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Using NetView for z/OS for Enterprise-Wide Event Management and Automation

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IBM Advanced Technical Skills

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ABSTRACT

IBM Tivoli NetView for z/OS is more just than an SNA or TCP/IP network management tool. It integrates with a variety of event sources and event managers to support event consolidation and automation across the System z and distributed environment. This session will show how NetView on z/OS can exchange information, automate, and correlate events and information from sources such as:

- DB2 and other relational databases
- Event managers such as Netcool/OMNIbus
- J2EE applications
- SNMP traps
- Web services

Examples of integrating NetView with these sources, as well as general considerations for enterprise event management integration, will also be provided.

.

Agenda

- Tivoli NetView for z/OS Automation Overview
- Integration Interfaces
- Integration Examples
  - Native
  - Product
- General Event Management Integration Considerations

"Explore the Possibilities"

Why Does Event Integration/Automation Matter?

- Events indicate changes in the environment that might impact service delivery
- Technologies are creating events from more sources
  - From a “nice to have” to a “critical requirement”
  - From both infrastructure and business event sources
- Modern applications span technologies
  - No single resource can give a true picture of overall application status
  - Events must be gathered (and sometimes correlated) across multiple technologies
- Automation is necessary to support efficient management
  - Process efficiency
  - IT Service Management **Visualization, Control, and Automation**

NetView Perception vs. NetView Reality

"It is only a SNA Network Management product"

- ➔It is that and much more
- ➔Provides extensive system automation and TCP/IP management functions

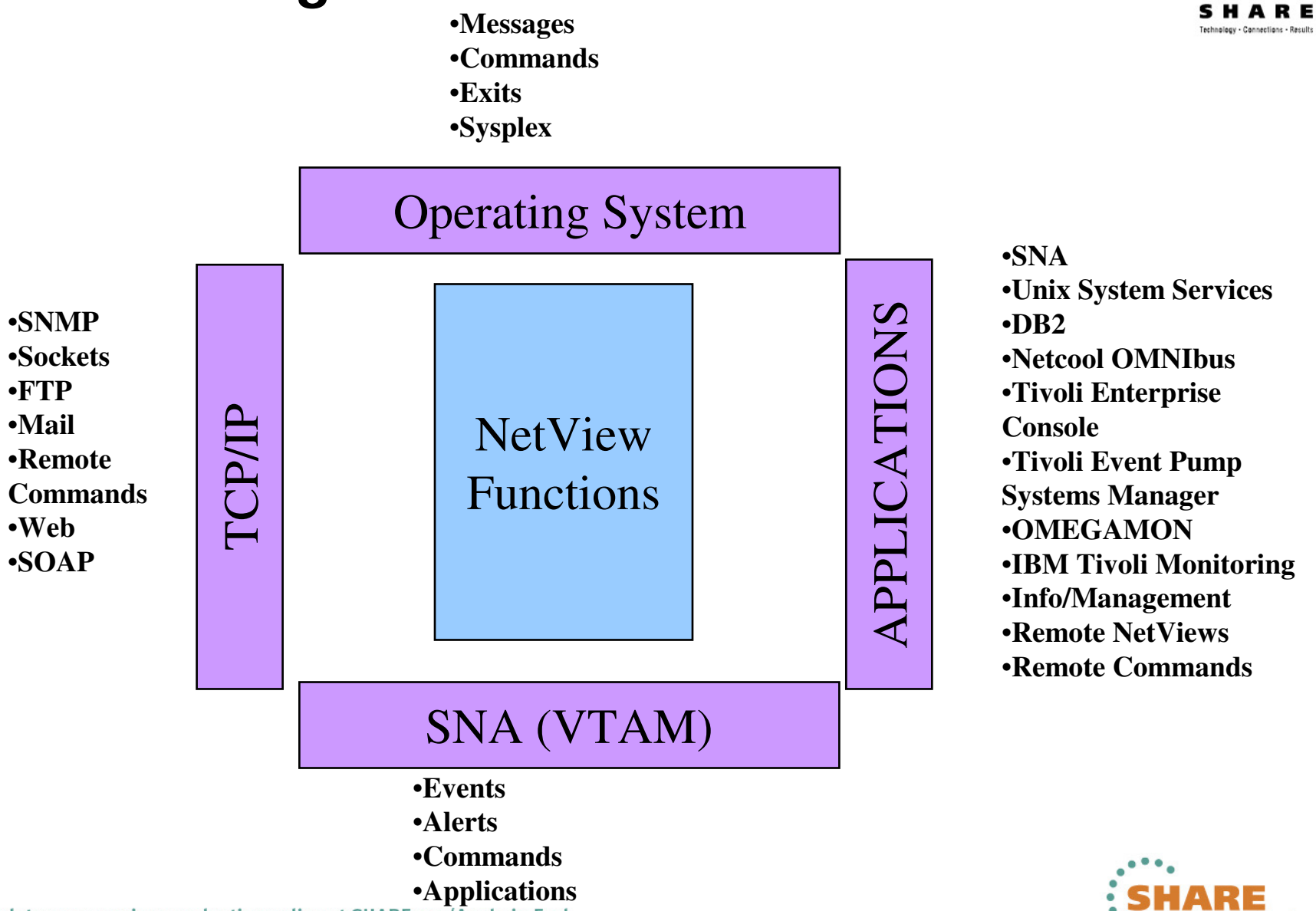
"It takes a lot of overhead"

- ➔Anything takes overhead… if it is not tuned
- ➔Filter out events and turn off interfaces not needed
- ➔Spread the functions across multiple address spaces
- ➔Prioritize tasks within NetView manually or using WLM
- ➔**Use the NetView Tuning Guide – it contains a wealth of information**

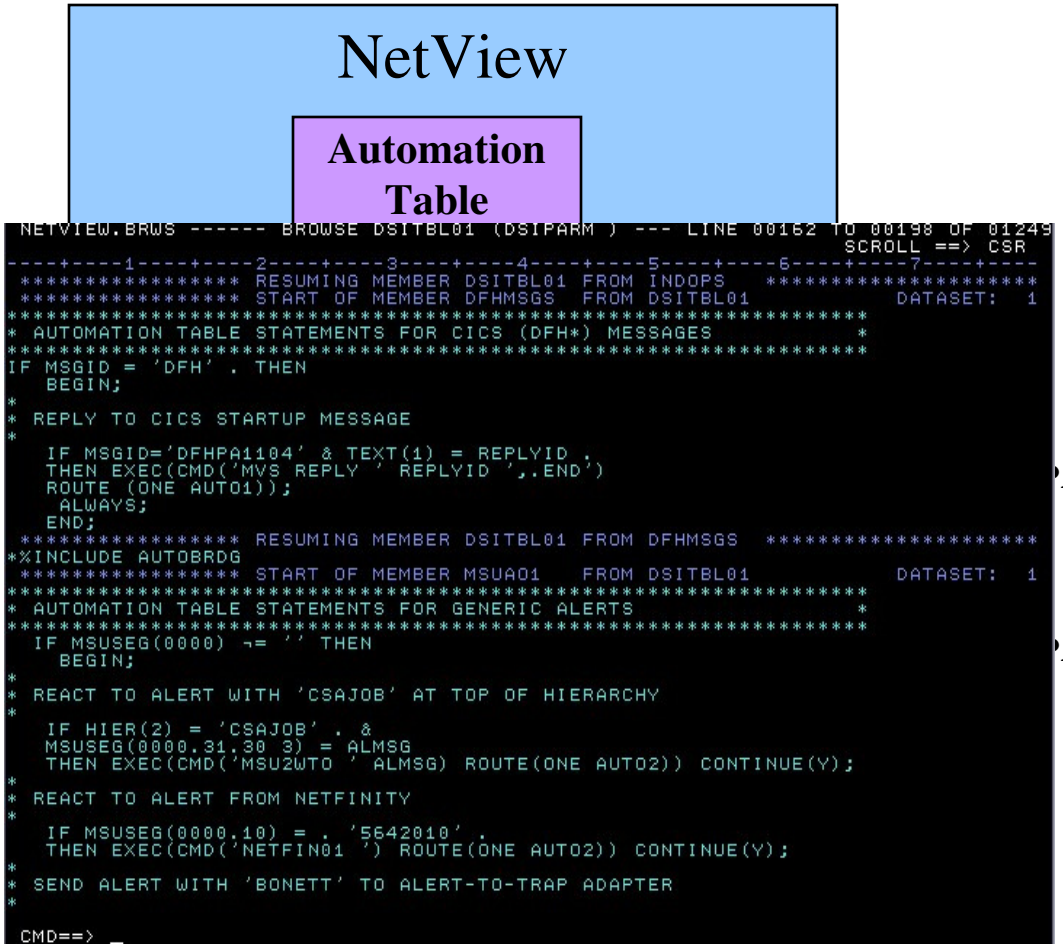
"It does not integrate with with other technologies"

- ➔Direct integration with TCP/IP applications
- ➔Provides web and web services access
- ➔Programmable in various languages
- ➔Access to DB2, Unix System Services, TSO, and cross-platform environments

NetView Integration Interfaces



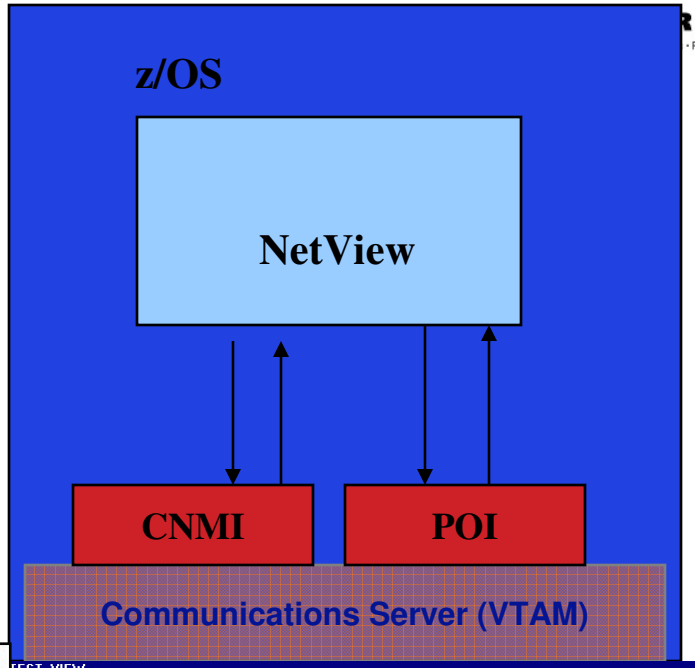
NetView Automation



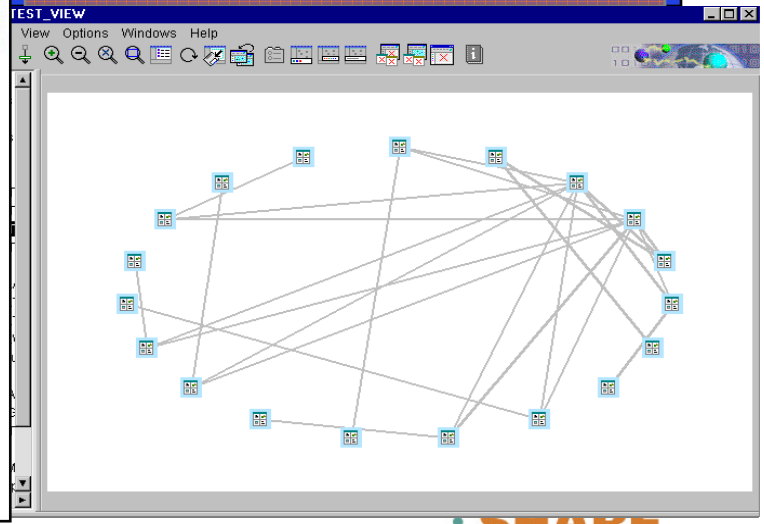
- Automation actions can be are triggered by:
  - Message contents
  - SNA Message Service Unit (MSU) Contents
  - SNMP Traps
  - UNIX syslog protocol (RFC 5424)
  - Event Integration Facility (EIF) events
  - Time (specific or interval)
- Additional data obtained from
  - Event contents
  - NetView Global Variables
- Actions invoked include
  - Commands (NetView, VTAM, z/OS, custom)
  - CLIST and REXX procedures
  - Correlation
  - Activating/deactivating automation

SNA Automation Interface

- SNA Management Service Units (MSUs) captured from VTAM
  - Alerts are the most common ones captured
  - Automation can be driven based on MSU content
- Programmatic access to 3270 screen applications

