

LANCOM Release Notes



10.42 RU5

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Table of Contents

1. Preface	2
2. Device-specific compatibility to LCOS 10.42	2
3. Advices regarding LCOS 10.42	2
Information on default settings	2
4. Feature overview LCOS 10.42	3
4.1 Feature highlight 10.42	3
Dynamic Path Selection	3
4.2 Further features 10.42	4
Dynamic DNS Service for the Public Cloud	4
Cloud-managed Hotspot	4
Best quality for digital business applications in large-scale SD-WANs	4
5. History LCOS 10.42	5
LCOS improvements 10.42.0612 RU5	5
LCOS improvements 10.42.0611 RU4	6
LCOS improvements 10.42.0473 RU3	9
LCOS improvements 10.42.0383 RU2	11
LCOS improvements 10.42.0280 RU1	13
LCOS improvements 10.42.0277 Rel	13
LCOS improvements 10.42.0212 RC3	15
LCOS improvements 10.42.0155 RC2	15
LCOS improvements 10.42.0037 RC1	17

6. General advice	18
Disclaimer	18
Backing up the current configuration	18
Using converter firmwares to free up memory	18

1. Preface

The LANCOM family of operating systems—LCOS, LCOS SX, LCOS LX, and LCOS FX—forms the trusted basis for the entire LANCOM range of products. Within the scope of the hardware specified by the products, the latest firmware version is available for all LANCOM products and is offered by LANCOM Systems for download free of charge.

This document describes the innovations within LCOS software release 10.42 RU5, as well as the improvements since the previous version.

Before upgrading the firmware, please pay close attention to chapter 6 “General advice” of this document.

Latest support notes and known issues regarding the current LCOS version can be found in the support area of our website <https://www.lancom-systems.com/service-support/instant-help/common-support-tips/>

2. Device-specific compatibility to LCOS 10.42

LANCOM products regularly receive major firmware releases throughout their lifetime which provide new features and bugfixes.

LCOS release updates including bugfixes and general improvements are available on a regular basis for devices which do not support the latest LCOS version. You can find an overview of the latest supported LCOS version for your device under <https://www.lancom-systems.com/products/firmware/lifecycle-management/product-tables/>

3. Advices regarding LCOS 10.42

Information on default settings

Devices delivered with LCOS 10.00 or higher automatically connect to the LANCOM Management Cloud (LMC). This functionality provides zero-touch installation for new devices. In case you do not want to use the LMC, this feature can be disabled while running the default setup wizard for the initial configuration, or at any time from within LANconfig under Management > LMC. You can manually re-enable the usage of the LMC whenever you want.

4. Feature overview LCOS 10.42

4.1 Feature highlight 10.42

Dynamic Path Selection

With the new highlight feature Dynamic Path Selection, you can route mission-critical business applications in your SD-WAN always over the best quality line. The feature continuously monitors your WAN connections in terms of load, packet loss, latency, or jitter and dynamically decides the best route for specific applications depending on the current connection quality. You can flexibly define the performance policies for the WAN connection according to your application. Thus, you benefit from maximum performance and reliability in large-scale SD-WAN infrastructures with several WAN connections in active/active mode.

4.2 Further features 10.42

Dynamic DNS Service for the Public Cloud

The LANCOM Management Cloud (Public) becomes a DynDNS provider! Simply assign a fixed, self-selected subdomain (mycompany.dyndns-lmc.de) to the gateways implemented there in the sites settings. This subdomain can then be stored in VPN remote stations such as the LANCOM Advanced VPN Client. With the new LCOS 10.42, even gateways with dynamic WAN IP addresses remain accessible at all times via this domain name.

Cloud-managed Hotspot

Create a simple Wi-Fi hotspot with a few clicks – directly from the LMC. No additional gateway or WLAN controller with LANCOM Public Spot Option is required. Intuitive menus provide you with the opportunity to customize your hotspot welcome screen with your logo and corporate colors and integrate important information such as imprint and usage guidelines for your hotspot users. Afterwards you can assign the new hotspot to the respective location and it will be available to your visitors.

