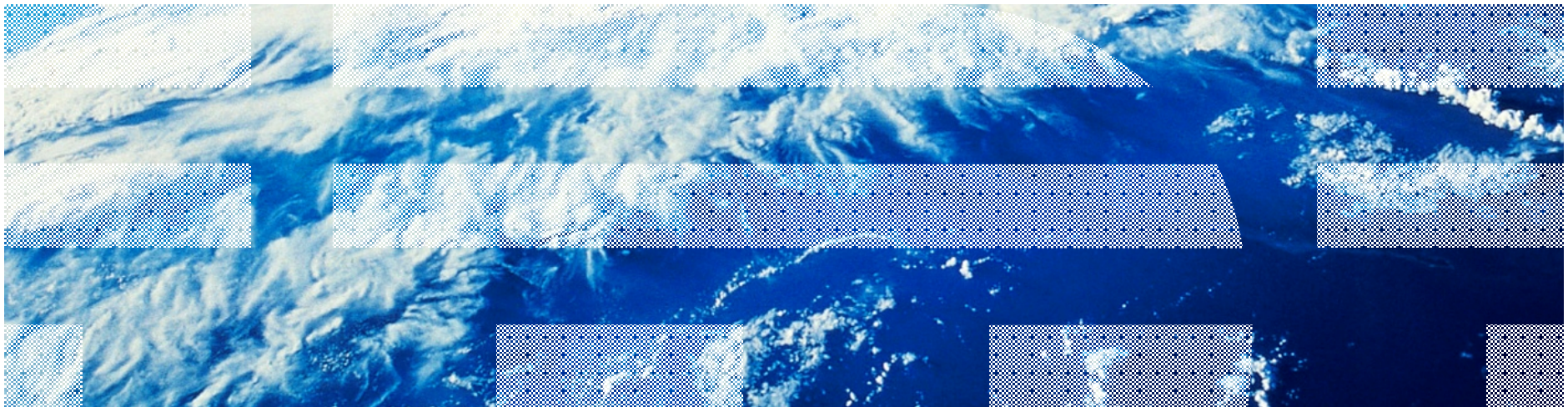


# Setup Monitoring for z/VSE

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## What is and why use monitoring

### § Monitoring definition

- Monitoring is a continuous process to keep eye on systems or scheduled activities.
- Its aim is to obtain real-time information to ease the overview or action in certain cases.
- Monitoring varies from to time, project to project and activity to activity.
- Can be Real-time or Event driven

### § Why use monitoring

- to be aware of the state of a system
- to observe a situation for any changes which may occur over time
- to react on unpredicted or predicted situations

## Monitoring types

### Business Monitoring vs. Technical Monitoring

#### § Business Monitoring ( Near-time Monitoring)

- displaying **measurements** or **KPIs** (Key Performance Indicators) to a business process **controller/management**
  - applying a range or SLA
  - measurements with a Target Near-time Monitoring

#### § Technical Monitoring - **Real-Time Monitoring**

- **displaying** technical information
  - to IT Support/Maintenance/Administration experts
- **acting on specific events** or situation changes
  - Event driven monitoring

## z/VSE V4.3 – SNMP Monitoring Agent support (1)

### § z/VSE V4.3 Announcement letter (210-313)

#### System management enhancements:

SNMP (Simple Network Management Protocol) is a widely used standard network protocol that allows systems to monitor elements of a network. **z/VSE V4.3 will provide a monitoring agent** that allows SNMP version 1 clients to retrieve z/VSE specific system and performance data. This will help performance monitors to collect data that can be used for planning purposes.

### § What is SNMP (Simple Network Management Protocol) ?

#### – From Wikipedia:

Simple Network Management Protocol (SNMP) is an **Internet-standard protocol** for managing devices on IP networks. Devices that typically support SNMP include routers, switches, servers, workstations, printers, modem racks, and more.

[...]