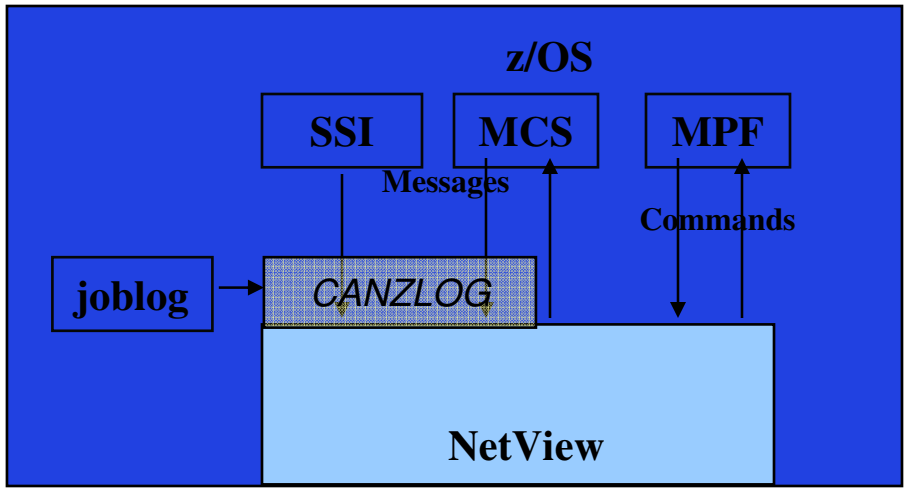



```
*********************************************************************
* AUTOMATION TABLE STATEMENTS FOR GENERIC ALERTS                    *
*********************************************************************
  IF MSUSEG(0000) ¬= '' THEN
    BEGIN;
*
* REACT TO ALERT WITH 'CSAJOB' AT TOP OF HIERARCHY
*
   IF HIER(2) = 'CSAJOB' . &
   MSUSEG(0000.31.30 3) = ALMSG
   THEN EXEC(CMD('MSU2WTO ' ALMSG) ROUTE(ONE AUTO2)) CONTINUE(Y);
*
* REACT TO ALERT FROM NETFINITY
*
   IF MSUSEG(0000.10) = . '5642010' .
   THEN EXEC(CMD('NETFIN01 ') ROUTE(ONE AUTO2)) CONTINUE(Y);
*
* SEND ALERT WITH 'BONETT' TO ALERT-TO-TRAP ADAPTER
*
   IF MSUSEG(0000.10) = . '5699001' .
   THEN EXEC(CMD('TECROUTE PIPE SAFE * | PPI (TRAPROUT) NYC4TEC')
         ROUTE(ONE AUTO1))  CONTINUE(Y);
*
```



Operating System Automation Interface

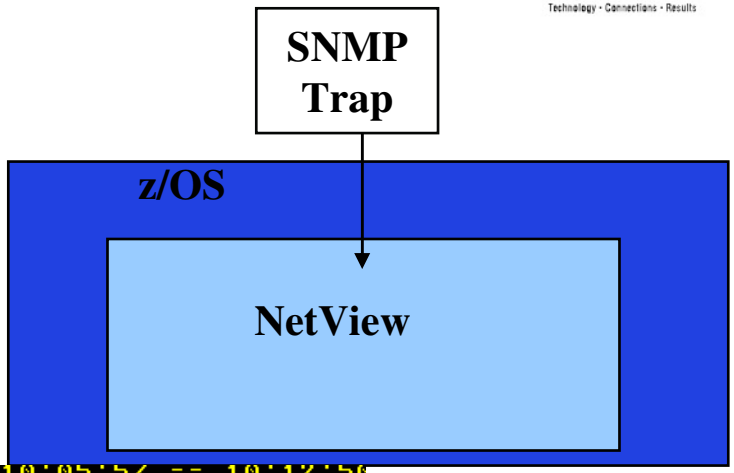
- Connection into z/OS to capture events and issue commands and messages
  - NetView V6R1 – CANZLOG consolidates Subsystem interface (SSI), Multiple Console Support (MCS) and JES2 joblog messages for automation
  - Message Processing Facility (MPF) command exit for commands
- Detects console and joblog messages from all OS components and subsystems
- Message Revision Table (MRT) and Command Revision table (CRT) for actions before message automation and issuing commands
- Invokes automated actions




```
IF MSGID = 'IEF' . THEN
   BEGIN;
*
* IEF404I , IEF450I FOR OFFLOADING SYSLOG DATASET
*
IF MSGID = 'IEF404I' & ( TOKEN(2) = 'JWTR')
   THEN EXEC(CMD('MWBSYSL1 ') ROUTE(ONE AUTO3));
*
IF MSGID = 'IEF450I' & ( TOKEN(2) = 'JWTR')
   THEN EXEC(CMD('MWBSYSL1 ') ROUTE(ONE AUTO3));
*
* IEF176I JWTR JOB FINISHED - CANCEL IT
*
IF MSGID = 'IEF176I' & TOKEN(3) = WTRID
   THEN EXEC(CMD('MVS P ' WTRID) ROUTE (ONE AUTO2 AUTO3));
*
   END;
*************************************************************
**
```

SNMP Trap Interface

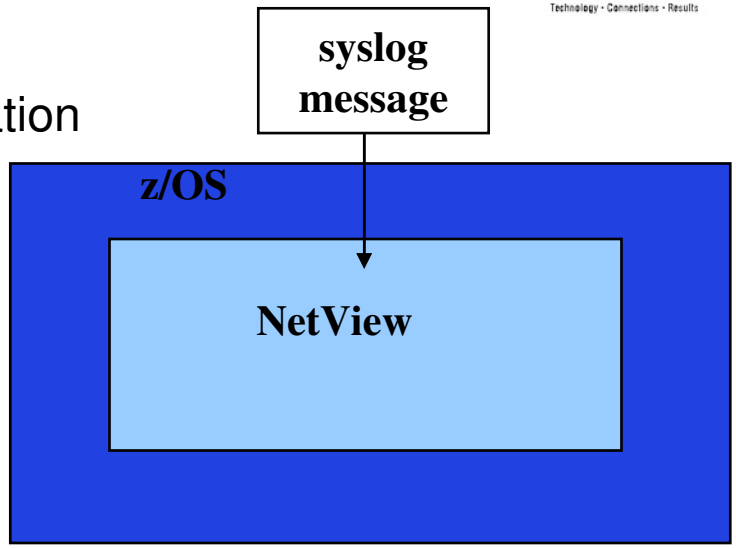
- Task that receives SNMP traps and converts to an SNMP CP-MSU for automation
- Supports SNMP v1, v2, v2c, and v3
- Supports TCP and UDP across IPV4 and IPV6
- Multiple tasks can run concurrently
- Defined via CNMSTYLE COMMON.CNMTRAP and TASK statements




```
canzlog   TAG=(NVMSG,MVSMSG,DOM)                    07/28/12 10:05:57 -- 10:12:56
10:05:57 KLVFL003 ALL PENDING NAF RECORDS HAVE BEEN WRITTEN
10:06:47 Start of received data
10:06:47 30 4C 02 01 00 04 06 70   75 62 6C 69 63 A4 3F 06   .<......   ..%..u..
10:06:47 07 2B 06 01 04 01 96 26   40 04 09 50 15 1F 02 01   .......o.   ..&....
10:06:47 06 02 01 01 43 04 05 B1   39 9C 30 22 30 20 06 08   ........   ........
10:06:47 2B 06 01 04 01 96 26 01   04 14 54 65 73 74 20 74   .....o..   ........
10:06:47 72 61 70 20 66 72 6F 6D   20 48 35 37 35 39         ./....?_   ......
10:06:47 End of received data
10:06:47 Start of a complete PDU
10:06:47 30 4C 02 01 00 04 06 70   75 62 6C 69 63 A4 3F 06   .<......   ..%..u..
10:06:47 07 2B 06 01 04 01 96 26   40 04 09 50 15 1F 02 01   .......o.   ..&....
10:06:47 06 02 01 01 43 04 05 B1   39 9C 30 22 30 20 06 08   ........   ........
10:06:47 2B 06 01 04 01 96 26 01   04 14 54 65 73 74 20 74   .....o..   ........
10:06:47 72 61 70 20 66 72 6F 6D   20 48 35 37 35 39         ./....?_   ......
10:06:47 End of a complete PDU
10:06:47 Start of CP-MSU data
10:06:47 00 AC 12 12 00 22 FF F0   00 0E FF F1 F9 4B F8 F0   .......0   ...19.80
10:06:47 4B F2 F1 4B F3 F1 00 09   FF F2 F5 F7 F6 F2 F8 00   .21.31..   .257628.
10:06:47 07 FF F3 E4 C4 D7 00 86   FF A4 00 08 FF 00 00 00   ..3UDP.f   .u......
10:06:47 00 00 00 0A FF 01 70 75   62 6C 69 63 00 14 FF 02   ........   .%......
10:06:47 F1 4B F3 4B F6 4B F1 4B   F4 4B F1 4B F2 F8 F5 F4   1.3.6.1.   4.1.2854
10:06:47 00 0E FF 03 F9 4B F8 F0   4B F2 F1 4B F3 F1 00 08   ....9.80   .21.31..
10:06:47 FF 04 00 00 00 06 00 08   FF 05 00 00 00 01 00 08   ........   ........
10:06:47 FF 06 05 B1 39 9C 00 36   FF 11 00 16 FF 12 F1 4B   ........   ......1.
10:06:47 F3 4B F6 4B F1 4B F4 4B   F1 4B F2 F8 F5 F4 4B F1   3.6.1.4.   1.2854.1
10:06:47 00 1C FF 13 00 00 00 04   54 65 73 74 20 74 72 61   ........   ......./
10:06:47 70 20 66 72 6F 6D 20 48   35 37 35 39               ....?_..   ....
10:06:47 End of CP-MSU data
```

UNIX syslog Message Interface

- DSIIPLOG task receives syslog (RFC 5424) messages and converts to a message for automation
  - BNH703I (multiline) if host is registered
  - BNH710I if host is not registered
- REGIP command maintains host registration list
- Coexists with z/OS Comm Server syslog




```
TASK.DSIIPLOG.INIT=Y
IPLOG.TCPANAME = &CNMTCPN.
IPLOG.PORT     = 514
IPLOG.SOCKETS  = 100
```

```
linux117:~ # logger -p local4.info "important message regarding application running on Linux"
```

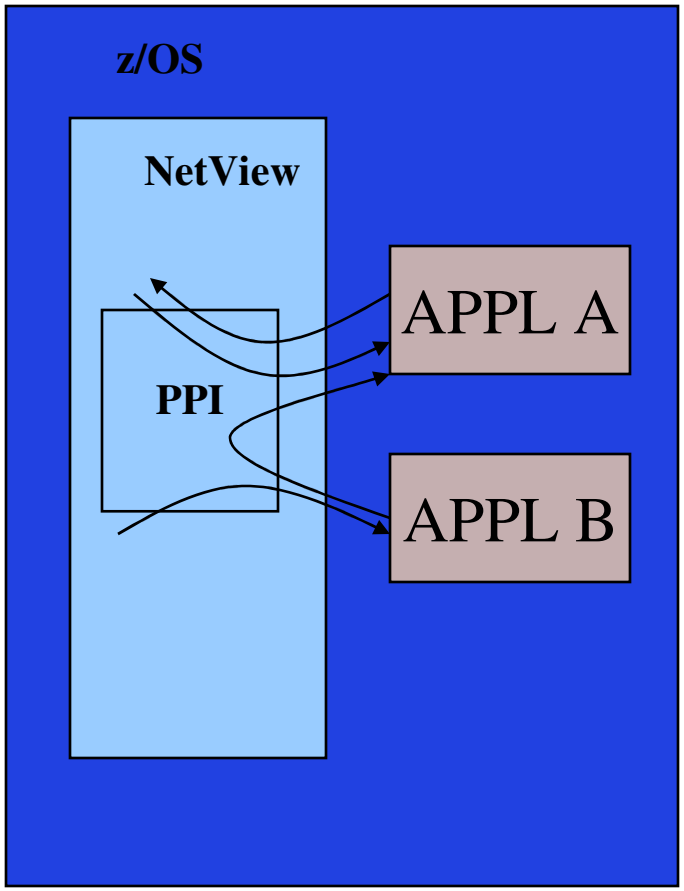
```
/etc/syslog.conf: local4,local5.*      @hasl125
```

```
BNH703I SYSLOGD MESSAGE RECEIVED. FACILITY= LOCAL4. PRIORITY= INFO. ORIGIN= 10.1.1.117
root: important message regarding application running on Linux*
```