Best quality for digital business applications in large-scale SD-WANs

In infrastructures with several WAN connections and business-critical applications, reliable and high-performance connections are essential. With the new LCOS 10.42 feature Dynamic Path Selection, you can now benefit from maximum application performance and fail-safe data communication in your SD-WAN: Thanks to quality-based routing, your data traffic is always steered via the line with the best performance values.

You can find further features within the individual builds sections in chapter 5 “History LCOS 10.42”.

5. History LCOS 10.42

LCOS improvements 10.42.0612 RU5

Bug fixes / improvements

General

- A script upload via HTTPS no longer leads to a watchdog.

LCOS improvements 10.42.0611 RU4

Bug fixes / improvements

General

- An access via LL2M to a device with hashed password failed and was acknowledged with the error message "user unknown on remote system".
- When using certificates with Elliptic Curve Algorithm for RADSEC, TLS negotiation could not be completed successfully.
Furthermore, the private key of a certificate with elliptic curve algorithm could not be uploaded to the RADSEC slot. The import process was aborted with the message "FAILURE".
- Creating a Wireshark trace via LCOSCap on a device with a hashed password failed and was acknowledged with the error message "cannot retrieve PSK".
- The 'Dynamic Path Selection' could not perform the DNS resolution via a loopback address. If a DNS server could only be addressed via a loopback address with a routing tag other than 0, this meant that DNS resolution of the measurement target (e.g. measurement1.cloud.lancom.eu) was not possible. As a result, incomplete data was displayed in the DPS graph in the LMC.
- With the console command 'passwd -n' a password change can be performed without query. The change was not applied to SNMP access, so SNMP access was still possible with the old password.
- When creating a RADIUS user via WEBconfig, the user profile could not be saved if no passphrase was entered there.
- The rollout wizard was not started automatically with an existing rollout user, but you had to explicitly log on to the system as a rollout user for the wizard to start.
- After an update to LCOS 10.42 RU3 it could happen that after a configuration synchronization with the LANCOM Management Cloud (LMC) a firewall rule containing a DNS destination could no longer be edited with LANconfig.
- When using the LOCALNET station object in firewall rules, routes learned via RIP and BGP were assigned to LOCALNET. This could lead to the CPU of the router having a high load due to a very large number of filter rules. Only networks in the 'Connected LAN' status are now assigned to the LOCALNET station object.
- Running an LCOS script when using automatic network selection caused LANCOM devices with 4G module to terminate an existing WWAN connection, even if there was no configuration change to the WWAN connection that required the connection to be restarted.
- If a LANCOM router or access point belonged to an ARF network that had a routing tag other than 0, the LLDP information displayed was not the IP address of the device but its MAC address.
- Due to a misbehavior in the DHCP relay agent of a LANCOM router, it could happen that a network client could not obtain an IP address if the LANCOM router was configured as a DHCP relay.
- When using TACACS+, the configuration could not be saved by a TACACS+ user via LANconfig if the main device password was present as an encrypted hash value.

- If one of the default networks INTRANET or DMZ was not used (IP address 0.0.0.0) and 'Intranet' was selected as 'Network type', this network was treated as active by the router. If a self-created network was assigned the same interface as the default network (e.g. LAN-1), no communication was possible because the packets were discarded by the firewall with the error message "Filter info: packet received from invalid interface LAN-1".

