Scheduling Concepts

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Ensuring that you have all the files needed to restore your system is a complex task. Typically, it is not practical – from either a time or a media perspective – to create a full backup every day. The solution involves running different types of jobs (full, incremental, differential or copy) on predefined schedule intervals using predefined numbers of media sets that get reused over time. The process of reusing media is referred to as media rotation. The media rotation type determines how and when each media set is used, how long it is retained once it contains data, and the granularity of your backup history.

Media Sets

Yosemite Server Backup organizes media into sets based on the rotation type and schedule interval. Whether the job requires several or only one physical media to complete, they are identified in the Yosemite Server Backup catalog as a set. When more than one physical media is required for a job, Yosemite Server Backup will create a unique name for each media in the set.

When planning scheduled backup jobs, it is important to know whether one or several physical media will be required to complete a backup job. This can usually be estimated by comparing the size of the backup selection to the capacity of the selected media. If you do not want Yosemite Server Backup to use more than one media for a backup job, then you must select fewer files to back up.

> The terms media can be used to refer to both physical media, like an LTO tape, or to the catalog object Yosemite Server Backup uses to keep track of file versions that have been backed up.

Intervals

Job schedules are defined using the Intervals **Daily**, **Weekly**, **Monthly**, and **Yearly** . Intervals are used to defined which days a job will run, what type of backup (full, incremental, differential, or copy) will be done, and how many sets of media are dedicated to the interval. The size of an interval refers to the amount of time between runs of that interval.

When the **Run repeatedly** schedule type is chosen the job **Configuration** page will show an additional section, **Interval settings**, that control the schedule parameters. Each interval type is listed along with a textual description of its current setting. To customize the settings for an interval, click on one of the interval buttons. Most schedules are defined in terms of the following intervals:

Daily – run on sequential weekdays.

Weekly – run once per week on the day specified by the user, for example, Friday.

Monthly – run once per month on a day specified by the user such as the first day, the last day, the first Monday, and others. You can also specify how many months should elapse between monthlies. Setting the monthly interval to every 3 months will create a backup every quarter.

Yearly – run once per year on a specified day of the year. By increasing the interval you can also schedule a job to run once every so many years.

There are also **Hourly** and Minutely intervals that are less commonly used. The concepts behind using them are similar to those of the intervals discussed above.

For all intervals there is a setting that controls the number of sets. This settings determines how many sets of that backup interval will be created before Yosemite Server Backup goes back and overwrites the first. For example, if your schedule starts in January and calls for three monthly sets, you will have a set for January, a set for February, and a set for March. In April, the job will overwrite the set from January.

When configuring a rotation the Calendar view displays the schedule graphically. The interval type for each day is displayed in the calendar. Clicking on a day in the calendar will display the type of backup, the write mode, and the name of the media that will be used on that day.

You can change the interval for a given day of a schedule by right-clicking on the day in the calendar and selecting the desired type.

You can prevent the job from running on a given day. This is helpful for times when you know the job will not complete because you are unable to supply the right media for the job, as in the case of holidays.

You can enable or disable jobs from running on specified days of the week by clicking the name of the day in the heading of the calendar view. For example, if you want daily backups on Saturdays.

Implications of Intervals for Restoring Data

Intervals also define the granularity of the data you can restore. Rotations are set up to capture more

granularity in the recent past and less granularity as data gets older. Larger intervals, like Yearly and Monthly, produce lower granularity data history. Smaller intervals, like Daily, produce higher granularity history. Take, for example, a rotation with three full monthly backup sets on the last day of each month, four full weekly backup sets created on each Friday, and four incremental daily backup sets created Monday through Thursday. Now suppose you have a critical file that changes daily. On Wednesday, you are asked to retrieve the file as of a specific date. With this rotation you can roll back to the Monday and Tuesday versions of the file in the current week and the Wednesday, Thursday, and Friday versions of the file in the previous week. Beyond that, you will only have the versions of the file as they existed on Friday for the previous four weeks previous to the current week. And beyond that you will only have the versions of the file that existed on the last day of the month for the previous three months.

The catalog keeps track of the files and versions that have been backed up so you don't have to remember what media they are on. This knowledge makes the restoration process very simple. You only need to specify the files you want restored and Yosemite Server Backup will prompt you for the media it needs restore the files. Full reconstruction of data may require multiple media sets. For example, to reconstruct the data for a Wednesday from a GFS 20 set rotation type, you will require the full backup media set from the previous end of week and all of the incremental media sets from that week (that is, Mondays, Tuesdays and Wednesdays). In some circumstances, the preceding full backup media set will be a monthly or yearly job and not a weekly job. As long as none of these media sets has been overwritten, full data recovery is possible.

When a full backup media set is reused, any incremental or differential backups relative to that full backup will no longer be usable for full system restores. However, files on those media are still recoverable.

Yearly backups only provide you with access to files present on your computer or network on that one day each year. No copy exists for files that were created after the oldest yearly backup and then deleted before the most recent yearly backup. It is the responsibility of the user to manage the retention of media containing critical business data.