*NetView can also send syslog messages using the **PIPE IPLOG** stage*

Program-to-Program Interface (PPI)

- Application Programming Interface (API) to integrate with applications running on same operating system image
  - Programmable in Assembler, PL/I, C, REXX
  - Applications register to be PPI receivers for exchanging information
    - Between NetView and other applications
    - Between 2 applications using NetView as the data transport



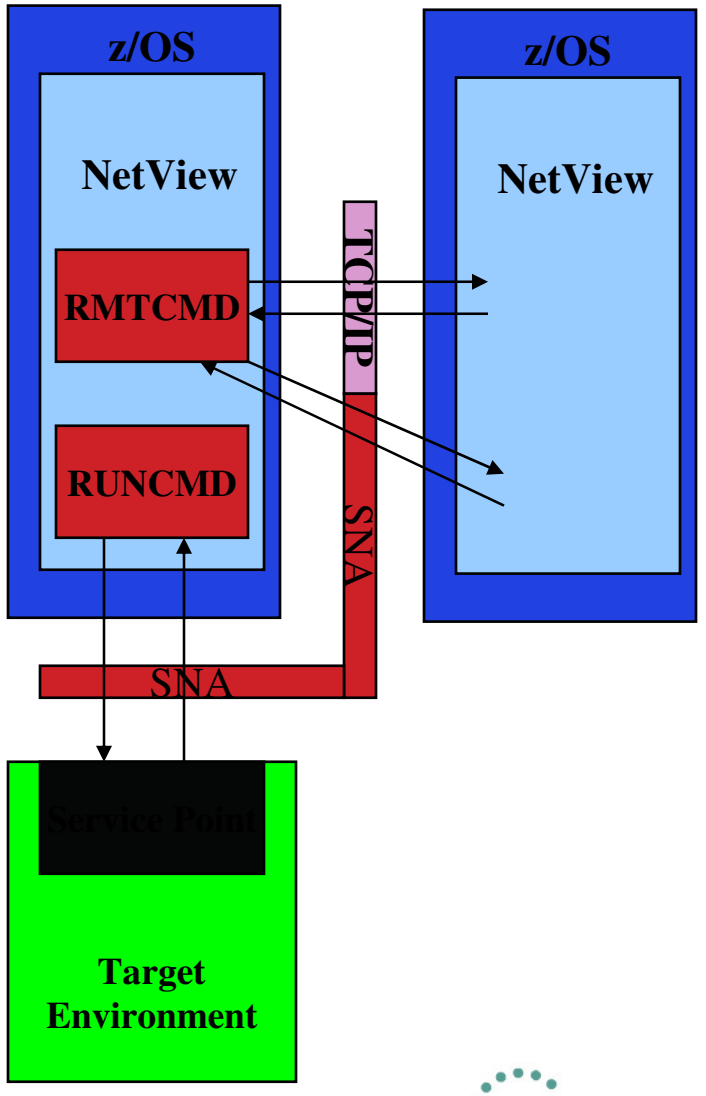
PPI - REXX Coding Example

- *DSIPHONE is a REXX external subroutine that enables you to send and receive data across the NetView PPI.*
- *This function enables any application (capable of running TSO REXX) to open, close, send data to, or receive data from a PPI receiver*

```
/*** START UP PPI RECEIVER ***/
x1=dsiphone('OPENRECV','MYPPI')
say "DSIPHONE OPEN CALL RC:" x1

/* SEND DATA TO REXX TSO COMMAND SERVER PPI (DSICMDSV) */
/* RQUEST CONTAINS DATA TO SEND */
x2=dsiphone('SEND','DSICMDSV','RQUEST','MYPPI')
say "SEND CALL RC:" x2

/* WAIT FOR RESULT TO BE RETURNED */
/* KEEP RECEIVING DATA UNTIL A X'37' IS RETURNED */
result. = ''
i=0
i_save = 0
do while result.i <> '37'X
   x3=dsiphone('RECEIVE','MYPPI','RESULT.', 'SENT_BY',30)
   end

/*** CLOSE THE PPI RECEIVER ***/
x4=dsiphone('CLOSE','MYPPI')
say "DSIPHONE CLOSE CALL RC:" x4
```

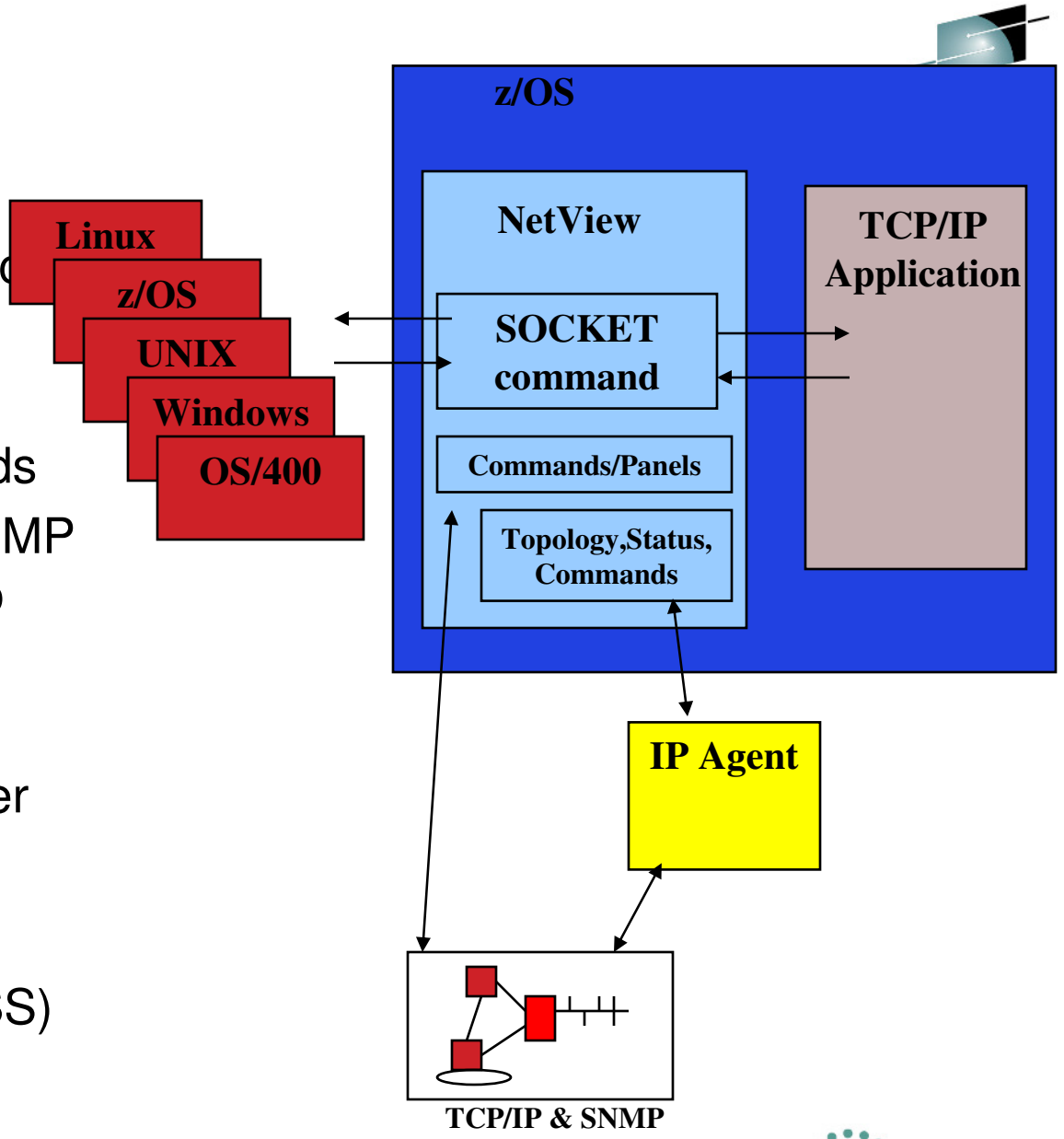
RMTCMD and RUNCMD

- **RMTCMD** sends a command to another NetView
  - Uses either SNA or IP transport
  - Recommended method of communication
  - Foundation for NetView Sysplex Management control
- **RUNCMD** sends a commands to another platform via SNA
  - Service Point application required to receive and execute command
- Both methods capture the command response
  - Can drive automated actions

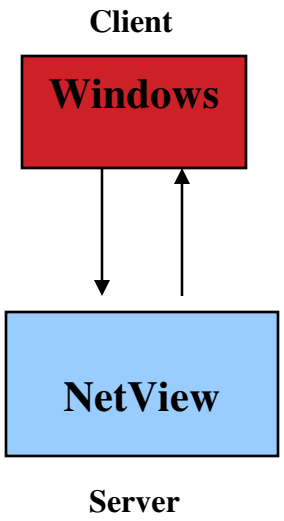


TCP/IP Services

- Socket applications
  - SOCKET command as c
    or server
- SNMP
  - Native SNMP commands
  - MIBs accessible via SNMP manager, 3270, or Web Interface
  - Generate SNMP traps
  - Act as a SNMP manager
- TCP/IP commands
  - Native
  - Indirect (via z/OS or USS)
- Packet traces



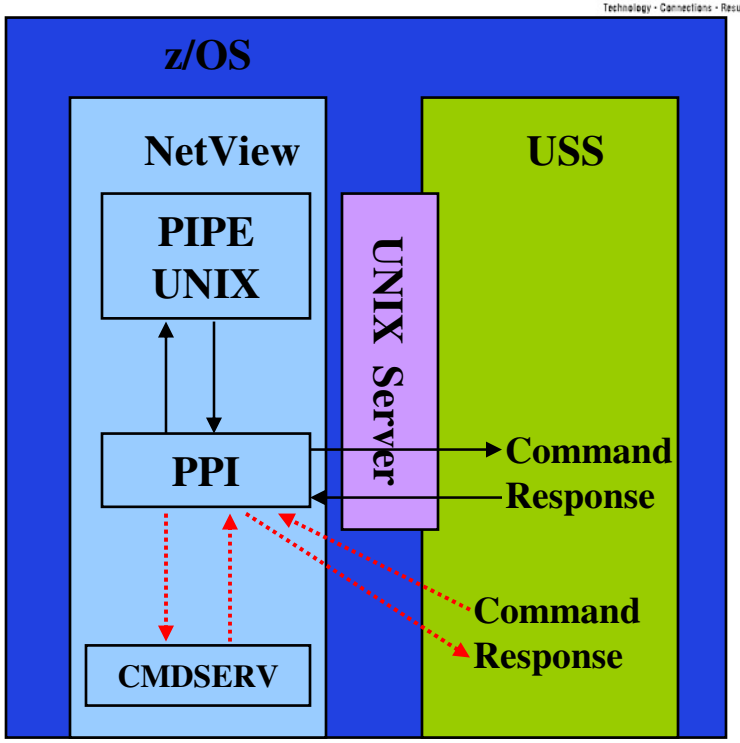
TCP/IP Services - Socket Server Example




```
2:56:21 * TESTSKSV 9999 1
2:56:21 - BNH623I SOCKET INTERFACE HAS ALREADY BEEN INITIALIZED ON TCP/IP TCPI
2:56:21 C INIT: 8
2:56:21 C SOCKET: 0 BNH606I SOCKET REQUEST COMPLETED SUCCESSFULLY.  SOCKET 3 H
2:56:21 C SOCKET ID 3
2:56:21 C BIND: 0 3 9.82.56.125 9999
2:56:21 - BNH614I BIND REQUEST ON SOCKET 3 COMPLETED SUCCESSFULLY
2:56:26 C LISTEN: 0
2:56:37 C ACCEPT RC: 0 LINES: 1
2:56:37 C j* BNH612I SOCKET 3 ACCEPTED CONNECTION FROM 9.54.139.58 PORT 1423.
2:56:37 C ===>INCOMING! 4  9.54.139.58   1423
2:56:37 C INSTRING: èÇÑË*Ï/Ë*ËÁ>È*ÃÊ?_*/*ÏÑ>À?ÏË*Ë?Ä,ÁÈ*Ä%ÑÁ>È
2:56:37 C EBSTRING 1: This was sent from a windows socket client
2:56:37 C SHUTDOWN CLIENT: 0
2:56:37 C CLOSE CLIENT: 0
2:57:04 C ACCEPT RC: 0 LINES: 1
2:57:04 C j* BNH612I SOCKET 3 ACCEPTED CONNECTION FROM 9.54.139.58 PORT 1424.
2:57:04 C ===>INCOMING! 4  9.54.139.58   1424
2:57:04 C INSTRING: ëçíèàÏ+
2:57:04 C EBSTRING 1: SHUTDOWN
2:57:04 C SHUTDOWN CLIENT: 0
2:57:04 C CLOSE CLIENT: 0
2:57:04 C ALL DONE!
2:57:04 C SHUTDOWN SERVER: 0
2:57:04 C CLOSE SERVER: 0
```

