



■ connecting your business

## LCOS 9.10 RC1

Feature Notes

**LCOS** 9.10  
[LANCOM OPERATING SYSTEM]

[www.lancom.de](http://www.lancom.de)

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**LANCOM**  
Systems

# LCOS 9.10 RC1

## The new highlight features



The LANCOM firmware LCOS and the respective managements tools (LCMS) **regularly provide new functionalities** for current LANCOM routers, access points, and gateways – **free of charge**.

### **LANCOM sets a milestone for security!**

LCOS 9.10 is a true **power release** with more than 100 features for **maximum VPN security** as well as a **comfortable management** for networks of any scale!

Benefit from **Smart Certificate** on your LANCOM device for securely encrypted VPN connections due to a comfortable creation of certificates, from **High Availability Clustering** for highly available device groups, as well as **more than 100 further features**.

# LCOS 9.10 RC1

## The new highlight features



### Smart Certificate

#### **LANCOM sets a milestone for security**

Maximum security for VPN accesses: As of now, all users benefit from the user-friendly functionality to create digital certificates - an external certificate authority (CA) is no longer necessary. VPN connections can be set up and securely encrypted with self-produced certificates. This maximum of security is included in all LANCOM central site VPN gateways, WLAN controllers, and all current LANCOM routers with the LANCOM VPN 25 Option.



### High Availability Clustering

#### **Grouping and central management of multiple WLAN controllers and central site VPN gateways**

Group several WLAN controllers or central site VPN gateways to a high-availability cluster! With the LANCOM High Availability Clustering Options you can combine several devices to one cluster. As a consequence, there are many advantages like the central management and convenient configuration alignment (Config Sync) of all cluster devices. This is particularly beneficial for setting up intelligent backup scenarios since only one WLAN controller or central site VPN gateway has to be configured – an enormous time saver for administrators. Furthermore, you benefit from an automatic load balancing and the enrollment of cluster certificates.

# LCOS 9.10 RC1

## The new highlight features



### More than 100 further features

#### More security, more management, more virtualization

Benefit from the many new possibilities to further professionalize your network management: As of LCOS 9.10 you can choose to encrypt your configuration, flexibly connect external networks via GRE tunnel as a “virtual Ethernet cable”, you grant all an equal bandwidth for WLAN users per SSID, or you set up high-performance point-to-point connections via Gigabit wireless LAN with up to 1.3 Gbps.

# LCOS 9.10 RC1

## The new highlight features

### LANCOM Smart Certificate

#### Sounds familiar?

#### The trouble with passwords:

- Only complex passwords are safe passwords
- Complex passwords are hard to remember and are often written down
- Password allocation is often carried out via an unsafe medium (e.g. telephone, e-mail, papers, etc.)

**The users' handling with passwords has an extreme influence on the security!**

#### Worst passwords in 2014\*

- |              |                |
|--------------|----------------|
| 1. 123456    | 9. iloveyou    |
| 2. password  | 10. adobe 123  |
| 3. 12345678  | 11. 123123     |
| 4. qwerty    | 12. sunshine   |
| 5. abc123    | 13. 1234567890 |
| 6. 123456789 | 14. letmein    |
| 7. 111111    | 15. photoshop  |
| 8. 1234567   |                |



Source:

[\\*http://www.m-magazin.net/2014/01/das-sind-die-meistgenutzten-passwoerter-2013-36121.html](http://www.m-magazin.net/2014/01/das-sind-die-meistgenutzten-passwoerter-2013-36121.html)



# LCOS 9.10 RC1

## The new highlight features

### LANCOM Smart Certificate

**The extremely safe alternative**

#### Advantages of digital certificates:

- Due to a key-lock-system certificates are way more secure than passwords (pre-shared keys)
- Certificates can be explicitly allocated per device
- Delivered certificates can be revoked

#### Disadvantages of digital certificates:

- External certificate authority (CA), which provides confidential certificates, is necessary, mostly via third parties
- Very extensive development process and therefore deep know-how of the administrator necessary



# LCOS 9.10 RC1

## The new highlight features

### LANCOM Smart Certificate

**Maximum security for VPN connections!**

**LANCOM provides for the first time:**

- The comfortable generation of digital certificates – without an external certificate authority!

#### **Advantages:**

- VPN connections can be set up and encrypted securely with self-produced digital certificates
- LANCOM allows all users the creation of highly secure certificates in just a few steps

**LANCOM  
sets a true  
milestone in  
the field of  
security!**



# LCOS 9.10 RC1

## The new highlight features

### LANCOM Smart Certificate

#### Maximum security

- With Smart Certificate, the router becomes a certificate authority and can generate and verify digital certificates for identity verification, e.g. for VPN connections
- Integrated in all LANCOM central site VPN gateways, WLAN controllers, and all current LANCOM routers with LANCOM VPN 25 Option



**Note for routers:**  
Only in combination with the  
LANCOM VPN 25 Option

**Quick and easy!**

Highly secure VPN connections  
with digital certificates





# LCOS 9.10 RC1

## The new highlight features

### LANCOM Smart Certificate

- Due to a comfortable certificate wizard, certificates can be manually created by the administrator

- 1 Generate certificate
- 2 Save certificate
- 3 Ready!



