



Logical Partitions

Backing up and recovering



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Chapter 1. Backing up and recovering logical partitions

Backup of logical partitions follows most of the same procedures you would use for a system without logical partitions. However, you must perform backups individually for each logical partition. The backup and recovery information in this section can help you ensure that your system data, user data, and configuration data are safe. This information can help you to recover quickly from disasters or system failures.

You can read about how to do these tasks:

- Back up your system before creating logical partitions.
- Back up your user data on a logical partition.
- Recover your user data on a logical partition.
- Work with and restore logical partition configuration data.
- Troubleshoot problems with the configuration data in your logical partitions.



Chapter 2. Preparing for logical partitions

Your preparation needs are based on the system on which you want to create logical partitions:

Type of System	Action Needed
New System	You do not need to do anything special before creating logical partitions as long as you have not restored any user data to the system. If there is user data on the system, back up all data (see below) before creating logical partitions. Otherwise, start with the Setting up Logical Partitions topic.
Existing System	You need to back up all your data (see below) before creating any partitions.

You need to have a backup copy of all your system data and user data before creating any logical partitions. You need to make two copies of the backup, or perform one full backup and duplicate the save media. Use option 21 on the save menu. You should have two copies because you should always store one off site in case of a disaster.

Use the following steps when you create logical partitions on a system that already contains user data and system data:

1. Perform a backup. You can find the steps for using option 21 in the Save Menu chapter of your Backup and Recovery book  .
2. After you complete your backups, continue with the steps for creating logical partitions.
3. After you create the logical partitions, follow the steps for restoring data from save media. You can find this in the Recovering Information on Your System section of your Backup and Recovery book  .

Chapter 3. Backup for logical partitions

Each logical partition functions like an independent system, so you should perform backups accordingly. However, you can also connect them together, or even to another system. This has some of the same backup benefits as a clustered environment and as a set of connected systems. In these ways, logical partitions can provide you with some unique and helpful backup procedures for your AS/400.

This section covers the information you need to know to make backing up data on your logical partitions easier.

- Read this list of special considerations for backing up a system with logical partitions.
- Read the information about backing up logical partitions before you start the backup process.
- Get information on how your system saves the logical partition configuration.

Backup considerations with logical partitions

The process of backing up a logical partition is fundamentally the same as backing up a system without logical partitions. Each logical partition requires its own save strategy.

Here are a few items that should affect how you plan your backup strategy:

- It is important to remember that each logical partition functions independently of any others. Therefore you cannot perform a single, entire system backup. Instead, you need to back up each logical partition separately.
- As part of your backup strategy, remember that a processor failure, main storage failure, failure in the primary partition, or disaster shuts down the entire system. This may require you to recover all or some of your logical partitions. Therefore, plan carefully how you use your logical partitions and how often you need to perform a backup of each logical partition.
- You can generally perform these backups at the same time since each logical partition functions like an independent system. This can reduce the time that is required for performing backups.
- If any secondary partitions switch a removable media device between themselves, you must back up each of these logical partitions sequentially. You must manually remove and add the removable media device between the logical partitions after each save. The articles on changing resources explain how to do this effectively.
- The system automatically maintains the configuration data for your logical partitions. This data is not saved to or restored from removable media.
- You should print your system configuration when you make changes to your logical partition configuration.
- Any function that requires you to power off or restart the system (like applying program temporary fixes [PTFs]) requires special care. If you need to power off or restart only a secondary partition, then you may safely do it. However, if you need to power off or restart the primary partition, then you need to power off all the secondary partitions **before** you perform that function.

Backing up a logical partition


Each logical partition functions like an independent system, and needs to be backed up individually. For other information on how logical partitions affect how you perform backups, see the backup considerations.


You can not include multiple logical partitions in the same save operation. You must back up each logical partition individually. However, you can perform a backup for each logical partition at the same time (provided all logical partitions have a dedicated removable media device).

The system automatically maintains the configuration data for your logical partitions; you cannot save it to removable media.

You need to make two copies of each backup you perform because you should always store one copy off site in case of a disaster.

It is essential that you have a backup and recovery strategy for each logical partition so that you do not lose any of your important data.

If you have any advanced program-to-program communications (APPC) controls configured that use OptiConnect on the logical partition, vary off these controllers before performing the save. If you do not vary off these controllers, they go into a failed status, are marked as damaged, and are not saved. For more information about OptiConnect, see the OptiConnect for OS/400 book  .

