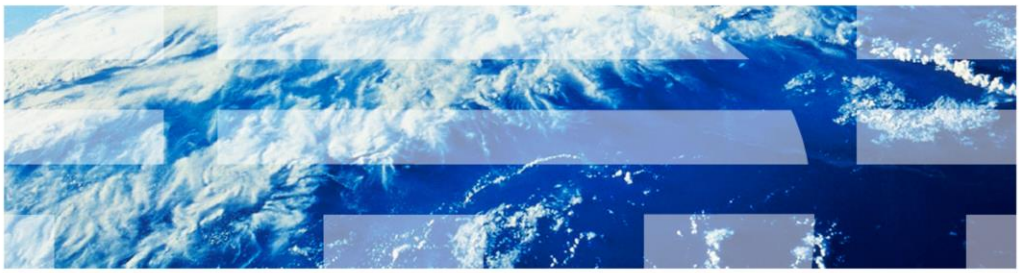
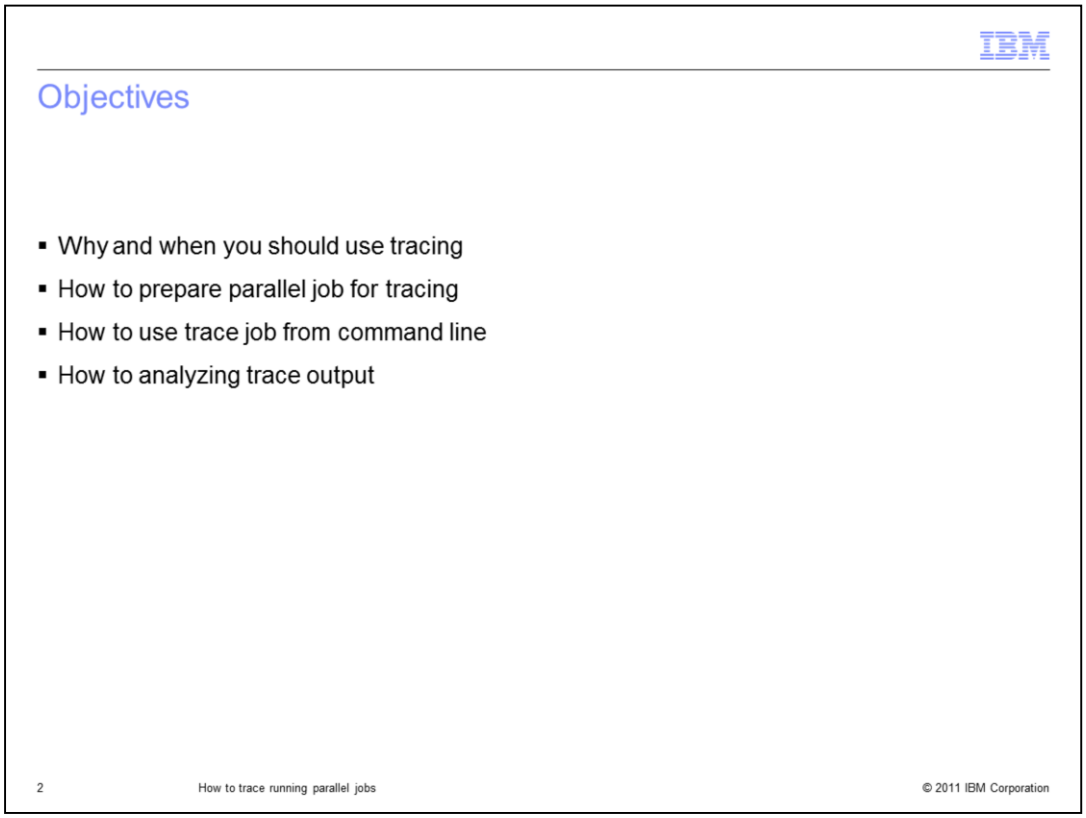
IBM

