Project N°: 610456

D7.7 Press release highlighting commercial exploitation

July 29, 2016

Abstract:

This deliverable describes the EUROSERVER Publicity actions that were organized in June 2016 (a Press Release and an Inauguration event) and their positive impact so far already, which had to do with the commercial exploitation of several of the project results, as well as the preparation by the consortium for the next project Press Release and the strategy that we currently follow for selecting the date when that will be released.

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The EUROSERVER Consortium consists of the following partners:

Participant no.	Participant organisation names	short name	Country
1	Commissariat à l'énergie atomique et aux énergies alternatives	CEA	France
2	STMicroelectronics Grenoble 2 SAS	STGNB 2 SAS	France
3	STMicroelectronics Crolles 2 SAS	STM CROLLES	France
4	STMicroelectronics S.A	STMICROELECTRONICS	France
5	ARM Limited	ARM	United Kingdom
6	Technische Universitaet Dresden	TUD	Germany
7	Barcelona Supercomputing Center	BSC	Spain
8	Foundation for Research and Technology Hellas	FORTH	Greece
9	Chalmers Tekniska Hoegskola AB	CHALMERS	Sweden
10	ONAPP Limited	ONAPP LiMITED	Gibraltar
11	NEAT	NEAT Srl	Italy

Revision history

Version	Author	Notes
	KALEAO Marketing Manager	KALEAO "KMAX" product announced on web (14 June 2016)
	KALEAO & FORTH PR Dept's	first Press Release (21 June 2016)
	KALEAO & FORTH PR Dept's	Inauguration Event Announcement (27 June 2016)
	KALEAO & FORTH PR Dept's	Inauguration Event (30 June 2016)
0.5	Manolis Katevenis	next Press Release Skeleton – pptx format (30 June)
0.6	Manolis Katevenis	synthesis of partner contributions (20 July)
	All	comments by partners (21 July)
0.7	Madeleine Gray	comments by PR expert (22 July)
0.9	Manolis Katevenis	semi-final form (28 July)
1.0	I. Dor, D. Dutoit	final review and Submission (29 July)

Contents

1. Overview of June Publicity Actions and Strategy for the next PR

Commercialization of research result is an important goal for a large portion of the partners of EU-funded RTD projects, usually pursued mostly after completion of the project. The EUROSERVER project has surpassed this goal, since it has led, directly or indirectly, to the creation of *two start-up* companies *already during the duration* of the project, where these companies are either based directly on EUROSERVER research results, or inspired by the main ideas of EUROSERVER and utilizing IP's and expertise that were created within EUROSERVER: *ZeroPoint* Technologies AB (Sweden), and *KALEAO* Ltd. (UK).

In *June 2016*, a number of independent events, all related to commercialization of EUROSERVER results, concurred with each other, thus creating a unique opportunity for publicity in this domain:

- KALEAO Ltd. reached a maturity point that allowed it to publicly announce its first product, "KMAX";
- A large part of KMAX has been designed in KALEAO's Development Center in the Science and Technology Park of Crete, next to EUROSERVER-partner FORTH; this Developemnt Center had been started a few months earlier, following the signature of a Memorandum of Cooperation between KALEAO and FORTH, where EUROSERVER research results were the catalyst in creating this cooperation;
- The EUROSERVER consortium had already planned its summer'16 face-to-face meeting in Crete (FORTH) on 29 and 30 June; and
- The first of a series of EUROSERVER Publicity Actions, focused on commercialzation, as reflected by this Deliverable D7.7, was due in that same month of June 2016.

It was obvious that all these events concurring in the same month of June called for our consortium to handle them all in combination, in one major publicity action thrust. Thus, EUROSERVER organized (or took advantage of) the following Publicity Actions in June 2016:

- KALEAO first publicly announced its first product, "*KMAX*", on *14 June*, through their web site;
- KALEAO and FORTH first publicly announced their on-going collaboration and its relation to EUROSERVER through a *Joint Press Release* (PR) on *21 June*; that same PR also announced the creation of KALEAO's Heraklion-Crete Developemnt Center, to be Inaugurated on 30 June – the agenda of and invitation to the Inauguration were issued on *27 June*;
- The EUROSERVER consortium face-to-face meeting was held on *29 and 30 June*, and the Inauguration event occurred on 30 June afternoon and evening, as part of this EUROSERVER meeting.
- The KALEAO-Crete Development Center was inaugurated on *30 June* by the *Governor of the Region of Crete*, Mr. Stavros Arnaoutakis, and by KALEAO's CSO, Prof. John Goodacre, and VP of Engineering, Mr. Paul Arts. The event included a Keynote Speech, an address by the Coordinator of EUROSERVER and by OnApp (besides FORTH and KALEAO), and a *Press Conference*.

All the above actions were of course linked to EUROSERVER; on the other hand, by their nature, they had a strong focus on KALEAO –one of the two EUROSERVER-related start-up's– and on FORTH –one of the many EUROSERVER partners.