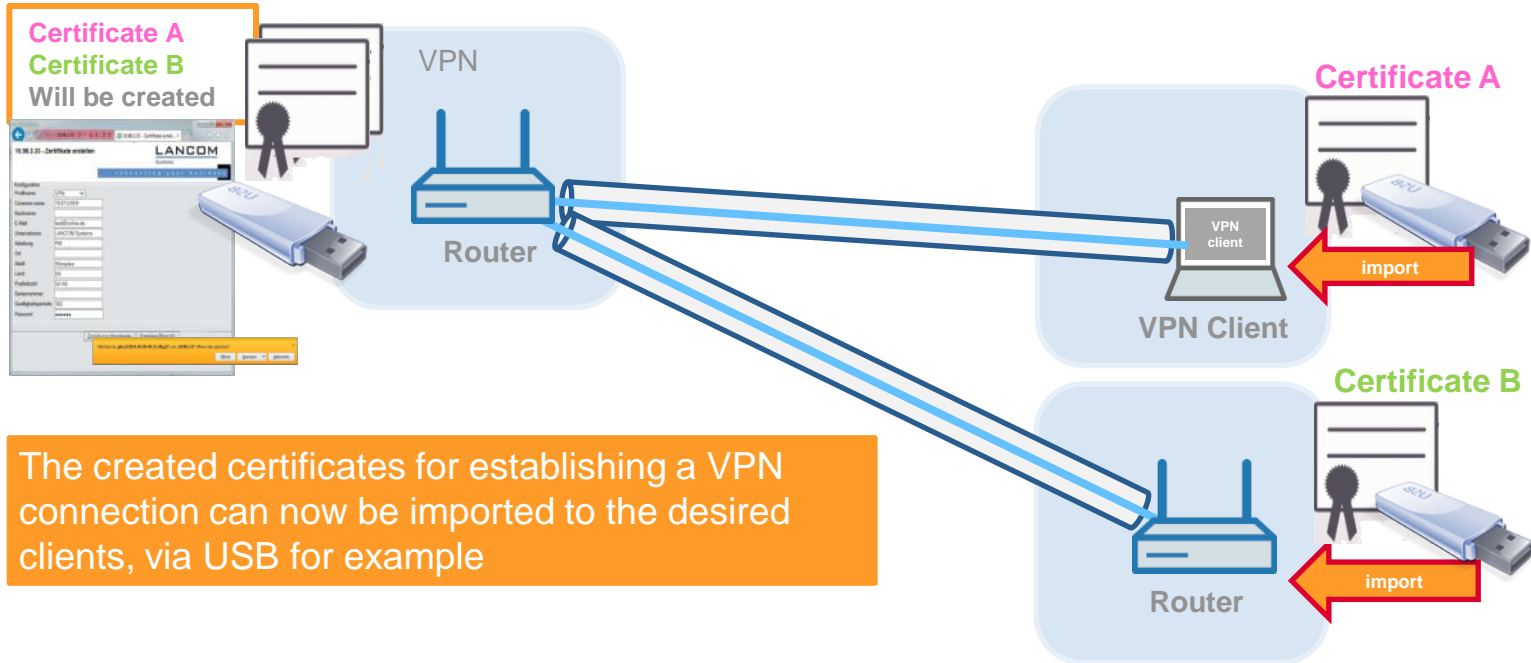
1781x with integrated CA

A screenshot of a web browser showing the '10.98.3.33 - Enroll certificates' page. The page has a header with the LANCOM Systems logo and a tagline 'connecting your business'. Below the header is a 'Config' section with various input fields: Profile-name (VPN), Common-name (TESTUSER), Surname, E-Mail (test@online.com), Organization-name (LANCOM Systems), Organization-unit-name (PM), Locality-name, State-or-province (Wuerselen), Country-name (DE), Postal-code (52146), Serial-number, Validity-period (365), and Password (masked with dots). At the bottom of the form are 'Back to Main-Page' and 'Enroll(Pkcs12)' buttons. Below the form is a yellow dialog box asking 'Do you want to open or save pkcs122014\_10\_28-10\_34\_05.p12 from 10.98.3.33?' with 'Open' and 'Cancel' buttons. A USB drive is shown at the bottom right of the screenshot.

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## The new highlight features

### LANCOM Smart Certificate: Example of use



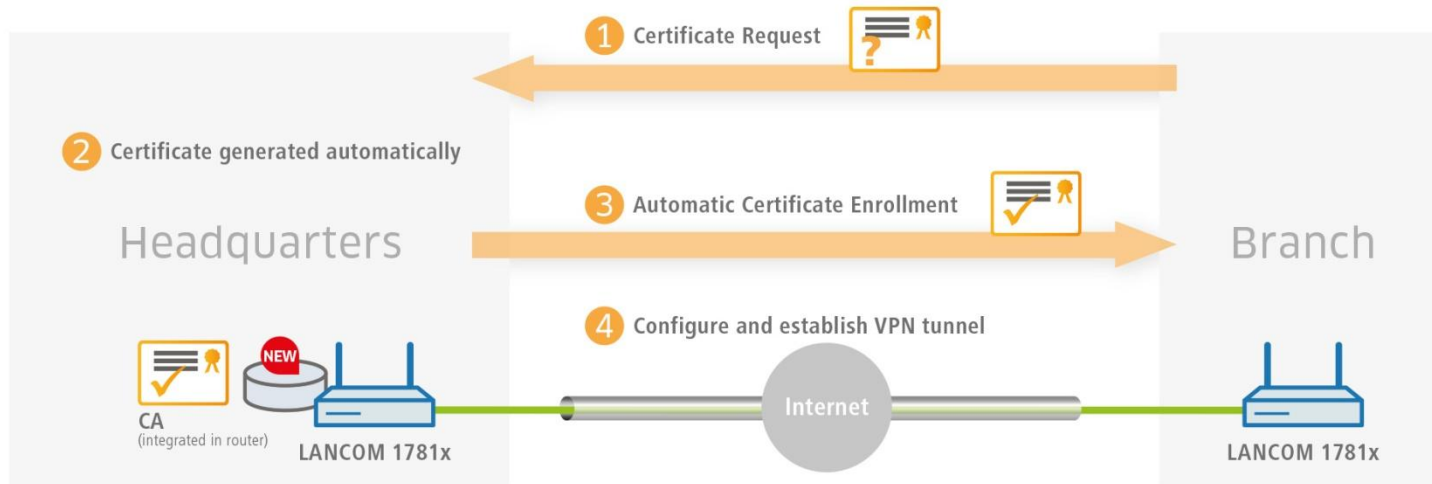
The created certificates for establishing a VPN connection can now be imported to the desired clients, via USB for example

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## The new highlight features

### LANCOM Smart Certificate: Example of use

- Via SCEP (*Simple Certificate Enrollment Protocol*) router certificates can be enrolled automatically, even before a VPN tunnel has been established



