Sudan HPC & Grid Computing Center
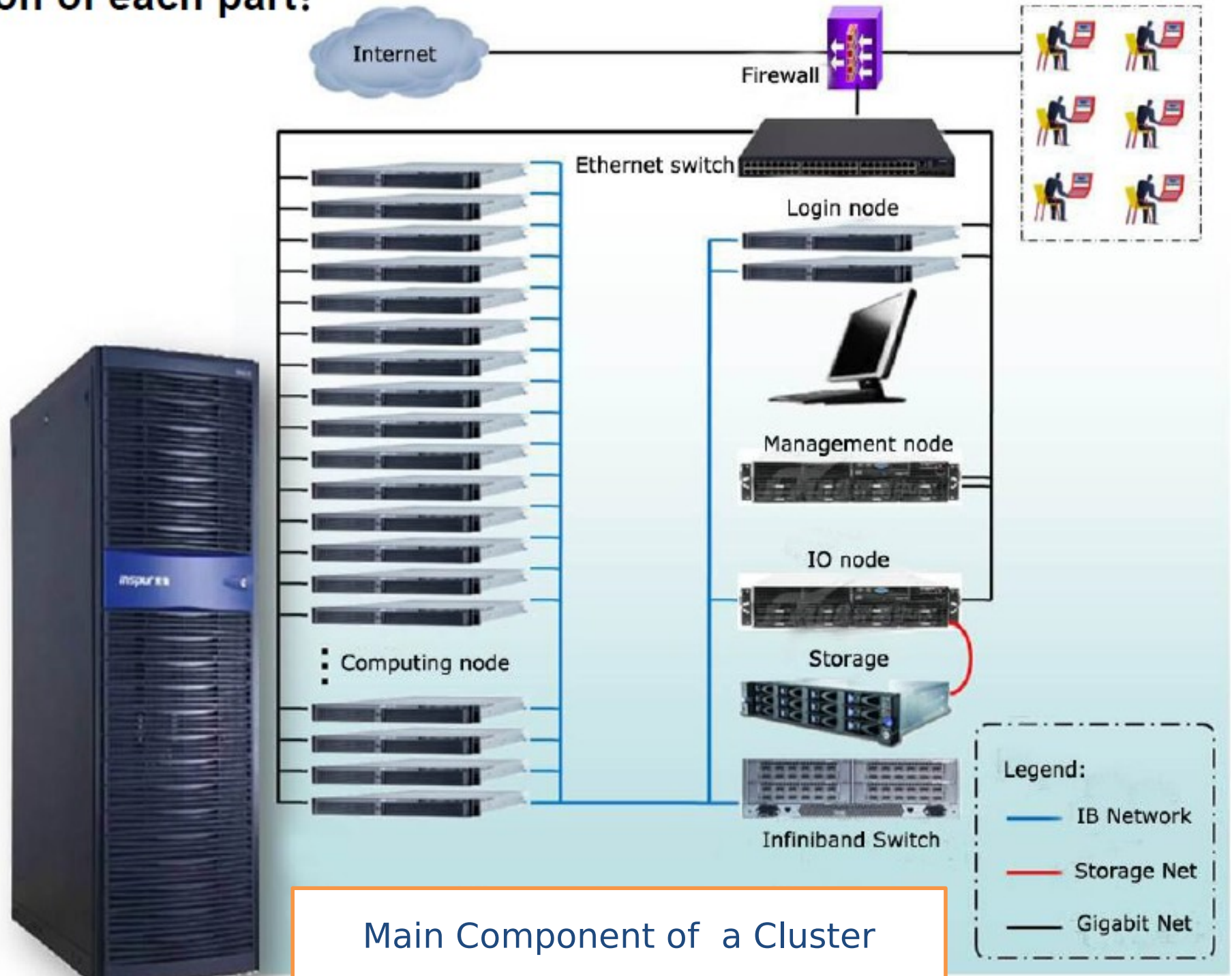## Africa City of Technology