SNMP is a component of the Internet Protocol Suite as defined by the Internet Engineering Task Force (IETF). It consists of **a set of standards for network management**, including an **application layer protocol**, a database schema, and a set of data objects.

- SNMP uses an extensible design, where the available information is defined by **management information bases** (MIBs). MIBs describe the structure of the management data of a device subsystem; they use a hierarchical **namespace** containing **object identifiers** (OID). Each OID identifies a variable that can be read or set via SNMP. MIBs use the notation defined by **ASN.1**.

à [http://en.wikipedia.org/wiki/Simple\\_Network\\_Management\\_Protocol](http://en.wikipedia.org/wiki/Simple_Network_Management_Protocol)



## z/VSE V4.3 – SNMP Monitoring Agent support (2)

### § Management Information Base (MIB)

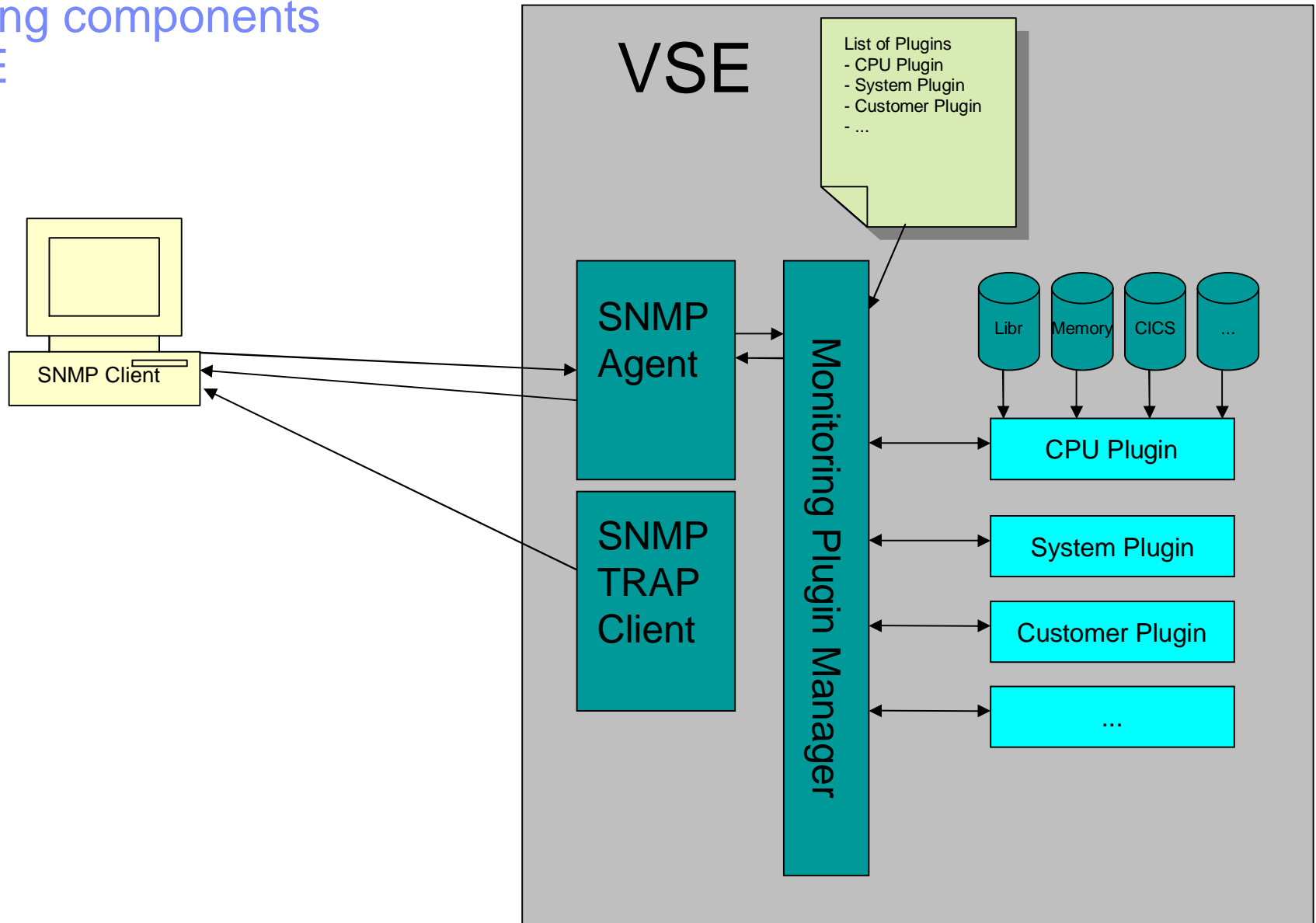
- SNMP itself does not define which information (which variables) a managed system should offer
- Rather, SNMP uses an **extensible design**, where the available information is defined by **management information bases (MIBs)**.
- MIBs describe the structure of the management data of a device subsystem
  - They use a hierarchical namespace containing **object identifiers (OID)**.
  - Each OID identifies a variable (e.g. a performance counter) that can be read or set via SNMP.