# LCOS 9.10 RC1

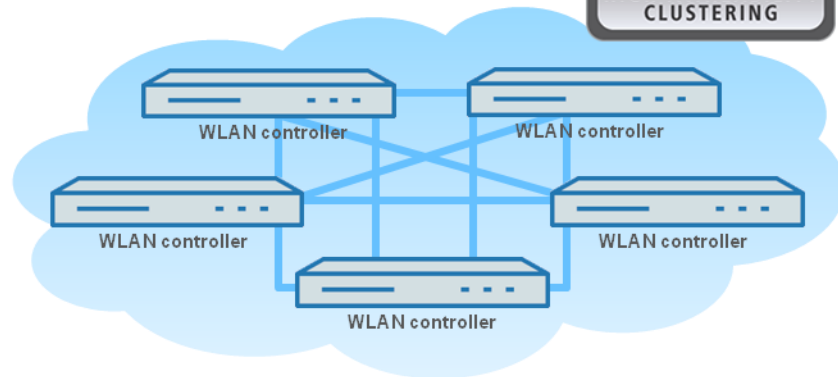
## The new highlight features

### LANCOM High Availability Clustering

- Create a group of several WLAN controllers and central site VPN gateways to a high-availability cluster
- This group can be centrally configured and administered
- **LANCOM High Availability Clustering:** Configuration changes are synchronized automatically (Config Sync)



Administer several WLAN controllers or central site VPN gateways just like one device!




# LCOS 9.10 RC1

## The new highlight features

### LANCOM High Availability Clustering Option

Central management and comfortable configuration  
synchronization of several WLAN controllers or central site VPN gateways

- Comfortable administration of highly available device clusters just like one device – even for cross-site networks
- Enables the grouping of up to 10 WLAN controllers and central site VPN gateways to a high-availability device cluster
- Available as LANCOM WLC High Availability Clustering XL Option and as LANCOM VPN High Availability Clustering XL Option for central site VPN gateways
- As of LCOS version 9.10 RC1: Available as 30 days trial version




**Available for following devices**

**WLAN controller**

- LANCOM WLC-4025+
- LANCOM WLC-4100

**Central site VPN gateways**

- LANCOM VPN 7100+
- LANCOM VPN 9100+



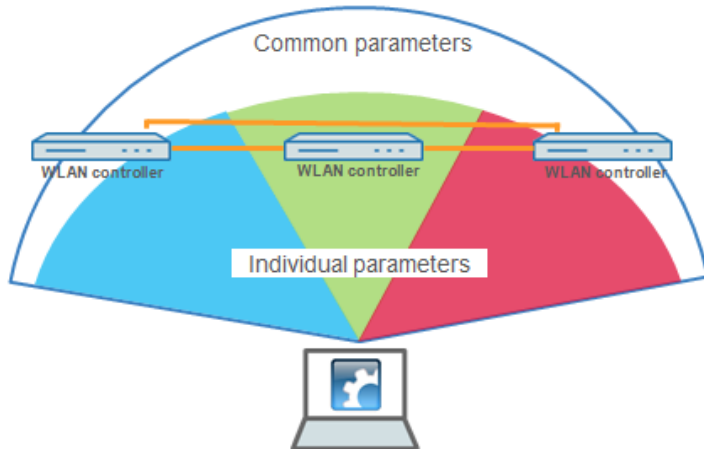
# LCOS 9.10 RC1

## The new highlight features

### LANCOM High Availability Clustering Option

#### Application 1: Config Sync

- Central configuration of WLAN controllers or central site VPN gateways
- Automatic configuration alignment



- 1 Definition of a common cluster configuration
- 2 Configuration of individual parameters (e.g. IP address)

HIGH AVAILABILITY  
**CLUSTERING**





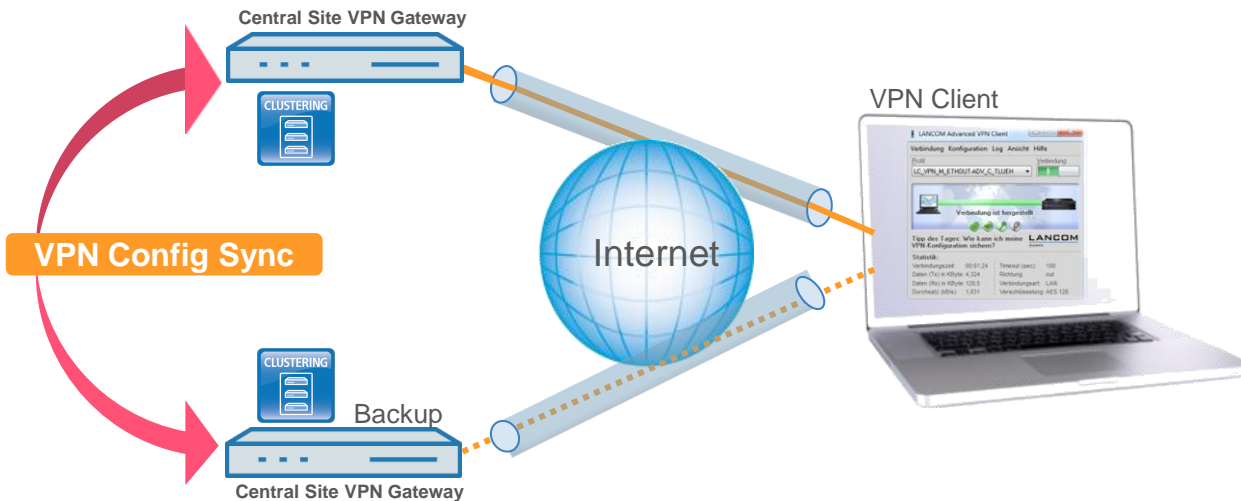
# LCOS 9.10 RC1

## The new highlight features

### LANCOM High Availability Clustering Option

#### Application 1a: VPN Clustering

- Config Sync enables the configuration synchronization of all cluster devices – ideal for high-availability scenarios



