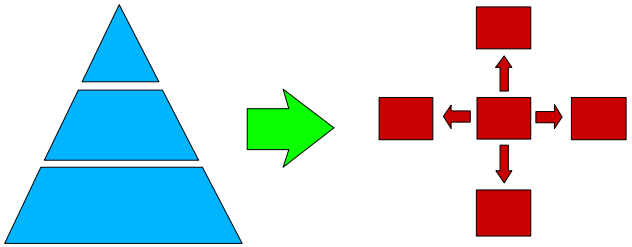
Controlling Searches In Mixed APPN/Subarea Networks



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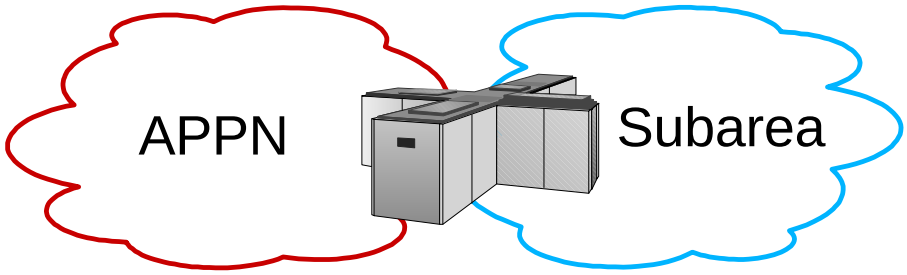
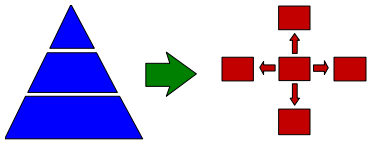
Introduction

- VTAM Has Two Distinct Search Algorithms: Subarea & APPN
  - Understanding Details Of Either Is Difficult
  - Understanding Details Of Both Is Very Difficult
  - Understanding How They Interact Is Almost Impossible!



- In Complex Networks, Tuning For Performance Requires Work
  - Trade-Off: Dynamics Versus Predefinition
- Problems Are Not As Bad As They May Seem
  - Search Performance Usually Improves After Resources Are Found
  - Complexity Is Significantly Reduced When Network Is Completely APPN
  - New Functions Are Being Implemented To Ease Migration And Tuning



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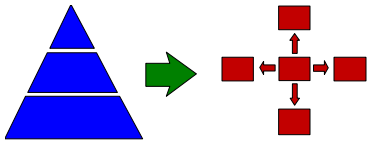
Agenda

- Overview Of Search Algorithms
  - Subarea Searching
  - APPN Searching
  - Subarea/APPN Search Interactions
- Network Design Recommendations
  - Network Design Considerations
  - Start Options And Definitions
  - Network Search Strategies
- Problem Determination
  - Debugging Aids
  - Common Problems



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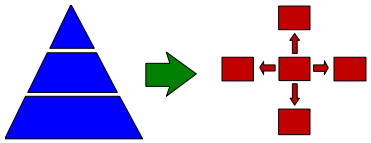
Overview Of Subarea Searching

- Trial-And-Error Routing
- Based On ADJSSCP Tables
  - "ISTAPNCP" Entry Means "Search APPN Network"
  - Includes Adjacent Subnetwork (Border Node) Searching
- Different Tables Allowed For Different Resources
  - NETID Known, CDRM Known, NETID And CDRM Known
  - Default Table Is Used When No Matching Table Is Found
  - ADJLISTs Associate Specific Tables With CDRSCs
- ADJSSCP Selection Function (SME) Allows Re-ordering



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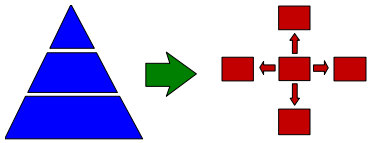
Overview Of APPN Searching

- Registration of Local Resources
  - ENs Register To CDS And/Or NNS; NNs Register To CDS
- Searches May Be Directed Or Broadcast
  - Directed Search When Target Location Is Known (RDTE, DS DB, TOPO DB)
  - Broadcast Search Of Domain ENs And Local Subnetwork
  - Serial Directed Search Of Interchange Nodes And Adjacent Subnetworks
- CDServers Reduce Frequency Of Broadcasts
  - CDS Becomes Focal Point For Network Broadcasts
  - Origin CDS Queries Other CDSs Before Sending Broadcast
- Adjacent Subnetwork (BN) Search Uses ADJCLUST Tables
  - Different Tables Allowed For Different Resources
    - Based On Target NETID Only (Not Owning CP Or CDRM)
    - Default Table Used When No Matching Table Is Found
  - "This EBN" Entry Means "Search Local Subnetwork"
- Directory Services Management Exit (DSME)
  - Allows Search Steps To Be Eliminated
  - Allows Re-ordering Of ADJCLUST Entries



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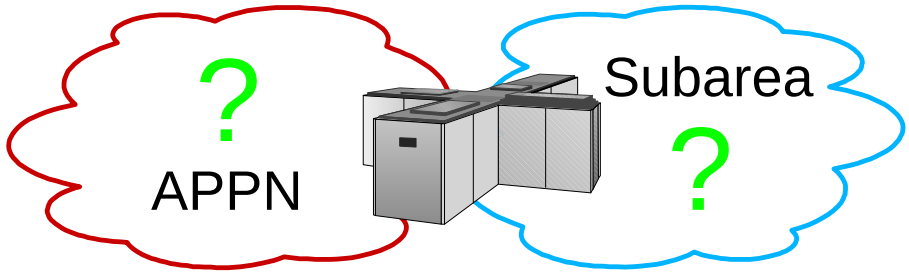
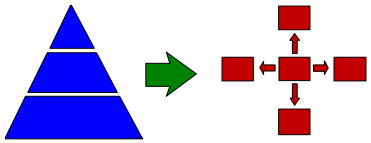
Subarea And APPN Search Interaction

- **Which Search Algorithm Is Used?**
  - Depends On Origin Of Search (Subarea Or APPN)
  - Searching Switches Between Subarea And APPN As Needed

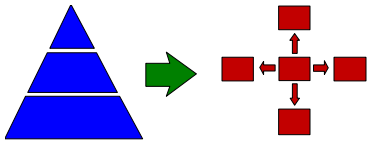


- **Other Points Of Interest**
  - Subarea-Side May Search APPN-Side Twice
  - Directory Database Only Search (Directed Only)
  - APPN Network (And Adjacent Subnetwork) Search
  - APPN-Side Searches Subarea-Side Only Once
  - Neither Side Searches The Other Side, If Search Originated On The Other Side