WLAN

- In LCOS 10.42, the transmission channel between access point and ePaper display was not correctly transmitted to the ePaper server, which caused ePaper displays to be displayed as "Not reachable" and no communication between server and display could take place.
- In LCOS 10.42, the ePaper module of the access point could not automatically report to the ePaper server due to a missing 'restart' command in the firmware. As a result, the access point lost the connection to the ePaper server. After restarting the access point, it reconnected to the ePaper server, but later lost the connection again.
- If more than one voucher was created at the same time in the WEBconfig menu 'Setup Wizards / Set up Public Spot Users', the window for printing all created vouchers was not displayed at the end of the creation process.
- In LCOS 10.40 or higher it could happen that certificate-based RADIUS authentication with ECDSA certificates failed. The ECDSA signatures have now been corrected.
- When using the client management in the Wi-Fi, an abrupt restart could sporadically occur when the environment scan was performed.
- For access points and Wi-Fi routers with IEEE 802.11ac Wi-Fi module, the base data rate (management frames) continued to be transmitted at 6 Mbps when the RX/TX transmission rates in the Wi-Fi were fixed at a value greater than 6 Mbps.

VPN

- During the negotiation of an IKEv2 connection, the establishing router (VPN initiator) always sent the 'MANAGEMENT_IP4_ADDRESS' parameter of the 'Dynamic Path Selection' feature, even if this was not active. If this feature was not supported by the accepting router (VPN responder), this could result in the VPN connection not being established.

VoIP

- If a VoIP client sent the parameter 'rtcp-rsize' with an outgoing call, the LANCOM router recognized this parameter as 'Invalid' and rejected the 'Invite' with the message "406 SDP - not acceptable". As a result, the outgoing call did not go through.
- With an incoming ISDN call it could happen that the external caller could not hear the called party (one-way voice transmission) because the 'Media Attribute (a): nortpproxy:yes' prevented the transmission of RTP data.
- Forwarding an incoming external call from a SIP subscriber to an analog subscriber resulted in an immediate restart of the router.
- It could happen that phone calls were not transmitted via the SIP-ALG because the external port was declared as invalid by the router. The packets were then rejected with the error message "ICMP Destination unreachable (Port unreachable)".

Furthermore, the bandwidth reservation in SIP-ALG did not work anymore.

- The functions 'Consultation' and 'Switching' did not work, because the router did not send SDP information in the "200 OK" after the Re-INVITE.
- In a scenario with a Swyx Mediabridge a REFER with the actual destination of the call is sent in the 'Refer-To' header after call setup. Then the router sends an INVITE to this 'Refer-To' destination via the Swyx PBX. In case of an error the Swyx PBX did not answer with a "200 OK" but with the error message "500 Server Internal Error". In this case the router tried to send the INVITE on another line. But since the replace information from the REFER was still used for this, the router sent the INVITE again via the gateway line to the Swyx PBX.

An INVITE is no longer sent on a gateway line after the error message "500 Server Internal Error" has been received on this line. Furthermore the router waits for a "BYE" from the Swyx PBX and then terminates the call setup. If no "BYE" is received from the Swyx PBX, the router sends the "BYE" and terminates the call setup.

LCOS improvements 10.42.0473 RU3

Bug fixes / improvements

General

- If H.323 is enabled in the configuration (default setting), this is disabled after an upgrade to LCOS 10.42 RU3. If the protocol is enabled again in the configuration, a syslog message is generated.
- The cellular modem did not send regular router advertisements (RA) during IPv6 operation. This meant that after the router lifetime of 65,535 seconds (approx. 18 hours) had expired, the router no longer had a gateway and IPv6 communication was therefore no longer possible.
Shortly before the RA lifetime expires, a router solicitation (RS) is now sent to update the router lifetime.
- If a router or access point was used as a DHCP client and a static routing entry with a gateway (next hop) was created on it, the gateway learned via DHCP was not adopted correctly. This resulted in no communication being possible via the static route.
- When using particular DSLAMs on the provider side, it could happen with a LANCOM 1926VAG that the DSLAM did not transmit all the required parameters to the DSL modem due to an incompatibility between the installed DSL modem and the DSLAM. This meant that no DSL sync could be established and thus no DSL connection could be established.
- The Wireless ePaper features 'SyncProfile' and 'Label Events' were not functional.
- A disabled IPv4 firewall rule in which one or more port ranges were specified was misinterpreted when writing back the configuration, which meant that the configuration could not be written back to the LANCOM router.

