



SOLUTION BRIEF

**StableNet[®] and FNT Command:
The holistic network management
solution**

Increasing Complexity in the Network Infrastructure

Digitization, networking and automation are the primary challenges that are facing companies, institutions and organization across the globe. For many, the goal is to automate processes and services as much as possible to facilitate planning, managing, and monitoring networks and services for increased quality and reliability, while simultaneously reducing costs. Private households are also steadily increasing their number of networked devices due to the growing popularity of IoT devices and smart home technologies.

The rapid growth of networking goes hand in hand with the increasing complexity of the digital infrastructure. More and more devices from different manufacturers with a wide variety of hardware and software are being networked and must communicate with each

other seamlessly. The trouble-free functioning of this infrastructure has become a prerequisite for smooth operations.

From planning and administration to production and the delivery of products and services to the end customer, automated access to relevant data in real time is now a prerequisite in order to manage processes efficiently. The expansion of the necessary infrastructure and the automation of the corresponding management and maintenance processes are therefore of strategic importance for companies in order to survive and succeed in a global marketplace.

Managing Complex Network Infrastructures Effectively

The increasing complexity of the infrastructure and the parallel rise in the volume of data flows require powerful management tools for planning and growth. With the radical increase in networking demands, an efficient underlying infrastructure is becoming more and more important.

Failures of individual devices or services can quickly cascade and cause serious problems and high costs, as other processes and further infrastructure components depend on them to function. In addition, downtime can negatively impact the company's image, jeopardizing existing contracts along with the acquisition of new customers.

Since problems and disruptions can never be completely avoided, it is all the more important to be able to respond to them as quickly and effectively as possible.

Powerful network management tools enable rapid localization and identification of the affected components in the event of a fault and can minimize the mean time to repair (MTTR) with automated processes. This significantly reduces the man-hours required and drastically shortens downtimes

Such tools also enable a detailed and automatically generated depiction of the existing network infrastructure, with a comprehensive overview of the geo-data, configurations and maintenance intervals of the individual components and devices. This allows for effective planning of future changes and extensions to the infrastructure. Furthermore, in the case of mergers and acquisitions, a cost-effective consolidation of several networks is made possible while avoiding redundancies.

Advantages of the complete solution with StableNet® and FNT Command

Smooth communication through the bidirectional interface

The combined use of StableNet® and the FNT Command Platform allows the strengths of both products to be combined into a holistic network management solution. Thanks to the specially developed bidirectional interface, the products communicate smoothly with each other and enable a seamless overview of the device infrastructure.

Optimal distribution of tasks

While StableNet® (which includes Inventory, Configuration, Fault and Performance Management) is responsible for the device infrastructure, FNT Command enables efficient management of the entire IT and network infrastructure and creates transparency.

Discover devices automatically using the Discovery function

The powerful discovery feature of StableNet® not only enables fast and automated discovery of devices on the network using traditional monitoring protocols (SNMP, ICMP, WMI, etc.), but is also customizable via eXtensible Markup Language (XML) to meet specific needs and requirements.

Automated XML Discovery can be used to automatically detect all devices in the assigned network with pre-configured settings as an out-of-the-box solution. An inventory list and a measurement tree, as well as connections between devices, sensor measurements and preconfigured alarm thresholds are created in order to facilitate the multiple use cases.

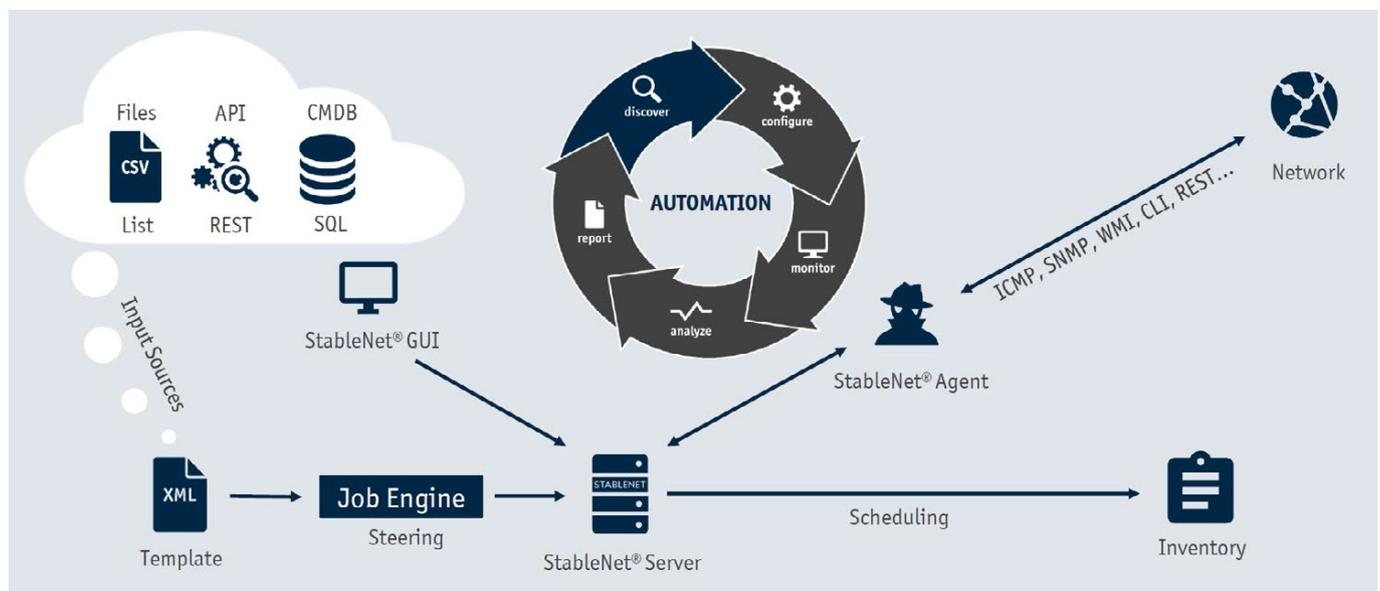


Fig. 1: XML Discovery Engine

Advanced XML Configuration

If a solution tailored to your own use case is required, the automated data and information collection can be customized with the Advanced XML Configuration. Individualized pre- and post-filters can be created as blocks in the XML template, e.g. to access only certain devices, to perform different measurements (IP SLA, Netflow, Interface, Script, etc.) or to define individual maintenance intervals.

