SCALABILITY 2024

Forward

The First International Conference on Systems Scalability and Expandability (SCALABILITY 2024), held on November 17-21, 2024 in Valencia, Spain, inaugurates a series of events covering all aspects related to scalability challenges and solutions from design, to monitoring, and maintenance of computational systems.

The true definition of scalability has to do with meeting demand. Scalable design is a form of responsiveness. Scalability is the ability of a system to provide throughput in proportion to, and limited only by, available hardware resources. A scalable system is one that can handle increasing numbers of requests without adversely affecting response time and throughput.

The growth of computational power within one operating environment is called vertical scaling. Horizontal scaling is leveraging multiple systems to work together in parallel on a common problem. Cloud scalability in cloud computing refers to the ability to increase or decrease IT resources as needed to meet changing demand. Scalability is one of the hallmarks of the cloud and the primary driver of its exploding popularity with businesses. Scaling is one of the most important components of cloud cost management: performance vs. availability vs. scalability tradeoff is essential.

Data storage capacity, processing power and networking can all be scaled using existing cloud computing infrastructure. Better yet, scaling can be done quickly and easily, typically with little to no disruption or down time. Third-party cloud providers have all the infrastructure already in place; in the past, when scaling with on-premises physical infrastructure, the process could take weeks or even months and required tremendous expense.

Whether traffic or workload demands increase suddenly or gradually over time, a scalable cloud solution enables organizations to respond appropriately and cost-effectively to an increased need for storage and performance. The switch to cloud has improved the computing power for organizations that used to run servers on premises. The leading cloud providers - Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform - offer flexibility for organizations that may need to add or reduce resources at a moment's notice.

Virtualization is what makes cloud scalability possible. In cloud computing, scaling is the process of adding or removing computing, storage, and network services to meet the demands a workload has for resources in order to maintain availability and performance as utilization increases.

The number of IoT devices might soon reach 39 billion. Other more complex systems (such as vehicles and power grids, equipped with sensing and storage capabilities) generate huge amounts of data of various types. 5G operation uses a large scale of heterogeneous IoT devices while being performance-efficient in real-time is challenging considering central processing by services hosted on geographically distant clouds (latency incurred and the ingress bandwidth).

To leverage resources located at the edge of the network forming a continuum between the cloud and the edge, the Fog/Edge computing paradigm is expected to increase not only scalability, but also the agile adaptation of sudden traffic, speed, and load changes. The approach deals with latency and bandwidth in close vicinity with data producers (IoT devices, such as home routers, gateways, or more substantial micro data centers) by harnessing the edge. This approach raises security aspects (trust, privacy, guarantees) in edge-based computing.

This conference was very competitive in its selection process and very well perceived by the international community. As such, it attracted excellent contributions and active participation from all over the world. We were very pleased to receive a large amount of top quality contributions.

We take here the opportunity to warmly thank all the members of the SCALABILITY 2024 technical program committee as well as the numerous reviewers. The creation of such a broad and high quality conference program would not have been possible without their involvement. We also kindly thank all the authors that dedicated much of their time and efforts to contribute to the SCALABILITY 2024. We truly believe that thanks to all these efforts, the final conference program consists of top quality contributions.

This event could also not have been a reality without the support of many individuals, organizations and sponsors. We also gratefully thank the members of the SCALABILITY 2024 organizing committee for their help in handling the logistics and for their work that is making this professional meeting a success.

We hope the SCALABILITY 2024 was a successful international forum for the exchange of ideas and results between academia and industry and to promote further progress in scalability and expandability research. We also hope that Valencia provided a pleasant environment during the conference and everyone saved some time for exploring this beautiful city

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