

# 90000

## JunglePAX – Release Notes

Firmware Package p/n 90000-01  
Version: 1.18.29263  
Release Date: October 19<sup>th</sup>, 2020  
Type of Release: Production Release

### Lentronics JunglePAX



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## RELEASE SUMMARY

### REQUIREMENTS

- A networked PC with access to the JPAX subnet
- Web-browser (latest version of Chrome, IE or Firefox)
- Terminal session. Putty.exe
- Advanced NMS (p/n 90000-50, -50/G, -51, -50/G) versions 8.3.2, 8.4 or 8.5

### DOCUMENTATION CONTROL

Document Version 1.00	PR 1.18.29263	October 19 <sup>th</sup> , 2020
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### PRODUCT/COMPONENT

This production firmware release is comprised of numerous individual firmware components packaged together and distributed as a controlled JunglePAX part number 90000-01. The overall product structure, including hardware and firmware contains the following sub-components

#### JPAX Firmware Package 1.18.29263

- CHASSIS, p/n 90001-01
  - Comprised of Backplane, daughter-card and mechanical
- CORE Module, p/n 90010-01
  - NMS                                    jpax\_nms.itb                                    crc=0DC2971C                                    version=1.18
  - DP (Dataplane)                        jpax\_dp.itb                                    crc=10166AF2                                    version=1.18
  - FPGA                                    jpax\_fpga.itb                                    crc=4A33E9C6                                    version=1.18
  - UBOOT                                    jpax\_uboot.itb                                    crc=84BBABF8                                    version=1.07
  - EF-4A                                    ac9020001.bin                                    crc=0A2294FA                                    version=2.01.16
  - EC-4A                                    ac9020101.bin                                    crc=F23DE760                                    version=2.01.11
  - T1E1-4A                                    ac9030002.bin                                    crc=A3AF5C9A                                    version=2.01.08
  - CBUS-4A                                    ac9030101.bin                                    crc=70F85CD2                                    version=2.01.08
  - C3794-1A                                    ac9036001.bin                                    crc=BEEE108C                                    version=2.01.15
  - C3794-4A                                    ac9036002.bin                                    crc=E15B293B                                    version=2.01.15
  - C3794-1A-FPGA                            af9036001.bin                                    crc=5C91D5CA                                    version=1.13
  - C3794-4A-FPGA                            af9036002.bin                                    crc=5C91D5CA                                    version=1.13
  - DR-1A                                    ac9035001.bin                                    crc=52A5DFF3                                    version=2.01.03
  - DR-4A                                    ac9035002.bin                                    crc=EB01E28D                                    version=2.01.03
  - DR-1A-FPGA                                    af9035001.bin                                    crc=4F5ED83A                                    version=1.08
  - DR-4A-FPGA                                    af9035002.bin                                    crc=4F5ED83A                                    version=1.08



• G703D-4A	ac9036601.bin	crc=983ABC51	version=1.00.00
• G703D-4A-FPGA	af9036601.bin	crc=AE542A8A	version=1.03
• DTT-2A-01	ac9034101.bin	crc=7D69753C	version=1.14.00
• DTT-2A-03	ac9034103.bin	crc=CCA0923A	version=1.14.00
• DTT-2A-05	ac9034105.bin	crc=CEB822DD	version=1.14.00
• DTT-2A-01-FPGA	af9034101.bin	crc=ADDD0F94	version=1.06
• DTT-2A-03-FPGA	af9034103.bin	crc=ADDD0F94	version=1.06
• DTT-2A-05-FPGA	af9034105.bin	crc=ADDD0F94	version=1.06
• AC_BOOT08	ab90xxx08.bin	crc=8A5792DC	version=1.08.05
• AC_BOOT50	ab90xxx50.bin	crc=3B7E8961	version=1.08.05

#### CORE UNIT DATA PLANE FIRMWARE

The data plane firmware provides the real-time operating environment responsible for the real-time components of the JPAX system and where all the time critical functionalities are implemented, including:

- data path configuration
- data path status monitoring
- alarm monitoring and reporting
- hardware drivers and control
- inter-core operation
- system initialization
- inventory
- node health status
- logging and event notification

The data plane is comprised of critical interfaces and associated systems that affect the flow of data within a JunglePAX node (Inter-core configuration and monitor) and across a JunglePAX network, including the CBUS Interface, TDM packetizer, MPLS capable switch, FPGA, Power Supply, DPLL, SFP status, alarm control and status, access unit control, and system logging functionality.



