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IT and communications solutions



NETvisor

IP Explorer

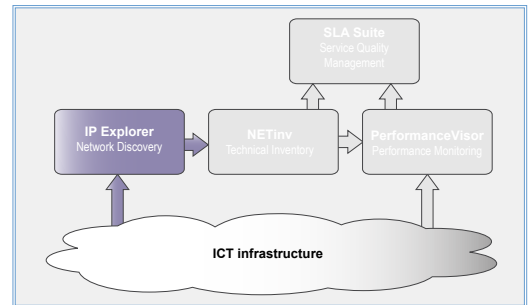
| telecommunication networks | it networks | research and development | cost effective operation

IP Explorer

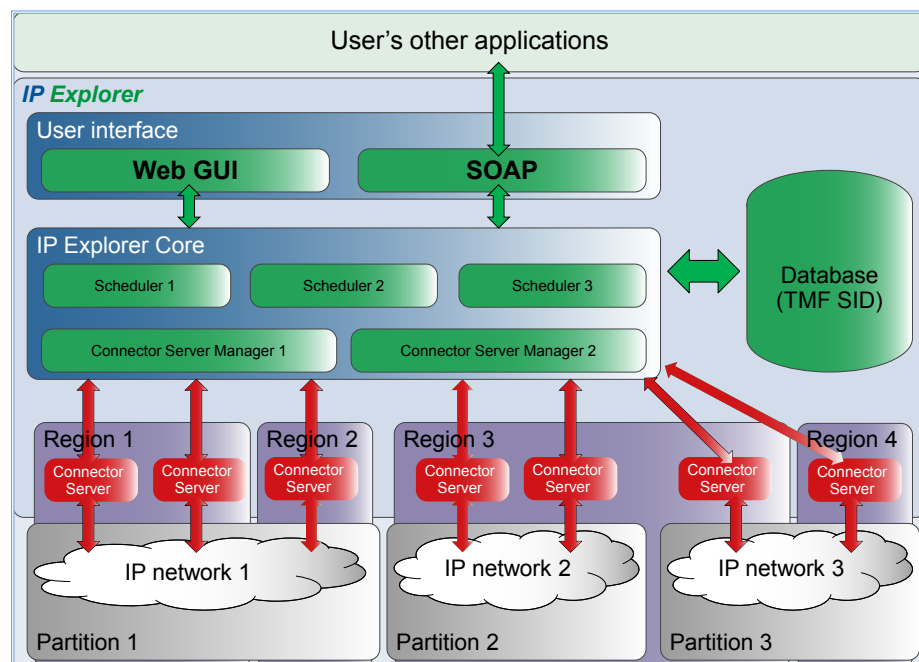
Network Discovery, Documentation and Visualization

For enterprises, telecommunication service providers, and companies with large networks

Most network management processes depend on the availability of up-to-date network information. Almost every system that supports higher-level management processes (such as troubleshooting, configuration and performance management) has some sort of network discovery functionality. However, these solutions are usually limited to a skeleton functionality and the minimum data required for the operation of the given management system. **IP Explorer** offers the following:

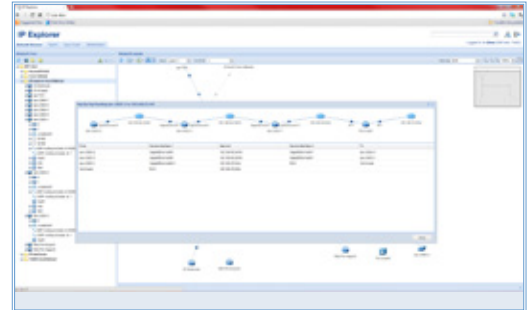


- Network discovery with comprehensive functionality and the widest possible scope of **up-to-date network information** to ensure 360 degree visibility.
- Fully automated, **end-to-end** (E2E) discovery of any heterogeneous IP/Ethernet/MPLS network.
- **Vendor-independent** model for storing the discovered network, visualized on a feature-rich Web interface.
- **Fast and easy creation of network documentation** based on real-life, up-to-date information.
- Standards-compliant open interface that enables any **higher-level management process to access current network information**.