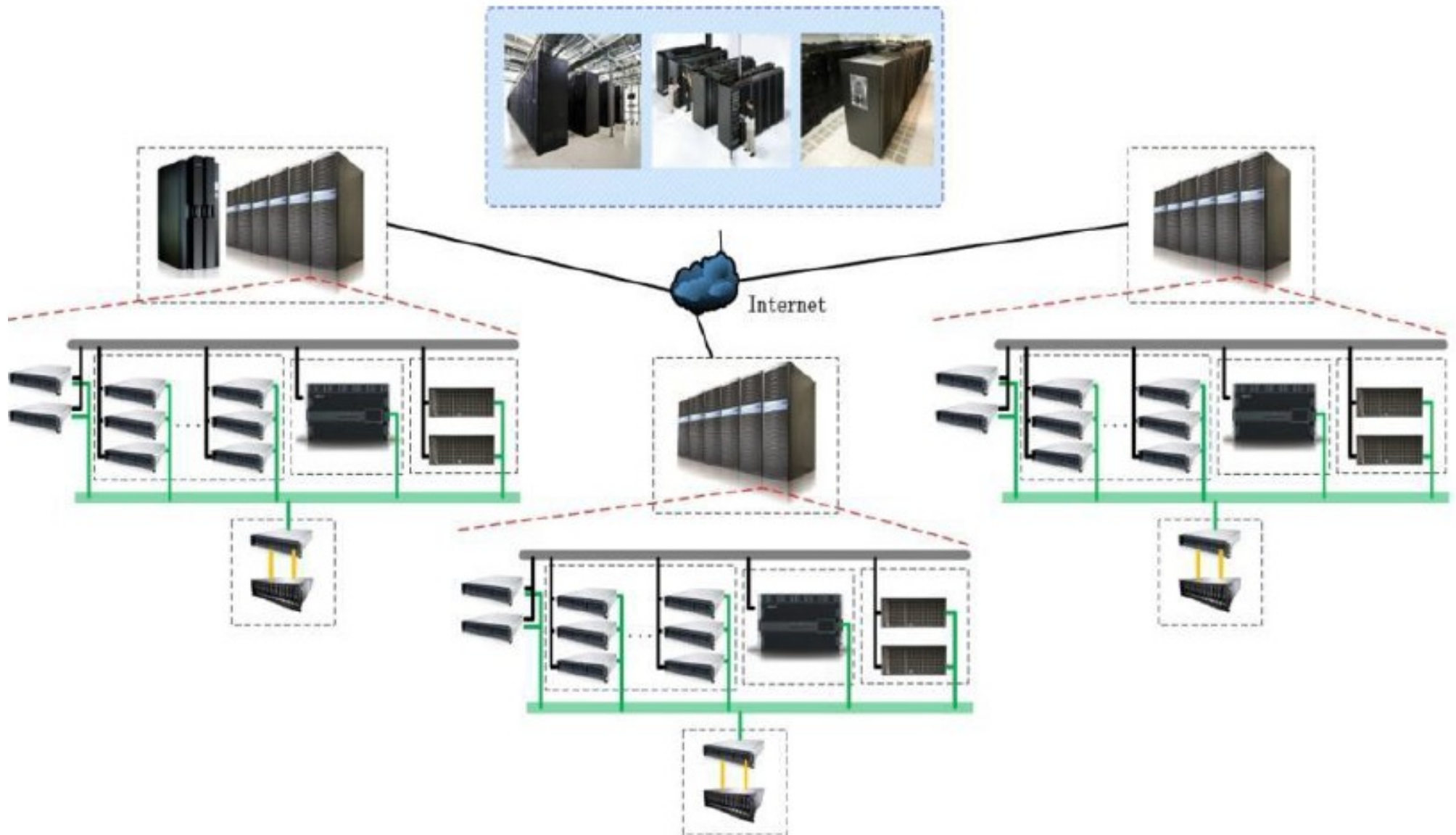
Alwaleed Ahmed Adllan
Technical Operations Manager

