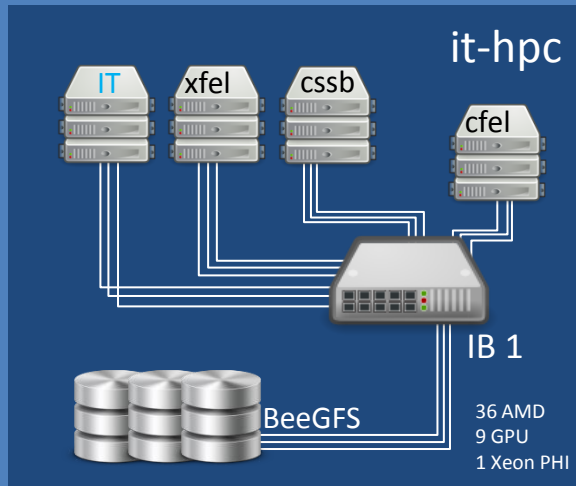


# HPC Infrastructure (evolution)

- Old HPC configuration
- Infrastructure consolidation
- Maxwell configuration

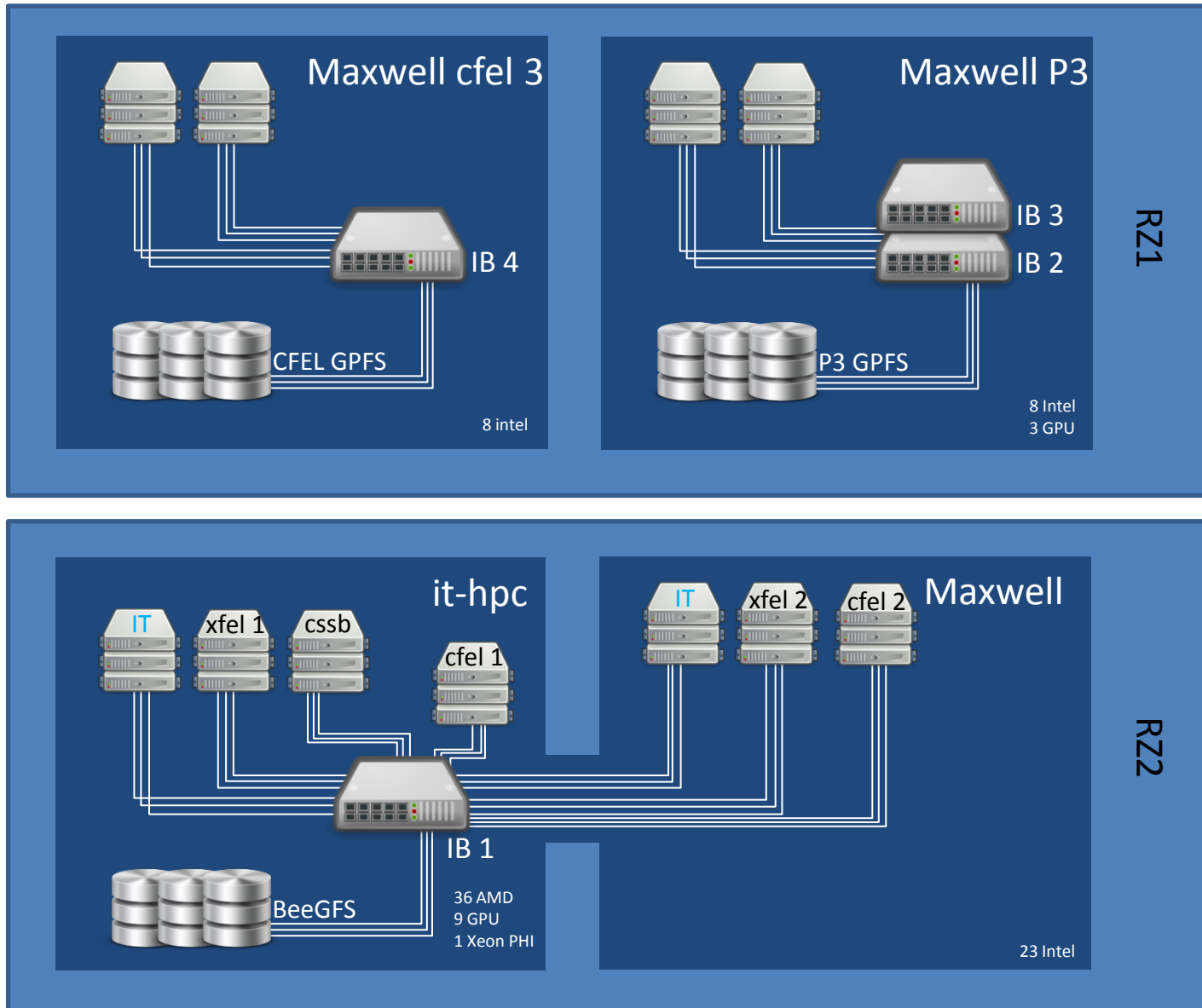
# HPC infrastructure 2015

RZ1