VPN

- If the router tried to send a packet over the VPN connection during a VPN connection setup in the time window between IKE negotiation and the change to the 'Up' state, all packets were dropped.
- If a VPN connection was initiated by a downstream router with port forwarding active for UDP port 500, the response packets were not entered in the IPsec masking table by port forwarding. This resulted in the VPN connection not working.

Wi-Fi

- The Public Spot 'Idle Timeout' could not be set via the XML interface. The value selected in the XML command was not accepted and the value entered in the device was output instead.

VoIP

- In individual cases, it may happen that an UPDATE is sent by the caller instead of the called party during the early media phase of an incoming call. In such a case, the UPDATE was sent by the router back to the SIP line instead of to the local subscriber. This resulted in a one-way voice transmission.
- In a scenario with a parent SIP PBX, if different codecs are used in the sessions between the router and the SIP client and the router and the SIP PBX for an outgoing call, the codec must be renegotiated with the SIP client in a re-INVITE so that the codec matches. If the SIP PBX sent a Re-INVITE to forward the call to the router at that moment, it was sent from the router to the SIP client even though the first Re-INVITE was not confirmed yet. This resulted in missing voice transmission in connection with noise at the calling subscriber. The second Re-INVITE of the SIP PBX is now transmitted only when the first negotiation is completed.
- If the Voice Call Manager received a REFER for call forwarding from a SIP PBX to a SIP client and received a 'Session Progress' with SDP data from the SIP PBX after sending an INVITE to the SIP client, the Voice Call Manager first sent a Re-INVITE to the SIP client and then, after receiving the message "200 OK" from the SIP client, erroneously sent an ACK to the SIP PBX, although the call negotiation was still open (such behavior will mainly occur in a scenario with a Swyx PBX in combination with a CTI+ client). This led to a call termination.
- If the router received parameters in the 'From and Contact' field in an UPDATE that differed from the SIP registration, the router could not assign the SIP user. This led to a call termination.
- In a SIP trunk scenario, it could happen that no call number tones were transmitted to the ISDN PBX. As a result, an outgoing call could not be initiated and established.

LCOS improvements 10.42.0383 RU2

Bug fixes / improvements

General

On 'Deutsche Glasfaser' Internet connections, the router advertisement is sent to the multicast IPv6 group and the unicast MAC address of the router. This caused the router to discard the router advertisement and thus Internet communication was not possible.

The router now accepts the router advertisements.

- When writing back a configuration via SSH, it could happen that LANconfig reported "The configuration could not be written back to the device", although the operation was successful.
- With LANCOM Wireless ePaper access points (e.g. LANCOM LN-830E) it could happen that the connection to the Wireless ePaper Server was lost and not automatically re-established.
- For some LANCOM devices it was not possible to download the SNMP device MIB via WEBconfig.
- The fallback from IPv6 to IPv4 did not work correctly with the NTP client.
- When using the 'Dynamic Path Selection' feature, if the firewall destination did not match the routing entry during the firewall check, the message "bad gateway: <host A> does not match <host B>" was issued and the next firewall rule was run. It could also happen that packets were dropped.

The gateway of the route is now checked before the route selection for the Dynamic Path Selection and the next rule is run through if the gateway does not match the firewall destination. Furthermore, the firewall trace displays the message "bad gateway: ACTUAL does not match REQUESTED".

- If the command 'do Setup/Certificates/SCEP-Client/Update' was executed via an addin script in the LMC on a device for the purpose of obtaining a certificate via SCEP client, this led to an immediate reboot of the device.
- When using a load balancer, it could happen that the load balancer did not switch to the 'connected' status after the first line had been established. This resulted in further Internet remote stations not being set up.

