DeIC HPC TekRef group report on the

**Supercomputing 2022 conference**

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**Preface**

The DeiC **HPC TekRef** group, represented by a delegation of *High Performance Computing* (HPC) system administrators from Danish universities (KU, AAU, ITU, and DTU), DeiC participated in the *SC22* *International Conference for High Performance Computing, Networking, Storage, and Analysis[[1]](#footnote-1)* annual conference in November 2022 in Dallas, Texas, USA. The delegation also participated in the satellite conference HPE ForCAST Fall 2022.

This report summarizes the fact-finding investigations carried out by the delegation during the conferences for the purpose of obtaining and accumulating knowledge about the latest HPC systems, technology, and software for use by DeIC as well as the HPC community in Denmark.

The delegation attended a large number of conference sessions, and in addition held a number of prearranged one-to-one meetings with key technology vendors under *Non-Disclosure Agreements* (NDA). The vendor list was Intel, AMD, Nvidia, Mellanox, DellEMC, HPE, Lenovo, and Cornelis Networks. The information obtained under NDA cannot be disclosed in the present public report, but any publicly available information is reported.

The topics in the following sections represent the most important trends in HPC, with a particular emphasis on HPC in Denmark.

**CPUs for HPC**

**Intel**

**AMD**

**ARM**

**Accelerators**

**NVIDIA**

**AMD**

**Intel**

**Field Programmable Gate Array (FPGA)**

**Quantum computing**

**Server products**

**Interconnects for HPC**

**Mellanox Infiniband**

**Omni-Path**

The Omni-Path network fabric products were spun out from Intel in 2020 to a new company *Cornelis Networks*.

**HPE/Cray Slingshot**

**Data centers and liquid cooling**

**Direct Liquid Cooling**

**Cooling Distribution Units**

**Middleware and software for HPC**

**Slurm**

**Software modules**

**Containers**

**Cloud services for HPC**

**Artificial Intelligence (AI) and Machine Learning (ML)**

**TOP500 supercomputers**

**Exascale computing**

**Conclusion**

1. SC22 <https://sc22.supercomputing.org/> [↑](#footnote-ref-1)