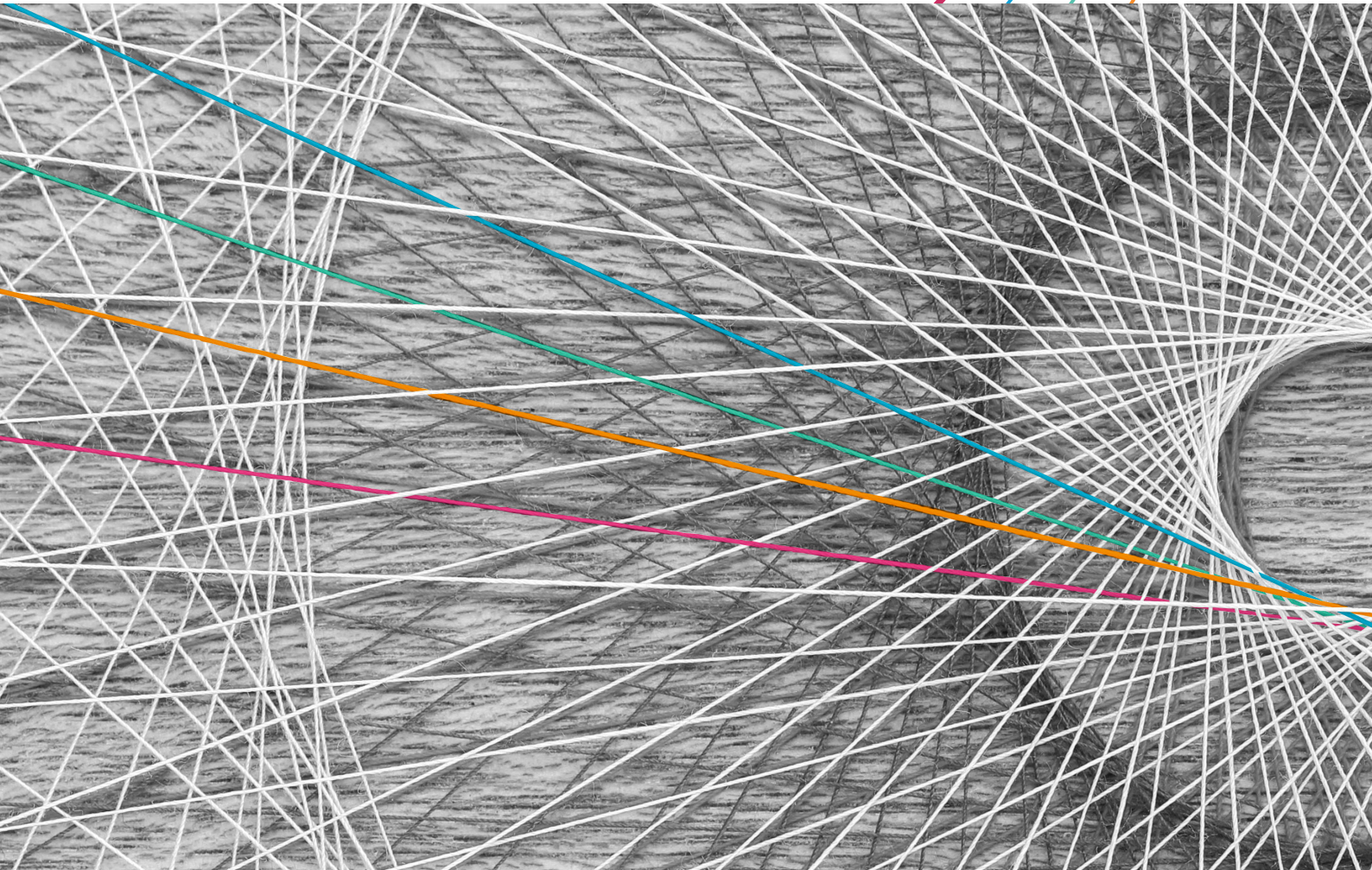


NETWORKS

Analyzing, Planning & Optimizing

NG Transport



DETECON
CONSULTING

The Features

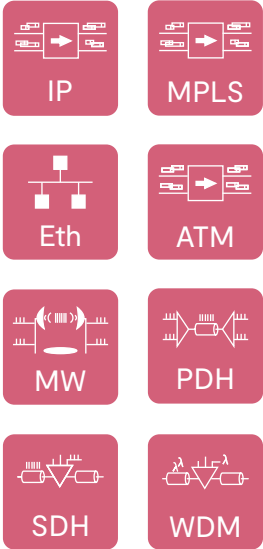
NETWORKS NG Transport is a comprehensive tool for analyzing, planning and optimizing your transport network based on IP/MPLS, Ethernet and TDM/WDM technology.