The bidirectional interface ensures the automated import and alignment of chassis (routers, switches, load balancers, etc.), modules, sub-modules and physical ports. The devices detected with StableNet® can thus be assigned to their respective zones (e.g. campus, building, floor, room, DP cabinet) in the infrastructure repository of the FNT Command Platform and supplemented with further organizational information (responsible persons, contracts, etc.).

Detect and handle discrepancies in the network automatically

When imports into the repository take place using the target/actual comparison functionality of the FNT Command Platform, discrepancies between the documented target inventory and the detection of the physical reality in the network can be identified and dealt with easily and automatically.

This means that any problems that occur regarding the function and configuration of individual devices can be localized quickly and remedied swiftly using automated processes. Error messages can be sent automatically to affected service and management teams, or faulty configurations can be reset to automatically created backups.

Cost savings and a more secure network

As a result, considerable savings can be achieved in the time spent on work and downtime can be drastically reduced. The minimized downtime increases customer satisfaction and helps to maximize profits. In addition, the planning of future expansion or conversion measures is greatly simplified with StableNet® and the FNT Command Platform, since complete documentation of the current status can be accessed at any time and planned changes can be displayed in parallel to ongoing operations with the help of graphical interfaces.

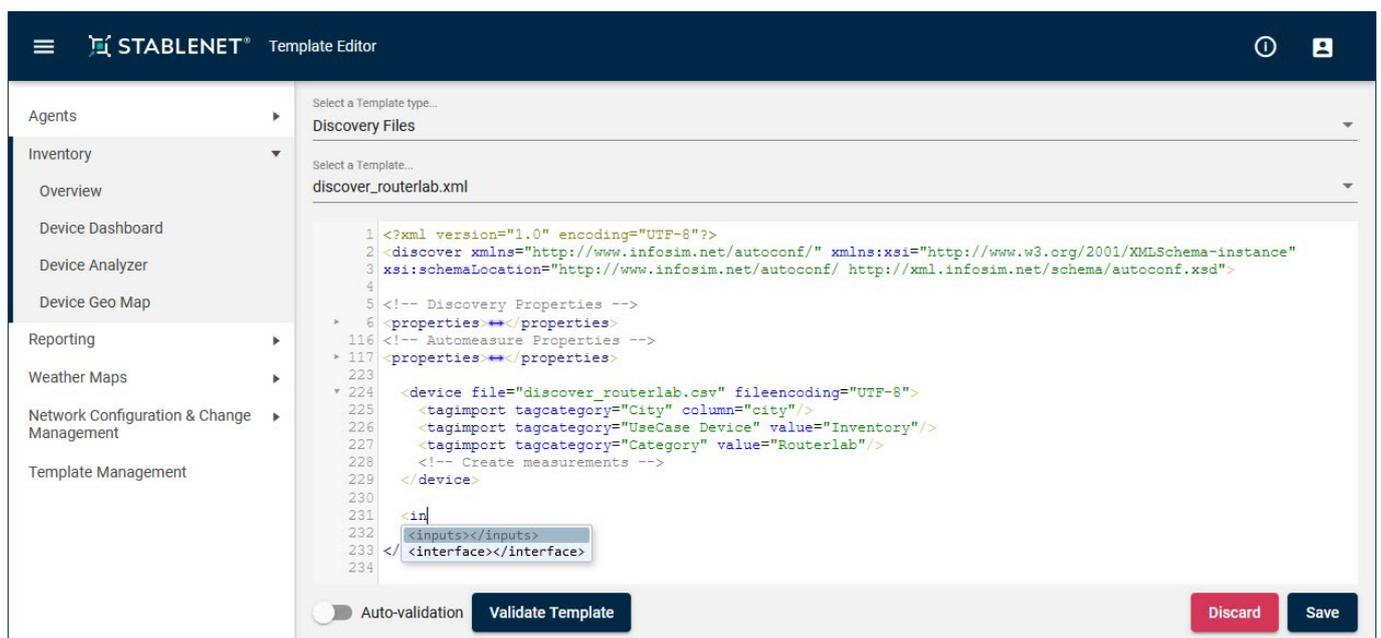


Fig. 2: XML Discovery in the StableNet® Web Portal

What StableNet® offers

As a vendor-independent network and service management platform, StableNet® is based on a uniform data structure.

This means that even large multi-vendor environments, which are growing rapidly due to NFV, SDN, BYOD and IoT, can be managed efficiently by the user with just a single platform and with the help of automated processes.

