

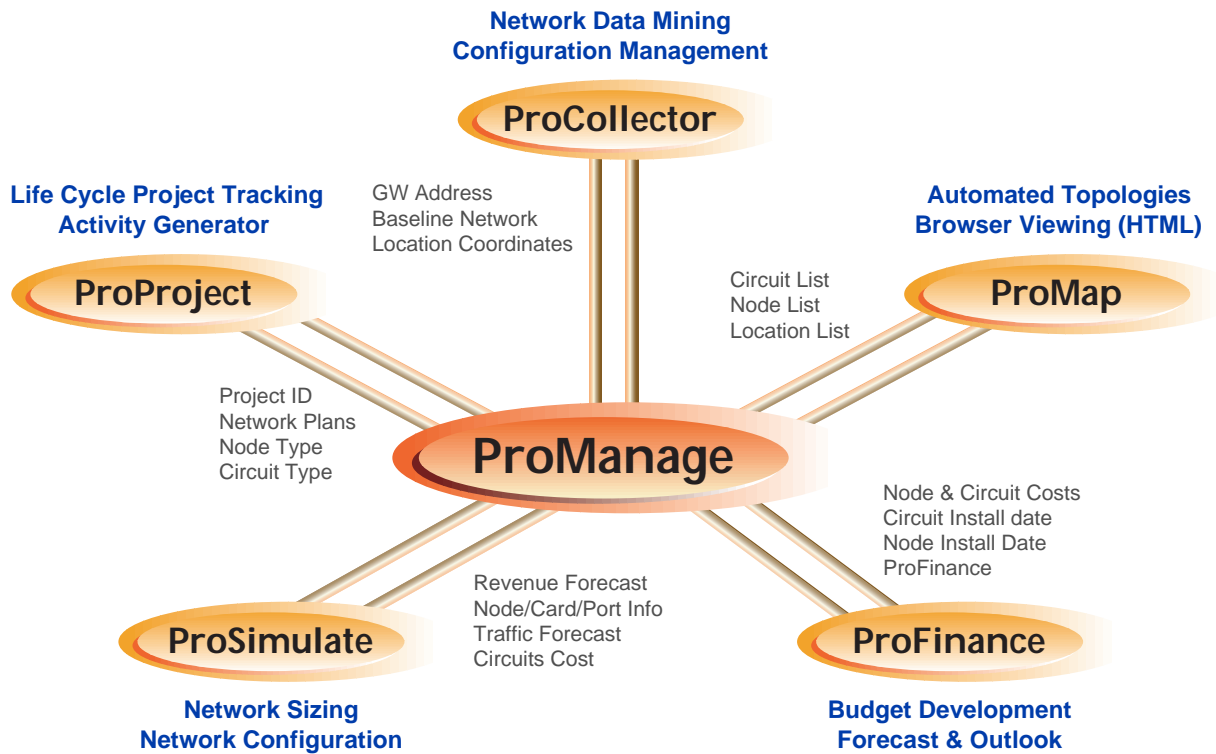
ProManage

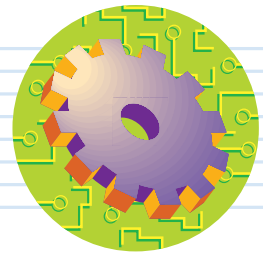
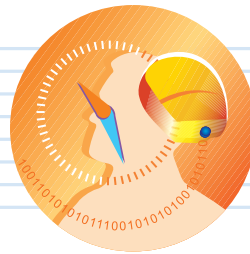
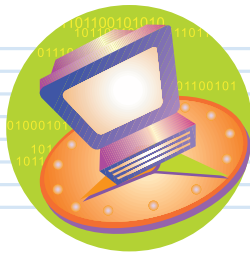
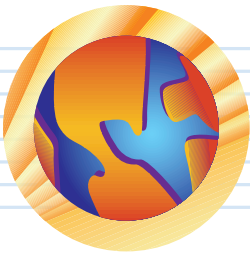
THE INTELLIGENT NETWORK INFORMATION MANAGEMENT SYSTEM

The ProManage module is the heart of the ProTools IT application suite containing the basic database structure and is a mandatory element of any ProTools configuration. All other ProTools modules are optional and can be added as required based on customer need.

Utilizing ProManage, relevant network information is entered, stored, and maintained in a predefined manner allowing for ready telecom network design and operation as well as business decision support.

The ProManage architecture and data structures are pre-optimized for most telecommunications environments although customization is possible based on particular customer environments. Collection and organization of all relevant network information in ProManage with built-in queries and report generation is the first and most important step in any ProXit engagement. The relationship between ProManage and the other ProTools applications is as illustrated:





■ CABLE & TRANSMISSION ACQUISITIONS & LEASE

Effectively map and track cable investments. Display physical routing of cable path including wet and dry segments. Calculate distance, availability and delay characteristics for cable routes effortlessly. Record all capital investments and ongoing maintenance expenses. Financial analysis based on user-defined depreciation schedules. Track installation dates, carrier performance, and all relevant administrative details.

