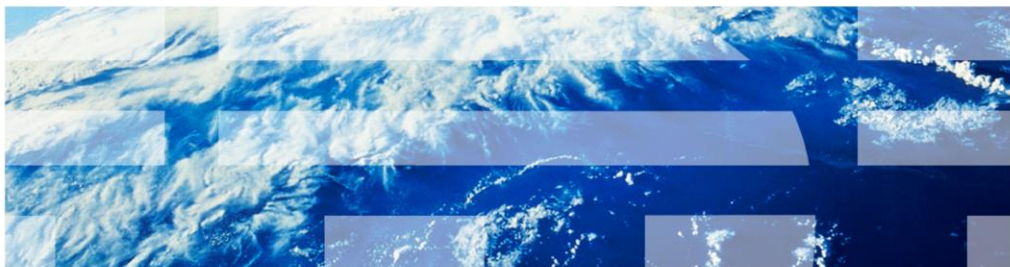


InfoSphere Information Server

Troubleshooting DataStage engine start up issues



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This presentation will discuss how to troubleshoot DataStage® engine startup issues. This presentation is relevant for all versions of DataStage.

Objectives

- DataStage startup script
- Checking if engine is "up"
- Common startup issues

The objectives of this presentation are to discuss what the DataStage engine startup script does, how to determine if the engine is completely up, and to discuss some common startup issues and their solutions.

Startup script

- Start and Stop engine
 - DSEngine/bin/uv -admin -start
 - DSEngine/bin/uv -admin -stop
- Versions 7 and 8
 - Checks if main shared memory segment is up
 - Checks if Job Monitor is running
 - su to dsadm user
 - Sources dsenv
 - Captures environment
 - Gets rid of problematic characters in environment
 - Saves final environment to temporary files
 - Returns back to original user
 - Sources temporary files to set up environment for dsrpcd
 - Start dsrpcd
 - Create shared memory segments
- Version 9
 - Checks if impersonation mode is on
 - If impersonation is off
 - Just sources the dsenv

When the DataStage engine is started, several things take place. The startup script will do several tasks before attempting to start the engine, such as checking if the main shared memory segment is up and checking if the Job Monitor is running. Once it has determined that it is ok to try to start the engine, the script will su to the DataStage administrative user, source the dsenv file, capture the environment, and get rid of problematic characters in the PS1 prompt. It also saves the environment to a temporary file, returns back to the original user, and sources the temporary environment files to set up the environment for the dsrpcd process. Starting at version 9, the script will see if impersonation mode is off. If so, the su is skipped and the script sources the dsenv file. Once this is done, the dsrpcd daemon is started and the shared memory segments are created.

Check if the DataStage engine is up

- For DataStage engine to be "up"
 - Main shared memory segment must be up
0x<itag>c<version>
EX. 0xadec8500
 - dsrpcd process must be running
- Always check if engine is up or down
 - Is dsrpcd running
 - ps -ef|grep dsrpc
 - For an itag other than default "ade", dsrpcd process is called <itag>dsrpcd
 - Is main shared memory segment up
ipcs -m | grep <itag>
 - If partially up
 - Stop and restart engine
- What is itag?
cd DSEngine

```
$ grep -i INSTANCETAG uvconfig
# INSTANCETAG - Specifies a 3 digit hex value indicating
INSTANCETAG eee
```

When debugging a startup issue with the DataStage engine, the first thing that needs to be done is to see if the DataStage engine is up and running. In order for the engine to be considered "up", the dsrpcd daemon must be running and the main DataStage shared memory segment must be created. In order to check if the dsrpcd daemon is running, at an operating system prompt, use the ps command displayed on this slide to see if the daemon process is running. If the itag is anything other than the default of "ade", the dsrpcd process will have the itag added to the beginning of the process name, for example, eeedsrpcd.

The main shared memory segment will have an address of "0x", the itag of the DataStage install, the letter "c" and the DataStage version. On a default version 8.5 install, the shared memory segment address is 0xadec8500. Use the ipcs command displayed on this slide to check if the main shared memory segment is up. If it is not clear what the itag of the installation is, cd to the DSEngine directory and type grep -i INSTANCETAG uvconfig. The output will show the instance tag, or itag, being used. ade is the default instance tag.