Network Design Considerations

- Existing Search Traffic Patterns
  - What Resources Are Most Frequent Search Targets?
  - Where Are Target Resources Located (APPN Or Subarea)?
  - Can Target Resource Location Be Determined By NETID?
- Performance Versus Dynamics
  - Predefine CDRSCs, ADJSSCP & ADJCLUST Tables?
- Configuration And Session Restrictions
  - HPR Requires APPN Session Path (Or VRTGs)
  - NCP Ownership And SSCP Takeover Require Subarea Path
  - Bisynchronous 3270 Not Supported By APPN (See Common Problems)
  - Unextended BINDs Not Supported By APPN (See Common Problems)
  - HPR-Only TGs Adjacent To (SNI) Interchange TGs
    - MPC+ (To Non-VTAM Nodes), ATM, Enterprise Extender
    - 3746 Nodes With "Control Flows Tower" Enabled



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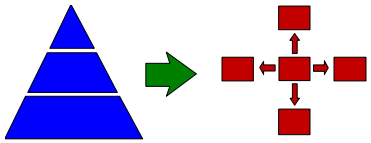
Start Options Available

- Start Options For Subarea Searching
  - DIALRTRY=YES | NO - Reroute Search Request On Dial-Out Failure
  - DYNASSCP=YES | NO - Create Dynamic Default ADJSSCP Table
  - MAXSSCPS=10 | nn (1-255) - SSCP Visit Count (Subarea Searching)
  - SORDER=APPN | APPNFRST | SUBAREA | ADJSSCP - Search Order
  - SSCPDYN=YES | NO - Update History Information Of Origin Resource
  - SSCPORD=PRIORITY | DEFINED - Priority (History) Or Defined Searching
- Start Options For APPN Searching
  - BNDYN=LIMITED | FULL | NONE - Border Node Search Dynamics
  - BNORD=PRIORITY | DEFINED - Priority (History) Or Defined BN Searching
  - DUPDEFS=ALL | NONE | APPL | DEPLU - Duplicate APPL/LU Definitions Exist
  - MAXLOCAT=5000 | nnnnn (threshold) - Locate Search Congestion Control
  - SNVC=3 | nn (1-255) - APPN Subnetwork Visit Count (Border Node Searching)
  - SSEARCH=YES | NO | CACHE | APPNFRST - Subarea Search Control



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Subarea: SORDER And SSCPORD

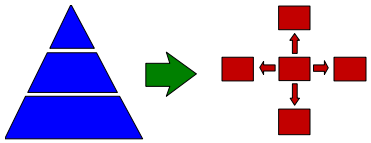
SORDER

SSCPORD / PRIORITY	APPNFRST	APPN	ADJSSCP	SUBAREA
PRIORITY	1. APPN Network 2. Real Owner 3. Coded Owner 4. Prev. Successes 5. ADJSSCP Table 6. Prev. Failures	1. Real Owner 2. Coded Owner 3. APPN DS DB 4. Prev. Successes 5. APPN Network 6. ADJSSCP Table 7. Prev. Failures	1. Real Owner 2. Coded Owner 3. APPN DS DB 4. Prev. Successes 5. ADJSSCP Table 6. Prev. Failures	1. Real Owner 2. Coded Owner 3. APPN DS DB 4. Prev. Successes 5. ADJSSCP Table 6. Prev. Failures 7. APPN Network
DEFINED	1. APPN Network 2. Real Owner 3. Coded Owner 4. ADJSSCP Table	1. Real Owner 2. Coded Owner 3. APPN Network 4. ADJSSCP Table	1. Real Owner 2. Coded Owner 3. APPN DS DB 4. ADJSSCP Table	1. Real Owner 2. Coded Owner 3. APPN DS DB 4. ADJSSCP Table 5. APPN Network

Prefers APPN ◄——————————► Prefers Subarea

Notes:

1. SORDER and SSCPORD do not apply to CDRSCs with ADJLIST coded.
2. SORDER and SSCPORD only affect "subarea searches" (originated on this VTAM or received from adjacent CDRM), EXCEPT:
3. If SSCPORD=DEFINED, "APPN DS DB" Search is limited to resources on served ENs; If SSCPORD=PRIORITY, any DS DB entry may be used.
4. ISTAPNCP is ignored in ADJSSCP tables, unless SORDER=ADJSSCP.
5. If SORDER=ADJSSCP, APPN (DS DB and Network) is only searched if ISTAPNCP is coded in the selected ADJSSCP table.
6. "Previous Successes" and "Previous Failures" can include ISTAPNCP.
7. ADJLISTs can include ISTAPNCP.



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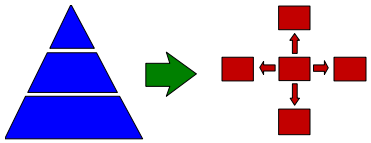
Choosing SORDER

- **SORDER=APPNFRST, APPN or SUBAREA**
  - "ISTAPNCP" Automatically Added To ADJSSCP Tables
    - At The Top, Near The Top or At The Bottom (Respectively)
  - Added The Same Way In All Tables (All NETIDs/CDRMs)
  - **Use:** When MOST/ALL Resources Are In Same Location
    - SSCPORD=PRIORITY Can Improve Next Search, BUT:
    - Can Eventually Prefer Non-Optimal Path

- **SORDER=ADJSSCP**
  - "ISTAPNCP" Must Be Explicitly Coded In ADJSSCP Tables
  - Allows Customized Placement of "ISTAPNCP" By Table
    - Include In Some Tables (Native NETID, Default, Etc.)
    - Do Not Include In Other Tables (Non-Native NETIDs)
    - Remember "Casually Connected" Resources
  - **Use:** When Target NETID Determines Resource Location
  - **NOTE:** Consider SORDER On ADJSSCP Tables (CS/390 V2R7)



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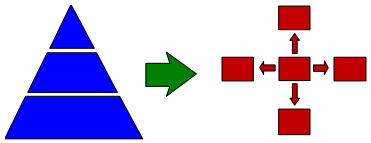
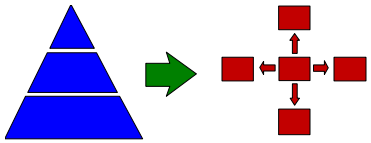
Choosing SSCPORD And BNORD

- **SSCPORD=** and **BNORD=**
  - **PRIORITY** Prefers Previously Successful Path(s)
    - SSCPORD: Real And Coded Owning CDRMs Always Tried First
    - BNORD: Subnetworks With Matching NETID Tried First
    - **Use:** When Tight Control Over Search Order Is Not Required
  - **DEFINED** Forces Use Of "Preferred Path"
    - Always Searches In The Order Specified In The ADJSSCP Or ADJCLUST Table
    - **Use:** When Tight Control Over Search Order Is Desired
- CS/390 V2R6 Allows MODIFY VTAMOPTS,SSCPORD=
  - MODIFY VTAMOPTS,BNORD= Has Always Been Allowed



