Purpose
The purpose of this document is to explain how optimized duplication technology can be used in Backup Exec environments to copy deduplicated backup sets from one Backup Exec media server to another, or from one OpenStorage (OST)-compatible appliance to another OST-compatible appliance. This process allows backup data to be recoverable at different locations and allows for redundancy in a backup environment, eliminating a single media server or a single OST-enabled appliance as a single point of failure. When backup sets are transferred using optimized duplication, the data is copied in its deduplicated or reduced form, greatly reducing the amount of data being moved and reducing the amount of network bandwidth required.

Data deduplication has become a primary technology in all kinds of information management systems.

It is used in backup solutions, archiving solutions, and other technologies in order to reduce the amount of redundant data maintained on storage systems and to thereby lower the amount of storage space required. Symantec has a very strong presence and business interest in data deduplication technology. This document is intended to help the reader better understand what Backup Exec 2010 optimized duplication technology is and how the reader can benefit from it.

Intended Audience
This document is intended for anyone interested in understanding what Backup Exec optimized duplication is and how to configure it.
# Backup Exec 2010 Optimized Duplication

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1 What is Optimized Duplication?

Backup Exec supports optimized duplication, which enables deduplicated data to be copied directly from one OpenStorage (OST) device to another OpenStorage device from the same vendor. Because the data is deduplicated, only unique data is copied between the devices. The optimized duplication feature can be used to copy data between Backup Exec media servers or between Backup Exec, NetBackup PureDisk server, and OST-enabled Appliances.

One important problem that optimized duplication can solve is disaster recovery (DR). Copying backup sets from one Backup Exec media server to another using optimized duplication makes the same backup data available for recovery at multiple locations, thereby offering a convenient disaster recovery solution.
2 Requirements for Optimized Duplication

The ability to perform optimized duplication is built into the Backup Exec Deduplication Option. The Deduplication Option license must be installed on each media server that is involved in the transfer of data. It also requires the Backup Exec Central Admin Server Option (CASO) or Shared Storage Option (SSO) to be licensed on the second media server. In this configuration, Backup Exec will be fully aware of the secondary copy of data, which allows for easy recovery of data in case of disasters.

Optimized duplication requires the ability to share independent devices (deduplication storage folders) between media servers. Once these deduplication storage folders are shared between media servers, backup jobs and duplicate backup jobs from one media server can be targeted to those devices on other media servers. Either CASO or SSO is necessary to enable device sharing.

In an SSO environment or a CASO environment, Backup Exec maintains a database of the shared devices. Otherwise, the backup data that one server submits to the device can overwrite the data that another server submits. In a CASO environment, you can add a device to a central administration server (CAS), a managed media server (MMS), or both. Multiple media servers in a CASO environment can share a device.

Media servers can share the following types of storage:

- Devices that are attached to an NDMP server
- Deduplication storage folders
- OpenStorage devices
- Remote Media Agents
- Remote agents that are configured to send data directly to a storage device

Note: You can also share backup-to-disk devices. However, the process is different for backup-to-disk folders and is not covered in this guide.

2.1 Requirements for Optimized Duplication using Backup Exec CASO or SSO

Server A (Backup Exec media server at main office)

a. Backup Exec 2010 media server license
   Installs the core Backup Exec media server components that are necessary to perform tape and disk-based backups.
b. **Deduplication Option**
   Provides an integrated data deduplication solution that optimizes storage and reduces backup redundancy.

c. **Central Admin Server Option**
   Provides centralized administration and job load balancing for existing or newly configured media servers. Managed media servers are centrally managed and monitored from the central administration server.

   Or

   **SAN Shared Storage Option (primary server)**
   Allows multiple Backup Exec media servers to share centralized storage devices that are connected over a SAN or an iSCSI network.

**Server B or any additional servers (Backup Exec media server at a branch office or a DR Site)**

   a. **Backup Exec media server license**
      Installs the core Backup Exec media server components that are necessary to perform tape and disk-based backups.

   b. **Deduplication Option**
      Provides an integrated data deduplication solution that optimizes storage and reduces backup redundancy.

   c. **Managed Media Server (MMS)**
      Performs the processing of backup and restore jobs in a CASO environment. Managed media servers are centrally managed and monitored from the central administration server. You can install managed media servers after you install a central administration server.

      Or

   **SAN Shared Storage Option (secondary server)**
   Allows multiple Backup Exec media servers to share centralized storage devices that are connected over a SAN or an iSCSI network.
Case 1: Optimized duplication from MMS to MMS or from SSO secondary to SSO secondary

Case 2: Optimized duplication from MMS to CAS or from SSO secondary to SSO primary
2.2 Requirements for optimized duplication using Backup Exec and NetBackup PureDisk

Backup Exec media server at main office, branch office, or at a DR site

a. Backup Exec media server license
   Installs the core Backup Exec media server components that are necessary to perform tape and disk-based backups.

b. Deduplication Option
   Provides an integrated data deduplication solution that optimizes storage and reduces backup redundancy.