Common issues - Nothing happens at startup (1 of 3)

- Start engine - nothing happens
 - Generally at version 7
 - Version 8 and 9 has other daemons that will start
 - Script checks for main shared memory segment
 - If it exists, script exits
- Solution 1
 - Engine is partially or fully running
 - Stop and restart to ensure engine is up cleanly
 - bin/uv -admin -stop
 - bin/uv -admin -start

The first common DataStage engine startup issue that this presentation will discuss is the issue where the startup is run but nothing happens. With version 7, when the startup script is run, the operating system prompt is returned and nothing happens at all. At versions 8 and 9, messages appear that the job monitor and so on, are being started but the engine and the dsrpcd daemon do not start.

When this happens, the first thing that needs to be verified is that the engine is fully up as displayed on the previous slide. If the engine is found to be partially up, try stopping and restarting the engine.

Common issues - Nothing happens at startup (2 of 3)

- Solution 2
 - Startup errors
 - Errors written to dsenv.errs.xxxxxx.xxxxx files in DSEngine
 - ls -ltr
 - rwxr-xr-x 1 dsadm dstage 2204 Jul 16 08:50 dstmp.130716.085056A
 - rwxr-xr-x 1 root dstage 3069 Jul 16 08:50 dstmp.130716.085056B
 - rw-rw-r-- 1 root dstage 101 Jul 16 08:50 dsenv.errs.130716.085056
 - dstmp.xxxxxx.xxxxxxx - temporary environment files startup sources
 - dsenv.errs.xxxxxx.xxxxx - errors generated at startup
 - Many startup errors caused from errors when script sources dsenv
 - Check dsenv.errs.xxxxxx.xxxxx file
 - Example 1
 - # more dsenv.errs.130829.092821
- /opt/IS87/IBM/InformationServer/Server/DSEngine/sample/ds.rc[412]: TESTVAR: is read only
- Ensure dsadm user does not have Read Only environment variables set
 - This example - TESTVAR was read-only

If the stop and start scripts are run and the engine is still not starting, look for the startup error logs in the DSEngine directory. These logs will begin with dsenv.errs. List the files in DSEngine and sort by time to see which dsenv.errs file was created last and look at the errors in this file. In many cases, an error occurs when the startup script attempts to source the temporary startup files. If this occurs, the errors are logged in the dsenv.errs file and the temporary environment files are left in DSEngine so that they can be examined.

In the example displayed on this slide, the engine failed to start and the dsenv.errs file showed the error occurred when the env file was sourced. The error was TESTVAR: is read only. If your DataStage administrative user has read only environment variables set, when the env file is sourced, it will produce an error and the startup will fail. Be sure the DataStage administrative user does not use read only environment variables.

Common issues - Nothing happens at startup (3 of 3)

- Example 2

```
$ cat dsenv.errs.130829.094422  
/u2/IS810/IBM/InformationServer/Server/DSEngine/sample/ds.rc[391]: $=$: not found.  
/u2/IS810/IBM/InformationServer/Server/DSEngine/sample/ds.rc[391]: $: This is not an  
identifier.
```

- Errors occur together with unsupported characters in PS1 prompt

- .profile for dsadm has PS1 set with a line feed

```
PS1='${USER-$LOGNAME}@$HOSTNAME:$PWD  
$ '
```

```
export PS1
```

- Startup script removes many unsupported characters for PS1

- Line feed and special characters in any env variable will cause issue

- Check environment of dsadm user

- Look for characters shown in error message from dsenv.errs file

- Remove problem variables from DataStage administrator's profile

In the example displayed on this slide, the dsenv.errs file shows the error `$=$: not found` and `$: This is not an identifier`. This generally occurs when an environment variable has unsupported characters, in this case, a line feed was part of the PS1 prompt. Check the dstmp files and the DataStage administrative users environment for the character shown in the error. Remove the environment variables from the DataStage administrator's profile.

