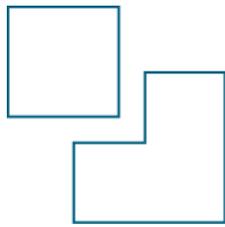


White Paper



# Government-Wide Cyber Security

Leveraging Network Intelligence Technology

April 2009

Enabling True Network Intelligence Everywhere

## Executive Summary

**Governments and multi-government organizations can better support IT network security across applications and government functions with a common technology platform leveraging Network Intelligence building blocks.**

IT security continues to be the greatest challenge facing government CIOs worldwide. Most experts agree that governments require stronger partnerships between the public and private sectors for both better protection of government IT systems from intruders and for greater visibility into operators' network traffic to fight crime. However, government systems and intelligence activities constitute a very sensitive information environment. Governments must proceed with caution when forming technology partnerships for hardening their IT network security. Melissa E. Hathaway, who in February 2009 was named to be the Obama Administration's top cyber security official, points out how government IT organizations should be asking questions such as:

- Who designed the security technology?
- Who built the technology?
- Who operates and maintains the technology?
- Who upgrades the technology?
- Who retires the technology?<sup>1</sup>

Commercial-Off-The-Shelf (COTS) products are not always suited for government network security needs. Governments can better support network security across applications and government functions with a common technology platform consisting of reusable technology building blocks. Such a global approach would enable government organizations to *control* the development, *performance* and maintenance of security applications, while preserving the *confidentiality* of security mechanisms for detecting cyber criminals and protecting information. Qosmos Network Intelligence provides this capability.

Qosmos Network Intelligence provides this capability with technology to extract detailed IP metadata from network traffic. The Qosmos technology building blocks enhance situational awareness and give cyber security specialists a complete view of network status and potential threats. These new capabilities allow governments to improve preventive measures, protect network assets in real-time, and perform more accurate post-mortem analysis when attacks occur.

This document describes:

- The security challenges facing government IT organizations
- The prudence of a pragmatic global approach to cyber security
- The value of reusing technology building blocks and leveraging IP metadata
- How governments at the forefront of network protection are using Network Intelligence technology

---

<sup>1</sup> Melissa E. Hathaway, "Cyber Security: An Economic and National Security Crisis," *Intelligence: Journal of U.S. Intelligence Studies*, Volume 16, No.2, Fall 2008

# Contents

- Executive Summary..... 2
- Introduction ..... 5
- Government IT Environment ..... 6
  - Homeland security ..... 6
  - Public safety ..... 6
  - Information security ..... 6
  - Number of organizations supported ..... 7
  - Number of government and citizen users ..... 7
- Government IT Security Requirements ..... 7
  - Control ..... 8
  - Confidentiality ..... 8
  - Performance ..... 8
- Global Approach to Government Cyber Security Applications with Qosmos Network Intelligence ..... 8
  - Government control of security applications ..... 10
  - Superior response to new threats..... 10
  - Common platform for complete range of applications..... 10
  - High performance across complexity and scale of networks ..... 11
  - Network-intelligent security solutions based on IP metadata ..... 11
- Qosmos Experience in the Government Sector ..... 12
- Network Intelligence Deployment Options ..... 13
  - Qosmos ixEngine..... 13
  - Qosmos ixMachine ..... 13
- Conclusion ..... 14
- Glossary..... 15
- Appendix: Government Use-Case Examples of Qosmos Technology..... 16
  - Lawful Intercept ..... 17
    - Challenge..... 17
    - Solution..... 17
    - Example of recognized applications and protocols ..... 17
    - Example of information extracted ..... 17
    - Benefits of Qosmos Network Intelligence ..... 17
  - Data Retention..... 18
    - Challenge..... 18
    - Solution..... 18
    - Example of recognized applications and protocols ..... 18

|  |           |
|--|-----------|
| Example of information extracted .....                 | 18        |
| Benefits of Qosmos Network Intelligence .....          | 18        |
| <b>Cyber Protection of Infrastructure .....</b>        | <b>19</b> |
| Challenge.....   | 19        |
| Solution.....  | 19        |
| Example of recognized applications and protocols ..... | 19        |
| Example of information extracted .....                 | 19        |
| Benefits of Qosmos Network Intelligence .....          | 19        |
| <b>About Qosmos.....</b>                               | <b>20</b> |

