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Actility ThingPark
Software Release Notes
Cisco IXM - LRR 2.6.53

Under NDA

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VERSIONS

Version	Date	Author	Details
01	03-Jun-2021	Actility	Initial Version
02	08-Dec-2021	Actility	Update bug fixes list: • RDTP-16069 and RDTP-14405 were missing from 2.6.53 • PT-1512 had 2 different descriptions in 2.6.53 and 2.6.10_2 • Improved display of backported fixes.

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1 INSTALLATION

To perform a clean installation and prevent installation issue, please use the "/factory" option while installing the Cisco firmware:

```
# archive download-sw firmware /factory /save-reload flash:<targz fw file>
```

2 SUPPORTED PLATFORMS

2.1 Version 2.6.53

Hardware Model	Cisco IXM	• Standalone/1-box version (Corsica) • Multi-boxes version (Warbler)
FPGA	61	
Firmware Version	2.2.0	HAL 5.1
LRR version	2.6.53	Standard 2.6.53

2.2 Version 2.6.10_4

Hardware Model	Cisco IXM	• Standalone/1-box version (Corsica) • Multi-boxes version (Warbler)
FPGA	61	
Firmware Version	2.0.32	HAL 5.1
LRR version	2.6.10_4	Standard 2.6.10 (2.4.85 equivalent) + hot-fix #1, #2 and #3

2.3 Version 2.6.10_3

Hardware Model	Cisco IXM	• Standalone/1-box version (Corsica) • Multi-boxes version (Warbler)
FPGA	61	
Firmware Version	2.0.32	HAL 5.1
LRR version	2.6.10_3	Standard 2.6.10 (2.4.85 equivalent) + hot-fix #1, #2 and #3

2.4 Version 2.6.10_2

Hardware Model	Cisco IXM	• Standalone/1-box version (Corsica) • Multi-boxes version (Warbler)

FPGA	61	
Firmware Version	2.0.32	HAL 5.1
LRR version	2.6.10_2	Standard 2.6.10 (2.4.85 equivalent) + hot-fix #1 and #2

2.5 Version 2.4.85

Hardware Model	Cisco IXM	• Standalone/1-box version (Corsica) • Multi-boxes version (Warbler)
FPGA	61	
Firmware Version	2.0.32	HAL 5.1
LRR version	2.4.85	Standard 2.4.85

2.6 Version 2.4.79

Hardware Model	Cisco IXM	• Standalone/1-box version (Corsica) • Multi-boxes version (Warbler)
FPGA	61	
Firmware Version	2.0.32	HAL 5.1
LRR version	2.4.79	Standard 2.4.79

2.7 Version 2.4.45

Hardware Model	Cisco IXM	• Standalone/1-box version (Corsica) • Multi-boxes version (Warbler)
FPGA	61	
Firmware Version	2.0.32	HAL 5.1
LRR version	2.4.45	Standard 2.4.45

2.8 Version 2.4.21

Hardware Model	Cisco IXM	• Standalone/1-box version (Corsica) • Multi-boxes version (Warbler)
FPGA	61	
Firmware Version	2.0.32	HAL 5.1
LRR version	2.4.21	Standard 2.4.21

2.9 Version 2.2.82

Hardware Model	Cisco IXM	• 1-box version (Corsica) • 2-box version (Warbler)
FPGA	61	
Firmware Version	2.0.28.4 2.0.30.fcs	HAL 5.1
LRR version	2.2.82	Standard 2.2.82 (new process: all gateway-specific integrated)

2.10 Version 2.2.68

Hardware Model	Cisco IXM	• 1-box version (Corsica) • 2-box version (Warbler)
FPGA	61	
Firmware Version	2.0.20.fcs	HAL 5.1
LRR version	2.2.68	Standard 2.2.68 + gateway-specific adaptation