The next step is obviously to organize publicity actions related to the entire EUROSERVER consortium, and to both EUROSERVER-related start-up companies. We have a number of such actions planned for the remaining months of the project, but of course we have to start with a next Press Released related to the entire project.

We started preparing this *next Press Release* during our face-to-face meeting of *30 June*, and then worked on it during July. We also discussed when to issue this next "global" PR. Our public relations expert advisor,

Ms. Madeleine Gray (BSC) advised us that we have to *not* issue it too close in time to our first publicity actions (of June), in order for it to have a greater impact: press releases, she explained, should ideally be linked to some specific event, each, and should be spaced apart, in time. We did have an event in June –the Inauguration– so for the next PR we should wait for another important, specific even, in Fall, e.g. a video about our project –and also avoid the summer vacation period.

For these reasons, although we did prepare the preliminary text of our next Press Release (see section 4), we have *not yet issued* this next PR –we will do so in the Fall. The next sections give more information about our above publicity actions, and the two appendices contain the full text of the first PR and of the Inauguration announcement/invitation/agenda.

2. The first Press Release (21 June) and its Impact

Our first Press Release, according to the above description, was issued on 21 June, jointly by KALEAO Ltd (Cambridge) and FORTH (Heraklion), and its full text appears in Appendix 1: First Press Release – 21 June 2016. It: "announced […] the creation of the KALEAO's Heraklion development centre that officially seals their [FORTH and KALEAO] on-going collaboration towards a joint research lab on low power computing and shows a clear indication of the growing international high-tech involvement in Crete, Greece. The centre [is going to be] (was) inaugurated on the 30th of June in Heraklion".

The key references to EUROSERVER in that PR are as follows:

> "FORTH started collaborating with the founders of KALEAO in *EuroServer*, a research project part of the European Union's FP7 programme. *EuroServer* focuses on the innovation and implementation of new computer system solutions to enable the power efficient delivery and scalability of computing for the server market.
>
> One of the goals of *EuroServer* is to research and innovate key components towards ARM-based micro-servers. FORTH, as a partner of the project, designed various hardware prototypes of key importance for the project, including significant operating system software components. These systems leverage ARM based processors to obtain very high energy efficiency, in line with the growing requirement of low power IT infrastructure coming from the industry."

The key reference to KALEAO's recently announced first product was as follows:

> "Last week, KALEAO unveiled *KMAX*, their new commercial product, offering a true converged rack mountable hardware platform and software computing appliance. The low-power ARM-based *KMAX* is capable of offering 192 eight-core servers with 48 solid-state disk (SSD) slots within just 3U height of rack space."

The primary release of this PR was made through the News pages of the web sites of KALEAO and FORTH:

- http://www.kaleao.com/about/news
- http://www.forth.gr/index_main.php?l=e&c=28&i=933

This was subsequently picked up by a number of international News sites:

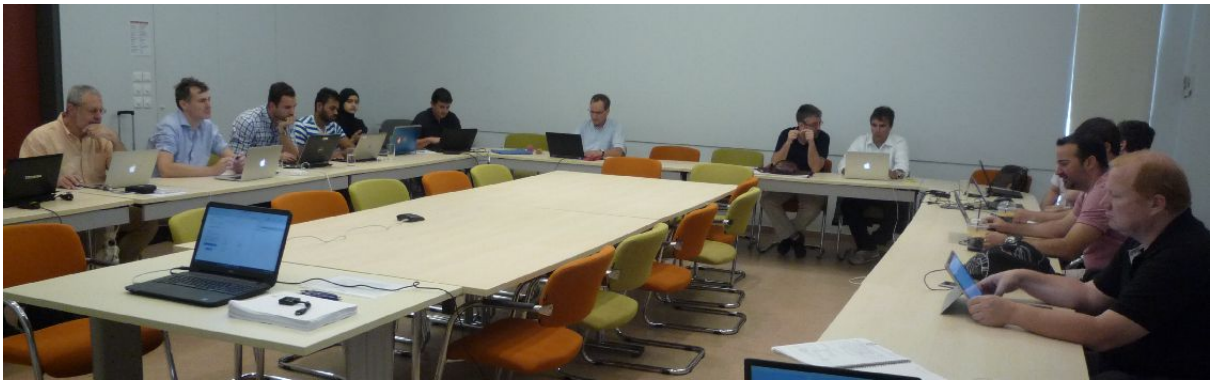
- **HPC Wire**: https://www.hpcwire.com/off-the-wire/kaleao-forth-announce-creation-new-development-centre/
- **HiPEAC**: https://www.hipeac.net/press/6786/crete-becomes-the-silicon-island-of-high-technology-research-and-development/
- **PR*URGENT**: http://www.prurgent.com/2016-06-21/pressrelease410608.htm
- **Data Centres News**: http://www.datacentres.com/dc-news/crete-becomes-silicon-island-high-technology

as well as by a number of Greece-wide and Cretan Newspapers and sites:

