



White Papers | Webcasts | Newsletters | Research Centers | Events | Magazine



Topics ▾ | News | In Depth | Reviews | Blogs ▾ | Opinion | Shark Tank | IT Jobs | More ▾

Hardware | Computer Peripherals | Laptops | Macintosh | Netbooks | PCs | Processors | Servers

[Home](#) > [Hardware](#) > [Processors](#)

News

Smartphone chips could replace server processors in HPC, researchers say

Looking at historical trends and benchmark tests, researchers say cellphone chips may eventually be used in supercomputers

By **Agam Shah**

May 24, 2013 04:42 PM ET

[Add a comment](#)

Share 2

Like 8

IDG News Service - Looking at historical trends and performance benchmarks, a team of researchers in Spain have concluded that smartphone chips could one day replace the more expensive and power-hungry x86 processors used in most of the world's top supercomputers.

"History may be about to repeat itself," researchers at the Barcelona Supercomputing Center wrote in a [paper](#) titled "Are mobile processors ready for HPC?" The paper was presented at the EDAsymposium13 in Dresden, Germany, this month.

The researchers point to the history of less expensive chips bumping out faster but higher-priced processors in high-performance systems. In 1993, the list of the world's fastest supercomputers, known as the Top500, was dominated by systems based on vector processors. They were nudged out by less expensive RISC processors like IBM's Power chip, whose use in supercomputers peaked early in the past decade. The RISC chips in turn were eventually replaced by cheaper commodity processors like Intel's Xeon and Advanced Micro Devices' Opteron, which today are used in more than 400 supercomputers on the Top500 list.

The transitions had a common thread, the researchers wrote: Microprocessors killed the vector supercomputers because they were "significantly cheaper and greener," they said.

"Mobile processors are not faster ... but they are significantly cheaper," the researchers wrote.

Low-power chips based on designs from U.K. chip company ARM are used in most smartphones and tablets sold today. Intel has found some limited success with its Atom processor, which was originally designed for netbooks and is still based on its x86 architecture.

Interest in using mobile processors in servers is mounting as companies look to reduce data-center power bills. Smartphone chips are seen by some as well-suited for workloads that involve high volumes of small transactions, like dishing up search results and processing "likes" on social networks. Beefier chips like the Xeon and Opteron are seen as best for software that requires more performance, such as large database applications and ERP (enterprise resource planning) systems.

One of the goals at the Barcelona Supercomputing Center (BSC) is to build prototype systems that help improve performance-per-watt. The organization, funded by the Spanish government and the European Union, has built servers based on Nvidia's quad-core Tegra 3 chip, which uses an ARM Cortex-A9 processor design, and another on Samsung's dual-core Exynos 5, based on the faster Cortex-A15.

As well as looking at history, their prediction about smartphones chips is based on benchmark results. They compared Samsung's 1.7GHz dual-core Exynos 5250, Nvidia's 1.3GHz quad-core Tegra 3 and Intel's 2.4GHz quad-core Core i7-2760QM -- which is a desktop chip, rather than a server chip.



COMPUTERWORLD INSIDER FREE INSIDER GUIDE

IT Certification Study Tips

Register for this Computerworld Insider Study Tip guide and gain access to hundreds of premium content articles, cheat sheets, product reviews and more.

[Register for FREE now! »](#)

Processors Resources

Harness IT -- An Introduction to Business Intelligence Solutions

Learn the key selection criteria required to provide your organization with the capability to address structured data, unstructured data and mobile demands so...

Business Intelligence Shows its Smarts

Today's Business Intelligence (BI) tools provide a new way to think about data with self-service capabilities and user-friendly analytics that can be used...

Proactive Planning for Big Data

Big data is less about the terabytes and more about the query tools and business intelligence needed to make sense of massive amounts...

Inquiry Spotlight: Consumer-Facing Identity

The challenges of consumer-facing identity management, access management, and authentication differ in ways subtle and dramatic from those of the employee-facing variety.

Becoming An Analytics Driven Organization

Join us on Tuesday, June 18, 2013, 11:00 AM EDT and learn how your agency can create an analytics culture that will enable...

3 Reasons Why Sepaton is the World's Fastest Backup Solution

Leading analyst, Storage Switzerland learns how Sepaton backs up and deduplicates massive data volumes while maintaining the industry's fastest performance - all in...

[All Processors White Papers | Webcasts](#)

The researchers said they found that ARM processors were more power-efficient on single-core performance than the Intel processor, and that ARM chips can scale effectively in HPC environments. On a multi-core basis, the ARM chips were as efficient as Intel x86 chips at the same clock frequency, but Intel was more efficient at the highest performance level, the researchers said.

In a battle between two ARM chips, the Nvidia Tegra 3 chip was compared to Samsung's Exynos 5250. The Exynos 5250 was 1.7 times faster than the Tegra 3 on single-core performance.