Unlike traditional OSS/BSS and IT & Service Management systems, StableNet®'s 4-in-1 solution enables deployment on multi-tenant, multi-customer and dedicated platforms and scales easily in highly dynamic flex-compute environments. As an Automated Network & Service Management platform, StableNet® is built on four pillars:

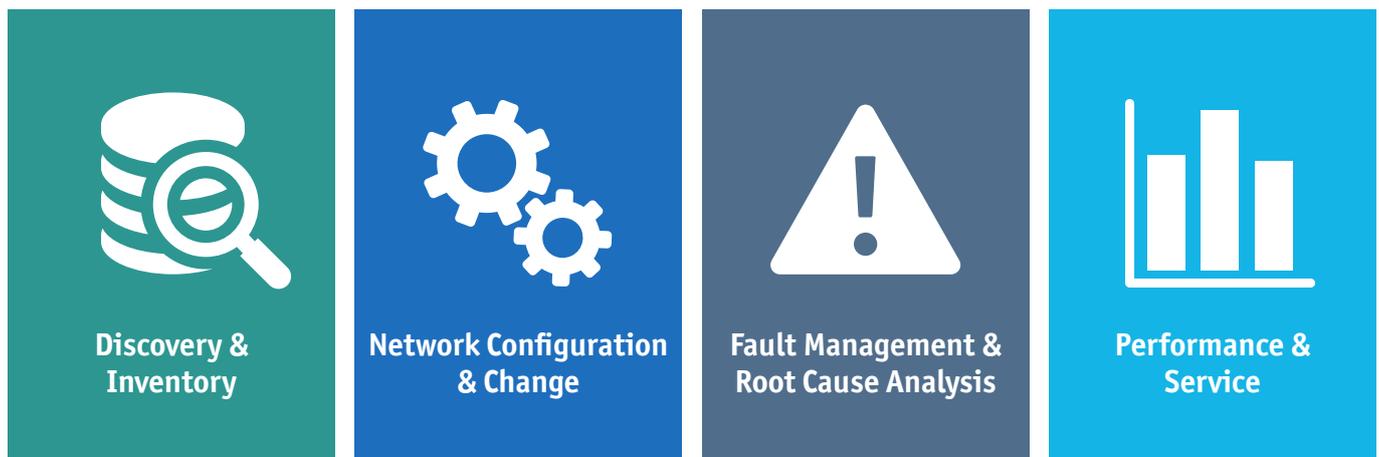


Fig. 3: The four pillars of StableNet®

Automation

StableNet® delivers optimized automation workflows with immediate results, without the need for extensive up-front programming investments. In addition, the purpose-built platform offers great flexibility in customizing a specific implementation, meeting the requirements for seamless integration into current OSS/BSS environments. Particularly in the case of recurring tasks, StableNet® can save considerable time and - in conjunction with the consolidation of functionalities - significantly reduce costs (OPEX and CAPEX).

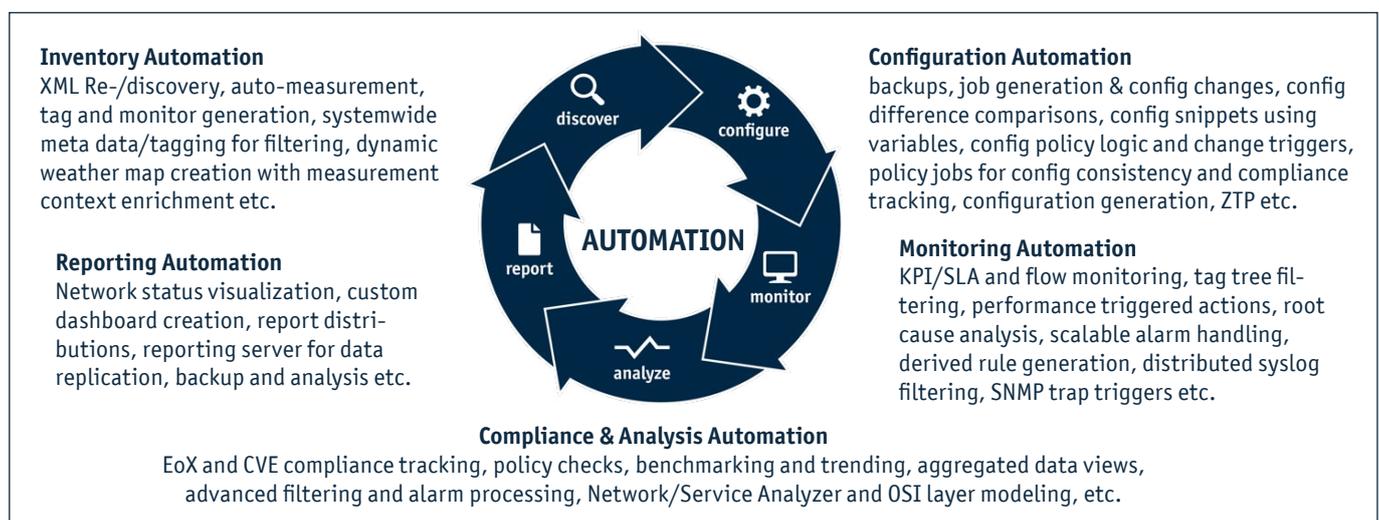


Fig. 4: Automation in StableNet®

The Key Benefits of StableNet® are:

Consolidation

An effective, easy-to-use platform for Discovery & Inventory, Fault, Performance and Configuration Management with a unified data structure.

Scalability

With its flexible framework, StableNet® can scale to any size network. This enables not only rapid growth, but also the ability to handle a proliferation of IoT devices

Customization

Enables high flexibility and easy integration of a large number of third-party systems (southbound and north-bound). Dashboards are customizable and data visualization, reporting and more can be flexibly adapted to individual needs.

