

Subject: MCR-10072 Correct inaccuracies in boot.info

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## Problem Description

The `boot.info` help file documents the `boot salv` option, which does not exist, and fails to document the `boot nosc` option that is supported.

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### boot salv

Attempting to invoke `boot salv` results in the error:

```
system_startup_: salv is not a legal command. Type help for a list of commands.
```

There is no such option. You can force an RPV or RLV salvage by issuing the `boot rpvs` or `boot rlvs` commands, respectively. The `boot.info` segment already documents the `rpvs` and `rlvs` keyword arguments correctly.

According to the history comments in `system_startup.pl1`, the `salv` short name for `salvage_dirs` was removed in 1983.

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### boot command parameters

The BCE `boot` command can pass an initial command into the ring-1 command processor, `system_startup_`, by updating the INTK config file entry with additional fields. In this way, it can pass up to 4-character strings into `system_startup_`. `system_startup_` handles a few strings specially (`nodt`, `nolv`, `rlvs`, and `rpvs`), but otherwise uses the INTK parameter values to build a command line executed as the first command. However, as the commands and arguments so passed are limited to 4 characters, you generally cannot use arbitrary commands that take parameters of more than 4 characters. For example, the `add_vol` command cannot be invoked because this command is longer than 4 characters. However, there exists an abbreviation, `av`, that could. However, this command takes parameters, one of which is a disk drive name, and all valid disk drive names are longer than 4 characters. So practically, you can only invoke a small number of commands from BCE via the `boot` command. These commands are `mult`, `stan`, and `star` — the abbreviations for `multics`, `standard`, and `startup`.

Note: you can also invoke the `list_disks` command, whose abbreviation is `ld`, the `shut` command, and the `bce` command, although none of these are really useful. Therefore it is acceptable that none of these is documented in `boot.info`.

The `mult`, `stan`, and `star` commands are currently documented.

In addition to these commands, there are some *keywords* that are supported. These are `rpvs`, `rlvs`, `nodt`, `nolv`, and `nosc`. All of these are documented now — except for `nosc`.

## boot nosc or boot stan nosc

The `nosc` keyword causes an emergency listener to be used when the ring-4 listener and command processor would normally be invoked. Invoking either `boot nosc` followed by `stan` or `boot stan nosc` results in the following:

```
M-> boot nosc
```

```
Multics MR12.6f - 01/23/20 0653.8 pst Thu
Command: M-> stan
```

```
CONSOLE: ALERT
0653.9  sc_init_: Invoking emergency listener because "nosc" parameter specified.
sc_init_: A serious error was encountered setting up the system control
environment. The system will attempt to establish a Multics
listener level. You should repair the problem, and then type:
          "hphcs $shutdown", and reboot the system.
r 06:53 0.683 4576
```

The “Multics Administrative, Maintenance, and Operator Commands” (GB64) manual documents the `nosc` parameter to the `boot` command in this way:

The following BCE command line will boot the system to the ring 4 emergency listener:

```
boot stan nosc
```

The emergency listener should be used only in the following circumstances:

1. The system cannot be booted to standard level from ring 1, or it refuses to enter admin mode once it has been booted there.
2. The system libraries are thought to be intact.

If 2 is not the case, then the system will either fail to reach the listener level, or you will be unable to execute many commands.

The system will establish the emergency listener even if the RL V is incomplete. If the RL V is incomplete, some or all commands may be unavailable.

The emergency listener level is a full Multics command level. It is impossible to start the answering service from the emergency listener. After repairing the problem (or deciding that you cannot repair it) you must shut down Multics with `hphcs_$shutdown` which will return you to BCE.

The emergency listener level is primarily useful for two circumstances:

1. If the logical volume registration for the root logical volume is damaged such that the system claims that the root is incomplete when it is in fact complete, you can use the emergency listener level to repair the registration with the volume registration commands.
2. If the log `>scl>as_logs>admin_log` is damaged such that Multics cannot automatically recover it, the emergency listener level is entered automatically to allow you to resolve the problem.

As the `nosc` keyword parameter is documented, works as advertised, and may well be useful in the cases referenced in the documentation, it should be included in the `boot.info` info segment.

Ticket <http://multics-trac.swenson.org/ticket/150> describes this issue.

