

# THE LIGHTNING FLASH

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## Lightning-Linux: creating a new technology for Internet routers and appliances.

Foreseeing already two years ago the great success Linux operating system is having nowadays, LIGHTNING Instrumentation has now completed the development of its first Linux-based Internet-router: MultiCom Ethernet II.

Lightning developed an optimized but complete Linux for stand-alone, embedded, systems: the Lightning-Linux.

Lightning has focused to optimize Linux, which is usually running on PCs, to the needs of stand-alone systems, while preserving all its functionalities. Additionally, easy-to-use configuration tools have been developed allowing for a very easy deployment of Lightning-Linux routers. This avoids the hassle of internal Linux configurations by experts, and adds the Lightning-finish to this exceptional router.

Lightning not only introduces a new high-end Internet router technology but it is today even more reactive to the Internet market thanks to the experience acquired in rebuilding and optimizing Linux for Internet appliances. This allows for offering specific customized solutions under standard Linux environment.

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Due to the recent Internet deployment in different fields of business, security has become a mandatory feature in communication networks. Encryption methods are used for data transmission over the public Internet to protect private information from unauthorised accesses. As a consequence many proprietary algorithms have been developed and implemented. In the near future, Lightning will be able to offer the choice between its well known, broadly used, highly secure proprietary solutions, and a new security standard that allows to exchange encrypted information among different vendors' equipment, the IPSec protocol suite.

The IPSec (IP Security) standard has been deployed by the Internet Engineering Task Force (IETF) as a response to the requirements of the evolving security market. IPSec provides privacy and authentication services by using modern cryptographic methods.

The advantage of IPSec is the possibility of using the Internet to provide secure Virtual Private Networks (S-VPN) among remote work-sites equipped with technologies from different vendors. Exploiting the public Internet for virtual point-to-point links has demonstrated to be a cost-effective solution that offers an optimum trade-off between prize and performances compared to more expensive dedicated leased lines.

Lightning's response to the security demanding market is MultiCom Ethernet II, a high-end LAN-to-LAN router based on a fundamentally new technology (See story on page 2).

Announced in software release

### IP Security Standard

## Lightning runs on IPSec highways



MultiCom Ethernet II: the new Lightning router/encryptor.

**In the endless run for providing secure data transport over the Internet, the IP Security standard (IPSec) from IETF is today driving industrial security implementations. Introducing its new Ethernet MultiCom routers, Lightning Instrumentation SA has been fully compliant with today market requirements. Ethernet MultiCom routers will be optionally equipped with the IPSec protocol suite.**

3.0, MultiCom Ethernet II will be optionally enhanced with the recent IETF IP security standard, IPSec.

### The ideal router/encryptor for a "standard" solution

Taking advantage of the upgrade to the fully compliant IPSec protocol, the MultiCom Ethernet II routers will be the most suitable solution for secure VPNs implementation also in those scenarios where compatibility with different IPSec vendors' products is required.

Both Encapsulating Security Payload (ESP) and Authentication

Header (AH) security services are provided in the Tunnel and Transport mode. According to the IPSec standard 56-bit DES and 168-bit Triple DES industry-standards are available for data encryption. Moreover the top-security 128-bit International Data Encryption Algorithm (IDEA) is implemented.

Equipped with one 10/100 Mbits/s LAN interface and one 10 Mbits/s WAN interface, MultiCom Ethernet II can be deployed as a LAN to LAN encryptor in those situations where a router is already existing that

doesn't provide IPSec. Moreover the complete set of routing features makes it suitable to those scenarios where an existing modem is providing broadband Internet access, but neither routing nor encryption is present.

### **MultiCom Ethernet II + IPSec: a winning couple for xDSL and CATV access**

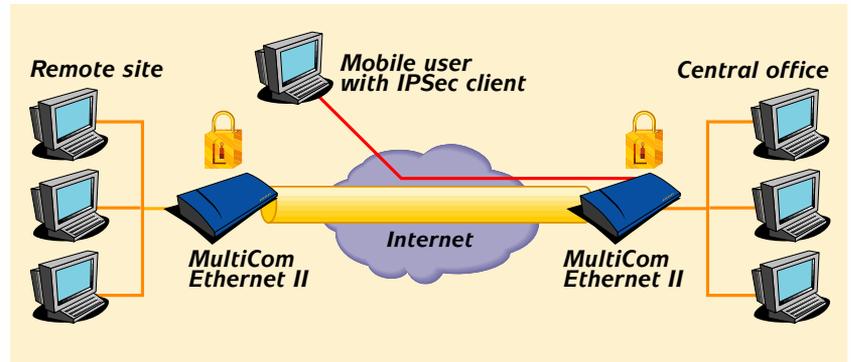
Nowadays xDSL and CATV are the most promising technologies for broadband Internet access. The introduction of xDSL (in all its different flavours: ADSL, HDSL, etc.) has opened the Internet market to Telcos operators while the exploitation of the

cable infrastructure has encouraged the foreseeing of CATV provisioners towards the new Internet business.

