

The logo features a white 5G symbol with three curved lines above it, set against a green square background. Below the symbol, the word "READY" is written in white capital letters.

5G
READY

A white rectangular box with a thin white border containing the text "OSS Products". A small yellow triangle is positioned at the top-left corner of the box.

OSS Products

info@ttgint.com
www.ttgint.com

The logo consists of a stylized globe icon made of concentric lines, followed by the letters "TTG" in a bold, orange, sans-serif font. Below this, the text "International Ltd." and "Software House" is written in a smaller, black, sans-serif font.

TTG
International Ltd.
Software House

About TTG

TTG Int. LTD, a privately owned company established 2001, is the leading global provider of best-in-class proactive and customer oriented approach to Service Assurance as well as customized OSS software solutions to the telecoms industry.

TTG growth has been outstanding to its exceptional vision and leadership in the development of 3G technology, NGNs as well as Fix networks. The expertise gained in these technologies has enabled TTG to pioneer the OSS tools such as Performance Management, Fault & Alarm Management, Leased Line Inventory, Network and Transmission Inventory of such 2G, 2.5G, 3G, WCDM, PDH/SDH, IP/MPLS and LTE networks. Our OSS tools are designed by telecommunication engineers that have been in the operator's site for many years. All these unique expertise is added in our OSS software excellence, systems integration and network engineering.

TTG to pioneer the OSS tools such as Performance Management, Fault & Alarm Management, Leased Line Inventory, Network and Transmission Inventory of such 2G, 2.5G, 3G, WCDM, PDH/SDH, IP/MPLS , LTE (4G) and 5G networks."



International Ltd.
Your OSS partner



Corporate Strategy

Corporate Strategy & Philosophy

TTG International Ltd. is the leading OSS supplier. We have Global Supplier Agreements with a number of clients. Our strategy is to maintain this leading position by organic growth, partnerships and acquisitions.

More over our strategy is to extend the scope of the product offering to Telco's by joint developments, partnerships or other commercial arrangements.

The software is offered to our client as a complete Solution including Consultancy, Training and Support. Our consultants, who will work with you to install and configure the system, are all TTG's employees with considerable experience in OSS projects worldwide.

Our Customer Service capability is available 24 hours a day, 365 days a year. It offers advice and assistance to optimize the use and benefits of your system.

We continually review our products and services by both internal and external quality audits to ensure we continue to offer professional and high quality products and services.

Markets

TTG International Ltd.'s market focus is totally on the telecoms sector, primarily the mobile sector, though we have clients using the product for Broadband and Wireless local loop applications. Our prospects and clients are broadly in the following sectors. Mobile operators Equipment suppliers Telecommunication construction companies Government

Financial History and Status

TTG International Ltd. has achieved a strong financial record since its formation in 2001 with consistent revenue and profit growth. It is one of the fastest growing OSS technology companies in the Turkey.

Products and Services Portfolio

All Tools has been developed completely by TTG International Ltd. with the original architects are still in the development team. The products are not only very stable and mature but also are continuously being enhanced.

Vision:

To provide innovative OSS solutions for Telecom.

Mission:

To focus on our customers' market challenges and need by providing excellent OSS network solutions and services, enabling them to achieve maximum value for their business.

Development Strategy:

- Serving our customers is the only reason TTG exists.
- Customer demand is the fundamental driving force of our development.
- Innovative solution and high quality.
- Low operating costs and meeting our customers' requirements.
- Tools are designed to meet our customers' requirements.
- Continuous development for ensuring high-quality end-to-end OSS solutions.



Let us light your way to success

The Role of T-TOMS*

* TTG TELECOM OPERATION MANAGEMENT SYSTEMS

TTG offers best-in-class applications on single or multiple platforms. TTG offers a number of best-in-class applications that extend T-TOMS for switching transmission, signaling, data/IP, 2G, 3G, LTE, IMS infrastructure and services management that will accelerate the transition to Fourth Generation (4G) networks. Currently T-TOMS can provide a complete management solution in the following areas, regardless of whether your network is fixed or mobile.

Network Management

- Service Assurance
- Performance Management
- Fault & Alarm Management
- Transmission Inventory Management
- Configuration Management
- Parameters Management
- Accounting
- Security
- Mind - Set *
- Mind Set: Continuous monitoring, ceaseless curiosity about what useful information

the network can yield and dynamic performance analysis of the infrastructures are a must for operators to improve network quality.

T-TOMS provides end-to-end management of convergent networks and services with seamless integration of other applications and technologies.

Role of T-TOMS

T-TOMS has been developed to provide a basis for the long term, logical development of management solutions for telecommunications network. T-TOMS models integrated management systems and system components, by specifying an environment in which these components can inter-operate and implements automated management functions. This architecture has been developed to provide as much flexibility as possible so that you can:

- Define and implement network management strategies based on your needs
- Manage existing network elements in real-time
- Add new resources to your network when needed without interruption
- Continue to use inherited applications
- Easily integrate with third party applications

T-TOMS implements an open, distributed architecture that covers all your network management OSS tools. T-TOMS can connect to network elements using advanced OSS tools functions. The OSS products are designed carefully and specifically for the management of telecommunications and corporate networks.

The T-TOMS Client, displays T-TOMS data using interface applications to provide a comprehensive system of full network management.

NORTH-I
PERFORMANCE
MANAGEMENT

SxQM
SUBSCRIBER EXPERIANCE
QUALITY MANAGEMENT

FAMAN
FAULT & ALARM
MANAGEMENT

TTeX
TROUBLE TICKETING MANAGENT

CMEx
CONFIGURATION
MANAGEMENT EXPERT

NET-TRANS
TRANSMISSION MANAGEMENT

TIPS
TRANSMISSION
INVENTORY & PROVISIONING

CNDAPT
CORE NETWORK DIMEN SIONING
ANALYSIS AND PLANNING TOOL

PMS
POWERLINE MONITORING SYSTEM



Network Optimization Reporting Troubleshooting & Health Indicator NORTH-I

INTEGRATED PNF&VNF OSS MANAGEMENT SYSTEM Measure for the Success

Managing a wireless network has always been a balancing act: Operating at maximum efficiency while maintaining competitive quality of service (QoS), deploying capacity whenever wherever needed as traffic increases and making the most of the frequency spectrum whilst avoiding interference. NORTH-I is the solution for communications providers across the world, enabling them to maximize QoS through optimum network performance.

NORTH-I Performance Manager

TTG's NORTH-I solutions have set the standard for dependable multi-vendor, multi technology performance management. NORTH-I manages GSM, CDMA, GPRS, UMTS, IMS, LTE, POTS, SDH/SONET, SS7 and Sigtran, IN, ATM, Frame Relay, IP, LTE and other technologies today.

Lowest Cost of Ownership

NORTH-I takes performance management to the next level by increasing the performance of your network, your customers and your business. Built using cutting-edge technology, it has the flexibility to collect and interpret terabytes of data from, almost, an unlimited range of sources in near real-time. With its extremely customizable architecture, robust, easy-to-use Web-based administration and reporting tools, dashboard, report portal, industry-standard database and open interfaces including SQL, ODBC, XML and CORBA, SNMP NORTH-I Performance Manager enables full control over your data.

