

## SARC: Scalable Computer Architecture

### Description

SARC was an integrated project concerned with long term research in advanced computer architecture. It focused on a systematic scalable approach to systems design ranging from small energy critical embedded systems right up to large scale networked data servers. It came at a stage where, for the first time, we were unable to increase clock frequency at the same rate as we increased transistors on a chip.

Future performance growth of computers from technology miniaturisation is expected to flatten out and we will no longer be able to produce systems with ever increasing performance using existing approaches. As current methods of designing computer systems will not be feasible in the future, what was needed at the time was a new innovative approach to architecture design that scales both with advances in underlying technology and with future application domains. This was achieved by fundamental and integrated research in scalable architecture, scalable systems software, interconnection networks and programming models each of which is necessary component in architectures 10+ years from now. This allowed Europe to capitalise on its dominance in embedded systems and interconnection networks and gain market share as consumer electronics and general purpose computing continue to converge.

The objectives of the project were following:

- Develop a scalable integrated architecture applicable to a wide range of applications
- Solve the design crisis by reducing architecture complexity and automating design space exploration
- Develop innovative approaches to compiler construction that can adapt to the architecture evolution
- Propose new system wide approaches to reduce power consumption and integrate power and performance in architectural development
- Investigate and develop new programming models and runtime systems to provide scalable exploitation of future architecture
- Integrate research by bringing processor & interconnection designers, compiler, language & runtime experts together to develop long-term sustainable approaches to advanced computer architecture in Europe.

This four year project brought together the best researchers in advanced computer architecture to work on disruptive scalable technology for the future. It had a cutting-edge research agenda and Europe's most strategically significant industrial partners to exploit this technology and increase Europe's market share in the changing computing landscape of the future.

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**Source URL (retrieved on 26 Nov 2024 - 05:29):** <https://www.bsc.es/es/research-and-development/projects/sarc-scalable-computer-architecture>