LENTRONICS PROFESSIONAL SERVICES

For Hardened Optical Solutions

The Right Assistance at the Right Time

When making significant changes to a critical asset, such as networks supporting key Operational functions, it is important to have the support and assistance of experts who have "been there" in order to ensure a successful implementation of any new technology or significant expansion to core networking topologies.

Having a team of experts ready and available to perform critical tasks, or train your operations staff to be able to do so, is a huge benefit to being able to keep the 'lights on' and perform necessary network life-cycle functions.

GE Vernova professional services team is ready to assist your organization and perform the duties necessary to achieve the desired level of network support and development.

Key Benefits

Timely access to GE Vernova experts and internal resources for expedited problem solving, and performing annual network analysis and preventative maintenance

- Reduced time to new technology implementation through:
  - Expert analysis for best-path migration assessments
  - Access to networking experts for implementation, support, or cross-training
- Efficient use of operational training dollars
  - On-the-job training facilitated by real-world experience working with networking experts on your own network
  - Training at your pace, your way: on-site or off-site
- Capitalize costs by augmenting internal workforce on project basis
- Trial new technologies and concepts in a 'safe', isolated environment

Industry-leading Expertise

- SONET/SDH multiplexer design/implementation experts
- JunglePAX hybrid MPLS-TP and SONET/SDH experts
- TDM to packet expertise
- Utility expertise for a packet world

Fast-track Problem Solving

- Access to GE Vernova tiers 1-2-3[†]
- On-site technical field experts

Managing the Technology Advancement Curve

- Access to proof of concept centre
- Regular updates on GE Vernova product advancements

Implementation Assistance

- On-site on-demand Implementation experts
- Access to GE Vernova analysis/ design expertise
- GE Vernova-style customer-first Support

GE VERNOVA

Customer Challenges

Maintaining as-built networks

- Documenting network physical and service connectivity
- Ensuring proper equipment configuration
- Performing annual preventative maintenance

Supplementing internal core-competency

- Resourcing short term projects
- On-the-job knowledge acquisition and transfer

Limited operational budget versus

- Capital budget
- Capitalizing project costs

Aging workforce

- Prevention of loss of built-up knowledge
- Training of new employees
- Ability to keep up with new technologies

Experience with migration to packet technologies

- Avoiding pitfalls due to inexperience
- Executing best-practices for new technologies
- Using experienced experts

Engineering Services: Network Audit and Analysis

GE Vernova network experts collect a comprehensive set of data on your existing network equipment, services, and topology to produce a detailed and documented picture of the current state of your network asset. A network audit/analysis report is produced to present a clear picture of the health of your network, its composition and configuration, and a detailed set of recommendations for corrective actions and possible improvements.

This report details:

- Physical, logical, and service topology
- Hardware and firmware inventory
- Multi-level alarm state review
- TDM / MPLS service points of presence
- Network design observations and recommendations
- System and node-level discrepancies
- Recommendations on corrective measure

Engineering Services: Network Design

GE Vernova Network engineering experts use information collected in network analysis exercises and combine it with customer plans for network use and expansion to produce industry-leading designs of next-generation networks including engineering for traffic. Intended for new network deployments, large expansions to existing networks, or node additions to existing networks, GE Vernova network design professional services work with you, the customer, to produce the right network services and topologies to meet your needs for today and the foreseeable future.

The designs produced include:

- Physical, Logical (MPLS tunnels, Virtual Tributaries (VT) / Tributary Units (TU) and Services)
- Synchronization, and management topologies
- Proposed hardware, firmware, and physical infrastructure
- Proposed synchronization and network management definitions and configurations
- Proposed logical infrastructure along with configuration scripts
- Script definitions for service points-of-presence
- High level summary of the recommended implementation steps
- Traffic Engineering (TE)

Factory Services

Providing the same base level of service GE Vernova customers have come to cherish and respect, the GE Vernova professional factory services team uses information generated in network design engagements to create preliminary as-built documentation, assembly and configuration of ordered JunglePAX and JungleMUX/TN1U/Ue node.

