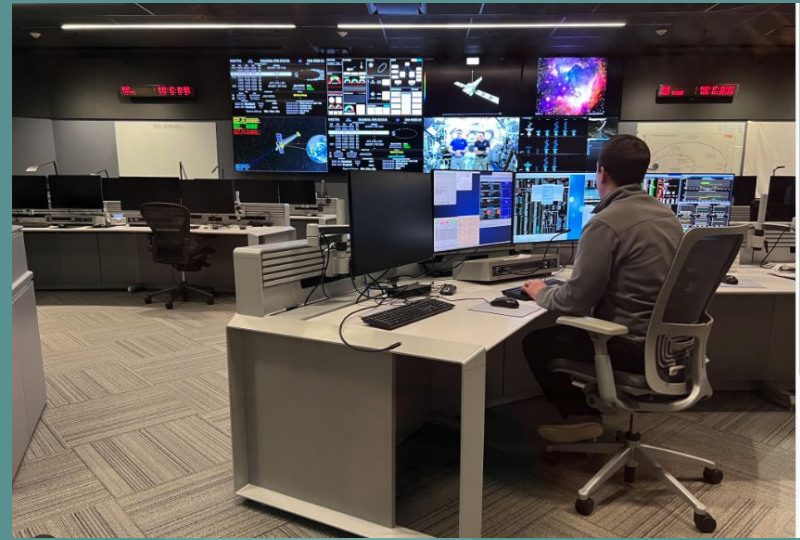


# Experiences Upgrading CentOS 6/7 to RHEL8 in a Production Environment



Brandon Vogel - 2024-08-21

\*\* not representing any employer or project \*\*

# Overview

**What:** Replace CentOS7 systems with RHEL8 systems. Workstations and servers.

**Who:** SAO IT Staff (me)

**When:** 2022-2023

**Where:** On-Site On-Prem Burlington, MA

**Why:** RHEL7 EOL, also old hardware

**How:** One-for-one replacement - no in-place upgrades.



# Who am I?

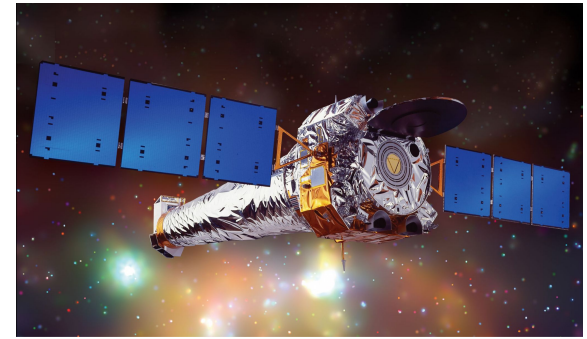
Brandon Vogel

IT Pro with 25+ years experience.

- 1990's - ran dial-up BBSes
- 1996? - introduced to Slackware Linux
- 1997 - ran ISP with BSD UNIX, Windows NT, modem banks
- 1998 - Ingram Micro tech support - Novell Netware and Cisco / Bay
- 1999 - Network Engineer for first banner-ad broker WebPromote.Com
- 2000 - IT Manager for Fund-Raising / Financial software company - VAX, Windows
- 2010 - IT Manager for Federal Public Defenders in Western District of New York - NOVELL again, ugh.
- 2016 - IT Specialist at Smithsonian Observatory - Linux Servers!
- 2024 - Linux IT Admin at MIT Lincoln Lab



# What is the Chandra OCC?



Chandra X-Ray Telescope

Chandra X-Ray Center: <https://chandra.harvard.edu/>

Center for Astrophysics - Harvard / Smithsonian: <https://cfa.harvard.edu/>

Chandra OCC - Cambridge then Burlington:

<https://chandra.harvard.edu/about/asc.html>

<https://www.cfa.harvard.edu/news/behind-scenes-tour-chandra-operations-control-center-now-available>

Linux footprint - “office”, control room. FST role.



# Initial Conditions

Running CentOS7 (and some 6...) systems on Dell Precision workstations (T 3500) in the control room for the Chandra X-Ray telescope.

General purpose workstations running a couple of custom-built apps to command the spacecraft.



# Problems / Issues

Issue #1: Aged hardware. Needed to replace the old Dells due to graphic card failure and other hardware issues. Out of warranty equipment introduced risk. Spares available but not ideal.

Issue #2: With the CentOS upstream decision by IBM / RedHat and the EOL of EL7, a decision needed to be made.



# Options to Move Forward

## Evaluate multiple alternatives:

- Continue with CentOS (8 or 9)
  - Upstream risks would be introduced to Production environment.
- Switch to Rocky Linux or AlmaLinux
  - Not tested yet as of end of 2021-2022.
- Move to RHEL
  - Popular solution
  - But costs \$\$



# Proposed Solution

Replace the CentOS Dell workstations with new Dell Optiplex workstations and RHEL7.

## Reasons:

- RHEL has support and Linux resources at OCC minimal
- RHEL is a natural progression from CentOS
- Pricing was affordable for our footprint





# Decisions, decisions....

No upgrade path, so in-place not feasible.

New hardware had to be ordered. Dell Optiplex workstations were determined to be adequate for the general use purpose case.

How to deploy?

- Image machines?
- Full install?
- Kickstart?
- Manual vs. automated...



# HOW

Built PXE Kickstart server. Target network air-gapped. Best way to do the build was to create a segregated subnet, do the PXE Boot and initial kickstart imaging there, then move to the new network where we built our RPM repo for additional software builds.

Built our own RPM repo. Just Apache and repo utils on RHEL8 server.

Build kickstart image. Edited the kickstart file.

Added post-install scripts. Some simple bash scripts to do some additional configuration, printers add, etc.

Some manual steps. Subscription-manager stuff, etc.

Comms, replacement, follow-ups. Communication was key during this.

One-for-one replacement one at a time so a gradual roll-out over a few weeks. Helped with transition for users and apps.



# Hiccups

Package incompatibilities from CentOS 6/7 to RHEL8.

Older custom-built software needed some mods.

Users not getting 'what they always had'. KDE on CentOS6 looks nothing like Gnome on RHEL8.

- Decided to use MATE Desktop

Remote Access - VNC no longer behaved the same. Tried XToGo, VNC, NoMachine. Settled on X2Go.



# What about the servers?!

Various application servers, mostly CentOS7, needed to be upgrade.

Since these were VMware VMs, we just built new ones and migrated the apps, then did a managed cutover.



# Lessons Learned

Testing, trials. Unit tests and overall usage scripts to do a before/after planning.

Better Kickstart planning. Less needed in post-install scripts if they are wrapped up in the initial Kickstart.

Better deployment planning. Next time stage ALL before doing the final swap-outs.

More end-user input. Some apps were deemed critical AFTER the switchover. Some were no longer available. (?filerunner?)

Management buy-in.

Documentation / comms can be better with use of a Wiki in addition to async e-mails and other un-archivable Slack comms.

Keep systems updated so huge leaps are not needed.



## Other Notes

Non SAO - recently did similar at current job - RHEL7 -> RHEL8. Added new servers, etc.

Remote access challenges - anyone have any better ideas? Full desktop, not individual apps.

MatLab centralization for compute.

Air-gapped network challenges.



# Questions / Comments?

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