2.11 Version 2.2.66

Hardware Model	Cisco IXM	• 1-box version (Corsica) • 2-box version (Warbler)
FPGA	61	
Firmware Version	2.0.20.fcs	HAL 5.1
LRR version	2.2.66	Standard 2.2.66 + gateway-specific adaptation

2.12 Version 2.2.62

Hardware Model	Cisco IXM	• 1-box version (Corsica) • 2-box version (Warbler)
FPGA	61	
Firmware Version	2.0.19.rc6 2.0.20.fcs	HAL 5.1
LRR version	2.2.62	Standard 2.2.62 + gateway-specific adaptation

2.13 Version 2.2.48b

Hardware Model	Cisco IXM	• 1-box version (Corsica) • 2-box version (Warbler)
FPGA	58	
Firmware Version	2.0.10.fcs	HAL 5.0
LRR version	2.2.48b	Standard 2.2.48 + gateway-specific adaptation

2.14 Version 2.2.46a

Hardware Model	Cisco IXM	1-box version (Corsica) only
FPGA	58	
Firmware Version	2.0.10.fcs	HAL 5.0
LRR version	2.2.46a	Standard 2.2.46 + gateway-specific adaptation

2.15 Version 2.2.39a

Hardware Model	Cisco IXM	1-box version (Corsica) only
FPGA	58	
Firmware Version	2.0.10.fcs	HAL 5.0
LRR version	2.2.39a	Standard 2.2.39 + gateway-specific adaptation

2.16 Version 2.2.27b

Hardware Model	Cisco IXM	1-box version (Corsica) only
FPGA	58	
Firmware Version	2.0.02.fcs	HAL 4.1.2
LRR version	2.2.27b	Standard 2.2.27 + gateway-specific adaptation

3 NEW FEATURES

3.1 Version 2.6.53

3.1.1 New firmware support

This version introduces the support of Cisco firmware 2.2.0.

3.1.2 Improvement of menu-driven configuration (suplog menu)

Although the effort already started in previous versions, “suplog” now integrates the configuration of many network-related features:

- NTP configuration
- PKI configuration (IPSec)

Please consult the related documentation

3.1.3 Improvement of communication management

Enhanced VPN management: monitoring of connections, management of certificates (automatic download and installation, anticipation of expiration date for instance)

3.1.4 Others features:

- PT-1733 : Automatic AES keys generation for geolocation during installation

3.2 Version 2.6.10_4

Only fixes.

3.3 Version 2.6.10_3

Only fixes.

3.4 Version 2.6.10_2

Integration of 2.6 code not used on Cisco gateways (2.4.85 equivalent code used).

3.5 Version 2.4.85

No new feature: maintenance version fixing issues only.

Important:

Fix for PT-1275 is a patch to be applied on the HAL 5.1.0 source. Rebuilding LRR from its sources requires the patch to be applied on the HAL sources before building it and linking it to the LRR objects.

3.6 Version 2.4.79

No new feature: maintenance version fixing issues only.

However, “suplog” menu was improved (more information displayed) in order to prepare a coming feature related to gateway network configuration (availability on Cisco not committed yet because of host/container architecture)

3.7 Version 2.4.45

No new feature: maintenance version fixing issues only.

3.8 Version 2.4.21

This version introduces the support of Cisco firmware 2.0.32. Cisco development made on Actility recommendations allows a better integration of the LRR in standalone mode and in router mode (gateway connected to IR8x9 router).

IMPORTANT:

The LRR version 2.4.21 is incompatible with firmware versions older than 2.0.32. It relies on functionalities not present in previous firmware versions.

Features

- PT-324: IPsec log access from suplog menu
- PT-833: new firmware: new way to detect standalone/router mode
- PT-455: redesign to correctly process standalone mode and router mode

3.9 Version 2.2.82

3.9.1 PT-558: new firmware support

Adapted and validated for Kernel 4.4-based firmware

Mainly adaptation regarding SPI device access.

