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An Overview of the Monitoring and Accounting Architecture for Computing within INFN Projects (REMOTE)

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In computer science, monitoring and accounting involve tracking and managing the usage of system resources in IT environments by users, applications, or processes. These activities typically encompass monitoring CPU usage, memory allocation, disk space, network bandwidth, and other critical resources. The insights obtained through activity tracking and analysis serve several purposes. Resource allocation enables administrators to distribute resources effectively, ensuring fair usage and preventing monopolization. Cost management is particularly critical in cloud computing and shared systems, where users or organizations are billed based on resource consumption. Performance optimization identifies resource bottlenecks or inefficient processes, enhancing overall system performance. Security focuses on detecting unauthorized or anomalous activities to prevent misuse or cyberattacks. Finally, auditing and compliance ensure the maintenance of detailed logs to meet regulatory or organizational requirements. In summary, monitoring and accounting are pivotal for managing and optimizing system performance, cost-efficiency, and security in IT environments.

In this context, monitoring and accounting mechanisms have been designed and implemented within the INFN Cloud infrastructure, a private cloud offering INFN users a comprehensive and integrated set of cloud services, and within DARE, a European project aimed at managing sensitive data and developing solutions for population surveillance, prevention, health promotion, and security. Due to its distributed nature, INFN Cloud leverages a network of geographically dispersed data centers across Italy, introducing additional challenges in monitoring and accounting. When a user from a specific community requests a cloud service, computational resources are allocated to the data center best suited to meet the user's requirements, based on predefined criteria such as resource availability. In the context of DARE, and in projects involving sensitive data more generally, these methods are both beneficial and essential for ensuring comprehensive control over infrastructure activities.

This presentation provides an overview of the monitoring and accounting architecture developed and implemented within the INFN Cloud and DARE infrastructure, with a focus on the methods employed for generating, collecting, and analyzing relevant data. The proposed approach not only enhances operational efficiency but also offers a scalable model suitable for distributed cloud infrastructures.

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