Choosing SSEARCH

- **SSEARCH=YES Or APPNFRST**
  - Allows APPN Searches To Enter Subarea Network Via This ICN
  - **APPNFRST** Works The Same As **YES**, But APPN Is Always Searched First
    - Forces APPN Searches To "Stay APPN", If At All Possible
    - Maximizes Use Of APPN And HPR
    - **CAUTION:** APPN Always Searched First For SNI Resources Too!
  - **Use:** Recommended For Almost All Configurations
- **SSEARCH=NO**
  - Prevents APPN Searches From Entering Subarea Network Via This ICN
  - **Use:** When Subarea Searching Should Not Be Performed By This VTAM
- **SSEARCH=CACHE**
  - Allows Subarea Search Only If Target Was Previously Found In Subarea
  - **Use:** Not Much Use For This (That I Have Found)



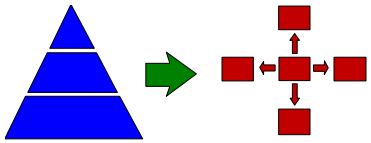
Adjacent SSCP Lists (ADJLISTs)

ADJLISTs

- Define Explicit ADJSSCP Search Lists (By Name)
  - ADJLISTs Are Coded Within ADJSSCP Table
  - ADJLIST Name Is Coded on CDRSC Or GROUP Definitions
- When Searching For A CDRSC With ADJLIST Coded:
  - SORDER, SSCPORD, Real And Coded Owning CDRMs Are Ignored!!
  - What You Code In The ADJLIST Is What You Get!

Use ADJLISTs:

- When Tight Control Over Search Order Is Desired For Some CDRSCs
- When A Simple Search Strategy Is Adequate For Most CDRSCs
  - Predefine CDRSCs With ADJLISTs For The Exceptions



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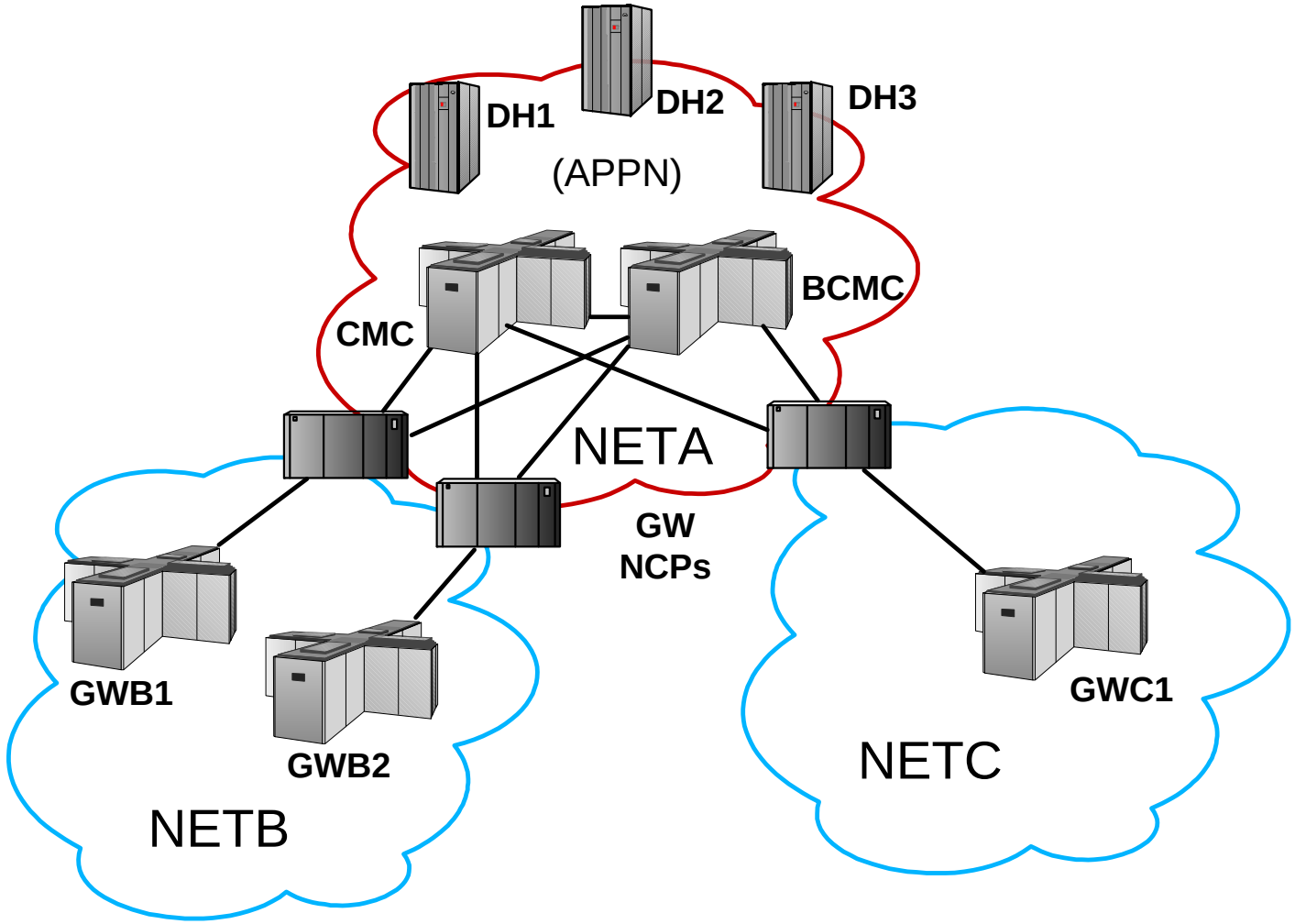
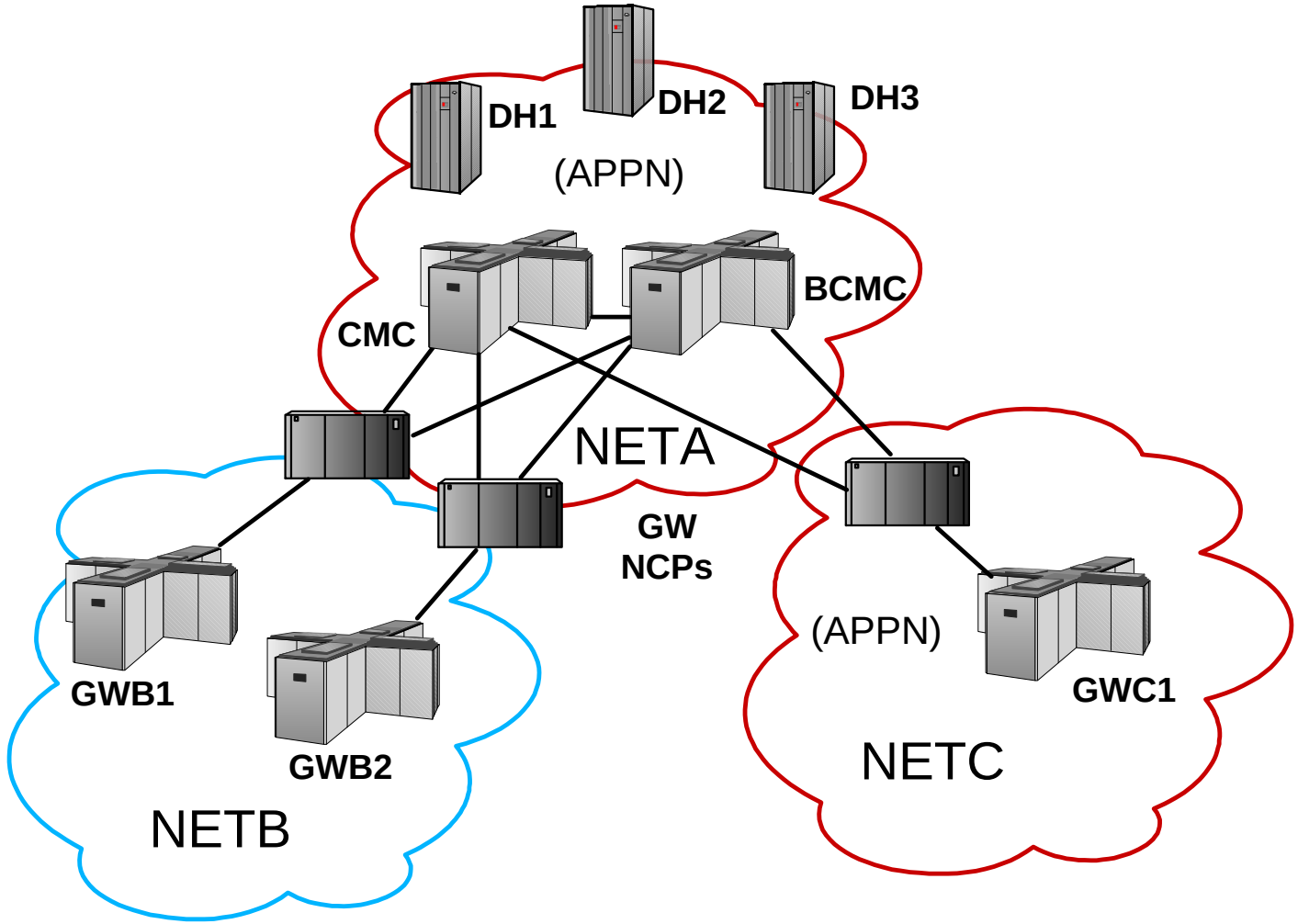
Sample Network - Stage 1