3.9.2 Minor features

- RDTP-2574: $ROOTACT/var/log/lrr/lrcstatuslink.txt updated each time LRC link status changes and every 10 s.

3.10 Version 2.2.68

No new feature: maintenance version fixing issues only.

3.11 Version 2.2.66

No new feature: maintenance version fixing issues only.

3.12 Version 2.2.62

3.12.1 PT-379 – Integration of LRR with HAL 5.1.0

New HAL support:	5.1.0
FPGA Version support:	61

3.12.2 NFR#924 – Long term downlink duty cycle

Calculate long term downlink for 7 days.

The period (7 days by default) is configurable using the key [lrr].dtcltperiod. The units are Hours (default=168)

3.13 Version 2.2.48b

No new feature: version focused on porting on Cisco Warbler 2-box version (with IR8x9).

3.14 Version 2.2.46a

3.14.1 NFR#698 – suplog shows last cause of autorestart/autoreboot

Logging of automatic actions.

3.14.2 NFR#187 – multicast class C on PPS

Implement LoRaWAN downlink multicast

A multicast group can span one or several LRR groups (these LRR groups are a new concept on LRC), or a list of Area ID (cf NFR 104 roaming).

A multicast message to a multicast group is sent by LRC for transmission to all relevant LRRs, with lower priority than ACK messages.
Prioritization of multicast messages versus other unicast messages on each LRR is based on assigning a higher priority to multicast over downlink unicast (except ACKs and downlinks that are piggy backed on ACK which always have higher pirority), but each multicast group is subject to aa token bucket regulator.

3.15 Version 2.2.39 (changes since version 2.2.27b only)

3.15.1 NFR#971 – Integration of LRR with HAL 5.0.x

New HAL support:	5.0.0
FPGA version support:	58 (no change)

3.15.2 NFR#806 – Corsica – LBT/Class B LRR

Integration of class B devices support + Listen Before Talk (LBT).
Important: the usage of LBT feature depends on local regulations. It is not activated by default.

4 BUG FIXES

4.1 Version 2.6.53

- PT-1893: suplog operation may reset file permission of custom logs and files. Force umask to 0002 on ciscoms
- PT-1879: getid.sh returns an incorrect LRR ID
- PT-1691, PT-1875: Improved Timezone downloading robustness
- PT-1646: class C logging in traces
- PT-1581: missing IsmBand mapping to IsmFreq
- PT-1432: LRR version not updated after an upgrade
- PT-1404: reverse SSH opens mistakenly connection to backup support server when connection with primary is closed.
- PT-1377: request “sync” status to NTP server instead of checking the process status to have a more precise NTP sync status.
- PT-1247: permission of /etc/resolv.conf changed when changing DNS server list on host side, causing DNS resolution to stop working into the LXC container
- PT-1224: Downlink error if power is too low (because of antenna gain for instance)
- RDTP-15186: Enhance dnconfig.sh to search for tarballs in local directory.
- RDTP-15129: cause forced to 0 in Sent indication if delivery status is Sent

4.1.1 Backported to hotfix version 2.6.10_4

- RDTP-16069: ABP device reset but device boot RX2 frequency not used. [lrr].ignoreusedforrx2 (defaut: 1) setting added. If set, LRR ignores “usedforrx2” from channels.ini if LRC sets a channel for RX2

4.1.2 Backported to hotfix version 2.6.10_3

- RDTP-15343: Frequency correction for beacon and multiclass C. Adjust frequency because of xtal drift for downlink using ON_GPS mode (set lrr.ini:[lrr].driftcompensation=1)