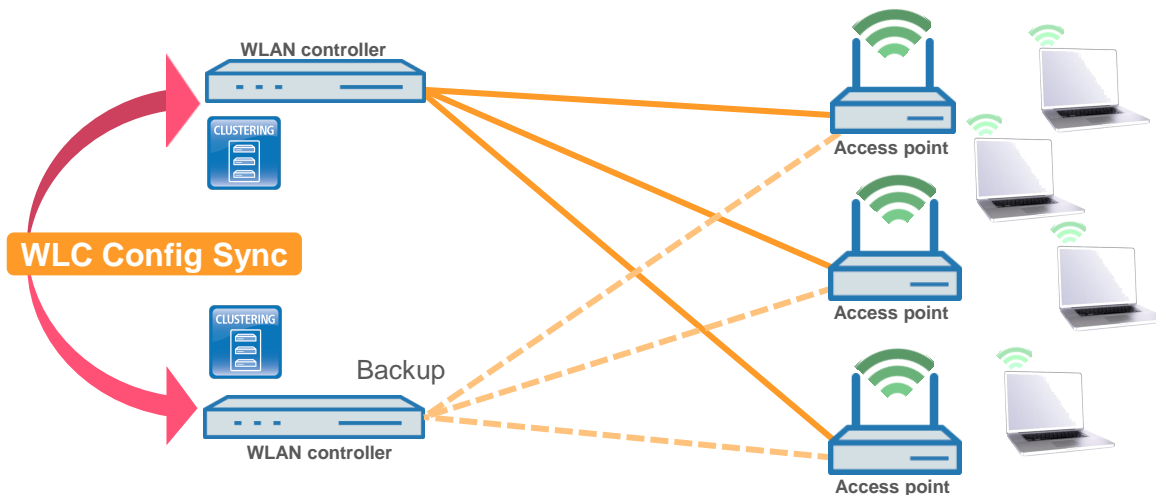
# LCOS 9.10 RC1

## The new highlight features

### LANCOM High Availability Clustering Option

#### Application 1b: WLC Clustering

- Config Sync enables the configuration synchronization of all cluster devices – ideal for high-availability scenarios

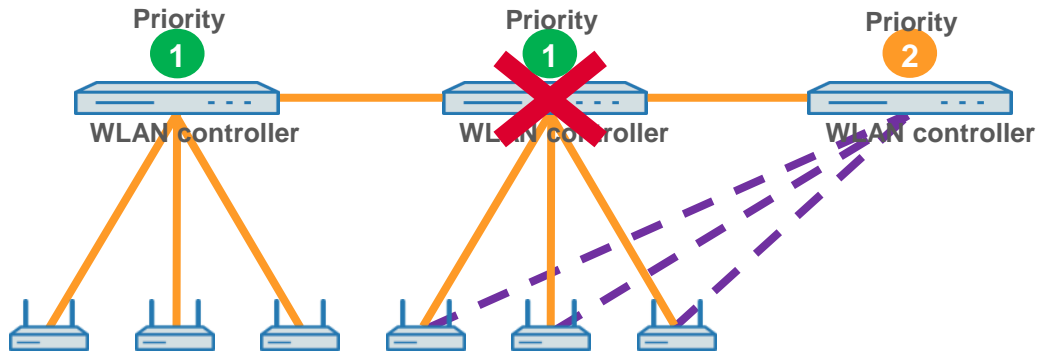


# LCOS 9.10 RC1

## The new highlight features

### LANCOM High Availability Clustering

#### Application 2: WLC Backup



High availability due to  
reliable backups



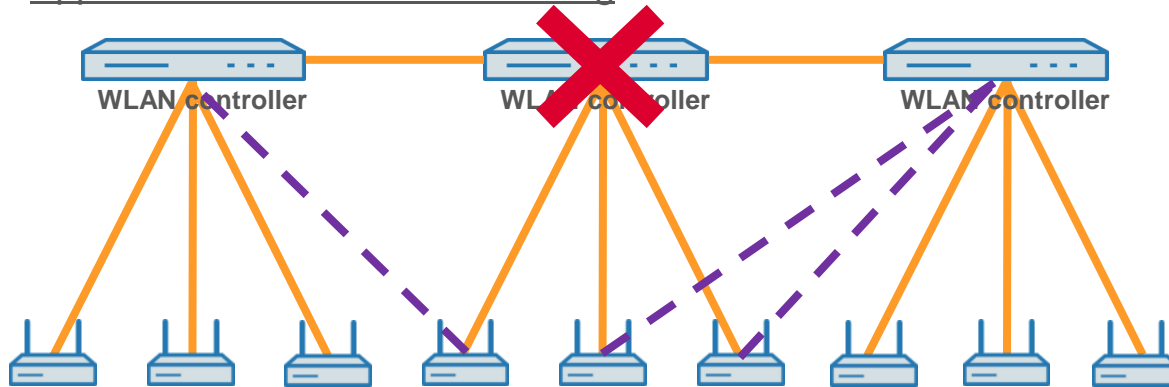
- In case of WLC failure or if the capacity of a higher prioritized WLC is exceeded, access points are automatically distributed to lower prioritized WLCs
- Automatic redistribution to the re-available, higher prioritized WLC

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## The new highlight features