Working with a predefined list of outputs from network design activities allows the GE Vernova professional services factory team to assemble, configure, test, and document all the equipment ordered as part of any network deployment, or enhancement, exercise.

Basic professional factory services can be enhanced with the addition of customer witness testing, allowing customer representatives to come to GE Vernova's state of the art factory facilities to take part in node and system acceptance testing.

Outputs from the professional factory services activities include:

- Node assignment diagrams and configuration exports
- Test results from the comprehensive set of factory assembly activities
- Familiarization of the equipment setup, configuration and network management tools

Custom Professional Field Services

GE Vernova trained and experienced staff are ready to help you deploy your new JunglePAX or existing multiplexer equipment as needed. The GE Vernova professional field services team can either provide over-the-phone assistance in configuration duties or dispatch network technicians to your sites to do commissioning activities where you have skillset or resource availability challenges.

GE Vernova network technical staff are ideally suited to provide support to your operational team.

Further advanced options are available for GE Vernova professional field services team members to travel to customer-defined locations and participate further in the entire node and system assembly, configuration, and testing process providing invaluable training and experience to operations personnel.

VistaNET and advanced NMS

TN1U

TN1UE

JPAX

T1/E1 Mx

Professional Services for Hardened Optical Solutions

JMUX

Technical Support services

Continuing with the same base level of customer service and product support GE Vernova customers have come to cherish and respect, these offerings have been categorized as 'Basic' customer care, that includes:

- Tier 1[†] and 2[†] support during business hours of 8am-5pm PST, Monday – Friday (PST and CET)
- Firmware for all supported multiplexer and JunglePAX products, plus VistaNET management software

The GE Vernova professional services technical support team builds on the base level by offering enhanced levels of service and access.

Customers purchasing 'Gold' annual support services can expect access to:

- Tier 1[†], 2[†], and 3[†] support during business hours of 8am-5pm, Monday – Friday (PST)
- Annual troubleshooting training workshop
- Annual network analysis
- 1 week of on-site support including:
  - Annual troubleshooting training workshop
  - Annual on-site preventative maintenance (based on results of network analysis)
  - Annual on-site VistaNET update at network operation centers

Customers purchasing 'Platinum' annual support services receive:

- Tier 1[†] support 24hrs a day, 7 days a week
- Tier 2[†] and 3[†] support during business hours of 8am-5pm, Monday – Friday (PST), dispatched to the customer site if critical issues cannot be otherwise resolved.
- A dedicated 1-800 support number, 24/7/365 with 4-hour Tier-2 technical phone response also 24/7/365
- Training towards annual GE Vernova equipment certification

- Annual Software licensing for GE Vernova's embedded management system[††]
- Annual remote network analysis
- Onsite support (1 week, up to twice per year) for analysis, design and/or new equipment deployment and service implementation

Education Services

GE Vernova experts have compiled an extensive library of training material to help you get the most out of your GE Vernova JunglePAX and SONET/SDH Multiplexer networks. Training classes can be arranged for student groups at GE Vernova training facilities or GE Vernova expert trainers can come onsite to train groups of employees wherever convenient to the customer.

The GE Vernova portfolio of training includes:

- General technology training from basic to advanced network concepts
- Product-specific education and certification
- On-site or off-site group training
- Custom webinars addressing specific issues raised by our GE Vernova customers
- Scenario-specific education to address questions like "How do I transport Teleprotection on JunglePAX via Hybrid+SONET/SDH or MPLS layers?"

Custom Professional Services

For those customers with advanced networks needing enhanced access to GE Vernova network experts and facilities, GE Vernova offers a suite of custom professional services. Within GE Vernova's customer experience labs, customers are offered a design, testing and training environment for Hardened Optical Networking communications applications. This environment offers a place where ideas and new technologies can be proven and demonstrated in an isolated, secure, and safe environment, that reduces the risk and costs by getting it right the first time through collaboration and solution validation with GE Vernova experts.