Unix System Services

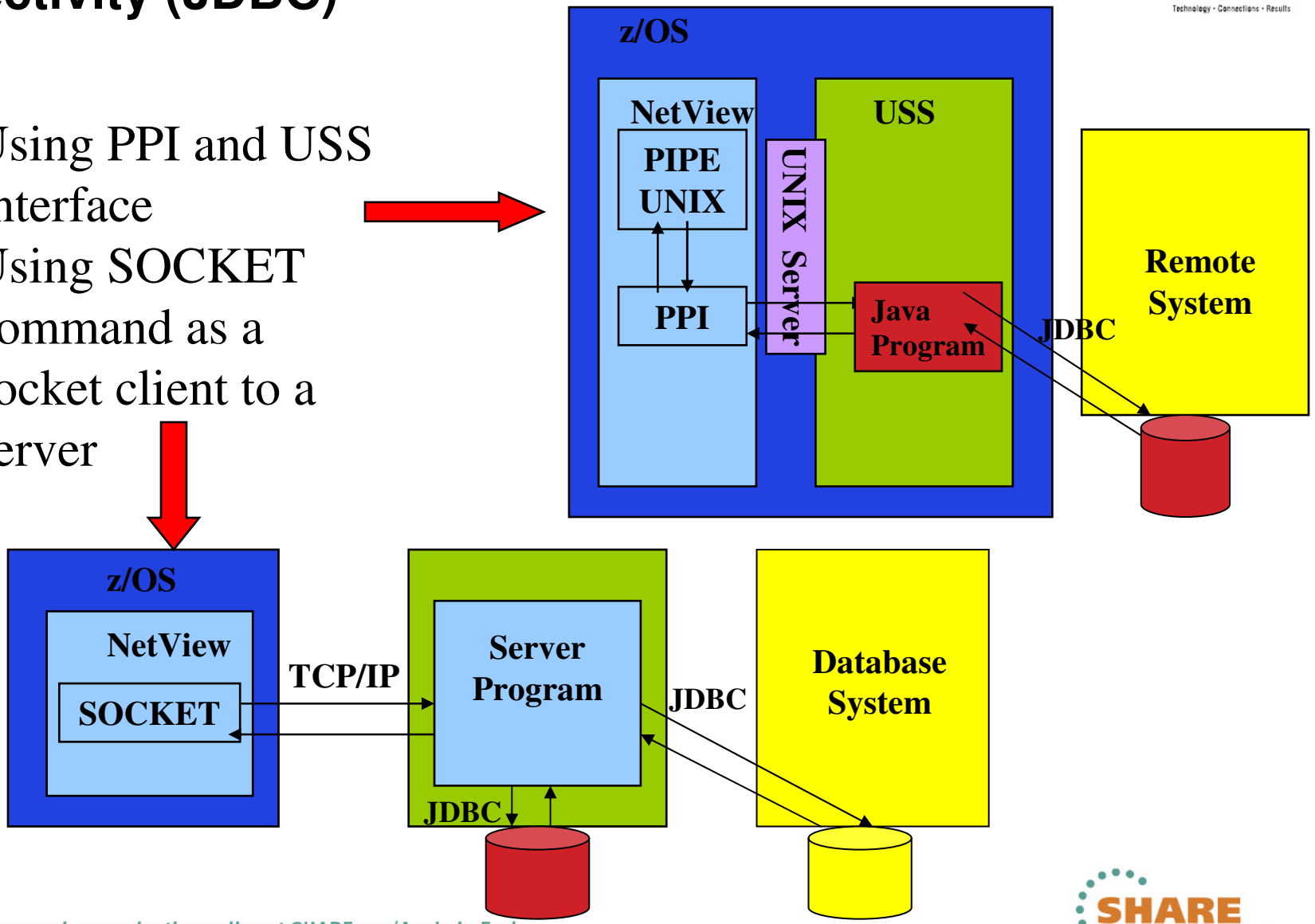
- Exchange information between USS based applications and NetView
  - NetView can issue USS commands via the PIPE UNIX function
  - Responses can be captured for automation purposes
  - USS applications can issue NetView commands using the REXX DSIPHONE interface and the CMDSERV PPI command server




```
HCN53    PIPE UNIX df -k | wait 20 | separate | loc /WebSphere/ | console
------------------------------------------------------------------------------
/zOSV1R9/shared/WebSphere610 (IBM.WAS610.SBBOHFS) 113764/1684800 4294945687 Available
/zOSV1R9/shared/WebSphere510 (IBM.WAS510.SBBOHFS) 27188/504000 4294961409 Available
/zOSV1R9/shared/WebSphere (WAS35.WAS.SEJSHFS2.@010227) 10100/48000 4294965560 Available
/WebSphere390/V610/config (IBM.WAS610.CONFIG.HFS) 193612/300000 4294931936 Available
/WebSphere390/V510/config1 (WAS510.WAS.CONFIG1.HFS) 209280/468000 4294947865 Available
```

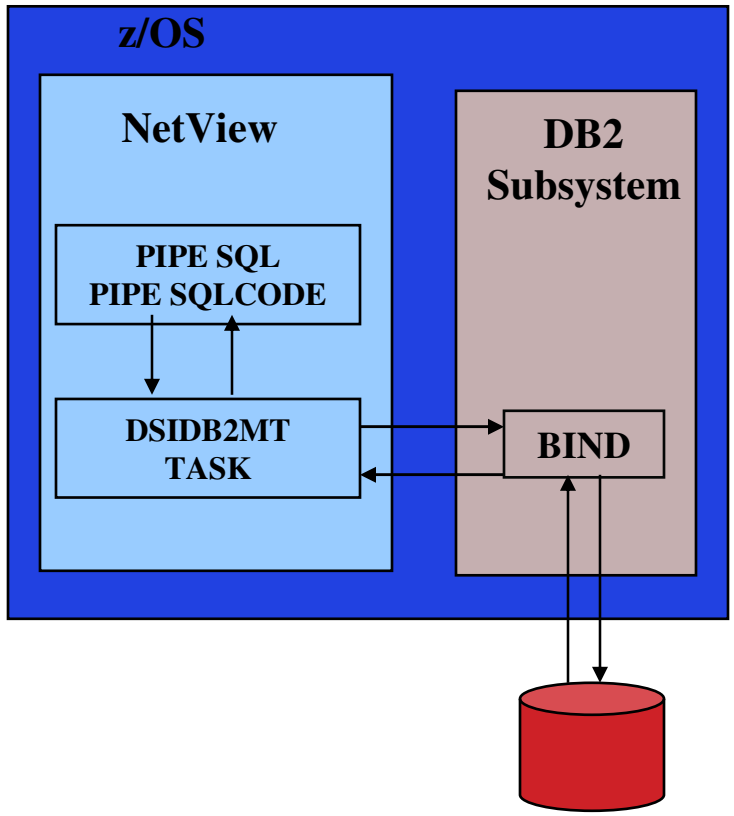
General Database Access via Java Database Connectivity (JDBC)

1. Using PPI and USS Interface
2. Using SOCKET command as a socket client to a server



DB2 for z/OS Interface

- NetView can directly access DB2 subsystems running on the same zO/S image
  - Built on the NetView PIPE function
  - Run DB2 BIND command using supplied packages for access
- NetView can indirectly access DB2 systems running on other systems
  - via Unix System Services
    - Invoking a Java JDBC program
  - via RMTCMD
    - Invoke a command on another NetView running on DB2 z/OS image
  - Via SOCKET command
    - Connect to a server with access to the DB2 subsystem



DB2 coding example

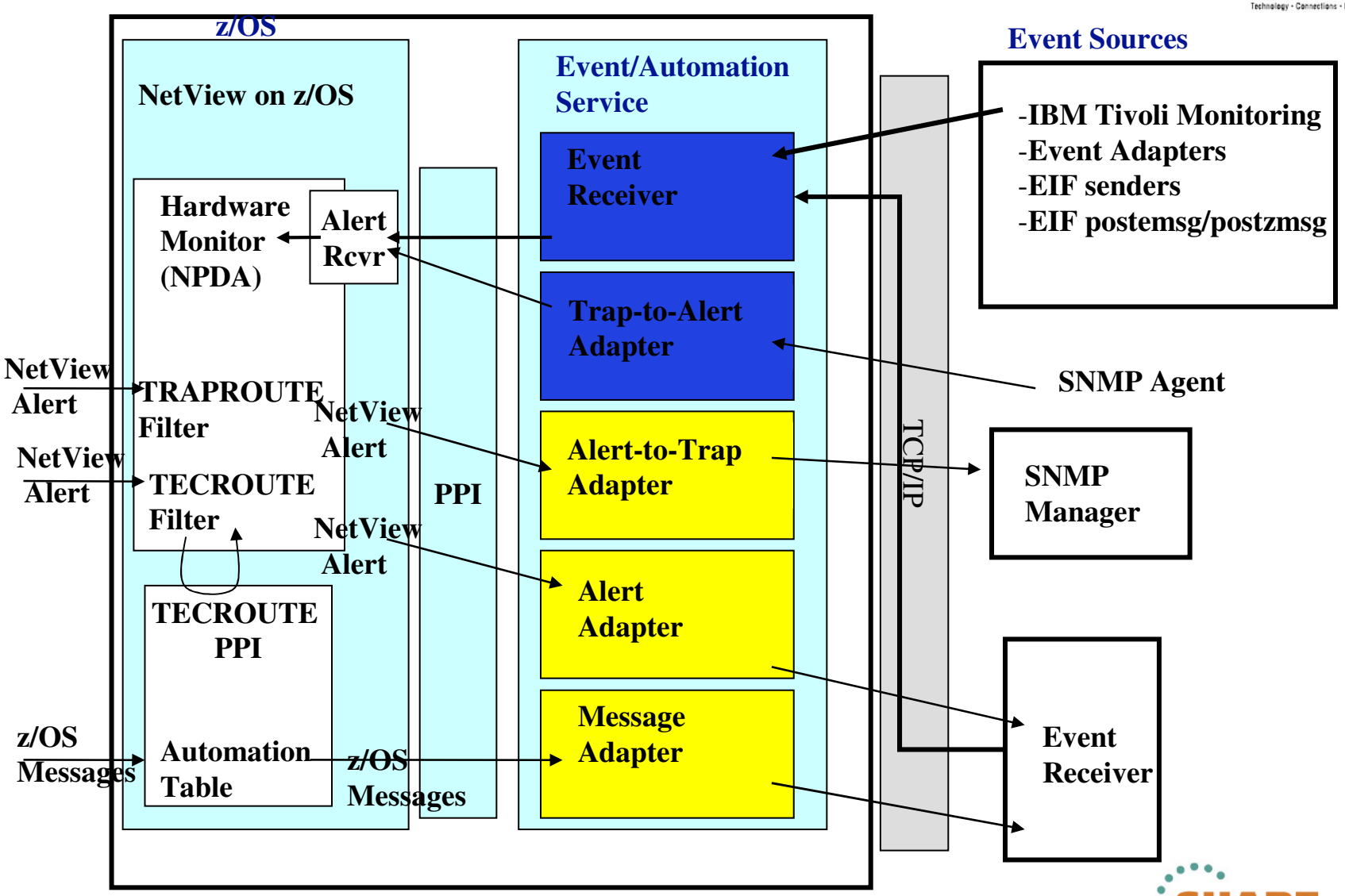
SQSELECT is a supplied REXX procedure that calls PIPE SQL and formats the retrieved data for display

```
HCBN4    12:21:04 * SQSELECT * FROM BONETT.ETETABL1 WHERE DEPT <> 'DS5'
HCBN4    12:21:04 | LASTNAME--------------- FIRSTNAME-------------- ZIPCODE
HCBN4    12:21:04 " TASH                   CHARLES                  11111
HCBN4    12:21:04 " BRIDGES                NASH                     22222
HCBN4    12:21:04 " FUDD                   ELMER                    33333
HCBN4    12:21:04 " TANNER                 DAN                      44444
HCBN4    12:21:04 " GUNN                   PETER                    55555
HCBN4    12:21:04 " LONGSTREET             JAMES                    66666
HCBN4    12:21:04 " WISE                   STEVEN                   39208
HCBN4    12:21:04 " GONZALES               LEO                      93406
HCBN4    12:21:04 " BROWN                  JAMES                    08836
HCBN4    12:21:04 " CLARK                  JAMES                    94611
HCBN4    12:21:04 " SMITH                  SARAH                    10021
HCBN4    12:21:04 " WILSON                 PATRICIA                 92663
HCBN4    12:21:04 " GARCIA                 JASON                    11509
HCBN4    12:21:04 " YOUNG                  MARIA                    20854
HCBN4    12:21:04 " GARCIA                 JAMES                    90210
HCBN4    12:21:04 " YOUNG                  MARIA                    20854
HCBN4    12:21:04 " MILLER                 SHARON                   06903
```