## Introduction

**Hackers hide attacks in normal everyday IP traffic. The only effective way to deal with security threats is to deploy a government-wide cyber security system.**

In new survey results released by TechAmerica in February 2009, it was confirmed again that IT security continues to be the greatest challenge facing government CIOs. The survey was based on in-person interviews with federal CIOs from U.S. civilian, homeland security and defense agencies, as well as key officials from the White House Office of Management and Budget, the U.S. Government Accountability Office, and the Congress.<sup>2 3</sup>

The U.S. is now in the early stages of a major “cyber initiative” that will expand monitoring of federal IT networks. Robert Jamison, an undersecretary within the U.S. Department of Homeland Security, when testifying before a congressional committee, defended the need for better network monitoring, saying: “Our adversaries are very adept at hiding their attacks in normal everyday [network] traffic,” adding that the only effective way to deal with the security threats is to deploy a government-wide cyber security system. Such capabilities already exist within a few U.S. agencies, Jamison noted, but are “just not consistent.”

Given the massive volumes of data that the U.S. and other governments must manage and the volume of traffic across IT networks, government-wide security solutions pose significant technical challenges. According to Phil Bond, president of TechAmerica, “Now more than ever, a partnership between the public and private sectors in leveraging IT to achieve a more transparent government is essential to securing the public’s safety.”<sup>4</sup>

Most experts share this view. Without using the words “global approach to cyber security,” the premise of recent NATO initiatives clearly recognizes the need, with the catalyst for at least one SPS (Science for Peace and Security) workshop being: “Information systems engineers and security engineering researchers traditionally work independently, so security mechanisms are often imposed on the system without considering the overall design. This can result in problematic systems and security vulnerabilities.”<sup>5</sup>

But governments must proceed with caution when forming technology partnerships for IT network security. While committed to improving the capabilities, performance and scalability of security systems, governments charged with protecting national security and public safety cannot surrender *control* or the *confidentiality* of their solutions.

Qosmos Network Intelligence, which is an evolution of Deep Packet Inspection (DPI), offers a next-generation technology platform with sophisticated technology building blocks that enables governments (and, if applicable, their Systems Integrators) to build powerful solutions for a wide range of network security applications at government-wide levels. Among numerous benefits over productized security solutions, Qosmos Network Intelligence provides:

- A global approach to network security across applications and government functions
- Use of IP metadata to enhance situational awareness and give cyber security specialists a complete view of network status and potential threats

---

<sup>2</sup> Government Technology, *public cio* magazine, February 25, 2009

<sup>3</sup> TechAmerica was formed by the merger of the Information Technology Association of America (ITAA) and AeA, formerly the American Electronics Association, and Grant Thornton LLP.

<sup>4</sup> Jaikumar Vijayan, “Feds downplay privacy fears on plan to expand monitoring of government networks,” *ComputerWorld* magazine, February 28, 2009

<sup>5</sup> “SPS workshop rethinks approaches to cyber security,” <http://www.nato.int/docu/update/2009/02-february/e0206a.html>

- Government control of solution development, maintenance and response to new threats
- Confidentiality of security mechanisms
- Rapid solutions deployment at lower security technology costs government-wide

## Government IT Environment

**Government IT services face formidable network security challenges. For reasons of control, scalability, confidentiality and response time to new threats, productized security solutions based on COTS are not always practical.**

Government IT services must manage a diversity of critical tasks when dealing with network security. Network infrastructure is a highly strategic area because it carries sensitive information and supports vital processes. At the same time, governments need to implement homeland security and law-enforcement mechanisms that support their efforts to ensure public security and safety. Below are some of the formidable network security challenges that government IT services face and why Commercial-Off-The-Shelf (COTS) software solutions are not always suited.

