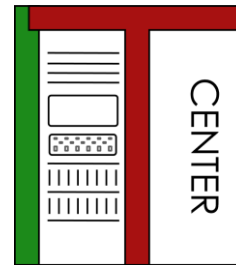





Infrastructures for Cloud and HPC

Antonio Cisternino

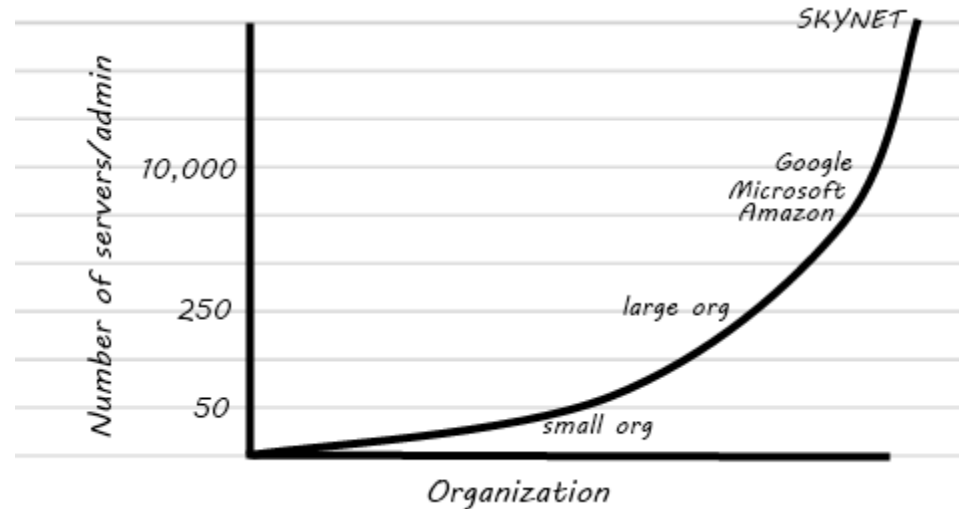


Denser fluid infrastructures



Every 8 seconds a new baby is born in the US

Every 6 seconds a new VM «cloud» is born

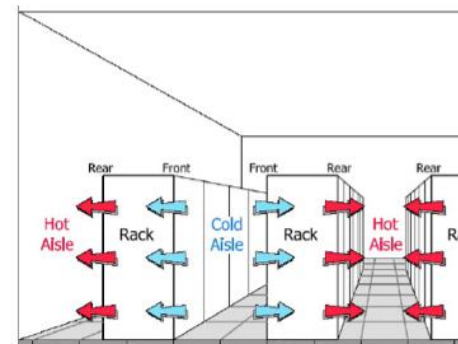
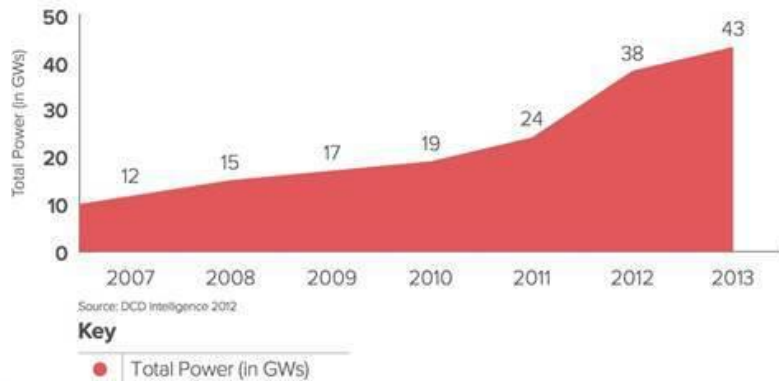
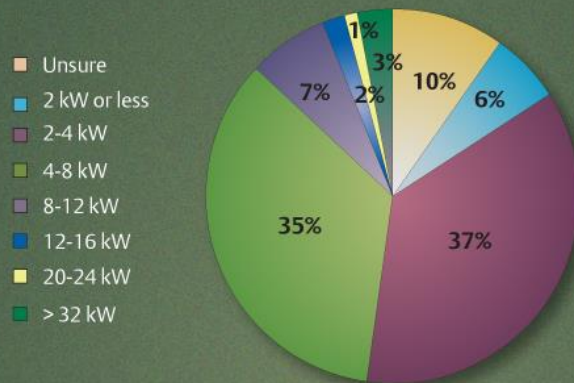