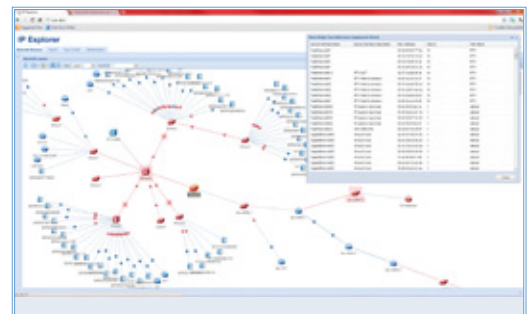


Benefits

- In addition to the physical connections of the devices, IP Explorer also discovers more complex E2E network connections such as VLAN, L2 VPN, EoMPLS and MPLS VPN.
- The network infrastructure can be analyzed and documentation can be created in view of the actual operation of the entire network.
- IP Explorer as a network management system provides a consistent view of multi-vendor environments to support higher-level management processes.
- Discovery results can be automatically uploaded to a network inventory system via the open northbound interface. Such a multi-layered network inventory is capable to consistently support all higher-level network management processes.
- With its many built-in connectivity options, IP Explorer can be efficiently integrated into any OSS system.
- Even as a stand-alone application, it can be used as an interactive network documentation solution.



Hop by hop routing



Layer 2 and bridge table

Areas of Use

- By **automating the network documentation process**, the time required for documenting large networks can be significantly decreased, which in turn reduces the inconsistencies resulting from changes made during the documentation process.
- Built-in **support for the network design process** ensures that the up-to-date structure of the network and accurate information on free capacities are available before the design effort begins.
- As part of **troubleshooting support**, the root cause error can be identified (when the immediate cause of a failure is identified on the basis of network discovery information), or impact analysis can be performed to identify the services and clients impacted by an error.

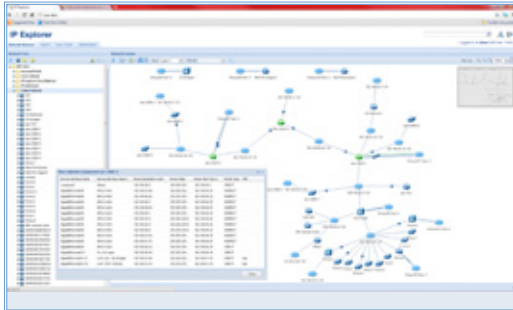
Key Features

IP Explorer is an IP/Ethernet/MPLS network discovery, visualization and documentation solution. It consists of the following four major components:



Layer 2 VLAN spanning tree view

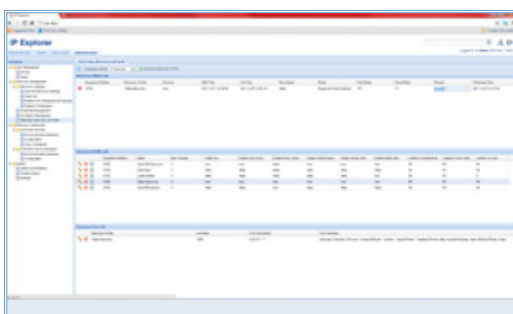




Layer 3 and routing table



Layer 3 VRF view



Managing discoveries

TMF SID-based IP network data model

IP Explorer is based on a vendor-independent IP network model designed in compliance with the SID model developed by the Telemangement Forum. The main advantage of the data model designed in accordance with SID recommendations is that it supports data mapping between systems developed along similar concepts when these are integrated into the same application environment.

ConnectorServer Architecture

Communication with the network devices is implemented using ConnectorServer modules. Via the management protocols supported by the given device type (SNMP, TELNET, SSH, etc.), the ConnectorServer module queries the network configuration of the given device and the neighbouring devices. The results are used for the comprehensive discovery of the network. In order to support a new device type, it is sufficient to extend this single module, which can also be performed by third parties.

