Accessing SDSF data using Rexx and Java

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Overview

With SDSF’s REXX and Java support, you can perform most of the tasks that you can perform interactively, such as:

- Display and modify jobs
- Display and modify resources and devices
- Browse SYSOUT data sets
- Print SYSOUT data sets

- REXX (added in z/OS 1.9) uses the same panel commands, action characters and column overtypes as with interactive SDSF
- Java (added in z/OS 1.12) ultimately uses a similar interface into SDSF but the programming interface is a collection of objects and methods which are more Java-friendly.

This presentation will discuss the REXX techniques first, since they more closely resemble the interactive commands, then discuss the equivalent function in Java
Getting Started with REXX

In a basic SDSF REXX exec, you:

1. Add the REXX host command environment; before issuing any SDSF commands, using **ISFCALLS**
   - Allows use of “Address SDSF” for commands
2. Issue an SDSF command to access a panel, using **ISFEXEC**
3. Issue an action character or “overtype” a column using **ISFACT**

- Data is returned in stem variables
- Use special variables to control results
  - These correspond to SDSF commands such as PREFIX and OWNER
Rexx Example – Cancel a Job

rc=isfcalls("ON")  Add host command environment

isfowner = “D96CLW1”
Address SDSF “ISFEXEC ST”  Access the ST panel

do ix=1 to JNAME.0  /* variable names same as FLD names */
if pos(“CHIP”,JNAME.ix) = 1 then  Find the job
    Address SDSF “ISFACT ST TOKEN(‘”TOKEN.ix”’) PARM(NP P)”
    [...] lines omitted [...]  Take an action on the job
end

rc=isfcalls("OFF")  Remove the host command environment (after closing the loop)
Getting Started with Java

• Update CLASSPATH environment variable to reference SDSF jar file:
  • export CLASSPATH=/usr/include/java_classes/isfjcall.jar:$CLASSPATH

• Update LIBPATH to reference SDSF DLL:
  • export LIBPATH=/usr/lib/java_runtime:$LIBPATH (31-bit)
  • export LIBPATH=/usr/lib/java_runtime64:$LIBPATH (64-bit)

• SDSF requires Java SDK V6
  • Either 31-bit or 64-bit mode
Getting Started with Java …

• Create a runner that corresponds to the panel you want to work with
  • A runner is a Java class that provides access to SDSF
  • Contains a results object describing completion of request
• Create request settings and associate it with runner
• Invoke SDSF to create a list of objects
• Process the returned objects and obtain column values for each row
• Invoke methods on a row object to retrieve information or modify the object
Example Java Application

```java
// Create optional settings object
ISFRequestSettings settings = new ISFRequestSettings();
settings.addISFOwner("D96CLW1"); // Set owner

// Get a runner used to access SDSF ST panel
ISFStatusRunner runner = new ISFStatusRunner(settings);

List<ISFStatus> statObjList = null;
statObjList = runner.exec();
// Missing exception handling – more on that later

// Cancel job
if (statObjList != null) {
    for (ISFStatus statObj : statObjList) {
        String jobname = statObj.getValue("jname");
        if (jobname.startsWith("CHIP")) {
            statObj.cancel();
        }
    }
}
```

Access the ST panel

Find the job

Take an action on the job
Accessing an SDSF Panel with REXX

- Use ISFEXEC to access a panel

- Syntax:
  Address SDSF "ISFEXEC sdsf-command ( options )"
  - *sdsf-command* is the same SDSF command as you use interactively, including parameters, for example:
    - Address SDSF “ISFEXEC DA”
    - Address SDSF “ISFEXEC CK ALL”

- DA command
- CK command with the ALL parameter
Java Runners and Settings

- A runner provides access to SDSF similar to SDSF commands
  - Choose the runner corresponding to the panel you want to access
    - ISFStatusRunner – ST (status panel)
    - ISFOutputRunner – O (output panel)
    - ISFHealthCheckRunner – CK (health checks)
    - etc.
    - ISFRunner – slash command, WHO, QUERY
  
- Complete cross reference of runners to panels contained in the Javadoc
Accessing an SDSF Panel with Java

• Create a runner for the panel
  • Each panel has a different one, for example:
    • ISFStatusRunner for ST
    • ISFHealthCheckRunner for CK
    • Etc.