Event/Automation Service (EAS)

- Integrates with Netcool/OMNIbus, IBM Tivoli Monitoring, Tivoli Enterprise Console (TEC) and SNMP managers
  - Receives Event Integration Facility (EIF) events directly from the event source
    - Tivoli products (IBM Tivoli Monitoring, OMNIbus, TEC…)
    - Third party products that generate EIF events
  - Send messages or alerts to an EIF Receiver
  - Receive SNMP traps and convert to alerts
  - Send messages or alerts as SNMP traps

Event/Automation Service Details



EAS - EIF Event to NetView on z/OS

Send Event Results

EVENT: ApplEvent; source='EIF Application'; probe='test'; msg='Sample Event Message'; probevalue='100'; sub_origin='J2EE Application'; hostname=test.com; origin='WebSphere'; probearg='testarg1'; sub_source='EIF servlet'; severity=HARMLESS; END

sendEvent worked! rc = 225

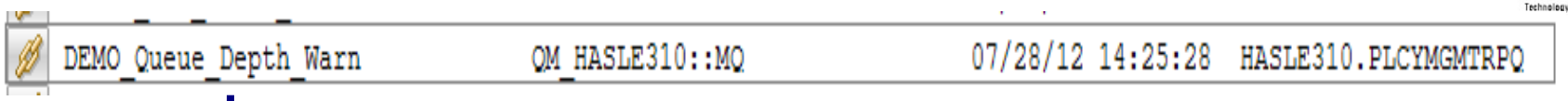
****

Return to Send Event Page

Event Receiver

```
N E T V I E W              SESSION DOMAIN: HCBN4     BONETT     05/04/04 20:52:32
NPDA-43S                          * EVENT DETAIL *                PAGE   1 OF   2

 HCBN4          TEST.COM       WEBSPHER       EIF_APPL
                +---------+    +---------+    +---------+
 DOMAIN         |  PWS    |---|  NTID   |---|  APPL   |
                +---------+    +---------+    +---------+

HIERARCHY NAMES LIST:
   PWS    test.com
   NTID   WebSphere
   APPL   EIF Application

DATE/TIME: RECORDED - 05/04 20:38

EVENT TYPE: TEMPORARY

DESCRIPTION: Sample Event Message;

PROBABLE CAUSES:
   severity=HARMLESS;

ORIGINAL T/EC EVENT:
    ApplEvent;
   source=EIF Application;
   probe=test;
   msg=Sample Event Message;
   probevalue=100;
   sub_origin=J2EE Application;
   hostname=test.com;
   origin=WebSphere;
   probearg=testarg1;
   sub_source=EIF servlet;
   severity=HARMLESS;
   END



ENTER A (ACTION) OR DM (DETAIL MENU)
```

EAS – ITM Situation to NetView z/OS Alert



Tivoli Enterprise Monitoring Server (TEMS)

Event Receiver

```
N E T V I E W                    SESSION DOMAIN: HCN61     BONETT
NPDA-43S                                  * EVENT DETAIL *

 HCN61          HASLE310       10.1.1.11        ITM
                +---------+    +---------+    +---------+
 DOMAIN         |   PWS   |---|   NTID  |---|   APPL  |
                +---------+    +---------+    +---------+

HIERARCHY NAMES LIST:
   PWS    hasle310
   NTID   10.1.1.11
   APPL   ITM

DATE/TIME: RECORDED - 07/28 14:25

EVENT TYPE: IMPENDING PROBLEM

DESCRIPTION: DEMO_Queue_Depth_WarnÝ(Current_Depth>10

PROBABLE CAUSES:
   severity=WARNING;

ORIGINAL T/EC EVENT:
   ITM_Queue_Status;
   cms_hostname=HASL125;
   cms_port=1920;
   integration_type=N;
   master_reset_flag='';
   appl_label='';
   situation_name=DEMO_Queue_Depth_Warn;
   situation_type=S;
   situation_origin=QM_HASLE310::MQ;
   situation_time=07/28/2012 14:25:28.000;
   situation_status=Y;
   situation_thrunode=REMOTE_HASLE315;
   situation_fullname=DEMO_Queue_Depth_Warn;
   situation_displayitem=HASLE310.PLCYMGMTRPQ;


ENTER A (ACTION) OR DM (DETAIL MENU)

 ???
CMD==> _
```

EAS – z/OS Message to Netcool/OMNIbus

```
HCB$ " IEF450I CICS31B CICS31B - ABEND=S222 U0000 REASON=00000000  TIME=18.17.46
HCB$ C MESSAGE IEF450I CICS31B CICS31B - ABEND=S222 U0000 REASON=00000000 WI
HCB$ C PPI2EAS3: MESSAGE IS IEF450I CICS31B CICS31B - ABEND=S222 U0000 REASO
HCB$ C message sent: IEF450I CICS31B CICS31B - ABEND=S222 U0000 REASON=00000
```

```
IF MSGID = 'IEF450I' & ( TOKEN(2 1 4) = 'CICS') & (TEXT =
MESSAGE)
   THEN EXEC(CMD('PPI2EAS3 NVC5TEC ' MESSAGE)
        ROUTE(ONE AUTO1 AUTO2))
        CONTINUE(Y);
```

```
WHEN (word(msg,1)='IEF450I') & (left(word(msg,2),4)='CICS')
 THEN do
     bsm_identity=word(msg,2)||':HCB$:CICSRegion'
     bsm_subsource='CICS'
     bsm_severity='CRITICAL'
     bsm_status='OPEN'
     end

msg1 = msg 'BSM_ID='||bsm_identity 'BSM_SV='||bsm_severity
msg1 = msg1 'BSM_ST='||bsm_status 'BSM_SS='||bsm_subsource
msg1 = msg1 'BSM_HN='||bsm_hostname

SAY "PPI2EAS3: MESSAGE IS" msg1
"PIPE VAR MSG1 | PPI TECROUTE" ppiname
say "message sent:" msg1
exit
```

EAS – z/OS Message to OMNIBUS…

```
FORMAT EAS2TBSM41  FOLLOWS NV390MSG_Event
%s* BSM_ID=%s* BSM_SV=%s* BSM_ST=%s* BSM_SS=%s BSM_HN=%s*
```

EIF Probe

```
[Event Processor] ClassName:        EAS2TBSM41
 [Event Processor] source:          NVEAS
 [Event Processor] jobname:         ''
 [Event Processor] msg:   'IEF450I CICS31B CICS31B - ABEND=S222 U0000 REASON=00000000'
 [Event Processor] date:  'SEP 27 18:17:46'
 [Event Processor] msg_id:          IEF450I
 [Event Processor] status: OPEN
```

Netcool/OMNIbus Event List : Filter="All Events", View="Default"

File Edit View Alerts Tools Help

All Events | Default | Top [OFF]

Node	Alert Group	Summary	Last Occurrence(+)	Coun
CICS31B-HCB$(Job		Overall Attribute of CICS31B-HCB$ is Bad.	/27/2008 06:17:47	1
CICS31B-HCB$(Job		Overall Attribute of the SCR_ServiceComponentRawStatusTemplate tag of CIC	/27/2008 06:17:47	1
LGI		Overall Attribute of the cicsr1 tag of Lord General Policy is Marginal.	/27/2008 06:17:47	1
CICS31B-HCB$(Job		Event based attribute ComponentRawEventStatusRule of template SCR_Servic	/27/2008 06:17:47	1
LGI		20.0% of SCR_ServiceComponentRawStatusTemplate children of Lord General	/27/2008 06:17:47	1
LGI		Overall Attribute of Lord General Policy is Marginal.	/27/2008 06:17:47	1
	RAD:Impact	A RAD:Impact process running on has connected as username root	/27/2008 06:17:47	1
CICS31B:HCB$:CIC	EAS2TBSM41	IEF450I CICS31B CICS31B - ABEND=S222 U0000 REASON=00000000	/27/2008 06:21:37	1

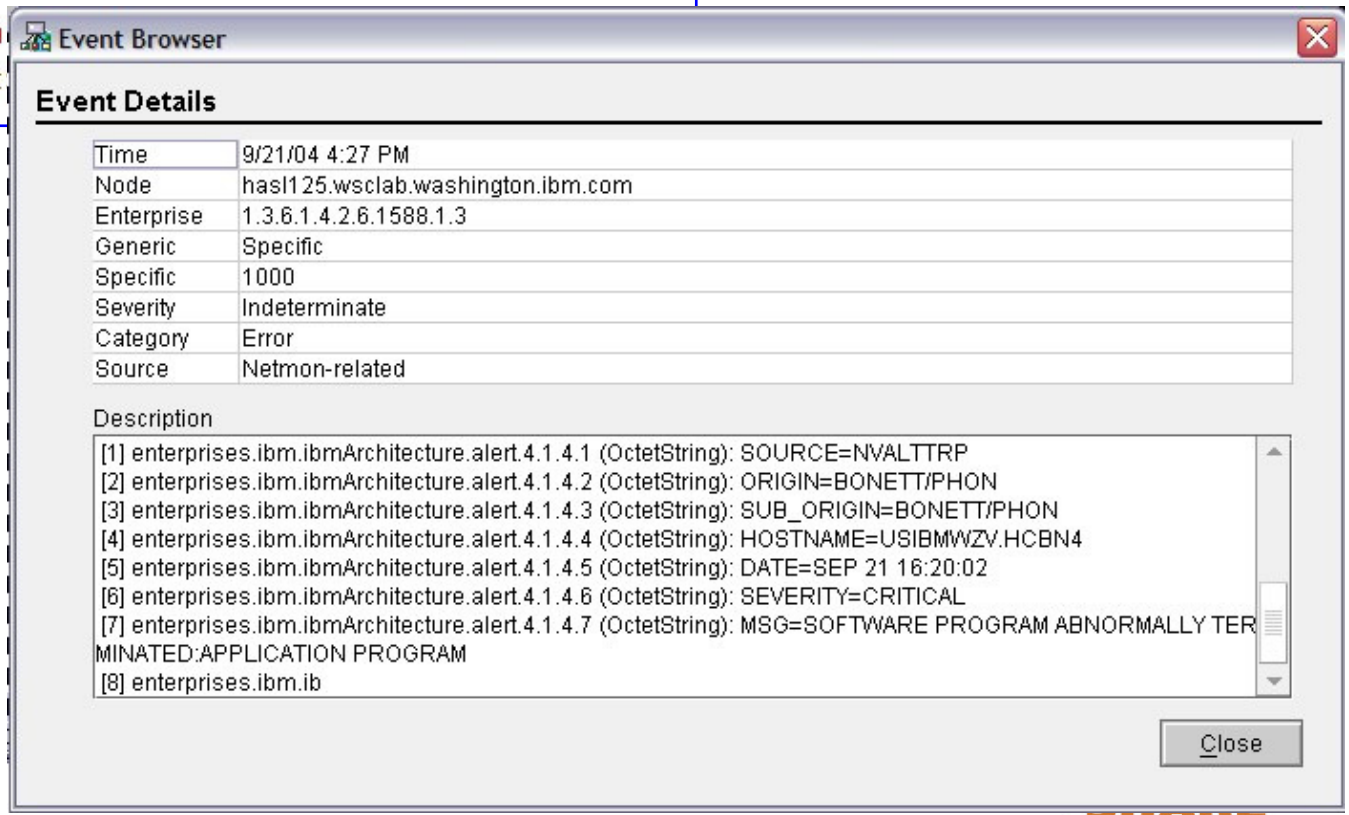
0 | 5 | 18 | 4 | 2 | 11 | All Events

0 row(s) inserted, 2 row(s) updated and 0 row(s) deleted. | 09/27/2008 06:22:07 PM | root | NCOMS[PRI]