Feature-rich Web client

Users can access IP Explorer information via a feature-rich Web-based interface that supports the five most popular browsers. Features include browsing the inventory-level information and configuration details of the network elements, as well as viewing, customizing and arranging topological diagrams.

Northbound SOAP Interface with Comprehensive Functionality

The open northbound interface enables integration with higher-level applications and automated processes. The entire functionality of the system is exposed through the open northbound interface, so all details discovered by the system can be queried. On the basis of the documentation and the service definition file, anyone can carry out the integration of IP Explorer into an existing management environment.

Network Management

When managing a large network, it is sometimes important to be able to break it down into smaller parts along several criteria, such as geography or its internal logic. IP Explorer supports two types of such segmentation:



Partitioning

In essence, partitioning in IP Explorer enables distinguishing between various networks. Since the number of assignable IP addresses is scarce in IPv4, certain address ranges are used by several companies and organizations in parallel for their internal networks. Network partitioning enables the management of multiple networks (using the same address ranges) for different customers on a single interface.

Breakdown by Regions

Breakdown into regions is designed for load distribution and traffic optimization purposes. Practically this means that you can assign ConnectorServer modules and devices to the regions. The device will be managed by a ConnectorServer module assigned to its region. If there are several such assignments, the system will optimally distribute the required tasks between the ConnectorServers. If one of the modules fails, another module automatically takes over.

Fault Tolerance, High Availability, Load Distribution

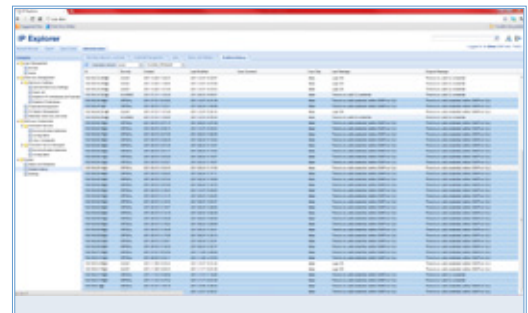
To eliminate the risk of single module failures disrupting the operation of the entire system, IP Explorer modules can be run in several instances. Modules with identical roles are able to take over the tasks of another failing module, ensuring continuous operation and high availability. With several modules running concurrently, even if no error occurs, these modules distribute their tasks among themselves and thereby improve the load distribution of the system.

Detailed Device and Network Topology Discovery

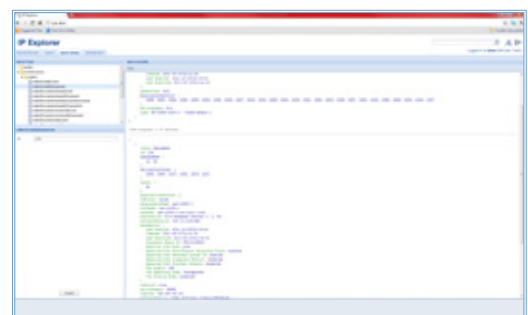
A network discovery process should inform the user about all there is out there, i.e. what devices the network consists of, the structure of these devices, how they are configured and connected with each other. Accordingly, information collected by IP Explorer about a network includes:

Inventory Information

- Device list with details
 - Vendor
 - Type
 - Serial number
 - Board ID
 - IOS/Firmware version
 - SysLocation
 - SysDescription



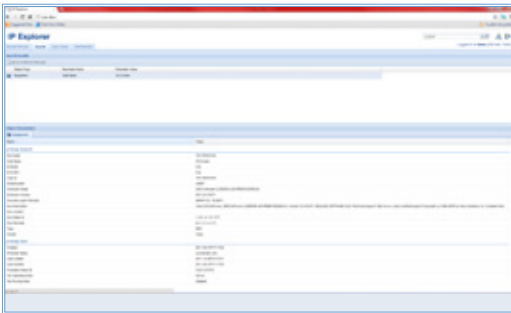
Problem history



Query dump



- SysServices
- Etc.
- Physical structure of the devices, component details
 - Cards
 - Modules
 - Connectors
 - Ports
 - Interfaces