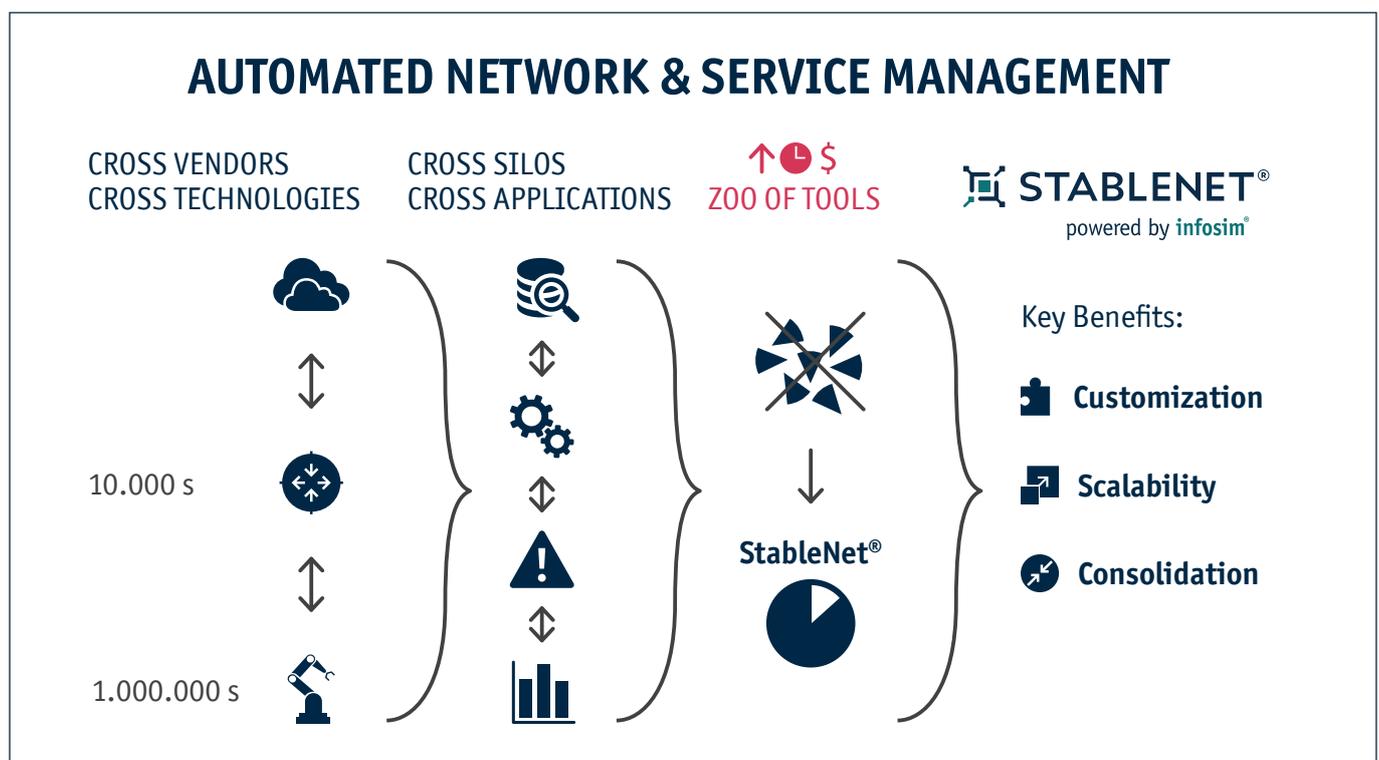


Fig. 5: The Automated Network & Service Management solution StableNet® works across vendors, across technologies, across silos and across applications

StableNet® is available in two versions:

StableNet® Telco for Telecom Operators & ISPs and **StableNet® Enterprise** for IT & Managed Service Providers

StableNet® Telco is an area-wide, unified management solution and enables: Quad-play, Mobile, High-speed Internet, VoIP (IPT, IPCC), IPTV across Carrier Ethernet, Metro Ethernet, MPLS, L2/L3 VPNs, multi-customer VRFs, Cloud and FTTx environments. IPv4 and IPv6 are fully supported.

StableNet® Enterprise is an advanced, unified and scalable network management solution for end-to-end management of medium to large mission-critical IT-supported networks, with rich dashboards and detailed service views focused on both network and application services.

What FNT offers

The FNT Command Platform enables companies to record all assets relevant to IT and network infrastructure and their connectivity via multiple interfaces and display them in one interface. This includes building infrastructure (power, cooling, floor space), IT infrastructure (networks, servers, storage - virtual and physical, on-premises and in the cloud), connectivity (physical cabling infrastructure, logical circuits/bandwidth) and the services on which they are based (software, applications).

This detailed overview of the “as-is” situation is not only useful for operations, but also for planning changes so that the impact can be assessed in advance. For example, IT managers can visualize the information stored in a central database and simulate effects on services and customers.

This is made possible by comprehensive resource management based on a uniform and integrated data model. It shows all physical and virtual assets along with their dependencies - regardless of manufacturer and technology. Physical, logical and virtual resources at different locations can be linked to create fully redundant paths between the edge and the data center, for example.

The solution is based on a single information database that automatically updates as changes occur.