VPN

- If several VPN connections were assigned the same route (e.g. via IKE-CFG mode), the route of the first connection was displaced in the routing table when the second connection was established. When the first connection was terminated, the route was completely removed. This meant that communication via the VPN connection to this destination was no longer possible.

Wi-Fi

- IGMP queries from the address 0.0.0.0 were not accepted. This caused the IAPP table to remain empty, resulting in disconnects during Wi-Fi roaming.
- On a vRouter, after updating to LCOS version 10.42, the 'Login (Email to SMS)' page was duplicated in the Public Spot page table and the 'Fallback Error' page was missing. This resulted in the configuration not being rolled out via the LMC and instead being acknowledged with an error.
- If the Public Spot page table in the path 'Setup/Public-Spot-Module/Page-Table' was filled with default values and changes were made to this table via LANconfig, the table contained empty values with "" characters after writing back.

VoIP

- The table of active VoIP lines in the LCOS path 'Status/Voice Call Manager' displayed a maximum of 32 entries. If more than 32 lines were active, the remaining lines were not displayed. A maximum of 64 entries is now displayed.
- Incoming SIP update packets via SDP were answered by the LANCOM router without SDP. As a result, calls in connection with a downstream PBX failed.
- If the priority order of the offered DNS SRV records changed during a TTL DNS period, this was not noticed in the LANCOM Voice Call Manager, so that the LANCOM router did not connect to the new highest weighted site after the TTL expired. As a result, a SIP registration failed.
- It could happen that an ISDN telephone displayed the destination number (connected number) in an unwanted format. It is now possible to suppress the connected number so that it is not sent in the ISDN 'Connect message'.

LCOS improvements 10.42.0280 RU1

Bug fixes / improvements

VoIP

- Fixed issues with transferring phone calls using RE-INVITE, REFER methods, and related voice codec negotiation in scenarios with Swyx PBXs.

LCOS improvements 10.42.0277 Rel

Bug fixes / improvements

General

- Requests from LANCOM-internal services (e.g. ICMP queries or ICMP measurements in the DPS) to the WAN which had a local sender address (e.g. 'ping -a INTRANET 8.8.8.8') were sent unmasked if only routes for load balancers were entered in the routing table and routes for the individual WAN connections were missing. As a result, the request failed.
- Loading a LANCOM router configuration from a USB stick plugged into an unconfigured device failed.
- The record for networks in the console path 'Status / DHCP client / LAN IP list' was always created with the maximum length instead of the actual length.
This resulted in a blank page and the error message "404 Not found" being displayed when selecting an interface (e.g. INTRANET) in WEBconfig in the menu 'Tools / LCOS menu tree / Status / DHCP client / LAN-IP list / Ifc'. The information could not be read out via console either.
- When logging DNS resolutions, the syslog was sent over port 512 instead of port 514.
As a result, the messages did not reach an external syslog server.
- The Voice Call Manager in the LANCOM router sent e-mails in a text encoding in which, for example, umlauts were output illegibly. The e-mails are now sent UTF-8 encoded.
- If a ping with a size smaller than 16 bytes was executed on the console (with the -s parameter), this resulted in an immediate restart, since the minimum packet size is 16 bytes.
- If a process on the vRouter took a very long time (triggered by a lack of CPU resources), this could lead to a sudden restart.
- The length check of ICMPv6 packets in the IPv6 firewall did not work correctly. This could cause ICMPv6 packets to be dropped by the router with the message "intruder detection".

Wi-Fi

- The 802.11u parameters 'Include-in-Beacon-OUI' and 'Additional-OUI' only allowed lowercase letters to be entered on the console. In LANconfig, however, uppercase letters were also allowed for these parameters. Uppercase letters are now converted to lower case letters.
- When using 802.11u in conjunction with Passpoint R2, the NAI realm was not transmitted to the end device, so it could not establish a connection.

