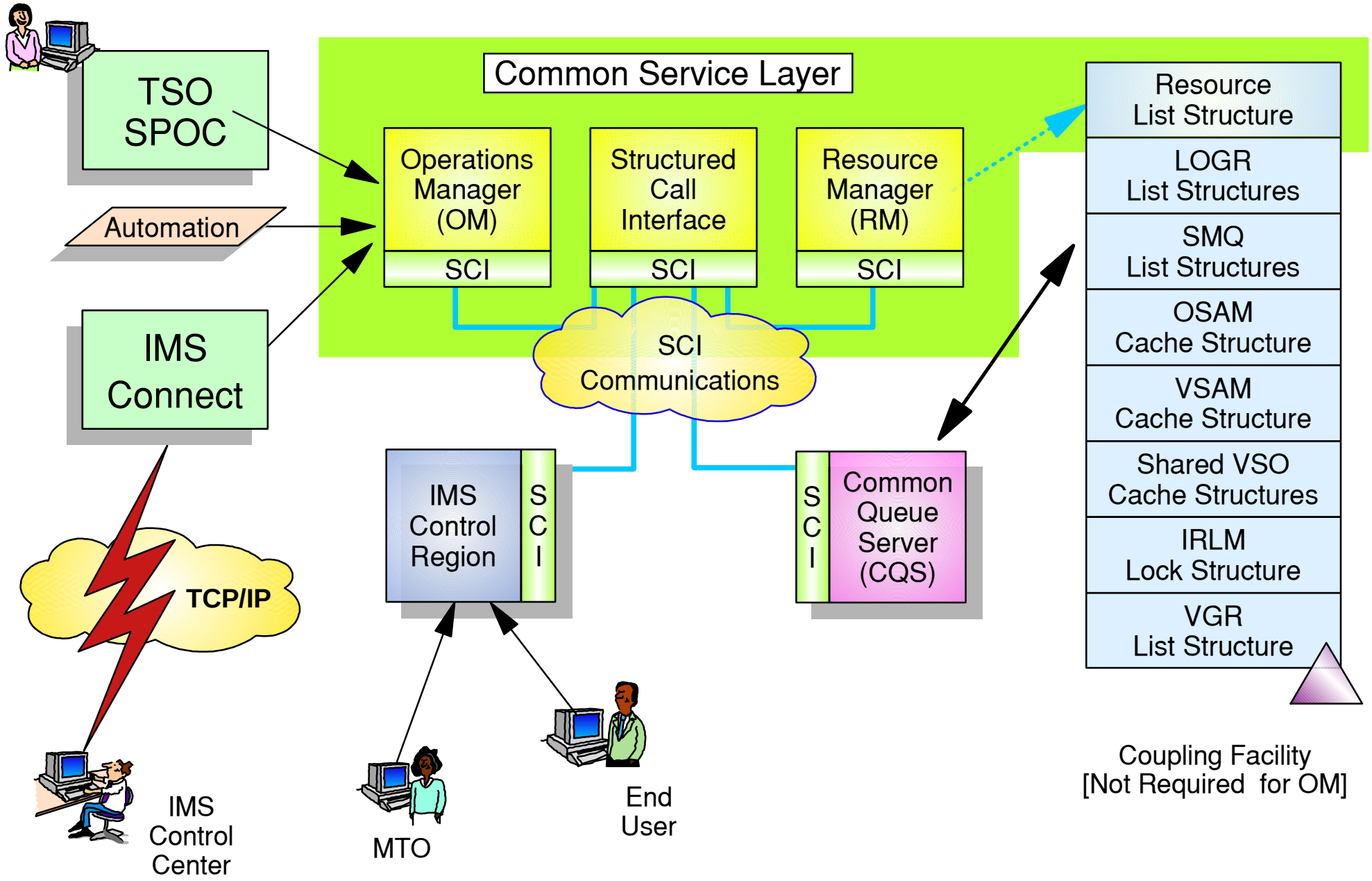
RETURN TO INDEX

Common Service Layer

- CSL Architecture
- **Operations Management**
  - OM
  - SPOC
  - REXX
  - DB2/IMS Control Center



Operations Manager (OM) Is Part of the CSL



CSL Components (OM)

Operations Manager

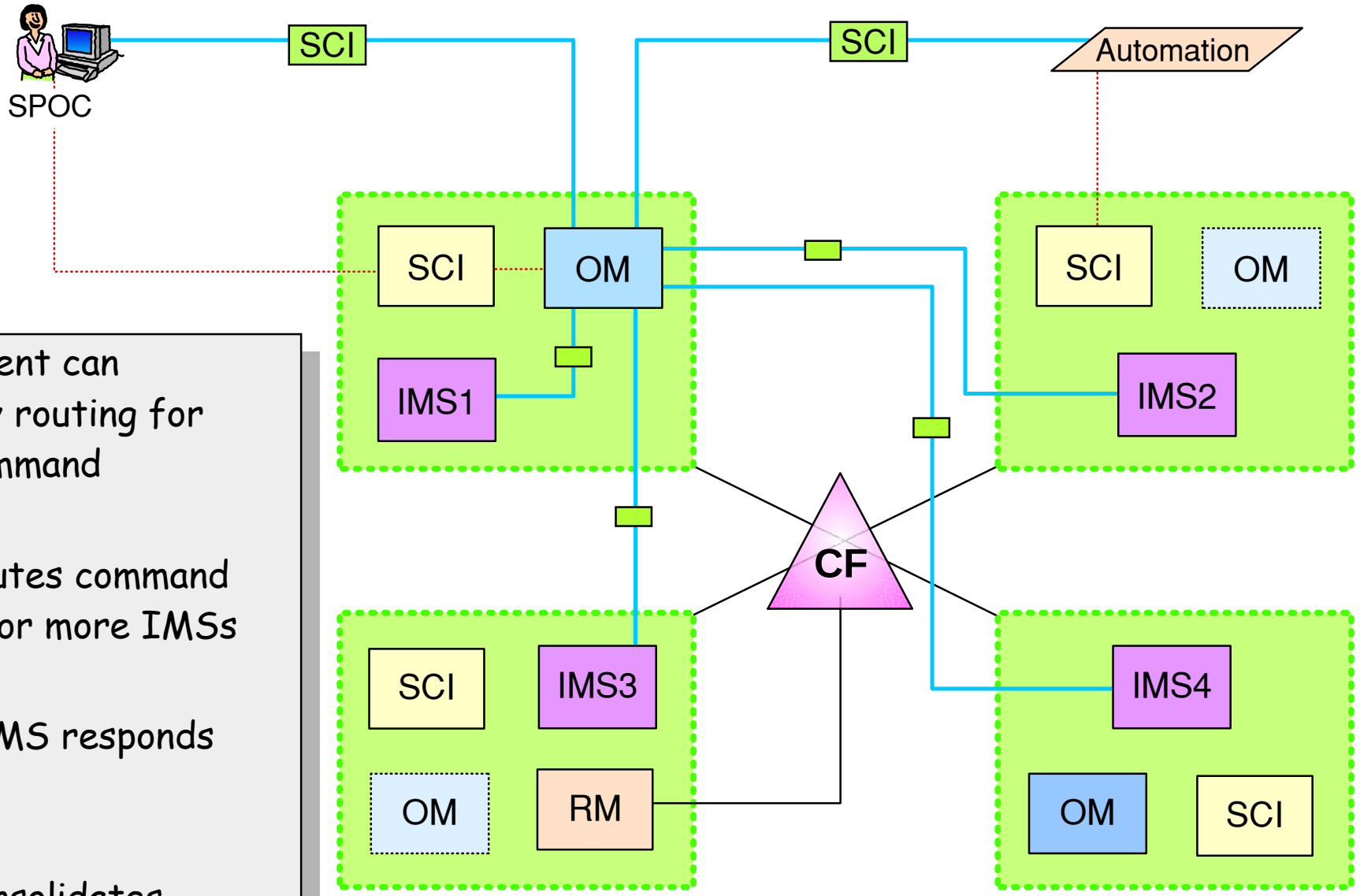
- One of the CSL address spaces
  - One OM address space required in each CSL IMSplex
  - Recommend at least two for availability
- OM registers with SCI as a member of the IMSplex
- OM communicates with other members using SCI communication services
- Provides an API supporting *common point of command entry* into IMSplex (can be single IMS - does not need Parallel Sysplex)
  - Focal point for operations management and automation
  - Command responses from multiple IMSs are consolidated