InfoSphere Information Server DataStage Version 8

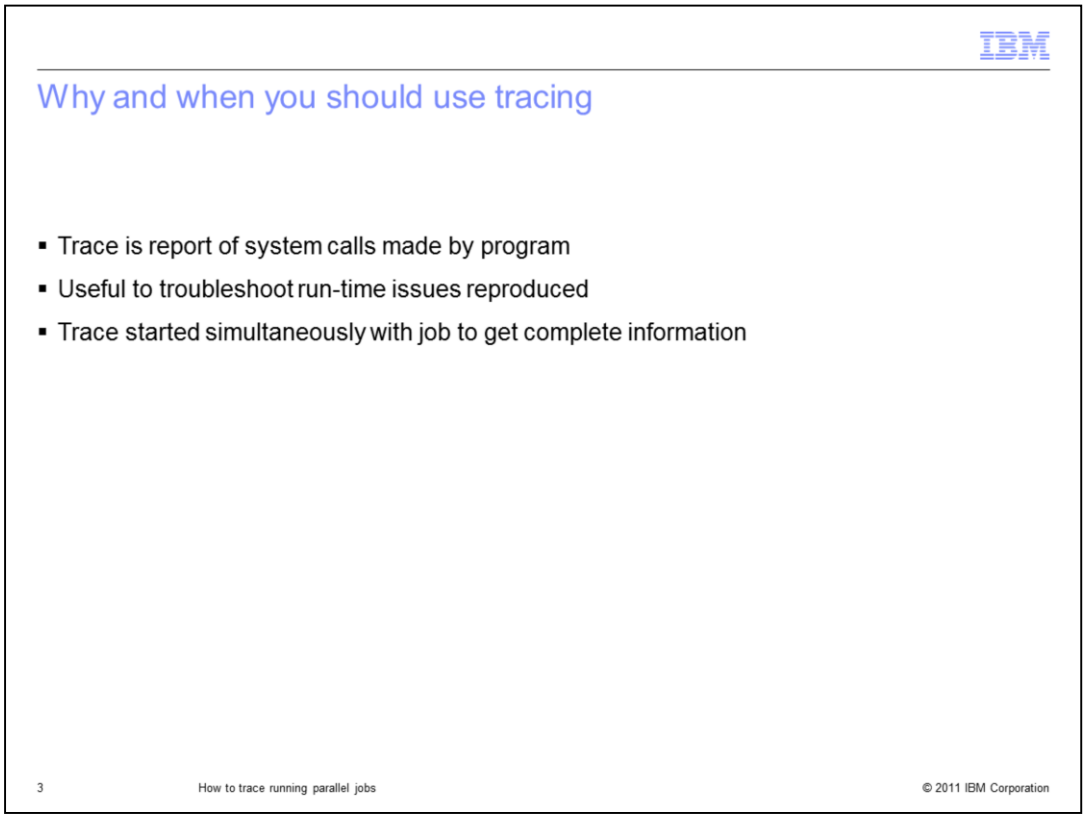
How to trace running parallel jobs



This presentation explains how to trace running parallel DataStage® jobs in version 8.



The objectives of this presentation are to explain why and when you should use tracing, how to prepare a parallel job for tracing, how to use trace from a command and how to analyze the trace output.

