

BLUE WATERS - GEO

MAPPING AND MODELING THE WORLD

Blue Waters System and Component Reliability

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Supercomputing Applications

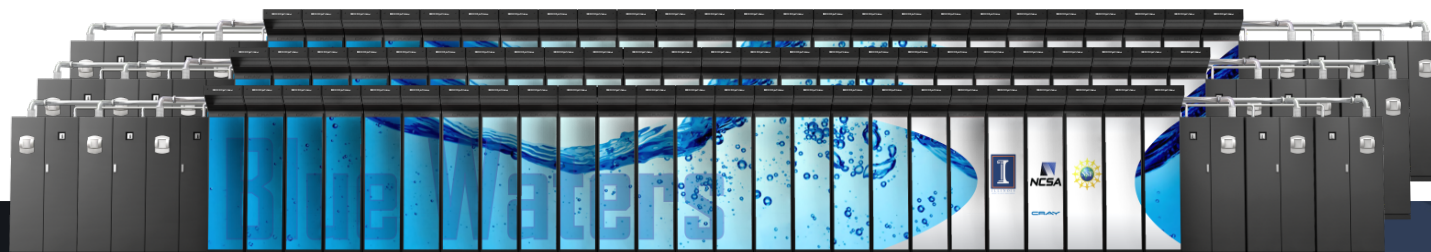
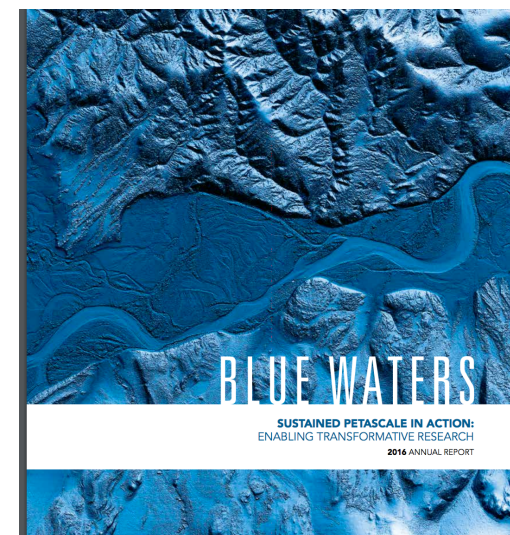