CSL Components (OM)

Operations Manager services

- Provides services to members and clients of an IMSplex
  - *Provide an API* for IMS commands submitted from outside IMS
    - Classic IMS commands (/cmd ...)
    - *New enhanced IMSplex commands (QRY, INIT, TERM, DEL, UPD)*
  - *Command registration* to support any command processing client (IMS, ...)
    - Clients tell OM which commands it can process
  - *Command security*
    - Perform authorization within OM - before sending to IMS
    - RACF or user-written command security exit
  - *Route commands* to IMSplex members registered for the command
  - *Consolidate command responses* from individual IMSplex members into a single response to present to the command originator

OM in a Multi-IMS IMSplex



OM Client can specify routing for any command

OM routes command to one or more IMSs

Each IMS responds to OM

OM consolidates responses for SPOC

Note: OM does not require a Parallel Sysplex if there is just one MVS image.

Operations Manager - API

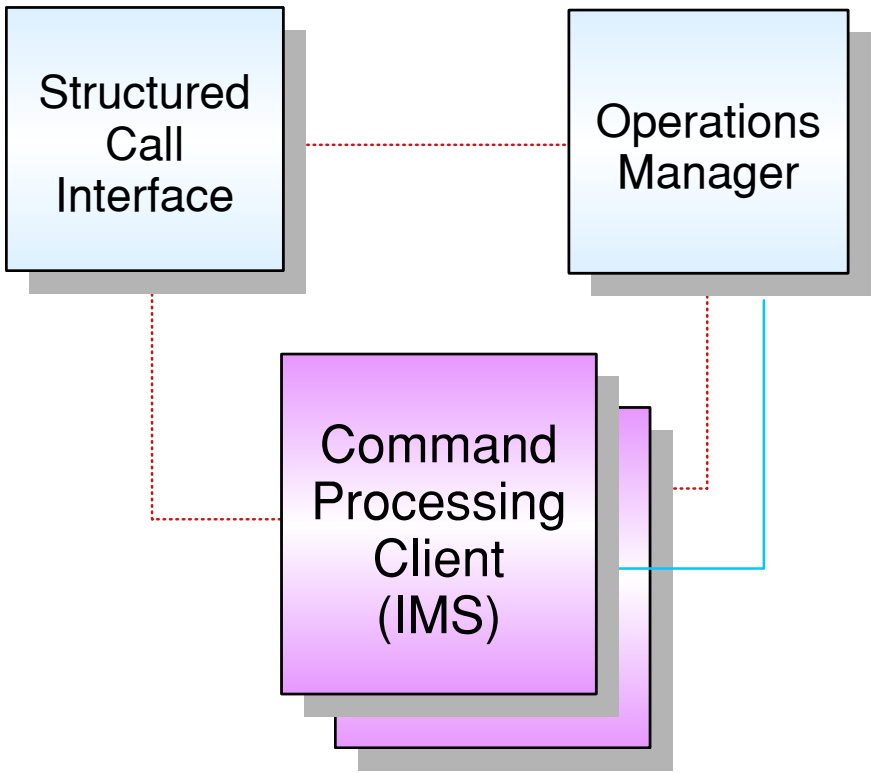
OM clients

- Command processing (CP) clients
  - Clients which process commands entered from other address spaces
  - IMS is a command processing client
- Automated operations (AO) clients
  - Clients through which commands are entered to OM and then to the command processing client
  - Command may originate with operator, be received from a network client, or be generated by an automation process
- OM services are invoked by
  - CSLOMxxx macros
    - Macro coding and use is described in ***CSL Guide and Reference***
  - REXX functions provided to reduce need to write in assembler

CP Client

Command Processing client

- OM client that processes commands
  - IMS and RM are command processing clients of OM
- CP client
  - Registers with SCI
    - Must be on same OS image
  - Registers with OM
    - Identifies commands that it can process
    - Any OM in IMSplex



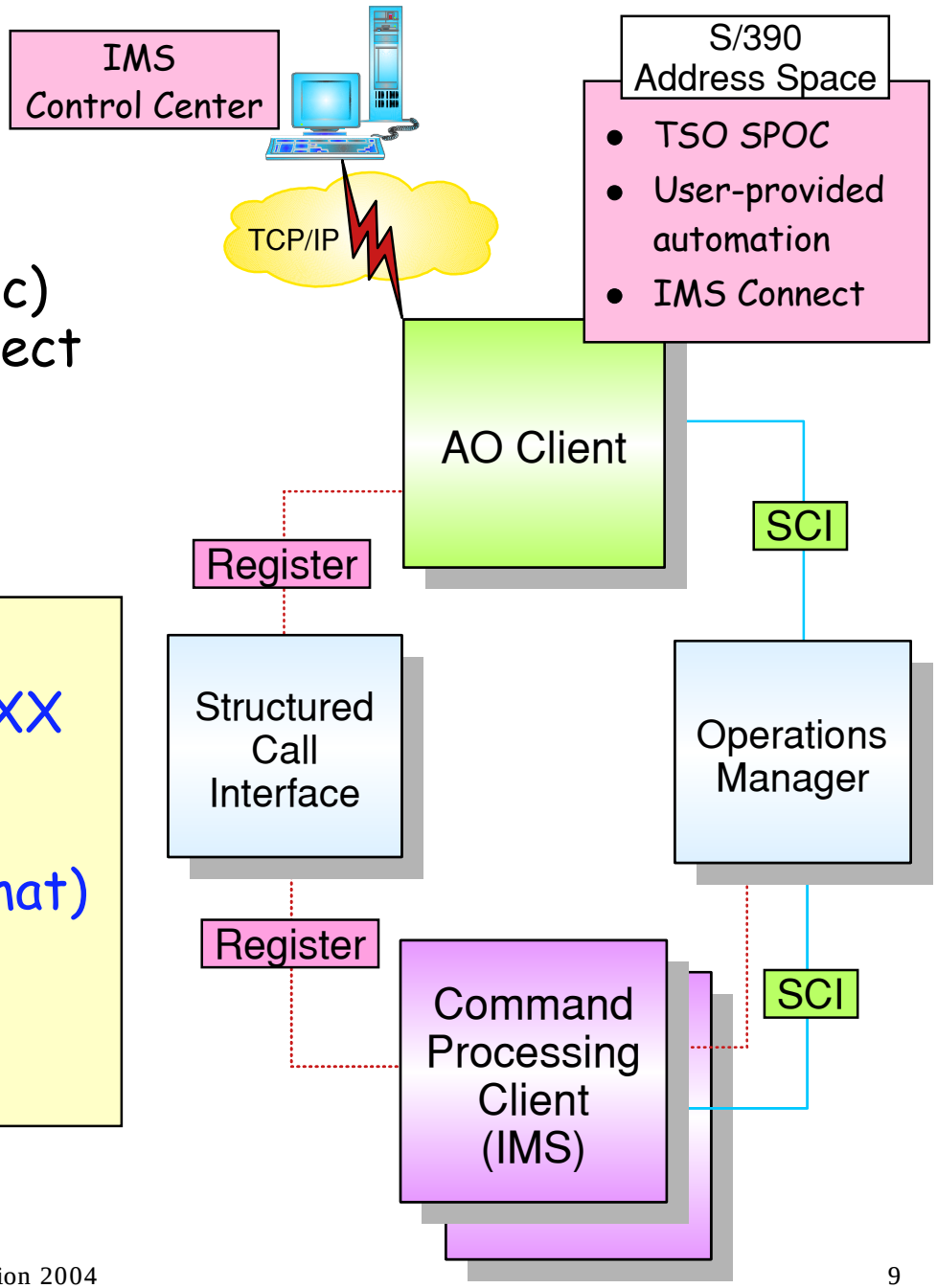
- Processes commands received from OM
- Sends command response back to OM