You must perform each backup from the console or a workstation that is attached to that logical partition. Follow the steps in the "Saving Information on Your System" section of your Backup and Recovery book  as you back up each logical partition.

Saving logical partition configuration data

Logical partition configuration data is automatically maintained for the life of the physical system. Each logical partition load source contains the configuration data.

Only disaster recovery to a different physical system would require that you rebuild the configuration from the beginning. You should print your system configuration when you make changes to your logical partition configuration. This printout will help you as you rebuild the configuration.

During a save operation, the configuration data for the logical partition is not saved to tape. This allows data to be restored to a system whether or not it has logical partitions. However, you can work with the configuration data for logical partitions as needed for recovery purposes.


Attention: Logical partitions that you keep powered off for extended periods should be restarted at least once after any change to the logical partition configuration. This allows the system to update the changes on that logical partition's load source.

Chapter 4. Recovery for logical partitions


Recovery for logical partitions falls within two main categories:

- Recovery of logical partition configuration data. This involves recovering from hardware failures, correcting errors, or performing maintenance after hardware movement.
- Recovery of **user data** to a logical partition. This section covers different topics about recovering your user data:
 - Read the considerations before attempting recovery in a logical partition.
 - Read information on recovering your logical partition configuration data.
 - Read general information regarding restoring data to a logical partition.
 - Recover user data from a deleted logical partition.

Recovery considerations with logical partitions

As you go through the recovery steps outlined in the Backup and Recovery book  , keep these points in mind:

- Recovery occurs on a partition-by-partition basis. There is not a system-wide recovery option for all logical partitions.
- Since each logical partition should have its own backup media, ensure that you use the appropriate media for the logical partition.
- Make sure that you recover the logical partition configuration data after initializing the disk units of the primary partition.
- On a full system recovery, perform the following steps:
 1. Restore the Licensed Internal Code to the primary partition.
 2. Recover the configuration data for the logical partitions.
 3. Recover the disk configuration for the primary partition.
 4. Install the operating system on the primary partition.
 5. Recover any of the secondary partitions by restoring the Licensed Internal Code, recovering the disk configuration, and installing the operating system.


These steps are covered in more detail in the Recovery section of your Backup and Recovery book  .

- You work with configuration data for logical partitions through a menu in dedicated service tools (DST). The configuration data for the logical partitions is never restored from the backup media.
- For secondary partitions that share removable media devices, switch the IOP and device to the required logical partition before you perform a recovery.
- You can view system reference code (SRC) activity for the secondary partitions through the primary partition in DST or SST. You can also view SRC activity for a secondary partition from its own DST display or its own SST display. You monitor the SRC codes on the Display Partition Status display.
- Look for all configuration data errors that are related to logical partitions in the Licensed Internal Code log (LICLOG) and product activity log (PAL). Each logical partition has its own logs you can view. However, some errors on a secondary partition can only be found in the logs on the primary partition. So, be sure to check both places when possible.

Information on recovering logical partition configuration data


Any time you initialize the load source disk unit on the **primary partition**, you need to recover the logical partition configuration data. Initialization may occur just prior to reinstalling the operating system. You need to recover the configuration because initializing the disk units erases everything on them: system data, user data, and configuration data.

When you recover the logical partition configuration data, the system looks for the configuration data that is stored on the secondary partitions. It then copies the configuration data to the primary partition. When you erase the disk units in a secondary partition, the configuration data is automatically copied from the primary partition to that secondary partition once you restart it.

First, you will reinstall the Licensed Internal Code on the primary partition. **Immediately** after the system reaches the IPL or Install the System display and before you configure disk units or recover auxiliary storage pools (ASPs), you need to follow the steps to recover your configuration. Then, continue with you recovery as directed in the Recovery section of your Backup and Recovery book  .

Restoring user data to a logical partition

Restoring user data to a logical partition follows most of the same steps as restoring data to a system without logical partitions. However, there are a few considerations to keep in mind before you begin recovery procedures.

See the Recovery section in your Backup and Recovery book  for the specific instructions on data recovery for your system.

Recovering user data from a deleted logical partition

In general, you cannot recover user data or system data from a deleted logical partition. However, if a logical partition is accidentally deleted, it may be possible to manually re-create it without any data loss. Disk units from the deleted partition must **not** meet any of the following conditions:

- Moved to another logical partition
- Removed from the system
- Configured into another logical partition or system


To recover the user data and system data, follow these steps:

1. Create a new logical partition.
2. Add ALL resources back into the deleted logical partition so that it has the same configuration as it did before it was deleted.
3. When you finish creating the logical partition, restart the system by using IPL source B in normal mode.
4. If the system restarts successfully, all user data and system data should be available.