The logo features the text "5G" in a large, bold, white font with a white signal icon above it, and the word "READY" in a smaller, white font below it. The entire logo is set against a green square background.

5G
READY

NORTH-I

Comprehensive Solutions

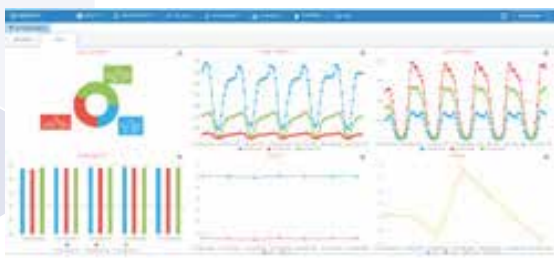
NORTH-I Performance Manager comes with a wide range of technology sets, making it simple to manage different technology types. Each Set comes with domain-specific data models, vendor-specific statistics and consistent vendor-neutral Key Performance Indicators (KPIs) along with value-added reports and graphs, delivering intelligence from day one.

Flexible and Future-proof

NORTH-I Performance Manager can be easily customized and extended to meet your explicit requirements. From supporting new technologies to innovative new ways of looking at your network data, NORTH-I Performance Manager delivers a comprehensive solution, today and tomorrow.

NORTH-I Features

- GSM Technology Set
- UMTS Technology Set
- GPRS Technology Set
- Transmission Technology Set
- Performance Alarm Viewer Module
- Performance Profiling Module
- Prediction Module
- NORTH-I Dashboard
- NORTH-I Ad hoc Report Development & Analysis Module
- NORTH-I / GIS
- Anomaly Detection





Anomaly Based Intrusion Detection ABID+

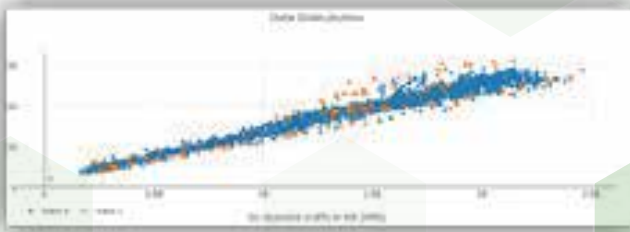
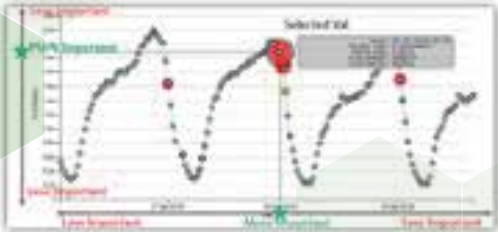
INTEGRATED PNF&VNF OSS MANAGEMENT SYSTEM

Understanding & Utilizing Data Trends

We understand all the needs from operator's point of view as well as network operation experts'. In order to find out the root cause of "what is happening in the network", we analyze data trends and put them into different classes using machine learning algorithms. ABID+ checks which KPIs are closely related, how their trends are changing over time and reports them periodically. It keeps track of current trends and compares them with huge datasets to find out anomalies in the network.

ABID+ helps to understand data trends based on time series. It can understand the previous trends by day, weekly, hourly, monthly and yearly and find out current anomalies in the network based on region and cells. This feature gives more advantage to the network expert to find out root causes and their behavior for anomalies+ in the network. ABID+ is able to make forecasts by using alarm notifications and configuration change information to detect future anomalies. Weather changes are also included these forecasts to prevent congestions.

ABID+ is also able to show the data for single and multi-dimensional comparisons of the network data. We determine the different data trends and preferable threshold values from the operators and finally classify the anomalies in the network. It can show the confidence intervals and multi-dimensional graphs for the correlated KPI groups decided by special algorithms. Users can check up to dimensional graph view to find out real KPI values which can cause the anomaly.





ABID+

Advanced Reporting & Dashboard

ABID+ is able to show different KPI graphs based on different filters consisting of cell, RNC, NodeB, eNodeB, gNodeB, BSC and BTS.

It finds out the most frequent anomalies in the network by cell and region and displays them in the dashboard. It shows all the regions using map over the available network regions and shows their analytics.



ABID+ has several features to understand anomalous data and the root causes. It can demonstrate multi variant and multi-dimensional anomalies in the network data. Special algorithms increase its ability to learn from previous network data. It also uses correlation techniques to find out the most correlated group of KPIs for root cause analysis.



Configuration Management Expert CMeX

INTEGRATED PNF&VNF OSS MANAGEMENT SYSTEM

Minimize multi-vendor and multi-technology network complexities while maximizing quality of service levels while reducing the OPEX.

Maintaining and improving Quality of Service is an imperative task of day to day operational activities. As technology rapidly evolves to 4G and beyond, operators are contended with both legacy and new generation systems and ensuring that both are equally managed, optimized and deliver high quality of service for the benefit of their end users.

TTG's network configuration solution effectively allows multi-vendor and multi-technology mobile operators the ability to manage different vendors and technology network configuration settings, as well as provides invaluable insight into the overall call process, furnishing engineers with the luxury of time to tackle network problems and formulate strategic decisions that enhances the networks' overall performance.

The CMeX platform is an automated solution, that brings together multiple data sources regardless of your vendor and technological preferences, within the mobile operators' network, to enable both engineering and operations departments to view the network consistency. The CMeX automatically identifies inconsistencies in the network.

With the CMeX a hidden configuration problem/s, that may cause the poor performance can be detected before a fault or customer complaints arises. It is a positive move towards pro-active network management.



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CMeX

Configuration and Change Management

- **Configuration Reports**
 - Change Reports
 - Inconsistency Reports
- **Default Parameter Settings**
 - Cell Parameters
 - NodeB Parameters
 - gNodeB Parameters
 - RNC Parameters
- **All Parameters**
 - All RNC Parameters
 - All Cell Parameters
- **Handover Parameters**
 - Handover Parameters
 - Blind Handover
 - Neighbors Report

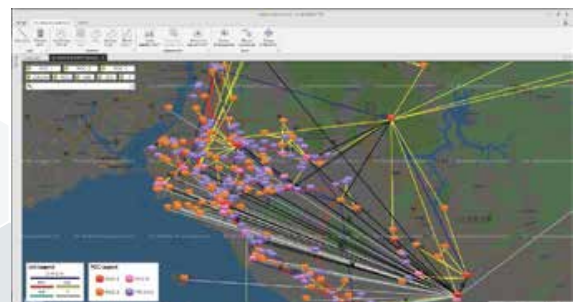
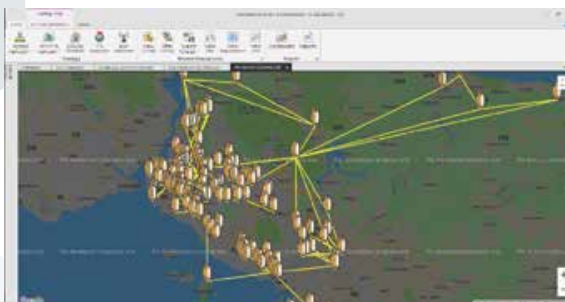




Transmission Inventory & Planning System TIPS

TIPS (Transmission Inventory & Provisioning system) tool is a strategic solution focused on meeting the challenges facing mobile operators who are offering high-speed data and interactive multimedia services over their mobile networks. This intelligent inventory/ configuration solution provides a consolidated cross-technology end to end view of transmission network.