- Deregisters from OM
- Deregisters from SCI

AO Client

S/390 address space

- Command originates from
  - Operator (e.g., TSO SPOC)
  - Automation (e.g., NetView Exec)
  - Network client with IMS Connect
- AO client
  - Registers with SCI
    - Accepts or creates command
    - Uses **CSLOMxxx** macro or REXX interface to
      - Send command to OM
      - Receive reply (in XML format)
    - Processes reply
      - Format for display
      - Forward to network client
  - Deregisters from SCI



New "Type 2" Commands Entered through OM Interface Only

INIT (INITiate process)

- INIT OLC - starts a global online change (G-OLC) process

TERM (TERMinate process)

- TERM OLC - stops a global online change that is in progress

UPD (UPDate resource)

- UPD LE - updates dynamic LE runtime options
- UPD TRAN - updates selected TRAN attributes

DEL (DELete resource)

- DEL LE - deletes dynamic runtime LE options

New "Type 2" Commands ...

QRY (QueRY resource)

- QRY IMSPLEX - returns information about one or more members of the IMSplex
- QRY MEMBER - returns status and attributes of the IMS members in the IMSplex
- QRY LE - returns runtime LE options
- QRY OLC - returns OLC library and resource information
- QRY TRAN - returns TRAN info similar to /DIS TRAN
- QRY STRUCTURE - returns structure information of the RM resource structure

Examples - Type 2 Commands

```
INIT OLC PHASE(PREPARE) TYPE(ALL)
INIT OLC PHASE(COMMIT)
TERM OLC

UPD LE SET LEOPT(YES)
UPD LE TRAN(TRXN1) SET(LERUNOPTS(TERMTHDACT))
QRY LE
DEL LE TRAN(TRXN1)

QRY TRAN QCNT(GT,10) SHOW(ALL)
UPD TRAN NAME(TRXN1) SET(PARLIM(3),NPRI(10))
UPD TRAN NAME(TRXN2) START(SCHD)

QRY IMSPLEX NAME(CSLPLEX1) SHOW(ALL)

QRY MEMBER TYPE(IMS) SHOW(STATUS)
```

Sample Command and Response

```
UPD TRAN NAME(PART) SCOPE(ALL) STOP(Q,SCHD)
      START(TRACE) SET(CLASS(4))

TRANCODE   MBRNAME    CC
PART       IMS1        0
PART       IMS2        0
PART       IMS3        0


QRY TRAN NAME(PART) SHOW(CLASS,STATUS)

TRANCODE   MBRNAME    CC    CLS   STATUS
PART       IMS1        0      4   STOQ,STOSCHD,TRA
PART       IMS2       ...
```

Type 2 Commands Enhanced in V9

Database support

- QRY (database or DEDB area status)
- UPD (database, DEDB area, or datagroup status)

Online Reorganization of HALDB databases

- INIT (online reorg process)
- UPD (online reorg parameters)
- TERM (online reorg process)
- QRY (status of online reorg process)

Examples - Type 2 Commands - V9

```
QRY   DB STATUS(STOSCHD,STOUPDS) SHOW(ALL)
UPD   DB NAME(ACCTDB) START(ACCESS)
UPD   DB NAME(TESTDB) STOP(SCHD)
UPD   DATAGRP(FINDBS) STOP(ACCESS)
```

```
INIT OLREORG NAME(CUSTP1,CUSTP2)
     SET(RATE(100)) OPTION(DEL)
QRY  OLREORG NAME(*) SHOW(ALL)
UPD  OLREORG NAME(CUSTP2) SET(RATE(50))
TERM OLREORG NAME(CUSTP1) OPTION(FORCE)
```

Classic IMS Commands

Most classic IMS commands (/cmd ...) can be entered through OM API

- IMS commands specific to an input LTERM or NODE are not supported from OM
  - For example

```
/SIGN ON|OFF, /EXIT, /REL, /RCL, /EXC, ...
```

If ***Resource Structure*** exists, some commands have global impact, for example

```
/STOP NODE ABC
```

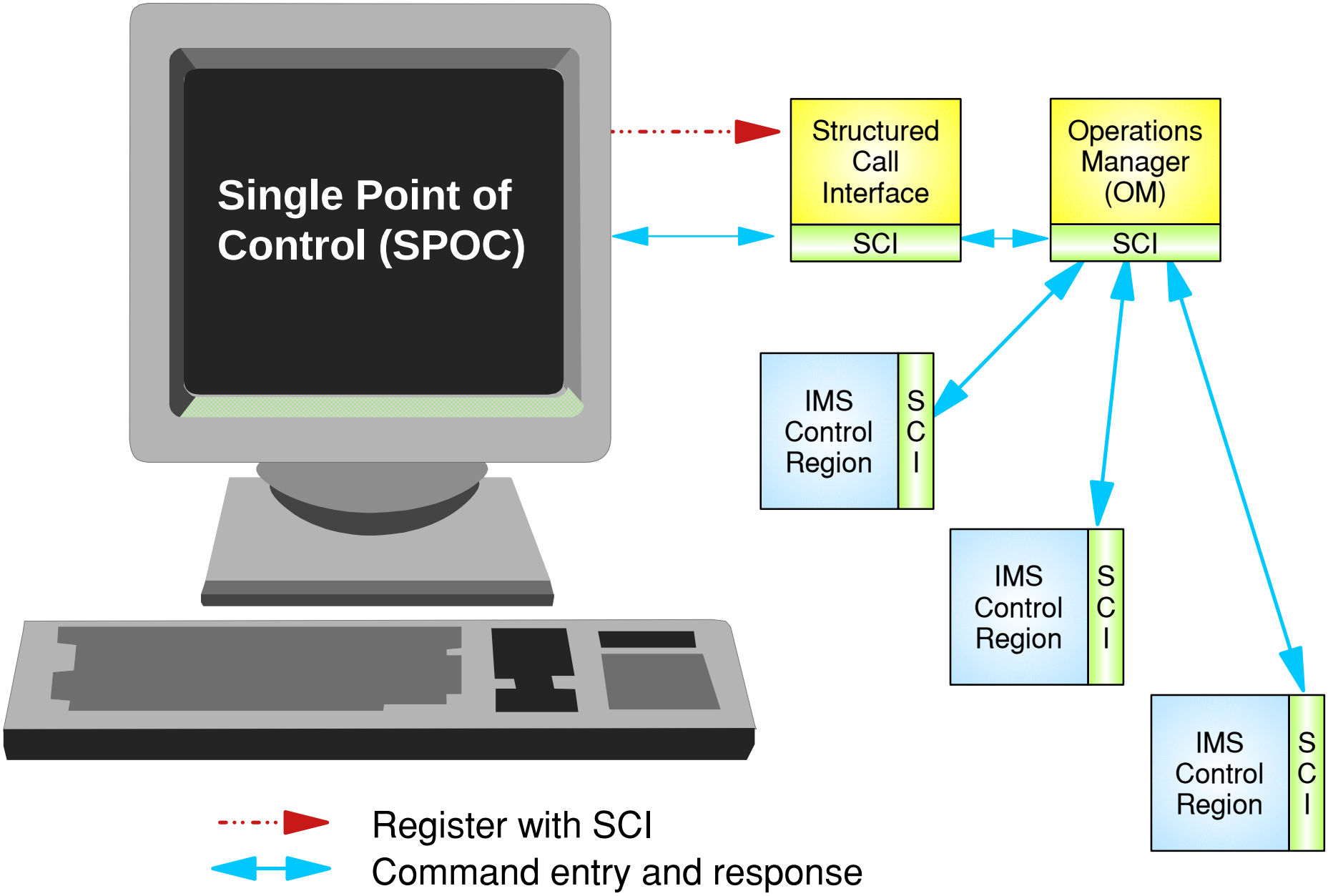
- Node ABC is flagged as stopped in resource structure
- Node ABC is stopped on all IMSs
  - Cannot log on to any IMS in IMSplex