Chapter 5. Working with configuration data for logical partitions

You may sometimes need to work with logical partition configuration data. Typically, you will need to do so in order to recover from hardware failures, to correct errors, or to perform maintenance after hardware movement.

The system maintains the configuration data for all logical partitions on the load source of each logical partition. The configuration data maintained on the primary partition is considered the master copy. Problems can occur when the configuration information on the primary partition and a secondary partition conflicts, or after you initialize disk units during an install.

If you are migrating data or recovering a system with logical partitions, see the Backup and Recovery book  .

This section contains the following information on how to recover from errors and work with the configuration data:

- How to recover your configuration data after initializing the primary partition.
- How to clear your configuration data.
- How to update your configuration data.
- How to clear the configuration data from a nonconfigured disk unit.
- How to clear resource references for hardware that no longer resides on the system.
- How to accept a disk unit as load source for an existing logical partition.
- How to copy configuration data between IPL sources (A to B, or B to A).
- How to delete your logical partitions in order to have a system without logical partitions.


Recovering logical partition configuration data

The following information applies only to **primary partitions**. This procedure is part of a full system recovery, as directed by the Backup and Recovery book  .

You can also read general information about recovering your configuration data.

After reinstalling the Licensed Internal Code on the primary partition, stop at the IPL or Install the System display. Select option 3 (Use Dedicated Service Tools [DST]) in order to recover the logical partition configuration data:

1. Before changing your disk configuration or recovering your user ASPs, select option 11 (Work with system partitions).
2. Select option 4 (Recover configuration data).
3. Select option 1 (Recover primary partition configuration data). The system locates a nonconfigured disk unit that contains the most recent configuration data for your system. If the message No units found with more current configuration data displays instead of a list of resources, then no unassigned disk units contain any appropriate configuration information. Consult a service representative for more options.

4. Verify that the date and the time fall within a valid time frame for the configuration.
5. Confirm your selection by pressing the Enter key.
6. The system copies the new configuration data to the primary partition's load source and automatically restarts the primary partition.
7. When you next perform an IPL for the secondary partitions, the system updates their logical partition configuration data.
8. Once the primary partition completes its IPL, continue with any further recovery steps as outlined in the Recovery section of your Backup and Recovery book  .

Clearing configuration data for logical partitions

You can clear the configuration data for the following:

- All logical partitions (delete all logical partitions).
- Nonconfigured disk units (delete old configuration data on a disk unit).

Updating configuration data on all logical partitions

Note: You should only perform these steps when instructed to do so by a service representative.

You can update the configuration data for every active logical partition by copying it manually from the primary partition to all active logical partitions.

Perform this procedure from the dedicated service tools (DST) or system service tools (SST) menu:

1. From DST, select option 11 (Work with system partitions). From SST, select option 5 (Work with system partitions). Press Enter.
2. Select option 4 (Recover configuration data).
3. Select option 2 (Update configuration data).

Attention: Using this function when the configuration data on the primary partition is incorrect ruins your existing configuration.

4. Confirm your choice by pressing the F10 key.
5. Service may ask you to restart your system in order to apply any changes.

Clearing configuration data for nonconfigured disk units

When you move disk units between logical partitions or systems, you may need to erase any old configuration data before the system can use the logical partition again.

You need to clear the configuration data when the disk unit has all of the following characteristics:

- A system reference code (SRC) of B600 5311 has been reported in the product activity log (PAL) against a nonconfigured disk unit.
- It is no longer a load source in its own logical partition.
- It is originally from a different logical partition where it was a load source, or it is from a different system which had logical partitions.

Perform this procedure from a dedicated service tools (DST) display:

1. Go to the DST menu.
2. Select option 11 (Work with system partitions).
3. Select option 4 (Recover configuration data).
4. Select option 3 (Clear non-configured disk unit configuration data).
5. Select the disk unit with the configuration data you want to erase. Type a 1 in the Opt field to the left of the disk unit listing.
6. Press the Enter key.
7. Confirm that you truly do want to erase the configuration data.
8. The changes take effect immediately.

Clearing nonreporting resources on logical partitions

Attention: This procedure should **not** be run if ANY hardware is marked as failed. It should only be run when all system hardware is completely operational.

