Subject: MCR-10041, Fix init_clocks boot_delta check

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Introduction

The clok supports a parameter, called boot_delta, which is optional. AM81 documents this parameter in the following way:

> this number reflects the site's normal interval between shutdowns and boots in hours (if the number is decimal. the decimal point must be supplied). If the system was down for more than the specified number of hours, the next time you attempt to boot the system you are informed of the "suspicious" situation and asked if you still want to boot. This control argument can be used to check for incorrect clock settings before damage is done to the storage system. The default is off.

AM81 says that the default is off. This suggests that if you do not specify a boot_delta parameter on the clok card, that no check is performed and the operator is not prompted to verify the correct time. In fact, if this parameter is not specified, the check is currently performed and always results in a message to the operator of the form:

```
The current time is more than the supplied boot_delta hours beyond the
unmounted time recorded in the RPV label.  Is this correct?
```

This MCR addresses this isssue.

Problem

The code in init_clocks.pl1 that perform this boot_delta check does not check for the presence of this parameter before using it in the check. The current code looks like this:

```
if clock () > label.time_unmounted + clok_card.boot_delta * 3600 * 1000000
then do;
  call bce_query$yes_no (yes_no, "The current time is more than the supplied
      boot_delta hours beyond the unmounted time recorded in the RPV label.  Is
      this correct? ");
  if ^yes_no
  then go to CHECK_TIME;

  if (divide (clock () - label.time_unmounted, 3600 * 1000000, 17, 0) > 12)
  then do;
    call bce_query$yes_no (yes_no, "The current time I'm using is more than 12
        hours after the last shutdown time recorded in the RPV label.
        Are you sure this is correct? ");
    if ^yes_no then
    goto CHECK_TIME;
  end;
end;
```

When no value is specified on the clok card, for example:

```
clok +05. est
```

or

```
clok -delta +05. -zone est
```

the value of clok_card.boot_delta is -1. This value is then used in the above calculation, which always results in the query being issued.

Proposed Changes

The fix is to add a check for clock_card.boot_delta ^= 1 as another condition in the `if` statement in the above code fragment. The first line would then read:

```
if clok_card.boot_delta ^= -1 &
    clock () > label.time_unmounted + clok_card.boot_delta * 3600 * 1000000
```

Testing of the Change

Testing this fix involves booting the system with and without a boot_delta parameter on the clok card. When no parameter is specified, the query should not be seen (regardless of the actual difference between when the system was last shut down and the current time. When the parameter is specified, the query should only be performed if the time between last shutdown and the current time is greater than boot_delta hours.

Bug Reference

- Reference URL of Multics Change Ticket: http://multics-trac.swenson.org/ticket/73.

Documentation

There is no need to document this change as the fix makes the code match the current documentation in AM81. The release notes of the next Multics release, of course, will document the new behavior.

Version History

Date	Revision	Author	Comment
2018-01-12	1.0	Eric Swenson	Initial version of MCR.