TSO Single Point Of Control (SPOC)

TSO SPOC is an *AO client* of OM

- Runs in TSO session
  - ISPF Application (DFSSPOC)
- May or may not be on the same LPAR as OM
  - Must be on MVS image with SCI
  - Uses SCI to communicate with OM
- Provides a **GREEN SCREEN** terminal interface from which IMS commands may be entered by an operator to one or more members of an IMSplex
  - Including DB/DC, DB/CTL, DC/CTL
- Formats command responses for display
  - OM response is encapsulated in XML
- OM provides *security checking*
  - TSO userid is used to determine RACF authorization
  - RACF and/or Command Authorization Exit

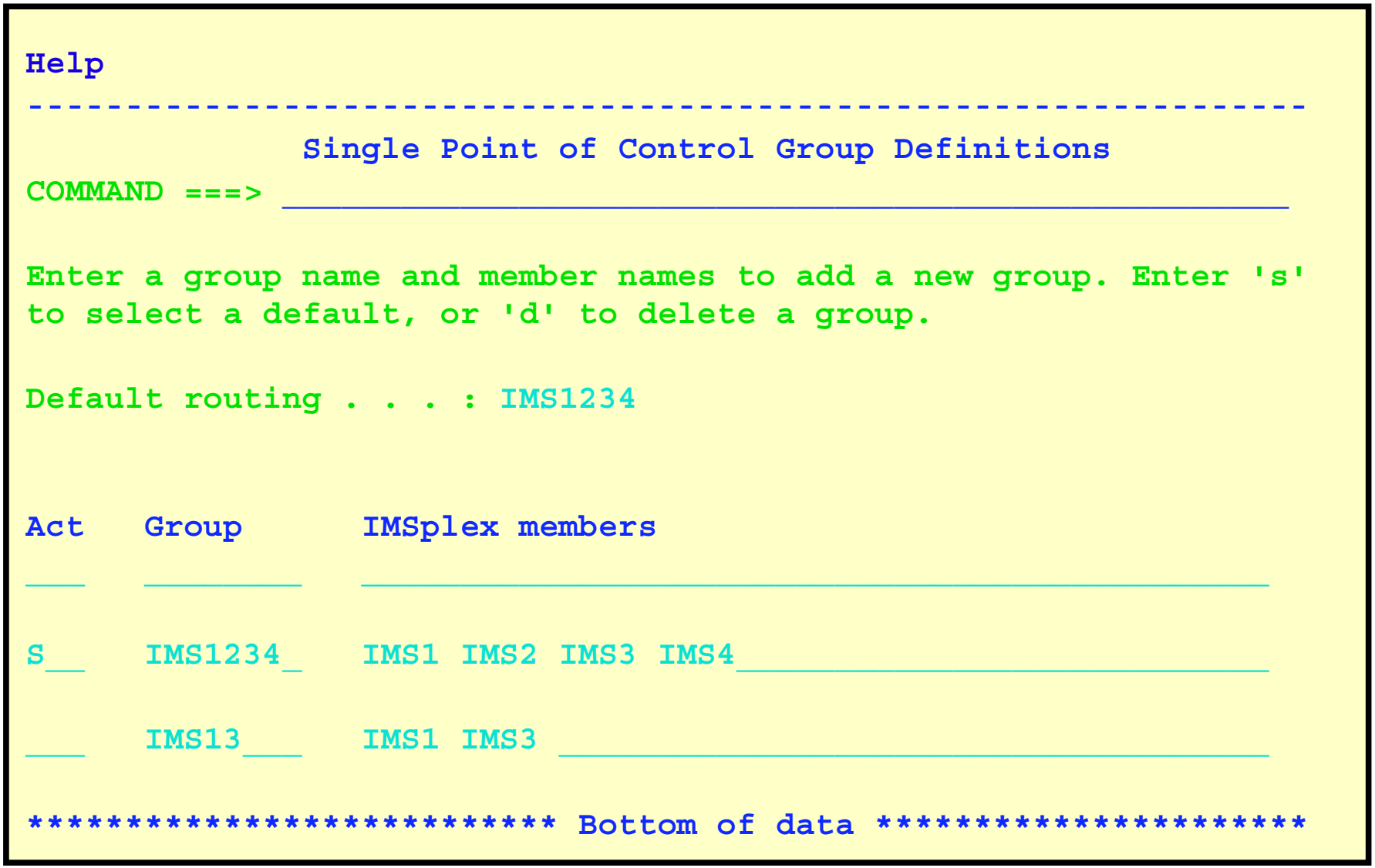
SPOC Registers with Local SCI



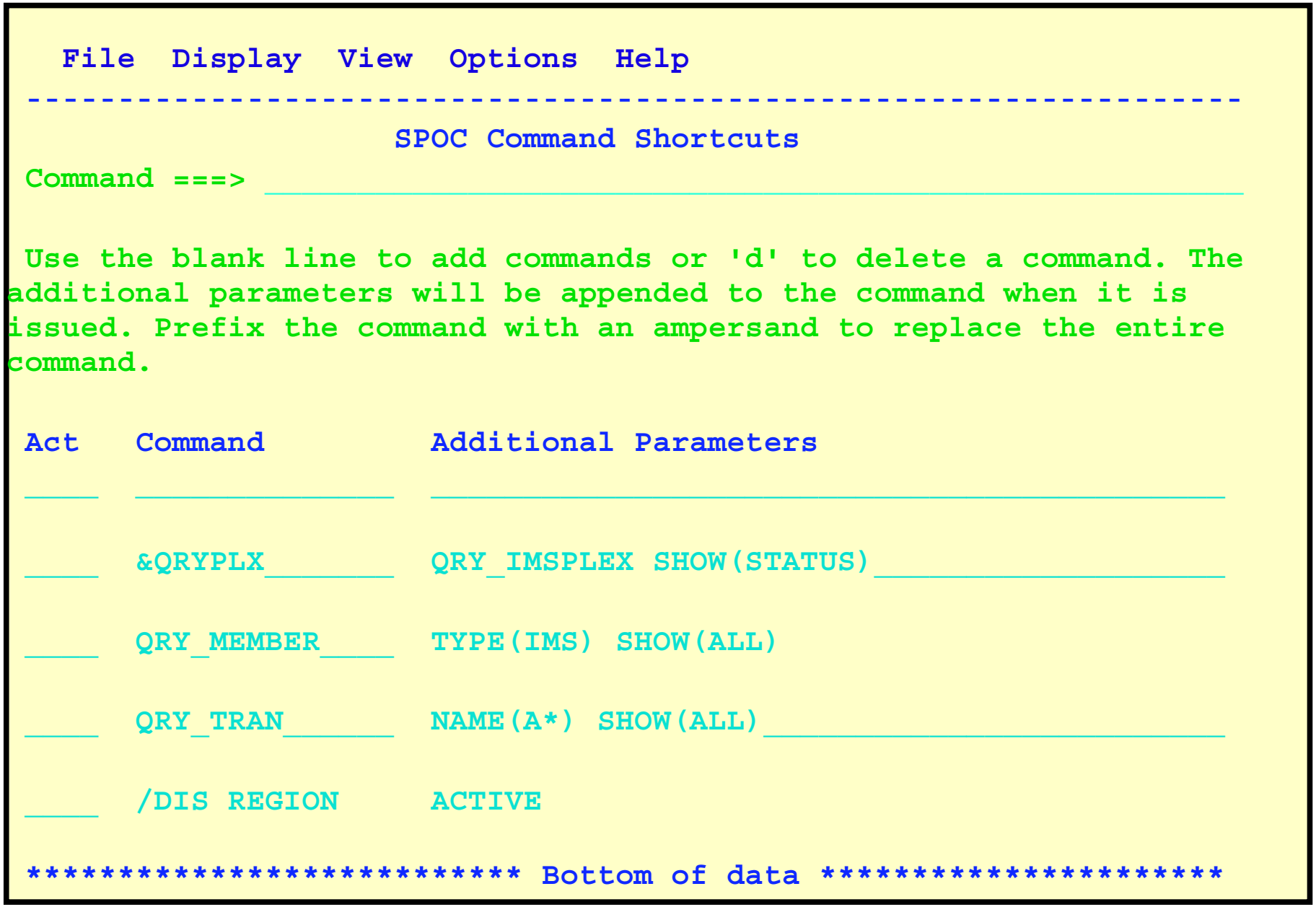
Setting Preferences

```
                  IMS Single Point of Control Preferences
Command ===>
Select your options and press the Enter key.

Default IMSplex. . . . PLX0
Default routing. . . . IMS1 IMS2 IMS3 IMS4_____________________________

Wait interval. . . . . 1:00   (MM:SS)
Waiting preference . . 2  1.  Wait for command to complete.
                          2.  Do not wait for command response.

Command shortcuts. . . 1  1.  Use command shortcuts.
                          2.  Do not use command shortcuts.

Shortcut processing. . 2  1.  Merge explicit and default parameters.
                          2.  Explicit parameters override defaults.

Initial view . . . . . 1  1.  SPOC command panel.
                          2.  SPOC status list.
```