## Proposed Changes

This MCR proposes to remove the reference to `salv` from the list of ring-1 command abbreviations supported. The relevant text currently looks like this:

```
Arguments:
command
    can be one of the following ring 1 command abbreviations:

        mult      multics
        salv      salvage_dirs
        stan      standard
        star      startup
```

This will be updated to:

```
List of commands:
    commands can be one of the following ring 1 command abbreviations:

mult
    perform a multics startup, which initializes the answering service
    but does not permit logins.
stan
    perform a standard startup, which enters ring 4 but does not start
    the answering service or permit logins.
star
    perform a full startup, which starts the answering service and
    permits logins to Multics.
```

The above change of formatting facilitates the use of the `help` command in that it allows for the “List of commands” section and the ability to use the `-ca` control argument to select one of the three commands listed.

The other change is to add a description of the `nosc` keyword:

```
nosc
    invokes an emergency listener when ring-4 command level is
    reached. Use this only if the system cannot be booted to
    standard level from ring-1 or if it refuses to enter admin
    mode once it has been booted there. See the description of
    the "boot" command in "Multics Administrative, Maintenance,
    and Operator Commands", GB64, for more details.
```

As with the change for the commands, above, the keywords section will be updated as well to be introduced by a “List of keywords:” section.

The `compare_ascii` output is shown below:

```
compare_ascii >doc>subsystem>bce>boot.info ==

A1      04/05/85 boot
Changed by B to:
B1      :Info: boot: 2020-02-01 boot

A10     Arguments:
A11     command
A12     can be one of the following ring 1 command abbreviations:
A13
A14             mult      multics
A15             salv      salvage_dirs
A16             stan      standard
```

```

A17             star             startup
A18
A19 keywords
A20     can be one or more of the following:
A21     nodt
A22         recreates the disk table; renames and ignores the existing one.
A23
A24
A25     nolv
A26         recreates the logical volume registration directory (>lv);
A27         renames and ignores the existing one.
A28     rlvs
A29         performs a volume salvage of the RPV (root physical volume), a
A30         directory salvage of all directories used in initialization, and
A31         a volume salvage of all other member volumes of the RLV (root
A32         logical volume).
A33     rpvs
A34         performs a volume salvage of the RPV and a directory salvage of
A35         all directories used in initialization.
Changed by B to:
B10     List of commands:
B11         commands can be one of the following ring 1 command abbreviations:
B12
B13     mult
B14         perform a multics startup, which initializes the answering service
B15         but does not permit logins.
B16     stan
B17         perform a standard startup, which enters ring 4 but does not start
B18         the answering service or permit logins.
B19     star
B20         perform a full startup, which starts the answering service and
B21         permits logins to Multics.
B22
B23
B24     List of keywords:
B25         keywords can be one or more of the following:
B26
B27     nodt
B28         recreates the disk table; renames and ignores the existing one.
B29     nolv
B30         recreates the logical volume registration directory (>lv);
B31         renames and ignores the existing one.
B32
B33
B34     rlvs
B35         performs a volume salvage of the RPV (root physical volume), a
B36         directory salvage of all directories used in initialization, and
B37         a volume salvage of all other member volumes of the RLV (root
B38         logical volume).
B39     rpvs
B40         performs a volume salvage of the RPV and a directory salvage of
B41         all directories used in initialization.
B42
B43
B44     nosc
B45         invokes an emergency listener when ring-4 command level is
B46         reached. Use this only if the system cannot be booted to
B47         standard level from ring-1 or if it refuses to enter admin
B48         mode once it has been booted there. See the description of
B49         the "boot" command in "Multics Administrative, Maintenance,
B50         and Operator Commands", GB64, for more details.

```

Inserted in B:

```

B59
B60
B61     :Internal: history_comment.gi: 2020-02-01 history_comment
B62
B63
B64     /***** HISTORY COMMENTS:
B65         1) change(2020-01-22,Swenson), approve(2020-01-22,MCR10072),
B66         audit(2020-02-01,GDixon):

```

```
B67      Remove "boot salv" description, since this isn't supported. Added
B68      description of "nosc" keyword.
B69
B70      END HISTORY COMMENTS */
At end
```

Comparison finished: 3 differences, 81 lines.

## Documentation

This is the documentation.

## Testing

Testing will involve using the `validate_info_segment` command on the info segment and making sure that it gets no errors and also invoking the `help` command on it to make sure the experience is good.

## Version History

| Date       | Revision | Author       | Comment                                                              |
|------------|----------|--------------|----------------------------------------------------------------------|
| 2020-01-22 | 1.0      | Eric Swenson | Initial revision of the MCR.                                         |
| 2020-01-23 | 1.1      | Eric Swenson | Integrate reviewer comments; reference GB64 documentation on “nosc”. |
| 2020-02-01 | 1.2      | Eric Swenson | Reformatted to make “help” experience better.                        |