



■ connecting your business

LCOS 8.84

Feature Notes

LCOS 8.84
[LANCOM OPERATING SYSTEM]

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LANCOM
Systems

LCOS 8.84

Introduction



The LANCOM operating system LCOS and the corresponding management tools (LCMS) **regularly provide free new functions** for current LANCOM routers, access points, and gateways.

Activate the full potential of your WLAN!

The new LANCOM operating system LCOS 8.84 is also the start of our intelligent WLAN optimization concept - **LANCOM Active Radio Control**.

In addition, LCOS 8.84 offers a powerful package for **sending and receiving SMS** via the router, an efficient **data volume management, and fast roaming in controller-based WLAN environments**.

Read on for more of the most important features and improvements summarized in brief.

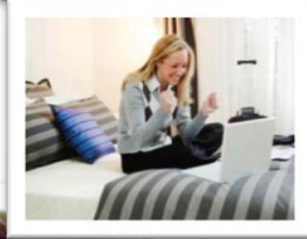
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WLAN optimization concept - LANCOM Active Radio Control

LANCOM Active Radio Control

Activate the full potential of your WLAN

The intelligent WLAN optimization concept
LANCOM Active Radio Control (ARC)
helps you to lastingly enhance the performance of your WLAN



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WLAN optimization concept - LANCOM Active Radio Control

Professional WLAN optimization tools for:



...more WLAN throughput due to less channel overlapping, thanks to the automatic selection of optimal WLAN channels (**RF Optimization**)



...optimized load distribution throughout the WLAN by actively steering clients to the less congested and more powerful 5 GHz frequency band (**Band Steering**)



NEW
in LCOS
8.84

...significantly more data throughput for clients in heavily loaded WLAN environments with many foreign interferences in the radio field (**Adaptive Noise Immunity**)



...efficient WLAN troubleshooting by graphical representation of interferences in the radio field (**Spectral Scan**)



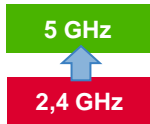
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WLAN optimization concept - LANCOM Active Radio Control



Professional optimization for your WLAN installations

Initial situation: Controller-based network infrastructure



1. **RF Optimization:** For less channel overlapping
2. **Band Steering:** For an optimal load distribution in the WLAN
3. **Adaptive Noise Immunity:** Ignores foreign interferences
4. **Spectral Scan:** Displays interferences in the radio field graphically

- Perfect WLAN user experience
- Significantly better WLAN throughput



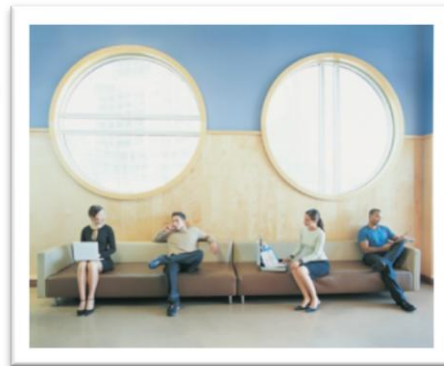
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WLAN optimization concept - LANCOM Active Radio Control



Your advantages:

- Sustainable optimization of the WLAN radio field
- Professional design of WLAN infrastructures
- Significantly increased performance for a perfect WLAN user experience
- Efficient prevention of interferences in the WLAN
- Easy setup via our free LANCOM management systems



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WLAN optimization concept - LANCOM Active Radio Control



LANCOM Active Radio Control is...

■ Powerful.

- Professional optimization of your WLAN installations for a significant increase in performance.

■ Sustainable.

- Long-term improvements of the WLAN radio field for a first-class user experience.

■ Efficient.

- Easy to set up, maximum results.

■ Up-to-date.

- Regularly new updates including new functions and improvements.

■ Free of charge.

- Included in the free LANCOM management systems.



A combination of professional WLAN features that is unique on the market



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The new features

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The new highlight features

Short Message Service

Automatic sending of SMS for Smart Ticket and network events

Design your network processes more efficiently with the sending and receiving of SMS via your 3G/4G router. With this, the SMS transmission of Public Spot credentials via Smart Ticket can be done directly via the router – without an external SMS gateway. Additionally, in case of predefined network events, such as failures, you will be notified via SMS to your mobile phone.



Extended Data Budget Control

Full control over your data traffic

Maintain control over the usage of your data volume – especially of your cellular connections. Per WAN connection (DSL, 3G/4G, VPN tunnel, etc.), you can monitor the quantity of used traffic and have follow appropriate actions at a definable limit.