Group Definitions

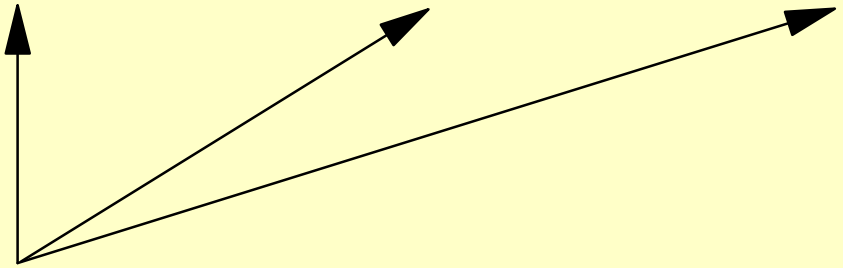


Command Shortcuts



SPOC Command Entry Panel

```
 File  Display  View  Options  Help
-------------------------------------------------------------------------
PLX0                IMS Single Point of Control
Command ===> QRY TRAN NAME(A*) SHOW(ALL)
---------------------- Plex . _____ Route . IMS13____ Wait . ____
Response for:




     Override 'Preferences'




F1=Help F3=Exit F4=Showlog F6=Expand  F9=Retrieve  F12=Cancel
```



Command Response

```
  File  Display  View  Options  Help
-------------------------------------------------------------------------
                    IMS Single Point of Control
Command ===> ____________________________________________________________
---------------------- Plex . _____ Route . IMS13____ Wait . ____
Response for: QRY TRAN NAME(A*) SHOW(ALL)                    More:   +>
Trancode MbrName    CC PSBname      LCls    LQCnt  LLCT LPLCT
ADDINV   IMS1        0 INVPSB          4        6     2 65535
ADDINV   IMS3        0 INVPSB          4       12     2 65535
ADDPART  IMS1        0 PARTPSB        23        0 65535 65535
etc.
```

Display formatted by SPOC from **XML response**.

```
F1=Help  F3=Exit  F4=Showlog  F6=Expand  F9=Retrieve  F12=Cancel
```

Command Response w/Shared Queues

```
  File  Display  View  Options  Help
-------------------------------------------------------------------------
                    IMS Single Point of Control
Command ===> ____________________________________________________________
----------------------- Plex . _____ Route . IMS13____ Wait . ____
Response for: QRY TRAN NAME(A*) SHOW(ALL)                    More:  +>
Trancode MbrName    CC PSBname       QCnt LCls    LQCnt  LLCT LPLCT
ADDINV   IMS1        0                 0
ADDINV   IMS1        0 INVPSB             4         0     2 65535
ADDINV   IMS3        0                 0
ADDINV   IMS3        0 INVPSB             4         0     2 65535
ADDPART  IMS1        0                 0
ADDPART  IMS1        0 PARTPSB           23         0 65535 65535
etc.
```

When running with shared queues,
one IMS reports global queue count.

```
F1=Help F3=Exit F4=Showlog F6=Expand  F9=Retrieve  F12=Cancel
```

Classic Command and Response

```
 File  Display  View  Options  Help
-------------------------------------------------------------------------
                    IMS Single Point of Control
Command ===> ____________________________________________________________
---------------------- Plex . _____ Route . IMS13____ Wait . ____
Log for . . .: /DIS STATUS DATABASE
IMSplex . . . . . : PLX0
Routing . . . . . : IMS13
Start time. . . . : 2001.199 16:43:53.31
Stop time . . . . : 2001.199 16:43:54.47
Return code . . . : 00000000

Reason code . . . : 00000000
Command master. . : IMS1

MbrName     Messages
IMS1        **DATABASE**
IMS1        STATUS UNRESTRICTED
IMS3        **DATABASE**
IMS3        BANKATMS  NOTINIT, NOTOPEN, STOPPED

F1=Help F3=Exit F4=Showlog F6=Expand  F9=Retrieve  F12=Cancel
```

Command message log can be shown at top or bottom of display.

Command Entry Using Shortcut

```
 File  Display  View  Options  Help
-------------------------------------------------------------------------
PLX0                IMS Single Point of Control
Command ===> QRY TRAN
----------------------- Plex . _____ Route . IMS13____ Wait . ____
Response for:
```

QRY TRAN command without parameters uses defaults from SHORTCUTS.

```
QRY TRAN NAME(A*) SHOW(ALL)
```

```
F1=Help F3=Exit F4=Showlog F6=Expand  F9=Retrieve  F12=Cancel
```

Command Entry Using Shortcut ...

```
 File  Display  View  Options  Help
-------------------------------------------------------------------------
PLX0                IMS Single Point of Control
Command ===> QRY TRAN NAME(B*) SHOW(QCNT)
---------------------- Plex . _____ Route . IMS13____ Wait . ____
Response for:
```