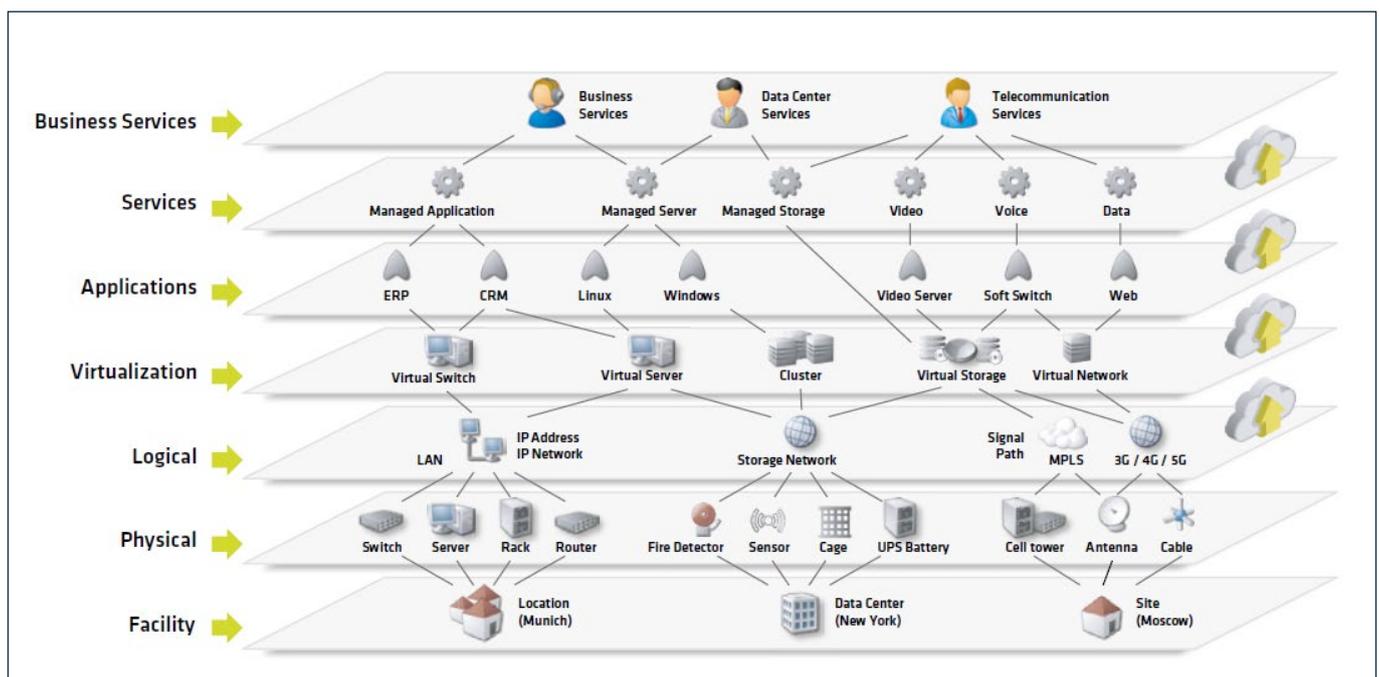


Fig. 6: From the location to the business service:
A central documentation tool shows all assets and dependencies in the IT infrastructure

Efficient management of the cable infrastructure

One area in which the FNT Command Platform really shines is as a modern cable management solution. It can be used to document, plan and manage any internal IT network, cable as well as network infrastructures belonging to Inside Plant Management. Extensive telecommunications or broadband networks (such as FTTx) in the wide area, urban and access sectors can be mapped just as easily in Outside Plant Management.

All types of network topologies, from fiber optic and copper networks including all deployed technologies, are described using geo-referenced representation in FNT GeoMaps or by means of schematic network plans via network spiders. FNT’s Cable Management solution enables complete transparency of the entire network, allowing even complex infrastructures to be managed with relative ease.

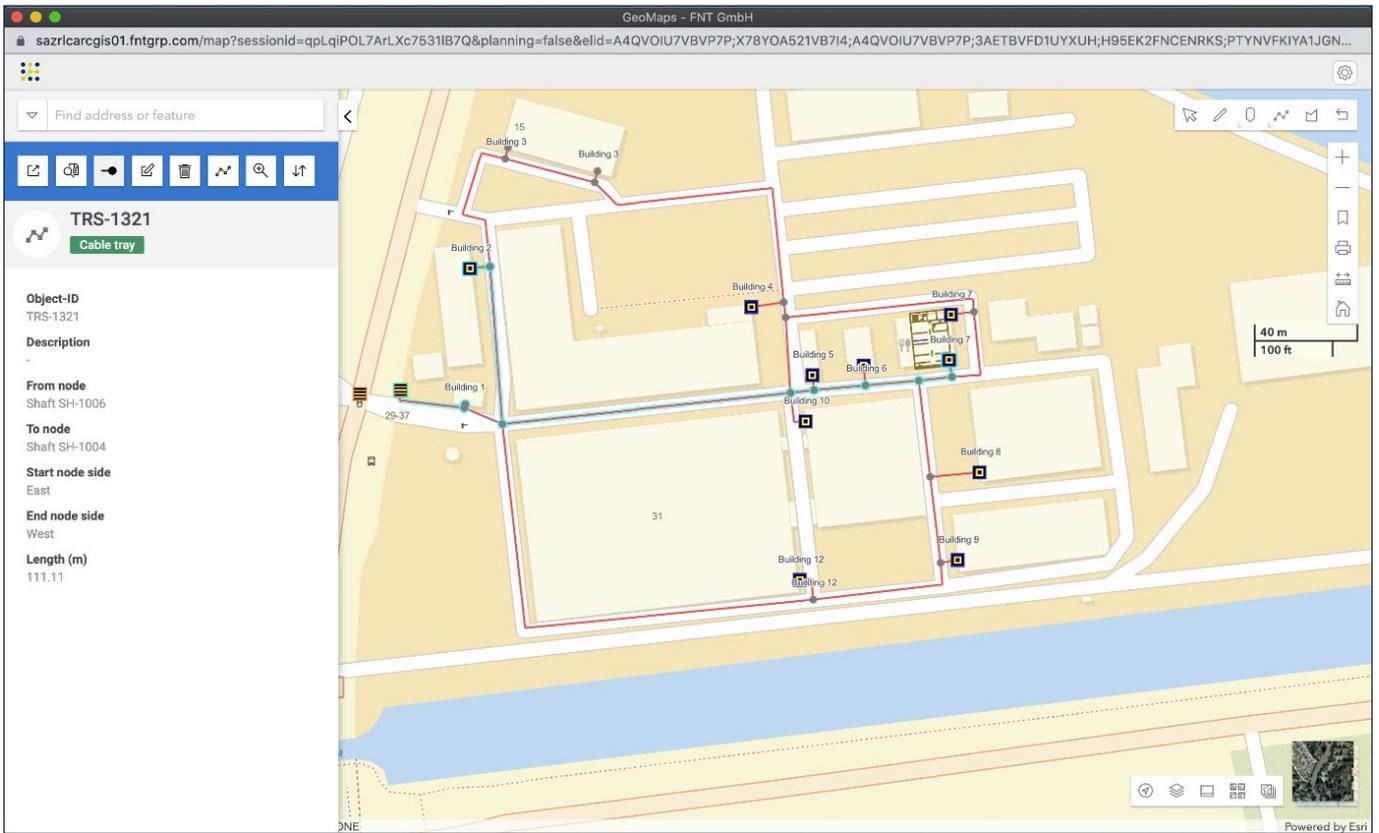


Fig. 7: Networks can be georeferenced with FNT GeoMaps. Linking geo-information with network infrastructure details allows better decisions regarding network capacity, rollout strategies and routing redundancy, as well as improved operational prioritization.

