

LANCOM Release Notes

LCOS LX

5.34 RU3

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January 28th 2022, CBuersch

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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 LX software release 5.34 RU3, 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 LX 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 LX

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

LCOS LX release updates including bugfixes and general improvements are available on a regular basis for devices which do not support the latest LCOS LX version. You can find an overview of the latest supported LCOS LX version for your device under

<https://www.lancom-systems.com/products/lcos/lifecycle-management/product-tables/>

3. Advices regarding LCOS LX

Information on default settings

Devices delivered with LCOS LX 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. History LCOS LX 5.x / 4.x

LCOS LX improvements 5.34.0080 RU3

Bugfixes / improvements

- Bluetooth Low Energy (BLE) is functional again on the LANCOM OW-602.
- On the LANCOM OW-602, the Link Layer Discovery Protocol (LLDP) correctly retransmits the remote port ID.

LCOS LX improvements 5.34.0072 RU2

Bugfixes / improvements

- When using Fast Roaming (both in a WLAN controller scenario and standalone) and dynamic VLAN at the same time, the VLAN ID was removed after roaming to another access point. This caused the Wi-Fi end device to connect to the wrong network.
- When using the WLC tunnel, a bridge was switched between the wireless LAN interface and the Ethernet interfaces in the first 10 seconds after a connection was established with a WLAN controller on the access point. Only then was the state of the bridge changed. This could result in a Wi-Fi client being incorrectly bridged during the first 10 seconds. If the connection between the access point and the WLAN controller was not established correctly, the bridge could remain in the state of the first 10 seconds and the SSID could still be broadcast. Wi-Fi clients connected to the affected access point were permanently incorrectly bridged.
- The 'Multicast Snooping' feature (can be activated in the menu 'Other Services/Multicast Snooping') could not stop multicast traffic if it was tagged with VLAN tag 0.
- Updating the firmware via a WLAN controller took a very long time of up to 20 minutes. The process now only takes a few minutes.
Furthermore, the access point only checked once whether the firmware was available. If the firmware was not available until a later time, this meant that the firmware update could not be performed. The access point now checks in intervals of 30 seconds whether the firmware is available for download.
- In a WLAN controller scenario with Fast Roaming, the PMKs (Pairwise Master Key) were not correctly transmitted to the WLAN controller for forwarding to the other access points. As a result, Fast Roaming did not work correctly and regular RADIUS authentication was still required.
- After a connection loss between the access point and WLAN controller, Wi-Fi was reinitialized when the connection was re-established. This caused all connected clients to lose the connection.
The Wi-Fi configuration is now kept in the access point's internal memory and is only reinitialized when changes are made to the wireless network.
- After a configured time for autonomous continued operation of an SSID in a WLAN controller scenario had elapsed, the access point continued to broadcast the SSID.
- LEPS-MAC was no longer functional for a Wi-Fi client when it switched from the 2.4 GHz to the 5 GHz band (e.g., when roaming or via client management).
- If the SSID on an access point was fixed to '802.11g/n/ax mixed' mode, it still broadcast beacons for '802.11b' mode.
- RX/TX limits for Wi-Fi clients configured in a WLC profile were not adopted by the LANCOM access point if manually set values >0 were entered on the access point.

- If more than eight logical WLAN networks (SSIDs) were configured in a WLC and these were rolled out to a LANCOM LW-600, the LW-600 could not accept all SSIDs because it can accept a maximum of eight logical WLAN networks.

The WLC now always transmits a maximum of eight SSIDs to the LW-600, even if more SSIDs are configured in the controller. In addition, a corresponding message is output in the 'CAPWAP-CTRL' trace of the WLAN controller (as of LCOS 10.50 RU3).

- A packet capture recording performed on an access point only showed IP packets received at the access point's Ethernet port. IP packets sent from the access point were missing from the recording.
- In the configuration of an LCOS LX access point, the antenna gain can now also be configured in a WLAN controller scenario (in the physical wireless LAN profile of the controller). Thus it is possible, for example, to achieve a reduction in transmit power for the respective access point.

LCOS LX improvements 5.34.0027 SU1

Bugfixes / improvements

- › Adjustments to SYSLOG messages of security-related information when logging on to encrypted SSIDs of WLAN controller-managed access points.

LCOS LX improvements 5.34.0010 Rel

New features

- › Support for multicast snooping
- › Support for multicast-to-unicast conversion
- › Support for USB Ethernet devices
 - › currently qualified: Hanshow HS_C09978 ESL Controller, SoluM EGU200NA0X ESL GEN2 USB Gateway

Bugfixes / improvements

- › The layout of the overview page for Wi-Fi scan results has been improved and made clearer.