Hewlett-Packard recently launched its Moonshot server, which is based on Intel's low-power Atom server chip. ARM processors from Calxeda and Texas Instruments are expected to be used in future Moonshot systems. Dell has also built prototype ARM servers and is contemplating use of the low-power chips in supercomputers.

The BSC researchers point to weaknesses in ARM designs that may hold up their use in servers. Today's ARM chips are 32-bit designs, meaning the amount of memory they can address is limited. They also lack error correction technologies, have no network off-load chip, and do not use standard I/O interfaces.

ARM has announced a 64-bit design, however, and Calxeda, AMD and AppliedMicro are among the chip makers expected to ship 64-bit ARM chipsets with an array of I/O and networking features.

As the ARM server market evolves, the technical challenges will be resolved, according to the researchers, and increased competition could further drive down prices.

"Mobile processors have qualities that make them interesting for HPC," the researchers wrote, advising readers to "get ready for the change, before it happens."

BSC is also involved in [Project Mont-Blanc](#) and the [Axle Project](#), which are efforts to develop supercomputers that combine the processing power of CPUs, graphics processors and other computing resources.

Agam Shah covers PCs, tablets, servers, chips and semiconductors for IDG News Service. Follow Agam on Twitter at [@agamsh](#). Agam's e-mail address is agam_shah@idg.com

FREE DOWNLOAD: Top 10 IT Jobs (Computerworld) ▶

Comments (Add a comment)

Print


Share

Like 8

Reprinted with permission from IDG.net. Story copyright 2012 International Data Group. All rights reserved.

Today's Top Stories	From CSOonline and CIO
Sold! Antique Apple-1 brings a record \$671K	The 20 Best iPhone/iPad Games of 2013 So Far
Beach reads for techies 2013	9 Steps to Build Your Personal Brand (and Your Career)
Microsoft knuckles under, yanks YouTube app for Windows Phone	7 Consumer Technologies Coming to an Enterprise Near You
Mike Elgan: What I learned using only Google products	11 Signs Your IT Project is Doomed
Are we ready for a mobile-first world?	A walking tour: 33 questions to ask about your company's security
Smartphone chips could replace server processors in HPC, researchers say	15 social media scams
Google Glass breaks into business	The 7 elements of a successful security awareness program

Additional Resources

 **WHITE PAPER**
[How Cloud Communications Reduce Costs and Increase Productivity](#)
 Small and midsize businesses are moving to the cloud to host their communications capabilities. Learn how enterprise-quality phone benefits, online management, conferencing, auto attendant, and ease of use are built into a system that is half the cost of a PBX.
[Read now.](#)

Like

IT Jobs

Variuos IT Positions
 Fremont, CA-Agama Solutions

IT Network Engineer (Networking/Security Projects)
 New York, NY-Segal

Senior Web Designer and Developer
 Elgin, IL-Elgin Community College

Director of Web Services
 Elgin, IL-Elgin Community College

Business Applications Administrator II
 Sparks, NV-Sierra Nevada

[See All Jobs](#) [Post a job for \\$295](#)

job title or company location

Jobs by [SimplyHired](#)

Comments powered by

[Our Commenting Network](#) | [Policies](#) | [Privacy](#)

Add New Comment

[Login](#)



Type your comment here.

Processors White Papers | [All Processors White Papers](#)

Showing 0 comments

Sort by newest first

Subscribe by email RSS

Reactions



- [Harness IT -- An Introduction to Business Intelligence Solutions](#)
- [Proactive Planning for Big Data](#)
- [IDC Security Infographic](#)
- [Security Empowers Business](#)
- [Beyond Data Migration Best Practices](#)
- [Case Study: In-the-Cloud Email Service Replaces Three Point Products](#)
- [What does it take to deliver Security, Privacy and Trust at Mimecast?](#)
- [The Shape of Email](#)
- [Your Data under Siege: Protection in the Age of BYODs](#)
- [ESG: The Contemporary Value of Virtual Storage Appliances: HP renews its focus with StoreVirtual VSA](#)