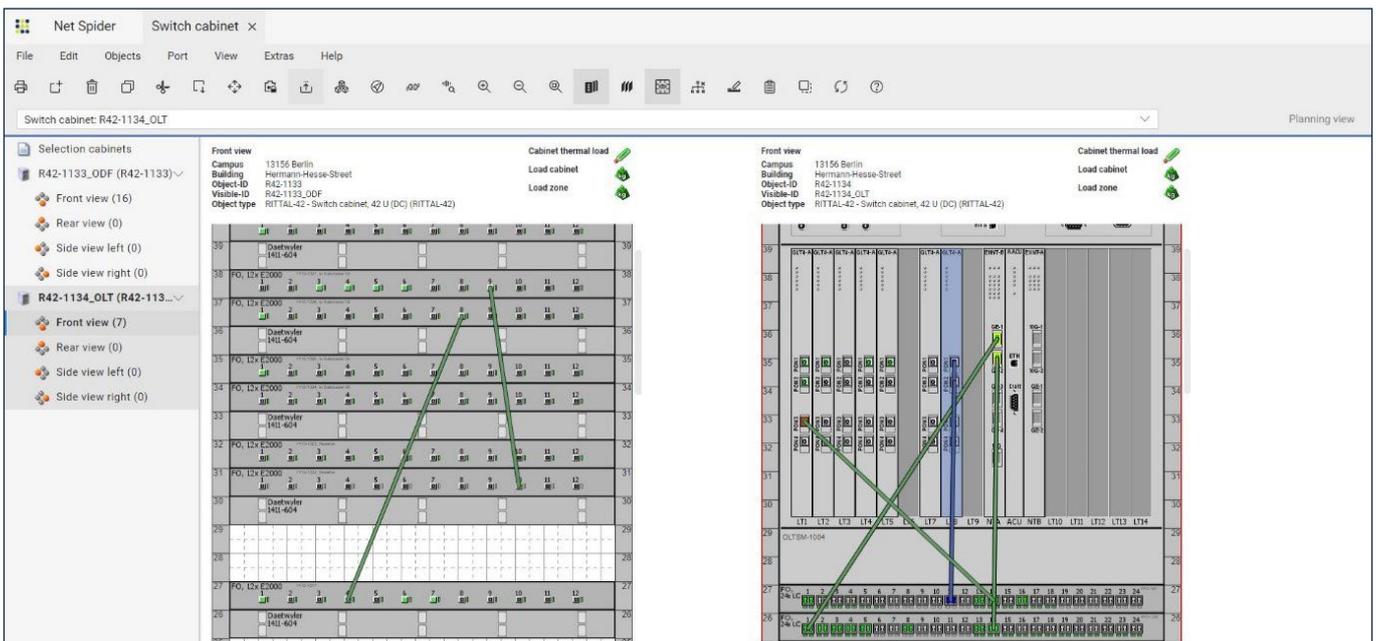


Fig. 8: Photorealistic representation of network cabinets including the equipped devices. The assignment of ports (cables plugged in, planned or reserved) is also color-coded.

Application in practice

Reference: Large Banking Institution in Germany (high availability through transparency)

Faster troubleshooting thanks to comprehensive documentation of the IT infrastructure

For banks, the high availability of their IT infrastructure is of immense business importance. Network failures can cause considerable additional damage. High availability is therefore a top priority at one of Germany's largest private banks, and not just on paper. For this reason, this credit institution has relied on solutions from FNT and Infosim® for many years to ensure that all IT structures are mapped transparently, thus guaranteeing high availability of operations.

A central infrastructure repository is the basis

The basis for a fail-safe IT infrastructure at this bank is the comprehensive documentation of all important infrastructure components. This data on the IT infrastructure is stored within the FNT Command Platform, which in turn serves as the basis for processes. Not only does it contain all the important information on the individual IT assets, but the tool also maps the relationships between the assets and the dependencies between them.

Before the introduction of FNT's solution, employees had to make a site visit to the control cabinet in order to get an overview of whether enough height units or ports were available. Thanks to the FNT Command Platform, free capacities are displayed visually. Changes and conversions can be planned in parallel with ongoing operations. The documentation also shows which employee from which department is responsible for each component. In this way, the customer has already laid the foundation for creating a work order directly from the system using an automated workflow and initiating the replacement of a device in the future. A work order with precise work instructions supports the employee during implementation.

Auto-discovery of new components with StableNet® from Infosim®

The customer first documents chassis in the infrastructure repository of the FNT Command Platform and then passes them on to StableNet® for readout. Modules are automatically detected by StableNet® as soon as they are integrated into the network. This information is transmitted to the FNT Command Platform via an interface and compared with the existing plans or documentation. Two complete, automatic reconciliations of the documentation for the existing infrastructure components take place every day - more than 14 million data records are transmitted per hour. Erroneous or missing entries in the documentation are thus immediately detected and automatically corrected. The situation is different for the chassis: here, an error report is created and corrected manually. The documentation thus always corresponds to the actual situation of the IT infrastructure. The result: the best possible data quality and reliability.