Today, data transmission through xDSL and CATV modems doesn't provide any type of encryption or security feature: all neighbours could potentially listen to your IP traffic. The deployment of a MultiCom Ethernet II router behind an already existing Ethernet-type modem allows for secure transmission by means of a standard encryption model, IPSec. Moreover the SecureWall suite provides a full set of security features as firewalling, filtering and

reporting/logging functionality. IPSec is today the only security protocol that allows compatibility among different vendors. This is the reason why it will become the most largely deployed method for ensuring S-VPN connections through the

Internet. Taking advantage of this enhanced feature, MultiCom Ethernet II is the ideal equipment for building secure Virtual Private Networks over CATV, xDSL and other access infrastructures.



### **Lightning Linux**

# **LIGHTNING bets on LINUX!**

## **Introducing a Linux based technology for the new generation of Lightning's Ethernet routers.**

At the occasion of CeBIT 2000 LIGHTNING Instrumentation is proud to present an innovative technology that is at the core of the new Lightning MultiCom Ethernet routers. The Ethernet branch of the MultiCom routers family has been designed adopting what is today considered the most revolutionary operating system: LINUX!

The new MultiCom Ethernet II router is the headline product of this new family. It is the successful witness of the innovative effort that Lightning's engineers have faced for transforming in a real product the foreseeing idea of using Linux for Internet routers. Lightning has succeeded in developing a complete Linux product that is compatible with the most popular Linux for PC. The choice of adopting Linux is a new approach to product development that al-



lows for quickly responding to the specific needs of a continuously evolving market like the Internet technologies one. To better understand the reason and the meaning of Lightning's achievement it is useful to go through a short overview on Linux.

### **What's LINUX?**

Whoever is today involved in the Internet and computers technologies market has most likely become familiar with a new word: Linux.

Linux is simply an operating system, but with a great "added

value". Since 1994, when version 1.0 of Linux kernel was released, Linux has been at the center of a big revolution that has brought to a re-design of the way an Operative System is conceived.

The reason that makes Linux so different is that the kernel code is 'open source'.

The kernel is the most important part of an operating system. It provides services that allow the applications to run. Being 'open source' means that every developer is allowed to inspect it and to contribute without any license restriction.

Kernel, libraries and utilities have been largely and freely developed by many people located in different parts of the world. Being public and having no license restrictions has transformed Linux in the 'world operating system'. A big amount of

public code is available on the Internet and is constantly updated by the continuous effort of Linux fans developer. Another aspect that contributed to make this operating system more and more popular is that many applications written for Unix can be recompiled in Linux environment and they simply work.

Today a new chapter is interesting Linux history: embedded design and deployment. The target is to re-elaborate the Linux operating system running on the most known PCs in such a way that it can fit the needs of specific stand-alone products design.

### **The Lightning-Linux.**

LIGHTNING has empowered its Linux based router with easy to use configuration tools. Any Linux machine can be potentially used as a basic router. Adding some specific applications, a Linux based machine can provide a wide range of services that are today highly demanded in the Internet and telecommunications market. However, for configuring a Linux PC with its applications in a complete router, it is today necessary to edit a large amount of files, each one in a specific format. This creates a big problem in making

## Why choosing a Lightning Multi-Linux router ?

- **Fast, complete, robust thanks to Linux' legendary reliability and Lightning's "Easy and Secure" finish**
- **Highly available networking applications allow for Lightning's quick reaction to the evolving Internet market**
- **Linux open-source nature guarantees continuous optimization and integration of future standards**
- **At Lightning, Linux is the future, today.**

Linux routers popular, because users are not only looking for complete routers, but they are interested in features like simple configuration, management and ease of use as a stand-alone router.

In response to this problem, Lightning has created, for its Linux based routers, a configuration application that encapsulates all routing parameters into a coherent and easy to use interface. This allows for a large saving of time. The configuration interface is accessible through a Java application that can run on every type of platform. This Java application presents a graphical interface that is very easy to use also for config-

uring the most advanced routing services.