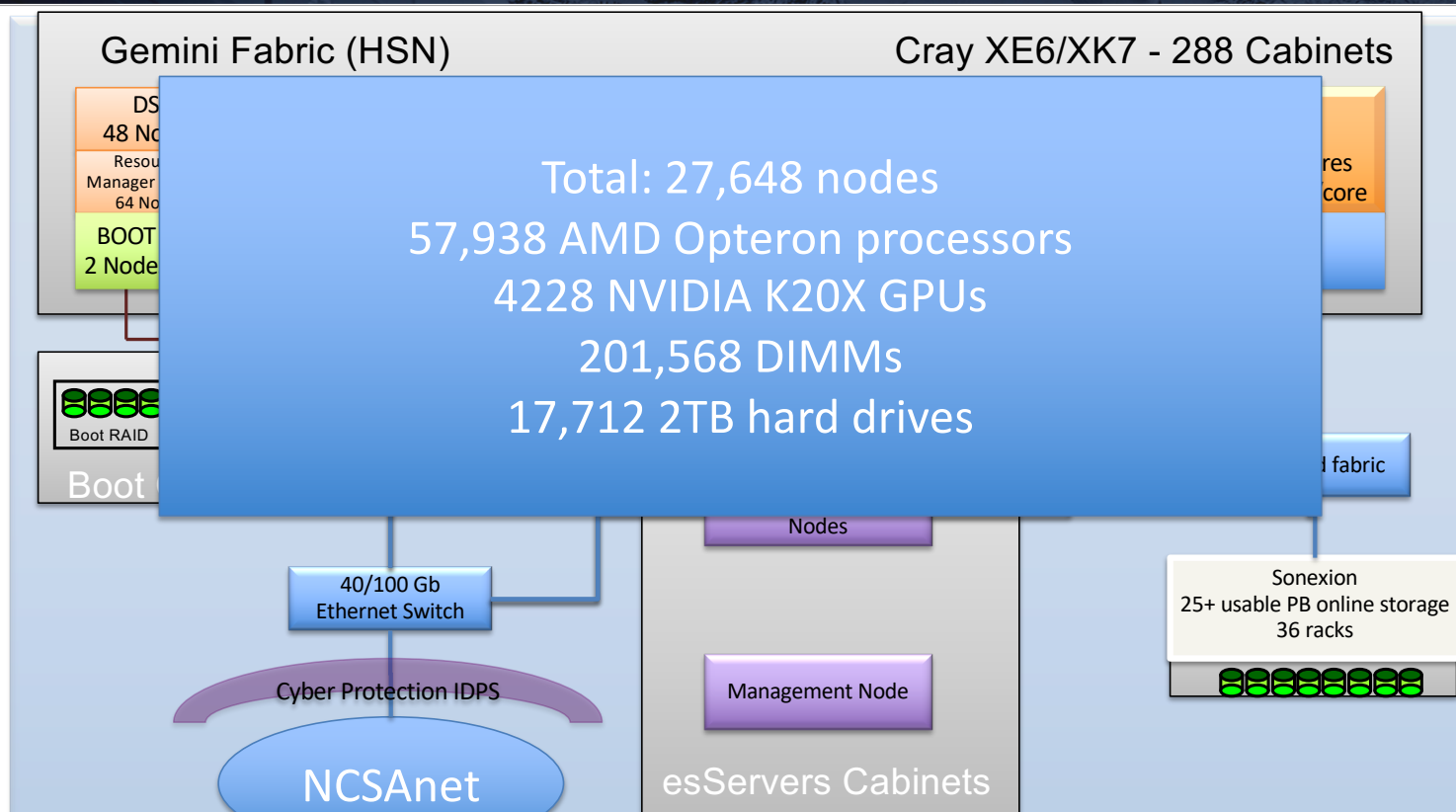
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Brief History of Blue Waters

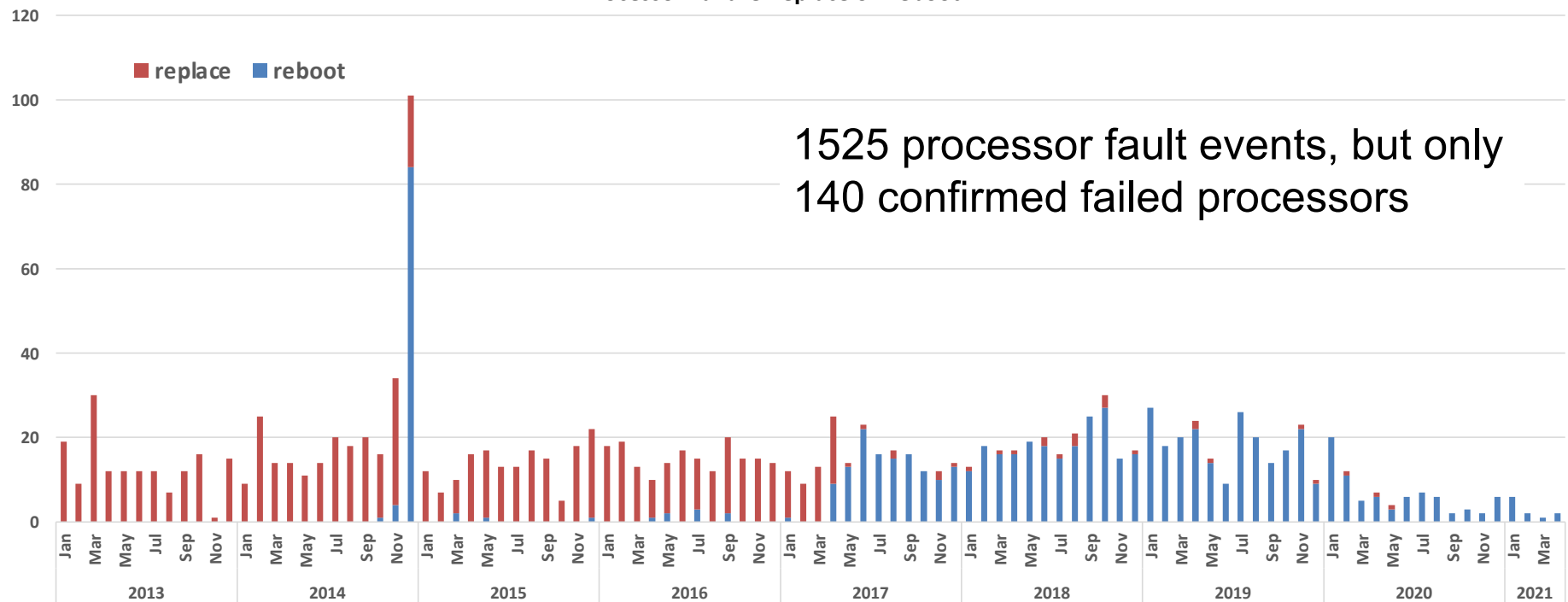
- 2007 – NSF Proposal and Award for a Broad use “leadership” computing system
- - Funding shared 2007-2019 NSF (~60%), University of Illinois (~25%) and State of Illinois (~15%)
- Now NGA
- 2008-11 – “Co-Design”, Development, NPCF completion
- 2012 – Build, deploy, test BW
- 2013 Q1 – Early Science Operations
- April 2013 to present – Full-Service Operations
- See annual reports for science accomplishments
<https://bluwaters.ncsa.illinois.edu/annual-report>