- [Business Intelligence Shows its Smarts](#)
- [Inquiry Spotlight: Consumer-Facing Identity](#)
- [Key Drivers: Why CIOs Believe Empowered Users Set the Agenda for Enterprise Security](#)
- [Business Assurance Technology Infographic](#)
- [Case Study: Hospital Turns to Email Archiving Solution to Ensure Regulatory Compliances](#)
- [Case Study: Simplifying the Transition to Exchange 2010 with Email Management Solutions](#)
- [The Total Cost of Email](#)
- [SaaS with a Face: User Satisfaction in Cloud-Based E-mail Management with Mimecast](#)
- [Your Data under Siege: Defeating the Enemy of Complexity](#)
- [Taneja Group: HP 3PAR StoreServ 7000 - Enterprise for the Mid-range](#)



vmware

Call for Submissions
VMware Innovation Awards

Nomination deadline:
May 31, 2013

Produced by **COMPUTERWORLD**

Sponsored Links

- [Powerful and secure remote support with LogMeIn Rescue - Try it free](#)
- [Increase your speed and agility with big data analytics from SAP®.](#)
- [How big is your 'phishing attack surface'? Find out now. A new free service!](#)
- [Intel ProLiant --Double compute density to tackle bigger workloads with HP ProLiant servers. Learn more](#)
- [Cervalis-S.S.A.E. 16 data centers keep critical IT applications running.](#)
- [Jumpstart business transformation with VCE solutions for SAP](#)
- [Check out Gartner Predicts 2013: Application Integration](#)
- [Rugged and reliable Panasonic Toughbook® mobile computers.](#)
- [New CIO Playbook helps you commit to SLAs with confidence.](#)
- [Transform enterprise IT with ServiceNow. See how easy IT can be.](#)
- [DEMO Velocity: Create branded interactive live events & training.](#)
- [See how Royal Caribbean is unlocking intelligence w/ Windows Embedded.](#)
- [BlackBerry for business. Built to keep your business moving.](#)
- [IDC Report: Managing the I/O Explosion Without Extra Hardware](#)
- [Top Ten Myths About Recovering Deleted Files](#)
- [Online Master of Science in Information Systems at Northwestern University](#)
- [ITwhitepapers.com - Access thousands of white papers on 300+ technical topics.](#)
- [Leverage Your Cisco infrastructure for Superior Application Performance](#)
- [Learn about the AMD Virtual Experience](#)
- ["The Definitive Guide to Security Management" Chapter 1: Introduction to Security Management](#)

- [Base your business decisions on complete, accurate data-with SAP®.](#)
- [Finally, a tablet that thinks the way you work. Intel®-based tablets](#)
- [Improve your ROI by the power of three with HP Converged Storage.](#)
- [Splunk - Machine data goes in, business insight comes out. Learn more.](#)
- [Focus on business, not infrastructure with Vblock™ Systems from VCE](#)
- [Platform without Boundaries - Extend your Datacenter](#)
- [What's your Integration Strategy? View Gartner Predicts 2013: Application Integration.](#)
- [MIT Sloan: cutting-edge short courses for busy executives](#)
- [AirWatch - Leader in the Gartner Magic Quadrant Report for MDM. Download Now](#)
- [Connect to the Cloud faster with Comcast Business](#)
- [MIT Sloan: cutting-edge short courses for busy executives](#)
- [Imagine a future shaped by simplicity. See it at HP Discover 2013. Register Now.](#)
- [Join the Peer-Driven Community For All Things Mobility](#)
- [openBench Labs: How Diskeeper 12 Keeps the Latest Windows OS Running Like New](#)
- [Redefine Mobility Mgmt at Enterprise Mobile Hub](#)
- [Download Microsoft's latest Data Protection Management tool](#)
- [Not All QSAs Are Created Equal: What You Should Know Before You Buy](#)
- [The arrival of Serial Attached SCSI \(SAS\) marks a new era in storage scalability](#)
- [The AMD Virtual Experience Virtual Trade Show](#)
- ["The Definitive Guide to Security Management" Chapter 1: Introduction to Security Management](#)

Resource Center



Forms Processing SDK
Build structured forms processing and character recognition applications.



Phoenix NAP Public Cloud
Set up your account today and get \$50 in free usage; prices start at only \$0.025

Ads by **techwords** BETA
[See your link here](#)

[▲Skip to top](#)

[About Us](#) [Advertise](#) [Contacts](#) [Editorial Calendar](#) [Subscribe to Computerworld Magazine](#) [Help Desk](#)
[Newsletters](#) [Careers at IDG](#) [Privacy Policy](#) [Reprints](#) [Site Map](#) [Ad Choices](#) |

The IDG Network: [CFOworld](#) | [CIO](#) | [CITEworld](#) | [Computerworld](#) | [CSO](#) | [DEMO](#) | [IDC](#) | [IDG](#) | [IDG Connect](#) | [IDG Knowledge Hub](#) | [IDG TechNetwork](#) | [IDG Ventures](#) | [InfoWorld](#) | [ITwhitepapers](#) | [ITworld](#) | [JavaWorld](#) | [LinuxWorld](#) | [Macworld](#) | [Network World](#) | [PC World](#) | [TechHive](#) | [Technology Briefcase](#)

Copyright © 1994 - 2013 Computerworld Inc. All rights reserved. Reproduction in whole or in part in any form or medium without express written permission of Computerworld Inc. is prohibited. Computerworld and Computerworld.com and the respective logos are trademarks of International Data Group Inc.