LCOS LX improvements 5.32.0035 RU1

Bugfixes / improvements

- › If the hotspot SSID was deleted from an LMC-managed access point with configured "cloud-managed hotspot", it could happen in individual cases that the hotspot login was also active in other networks.

LCOS LX improvements 5.32.0029 Rel

New features

- Support for WLC Layer-3 tunnel
 - Note: To use this feature, the LANCOM WLAN controller requires LCOS 10.42 RU3 or higher.
- A bandwidth limitation can now be configured per Wi-Fi client, too.
- Buffering of BLE API messages via the LBS API is now configurable.
- The display of the different pages of the tiles on the WEBconfig dashboard is now done with multiple tabs.
- The unified SNMP MIB for LCOS LX can now be downloaded from the SNMP configuration area of WEBconfig.
- The WEBconfig page title now displays the user-defined device name.

Bugfixes / improvements

- When accessing via WEBconfig and with an activated password manager in the used web browser, the error message "Unsaved or invalid data" was displayed when switching from the Wi-Fi configuration to another menu, because the password manager interpreted the field 'WPA key' as a password.
- When using a 'cloud-managed hotspot' (hotspot network) in which the access point was not the gateway, the MAC addresses of all WLAN end devices were masked behind the MAC address of the access point instead of forwarding the data traffic transparently.
- Entering a RADIUS server with an IP address containing 255 was not possible because 255 was not included in the allowed character set.
- If the language selection 'DE' (German) was used in WEBconfig, a LEPS profile could not be created with the option 'Do not check' for the parameter 'Check MAC address'. This was acknowledged with an error message.
- Despite fixed encryption setting to WPA2, 'WPA(2/3)-PSK' was displayed as authentication type in the dashboard.
- The 'Fast Transition Mobility Domain' was misinterpreted when using Fast Roaming and was therefore different from access points with LCOS. This meant that in scenarios where both LN-xxxx and LW-xxx / LX-xxxx access points were used, the 802.1X keys had to be renegotiated when roaming between access points with LCOS and LCOS LX.
- If a LEPS profile that was still being used was deleted from the configuration, no warning message appeared. In addition, it was not apparent in the configuration that the profile was currently in use.
- The 'Device-Type' and 'Vendor-Specific Version' parameters were sent to the Wireless ePaper Server in quotes in an incorrect way. This caused an error in the Wireless ePaper Server.
- Location information was not output to 'Sysinfo' and therefore not displayed in LANconfig.

LCOS LX improvements 5.30.0073 SU3

Bugfixes / improvements

- Fix for 'Aggregation & Fragmentation Attacks Against Wi-Fi' (CVE-2020-26146)

LCOS LX improvements 5.30.0045 RU2

Bugfixes / improvements

- A BLE (Bluetooth Low Energy) trace was available for the LANCOM LW-500 and LW-600 access points, although the devices do not support this function.
- The packet and throughput counter did not work correctly. As a result, a throughput of 0 kbps was displayed in the WEBconfig dashboard or in the LMC.
- The Wi-Fi data rates were displayed with a value that was too high.
- It could happen that a DHCP discover of a Wi-Fi end device was not sent on the LAN interface. In this case, no DHCP address reference was possible.
- Fast Transition (Fast Roaming) did not work on LW-500, LW-600, LX-6400/6402 access points in conjunction with a preshared key (PSK). During a roaming process, the Wi-Fi connection could be terminated and long login times to the SSID could occur. Furthermore, when 'waking up' a terminal device from standby, it could happen that no data transfer was possible via the Wi-Fi connection. Fast Transition with preshared key has therefore been disabled until further notice.

For already configured WPA2/3-PSK networks with Fast Roaming, this change may cause clients connected to it to request the WLAN passphrase once again.

- When using Dynamic VLAN, it could happen that a duplicate entry was made in a table when a terminal device was logged into the wireless LAN. When the end device was logged out of the wireless LAN, the access point restarted immediately.

LCOS LX improvements 5.30.0039 RU1

As part of the update to LCOS LX 5.30 RU1, the firmware loader for the LANCOM LX-6400 and LX-6402 devices is updated. Please make sure not to disconnect the device from the power supply for three minutes after the reboot automatically triggered by the update!