Need for infrastructure automation

Datacenter for infrastructure sharing and better resource usage

Denser racks

Average Power Density per Rack Holds at 5.94 kW



	Front	Interior	Back
42			B4-BT1
41	ipmi 2		B4-BT2
40	Acer GW2000 - 5		
	GB18		GB20
39	GB17		GB19
38	Acer GW2000 - 4		
	GB14		GB16
37	GB13		GB15
36	Acer GW2000 - 3		
	GB10		GB12
35	GB9		GB11
34	Acer GW2000 - 2		
	GB6		GB8
33	GB5		GB7
32	Acer GW2000 - 1		
	GB1		GB3
31	GB2		GB4
30	Mennucci v1 13		
	SB1		SB2
29	Mennucci v1 12		
	SB3		SB4
28	Mennucci v1 11		
	SB5		SB6
27	Mennucci v1 10		
	SB7		SB8
26	Mennucci v1 9		
	SB9		SB10
25	Mennucci v1 8		
	SB11		SB12
24	Mennucci v1 7		
	SB13		SB14
23	Mennucci v1 6		
	SB15		SB16
22	Mennucci v1 5		
	SB17		SB18
21	Mennucci v1 4		
	SB19		SB20
20	Mennucci v1 3		
	SB21		SB22
19	Mennucci v1 2		
18			
17	Mennucci v1 1		
16			
15			
14			
13	Mennucci 3		
12			
11			
10	Mennucci 2		
9			
8			
7			
6	Mennucci 1		
5			
4			
3			
2	B4-FB2		
1	B4-FB1		



Converged & modular systems

Cloud



HPC



On going activity

Distributed Data Center

3 sites (23km) interconnected (Imago 7, SNS)

Benchmarking and testing

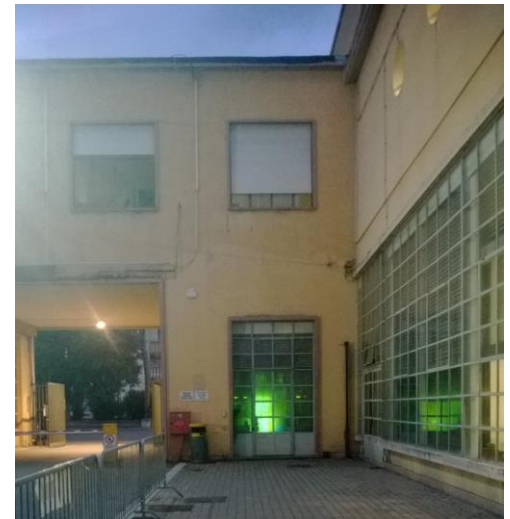
Virtualization & Storage lab (Intel)

Computational chemistry

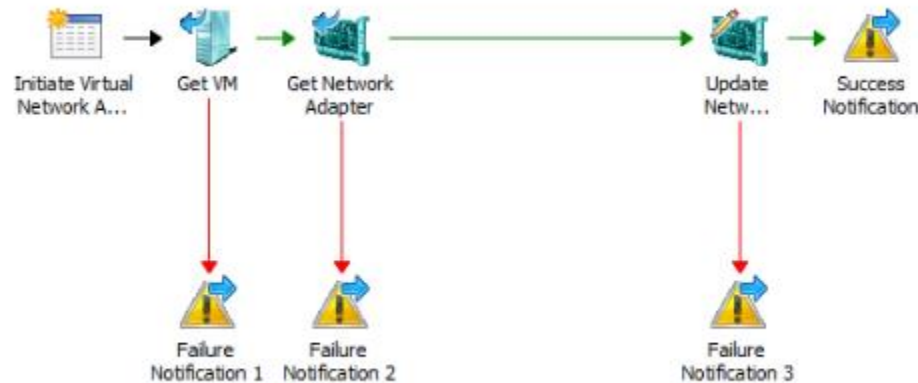
Bigdata manipulation

Enterprise storage

Hadoop, HDFS and HBase



Expert infrastructure mgmt



Workflows generally used to orchestrate cloud resources

Issue: difficult to avoid conflicts among different workflows

We are investigating the use of expert systems (CLIPS) in this context