TIPS collects all the inventory/configuration information automatically via SNMP, CORBA, TLI and SQL based systems. With the aid of TIPS, transmission operations & maintenance and planning engineers are able to view current capacity and paths of their transmission network.

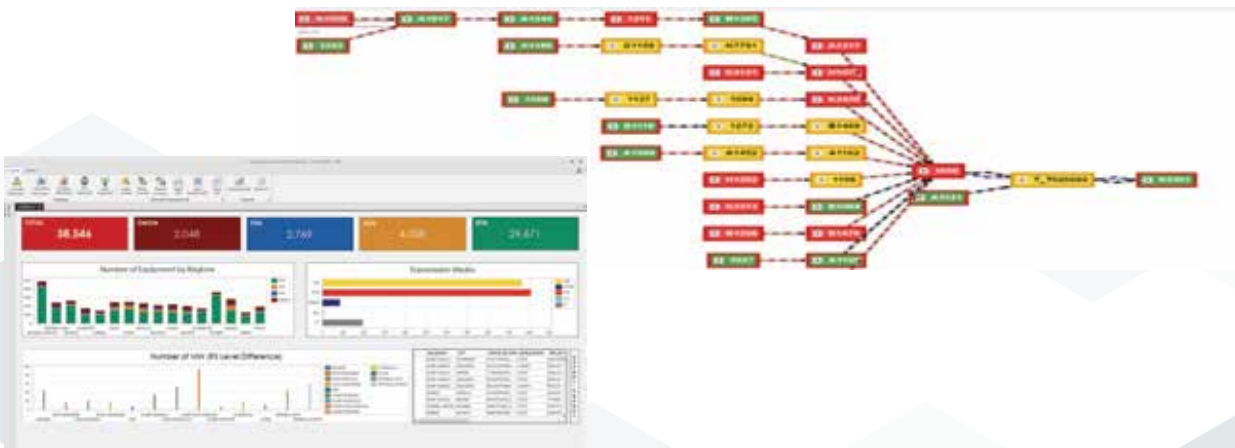




TIPS

Benefits

- Rapid return on investments can be achieved from the use of the TIPS.
- Reduced capital expenditure on transmission network infrastructure through targeted build and better utilization of network resources.
- Reduced operational expenditure through efficient planning and engineering and increased workforce productivity
- Faster return on investments for new network build due to targeted network expansion to areas of higher demand/revenue.
- Faster deployment of new equipment leading to a more rapid increase in network coverage.
- Faster provisioning with fewer errors and reduced risk of failure due to accurate network data.





Manage your leased-line inventory seamlessly **NET-TRANS**

NET-TRANS: Manage your leased-line inventory seamlessly

Motivation

Today, since telecommunication networks have grown tremendously in size, companies face increasing equipment and labor costs. In addition to this, operators should make their infrastructure investments in an efficient and cost effective manner. Let's say that your company has thousands of leased-lines with costs reaching millions every month and all the inventory is being managed on spreadsheets (or some other semi-structured, un-reliable and un-formatted storage method). This, unfortunately with 99.9% confidence, is a strong indication that your company is losing money, possibly thousands, each month. This can only be considerably reduced, if not eradicated, by a software system that keeps a detailed track of your inventory to realize OPEX or CAPEX benefits.

Through the years, we have seen many operators greatly troubled by the insidious pitfall of underestimating the necessity of a software based solution for inventory management. Thus, we developed NET-TRANS, a strong and easy to use network Inventory Management software as the ultimate solution for the increasing instances of this issue. With NET-TRANS telecom operators can now preserve their investments, increase efficiency and reduce costs with no extra effort.





NET-TRANS

NET-TRANS in a nutshell

- Vendor-independent in every aspect
- Dynamic design that follows leased-line applications and procedures in your company
Flexible reporting feature. Non-standard reports are easily created by using the Report Developer module. The reports and database information so created can be transferred to or received from such mediums as Excel, TXT, HTML or XML when required.
- Rental, rental dates and contract information and related alarms can be formed
- Request of a Leased Line (new, transfer, cancellation etc.) can be made through the regional offices of the operator by completing the relevant parts of the program. Requests are automatically transmitted to the Head Office, where automatic application letters to the transmitting company (Telecommunication) are compiled.
- History of each line can be monitored.
- Payment for each Lease Line to the Service Provider Company (for example Turkish Telecommunication) is filed (advance, monthly rental, transfer fee etc.).
- Any new daily, weekly, monthly (or between any two dates) requests, transfer requests, cancellation requests and contract numbers can be monitored in graphic or report format through NET-TRANS on the basis of the line speed and purpose of use.
- Centralized, cost-effective online deployment
- Redundant architecture for avoiding data loss
- Easy to integrate with other Oss software



Fault & Alarm Management FAMAN

INTEGRATED PNF&VNF OSS MANAGEMENT SYSTEM

FAMAN SERVER: A high-speed, in-memory database, optimized for collecting events and designing filters and views, rule set, trouble ticket, integration, reports, report development, etc. which provide the core processing functions for the FAMAN suite. The FAMAN application includes the following components:

Fault Management (FAMAN): Performs alarm filtering and reduction and presents alarms from the entire network on a single screen.

Fault Correlate: Pinpoints the root cause of network faults using network-wide topology data and conditional rules. **Fault Maintenance:** Proactively solves network faults by automatically sending predefined commands to the network elements in response to alarms.

Trouble Ticket: Manages trouble tickets from creation through resolution and facilitates application of known solutions to recurring problems.

Filters: System has filtering for most of the fields such as alarm severity, alarm state, alarm type, by node, etc. as well as Location, Area, Region and so on.

Integration: FAMAN is able to integrate to others tools **Report Development:** System has very flexible and easy to use report development module to help you develop your requirements.

Reports/Statistics: FAMAN has variety of reports (hourly, daily, weekly, monthly and historical) that user are able to get them with a mouse click.

Rule Set: FAMAN (MeerKat) has a rule set that allows user to define their-own rules. **Schedule:** FAMAN has a scheduler for predefined jobs such as; Reports, command sending, proactive warning and so on.

Reports

Reports, that supplied as standard with the FAMAN Management Module, are shown below:

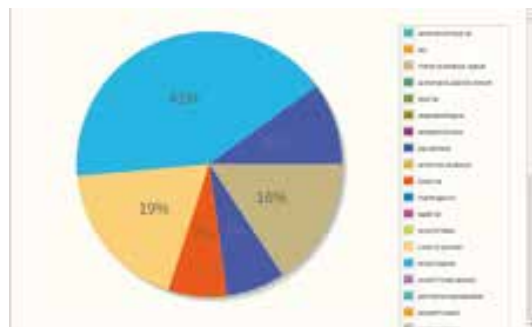
- Alarm Summary
- List of the Most Frequent Alarms
- Average Alarm Duration
- SLA reports
- List of objects that generate most of alarms
- Daily distribution of alarms
- Historical reports
- TT reports, etc.