### Homeland security

Criminal, hackers and hostile countries conduct a variety of subversive activities over the Internet, which includes seeking to penetrate government networks. Such threats could endanger lives by disrupting government networks, emergency medical services, air and land transportation systems, telecommunications, utilities, etc. Hackers also use encrypted email and chat rooms to plan and coordinate operations. Homeland security and law enforcement agencies therefore need effective tools to legally investigate Internet traffic and protect national security interests. For obvious reasons, the network security tools must remain confidential.

Reliance on COTS solutions compromises confidentiality: COTS by its nature is in the public domain and available for anyone to research over the Internet or reverse engineer. Response to new threats and new types of attacks on a government network can take months for a COTS manufacturer's R&D team to counter. Governments cannot afford to wait that long for a next software release.

### Public safety

Criminals, predators, and mischievous hackers use the Internet for hostile intent. Illegal activity can range from identity theft, money laundering and industrial espionage to denial-of-service attacks, email scams linked to fake but seemingly real "government" websites, and pranksters just out to probe and expose security vulnerabilities. All pose threats to public safety and security. The failings of COTS are the same as previously cited for homeland security.

### Information security

Government networks manage massive volumes of sensitive data – from internal government information to personal identity records. There are government workers with authorized remote access, such as from laptops, smart phones and home computers. There are trends in governments to

operate more efficiently and become more “citizen centric” through the use of e-government websites with citizen self-help services, which substantially increases network traffic. There are also initiatives, such as computerizing electronic medical records to reduce healthcare costs, which create more data and access privileges to manage and protect. All presents vulnerabilities to information becoming exposed, and increases challenges to secure networks from criminals.

## Number of organizations supported

Governments support multiple agencies for national security, federal law enforcement, health and human services, revenue and taxation, commerce and international trade, energy, transportation, agriculture, environmental protection, etc. Each agency presents its own set of network security objectives, requirements, vulnerabilities and challenges. COTS products cannot address the range of security applications that government IT departments must provide.

## Number of government and citizen users

COTS products are mostly designed for corporate networks, where even the largest enterprise accommodates tens of thousands of users and millions of network events annually. Government networks are used by up to hundreds of thousands of government workers and millions of citizens representing billions of network events. Government IT solutions must address levels of scalability that do not exist in the private sector and exceed the capabilities of COTS.

## Government IT Security Requirements

**Government IT organizations must understand where systems and public safety can be vulnerable, starting with who designs, develops and controls their security solutions.**

In an article published in the *Intelligencer: Journal of U.S. Intelligence Studies*, Melissa E. Hathaway, who at the time was a cyber coordination executive and senior advisor to the director of U.S. National Intelligence wrote: “Sophisticated adversaries can take advantage of the global IT market to operationally introduce exploitable vulnerabilities into the critical systems of their target. Countering this requires understanding.”<sup>1</sup> Hathaway, who in February was named to be the Obama Administration’s top cyber security official, went on to explain what is meant by “understanding” with a series of questions that every government IT organization, not just the U.S., should be asking about their network security:

- Who designed the technology?
- Who built the technology?
- Who operates and maintains the technology?
- Who upgrades the technology?
- Who retires the technology?

"We [government] need this understanding," she wrote, "because each of these points of interface of the device with the hardware, software, and technology design, presents an opportunity to introduce or exploit vulnerability."<sup>6</sup>

## Control

Governments need to control their network security technology to 1) minimize vulnerabilities and 2) quicken response to new threats. With COTS, the solution provider owns control, even when maximizing knowledge share with their government customer.

## Confidentiality

A COTS solution may not be entirely developed or supported by a single entity: a software vendor can acquire or OEM technology from other parties to integrate within their product. This further blurs the lines of who designed, built and can maintain COTS for a government security application, and who outside of government IT has inside knowledge of how to defeat security mechanisms.