Function of each part:

Main Component of a Cluster

Total System Topological Graph

Topological Graph of Each Center

Sudan ACT Grid & High-performance Computing Center
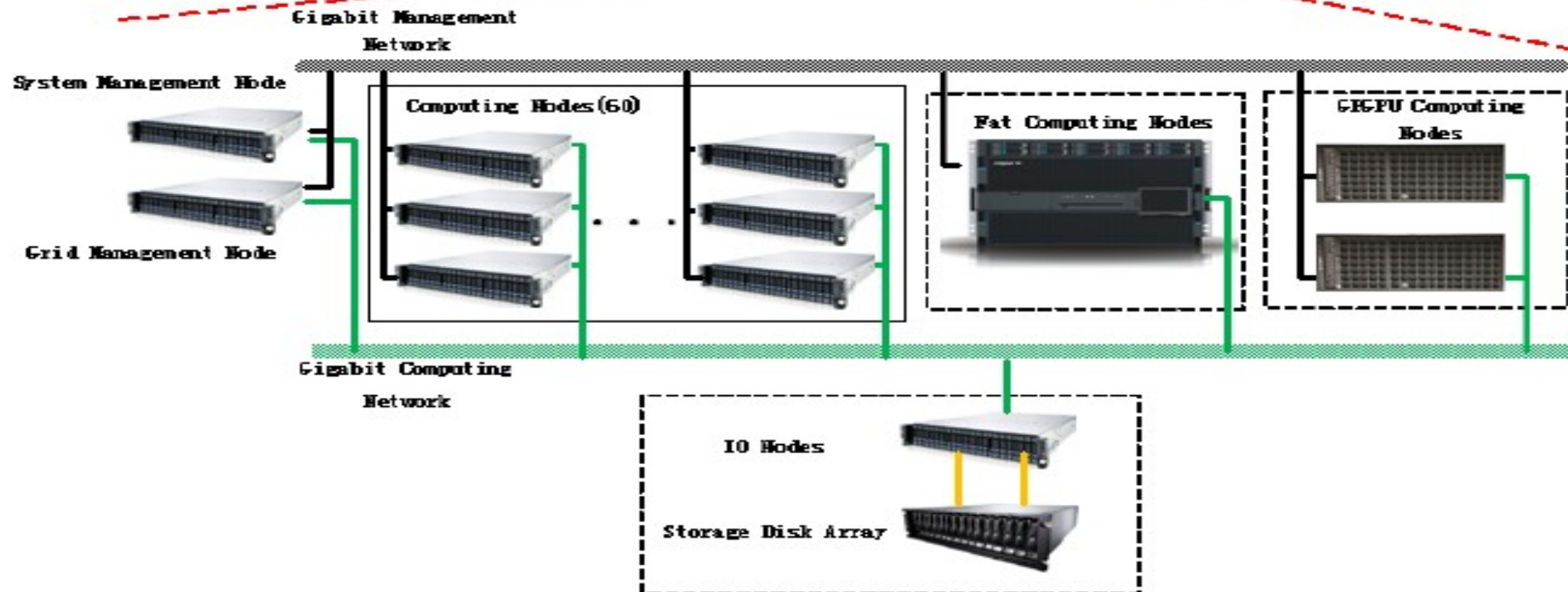
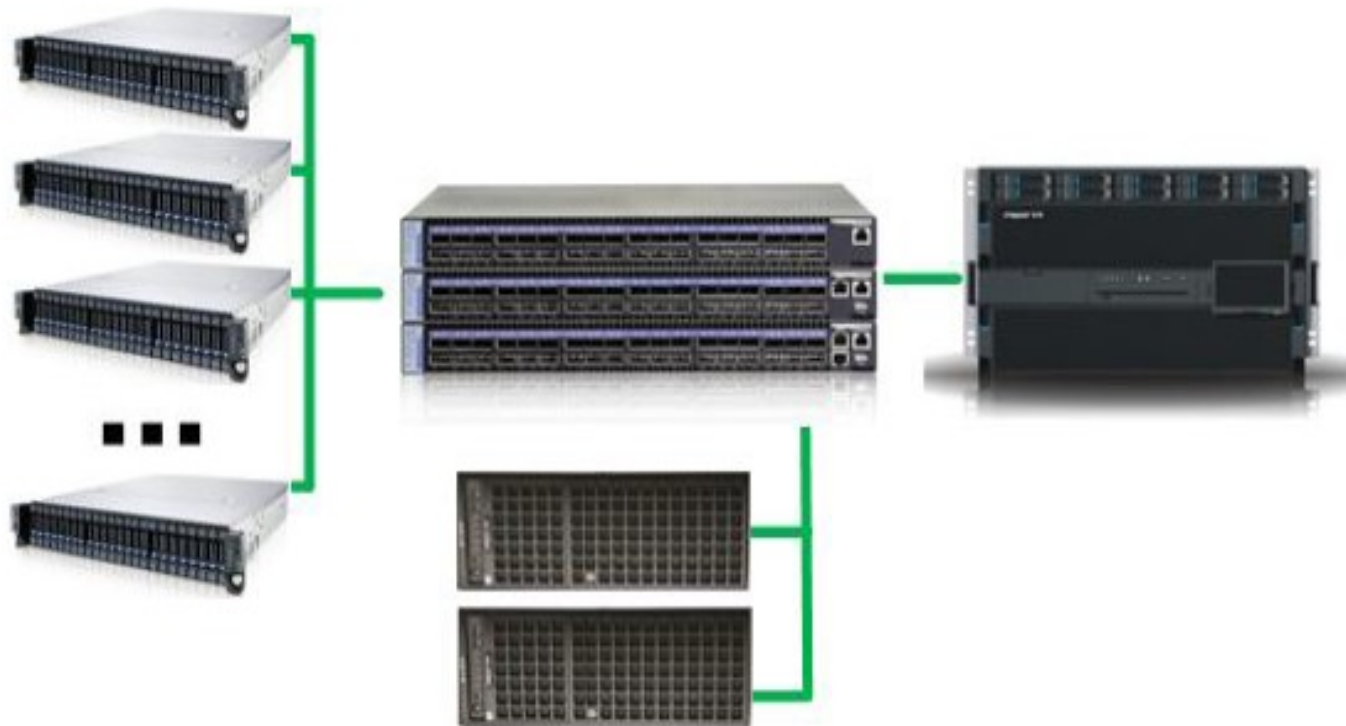# InfiniBand Network