- **ETHNOS** (country-wide Newspaper): http://www.ethnos.gr/koinonia/arthro/silicon_island_kentro_anaptyksis_imiagogon_sto_texnologiko_parko_kritis-64395649/
- **The Editors' Newspaper** (Εφημερίδα Συνατκτών - country-wide Newspaper): https://www.efsyn.gr/arthro/prohorimena-systimata-pliroforikis
- **NewsLog**: http://www.newslog.gr/art/3324062/ftiaxnoun-silicon-valley-stin-kriti
- **Greek News Agenda**: http://www.greeknewsagenda.gr/index.php/topics/business-r-d/6101-crete-becomes-the-silicon-island-of-high-technology-r-d
- **Insider.gr**: http://www.insider.gr/eidiseis/ellada/15745/i-kriti-prootheitai-os-neo-silicon-island
- **iGuru**: https://iguru.gr/2016/06/21/59479/crete-silicon-island/
- **Enikonomia**: http://www.enikonomia.gr/timeliness/105780,dimiourgia-neou-kentrou-anaptyxis-sto-technologiko-parko-kritis.html
- **Lykavitos**: http://www.lykavitos.gr/archives/414728
- **Dikaiologitika.gr**: http://www.dikaiologitika.gr/eidhseis/oikonomia/112035/i-kriti-ginetai-to-silicon-island-tis-erevnas-ypsilis-texnologias
- **CretaLive**: http://www.cretalive.gr/science/h-krhth-ginetai-to-silicon-island-ths-ereynas-kai-anaptykshs-ypshlhs-technologias
- **Crete News**: http://www.crete-news.gr/σε-"silicon-island"-της-ανάπτυξης-υψηλής-τεχνολογίας-μετατρέπεται-η-κρήτη
- **Agonas Kritis**: http://agonaskritis.gr/σε-silicon-island-της-ανάπτυξης-υψηλής-τεχνολο/

3. The Inauguration Event (30 June) and cumulative Impact

The Inauguration of the KALEAO-Crete Development Center was held on Thursday 30 June 2016, as summarized in section 1 above, in conjunction with the EUROSERVER face-to-face meeting (photo).



The Agenda of the event, and the open Invitation to the public was published on 27 June on the Events web site of FORTH: http://www.forth.gr/index_main.php?l=e&c=18&i=936 and its full text is given in Appendix 2: Announcement (27 June) – Invitation to the Inauguration Event. This announcement included the following key references to EUROSERVER and to the KALEAO technology:

> Professor John Goodacre, co-founder and Chief Scientific Officer of KALEAO, added: "KALEAO has just unveiled KMAX, our revolutionary product, which leverages, among others, some very useful research results from FORTH and from the *EuroServer* project of the European FP7 programme. KMAX, KALEAO's flagship solution, offers unprecedented compute density, providing, among others, up to 1 Terabit/second network into 192 eight-core ARM-based server sockets with 48 solid-state disk (SSD) slots (176 TeraBytes), all within just 3U height of rack space, with a hardware accelerated web-scale, software-defined application framework […]"
>
> Professor Manolis Katevenis, Head of the Computer Architecture and VLSI Systems (CARV) Laboratory, in ICS, FORTH, commented: "We are very happy that our three decades of research and the multiple hardware and systems software prototypes that we have built in CARV, within tens of European-funded projects including, recently, *EuroServer*, have led to a number of commercialization opportunities, for the benefit of Greece and Europe, with this one by KALEAO being the most recent. […]"

The event started with a Keynote Speech by Christos Kozyrakis, Professor of Computer Science and Engineering at EPFL, Switzerland, and Stanford University, California USA (photo, right); Christos is also an alumnus of the University of Crete, and a native of Heraklion. The talk was highly related to EUROSERVER and KALEAO: it was entitled "The Picosecond is Dead; Long Live the Picojoule", and it described the challenges and opportunities in designing high performance, yet energy efficient systems.