After you add, remove, or move hardware within a system with logical partitions, you may have resources that are no longer available or that are listed twice.

You can clean up these listings so that all nonreporting resources are erased from the configuration data for the logical partition. You do this from a dedicated service tools (DST) display:

1. After making all your hardware changes, restart your system in manual mode. Get to a DST menu.
2. Select option 11 (Work with system partitions).
3. Restart all secondary partitions in normal mode. Stop at the sign-on display for the operating system. Wait until all secondary partitions complete their IPL before you continue to the next step.
4. From the primary partition's console, select option 4 (Recover configuration data).
5. Select option 4 (Clear non-reporting logical partitioning resources).
6. To confirm the deletion of nonreporting resources, press the F10 key.

Accepting a disk unit as load source for a logical partition

When configuration data on the load source of a logical partition is different from what the system expects, an error is logged in the product activity log (PAL). A reference code of B600 5311 occurs against the load source disk unit.

If you have recently moved or added disk units either within the system or from another system, they may still contain configuration data. If you do not want to use one of them as the load source, you need to clear the configuration data before proceeding.

Otherwise, if you do want to use one of the disk units as your new load source on the logical partition, follow these steps from the dedicated service tools (DST) menu:

1. At the DST menu, select option 11 (Work with system partitions).
2. Select option 4 (Recover configuration data).

3. Select option 5 (Accept load source disk unit).
4. Confirm that you really do want to use the disk as a load source in the logical partition by pressing the F10 key. The system replaces the configuration data on the load source disk unit with the current configuration data.
5. The logical partition may now continue its IPL with the new load source disk unit.

Copying configuration data between IPL sources

Your system may experience a disk read error of logical partition configuration data if the following terminating reference codes display when you restart from one source but not another:

11 B193 4511

12 xxxx xxx5D (where x equals any value 0-9 or A-F)

13 690A 2060

You find these reference codes on the operations panel. You can copy the data from the functioning source to the faulty source with this procedure.

Attention: You should only attempt this when you are certain that the logical partition restarts normally when using the other IPL source.

Perform this procedure from a dedicated service tools (DST) display:

1. If you are doing this on the primary partition, power off all secondary partitions.
2. Restart your system in manual mode with the other IPL source (for instance, source A if source B fails).
3. From DST, select option 11 (Work with system partitions).
4. Ensure that the configuration information contained on this IPL source is correct. Verify this by displaying your logical partition's status. A correct configuration would show your most recent configuration of logical partitions. If it is correct, continue to the next step. If the configuration is not correct, **do not** continue. Consult a service representative.
5. Press the F3 key to return to the Work with System Partitions menu.
6. Select option 4 (Recover configuration data).
7. Select option 6 (Copy configuration data to other side).
8. Confirm your choice by pressing the F10 key.
9. Restart the logical partition using the other IPL source (source B, if source A had the correct configuration data you just copied from).
10. If you continue to have problems, contact a service representative.



Deleting all of your logical partitions

There may be a time when you need to erase all your logical partitions to make the system non-partitioned again.

It is possible to return all hardware resources to the primary partition. However, **all** user data contained within the secondary partitions will be lost. Make sure that you have adequate backups prepared for all logical partitions.

Attention: Following these instructions destroys all user data and system data on the secondary partitions.

You can delete all logical partitions from the dedicated service tools (DST) menu:

1. Perform a full system backup (option 21) for each logical partition, as described in the Backup and Recovery book  .
2. Power off all secondary partitions before proceeding.
3. Make sure that you are at the DST menu.
4. Select option 11 (Work with system partitions).
5. Select option 4 (Recover configuration data).
6. Select option 7 (Clear configuration data).
7. Confirm that you really do want to delete all your logical partitions.
8. Restart the system in manual mode for the change to take effect.
9. Perform the steps for clearing configuration data from nonconfigured disk units from DST. Do this once for every former secondary partition load source disk unit.
10. Refer to your Backup and Recovery book  for information on how to restore any user data or system data to the system.

Chapter 6. Troubleshooting configuration data errors for logical partitions

This article covers system reference codes and problems with the logical partition configuration data. You can find general troubleshooting information in the Managing logical partitions articles.