4.1.3 Backported to hotfix version 2.6.10_2

- PT-1633: Do not postpone a beacon
- PT-1512:
    - For class A Downlink, try rx2 if rx1 fails for any reason
    - Introduce 3 new settings changing V2 gateway behaviour:
        1. [lrr].retryonmisswin=1 (default; 0). If set, RX2 is tried if sending class A downlink on RX1 fails (0: only done for LBT failure).
        2. [lrr].useinstcnt=1 (default: 0): if set, use the function sx1301ar_get_instcnt() instead of sx1301ar_get_trigcnt()
        3. [classb].adjustretryoncollision=1 (default: 0): if set, Queue again class B downlink avoiding a collision so it is available to be sent at next pingslot.
- RDTP-15129: force cause to 0 in Sent indication if delivery status = sent

- RDTP-14405: modify some Downlink error codes for consistency (like class B downlink for instance)

4.2 Version 2.6.10_4

- RDTP-16069: ABP device reset but device boot RX2 frequency not used. [lrr].ignoreusedforrx2 (defaut: 1) setting added. If set, LRR ignores “usedforrx2” from channels.ini if LRC sets a channel for RX2

4.3 Version 2.6.10_3

- RDTP-15343: frequency correction is missing for beacon transmission. [lrr].driftcompensation=1 (default:0). If set, the frequency is adjusted just before sending GPS-based downlink (beacon and class C multicast).

4.4 Version 2.6.10_2

- PT-1633: PKT SEND busy continues for 2 minutes (beacon wrongly postponed)
- PT-1512:
    - For class A Downlink, try rx2 if rx1 fails for any reason
    - Introduce 3 new settings changing V2 gateway behaviour:
        1. [lrr].retryonmisswin=1 (default; 0). If set, RX2 is tried if sending class A downlink on RX1 fails (0: only done for LBT failure).
        2. [lrr].useinstcnt=1 (default: 0): if set, use the function sx1301ar_get_instcnt() instead of sx1301ar_get_trigcnt()
        3. [classb].adjustretryoncollision=1 (default: 0): if set, Queue again class B downlink avoiding a collision so it is available to be sent at next pingslot.
- RDTP-15129: force cause to 0 in Sent indication if delivery status = sent (already part of Hot-fix # 1)
- RDTP-14405: modify some Downlink error codes for consistency (like class B downlink for instance)

4.5 Version 2.4.85

- PT-1277: use absolute value of Linux and GPS time difference to check time consistency
- PT-1275: fix a HAL issue causing packet fine timestamp to be incorrect

4.6 Version 2.4.79

- PT-1243: LRR doesn’t start because of missing LRRUID (depends on gateway S/N)
- PT-1228: fix allowed characters for NTP server in Suplog
- PT-1227, PT-1233: prevent TRACE.log deletion during upgrade
- PT-1229: fix potential buffer overflow in Suplog
- PT-1232: “support” cannot create files into /tmp
- PT-1208: Suplog reboots the container, not the gateway

- PT-1217: restore suplog files ownership after gateway reboot (changed by Cisco firmware)
- PT-1193: usr_postinstall.sh executed after support account creation
- PT-1183: use firmware version stored into /proc/cisco_version
- PT-1169: fix priority when retrieving values from .ini file in Bash
- PT-1166: FPGA and Chip ID incorrect in versions.ini
- PT-1158: setting of margin between uplink time and reply on rx1 or rx2 [<system>.dnmarginrx1rx2] (default value: 3 for upward compatibility)
- PT-1008: [lrr].gpsmaxbadchecksum to force a GPS TTY reset after several consecutive "bad checksum" frames (default: 1000, 0 to disable the feature)
- PT-1137: SKU in versions.ini: use actual gateway model instead of LRA SKU
- PT-1135: firmware version not reported if no network
- PT-1101: check if trace folder exists before trying to add it to uploaded log
- PT-1120: debug information of Expect scripts stored into /tmp
- PT-1121: support of get_gateway_info.sh
- PT-865: improve ipsec status check
- PT-1106: get_gateway_info.sh must not return LRRID
- RDTP-9512: add option -E to shell commands that call restart or reboot
- RDTP-9756/7649: no lrr reboot after autorebootimer when no reply to get LRR ID from LRC
- PT-1049: suplog: whitelist for allowed chars
- PT-791: create $ROOTACT/var/log/lrr/SHELL.log if it does not exist
- RDTP-9489: use sftp provided by the LRR by default

