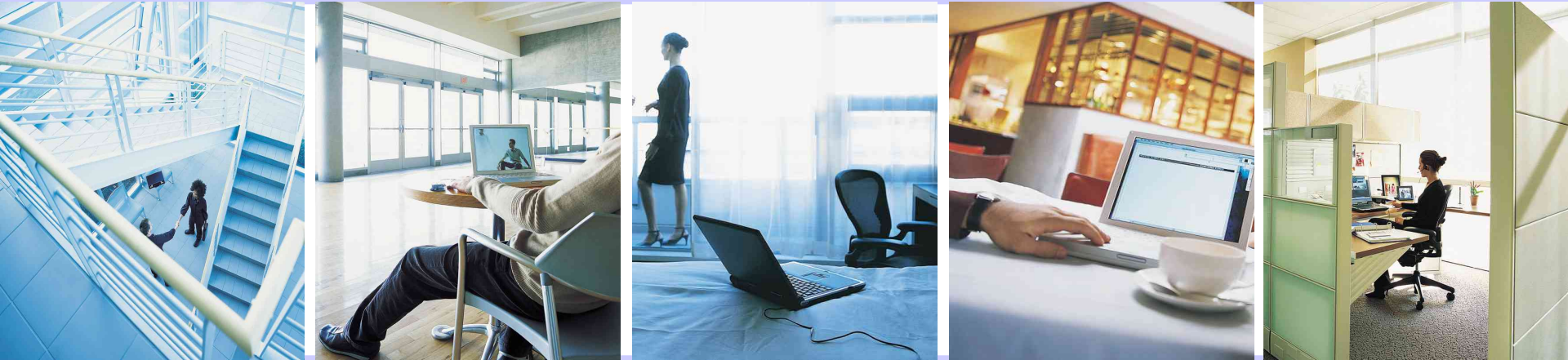


LANCOM Systems

... connecting your business



LANCOM Software Version 4.00

December 2004

LC.OS 4.00
[LANCOM OPERATING SYSTEM]

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www.lancom.de

LANCOM
Systems

Supported devices

LCOS 4.0

▶ Supported

LANCOM models:
LANCOM 800+,
LANCOM DSL/I-10+,
LANCOM DSL/I-1611 Office,
LANCOM 821/1621 ADSL/ISDN,
LANCOM 7011 VPN,
LANCOM L-54 Wireless,
LANCOM 3050/3550 Wireless,
LANCOM IAP-54 Wireless,
LANCOM 1511/1521 Wireless (A)DSL,
LANCOM 1711 VPN,
LANCOM 1811/1821 Wireless (A)DSL,
LANCOM 7111 VPN,
LANCOM 8011 VPN

▶ Also for ELSA LANCOM and Telekom T-Octopus LAN, and Business LAN

- ▶ LANCOM Systems has made significant developments to their operating system LCOS in recent months.
- ▶ New developments are mainly concern VPN and 54/108 Mbit Wireless LAN functions.
- ▶ Some products have insufficient internal capacity to handle all of the innovations and refinements of the LCOS system.
- ▶ These products will benefit from LANCOM Systems' continued development of the LCOS operating system based on the version 3.5x. Thus the publication of LCOS Version 4.0 is simultaneous with the new version 3.54 for the affected products.
- ▶ The following products are affected:
- ▶ L-2, IL-2, L-11, IL-11, 1000, 1100, 2000, and LC 800, DSL/10 and DSL/I-10

Contents

- ▶ **On the following pages, we provide you with an overview of the new features and improvements in the new LCOS version and the LANtools.**
- ▶ The new LCOS version 4.00
 - ▶ New Wireless LAN features
 - ▶ New management features
 - ▶ New LANtools
- ▶ Notes about Service and Support
- ▶ Information about features in previous LCOS versions can be found in the [documentation area](#) on the LANCOM CD.

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LCOS 4.00
LANCOM OPERATING SYSTEM

The new LCOS version 4.00

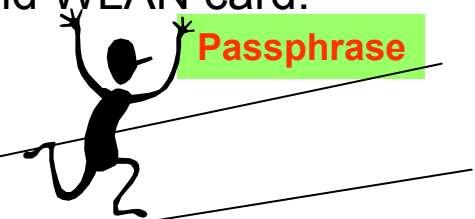
Wireless LAN:

▶ LEPS and compression is compatible to AirLancer MC-54g/MC54ag, PCI-54ag with driver version 3.1 and higher

- ▶ LEPS—LANCOM Enhanced Passphrase Security
- ▶ 802.11i for point-to-point WLAN connections
- ▶ Default WEP encryption
- ▶ Compression for WLAN connections

LEPS—LANCOM Enhanced Passphrase Security

- ▶ Advantages of a passphrase: Easy to set up, just one global string
- ▶ Disadvantages until now (without LEPS):
 - ▶ Just one global passphrase for all WLAN clients
 - ▶ Human factor: The passphrase can fall into the hands of unauthorized persons
 - ▶ Security loophole: Unauthorized persons can use the passphrase to access the network because there is no association between passphrase and WLAN card.

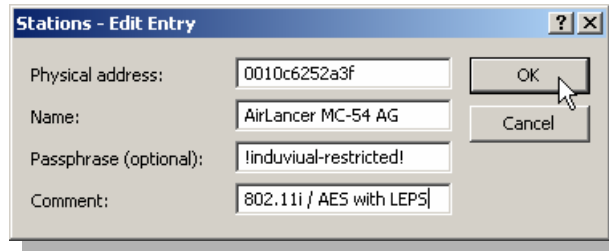


LEPS—LANCOM Enhanced Passphrase Security

Each user has an individual passphrase with LEPS

- ▶ No communication to large user groups
- ▶ LEPS matches the passphrase to the MAC address of the WLAN client
- ▶ Can only be utilized by the user of the WLAN client
- ▶ Side-effect: MAC address spoofing is prevented as there are now 2 unknowns that have to be cracked: Passphrase and MAC address

LEPS is amazingly simple to set up:



The screenshot shows a dialog box titled "Stations - Edit Entry". It has four input fields and two buttons. The fields are: "Physical address" with the value "0010c6252a3f"; "Name" with the value "AirLancer MC-54 AG"; "Passphrase (optional)" with the value "!ndividual-restricted!"; and "Comment" with the value "802.11i / AES with LEPS". The "OK" button is highlighted with a mouse cursor.

