Note

Before using this information and the product it supports, read the information in "Notices" on page 15.
## Contents

### Reporting with the Analyzer
- Analyzer prerequisites ........................................... 1
- Analyzer JCLLIB and PARMLIB members ..................... 2
- Running the Analyzer in online mode ......................... 2
  - Analyzer communication port ................................ 3
  - Analyzer security ........................................... 4
  - Analyzer BASIC security .................................... 4
  - Analyzer SYSTEM security .................................. 5
- SSL Certificates .................................................. 6

### Analyzer prerequisites
- Online login to the Analyzer ................................ 9
- Controlling the Analyzer address space ..................... 11
- Running the Analyzer in batch mode ......................... 12
- Analyzer globalization support ............................... 13

### Notices
- Trademarks ..................................................... 16
Reporting with the Analyzer

The primary reporting facility in IBM® Tivoli® Asset Discovery for z/OS® is the Analyzer.

The Analyzer runs as a started task or batch job on the same z/OS host as the DB2® Subsystem or SQLite database that contains the Tivoli Asset Discovery for z/OS database(s).

The Analyzer has two modes:

Online mode
A PC Browser, for example Firefox, is used to communicate with the Analyzer for interactive queries.

Batch mode
This mode uses the Analyzer to generate the report to an output file. The Batch mode is useful when you want to automate reports or develop your own reports. Batch mode is also useful when you want to select multiple criteria, such as multiple libraries or multiple users which you cannot do online from some reports.

All Analyzer reports can be run in online and batch modes and can produce the following output formats:
- HTML (htm)
- Excel (Excel)
- Text line (txt)
- Comma Separated Value (csv)

Analyzer prerequisites

The Analyzer uses the DB2 Call Library Interface (ODBC/CLI), also used by the Inquisitor Import, Usage Import and other batch components, and the z/OS socket application programming interface. For the SQLite database, the Analyzer uses an internal ODBC interface.

There is no dependency on any other middleware components. For example, no dependency exists on the HTTP Server, WebSphere® Application Server, or Java™.

The Analyzer has been designed with minimal prerequisites. These are:
- The Analyzer must be run on the same z/OS host as the DB2 subsystem or SQLite database that contains the Tivoli Asset Discovery for z/OS repositories.
- The user ID of the Analyzer address space must have previously been granted access to the databases. See the HSISGRNT job in the JCLLIB for sample JCL to grant access.
- When running the Analyzer in the online mode, you need access to a TCP/IP port. The default is port 9000.
- When running the Analyzer in online mode with SECURITY=SYSTEM, the Analyzer SHSIMOD1 load library must be defined to the z/OS Authorized Program Facility (APF). In addition, all data sets in the Analyzer STEPLIB, or JOBLIB DD concatenation, must be defined to APF.
You can run the Analyzer in online mode while Inquisitor Import or Usage Import is also updating data into the repositories. However, the Analyzer reports may not display the correct information on the latest updates due to concurrency issues in DB2. To ensure that the latest correct information are displayed, do not run operational jobs that update data in the repositories while users are running reports with the Analyzer. For the SQLite database, this is not an issue as only single thread is allowed.

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**Analyzer JCLLIB and PARMLIB members**

Several JCLLIB and PARMLIB members are used when you run the Analyzer to generate reports.

The members in the JCLLIB contain sample JCL to run the Analyzer.

*Table 1. JCLLIB members for Analyzer*

<table>
<thead>
<tr>
<th>Member</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSIJANLO</td>
<td>Analyzer PROC for online mode. Copy this PROC from the JCLLIB to a system PROCLIB data set to run the Analyzer as a started task</td>
</tr>
<tr>
<td>HSISANLB</td>
<td>Analyzer batch job for batch mode</td>
</tr>
<tr>
<td>HSISANLO</td>
<td>Analyzer batch job for online mode</td>
</tr>
<tr>
<td>HSISANS1</td>
<td>Define the Analyzer security profiles in RACF (only applicable for Analyzer SECURITY=SYSTEM setting)</td>
</tr>
<tr>
<td>HSISANS2</td>
<td>Generate the Analyzer SSL certificate in RACF (only applicable for Analyzer SECURITY=SYSTEM setting)</td>
</tr>
<tr>
<td>HSISANS3</td>
<td>Connect the Analyzer user ID to an existing SSL certificate in RACF (only applicable for Analyzer SECURITY=SYSTEM setting)</td>
</tr>
</tbody>
</table>

The following members in the PARMLIB contain sample configuration settings for the Analyzer in online mode. These members are referenced with the TPARAM setting in the HSIJANLO PROC.