4.7 Version 2.4.45

- PT-918: adapt attenuation in lowlvlgw.ini for Japan
- RDTP-9410, RDTP-7582: suplog: modify menus related to key installer pubkey authentication
- RDTP-8848: add BootServer HA support in the LRCv2 context
- PT-1038: password visible in plain text when changing timezone
- RDTP-7286: after asynchronous command cmdstatus <number> shows wrong information
- RDTP-4291: return to LRC the true bandwidth used for UL/DL packets
- RDTP-3389: rfscanv1.sh transfers the result also on support2
- RDTP-3384: openssh.sh tries to reach backup support server if the primary one is unavailable
- RDTP-8244: when uploading file, change error message to be more explicit
- PT-891: rfscanv1 step can be supported in lrr.ini
- RDTP-7940: suplog: power transmission adjustment: enhance checking of antenna input
- RDTP-6778: suplog: propose a list when changing time zone
- RDTP-6639: rescue console: auto reverse ssh uses default lrrid when lrr is restarted
- RDTP-6247: LRC – beacon requests sent to LRR twice

- PT-919: wrong error function name in execrff and saverff
- PT-913: add an “Implementation & Troubleshooting” README.txt for Cisco
- RDTP-5341: add more traces for geoloc

4.8 Version 2.4.21

- RDTP-6094/PT-716: GPS time reported is temporarily shifted away from NTP time
- RDTP-7315: LBT checking remained in LRR even though RF region has been changed
- PT-852: unexpected TRACE.log rotation if bigger than default at LRR startup
- RDTP-7119: TimeOnAir calculation wrong if packet size >= 256
- PT-870: lbt.classcdelay default value set to 30 instead of 5
- PT-853: sometimes, cannot determine virtual channel on router if one gateway is off
- PT-802: LRR starting issue on 2-box
- RDTP-6803: correct typos in suplog
- RDTP-6786, RDTP-6841: suplog reverse ssh: allow ‘-‘ for username and host
- RDTP-6797: suplog: remove scrollbar from LRC list in Troubleshooting/Ping LRCs
- RDTP-4810: do not start GPS if not needed
- RDTP-6965: checkTLS stopped using “ps -p”
- PT-808, PT-722: fix RF Scan issue (including region detection)
- PT-799: fix issues regarding boot sequence and installation
- RDPY-6963: lrr.x crashes in loop with option pingaddrsrc=@itf
- PT-803, PT-758: calibration: new lowlvl_ciscoms.ini + revisited lowlvlgw.ini creation
- RDTP-2543: multi RX2 channels
- PT-744: libjansson linked statically with suplog.x
- RDTP-6172: uselgwtime no more configurable (forced to 1)
- RDTP-5911: support shifting of DL frequencies
- PT-662: usr_postinstall.sh adaptation to take into account custom settings.

4.9 Version 2.2.82

- PT-473, PT-474: fixed in 2.2.68. Add improvement when accessing host from the container (retrieving of host ip, reboot)
- NOREF: radio configuration failure when number of LBT channels is greater than number allowed by reference design
- RDTP-4167: updated suplog menu to add TPE-specific configuration (Change Network, PKI config)
- PT-578: avoid network flood (traceroute) once the model (1-box or 2-box) is detected.
- PT-613: fix LRR ID retrieval issue from TWA for Cisco
- PT-662: usr_postinstall.sh adaptation to take into account custom settings

4.10 Version 2.2.68

- PT-456 LBT doesn’t work: transmitting in all cases.