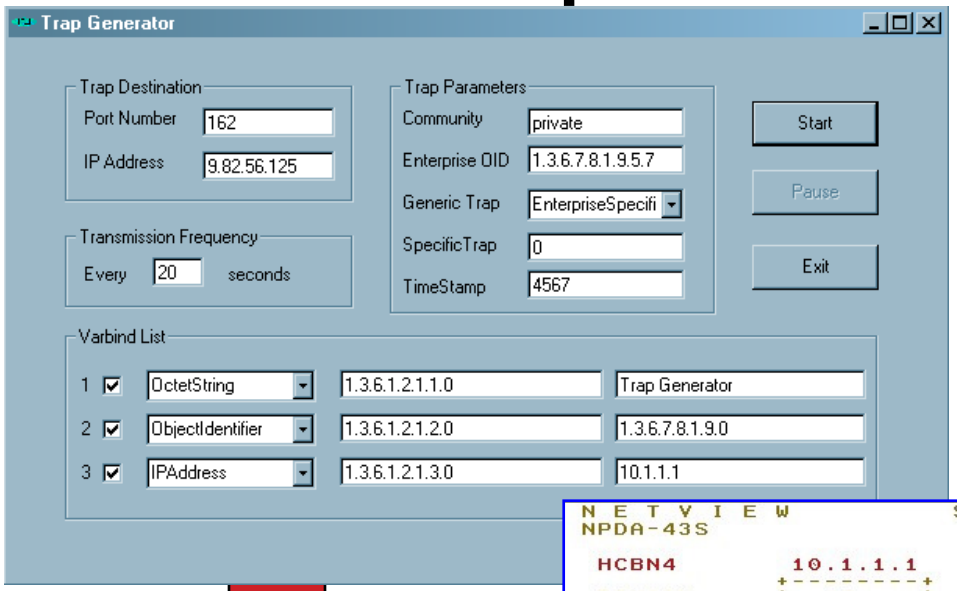
EAS - NetView z/OS Alert to SNMP trap

```
N E T V I E W              SESSION DOMAIN: HCBN4     BONETT
NPDA-43S                          * EVENT DETAIL *

 HCBN4          BONETT
                +--------+
 DOMAIN         |  PHON  |
                +--------+

DATE/TIME: RECORDED - 09/21 16:05

EVENT TYPE: PERMANENT

DESCRIPTION: SOFTWARE PROGRAM ABNORMALLY TERMINATED

PROBABLE CAUSES:
   APPLICATION PROGRAM

APPLICATION PROGRAM TE
   TEST ALERT
```

Alert-to-Trap Adapter



EAS - SNMP trap to NetView z/OS Alert

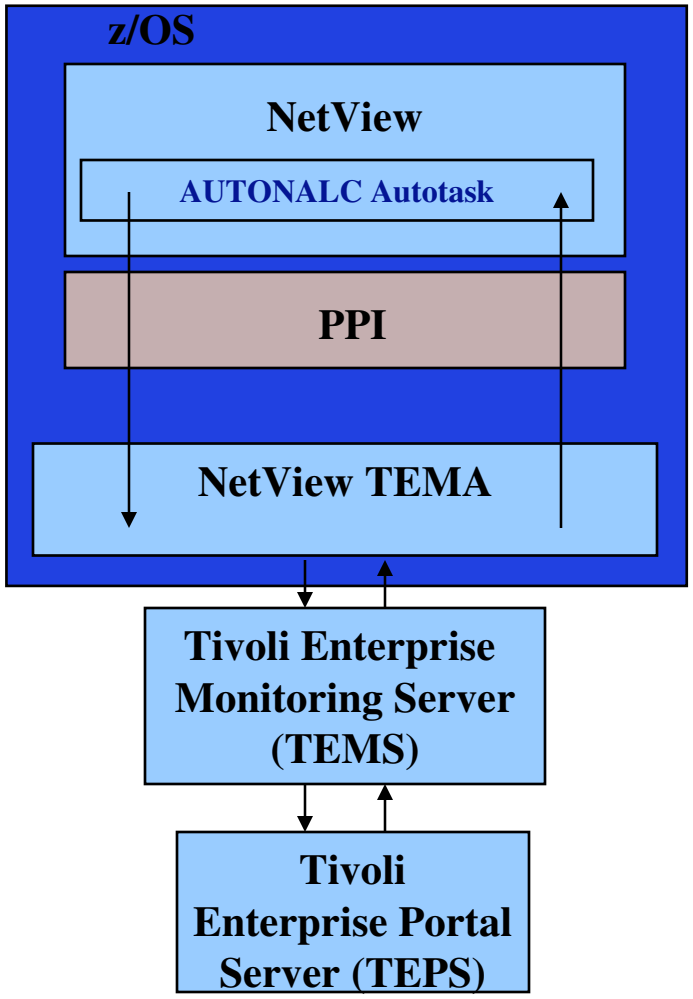


Trap to Alert Adapter

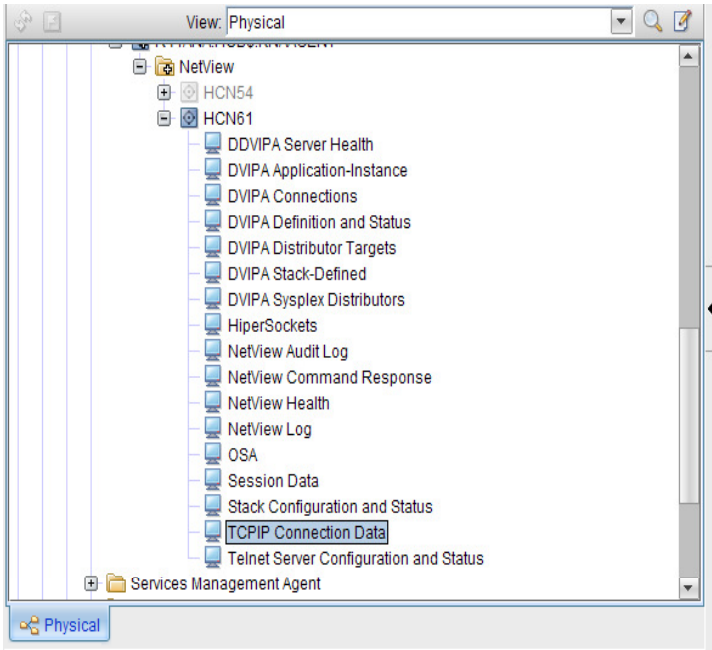
```
N E T V I E W              SESSION DOMAIN: HCBN4     BONETT     09/21/04 17:03:15
NPDA-43S                          * EVENT DETAIL *                      PAGE  1 OF  2

 HCBN4          10.1.1.1
                +---------+
 DOMAIN         |   SP    |
                +---------+

SEL# TYPE AND NAME OF OTHER RESOURCES ASSOCIATED WITH THIS EVENT:
( 1) SP        10.1.1.1

DATE/TIME: RECORDED - 09/21 17:02     CREATED - 09/21/04 17:02:14

EVENT TYPE: UNKNOWN

DESCRIPTION: UNDETERMINED ERROR

PROBABLE CAUSES:
   UNDETERMINED

QUALIFIERS:
   1)  ENTERPRISE 1.3.6.7.8.1.9.5.7
   2)  SNMP GENERIC-TRAP NUMBER 0
   3)  SNMP SPECIFIC-TRAP NUMBER 0

   ORIGIN_ADDR=9.65.246.220;

   ORIGIN_PORT=2296;

   SNMP_VERSION=0;

   community=7075626C6963;

   enterpriseOID=1.3.6.7.8.1.9.5.7;

   agent_address=10.1.1.1;
```

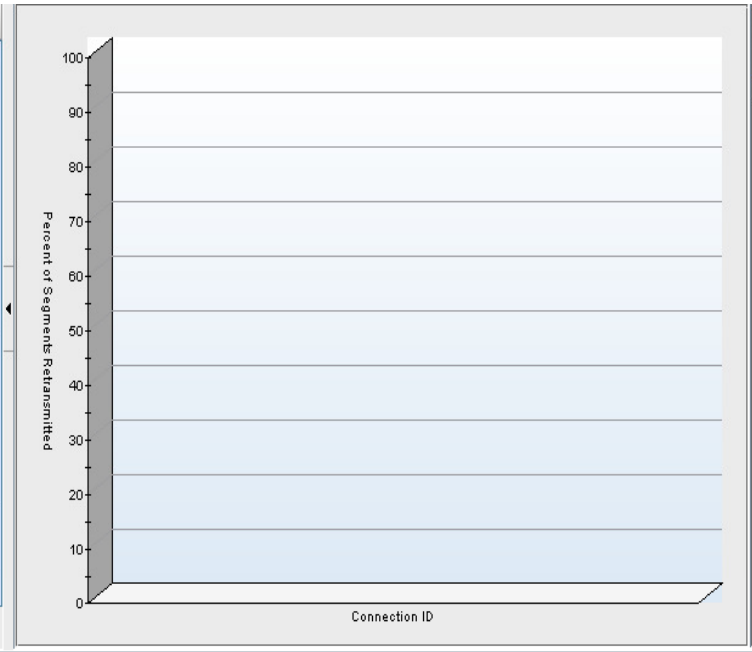
NetView Tivoli Enterprise Management Agent

- Integrates NetView with the Tivoli Enterprise Portal Environment
  - DVIPA information
  - Hipersockets
  - OSA
  - Packet Trace
  - TCP/IP Stack and connections
  - SNA Sessions
  - NetView health and log information
- NetView commands can be issued from the TEP desktop
- Transfer in context to OMEGAMON XE for Mainframe Networks
- Replaces old NetView TEP Agent (V5R2)



NetView TEMA – Portal View





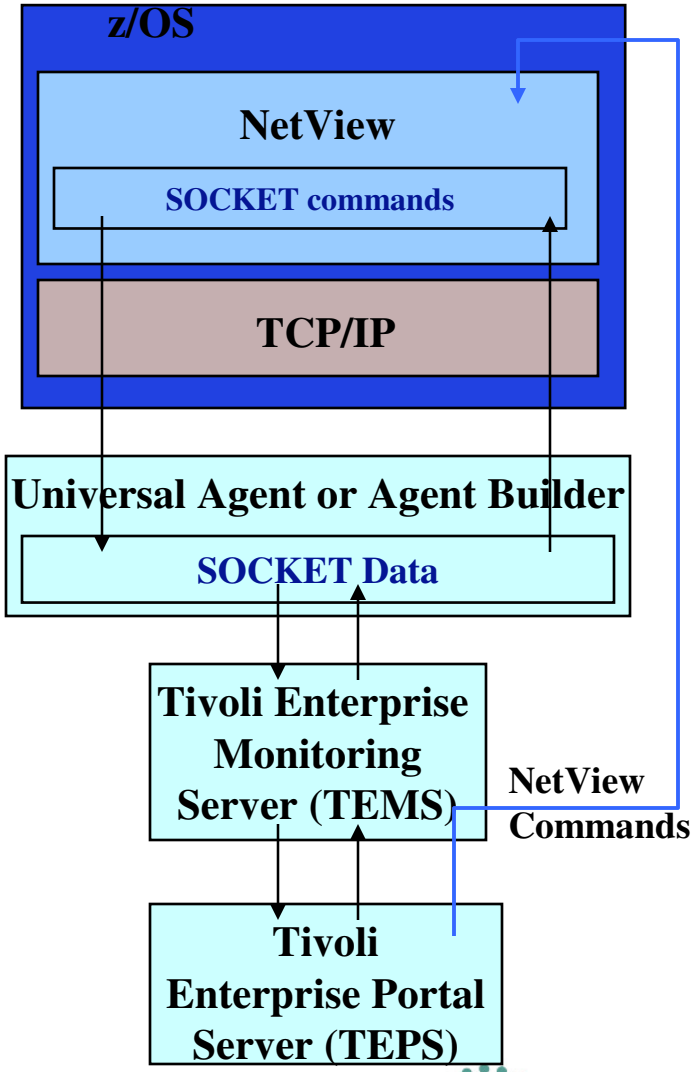
	Collection Time	Total Active Connections
	07/28/12 13:24:49	142