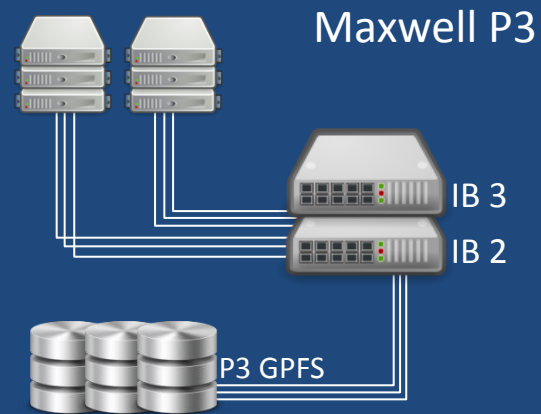
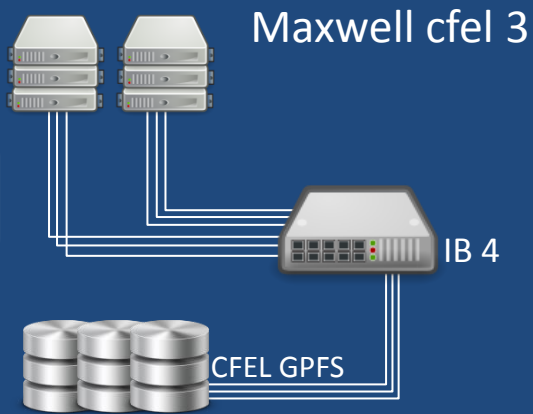
RZ2

# HPC infrastructure 02/2016



# HPC infrastructure 02/2016

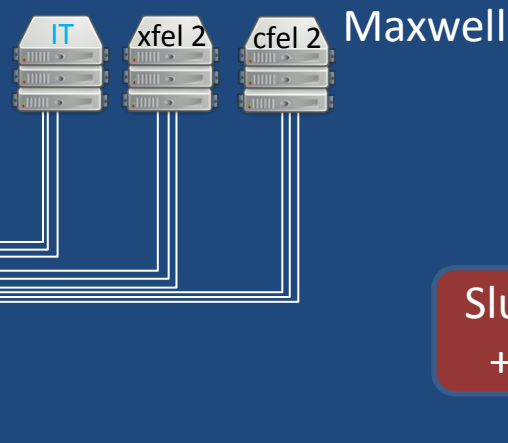
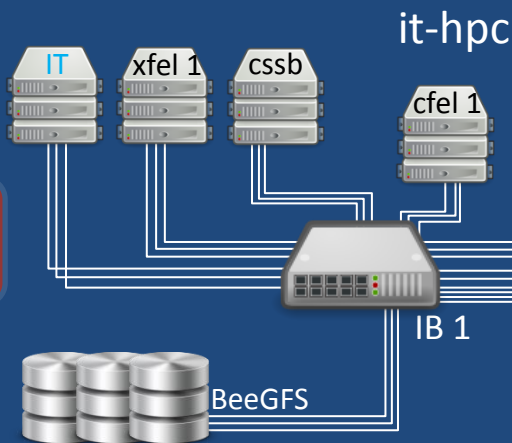
3+1 IB Fabrics



