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.

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.

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:

```bash
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  rlvs
A24    performs a volume salvage of the RPV (root physical volume), a
A25    directory salvage of all directories used in initialization, and
A26    a volume salvage of all other member volumes of the RLV (root
A27    logical volume).
A28  nosc
A29    invokes an emergency listener when ring-4 command level is
A30    reached. Use this only if the system cannot be booted to
A31    standard level from ring-1 or if it refuses to enter admin
A32    mode once it has been booted there. See the description of
A33    the "boot" command in "Multics Administrative, Maintenance,
A34    and Operator Commands", GB64, for more details.
A35
A36  A19  keywords
A37  can be one or more of the following:
A38  nodt
A39    recreates the disk table; renames and ignores the existing one.
A40  rlvs
A41    performs a volume salvage of the RPV (root physical volume), a
A42    directory salvage of all directories used in initialization, and
A43    a volume salvage of all other member volumes of the RLV (root
A44    logical volume).
A45  nosc
A46    invokes an emergency listener when ring-4 command level is
A47    reached. Use this only if the system cannot be booted to
A48    standard level from ring-1 or if it refuses to enter admin
A49    mode once it has been booted there. See the description of
A50    the "boot" command in "Multics Administrative, Maintenance,
A51    and Operator Commands", GB64, for more details.

Changed by B to:
B10  List of commands:
B11    commands can be one of the following ring 1 command abbreviations:
B12  mult
B13    perform a multics startup, which initializes the answering service
B14    but does not permit logins.
B15  stan
B16    perform a standard startup, which enters ring 4 but does not start
B17    the answering service or permit logins.
B18  star
B19    perform a full startup, which starts the answering service and
B20    permits logins to Multics.
B21
B22  List of keywords:
B23    keywords can be one or more of the following:
B24  nodt
B25    recreates the disk table; renames and ignores the existing one.
B26  rlvs
B27    performs a volume salvage of the RPV (root physical volume), a
B28    directory salvage of all directories used in initialization, and
B29    a volume salvage of all other member volumes of the RLV (root
B30    logical volume).
B31
B32  nosc
B33    invokes an emergency listener when ring-4 command level is
B34    reached. Use this only if the system cannot be booted to
B35    standard level from ring-1 or if it refuses to enter admin
B36    mode once it has been booted there. See the description of
B37    the "boot" command in "Multics Administrative, Maintenance,
B38    and Operator Commands", GB64, for more details.

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

MCR-10072

B67 Remove "boot saly" description, since this isn't supported. Added
B68 description of "nosc" keyword.
B69
B70
At end

END HISTORY COMMENTS /*

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Author</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020-01-22</td>
<td>1.0</td>
<td>Eric Swenson</td>
<td>Initial revision of the MCR.</td>
</tr>
<tr>
<td>2020-01-23</td>
<td>1.1</td>
<td>Eric Swenson</td>
<td>Integrate reviewer comments; reference GB64 documentation on “nosc”.</td>
</tr>
<tr>
<td>2020-02-01</td>
<td>1.2</td>
<td>Eric Swenson</td>
<td>Reformatted to make “help” experience better.</td>
</tr>
</tbody>
</table>