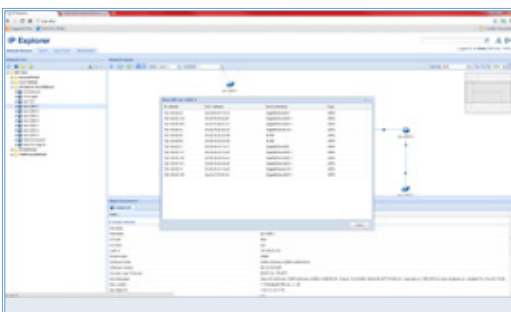
Search

Device Configurations

- VLANs defined in the devices
- Interface-VLAN assignments
- VRFs defined in the devices
- Interface-VRF assignments
- Xconnects (for EoMPLS)
- IPv4 and IPv6 addresses
- MAC addresses
- Routing and bridge tables
- Routing protocols
- QoS information

Network Topology Information

- Physical connections
- Logical connections
 - VLAN
 - EoMPLS, L2VPN
 - MPLS VPN
- Spanning tree information



Show ARP table

Visualization, Documentation, Integration Capabilities

Users need to see and use the information collected from the network, including the ability to upload it to other systems. This is perhaps one of the requirements in respect of which IP Explorer is superior to competing solutions. Its key features are the following:

Network Visualization, Operation Support

- Information organized along container hierarchy
- Layer2 visualization
 - General
 - VLAN level
 - Spanning-tree
- Layer3 visualization



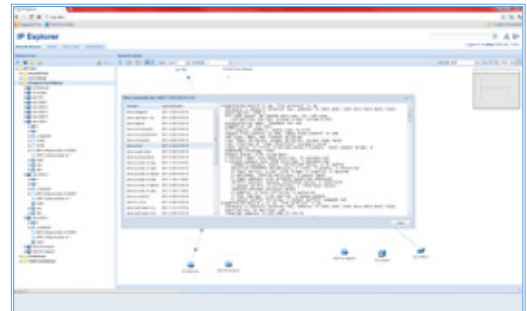
- General
- VRF level
- Functionality
 - Vector-graphic display
 - Default automatic layout, which can be subsequently manually edited and saved for re-use
 - Devices icons are displayed by device type, and connections by bandwidth
 - Interactive diagrams allow drilldown to more detailed levels of the network documentation

Network Documentation

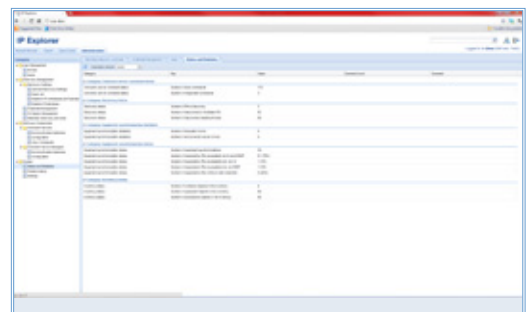
- Exporting the diagrams displayed. The topographical diagrams described in the previous section can be exported to .pdf or .svg vector format.
- Reporting from the underlying database. The vendor-independent relational database at the core of IP Explorer supports the creation of reports of any complexity.
- Built-in functionality enables the retrieval of a wide variety of specific details. E.g. the Layer3 routing from a device to another device or to a given IP address can be displayed with a few clicks.

Open SOAP Interface

- This API exposes all functionality to the higher-level management systems.
- It can be used to support all higher-level management systems/processes, as it can provide any information required by these



Show commands



Status and statistics



NETvisor

● NETvisor products worldwide



NETvisor Ltd.

Petzvál József u. 56. H-1119 Budapest, HUNGARY

Tel.: +36 (1) 371-2700 | Fax: +36 (1) 204-1664

email: netvisor@netvisor.hu

www.netvisor.eu