Oracle's USLA HEAP patches available on AIX!!

Many customers have noted increased per-process memory consumption for the "USLA heap" segment with Oracle 11gR2. USLA stands for User-Space Loader Assistant and "heap" is an area of memory used for dynamic memory allocation. To fully resolve this, IBM and Oracle have collaborated to develop, test and release AIX enhancements and Oracle patches that reduce memory use to levels close to those previously experienced.

This paper describes the background of the situation, how to use the latest AIX TL releases to fully resolve it and a workaround for those unable to upgrade to the latest TLs (Technology Level) at this time.

With the release of 11gR2, Oracle introduced a new feature called **online patching**. This enhancement allows the Oracle binary to be patched without the need for restarting the application, therefore providing higher availability. To support this feature, AIX released features in AIX 6 TL02 and AIX 7 TL0 which Oracle utilized. However, our customers' experience showed that using online patching on AIX increased memory use. To resolve this in the near term, Oracle introduced a patch that deactivated online patching, eliminating the increased memory use, at the price of diminished functionality. As a longer term solution, AIX has enhanced its support of the feature in AIX 6.1 TL07 and AIX 7.1 TL01, reducing memory use for "USLA heap" segment to levels close to previous versions. Oracle has now announced a patch that leverages this change in AIX.

The **IBM and Oracle recommended resolution** is that customers upgrade to AIX 6.1 TL09 or AIX 7.1 TL03 (use latest SP), and then apply the Oracle patch for database 11.2.0.2 and 11.2.0.3 that can be found by searching My Oracle Support (MOS) for bug number 13443029 (please note that a userid and password are required to access MOS). This patch relinks Oracle with the current TL’s, reducing per-process memory consumption for "USLA heap" segment. **When upgrading your environment it is recommended to use AIX 6.1 TL09 SP03 (minimum TL07 SP10) or AIX 7.1 TL03 SP03 (minimum TL01 SP06) or higher.** If AIX 6.1 TL09 SP03 or AIX 7.1 TL03 SP03 or higher is not used, you need to ensure that the following APAR is appropriately installed for your OS level to resolve a linker error that will occur with Oracle installation or with the relinking. For example:

**AIX 6.1 TL-07**  APAR IV09580, IV28319, and IV20880

http://www-01.ibm.com/support/docview.wss?uid=isg1IV09580
http://www-01.ibm.com/support/docview.wss?uid=isg1IV28319
http://www-01.ibm.com/support/docview.wss?uid=isg1IV20880

• click on "obtain the fix for this APAR;" choose 6100-07

**AIX 7.1 TL-01**  APAR IV09541, IV28925, and IV21116

http://www-01.ibm.com/support/docview.wss?uid=isg1IV09541
http://www-01.ibm.com/support/docview.wss?uid=isg1IV28925
http://www-01.ibm.com/support/docview.wss?uid=isg1IV21116

• click on "obtain the fix for this APAR;" choose 7100-01
Also, IBM recommends that customers, who have multiple Oracle 11gR2 database or ASM installed on the same LPAR and the installed areas are patched or going to be patched with Oracle’s USLA heap patch, apply APAR IV20880 on AIX 6.1 TL-07 or APAR IV21116 on AIX 7.1 TL-01 to resolve system or application crash or hang that may occur in certain conditions.

If customer cannot upgrade to AIX 6.1 TL09 or AIX 7.1 TL03, apply the Oracle patch that can be found by searching My Oracle Support (MOS) for bug number 10190759. This Oracle patch also relinks the binary to reduce the memory footprint of Oracle processes; however it has the disadvantage of disabling Oracle's online patching mechanism.

Additional information may be found at these websites:

1. My Oracle Support (for the Oracle Certification Matrix)\(^{(1)}\):  
   [https://support.oracle.com/CSP/ui/flash.html](https://support.oracle.com/CSP/ui/flash.html)

\(^{(1)}\): A userid and password are required to access that website. This is available for Oracle customers and Oracle Business Partners. After accessing that website, please refer to Document id # 282036.1 and/or the Certification folder for generic information on AIX.

Please e-mail the IBM Oracle International Competency Center at ibmoracle@us.ibm.com with any questions you may have on this topic.