## Performance

As previously cited under "Government IT Environment," government network security must guard massive data volumes and network traffic serving up to millions of government workers and citizens for many disparate agencies. On one hand, there are the challenges of protecting national interests and law enforcement through applications such as content monitoring and filtering. On the other hand, there are challenges of protecting government IT infrastructure and sensitive data stored on servers through application hardening and shielding, data loss prevention and database activity monitoring. The complexity and scale of government networks require a range of security applications at levels of performance that COTS cannot provide.

# Global Approach to Government Cyber Security Applications with Qosmos Network Intelligence

**Qosmos' powerful building-block technology enables governments to develop their own network security applications, unilaterally or in concert with Qosmos and Systems Integrators. Government control and confidentiality of network-intelligent security solutions based on IP metadata lead a long list of benefits.**

Governments can better serve their network security needs across applications and government functions with a common technology platform consisting of reusable technology building blocks. Such a global approach would enable governments to *control* the development, *performance* and maintenance of security applications, while preserving the *confidentiality* of security mechanisms for

---

<sup>6</sup> Melissa E. Hathaway, "Cyber Security: An Economic and National Security Crisis," *Intelligence: Journal of U.S. Intelligence Studies*, Volume 16, No.2, Fall 2008

detecting cyber criminals and protecting information. It would also reduce the cost and time to deploy more effective applications. Qosmos Network Intelligence (Figure 1) provides this capability.

The Qosmos technology, which is an evolution of Deep Packet Inspection (DPI), quickly identifies events and thoroughly extracts and analyzes detailed information from any IP network. It provides powerful building blocks that enable governments to develop their own network security applications, unilaterally or in concert with Qosmos and government Systems Integrators.

**Figure 1. Qosmos Network Intelligence**

|                               |  |
|-------------------------------|--|
| <p><b>Rationality</b></p>     | <ul style="list-style-type: none"> <li>• <b>Building-block approach</b></li> <li>• <b>Foundation for high-performance, tailored solutions</b></li> <li>• <b>Common platform across government organizations</b></li> <li>• <b>Government control of network security applications</b></li> </ul>   |
| <p><b>Performance</b></p>     | <ul style="list-style-type: none"> <li>• <b>Identification of users across multiple digital identities:</b> <ul style="list-style-type: none"> <li>- VoIP caller and called party via phone numbers, names and IP addresses*</li> <li>- Email/webmail sender, receiver and subject matter via email addresses, logins and aliases*</li> <li>- Instant messaging sender, receiver, contact lists and status*</li> <li>- Quick correlation of a user's multiple identities</li> </ul> </li> <li>* <i>Includes International Mobile Equipment Identity (IMEI) and International Mobile Subscriber Identity (IMSI)</i></li> <li>• <b>Real-time information extraction:</b> <ul style="list-style-type: none"> <li>- Information embedded in or computed from network traffic</li> <li>- Metadata: caller, type of file downloaded, etc.</li> <li>- Content: data used to reconstitute data objects (e.g., an email or VoIP stream based on RTP data)</li> </ul> </li> <li>• <b>Advanced, dynamic parsing of flows for 100% reliability</b><br/>(unlike static pattern matching)</li> <li>• <b>Full visibility into tunneled traffic</b> (up to 16 levels of encapsulation)</li> <li>• <b>Analysis of hundreds of protocols and applications</b></li> <li>• <b>New protocol updates completed in days</b></li> <li>• <b>Scalability up to core network rates</b></li> </ul> |
| <p><b>Confidentiality</b></p> | <ul style="list-style-type: none"> <li>• <b>No dependence on productized security solution</b></li> <li>• <b>Governments can develop home-grown security solutions and their own protocol plugins</b></li> <li>• <b>Technology that structures and delivers selected metadata</b></li> <li>• <b>Privileged access to the Qosmos foundational technology</b></li> </ul>   |

## Government control of security applications

Qosmos Network Intelligence provides best-in-class technology and standard interfaces to rapidly build proprietary security applications. Governments can develop and leverage their own customized protocol, application plugins and rules. This gives governments:

- Control over their security solutions
- Independence to react fast to new threats
- Confidentiality that improves the effectiveness of government systems protection and lawful inspection of traffic on operator networks

Using Qosmos Network Intelligence, protocol and application knowledge evolution do not impact a government's central network intelligence mechanisms. The technology easily integrates into any application within weeks and is continuously and covertly supported on a government's terms by experienced, trustworthy, professional services dedicated to government IT environments.

