

NetCracker Resource Inventory

The Resource Management Challenge

For Communications Service Providers (CSPs), the network is one of their most important assets. Having deployed the network to provide connectivity and access, CSPs seek to monetize this asset by layering services over it.

Over the years, networks have grown and become more complex and intelligent. Despite their increased sophistication, however, they still cannot create, deliver, and manage services by themselves.

Network expansion and the introduction of new services require network planning and design skills that are external to the network. To create and deliver services, a detailed knowledge of the network, its configuration, its topology, and the relationships between different layers and components is necessary.

This information is typically scattered throughout many different systems supporting fulfillment, assurance, and billing activities. All this

information needs to be consolidated in order to produce a complete picture of the physical and logical network. Only then can a CSP efficiently create and deliver converged services and maximize the return on their network asset.

NetCracker's Resource Inventory module provides a clear picture of the entire network and serves as a solid foundation for multiple resource and service management activities, including fulfillment, assurance, and billing.



Centralization and Consolidation

Resource inventory management is widely accepted as the cornerstone of any service- and resource-related activities (such as fulfillment and assurance) and as a core component for any modern OSS. NetCracker Resource Inventory consolidates resource topology, configuration, status, connectivity, and assignment information in a centralized repository.

Handling all resource-related data in an accurate, integral way, Resource Inventory feeds this data to design and planning activities (supported by NetCracker Design & Planning), service fulfillment (supported by NetCracker Service Provisioning & Activation), asset management (supported by NetCracker Asset Management) and serves as a consistent, accurate source of data for the entire OSS/BSS.

Comprehensive and Future-Proof

Unlike technology-specific fulfillment solutions, NetCracker's flexible solution accommodates current and future technologies and devices.

NetCracker's Resource Inventory uses a metadata approach and is a fully open, configurable, technology-neutral solution that can quickly introduce and support new network technologies and resources.

The Resource Inventory module provides unified data models for technology-specific resources, together with capacity management, connectivity, and naming rules. The data model approach allows new resource types to be added easily. As soon as they are configured, new resources are available for searches and reports as well as capacity management.

The following core data models are provided:

Physical Resource Model: A comprehensive data model that describes the equipment configuration and physical connectivity, including slot, card, port, connector, and cable.

Logical Resource Model for Circuits: Enables the representation of network paths and trails, including channels, time slots, wavelengths, and virtual paths.

Logical Resource Model for Network Elements: Aggregates complex equipment models or logically related resources into a network element model and represents it as a single functional entity.

The network resource model provides capacity management for:

- SDH/SONET, PDH bandwidth
- ATM, FR, X.25 bandwidth
- WDM/DWDM wavelengths
- Radio link, cable, and HFC frequencies
- IP addresses and ranges
- Telephone numbers and ranges
- Port and slot availability
- Power consumption, HVAC consumption, floor space utilization, etc.

Resource Inventory Components

NetCracker Resource Inventory consists of several components:

Logical and Physical Resources are documented, configured instances of equipment and connectivity on every network layer beyond the Service Layer.

Data Center Inventory. The Data Center Inventory component provides data center and IT infrastructure management, modeling, and documentation for LAN switches, physical connectors, logical ports, configuration items, clusters, nodes, etc. The management operations include lifecycle management, network capacity management, and phone number and IP address management.

IP Address Management. NetCracker IP Planner provides comprehensive management of IPv4 and IPv6 ranges and pools. The management operations include adding, deleting, and moving IP ranges to/from IP pools as well as merging IP pools in accordance with user-definable data integrity rules. SWIP/unSWIP reports can be created for regulatory authorities.

Number Management. NetCracker Telephone Number Planner, VPN Planner, VPI/VCI, and other planners provide tools for managing numbered and range-based resources.

Device Library is a database of 45,000 equipment models and corresponding technical specifications from industry-leading telecommunications device vendors. NetCracker constantly updates Device Library to capture new equipment types, models, and configurations.

Location Management facilitates the management of regions, markets, cities, towns, districts, sites, buildings, floors, and rooms.

Address Repository provides a single access point for location address information, street guides, house numbers, distribution, and wiring areas. Address Repository can be integrated with external street guides for information updates.