PureDisk Server

a. PureDisk server host name or IP address
   This information can be obtained from the PureDisk Administrator.

b. Account with sufficient permissions on the PureDisk Server
   This information can be obtained from the PureDisk Administrator.

Note: It is strongly advised that you use CASO or SSO if you are planning to use Backup Exec optimized duplication with NetBackup PureDisk.
2.3 Requirements for optimized duplication using Backup Exec and an OST appliance

Backup Exec media server at main office, branch office, or at a DR site

a. **Backup Exec media server license**
   Installs the core Backup Exec media server components that are necessary to perform tape and disk-based backups.

b. **Deduplication Option**
   Provides an integrated data deduplication solution that optimizes storage and reduces backup redundancy.

c. **OST appliance plug-in**
   Enables Backup Exec to communicate with the OpenStorage device. It is installed and configured on all media servers.

**OST Appliance**

a. **Host name or IP address**
   This information can be obtained from the documentation that came with the OST appliance.

b. **Account with Sufficient Permissions on the Deduplication Appliance**
   This information can be obtained from the OST appliance administrator.

1. Local backups to Appliance A at the local office.
2. Duplicate backup job to copy data from Appliance A at the local office to Appliance B at the remote/DR site.
3. Catalogs for local backup and duplicate jobs are stored on the media server.
3 How to configure optimized duplication in a CASO environment

1. Configure one media server as the central administration server.
2. Configure the second media server and any additional media servers as managed media servers.
3. Configure deduplication storage folders on each media server that you want to participate in optimized duplication.
4. Share the deduplication storage folders between media servers.
5. Create a duplicate backup job, which copies deduplicated data to the selected device.

3.1 Sharing devices between media servers

1. Ensure all servers are online.
2. On the navigation bar, click Devices.
3. In the Devices view, right-click the deduplication storage folder that you want media servers to access.
4. Select Manage sharing.
5. Select the deduplication device that you want to share.

6. Under media servers, select the media servers that you want to use with the deduplication device.

7. Click OK.

8. Restart the Backup Exec services on the media servers that you selected in step 5.

9. After restarting the Backup Exec services, ensure that the device is listed and that a hand icon appears under the shared folder.
3.2 Creating a duplicate backup job

1. Ensure all servers are online
2. On the navigation bar, select Job Setup, and then under Backup Tasks, select **New job to duplicate backup sets**.

3. Select **Duplicate existing backup sets** if you would like to make a copy of already backed up data or select **Duplicate backup sets following a job** to duplicate data that will be backed up in the future.

Note: “Duplicate backup sets following a job” requires a scheduled backup job to run and must not be associated with any other duplicated backup set job.
4. In the task pane, under Source, click Selections. Select the data you want to duplicate.

5. In the task pane, under Destination, click Device and Media. Select the device where you want duplicate data to be sent. (In the following example, data will be copied from Folder 002, which is on the MMS, to Folder 001, which is on the CAS.)
6. In the task pane, under Settings, click General. Specify the job name and source device information.

![Backup Exec 2010 Optimized Duplication](image)

7. Check other settings and run the job. After job completion you should observe a new set of catalogs under the restore selection.

Note: Depending on your catalog sharing mode, you may have to run inventory and catalog jobs on the newly created media. In order to find the media information, open the job log and look for “Media Label” under the “Destination Drive and Media Information” section.
Once you locate the media information, go to Devices, right-click the media, and select **Catalog media** to start the catalog operation.

The catalog operation is not required if catalog location is already set to Centralized or Replicated. To change the catalog location, go to the properties for the MMS, and then go to the Advanced tab.

4 **How to Configure Optimized Duplication in a SAN SSO Environment**

The SAN Shared Storage Option (SSO) can be used to enable device and catalog sharing between media servers. SSO does not offer any of the additional management or WAN-friendly catalog sharing mechanisms that are available when using CASO, so SSO is viewed as a non-recommended alternative. However, Backup Exec’s media management services and catalogs are truly shared in real time, and data can be recovered from other media servers to which data has been copied using optimized duplication without a separate cataloging/inventorying step.

To configure optimized duplication using SSO, perform the following steps.

1. Configure one media server as the SSO primary server.
2. Configure the second media server and any additional media servers as SSO secondary servers.
3. Configure deduplication storage folders on each media server that you want to participate in optimized duplication data transfers.
4. Once SSO and the various deduplication storage folders are configured, share the deduplication storage folders between media servers.