World-class InfiniBand switches provide full wire-speed 40Gb network interconnection for all compute nodes.

Performance Overview

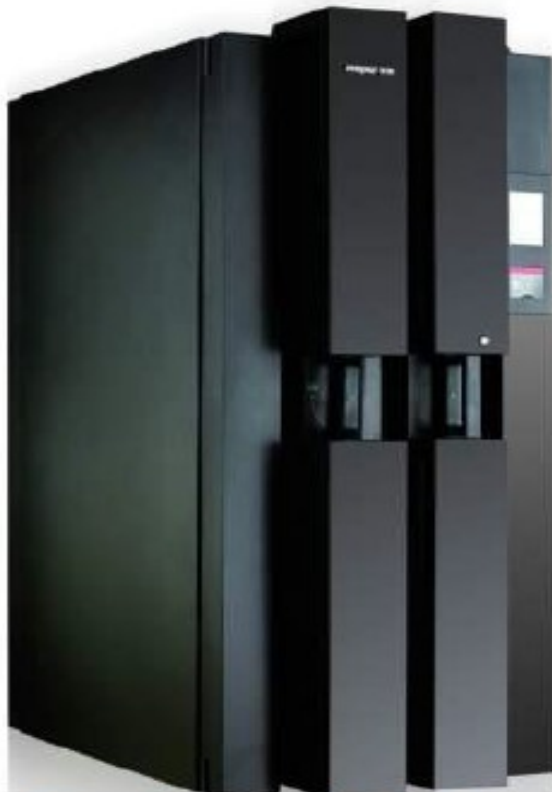| System				Type : Inspur TS10000			
	CPU	Theoretical calculation performance	38.92 Tflops	Software	System efficiency (Linpack)	92%	
		Frequency	2.60GHz				
		cores/CPU	8				
					OS	Linux5.5_x64	
		Total Cores	2744				
	Mem	Total	5744GB		Complier	C/C++,Fortran77/90/95,Java,OpenMP and MPI , intelc++ , intelF , pgi	
		Frequency	1600MHz				
	Storage	204TB			Server monitor	Inspur TSMM4.0	
	Computing Net	40Gbps Infiniband Fat tree network			Job manager	Inspur TSJM2.0 grid	
	Manage Net	Gigbit Net					
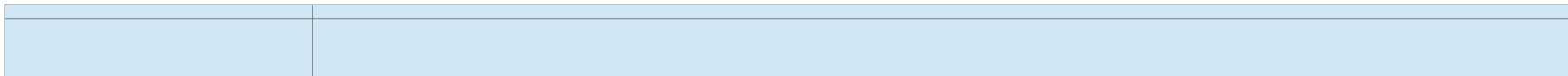
Sudan Grid & HPC Center Solution