## Superior response to new threats

Qosmos Network Intelligence frees governments from having to depend on COTS solutions that lack scalability, performance, confidentiality and the *control* to rapidly respond to new threats. The technology detects new breaches of protocol and application security. New protocols can be implemented in days by Qosmos, a government's Systems Integrator, or the government, which has the *control* to develop its own Network Intelligence and threat mitigation. Qosmos provides regular protocol and building block application updates, which radically reduce the time and cost for governments to stay abreast of ongoing IP technology evolution. Governments also can develop their own protocol plugins and independently react fast for very specific protocols.

## Common platform for complete range of applications

Qosmos Network Intelligence enables governments to leverage a common technology platform across government functions and applications, and thereby institute a global approach to network security that more effectively manages the diversity of government missions and security requirements. The Qosmos technology supports rapid development of custom solutions tailored to government needs in application areas such as:

- Lawful intercept
- Data retention
- Cyber Protection

Among benefits, security applications gain a greater design consistency for global protocol updates and future enhancements. Security technology partnerships are minimized across government organizations to just one or two security technology partners – Qosmos and, if applicable, a government's Systems Integrator. Governments can significantly reduce the time to deploy and enhance security applications for not just one, but multiple departments.

## High performance across complexity and scale of networks

Qosmos Network Intelligence (Figure 1) identifies events occurring on IP networks, and extracts event information (content and metadata) in *real time* with unparalleled precision and depth. The Qosmos technology examines every communication session occurring on a network, including fragmented, duplicated and de-sequenced session packets; bidirectional and unidirectional traffic; and tunneled or “greynet” traffic, such as non-standard POP and STMP email, webmail, instant messaging, chat rooms and gaming applications that can be used for chat.

Using the Qosmos technology, governments gain capabilities to extract and leverage metadata for intelligence gathering that results in much greater situational awareness. Metadata provides a global understanding and investigative information from network traffic, such as:

- The ability to map communication patterns
- The ability to reconstruct links between communicating network users
- The ability to know all virtual IDs that an individual uses
- The ability to detect and analyze information hidden on “the dark web”
- The ability to track who access what database, when, and the information viewed

COTS products are not designed with pervasive IP metadata in mind. They focus on the IP packets that transit a network, but not the metadata that provides a detailed understanding of users and applications. The sophisticated metadata approach taken with Qosmos Network Intelligence enables governments to build completely new types of intelligence and network security solutions, gain a better understanding – a macro view – of potential threats, and optimize investments in computing power, data storage and human resources.

## Network-intelligent security solutions based on IP metadata

There are over 1.5 billion Internet users today, and thousands of web applications. Current content-focused tracking and information-processing solutions used for security purposes cannot hope in the future to keep up with the exponential increase in IP communications and the amount of content generated. The only technological response to these challenges is to design security solutions with true Network Intelligence capabilities, including:

- Extraction of significant information that is structured intelligently *as metadata becomes available*
- Continuous streaming of metadata and network information
- Automatic metadata computation and information correlation
- Adapted deployment options: full IP traffic redirection, or direct metadata extraction

Among the benefits of network-intelligent security solutions based on IP metadata, governments gain:

- Automated intelligent information extraction and lawful interception processes
- Improved capabilities to anticipate potential threats before they materialize by automatically detecting suspicious communication behavioral patterns
- Increased reactivity to new threats by dramatically reducing the time- and resource-consuming post-processing of increasingly large amounts of information
- Optimized technology investments by reducing storage and resource requirements
- Control of security policies and solutions

## Qosmos Experience in the Government Sector

Qosmos has a successful track record of working with governments to upgrade their cyber security capabilities for critical homeland security, law enforcement and information protection. In fact, government customers constitute more than half of all Qosmos Network Intelligence adoption. Among Qosmos' defining differentiators are:

- Best-in-class Network Intelligence technology
- Government focus, experience and earned trust over numerous customer engagements
- Global building-block approach that puts governments in control of their network security, reduces response times to new threats, and preserves confidentiality
- Strong relationships with government organizations and governments' Systems Integrators (when applicable)

Qosmos fully supports its government customers with regularly updated protocols and application signatures, professional services, and an on-line customer support portal. Still, not even Qosmos knows how their enabling Network Intelligence technology is used by many government customers. Bound by confidentiality, Qosmos cannot publicize any of its relationships with government customers, but can cite "generic" use-case examples that are provided in the Appendix at the end of this document.

## Network Intelligence Deployment Options

Qosmos offers two methods to implement its Network Intelligence technology:

- With software embedded into a solution (Qosmos ixEngine® Software Development Kit)
- With a hardware probe (Qosmos ixMachine® appliance)

### Qosmos ixEngine

The Qosmos ixEngine is a software suite that enables developers to implement powerful Network Intelligence features into security applications. The Qosmos ixEngine supports market leading CPU environments and includes optimized code for specific CPUs. The Qosmos ixEngine Software Development Kit allows developers to:

- Identify applications whatever port numbers they use, based on semantic and grammatical protocol recognition,
- Detect when tunneling protocols are used, and parse through them to find the information they encapsulate,
- Group application data into their respective flows, and use signaling information to group correlated flows into sessions,
- Extract application metadata and content, to provide a truly unique database view of the network.

### Qosmos ixMachine

The Qosmos ixMachine is a portfolio of next-generation hardware appliances that structures and delivers metadata extracted from traffic flows. Qosmos ixMachine appliances fully or selectively extract traffic data according to advanced triggers tuned to application and line rate requirements:

- Qosmos ixM 10: ~ 10s Mbps
- Qosmos ixM 100: ~ 100s Mbps
- Qosmos ixM 1 000: ~ Gbps
- Qosmos ixM 10 000: ~ 10s Gbps

Installed passively in port mirroring or split configuration mode, ixMachine appliances may be connected anywhere on a network, exactly where required information can be found. This carrier-class network equipment interfaces with standard reporting tools.

## Conclusion

Cyber criminals continue to grow in numbers and in their sophistication to pose new threats to national security and public safety. Only a global approach to network security using the latest technology advancements can improve protection across disparate government organizations and security applications in a timely and affordable manner.

Qosmos Network Intelligence provides a powerful building block technology with leading-edge IP metadata extraction capabilities that enables governments to institute a common technology platform for different types of security applications. Using Qosmos Network Intelligence, governments can significantly improve their network security and response times to new threats. To answer the poignant questions raised by top cyber security officials:

- **Who designed the technology?** Qosmos for the key Network Intelligence capability, and the government or their trusted Systems Integrator for proprietary, confidential security solutions.
- **Who built the technology?** Qosmos for Network Intelligence, and the government or their Systems Integrator for complete solutions development.
- **Who operates and maintains the technology?** The government retains control with Qosmos supplying the latest updates to new IP protocol and application signatures. The government with their Systems Integrators can maintain the technology independently, including development of their own protocol plugins.
- **Who upgrades the technology?** The government retains control.
- **Who retires the technology?** The government retains control.

Unlike productized COTS solutions, Qosmos Network Intelligence addresses governments' much larger performance, scalability and confidentiality needs against a larger and more diverse world of cyber threats.