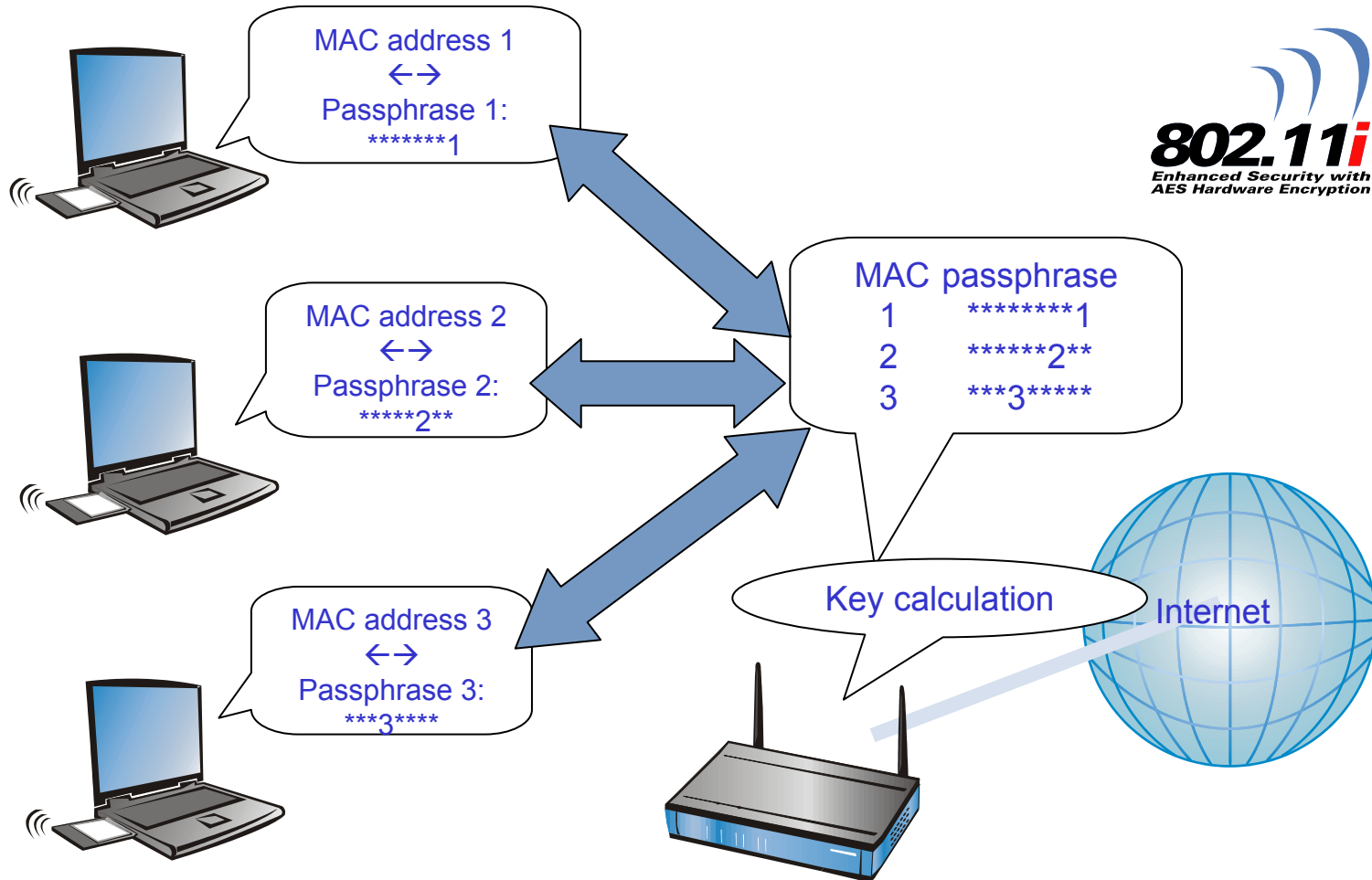
- ▶ LEPS can be used with RADIUS
- ▶ LEPS can be used for point-to-point connections
- ▶ LEPS works for WPA and 802.11i
- ▶ LEPS can replace far more complex 802.1x installations



LEPS—LANCOM Enhanced Passphrase Security

Eliminates the weaknesses passphrases without having to superimpose 802.1x :

- ▶ An individual passphrase per client
- ▶ Distinctive match with the MAC address
- ▶ “Human weaknesses” are avoided
- ▶ Simple administration per RADIUS



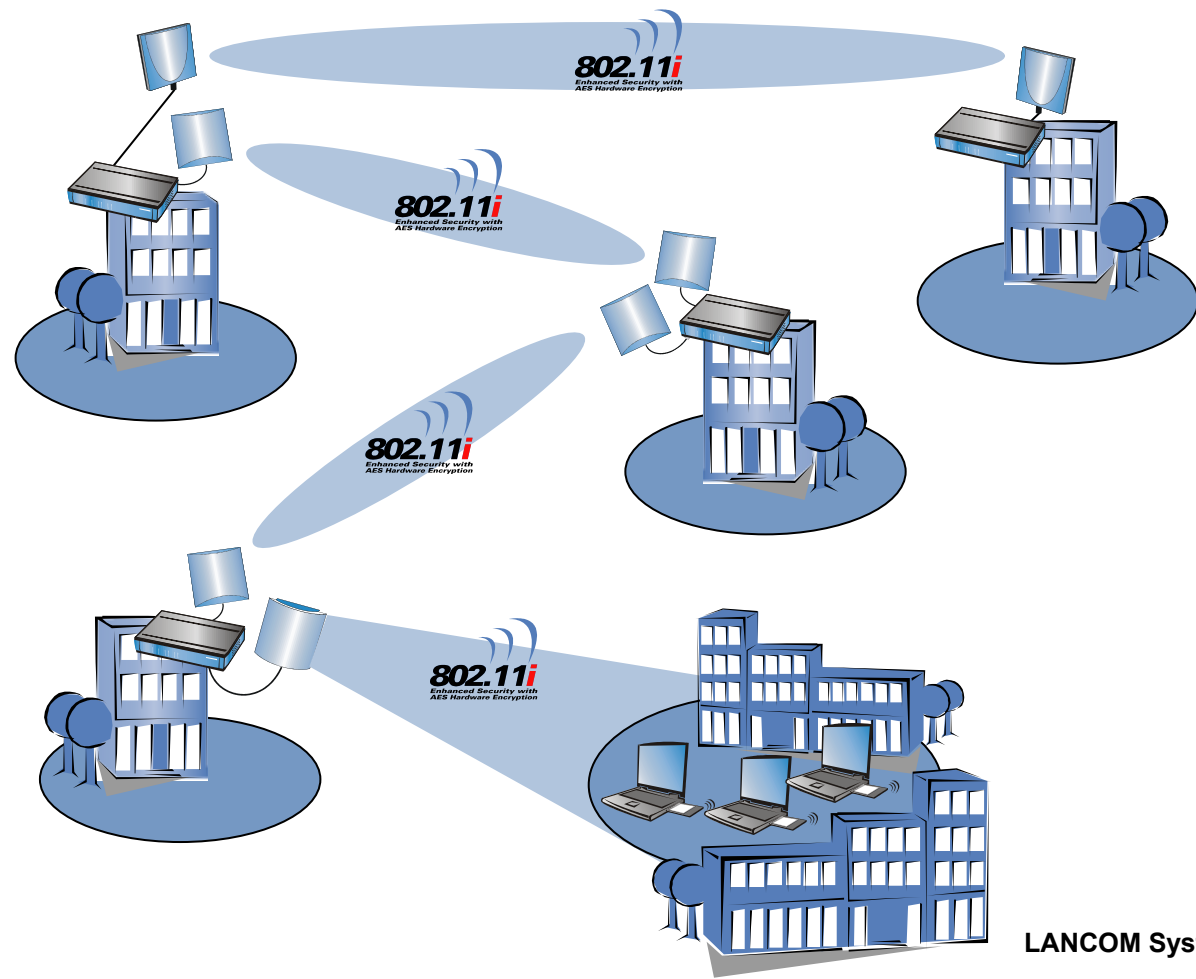
IEEE 802.11i—now also for point to point