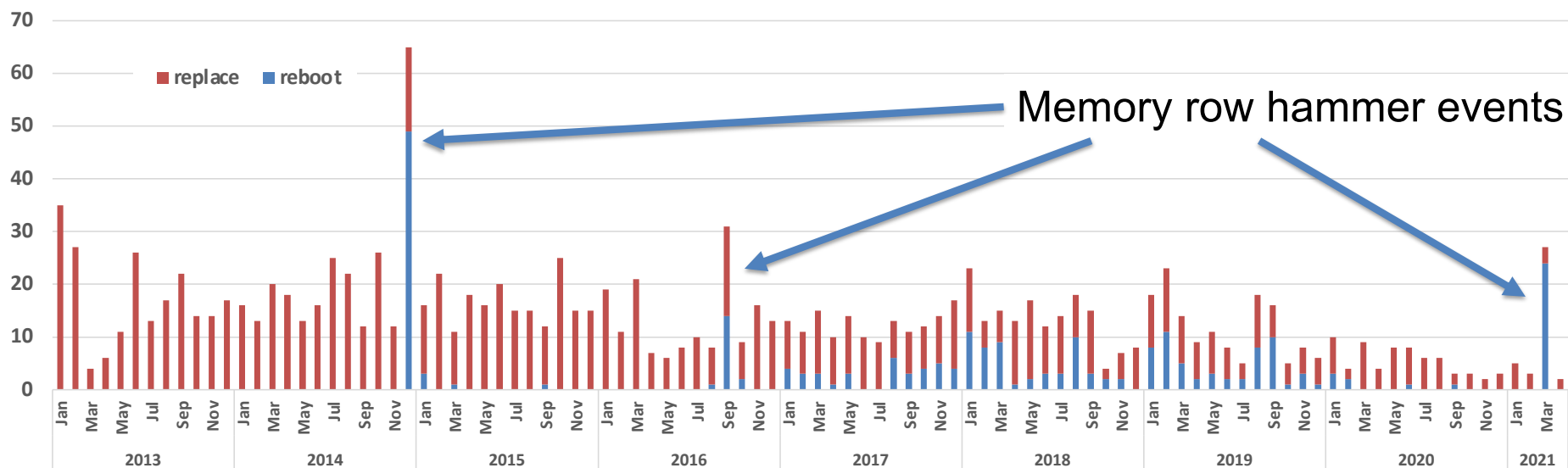


AMD Processor Faults

Processor Failure Replace or Reboot

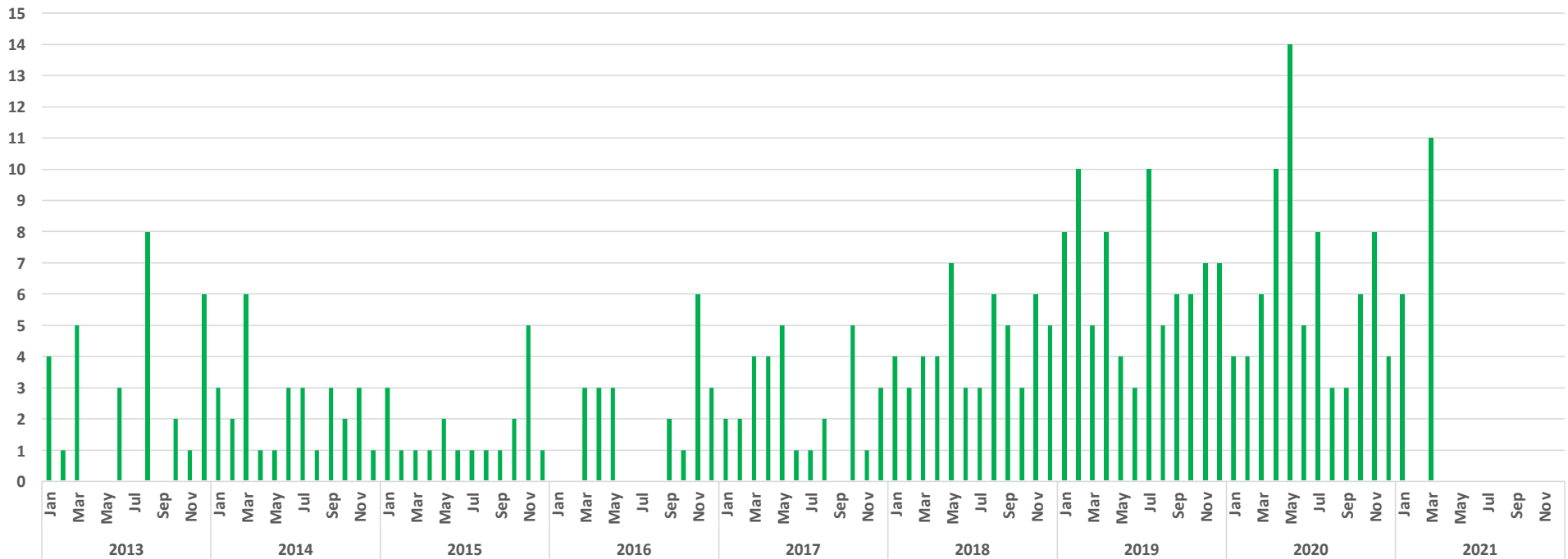


DIMM Faults



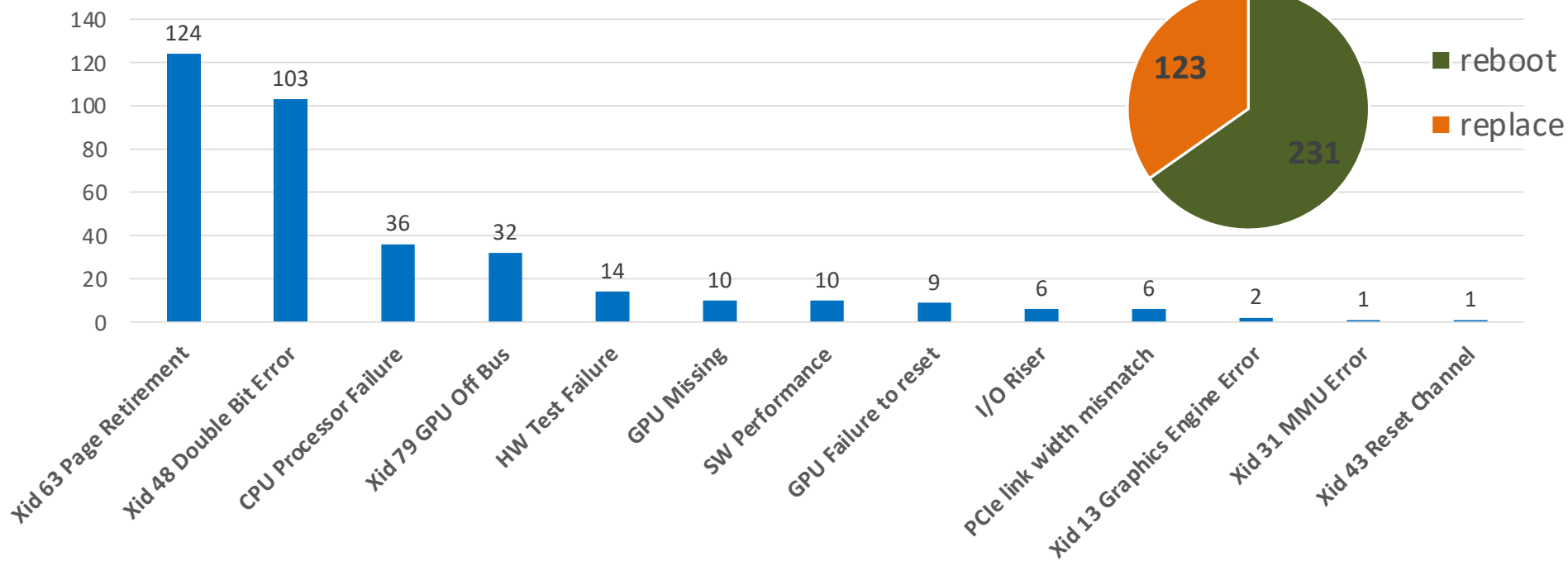
Manufacturer	Installed	Failures	Per Installed	Model
Micron Technology	92160	574	0.62%	DIMM 8GB MICRON PC3-12800
Samsung	51928	298	0.57%	DIMM 8GB SAMSUNG PC3-12800
Hynix Semiconductor	57288	170	0.30%	DIMM 8GB HYNIX PC3-12800
Qimondo	192	0	0.00%	DIMM 4GB QIMONDA PC2-6400
Totals	201568	1042	0.52%	