## CORE UNIT MANAGEMENT PLANE FIRMWARE

The management plane firmware provides embedded management environment responsible for management plane functionality of the JunglePAX including:

- Configuration
- Alarm logging
- Status reporting
- Transaction and Session Management
- Security, including role-based access control
- Firmware upgrades
- Network discovery and remote management

The EM10 system is comprised of functional modules including the ConfD Infrastructure, Applications and Daemons, and the Interfaces that support the configuration of, and status/alarms-reporting from, the RTOS Components, which are also referred to as the Data Plane Components.

A JunglePAX model is created through the YANG modelling language and incorporated into the code build. The ConfD compilation infrastructure creates the north-bound interfaces (Netconf, CLI, HTTPS and SNMP). SNMP is not currently supported in this release. Each parameter set/get request is sent to the ConfD server, which will pass it via an Application or Daemon (often referred to as a Data Provider) to the Data Plane. The Data Provider uses functions in the Interfaces to send the requests to the Data Plane.

For this release of the EM-10, access to the JunglePAX is via the **webui (aa.bb.cc.dd)**, where **abcd** represent the IP address of the locally connected CORE module. This release supports local and remote unit access, with remote navigation provided by a Network node list. Access to either left or right remote CORE units is offered through the network node list.

Physical access to the embedded manager is provided through the TOP NMS port (RJ-45) on either left or right CORE modules.

Access to the Command Line Interface (CLI) is accessible via the webUI interface by pressing the CLI button or using an SSH client like PuTTY on the standard SSH port 22. Connect to the IP address of the CORE unit. The advantage of the SSH client is better window size flexibility and text handling like pasting scripts.



## CORE UNIT BOOTLOADER

The Core Unit Bootloader controls the boot process of JPAX. It is responsible for the following:

- Loading factory firmware images from TFTP or SD card
- Extracting/Verifying and Booting EM and DP firmware images
- Extracting/verifying/flashing FPGA images to serial flash
- Configuring system memory map for all peripherals
- Storing MAC addresses, default IP settings and factory calibration settings
- Low-level system debugging support

## ACCESS UNIT FIRMWARE

The access unit firmware for the microprocessor consists of two parts: the bootloader and the user application. There are different user applications to support the six types of access units

- 4-port Ethernet Optical (SFP),
- 4-port Ethernet Copper (RJ-45),
- T1/E1,
- CBUS,
- 1 & 4-port C37.94
- 1 & 4-port Direct Relay unit supporting RS232 (up to 4 ports) and G.703 (1 port)
- 4-port G.703, and
- 48/130/250VDC Direct Transfer Trip modules



## RELEASE DETAILS

### SUMMARY - NEW FEATURES (1.18)

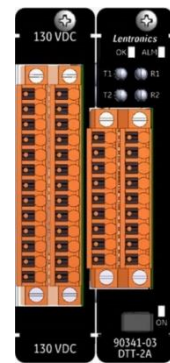
GE's JunglePAX is a purpose-built optical packet switched solution that's hardened through layers of redundancy for secure and dependable utility communications. This production release of the CORE units' firmware introduces a variety of new product features and fixes with the major items summarized below. The complete list is included along with their JIRA (issue tracking) number. Where a detailed description of the issue is required, please contact GE with the JIRA number.

#### Firmware version 1.18 new features

#### 1. Added support for a new 2-port Direct Transfer Trip unit (p/n 90341-0x)

This third-generation Direct Transfer Trip module provides two full-duplex channels, keyed at 48VDC, 130VDC or 250VDC (p/n 90341-01, -03, -05). Each channel can be routed over JunglePAX Hybrid ports for transport over SONET/SDH or MPLS-layers. Compatible with GE's DTT Test Panel and interoperable with DTT cards installed in Lentronics Multiplexers (JMUX/TN1U/TN1Ue and T1MX/E1MX/E1MXe/TTMX products).

When equipped within the JunglePAX chassis, this new access module occupies two shelf slots. It can be installed in any slot with the 'Flex' zone (slots 7-16). Like the JungleMUX/TN1U DTT units, removable connectors allow technicians to conveniently establish the relay connections prior to plugging the connector into the main assembly.