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The new highlight features

Adaptive Noise Immunity

Better WLAN throughput due to immunity against interferences

With Adaptive Noise Immunity WLAN clients benefit from significantly more data throughput, thanks to a trouble-free WLAN coverage. With Adaptive Noise Immunity the access point dismisses interferences in the radio field and focuses only on WLAN clients with sufficient signal strength.



Rapid Roaming

Fast roaming in controller-based WLAN environments

LANCOM Rapid Roaming (based on the technology Opportunistic Key Caching) enables fast roaming operations between access points for an optimal WLAN user experience. In controller-based WLAN installations with IEEE 802.1X authentication, the access keys of the clients are cached and automatically passed on to all managed access points.



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Highlight features

Adaptive Noise Immunity



**Better WLAN
throughput because
of immunity against
interferences!**



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Highlight features

Adaptive Noise Immunity – Motivation

- Receivers of modern WLAN access points are increasingly sensitive and thus also perceive interferences and data transmissions of other, more distant WLAN networks

➔ Proprietary data is transmitted with delay



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Highlight features

Adaptive Noise Immunity – Functionality

1. Interference detection

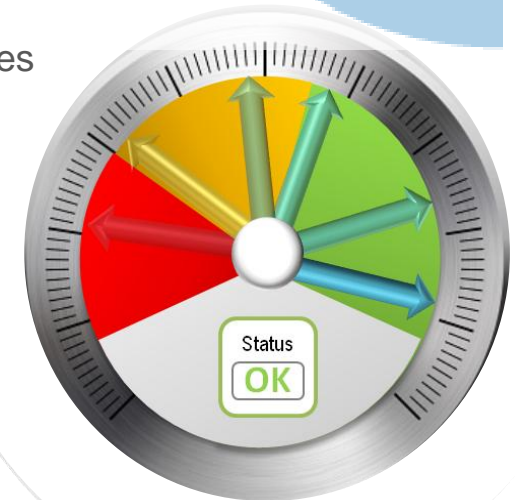
The WLAN module permanently sends measured values, displaying the existence of external sources of interference. LCOS assesses the quality of the radio field based on these values.

2. Reduction of the reception sensitivity

If the interferences exceed a defined threshold, LCOS will slightly reduce the reception sensitivity of the WLAN module. This increases the probability that the WLAN module may ignore interferences while searching for a free transmission slot., due to the CSMA/CD procedure ("Carrier Sense Multiple Access / Collision Avoidance").

3. Adaptive regulation algorithm

As soon as the external interferences fall below the defined threshold, LCOS dynamically increases the reception sensitivity of the WLAN module back to maximum sensitivity.

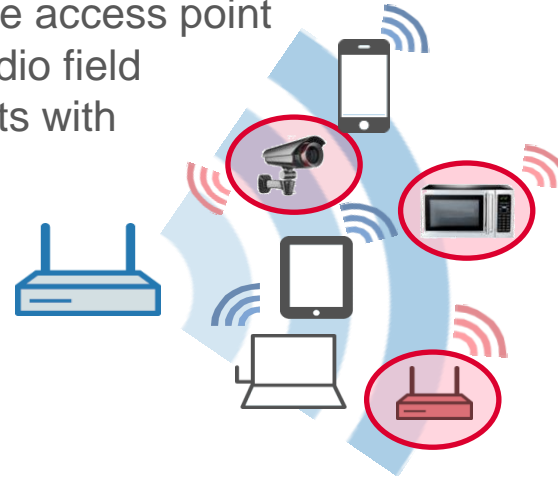


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Highlight features

Adaptive Noise Immunity

- With Adaptive Noise Immunity the access point dismisses interferences in the radio field and focuses only on WLAN clients with sufficient signal strength



Without Adaptive Noise Immunity

```
System information
├── Device: LANCOM L-451agn Wireless
├── Interfaces
│   ├── Transmit power: 18 dBm
│   ├── Noise level: -84
│   └── Channel load: 70 %
```

With Adaptive Noise Immunity

```
System information
├── Device: LANCOM L-451agn Wireless
├── Interfaces
│   ├── Transmit power: 18 dBm
│   ├── Noise level: -84
│   └── Channel load: 26 %
```