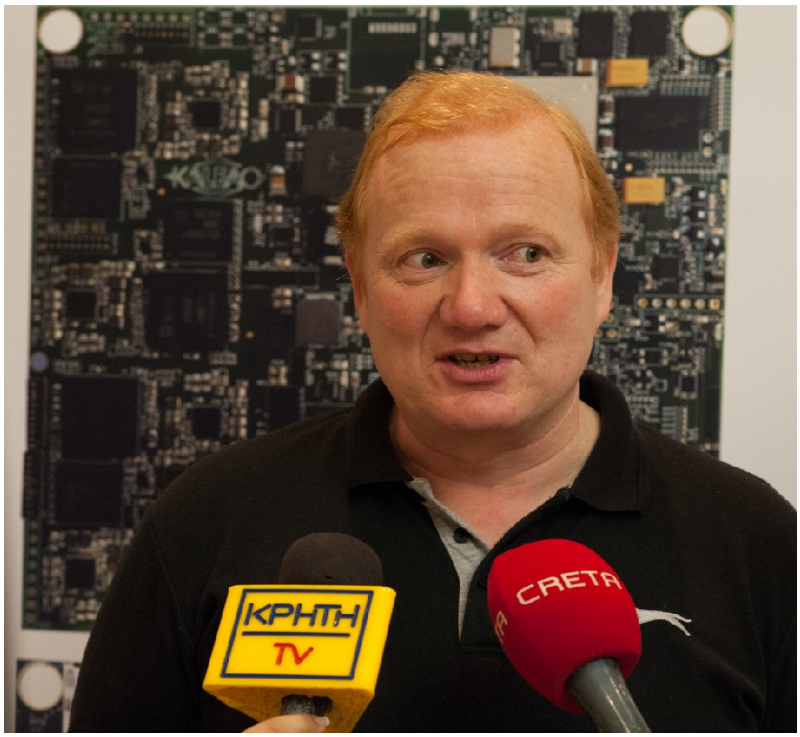
The talk and the event were highly attended, by about 120 people, many of whom were young students that got very motivated by the overall event and its messages – see the photo below, and the impact assesment later in this section.

Following the keynote, a number of people addressed the audience and stressed the importance of what KALEAO and EUROSERVER are doing, as well as of the technological advancement that these bring to Greece and to the Region of Crete. The first speakers were: the Governor of the Region of Crete; the Vice-Mayor of Heraklion; the Director of the Science & Technology Park of Crete; the President of FORTH; and the Director of the Institue of Computer Science.

Next, the Coordinator of EUROSERVER, Ms. Isabelle Dor, spoke about the important innovative technologies that the project is developing (first photo on the right).

After that, Dr. Julian Chesterfield, Director of Emerging Technologies at OnApp Ltd., spoke about the R&D of OnApp within EUROSERVER, as well as about the collaboration between OnApp and KALEAO, and the fact that OnApp, based in Cambridge like KALEAO, also has a development team of its in Heraklion, again like KALEAO (second photo on the right).

The other three talks were by Prof. Manolis Katevenis, Head of the Computer Architecture & VLSI Systems Lab at FORTH; Dr. Iakovos Mavroidis, Head of the KALEAO-Crete Development Centre; and Prof. John Goodacre, Co-Founder and Chief Scientific Officer (CSO) of KALEAO Ltd. (UK).



During an intermission between the talks, a Press Conference was given. Among others, John Goodacre spoke to two TV channels, as seen in the third photo, on the left; John was standing in front of a large poster that displayed a photograph of the processor board of KMAX, KALEAO's first product.

After the talks, all attendees moved to the nearby buildings in the campus, where the Science & Technology Park of Crete is located. There, Mr. Stavros Arnaoutakis, Governor of the Region of Crete, cut the ribbon thus inaugurating the KALEAO-Crete Development Centre. Stavros Arnaoutakis is seen in the photograph on the right at the moment of the inauguration, in front of John Goodacre, Constantine Stephanidis (Director of the Institute of Computer Science of FORTH), Manolis Katevenis, and Paul Arts (VP of Engineering of KALEAO – barely seen behind the door of the Development Centre).

➔ *Impact*

The inauguration event was presented in a number of news channels, newspapers, and news sites:

- **ERT** (*Greek National Public Radio & TV*): http://www.ert.gr/kriti-technologiki-kenotoma-protoporia-tou-ite-anigi-diethnos-gefyres-synergasias/
- **ETHNOS** (Greek country-wide Newspaper): http://www.ethnos.gr/koinonia/arthro/sxediasan_epanastatiki_plaketa_gia_paneksypnous_ypologistes_neas_genias-64400632/
- **PC Magazine**: http://gr.pcmag.com/idruma-tekhnologias-ereunas/21250/news/egkainia-tou-kentrou-anaptuxes-tes-kaleao-sto-ite
- **Crete Plus**: http://www.creteplus.gr/news/to-ite-sunexizei-na-prosferei-stin-epistimi-kai-tin-texnologia---egkainiastike-to-kentro-anaptuksis-tis-kaleao-174657.html
- **CretaLive**: http://www.cretalive.gr/crete/egkainia-toy-kentroy-anaptykshs-ths-kaleao-sthn-krhth
- **PATRIS** Newspaper: http://www.patris.gr/articles/300720#.V5puEunqEhe
- **Iraklio Blog**: http://iraklioblog.blogspot.gr/2016/06/blog-post_263.html
- **Hania News**: http://hania.news/2016/06/30/τεχνολογικό-κέντρο-ανάπτυξης-από-ιτε/
- **Apopsi Live**: http://apopsilive.gr/kriti/egkainia-sto-neo-kentro-anaptuxis-ypshlis-technologias-tou-ite
- **Hxo News**: http://www.hxonews.gr/details.php?id=20287
- **Anatoli** (sunrise): http://www.anatolh.com/2016/06/30/εγκαίνια-του-νέου-κέντρου-ανάπτυξης-τη/
- **Eparxies**: http://eparxies.gr/εγκαίνια-του-νέου-κέντρου-ανάπτυξης-τ/
- **Ioannina24**: http://www.ioannina24.gr/texnologia/eidiseografia/texnologia/egkainia-tou-kentrou-anaptiksis-tis-kaleao-sto-ite