Optimal level of security

- ▶ With AES encryption, state-of-the-art as with VPN
- ▶ No more open security loopholes
- ▶ Continuous encryption from the WAN to the client

Easy to set up

- ▶ With passphrase and LEPS
- ▶ Security through regular automatic key change



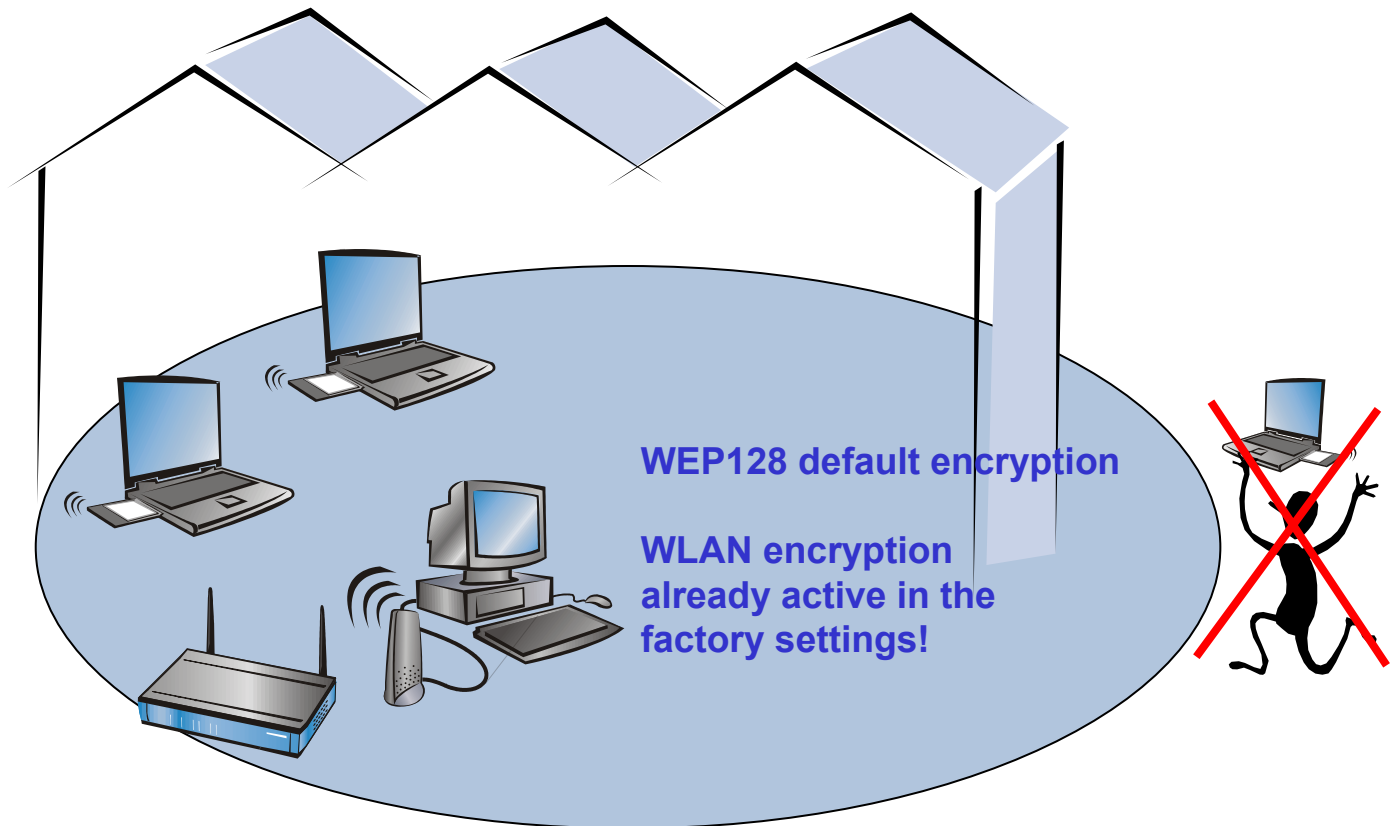
Default WEP for all access points

Encryption as a factory setting

- ▶ WEP128 key
- ▶ WEP key = „L00A057xxxxx“
- ▶ Consists of: “L“ + “MAC address“
- ▶ Active as factory setting or after device reset

Prevents abuse

- ▶ By war drivers
- ▶ No more accidentally open networks



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LCOS 4.00
[LANCOM OPERATING SYSTEM]

