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## Proper Use of a DDS Autoloader

*Abstract:* This document explains the features and uses of a DDS Autoloader. The DDS Autoloader was designed to automate the backup process. To receive the greatest benefits from a DDS Autoloader, the intended use and unit features need to be understood.

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Proper Use of a DDS Autoloader  
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## Introduction

There is a need in today's world to retain more and more information. Businesses have to adjust to smaller Information System (IS) budgets, staff, and backup windows while server primary storage gets larger. There often is a lack of technical personnel available at remote offices to handle daily backup and restore functions. The DDS Autoloader is designed to solve these problems by automating the backup processes.

## DDS Autoloader Features

The DDS Autoloader provides the following features:

- An automated backup system with higher storage capacity, performance, and reliability.
- A single tape drive with a robotic mechanism for retrieving and loading tapes. Previously recorded data can be accessed or new data can be written without user intervention to perform loading and unloading of tape cartridges.
- A tape cassette magazine holding up to eight data cassettes or seven data cassettes and a cleaning tape on the higher capacity autoloader. This provides a complete week's worth of randomly accessible backups with an automated cleaning cycle when combined with software such as VERITAS Software Backup Exec with the Autoloader Module or Computer Associates ARCserveIT with the Tape Library Option.
- The ability to restore archived media because of backward read/write compatibility with previous DDS formats. DDS-4 is backward compatible with DDS-1, DDS-2, and DDS-3 formats.
- An extension of standard technology for existing DAT users with a stand-alone backup system.
- The ability to store up to 320 GB of data when using a 20/40-GB DAT DDS Autoloader with eight data cassettes in the tape magazine and with 2:1 compression enabled.
- The ability to transfer up to 16 GB of data per hour with a 20/40-GB DAT DDS Autoloader allowing more data to be backed up in a shorter time frame with 2:1 compression enabled.



Figure 1: Compaq 20/40-GB DAT DDS Autoloader

## DDS Autoloader Uses

A DDS Autoloader, when used for automating processes in the recommended work environment, will provide reliable data protection and better media management.

### Work Environment

Install the DDS Autoloader in the right working environment for maximum benefit. Autoloaders are recommended for use with workgroup and departmental servers that have a primary storage capacity of 40 GB of data or less. The high capacity 20/40-GB DAT DDS Autoloader allows all data to be backed up using one tape cassette. The autoloader is not intended or recommended for daily backup of systems with a storage capacity larger than 40 GB.

### Need Automated Process

DDS Autoloaders are designed for low administrative overhead backups. The user loads cassettes into the magazine once a week or once a month and the software does the rest. Automating the backup process frees users from tedious manual backup duties so they can concentrate on more critical tasks. Automating the backup process also reduces the chances of the previous day's backup being overwritten because of the lack of trained staff at remote or branch offices.

The DDS Autoloader provides flexibility in designing a daily backup schedule to meet the backup window time frame. A schedule can be set up for a reduced backup window or an unrestricted backup window.

- Reduced backup window – The tape drive will perform a total system backup on the first day, incremental backups on days two through seven, and a cleaning on day seven.
- Unrestricted backup window – The tape drive will perform a total system backup on days one through seven and a cleaning on day seven. In case of a restore, time is saved because only one backup tape has to be restored.

An automated backup process provides numerous benefits. Scheduling a weekly cleaning will extend the life of the tapes and tape drive and will improve the reliability of the backup data. The user also can devise an automatic tape rotation scheme using additional magazines and tapes.

## Backup Tape Management

Properly managing a library of tapes ensures the protection and reliability of the backup data. The autoloader's tape cassette magazine enhances the tape management process and reduces the time needed to maintain the library. A tape rotation scheme for a reduced backup window, an unrestricted backup window, or backing up a full month of data using an autoloader eight-tape cassette magazine, can be easily developed.



**Figure 2: Autoloader eight-tape cassette magazine**

### Loading Autoloader Cassette Magazine

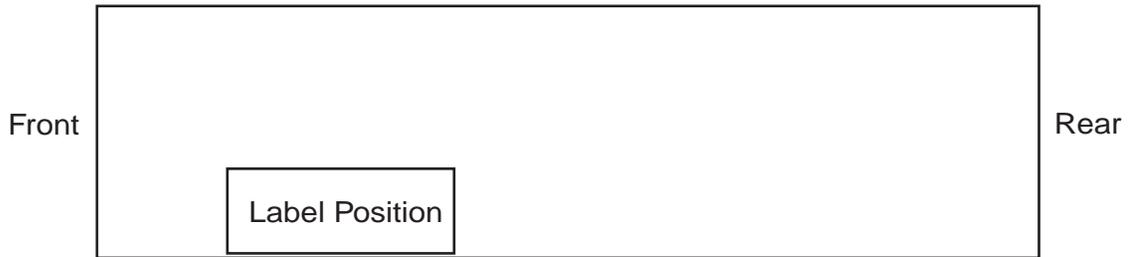
Before installing the tapes in the autoloader magazine, label the tapes with the positions and the day/dates they will be used. Labeling prevents problems if the tapes are removed from the autoloader magazine at a later date. Load the autoloader's eight-tape cassette magazine from the front in the following order:

1. Load tape positions three, two, and one in that order in the magazine's bottom slot.
2. Load tape positions four, five, six, and seven in that order in the magazine's top slot.
3. Load a cleaning cartridge into position eight in the middle magazine slot.

