

MEDIA RELEASE

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NICTA DEVELOPS SECURE EMBEDDED OPERATING SYSTEMS TECHNOLOGY

National ICT Australia (NICTA), Australia's national centre for research in information and communications technology (ICT), has developed an advanced open source operating system (OS) that will increase the security, reliability, and trustworthiness of embedded systems.

Embedded systems are special-purpose computer systems that are completely encapsulated by the device they control. They have specific requirements and perform pre-defined tasks and are used in devices such as mobile phones, televisions, cars, toys, smart cards, network switching equipment, and sensors.

“Our L4/Iguana operating system has the potential to revolutionise the use of embedded systems around the world,” said Professor Gernot Heiser, Program Leader of NICTA's Embedded, Real-Time, and Operating Systems Program (ERTOS). “It is currently being evaluated for deployment by a number of small-to-medium-sized enterprises in Australia and multinational corporations.”

The first NICTA-developed technology to be commercially deployed, L4/Iguana will solve problems caused by growing software complexity, network connectivity, and mobile code.

“L4/Iguana is a small operating system developed specifically for safe and secure embedded systems. It minimises the amount of software that must be trusted to protect sensitive data or valuable intellectual property, and provides strong isolation between different software components on an embedded system. It also provides protection from misbehaving or malicious untrusted components,” said Professor Heiser.

L4/Iguana is part of a general embedded OS framework developed by NICTA's ERTOS Research Program located at the Kensington Neville Roach Research Laboratory in Sydney, Australia. “We are focusing on using microkernel technology to support the application of software engineering techniques and formal methods to embedded software,” said Professor Heiser.

The software is based on previous work conducted on the L4 microkernel by NICTA in partnership with the University of Karlsruhe in Germany and the University of New South Wales in Sydney, Australia.

The unique framework of the ERTOS embedded OS uses hardware protection mechanisms to encapsulate complex software into protected components, shielding the rest of the system from failures. This minimises the amount of code that can circumvent security measures; protects critical real-time components from non-real-time and legacy components; and protects device manufacturer's IP rights.



L4/Iguana supports a number of processor architectures that are important in the embedded space, including ARM, x86, and MIPS. On ARM it will be the fastest operating system with memory protection, and the first that provides a virtual-machine environment for running Linux.

About NICTA

National ICT Australia (NICTA) is a national laboratory with a charter to build Australia's pre-eminent Centre of Excellence for information and communications technology (ICT). NICTA is building capabilities in ICT research, research training, and commercialisation in the ICT sector for the generation of national benefit.

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For further information contact:

Marijana Okanovic

Communications Coordinator

National ICT Australia

Ph: +61 2 8374 5489 or + 61 2 437 398 228

marijana.okanovic@nicta.com.au

<http://ertos.nicta.com.au>