4.11 Version 2.2.66

- PT-490: error “sx1301ar_parse_ubx_timegps failed: Unspecified error code”
- RDTP-3111: Increase log level when parsing error on GGA or RMC NMEA frames
- RDTP-3509: LBT not working on FPGA 61/HAL 5.1.0

4.12 Version 2.2.62

- PT-473: no IP address for eth0 displayed in the GUI
- PT-474: reboot doesn’t work from GUI
- PT-406: handling of GPS error when not yet synchronized
- RDTP-1825; RF cell automatically restarted after “radiostop” command
- RDTP-1918: suplog.x commands return permission denied
- RDTP-3123: Return error code in LBT case
- RDTP-2983: frequency hopping for class B
- PT-215: improve GPS UBX frames algorithm
- RDTP-1969: frequency hopping for beacon (us915, au915, cn470)
- RDTP-2198: increase accuracy in estimated UTC time for class B downlink
- RDTP-2198: add parameter to control class B downlink time transmission to the radio board
- RDTP-477: xlap: send back messages not ACK’ed
- RDTP-2009: TRACE.log displays repeatedly:
  “GPS device /dev/ttyS1 with fd=-1 read() returned -1”
- PT-353: “lrr.x –config doesn’t display configuration (redirected to TRACE.log)

4.13 Version 2.2.48b

- PT-260: Porting on Warbler 2-box
- PT-353: Lrr.x –config doesn’t display configuration
- PT-215: Update GPS UBX and NMEA frames algorithm
- RDTP-1695: Mutex crash with LBT when report sent on RX2
- RDTP-1694: Timing issue for the beacon due to wrong fine timestamping
- RDTP-1234: TRAVE.log: add 0 for padding decimal part
- NOREF: suplog: iptables screen changed to see interface names and to disable name resolution
- NOREF: traces always activated during startup and stopped once complete if not enabled

4.14 Version 2.2.46a

- PT-260: adaptation to support Cisco Warbler 2-box
- PT-319: reboot from GUI is KO sometimes after an upgrade
- PT-300: logs from support menu are not available
- RDTP-690: suplog.x – code injection through the Password field
- RDTP-847: antenna gain and cable loss shows only integer value
- RDTP-895: Cisco gateways use RSSI_sig instead of RSS-channel
- RDTP-793: “Export Logs” now uses sftp by default

- RDTP-438: force closing openssh after 1 hour

4.15 Version 2.2.39 (changes since version 2.2.27b only)

- PT-193/PT-201: more robust password for container root account
- PT-187: different location of custom hosts and nsswitch.conf
- PT-124: script for upgrading/downgrading firmware
- PT-272: etc/hosts get erased after GW reboots
- RDTP-857: LBT broke class C devices
- RDTP-680: LBT failure not correctly handled
- RDTP-690: security fixes to prevent command injection from Support CLI

5 KNOWN ISSUES

- PT-1814: "NTP not synchronized" when GPS is used. This is a firmware restriction (GPS sync is independent of NTP).
- PT-866: restriction: upgrade LRR not available for router version

ABOUT ACTILITY

Actility is an industry leader in LPWAN (Low Power Wide Area) large scale infrastructure with ThingPark™, the new generation standard-based M2M communication platform. Actility's ThingPark Wireless™ network provides long-range coverage for low-power sensors used in SmartCity, SmartBuilding and SmartFactory applications. Actility also provides the ThingPark X which provides big data storage for sensor data and exposes sensor function through an open API allowing developers to provide vertical applications on top of rolled out sensors. To help vendors transform their sensors, Actility provides the ThingPark IoT platform which include embedded software solutions and cloud solutions to help devices connect to innovative applications. Via the ThingPark Market, an online marketplace engine dedicated to the IoT sensors, applications and network solutions, Actility enables the roll-out of new innovative IoT services for sensor vendors and network solution vendors. Actility is a founding member of the LoRa Alliance™: the largest, most powerful standards-based effort to enable the Internet of Things (IoT). Visit www.actility.com.

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