More importantly, though, the indirect impact of this publicity is seen from the following facts and numbers:

- A number of companies learnt about the KALEAO-Crete Development Center, and expressed their interest in collaborating with KALEAO; most important between them is *PRISMA Electronics S.A.*, with whom promising discussions are under progress.
- The CARV Laboratory, which is FORTH's Lab in EUROSERVER and link with KALEAO, received, in early July, a record number of *young students* who all wanted to work on EUROSERVER & KALEAO related topics, learn more, and then work in this area: while this Lab received such expressions of interest by about 3 to 5 new students per year in previous years, this July it received about **4 to 5 times more** interested people: around *15 to 20 new students* came to the Lab, and are currently learning UNIMEM, FPGA firmware, and systems software. We also received a number of job applications by new engineers.

4. The next Press Release (preliminary)

Our next Press Release will be project-wide, as explained in the latter part of section 1. We started preparing this during our face-to-face meeting in Crete (30 June), and we completed its preliminary version in July. As explained in that section, our strategy is to issue this after the summer vacation period, and preferably in conjunction with some specific event – perhaps a project video. The preliminary text of this next PR is as follows:

More computations for less energy –the European way

New ARM-based technology will lead to 50% or more energy savings for data centers

(The EUROSERVER project paves the way to energy-efficient computers and big data for the information society of tomorrow)

Grenoble, XXX October 2016 –

Based on chiplets mounted in multi-chip modules, the EUROSERVER project is creating energy-efficient micro-servers with the potential to reduce energy consumption in data centres at least two-fold, resulting in substantial cost savings. Architectural and runtime software innovations on 64-bit ARM cores will manage shared peripheral devices, compress data for memory, and reduce communication overhead; they are being demonstrated in datacenter and telecommunication applications.

Two start-ups have already been launched on the basis of the technology created: *KALEAO*, based in the UK, which introduces a unique new-generation scale-out hyper converged server platform featuring low consumption and extreme core density, and *ZeroPoint* in Sweden, which commercialises the memory compression innovations.

[1] Data centres account for a huge amount of energy consumption; if data centres in the USA alone were a country, their energy consumption would be 12th in the world. EUROSERVER's innovation is to take low-power ARM processors, designed in Europe and used for smartphones as well as other mobile computing applications, and use these to design a new type of server.

[2] The evolution is comparable to the transition from mainframe computers to mass-produced personal computers in the 1980s, which in turn resulted in modern servers. With smartphones being the

[1] This paragraph originates from the condensation of the following two-paragraph original text:
How much electricity does your "Information Society" consume? A lot, as it turns out, and we have to reduce it! EuroServer is the main research project that the European Union funds since 2013 to pave the way towards lower energy consumption in the datacenters. The secret is to start from a simple observation: mobile phones have been made very energy-efficient. But the rest is not at all obvious: how can you build huge datacenters from tiny mobile-phone processors?
The smarts of information society resides in Datacenters that contain tens of thousands of server computers: your social networks, the web pages and your searches in them, the on-line services, and many more, all run in large, central datacenters. Unfortunately, if the datacenters of USA alone were a country, that country would be listed 12th in the world in electricity consumption, somewhere between Spain and Italy, and that has now become too expensive and too unfriendly for the environment, so we have to do something about this problem!

[2] This paragraph originates from the condensation of the following two-paragraph original text:

contemporary equivalent of 1980s PCs, now is the time to use them to create the energy-efficient micro-servers of the future.

Isabelle Dor, Research Engineer at CEA and EUROSERVER Coordinator, said: `EUROSERVER is delivering vital energy savings for data centres, and CEA/LETI is proud to coordinate this important EU-funded project. The System-on-Chip architectures and advanced packaging solutions being developed bring us one step closer to scalability and power efficiency in datacenters. We are also delighted that two start-ups have been created to leverage innovations from the project'.

[*ARM - <under PR Dept. review>: RAS for servers, arch for the IoT, including datacenters*]

[*ST - <under PR Dept. review>: excited about prospects of & worked on: ARM processors and advanced packaging technologies*]

Simone Cabasino, President in *NEAT*, noted: `We are happy to design, develop and bring-up the board and the system for the project, and we are also proud to be a technology partner of the KALEAO start-up'.