FAMAN

Key Benefits

- Real-time, Multi-vendor and Multi-domain.
- Lower mean-time-to-repair and increases network uptime and efficiency.
- Faster problem resolution by rapidly determining the root cause of a problem.
- Prioritizes repair activities according to affected customer or service.
- Automatic alarm dispatch (SMS and e-mail) and escalation.
- Automates resolution of problems, freeing staff to make better use of their time and expertise.
- Efficiently solves network problems and customer reported troubles by automating the creation of trouble tickets.
- Alarm via on GIS.
- Tailor network alarm monitoring and management to your specific requirements.



Generic Element Management System GEMS

Automated Network Discovery

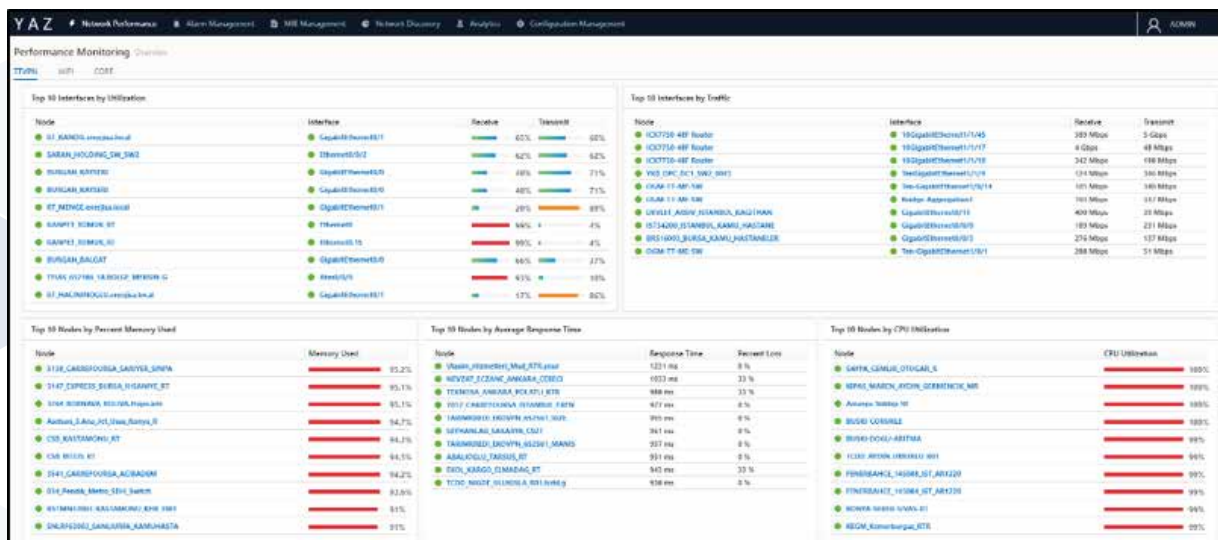
You can schedule regular scans from a Web-based discovery wizard that will find new network devices and alert you when a new device/s joins your network. Hence, ensuring you are monitoring all your network equipment.

Availability and Performance Monitoring

Monitors network device and interface availability and key performance indicators (KPI), such as utilization, bandwidth, packet loss, latency, errors, discards, CPU, and memory for all your SNMP and WMI-enabled devices.

Intelligent Network Alerting

Quickly configure alerts for correlated events, sustained conditions, and complex combinations of device states. Topology and dependency-based alert suppression enables you to intelligently escalate alerts for issues that are truly critical.





GEMS

Network Topology Mapping

Network topology mapping, or network mapping, is the automatically process of creating maps that visualize your network layout by creating a network map between devices and their real-time status.

Multi-Vendor Device Support

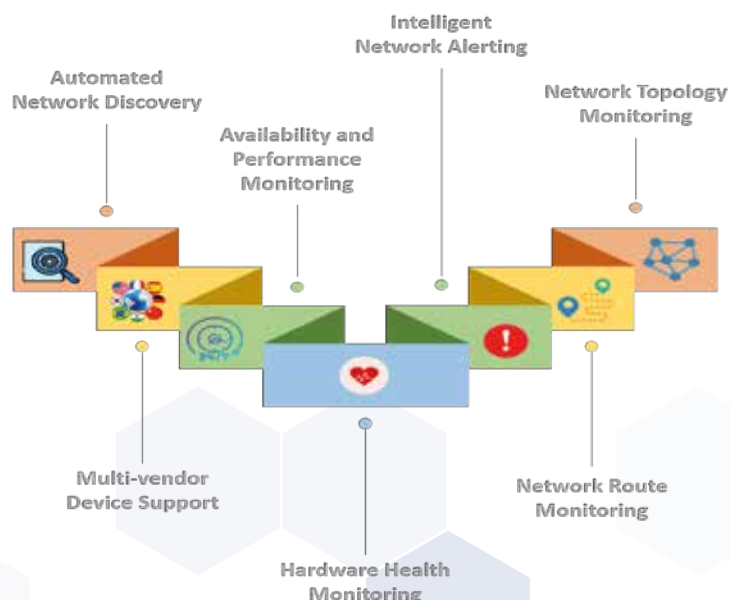
GEMS monitors availability and performance statistics for any router, switch, firewall, VPN concentrator, wireless access point, and other devices. GEMS will notify you when anything goes wrong with your network before it causes problems for your customers. The essential service helps you identify what's really going on in your business-critical networks so you can resolve issues before they become an expensive problem.

Hardware Health Monitoring

Get at-a-glance insight into the health of your network hardware by monitoring, alerting, and reporting on the state of key device sensors including temperature, fan speed, and power supply.

Network Route Monitoring

You'll never have to worry about the state of your network or any of its devices ever again. You can see all active routes briefly in Realtime - including routing tables, changes in default routes, BGP transitions, and flapping routes. GEMS support for major routing protocols (RIP v2, OSPF v2,)



We can
MANAGE THE NETWORK
because we correctly
MEASURE it!

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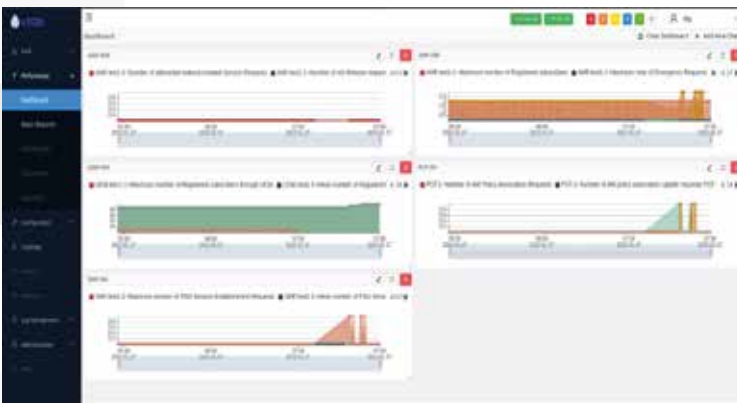
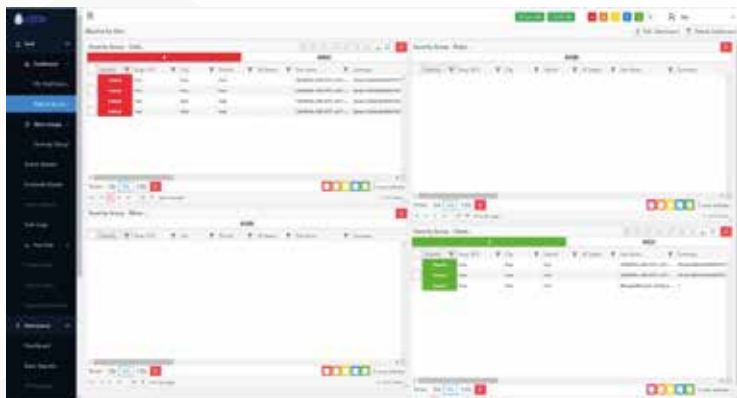


5G EMS

Virtualized Telecom Element Management System

A complete solution is needed by telcos to meet network management requirements in according to standards and industry best practices. FCAPS model was introduced by ISO as a framework for network management systems. The purpose of the framework is assuring services for both customers and employees.

vTEM (Virtual Telecom Element Management System) provides a management suite for network elements from all domains (RAN, Core, Transport etc.) unlike other vendors' "single OSS per single domain" approach.