• Execute the runner using exec() method
  • Output is a list of objects (Java.util.List)
    • ISFStatus for ST
    • ISFHealthCheck for CK

```java
ISFStatusRunner runner = new ISFStatusRunner();
List<ISFStatus> statObjList = null;
statObjList = runner.exec();
```

ST command example
Accessing an SDSF Panel – Options (REXX)

Options you can use when accessing a panel with ISFEXEC or ISFACT:

- **PREFIX**: specify a prefix for column variables that are created
- **PRIMARY**: use the primary field list
- **ALTERNATE**: use the alternate field list
- **DELAYED**: include delayed-access columns
- **NOMODIFY**: don’t return row tokens for use in modifying values
- **VERBOSE**: add diagnostic messages to the isfmsg2. stem variable (more on this later)
Accessing an SDSF Panel – Options (Java)

Options are specified within a ISFRequestSettings object, via specific methods for each

- `settings.addPrimary()`: use the primary field list
- `settings.addAlternate()`: use the alternate field list
- `settings.addDelayed()`: include delayed-access columns
- `settings.addNoModify()`: don’t return row tokens for use in modifying values
- `settings.addVerbose()`: add diagnostic messages to the ISFRequestResults object (more on this later)
Special Variables to Control SDSF

- Special variables for use with SDSF REXX
  - Defined by SDSF
  - Some correspond to SDSF commands
  - Others provide access to fields or data, such as the title line on an SDSF panel
    - Some input only, some output only, some both
  - Names start with “ISF”
Special Variables – Input

- Special variables with panel commands:
  - Limit the response when accessing a panel
  - Use before invoking ISFEXEC or ISFACT
- Examples
  - `isfprefix=*` corresponds to the command `PREFIX *`
  - `isfowner=ken` corresponds to the command `OWNER KEN`
  - `isffilter="j prio gt 5"` corresponds to the command `FILTER PRTY GT 5`
  - `isfcols="JNAME JOBID OWNERID ACTSYS"` limits the column variables created
  - `isfsort = "TGNUM D"` corresponds to the command `SORT TGNUM D`
Java Runners and Settings ...

• Settings are used to qualify the request
  • Job name prefix, owner, destination
  • Most settings correspond to SDSF commands
  • Limit the column values retrieved

• Represented by ISFRequestSettings class
  • Create an instance of settings and associate it with runner
  • Various addISFxxxx methods to add a setting to the object

```java
settings.addISFPrefix("**");
settings.addISFOwner("ibmuser");
settings.addISFCols("jname jobid");
```
Java Runners and Settings …

// Create optional settings object
ISFRequestSettings settings = new ISFRequestSettings();

settings.addISFPrefix("***");  // Corresponds to PREFIX ** command
settings.addISFOwner("ibmuser");  // Corresponds to OWNER IBMUSER command
settings.addISFCols("jname jobid");  // Requests just the JOBNAME and JobID columns

// Get a runner used to access SDSF ST panel using settings
ISFStatusRunner runner = new ISFStatusRunner(settings);

Note that both Rexx and Java use column names rather than column titles for sorting and filtering. See COLSHELP to see the relationship between names and titles.
## Special variables and settings (input)