■ CAPACITY PLANNING

Follow the capacity usage of both routing/switching elements and transmission links. Simplify decision-making as to when to install more network equipment or order more transmission links. Trend analysis and data mapping. Normal and exception reporting on usage of network assets.

■ PROJECT MANAGEMENT

Record all new network deployment on a project-by-project basis. Track project progress as

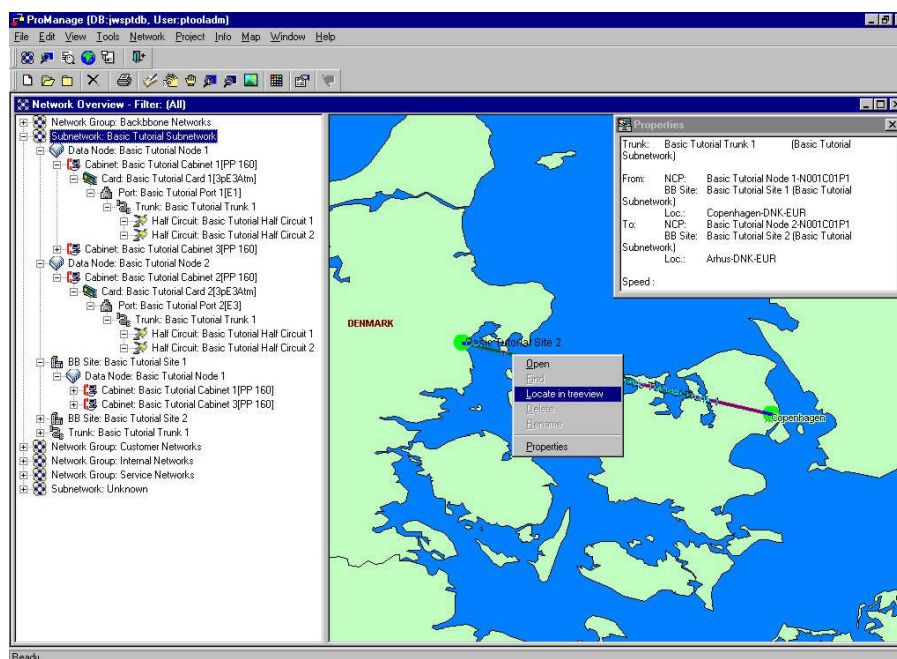
implementation occurs. Calculate dependencies between network elements within projects or "containers."

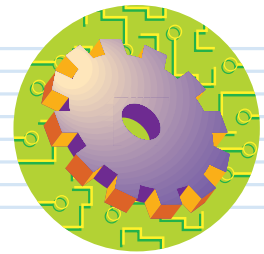
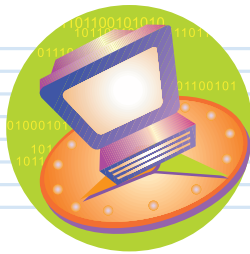
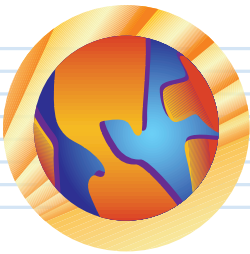
■ COST CONTROL

Provide monthly, quarterly or annual budgets for the whole network or segments of the network, by geography or network layer. Perform cost reconciliation by comparing actuals to budget, by geography or network layer. Validate supplier invoices for both capital investments (routers, switches, interfaces) and periodic expenses (access lines, transmission circuits, settlement). Develop currency risk scenarios and understand the impact of currency fluctuation.

■ OVERALL NETWORK PLANNING

Have a common reference point for all network assets. Extract information for ad hoc analysis for part of the network (by region, POP, subnetwork, etc.). Share detailed web-based network maps and lists of network elements for presentations and reports; simple copy and paste between ProManage and MS Office or equivalents application.





INFORMATION STRUCTURE

The basic database structure in ProManage allows for the capture of all relevant information about a given network. In most cases, only customer-specific administrative information must be added into the structure of the database to accommodate and handle customer-specific requirements.