## Glossary

|      |   |
|------|---|
| CIO  | Chief Information Officer                           |
| COTS | Commercial Off The Shelf                            |
| DHCP | Dynamic Host Configuration Protocol                 |
| DNS  | Domain Name System                                  |
| DPI  | Deep Packet Inspection                              |
| FTP  | File Transfer Protocol                              |
| HTTP | Hypertext Transfer Protocol                         |
| IMAP | Internet Message Access Protocol                    |
| IMEI | International Mobile Equipment Identity             |
| IMSI | International Mobile Subscriber Identity            |
| IP   | Internet Protocol                                   |
| IT   | Information Technology                              |
| ixE  | Information Extraction Engine                       |
| ixM  | Information Extraction Machine                      |
| MAC  | Media Access Control                                |
| MGCP | Media Gateway Control Protocol                      |
| MMSE | Multimedia Messaging Service Environment            |
| P2P  | Peer to Peer  |
| POP  | Post Office Protocol                                |
| QQ   | Instant Messaging Software from Tencent QQ in China |
| RTP  | Real-time Transport Protocol                        |
| RTCP | RTP Control Protocol                                |
| RTSP | Real-time Streaming Protocol                        |
| SCCP | Skinny Call Control Protocol                        |
| TCP  | Transmission Control Protocol                       |
| UDP  | User Datagram Protocol                              |
| VoIP | Voice over Internet Protocol                        |

## Appendix: Government Use-Case Examples of Qosmos Technology

Qosmos honors the confidentiality needs of all government customers. Qosmos does not publicize its relationships with government customers or disclose details of how Qosmos Network Intelligence is actually used. Example use cases provided herein are “generic” applications built with Qosmos Network Intelligence.

## Lawful Intercept

### Challenge

Criminals, predators and hackers now use chats, blogs, webmail and Internet applications such as online gaming and file-sharing sites to hide their communications.

### Solution

Qosmos provides law enforcement agencies with a powerful solution to identify a target using multiple virtual IDs and intercept all related IP-based communications. Any trigger, such as a “user login = target” initiates intercept of all IP traffic related to the “target.”

### Example of recognized applications and protocols

- VoIP
- Email (POP, SMTP)
- Webmail (Gmail, Hotmail, Live Mail, SquirrelMail, Yahoo mail, etc.)
- Instant Messaging (Aim, SNM, Skype, Yahoo, Google Talk, QQ, Maktoob, Paltalk, etc.)
- Online games (World of Warcraft)
- Online classified ads
- Audio/Video (H.323, SIP, MGCP, RTP, RTCP, MMSE, RTSP, SHOUTcast, Yahoo Video, MSN Video, SCCP, etc.)
- Web applications (Dailymotion, Google, eBay, Google Earth, HTTP, MySpace, Wikipedia, YouTube, etc.)

### Example of information extracted

- Caller, phone number, called party, duration of call
- Webmail login, email address, sender, receiver, subject matter, attached documents
- Instant messaging sender, receiver, contact lists and status
- Forum login, IP address, MAC address, mobile ID (IMSI, IMEI)
- Protocols identified even for unidirectional traffic (e.g. email by satellite).

### Benefits of Qosmos Network Intelligence

- Quickly and accurately detect targets across all identities in the complex IP communications environment
- Content and metadata records of communications for analysis with Business Intelligence tools

## Data Retention

### Challenge

In most countries, telecom operators are legally required to retain information on network traffic and location data for the investigation, detection, and prosecution of criminal activity. Government organizations use information such as user ID, caller, called party, duration, time of call, etc. for specific enquiries, as described in regulations such as the Directive 2006/24/EC of the European Union.

### Solution

Qosmos technology queries the IP network in real-time as if it were a database and filters the relevant data to optimize storage space and speed up post-processing. Filter configuration is made simple thanks to Qosmos' unique information extraction query language ixQL, enabling the use of simple regular expressions and Boolean operators.

### Example of recognized applications and protocols

- Audio/Video (H.323, SIP, MGCP, RTP, RTCP, MMSE, RTSP, SHOUTcast, Yahoo Video, MSN Video, SCCP, etc.)
- Instant Messaging (Aim, SNM, Skype, Yahoo, Google Talk, QQ, etc.)
- Network (IP, TCP, FTP, Ethernet, DNS, DHCP, UDP, etc.)
- Web applications (Dailymotion, Google, eBay, Google Earth, HTTP, MySpace, Wikipedia, YouTube, etc.)
- Webmail (Gmail, Hotmail, Live Mail, SquirrelMail, Yahoo mail, etc.)

