

# NSTXpool Computer Upgrade

## WP #1685

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# Work Scope

- Upgrade **Operating System, Application Software, and Programs** that run on NSTX computers using Red Hat Enterprise Linux 3.
  - nstxpool computers + nstxops
  - nstxWindowsPC (Control Room Display Wall)
  - Big Blue cluster for EFIT
  - Selected EPICS computers
- Buy new computers

# Upgrade Reason

- RHEL3 is at its end-of-life
  - Cyber Security risk
  - No more bug fixes or updates

# Further Motivation

- **Maintainability:** All NSTX Linux computers will have binary compatibility
- **Performance:**
  - We could use more processors when things get busy (especially when tasks run away)
  - 64-bit architecture allows programs to access more than 2 GB of RAM
  - CPU crunchers should be on their own node

# Software Issues

- Identifying the software that needs to be ported:
  - IT-maintained code
  - User-maintained code
- IDL, perl (WebTools), Matlab, python should port easily
- C, C++, FORTRAN software that doesn't yet run on the portals, will need to be recompiled for 64bit RHEL5
- The Display Wall computer will have a user cursor, but not Multi-cursors
- No known show-stoppers



# Testing

- IDL, MDSplus utilities, and FORTRAN programs have been tested
- Checksum of a signal from each tree is the same on new and old systems
- Pre-Operational Test Procedure (PTP) to verify IT core functions

# Tested on 64-bit RHEL5

efitmovies	WebTool plot servers
reviewplus	IDL writing MPEGs
efitviewer	MDSplus segmented records
syb_entry	jMovie (QuickTime movies from java)
fireTip analysis	Numerical FORTRAN codes.
dwscope	Perl scripts
jScope	ArchiveViewer
Nedit	medm
Xfbv	mozilla
	Matlab



# NSTXwindowsPC (Wall)

- Drives Control Room Display Wall projectors
- RedHat 5 64-bit is not supported on current hardware
- Key software is SharedAppVNC & x2x

# NSTXwindowsPC (Wall)

- Tests on another system went well
- New PC needs to be purchased
- \$2,700 for PC & graphics board
- Supports up to 4 Displays

# Cost

- For a system with 8-core 2.4GHz Opteron CPUs & 32 GB of memory the price is ~\$3200 each
- Only maybe 30% faster, so keep old ones
- NSTXwindowsPC has to be upgraded (\$2700)
- More computers will improve performance:  
 $3 \times \$3200 = \$9,600$



# Conclusions

- This change will help to:
  - Mitigate Cyber Security Risks
  - Migrate core NSTX computers to a supported Linux OS
  - Reduce impact of runaways
  - Improve performance

Questions?