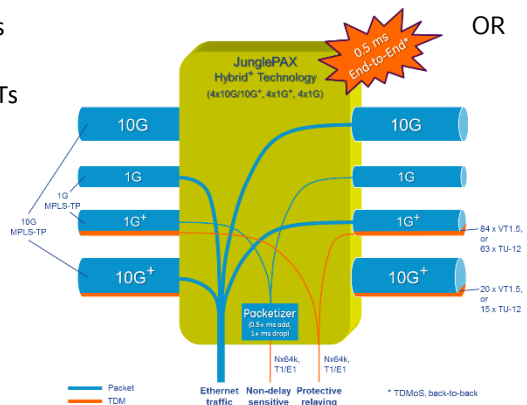


#### 2. JPAX Hybrid Mode

**JunglePAX Hybrid+ Technology** offers the best of both worlds by preserving SONET/SDH performance in a packet-switched network. This is achieved by adding an independent SONET/SDH layer alongside the MPLS-TP layer (without impacting its capacity) over the same optical WAN link. Use of this layer is optional and is intended for TDM-based relaying applications (C37.94, RS-232 Mirrored Bit, G.703 64k etc.) that are extremely delay sensitive.

#### o WAN port support for Hybrid TDM Mode (SONET-Layer)

- 1G WAN ports #3 and #5 to carry 84 VTs  
63 TU-12's,
- 10G WAN ports #1 and #2 to carry 20 VTs  
OR 15 TU-12's

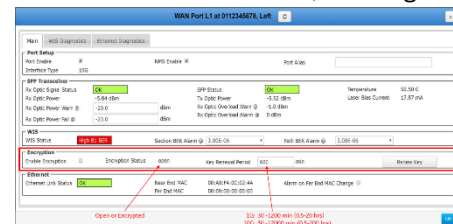




- (continued) Core Card Hybrid Mode for SONET & SDH support:
  - Point to Point (P2P) for nx64kb/s signals connected to
    - iCBUS (internal Channel Bus equipped with iDS0 level cards),
    - CBUS (JMUX/TN1U Channel Bus),
    - T1E1 ports
  - P2P-BulkT1E1 services
  - VT1.5/TU-12 Through and Drop modes
  - VT1.5/TU-12 to MPLS service conversion supported
  - OAM signal conversion
  - VT1.5/TU-12 alarm and status monitoring: AIS/LOP, High BER, RDI
  - VT1.5/TU-12 loopbacks and JungleMUX/TN1U/Ue-compatible Tx/Rx
  - VT1.5/TU-12 continuity tests at both terminating and intermediate nodes
  - VT1.5/TU-12 protection switching (1+1)

### 3. WAN Encryption for improved confidentiality

Encryption of all traffic carried over the WAN is now supported. This is a licensed feature, allowing users to encrypt individual fiber optic segments on any of the 12 JunglePAX WAN ports. After enabling Encryption on both sides of a WAN link, public/private keys will automatically roll based on the administrator's configuration (30 min to 200 hrs), or keys can be manually renewed on each segment via the Web User Interface.

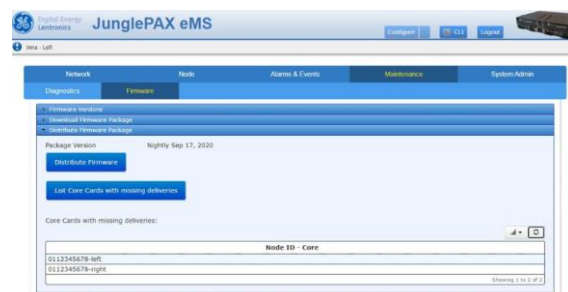


### 4. Committed and Peak Information Rate (CIR/PIR) for engineered service quality (QoS)

JunglePAX has employed trTCMColorBlind and trTCM-ColorAware Policing Schemes per RFC 4115 for Ethernet-based services. Both Policers and Monitors are available to users at access points and WAN ports (per service/pseudowire) to allow them to engineer SLA (service level agreements) across the entire service/pseudowire path.

### 5. Simplified firmware upgrade

JunglePAX firmware distribution is a function<sup>1</sup> of the embedded software controller (eSWC) used by customers to control and enforce synchronization of information across the JPAX network.