RZ1

3 locations  
on 2 floors

> 10 disjunct  
network fs



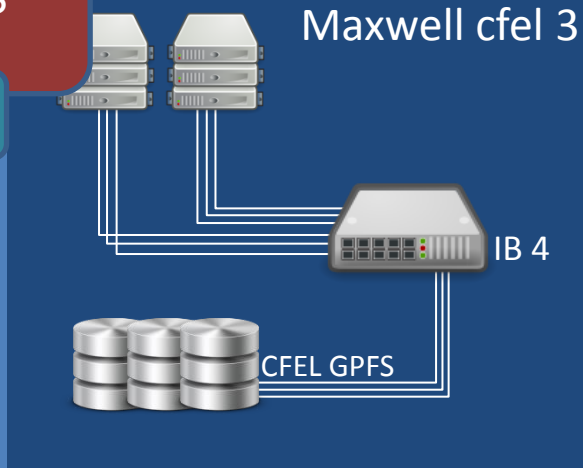
RZ2

Slurm+calendar  
+unmanaged

# Configuration 02/2016

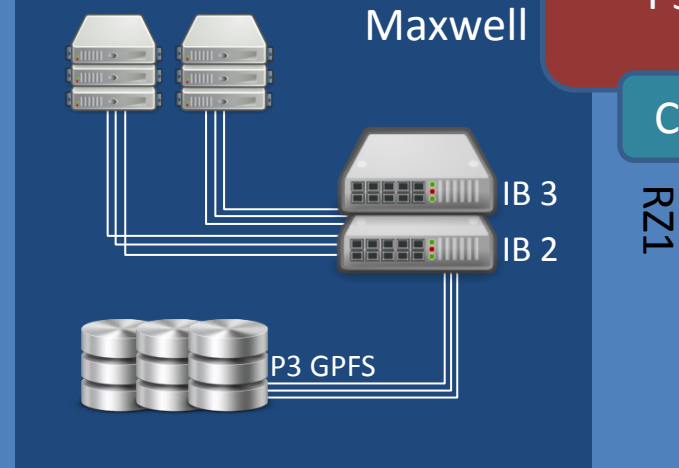
CFEL GPFS

Centos 7



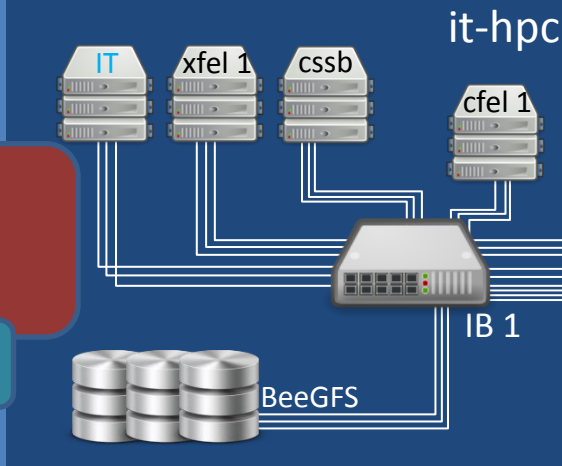
P3 GPFS

Centos 7



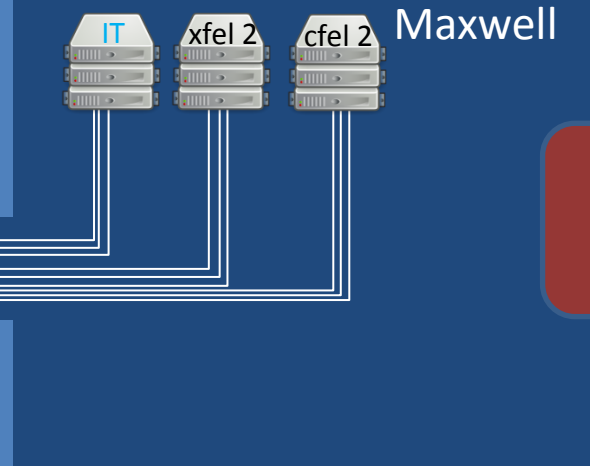
AFS

SL 6



BeeGFS

Centos 7





Impressions from construction works

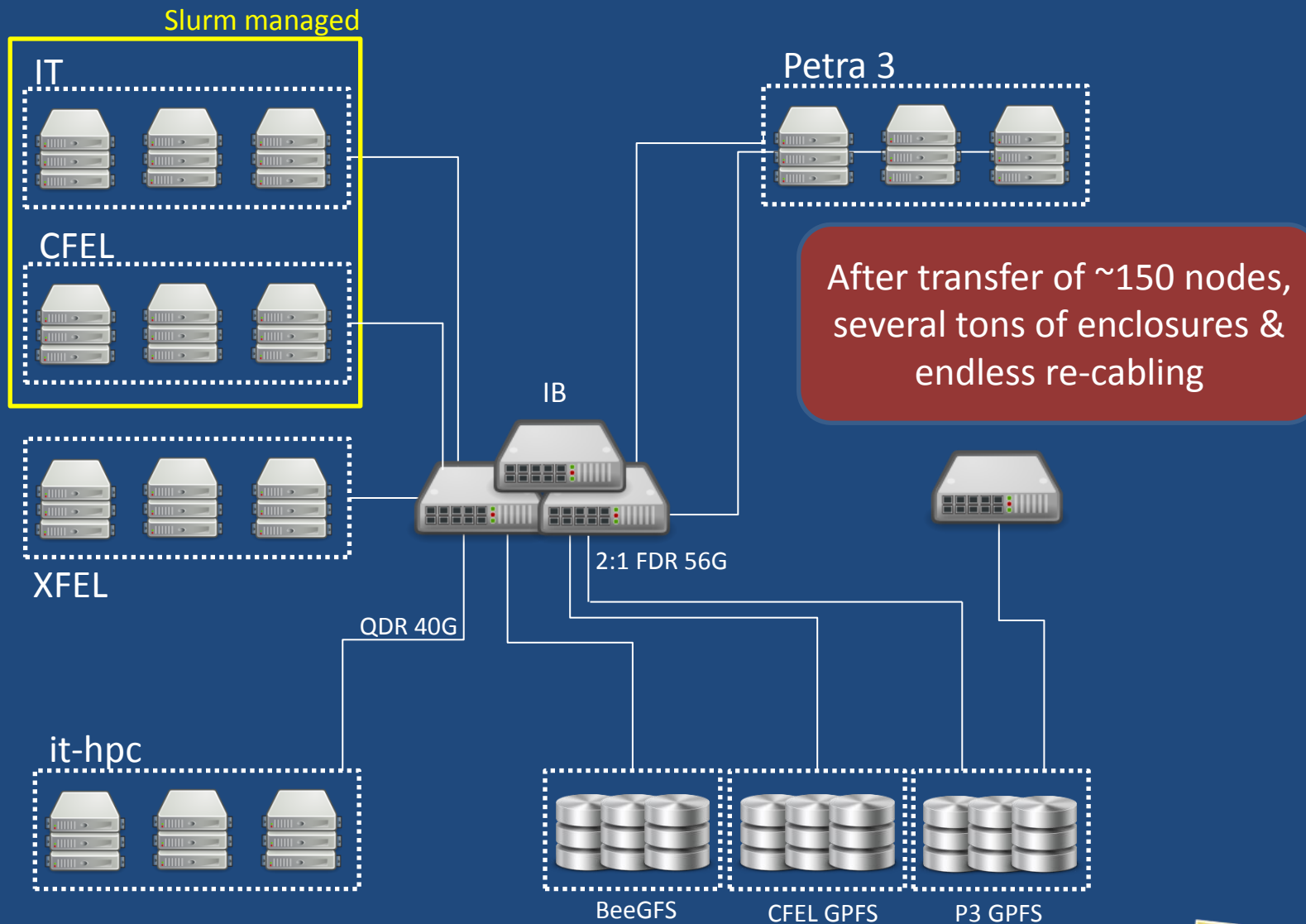
# Maxwell Cluster



Yves iPhone's view of part of the Maxwell-Cluster

