Wikiprint Book

Title: Programming with OmpSs?-2

Subject: DEEP - Public/User_Guide/OmpSs-2

Version: 53

Date: 20.04.2025 04:22:30

Table of Contents

Programming with OmpSs?-2	3
Introduction	3
File Systems	3
Stripe Pattern Details	4
Additional infos	4
Notes	4

Programming with **OmpSs?**-2

- Introduction
- Quick User Guide

Introduction

<u>OmpSs?</u>-2 is a programming model composed of a set of directives and library routines that can be used in conjunction with a high-level programming language in order to develop concurrent applications. Its name originally comes from two other programming models: **OpenMP** and <u>StarSs?</u>. The design principles of these two programming models constitute the fundamental ideas used to conceive the <u>OmpSs?</u> philosophy.

OmpSs?-2 thread-pool execution model differs from the fork-join parallelism implemented in OpenMP.

File Systems

On the DEEP-EST system, three different groups of filesystems are available:

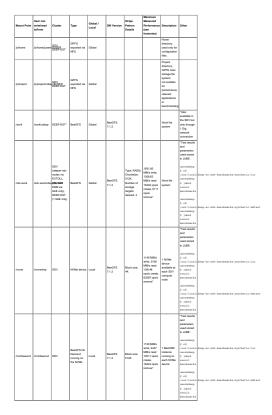
- the <u>?JSC GPFS filesystems</u>, provided via <u>?JUST</u> and mounted on all JSC systems;
- the DEEP-EST (and SDV) parallel BeeGFS filesystems, available on all the nodes of the DEEP-EST system;
- the filesystems local to each node.

The users home folders are placed on the shared GPFS filesystems. With the advent of the new user model at JSC (<u>?JUMO</u>), the shared filesystems are structured as follows:

- \$HOME: each JSC user has a folder under /p/home/jusers/, in which different home folders are available, one per system he/she has access to. These home folders have a low space quota and are reserved for configuration files, ssh keys, etc.
- \$PROJECT: In JUMO, data and computational resources are assigned to projects: users can request access to a project and use the resources
 associated to it. As a consequence, each user has a folder within each of the projects he/she is part of. For the DEEP project, such folder is located
 under /p/project/cdeep/. Here is where the user should place data, and where the old files generated in the home folder before the JUMO
 transition can be found.

The DEEP-EST system doesn't mount the \$SCRATCH and \$ARCHIVE filesystems, as it is expected to provide similar functionalities with its own parallel filesystems.

The following table summarizes the characteristics of the file systems available in the DEEP-EST and DEEP-ER (SDV) systems:



Stripe Pattern Details

It is possible to query this information from the deep login node, for instance:

```
manzano@deep $ fhgfs-ctl --getentryinfo /work/manzano
Path: /manzano
Mount: /work
EntryID: 1D-53BA4FF8-3BD3
Metadata node: deep-fs02 [ID: 15315]
Stripe pattern details:
+ Type: RAID0
+ Chunksize: 512K
+ Number of storage targets: desired: 4
manzano@deep $ beegfs-ctl --getentryinfo /sdv-work/manzano
Path: /manzano
Mount: /sdv-work
EntryID: 0-565C499C-1
Metadata node: deeper-fs01 [ID: 1]
Stripe pattern details:
+ Type: RAID0
+ Chunksize: 512K
+ Number of storage targets: desired: 4
```

Or like this:

```
manzano@deep $ stat -f /work/manzano
File: "/work/manzano"
  TD: 0
         Namelen: 255
                              Type: fhgfs
Block size: 524288 Fundamental block size: 524288
Blocks: Total: 120178676 Free: 65045470 Available: 65045470
Inodes: Total: 0
                      Free: 0
manzano@deep $ stat -f /sdv-work/manzano
File: "/sdv-work/manzano"
  ID: 0 Namelen: 255
                             Type: fhgfs
Block size: 524288 Fundamental block size: 524288
Blocks: Total: 120154793 Free: 110378947 Available: 110378947
Inodes: Total: 0
                        Free: 0
```

See <a>?http://www.beegfs.com/wiki/Striping for more information.

Additional infos

Detailed information on the BeeGFS Configuration can be found ?here.

Detailed information on the BeeOND Configuration can be found ?here.

Detailed information on the Storage Configuration can be found ?here.

Detailed information on the Storage Performance can be found ?here.

Notes

- The /work file system which is available in the DEEP-EST prototype, is as well reachable from the nodes in the SDV (including KNLs and KNMs) but through a slower connection of 1 Gig. The file system is therefore not suitable for benchmarking or I/O task intensive jobs from those nodes
- Performance tests (IOR and mdtest) reports are available in the BSCW under DEEP-ER → Work Packages (WPs) → WP4 → T4.5 Performance measurement and evaluation of I/O software → Jülich DEEP Cluster → Benchmarking reports:
 ?https://bscw.zam.kfa-juelich.de/bscw/bscw.cgi/1382059
- Test results and parameters used stored in JUBE:

user@deep \$ cd /usr/local/deep-er/sdv-benchmarks/synthetic/ior user@deep \$ jube2 result benchmarks

user@deep \$ cd /usr/local/deep-er/sdv-benchmarks/synthetic/mdtest

user@deep \$ jube2 result benchmarks