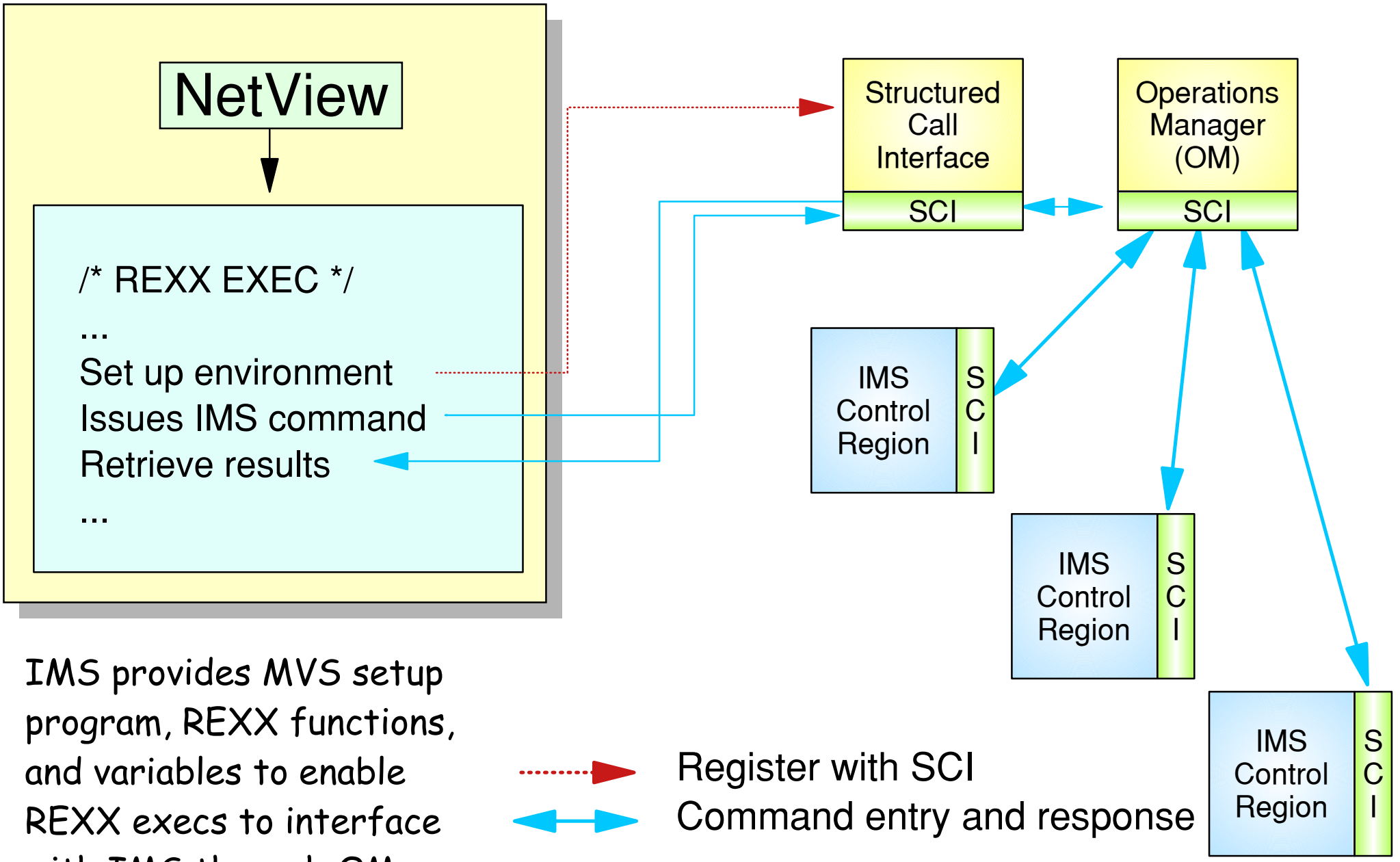
QRY TRAN command ***with*** parameters may ***override*** or be ***merged*** with parameters defined in SHORTCUT.

Depends on PREFERENCE.

```
QRY TRAN NAME(B*) SHOW(QCNT)
```

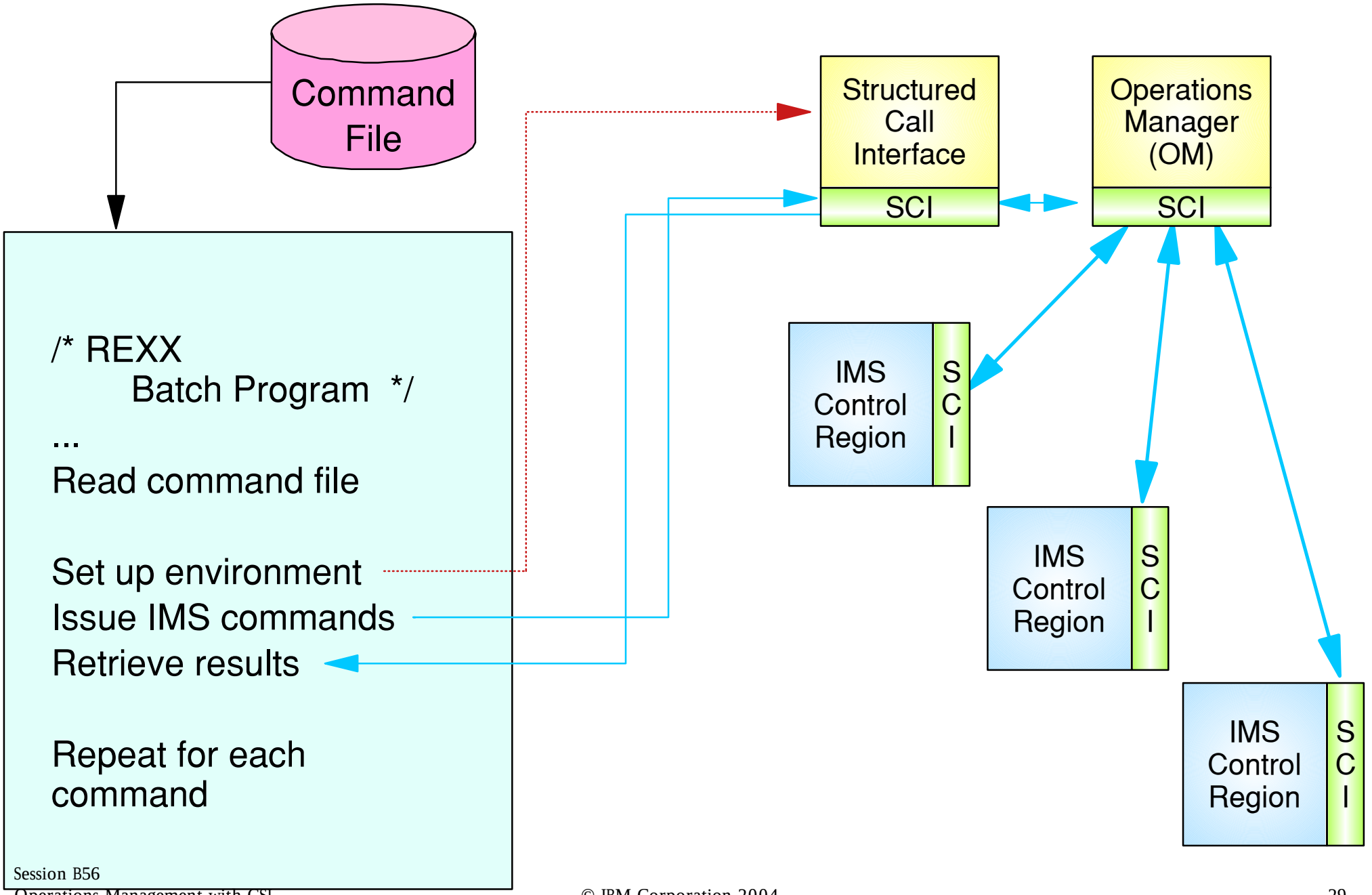
```
F1=Help F3=Exit F4=Showlog F6=Expand  F9=Retrieve  F12=Cancel
```

REXX Exec Interface to OM and IMS



IMS provides MVS setup program, REXX functions, and variables to enable REXX execs to interface with IMS through OM.

REXX Exec Interface to OM and IMS



REXX SPOC

Support for a REXX SPOC includes

- CSLULXSB program
  - Sets up IMSSPOC host command environment for REXX with several subcommands
  - Establishes REXX function for retrieving response
  - Provides REXX variables for return and reason codes
- IMSSPOC command
  - Establishes IMSSPOC host command environment
    - All commands to OM
  - Subcommands establish IMSplex parameters
- CSLULGTS() function
  - REXX "function" to retrieve response from OM