Sample Network - Stage 2



Search Strategies - SORDER=ADJSSCP

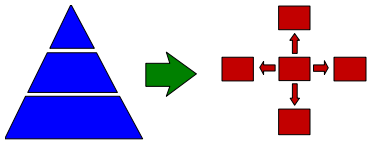
ADJSSCP Tables - Stage 1

```
ADJSSCP  VBUILD  TYPE=ADJSSCP
DEFAULT  NETWORK
ISTAPNCP ADJCDRM
CMC      ADJCDRM
BCMC     ADJCDRM
GWB1     ADJCDRM
GWB2     ADJCDRM
GWC1     ADJCDRM
*
NETA     NETWORK NETID=NETA
ISTAPNCP ADJCDRM
CMC      ADJCDRM
BCMC     ADJCDRM
*
NETB     NETWORK NETID=NETB
GWB1     ADJCDRM
GWB2     ADJCDRM
*
NETC     NETWORK NETID=NETC
GWC1     ADJCDRM
```

ADJSSCP Tables - Stage 2

```
ADJSSCP  VBUILD  TYPE=ADJSSCP
DEFAULT  NETWORK
ISTAPNCP ADJCDRM
CMC      ADJCDRM
BCMC     ADJCDRM
GWB1     ADJCDRM
GWB2     ADJCDRM
*
NETA     NETWORK NETID=NETA
ISTAPNCP ADJCDRM
CMC      ADJCDRM
BCMC     ADJCDRM
*
NETB     NETWORK NETID=NETB
GWB1     ADJCDRM
GWB2     ADJCDRM
*
NETC     NETWORK NETID=NETC
ISTAPNCP ADJCDRM
```

- Allows Customized Placement Of ISTAPNCP By Table
- ISTAPNCP Must Be Explicitly Coded, Where Appropriate
  - Included As First Or Last Entry In Some ADJSSCP Tables
    - Default, Local NETID And APPN Border Node Attached NETID Tables
    - Not Included In Other ADJSSCP Tables (SNI-Attached NETIDs)



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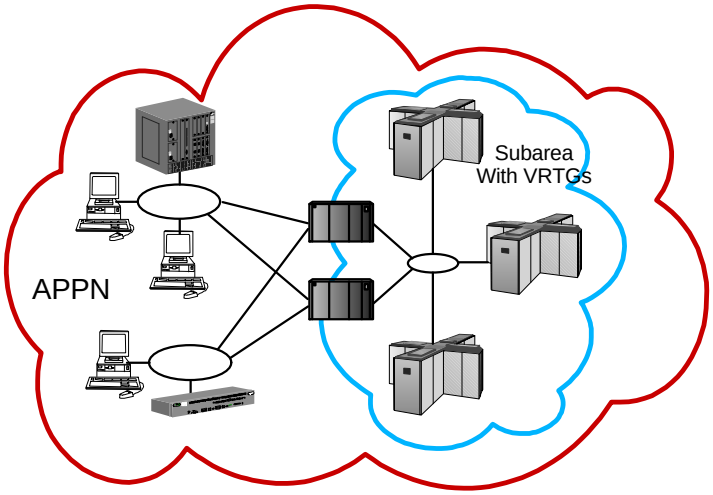
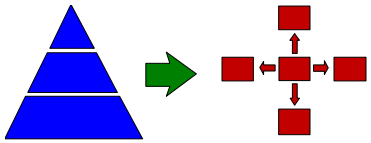
Search Strategies - SORDER=ADJSSCP



- Coding ISTAPNCP At The Top Works Like SORDER=APPN (Not SORDER=APPNFRST)
  - Can Cause Problems If Parallel APPN/Subarea Paths Or VRTGs Exist
    - "Subarea Only" Session (Like Bisynch) Forces Subarea Path
    - Target APPL's Owning CDRM Is Remembered By CMC/ICN
    - APPN Capable Sessions Now Use Subarea Path Too!
    - Prevents HPR From Being Used Whenever Possible
  - Consider SORDER=APPNFRST Strategy Instead (But **Be Careful!**)