### § SNMP V1 Protocol

- **Get**                    Get the value of an object identified by its OID
- **GetNext**            Get the value of the next object identified by an OID
- **Set**                    Set the value of an object identified by its OID (not used by z/VSE)
- **Trap**                  Asynchronous notification about something (an event)

à [http://en.wikipedia.org/wiki/Simple\\_Network\\_Management\\_Protocol](http://en.wikipedia.org/wiki/Simple_Network_Management_Protocol)

# Monitoring components in z/VSE



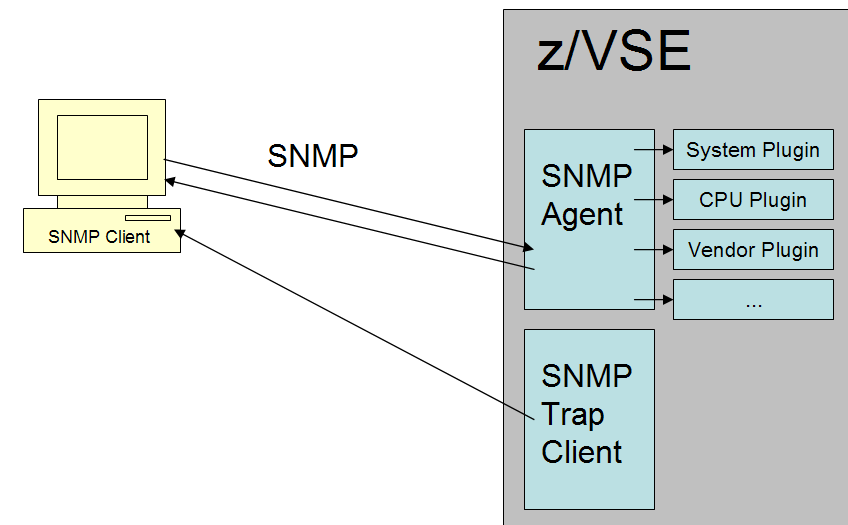
## z/VSE V4.3 – SNMP Monitoring Agent support

### § z/VSE Monitoring Agent enables customers to monitor z/VSE systems using standard monitoring interfaces (SNMP V1)

- It also includes an open interface, which enables customers or vendors to use own programs (plugins) to collect additional data

### § Data collected by the IBM provided plugins contains

- Information about the environment (e.g. Processor, LPAR and z/VM information)
- Number of partitions (static, dynamic, total, maximum)
- Partition priorities
- Number of CPUs (active, stopped, quiced)
- Paging (page ins, page outs)
- Performance counters overall and per CPU
- CPU address and status
- CPU time, NP time, spin time, allbound time
- Number of SVCs and dispatcher cycles