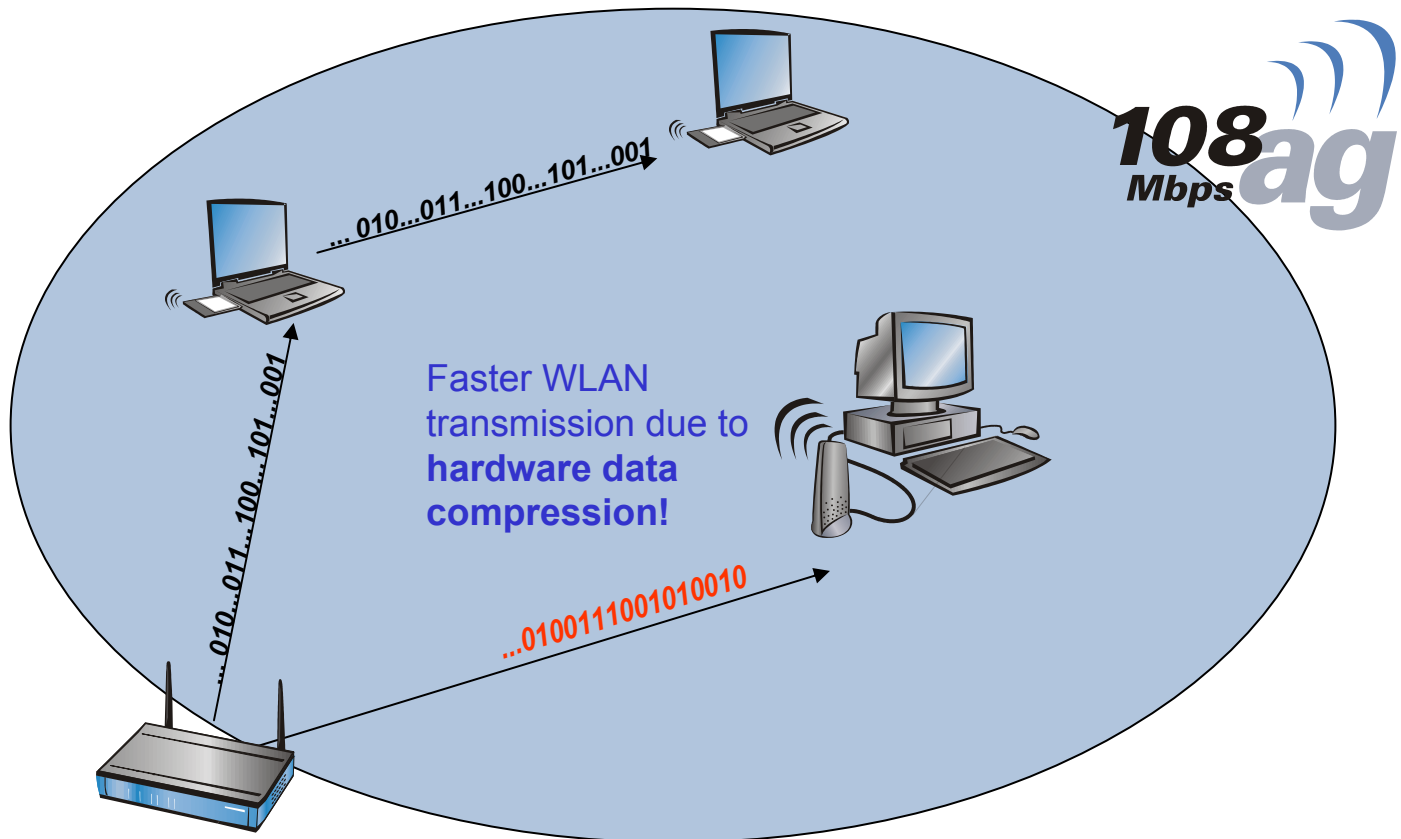
Super A/G with compression

For all AirLancer 54 client adapters

- ▶ Turbo mode
- ▶ Compression
- ▶ Bursting

Higher net throughput

- ▶ Up to 60 Mbps
- ▶ Also for P2P
connections



LANCOM Systems

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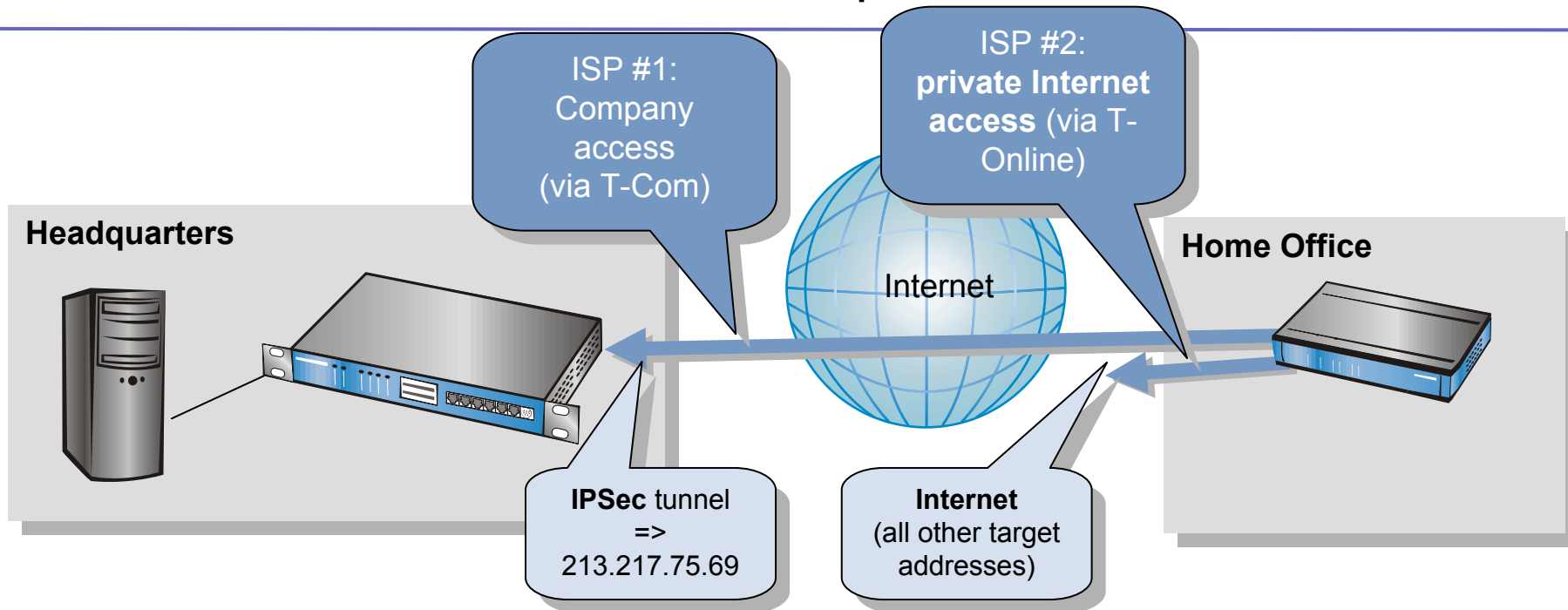
LCOS 4.00
[LANCOM OPERATING SYSTEM]

The new LCOS version 4.00

New router features:

- ▶ Multi-PPPoE
- ▶ Supports redundant VPN gateways
 - ▶ For all devices with VPN
- ▶ Manual MTU definition
- ▶ Port mapping