React faster to errors

The private bank benefits most notably from this transparency when it comes to fail-safety and high availability. With reliable documentation as a basis, the tool from FNT provides essential support in the rapid rectification of faults. With a signal tracking function, all related devices can be identified in the event of a fault. This makes it possible to pinpoint the source of the fault and initiate the necessary measures.

All this increases fail-safety, reduces costs and enables faster provisioning of the IT service for the end user!

The solution in detail

Apart from the chassis, the network components scanned by StableNet® are compared with the documented status via the Auto-discovery (ADG) interface in FNT Command.

The results of this comparison are displayed in the FNT Command Auto-discovery Gateway. Data from communications networks collected by a network scanning tool is compared to the documented inventory in FNT Command through the FNT Command Auto-discovery Gateway (ADG).

The interface between FNT Command and StableNet® is used to match documented network nodes and all subcomponents, ports and connected inventory against network components scanned in real time. As part of the process, component properties such as MAC addresses, IP addresses, FQDN, etc. are updated, and newly detected subcomponents are automatically placed in FNT Command and documented.

Any discrepancies between the documentation and the network scanner results are logged or reported and corrected. The interface works cyclically in the background, but the individual functions can also be initiated manually. The raw data is exchanged via the StableNet® Rest API.

The auto-discovery data is converted from the supplied XML format of the auto-discovery application to the standardized format of the FNT Command ADG tables by a preprocessor before being transferred to the FNT Command system.

The following network components are collected and aligned at the private bank:

- Chassis
- Modules
- Submodules
- Ports
- Attributes of the network components

In total, more than 14 million records are matched per day!

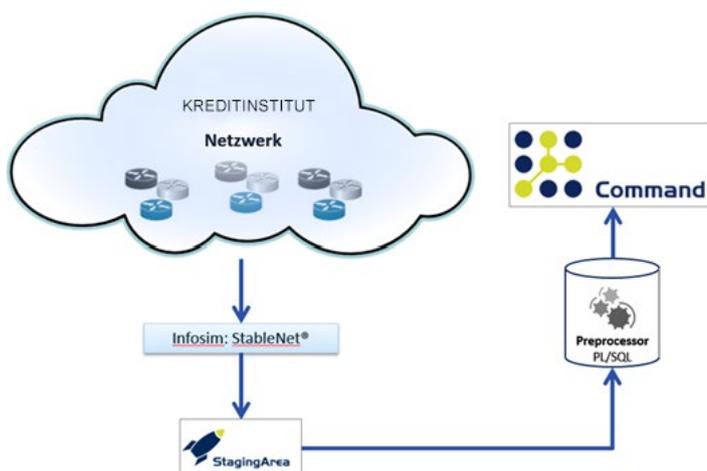


Fig. 9: FNT Command and StableNet® in use at a financial institution

The productive system in numbers:

Switch cabinets:	6600
Chassis:	28000
Data sockets:	180000

Application in practice

Reference: NetCom BW (Plan more efficiently and react faster to errors - deployment at a regional telco carrier)

Optimized Mean-Time-To-Repair and More Efficient Device Onboarding in Complex Networks

NetCom BW is active as a regional carrier in the business areas of Internet, data communications, site networking and telephony for private and business customers in Baden-Württemberg, Germany. Especially in the field of telecommunications, the high availability of the services offered is a top priority, which is why effective network management tools are an indispensable building block in the company's internal IT infrastructure.

NetCom BW's complex and heterogeneous network, which is based on numerous technologies (such as WDM, PDH, SDH and MPLS) and hardware from different manufacturers, could only be managed in a time-consuming manner before the deployment of the FNT Command Platform and StableNet®. Particularly during network expansion and outages, the lack of cross-network documentation of the cable and device infrastructure resulted in high costs and unnecessarily long mean-time-to-repair (MTTR). In addition, the manual configuration of the individual devices was very time-consuming, which is why a configuration solution that was as automated as possible was so important.

Manage the entire network centrally

The entire network infrastructure can now be managed centrally via a central configuration management database (CMDB), which is created and kept up-to-date by the interaction of StableNet® and the FNT Command Platform. In addition, important customer information and service contracts can now also be accessed centrally.

For searches, the devices in the network are specified by the infrastructure repository of the FNT Command Platform and detected via the discovery function of StableNet®. With the central database, all assets that depend on a cable connection, device or component can now be identified quickly and easily.

Significant cost reduction through up-to-date data

In the past, NetCom BW often had problems with the target/actual comparison of available and occupied ports. When new customers were acquired, the creation of the necessary documentation was relatively quick, but when a customer decided to terminate the contract, the ports that were now available again were often still shown as occupied in the static documentation. These management problems surrounding dismantling would sometimes lead to incorrect investment decisions for hardware expansion, as they were made on the basis of outdated data.

These errors in the documentation have been a thing of the past since the combined use of StableNet® and the FNT Command Platform. With StableNet®, the existing device infrastructure can be recorded and merged with the planning data by means of a target/actual comparison in FNT Command.

With this highly accurate documentation, savings in the range of millions can be achieved through more effective planning.

Centralized alert and event management

In the event of planned service outages, business customers can also be notified directly from FNT Command via email or other departments can be informed that connections for certain services need to be rerouted. The average process time at NetCom BW has thus been significantly reduced.

With the help of the centralized alarm and event management system, the affected components and services caused by unplanned outages can be identified immediately and remedied as quickly as possible. The data required for this is provided to StableNet® by FNT Command and can be customized.

Better overview through tagging

Tagging provides a clear overview of the dependencies and links between individual devices and services, and it is possible to see at a glance which customers and services are affected in the event of problems or changes. Using StableNet® XML discovery, tags are initially created automatically and additional tags are added manually as needed (allowing for innumerable customization options!). The tag information can be mapped manually by the operator as needed.