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Highlight features

Rapid Roaming

- In controller-based WLAN installations with IEEE 802.1X authentication, due to Opportunistic Key Caching the access keys of the clients are cached and automatically passed on to all managed access points
- No new request to the central RADIUS server required
- **Test construction:**
Speed roaming process **without OKC:** 244 ms; **with OKC:** 30 ms



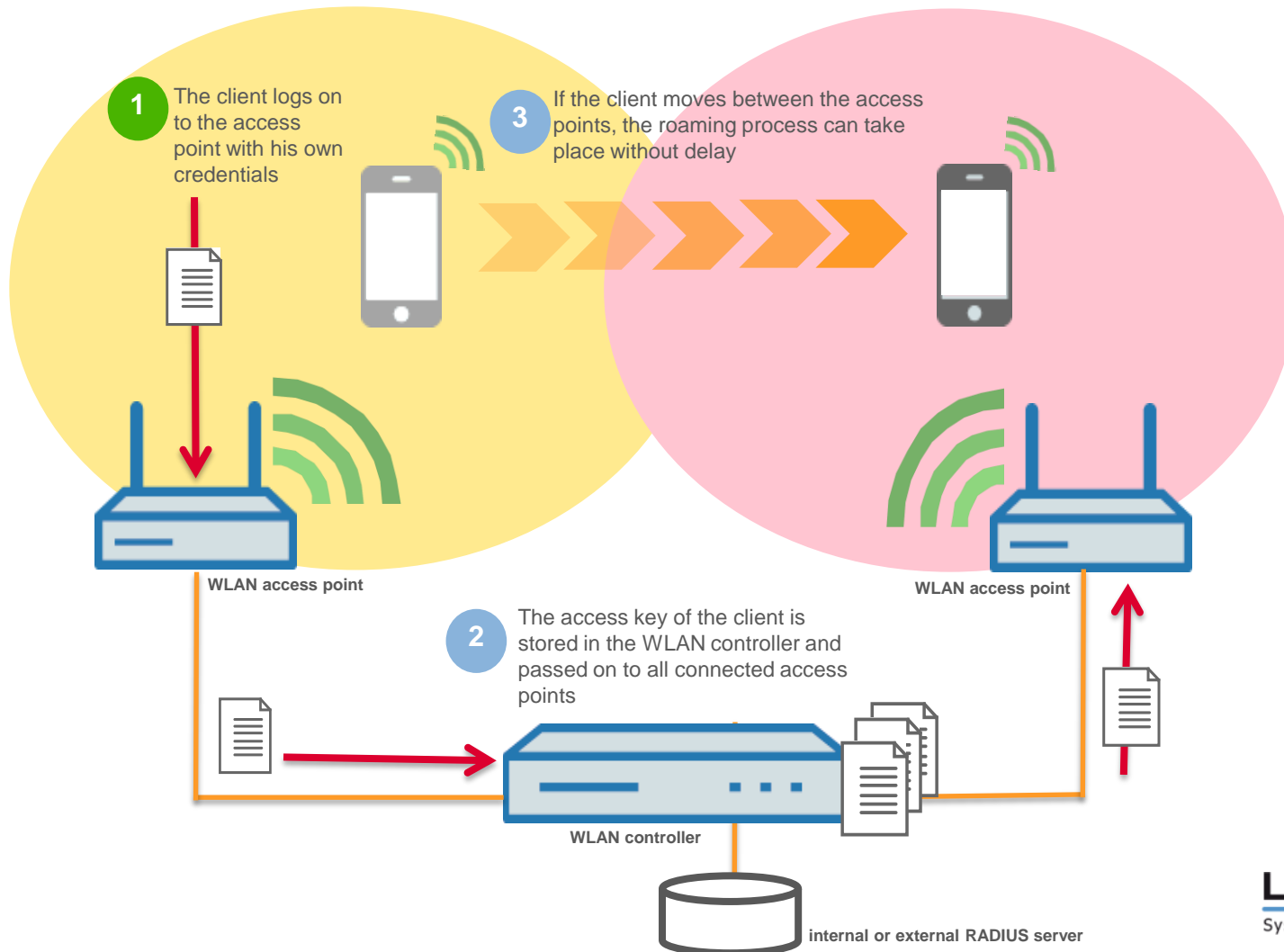
8X faster roaming



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Highlight features

Rapid Roaming based on Opportunistic Key Caching

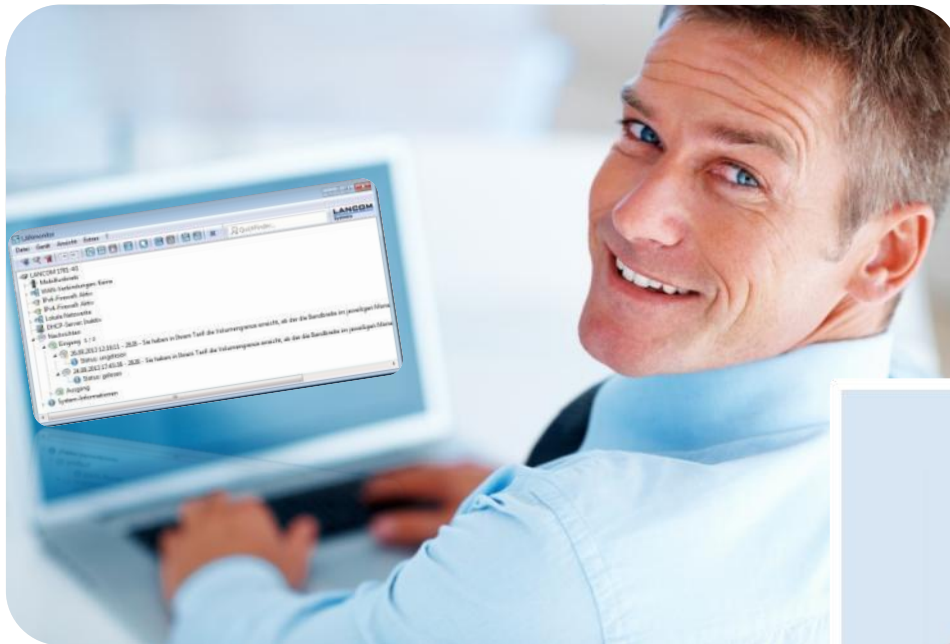


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Highlight features

Short Message Service

Receive and send SMS via your 3G/4G router



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Highlight features

Short Message Service

LANCOM routers receive and send SMS*

Application 1a: Direct transmission of hotspot credentials via SMS

- Perfect extension for LANCOM Smart Ticket functionality due to the automatic sending of hotspot credentials via SMS
- No external e-mail-2-SMS gateways necessary



*) Feature only for devices with integrated 3G/4G modul and valid SIM card with SMS functionality, Suitable for installations with an maximal SMS throughput of 10 per minute.