- Discuss product features and direction
- Influence product strategy
- Network analysis, design, migration strategies
- Product training
- Full support with testing

GE Vernova's custom professional services are designed to offer expertise, experience, and exposure to GE Vernova's advanced, high-tech, networking and commercial products.

Typical activities include:

- Testing applications in a TDM and/or packet environment
- Teleprotection, SCADA, 61850, legacy services; voice, serial, data, advanced NMS operations & differentiated IT services
- Performance testing in a TDM and/or packet environment
- Latency (including asymmetry) for time-sensitive applications,
- Determinism - static routes, latency and jitter, guaranteed QoS and path switching
- Bring 3rd party equipment for interface and performance testing

† Tier 1: Support is provided through individuals with a basic understanding of the product structure and can field high-level product questions. Tier 2: Support is provided through technologists with an expert understanding of the SONET/SDH equipment. Tier 3: Support is provided by individuals with design expertise of the SONET/SDH equipment, often through the tier-2 technical support team.

†† External network management solutions sourced through GE Vernova and purchase for managing JunglePAX equipment is subject to Annual software licensing

Professional Services Ordering Codes

PART	PART NUMBER	DESCRIPTION
JMUX - SUPPORT-TRAINING	NA_TRAINING_1	JMUX - On-Site Training (NAM)
TN1U/Ue - SUPPORT - TRAINING	GLOBAL_ TRAINING	TN1U/TN1Ue - On-Site Training (Rest of the World)
JPAX - SUPPORT -TRAINING	90510-01/-02	JPAX - On-Site Training (01-NAM/02-Rest of the World)
SUPPORT-TRAINING	90510-03	GE Vernova In-house Training
SUPPORT-TRAINING	90510-04	Training Per Seat (On-Site)
SUPPORT-TRAINING	90510-05	Training Per Seat (GE Vernova In-house)
MUX-SW-TRAINING-STD	86456-86	On site Product Training (STANDARD), 2-days, No TnL
MUX-SW-TRAINING-GOLD	86456-86/G	On site Product Training (GOLD), 3-days, No TnL
JPAX-SW-TRAINING	90510-50	On site Product Training (STANDARD or GOLD), 2-days, No TnL
MUX - SERVICES - FACTORY	OE	FACTORY - ORDER ENGINEERING for SONET/SDH Multiplexers
MUX - SERVICES - FACTORY	OE-T1/ OE-E1	FACTORY - ORDER ENGINEERING for T1 or E1 Multiplexers
JPAX - SERVICES - FACTORY	OE-JPAX	FACTORY - ORDER ENGINEERING for JPAX
JPAX - SERVICES - FACTORY	90000-STA-1	SYSTEM Assembly & Test, Factory Staging, BASIC (<=4 hrs) for JPAX
JPAX - SERVICES - FACTORY	90000-STA-2	SYSTEM Assembly & Test, Factory Staging, MEDIUM (<=8 hrs) for JPAX
JPAX - SERVICES - FACTORY	90000-STA-3	SYSTEM Assembly & Test, Factory Staging, ADVANCED (<=12 hrs) for JPAX
JPAX - SERVICES - FACTORY	90000-STA-4	SYSTEM Wire & Test Labour - Custom n*hrs/Node
MUX - SERVICES - FACTORY	86400-STA-1	SYSTEM Assembly & Test, Factory Staging, BASIC (<=4 hrs) for SONET/SDH Multiplexers
MUX - SERVICES - FACTORY	86400-STA-2	SYSTEM Assembly & Test, Factory Staging, MEDIUM (<=8 hrs) for SONET/SDH Multiplexers
MUX - SERVICES - FACTORY	86400-STA-3	SYSTEM Assembly & Test, Factory Staging, ADVANCED (<=12 hrs) for SONET/SDH Multiplexers
MUX - SERVICES - FACTORY	86400-STA-4	SYSTEM Wire & Test Labour - Custom n*hrs/Node
JPAX - SERVICES - FACTORY	CWT-JPAX	Customer Witness Test (<= 5 JPAX nodes), equivalent to Factory Acceptance Tests (FAT)
MUX - SERVICES - FACTORY	CWT	Customer Witness Test(<= 5 MULTIPLEXERS nodes), equivalent to Factory Acceptance Tests (FAT)

