



IBiSCo at UNINA

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- **UNINA received funds for a total of € 2.302.656,62**
- **The money actually spent was € 2.300.536,91**

soggetto	nome breve	codice univoco	numero gara	Importi assentiti (con IVA)	Totale fatture (con IVA)	Fatture arrivate o previste (senza IVA)	Fatture arrivate o previste (senza IVA)	Residuo
UNINA	NA-13-IMP-UNINA	PIR01_00011_141756	gara 9/F/2019	€ 151.000,00	€ 150.726,52	€ 81.967,21	€ 41.579,12	€ 273,48
UNINA	NA-19-NET-UNINA	PIR01_00011_143217		€ 65.490,00	€ 65.411,83		€ 53.616,25	€ 78,18
UNINA	NA-22-IMP-UNINA	PIR01_00011_144486		€ 207.773,50	€ 207.525,40	€ 122.950,82	€ 47.151,97	€ 248,10
UNINA	NA-23-IMP-UNINA	PIR01_00011_144648		€ 421.496,62	€ 421.425,55	€ 176.065,57	€ 169.365,21	€ 71,07
UNINA	NA-21-IMP-UNINA	PIR01_00011_144312	Estensione 9-F-2019	€ 209.517,00	€ 209.344,97	€ 131.779,44	€ 39.814,80	€ 172,03
UNINA	NA-15-STO-UNINA	PIR01_00011_142051	gara 12/F/2019	€ 285.579,50	€ 285.316,52	€ 232.006,00	€ 1.860,00	€ 262,98
UNINA	NA-16-NET-UNINA	PIR01_00011_142352		€ 111.420,00	€ 111.367,70	€ 91.285,00		€ 52,30
UNINA	NA-17-CAL-UNINA	PIR01_00011_142724		€ 282.000,00	€ 281.800,31	€ 230.983,86		€ 199,69
UNINA	NA-20-NET-UNINA	PIR01_00011_143509		€ 16.010,00	€ 15.721,82	€ 12.886,74		€ 288,18
UNINA	NA-14-CAL-UNINA	PIR01_00011_141875	Convenzione CONSIP	€ 460.500,00	€ 460.482,90	€ 113.241,00	€ 264.204,00	€ 17,10
UNINA	NA-18-CAL-UNINA	PIR01_00011_142957	Convenzione CONSIP	€ 91.870,00	€ 91.413,38	€ 74.929,00		€ 456,62
			TOTALI	€ 2.302.656,62	€ 2.300.536,91	€ 1.268.094,64	€ 617.591,35	€ 2.119,71



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- **The goal was to increment the effectiveness of**
 - A. Power & Cooling,**
 - B. Network,**
 - C. Storage,**
 - D. Compute nodes, HPC**
 - E. Compute nodes, HTC**
 - F. Service nodes**
- **This goal was achieved by aggregation of expenses in only four “big” tenders**
- **Almost all the acquisitions were devoted to the SCoPE Data Center, recently renamed as DC1 of ICSC (DC2 is the INFN one)**



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A. Power & Cooling

- **We increased availability by means of a new UPS, 400 KVA, with all the batteries**
- **Revamping of parts of the chiller for DC1**
- **We increased the cooling in DC1 with new refrigerated doors**



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B. NETWORK

- **We renewed completely the network, both for data transfer and for the monitoring subsystem**
- **A stack of seven new Huawei switches, with a total of 512 ports at 10/25 GbE and 56 ports at 100 GbE, full software licenses (many protocols) – a single-step approach, no ToR, no EoR**
- **A set of new monitoring switches, one for each rack -ToR**
- **Two new Infiniband switches at 100 Gb/S EDR**
- **Two Huawei Firewall, now in between DC1 and GARR, 2x10 GbE**



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C. STORAGE

- **We renewed completely the storage, with 10 server witch 330 Tbytes each, each devoted to a kind of users**
- **Storage servers connected at 2x25 GbE**
- **Four more storage servers connected only to HPC nodes for LUSTRE filesystem**
- **Also 4 Synology NAS systems, for access via SAMBA protocol**



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D. COMPUTE NODES - HPC

- **We promoted and realized a common HPC system, with a total of 32 nodes, each with 4 nVidia GPUSs (V100 model); 12 server bought by UNINA, 15 by CNR (SPIN, ISASI), 5 by INFN**
- **All nodes connected at 100 Gb/s EDR Infiniband and 10 GbE**
- **LUSTRE file system over EDR Infiniband (4 storage servers)**
- **NFS over Ethernet (4 storage servers)**



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E. COMPUTE NODES - HTC

- **40 nodes in a grid environment,**
- **All nodes connected at 10 GbE**



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F. SERVICE NODES

- **6 general purpose nodes added, replacing old SCoPE nodes**
- **A dozen of workstation for the Control Room**



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USAGE

- **More than 100 users, mainly on the HPC cluster**
- **Continuous job submission, queue saturated**
- **Several scientific publications produced by different scientists in many fields**



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USAGE - HTC

Users from VOs `unina.it` and `belle`

- **starting from the date (January 2020) the resource is in the production state till now,**
 - **About 1618k jobs are executed**
 - **For approximately 4758k “computing hours”**



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USAGE – HPC

- **About 100 users from all the partner institutions**
- **starting from the date (April 2020) the resource is in the production state till now,**
 - **About 226k jobs are executed**
 - **For approximately 1213k “computing hours”**



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MOVING TOWARDS ICSC

- **Upgrade of the Ethernet Network to 25 Gbe and 100 GbE (both), with redundancy**
- **Upgrade of the Infiniband Network to 200 Gb/S HDR**
- **Upgrade of HPC nodes to L40 and H100**
- **Increase of memory to a minimum of 1.5 Tbytes (and up to 3 Tbytes) per node**