Search Strategies - SORDER=APPNFRST

ADJSSCP Tables - Stage 1&2

```
ADJSSCP  VBUILD  TYPE=ADJSSCP
DEFAULT  NETWORK
CMC      ADJCDRM
BCMC     ADJCDRM
*
NETA     NETWORK NETID=NETA
CMC      ADJCDRM
BCMC     ADJCDRM
*
NETB     NETWORK NETID=NETB
LISTB    ADJLIST
GWB1     ADJCDRM
GWB2     ADJCDRM
*
NETC     NETWORK NETID=NETC
LISTC    ADJLIST
GWC1     ADJCDRM
```

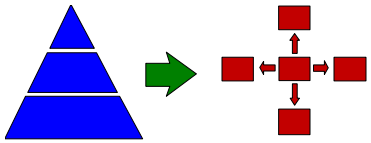
CDRSCs - Stage 1

```
CDRSC    VBUILD  TYPE=CDRSC
NETA     NETWORK NETID=NETA
TSOA1    CDRSC
TSOA2    CDRSC
CICSA1   CDRSC
CICSA2   CDRSC
*
NETB     NETWORK NETID=NETB
NETBGRP  GROUP ADJLIST=LISTB
TSOB1    CDRSC
CICSB1   CDRSC
*
NETC     NETWORK NETID=NETC
NETCGRP  GROUP ADJLIST=LISTC
TSOC1    CDRSC
CICSC1   CDRSC
```

CDRSCs - Stage 2

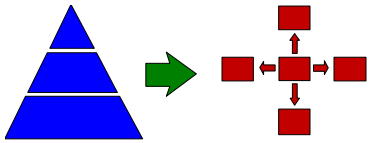
```
CDRSC    VBUILD  TYPE=CDRSC
NETA     NETWORK NETID=NETA
TSOA1    CDRSC
TSOA2    CDRSC
CICSA1   CDRSC
CICSA2   CDRSC
*
NETB     NETWORK NETID=NETB
NETBGRP  GROUP ADJLIST=LISTB
TSOB1    CDRSC
CICSB1   CDRSC
*
NETC     NETWORK NETID=NETC
TSOC1    CDRSC
CICSC1   CDRSC
```

- Assumes Predefined CDRSCs For ALL "Subarea" Resources
  - ISTAPNCP Added To The Top Of Every ADJSSCP Table
    - Forces APPN Search/Session Path To Be Used Whenever Possible
    - Even When Prior Search For Same Target Went Through Subarea



Search Strategies - SORDER=APPNFRST

- NOTE: APPN Is Searched First For Cross-Net Resources Too!
  - Not Just The First Time...EVERY TIME!
  - Even If SSCPORD=PRIORITY Is Specified!
- CDRSC With ADJLIST Is The Only Override For APPNFRST
  - Requires Predefined CDRSCs For **ALL** "Subarea" Resources
    - Many Customers Already Do This (To Predefine NETID Of CDRSCs, So That Correct ADJSSCP Table Is Used)
- Easy To Make Necessary Changes, If CDRSCs Already Exist
  - Change Cross-Network ADJSSCP Tables To ADJLISTs
    - May Require Both, If Some Subarea CDRSCs Are Created Dynamically
  - Add ADJLIST= To Cross-Network CDRSCs
    - ADJLIST= On GROUP Statement In CDRSC Major Node Makes This Easy!
- Use With SSEARCH=APPNFRST For Maximum Benefit



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Search Strategies - SORDER On ADJSSCP Tables

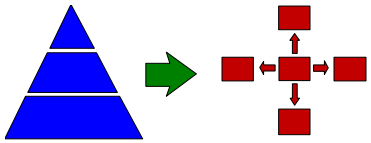
ADJSSCP Tables - Stage 1

```
ADJSSCP  VBUILD  TYPE=ADJSSCP
DEFAULT  NETWORK SORDER=APPNFRST
CMC      ADJCDRM
BCMC     ADJCDRM
GWB1     ADJCDRM
GWB2     ADJCDRM
GWC1     ADJCDRM
NETA     NETWORK NETID=NETA,SORDER=APPNFRST
CMC      ADJCDRM
BCMC     ADJCDRM
NETB     NETWORK NETID=NETB,SORDER=ADJSSCP
GWB1     ADJCDRM
GWB2     ADJCDRM
NETC     NETWORK NETID=NETC,SORDER=ADJSSCP
GWC1     ADJCDRM
```

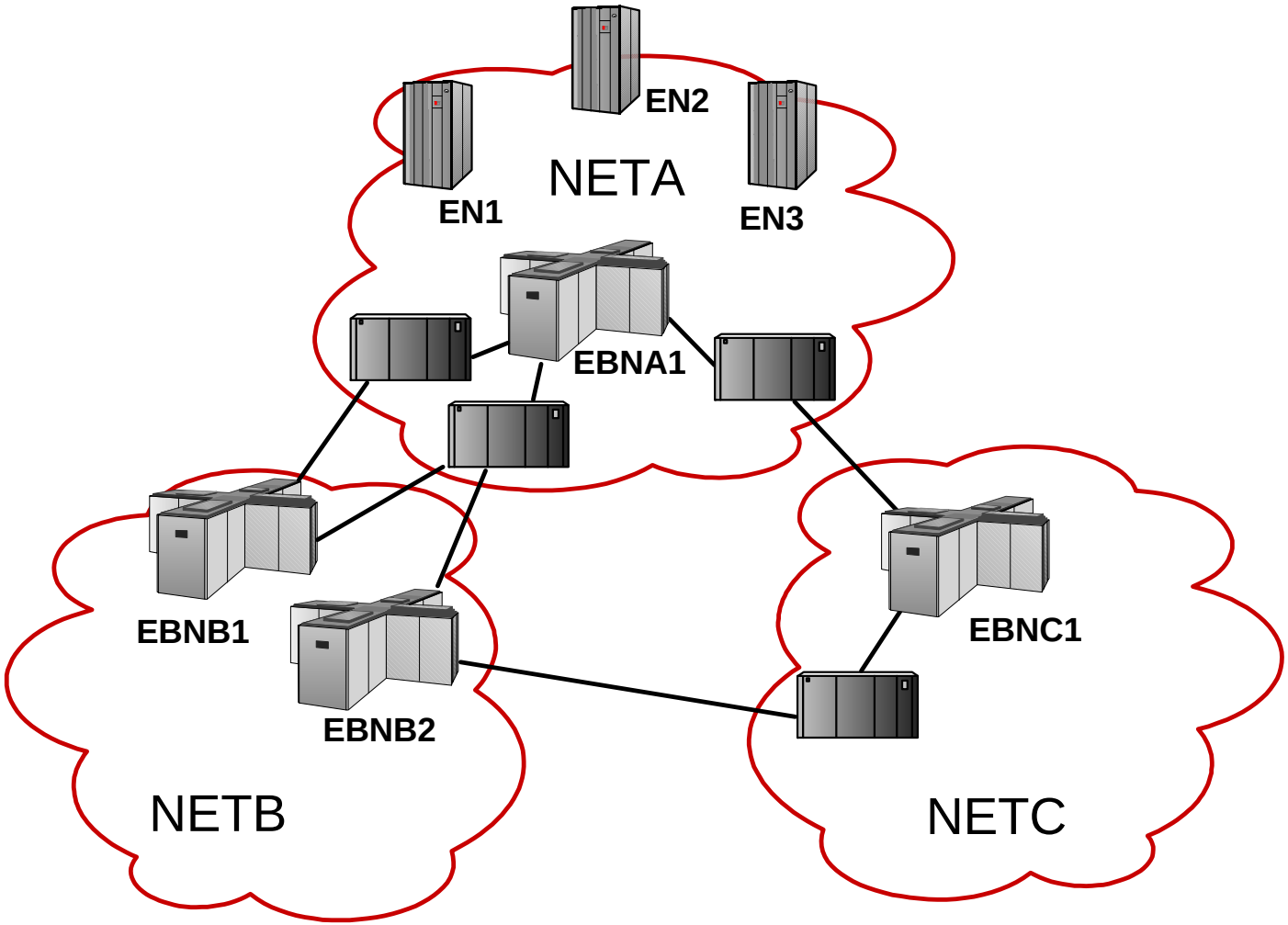
ADJSSCP Tables - Stage 2

```
ADJSSCP  VBUILD  TYPE=ADJSSCP
DEFAULT  NETWORK SORDER=APPNFRST
CMC      ADJCDRM
BCMC     ADJCDRM
GWB1     ADJCDRM
GWB2     ADJCDRM
GWC1     ADJCDRM
NETA     NETWORK NETID=NETA,SORDER=APPNFRST
CMC      ADJCDRM
BCMC     ADJCDRM
NETB     NETWORK NETID=NETB,SORDER=ADJSSCP
GWB1     ADJCDRM
GWB2     ADJCDRM
NETC     NETWORK NETID=NETC,SORDER=APPNFRST
GWC1     ADJCDRM
```