dsrpcd daemon will not start (1 of 3)

- Shared memory segments come up but dsrpcd will not start
- Solution 1
 - Version 7 through 8.0.1 FP2
 - Check for established connections on port

```
netstat -a |grep dsrpc
tcp    0    0 myserver:dsrpc      sig-9-65-227-218.m:ms-sql-m
ESTABLISHED
tcp    0    0 myserver:dsrpc      sig-9-65-227-218.mt:sapgw42
ESTABLISHED
```
 - dsrpcd cannot rebind to port if there are established connections
 - Error is dsrpcd trace:

```
RPCPID=97708 - 13:35:45 - uvrpc_debugflag=9 (Debugging level)
RPCPID=97708 - 13:35:45 - ln rpc_init()
RPCPID=97708 - 13:35:45 - bind bombed errno=67
RPCPID=97708 - 13:35:45 - listen failed
```

Another common issue that may be encountered when starting the DataStage engine is an issue where the shared memory segments are created but the dsrpcd daemon fails to start. This will occur in versions 7 through 8.0.1 FP2 if there are active connections still bound to the port when the dsrpcd tries to start. The dsrpcd daemon cannot bind to the port if another process is established on that port. Run the netstat command as displayed on this slide to check if there are established connections on the dsrpcd port.

If the dsrpcd is traced, the log file will show the error "bind bombed".

dsrpcd daemon will not start (2 of 3)

- Solution 1 (more)
 - Terminate client connections bound to port
 - Retry startup after netstat shows no connections
 - Be careful using kill -9 on client processes
 - Port may get stuck in Fin Wait state
 - rsock on AIX® may be used to remove "stuck" connections
 - Reboot required on other platforms
 - Fixed in 8.0.1 FP3 and higher
 - Patch JR30318 for earlier versions including version 7

If established connections are found, terminate the clients holding the connections and run the netstat command again to confirm that all the connections are gone. When terminating these sessions, it is always best to have the clients shut down properly as opposed to stopping the processes at the operating system level. If it is necessary to stop the processes, attempt to stop without using a -9 first. In some instances a kill -9 may be necessary if a regular stop will not stop the process. When a kill -9 is done on a client process, many times the port gets stuck in a FIN WAIT state and then the system may have to be rebooted to clear the port.

On AIX systems, if a port is stuck, the rsock command may be used to clear the port.

A fix was created to allow the dsrpcd daemon to rebind to the port even if there are established connections on the port. This fix is included in the Information Server DataStage releases 8.0.1 FP3 and higher. For earlier releases of DataStage, call Support and request the patch for JR30318.

dsrpcd daemon will not start (3 of 3)

- Solution 2
 - /etc/services entry missing
 - Example - `cat /etc/services | grep dsrpc`
`dsrpc 31538/tcp # RPCdaemon`
`DSEngine@/opt/IBM/InformationServer/Server/DSEngine`
 - Manually add correct entry back into /etc/services file
 - Trace on dsrpcd shows

```
RPCPID=4749 - 13:59:57 - uvrpc_debugflag=9 (Debugging level)
RPCPID=4749 - 13:59:57 - In rpc_init()
RPCPID=4749 - 13:59:57 - get service by name bombed errno=0
RPCPID=4749 - 13:59:57 - listen failed
```
- More information on how to trace the dsrpcd
 - <http://www.ibm.com/support/docview.wss?uid=swg27021057>

Another issue that will prevent the dsrpcd from starting occurs when the entry for the dsrpcd daemon is missing from the /etc/services file. The resolution to this issue is to add the entry back into the services file. This slide displays an example entry in the services file.

A trace on the dsrpcd process will show the error "get service by name bombed".

