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# Merging make\_\*recovery

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Merging make\_recovery capabilities into make\_net\_recovery

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## Merging make\_recovery capabilities into make\_net\_recovery

### Introduction

#### Abstract

The two system disaster recovery tools **make\_recovery** and **make\_net\_recovery** are part of the **Ignite-UX** tool set. **make\_recovery** produces a bootable tape that allows a customer to re-install a root disk/volume group in the event of a disk failure. **make\_net\_recovery**, on the other hand, addresses the same basic customer needs (re-creation of the root disk/volume group in the case of a disk failure) with a different feature. That feature is to store the archive and associated configuration files on an **Ignite-UX** server across the network. To provide our customer a better support model and to maintain one set of code for recovery tools, **make\_recovery** and **make\_net\_recovery** have been merged into one set of code. In order to distinguish the tape and net recoveries, we have a new name for tape recovery, **make\_tape\_recovery**. **make\_tape\_recovery** is hard-linked to **make\_net\_recovery**. The new merged code keeps all the existing features of **make\_net\_recovery** and adds all user-accessible features of **make\_recovery** so that **make\_recovery** can be removed from future releases with minimal effect to the user.

#### Product Identification

Project Name	Ignite-UX make*recovery merge
Project Mnemonic	IUX MKREC MERGE
Target Release	DART52
Target Release Date (est.)	February 2001
Project Personnel	Lin Zhang, Julie Szmyd, and Wayne Cook: Core IUX Al Jackson, Learning Products
Review Personnel	Mike Abrams, WTEC; Ellen Grun, HP Field

### Introduction

We have received many requests from our customers to have many of the same features in both **make\_recovery** and **make\_net\_recovery**. The most common requests are to have:

- 1) Preview and resume modes in **make\_net\_recovery**, like **make\_recovery** has.
- 2) Ability to run a tape recovery from the Ignite-UX server.
- 3) Have both handle sparse files properly.

## Command Line Option Translation Table

make_recovery		make_net_recovery		make_net_recovery make_tape_recovery	
Option	Description	Option	Description	Option	Description
-A	Specifies that the entire root disk/volume group is to be included in the System Recovery tape.			-A	It is equivalent to -x inc_entire=/dev/dsk/<name><vgname>.
		-a server:archive_dir	Specifies the NFS server and location to store the archive	-a [server:]archive_dir	Specifies the NFS server and location to store the archive. This location can be the tape drive device file or regular directory.
-b boot-dest-file	Specifies the temp location where LIF volume will be assembled before it is written to tape.			-B boot-dest-file	Specifies the temp location where LIF volume will be assembled before it is written to tape ( <b>make_tape_recovery</b> only).
		-b	When used in combination with the -i option, it causes make_net_recovery to run in the background after the interactive user interface complete.	-b	When used in combination with the -i option, it causes the tool to run in the background after the interactive user interface complete.
-C	Creates output for use by check_recovery			-C	Adds checksum information to file list for check recovery
-d destination	Specifies the device file of a DDS or DLT tape drive where the System Recovery Tape is to be created.			(See -a option)	
				-d description	One line description of the system recovery archive
		-f content_file	Location of the file, which identifies keywords to specify inclusions and exclusions for the archive.	-f content_file	Location of the file, which identifies keywords to specify inclusions and exclusions for the archive.
-i	Cause the system recovery process to be interactive when booting from the tape.			-I	Cause the system recovery process to be interactive when booting from the tape ( <b>make_tape_recovery</b> only).
		-i	interactive	-i	Interactively control making archive
		-l lanic_id	The lanic id of the system being archived	-l lanic_id	The lanic id of the system being archived
		-n num_archives	Specifies the number of archives that should remain on the server at any given time	-n num_archives	Specifies the number of archives that should remain on the server at any given time.
		-P s w e	display messages	-P s w e	display ERROR(e), WARNINGS(w), or SUPPRESS(s) messages
-p	Preview mode			-p	Preview mode
-r	Resumes creation of the System Recovery tape after the -p option has been used.			-r	Resumes creation of the System Recovery tape after the -p option has been used.
		-s IUX_Server	Specifies the hostname of the IUX server.	-s IUX_Server	Specifies the hostname of the IUX server.
-t tape-title-strings	specifies a custom message that will be displayed to the user during a recovery from the tape.			-t tape-title-strings	Specifies a custom message that will be displayed to the user during a recovery from the tape ( <b>make_tape_recovery</b> only).
-v	verbose	-v	verbose	-v	verbose
		-x include=file/dir inc_entire=/dev/dsk/ <name> vg_name inc_cross=file/dir exclude=file/dir	include/exclude file/dir/desk/volume group	-x include=file/dir inc_entire=/dev/dsk/ <name> vg_name inc_cross=file/dir exclude=file/dir	include/exclude file/dir/desk/volume group

## Terms and Definitions

### **Ignite-UX**

An HP-UX product which is shipped as a free product on the DART which is capable of installing and configuring HP-UX.

