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

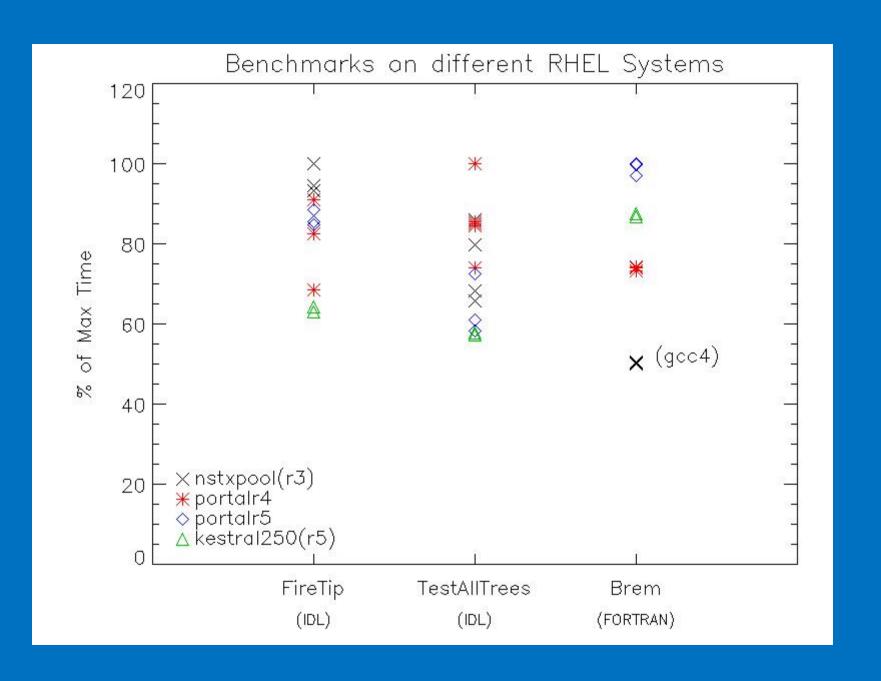
- RHEL3 is at its end-of-life
 - Cyber Security risk
 - No more bug fixes or updates

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
Xfvb	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: 3x\$3200 = \$9,600

LOC. IT PHYLLET HPH	4- Oct	Nov.			3- Jan			Engineer Hours
Solicit user input on their codes								4
Preliminary Testing								60
Design Review								20
Procure new nstxpool nodes								0
Procure new display wall computer								0
Procure new Big Blue nodes								0
UnixAdmins add & update computers								overhead
Port & Test nstxops programs								40
								4.0
Port & Test Display Wall items								40
Dove C. Mort EDIGGrate 01								4.0
Port & Test EPICSgate01								40
Don't C Most NGWY-0s1								40
Port & Test NSTXioc1								40
Port & Test EFIT codes on Big Blue								
FOIL & TEST EFTI COURS OIL BIG BIVE								
Write & Perform Pre-Ops Test Procedure								40

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?