We can resume saying that Lightning's new approach towards development is to leverage the power of public Linux applications, together with Lightning's own developments, into easy to use, secure, performant and reliable stand-alone products. This allows Lightning to be even more reactive to the market and to quickly respond to specific needs and new requirements.

### Why Linux ?

LIGHTNING Instrumentation has foreseen the great success that Linux is having today. The

already two years old decision of using Linux as operating system for the Ethernet routers family has been driven by a series of advantages that a Linux based system offers. We can mainly find three aspects that drove Lightning's choice. At first, the open source nature of Linux allows highly reliable and easily available code. This aspect allows saving time in the process of developing the product. The engineering can be in such a way concentrated on the optimization of the code and on the development of new specific applications. The second driving aspect has been performance: Linux systems are stable, power-

market while empowering Lightning to be even more reactive to customers' requirements.

Beside the previously described development approach a continuous effort is going on for keeping Lightning-Linux compatible with the rapid evolution of Linux operating system. This assures Lightning's Linux based products to be continuously aligned with latest Linux updates.

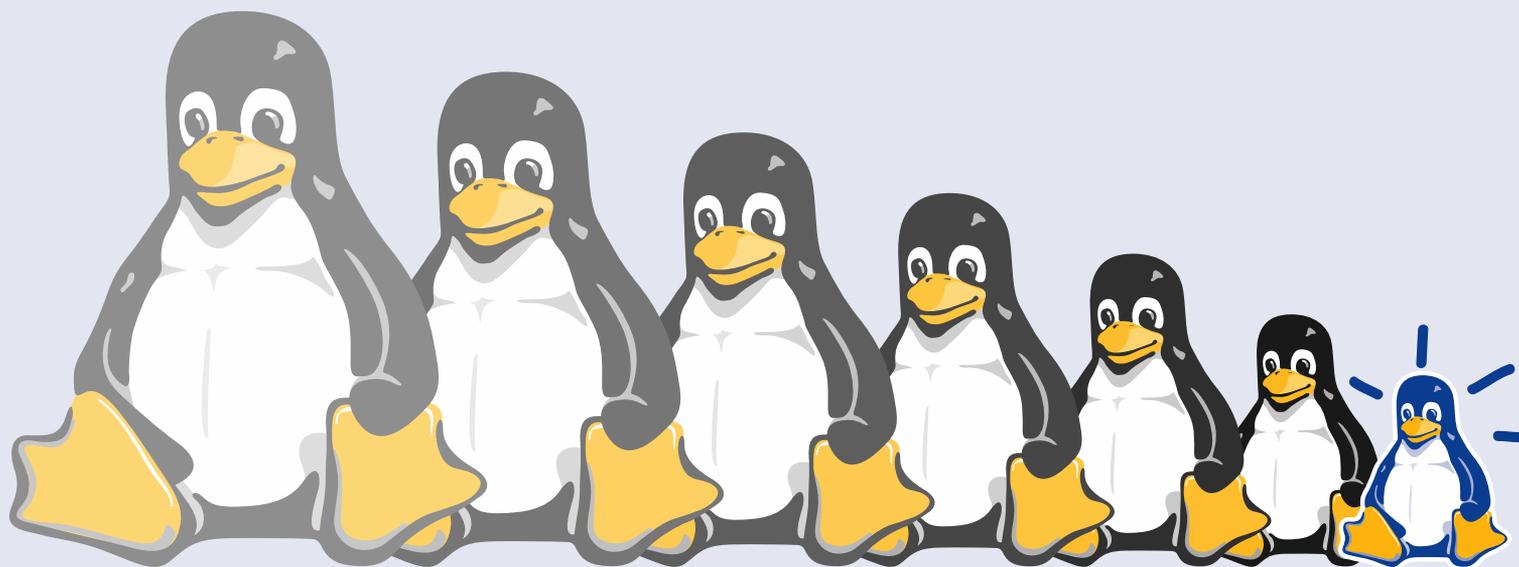
Lightning believes in Linux' powerful future possibilities and has focused its target on the improvement of Linux usability and portability to different architecture.

