Product Support Notice

© 2015 Avaya Inc. All Rights Reserved.

PSN #	PSN004214u	Avaya Proprietary – Use pursuant to the terms of your signed agreement or company policy.			
Original publication date: 31-Mar-2015. This is Issue #01, published date: 31-Mar-2015.		Severity/risk level	Medium	Urgency	Immediately
Name of problem	CMS mitigation for leap second issues				

Products affected

All R17 CMS Linux-based Servers

Problem description

Introduction

Leap seconds are a periodic one-second adjustment of Coordinated Universal Time(UTC) in order to keep a system's time of day close to the mean solar time. However, the Earth's rotation speed varies in response to climatic and geological events, and due to this, UTC leap seconds are irregularly spaced and unpredictable. This PSN seeks to provide information regarding the leap seconds themselves, along with addressing how CMS R17 on Red Hat Enterprise Linux 6.x handles the insertion of one.

Upcoming Leap Second Events

The next leap second insertion is scheduled for June 30th, 2015 at 23:59:60 UTC.

Handling of the Leap Second

The handling of this issue depends on whether or not the Red Hat Enterprise Linux system is running a NTP (Network Time Protocol) daemon or Not running NTP daemon.

Systems running NTP (Customer may have setup connection to NTP server on CMS. This is allowed but not default)

Systems running any version of Red Hat Enterprise Linux should automatically account for leap second corrections if they are using the NTP (Network Time Protocol) daemon to synchronize their local timekeeping with an NTP server. During the last day before a leap second correction, NTP servers should notify their clients that a leap second will occur, and at 23:59:59 UTC, the Linux kernel should add or remove an extra second by making the 60th second twice as long or removing it entirely. Thus, Red Hat Enterprise Linux systems running an NTP client during the last leap second correction should have counted time as follows:

2008-12-31 23:59:59 UTC

2008-12-31 23:59:59 UTC

2009-01-01 00:00:00 UTC

When the leap second occurs, the kernel prints a message to the system log.

Systems not running NTP or PTP (standard for CMS systems as configuring at factory)

By default, Linux systems not using NTP or PTP to synchronize their timekeeping will not correct for leap seconds, and the time reported by these systems will have a one-second difference relative to UTC after the leap second correction. You should reset the clock manually after leap seconds occur.

You can also configure these systems to report time corrected for leap seconds by updating the tzdata package to the latest version available, copying the appropriate file from the /usr/share/zoneinfo/right directory hierarchy to /etc/localtime, and resetting the clock to the correct local time. The files in /usr/share/zoneinfo/right contain local time information corrected for all leap seconds that have occurred since the beginning of the Epoch on 1970-01-01 00:00:00 UTC. The other time zone files in /usr/share/zoneinfo do not have leap second corrections added. After the 2008 leap second, there were 24 leap seconds added since the Epoch.

As an example, if a system is in the America/Los_Angeles (US Pacific) time zone, you can reconfigure the system to report leap-second-corrected time by running the following and resetting the clock to Pacific Time:

cp /usr/share/zoneinfo/right/America/Los_Angeles /etc/localtime

Possible issues related to leap second insertion for CMS R17 Linux systems.

- There is a chance that a system can hang once it receives notification of the insertion of a leap second; this issue is documented in Systems hang due to leap-second livelock. The issue is resolved in the RHEL 6.3 kernel version 2.6.32-279.5.2.el6, a kernel later than that one is included in the R17 R4 upgrade mentioned below in the workaround section.
- After the leap second has been inserted futex heavy applications began consuming a large amount of CPU; this issue is documented in Why is there high CPU usage after inserting the leap second?. The issue is resolved in the RHEL 6.3 kernel version 2.6.32-279.5.2.el6, a kernel later than that one is included in the R17 R4 upgrade mentioned below in the workaround section.
- Ensure that tzdata-2015a-1.el6 or later is installed so that this leap second may be inserted for systems not synchronized by ntpd; This is implemented below in the workaround section by applying the supplied rpm updates. RPMs tzdata-2015b-1.el6.noarch.rpm and tzdata -java-2015b-1.el6.noarch.rpm are available on support.avaya.com at

https://support.avaya.com/downloads/download-details.action?contentId=C201533184592230_4&productId=P0030&releaseId=17.0.x

- The TAI offset is not updated correctly during the leap second; this issue is documented in TAI offset is incorrect during the leap second. This should only affect systems that are used as NTP servers. Using a CMS as an NTP server is not supported. NTPclient use is supported for CMS.
- Using -x with ntp still results in instantaneous clock changes when leap second occurs; this issue is documented in Does Red Hat plan to release xleap.patch with ntp?. Issue is resolved with rpms ntp-4.2.6p5-3.el6_6.x86_64.rpm and ntpdate-4.2.6p5-3.el6_6.x86_64.rpm which are available on the support.avaya.com site at https://support.avaya.com/downloads/download-details.action?contentId=C201533184592230_4&productId=P0030&releaseId=17.0.x

To minimize the risk customers should:

- Upgrade to the latest R17 R4 (r17jb.a) load.