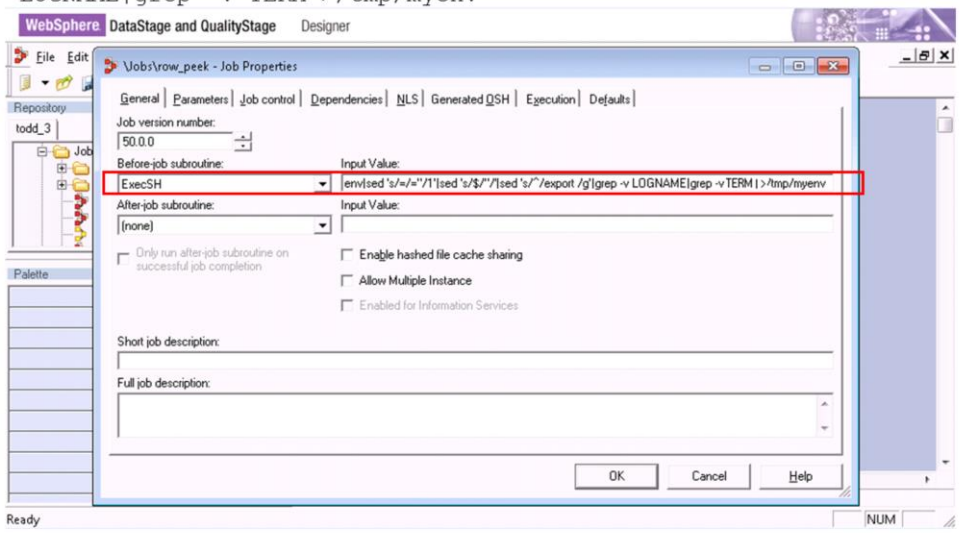


A trace is a report with detailed information of the system calls a process invokes while running. Some examples of the data you can capture include: environment variables, parameter values, library locations and return codes. With regards to DataStage parallel jobs, a trace is recommended when you have a job that is showing a consistent problem at run-time and for which the messages in the log are not enough. Although a trace can be performed on a running job that was started from Designer or Director, it is better if you start the trace at the same time the job starts. This will allow you to capture a complete report of the job's activities since the main process was created and you will not have to manually identify the *pids* of the job's processes. This presentation shows you how to run your job from a command line so it can be easily traced.