### LANCOM High Availability Clustering

#### Application 3: WLC Load Balancing



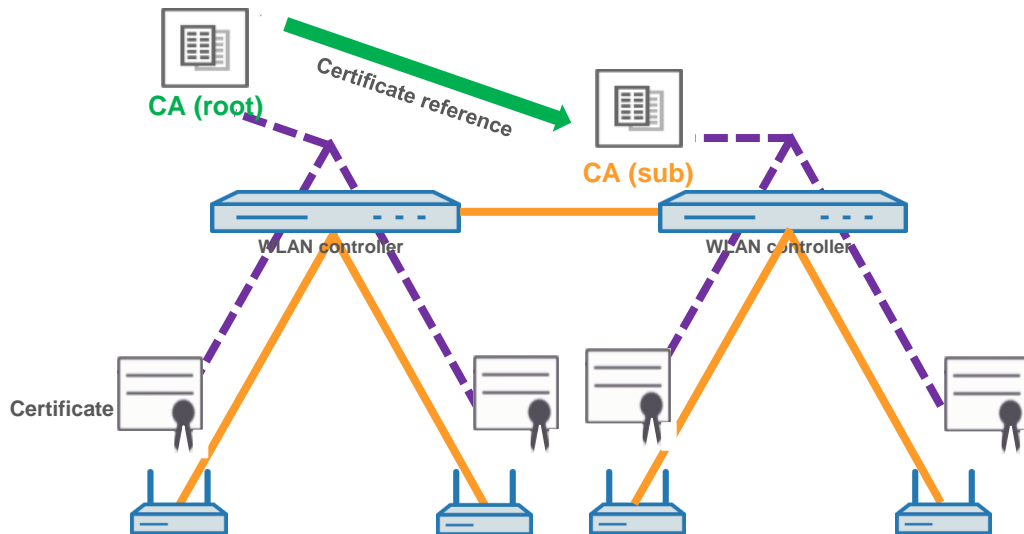
- Optimal load balancing due to an equal distribution of access points to the WLCs
- Equal distribution of access points after failure of one WLC
- Redistribution can be conducted during maintenance periods or during times of little traffic

# LCOS 9.10 RC1

## The new highlight features

### LANCOM High Availability Clustering

#### Application 4a: WLC CA Hierarchization



- Trusted chain between the CAs (Certificate Authorities) on connected WLAN controllers

# The new highlight features

## Application 4b: WLC CA Hierarchization



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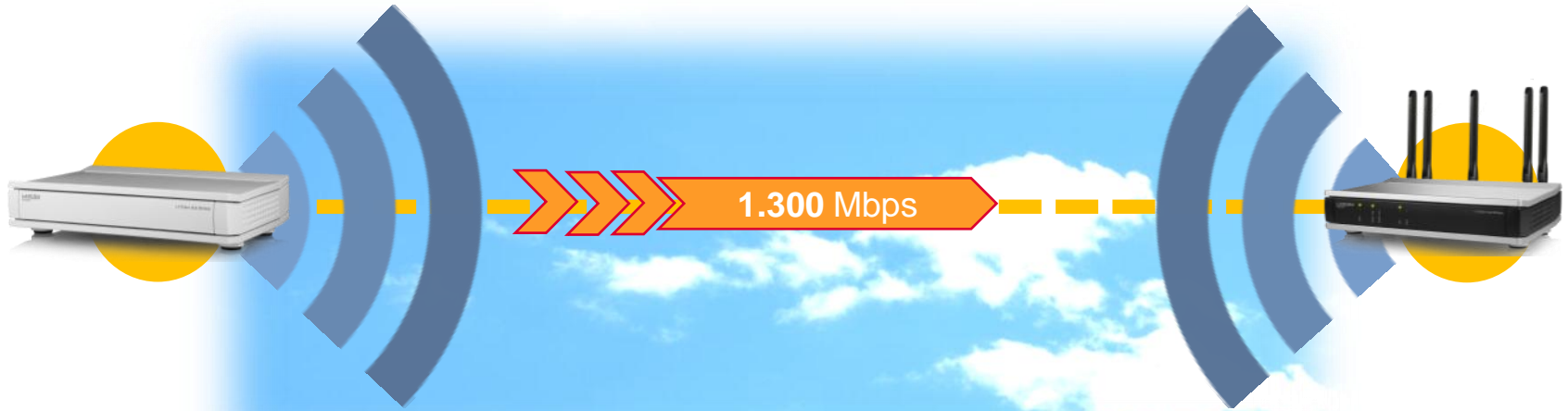


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## Further features

### P2P support and client mode for the L-13xx series

- Point-to-point functionality for the 11ac access points of the L-13xx series for high-performance radio links with up to 1.300 Mbps (up to 6 P2P links with a range of up to 1km)
- Support of client mode



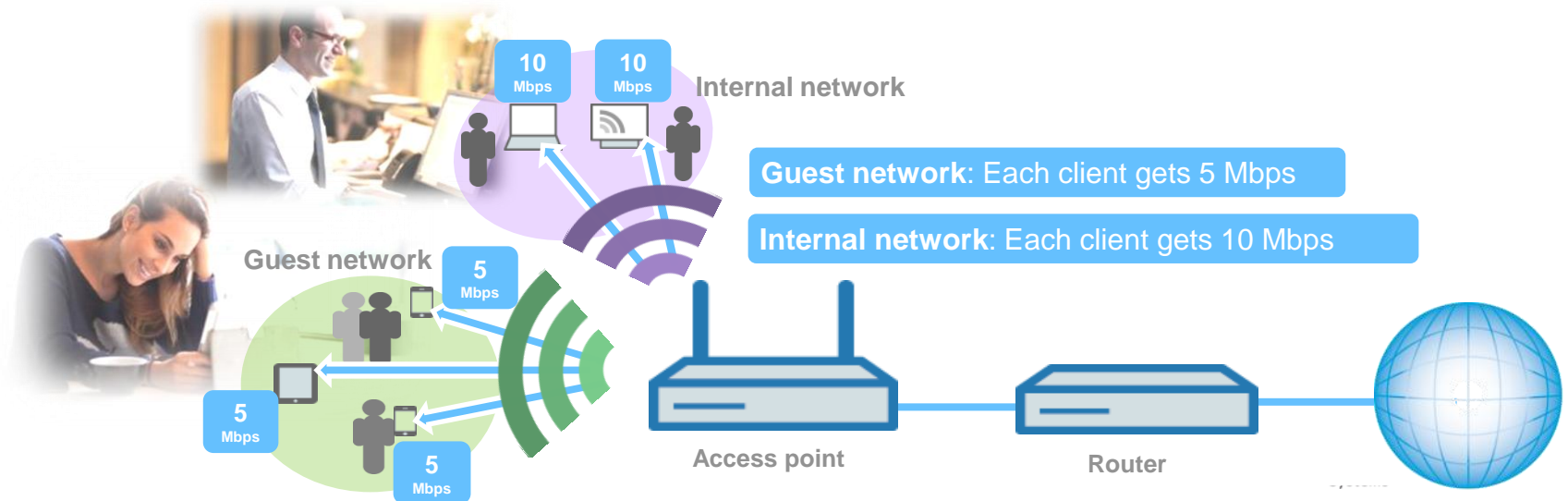
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## Futher features