### **IUX**

A synonym for **Ignite-UX**.

<b>make_recovery</b>	A tool for generating an <b>IUX</b> installable “image” of an existing system, and writing it to DDS or DLT tapes.
<b>make_net_recovery</b>	A tool for generating an <b>IUX</b> installable “image” of an existing system, and store on a networked <b>IUX</b> server.
<b>make_tape_recovery</b>	A tool for generating an <b>IUX</b> installable “image” of an existing system, and writing to a DDS or DLT tape on the archive system or on another system on the network. This is the replacement tool for <b>make_recovery</b> and is hard-linked to <b>make_net_recovery</b> .
<b>archive</b>	a system image written on tape(s) or in a directory of an <b>IUX</b> server.
<b>SD</b>	<b>Software Distributor</b> , an HP-UX bundled product for performing software management on HP-UX.
<b>UI</b>	<b>User Interface</b>
<b>GUI</b>	<b>Graphic User Interface</b>
<b>TUI</b>	<b>Terminal User Interface</b>

## Main Report

### Old Features of tape and network recovery

**make\_recovery** was the original tool that was development for saving and restoring systems. It was (and is still) run on a single system, with the image put onto a local tape. Later, **make\_net\_recovery** was developed for a similar purpose, to save a system image on a remote server across a network. As both tools developed, many similar features were added to them. However, they continued to have certain unique characteristics that were not in the other tool. For example, the **make\_recovery** tool could break the archiving process into two distinct steps to allow configuration files to be created by the first process, modified by the user, and final stored to tape in the final process. Unfortunately, **make\_net\_recovery** did not have this option. On the other hand, **make\_net\_recovery** could back up multiple volume groups (VGs), while **make\_recovery** could not (unless */usr* was on some other VG). To get a better idea of what each tool could and could not do, take a look at the command line option chart in the previous section.

### New Features of tape and network recovery

We wanted to have one tool that did both tape and network recoveries. We also wanted to prevent any major rewrites of any scripts that our customers had that used either of the original tools. This implied that we needed to have a one-to-one mapping of each of the old tools' command line options to the new tool's command line options. We decided to keep all **make\_net\_recovery** command line options remain the same. This would allow us to introduce the new tool and require no changes to the customer's use of this tool. We also would allow a script to be written that would translate **make\_recovery** commands, with all of their command line options, into a new command using the new tool. Doing this gave each version (tape and network) of the new tool all of the command line options of the older tape and network tools. Again, the command line option table in the previous section describes the transition of the options from the old tools to the new tool. We decided to implement all but the *checksum* feature of **make\_recovery** in the first release. We also decided to not add any new features, like remote tape creation, in this first release.

## Target Customers and Environment

The target customers for this combined product are people who would like to archive HP-UX systems for disaster recovery, system cloning (onto systems with similar architecture), or any other related purpose. This group includes those that want to create this archive on a tape and those who want to create it on a central system. The current products, **make\_recovery** and **make\_net\_recovery**, cover many of these needs, however we would like customers who want more flexible in archiving HP-UX systems to be delighted with the new product. We want a customer, who wants a consistent and reliable method for creating archives on either a server or a tape, so they can apply the knowledge and skills of using one version of this tool to using the other version.

The environment in which **make\_net\_recovery** and **make\_tape\_recovery** should run include:

- All HP-UX 11.X systems, making either a tape (initially on the client only) or an image on a HP-UX 11.X Ignite-UX (“B” version) server. The tape can be created either from the client (including stand-alone) or from the Ignite-UX server.
- All HP-UX 10.20 systems, making either a tape (initially on the client only) or an image on either a HP-UX 11.X Ignite-UX (“B” version) server or HP-UX 10.20 (“A” version) server. . The tape can be created either from the client (including stand-alone) or from the Ignite-UX server.
- *NOTE: The following statement is true, only if the “A” version of the server is to be updated.* HP-UX 10.01 and HP-UX 10.10 systems, served by a HP-UX 10.20 Ignite-UX server running the “A” version of Ignite-UX, can have created either a tape (initially locally) or an image on the Ignite-UX server
- In a later release, the tape drive may be on a non-local (to the system being archived) system.
- In a later release, it would be nice if there was a way to convert a tape image to a disk image and a disk image to a tape image.

## Main Design

We wanted all of the features of **make\_recovery** and **make\_net\_recovery** to be available for both tape and network recovery creation. We wanted to have a common *User Interface* for both tools. We also wanted to make the transition from whichever tool changed the most to be as easy as possible. The first goal was achieved, as seen in the command line chart toward the front of this document. The second goal was achieved by using **make\_net\_recovery** to be used as the basis for both tools. The last goal is the one on which we are currently working. We have left **make\_recovery** in the *DART52* and *DART53* releases, but we will replace it by a script for the *DART54 (June 2001 timeframe)* release. We will make sure that the old executable is still available, but the old **make\_recovery** will be in an “old bin” directory and the new **make\_recovery** script will be in the main bin directory. We will make the transition as seamless as possible.