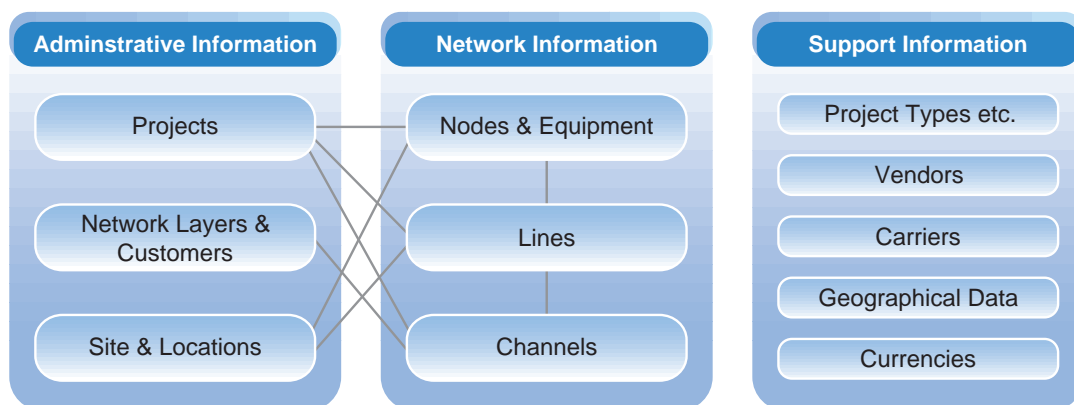
An important difference between the ProManage database structure and traditional NMS oriented databases is the time factor. The ProManage application allows for scenario planning, including how the network may look in the future or the characteristics of the network historically. The number of scenarios (both past and present) is only limited by the amount of free disk space. This aspect can be critical when doing network design and planning, and for performing "what-if" simulations.

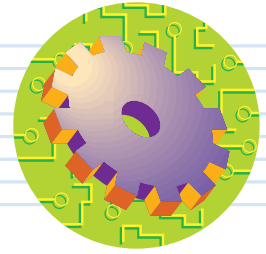
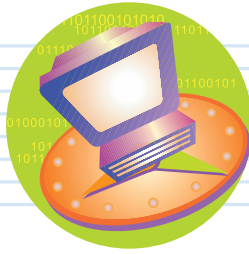
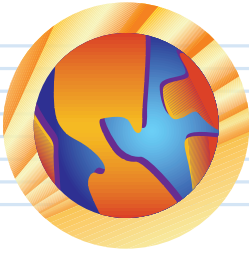
ProManage is also able to capture detailed cost information for all network elements. Even depreciation for various elements like network nodes and transmission acquisitions can be stored. As cost is an important aspect of any serious network planning it is important that the actual cost for the any part of the network is captured and used in the planning process.

In order to capture and normalize information about the network, all the parts of the network are treated as "Network Elements." Each Network Element has a set of common attributes including name, device ID, etc.

Additionally for each Network Element, one can add detailed information attributes such as cost, planned/install/commission dates, and other informational items. This approach allows a normalization of network data and consistency across all the Elements in the Network.

A high level view of the basic structure is shown below.





NETWORK ELEMENT

The main element types that are defined in the system are:

- Subnetwork
- Physical Links and Virtual Channels
- Node and Equipment Elements
- Sites and Locations

Each of these is described more in detail below:

SUBNETWORK OR NETWORK LAYER

Today's telecom networks are complex multi-technology and multi-service in nature. Many Subnetwork or Network Layers stitched together comprise the whole network. Each Subnetwork contains a group of related network elements and serves as a convenient way of referring and working with these items. A Subnetwork can either be all elements related to a specific customer's virtual network in the Service Provider network or it can be the group of network elements that comprise the network under consideration (IP, Frame Relay, etc.). This distinction is completely under the control of the user to group a collection of network elements into which ever collection makes the most sense for them. Subnetworks can also be structured hierarchaly, where one Subnetwork contains all customer devices, one contains all the service Subnetworks etc. Again once the data has been collected and resides in ProManage, the organization of the information is completely up to the user.

PHYSICAL LINKS AND VIRTUAL CHANNELS

Both physical and logical circuits can be easily maintained In ProManage. Accurate record keeping on all physical links and link segments is available whether a circuit is comprised of one segment or twenty. Information attributes specific to Service Providers that purchase, lease or

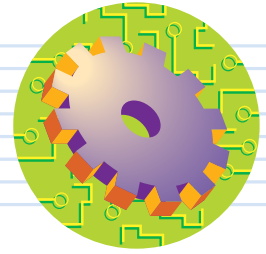
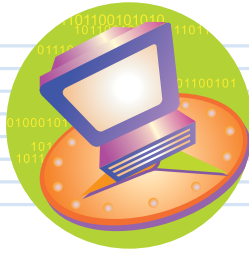
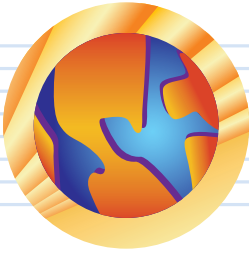
operate transmission Networks (fiber-optic, satellite, wireless) are maintained in the ProManage database including:

- Carrier and routing information
- Map Coordinates (V&H, latitude and longitude)
- Automatic Map Generation
- Accurate Distance Calculation
- One-way and Round Trip Delay
- Capital Investments
- Period Expenses
- Any Traded Currency (over 100 in library)
- All Action Dates (Installation, Cancellation etc.)
- Admin Info (Contacts, Phone Numbers)
- Attached Records (Floor Plans, Lease Contracts, Others)

This gives the ability to view summarized information on a per link basis or collection-of-links basis. Never before available data mining capabilities become feasible with this structured and ground-breaking approach.