## A continuous effort for maintaining compatibility

This approach allows Lightning to offer a set of solutions for the telecommunications market opening a new branch of interest for Lightning's customers: the possibility of collaborating for the development of specific custom projects. If you are interested to have more information about this already running Lightning's activity, please feel free to contact us at: [info@lightning.ch](mailto:info@lightning.ch)

ful, fast and highly reliable. This is perfectly in agreement with Lightning's products philosophy. Finally, as a consequence of the previous two advantages, adopting Linux allows for considerably shortening time-to-

# EMBEDDED LINUX™ ROUTER ?



# ...DONE !

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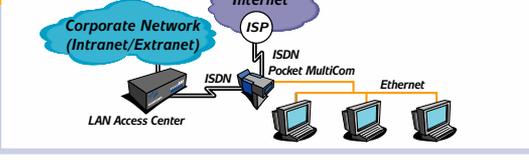
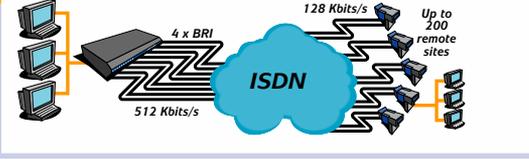
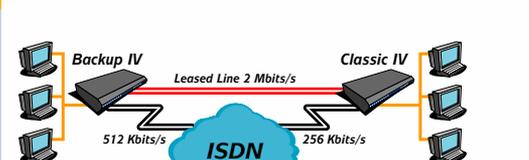
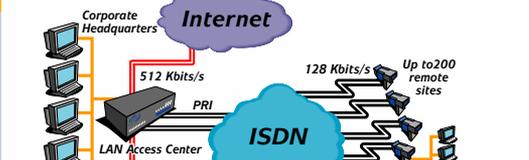
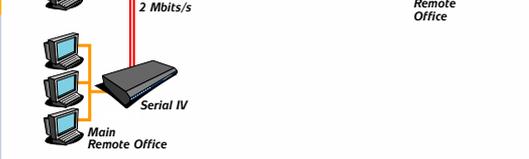
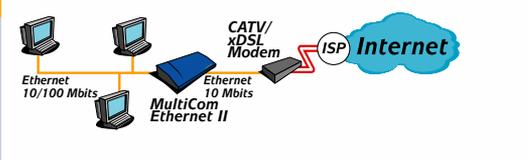
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highlight

# The new MultiCom Classic IV

At CeBIT 2000, LIGHTNING Instrumentation is introducing the MultiCom Classic IV router, which is part of the Series IV routers and is going to replace the original Classic MultiCom. This new product presents the same set of software features that character-

izes the Series IV routers but it is equipped with two BRI (2 x 128 Kbits/s) and two serial interfaces (2 x 2 Mbits/s) on the WAN side. An Ethernet interface is present for connection to the local LAN. It allows for leased lines Backup and Overflow over ISDN and, as for the other MultiCom routers, it can be optionally equipped with Lightning's highly reliable encryption algorithms.

<p><b>Pocket MultiCom: 1 Ethernet, 1 BRI</b></p> 	<p>The Pocket MultiCom, the smallest router in the world for mobile users, SoHo home offices, and smaller companies can serve any number of computers. It is also the first and only pocket router including 128 bit key encryption.</p>	
<p><b>MultiCom Access IV: 1 Ethernet, 4 BRI</b></p> 	<p>The MultiCom Access IV delivers fully secure network connectivity for remote workgroups and single remote users.</p>	
<p><b>MultiCom Backup IV: 1 Ethernet, 4 BRI, 2 Leased Lines</b></p> 	<p>The MultiCom Backup IV, the solution for secure high-speed backup and remote access.</p>	
<p><b>MultiCom Classic IV: 1 Ethernet, 2 BRI, 2 Leased Lines</b></p> 	<p>The MultiCom Classic IV is ideal for linking remote workgroups to a corporation-wide network via leased lines with integrated Backup and Overflow over ISDN.</p>	
<p><b>MultiCom Serial IV: 1 Ethernet, 2 Leased Lines</b></p> 	<p>The MultiCom Serial IV delivers fast and secure network connectivity through synchronous leased lines.</p>	
<p><b>MultiCom LAN Access Center: 1 Ethernet, up to 12 BRI or 2 PRI, 2 LL</b></p> 	<p>The MultiCom LAN Access Center meets the requirements of large enterprises and Internet providers, which require extensibility. This modular multiprotocol router manages up to 2 PRI and two leased lines.</p>	
<p><b>MultiCom Ethernet II: 1 Ethernet 10, 1 Ethernet 10/100</b></p> 	<p>The MultiCom Ethernet II router introduces the new Ethernet branch of the MultiCom family. It provides Ethernet to Ethernet routing capabilities and secure access for Internet connections through CATV/xDSL modems. IPsec security protocol will be in future available for VPNs support.*</p>	

\*Not in stock at press time

The complete range of Lightning's MultiCom routers

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