<table>
<thead>
<tr>
<th>Interactive</th>
<th>Rexx</th>
<th>Java</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET PREFIX *</td>
<td>isfprefix = ‘*’</td>
<td>settings.addISFPrefix(“*”)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings.removeISFPrefix()</td>
</tr>
<tr>
<td>SET OWNER D96CLW1</td>
<td>isfowner = ‘D96CLW1’</td>
<td>settings.addISFOwner(“D96CLW1”)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings.removeISFOwner()</td>
</tr>
<tr>
<td>FILTER JPRIO GT 5</td>
<td>isffilter = ‘j prio gt 5’</td>
<td>settings.addISFFilter(“j prio gt 5”)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings.removeISFFilter()</td>
</tr>
<tr>
<td>SORT TGNUM D</td>
<td>isfsort = ‘t gnum d’</td>
<td>settings.addISFSort(“t gnum d”)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings.removeISFSort()</td>
</tr>
<tr>
<td>n/a (limit number of data rows returned)</td>
<td>isflinelim = 1000</td>
<td>settings.setResponseLimit(1000)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings.removeResponseLimit()</td>
</tr>
<tr>
<td>n/a (limit columns returned)</td>
<td>isfcols = ‘j name jobid’</td>
<td>settings.addISFCols(“j name jobid”)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings.removeISFCols()</td>
</tr>
<tr>
<td>s.server(SDSF)</td>
<td>isfserver = ‘SDSF’</td>
<td>settings.addISFServer(“SDSF”)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings.removeISFServer()</td>
</tr>
</tbody>
</table>

... and lots more
Accessing an SDSF Panel – Data (Rexx)

- SDSF builds stem variables/objects that correspond to the panel’s rows and columns
  - *column-name.index* format
    - *column-name* is the name used on an FLDENT statement (not the column title), for example:
      FLDENT COLUMN(OWNERID),TITLE(OWNER),WIDTH(8)
    - *index* is the number of the row
      - 0 index is the number of variables in the stem

- Display the column names with the COLSHELP command
Stem Variables for Panel Data - Example

REXX Stem variables and values for columns on the Status panel:

JNAME.0=2
JNAME.1=KENA
JNAME.2=BOBB
OWNERID.0=2
OWNERID.1=KEN
OWNERID.2=BOB
... and so on

Count of job name variables
Job name for row 1
Job name for row 2
Count of owner variables
Working with Row Objects in Java

- SDSF creates one object per row
  - Column values are contained within the object
  - Use getValue() method to retrieve a column value
    - Use the SDSF column name (FLD name), not the column title
      - `String jobname=statObj.getValue("jname")`
      - `String owner=statObj.getValue("ownerid")`
  - Use getFixedField() method for fixed field
    - `String fixedField=statObj.getFixedField();`
  - Convenience methods exist for certain columns
    - `String jobname=statObj.getJName();`
Working with Objects ...

... statObjList = runner.exec(); ...

for (ISFStatus statObj : statObjList) {
    String jobname = statObj.getValue("jname")
    or String jobname = statObj.getJName();

    System.out.println(statObj);
    System.out.println(statObj.toVerboseString());
}

Get job name
Get job name
Print short form of row properties
Print short form of row properties
Print all properties for row
Print all properties for row
Special Variables – Output

- Return data not associated with a particular row
- Examples
  - isftline – title line
  - isfrows – number of rows returned
  - isfcols – list of columns returned
  - isfmsg – short message
  - isfmsg2. (stem variable) – detailed message information
  - isfulog. (stem variable) – contents of user log (ULOG)
Request Results (Java)

• The runner references an ISFRequestResults object that is updated after each request
  • Contains messages describing completion of request
  • Return and reason codes
  • List of columns returned
  • Convenience methods to print messages
• Always check the results after each request
  • ISFRequestResults results = runner.getRequestResults();
  • string = results.getTitleLine()
  • string = results.getColumnNames()
  • results.printMessageList(print stream)
Rexx error handling

Should also check the return code from the SDSF command, for example: if rc<>0 then …

Return codes for ISFEXEC and ISFACT:

- **00** The request completed successfully.
- **08** An incorrect or invalid parameter was specified for an option or command.
- **12** A syntax error occurred parsing a host environment command.
- **16** The user is not authorized to invoke SDSF.
- **20** A request failed due to an environmental error.
- **24** A request failed due to an environmental error.
Rexx Message Variables

