Grid Solutions

EVOLUTION MODULE

Evolving and Modernizing Optical Communication Infrastructure

GE Vernova's JungleMUX hardened optical networking solutions have protected our customers most critical assets ensuring safe and reliable delivery of services within harsh industrial environments for over 25 years. Over this period, the product has evolved as technology trends and customers needs have changed, leading to new innovation that's extendable and interoperable with the core platform operation.

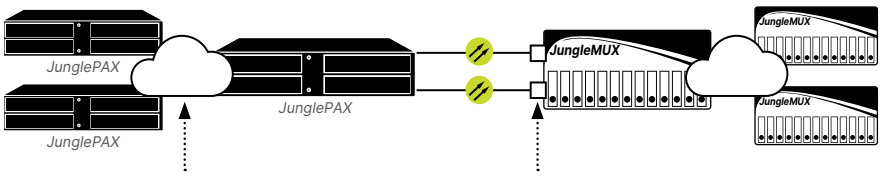
Currently, change comes in the form of an entirely new technology, MPLS (via GE Vernova's JunglePAX), a label switched approach for service deployment edge to edge. This is not a replacement for JungleMUX but instead an evolution of the Lentronics Optical Networking family of products, a strategy that's convenient, consistent and controlled.

Evolution Module (B86900-01) enables migration to MPLS ring by ring or node by node and offers an upgrade opportunity to modernize hardware while preserving highly dependable SONET/SDH delay performance for critical services through deployment of JunglePAX Hybrid Mode. Evolution and Hybrid work together to ensure ongoing security and dependability across both SONET/SDH and MPLS planes.

Our evolution strategies are consistent, convenient and controlled for customers using GE Vernova's optical multiplexers. We ensure migration from SONET/SDH to packet technologies without compromising application performance, equipment reliability and network wide availability.

Evolution Module

An Evolution Module is first installed in GE Vernova JungleMUX OC-3, 12 & 48 or TN1U/TN1Ue STM-1, 4 & 16 nodes, then optically connected via the units' SFP transceiver to a GE Vernova JunglePAX node via it's 1G+ WAN Port. A JunglePAX can be programmed to extract the entire contents of the Bulk VT1.5 / TU-12, or a selection of shared channels. Each 64kb/s channel can then be carried across the JunglePAX network through an MPLS (packetized) or SONET/SDH (non-packetized) service using JPAX's Hybrid Transport Mode.



Single fiber pair connected to 1G WAN port (carrying Ethernet, packetized TDM traffic and non-packetized 64 kb/s traffic)

Evolution Module(s), installed within the Multiplexer. Dual-homing is optional

Example of Evolution modules used to bridge 64kb/s and TDM traffic from SONET/SDH networks into JPAX

Features & Benefits

- New interface unit equipped at strategic JunlgeMUX or TN1U/TN1Ue nodes
- Offers a 1G+ Optical Interface for connection to GE Vernova's JunglePAX
- Passes TDM (VT/TU) Traffic from SONET/SDH to MPLS or Hybrid networks

Protects Existing Investment

- Evolution modules enable new JunglePAX nodes to interoperate within GE Vernova's SONET/SDH networks
- SONET/SDH rings are preserved to maintain network wide application performance

Works with JunglePAX Hybrid Tranport Mode

- To bridge 64k and channelized T1/E1 traffic between SONET/SDH & MPLS network boundaries
- Enabling the creation of Hybrid networks comprised of JunglePAX, JungleMUX & TN1U/TN1Ue platforms
- Supports Single or Dual-homed ties between networks
- Preserve 64k & TDM traffic integrity by bypassing packetization, delivering
  - Exceptional traffic performance (low latency & Symmetry) equivalent to TN1U/TN1Ue Multiplexers
  - SONET/SDH-like determinism without traditional packet-based traffic engineering and Quality of Service complexities