Bugfixes / improvements

- In rare cases, devices of type LANCOM LW-600, LX-6400, and LX-6402 experienced an unexpected reboot when receiving certain Wi-Fi packets. This issue only occurred with the release version LCOS LX 5.30 Rel.

LCOS LX improvements 5.30.0037 Rel

As part of the update to LCOS LX 5.30 Rel, the firmware loader for the LANCOM LX-6400 and LX-6402 devices is updated. Please make sure not to disconnect the device from the power supply for three minutes after the reboot automatically triggered by the update!

New features

- › Support for the cloud-managed Hotspot in combination with the LANCOM Management Cloud
- › Wireless ePaper support (for the LX-640x series in combination with the LANCOM Wireless ePaper USB expansion module)
- › Support for the BLE REST API
- › Support for setting a Wi-Fi target transmission power
- › Support for packet capturing via WEBconfig
- › Support for remote syslog servers
- › The Wi-Fi multicast and broadcast transmission rates can now be configured.
- › Automatic collection of diagnostic information in the event of a device crash
- › Wi-Fi driver update for increased stability and compatibility
- › Multiple NTP servers can now be configured simultaneously.
- › Ping and traceroute commands are now available on the CLI.

Bugfixes / improvements

- › When configuring a WPA key which contained the '#' character on the LANCOM LW-500 via LANconfig, the error message was displayed that this character is not allowed in the input field.
- › When uploading a firmware that is not suitable for the device, no error message with information was displayed in WEBconfig. The upload process terminated in a timeout and was not executed.
- › If an encryption was to be changed from WPA2 to WPA3 via WEBconfig, no save icon was displayed after selecting WPA3. As a result, the change could not be applied.
- › In a WLAN controller scenario, the LCOS LX access points did not report the WPA version of connected wireless nodes to the WLAN controller. However, this had no effect.
- › When changing channels, the new Wi-Fi channel was not changed in the table 'Status / WLAN / Radios', so the original channel was still stored.
- › In a WLAN controller scenario, the LCOS LX access points did not report the PMK (Pairwise Master Key) to the WLAN controller. As a result, fast roaming did not work.
- › In the selection field for configuring the time window for checking for a possible firmware update, a value greater than 24 hours could be entered.
- › In the password input field of the login form as well as in other password input fields there was a 'Copy' button which is not needed.
- › After activating the function 'Allow communication between end devices' via checkbox 'only within own SSID' in an SSID, the change could not be saved without adjusting further parameters.
- › The MAC addresses of both Wi-Fi modules were not displayed in Sysinfo.
- › During a roaming process to another access point, it could happen that the VLAN tag was not transmitted. In such a case, communication was not possible because the logged-in end device was in the wrong VLAN.

- In individual cases, an unmediated restart could occur due to incorrect coding in a JSON file.

LCOS LX improvements 5.20.0092 RU4

Bugfixes / improvements

- If many WLAN end devices were connected to one access point and another end device established a connection to the WLAN, an abrupt restart of the access point could occur.
- After a firmware update to LCOS LX 5.20 RU3, the access point did not set the "Don't Fragment" bit during PMTU negotiation with a WLAN controller. This resulted in a WLAN controller scenario in which the access point could not communicate with the WLAN controller when a remote access point was connected (e.g. when connected via a VPN connection) because the WLAN controller sent the response packets in fragmented form.

LCOS LX improvements 5.20.0088 RU3

Bugfixes / improvements

- Temporary monitoring of an access point with LANmonitor was rejected with a login error due to wrong credentials, although the correct credentials were used.
- If the channel bandwidth 'Auto' was configured in the radio settings of an access point, WEBconfig did not display a bandwidth value in the dashboard.
- The resolution of the DNS name 'wlc-address' failed because the access point did not provide the domain suffix in the request. Therefore the DNS server did not answer the query. As a result, the access point could not establish a Wi-Fi connection to a WLAN controller if the two devices were located in different networks.
- It was not possible to update a firmware via WLAN controller using the function 'Load firmware to managed AP'.
- An access point could not be managed by a WLAN controller if the devices were located at different sites and an MTU smaller than 1452 bytes was used to connect the sites (e.g. for a VPN connection).