• Message variables contain SDSF messages
  • `isfmsg` contains the SDSF short message (displayed in the upper right corner on an SDSF panel)
  • `isfmsg2.` stem contains the SDSF numbered messages
  • `isfulog. ` stem is for the user log (ULOG)

• Check after each SDSF request to ensure the request was successful
Java error handling

• Invocation of the exec() method on a runner can cause an exception, so those exceptions need to be handled
  • Exceptions generally represent a non-zero return code from SDSF

```java
try {
    statObjList = runner.exec();
} catch (ISFException ie) {
    ie.printStackTrace();
    System.out.println(ie.toVerboseString());
    System.out.println(ie.getMessage());
    System.out.println(ie.getRequestResults().getMessageList());
}
```

Access the panel

Handle exception

Issue any messages that were generated
Message Variables Example with Slash

Address SDSF “ISFEXEC ‘/da’ (WAIT)”

if isfmsg<> “” then
  Say “isfmsg is:” isfmsg
  do ix=1 to isfmsg2.0
    Say “isfmsg2.”ix “is:” isfmsg2.ix
  end
end

Check for a short message

Check for a numbered message. The 0 stem contains a count of the numbered messages.

Check the ULOG

Issue the w/da command with WAIT option

Issue the w/da command with WAIT option

Check for a short message

Check for a numbered message. The 0 stem contains a count of the numbered messages.

Check the ULOG
ISFSLASH Command

• Simplifies issuing system commands

• Similar to ISFEXEC, but:
  • Multiple commands can be entered on same invocation
  • Use either a stem variable or list of commands
  • All responses come back together in isfulog stem variables

• Syntax:
  • Address SDSF “ISFSLASH (stemname) | command-list (options)”
ISFSLASH Command Syntax

- Address SDSF “ISFSLASH (stemname) | command-list (options)”

  - *stemname* names a stem variable containing the commands to be issued
    - *stemname.0* contains the count of variables that follow

  - *command-list* is a list of one or more commands to issue

- *isfcmdlim* special variable
  - Specifies a command limit to prevent excessive number of commands from being issued.
  - Default is no limit
Using ISFSLASH to Issue Multiple Commands

```
rc=isfcalls("ON")  Add the host command environment

cmd.0=2            Add commands to the stem variable
cmd.1="$da"
cmd.2="$dq"

Address SDSF "ISFSLASH (cmd.) (WAIT)"

do ix=1 to isfulog.0  Display messages from ULOG
    say "isfulog."ix "is:" isfulog.ix
end

rc=isfcalls("OFF")  Remove the host command environment
```
**ULOG Variables Example - Results**

<table>
<thead>
<tr>
<th>isfulog.1</th>
<th>Date</th>
<th>Time</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>isfulog.1</td>
<td>SY1</td>
<td>2009061</td>
<td>12:47:58.49 ISF031I CONSOLE KJONAS</td>
</tr>
<tr>
<td>isfulog.2</td>
<td>SY1</td>
<td>2009061</td>
<td>12:47:58.49 -$da</td>
</tr>
<tr>
<td>isfulog.3</td>
<td>SY1</td>
<td>2009061</td>
<td>12:47:58.49 J00000032 $HASP890 JOB(KJONASR)</td>
</tr>
<tr>
<td>isfulog.4</td>
<td></td>
<td></td>
<td>$HASP890 JOB(KJONASR)</td>
</tr>
<tr>
<td>isfulog.5</td>
<td></td>
<td></td>
<td>$HASP890</td>
</tr>
<tr>
<td>isfulog.6</td>
<td>SY1</td>
<td>2009061</td>
<td>12:47:58.50 -$dq</td>
</tr>
<tr>
<td>isfulog.7</td>
<td>SY1</td>
<td>2009061</td>
<td>12:47:58.50 $HASP643 10 PPU LO</td>
</tr>
<tr>
<td>isfulog.8</td>
<td>SY1</td>
<td>2009061</td>
<td>12:47:58.54 $HASP646 24.0000 PERCE</td>
</tr>
</tbody>
</table>
MVS Commands from Java