Julian Chesterfield, Director of the Emerging Technology Group at *OnApp* Ltd. reports: `The EuroServer design highlights the trend for power efficient and high density computing environments entering the datacenter. As a Cloud infrastructure provider, our customers will benefit from the improvements in the virtualisation platform, being able to handle more end-users while at the same time benefiting from lower electricity costs'.

Giampietro Tecchiolli, CEO of KALEAO Ltd., stated: `We started up KALEAO in order to revolutionize the server market by enabling true convergence at web scale with our products. EUROSERVER has been a source of inspiration, expertise, and technology contributions: following its paradigm, we use ARM cores in order to economize in energy and achieve unprecedented compute density'.

Per Stenstrom, Professor at *Chalmers* University of Technology, Sweden, said: `This project gave us the opportunity to develop novel memory optimizations, including memory compression and hybrid memory management technologies, for servers and high-performance platforms'.

Then, as founder and CTO of *ZeroPoint* Technologies AB, Per Stenstrom added: `Our results at Chalmers in EuroServer are so promising, that we created this spin-off company with the mission to commercialize these memory compression technologies; we are very happy with the interest that we have already seen among several potential customers'.

Manolis Katevenis, Head of the Computer Architecture Lab at *FORTH/ICS*, said: `The new UNIMEM architecture, to which we made key contributions, allows communicated data to reach directly into receiver memory, thus reducing overhead. We are glad to have built prototypes and systems software for

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Fortunately, not all computer processors are created equal: it turns out that if you give up a little bit in performance, you can gain a lot in energy consumption! Smartphones have had to accept this, or else their battery would go flat in a matter of minutes and your ear would boil. ARM processors, designed in Europe, have excelled in these demanding circumstances, and today they dominate in the smartphone market.
Can we use these ARM processors in datacenters too? It looks like we should, especially if we realize the analogy: in the 80's, the mass production of the personal computer (PC), its low cost, its maturity, and its reliability allowed this consumer device to displace the old "mainframe" computers and to evolve into the modern "server" computer out of which current datacenters are built. Well, today, smart mobiles are the contemporary equivalent of the PC of the eighties, so it is now time for them to give birth to the energy-efficient micro-servers of the future.

UNIMEM, and to have supported KALEAO through their Development Center in the Science and Technology Park of Crete'.

Emil Matus, Senior Researcher at *TUD*, Dresden University of Technology, noted: `TUD aims to achieve spectral efficiency, low latency, low power consumption, and ultra-fast mobile networks in 5G, by using the technological advantages of EUROSERVER in network hardware and software, computer chips, and spectrum and cloud computing'.

Paul Carpenter, Senior Researcher at *BSC*, the Barcelona Supercomputing Center, added: `BSC is advancing the state of the art in energy-efficient systems and runtime software to support memory capacity sharing, energy-efficient scheduling of tasks and workloads, and energy-aware virtual machine placement in cloud infrastructure'.

About EUROSERVER: this project is funded by the European Union under FP7 Grant Agreement 610456; for more information, visit www.euroserver-project.eu or contact Ms. Isabelle Dor – isabelle.dor at cea dot fr

Appendix 1: First Press Release – 21 June 2016

Crete becomes the Silicon-Island of high technology research and development

The technology excellence of FORTH grows as a key European research centre and attracts a growing hub of high-tech corporate development

Heraklion, Cambridge, 21 June 2016

FORTH – Foundation for Research and Technology - Hellas, in Heraklion, Greece and KALEAO Ltd. – High Tech company based in Cambridge, UK – announced today the creation of the KALEAO's Heraklion development centre that officially seals their on-going collaboration towards a joint research lab on low power computing and shows a clear indication of the growing international high-tech involvement in Crete, Greece. The centre is going to be inaugurated on the 30th of June in Heraklion.

FORTH is one of the largest research centers in Greece with modern facilities, highly qualified personnel, and a reputation as a top-level research foundation worldwide.

KALEAO designs and manufactures advanced computer systems and delivers solutions based on its innovative approach to web-scale computing.

Commenting on these new developments, Manolis Katevenis, Head of the CARV Laboratory and Deputy Director of the Institute of Computer Science (ICS) of FORTH, said: "We are proud of the 33-year history of FORTH and ICS, as well as of the CARV Laboratory and the numerous hardware and software prototypes that we have built here. We are very happy with our collaboration with KALEAO, a really innovative company on the leading edge of modern high technology, and we look forward to jointly making many more innovations. I feel that we now have an R&D environment in Crete which is at the forefront of worldwide high technology, and I invite all interested computer scientists and engineers in hardware design and in systems software to contact us, with the prospect of becoming part of this growing environment."

To the declaration of FORTH, Professor John Goodacre, co-founder and CSO of KALEAO, added: "We are very happy with our development centre in Crete and with our collaboration with FORTH, since these yielded the design of key components of our flagship solution KMAX. With the increasing research agenda of the CARV Laboratory at FORTH and the new KALEAO development centre in the Science and Technology Park of Crete (STEP-C), we expect to see an increasing collaboration between FORTH and industry, collaboration that creates new exciting academic and job opportunities in silicon high-technology in this beautiful Greek island – The new ``Silicon-Island''.