### Management of client bandwidth per SSID

- The usable bandwidth per SSID (download and upload) can be granted to each client equally
- Advantage: Gain more control over the available bandwidth per WLAN client

Maintain a consistent bandwidth for all wireless users



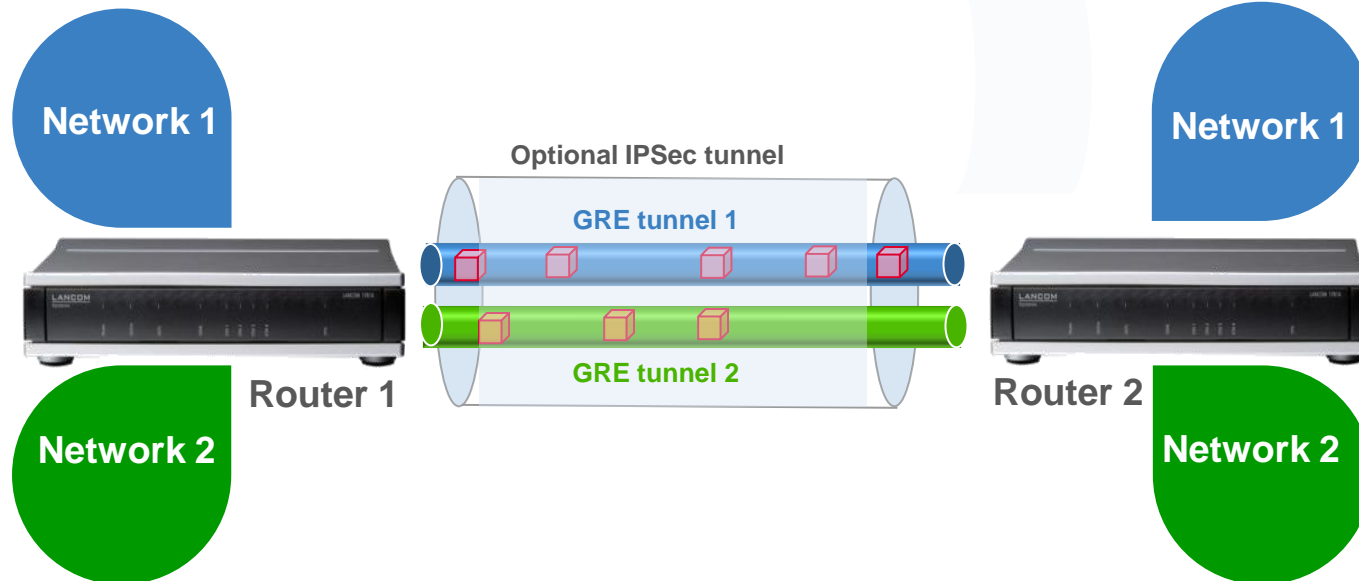
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## Further features

### GRE tunneling

- With Generic Routing Encapsulation (GRE) packages are embedded and transported between two end points via a tunnel
- ➔ Easy and flexible connection of networks

Maximum flexibility for the connection of distant networks

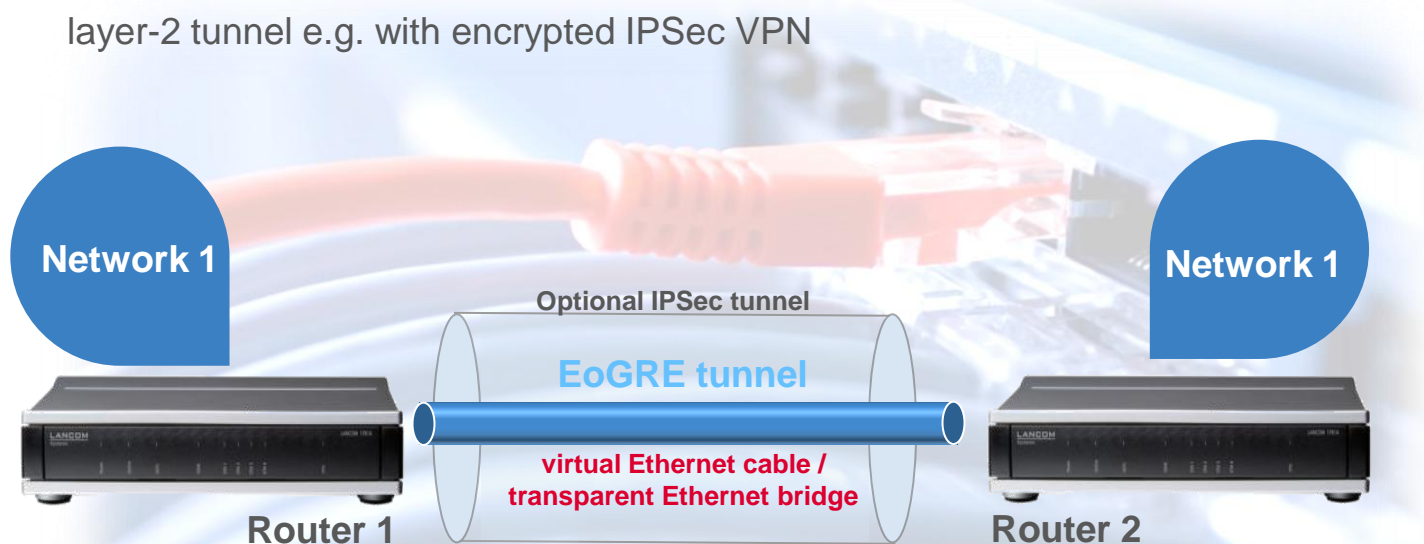


# LCOS 9.10 RC1

## Further features

### Ethernet over GRE tunnel

- The "virtual Ethernet cable" – ideal for the connection of two networks via layer-2 tunnel e.g. with encrypted IPsec VPN