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Highlight features

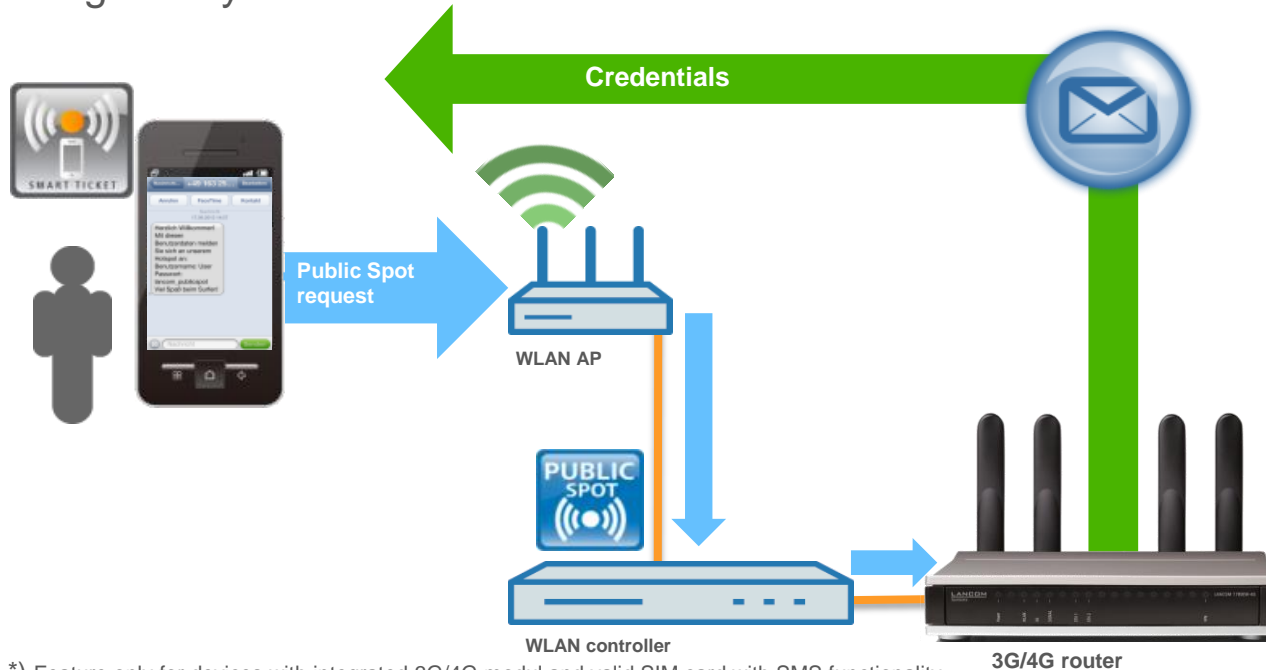
Short Message Service

LANCOM routers receive and send SMS*

Application 1b: SMS transmission of hotspot credentials via 3G/4G router in the network



- Smart Ticket requests will be processed by a WLAN controller as a hotspot gateway and the credentials will be sent via a 3G/4G router in the network



*) Feature only for devices with integrated 3G/4G modul and valid SIM card with SMS functionality, Suitable for installations with an maximal SMS throughput of 10 per minute.

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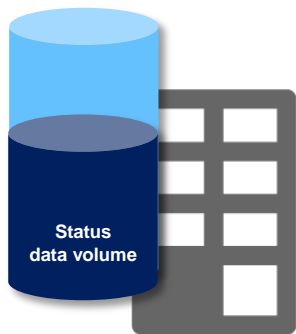
Highlight features

Short Message Service

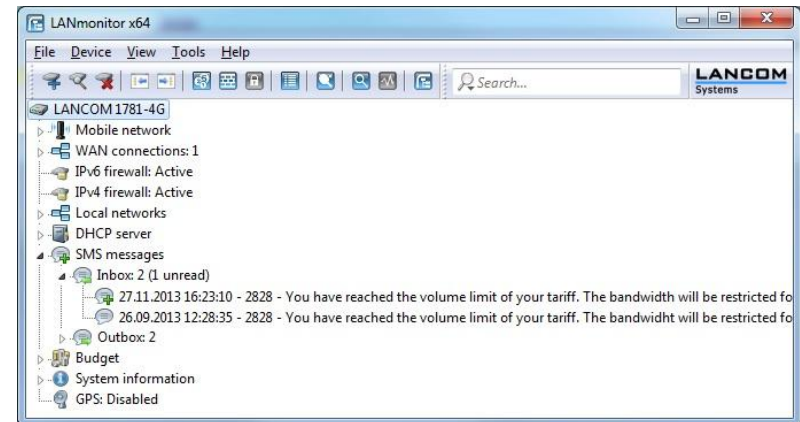
LANCOM routers receive and send SMS*

Application 2: Monitoring via SMS notifications

- The router receives SMS from a provider (e.g. information about the current data volume status)
- Messages can be read out via LANmonitor



Provider



Page 20

*) Feature only for devices with integrated 3G/4G modul and valid SIM card with SMS functionality, Suitable for installations with an maximal SMS throughput of 10 per minute.

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Highlight features

Short Message Service

LANCOM routers receive and send SMS*

Application 3: SMS transmission for network disturbances

- Sending SMS as an action based on the action table in LANconfig, e.g.: SMS for WAN or VPN down



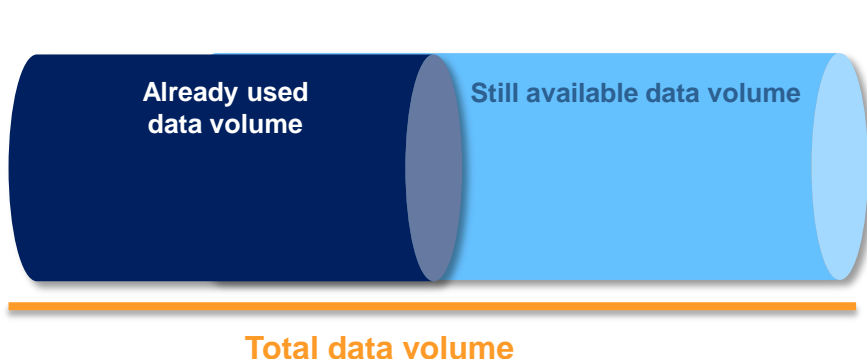
*) Feature only for devices with integrated 3G/4G modul and valid SIM card with SMS functionality, Suitable for installations with an maximal SMS throughput of 10 per minute.