The benefits of using NETWORKS NG Transport are:

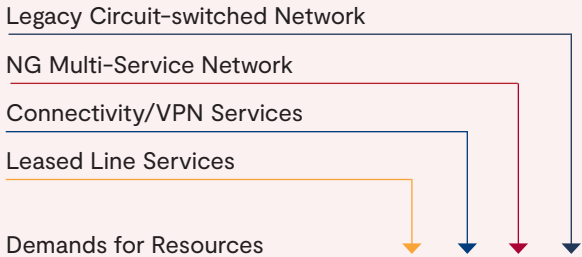
- > the reduction of investment and operational costs,
- > the possibility to provide efficient and reliable end-to-end services,
- > and the acceleration of decision processes by automated planning work.

The tool provides a detailed overview of your network structure, optimizes the routing of bandwidth demands, defines the capacities and the allocation of network resources, and also supports the configuration of devices. Different planning scenarios can be conveniently created and easily compared. The graphic and tabular functions and the interactive user interfaces enable you to plan your networks creatively and efficiently and to show the results clearly.

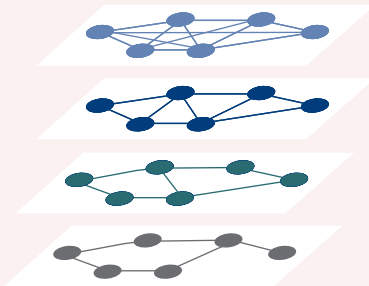
For general features please refer to our flyer NETWORKS Product Portfolio.



The planner designs a next-generation transport network based on the demands for resources from provided transport services for customers and internal demands from higher network layers.



Other NETWORKS products are available to deal with higher network layers.



- Packet-based Network
- Transmission Network
- Cable Network
- Duct Network

NG Transport Network Analysis

How the current network design fulfills performance and reliability requirements for a next generation transport network

Analyzing the situation

- > What is the current utilization of the links? Is there spare capacity?
- > Where are the capacity bottlenecks?
- > Which connections are affected in the event of a failure of the systems or cables?
- > Is there any single point of failure?
- > How reliable are the provided VPN, channel, wavelength or fiber services?

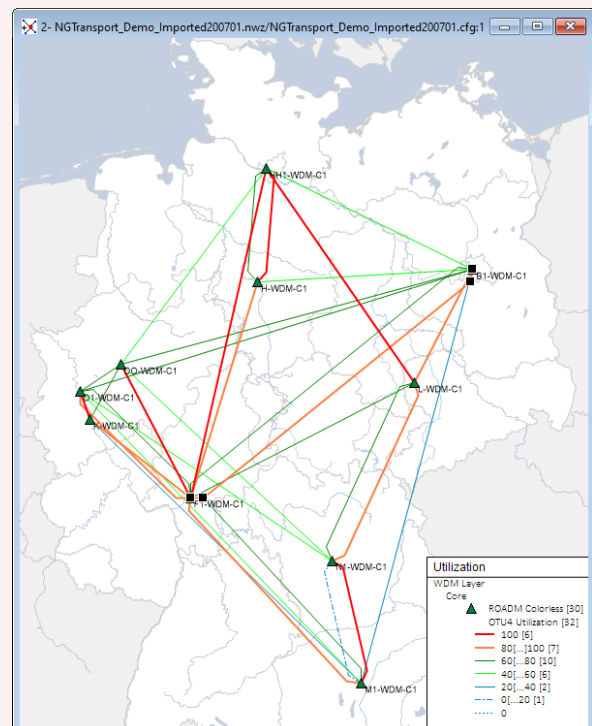
Planning the solution

- >> Import live network data from the network management systems or via a standard intermediate database interface.
- >> Calculate link utilization based on present and future bandwidth demands.
- >> Check routing tables/fast re-route configurations for completeness, correctness and for path diversity.
- >> Emulate failures of links and points for detecting shared risk groups.
- >> Calculate end-to-end availability of individual (virtual) connections.