Prepare parallel job to be traced (1 of 2)

- Add before-job subroutine with input value:

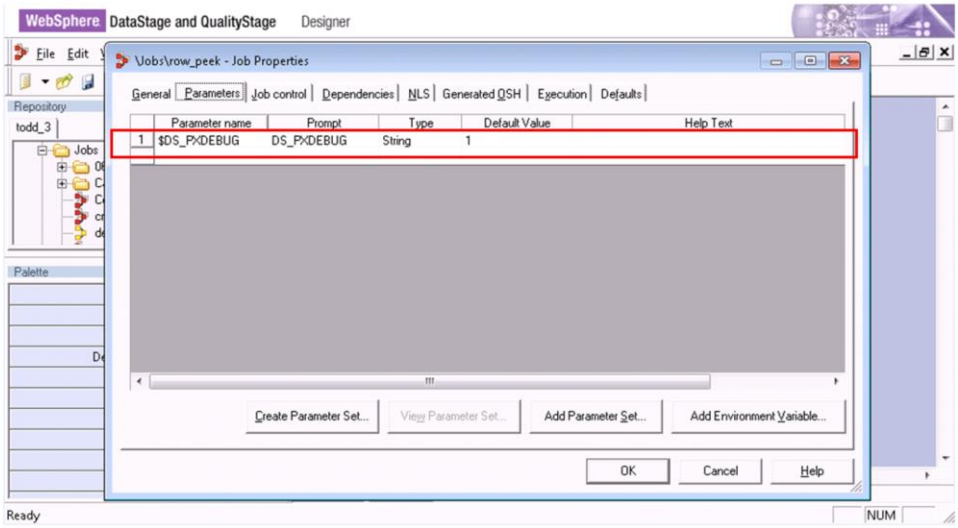
```
env|sed 's/=/="/1'|sed 's/$/"/'|sed 's/^/export /g'|grep -v
   LOGNAME|grep -v TERM >/tmp/myenv
```



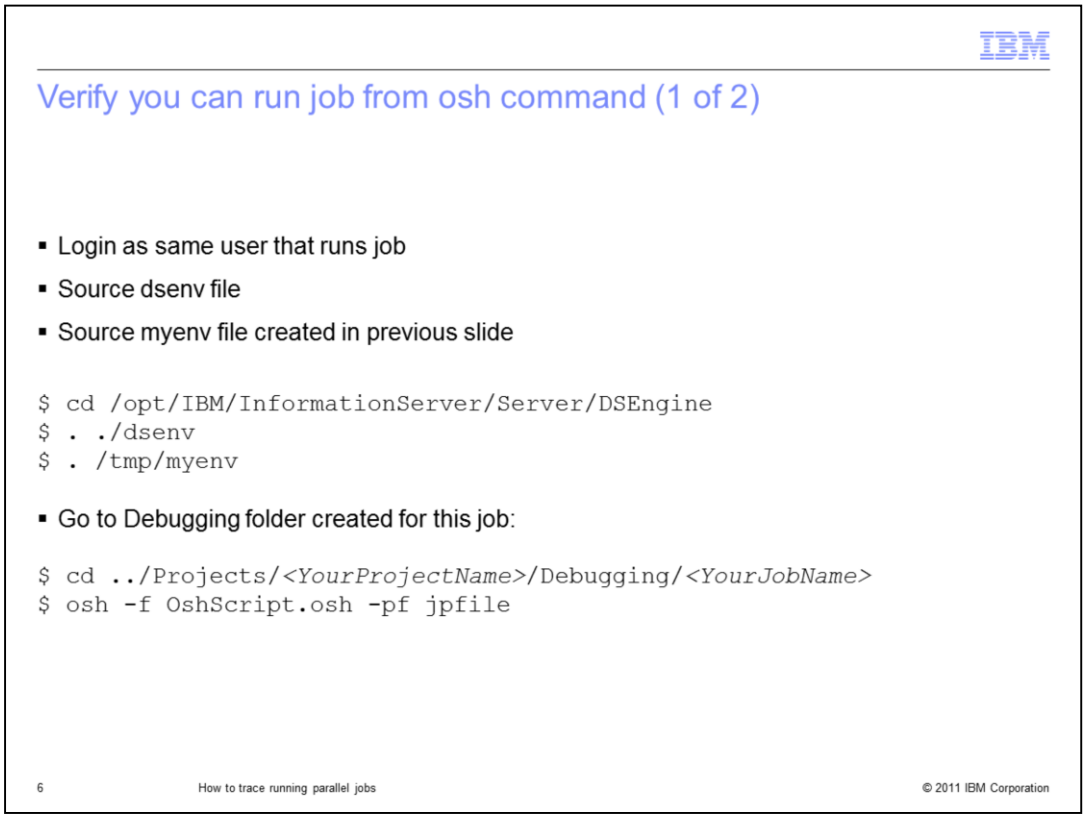
To ensure that the execution of the job from the command line reproduces the same environment of the job started from Designer or Director, set the environment variables of your terminal session so they have the same values as those used by the job during run-time. To capture the value of these variables you can add a before sub-routine under Job Properties with the input value displayed on this slide. This will create a file called /tmp/myenv that you can source from your terminal session. You can change the path of the output file as needed.