AND

- Update the Linux RPMs as noted in the above details. See the download link at https://support.avaya.com/downloads/download-details.action?contentId=C201533184592230_4&productId=P0030&releaseId=17.0.x

Resolution

Operating System patches and rpms will be incorporated into the next product releases for CMS R17, but the leap second will happen before that date, so use the workaround steps.

Workaround or alternative remediation

This workaround is customer installable. Customers may also contact their Avaya support organization or business partner regarding the installation of this patch. Installation by Avaya *is billable at current per incident rates.* This workaround can be installed following the instructions below:

Step 1 – Install Linux security rpms (if applicable)

a) Upgrade to the latest R17 (r17jb.a) CMS load. If this is not done, required dependent rpms could be missing.

b) Download the following files to /tmp on the CMS system.

File	Download from
tzdata-java-2015b-1.el6.noarch.rpm	https://support.avaya.com/downloads/download-details.action?contentId=C201533184592230_4&productId=P0030&releaseId=17.0.x
tzdata-2015b-1.el6.noarch.rpm	
ntp-4.2.6p5-3.el6_6.x86_64.rpm	
ntpdate-4.2.6p5-3.el6_6.x86_64.rpm	

c) Verify the md5sum of the downloaded files.

```
Prompt> cd /tmp
Prompt> md5sum tzdata*.rpm ntp*.rpm
       ba71df27a32663ccf986289b3276e682  tzdata-2015b-1.el6.noarch.rpm
       fa0011299ffb84755c38b646ce3cd47b  tzdata-java-2015b-1.el6.noarch.rpm
       e977f7000e9f014c612e1619ee2feef5  ntp-4.2.6p5-3.el6_6.x86_64.rpm
       67bca1a9c8c0ecff9e6977c08e060c39  ntpdate-4.2.6p5-3.el6_6.x86_64.rpm
```

d) Install the rpms

```
Prompt> rpm -Uvh tzdata-2015b-1.el6.noarch.rpm tzdata-java-2015b-1.el6.noarch.rpm
       Preparing...                ########################################### [100%]
       1:tzdata-java               ########################################### [ 50%]
       2:tzdata                    ########################################### [100%]
Prompt> rpm –Uvh ntp-4.2.6p5-3.el6_6.x86_64.rpm ntpdate-4.2.6p5-3.el6_6.x86_64.rpm
       Preparing...                ########################################### [100%]
       1:ntpdate                   ########################################### [ 50%]
       2:ntp                       ########################################### [100%]
```

A reboot is required for the timezone and ntp changes to become active.

e) Reboot the system:

© 2015 Avaya Inc. All Rights Reserved.

```
Prompt> shutdown –r now
```

Remarks
n/a

Patch Notes

The information in this section concerns the patch, if any, recommended in the Resolution above.

Backup before applying the patch
yes

Download
ntp-4.2.6p5-3.el6_6.x86_64.rpm
ntpdate-4.2.6p5-3.el6_6.x86_64.rpm
tzdata-2015b-1.el6.noarch.rpm
tzdata-java-2015b-1.el6.noarch.rpm

Patch install instructions	Service-interrupting?
n/a	Yes

Verification
n/a

Failure
n/a

Patch uninstall instructions
n/a

Security Notes

The information in this section concerns the security risk, if any, represented by the topic of this PSN

Security risks

Avaya Security Vulnerability Classification
Low

Mitigation
n/a

If you require further information or assistance please contact your Authorized Service Provider, or visit support.avaya.com. There you can access more product information, chat with an Agent, or open an online Service Request. Support is provided per your warranty or service contract terms unless otherwise specified in the Avaya support Terms of Use.

Disclaimer: ALL INFORMATION IS BELIEVED TO BE CORRECT AT THE TIME OF PUBLICATION AND IS PROVIDED "AS IS". AVAYA INC., ON BEHALF OF ITSELF AND ITS SUBSIDIARIES AND AFFILIATES (HEREINAFTER COLLECTIVELY REFERRED TO AS "AVAYA"), DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND FURTHERMORE, AVAYA MAKES NO REPRESENTATIONS OR WARRANTIES THAT THE STEPS RECOMMENDED WILL ELIMINATE SECURITY OR VIRUS THREATS TO CUSTOMERS' SYSTEMS. IN NO EVENT SHALL AVAYA BE LIABLE FOR ANY DAMAGES WHATSOEVER ARISING OUT OF OR IN CONNECTION WITH THE INFORMATION OR RECOMMENDED ACTIONS PROVIDED HEREIN, INCLUDING DIRECT, INDIRECT, CONSEQUENTIAL DAMAGES, LOSS OF BUSINESS PROFITS OR SPECIAL DAMAGES, EVEN IF AVAYA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

THE INFORMATION PROVIDED HERE DOES NOT AFFECT THE SUPPORT AGREEMENTS IN PLACE FOR AVAYA PRODUCTS. SUPPORT FOR AVAYA PRODUCTS CONTINUES TO BE EXECUTED AS PER EXISTING AGREEMENTS WITH AVAYA.

All trademarks identified by ® or ™ are registered trademarks or trademarks, respectively, of Avaya Inc.
All other trademarks are the property of their respective owners.