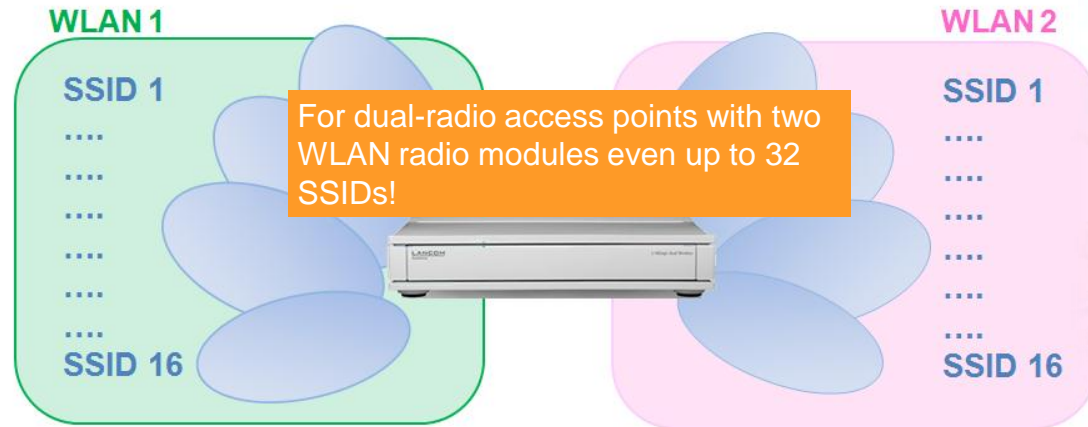


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## Further features

### 16 SSIDs

- As of now, 16 individual SSIDs can be configured per WLAN radio module
- ➔ More simultaneous WLAN services
- ➔ More virtual networks are available



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## Further features

### Display of used Public Spot licenses

- The current and maximum number of Public Spot users is displayed in the LANmonitor with an additional notification at 90 % used capacity.

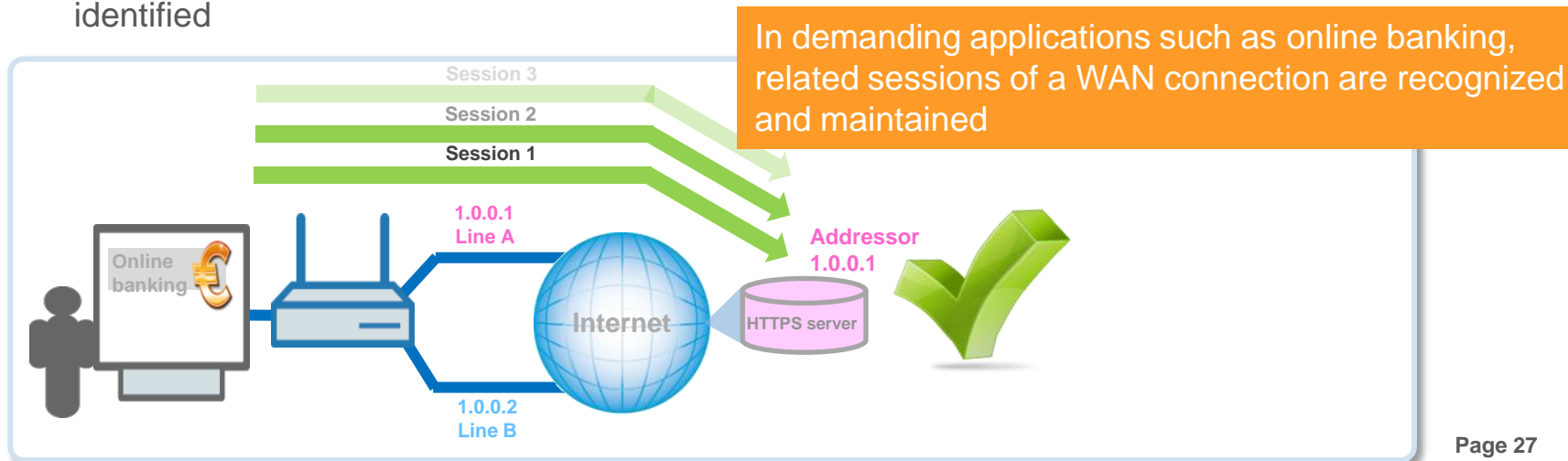


The image is a composite illustrating the 'Public Spot' feature. On the left, a group of four people (three women and one man) are gathered around a table, looking at a tablet. In the center, there is a blue square logo with the text 'PUBLIC SPOT' and a signal icon. Below this logo is a yellow triangular warning sign with a black exclamation mark. To the right of the warning sign is an orange rectangular box with the text '90 % used capacity'. On the right side of the composite is a screenshot of the 'LANmonitor - temporary (1)' software window. The window shows a tree view of system components. The 'Public spot (61/64)' item is highlighted with a blue selection box. Other visible items in the tree include 'Mobile network: Telekom.de', 'WAN connections: 1', 'Wireless LAN', 'Certificates', 'IPv6 firewall: Active', 'IPv4 firewall: 01/03/1900 05:32:37 intruder detection - Packet a', 'Local networks', 'DHCP server: Inactive', 'SMS messages', 'Budget', 'System information', and 'GPS: Disabled'. The LANCOM Systems logo is visible in the top right corner of the software window.



