



Tecnologie Informatiche @ OATo

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Big Data management on exascale architecture, Big Data analysis, Storage Architecture, Database designer, DBMS architect, Data Model, ICT Architect, Archiving, Data preservation, curation and exploitation, Design and development of computing systems for high performance computing and big data analysis; Design, development and optimization of libraries for cluster and multiprocessor environments





Big Data management on exascale architecture, Big Data

No subject of this contribution: software development
for astronomical data simulation and processing,
workflows, pipeline



Science Data Segment contribution

a
a
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a
environments



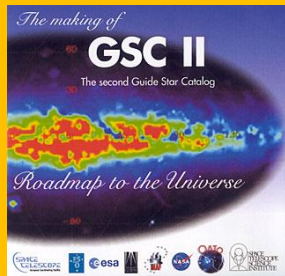
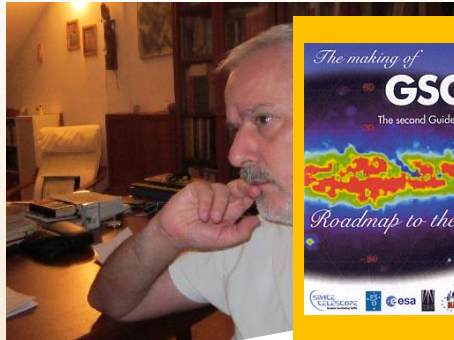


Big Data management on exascale architecture
 analysis, Storage Architecture
 architect

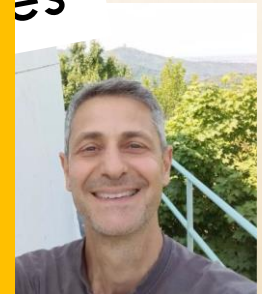
Different storage and database architecture solutions:
 different choices depending on data types

Different archiving approach: no one paradigm for all case studies
 - high performance
 - data analysis; Design, development
 - optimization of libraries for cluster and multiprocessor
 environments

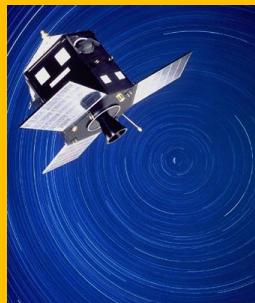




Astronet, Hipparcos, GSC I/II;
 Gaia; TLS; OPS4;
 SoHO-UVCS; Swelto



Diff
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<http://swelto.oato.inaf.it/>



Sala CED2 OATo- archivio DB progetto GSCII e delle lastre digitalizzate.



GSCII DB Object oriented (innovativo per l'epoca) File system based, di tecnologia Objectivity. Si pervenne alla creazione di un DB di produzione in grado di creare data containers contenenti singoli oggetti celesti (GSCII object id corrispondenti alle sources Gaia) associati alle proprie misure.

L'infrastruttura H/W e S/W basata su una commistione di OVMS e Windows è ancora oggi conservata presso l'OATo unitamente alle più di 8000 immagini digitali di aree di cielo digitalizzate che costituiscono il "serbatoio" di quanto fu poi elaborato per pervenire alla fine del XX secolo ad un catalogo contenente un miliardo di oggetti.

Le macchine Alpha OVM della Digital sono spente conservate unitamente a tutto quanto indispensabile e non sono nell'immagine. A distanza di ormai 20 si è ancora in condizione di riattivare la pipeline di processamento e popolamento del DB.

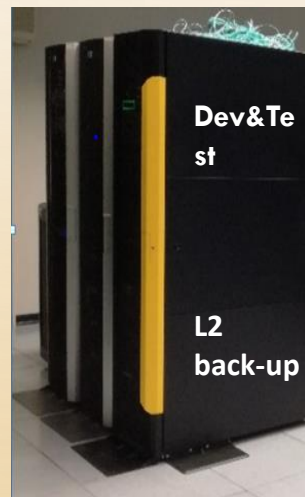
2008 sala CED ALTEC foto della SGI su cui ha girato il primo codice del milione di stelle per la pipeline di GSR - Gaia.
8 processori ITANIUM dual core e 256 GB di RAM indirizzabile da ciascun singolo core mediante la tecnologia NUMALINK un brevetto SGI.