- Allows A Different SORDER Value For Each ADJSSCP Table!
  - Code SORDER On NETWORK And/Or CDRM Statements
    - SORDER=STARTOPT Is Default For NETWORK Statements
    - SORDER On NETWORK Sifts Down To Subordinate CDRM Tables
    - SORDER=STARTOPT On CDRM Overrides NETWORK Value With Default
  - SORDER Is Not Allowed On ADJLISTs (WYSIWYG)
  - If SORDER=STARTOPT, MODIFY VTAMOPTS,SORDER= Has Immediate Affect

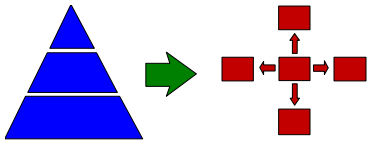


Border Node Searching - ADJCLUST Tables



Border Node Searching - ADJCLUST Tables

```
************************************************
*     Default ADJCLUST Table                   *
************************************************
DEFAULT  VBUILD TYPE=ADJCLUST
         NETWORK
EBNA1    NEXTCP CPNAME=NETA.EBNA1,SNVC=1
EBNB1    NEXTCP CPNAME=NETB.EBNB1,SNVC=3
EBNB2    NEXTCP CPNAME=NETB.EBNB2,SNVC=3
EBNC1    NEXTCP CPNAME=NETC.EBNC1,SNVC=3
************************************************
*     NETA ADJCLUST Tables                     *
************************************************
         NETWORK NETID=NETA
EBNA1    NEXTCP CPNAME=NETA.EBNA1,SNVC=1
************************************************
*     NETB ADJCLUST Tables                     *
************************************************
         NETWORK NETID=NETB,SNVC=2
EBNB1    NEXTCP CPNAME=NETB.EBNB1
EBNB2    NEXTCP CPNAME=NETB.EBNB2
EBNC1    NEXTCP CPNAME=NETC.EBNC1,SNVC=3
************************************************
*     NETC ADJCLUST Tables                     *
************************************************
         NETWORK NETID=NETC,SNVC=3
EBNC1    NEXTCP CPNAME=NETB.EBNC1,SNVC=2
EBNB1    NEXTCP CPNAME=NETB.EBNB1
EBNB2    NEXTCP CPNAME=NETC.EBNB2
```

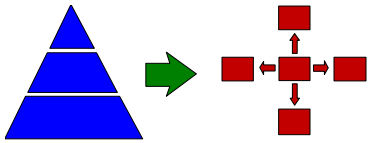


IBM

Debug Aids: DISPLAY ADJSSCPS,CDRSC=

```
d net,adjsscps
 IST097I DISPLAY ACCEPTED
 IST350I DISPLAY TYPE = ADJACENT SSCP TABLE
 IST623I DYNAMIC ADJACENT SSCP TABLE
 IST1705I SORDER = APPN FROM START OPTION
 IST624I   SSCP2A
 IST1454I 1 RESOURCE(S) DISPLAYED
 IST314I END

d net,adjsscps,cdrsc=applaa1
 IST097I DISPLAY ACCEPTED
 IST350I DISPLAY TYPE = ADJACENT SSCP TABLE
 IST611I ADJACENT SSCP TABLE FOR APPLAA1 IN NETA
 IST1705I SORDER = APPN FROM START OPTION
 IST1220I  SSCPNAME NETID    CURRENT STATE  ROUTING STATUS
 IST624I   SSCPAA   NETA     NEVAC          ***NA**
 IST624I   ISTAPNCP NETA     ACTIV          ***NA**
 IST624I   SSCP2A   NETA     ACTIV          ***NA**
 IST1454I 3 RESOURCE(S) DISPLAYED
 IST314I END
```

- **DISPLAY ADJSSCPS,CDRSC=resource**
  - Displays ADJSSCP Table For **This CDRSC!!**
    - Takes Into Account Start Option Values And Learned Information
  - Use To Determine Which Other CDRMs Will Be Searched And In What Order
    - For The Next Search (May Not Be The Same As The Previous Search)
    - Use At Those Other CDRMs Too!
  - What If CDRSC Does Not Exist?
    - Use MODIFY ALSLIST,...,ACTION=CREATE



IBM

Debug Aids: xSIRFMSG= Start Options

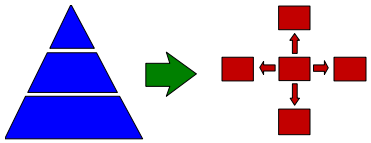
At SSCP2A:

```
IST663I CDINIT REQUEST FROM SSCP1A FAILED, SENSE=087D0001
IST664I REAL  OLU=NETA.APPL1          REAL  DLU=NETA.APPLAA1
IST889I SID = EAABEEC3071AFDDD
IST1705I SORDER = APPN FROM START OPTION
IST894I ADJSSCPS TRIED  FAILURE SENSE   ADJSSCPS TRIED  FAILURE SENSE
IST895I    SSCPAA          08420000        ISTAPNCP        087F0005
IST895I    SSCP1A          08260000
IST314I END
```