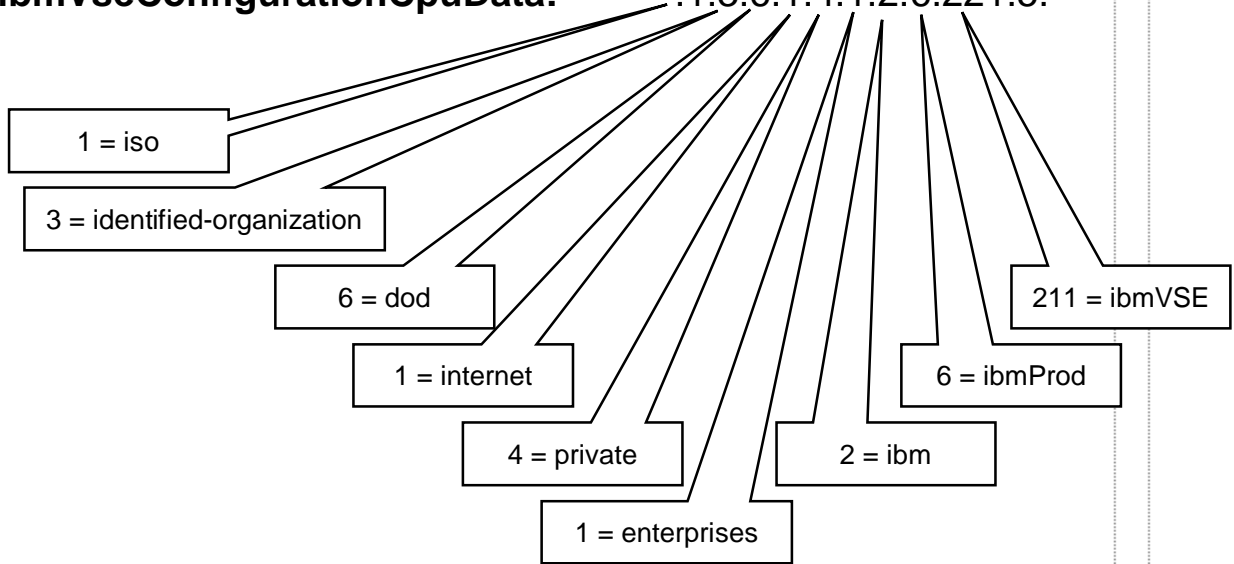


# z/VSE V4.3 – SNMP Monitoring Agent support

§ A **MIB** (Measurement Information Base) is provided describing the data collected

à IESMPMIB.Z in PRD1.BASE (plain text member)

- ibmVSE:** .1.3.6.1.4.1.2.6.221
- ibmVseConformanceGroup:** .1.3.6.1.4.1.2.6.221.1.\*
- ibmVseConfigurationStatic:** .1.3.6.1.4.1.2.6.221.2.\*
- ibmVseConfigurationDynamic:** .1.3.6.1.4.1.2.6.221.3.\*
- ibmVseConfigurationPerformance:** .1.3.6.1.4.1.2.6.221.4.\*
- ibmVseConfigurationCpuData:** .1.3.6.1.4.1.2.6.221.5.\*



MIB Browser tree structure:

- root
  - ccitt
  - iso
    - standard
    - registration-authority
    - member-body
    - identified-organization
      - dod
        - internet
          - mgmt
          - private
            - enterprises
              - sun
              - cisco
              - ibm
                - ibmArchitecture
                - ibmProd
                  - ibmVSE
                    - ibmVseConfigurationStatic
                      - ibmVseUnderVM
                      - ibmVseVMGuestName
                      - ibmVseVMCPName
                      - ibmVseLPARNumber
                      - ibmVseMaxPartitions
                      - ibmVseVMGuestLevel
                      - ibmVseProcessor
                      - ibmVseLPARName
                      - ibmVseInLPAR
                    - ibmVseSystemPerformance
                      - ibmVseNumPageINs
                      - ibmVseLastResetTime
                      - ibmVseTotalDispatcherCycles
                      - ibmVseTotalNPTime
                      - ibmVseTotalAllboundTime
                      - ibmVseNumPageOUTs
                      - ibmVseTotalCPUTime
                      - ibmVseNumSVCs
                      - ibmVseTotalSpinTime
                    - ibmVseConformanceGroup