System

➢ 2-way computing node: 180(30/60/90) sets of 2-way   6-core rack nodes NF5220

➢ 8-way Fat node: 3(3*1) set 8-way 8-core rack node TS850

➢ GPU node 6(3*2) sets 6-core+3*C2050 GPU adapter rack nodes NF5588

➢ 32-way high end fault tolerance server TSK1: 32 Itanium2 processors

Advanced Computing Platform

32-way high-end fault-tolerant server TSK1

K1 system
A perfect overall IT solution
Server + storage + network + OS + manage software

➤ High performance : 32-way Tightly coupled ccNUMA architecture, 128 cores, 4 million TPmC

➤ High reliability : High RAS with combination of hardware and software, reliability up to 99.999%

➤ Easy expansibility : support hardware partition and virtualization, 2TB of physical memory

➤ Easy management : Green smart resource management platform, general system status monitoring, virtual machine application management

Specification

Peak fixed-point computing : ≥ 819.2GIPS
Peak floating-point computing : ≥ 819.2GFLO
Global shared storage capacity : ≥2TB
Total storage bandwidth : 819.2GB/s
Total network bandwidth : 960GB/s
Total I/O bandwidth : 576GB/s
Hardware partition : 1~8 partitions

World advanced high-end computing platform, unified technical level with IBM/ HP high-end product !

Advanced Computing Platform

8-way Fat node TS850

CPU : 8×Intel Xeon E7-8830(24M Cache,2.13 GHz,6.40GT/s)

RAM : 16×8GB Registered ECC 1333MHz DDR3

HDD : 2×146G hot-swap SAS (10K RPM) 2.5"

Network : 40Gb full wirespeed InfiniBand provide high performance IO channel

Power : 3+1High conversion efficiency redundant power

Advanced Computing Platform

Rack server computing node NF5220

CPU : 2×Intel X5650 6-core 2.66GHz

RAM : 24G 1333MHz DDR3, 3-channel read

HDD : 1×500GB 2.5" 7200 RPM, SATAII HDD

Network : 40Gb full wirespeed InfiniBand provide high performance IO channel

Power : High conversion efficiency power

Advanced Computing Platform

GPU node：NF5588

CPU : 2×Intel Xeon X5650(2.66GHz)/6.4GT/12M/1333 6core

RAM : 6×4G Registered ECC 1333MHz DDR3

HDD : 1×500GB 3.5″   7200 RPM SATAII

GPU accelerator cards : 3 PCS C2075GPU accelerator cards , single node double precision floating-point computing power 1.5Tflops

Service : Senior GPU computing experts provide CUDA migration consultation of application software and GPU Product Training

Software Preinstalled on The System

1	Intel Cluster Studio 2011		14	Fluent
2	Intel Parallel Studio 2011		15	gambit
3	ParaWis		16	FDS
4	TotalView		17	Phaser
5	PGI Cluster Development kit		18	BWA
6	SCE		19	BLAST
7	Discovery Studio		20	MPIBLAST
8	Sybyl		21	FASTA
9	DOCK		22	velvet
10	AUTODOCK		23	AMBER
11	Modeller		24	GROMACS
12	Ansys		25	NAMED
13	CFX		26	CHARMM

Software Preinstalled on The System

27	LAMMPS
28	ARP/wARP
29	VMD
30	Cns
31	Protomo
32	EMAN
33	Spider
34	PRO
35	Q-CHEM
36	TURBOMOLE
37	ADF+GUI
38	Gaussian
39	Dacapo

40	Abinit
41	CPMD
42	Materials Studio
43	VASP
44	WIEN2K
45	Siesta
46	WRF
47	MM5
48	CCSM
49	Matlab
50	Mathematica
51	3D MAX 2011
52	Maya 2011