Applications

IP Applications

- IP – Internet access
- IP – VPN (L2 and L3)
- IP – Multimedia (video, voice)
- IP – Hosting
- IP – Other application and content services (location, presence, games, SMS/MMS, music subscriptions, chat, etc.)

Cable Application

- Residential

PSTN Applications

- Residential
- Business

Mobile Applications

- Voice
- Content Services (VAS)

Converged Application

- Combination and extension of all the above

Access Networks

- Optic: FTTx
- xDSL (including VDSL2, SDSL)
- HFC
- Radio
- Microwave
- WiMAX

Cellular

- CDMA/UMTS
- GSM/GPRS/EDGE

Layer 2 Transport Networks

- MPLS
- VPLS
- L2TP
- ATM
- FR

Physical Transport Networks

- SDH/SONET
- PDH
- WDM/DWDM
- xPON
- Dark Fiber

Metropolitan Network

- Metro Ethernet
- GigE
- WDM/DWDM
- Microwave Radio

Voice

- PSTN
- SS7
- VoIP
- PBT

Reporting

NetCracker Resource Inventory comes with a set of pre-configured reports as well as the ability to re-configure existing reports and add new reports. The following are examples of pre-configured reports:

- CLR/DLR Reports can be based on industry standards or a CSP's preferences. They provide views of logical connections and connection terminations at demarcation points.

- Cross Connect Reports provide flat representations of network elements, multiplex matrixes, and passive internal connectivity for cross connects.

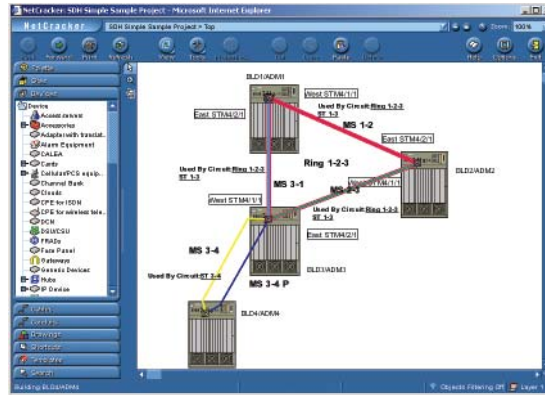
- Technology-Specific Capacity Utilization Reports are provided, starting from bandwidth reports down to floor space utilization and power consumption.

Diagramming and Visualization

NetCracker Resource Inventory provides physical and logical network topology diagrams at each layer. The visualization functionality is based on Network Configurator, a fast and flexible vector graphics-based rendering engine. The following views are available:

- Shelf configuration views
- Card views

- Network views of global, metropolitan, and local layers (including world, country, region, state, city, and district)
- Topology views
- Circuit views and end-to-end assignment diagrams
- Floor plans
- Rack population views



Holistic Approach to Integration

Many current OSS environments include legacy systems. Designed as specialized solutions for a particular technology, legacy systems have effectively solved the problems for which they were designed. As the pace of technology adoption increases, CSPs face a dilemma. Their legacy systems are too expensive to be updated, and the cost of a complete replacement can be high.

NetCracker Resource Inventory provides an answer to this problem. It can be the single point for inventory information without immediately and

physically replacing all legacy inventory systems. Resource Inventory allows legacy inventory systems to be seamlessly leveraged as data sources and transparently incorporated into the new back-office infrastructure. Supported integration scenarios include any combination of the following:

- On-demand data access and updating
- Scheduled (timely) reconciliation
- Business process level integration

Benefits of NetCracker Resource Inventory

- Having a complete, up-to-date picture of the entire network greatly improves the efficiency of the fulfillment and assurance processes and also improves customer satisfaction.
- The central repository of network infrastructure information used by all back-office systems enables a high level of automation, which further lowers operational costs.
- The unique, built-in network visualization capabilities present information in a more intuitive form and thereby increase worker productivity and efficiency.
- The wide range of pre-configured technologies and equipment that support any kind of network expedites the implementation and activation of new technologies and equipment.
- Comprehensive end-to-end network capacity management features enable the efficient use of resources and the optimization of capital and operational expenses.
- The ability to seamlessly integrate legacy systems and data sources allows cost-effective back-office transformations.
- The technology-neutral framework allows new configurations and resource types to be easily introduced, and thereby creates a future-proof investment.
- Comprehensive support is provided for configuration, naming, design, and capacity management rules, equipment libraries, and templates.