TCPIP Connection Data Summary

	Collection Time	TCPIP Job Name	Local IP Address	Local Port	Remote IP Address	Remote Port	Connection Start Time	Last Activity Timestamp	Resource Name	Connection ID	Total Bytes Received	Total Bytes Sent	Total Bytes	Bytes Received	Bytes Sent	Bytes Sent or Received	Byte Rate	Total Segments Retransmitted
				9080	9.82.38.33	54967	07/28/12 13:24:23	07/28/12 13:24:23	TOMCAT01	0X003AC401	209	8253	8462	209	8253	8462	8462	0
				080	9.82.56.125	54931	07/28/12 13:24:23	07/28/12 13:24:24	V6S1	0X003AC3FF	349	7740	8089	349	7740	8089	8089	0
				931	9.82.56.125	19080	07/28/12 13:24:23	07/28/12 13:24:24	WEBHCB1	0X003AC3FE	7740	349	8089	7740	349	8089	8089	0
				80	9.82.38.33	54966	07/28/12 13:24:23	07/28/12 13:24:23	WEBHCB1	0X003AC3FC	207	7874	8081	207	7874	8081	8081	0
				918	9.82.38.21	4411	07/28/12 13:15:13	07/28/12 13:15:13	R41ADSST	0X003AC158	21276	544494	565770	21276	544494	565770	56577	0
				23	9.65.242.1	1939	07/28/12 08:21:37	07/28/12 13:21:57	TN3270	0X003A5E93	16651	848466	865117	1738	71993	73731	4915	6
				829	9.82.38.11	1414	07/27/12 07:53:05	07/28/12 13:24:37	CSQ3CHIN	0X003875A6	48520	6387276	6435796	420	55380	55800	3720	0
				414	9.82.38.11	47943	07/27/12 07:37:22	07/28/12 13:24:37	CSQ3CHIN	0X00386DD5	6387668	48912	6436580	55380	420	55800	3720	0
				918	9.82.38.16	1085	06/30/12 08:27:02	07/28/12 13:24:02	R41ADSST	0X000B753A	210000894	246504632	456505526	69608	84540	154148	10276	0
	07/28/12 13:24:49	TCPIP	9.82.56.125	57310	9.82.38.23	5455	06/30/12 08:25:32	07/28/12 13:24:47	CYTAPROC	0X000B751E	0	408308196	408308196	0	136375	136375	9091	13
	07/28/12 13:24:49	TCPIP	9.82.56.125	57304	9.82.38.23	5455	06/30/12 08:25:02	07/28/12 13:24:47	CYTQPROC	0X000B750E	0	1676263023	1676263023	0	623470	623470	41564	26
	07/28/12 13:24:49	TCPIP	9.82.56.125	11918	9.82.38.31	55950	06/30/12 08:24:01	07/28/12 13:24:00	R41ADSST	0X000B74F1	8238887	41530951	49769838	3700	15240	18940	1262	0
	07/28/12 13:24:49	TCPIP	9.82.56.125	11918	9.82.38.31	41985	06/30/12 08:23:50	07/28/12 13:24:45	R41ADSST	0X000B74EF	86447080	264893885	351340965	131996	3967265	4099261	273284	11
	07/28/12 13:24:49	TCPIP	9.82.56.125	1414	9.82.56.125	57293	06/30/12 08:23:43	07/28/12 13:24:23	CSQ3CHIN	0X000B74E7	201232060	200760412	401992472	76800	76620	153420	10228	0
	07/28/12 13:24:49	TCPIP	9.82.56.125	57293	9.82.56.125	1414	06/30/12 08:23:43	07/28/12 13:24:23	V6S1S	0X000B74E6	200760412	201232060	401992472	76620	76800	153420	10228	0

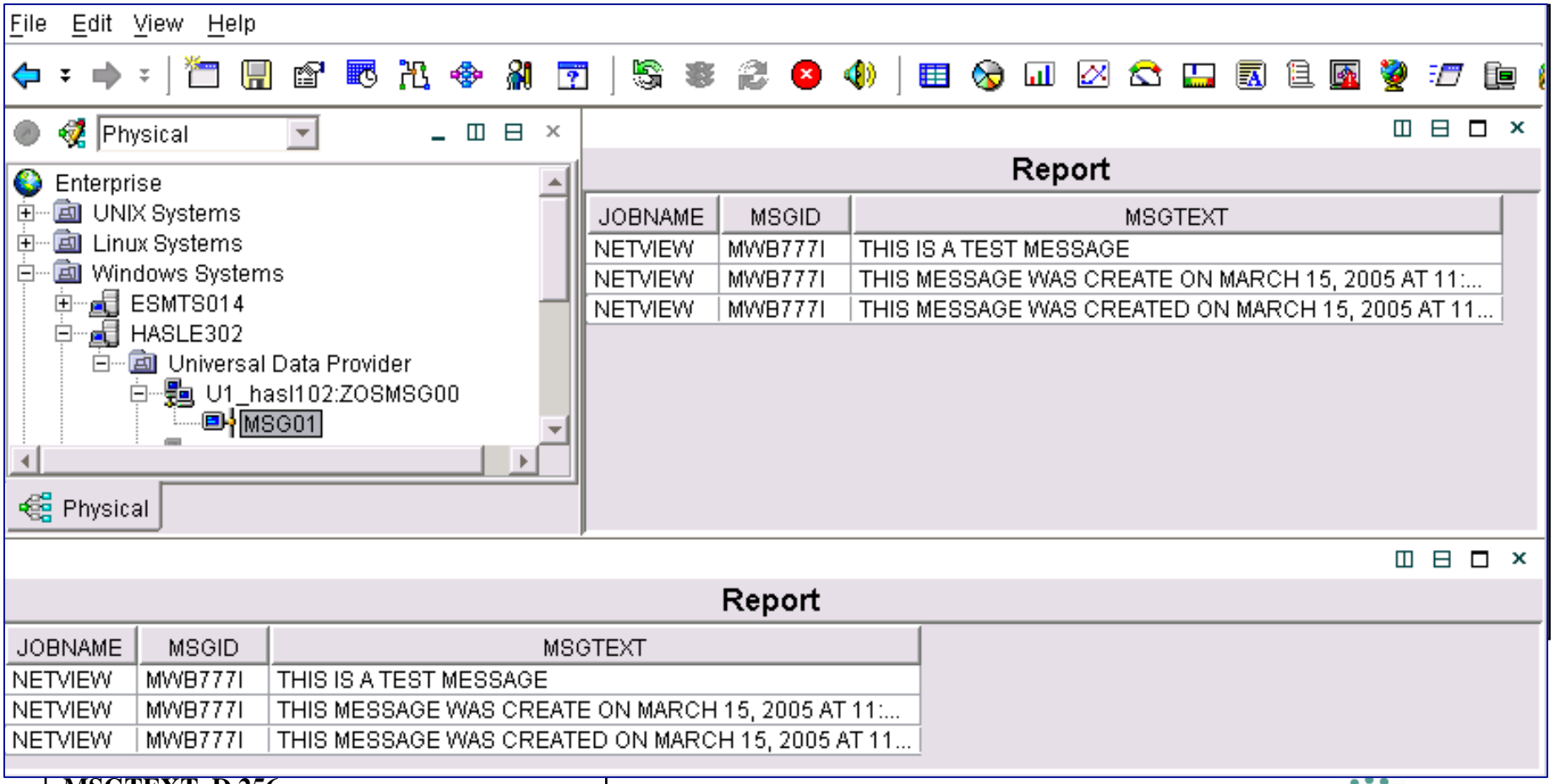
IBM Tivoli Monitoring Custom Integration

- NetView can send data to the ITM Environment either the IBM Tivoli Universal Agent or the Agent Builder Socket Data Source
  - NetView uses SOCKET functions as a socket client to send data
  - Universal Agent and Agent Builder agents can receive data via TCP/IP sockets
  - Any information NetView can detect or create can be sent
    - ITM functions can be applied to data (detecting threshold/content exceptions, situation and policy automation, etc.)
- Commands can be issued to NetView using Situations and Take Action Commands



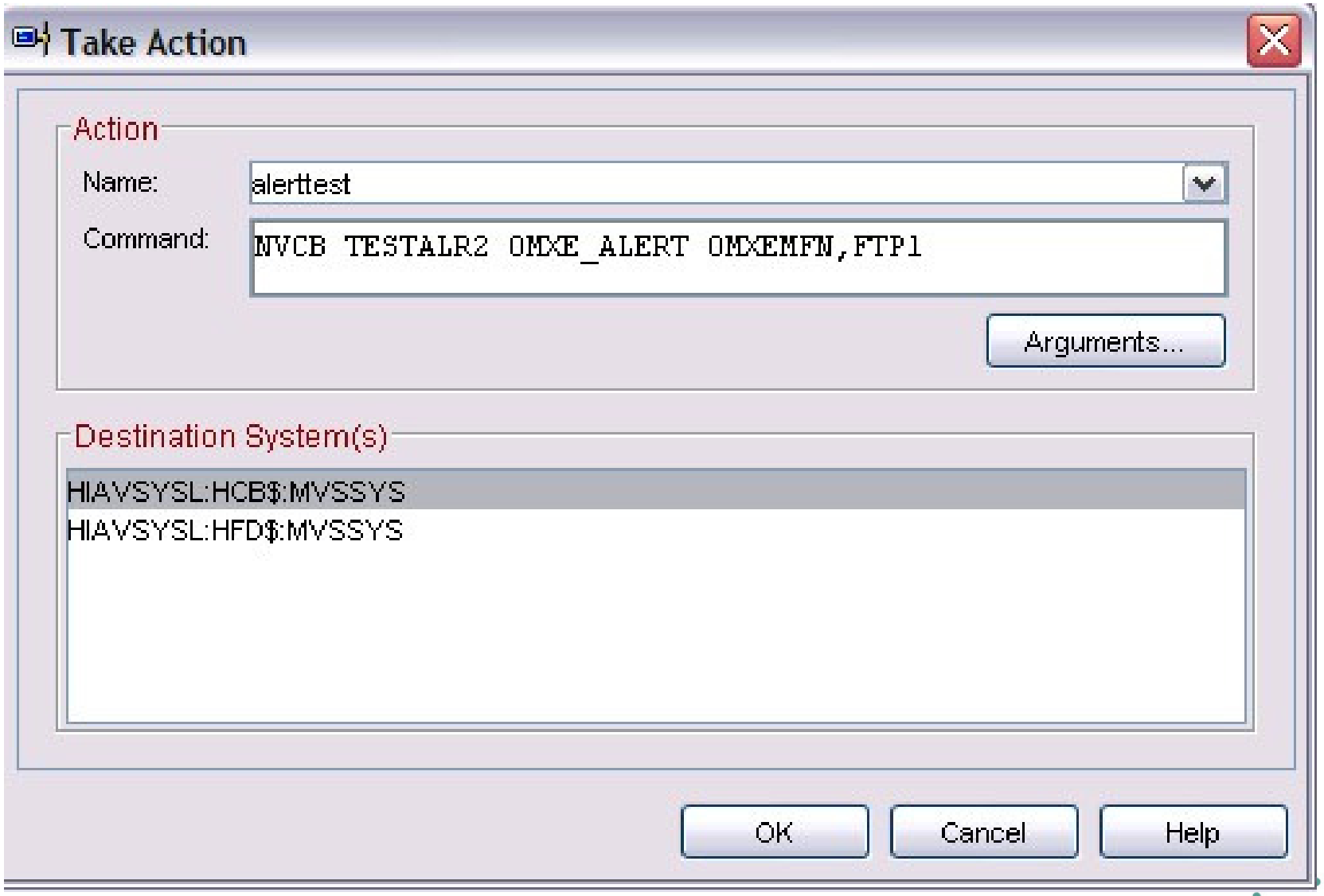
NetView Socket Client to Universal Agent

```
IF MSGID = 'MWB777I' & TEXT=MESSAGE    THEN
EXEC(CMD('TESTSKC2 ' MESSAGE) ROUTE(ONE AUTO1))
          CONTINUE(Y) NETLOG(Y);
```