GPU Faults by Month



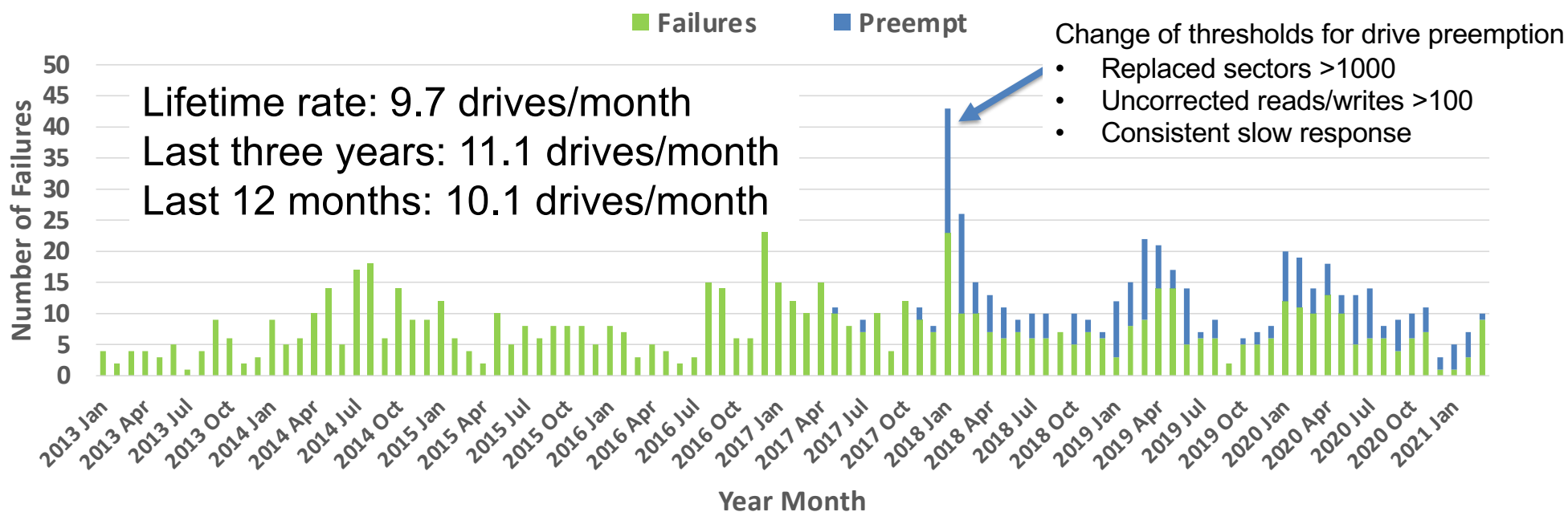
GPU Failure Causes

Maintenance Action

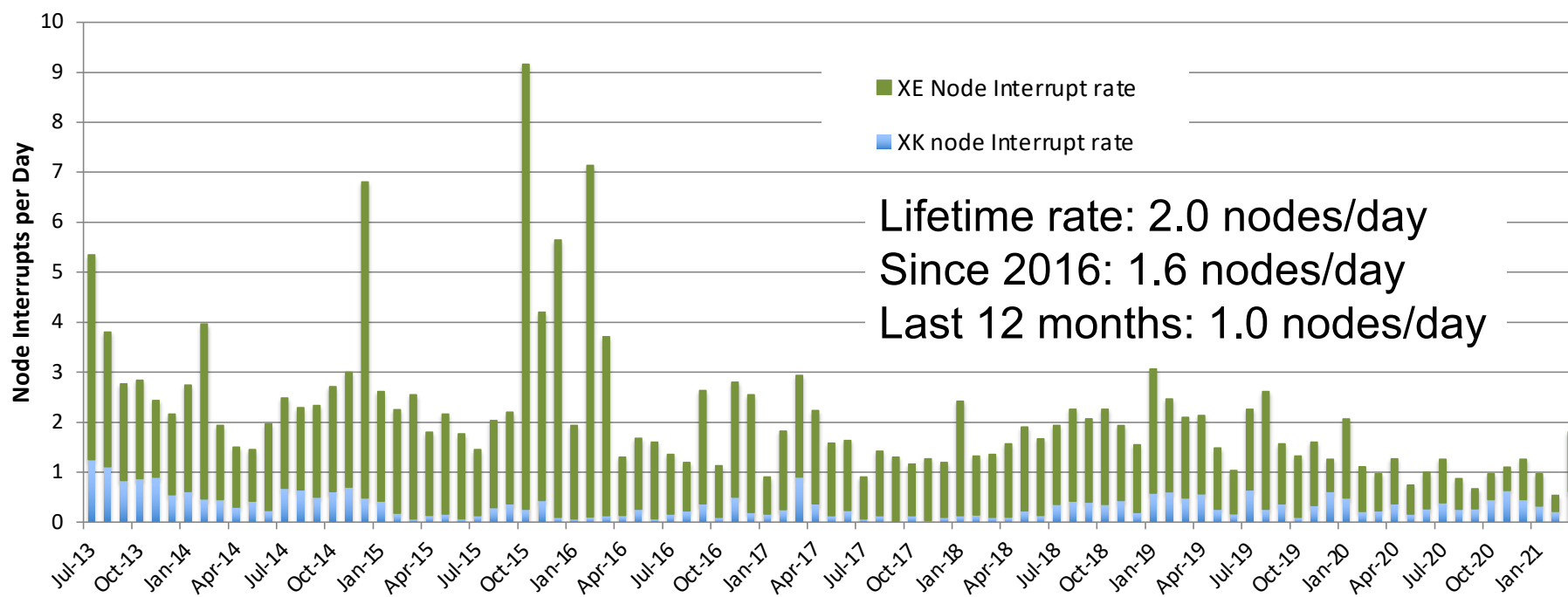


Hard Drive Failures

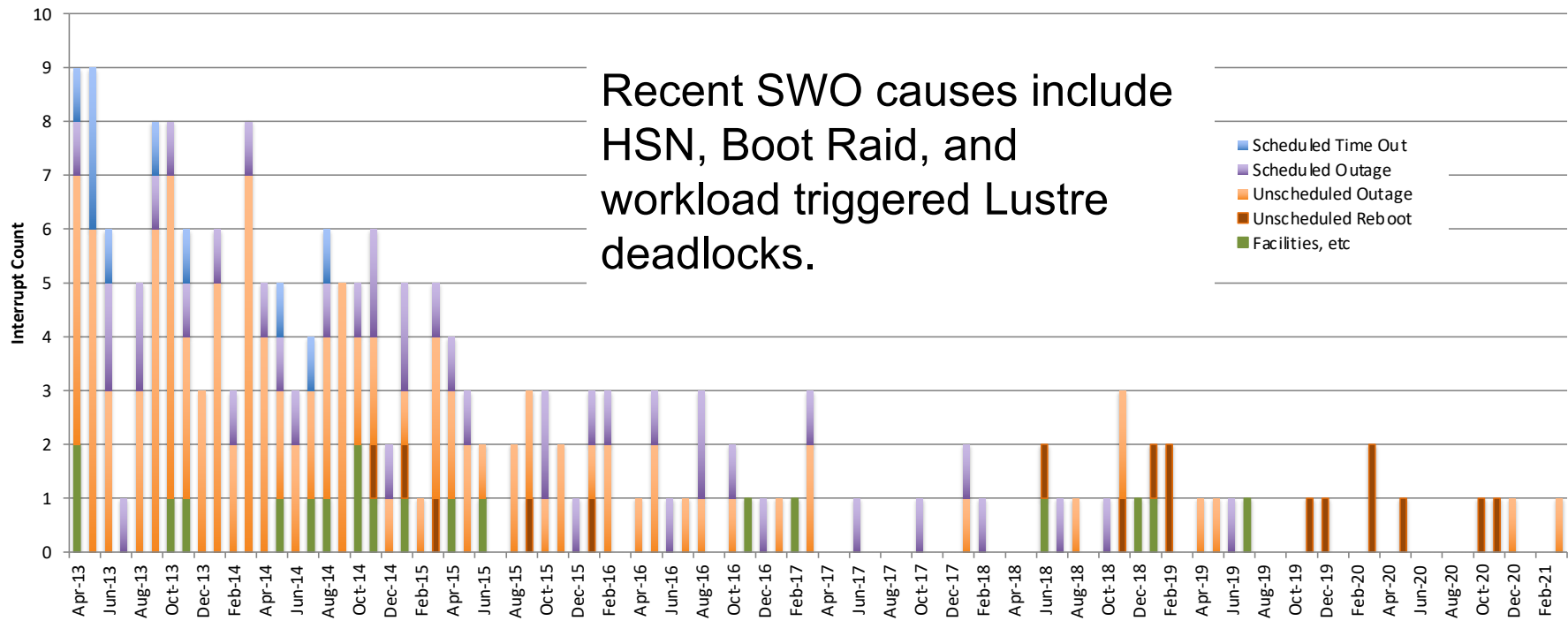
Number of 2TB Drive Failures and Preemptive Removals per Month



Daily Node Interrupt Rate



System Wide Interrupts



Blue Waters Data is Available to Researchers!

- Blue Waters data is available for download via Globus.
- <https://bluewaters.ncsa.illinois.edu/data-sets>
- What is available:
 - Collected metrics
 - System Logs
 - Torque accounting logs
 - Darshan job data
 - Lustre user experience I/O data
- Username, id, and project codes are anonymized.

Acknowledgments

- The Blue Waters sustained-petascale computing project is supported by the National Science Foundation (awards OCI-0725070 and ACI-1238993), the National Geospatial-Intelligence Agency and the state of Illinois.
- Blue Waters is a joint effort of the University of Illinois at Urbana-Champaign and its National Center for Supercomputing Applications.
- Personnel: **NCSA** team, HPE/Cray site team

Questions:

- Email brett@illinois.edu or help+bw@ncsa.illinois.edu