For more information of how to trace the dsrpcd daemon, see the IBM Education Assistant module on dsrpcd tracing.

dsrpcd does not start as root (1 of 3)

- When starting DataStage engine as dsadm
 - Engine starts but dsrpcd starts as dsadm user
 - Users cannot login - 80011 error
- Solution 1
 - Verify engine file system mount point does not have nosuid
 - Use "mount" command to verify options

```
# mount
node   mounted      mounted over  vfs   date      options
-----
/dev/hd4    /              /              jfs2  Jul 26 17:45 rw,log=/dev/hd8
/dev/hd2    /usr           /usr           jfs2  Jul 26 17:45 rw,log=/dev/hd8
/dev/hd9var /var           /var           jfs2  Jul 26 17:45 rw,log=/dev/hd8
/dev/hd3    /tmp           /tmp           jfs2  Jul 26 17:45 rw,log=/dev/hd8
/dev/hd1    /home          /home          jfs2  Jul 26 17:45 rw,log=/dev/hd8
/dev/hd10opt /opt           /opt           jfs2  Jul 26 17:45 rw,log=/dev/hd8
/dev/fslv00 /u1            /u1            jfs2  Aug 28 16:37 rw,nosuid,log=/dev/hd8
```

The next startup issue that this presentation will discuss is an issue where the engine is started by the DataStage administrative user and the dsrpcd starts but the process starts as the DataStage administrative user and not as root. When this occurs, you will receive an error 80011 when logging into DataStage.

One reason this may occur is if the file system that the engine is mounted on has the nosuid option set. This can be seen by running the mount command at the operating system level. To correct this, un-mount the file system and remount without the nosuid option.

dsrpcd does not start as root (2 of 3)

- Solution 2
 - Files in DSEngine/bin missing suid bit or root ownership
 - Impersonation mode on
 - Files need root ownership and uid bit set
 - Example
 - # pwd
 - /u1/IS9101/IBM/InformationServer/Server/DSEngine/bin
 - # ls -l |grep rws
 - -rws--x--x 1 root dstage 87914 Mar 21 02:14 DBsetup
 - -rwsr-x--x 1 root dstage 798228 Mar 21 02:14 dsdlockd
 - -rwsr-x--x 1 root dstage 759031 Mar 21 02:14 dslictool
 - -rws--x--x 1 root dstage 9232 Mar 21 02:13 dstskup
 - -rwsr-x--x 1 root dstage 1770906 Mar 21 02:14 list_readu
 - -rwsr-x--x 1 root dstage 1763821 Mar 29 17:53 load_NLS_shm
 - -rwsr-x--x 1 root dstage 65640 Mar 21 02:14 uv

Another issue that will cause the dsrpcd to start as the DataStage administrative user is when the suid bit is removed from the key files in the DSEngine/bin directory. When DataStage is running in Impersonation mode, the dsrpcd will always run as root. In order to do so, certain files in the engine's bin directory must be owned by root and have the suid bit set. To check if this is the issue, change directories into the DSEngine/bin directory and run the ls command displayed on this slide. There should be seven files that are owned by root and have the suid bit set. If the files do not have the ownership and permissions that are displayed on this slide, then they need to be reset correctly.

dsrpcd does not start as root (3 of 3)

- Solution 2 (more)
 - Option 1: Reset permissions manually on all 7 files
 - Must be run as root
 - Example:
chown root uv
chmod 4751 uv
 - chown must be run before chmod
 - Option 2: Run DSEenable_impersonation.sh
 - Must be run as root
cd DSEngine/scripts
./DSEenable_impersonation.sh

There are two ways to fix the ownership and permissions. These can be reset manually using the chown and chmod commands displayed on this slide to each of the seven files listed on the previous slide. Be sure to do the chown before the chmod as chown will remove the suid bit if it is set.

The second option is to run the DSEenable_impersonation.sh script located in the DSEngine/scripts directory.

Both of these options must be done as the root user.

Startup prompts for a password (1 of 4)

- Startup as dsadm prompts for password
- Solution 1
 - Impersonation mode on
 - suid bit and ownership not set correctly in DSEngine/bin
 - See slide 13 to correct
- Solution 2
 - Impersonation mode off
 - dsadm user does not have permission to su
 - Verify permissions with UNIX/Linux admin
- Solution 3
 - File system for DSEngine has nosuid option set
 - See slide 11 to correct

The last common issue that this presentation will discuss is the issue where the startup script prompts for a password when being run as the DataStage administrative user.