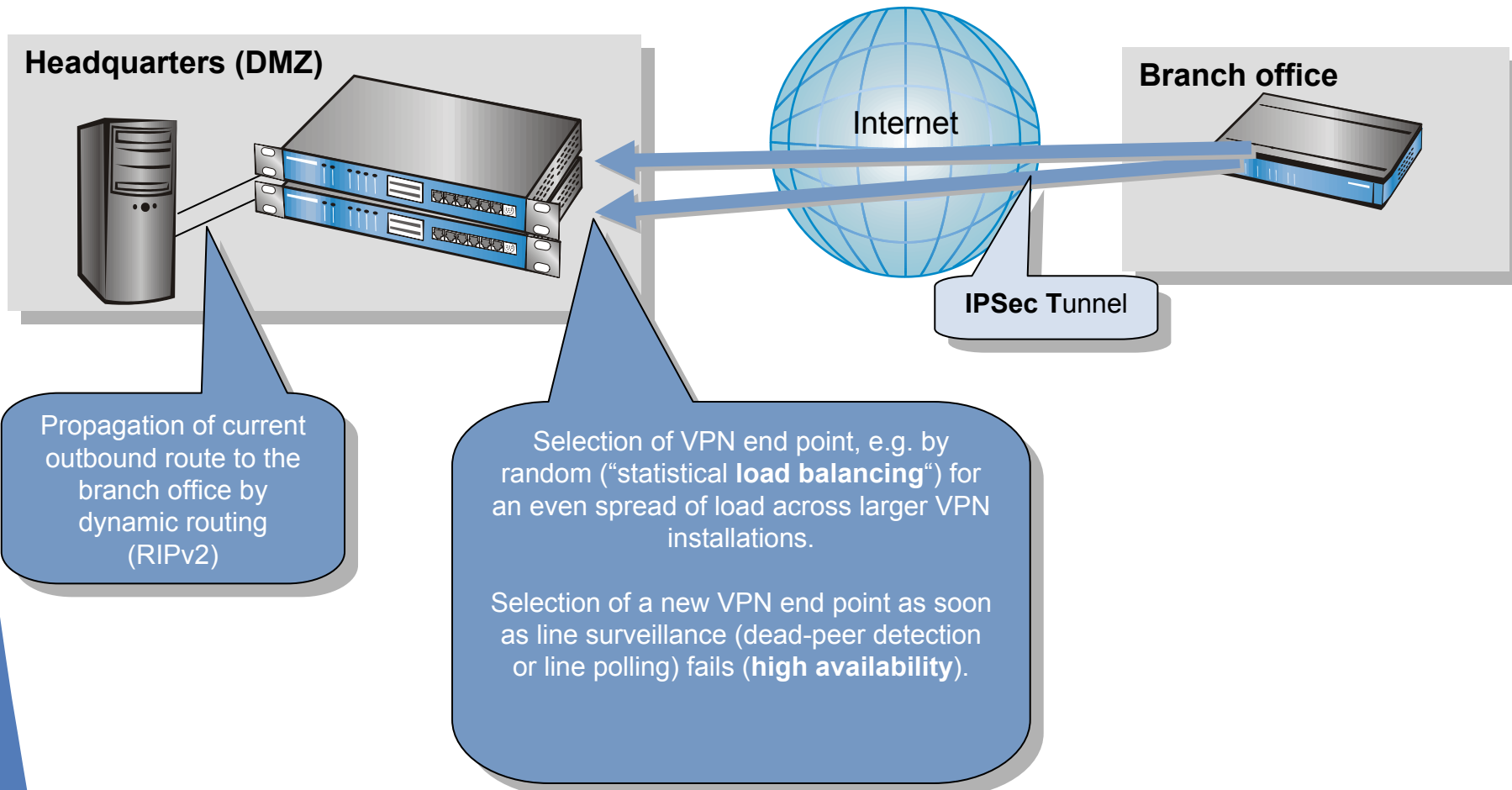
Multi-PPPoE / ISP backup, ISP select



Multiple Internet Service Providers with one DSL connection

- ▶ Keeps private and business Internet access separate
- ▶ For ISP backup

Redundant VPN gateways (1/2)



Redundant VPN gateways (2/2)

Redundant VPN gateways

Supports parallel operation of redundant VPN gateways for large installations.

- ▶ High availability thanks to 8-times redundancy and end-to-end surveillance (dead-peer detection or ICMP polling)
- ▶ Even spread of load by random selection of the VPN end point

Remote Gateway - New Entry

For connection establishment of redundant VPN routes you can assign further destination gateway IP addresses or URLs. Those addresses are used for the referenced connection additional to the one specified in the VPN connections list. All gateways must be configured same according to the referenced VPN

OK
Cancel

Name of connection: LCS

Remote gateway 2: 213.217.69.75

Remote gateway 3: 213.217.69.76

Remote gateway 4: 213.217.69.77

Remote gateway 5:

Remote gateway 6:

Remote gateway 7:

Remote gateway 8:

Remote gateway 9:

BeginWith: Random

Manual MTU definition

Maximum Transmission Unit

Defines the maximum size of unfragmented packets across a connection.

- ▶ Automatic designation of the MTU during the PPP negotiation (e.g. with T-DSL) used until now
- ▶ Should your Internet Service Provider advise you to set a different MTU (typically 1492), you can set the MTU value manually

[Expert Configuration](#)

[Status](#)

[WAN-statistics](#)

MTU-Statistics

Device-name	MTU
LCS	1392
T-ONLINE	1492

[Expert Configuration](#)

[Setup](#)

[WAN-module](#)

MTU-list

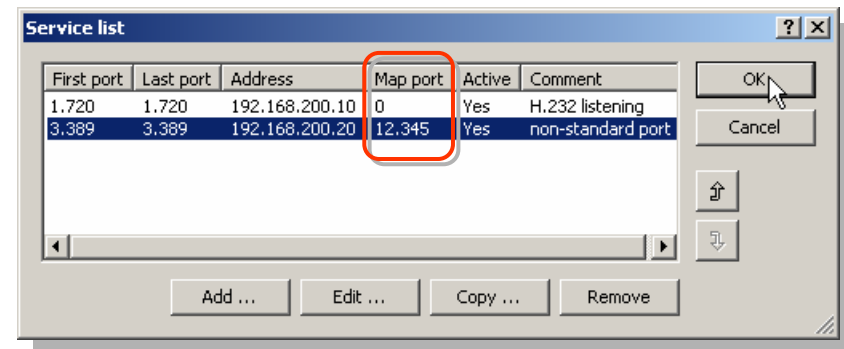
Device-name	MTU
<no entries>	

Port mapping

Port mapping

Translation of port numbers for masked connections.