• Can issue one or more MVS commands

• Use ISFRunner with system method
  • Takes an array of string commands

  ```java
  String[] commands = new String[] {"$da","$dq"};
  runner.system(commands)
  ```

• Get ISFRequestResults object using getRequestResults()
• Get command responses using
  • results.getResponseList() or
  • results.printResponseList(print stream)
Actions and Overtypes (Rexx)

- Use the ISFACT command to issue an action character or modify a value (overtype a column)

- Syntax:

  Address SDSF “ISFACT SDSF-command TOKEN((stemname) | token.1, token.2, … , token.n) PARM(parms) (options)”

- **SDSF-command** is the same SDSF command you used with ISFEXEC to access the panel
Actions and Overtypes - continued

TOKEN(*stemname*) is the name of stem variable containing row tokens
- Name is enclosed in parentheses
- *stemname*.0 contains the count of variables that follow
- A stem variable can be null to skip a row

- TOKEN(*token.1, token.2, … token.n*) is a list of row tokens

PARM(*parms*)
- Describes the action or modification
  - PARM(OCLASS A FORMS 1234)
  - PARM(NP C)

- Change both class & forms
- Use NP for action characters
Example - Change Output Forms

```
isfprefix="***"
isfowner="RJONES"
Address SDSF "ISFEXEC O"
  do ix=1 to JNAME.0
    if pos("BOB",JNAME.ix) = 1 then
      do
        Address SDSF "ISFACT O TOKEN('TOKEN.ix')"
        PARM(FORMS 1234)"
      end
    end
  end
```

- Set filters
- Access O panel to set variables
- Find a row with job name BOB
- Change forms
- Use the token for that row to identify it, enclosing it in single quotes

Access O panel to set variables
Find a row with job name BOB
Set filters
Change forms
Use the token for that row to identify it, enclosing it in single quotes
Actions (Java)

- You can modify an object similar to an action character
- Rows are represented by objects, lists of which are retrieved by executing runners
- Actions are represented by methods
  - Available actions defined in the interface for the object
    - See the Javadoc for com.ibm.zos.sdsf.core
  - For example:
    - ISFStatus.cancel()
    - ISFInitiator.start()
    - ISFHealthCheck.activate()
    - etc.
Overtypes (Java)

- You can modify an object similar to an overtype
  - Use the requestPropertyChange method
  - Method takes two input arrays:
    - Column name array
    - Column value array

- Each column in the name array is changed to the corresponding value in the value array
Overtypes (Java) …

// Change job class to class A

// Build column name array
String[ ] propName = { "jclass" };

// Build column value array
String[ ] propValue = { "a" };

// Change the job class
statObj.requestPropertyChange(propName, propValue);
Browse Job Data Sets (Rexx)

- Use ISFACT to issue the SA action character against a job
  - Allocates the data set (free=close)
  - SA action is not allowed interactively

- Allocated ddname is returned in `isfddname`. stem variable

- Data set name is in `isfdsname`. stem variable

- Use EXECIO to read the data set
Example: Browse Job Data Sets

Address SDSF “ISFEXEC ST”
…
Address SDSF “ISFACT ST TOKEN(‘”TOKEN.ix”’) PARM(NP SA)”

do jx=1 to isfddname.0
  Say "Now reading" isfdsname.jx
  "EXECIO * DISKR" isfddname.jx "(STEM line. FINIS"
  Say “Lines read” line.0
  do kx=1 to line.0
    Say "  line."kx "is:" line.kx
  end
end
Browse Job Data Sets (Java)

- Use `results.getAllocationList()` method to obtain an array of allocated DD names
  - Allocates the data sets (free=close)

- Use `ZFile.read()` method to read the data set

- See `ISFBrowseSample.java` for an example
SDSF/Rexx SYSLOG/OPERLOG

• Syntax of ISFLOG command:
  • **ISFLOG ALLOCATE**
    • Returns isfddname. stem variable, similar to data set browsing
    • Use EXECIO to read data
    • SYSLOG only (no OPERLOG)