To share devices between media servers, see **Sharing devices between media servers**

5 **How to Configure Optimized Duplication with NetBackup PureDisk**

Before configuring Backup Exec to work with NetBackup PureDisk, please gather the following information from the PureDisk Administrator:

- NetBackup PureDisk version (Backup Exec 2010 R2 supports PureDisk 6.6 and above)
- FQDN or IP Address of the PureDisk Server
- User account with sufficient privileges (minimum backup and restore permissions are required on the Storage Pool Authority)
5.1 Verifying permissions and access to the PureDisk Server

1. Open Internet Explorer and enter the PureDisk FQDN or IP Address (https://ip_address of PureDisk Server).

2. Enter the user account details and make sure the Backup and Restore tab is visible.

Note: The above interface will not be used for optimized duplication. The above procedure is only to test permissions and access to the PureDisk server.

5.2 Configuring the PureDisk server as an OST device in Backup Exec

1. Start the Backup Exec administrator console.
2. On the navigation bar, click Devices.
3. Right click the name of the media server, and then select Configure Devices Assistant.
4. On the Configure Devices Assistant dialog box, select OpenStorage.

5. Select Add OpenStorage.

6. Specify the device name, server (either FQDN or IP Address), logon account (user account created in PureDisk server) and server type (PureDisk).

After you add the PureDisk server as an OST device, you can create duplicate backup jobs. See Creating a duplicate backup job.
6 How to Configure Optimized Duplication with OST Devices

Optimized duplication requires the ability to share independent OST devices between media servers.

Note: Supported devices are listed on the Backup Exec Hardware Compatibility List.

Once these OST devices are shared between media servers, backup jobs and duplicate backup jobs from one media server can be targeted to those devices on other media servers. Either CASO or SSO is necessary to enable device sharing.

The OpenStorage API is installed by default when Backup Exec is installed, but you will have to manually install the corresponding appliance OST plug-in on all media servers. The device’s vendor supplies the plug-in. Once you have successfully deployed the vendor-specific plug-in, you can start performing local backups to the appliance followed by duplicate jobs to copy data from the local appliance to an appliance in a remote site or at a DR site.

When a duplicate job is initiated, appliance A will start replicating the data to appliance B. Integrated replication, where the OST appliance does the replication, is called “optimized” because the data flows from the local appliance directly to the remote appliance in deduplicated format and does not travel through the media server. Because the job is initiated by Backup Exec, two copies of the catalog are maintained. One catalog is for the local appliance and one catalog is for the remote/DR site appliance. Administrators can restore backup data from either appliance in case of data loss or disaster.

The procedure to create duplicate backup jobs is similar to section 5 (Optimized duplication with NetBackup PureDisk) with the following exceptions:-

- Step 6 – Needs to be populated with appliance information

Please note: Backup Exec 2010 currently supports Quantum and Exagrid. Support for DataDomain will be coming early 2011.
7 Seeding Before Running an Optimized Duplication Job

Seeding can play a vital role in situations where customers cannot afford to transport large amounts of data over the WAN between their branch offices and head offices. In such situations, seeding is often employed as it allows the first bulk transfer of data to complete quickly and without involving the WAN. USB disks or tapes are used to make the first copy. They are then shipped to the central data center. In the data center, the data is copied to deduplication storage folders and from then on, updates require much less bandwidth.

To transport the first set of data, use the following method and then schedule a duplicate backup job to start optimized duplication.

1. Back up your data to disk or to tape.
2. Transport the tape or disk to the destination system.
3. Inventory and catalog the data.
4. Create a duplicate backup job from the disk or the tape to the deduplication storage folder.
5. After successful completion of the duplicate backup job from the disk or the tape to the deduplication storage folder, create a duplicate backup job between the CAS and the MMS.

Note: You should not use the compression or encryption options for backup jobs that deduplicate data. Data cannot be deduplicated when it is in encrypted or compressed form. Therefore when creating a backup job in step one, ensure compression and encryption options are disabled.

8 Conclusion

Optimized duplication is a feature that allows the Backup Exec media server to track backups regardless of where the deduplication device may replicate them, so any Backup Exec media servers can be aware of data that lives in several places. Without optimized duplication support, Backup Exec would not be aware of copies of data and manual inventory and cataloging operation would be required. You can also set separate retention periods for the various backup sets, allowing for different retention periods for different sites. When used with appliances, optimized duplication offers improved operational efficiencies because the hardware device does the actual deduplication and off-loading of the processes from the media server. After configuring optimized duplication with Backup Exec, you will have an onsite copy, offsite or DR copy, and a long-term-retention copy on tape.
# Additional Resources

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<td><a href="http://www.symantec.com/business/backup-exec-for-windows-servers">www.symantec.com/business/backup-exec-for-windows-servers</a></td>
<td>Landing Page for the Backup Exec Family</td>
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<td>What’s new in Backup Exec 2010</td>
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<td><a href="http://support.veritas.com/docs/304175">http://support.veritas.com/docs/304175</a></td>
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