LCOS LX improvements 5.20.0075 RU2

Bugfixes / improvements

- No IAPP messages were sent when using IEEE 802.1x. This could cause problems when roaming between access points.
- If the WPA2 key management was configured to 'Fast Roaming' in the encryption settings, the access point could temporarily lose the connection to the WLAN controller.
- The Wi-Fi modules of a device could not be switched off by an access point profile obtained via WLC. As a result, it was not possible, for example, to use only the first Wi-Fi module on a LANCOM LX-6402 and deactivate the second Wi-Fi module via a WLAN controller.
- An access point could not obtain a WLC Wi-Fi profile over a VPN connection. As a result, it was not possible to connect and manage the access point via WLC.
- It was not possible to create an unencrypted SSID via WEBconfig.

LCOS LX improvements 5.20.0047 RU1

Bugfixes / improvements

- In a WLAN controller scenario, no fixed Wi-Fi channel could be assigned to an access point.

LCOS LX improvements 5.20.0039 Rel

New features

- Support for management by LANCOM WLC devices
- Support for LEPS-MAC
- Check of MAC addresses against RADIUS server
- Dynamic VLAN via 802.1X/RADIUS and LEPS
- Wi-Fi time control for SSIDs

Bugfixes / improvements

- If the Auto-Updater is enabled on the device, this is now displayed in the LMC device list.
- If in the device's dashboard in WEBconfig a click on the 'Configure SSID' button was made, the message "No SSID has been created yet" was displayed.
- In WEBconfig, Wi-Fi end devices on the access point were permanently displayed in the status 'Connected', because the 'Idle Timeout' did not work. This was also the case if no SSID was transmitted.
- After pressing the 'Cancel' button in the WEBconfig menu 'LANCOM Management Cloud Coupling', the stored parameters were still displayed instead of being discarded.

- Although a maximum channel width of 40 MHz was configured in the 2.4 GHz settings of a radio module, only a maximum bandwidth of 20 MHz was used.
- In the dialog for scheduling firmware updates a negative value could be entered in the 'End of update time window' field.

LCOS LX improvements 5.10.0009 RU2

Bugfixes / improvements

- In individual cases, an invalid main device password could be set by the LMC in LMC-managed devices with LCOS LX; as a result, these devices could no longer be accessed via the LMC or via local access (e.g. SSH) after a restart. This bugfix avoids this state. To be able to manage a device that was previously in error status locally again, a valid password must be set via the LMC. To do this, start a configuration rollout from the LMC on the affected devices.
- In seldom cases, a LANCOM LW-500 restarted with the firmware available in the second FirmSafe slot.

LCOS LX improvements 5.10.0005 RU1

Bugfixes / improvements

- In individual cases, the configuration of LW- and LX series devices was not stored persistently, and HTTPS access was not possible.

LCOS LX improvements 5.10.0004 Rel

New features

- Support for WPA3
- The LANCOM LW-500 supports the features of LCOS LX 5.00:
 - Automatic software updates via auto-updater
 - Band Steering (for IEEE 802.11v-capable and legacy clients)
 - Fast Roaming based on IEEE 802.11r
 - IEEE 802.1X pre-authentication
 - LEPS-U (LANCOM Enhanced Passphrase Security - User)

Bugfixes / improvements

- After a firmware update in WEBconfig the message 'Access Denied' was displayed.
- When calling the 'Monitoring' menu in the Safari web browser, the graphs were displayed without content.

LCOS LX improvements 5.00.0024 Rel

New Features

- › Support for Wi-Fi 6
- › Automatic software updates via Auto Updater
- › Band Steering (for IEEE 802.11v capable and legacy clients)
- › Fast Roaming as per IEEE 802.11r
- › 802.1X Pre-Authentication
- › LEPS-U (LANCOM Enhanced Passphrase Security - User)
- › Support for LLDP
- › Support for SNMPv3
- › Support for LANmonitor
- › IEEE 802.1X supplicant for the Ethernet interface