*Table 2. PARMLIB members for Analyzer*

<table>
<thead>
<tr>
<th>Member</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSISANP1</td>
<td>SECURITY=BASIC HTTP communications with basic security</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>HSISANP2</td>
<td>SECURITY=SYSTEM HTTPS (SSL encrypted) communications with z/OS system security (SAF/RACF). Refer to members HSISANS1/2/3 in JCLLIB for sample JCL to define RACF profiles/certificates</td>
</tr>
</tbody>
</table>

---

**Running the Analyzer in online mode**

The primary reporting facility in Tivoli Asset Discovery for z/OS is the Analyzer. You can use the Analyzer in online mode to view reports, run queries, and drill down to related reports.
About this task

HSISANLO job in the JCLLIB is used to run Analyzer in online mode as a batch job.

//HSISANLO EXEC HSJANLO, TPARAM=HSISANP1

To run the Analyzer in online mode as a Started Task, copy the HSJANLO from the JCLLIB to a system PROCLIB data set.

//HSIJANLO PROC HSI='TADZ.V750', TADz Target library HLQ.
// HSISCLI='HSISCLI', DB2 CLIParms
// TPARAM='HSISANP1' TPARAM input parms
//*
//ANALYZER EXEC PGM=HSICANLZ, REGION=0M, TIME=NOLIMIT
// STEPLIB DD DISP=SHR, DSN= &HSI..SHSIMOD1
// DD DISP=SHR, DSN= &DB2EXIT
// DD DISP=SHR, DSN= &DB2LOAD
// SYSPRINT DD SYSOUT=*, HOLD=YES, LRECL=500
// HSIANL1 DD DISP=SHR, DSN= &HSI..SHSIANL1
// HSIANL2 DD DISP=SHR, DSN= &HSI..SHSIANL2
// DSNAONI DD DISP=SHR, DSN= &HSIINST..PARMLIB(&HSISCLI)
// HSICUST DD DISP=SHR, DSN= &HSIINST..PARMLIB(HSISANCQ)
// +HSINLS DD DISP=SHR, DSN= &HSI..SHSIANL1(HSINLSJP)
// TPARAM DD DISP=SHR, DSN= &HSIINST..PARMLIB(&TPARAM)

When the Analyzer is run with online mode, configuration options must be defined in the TPARAM DD, including the communication port and security mode.

Analyzer communication port

About this task

The Analyzer communication port is defined by using the HTTPPORT setting. Both sample PARMLIB members HSISANP1 (basic security), and HSISANP2 (system security), have the following:

***********************************************************************
* HTTPPORT defines the TCP/IP port used for communications.            *
* *                                                             *
* If HTTPPORT = 9000 is defined on a system with a TCP/IP host        *
* called sys1.mycompany.com, to access the TADz Analyzer the user      *
* would specify the following URL in their PC Browser:                *
*  http://sys1.mycompany.com:9000 if SECURITY=BASIC                 *
*  or https://sys1.mycompany.com:9000 if SECURITY=SYSTEM              *
*                                                             *
* The port specified must be available on your system.                *
*                                                             *
* TSO NETSTAT can be used to check if a port is available e.g.:        *
* TSO NETSTAT (PORT 9000) --- is port 9000 in use?                    *
* TSO NETSTAT PORTL(PORT 9000) --- is port 9000 reserved?             *
*                                                             *
* If no entries are returned from these NETSTAT commands, the port     *
* is most probably available. At some sites, you may need your        *
* Network Systems Programmer to reserve a port for TADz Analyzer.      *
*                                                             *
***********************************************************************

HTTPPORT = 9000

If HTTPPORT is not specified, or is set to 0, the Analyzer runs in batch mode instead of in online mode.
Analyzer security

You can view Analyzer reports in a web browser, such as Firefox, and you can communicate with the Analyzer utility to perform interactive queries.

Some of the Analyzer reports contain a large amount of information and it is recommended that you use a screen resolution of at least 1440 x 900 pixels to view them.

The following table describes the security modes that you can configure for accessing Analyzer online.

<table>
<thead>
<tr>
<th>Security configuration</th>
<th>Communication mode</th>
<th>Access ID and password</th>
<th>Access permissions</th>
</tr>
</thead>
</table>
| SECURITY=BASIC         | HTTP              | Standard user ID and password. Default values are:  
- User: tadzusr and password TADZ  
- Admin: tadzadm and password TADZ | User ID tadzusr has limited access and user ID tadzadm has full access |
| SECURITY=SYSTEM        | HTTPS             | z/OS system user ID and password  
Default: User TSO ID and password | Depends on access given to TSO ID |

Analyzer BASIC security

HSISANP1 in the PARMLIB defines basic user ID security settings for running the Analyzer.