FORTH started collaborating with the founders of KALEAO in *EuroServer, a* research project part of the European Union's FP7 programme. *EuroServer* focuses on the innovation and implementation of new computer system solutions to enable the power efficient delivery and scalability of computing for the server market.

One of the goals of *EuroServer* is to research and innovate key components towards ARM-based micro-servers. FORTH, as a partner of the project, designed various hardware prototypes of key importance for the project, including significant operating system software components. These systems leverage ARM based processors to obtain very high energy efficiency, in line with the growing requirement of low power IT infrastructure coming from the industry.

"The largest problem with data centres, today, is their growing consumption of electricity" – added Professor Manolis Katevenis – "It is estimated that if the data centres of USA alone were a country, that country would be listed 12th in the world in electricity consumption, somewhere between Italy and Spain".

To reduce their energy consumption, data centres must build their servers using new platform approaches and more energy-efficient components. KALEAO leverages ARM based technologies in a platform capable of delivering unprecedented computing capabilities to the data centre and IT infrastructure in terms of energy efficiency, density, agility, and IT simplification.

Last week, KALEAO unveiled KMAX, their new commercial product, offering a true converged rack mountable hardware platform and software computing appliance. The low-power ARM-based KMAX is capable of offering 192 eight-core servers with 48 solid-state disk (SSD) slots within just 3U height of rack space.

"Today's data centres are made of hundreds to tens of thousands of server computers and form the back-bone of Information and Communication Technology" – commented Professor John Goodacre – "The KALEAO KMAX solution provides a true converged platform with appliance-level simplicity, to reduce the total cost of ownership while delivering a rich catalogue of services, including content on the web, databases, social networks, telephony, on-line transactions, and smart storage".

FORTH is a founding partner of *HiPEAC*, the European Network on High Performance and Embedded Architecture and Compilation, which coordinates European research in these areas; KALEAO is also a member of that same network. FORTH's technological innovation continues through participation in a group of three European Horizon2020-funded projects that further develop this technology approach, *ExaNeSt*, *ExaNoDe*, and *ECOSCALE*.

For more information:

- www.kaleao.com
- www.ics.forth.gr

Appendix 2: Announcement (27 June) – Invitation to the Inauguration Event

KALEAO-Crete Development Centre

Science and Technology Park of Crete (STEP-C), Vassilika Vouton, Heraklion

I N A U G U R A T I O N

Thursday, 30 June 2016

Invitation

KALEAO Ltd., a high-tech start-up company based in Cambridge, UK, and the Institute of Computer Science (ICS) of *FORTH*, the Foundation for Research & Technology – Hellas in Heraklion Crete, Greece, in cooperation with *STEP-C*, the Science & Technology Park of Crete, invite you to the **Inauguration** of the *KALEAO-Crete Development Centre*, to be held on *Thursday 30 June* 2016, starting at 16:00, in FORTH's Amphitheatre.

Dr. Giampietro Tecchiolli, co-founder and Chief Executive Officer of KALEAO, on the occasion of this Inauguration, offered the following statement: "KALEAO is a highly innovative company that aims to revolutionize the server market by enabling true convergence at web scale in its products. Kaleao is a European company with a global presence, that leverages European technology, with main operations across several European countries and its marketing arm in the USA. We are particularly proud of our Crete Development Centre in STEP-C, and of our collaboration with ICS-FORTH, which produced key components

of our KMAX product, while at the same time we work towards creating a joint Research and Development Lab with ICS-FORTH, in Crete".

Professor Constantine Stephanidis, Director of ICS-FORTH, stated: "ICS-FORTH is a research institute internationally recognized for its excellence in the Information and Communications Technologies (ICT) sector. At ICS-FORTH, we strongly believe that one of the key factors for the future growth of the Greek economy is innovation in the high technology sectors and we have been working diligently for more than three decades for the advancement of science and technology in the ICT field, placing equal emphasis in basic and applied research, and aiming to bring the research results into the real economy of Greece - and Europe. FORTH plays a central role in the science and technology ecosystem of Crete. The island is the home of several academic and research institutions of the highest international standing, and is the host of high-tech developments that are based on three pillars: outstanding academic performance, capacity for excellent research, and propensity for industrial innovation. ICS-FORTH has always been working within the boundaries of this triangle, and I am personally very proud, as its Director, for the outcome of our unwithering contributions and active support in establishing, at international level, licensing agreements with industry, the transfer to industry of the intellectual property rights - thus monetizing research results, and the startup of a number of high tech companies that have their research and engineering basis operating in Crete – with this latest and most prominent addition of KALEAO. Our systematic approach in this direction has created several visible positive effects on the local Research and Technological Development ecosystem and is also contributing towards preventing, and ultimately reversing, the 'brain drain' trend in our field".