Bugfixes / improvements

- › An offline configuration created by LANconfig could not be saved to the LANCOM LW-500.
- › While performing an environment scan in WEBconfig the table was not populated with scan results.
- › A LANCOM LW-500 could not be restarted from within the LANCOM Management Cloud (LMC).
- › Only one IPv6 address was shown in the network settings, although multiple IPv6 addresses had been allocated to the device.
- › Wi-Fi devices were not stored to the station table if the device name contained special characters. Now all characters are accepted and thus all devices are displayed in the device list.
- › The displayed idle timeout of a Wi-Fi device was, against the usual process for other LANCOM access points, incremented instead of decremented.
- › When accessing a device by console with a non-existing user the message "admin not found" was displayed.
- › Entering a WPA2 Wi-Fi key with less than 8 characters caused the message "Wrong charset". Now a message appears showing the hint to use at least 8 characters.
- › The output of a table after using the command "set ?" was arbitrarily sorted. Now the output is displayed in the correct column order, starting with column 1.
- › The following display- and functional issues on Safari- and Chrome browsers have been fixed:
 - › A device could not be restarted, because the restart button was not active.
 - › A device could not be reset to factory defaults.
 - › A display issue when using the bandsteering function has been solved.
- › When the path "/WLAN/Radio" was reset to default settings by using the command "default", the Wi-Fi module 2 was configured to 2.4 GHz, although this frequency band is not supported by the module.
- › After selecting a radar signal it could happen that the LANCOM LW-500 changed the channel to a channel neighboring the weather radar range (120 bis 128). When using 80 MHz channel width this led to overlapping with the weather radar channel range. It is now ensured that channel overlapping is no longer possible.
- › In the dashboard the number of Wi-Fi devices connected to the 2.4 GHz band was not displayed correctly.

- The names of the encryption profiles were prefixed by a random sequence of 5 letters and numbers. This resulted in limited readability. This random sequence is no longer added.
- When using IEEE 802.1X the LANCOM LW-500 always reported the Wi-Fi standard IEEE 802.11b on the RADIUS authentication request in the field 'Connect-Info', if the Wi-Fi device was connected per IEEE 802.11ac. The LANCOM LW-500 does no longer report a Wi-Fi standard in the 'Connect-Info' field.

LCOS LX improvements 4.00.0130 RU3

New Features

WEBconfig

- The "Connected clients" table on the dashboard now contains a reload button.
- The "Neighborhood" and "Wi-Fi configuration > Technology" pages now contain the timestamp of the last neighborhood scan.
- The "Wi-Fi configuration > Technology" page now also contains a button for starting the neighborhood scan and thus for determining the neighboring SSIDs.

General

- The "default" command for recursively resetting configuration paths to their default values is now available on the CLI.

Bugfixes / improvements

- The number of operating days was missing in the information on the operating time of a device.
- The station table in the dashboard of the web interface was not queried regularly. This meant that newly connected stations were not displayed in the dashboard.
- An IPv6 address obtained via Router Advertisement was not displayed in the network settings.
- The graphical display for WLAN and LAN data throughput was lower than the real values.
- A maximum of 200 clients could be displayed in the station table.
- If the 2.4 GHz mode was configured to "IEEE 802.11g/n (Mixed)" in the radio settings, the access point continued to transmit with IEEE 802.11b.
- The counter in the **Status/LAN/Byte-Transport/** table was only 10 characters long. If the maximum value was exceeded, the affected interface disappeared from the table. In such a case, no more data for the affected interface was displayed in the LMC or in WEBconfig.
- A click into an input field in the WLAN configuration offered the "Save" dialog, although no configuration changes had been made yet.

In addition, after switching to the WLAN configuration in WEBconfig and subsequently leaving the WLAN configuration without making any configuration changes, the user was informed via popup about unsaved changes.

- No QR code for unencrypted SSIDs was displayed.

- If a firmware update was initiated via an IPv6 connection, the firmware update ran successfully. However, the web interface was not updated and remained in status **Firmware update in progress**.
- After changing the main device password in WEBconfig the configuration was not written back to the device. Thus the old password was still active after a restart.
- The mode **802.11b/g/n** was displayed in the WLAN dashboard and on the console when **802.11g/n** was used.

LCOS LX improvements 4.00.0108 SU2

Bugfixes / improvements

- Multiple vulnerabilities have been fixed which could cause linux-based systems to crash (CVE-2019-11477, CVE-2019-11478, CVE-2019-11479). See also the general security information on the LANCOM website: <https://www.lancom-systems.com/service-support/instant-help/general-security-information/>

LCOS LX improvements 4.00.0100 RU1

New Features

- The username „root“ is now predefined on the WEBconfig login screen.

Bugfixes / improvements

- After having received an IAPP message of an adjacent access point, clients which were connected by roaming have not been deleted from the station table.

LCOS LX improvements 4.00.0096 Rel

New Features

- Initial version supporting the LANCOM LW-500

5. Known restrictions

- When using both LAN ports for passing through data traffic only untagged data traffic or data traffic tagged with the management VLAN tag is passed through.
- Local configuration changes are not transferred to the LMC.
- The scripting of the device from the LMC is currently not supported, but the use of add-ins is.

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 LX 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.

Please see the LCOS LX 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.