Since 5G networks are intended to run Virtual Network Functions (VNF) based and to create network services (NS) in virtual environments, vTEM supports operating as a separate function in network either on NFV or physical environments.

The suite also combines state of the art software development technologies and deployed and maintained easily via docker or orchestration tools.

A Comprehensive Suite for Network Management

- Topology discovery and determination
- Change and inventory management
- NE connect/disconnect
- CLI for command based configuration
- Import/export bulk config files
- Script running and scheduling
- User friendly UI
- User and group configuration
- Optimizing user resources
- Minimizing operational costs
- Permissions to service configuration and change management
- Running traces at all protocol levels



- Rule and correlation editor
- Multiple adapters (SNMP, CORBA, ASCII etc.)
- Alarm history
- Smart alarm filtering
- Offline analysis, diagnosis and reporting

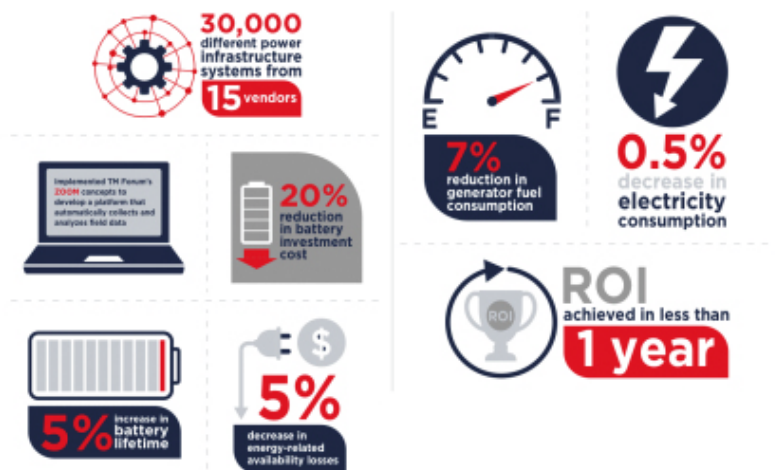
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- Access management to network assets
 - Adding layers, firewall and policies
 - Managing authorization and user hierarchy in line with telco organization (LDAP etc.)
 - User and system data encryption

-
- Configurable data collection interval (5/15/30/60 mins)
 - Auto parent/child structure generation based on NE topology
 - Enabling real-time issue troubleshooting
 - Creating new KPIs based on counters, formulae and aggregation methods
 - Pattern identification for making predictions

Smart Energy Infrastructure Management

Zero Touch Approach to Network Energy Infrastructure Management

In a typical telecom network, energy infrastructure consists of passive equipment (power supplies, batteries, cooling systems, diesel generators, smart meters etc.) and it is crucial to know about existing power capacity to make a precise resource dimensioning during new capacity or technology rollout process. Modern networks are required to be maintained via a single management platform providing data collection and analytics functions so that the network operations can focus on pain points and get organized efficiently for improved service quality and availability while optimizing OPEX and CAPEX. Thousands of devices from multiple vendors subject to the infrastructure management in the field and the vendors provide their own management and inventory tools at various maturity levels. The decentralized tools with different user interfaces and parameters do not help engineering teams to optimize either the investment or operations.



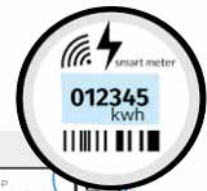
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SYNERGY

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**EXCELLENCE
AWARDS 2021**
FINALIST

Key Benefits

- OPEX/CAPEX optimization and efficient use of network budget
- Prepare network infrastructure for new technologies and network layers
- Focus remote network operations with modern predictive maintenance techniques for ANE devices
- Monitor energy KPIs for a sustainable network (PUE analysis on micro level, consumption per data and energy benchmarking)
- Avoid Infrastructure Over-dimensioning
- Reduce battery investment and spare part costs



Main Actions and Insights

- Capacity usage graphs to identify where power modules are excessive/short and power consumption reports to compare with energy invoice and avoid excessive billing
- Remote battery tests and parameter updates to identify battery aging and site backup capacity
- Rectifier/UPS average load, voltage, and instant power per device or site to determine sites with high power load
- Energy outage characteristics, AC phase failure reports to identify sites with poor grid quality
- Portable/stationary diesel generator operation archive to calculate diesel usage during site outage for environmental sustainability purposes
- Site temperature history to optimize cooling capacity



IT Application Monitoring System

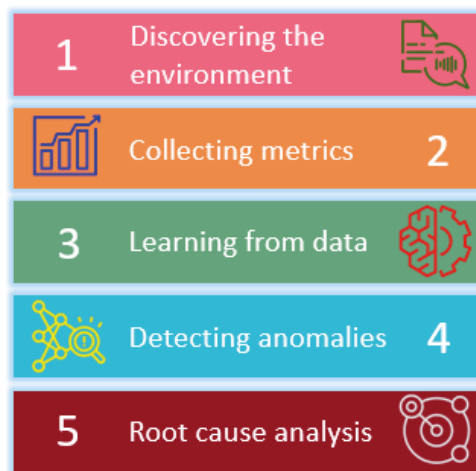
Embrace Your IT Performance

Software applications are becoming difficult to manage every day and they evolve as highly decentralized, multi-element in many cases. A conceptual approach is needed to allow telcos to monitor their applications and IT infrastructure with all its components. APMAN (Application Performance Monitoring Tool) provides a 5-step approach as a solution by utilizing an AI algorithm for end-to-end service based monitoring.

The tool aims to translate IT metrics into business values by management of availability and performance of software applications.