There are several reasons that this may occur. The first is when DataStage has Impersonation mode turned on but the seven key files displayed on slide 12 in DSEngine/bin do not have the proper ownership and permissions set. To resolve this issue, follow the steps on slide 13.

Another reason this issue may occur is if the DataStage administrative user does not have permissions to run a program owned by root with the suid bit set on it. To correct this issue, speak to your operating system administrator.

A third reason for this issue is if the file system that DSEngine is mounted on has the nosuid option set. See slide 11 for details on how to resolve this issue.

Startup prompts for a password (2 of 4)

- Solution 4
 - Version 9 only
 - Impersonation mode off only
 - New Work Load Manager (WLM) daemon not checking for impersonation mode
 - Edit DSEngine/sample/ds.rc as root
 - Make backup copy of ds.rc script
 - Edit "stop WLM server" and "start WLM server" sections

The last reason that this may occur is relevant to DataStage version 9 only where impersonation mode is turned off. At version 9 the startup script starts the new Work Load Manager. The script does not verify if impersonation mode is turned off and attempts to su to the DataStage administrative user even though the script is already running as the administrative user. This prompting for the password will occur both at startup and shutdown. In order to correct this issue, changes must be made to the ds.rc script located in DSEngine/sample. This file must be edited as the root user. Be sure to make a backup copy of this file before making any changes.

Startup prompts for a password (3 of 4)

- Change stop WLM server from

```
#stop WLM server
if [ -n "${DSWLM}" ]
then
    wlmcmd="stopwlm.sh"
    if [ -r "${DSWLM}/${wlmcmd}" -a -x "${DSWLM}/${wlmcmd}" ]
    then
        # shutdown WLM
        su $adminID -c "sh -c \"${DSWLM}/${wlmcmd}\""
    else
        echo "ERROR: ${DSWLM}/${wlmcmd} does not exist"
    fi
fi
```

- To

```
#stop WLM server
if [ -n "${DSWLM}" ]
then
    wlmcmd="stopwlm.sh"
    if [ -r "${DSWLM}/${wlmcmd}" -a -x "${DSWLM}/${wlmcmd}" ]
    then
        # shutdown WLM
        if [ "${exMODE}" = "1" ]
        then
            su $adminID -c "sh -c \"${DSWLM}/${wlmcmd}\""
        else
            sh -c \"${DSWLM}/${wlmcmd}\"
        fi
    else
        echo "ERROR: ${DSWLM}/${wlmcmd} does not exist"
    fi
fi
```

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In the ds.rc script, find the stop WLM section. Make the changes highlighted in yellow that are displayed on this slide.

Startup prompts for a password (4 of 4)

- Change start WLM server from

```
#start WLM server
if [ -n "$(DSWLM)" ]
then
    wlmcmd="startwlm.sh"
    if [ -r "$(DSWLM)/$wlmcmd" -a -x "$(DSWLM)/$wlmcmd" ]
    then
        # start WLM
        su $adminID -c "nohup $(DSWLM)/$wlmcmd > $(DSWLM)/start.w
lm.log 2>&1 &"
    else
        fi
    fi
    echo "ERROR: $(DSWLM)/$wlmcmd does not exist"
fi
```

- To

```
#start WLM server
if [ -n "$(DSWLM)" ]
then
    wlmcmd="startwlm.sh"
    if [ -r "$(DSWLM)/$wlmcmd" -a -x "$(DSWLM)/$wlmcmd" ]
    then
        # start WLM
        if [ "${exMODE}" = "1" ]
        then
            su $adminID -c "nohup $(DSWLM)/$wlmcmd > $(DSWLM)/start.w
lm.log 2>&1 &"
        else
            nohup $(DSWLM)/$wlmcmd > $(DSWLM)/start.wlm.log 2>&1 &
            fi
        else
            fi
        echo "ERROR: $(DSWLM)/$wlmcmd does not exist"
fi
```

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Troubleshooting DataStage engine start up issues

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Next, find the start WLM section and make the changes highlighted in yellow that are displayed on this slide.

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