The idea of DisResc is to place workloads with different requirements on heterogeneous resources, while both the requirements and the resources are considered. The overall goals are to better utilise (heterogeneous) data centres, provide better user experiences by selecting the best matching hardware for a workload, and to allow different workload types like virtual machines, containers or HPC jobs side by side in one data centre. DisResc is the vision to build a cluster management software for cloud and HPC workloads, running in parallel on a heterogeneous physical data centre.

DisResc Server Tasks
DisResc enabled compute nodes should i) run virtual machines, containers or HPC jobs, ii) compile time-based behaviour profiles of their workloads, in order to iii) detect suboptimal situations like over/under utilization. The resource utilisation should consider multiple metrics like processor, memory, disk, and network utilisation. The cluster should communicate in a peer-based manner to agree on the best fitting placement of new workloads, and workloads of nodes in a suboptimal state. This non-centralised approach can remove single points for management and monitoring, which are usually found in Cloud and HPC clusters.

From Monitoring Data to Placement – how?

Open Research Questions
1. How to compile a time-based behaviour profile with various metrics?
2. How to represent the physical infrastructure to map behaviour profiles on them?
3. How to create a distributed consensus algorithm to determine a best fitting node?

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