Network reporting is simplified and decision making, informed. A set of canned telecom-specific reports or Key Performance Indicators (KPI) ships with ProManage. Reports include:

- Total Cost (in any world traded currency)
- End-to-End Availability
- Installation Dates
- Link Distance
- Round-trip Delay
- Virtual Channel/Circuit Routing



■ NODES AND EQUIPMENT ELEMENTS

Multilayered networks are very common and comprise a host of different technologies. Each network device will have its own set of configuration rules and characteristics. The ProManage revolutionary database design allows for a level of abstraction from the uniqueness of the network devices and a normalization of the data associated with each of these elements. Tracking of all network equipment in one repository allows for recovery of stranded assets and optimal usage of the combined capability of the network. Down the port level, an unparalleled level of control can be achieved yielding an operationally sound and cost effective network infrastructure.

ProManage maintains information including:

- Equipment Vendor and Type
- Node/Card/Port Detail
- Software Revision Level
- Spares and Auxilliary Equipment
- Capital Investments
- Recurring Expenses
- Non-recurring Expenses
- Action Dates (Installation, Cancellation etc.)
- Contact Information
- Reference Attachments (Floor Plans, Work Orders, etc.)
- Element Usage

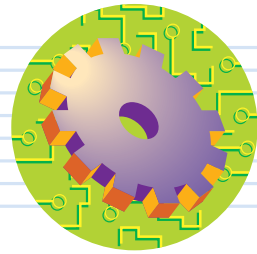
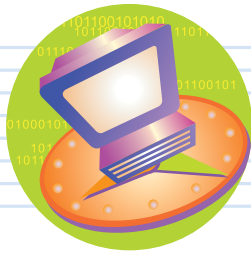
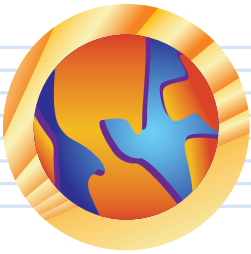
■ SITES AND LOCATIONS

Most carriers today have many points-of presence (POP) that they need to keep accurate track of. Facilities cost and related management plays an increasingly important part of the overall network capability. Therefore it is critical to effectively manage the facilities envelope and related attributes to ensure operational excellence and cost effectiveness. Information items including addresses, contact information, facility size and usage, main and backup power generation, and air conditioning capacity must all be carefully managed as a shortage of any of these elements is just as critical as lack of a spare port on a router or switch. ProManage simplifies the storage and management of this information, including information dissemination to the proper workgroup in the organization.

Sites consisting of multiple buildings and equipment rooms can be handled in ProManage and a graphical representation of each equipment room is available making it easy to set up and handle multiple rows of racks within a room. For each rack nodes can be inserted so the exact location of each equipment is known and also how much space there is available for additional nodes.

Carrier Access planning enabled you to handle multiple carriers per site and keep track of available and used capacity for a particular carrier.

Preventive and emergency maintenance cycles can be schedules and managed for all types of equipment (Air-Con, Fire Prevention, Transmission and Outdoor equipment). ProManage will schedule when maintenance should be carried out and calculate the next maintenance cycle accordingly making it easy to keep track of planned and actual date for maintenance and setting up KPIs for MTBR.



DATABASE SYSTEM

ProManage is implemented on top of the Oracle 8i Database Engine, a state-of-the-art database management system for use in large-scale multi-user environments. This DBMS is capable of handling very large volumes of data as well as very large numbers of simultaneous users, making it suitable for even the largest and most distributed organization.

SYSTEM REQUIREMENTS

- DBMS: Oracle DB v8i (ProTools)
- Operating System: Window 95/98/NT/2K/XP
- Workstation: Pentium III 350 Mhz, 64MB Ram, 100 MB free disk space



HQ: H.C. Orstedvej 63, 1879, Frederiksberg C, Denmark. Phone +45 35355055. Fax +45 47179553
R&D: B3-3-2, Megan Corporate Park, Jalan 1/125E, 57100, Kuala Lumpur, Malaysia. Phone +603 90511151. Fax +603 90511157
Regional: Via Di Villa Zingone 7, 00151, Roma, Italy. Phone +39 0658201920. Fax +45 47179553