VPN

- If the VPN partner requested multiple phase-1 proposals for parallel processing instead of sequentially as usual (e.g., SA1: AES-CBC, SA2: Blowfish), the router restarted immediately.
- After a firmware upgrade to LCOS 10.42 RC3 it could happen that IKEv2 VPN connections were no longer established via EAP authentication if no remote gateway was specified in them and 'No-Identity' was used as remote ID.
- After establishing a dial-in VPN connection from a remote site, the routes were deleted and directly added again. This led to the fact that already existing sessions were also deleted and communication via this session was no longer possible (e.g. RDP).

VoIP

- If a SIP provider sent an INVITE with a session timer that was too small, the router responded with the error message "422 Session Interval Too Small". If the SIP provider then did not send a new INVITE with an adjusted session timer, the call was disconnected and the caller did not hear a ringing signal.
The message "422 Session Interval Too Small" is now only sent when using a 'Gateway line' to connect a SIP PBX.
- If a SIP PBX sent the characteristic for SDP in lower case (rtp/avp) to the router in the message "200 OK", the router did not recognize the SDP and sent the "200 OK" without SDP to the provider. The provider responded with a BYE and the error message "488 Not Acceptable Here".
This led to the fact that in such a case the telephone call did not take place.
- If a SIP subscriber in INVITE sent the protocol in lower case in the SIP URI to the router (e.g. udp), the router rejected the packet with the error message "404 Not Found".
The router is now case-insensitive.

LCOS improvements 10.42.0212 RC3

New features

Routing & VPN

- IPv6 source address filter for IKEv2 VPN connections

Bug fixes / improvements

General

- The table for the mobile radio history in the path 'Status / Modem mobile radio / History' remained empty, regardless of whether a mobile radio connection was used or not, because the default value for recording the history in the path 'Setup / Interfaces / Mobile radio / Logging interval' was ,0' (switched off). The default interval has now been changed to 300 seconds (5 minutes).
- The table 'Status / Last-Admin-Logins' had a faulty structure, because the first column (the only index column) contained the IP address and not, as usual, a unique index value (e.g. a consecutive number).
- The configuration reference via TR-069 when using an IPv6 address failed because the router's own IPv6 address was put into square brackets by the router's TR-069 process and therefore was not recognized correctly. In this case a fallback via IPv4 was performed.

Wi-Fi

- In the table 'Setup / WLAN Management / AP Configuration / IEEE802.11u / General' a profile name with a maximum of 32 characters could be entered for an 802.11u site profile. However, the same parameter was used in the table of Wi-Fi profiles with a name length of max. 31 characters. As a consequence, a profile name with 32 characters could not be configured in the Wi-Fi profile table because the maximum allowed number of 31 characters was exceeded.
- In a WLAN controller scenario, the domain ID from the menu 'WLAN Controller / 802.11u / Hotspot 2.0 Profile' was not taken over by the access points, so the placeholder '0' was used. This caused an incorrect domain ID to be passed to requesting Wi-Fi subscribers.
- If an unsupported regular expression (RegEx) was entered for the 'Venue Name' in the console path 'Setup / WLAN Management / AP Configuration / IEEE802.11u / General' on a WLAN controller, the device rebooted immediately.
- When using an individual start page in the Public Spot, only a white page was displayed when calling it, because the redirect URI (Uniform Resource Identifier) was passed on to the Public Spot participant with a wrong IP address.

LCOS improvements 10.42.0155 RC2

New features

General

- The 802.1X authenticator for Ethernet ports is now included in all devices.
- The 802.1X authenticator can now optionally immediately perform a check of the MAC address of the connected Ethernet device with a RADIUS server instead of an 802.1X negotiation.
- In new configurations the MAC address of bundle interfaces is now '0' and is converted to the system-wide, device-specific MAC address during operation. This simplifies the porting of configurations.
- The HTTP(S) hit list of Layer 7 detection has been updated.
- The ThinAP2.0/TLS protocol can now be used to connect to a Wireless ePaper Server.
- In new configurations, the Telnet and Telnet-over-SSL management protocols are now disabled by default.

