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# Optimize Your Backup Environment with Tek-Tools Profiler

## Introduction

Many backup administrators are faced with the difficult chore of reducing the time it takes to perform daily, weekly, and monthly backups. The Profiler Suite, a comprehensive SRM package, can assist users by utilizing key features and functionality contained both within the entire suite, and the Backup Profiler module specifically. These features will significantly reduce the time it takes to collect information needed to accomplish this task and will even produce secondary money saving benefits. Before diving into the details of how Profiler is able to solve these problems, it is important to identify the issues that impact backup windows and durations.

## Key Factors

First, network bandwidth plays a big part in how fast a backup job will run. Some servers are backed up over a production network while others are directly attached to a storage area network. Either of these two scenarios impacts bandwidth differently.

Second, the number of files being backed up will affect the backup speeds. Backing up many small files will inevitably increase backup times. Resource contention will be a factor as well. If too many backup jobs are competing for the same resources, backups will take significantly longer to run.

Additionally, the time of day backups are scheduled to run can affect backup performance. If backups are happening during disk-intensive processes, such as virus scans, they can greatly affect backup performance and the length of time they run.

Resource problems can affect backup times, as well. If a tape drive is down for any reason, this fact will increase the amount of time backups run because there are fewer resources to perform the same amount of work.

Finally, failing jobs due to any number of exceptions will increase backup times. This issue has an even greater impact if jobs have to be repeatedly run in order to complete successfully. All of these are factors that negatively affect backup windows and durations.

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## Factor Analysis

Profiler has the capability of providing information on all of the factors mentioned above. Profiler's data collectors provide valuable statistics regarding each network interface installed on the server. By looking at the total bytes in per second and bytes out per second the user can identify whether or not they are achieving optimal transfer speeds during the backup operation. The user can even check the configured network speed through the Server Profiler console under the asset tab. If a user wants to compare throughput from multiple clients this is easily done through the reporting built into Profiler. A user is able to see charted network performance for multiple systems on one chart, which will significantly cut the time it takes to make the needed throughput comparisons. The user can also take this a step further and use Profiler to see which clients are configured for a particular media server or storage node and then determine if any possible configuration changes need to be made to properly load balance their clients across media servers or storage nodes.

The next thing to take a look at using Profiler would be sizes and types of files being backed up. Often the sizes of the files being backed up are the limiting factor of a backup's throughput. By using Profiler's data classification abilities one can identify the individual files being backed up. Not only does this capability help in identifying why a backup job might be going slow, but it is also a feature that will assist the user in finding files that don't belong, large files, old files, and duplicate files. In other words, Profiler can help a user reclaim space, thus reducing the time it takes to run backups. This is just one way Profiler can help reduce the backup window.

Resource contention always seems to be a concern for backup administrators as well. Many environments run into the problem of having backup jobs wait for resources when other usable resources sit idle. The problem is that identifying these idle times and bottlenecks can be difficult. By using Profiler's built-in activity reports, tape drive utilization consoles, and Storage Profiler for Sun StorageTek Automated Cartridge System Library Software (ACSL) module, users can quickly identify what resources are being over-utilized or under used. Profiler can look at tape drive usage, as well as host bus adapter (HBA) performance in the case where the backup destination is connected via fibre channel. It can help users understand if they need to add more HBAs or destination devices through performance reporting. Backup Profiler also contains load balancing reports that can bring to light the way jobs and resources are distributed throughout the environment during backup activity. Again this will allow the user to understand how the backup software is utilizing available resources.



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Time of day is another factor when trying to understand why backups may be running slow. Profiler can help users understand what processes are running on the backup clients in addition to what resources are being used. Process monitoring will allow administrators to see how much CPU and memory certain processes are consuming helping them to schedule backups during the least busy times. Disk and network performance utilization can be analyzed for the same purpose. If network utilization is high without backups being run, then adding the backup requests for data to the system will just slow the backups down. Profiler consolidates this data across one or multiple systems in one single graph allowing users to identify ideal times to run backup jobs. If disk reads are high, the same methodology applies. Backup Profiler provides a graphical backup window of all jobs that can be used to compare times of day and resource consumption.

Resources such as tapes and drives being out of commission or down can greatly affect the time it takes to run backup jobs. If backups normally run with ten tape drives and three go offline then the backup jobs have only seven drives to run on. If all ten drives are normally running at max capacity during the backup cycle the backup jobs will take a lot longer, because more are queued waiting for resources. Identifying if target resources are being fully utilized tends to be one of the biggest concerns of backup administrators. The ultimate question is, “Am I using all my tape drives to their fullest?” Profiler can answer this question using the interactive tape drive utilization console. This console allows administrators to see the idle times, showing the jobs that are running during activity. Profiler can also provide the online and offline status of tape drives while showing how often specific drives are offline.

Retrying failing jobs also causes backup cycles to run longer. Consider this scenario: a job that normally runs for ten hours fails unexpectedly. This job could have already run for eight hours and then had to be restarted or is retried through built-in configured retries. As a result, the backup may take 18 hours or more to complete. This means that the resources normally used for other jobs are being tied up and those other jobs have to wait or will take longer to finish due to these delays. Any kind of a delay in a backup job can have major consequences on meeting SLAs or backup window requirements.

Profiler identifies major offenders or the top “retrying” backup jobs or clients. If backup administrators have this information, they can focus their attention on problematic jobs and work to bring them back into regulation. In most cases this will greatly increase efficiency and successful backups, while also reducing backup times. Profiler also shows the top exceptions or failures, allowing administrators to focus on and eliminate the majority of their issues.



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## Conclusion

A backup administrator's task of reducing backup times is not easy. Using a tool such as Tek-Tools Profiler, can greatly reduce the time it takes to identify and analyze the necessary data needed to reduce backup times. Profiler can provide secondary money saving benefits such as reducing tape costs and maximizing use of current backup resources. The factors discussed above are certainly not all of the contributors to long backup times, but reflect the most common. When multiple Profiler modules are simultaneously utilized, administrators can maintain the integrity of the entire backup infrastructure from one single console.