• **ISFLOG READ TYPE(SYSLOG | OPERLOG)**
  • Can read either SYSLOG or OPERLOG
  • Data returned in isfline. stem variable
Java SYSLOG/OPERLOG

- Create ISFLogRunner object

- Allocate using runner.browseAllocate()
  - Similar to browsing data sets

  OR

- Get lines using runner.readSyslog() or runner.readOperlog()
  - results.getResponseList() retrieves array of lines
ISFLOG Allocate Example

rc=isfcalls("on")

Address SDSF “ISFLOG ALLOCATE”
do ix=1 to isfddname.0
  "EXECIO 10 DISKR" isfddname.ix "(FINIS STEM log."
do jx=1 to log.0
    Say mid "log."jx "is:" log.jx
  end
end

rc=isfcalls("off")
ISFLOG Read Example

rc=isfcalls(“on”)

Address SDSF “ISFLOG READ”

do ix=1 to isfline.0
   Say mid "isfline."left(ix,5)"::" isfline.ix
end

rc=isfcalls(“off”)

Read the logical SYSLOG into the isfline. stem

Report the log data
ISFLOG Special Variables

- Used only by READ (not by ALLOCATE)
- Starting date and time
  - `isflogstarttime (hh:mm:ss.th) / settings.addLogStartTime`
    - Default is 00:00:00.00
  - `isflogstartdate (mm/dd/yy) / settings.addLogStartDate`
    - Default is current day
- Ending date and time
  - `isflogstoptime (hh:mm:ss.th) / settings.addLogStopTime`
    - Default is 23:59:59.59
  - `isflogstopdate (mm/dd/yy) / settings.addLogStopDate`
    - Default is current day
- `isfdate (specify date format) / settings.addISFDate`
ISFLOG Special Variables …

- `isflinelim / settings.addISFLinelim`
  - Specifies the maximum number of variables to be created
  - Default is no limit

- `isflinelim=10000 / settings.addISFLineLim(10000)`
  - Create a maximum of 10,000 variables
ISFLOG Read Example By Time/Date

rc=isfcalls(“on”)  

isfdate="mmddyyyy /"  
currday=date("C")  
currday=currday-1  /* yesterday */  
isflogstartdate=date("U",currday,"C")  /* yesterday in mm/dd/yy */  
isflogstarttime=time("N")  /* current time */  
isflogstopdate=date("U")  /* current date in mm/dd/yy */  
isflogstoptime=time("N")  /* current time */  

isflinelim=1000  

Address SDSF “ISFLOG READ TYPE(OPERLOG)”

Read the OPERLOG  
This example also works if you specify TYPE(SYSLOG)
ISFLOG Read Example By Time /Date

do ix=1 to isfline.0
   Say mid "isfline."left(ix,5)"." isfline.ix
end

rc=isfcalls(“off”)

Report the log data

Report any messages
Java LOG Read Example By Time/Date

// Get date formatters for the time and date
final Calendar calendar = Calendar.getInstance();
final SimpleDateFormat dateFormat = new SimpleDateFormat("MM/dd/yyyy");
final SimpleDateFormat timeFormat = new SimpleDateFormat("hh:mm:ss");

final Date today = calendar.getTime();
calendar.add(Calendar.DATE, -1);
final Date yesterday = calendar.getTime();

// Set the start and stop times to limit records obtained
ISFRequestSettings settings = new ISFRequestSettings();
settings.addISFLogStartTime(timeFormat.format(today));
settings.addISFLogStartDate(dateFormat.format(yesterday));
settings.addISFLogStopTime(timeFormat.format(today));
settings.addISFLogStopDate(dateFormat.format(today));
settings.addISFDate("mmddyyyy /");
settings.addISFLineLim(1000);
Java LOG Read Example By Time/Date

ISFLogRunner runner = new ISFLogRunner(settings);

// Read the system log
runner.readSyslog();

ISFRequestResults results = runner.getRequestResults();

results.printMessageList(System.err);

results.printResponseList(System.out);
Avoiding Duplicate Variable Names (Rexx)