Professor John Goodacre, co-founder and Chief Scientific Officer of KALEAO, added: "KALEAO has just unveiled KMAX, our revolutionary product, which leverages, among others, some very useful research results from FORTH and from the EuroServer project of the European FP7 programme. KMAX, KALEAO's flagship solution, offers unprecedented compute density, providing, among others, up to 1 Terabit/second network into 192 eight-core ARM-based server sockets with 48 solid-state disk (SSD) slots (176 TeraBytes), all within just 3U height of rack space, with a hardware accelerated web-scale, software-defined application framework – see www.kaleao.com. We will keep innovating and offering revolutionary new products, and in order to be able to do that we invite interested and talented young scientists and engineers to come and join KALEAO, here in Crete in particular".

Professor Manolis Katevenis, Head of the Computer Architecture and VLSI Systems (CARV) Laboratory, in ICS, FORTH, commented: "We are very happy that our three decades of research and the multiple hardware and systems software prototypes that we have built in CARV, within tens of European-funded projects including, recently, EuroServer, have led to a number of commercialization opportunities, for the benefit of Greece and Europe, with this one by KALEAO being the most recent. Thanks to the environment of meritocracy and smooth productiveness that FORTH and the Institute of Computer Science have created, our CARV Laboratory was able to more than triple in size within the last decade, thus achieving the scale that is a prerequisite for being able to attract international-level industrial growth. We keep inviting interested and talented young students and researchers to come and join CARV, ICS, and FORTH".

The agenda of the Inauguration will be as follows:

Agenda – *KALEAO-Crete Development Centre Inauguration* – Thu. 30 June 2016

FORTH AMPHITHEATRE		
16:00 – 17:00	**KEYNOTE SPEECH:** *The Picosecond is Dead; Long Live the Picojoule* **Prof. Christoforos Kozyrakis,** EPFL and Stanford University	
17:00 – 17:40	**PRESS CONFERENCE**	**WELCOME -** *Coffee*
17:40 – 17:45	**Prof. Costas Fotakis,** Alternate Minister of Research and Innovation	
17:45 – 17:50	**Mr. Stavros Arnaoutakis,** Regional Governor of Crete	
17:50 – 17:55	**Mr. Vassilis Lambrinos,** Mayor of Heraklion	
17:55 – 18:00	**Prof. Constantine Stephanidis,** Director, Institute of Computer Science, FORTH	
18:00 – 18:05	**Dr. Artemis Saitakis,** Director, Science & Technology Park of Crete	
18:05 – 18:10	**Ms. Isabelle Dor,** Coordinator, EuroServer Project	
18:10 – 18:20	**Dr. Julian Chesterfield,** Director of Emerging Technologies, OnApp Ltd.	
18:20 – 18:25	**Prof. Manolis Katevenis,** Head, Computer Architecture & VLSI Systems Lab, FORTH-ICS	
18:25 – 18:30	**Dr. Iakovos Mavroidis,** Head, KALEAO-Crete Development Centre	
18:30 – 18:40	**Prof. John Goodacre,** Co-Founder and Chief Scientific Officer, KALEAO Ltd. (UK)	
STEP-C, Building B		
19:00	**Inauguration of the KALEAO-Crete Development Centre,** Mr. Paul Arts, VP of Engineering, KALEAO Ltd. (Padova, IT)	
STEP-C, Patio in front of Building B		
19:20 – 21:00	**Cocktail Party, light Live Music**	

Keynote Speech:

The Picosecond is Dead; Long Live the Picojoule

Christos Kozyrakis, EPFL & Stanford University

Abstract:

For decades, CMOS technology provided exponential improvements in transistor density and energy consumption, allowing hardware architects to focus on removing picoseconds from processor clock cycles

and adding megabytes to on-chip caches. Unfortunately, we are now in a phase where transistor cost and energy consumption are barely scaling. Consequently, the new name of the game is accounting for and optimizing every picojoule the hardware consumes. This talk will describe the challenges and opportunities in designing high performance, yet energy efficient systems. Specifically, we will discuss hardware and software specialization and raising utilization in datacenter systems. While these approaches represent a non-trivial departure from the way we design and use systems today, combined they can provide improvements equivalent to a few decades of Moore's law scaling.

Speaker Biography:

Christos is a professor of Computer and Communication Sciences at EPFL (Switzerland) and an associate professor of Computer Science and Electrical Engineering at Stanford University (USA). His research currently focuses on hardware and software techniques for resource efficient cloud computing. He is a member of the Pervasive Parallelism and Platform Labs at Stanford, two multi-faculty effort aiming improving the practicality and efficiency of multi-core and datacenter computing respectively. Christos holds a PhD degree from the University of California at Berkeley (USA) and a BS degree from the University of Crete (Greece). He is an IEEE fellow, a senior member of the ACM, and the recipient of distinctions such as the ACM Maurice Wilkes award and the NSF Career award.