At SSCP1A:

```
IST663I INIT OTHER REQUEST FAILED, SENSE=087D0001
IST664I REAL  OLU=NETA.APPL1          REAL  DLU=NETA.APPLAA1
IST889I SID = EAABEEC3071AFDDD
IST1705I SORDER = ADJSSCP FROM START OPTION
IST894I ADJSSCPS TRIED  FAILURE SENSE   ADJSSCPS TRIED  FAILURE SENSE
IST895I    SSCPAA          08420000        SSCP2A          087D0001
IST314I END

d net,adjsscps,cdrsc=applaa1
IST097I DISPLAY ACCEPTED
IST350I DISPLAY TYPE = ADJACENT SSCP TABLE
IST611I ADJACENT SSCP TABLE FOR APPLAA1 IN NETA
IST1705I SORDER = ADJSSCP FROM START OPTION
IST1220I  SSCPNAME NETID    CURRENT STATE  ROUTING STATUS
IST624I   SSCPAA   NETA     NEVAC          ***NA**
IST624I   SSCP2A   NETA     ACTIV          ***NA**
IST1454I 2 RESOURCE(S) DISPLAYED
IST314I END
```

- **xSIRFMSG=OLUSSCP | ALLSSCP | NONE**
  - SIRFMSG=ALLSSCP
    - Displays Initiation Failure Messages At All SSCPs
    - Verifies Which VTAMs Are Receiving The Search
  - FSIRFMSG=ALLSSCP
    - Includes ADJSSCPs Attempted And Sense Codes
    - Displays Result Of Each Attempt To Reroute Search
  - Modifyable Using MODIFY VTAMOPTS Command

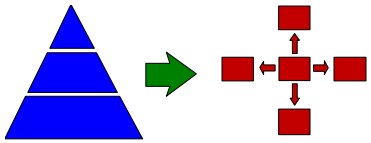


IBM

Debug Aids: DISPLAY SRCHINFO

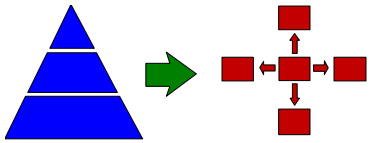
```
D NET,SRCHINFO,LIST=SUMMARY
IST097I DISPLAY ACCEPTED
IST350I DISPLAY TYPE = SRCHINFO
IST1520I SUBAREA SEARCH INFORMATION:
IST1521I   TOSSCP   NAME   CDINIT    DSRLST    IOCD   INITOT     TOTAL
IST1522I   SSCP1A                0         1       0        2         3
IST1525I   TOTAL NUMBER OF OUTSTANDING SEARCHES =          3
IST1454I 1 SSCP NAME(S) DISPLAYED
IST924I -------------------------------------------------------------
IST1526I APPN SEARCH INFORMATION:
IST1527I   TOCP   NAME       TYPE  STATUS   BROADCAST DIRECTED   TOTAL
IST1528I   NETA.SSCPAA        NN    OPEN            2        1       3
IST1525I   TOTAL NUMBER OF OUTSTANDING SEARCHES =          3
IST1454I 1 CP NAME(S) DISPLAYED
IST314I END

D NET,SRCHINFO,LIST=ALL
IST097I DISPLAY ACCEPTED
IST350I DISPLAY TYPE = SRCHINFO
IST1520I SUBAREA SEARCH INFORMATION:
IST1523I       OLU              DLU              SID       RU
IST1524I   NETA.APPL1        NETA.SSCP1A       ****NA****      DSRLST
IST1524I   NETA.APPL2        NETA.SSCP1A       ****NA****      INITOT
IST1524I   NETA.SSCP1A       NETA.SSCP1A       ****NA****      INITOT
IST1454I 3 PAIR(S) DISPLAYED
IST924I -------------------------------------------------------------
IST1526I APPN SEARCH INFORMATION:
IST1529I       OLU              DLU              SID       LOCATE
IST1530I   NETA.SSCP1A       NETA.SSCP2A       EAABEEC3C6093893     1
IST1530I   NETB.SSCP7B       NETA.NETAPPL2     C2BB19BCF437741D     1
IST1530I   NETB.SSCP7B       NETA.NETAPPL1     C2BB19BCF437741C     1
IST1525I   TOTAL NUMBER OF OUTSTANDING SEARCHES =          3
IST1454I 3 PAIR(S) DISPLAYED
IST314I END
```

- **DISPLAY SRCHINFO** Command (V4R4; V4R3 Via APAR)
  - Displays All Outstanding APPN And Subarea Searches
    - CDINITs, DSRLSTs, IOCDs, APPN Locates
  - Not All Can Be Terminated By Operator Command
    - For Example: DSRLSTs, IOCDs, Some APPN Locates



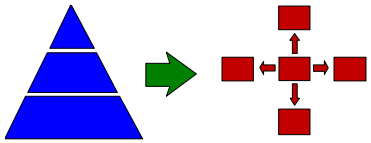
Debug Aids: DISPLAY SRCHINFO,SID=

```
D NET,SRCHINFO,SID=EAABEEC3C6093891
IST097I DISPLAY ACCEPTED
IST350I DISPLAY TYPE = SRCHINFO
IST1520I SUBAREA SEARCH INFORMATION:
IST1531I   SID = EAABEEC3C6093891         CP(OLU) = SSCP1A
IST1532I   OLU = NETA.APPL1               DLU = NETA.NETAPPL1
IST1540I   SEARCH STATUS = PDSRLST        SSCP(OLU) = SSCP1A
IST1539I   PCID MODIFIER = 00000000000000000000
IST1534I   SSCP/CP IN OLU DIRECTION = NETA.SSCP1A
IST1533I   SEARCH CONCENTRATED = NO       RDS = NO
IST1705I SORDER = APPN FROM START OPTION
IST894I ADJSSCPS TRIED  FAILURE SENSE   ADJSSCPS TRIED  FAILURE SENSE
IST895I    SSCP2A          08420000
IST1454I 1 ADJSSCP(S) DISPLAYED
IST1537I   AWAITING REPLY FROM THE FOLLOWING NODE(S):
IST1538I      NETA.ISTAPNCP
IST924I -------------------------------------------------------------
IST1526I APPN SEARCH INFORMATION:
IST1531I   SID = EAABEEC3C6093891         CP(OLU) = NETA.SSCP1A
IST1532I   OLU = NETA.APPL1               DLU = NETA.NETAPPL1
IST1539I   PCID MODIFIER = 10000000000000000000
IST1545I   NODE ROLE VECTOR = X'A000'
IST1541I   LOCATES PENDING =          0   CURRENT TASK = X'0B'
IST1533I   SEARCH CONCENTRATED = YES      RDS = NO
IST1534I   SSCP/CP IN OLU DIRECTION = NETA.SSCP1A
IST1535I   REPLY RETURNED TO ORIGINATING CP = NO
IST1536I   CONCENTRATED BEHIND C2BB19BCF437741C 22100000000000000000
IST924I -------------------------------------------------------------
IST1531I   SID = C2BB19BCF437741C         CP(OLU) = NETB.SSCP7B
IST1532I   OLU = NETB.SSCP7B              DLU = NETA.NETAPPL1
IST1539I   PCID MODIFIER = 22100000000000000000
IST1545I   NODE ROLE VECTOR = X'2000'
IST1541I   LOCATES PENDING =          1   CURRENT TASK = X'17'
IST1533I   SEARCH CONCENTRATED = NO       RDS = YES
IST1548I   BROADCAST = YES                DIRECTED = NO
IST1534I   SSCP/CP IN OLU DIRECTION = NETB.SSCP7B
IST1535I   REPLY RETURNED TO ORIGINATING CP = NO
IST1537I   AWAITING REPLY FROM THE FOLLOWING NODE(S):
IST1538I      NETA.SSCPAA
IST1543I   REQUESTS CONCENTRATED BEHIND THIS SEARCH =     1
IST314I END
```