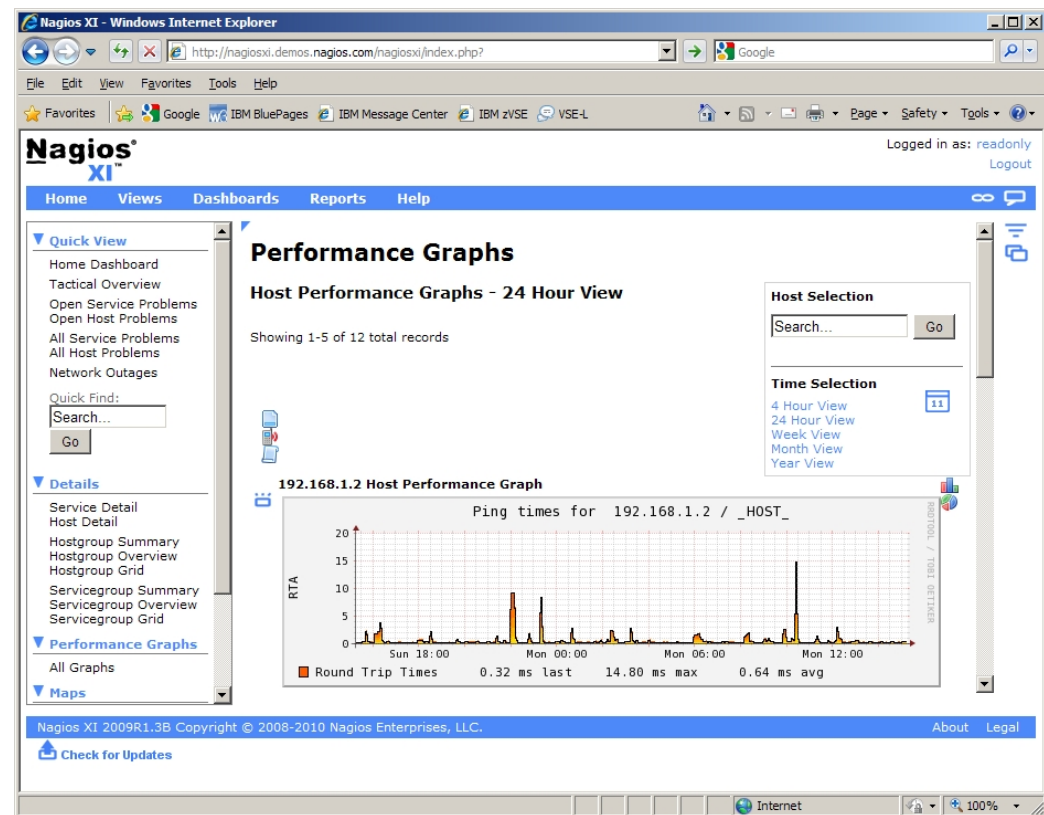
## z/VSE V4.3 – SNMP Monitoring Agent support

### § Standard **SNMP based monitoring tools** can be used to collect, display and analyze z/VSE performance monitoring data

- e.g. ITM (IBM Tivoli Monitoring), Velocity monitoring, Nagios ([www.nagios.org](http://www.nagios.org))

### § z/VSE **SNMP Trap client**

- Sends **SNMP V1 traps** to inform one or more monitoring stations or servers about **important events**
- For example:
  - The end of a job stream is reached.
  - An error has occurred during a job stream



## z/VSE V4.3 – SNMP Monitoring Agent support - Setup

**To setup the z/VSE Monitoring Agent you have to do the following steps:**

### **1. Create the configuration files**

- Use skeletons IESMASCF and SKMASCFG (ICCF library 59) to create the z/VSE Monitoring Agent configuration file
- If you want to use the System Plugin, use the skeletons IESMPSCF and SKMPSCFG (ICCF library 59) to create the System Plugin configuration file