PART	PART NUMBER	DESCRIPTION
SUPPORT- CONTRACT	90520-01	'Basic' Annual Support - Phone (8×5 PST, M-F), Firmware Upgrades
SUPPORT- CONTRACT	90520-10/-11/-12	1/3/5-Yr Gold; Per Node, Basic+ Annual Analysis/ Maintenance/ Workshop, per year
SUPPORT- CONTRACT	90520-20/-21/-22	1/3/5-Yr Gold; Per Network, Basic+ Annual Analysis/ Maintenance /Workshop, per year
SUPPORT- CONTRACT	90520-30/-31/-32	1/3/5-Yr Platinum; Per Node, Gold + Phone (24/7, Dedicated 1-800#), Annual SW Lie & Certif. training, per year
SUPPORT- CONTRACT	90520-40-/-41/-42	1/3/5-Yr Platinum; Per Network, Gold+ Phone (24/7, Dedicated 1-800#), Annual SW Lie & Certif. training, per year
SUPPORT- FIELD	LEN-FIELD-SERVICES	Field Services (per project scope)
SUPPORT- FIELD	90530-01	Field Services/ Commissioning (per day)
SUPPORT- FIELD	90530-02	Field Services/ Commissioning (TnL, Domestic, per week)
SUPPORT- FIELD	90530-03	Field Services/ Commissioning (TnL, International, per week)
SUPPORT- ENG	90540-01	Network Analysis - JMUX/TN1U, per node
SUPPORT- ENG	90540-02	Network Analysis - JPAX, per node
SUPPORT- ENG	90540-10	Network Design - New or Expansion, per node
JPAX - SUPPORT - SW	90550-01	JPAX - eMS Annual support
JPAX - SW - SUPPORT- 8×5-STD	90550-02	8×5 Annual Extended STANDARD Support for GE Vernova's Advanced NMS, for JunglePAX
JPAX - SW - SUPPORT- 24×7-STD	90550-03	24×7 Annual Extended STANDARD Support for GE Vernova's Advanced NMS, for Jungle PAX
JPAX - SW - SUPPORT- 8×5-GOLD	90550-02/G	8×5 Annual Extended GOLD Support for GE Vernova's Advanced NMS, for Jungle PAX
JPAX - SW - SUPPORT- 24×7-GOLD	90550-03/G	24×7 Annual Extended GOLD Support for GE Vernova's Advanced NMS, for Jungle PAX
JPAX - SUPPORT - HW	90570-01	JPAX - HARDWARE Warranty extension, Per year (starting Year 3)
MUX - SW - SUPPORT- 8×5-STD	86456-80	8×5 Annual Extended STANDARD Support for GE Vernova's Advanced NMS, for SONET/SDH MUX
MUX - SW - SUPPORT- 24×7-STD	86456-81	24×7 Annual Extended STANDARD Support for GE Vernova's Advanced NMS, for SONET/SDH MUX
MUX - SW - SUPPORT- 8×5-GOLD	86456-80/G	8×5 Annual Extended GOLD Support for GE Vernova's Advanced NMS, for SONET/SDH MUX
MUX - SW - SUPPORT- 24×7-GOLD	86456-81/G	24×7 Annual Extended GOLD Support for GE Vernova's Advanced NMS, for SONET/SDH MUX

For more information, visit
gevernova.com/grid-solutions

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