Just like for the original **make\_net\_recovery**, the executables run on the client system with the **ignite** program running on the *Ignite-UX* server functioning as the Graphical User Interface. The changes to the *Ignite-UX* interface are minimal, only adding features to cover the *tape* mode and some of the additional options allowed on the command line. The main visible change is in the **Actions** menu, where the choice **Create Tape Recovery Archive** was added just after **Create Net Recovery Archive**. **Create Tape Recovery Archive** takes you through a series of screens that explain what steps are needed to set up the creation of a tape recovery archive, very much like **Create Net Recovery Archive** does for a network recovery. When you press the **[[Finish]]** button, the client goes ahead and starts the process to create a tape on the client system. The interface will ask you about the device on which you want the archive created. Make sure you keep the destination host as the client host, since remote tape creation is a future enhancement. The last screen, that asks you which files/disks/volume groups you would like to include in the archive is identical to the *Network Recovery Archive* selection screen and is used in an identical manner.

The main benefits to **make\_net\_recovery** in the merge code were the addition of the three options, `-A`, `-p`, and `-r`. The first, `-A`, option, allows an easier way for you to specify that you want all files on any disk (for a whole disk) or volume group that has any files to be included in the archive. The list of files that are included usually come from the default `/opt/ignite/recovery/mnr_essentials` list of essential files. You could add to or modify this list with your own list at `/var/opt/ignite/recovery/mnr_essentials`. The `-p` option allows you to preview the creation of a recovery archive before it happens. The main advantage of this is it allows you to check the configuration files that will be used in the creation and restoration of the archive. Once these files are checked or modified you can resume the process with the `-r` option.

The **make\_tape\_recovery** tool retains an equivalent form of all its command line options and adds a few options that were originally for **make\_net\_recovery** only. The main advantage, though, is the use of the supporting tools. The first example was the use of **make\_net\_recovery**'s *GUI*, as was described in an earlier paragraph. You can now create tapes from an Ignite server and store control files on the server instead of on the system from which you are making the recovery tape. This clutters the system being archived a lot less and makes it easier to repeat the process for the tape creation. We will be looking at making the archive tape on a remote system (or at least the Ignite server) sometime in the future. One of the tools that took a lot of time to execute was the list generation process, especially since it was called multiple times. We wanted to have it used consistently between the tools so that the same files and directories would be archived, no matter which recovery tool was used. We also wanted to have it only call the list generation tool once. A side benefit of this is that the list of files and directories that were used to make the recovery archive is available to you. We also had this tool generate the impact calculations. The advantage of doing this at the time the archives are made, unlike at the time the archive, especially the tape that is in pax (most likely tar) format, is that the impact is calculated on the actual file size. The impact generation from the information on the tape did not handle sparse files correctly. It would say the needed space was the maximum size of the file being archived instead of the actual size being used. The new method should handle this properly. The side benefit of having the list of files that are being archived is that you can review this list. The list is generated during the *preview* mode, so it can be reviewed before the archive is even made.

The third accessible tool that was modified was **make\_sys\_image**. It is the tool that actually makes the recovery archive. The tool allows you several different choices in how the archive will be made. However, the primary users of this tool are **make\_net\_recovery** and **make\_tape\_recovery**. It is highly recommended that you use **make\_net\_recovery** and **make\_tape\_recovery** to create the recovery archive.

Creating an archive should be easier and more consistent than it was before these two tools were merged. We hope that these tools serve you well and that we can continue to improve their ease of use.

## Future Development

The future holds many options for the Ignite-UX team. In the short term, we will implement a *checksum* process for the new tool that will replace the *checksum* process that is associated with the old **make\_recovery** tool. The desire is to have **check\_recovery** recognize how the archive was created and do an appropriate *checksum*, and other checks on the file generated by **make\_recovery**, **make\_tape\_recovery**, or **make\_net\_recovery**.

In the mid-range term, we would like to add such things as remote tape creation to this tool.

In the long run, we would like to look at how we can present a consistent method for Igniting not only HP-UX, but also Windows NT<sup>1</sup> and Linux. We would also like to make it easier to clone systems and/or disks on the same system. There are many opportunities for us to improve Ignite-UX.

## Conclusion

Our goal is to make igniting and recovery your system as easy as it can be. For now, this is strictly for your HP-UX systems, but the future is wide open. By merging the features of **make\_recovery** and **make\_net\_recovery** into a single code stream, it makes developing the future much easier for us, as well as making the use of our tools much for consistent for our customers.

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<sup>1</sup> This is a registered trademark of Microsoft Corporation.