- ▶ The map port defines the port that incoming connections are to be directed to within the range from start port to end port
- ▶ No change to port number when Map Port = 0 (no change in behavior: Exposure of the defined address with the defined ports; e.g. server in the LAN)



LANCOM Systems

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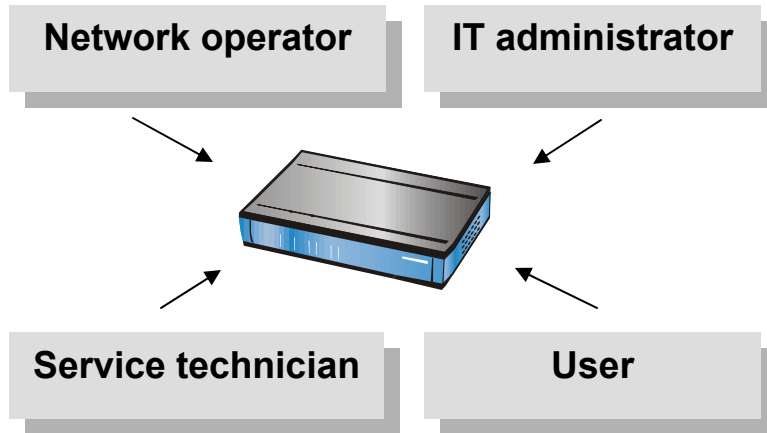
LCOS 4.00
[LANCOM OPERATING SYSTEM]

The new LCOS version 4.00

New management features:

- ▶ Access for multiple administrators
- ▶ Supports SSH protocol
- ▶ Supports loop-back addresses
- ▶ Internal logging

Multiple administrator access (1/2)



The screenshot shows the 'VPN_NHAMEL Configuration' window. A blue speech bubble points to the 'Further Administrators...' button, containing the text: 'Access for multiple administrators, each with individual access rights to the device configuration'. The 'Further Administrators - New Entry' dialog box is open, showing the following fields and options:

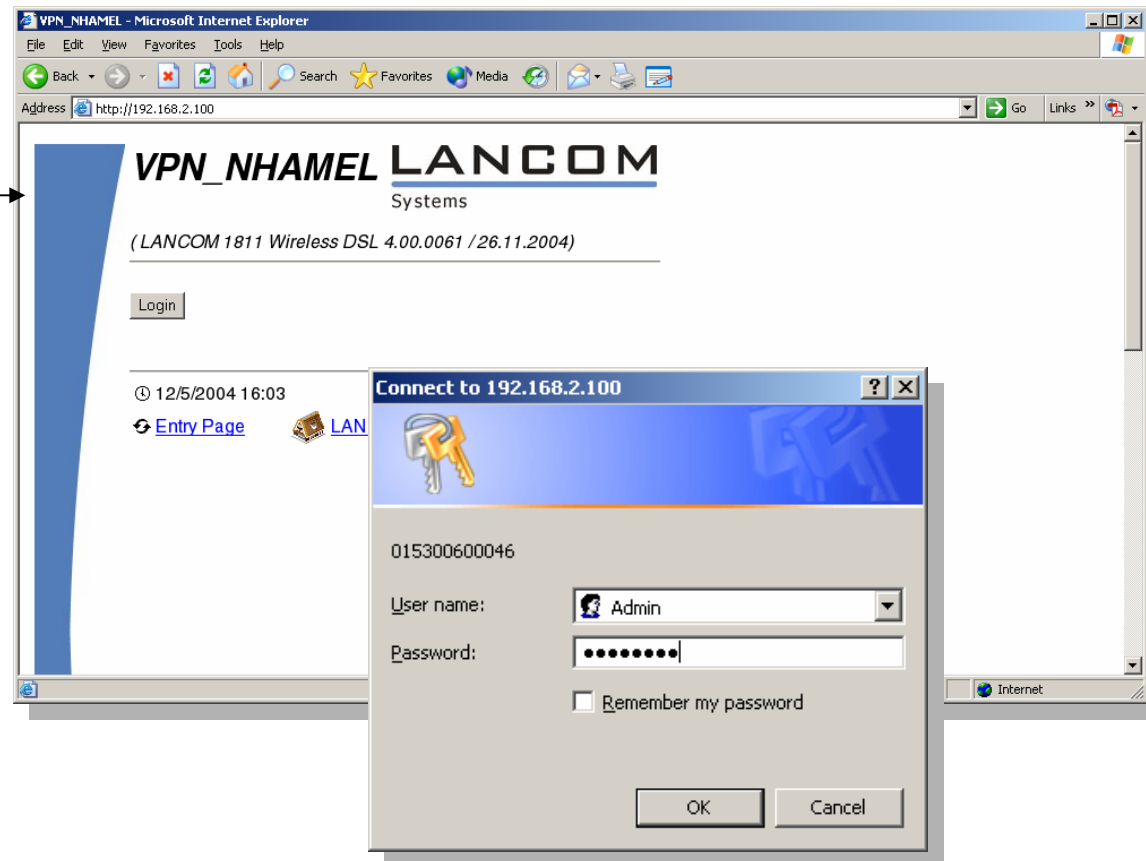
- Administrator: IT-admin
- Password: *****
- Entry active
- Access rights: All (dropdown menu is open showing options: All, Restricted, Read only, None)
- Function Rights for HTTP:
 - Basic Wizard
 - Security Wizard
 - RAS Wizard
 - Provider Selection
 - WLAN Linktest
 - Adjustment of Date and Time
 - Search of further Devices in LAN
 - Internet Wizard
 - LAN-LAN Wizard

Multiple administrator access (2/2)

Multiple administrator access

Multiple administrators can access the device with individual passwords and access rights.