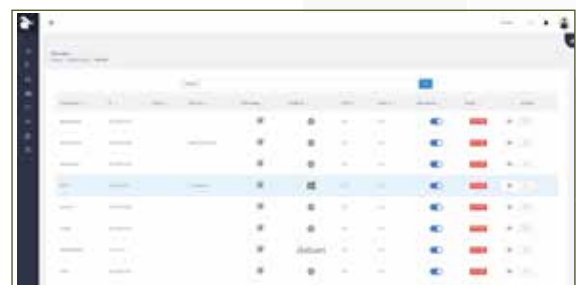
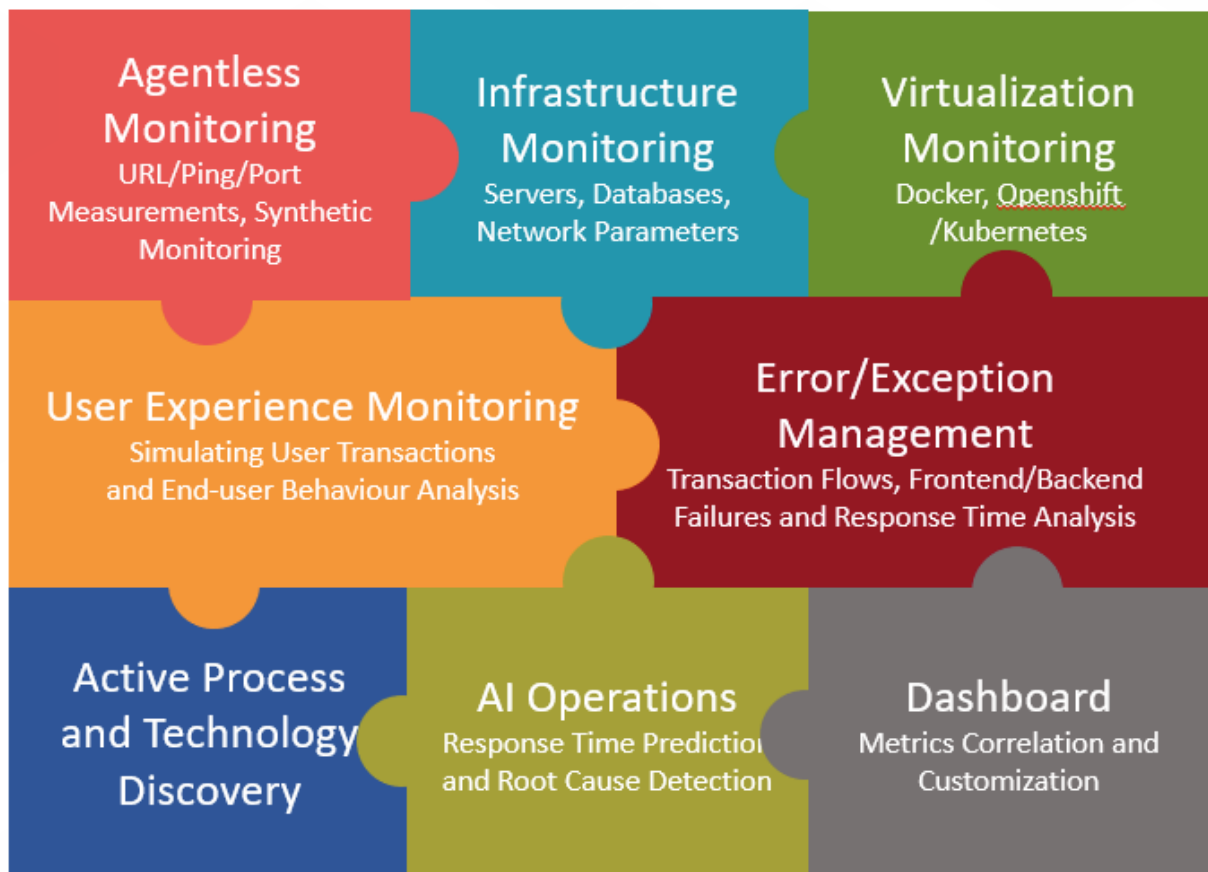
APMAN 5 Step Approach for End-to-End Service Based Monitoring

Application centric and end-to-end monitoring is the key strategy and practice for a seamless monitoring experience. Business applications performance tracking and end-user experience measurements allow the business owners to understand trends, isolate anomalies and get actionable insight for problem resolution and code optimization.





APMAN

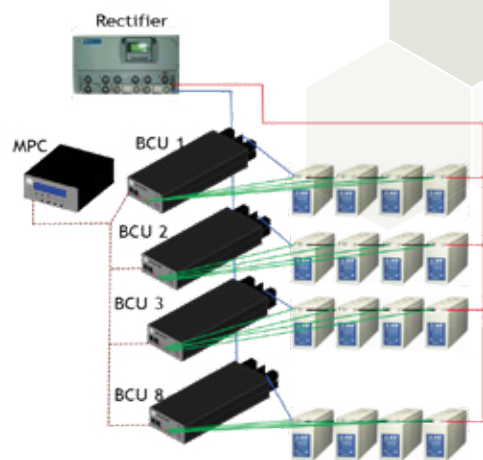




Battery Logging System (BATTLOG)

Battery Logging System is designed to monitor and balance the charge/discharge cycles of the batteries in a mobile communications infrastructure, which is the most common usage area of DC energy backup systems. Multiple batteries are stacked in these systems and Battlog ensures balanced charge/discharge cycles of all batteries and extends their lifetime.

Voltage balanced charged/discharged lead acid batteries' life times are longer than the free charged/discharged batteries. Battlog enables reducing the Mobile Operator's OPEX by monitoring and balancing every individual battery in a backup system.



General Features

Battery Logging System works by monitoring the DC backup system. It provides easy assembly with wireless measurement structure. Web interface, wireless communication, quick setup and reporting are general features.

The system offers five main features; measuring, balancing, failure detection, logging and reporting.

- Battery Balancer Measurement Units precisely measure battery values and transmit them to Main Unit wirelessly. It can also detect any defective battery in a stack.
- The System provides balancing to the batteries that has voltage differences. This way, the difference in charge/discharge is eliminated and the battery lifetime is extended.

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BATTLOG



- Once a defective battery detected, the system will automatically produce a warning. With a timely intervention, the deterioration of other batteries prevented.
- Logs are saved as CSV files in the memory of Main Unit and can be accessed/downloaded via WiFi connection.
- The charge/discharge voltages of the batteries constantly move together resulting the mean time between failures of the batteries extended with the use of Battery Logging System.

System Elements

The system consists of two elements, Main and Battery Balancer Measurement Unit.

Main Unit

Main Unit is designed as a system of measuring, balancing and alarm for each battery. It has a remote access infrastructure so it can be adapted to any protocol and the data can be sent to any location. The System software can easily be updated with a remote connection or FTP.

- Information such as voltage, alarm, defective battery list, serial number, installation date can be accessed by the Web interface.
- Main Unit has IOT technology, all browser devices and smart phones can control and configure it with a WiFi.
- There are two alarm output ports, one of them for faulty batteries, the other is for unauthorized access to backup site/batteries.
- Designed for telecommunications infrastructure, this product works with -48 volts.



The system has 2.4" LCD information screen.

- Instant Voltage Information
- System IP Address
- System Logging Status
- Number of Active Sets
- Field Code



There are two alarms, according to the threshold values on the Web page of the system.

- Battery Voltage Alarm
- Unauthorized Access Alarm



Remote monitoring, configuration and reporting are possible with the Ethernet port in the system.

- 10/100 Mbps Remote Connection Port



There are two alarm output ports.