<sup>1</sup> AAA policies, User-Management, Licensing, Firmware, Alarm Profiles, Time of Day are other functions





## KNOWN LIMITATIONS

The following is a list of known limitations related to JPAX firmware package 1.18.29263

- PHY Ethernet Diagnostics Tab View | Link-Status shows incorrect state
- G.703D-4A | Link Status shows OK for disabled ports
- iDS0 unit's status display stop updating if Core Card time is set backwards

### DTT

Case	Title	Severity
2740	DTT f/w upgrade via package occasionally causes AC to fail sanity check	Normal

### QoS

Case	Title	Severity
<a href="#">2648</a>	QoS: ColorAware mode can't differentiate incoming yellow/green packets	Normal
<a href="#">2646</a>	CIR: Traffic Monitor detects untagged frames' priority differently between Rx and Tx	Normal
<a href="#">2634</a>	QoS: CIR/EIR/CBS/EBS configurations can exceed UNI speed/capabilities	Normal
<a href="#">2460</a>	MP-Ethernet -> PW popup -> QoS tab (CIR)	Normal



## HYBRID SDH AND OTHERS

Case	Title	Severity
2770	Bogus iDS0 Access Card Alarms may be observed when rebooting JPAX nodes	Normal
2755	Companion sync with blank core card can prevent auth_mgr from initializing properly	Normal
2753	Mismatching Configurations by Changing TDMoP/S Port Type on the Right CC	Normal
2676	TELENIUM - JPAX sent an alarm message with a Service ID of 0	Normal
2660	Inconsistent Jitter Buffer Levels upon reboot of Core Cards	Normal
2604	Incorrect MUX protection switching for unprotected VPLS services	Normal
2538	Tunnel Object with Egress MAC 00:00:00:00:00:00 Causes BFD Down	Normal
2523	User Cannot Create Bulk T1/E1 or P2P-Nx64k Services Directly Through WebUI	Normal
2521	Channel Offset by one in E1 observed with all PRBS patterns	Normal
2785	Rebooting CC Flushes Distribution Status Information	Normal
2831	Unable to monitor one PW direction for High PLR	Normal



## RESOLVED LIMITATIONS

The following is a list of limitations that have been resolved

Case	Title	Severity
2756	Enabled auto-negotiation on Ethernet fiber link for compatibility with JMUX Ether-1000 unit.	Normal
2757	Limit service label range to 1-999999	Normal
2745	CBUS TDMoS Double Hit on Fiber Restore	Normal
2735	Error when configuring p2p-nx64k SONET service with selected all-channels	Minor
2708	Error when configuring p2p-nx64k service if transport-layer is not explicitly set	Minor
2674	CBUS TDMoS priority setting incorrectly placed on the left after LSR's core reboot	Normal
2656	Hairpin channel selection is restricted by existing iDS0 services	Normal
2588	Allow only one service per iDS0 port	Normal
2554	VTU Cross-connects do not get configured properly in SDH mode for VTU slots > 1	Normal
2539	Limit configurable VTU range to 15 and 64 for WAN ports 1/2 and 3/5 respectively	Normal
2331	Change T1/E1 Tests tab's Loopbacks and AIS from Action to Configuration	Normal
880	Limit password length to 32 characters	Normal



2180	Conversion services missing alarm enable/disable and thresholds	Normal
2638	Editing first VPLS service fails to provision changes fully	Normal
2592	Resource Denied error when configuring VTU CDROP	Normal
2535	Resource Denied error when creating hairpin service to C3794	Normal
2528	VF signaling does not work through Conversion node	Normal
2515	Inconsistent PW Diagnostics Statuses between Unprotected on Left WAN and Extended Right WAN	Normal
2501	Rx Priority for unprotected iDS0 services is always set to Left, irrespectively to the configuration.	Normal
2473	iDS0 TDMoS Traffic does not Switch on VT_RDI	Normal
2107	Occasionally Core Card may not bypass VT traffic after reboot	Normal

#### ENGINEERING RULES ASSOCIATED WITH JUNGLEPAX OPERATING MODES

GE allows for a mixture of firmware release 1.12a, 1.14, 1.14a, 1.16d/e and 1.18 in the same network, however network visibility is compromised when running multiple different firmware versions in the same network. Traffic is expected to work but GE can't guarantee highest performance when configured across differing firmware.

Ideally, all nodes within a JunglePAX network should be running the same firmware package.



## FIRMWARE UPGRADE PROCEDURE

Contact GE technical support team for instruction on upgrading the unit firmware. There is currently no cost to customers to upgrade their JunglePAX firmware to release 1.18.

### CONTACTS

For additional details or technical assistance, you may contact:

Customer Technical Service

Burnaby, BC Canada

Phone: 1-604-421-8610

[Lentronics.TechServices@ge.com](mailto:Lentronics.TechServices@ge.com)