Prepare parallel job to be traced (2 of 2)

- Add variable DS_PXDEBUG, set to 1 and run job

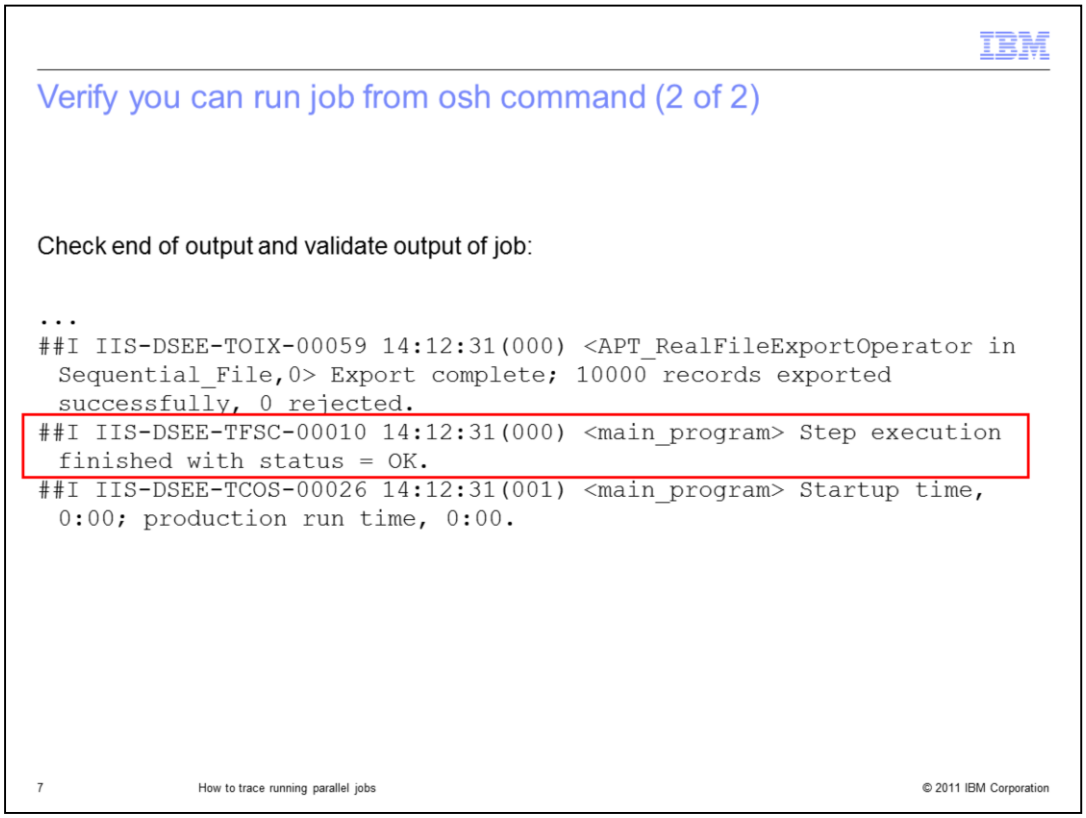


To run a job from the command line you also need some auxiliary files that can be obtained by turning debugging on for the PXEngine. To do this, add the user-defined environment variable DS_PXDEBUG under Job Properties and set it to one. If you have never used this variable, you need to create it for this project from the DataStage Administrator client. When creating this variable, always set its default value to zero at the project level as this variable may have an impact on the performance of your jobs and should only be used to troubleshoot specific problems. Add the variable as a job parameter for this job and set the value to one. Now you can save, compile and run the job. This will create a folder under Projects/<*YourProjectName*>/Debugging/<*YourJobName*> where <*YourProjectName*> is the name of your project and <*YourJobName*> is the name of this job.



Next, open a terminal session and login using the same user that runs the job. Go to the directory where DSEngine is located and source the dsenv file. Next, source the file /tmp/myenv created on slide 4. In this example, it is in /tmp. If you obtain errors while sourcing /tmp/myenv then you will have to manually modify the file to remove or edit those variables that are preventing you from sourcing it.

Next, go to the Debugging folder created under this project folder and validate if you can run the job from the command line by using the osh command displayed on this slide.



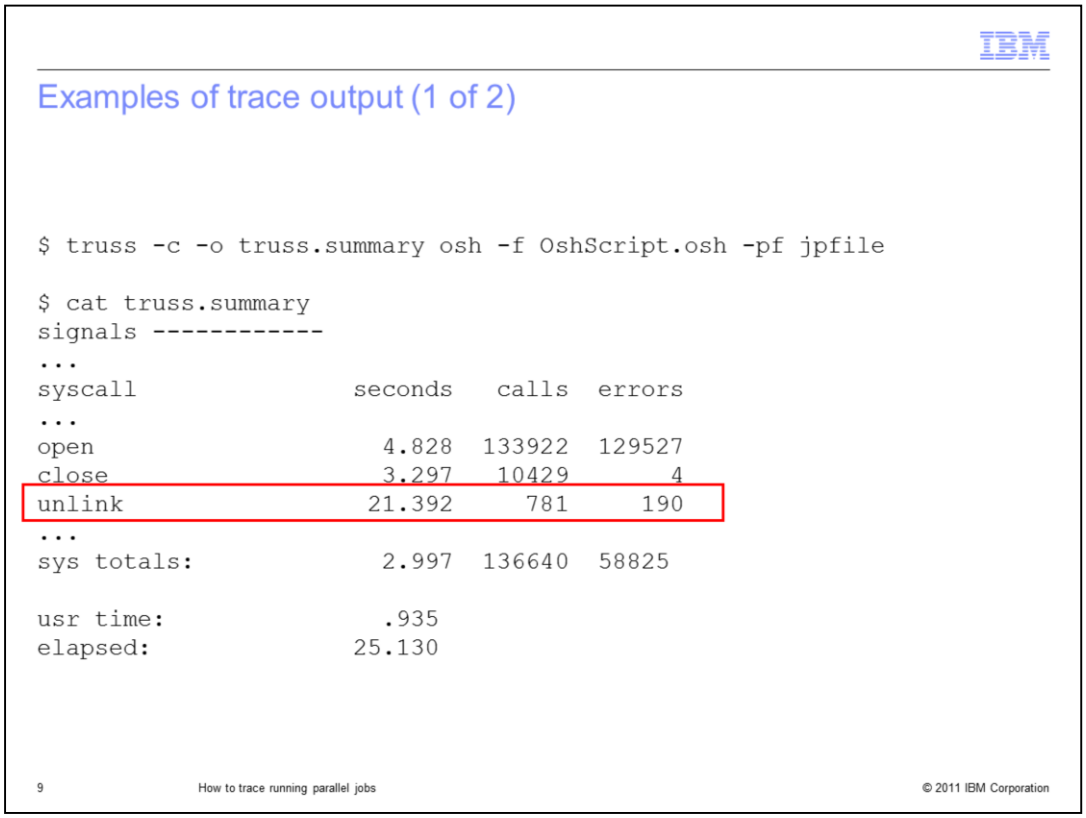
Finally, check the end of the output and validate that you are reproducing the same behavior as when you run the job from Director. In this example, the job ends successfully in Director and you also see that the job ends with "status = OK“ using the command line. If your job is hanging or aborting with an error, you will also get the same error or hanging condition using this command line.