Links with a high utilization of over 80% can be detected, for example, after adding new bandwidth demands to the current network topology.

| ID | System | #Positions-A | #Positions-B | Subnet | Type | Distance-Routing km |
|-----|-----------------------------|---------------|--------------|--------------|--------------|---------------------|
| 169 | [OMS]B1-WDM-C1<->HH1-WDM-C1 | OTM-40(40000) | 3 | 37 Core1 | Opt_DWDM_... | 414.27 |
| 170 | [OMS]B1-WDM-C1<->L-WDM-C1 | OTM-40(40000) | 3 | 37 Core1 | Opt_DWDM_... | 184.61 |
| 171 | [OMS]DO-WDM-C1<->H-WDM-C1 | OTM-40(40000) | 2 | 38 Core1 | Opt_DWDM_... | 232.82 |
| 172 | [OMS]D1-WDM-C1<->DO-WDM-C1 | OTM-40(40000) | 1 | 39 Core1 | Opt_DWDM_... | 72.15 |
| 173 | [OMS]D1-WDM-C1<->HH1-WDM-C1 | OTM-40(40000) | 1 | 39 Core1 | Opt_DWDM_... | 459.83 |
| 174 | [OMS]D1-WDM-C1<->K-WDM-C1 | OTM-40(40000) | 5 | 35 Core1 | Opt_DWDM_... | 38.88 |
| 175 | [OMS]F1-WDM-C1<->H-WDM-C1 | OTM-40(40000) | 4 | 36 Core1 | Opt_DWDM_... | 348.11 |
| 176 | [OMS]F1-WDM-C1<->K-WDM-C1 | OTM-40(40000) | 8 | 32 Core1 | Opt_DWDM_... | 200.98 |
| 177 | [OMS]F1-WDM-C1<->L-WDM-C1 | OTM-40(40000) | 1 | 39 Core1 | Opt_DWDM_... | 460.69 |
| 178 | [OMS]H-WDM-C1<->B1-WDM-C1 | OTM-40(40000) | 4 | 36 Core1 | Opt_DWDM_... | 281.03 |
| 179 | [OMS]H-WDM-C1<->HH1-WDM-C1 | OTM-40(40000) | 4 | 36 Core1 | Opt_DWDM_... | 158.75 |
| 180 | [OMS]K-WDM-C1<->DO-WDM-C1 | OTM-40(40000) | 3 | 37 Core1 | Opt_DWDM_... | 104.47 |
| 181 | [OMS]L-WDM-C1<->M1-WDM-C1 | OTM-40(40000) | 1 | 39 Core1 | Opt_DWDM_... | 510.77 |
| 182 | [OMS]M1-WDM-C1<->F1-WDM-C1 | OTM-40(40000) | 4 | 36 Core1 | Opt_DWDM_... | 445.36 |
| 183 | [OMS]M1-WDM-C1<->N1-WDM-C1 | OTM-40(40000) | 2 | 38 Core1 | Opt_DWDM_... | 171.08 |
| 184 | [OMS]N1-WDM-C1<->F1-WDM-C1 | OTM-40(40000) | 2 | 38 Core1 | Opt_DWDM_... | 227.69 |
| 185 | [OMS]N1-WDM-C1<->L-WDM-C1 | OTM-40(40000) | 2 | 38 Core1 | Opt_DWDM_... | 331.16 |
| 186 | [OMS]AC-WDM-A3<->K-WDM-A3 | OTM-8 | 0 | 0 Agg3:K-AC1 | Opt_CWDM_8 | 67.61 |
| 187 | [OMS]B1-WDM-A1<->B2-WDM-A1 | OTM-40 | 0 | 0 Agg1:B-HH1 | Opt_DWDM_40 | 11.19 |

| Object | Mapping Level |
|---|---------------|
| [ODU]DO-WDM-C1<->HH1-WDM-C1_01 (Unprotected) | ODU2/L0 |
| [DC-POP]N2-WDM-A1<->DO-WDM-C1_01 (Unprotected) | 100Base-Fdx |
| [ODU]N2-WDM-A1<->K-WDM-C1_01 (Unprotected) | ODU2/L0 |
| [DC-POP]N2-WDM-A1<->K-WDM-C1_01 (Unprotected) | 100Base-Fdx |
| [ODU]N1-WDM-C1<->NOR-WDM-A1_01 (Unprotected) | ODU2/L0 |
| [ODU]HH1-WDM-C1<->N1-WDM-C1_01 (Unprotected) | ODU0 |
| [DC-POP]HH1-WDM-C1<->N1-WDM-C1_01 (Unprotected) | ODU0 |