MARCONI 100 @CINECA

INTERNET LINK : 1 Gbps (300 Mbps guaranteed) via GARR
STORAGE CAPACITY: **2.5 PB overall raw disk space** distributed between two HP P7400 storage units and **one P8400**.
COMPUTING : **14 servers** HP DL580 G7/G9 with a total of about **600 CPU cores and 4.5TB RAM**.
DEV & TEST: 7 servers HP
DB SERVERS: **3 servers** HP DL580 G7 (**32 cores**, 256MB RAM each) based on Oracle RAC technology (**DBMS Oracle**).
NETWORK CONNECTION: LAN network up to 10 Gbps. SAN network redundant at 8 Gbps.
SECURITY SERVICE: redundant firewall based on pfSense, enabling secure remote access via VPN.
INFRA MONITORING AND MANAGEMENT: services based on VMWare virtual environment configured with two HP DL 580 G7 servers clustered and managed by vCenter Server.
BACKUP SERVERS: HP DL580 G7 dedicated to DB and filesystem backups from data volume snapshots.
3 LEVELS BACKUP : L1 on primary storage array, L2 on disks (StoreOnce 6600) and L3 on tape libraries (HP ESL G3).
HPC INTERCONNECTION: access to HPC super computer at CINECA for dedicated processing.

NOW → Torino Gaia Data Center @ ALTEC



The DPCT hardware infrastructure is based on **distributed environment**, including a computational grid, a database grid and a storage area network.

The DBMS choice is Oracle that provides advanced availability and scalability features. The database grid will use the following Oracle products:

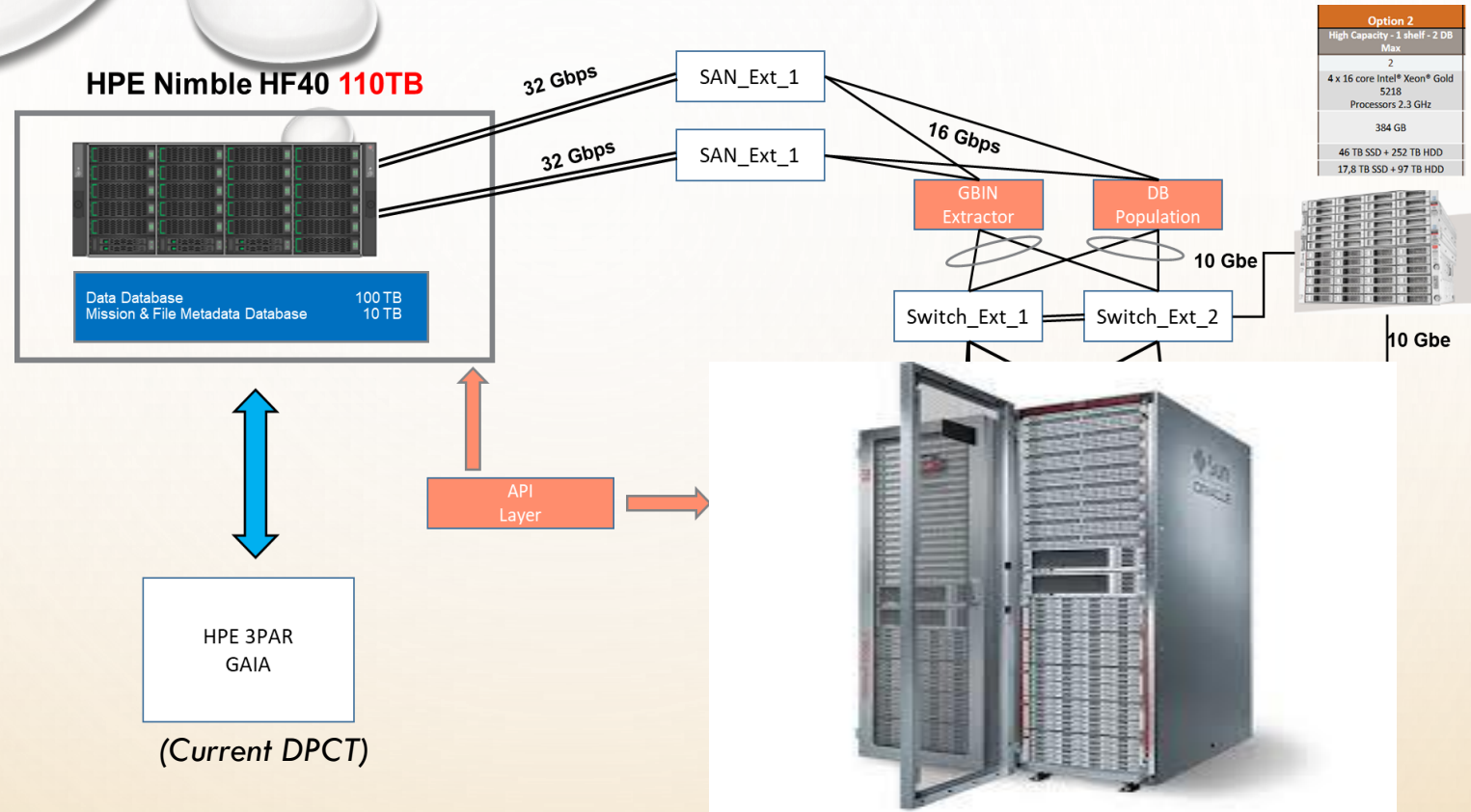
- Oracle Server
- Oracle RAC
- Oracle Partitioning
- Oracle ASM to manage storage used by database