User IDs TADZADM and TADZUSR can be used without any prior configuration. User ID AUDD001 is a sample of how to restrict a user ID to certain databases.

***********************************************************************
* SECURITY=BASIC - HTTP communications *
* with basic security defined in TPARAM DD *
* Dependencies: *
***********************************************************************

SECURITY = BASIC

***********************************************************************
* The following settings are only applicable for SECURITY=BASIC: *
* AUTH_USER defines Userids and passwords for Analyzer logon *
* AUTH_DB defines the databases access *
* AUTH_MENU defines the menus access *
* The sample settings profile: *
* - TADZADM userid: *
* - Password TADZ *
* - Access to all databases *
* - Access to all menu tabs *
* - TADZUSR userid: *
* - Password TADZ *
* - Access to all databases *
* - Access to menu tabs ASSET, DISC + CUSTOM only (not ADMIN) *
* - AUDD001 userid: *
* - Password PW01 *
* - Access to databases AUDB01 + AUDB02 only *
* - Access to menu tab ASSET only *
***********************************************************************
Analyzer SYSTEM security

HSISANP2 in the PARMLIB defines the system security settings for running the Analyzer.

The following system security settings are defined:

*SECURITY=SYSTEM - HTTPS (SSL encrypted) communications
  with z/OS system security (SAF/RACF).
  Refer to HSISANS1/2/3 in JCLLIB for sample JCL
  to define RACF profiles/certificates.

SECURITY = SYSTEM

* The following settings are only applicable for SECURITY=SYSTEM:
  *
  * AUTH_HLQ defines SAF/RACF profile high level qualifier
  *
  * AUTH_UPPERCASE=Y Analyzer will uppercase passwords when
    invoking SAF/RACF password authentication
  *
  * AUTH_UPPERCASE=N Analyzer will pass through mixed case passwords
    when invoking SAF/RACF password authentication
  *
  * GSK_KEYRING_FILE defines SAF/RACF Keyring name of SSL Certificate
  * GSK_KEY_LABEL defines SAF/RACF Label name of SSL Certificate
  * GSK_.... defines optional z/OS SSL environment variables.
    The z/OS Cryptographic Services
    Secure Sockets Layer Programming manual
    SC24-5901-07 explains the environment variables.
    For example, define GSK_HW_CRYPTO = 32
    for SHA-256 digest generation.
  *
  * JCLLIB(HSISANS1) contains sample JCL to define RACF profiles, using
    a high level qualifier of 'TADZ'. If you have changed HSISANS1,
    you may also need to change the AUTH_HLQ TPARAM setting.
  *
  * JCLLIB(HSISANS2/3) contains sample JCL to define RACF SSL
    Certificates. If you have changes HSISANS2/3, you may also need to
    change the GSK_KEYRING_FILE and GSK_KEY_LABEL TPARAM settings.

*---------------------------------------------------------------------*
SSL Certificates

When the Analyzer is running with SYSTEM=SECURITY, you must have an SSL Certificate defined in your SAF/RACF security system. You can either generate your own certificate, or connect to an existing certificate.

HSISANS2 in JCLLIB has sample JCL to generate SSL certificates in RACF.

```//**************************************************************
/* To enable TADz Analyzer to use HTTP secure (HTTPS) the following steps should be implemented by your site's RACF Administrator:
/* 1. Delete KEYRING(TADZ_KEYRING) and certificate with the
**************************************************************//
```
LABEL('TADZCERT').


3. Define Keyring TADZ_KEYRING.

4. Generate certificate.

5. Connect to Keyring.


7. Permit access to the Facility Class profiles.

The following JCL demonstrates a sample implementation:

1. Update all occurrences of "Userid-running-HSISANLO" to reflect your TADz HTTPS environment.

Do not change the RACF keyring 'TADZ_KEYRING' or label 'TADZCERT' unless you update the corresponding values in analyzer PARMLIB member HSISANP2 and restart the Analyzer STC/Job.

```plaintext
//RACFDEF EXEC PGM=IKJEFT01,DYNAMNBR=30
//SYSTSIN DD *
//SYSTSPRT DD SYSOUT=* PROF NOPREF

RACDCERT DELETE(LABEL('TADZCERT'))
RACDCERT ID(CMACN) DELRING(TADZ_KEYRING)

SETROPTS CLASSACT(DIGTCERT,DIGTNMAP)
SETROPTS RACLIST(DIGTCERT,DIGTNMAP)

RACDCERT ID(Userid-running-HSISANLO) ADDRING(TADZ_KEYRING)

RACDCERT ID(Userid-running-HSISANLO) CERTAUTH GENCERT -
SUBJECTSN( O('Your Organization') -
CN('Your Domain') -
C('US')) TRUST -
WITHLABEL('LOCALCA') -
KEYUSAGE(CERTSIGN)

RACDCERT ID(Userid-running-HSISANLO) GENCERT -
SUBJECTSN(CN('TADZCERT') -
OU('Your Dept.') -
C('US')) -
WITHLABEL('TADZCERT') -
SIGNWITH(CERTAUTH -
LABEL('LOCALCA')) -

RACDCERT ID(Userid-running-HSISANLO) CONNECT(ID(Userid-running-HSISANLO) -
LABEL('TADZCERT') -
RING(TADZ_KEYRING) -
DEFAULT -
USAGE(PERSONAL)) -

RACDCERT ID(Userid-running-HSISANLO) CONNECT(ID(Userid-running-HSISANLO) CERTAUTH -
LABEL('LOCALCA') -
RING(TADZ_KEYRING) -
USAGE(CERTAUTH)) -

SETROPTS RACLIST(DIGTCERT,DIGTNMAP) REFRESH

/*
//PERMIT EXEC PGM=IKJEFT01,DYNAMNBR=30
//SYSTSIN DD *
//SYSTSPRT DD SYSOUT=* PROF NOPREF

RDEL FACILITY IRR.DIGTCERT.LIST
RDEL FACILITY IRR.DIGTCERT.LISTRING
```
SETR RACLIST(FACILITY) REFRESH
RDEFINE FACILITY IRR.DIGTCERT.LIST UACC(NONE)
RDEFINE FACILITY IRR.DIGTCERT.LISTSTRING UACC(NONE)
SETR RACLIST(FACILITY) REFRESH
PERMIT IRR.DIGTCERT.LIST CLASS(FACILITY) -
   ID(Userid-running-HSISANLO) AC(READ)
PERMIT IRR.DIGTCERT.LISTSTRING CLASS(FACILITY) -
   ID(Userid-running-HSISANLO) AC(READ)
SETR RACLIST(FACILITY) REFRESH
/

HSISANS3 in JCLLIB has sample JCL to connect to existing SSL certificates in RACF:

---------------------------------------------------------------------
RACFDEF EXEC PGM=IKJEFT01,DYNSPRT=30
   SYSTSPRT DD SYSOUT=*  
   SYSTSIN DD *
   PROF NOPREF
   RACDCERT DELETE(LABEL('TADZCERT'))
   RACDCERT ID(CMACN) DELRING(TADZ_KEYRING)
   SETROPTS CLASSACT(DIGTCERT,DIGTNMAP)
   SETROPTS RACLIST(DIGTCERT,DIGTNMAP)
   RACDCERT ID(Userid-running-HSISANLO) ADDRING(TADZ_KEYRING)
   RACDCERT ID(Userid-running-HSISANLO) GENCERT -
      SUBJECTDN (CN('TADZCERT') -
      OU('Your Dept.') -
      C('US')) -
      WITHLABEL('TADZCERT')
   RACDCERT ID(Userid-running-HSISANLO) CONNECT(ID(Userid-running-HSISANLO) -
      LABEL('TADZCERT') -
      RING(TADZ_KEYRING) -
      DEFAULT -
      USAGE(PERSONAL))
Online login to the Analyzer

With the Analyzer reporting utility, you can log in with a browser to gain access to the Analyzer Asset, Discovery, and Administration reports and to any Custom reports that you create.

To access the Analyzer online, enter the URL including the host name and port number, in the address bar of a browser. The example URL in the following image is `sp12.tivlab.raleigh.ibm.com:9000`, and provides the user ID and password that are associated with the default basic security option.

![Analyzer Login](image)

When you login to the Analyzer online, the Analyzer Menu window includes the following tabs:

- The **Assets** tab contains reports that query high level aggregated data, such as product versions. This level of data is useful if you are reconciling product licenses.
The **Discovery** tab contains reports that query low-level discovery data, such as product releases, libraries, and modules. This level of data is useful if you support z/OS systems.