### Example of information extracted

- Caller, phone number, called party, duration of call
- Webmail login, email address, sender, receiver, subject matter, attached documents
- Instant messaging sender, receiver, contact lists and status
- Forum login, IP address, MAC address, mobile ID (IMSI, IMEI)

### Benefits of Qosmos Network Intelligence

- Rapid, efficient response to legal and investigative requests for electronic evidence
- Precise understanding of user behaviors and communication intent
- Proactive real-time processing and formatting of real-time information
- Only relevant data is extracted, which minimizes storage requirements and post-processing of information
- Ability to extract information directly from network, independently of servers – even in cases where there are no third-party logs or databases

## Cyber Protection of Infrastructure

### Challenge

Security solutions such as anti-virus, anti-spam, anti-spyware, and Intrusion Detection Systems are necessary, but not enough for comprehensive protection of government networks. The specifications and capabilities of these commercial point products are not always in line with the precise requirements of government security policies, both for detection of abnormal application activity and for protection against attacks. As a result, the sum of these systems does not provide the holistic understanding of network behavior, which is necessary for effective cyber security.

### Solution

Qosmos network intelligence technology enables government specialists to leverage their expertise and take back control over their cyber protection by developing an additional network security overlay, independent from the protection based on COTS systems. This cyber security & supervision mechanism can be built to provide complete situational awareness based on input from all network traffic and security elements (COTS and others). It can automatically track anomalies in network behavior and provide comprehensive protection both in real-time and for forensic analysis if an attack has already occurred.

Qosmos provides key technology to extract communication metadata or content in real-time from network traffic. This network intelligence is then fed to a government-developed security & supervision mechanism.

### Example of recognized applications and protocols

- Instant Messaging (Aim, MSN, Skype, Yahoo, Google Talk, QQ, etc.)
- Webmail (Gmail, Hotmail, Livemail, Squiremail, Yahoo mail, etc.)
- Network (IP, TCP, FTP, Ethernet, DNS, DHCP, UDP, etc.)
- Audio/Video (H.323, SIP, MGCP, RTP, RTCP, MMSE, RTSP, MSN Video, SCCP, etc.)

### Example of information extracted

- User ID, IP address, time of login / logoff
- Email subject, sender, receiver, and content
- Attached documents (content + metadata)
- Data transfer sessions (type, content, time)

### Benefits of Qosmos Network Intelligence

- Stronger cyber protection based on holistic understanding of network behavior
- Cyber security overlay solution which remains confidential and cannot easily be compromised
- Enhanced ability to quickly and accurately identify threats, both for detection of abnormal application activity and for protection against attacks
- Avoid significant investments by sourcing best-of-breed network intelligence technology
- Complete control over network security, thanks to Qosmos building block approach

## About Qosmos

Qosmos provides software and hardware platforms that identify and extract information traveling over networks in real time with unparalleled precision and depth. Qosmos network intelligence technology enables a wide range of applications such as lawful interception, network protection, data retention, regulatory compliance, content-based billing, audience measurement and service optimization. Using Qosmos platforms, Network Equipment Manufacturers, Software Vendors and Systems Integrators can enhance their solutions with detailed intelligence to better monetize, optimize or protect networked information.

[www.qosmos.com](http://www.qosmos.com)

### Headquarters

Immeuble Le Cardinet  
5, impasse Chalabre  
75017 – Paris – France  
Phone: +33 1 78 09 14 40  
Fax: +33 1 40 37 00 02  
[contact@qosmos.com](mailto:contact@qosmos.com)

### US Sales Office

Germantown, MD 20874  
Phone: + 1 301 528 8301  
Fax: + 1 301 528 8302  
[us-sales@qosmos.com](mailto:us-sales@qosmos.com)

Qosmos – SA à Directoire et Conseil de Surveillance au capital de 242.063,04€ - RCS Paris B 432 559 086 – TVA FR 18432559086

Qosmos, Qosmos ixEngine, Qosmos ixE, Qosmos ixMachine and Qosmos ixM are trademarks or registered trademarks in France and other countries.

© Qosmos 2009

Non-contractual document. Products and services and their specifications are subject to change without prior notice.