

# The Micro-Kernel

*Portable and Scalable Natural Language  
Analysis*

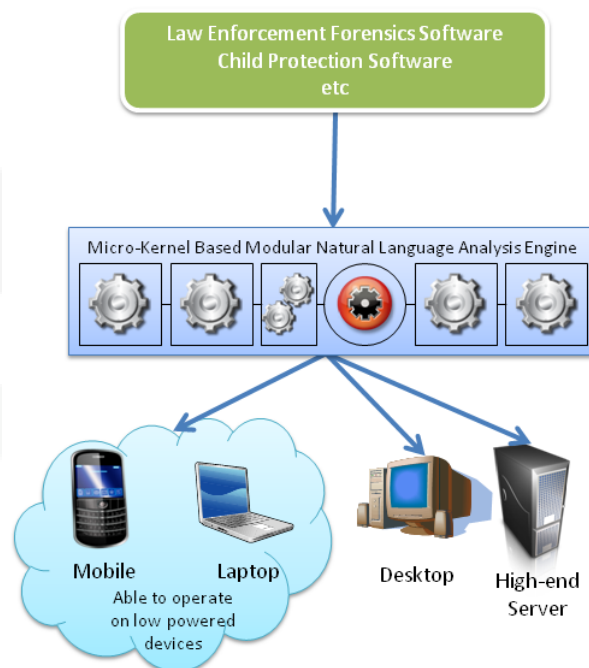


## The Challenge

Natural Language Analysis (NLA) technologies have been continuously developed over the past 40 years and successfully applied to a number of domains (for example, search engines, automatic translators, text mining, etc). At their core are a set of sophisticated statistical and rule-based analysis methods that allow for trends in language use to be identified, for example, the keywords that appear within a given text, how sentences are structured or how a certain individual uses language. However, these techniques have typically resulted in heavyweight and resource intensive implementations that require high-powered servers in order to operate effectively. The rise of mobile computing, and in particular mobile social networking, represents a new domain in which NLA technologies can be applied (for example, helping to analyse communication to identify potential threats), however this requires lightweight NLA implementations.

## The Solution

Isis Forensics has developed a Natural Language Analysis Micro-Kernel that is lightweight and flexible enough to be used across a spectrum of devices (from servers to mobile phones), whilst still providing a sophisticated analysis toolkit that possesses high levels of accuracy.



Reflecting the micro-kernel approach used widely in operating systems, Isis Forensics' NLA Micro-Kernel is built around core functionality on which more complex capabilities are layered. The advantage of this approach is that it allows different solutions to be configured according to the particular needs and constraints of a given application setting. For example, a solution for law enforcement agencies may involve deployment of the full spectrum of natural language analysis capabilities for use on their servers. Alternatively, a solution for use on a teenager's mobile phone will involve a subset of capabilities so that it will run efficiently on the device in question.

An additional key benefit is that the modular design of the software makes it much more adaptable to the needs of new situations, whether these be new devices with different facilities to allow children to interact online, or the need for new types of analysis to address new identified risks or new types of cybercrime (for instance, for tackling terrorist activities online).

Isis Forensics' Micro-Kernel has been developed in parallel with our standard NLA solutions<sup>1</sup>. As a result all our existing text analysis solutions are fully compatible with the Micro-Kernel.

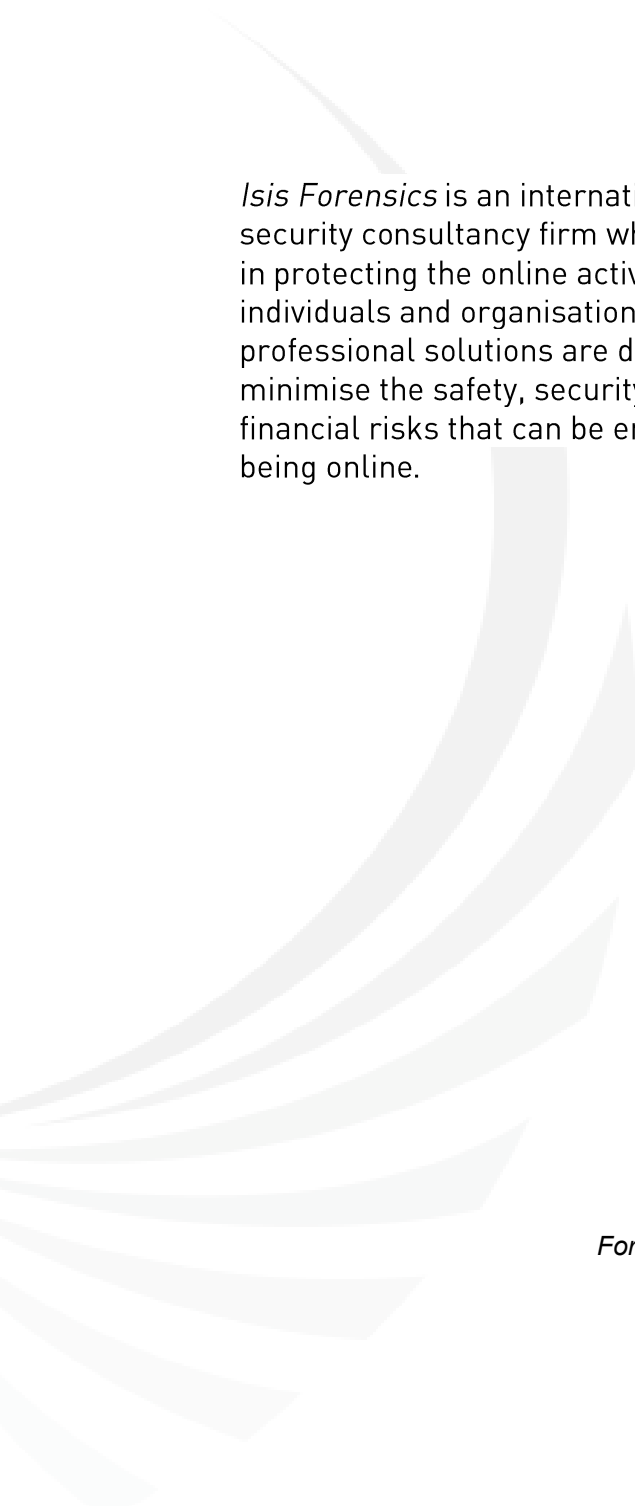
## The Benefits

Isis Forensics' Natural Language Analysis Micro-Kernel provides a flexible and configurable state-of-the-art platform for performing language analysis activities across all types of device. The Micro-Kernel provides a number of key benefits:

- **Lightweight** – unlike normal NLA implementations, the core of the Micro-Kernel has been specifically designed to run on mobile and resource constrained devices.
- **Configurable** – its modular nature means that the Micro-Kernel can be easily configured to meet the needs and constraints of a given application environment, whilst also allowing it to work on and with future technology and analysis methods.
- **Powerful** – although the Micro-Kernel possesses the benefits of flexibility, it does so without compromising on functionality. All standard NLA functionality is supported by the Micro-Kernel, but has been optimised so it can be effectively used in different operating environments.

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<sup>1</sup> As described within the 'Natural Language Analysis Toolkit' White Paper available from [www.isis-forensics.com](http://www.isis-forensics.com)



*Isis Forensics* is an international online security consultancy firm which specialises in protecting the online activities of individuals and organisations. Isis Forensics professional solutions are designed to minimise the safety, security, legal, and financial risks that can be encountered from being online.

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