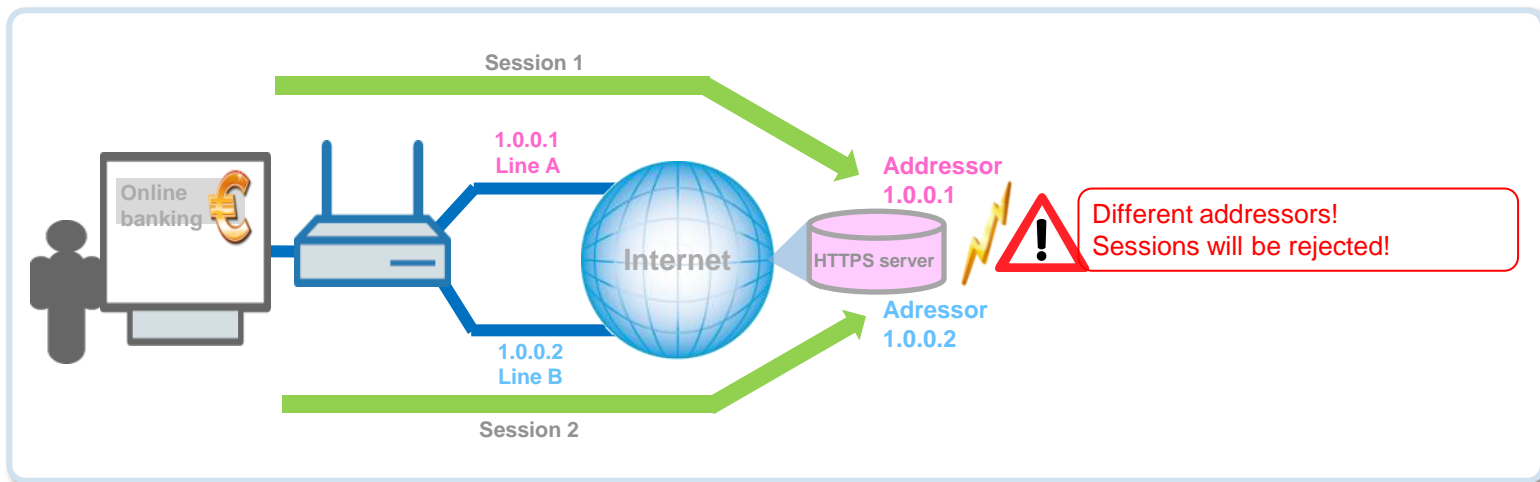
### LANCOM Load Balancer Client Binding

- In load balancing scenarios with several WAN lines, new sessions can be established on the same line
- The web server can assign the sessions to an addressor so the client can be correctly identified



### Without LANCOM Load Balancer Client Binding

- Due to the use of multiple lines, the HTTPS server thinks that it receives requests from different clients
- Consequence: For safety reasons, a new registration is required



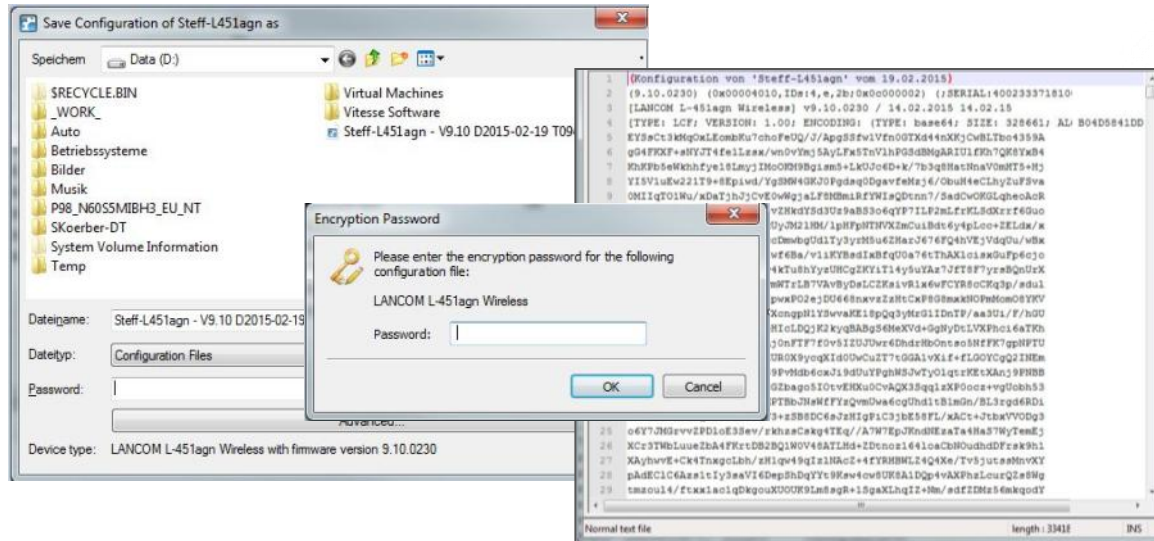
# LCOS 9.10 RC1

## Further features

### Encrypted configuration storage in LANconfig

- In LANconfig you can securely save your configuration data with a password

Do not allow unauthorized persons access to your configuration!



# LCOS 9.10 RC1

## Futher features

- **LANCOM Content Filter e-mail notification**

At Content Filter incidents you can receive a notification via e-mail either immediately or on a daily basis

- **Extended number of characters**

The possible number of characters for assigning device names has been extended to 64

- **New SCEP algorithms**

More security for using certificates: The SCEP algorithms AES192 and AES256 for encryption and SHA256, SHA384, and SHA512 for signature control are supported

- **New DynDNS providers in the setup wizard**

The providers “Strato” and “feste-ip.net” have been added to the DynDNS wizard



# LCOS 9.10 RC1

## Further features

- **Deactivatable WLC configuration assignment**  
More security against rogue APs: The automatic assignment of configurations by a WLAN controller to new access points via a WAN connection can be configured
- **LEDs can be deactivated via WLC**  
The LEDs of administrated WLAN devices can be centrally deactivated via the WLAN controller
- **Monitoring of configuration changes**  
Easy monitoring of configuration changes thanks to the display of hash data, time stamps, and change counters in the status menu



# LCOS 9.10 RC1

## Further features

- **Improved control of Public Spot volume budgets**

As of now, you can set more than 4 GB data volume limit in the Public Spot volume budget and additionally print the defined budget per user on the voucher.

- **Direct access to the voucher generation in the Public Spot**

Vastly simplified access for the generation of Public Spot vouchers due to an automatic forwarding to the respective interface – ideal for untrained staff!

- **TR-069 support**

"Zero-touch management" – in provider environments the protocol TR-069 allows an automatic provisioning and a securely encrypted remote management of a router





# Thank you for your attention!

Further information...

See for more informationen for products, solutions and services at

[www.lancom.eu](http://www.lancom.eu)

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