- ▶ Up to 16 different roles
- ▶ New login function under WEBconfig (http/https), SNMP and telnet
- ▶ Previous password remains available for the "Supervisor"



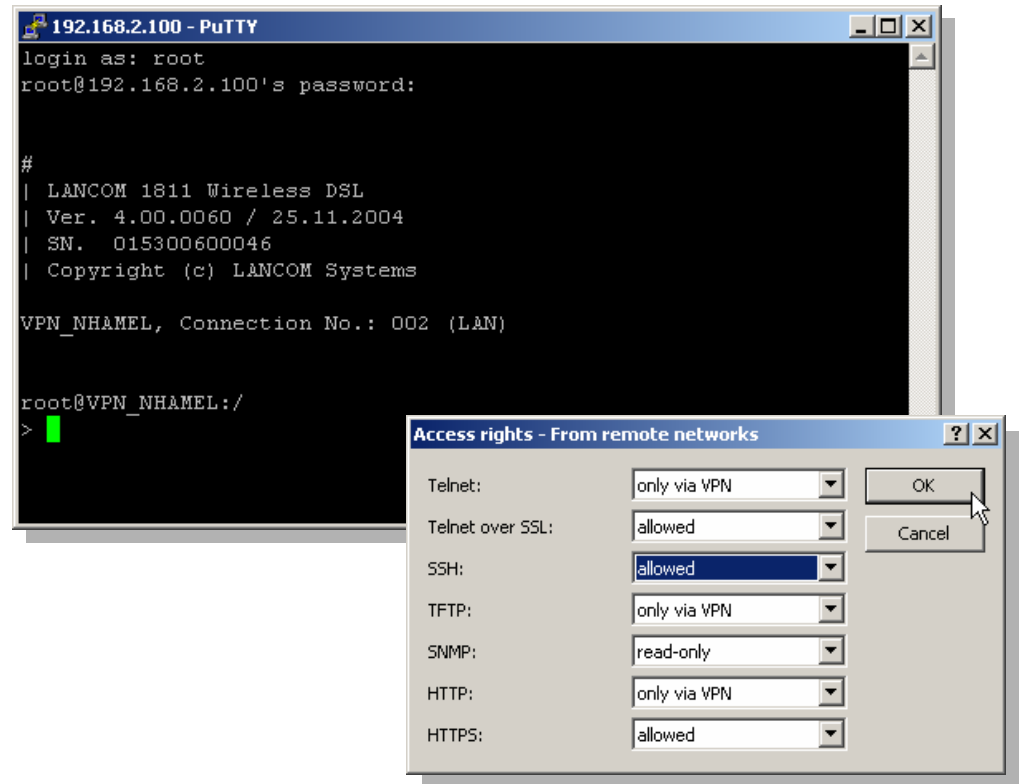
SSH remote configuration

SSH remote configuration

Supports the SSH protocol as an additional encrypted method of accessing the command-line interface.

▶ Secure remote configuration now with SSH clients, too

▶ For example, “PuTTY” is a freely-available “telnet via SSH” client for Windows and Unix platforms



Loop-back addresses

Loop-back addresses

Arbitrary additional IP addresses that can be used to address a LANCOM.

- ▶ For example, to explicitly address individual devices in multiple networks with the same pool of IP addresses
- ▶ Up to 16 additional loop-back addresses can be defined

[Expert Configuration](#)

↳ [Setup](#)

↳ [TCP-IP-module](#)

Loopback-list

Loopback-addr.

Internal logging

Internal logging

Activating the SYSLOG module allows the last 100 events to be logged in the device memory for diagnostic purposes.

- ▶ Diagnosis direct from the device, e.g. if the WAN connection was terminated
- ▶ Buffers the last 100 SYSLOG messages in RAM
- ▶ Selection of particular message types if the local loop-back address is entered as the SYSLOG client (e.g. 127.0.0.1)

Expert Configuration

- Status
- TCP-IP-statistics
- Syslog-Statistics

Last-Messages

Idx.	Time	Source	Level	Message
317	12/5/2004 17:45:07	AUTH		Notice logged out from peer T-ONLINE
318	12/5/2004 17:45:07	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE
319	12/5/2004 17:45:08	LOCAL0	Error	error for peer T-ONLINE: Auth.-rejected
320	12/5/2004 17:45:08	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE
321	12/5/2004 17:45:08	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE
322	12/5/2004 17:45:08	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE
323	12/5/2004 17:45:09	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE
324	12/5/2004 17:45:09	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE
325	12/5/2004 17:45:09	AUTH		Notice logged out from peer T-ONLINE
326	12/5/2004 17:45:09	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE
327	12/5/2004 17:45:10	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE
328	12/5/2004 17:45:10	LOCAL0		Notice Router state: DSL-1 - Disconnecting from T-ONLINE

SYSLOG clients - Edit Entry

IP address: 127.0.0.1

Source

<input checked="" type="checkbox"/> System	<input checked="" type="checkbox"/> Login
<input checked="" type="checkbox"/> System time	<input checked="" type="checkbox"/> Console login
<input checked="" type="checkbox"/> Connections	<input checked="" type="checkbox"/> Accounting
<input checked="" type="checkbox"/> Administration	<input checked="" type="checkbox"/> Router

Priority

<input checked="" type="checkbox"/> Alert	<input checked="" type="checkbox"/> Error
<input checked="" type="checkbox"/> Warning	<input type="checkbox"/> Information
<input type="checkbox"/> Debug	

OK Cancel

The new LCOS version 4.00

New LANtools:

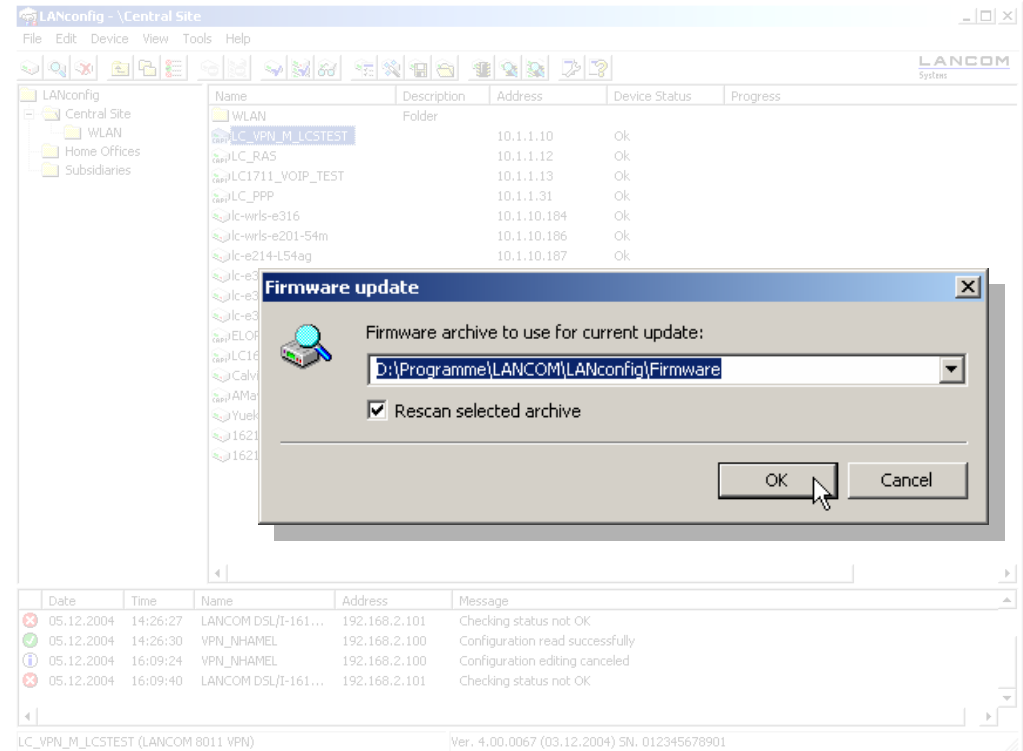
- ▶ LANconfig with firmware version management
 - ▶ Firmware archive
 - ▶ Auto-update function
- ▶ LANmonitor with button bar and window management

Version management (1/2)

Firmware archive with auto-update

Easy version management thanks to firmware archive with update function.