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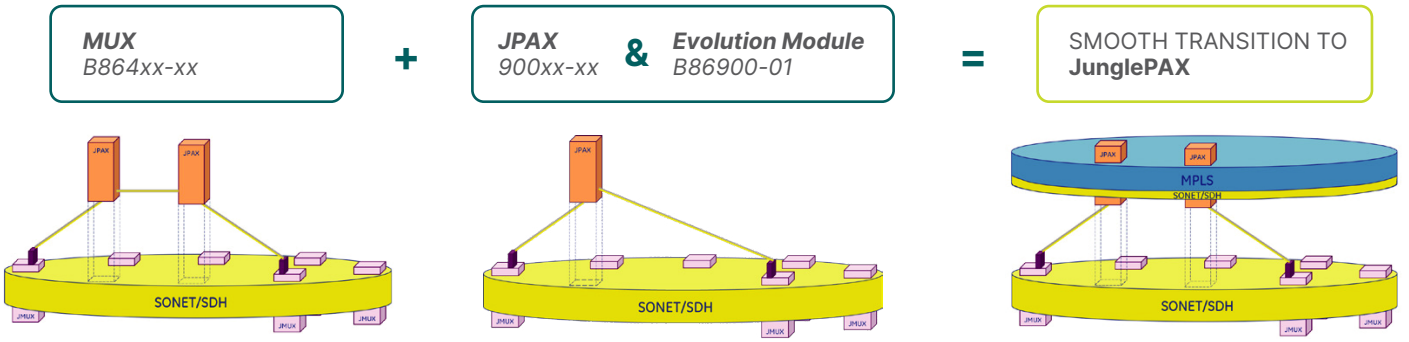
Evolution Equation

Evolution Module further simplifies the migration from JungleMUX/TN1U/Ue Multiplexers to JunglePAX on a ring-by-ring or node-by-node basis. When adding new or modernizing existing substations, utilities may now insert a JunglePAX node into the pre-existing SONET/SDH network without service impact. This strategy enables a 'self-paced' migration of the optical communication infrastructure until the entire network is upgraded.



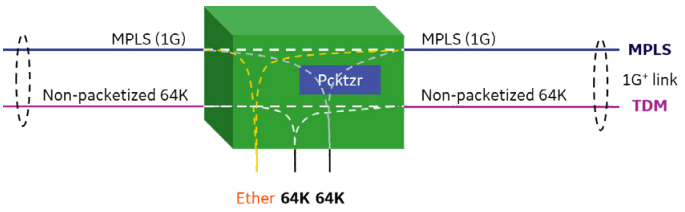
Self-paced Migration, Node-by-Node or Ring-by-Ring

Hybrid Mode

When migrating from SONET/SDH to Packet, utilities must

- Preserve the highly dependable performance for critical and time sensitive applications, and
- Guarantee Interoperability between the platforms.

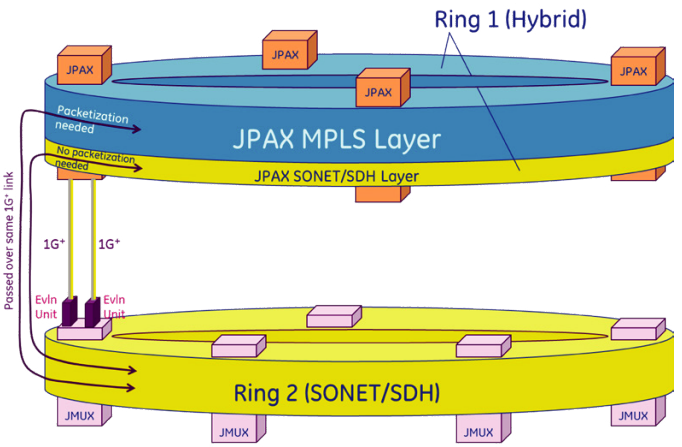
The JunglePAX offers a unique Hybrid Transport Mode to achieve both, supporting native TDM and MPLS streams on the same fiber. 64kb/s Teleprotection traffic carried over the JunglePAX network can do so without packetization, improving latency, asymmetry and determinism.



Evolution Modules and Hybrid Transport Mode work together to ensure ongoing security and dependability across both SONET/SDH and MPLS transport layers.

Hybrid & Evolution working together

When combined, Evolution Module optically connect JMUX/TN1U/TN1Ue nodes with JunglePAX at single tie site or dual-homed to further improve the network reliability. Operational Traffic (OT) can flow between the two networks uninterrupted and without any protocol conversion or packetization to preserve the performance for each services.



For more information, visit
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