Routing & VPN

- The line code of the LANCOM 179x series xDSL modem has been updated.

Wi-Fi

- Support for Stanley-AeroScout RTLS tags
- If the result of the channel evaluation of the automatic Wi-Fi channel selection consists of several channels of equal quality, one channel is selected from these using the system-wide MAC address. This improves scenarios in which several neighboring access points perform automatic channel selection simultaneously.
- Support of a JSON-API to extract BLE and WLAN location data
- The default WLAN passphrase is now empty. To activate an encrypted WLAN SSID, it is necessary to set a user-defined passphrase.
- Support for PassPoint R2 configuration via WLC

VoIP

- For SIP lines the transfer of a fixed PPI or PAI can be configured.
- A loopback address can now be configured for SIP PBX lines.
- The Voice Call Manager table 'User Settings' can now contain any number of entries.

Bug fixes / improvements

General

- In the LANCOM OAP-1702B, the specific specification for the PoE power requested via LLDP from a PoE-capable switch was missing in LCOS.
- LANCOM routers sporadically experienced CPU utilization of up to 100% due to a problem with the number of sessions in the IPv4 masking table of the devices. As a result, the high CPU load caused problems with IPv4 routing, among other things.
- Communication with an external syslog server via a user defined port (not equal to 514) was not possible, regardless of the protocol used (TCP or UDP). The router ignored the setting and continued to use port 514.

- The configuration could not be rolled out to a router managed by the LMC if a new object was simultaneously created in the DNS target list and referenced in a new firewall rule.
- If a routing entry was created for a GRE tunnel that referred to an IP address from a local network, the GRE tunnel could not be established.
- When changing the main device password with the console command 'passwd -n', which included the escape character '\', additional characters were added to the beginning of the password. As a result, the device could not be accessed with this password and the password could not be reset with the 'passwd -n' command.
- If 'Dynamic Path Selection' was activated during the roll-out process of a complex configuration via the LMC, a sudden restart could occur.

LCOS improvements 10.42.0037 RC1

New features

General

- The HTTP/HTTPS tracking list for the Layer-7 application detection has been updated.

Routing & VPN

- SD-WAN Dynamic Path Selection

Wi-Fi

- Omission of the standard Wi-Fi passphrase
- A LANCOM WLC now configures the first Wi-Fi module (2.4 GHz) of a managed access point for 20 MHz channel width by default. This only affects access points that have newly been added to the management.

6. General advice

Disclaimer

LANCOM Systems GmbH does not take any guarantee and liability for software not developed, manufactured or distributed by LANCOM Systems GmbH, especially not for shareware and other extraneous software.

Backing up the current configuration

Before upgrading your LANCOM devices to a new LCOS version it is essential to backup the configuration data!

Due to extensive features it is **not possible to downgrade** to a previous firmware without using the backup configuration.

If you want to upgrade devices which are only accessible via router connections or Wi-Fi bridges, please keep in mind to upgrade the remote device first and the local device afterwards. Please see the [LCOS reference manual](#) for instructions on how to upgrade the firmware.

We strongly recommend updating productive systems in client environment only after internal tests.

Despite intense internal and external quality assurance procedures possibly not all risks can be eliminated by LANCOM Systems.

Using converter firmwares to free up memory

Due to numerous new functions within the LCOS firmware it may not be possible in some circumstances for older devices to keep two fully-featured firmware versions at the same time in the device. To gain more free memory, a smaller firmware with less functionality has to be uploaded to the device first. As a result, significantly more memory will be available for a second firmware.

This installation has to be done only once by using a "converter firmware".

After having installed the converter firmware, the firmsafe function of the LANCOM device is only available on a limited scale. The update to a new firmware is furthermore possible without any problems.

However, after a failed update the LANCOM device works with the converter firmware which only allows local device access. Any advanced functionality, particularly the remote administration, is not available as long as the converter firmware is active.