- ▶ Scans all LCOS firmware files (*.upx) in a defined archive (incl. sub-directories)
- ▶ Automatic background process recognizes new firmware files
- ▶ Updates that are specific to individual device types are recognized
- ▶ Update per device or for complete installations (even with different device types)



Version management (2/2)

Firmware archive with auto-update

Easy version management thanks to firmware archive with update function.

► Multiple selection and grouping allow **updates und roll-backs** to be controlled centrally

The screenshot shows the LANconfig application interface. The main window displays a table of devices with columns for Name, Description, Address, Device Status, and Progress. A context menu is open over the 'LANCOM DSL/I-1611 Office' device, with 'Check for Firmware Update' selected. A 'Firmware update' dialog box is overlaid on the main window, showing a list of devices with their current and target firmware versions. The dialog box has 'Update Now' and 'Cancel' buttons.

Name	Description	Address	Device Status	Progress
VPN_NHAMEL	Configure	Enter	00	Ok
LANCOM DSL/I-1611 Office	Setup Wizard	Ctrl+W	01	Ok
	Check	Ctrl+F5		

Configuration Management

Firmware Management

- Check for Firmware Update
- Upload New Firmware Ctrl+U

WEBconfig / Console session

Monitor Device Ctrl+M

Set Date/Time ...

Activate Software Option

Delete Del

Cancel Action

Properties Alt+Enter

1 Version 4.00 of 26.11.2004

Firmware update

For the following devices firmwares were found:

- VPN_NHAMEL: 4.00 (26.11.2004) -> 3.52 (21.09.2004)
- VPN_NHAMEL: 4.00 (26.11.2004) -> 4.00 (25.11.2004)
- VPN_NHAMEL: 4.00 (26.11.2004) -> 4.00 (26.11.2004)
- LANCOM DSL/I-1611 Office: 4.00 (26.11.2004) -> 3.52 (21.09.2004)
- LANCOM DSL/I-1611 Office: 4.00 (26.11.2004) -> 4.00 (26.11.2004)

Update Now

Cancel

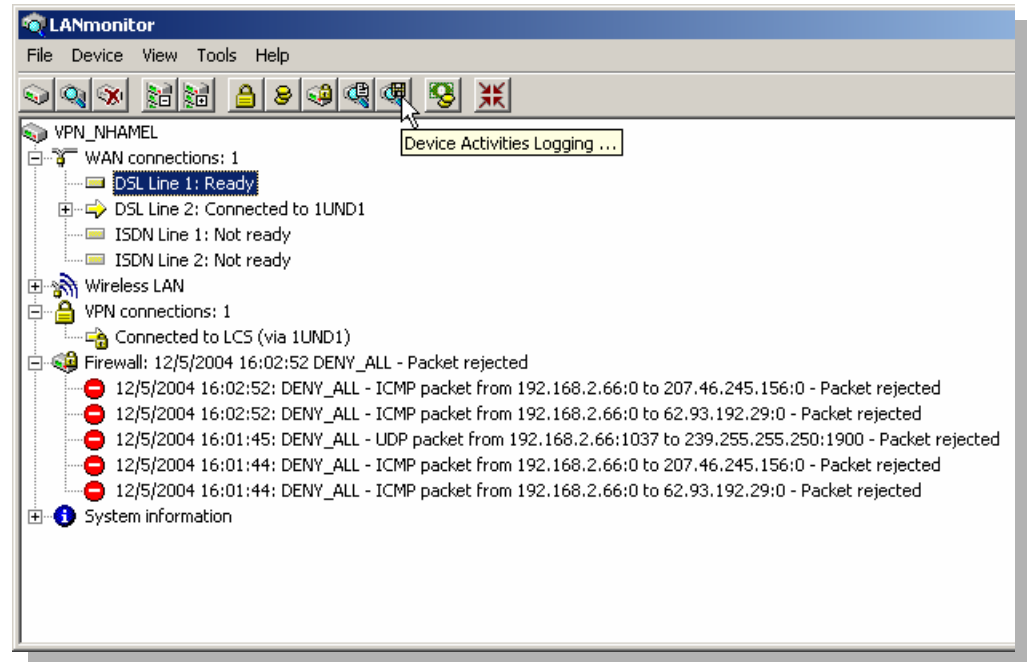
Searches appropriate firmwareupdates for all device(s).

New LANmonitor

Button bar in LANmonitor

Convenient access to all functions

- ▶ Plus: New window and view manager for managing larger pools of devices
- ▶ Reduction / extension of all device views
- ▶ Minimize / restore all protocol windows



LCOS Reference Manual

LANCOM LCOS Reference Manual updated

- ▶ Over 300 pages of background information, practical tips and detailed description of all functions
 - ▶ Available as PDF in the [download area](#) and on the [LANCOM CD](#)



NEU

Now available as a book upon order!

- ▶ Clear presentation in 2-color print
- ▶ Instant access to all themes thanks to index markers

Other changes

VPN: Supports IKE config mode

- ▶ Automatic assignment of local IP addresses
- ▶ For the new LANCOM Advanced VPN Client

The full, **detailed revision history** can be found along with other documentation, LCOS versions and LANtools in the Internet:

- ▶ www.lancom.de/download

Service and Support

We wish you every success with your new LANCOM product!

We look forward to your **praise and criticism, suggestions or questions** to info@lancom.de.

The latest information about Service and Support can be found on our Support flyer, our Internet site or from our **Knowledge Base** under www.lancom.de/support.

If the manual and our current support themes in the Internet are of no help to you, then our **Support Hotline** is available to you in Germany on work days from 9:00 – 17:00h under 0190-764100 (1,24 € / Min.).

Your LANCOM Systems Team

LANCOM

Systems