- Contact Output
- RJ45 Output (Alarm port of BBU)

Technical Specifications of Main Unit

- Operating Voltage: -48VDC (-12 to -75VDC)
- Operating Current: 0,75A
- Operating Temperature: 0-70°C
- Connection Types: 1 x RJ45 - 10/100Mbit
- 3 x Relay Contact Output
- 1 x RJ45 Alarm Output

Measuring and Balancing Unit

While battery measurement is being done continuously, if an unplanned power cut occurs at the DC cabinet or even during maintenance operations, System logs voltage values, date and hour information in 5 minutes intervals. Communication is via wireless signal, there is no cable connection

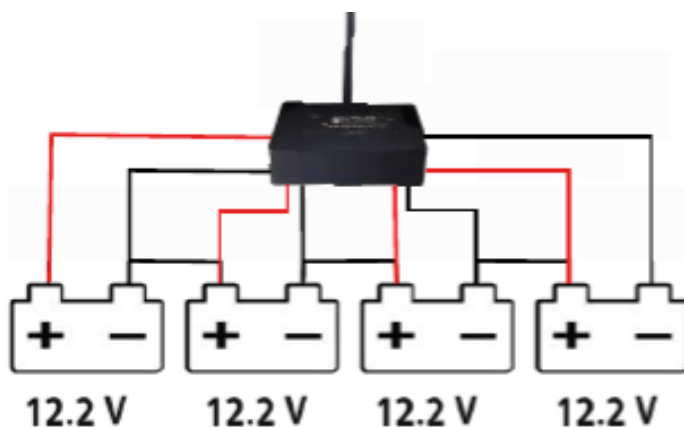
BATTLOG

between main unit and it works with current charge system so it doesn't interfere with energy.

- It eliminates the voltage differences that occur during the charge or discharge of the batteries connected in series and ensures a healthy battery stack.
- Balanced batteries can carry their existing electrical charges more stable.
- This unit is designed for transmitting data to Main Unit wirelessly providing easy assembly.
- It offers the opportunity to download and analyze reports such as measurement history, defective battery list recorded in the system or field information.

Technical Specifications of Battery Balancer Measurement Unit

- Operating Voltage: 4.5VDC - 32VDC
- Operating Current: 0,5A
- Operating Temperature: 0-70°C
- Connection Types: 4 x 20cm Insulated Fork Type Cable Terminal w/Cable
- Communication of Main Unit: 433MHz RF
- Box Type: ABS Plastic



The logo features a white Wi-Fi symbol above the text "5G" in a large, bold, sans-serif font, with the word "READY" in a smaller, all-caps, sans-serif font below it. The entire logo is set against a solid green rectangular background.

5G
READY

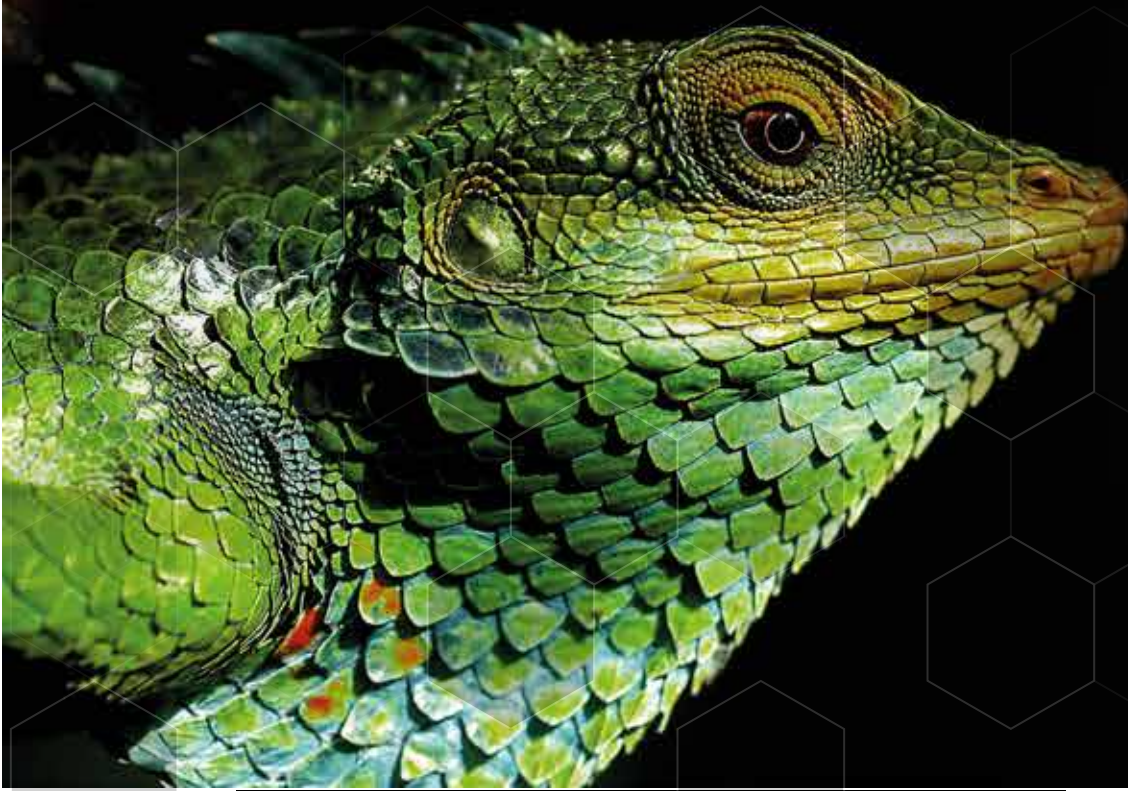
A white rectangular box with a thin white border. In the top-left corner, there is a small yellow triangle pointing downwards. The text "Tools for Telecom Regulatory Authorities" is centered within the box in a large, bold, white sans-serif font.

Tools for Telecom Regulatory Authorities

info@ttgint.com
www.ttgint.com

The logo consists of the letters "TTG" in a stylized, bold, orange font. The "T"s are connected to a circular graphic element that resembles a globe or a network of nodes. Below the logo, the text "International Ltd." and "Software House" is written in a smaller, black, sans-serif font.

TTG
International Ltd.
Software House



Telecom Equipment Registry Management

Control Your Handset Ecosystem

TERM is a CEIR (Central Equipment Identity Register) database of the IMEI numbers of blacklisted and whitelisted handsets. It keeps track of unapproved, software changed, cloned, illegal and stolen devices enabling rapid querying. TERM allows the mobile devices to enter the network according to device status. With its cutting edge technology, TERM brings modularity and extensive controlling capability to Telecom Regulatory Authorities. sonnel can be dispatched with necessary data regarding what problems in which location to reach the site faster.

Using TTG's enhanced algorithms; TERM analyzes and reports non-standard, cloned, illegal (unregistered) IMEIs with daily scheduled jobs such as Grey List counter processing, CDR analyzing processes, Cell ID coordinate jobs and scheduled reports.

TERM periodically or instantly updates the operators' EIR database after an operation causes a List Change for full synchronization.