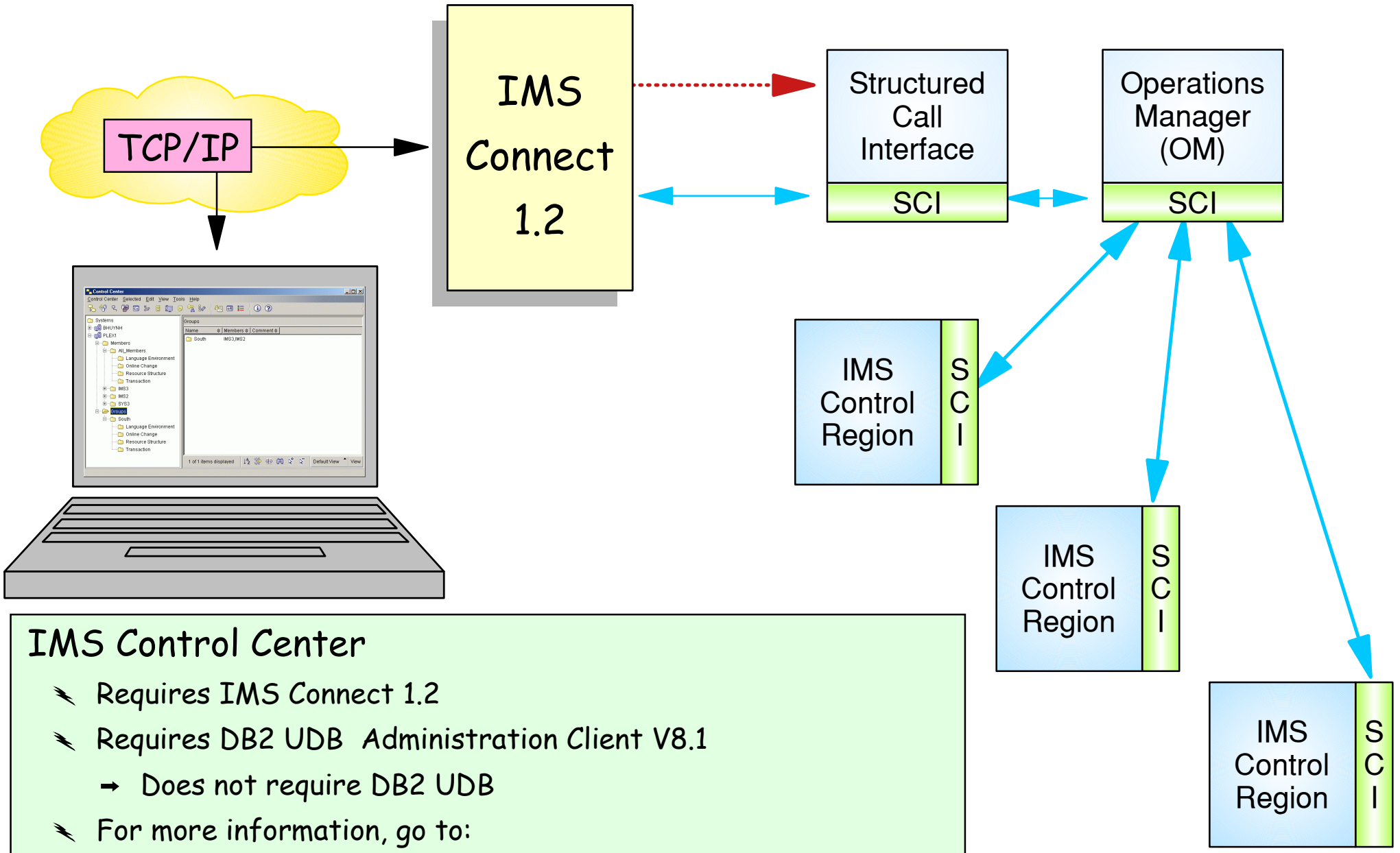
REXX SPOC Example

```
 1  /* sample rexx exec */
 2  parse upper arg theIMScmd
 3  Address LINK 'CSLULXSB'
 4  if rc = 0 then do
 5     Address IMSSPOC
 6     "IMS   plx0"
 7     "ROUTE ims1"
 8     "CART  token1"
 9     "WAIT  0:30"
10     theIMScmd
11     results = cslulgts('resp.','token1',"0:40")
12     say 'imsrc='imsrc   'imsreason='imsreason
13     if resp.0 /= '' then do
14         say resp.0' lines of output'
15         do indx = 1 to resp.0
16           say resp.indx
17         end
18       end
19     "END"
20   End
```