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Highlight features

Data Budget Control

- Per WAN connection (DSL, 3G, VPN tunnel...) the used data volume can be monitored*
- At reaching a configured limit, consecutive actions can be triggered, such as SYSLOG, SNMP trap, e-mail, disconnect
- Additional budget can be activated
- Free networks can be configured, such as IPTV, etc.
- Volumes of the last 12 months will be saved in the archive



Actions are configurable, for example:

- Additional budget can be activated
- Notification of the consumption

*) Applies for: 178x series, 1631E, 831A, Central Site VPN Gateways, L-4xx series, IAP series, OAP-3G, OAP-321(-3G), OAP-322, WLC-4006+

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Further features

Dräger validation

- New: Dräger validation for the following LANCOM devices:



LANCOM L-452agn dual Wireless



LANCOM L-451agn Wireless



LANCOM L-460agn dual Wireless



LANCOM WLC-4100



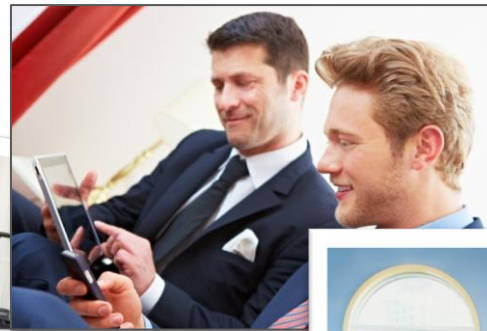
These devices have already been validated by Dräger:
LANCOM WLC 4025+, LANCOM L-320agn, LANCOM L-321agn, LANCOM L-322agn

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Further features

Compatibility with protel

- protel support of the LANCOM Public Spot PMS Accounting Plus option
- Bilateral compatibility confirmation of LANCOM hotspot solutions and protel's property management system (PMS)



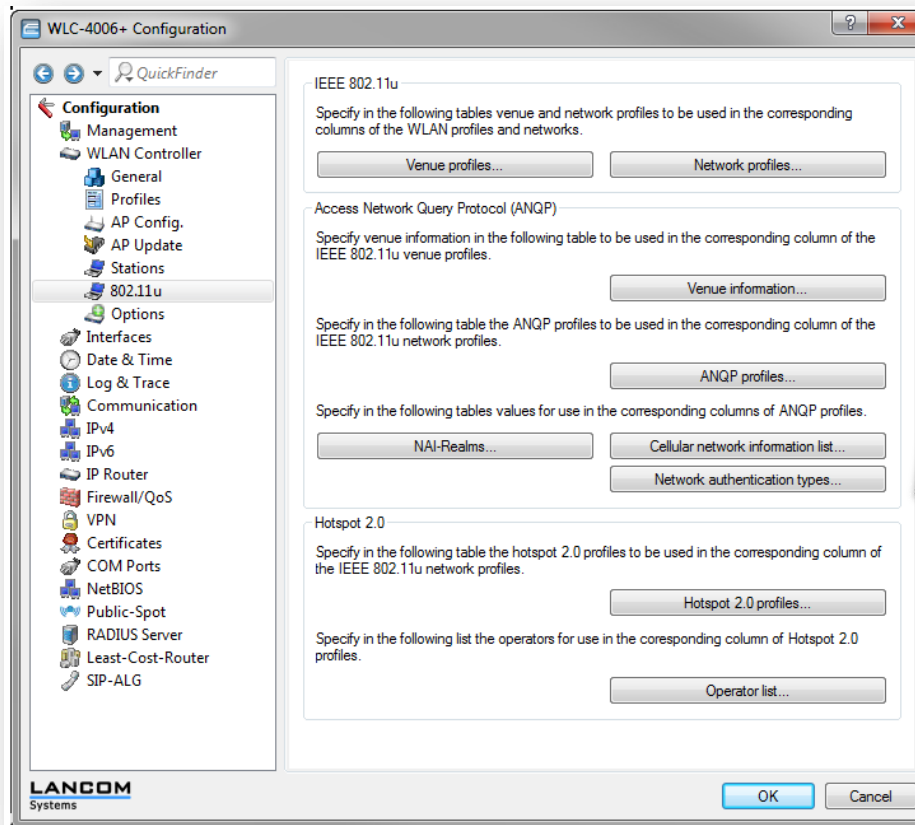
Note:
At the moment, the confirmation is only available in German language