Once you have validated that you can reproduce the same behavior of the job using the command line, you are ready to trace the job. To do this, use the command truss (or the equivalent in the operating system that you are using) before the osh command. For example:

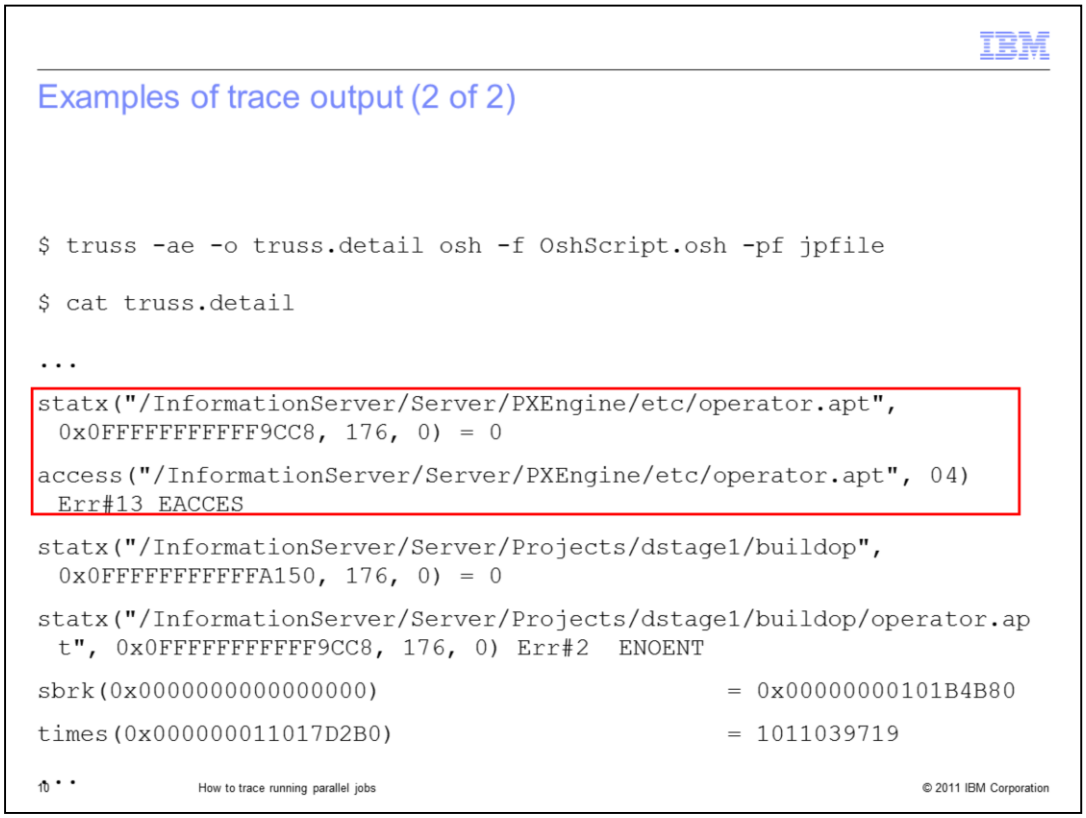
truss -o truss.output osh -f OshScript.osh -pf jpfile

This will create a file called truss.output with the output of the trace. You can use different options of truss depending what type of information you want to trace. Check the main page of truss to learn more about this command.

The truss utility is included by default in AIX®. Other operating systems have other trace utilities that can be used instead of truss. In Linux® or Solaris, you can use strace and in HP-UX you can use tusc. If the utility is not present you need to download it. You can also view the IBM Education Assistant module on operating system level tracing for more information.



Using the option –c, truss generates a summary of the time spent for each type of system call. This type of tracing can be used to identify bottlenecks in the execution of a job. In this example, the output shows that 21 seconds of the total job execution were spent in unlink system calls, which are part of the file deletion process. This might indicate an I/O problem possibly related to the use of a non-local system. If the job is using NFS files, the next test is to run the same job pointing to local files and compare times for this call.



Using the option –ae, you can obtain a more detailed output including the parameters passed for each system call function. This type of output is useful to identify problems caused by missing libraries or lack of permissions.

In this example, you see that the file operator.apt was found but the process was not able to access. The next step is to validate that users have the right permissions to access this file.

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