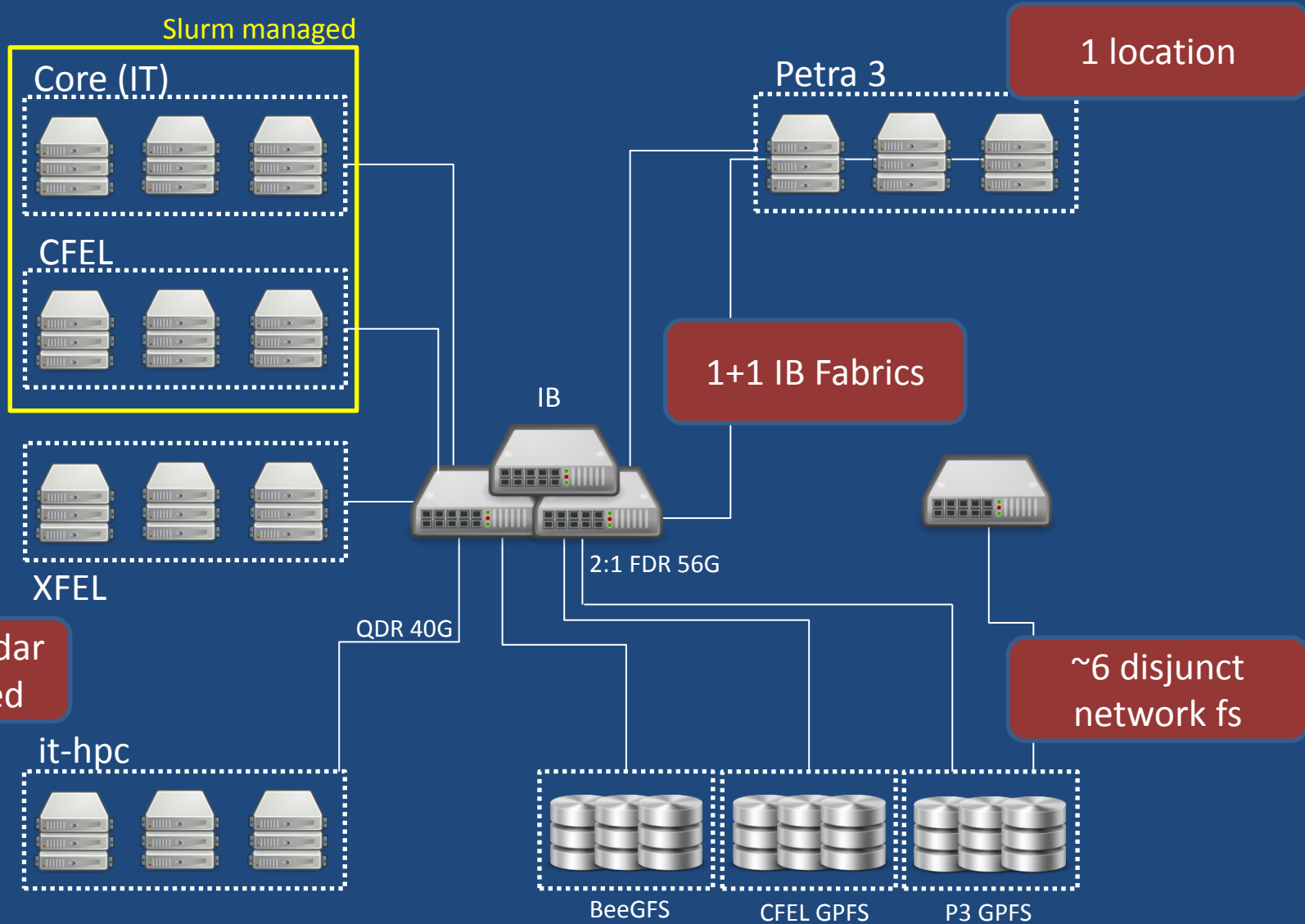


# HPC infrastructure 04/2016

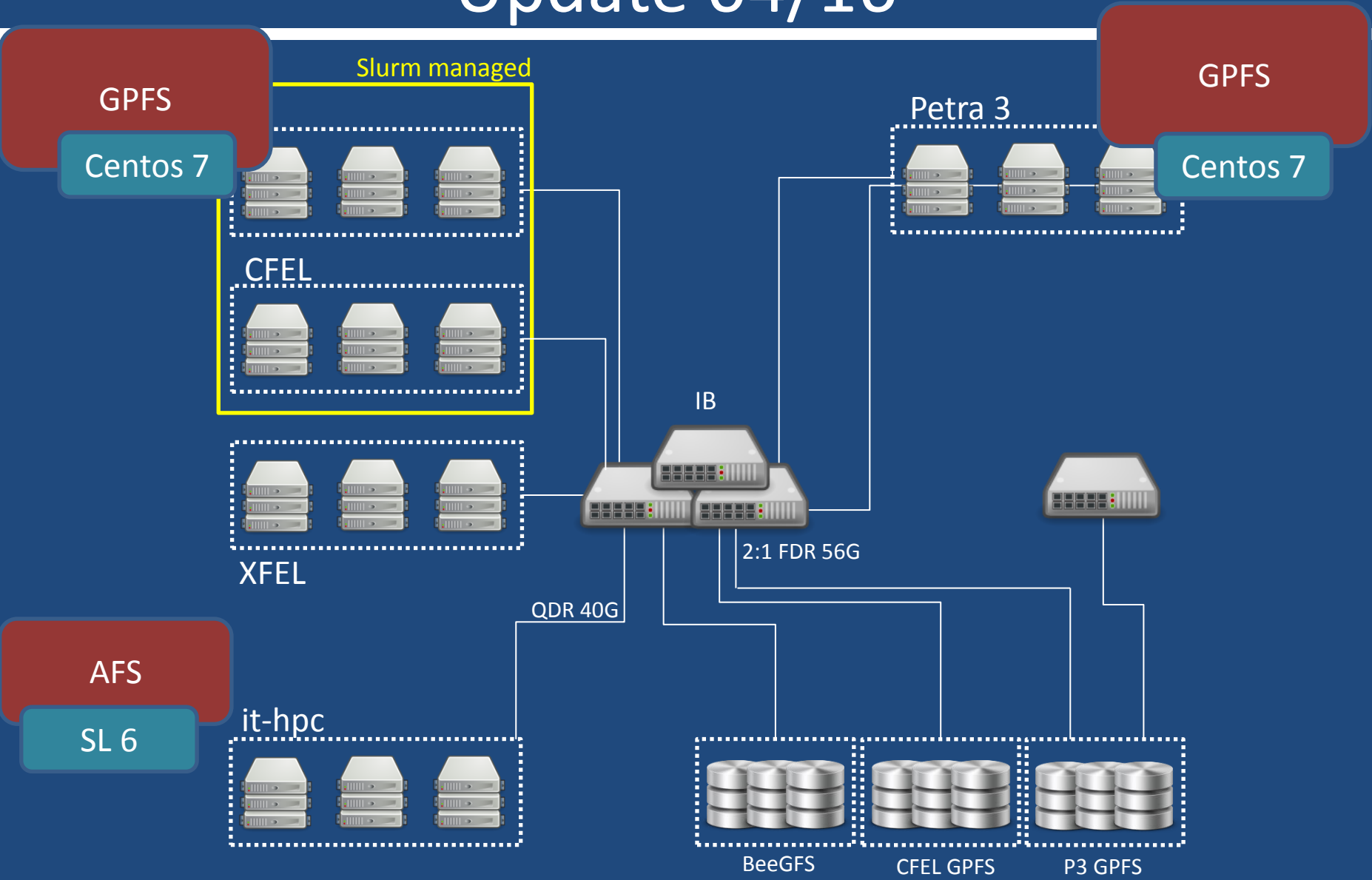




# Current configuration



# Update 04/16



Required short downtime of ALL maxwell systems!

# Update 05/16

GPFS

Centos 7

Slurm managed

Core (IT)



CFEL



Petra4



XFEL(?)

Petra 3



IB



2:1 FDR 56G



BeeGFS

CFEL GPFS

P3 GPFS

GPFS

Centos 7

Requires one day downtime of all it-hpc systems!

# Current hardware

Compute	Total	IT	FS	CFEL	XFEL	Others	Shareable/SLURM
AMD (it-hpc)	36	27	-	-	6	3	27