TERM has user friendly web based graphical user interfaces (GUI) for the Authorities as well as user friendly web pages enabling subscribers to carry out:

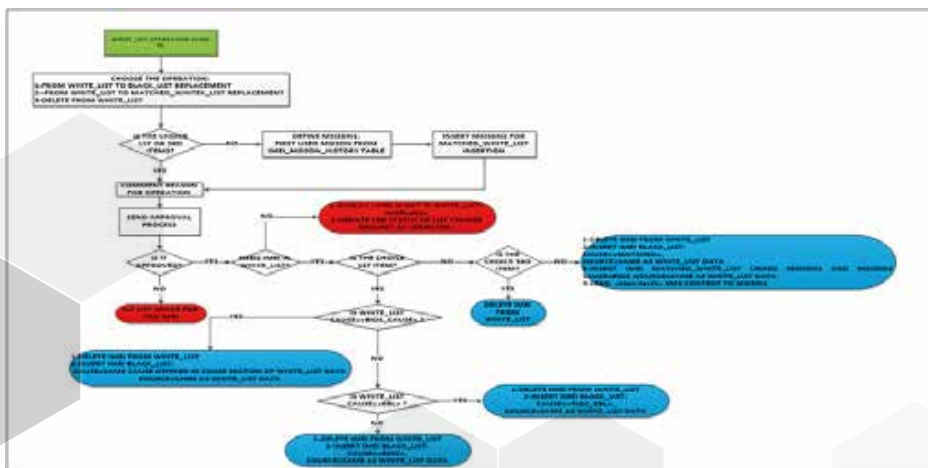
- Personal Import Registration
- Call Centre Lock/Unlock IMEI
- Querying the status (whether it is legal or illegal) of any IMEI



TERM

TERM Functions:

- Detection of GSMA registered valid IMEIs.
- Customization according to Telecom Regulatory Authority requirements.
- Enhanced SIM Box detection capability.
- Enhanced Reporting possibilities allowing the users creating their reports dynamically
- Enhanced Log Tracing system for every single transaction.
- Level based user management possibilities including out-of-authority users such as Importers Module or PIRM users.
- User based, access permission based and IP based system security.



- IMEI tracing capability based on history evaluated from CDRs
- IMEI used by all MSISDNs
- MSISDN used by all IMEIs
- First / Last usage dates



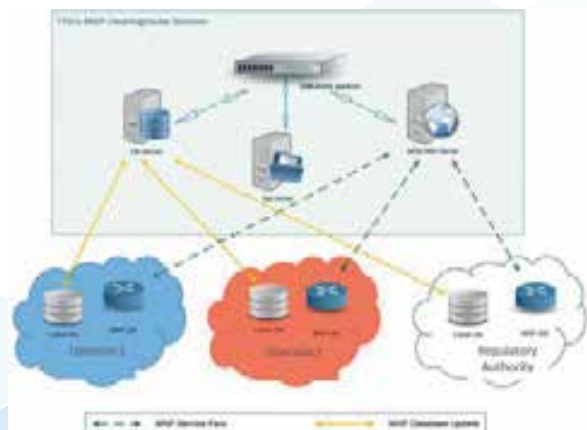
Portable Numbers System

The platform provides centralized ordering, porting provisioning and number administration information for ported numbers.

TTG's MNP solution consists of a HW & SW platforms including:

- Centralized Reference Database
- Repository for Ported Numbers
- Interface Processes which provide;
 - Centralized ordering
 - Porting Provisioning
 - Number Administration Information for Ported Numbers

- Centralized Porting Message exchange between operators;
 - WEB Service
 - Two Processes of Porting Cycle;
 - INITIATION
 - ACTIVATION
- Porting Cycle to be completed typically in 4 days
 - Contractual / Financial Obligations to be settled
 - Timers are associated for compliance



5G
READY

PORTUS

Main Features

- Reporting module allows users access a wide range of reports. Reporting administrator can create and schedule reports
- Users can run the reports manually or can receive the scheduled reports via email. via the GUI.





Information Reports for Telecommunication Authority -NETWORK

INFORTANT Provides monthly registration and reporting of systems belonging to telecommunications infrastructure operators (BTS-Base Station, GR-Repeater, RL-Radio Link). The main objective of the software is to ensure that the data of all the regions and systems used are collected in a standard format and aggregated into a single center. Users can input data via forms, or they can import the data from an Excel or CSV files prepared in a certain format in batches. Users can then generate LITAS Access Files (Licensed Telecommunication Infrastructure Systems), required by telecommunications companies and authorities.

INFORTANT collects data from network as well as from other tools (OSS/BSS) to give a high level network inventory visibility from TRX, cell, NodeB, eNodeB, transmission and assigned frequencies in addition to visibility about monthly new additions, replace, remove, relocation activities within a month, quarterly and annually.



5G
READY

INFORTANT

Main Features


Structured Modules and Configurable design
Admin and Login module

User control with profile and authority description
Logging of user actions
User Settings
Subscriber Change
Group Processing
Definitions

Ability to modify the algorithm if the BTK process changes
Automatic data capture and control of data from systems
Manual enter for importing site and transmission site inventory
Ellipse tool file converter module
Export data through "mdb, excel, csv" format.

6RL Distribution Report
Permanent Litas File
BTK Excel Reports
Report Mode:





Management of Wireless Systems

MoWS USE CASES

- Management of frequency allocation
- Management of applications and approvals
- Management of wireless devices locations
- Management of wireless device audits
- Management of complaints

MoWS MODULES & FUNCTIONS

BSM (Base Station Module) is used for the management of fixed or mobile base stations such as new base station application, changing the data of any approved base station, approval process, uploading a new application/update request on behalf of specified Service Provider.

MMRM (Maritime Mobile Radio Module) is used for the registration of Marine devices such as VHF radio devices, mobile satellite devices and Navigation radio devices.

SPM (Service Provider Module) is used for the management of wireless devices installed by Service Providers. Basically, used for:

- New installation of wireless device applications
 - Changing the data of any approved and installed wireless device
 - Regulatory approval process
- Uploading a new application/update request on behalf of specified Service Provider.

RLM (Radio Link Transmission Module) is used for the management of RadioLink Transmission data used by Service Providers. Basically, used for



MoWS

- New Radio Link Transmission applications
- Changing the data of any approved Radio Link
- Regulatory approval process
- Uploading a new application/update request on behalf of specified Service Provider

SPRM (Service Provider Registry Module) is used for the management of Service Providers. It is the main registry database where base station or radio link modules are granted.

CAM (Complaint & Auditing Module) is used for the management of complaints and audits of wireless devices such as new complaint incident, inserting the complaint results, scheduling an audit, inserting the results of an audit.

QEM (Quarterly Evaluation Module) is used for the management of quarterly declared Service Provider data evaluation.

CCM (Cost Calculation Module) is used for the management of annual costs of permitted wireless devices such as Marine Wireless Devices, Base Station or Radio Link Transmission, Basically, used for;

- Listing and monitoring of annual costs and the payment status of these costs for Base Stations, Radio Link Transmissions etc. of their own
- Listing and monitoring of annual costs and the payment status of these costs for Base Stations, RadioLink Transmissions or Marine Wireless Devices etc. for all Service Providers or Device owners.

RM (Reporting Module) is used for creating, scheduling or assigning reports and allow user to export the reports any standard format such as word, excel, pdf, html, etc.

LTM (Log Tracing Module) is provide the system administrators the detailed logging capability of the system and troubleshooting any specific action.

NM (Notification Module) is used for sending email notifications for pre-defined actions.

CM (Configuration Module) is used for listing and configuring the default settings of the modules.

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