Set up environment, formulate, and submit command

Process results received from IMSs through OM

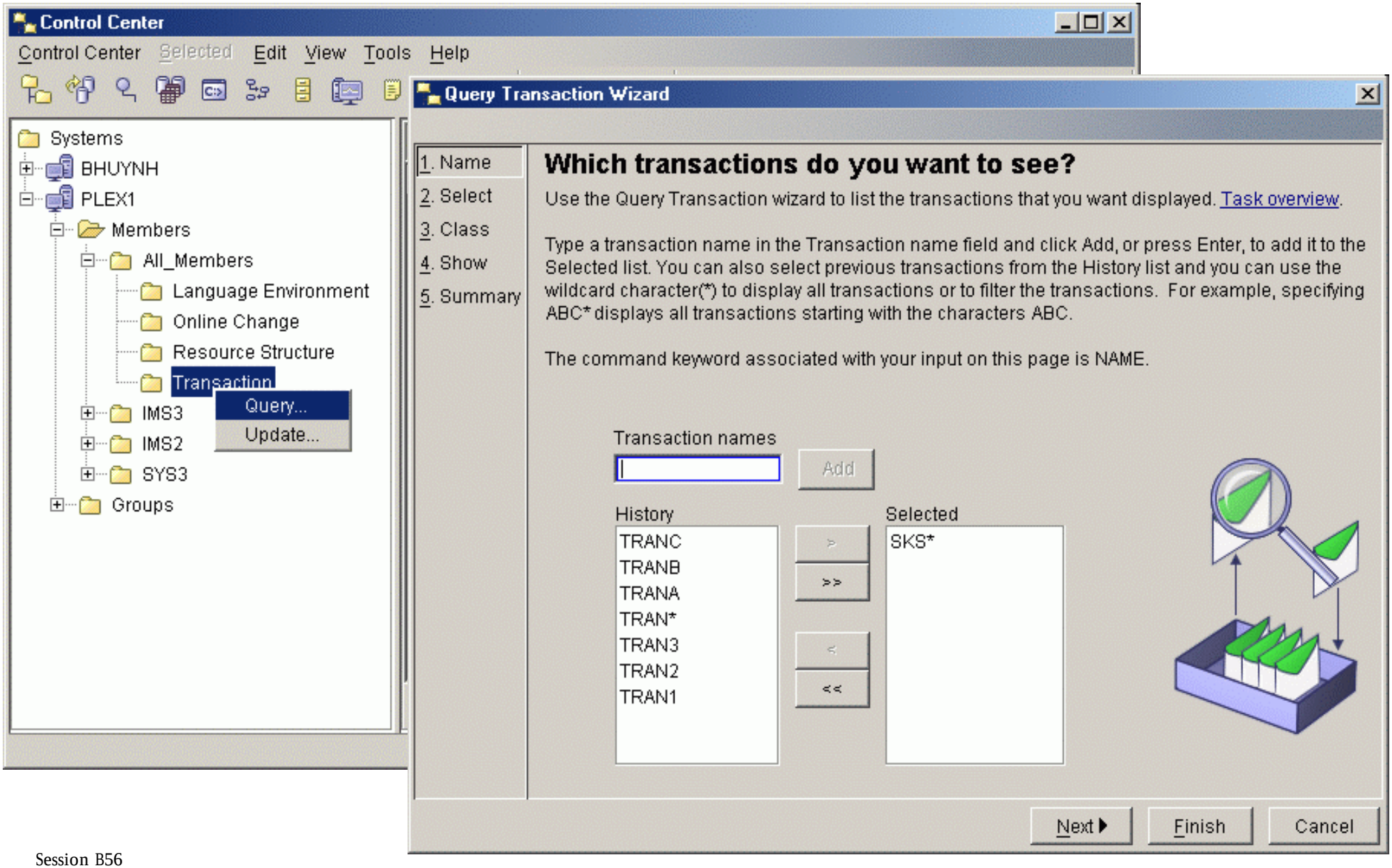
IMS Control Center



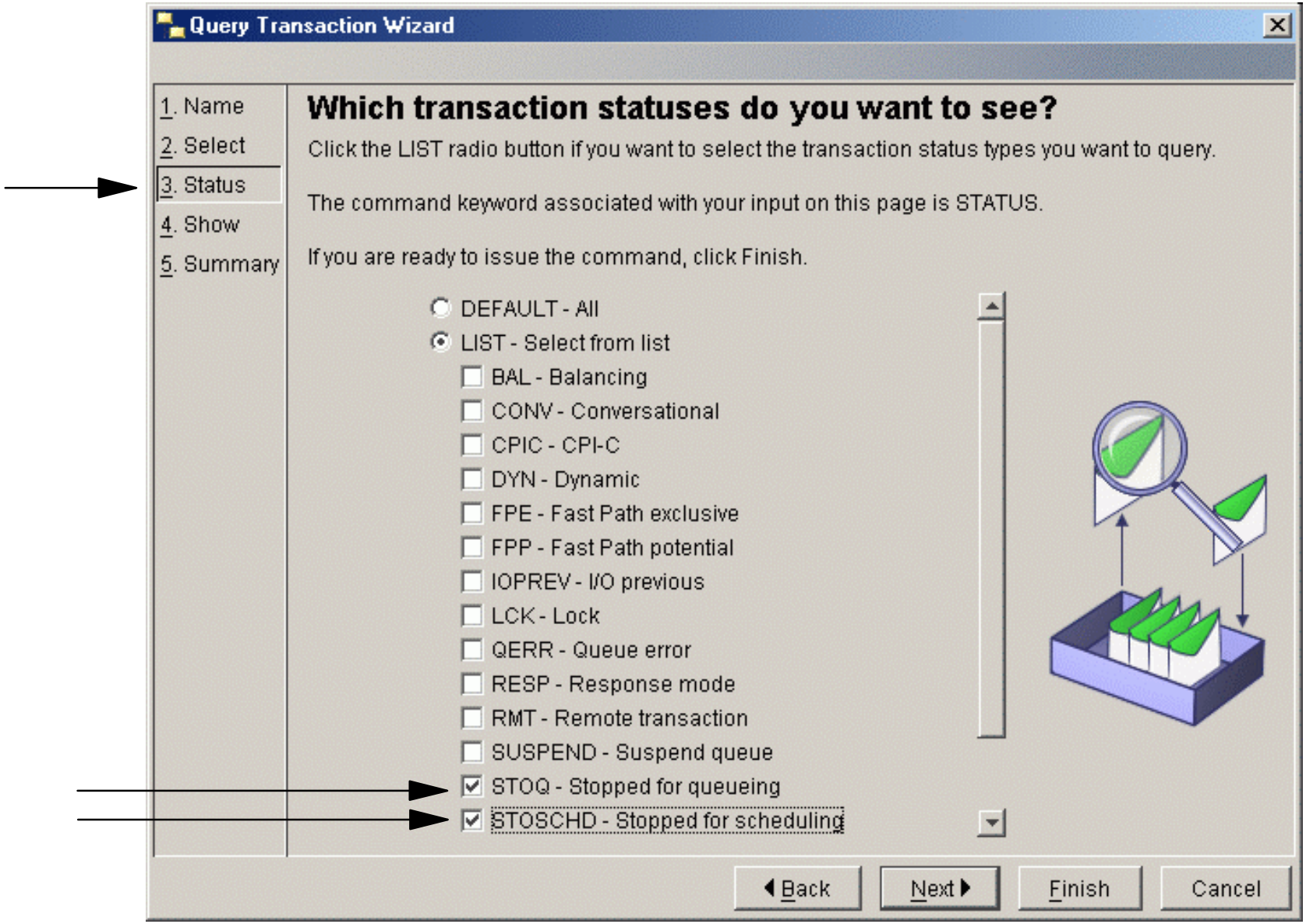
IMS Control Center

- Requires IMS Connect 1.2
- Requires DB2 UDB Administration Client V8.1
  - Does not require DB2 UDB
- For more information, go to:
  - http://www-3.ibm.com/software/data/ims/imscc/index.html

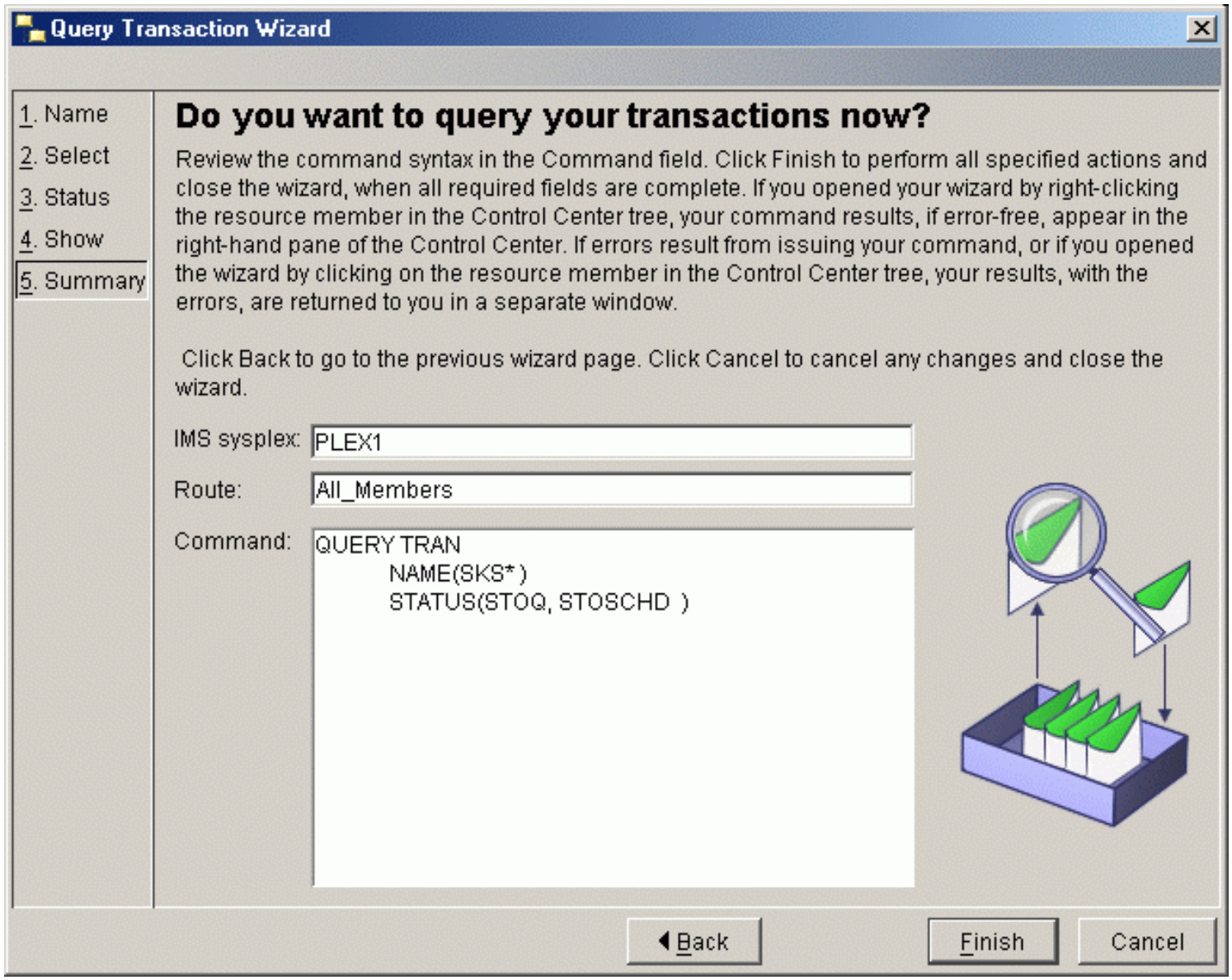
IMS Control Center - Example
Select TRAN QRY - Identify Trancode(s)



IMS Control Center - Example ... Select Transaction STATUS



IMS Control Center - Example ... Ready to Submit



OM Summary - Operations Manager

Operations Manager is part of Common Service Layer

- Joins IMSplex
  - Registers with SCI
  - Uses SCI to communicate with other IMSplex members
- One OM address space required per IMSplex
  - May have multiple OMs for availability and performance
  - Built on Base Primitive Environment (BPE)
- Provides services to IMSplex Command Processing (CP) and Automated Operations (AO) clients
  - API for submitting commands
  - Command registration for CP clients
  - Routes commands from AO clients to CP clients
  - Consolidates responses from CP clients and passes to AO client
  - Provides command security for classic and IMSplex commands

RETURN TO INDEX