The **Administration** tab contains administration tasks and troubleshooting reports. These reports are designed for Tivoli Asset Discovery for z/OS administrators and users only see this menu if they are granted specific access.
• **The Custom** tab contains your local custom reports. Two example custom reports are provided.

  From any of the tabs, when you click the link to a report, the next window opens that contains parameter selection lists based on the data in your database. Select items in the parameter lists to construct a query. Hold down the Ctrl or Shift key to select multiple items from a list. When you have selected all required parameters, click **Submit** to run the query.

  At the end of every report, the report name and parameters are shown in the same syntax that you can copy and paste into the HSISANLB batch job SYSIN DD deck to run the report in batch mode.

  When you construct a query, if you choose the option **Output format** and select **Browser** as the output format, the report includes hyperlinks that you can use to drill down for more information.

  You can download the content of a report, including the embedded content, in the following file formats:
  • Excel
  • HTML
  • Comma separated value (CSV)
  • Text (txt)

**Controlling the Analyzer address space**

The Analyzer supports several z/OS modify commands, including STOP, REFRESH, and TRACE.
The following tables show the z/OS modify commands that the Analyzer supports.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOP</td>
<td>Stops the Analyzer address space. For example /F HSISANL0,STOP</td>
</tr>
<tr>
<td></td>
<td>You can also issue this via the z/OS Stop command /P HSISANL0</td>
</tr>
<tr>
<td>REFRESH</td>
<td>Refresh Analyzer report templates and NLS text. For example /F HSISANL0,REFRESH. This is typically used to load new Custom queries</td>
</tr>
<tr>
<td>TRACE</td>
<td>Toggles on/off tracing. For example/F HSISANL0,TRACE. This should only be used when requested by IBM Support.</td>
</tr>
</tbody>
</table>

Running the Analyzer in batch mode

If you want to automate report generation, you can run the Analyzer in batch mode.

HSISANLB in JCLLIB contains sample JCL.

```plaintext
/*
 // SET OUTFMT=TXT
 // SET OUTFMT=XLS
 // SET OUTFMT=CSV
 // SET OUTFMT=HTM
 /*
 // SET OUTDSN=&SYSUID..TADZANLZ.&OUTFMT Output dsn
 /*
 //ALLOC EXEC PGM=IEFBRI4
 //OUTDSN DD DISP=(MOD,CATLG),DSN=&OUTDSN,
 //       DCB=(DSORG=PS,RECFM=VB,LRECL=1000,BLKSIZE=0),
 //       UNIT=SYSALLDA,SPACE=(CYL,(5,10))
 /*
 //ANALYZER EXEC PGM=HSICANLZ
 //STEPLIB DD DISP=SHR,DSN=HSIDEV.V720.D111.SHISMOD1
 //       DD DISP=SHR,DSN=DB2V910.DE91.SDNSEXIT
 //       DD DISP=SHR,DSN=DB2.V910.SDNSLOAD
 //SYSPRINT DD SYSOUT=*,HOLD=YES,LRECL=500
 //HSIANL1 DD DISP=SHR,DSN=HSIDEV.V720.D111.SHSIANL1
 //HSIANL2 DD DISP=SHR,DSN=HSIDEV.V720.D111.SHSIANL2
 //DSNAOINI DD DISP=SHR,DSN=MRES.V7500111.PARMLIB(HSISCLI)
 //HSICUST DD DISP=SHR,DSN=MRES.V7500111.PARMLIB(HSISANCO)
 //HSINLS DD DISP=SHR,DSN=HSIDEV.V720.D111.SHSIANL1(HSINLSJP)
 //TPARM DD DUMMY
 /*
 //OUTPUT1 DD DISP=OLD,DSN=&OUTDSN
 //SYSIN DD *
 /*asset/audit_trail
 vendor = IBM
 showfeature = on
 /*
```

The report name and parameters are specified in the SYSIN DD and the output goes to the OUTPUT1 DD.

The simplest way to know what report name and parameters to specify is to run the report first using Analyzer in online mode. At the end of every report, the report name and parameters are listed in the syntax needed for batch mode. You can cut and paste this syntax into the batch SYSIN DD.
Alternatively, you can directly type in the parameters. Wildcard filters have been enabled to assist in this case.

## Analyzer globalization support

By default, the Analyzer uses English for all report titles, headings, and descriptions. To change to Japanese, define the HSINLS DD to point to the HSINLSJP member in the SHSIANL1 data set.

You can also define your own custom language settings with the HSINLS DD. HSINLSJP member in SHSIANL1 data set provides a template. It contains English key phrases that are assigned to text that is used on the reports.
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