### **2. Create the startup job**

- Use skeletons SKSTMAS (ICCF library 59) to create a z/VSE Monitoring Agent startup job

### **3. Download the MIB (IESMPMIB.Z in PRD1.BASE) from your z/VSE system to be able to use it with your SNMP client**

### **1. Start the z/VSE Monitoring Agent (using the startup job), e.g. R RDR,STARTMAS**

## z/VSE V4.3 – SNMP Monitoring Agent support – Setup

### Monitoring Agent configuration file:

```
* ***** *  
* CONFIG FILE FOR z/VSE SNMP MONITORING AGENT *  
* ***** *  
* SNMP COMMUNITY NAME:  
COMMUNITYNAME = 'public'  
* PORT (default SNMP Port 161):  
PORT = '161'  
* SYSTEM PLUGIN  
PLUGIN = 'IESMPSYS'  
PARAM = 'DD:PRD2.CONFIG(IESMPSCF.Z)'  
* CPU PLUGIN  
PLUGIN = 'IESMPCPU'  
* SAMPLE PLUGIN  
* THE SAMPLE PLUGIN IS SHIPED AS SOURCE CODE, YOU  
* HAVE TO COMPILE IT, IF YOU WANT TO USE IT  
* PLUGIN = 'IESMPSMP'
```

COMMUNITYNAME  
must match on client  
and server

Location of the  
System Plugin  
config file

“\*” is used for  
comments

## z/VSE V4.3 – SNMP Monitoring Agent support – Setup

### System Plugin configuration file:

```
* ***** *  
* CONFIG FILE FOR MONITORING PLUGIN IESMPSYS *  
* ***** *  
* ENTER CONTACT INFORMATION AND LOCATION HERE  
CONTACT = 'Joe Tester'  
LOCATION = 'Colorado'  
* THE SYSTEM NAME AND DESCRIPTION ARE OPTIONAL  
*DESC = 'z/VSE TEST SYSTEM'  
*SYSNAME = 'VSETestSystem'
```



Enter your  
information  
here

## z/VSE V4.3 – SNMP Monitoring Agent support – Setup

### Startup job for the Monitoring Agent:

```

* $$ JOB JNM=STARTMAS,DISP=L,CLASS=R
// JOB STARTMAS STARTS THE SNMP MONITORING AGENT
* ***** *
* This Job starts the SNMP MONITORING AGENT. *
* Please change the ID and the SYSPARM card if necessary *
* ***** *
// ID USER=VCSRVR,PWD=VCSRVR
// LIBDEF *,SEARCH=(PRD2.CONFIG,PRD1.BASE,PRD2.SCEEBASE)
// OPTION SYSPARM='00'
// EXEC IESMASNM,PARM='DD:PRD2.CONFIG(IESMASCF.Z)'
/*
/&
* $$ EOJ

```



Location of the  
z/VSE Monitoring  
Agent Config File

## z/VSE V4.3 – SNMP Monitoring Agent support – Usage

### Operating Monitoring Agent:

To get status information from the z/VSE Monitoring Agent, enter at the z/VSE console

```
msg <jobname>,data=status
```

#### Sample output:

```
AR 0015 1I40I READY
R1 0045 IESMA118I AGENT STATUS:
R1 0045 AGENT VERSION:          0004.3000
R1 0045 CONFIG MEMBER:         DD:PRD2.CONFIG(IESMASCF.Z)
R1 0045 PORT:                   161
R1 0045 COMMUNITY STRING:       public
R1 0045 RECEIVED REQUESTS:      5869313
R1 0045 WRONG COMMUNITY STRING: 0
R1 0045 WRONG SNMP VERSION:     0
R1 0045 ANSWERED REQUESTS:      5869313
R1 0045 IESMM002I MONITORING PLUGIN MANAGER STATUS:
R1 0045 MANAGER VERSION:        0004.3000
R1 0045 INSTALLED PLUGINS:       2
R1 0045 HANDLED OIDS:           34
R1 0045 HANDLED OID GROUPS:     1
```