Strategic NG Transport Network Planning/ Service-Oriented Capacity Development

How to determine the strategic network development best suited to meet future service demands

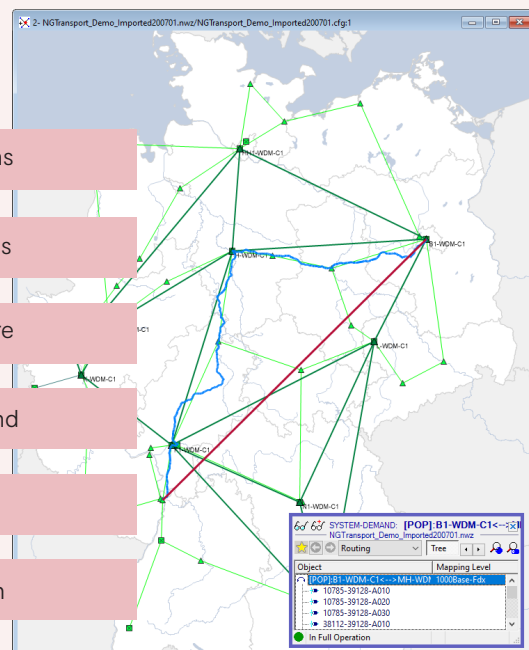
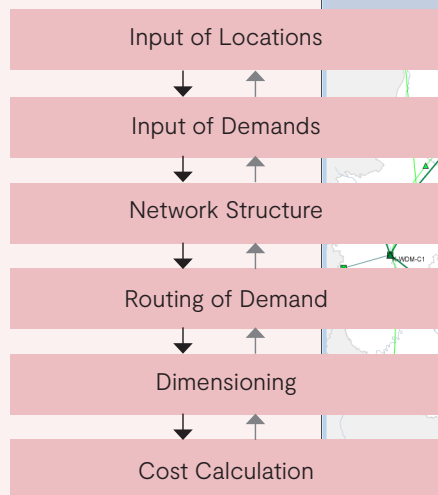
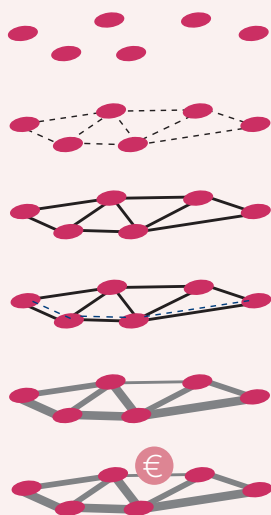
Analyzing the situation

- > How can the new and existing bandwidth demands be optimally routed, even if they are possibly restricted by existing capacities?
- > Which capacities are required for the transmission links and in the routing and multiplexing nodes?
- > Which quality of service class is to be used?
- > Which is the best and most cost efficient network topology?

Planning the solution

- >> Use shortest-path routing algorithms with capacity constraints, required disjointness, shared risk groups, and over subnetworks.
- >> Calculate loads and capacities for different mapping levels in use (2M, 100Base, VC4, 1GBase, ODUx, etc.) and for different equipment.
- >> Calculate packet delays per QoS class.
- >> Compare scenarios to find the most cost efficient topology.

The design phase is characterized by a location-based planning approach with aggregated links and demands to determine the capacities and cost of the resources.



Technical NG Transport Network Planning/ Device Assembly and Configuration

How to make the daily planning of individual bandwidth demands more efficient by using the current resources

