Updating Scientific Linux 7 to Alma Linux

Abby Jurewicz – Michigan Technological University – SIST intern
Bonnie King – Supervisor – FNAL

Introduction
This summer I worked with the Real-Time Processing Systems Department, in the SLAM group. They work on maintaining computing systems used for data acquisition in physics experiments. They also write the data acquisition software and take care of the server clusters. This summer I was tasked to help audit and upgrade the lab’s systems from Scientific Linux 7 to Alma Linux, this included writing a script to find how many machines needs to be upgraded, keeping track of which systems get updated and helping with upgrades.

Scientific Linux 7 & Alma Linux
Scientific Linux was introduced in 2003 by Connie Sieh, it was created to get a standard x86 configuration that could allow for easier collaboration in the science community. After providing support to scientific research and exchange of ideas it came to an end on June 30, 2024 after 20 years of service. With the end of life there was a need to replace this operating system with a supported Linux distribution. The distribution chosen to replace Scientific Linux is Alma Linux.

SQL Script for auditing the Scientific Linux 7 Machines.
SLAM maintains many of the machines here at lab. To keep track of them all there is a tool called OCSinventory. This runs nightly and can check to see what machine is on what version of Linux. To help with keeping track of updates, the team needs a couple of things:

- A script to list all the machines still on Scientific Linux 7
- Create a spread sheet that can help track all the machines upgrades.
- And get a list of machines that needs to be put into Tissue to be blocked.

The script for finding this information is a little over 20 lines of code. It will ask for an input to a machine you are looking for, if you are looking for a cluster of machines you can put the first two or three letters and the group will be printed. See figure 2.

Upgrade Process
Updating machines itself is not too difficult, but to do the upgrade there are many steps that take place before hand. These steps are:

- Obtain MAC and IP address
- Create a configuration in puppet
- Create host in SLAM-dish
- Build iso
- Download iso and convert to an image

Once all these steps are done you can download the image you created onto a flash-drive which will now allow you to upgrade the machine. At boot, a process called kickstart will run. This allows for different options to be selected at install. The configuration is then completed by Puppet.

SQL Script:
```
getOsComments() {
  $os = ":\$\{os\}"
  echo $os
}

mySQL select statement that will find machines that user gave that still have scientific linux 7 as of 7-8-2024 and = "SELECT name, comments FROM Hardware WHERE name LIKE %Scientific Linux 7% AND lastupdate >= 2024-07-08 ORDER BY comments DESC"
```

```
# This is the SQL query used to obtain the machines still running Scientific Linux 7

<table>
<thead>
<tr>
<th>enter a machine name</th>
<th>name or the starting letters (or 0 to quit): fa</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCSosComments</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
<tr>
<td>Scientific Linux release 7.9 (Nitrogen)</td>
<td></td>
</tr>
</tbody>
</table>

Fig.2 above: this is what an output can look like when running the OCSinventory script with machines still running Linux 7

Acknowledgments
A big thank you to the SLAM team: Bonnie, Ron, Scott, Pat and Farhan, for allowing me to work with you this summer and teaching me many new things! I hope I can work with you all again in the future and thank you for an amazing summer! Another big thank you to the SIST program for allowing me to come back this summer.

This manuscript has been authored by Fermi Research Alliance, LLC under Contract No. DE-AC02-07CH11359 with the U.S. Department of Energy, Office of Science, Office of High Energy Physics.