• Use the **PREFIX** option on ISFEXEC and ISFACT to add a prefix to variable names created by SDSF

  • Prevents duplicate variable names in existing scripts

    ➢ Needed when accessing the job data set panel, so that column variables don’t conflict

• Format: (PREFIX *prefix*)

• **PREFIX** only applies to column variables, not to special ISF variables.
Example: Using the PREFIX Option

Address SDSF "ISFACT ST TOKEN('"TOKEN.ix"') PARM(NP '?') (PREFIX jds_)"

do jx=1 to jds_DDNAME.0
say "DSName is" jds_DSNAME.jx
Say "Stepname is" jds_STEPN.jx
Say "Procstep is" jds_PROCS.jx
end

Access JDS using NP ? and define a prefix for all JDS variables.

References to variables all include the prefix
isfreset() Function

- REXX function to drop SDSF special variables
- Useful when multiple invocations of SDSF in same exec
- Syntax:
  - \texttt{rc=isfreset(“ALL” | “INPUT” | “OUTPUT” | “INOUT”)}
  - Drops all special variables of the type given
  - ALL (default)
    - \texttt{rc=isfreset()} will drop all SDSF special variables

- Not dependent on isfcalls(), can be placed anywhere in exec

- Not as interesting in Java as each runner can have its own unique ISFRequestSettings and ISFRequestResults objects
  - \texttt{settings.reset()} and \texttt{results.reset()} to clear them
Using SDSF with SYSREXX

- SDSF REXX Support works with System REXX
- Need proper security environment to access SDSF
  - Logon from console to get security environment
  - Need access to all commands used by EXEC
- Need to specify ISFJESNAME or ISFSERVER
  - ISFSERVER defaults to ‘SDSF’
Security

- SDSF security applies to REXX and Java usage

- No changes to ISFPARMS or SAF

- IBM recommends SAF for security instead of ISFPARMS for better control and auditing
Security – Assigning a User to a Group

• SDSF assigns users to a group in ISFPARMS with:
  • SAF: checks resource
    \texttt{GROUP.	extit{group-name}.	extit{server-name}} in the SDSF class
  • ISFPARMS: Uses user ID, logon proc, etc. to determine which group to use
    – With REXX, special values are assigned as follows:
      • Logon proc name: Set to \texttt{REXX}
      • TSO authority: Set to JCL authority
      • Terminal name: Derived from SAF or TSO based on the current environment
Diagnosing Problems

- Check ISFMSG variables and ISFMSG2. stem variable, or results.printMessageList()
- Use the VERBOSE option on ISFEXEC and ISFACT (settings.addVerbose())
  - Issues a message for each variable that is set
  - Useful in diagnosing problems such as ‘why doesn’t my job name comparison work?’
- Example: Address SDSF “ISFEXEC DA (VERBOSE)”
  Results (in isfmsg2. stem variable):
  ISF146I REXX variable JOBID.1 set, return code 00000001 value is ‘J0000040’.
  ISF146I REXX variable OWNERID.1 set, return code 00000001 value is ‘RJONES’.
Diagnosing Problems (cont.)

- ISFDIAG variable/results.getDiagxxx methods
  - Intended for use by IBM Service
  - Contains internal reason codes for each request
  - You may be asked to employ it if you call IBM with a problem
COLSHELP

- Interactive command to relate column titles to column names
  - Column names (FLD name) are used anywhere in Rexx or Java a specific column is referenced, rather than column titles.
    - isffilter, isfsort, isfcols, ISFACT PARM(*column_value*)
    - addISFFilter(), addISFSort(), getValue(), requestPropertyChange()
  - For example, JNAME for JobName column

- Context sensitive
  - Lists only columns for the panel
  - COLSH on DA lists only DA columns
    - Option to display all values

- Locate command to locate start of panel entries
- Filter command to filter by panel, name, or description
# COLSHELP Example

Columns on SDSF Panels

Command ===>

Sort with F5 (panel), F6 (column), F10 (title). Use Filter to filter rows.