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Further features

WLC support for Hotspot 2.0

- Comfortable management of Hotspot 2.0 functionalities using profiles in the WLAN controller



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Further features

Error page in the Public Spot in case of an inactive WAN connection

- In case of an interrupted Internet access, the Public Spot user is shown an error message



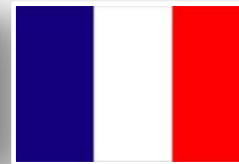
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Further features

Extension of national languages in the LANCOM Public Spot

Welcome your international guests automatically in their own language

- Recognition and presentation of the login page language takes place automatically according to the language of the client's browser
- Available languages:
 - German
 - English
 - **NEW:** French
 - **NEW:** Spanish
 - **NEW:** Italian
 - **NEW:** Dutch



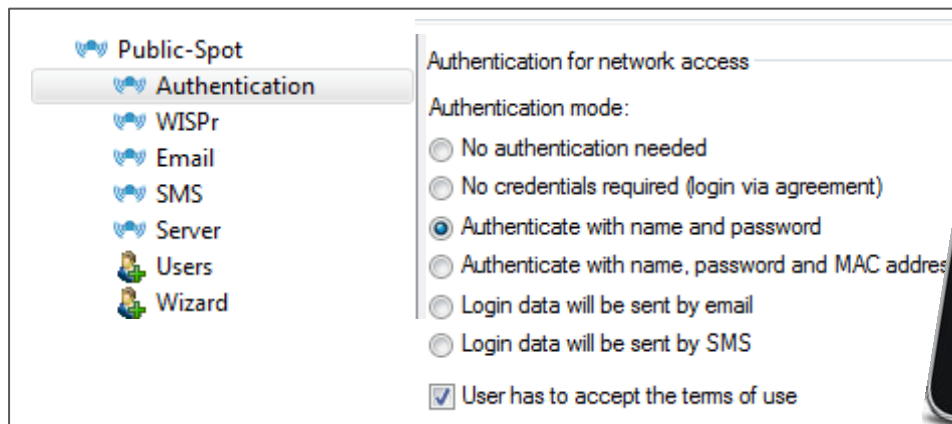
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Further features

Public Spot login via credentials and confirmation of the general terms and conditions

More usability due to the possibility to confirm the general terms and conditions already with the login page

- An additional page with conditions is no longer required
- At login via vouchers (with username and password), the option “User has to accept the terms of use” can be configured

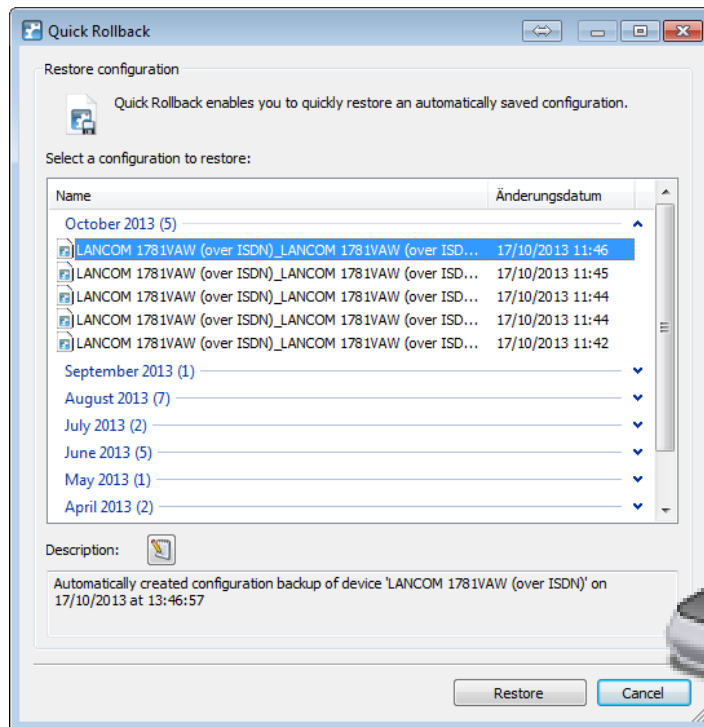


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Further features - LCMS

Quick Config Rollback

- Comfortable rollback to a previous configuration thanks to automatic configuration backup
- Ideal to reverse errors in configuration, for example if the current configuration cannot be implemented into the device