Intel+GPUs	13(1)	2(3)	3	8	-	-	2-10
Intel 32-core 512GB	16	-	8	8	-	-	8
Intel 16-core 256GB	23(39)	8(18)		8(12)	7	(2)	16(32)

Storage System	Bindings	Volume	Exports
AFS	10GE / AFS	Quota per volume	global
BeeGFS	56GE IB / BeeGFS	120TB	None
dCache	10GE / pnfs (NFS4.1)	Unlimited	DESY, global
GPFS home	56GE IB / gdfs	20GB / user	none
GPFS p3/cfel	56GE IB / gdfs	>1PB each	restricted
Netapp	10GE / NFS 3	30TB (3TB quota)	DESY

<https://confluence.desy.de/display/IS/Maxwell+Hardware>

# What changes? Everything!

	it-hpc	maxwell
Home Directory	AFS	GPFS
OS	SL 6	Centos 7
Software	openmpi 1.8 HDF5 1.8.5 gcc 4.4.x Python 2.6.x	openmpi 1.10 HDF5 1.8.12 gcc 4.8.x Python 2.7.x (+3.4.x,3.5x) ...
KRB+AFS	Yes	Jobs: no
Scheduling	Reservation only	slurm managed
Access	wgs: everyone wns: after registration	wgs: only maxwell users wns: only maxwell/cfel/.. users
Infiniband	1:1 non-blocking FDR/QDR	2:1 blocking FDR (AMD: QDR)
Hardware (basis)	AMD 64(32) core with 512G	Intel 16-32 core with 256-512G >2*AMD single core performance