<table>
<thead>
<tr>
<th>Panel</th>
<th>Column</th>
<th>Title</th>
<th>Delayed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA</td>
<td>JNAME</td>
<td>JOBNAME</td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>STEPN</td>
<td>StepName</td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>PROC</td>
<td>ProcStep</td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>JTYPE</td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>JNUM</td>
<td>JNum</td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>JOBID</td>
<td>JobID</td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>OWNERID</td>
<td>Owner</td>
<td></td>
</tr>
</tbody>
</table>

Option to display columns from all panels

Sorting indicated by underscore

Columns for DA only
Java samples

- Sample Java scripts in **com.ibm.zos.sdsf.sample**
  - ISFBrowseSample
  - ISFChangeJobPrioritySample
  - ISFGetJobsSample
  - ISFHealthCheckSample
  - ISFSearchSyslogSample
  - ISFSlashCommandSample
  - ISFWhoCommandSample
Installing Javadoc

• Download isfjcallDoc.jar to your workstation (in binary)

• Unzip the file
  • jar –xf isfjcallDoc.jar

• You can now access the index.html file in your web browser and navigate the Javadoc that way.
  • All the documentation for SDSF Java constructs reside here.

• You may also be able to access context-sensitive help, depending on tools you use to develop Java (e.g. RSA)
Javadoc example (web browser)

This is the Java™ API specification for z/OS™ System Display and Search Facility (SDSF).

See:

- Description

Packages

| com.ibm.zos.sdsf.core | Contains classes for controlling interactions with SDSF. |
| com.ibm.zos.sdsf.sample | Contains examples of using the SDSF classes. |
Javadoc example (RSA)
References

- Issue the **REXXHELP** command while using SDSF under ISPF
- Issue the **SEARCH** command while using SDSF under ISPF

- All Java documentation can be found in the Javadoc.

- See *SDSF Operation and Customization*:

- SDSF Web page, which will include examples for use with ISPF’s MODEL command:

- Redbook!
  - Loaded with interesting examples and experiences
Title: Implementing REXX Support in SDSF, SG24-7419-00

http://www.redbooks.ibm.com/abstracts/sg247419.html

Abstract:

This IBM Redbooks publication describes the new support and provides sample REXX execs that exploit the new function and that perform real-world tasks related to operations, systems programming, system administration, and automation.
SDSF REXX Redbook - Topics

Chapter 1. Issuing a system command
Chapter 2. Copying SYSOUT to a PDS
Chapter 3. Bulk job update processor
Chapter 4. SDSF support for the COBOL language
Chapter 5. Searching for a message in SYSLOG
Chapter 6. Viewing SYSLOG
Chapter 7. Reviewing execution of a job
Chapter 8. Remote control from other systems
Chapter 9. JOB schedule and control
Chapter 10. SDSF data in graphics
Chapter 11. Extended uses
SDSF REXX Redbook - Examples

CPU % of Top 10 consumers

- LLA
- DARIO5
- SMSVSAM
- CONSOLE
- TCPIP
- *MASTER*
- PAUTH
- RASP
- TRACE
- DUMPERSV

Complete your sessions evaluation online at SHARE.org/AnaheimEval
SDSF REXX Redbook - Examples

CPU total % of utilization

Sample

CPU Usage

Average CPU
Summary

- **Rexx**
  - Use ISFCALLS to enable “Address SDSF”
  - Use ISFEXEC to access SDSF data
  - Use isfxxxx special variables to set up parameters
  - Use isfxxxx special variables to check results
  - Use stem variables to access row and column data
  - Use ISFACT TOKEN(token) PARM(xx) for actions and overtypes

- **Java**
  - Point CLASSPATH and LIBPATH to SDSF libraries
  - Use runners and exec() method to access SDSF data
  - Use ISFRequestSettings object to set up parameters
  - Use ISFRequestResults object to check results
  - Use list of row objects to access row and column data
  - Use methods on row objects for actions and overtypes