This provides a clear overview of the steps and tasks required to initiate the appropriate processes and resolve any issues that arise as quickly as possible. This simplification of the problem solving processes allows a technically skilled employee in a NOC (Network Operations Center) to operate the network in a 24/7 model without having to rely on specialists.

Step-by-step implementation at NetCom BW

The integration of the FNT Command Platform and StableNet® is being implemented at NetCom BW in several phases, the first of which has already been completed. First, the decentralized existing documentation was merged into the CMDB of the FNT Command Platform and then existing systems were standardized in order to reduce the number of operating systems and manage assets and resources more efficiently.

The first phase also saw the implementation of monitoring, service management and visualization of approximately 75% of all network elements. In addition,

the required fault classes for alarm and fault management were defined and the automatic provisioning of DSLAMs from different manufacturers was implemented as much as possible.

The next phase of the implementation will include the expansion of the automated interaction of FNT Command and StableNet® (bidirectional integration) and also quality, consumption and inventory data in the CMDB. The functions already set up will also be extended to 100% of all network elements.

Furthermore, the automatic display of the complete network topology and the target/actual comparison of DSLAMs, ports and modules will be possible. Another part of this phase is the setup of network configuration and root cause analysis using StableNet® as well as the extension of automatic provisioning to DSLAMs, WDM Systems and MPLS Devices.

In the final phase, the plan is also to enable end-of-life management of components and devices as well as the integrated display of connections and affected departments. Likewise, supported by the data from the Infrastructure Repository of the FNT Command Platform, capacity planning will be improved upon and fault management via traps and syslogs enabled. Another step that is currently being planned is the implementation of an SMS gateway.

About Infosim®

Infosim® is a leading provider of automated service fulfillment and service assurance solutions for telcos, ISPs, managed service providers and enterprises. Since 2003, Infosim® has been evolving the StableNet® solution for its telco and enterprise customers, enabling inventory configuration, fault and performance management on a single platform.

Infosim® is privately held and has offices in Germany (Würzburg - headquarters), USA (Austin, TX) and Singapore. The company develops innovative software and IT solutions. The focus is on the development competence of the high-quality and high-performance products, which is made possible by a team of highly qualified and dedicated employees. All products are available for a trial period and Professional Services for a Proof of Concept (PoC) can be provided upon request.

In addition to building and maintaining long-term partnerships within the stakeholder community, Infosim® is also characterized by its enthusiasm for technology, which is demonstrated in numerous collaborations and projects with universities and research institutions. As a spin-off of the University of Würzburg, Infosim® and research are closely linked.



Fig. 10: Infosim® Base - Infosim® headquarters at Hubland in Würzburg, Germany

About FNT

FNT is a leading provider of software solutions for the integrated management of telecommunications, IT and data center infrastructure. FNT's solutions are cloud ready and can be used worldwide as an OSS/IT management application for communications service providers, enterprises and government organizations. Over 500 companies and public authorities rely on FNT to plan, document and manage their passive and active physical, logical and virtual IT, telecommunications and data center infrastructures, from the physical level to business services. FNT's unified resource management capabilities store this information in a vendor-agnostic uniform data model that builds a central system of record of a hybrid infrastructure. Whatever mixture of traditional on-premise IT and private, managed and public clouds an organization uses, the single source of information about all network assets that FNT provides is the key to gaining a clear understanding of overall utilization, capacities and asset status for more efficient planning, service assurance and fulfillment processes.

FNT is headquartered in Germany and has offices in the USA, Singapore, the UK and Russia. FNT offers its software in numerous countries through partnerships with market-leading IT service providers and system integrators.

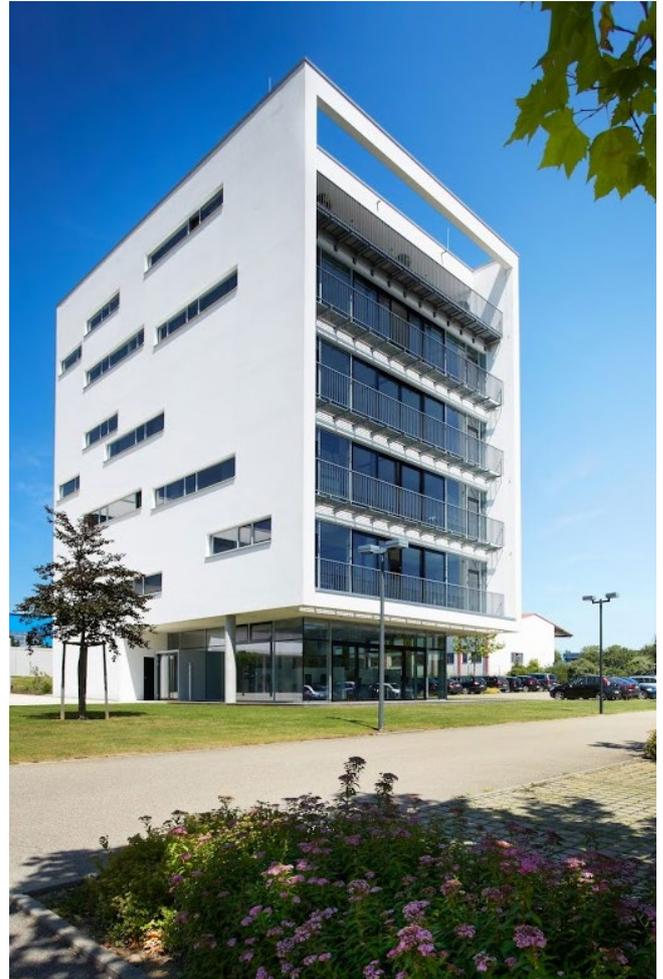


Fig. 11: One of the company buildings of FNT in Ellwangen

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