Common Problems - Too Much Searching!

- DIALRTRY Start Option (V4R4.1; V4R4 APAR OW29720)
  - If DIALOUT Failure Occurs For Target Resource:
    - Searching Continues To Find Other Instances That May Already Be ACTIVE
  - If Switched LUs Are NOT Defined On Multiple Nodes:
    - Search Rerouting After DIALOUT Failure Is Unnecessary Overhead
  - DIALRTRY=NO Prevents Rerouting Searches After DIALOUT Failure
  - DIALRTRY=YES Is Default Value (For Migration), But Worst Performer!
- Directory Services Management Exit (DSME)
  - Can Be Used To Control APPN Searching (Authorization, Search Steps)
  - More Flexibility Provided By APAR OW34778 (DSME Return Code 36)
    - 'Search Task List' Provided To DMSE Routine On Initial Authorization
    - Indicates Which Search Steps Directory Services Will Perform
    - RC = 36 From DSME Means 'Search Task List' Was Modified
    - Allows DSME To Prevent Specific Search Steps (e.g., Domain Broadcast)
  - NOT RECOMMENDED! Use At Your Own Risk!



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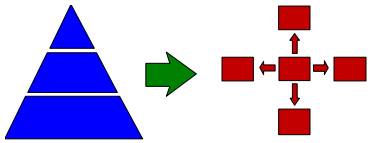
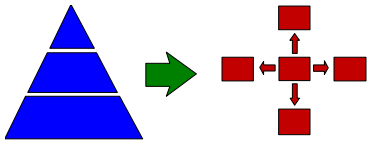
Common Problems - Too Much Searching!

- DUPDEFS Start Option (V4R4.1)
  - If Target Resource Is Found But Is Not Active:
    - Searching Continues To Find A Duplicate ACTIVE Instance
  - If Duplicate APPLs Or LUs Are NOT Defined On Multiple Nodes:
    - Additional Searching Is Unnecessary Overhead
  - MODIFYing DUPDEFS= Can Help!
    - DUPDEFS=APPL - Only Duplicate APPLs Are Defined On Multiple Nodes
    - DUPDEFS=DEPLU - Only Duplicate LUs Are Defined On Multiple Nodes
    - DUPDEFS=NONE - Neither APPLs Nor LUs Are Defined On Multiple Nodes
    - DUPDEFS=ALL - Default Value (For Migration), But Worst Performer!
- SRCHRED (Search Reduction) Start Options
  - Suppresses Subsequent Searches For "Not Found" Resources
    - Includes "Temporarily Not Found" Resources
  - SRCOUNT- Search Reduction Counter (Suppress This Many Searches)
  - SRTIMER - Search Reduction Timer (Suppress Searches For This Long)

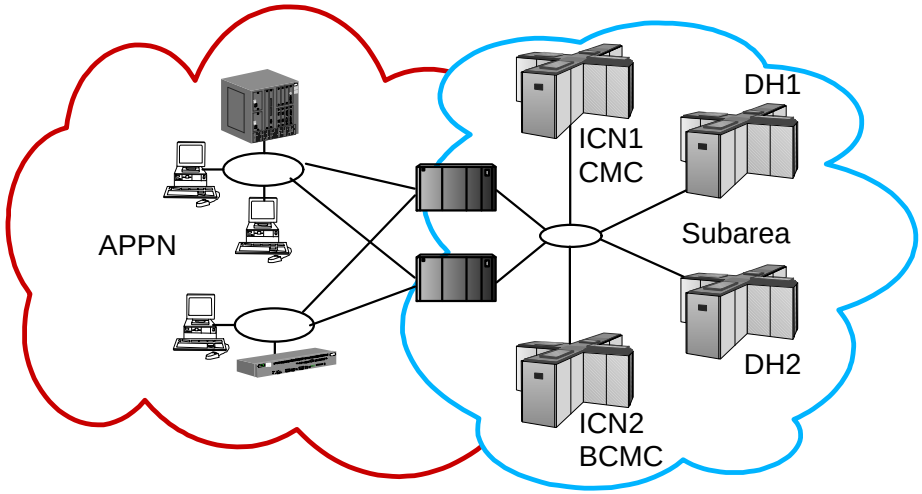


Common Problems - Unsupported Functions

- Bisynchronous 3270 Sessions Not Supported By APPN
  - Use 2218 To Convert Bisynch Devices To "Switched SNA", Or
  - Use "Relay Session Manager" On Owning VTAM
  - Use Virtual Route TGs (VRTGs)
    - APPN And Subarea Paths Both Exist (Over Same Links)
- Unextended BINDs Are Not Supported By APPN
  - NCP NRF, Tandem And Unisys All Have Primary LUs That Only Send Unextended BINDs
  - VTAM/NCP Solution Is Now Available!
    - Unextended BINDs Are Extended At APPN Boundary
    - VTAM APAR: OW32193
    - NCP APARs: IR37623 And IR38861
  - NCP APARs Should Be Applied First Or Session Failures May Result!



Common Problems - Bug Fixes



- Same-Net Reroute When CMCs/ICNs Are APPN Enabled
  - DH1 Searches ICN1; ICN1 Searches APPN; ICN2 Searches DH2
    - Causes Longer Session Path (Subarea-APPN-Subarea)
  - APAR OW29171 Fixes The Problem
    - Use DISJOINT=YES On Adjacent CDRMs To Enable Longer Session Paths
- SSEARCH=APPNFRST Specified On EN Or MDH
  - Prevents Subarea-Side Resources From Being Found!!
  - APAR OW31458 (Or Do Not Specify SSEARCH On ENs/MDHs!)