If a system with logical partitions experiences a configuration data error, the following indications will occur:

- When you perform a normal mode IPL, the system reference codes 11 A600 5090 and 13 0260 0000 display on the system operations panel. Restart the system by using a manual mode IPL and check the product activity log for specific system reference codes (SRCs).
- When you perform a manual mode IPL, the following messages appear:
 - The message Unit has incorrect logical partition configuration appears instead of the dedicated service tools (DST) sign on display.
 - The message Configuration data error detected - see Product Activity Log appears at the bottom of the Work with System Partitions display.

Check the product activity log for specific system reference codes (SRCs).

Finding the Product Activity Log (PAL)

You can view the product activity log (PAL) from dedicated service tools (DST) or system service tools (SST):

- From DST, select option 7 (Start a service tool) then select option 6 (Product activity log).
- From SST, select option 1 (Start a service tool) then select option 1 (Product activity log).

System Reference Codes (SRCs)

The following list contains the common SRCs that the PAL could report. Suggested corrective actions follow each SRC.

B600 5310

Description: Logical partition configuration data has a consistency error. The system cannot find a working copy of the configuration data for the logical partition.

Recovery action: Contact your service provider. The system will not continue its IPL past dedicated service tools (DST) until the problem is corrected.

Problem analysis procedure: Collect the detailed hex data from the product activity log (PAL) for this problem for your service provider.

B600 5311

Description: Logical partition configuration data does not match the current system configuration. Possible causes include:

- A nonconfigured disk unit which was previously a load source for a logical partition.

- Load source configuration data does not match the logical partition for which it is being used.
- Load source configuration data does not match the system serial number for which it is being used.
- Load source configuration data is newer than the primary partition configuration data.

Recovery action: Perform one of the following tasks:

- If the load source has been replaced inadvertently, return the original.
- If the load source is for the primary partition, recover the logical partition configuration data.
- If the specified load source is for a secondary partition, accept the disk as a load source for that secondary partition.
- If the specified disk unit is not configured, clear the nonconfigured load source to use the new disk unit in the system.
- If a new load source disk unit was moved from a system with logical partitions, but the system should no longer have logical partitions, clear all system configuration data in order to delete all of the secondary partitions.
- If the new load source unit was moved from a system with logical partitions and was inadvertently used to perform a partition IPL, the initialize disk process during installation will clear existing configuration data.

The logical partition will not continue its IPL past DST until the problem is corrected with one of the above actions.

Problem analysis procedure: Collect the detailed hex data from the product activity log (PAL) entry for this problem for your service provider.

B600 5312

Description: Informational indication that the system detected and corrected a configuration data inconsistency on a logical partition without any loss of data.

Recovery action: None.

Problem analysis procedure: None unless a significant number of errors occur. Collect the detailed hex data from the product activity log (PAL) entries for these problems for your service provider.

B600 5313

Description: The system detected a configuration data inconsistency for a logical partition and could not correct it without loss of the last configuration data update.

Recovery action: Manually validate configuration data and repeat any missing configuration actions.

Problem analysis procedure: None unless a significant number of errors occur. Collect the detailed hex data from the product activity log (PAL) entries for these problems for your service provider.

B600 5340

Description: A logical partition is running with less than the requested number of processors.

Recovery action: Perform recovery for the processor-specific errors that are logged in the primary partition.

Problem analysis procedure: Check the product activity log (PAL) in the primary partition for hardware errors that should be corrected.

B600 5341

Description: A logical partition is running with less than the requested amount of main storage.

Recovery action: Perform recovery for the main storage specific errors that are logged in the primary partition.

Problem analysis procedure: Check the product activity log (PAL) in the primary partition for hardware errors that should be corrected.

B600 5350

Description: A logical partition software version is outside of the supported secondary partition release delta.

Recovery action: Perform one of the following:

- Install a supported software version in the logical partition that has the problem.
- Upgrade the primary partition operating system to a level which supports the software version in the offending logical partition.

Problem analysis procedure: Display the logical partition release level and check the logical partition release delta.

B600 5380

Description: An unexpected event occurred in the logical partition management code that was recovered.

Recovery action: Contact your service provider if a significant number of these errors have occurred.

Problem analysis procedure: Collect the detailed hex data from the product activity log (PAL) entry for this problem.

B600 5390

Description: An unexpected event occurred in the logical partition management code which could not be recovered. Further logical partition configuration changes may not be possible.

Recovery action: Contact your service provider. The system might not IPL past DST until the problem is corrected.

Problem analysis procedure: Collect the detailed hex data from the product activity log (PAL) entry for this problem.



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