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Towards OPS4

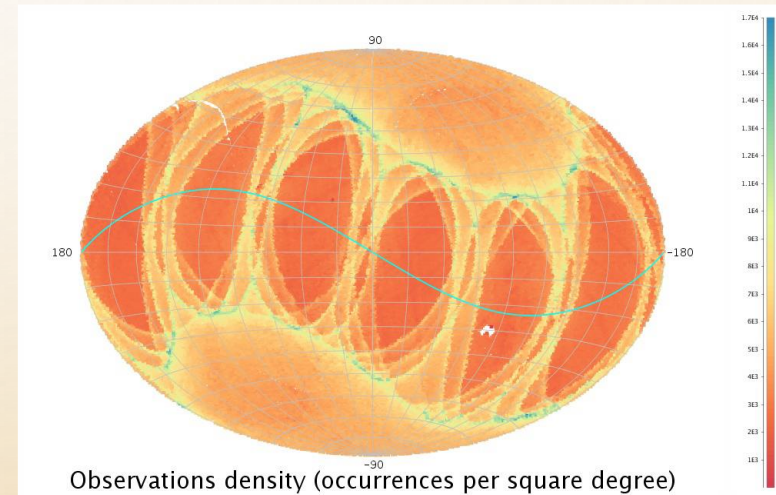


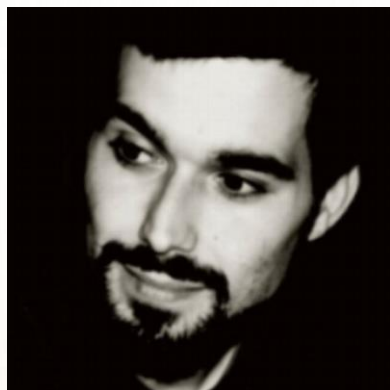
PNRR – Centro Nazionale

Design and development of computing systems for HPC;
Design, development and optimization of libraries for cluster and
multiprocessor environments

Example:

GSR solver within the GSR pipeline – Gaia
Sinergy with OACt





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Gianalfredo Nicolini



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Alberto Riva



Antonio C. Volpicelli



The image features a light beige background with a subtle gradient. In the top-left and bottom-right corners, there are several realistic water droplets of various sizes, rendered with soft shadows and highlights to give them a three-dimensional appearance. The word "THANKS!" is centered in the middle of the page in a bold, black, hand-drawn font with a yellow glow effect.

THANKS!