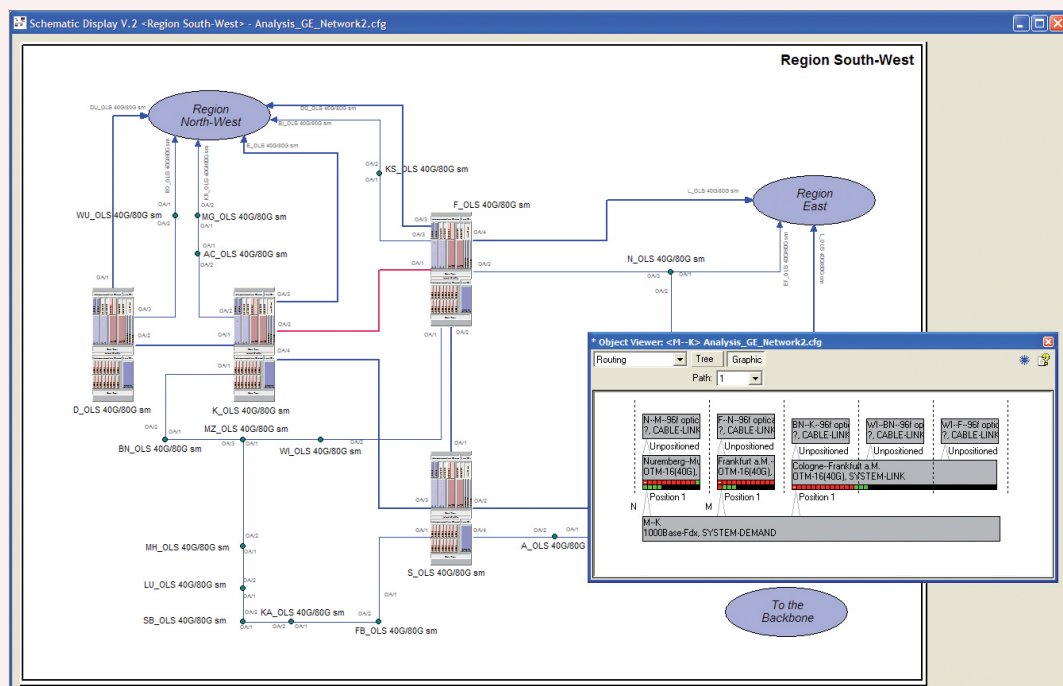
Analyzing the situation

- > Which bandwidth demand is routed over which transport system?
- > How can resources be provided for a new VPN service?
- > Which assemblies does a device contain? Which systems are connected to which port of the device?
- > Which equipment types should be used?
- > What is the cost of the new equipment?

Planning the solution

- >> View and edit the allocation of containers and systems.
- >> Specify service access points and calculate the required bandwidths between them based on a traffic estimation.
- >> Visualize schematically the assembled devices with modules and logical/physical interfaces and terminate the system links.
- >> Use the prepared device catalog containing scaled models of shelves and cards.
- >> Calculate individual as well as total costs of shelves and cards.

The allocation and configuration phase is characterized by a device-based planning approach with individual demands, containers, systems, modules and ports.



Cable and Duct Network Planning/ Equipment Placement

How to design a flexible and future-proof cable and duct network

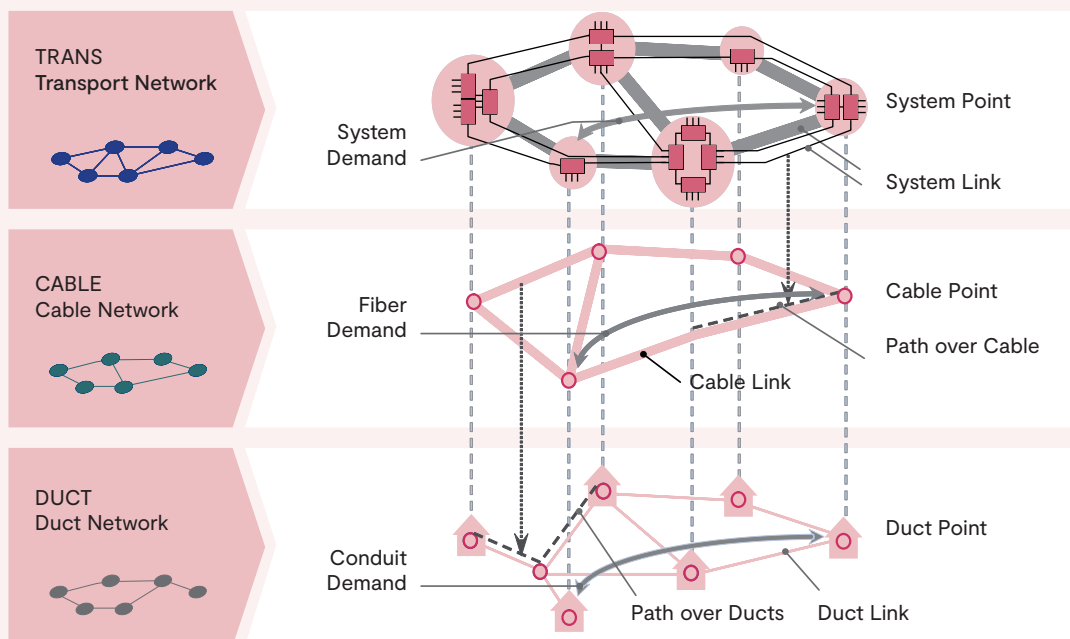
Analyzing the situation

- > Can the existing infrastructure fulfill all requirements?
- > Which duct and conduit sizes are required in consideration of sufficient spare capacity for future extensions?
- > Which cables should be used in consideration of sufficient spare capacity for future extensions?
- > Where should the new equipment be placed, into an existing rack with free space or into a new rack?