#### Supported Commands:

|             |                                  |
|-------------|----------------------------------|
| HELP        | Displays help information        |
| STATUS      | Displays the server status       |
| RESETSTAT   | Reset statistics                 |
| LISTOIDS    | List all handled OIDs            |
| LISTOIDSDET | List all handled OIDs (detailed) |
| LISTPLUGINS | List all active plugins          |
| SHUT        | Ends the server                  |
| SHUTDOWN    | Ends the server                  |

# z/VSE V4.3 – SNMP Monitoring Agent support – Trap Client

## Send a Trap (see SKSTTRAP in ICCF library 59):

```

* *****
* SNMP TRAP CLIENT sample
* You can add one or more destinations.
* The ADDSYSINF parameter adds system information to
* trap packet.
* If you specify the HELP parameter you will find a
* detailed help and a list of all supported parameters
* in the job listing.
* A '*' marks lines as comments
* *****
// OPTION SYSPARM='00'
// EXEC IESMTRAP
DEST=192.168.1.55
DEST=myserver1:162
OID=1.2.3.4
MSG=This is a test
ADDSYSINF
/*
    
```

**Trap Details**

Community: public

Trap Type: 6

Specific Type: 0

TimeStamp: 4 days 18h:47m:23.77s

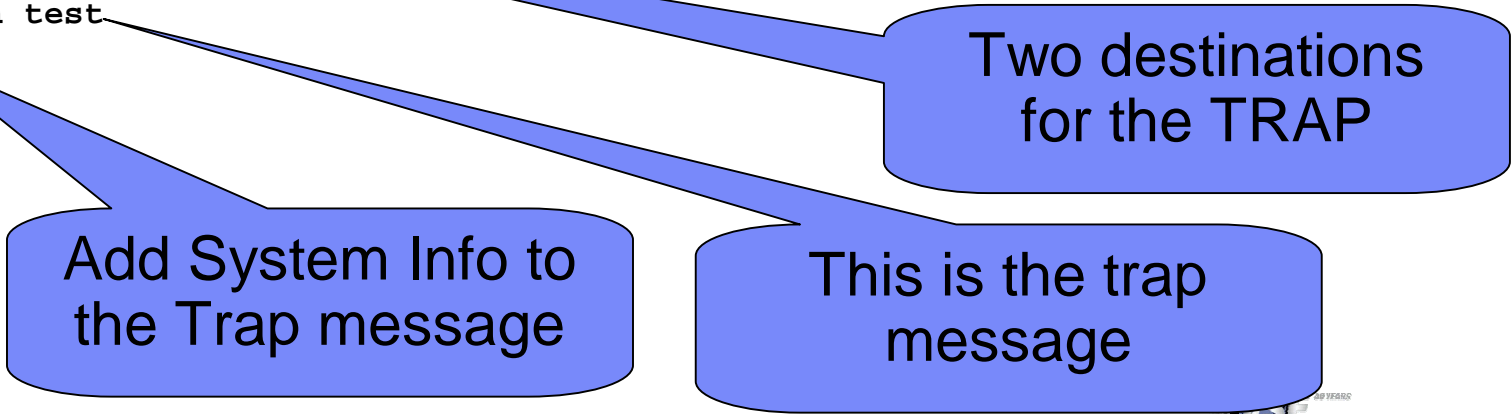
Ip Address: 9.152.84.155

Sender OID: 1.3.6.1.4.1.2.3.116

Trap Type: SNMPv1

| OID                       | Type   | Value                                   |
|---------------------------|--------|---|
| 1.2.3.4                   | String | This is a test                          |
| ibmVseConformanceGroup.16 | String | Tue Mar 22 10:02:53 2011                |
| sysDescr                  | String | z/VSE 4.3.0 (VSELP43) running in z/V... |

Buttons: Close, Show Raw, << prev, next >>





## Questions ?