	Tape 7	Tape 6	Tape 5	
Front	Cleaning Cartridge		Tape 4	Rear
	Tape 1	Tape 2	Tape 3	

**Figure 3: Autoloader eight-tape cassette magazine tape positions**

Label the autoloader cassette magazine before putting it in the tape drive. Figure 4 shows the proper placement of the magazine label.



**Figure 4: Autoloader cassette magazine label position (side view)**

## Reduced Backup Window

The best backup routine allows a total system backup to be performed every day. Unfortunately, this is not always possible with heavily used systems. To ensure data protection, perform a full system backup once a week and incremental backups daily. The backup routine for a reduced backup window, shown in Table 1, provides for easier data retrieval by storing the data for each day on one tape. If a data restore operation is required, you will start with the total system backup tape followed by the incremental backup tapes in the order they were recorded.

**Table 1. Reduced backup window tape schedule**

Day	Action
Monday	<ol style="list-style-type: none"> <li>1. Load autoloader tape cassette magazine with seven data tapes and a cleaning cartridge</li> <li>2. Total system backup to tape 1.</li> </ol>
Tuesday	Incremental backup to tape 2
Wednesday	Incremental backup to tape 3
Thursday	Incremental backup to tape 4
Friday	Incremental backup to tape 5
Saturday	Incremental backup to tape 6
Sunday	<ol style="list-style-type: none"> <li>1. Incremental backup to tape 7</li> <li>2. Clean tape drive using cleaning cartridge in tape position 8</li> </ol>

## Unrestricted Backup Window

An unrestricted backup window allows for the best possible backup routine because a total system backup is performed every day. Time is saved when a restore operation has to be performed because only one backup tape is required for the restore process. Table 2 shows an example of a one-week rotation scheme for an unrestricted backup window.

**Table 2. Unrestricted backup window tape schedule**

Day	Action
Monday	<ol style="list-style-type: none"> <li>1. Load autoloader tape cassette magazine with seven data tapes and a cleaning cartridge</li> <li>2. Total system backup to tape 1</li> </ol>
Tuesday	Total system backup to tape 2
Wednesday	Total system backup to tape 3
Thursday	Total system backup to tape 4
Friday	Total system backup to tape 5
Saturday	Total system backup to tape 6
Sunday	<ol style="list-style-type: none"> <li>1. Total system backup to tape 7</li> <li>2. Clean tape drive using cleaning cartridge in tape position 8</li> </ol>

## Full Month Backup

A full month of data can be backed up on a single eight-cassette magazine when primary storage is 30 GB or less. Table 3 shows an example of a one-month rotation scheme. The example routine runs a total system backup every three days to provide for easier data retrieval when a restore operation has to be performed.

**Table 3. Full month backup tape schedule**

Day/Tape	Week 1	Week 2	Week 3	Week 4
Monday/Tape 1	Total system backup	Incremental backup	Incremental backup	Total system backup
Tuesday/Tape 2	Incremental backup	Incremental backup	Total system backup	Incremental backup
Wednesday/Tape 3	Incremental backup	Total system backup	Incremental backup	Incremental backup
Thursday/Tape 4	Total system backup	Incremental backup	Incremental backup	Total system backup
Friday/Tape 5	Incremental backup	Incremental backup	Total system backup	Incremental backup
Saturday/Tape 6	Incremental backup	Total system backup	Incremental backup	Incremental backup
Sunday/Tape 7	Total system backup	Incremental backup	Incremental backup	Total system backup
Sunday/Tape 8 Cleaning tape	Clean tape drive	Clean tape drive	Clean tape drive	Clean tape drive

## **Tape Rotation**

The autoloader tape cassette magazine provides an easy way to rotate tapes. When the weekly or monthly backup schedule is complete, remove the tape magazine and store it off-site for better data protection. Replace the tape magazine with a new magazine or an archival magazine whose data can be overwritten. Using several cassette magazines makes it easier to find archived data without having to search through numerous individual tapes. If you archive the tapes individually without the cassette magazine, be sure to label the tapes to prevent problems later.