Planning the solution

- >> Analyze the network structure including the spare capacities.
- >> Calculate the required properties of trenches, pipes, and aerial routes including reserves.
- >> Calculate the required layout of cables including reserves, e.g. for cable-disjoint routing of bandwidths.
- >> Visualize the equipment placement in the racks and in the rack shelves.

The combined modeling of transport systems, cables, and ducts in one tool makes it possible to design highly reliable networks by minimizing the shared risk in case of failures.



Database-Supported Multi-User Planning

How to organize daily work among several planners of a network

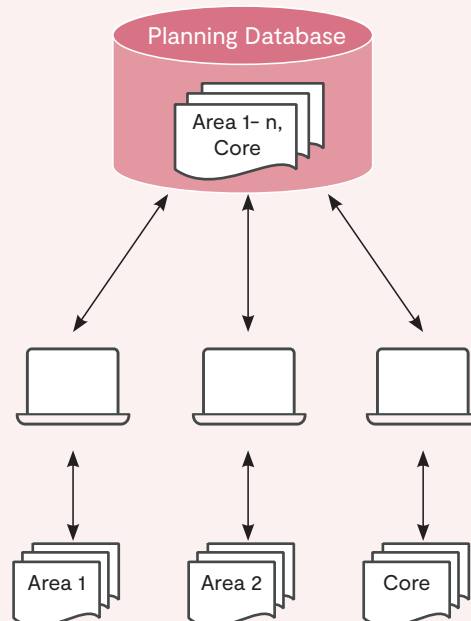
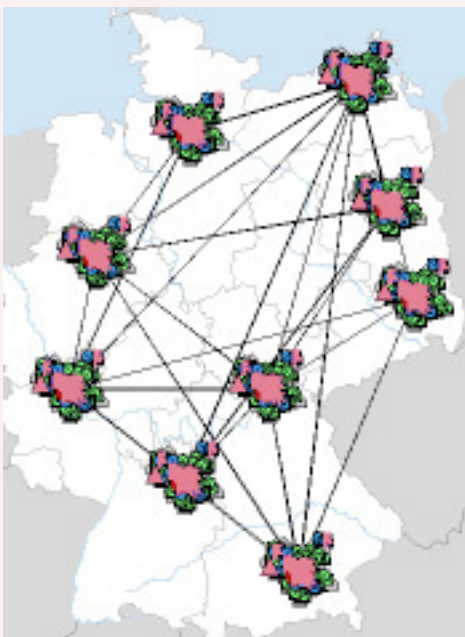
Analyzing the situation

- > How can all planning tasks be solved within a limited time frame?
- > Is the data of the network correct and complete?
- > How can modifications of the network be managed?
- > How can new business requirements be taken into account and be implemented quickly?

Planning the solution

- >> Work together with several planners in different planning domains at the same time.
- >> Fill and update the planning database automatically from available data sources and run checks.
- >> Make profound decisions based on the overview of the currently installed and planned infrastructure.
- >> Use the provided report functions to support an efficient deployment.

Several planners can work simultaneously in different planning domains. The network plans can be collected, merged, and published for all planners who have access to the planning database.



Your Benefits

NG Transport 6

NETWORKS NG Transport combines functions for analysis, short-term technical planning and mid- and long-term strategic planning of both active and passive transport network components.

NG Transport Network Analysis

- > Improved service quality due to fast detection of misconfigurations
- > Minimized risk of failures by applying optimized recovery mechanisms

Strategic NG Transport Network Planning/Capacity Development

- > Balanced loading and future-proof dimensioning of network resources
- > Cost-optimized and reliable topologies with lower investment risk

Technical NG Transport Network Planning/Device Configuration

- > Improved utilization of bandwidth resources at acceptable delays
- > Cost-optimized configurations with required performance

Cable and Duct Network Planning/Equipment Placement

- > Improved utilization of passive network resources
- > Minimized risk of failures for cable or conduit sections

Database-Supported Multi-User Planning

- > Support for the entire planning process from design to operations
- > Joint work of multiple users on a project at the same time

We invite you to benefit from the advantages of analysis, planning and optimization with NETWORKS.

We look forward to your inquiry.

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