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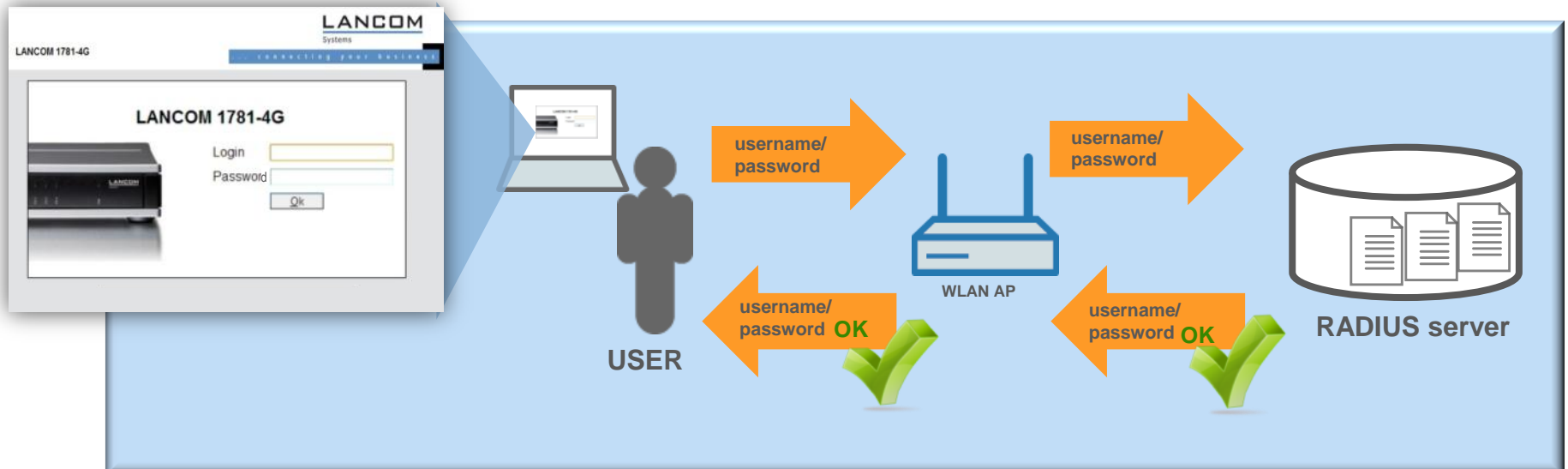
Further features

Login via RADIUS authentication

In addition to
TACACS+

Flexible login to LANCOM devices in the network thanks to a centralized user management in the RADIUS server

- Ideal for installations with several administrators with different access privileges
- Minimization of administrative effort and better integration into existing user databases



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Further features

- **Public Spot bandwidth limitation for layer 3 tunnels**
The available bandwidth for Public Spot users can also be individually configured for hotspot scenarios via layer 3 tunnels
- **Customizable templates for Smart Ticket**
Based on HTML pages, you can create your own registration pages for Smart Ticket in the LANCOM Public Spot
- **Enabling and disabling of individual users in the RADIUS table**
In absence, individual users can be temporarily disabled for network access and re-enabled at any time. Ideal for the Internet access of recurring guests
- **IPv6 address is usable as a script variable**
For the use of dynamic IPv6 addresses, the IPv6 WAN address can set up as a script variable in the LANconfig action table, for example for dynamic DNS services
- **Public Spot logout link**
Via <http://logout> the hotspot user has the possibility to be redirected to the status page to log out there (optional / switchable)

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Further features

- **Support of encrypted e-mails**

For an SSL-based encryption of credentials to an e-mail server, the SMTP client in LCOS supports the authentication methods and protocols "SMTP over TLS", "STARTTLS", and "CRAM-MD5"

- **Improved reliability for sending and receiving DHCP packets**

The robustness of the address reference increases because the access point automatically converts DHCP broadcast responses from an external DHCP server to unicast

- **Setup wizard for VoIP providers**

Setup wizard for a common use of LANCOM routers and cloud-based NFON PBX systems

- **LTE frequency band is set manually**

The use of the LTE frequency bands 800, 900, 1800, 2100, and 2600 MHz can be configured

Thank you

Further information...

You can find more information on our products, solutions and services at:

www.lancom.eu

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