MSGTEXT D 256

Take Action Command to NetView



Take Action Command to NetView…

```
STC04355 00000290  NVCB TESTALR2 OMXE_ALERT OMXEMFN,FTP1
STC04781 00000090  GENALERT COMMAND SUCCESSFULLY EXECUTED
```

```
/* Test generating generic alert */
parse arg text hier .
"GENALERT G TYPE=PERM,ALID=3722641,DESC=2000,PSID=5699001 PC=1001",
"TEXT='"||text||"' HIER="||hier||" ACTS=1012"
say "GENALERT command successfully executed"
exit
```

```
N E T V I E W          SESSION DOMAIN: HCEN5    BONETT    06/27/06 10:17:36
NPDA-30A                      * ALERTS-DYNAMIC *

    DOMAIN RESNAME  TYPE TIME  ALERT DESCRIPTION:PROBABLE CAUSE
     HCEN5 OMXEMFN  FTP1 10:17 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
```

```
N E T V I E W          SESSION DOMAIN: HCEN5    BONETT    06/27/06 10:19:00
NPDA-43S                      * EVENT DETAIL *                 PAGE  1 OF  1

 HCEN5        OMXEMFN
             +---------+
 DOMAIN      |  FTP1   |
             +---------+

DATE/TIME: RECORDED - 06/27 10:17

EVENT TYPE: PERMANENT

DESCRIPTION: SOFTWARE PROGRAM ABNORMALLY TERMINATED

PROBABLE CAUSES:
   APPLICATION PROGRAM

APPLICATION PROGRAM TEXT:
   OMXE_ALERT
```

Web Services: NetView SOAP Server

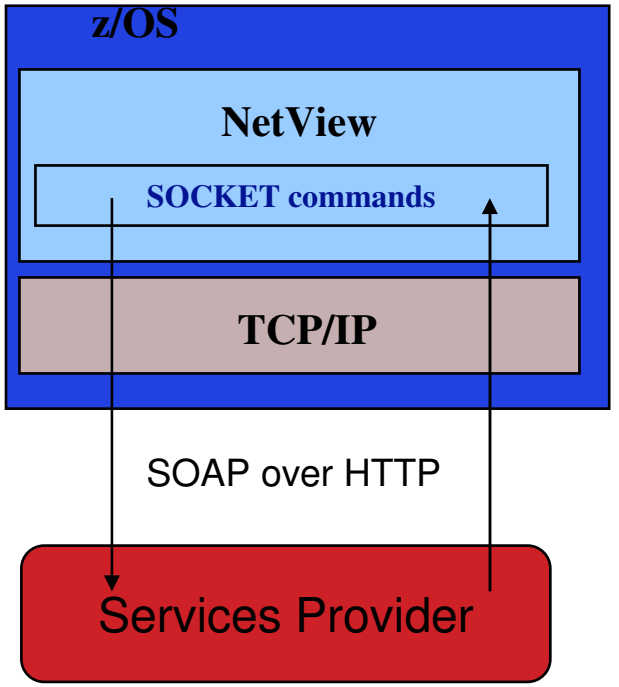
- Web Services Gateway to issue commands to NetView via SOAP over HTTP or HTTPS and receive response
- Provides Web Services Descriptor Language (WSDL) files
- Client requests can be made via
  - SOAP envelope and socket/http/https programming
  - WSDL generated proxy client
  - SOAP with Attachments API for Java (SAAJ)
  - Dynamic Invocation Inteface (DII) API

```
<SOAP-ENV:Envelope … >
<SOAP-ENV:Header …>
<h:BasicAuth …>
<Name>myid</Name>
<Password>mypassword</Password>
</h:BasicAuth></SOAP-ENV:Header>
<SOAP-ENV:Body>
<NVCMD><cmd>Usage</cmd></NVCMD>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

```
<SOAP-ENV:Envelope ...><SOAP-ENV:Body ...><resp>
<dl>resource</dl>
<dl>DSI386I NETVIEW RESOURCE UTILIZATION
12:36:38</dl>
<dl> TOTAL CPU %              = 3.85</dl>
<dl> NVCDAP61 CPU %           = 0.00</dl>
<dl> NVCDAP61 CPU TIME USED   = 263.31 SEC.</dl>
<dl> REAL STORAGE IN USE      = 40092K</dl>
<dl> PRIVATE ALLOCATED < 16M = 1120K</dl>
<dl> PRIVATE ALLOCATED > 16M = 131588K</dl>
<dl> PRIVATE REGION    < 16M = 10216K</dl>
<dl> PRIVATE REGION    > 16M = 164000K</dl>
<dl>END OF DISPLAY</dl>
</resp></SOAP-ENV:Body></SOAP-ENV:Envelope>
```

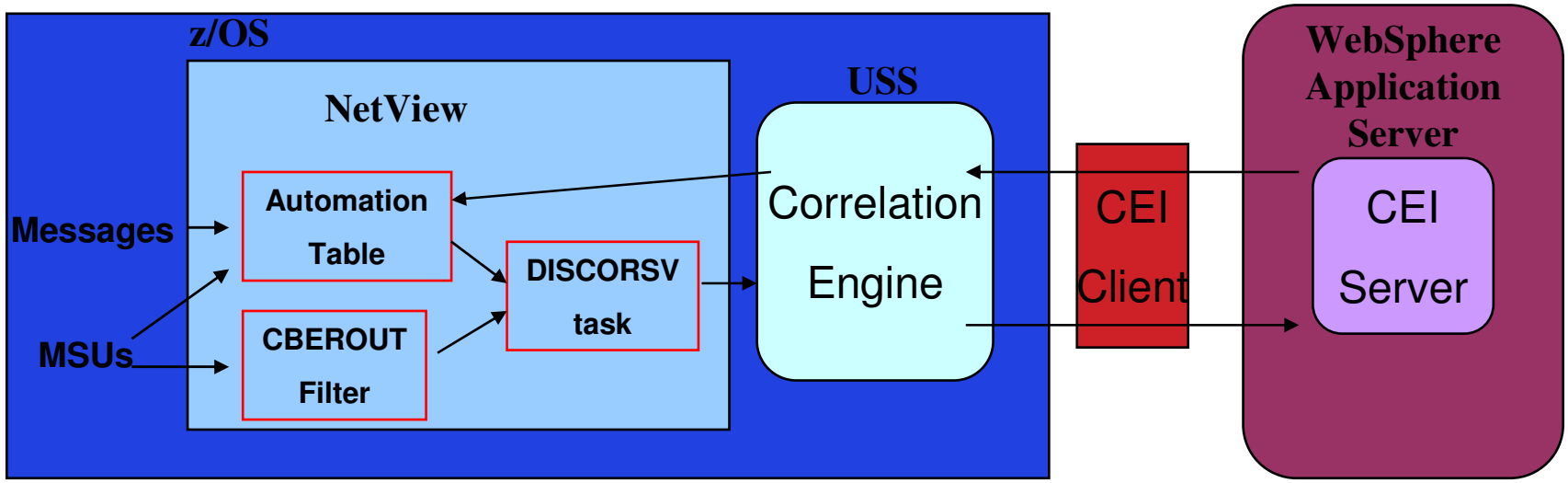
Web Services Integration: SOAP Client

- Use NetView SOCKET functions to create client for connecting to services via Simple Object Access Protocol
  - REXX programming required but is easily reusable
    - Build HTTP Header
    - Import or create SOAP XML envelope request
    - Send complete request to services port
  - Enables use of web services data within events and automation
- Example white paper on IBM Techdocs website



Common Event Infrastructure (CEI)

- IBM implementation of the WSDM Common Base Event standard
- Imbedded in many products as a key event integration technology (e.g. WebSphere, DB2), particularly for business events
- NetView creates events and passes them to the CEI and can receive from the CEI Infrastructure for automation purposes



Product Integration Examples

- AF/Operator
  - PPI and Command Interface for cross-product command execution and AF/Operator access to Alerts
- Event Pump for z/OS
  - Command Interface via Event Pump External Data Interface (EDI) to send events which can be escalated to Netcool/OMNIbus and Tivoli Business Service Manager (TBSM)
  - EIF events can be sent directly to Netcool/OMNIbus and mapped to TBSM events
- Tivoli Application Dependency Discovery Manager (TADDAM)
  - NetView Discovery Library Adapter (DLA) sends Resource Object Data Manager (RODM) data to TADDAM for inclusion in application relationship and dependency views and actions

Event Management Considerations

- What is the Event Management scope?
  - Technology (events from particular components)
  - Application (events from components supporting an application or business system)
- Where and how are the events produced?
  - Directly by the component
  - Indirectly for the component by a component management product
- Which event and event relationships are important?
  - Typically many more events are produced than are used
  - For every exception event, a clearing event must exist (or be created)

Event Management Considerations...

- What are the event sources?
  - Directly usable by NetView
    - z/OS Messages
    - SNA Alerts
    - EIF and Common Base Events
    - SNMP traps
  - Usable by invoking NetView monitoring/automation
  - Require integration with NetView
- What is the integration customization effort?
  - Product definitions and parameters
  - “Script level” code
  - Programming code
- What level of “event capacity” (events to process in an interval) can be supported?

Summary

- There are many ways to integrate with NetView
  - By directly using a NetView interface
  - By indirectly routing through another interface
- Use the power of NetView Automation
  - Standalone on System z
  - In conjunction with other mainframe/distributed automation
- It can be a powerful Enterprise Management Integration product
  - Extremely customizable
  - Platform for integration with other management products (System Automation for z/OS, TBSM, ITM, OMEGAMON, OMNIbus…)
- It can make monitoring for and reacting to situations more efficient – and adds to the efficiency of IT Service Management

For Further Information

- NetView Product Manuals (available at www.ibm.com/software/tivoli/products/netview-zos):
  - Installation: Configuring Additional Components
  - Customization Guide
  - Customization: Using REXX and the NetView CLIST Language
  - Customization: Using PIPES
  - Application Programming Guide
  - Automation GUide
- Redbooks (available at www.ibm.com/redbooks):
  - An Introduction to Tivoli NetView for OS/390 V1R2 (SG24-5224) – an oldie but goodie

For Further Information…

- White papers with integration examples (all available on www.ibm.com/support/techdocs, use “NetView” as search word):
  - Integrating IBM Tivoli NetView for z/OS with IBM Tivoli Monitoring
  - Options for Sending z/OS Events to Netcool/OMNIbus and TBSM
  - Using Tivoli NetView for z/OS as a TCP/IP Socket Server
  - An IBM Tivoli NetView for z/OS SOAP Client
  - Sending Tivoli Enterprise Console/Event Integration Facility Events to the NetView for z/OS Event Receiver
  - IBM Tivoli NetView for z/OS and IBM Tivoli AF/Operator for z/OS Integration (Parts 1 & 2)
  - Accessing Databases from Tivoli NetView for z/OS using JDBC
  - How to Power Up Distributed Servers Using Tivoli NetView for z/OS and Wake-On-LAN
  - Integrating WebSphere Applications with Event Integration Facility Products

Tivoli System z Session at SHARE

Monday

•11:00	11207: Automating your IMSplex with System Automation for z/OS	Platinum 7
•1:30	11832: What's New with Tivoli System Automation for z/OS	Elite 1
•3:00	11886: Improve Service Levels with Enhanced Data Analysis	Elite 1

Tuesday

•9:30	11792: What's New with System z Monitoring with OMEGAMON	Elite 1
•11:00	11791: Tuning Tips To Lower Costs with OMEGAMON Monitoring	Platinum 8
•1:30	11900: Understanding Impact of Network on z/OS Performance	Grand Salon A

Wednesday

•9:30	11835: Automated Shutdowns using either SA for z/OS or GDPS	Elite 1
•1:30	11479: Predictive Analytics and IT Service Management	Grand Salon E/F
•1:30	11899: Top 10 Tips for Network Perf. Monitoring w/ OMEGAMON	Platinum 9
•4:30	11836: Save z/OS Software License Costs with TADz	Elite 1

Thursday

•9:30	11905: Using NetView for z/OS for Enterprise-Wide Mgmt and Auto	Grand Salon A
•11:00	11909: Get up and running with NetView IP Management	Grand Salon A
•11:00	11887: Learn How To Implement Cloud on System z	Grand Salon E/F

Friday

•9:30	11630: Getting Started with URM APIs for Monitoring & Discovery	Elite 1

System z Social Media

- System z official Twitter handle:
  - @ibm_system_z
- Top Facebook pages related to System z:
  - Systemz Mainframe
  - IBM System z on Campus
  - IBM Mainframe Professionals
  - Millennial Mainframer
- Top LinkedIn Groups related to System z:
  - Mainframe Experts Network
  - Mainframe
  - IBM Mainframe
  - System z Advocates
  - Cloud Mainframe Computing
- YouTube
  - IBM System z
- Leading Blogs related to System z:
  - Evangelizing Mainframe (Destination z blog)
  - Mainframe Performance Topics
  - Common Sense
  - Enterprise Class Innovation: System z perspectives
  - Mainframe
  - MainframeZone
  - Smarter Computing Blog
  - Millennial Mainframer