Product Description

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Comms Server Pro for Windows NT

Product Identity

Order code: 010016

Comms Server Pro for Windows NT

Outline Description

The Comms Server Pro for Windows* NT is the gateway between the client workstations and one or more host computers. It uses intelligent communication boards, or peripherals to handle low-level communication details for the required protocols. It can also act as a 'host' for other gateways or control units if they are attached via a synchronous serial link (a downline). It supports a large number of workstations (depending on the upline speed), and several management connections. Each CSPNT can have a backup that can take over on command or automatically in case of failure. CSPNT is part of the Global Connect solution.

Host Protocols Supported

The following host protocols are currently be supported by CSPNT:

ALC, UTS, CPARS, AX25, and MATIP

General

The CSPNT is built on Distributed Component Object Model (DCOM) standards. The Component Object Model is an object-based programming model designed to allow two or more applications or "components" to easily cooperate and connect to each other as *software objects.* (A software object is a collection of related functions and their associated states.) DCOM serves to connect a client and a server object, and once that connection is established, the client and object communicate directly. The interaction between objects and the users of those objects in DCOM is based on a client/server model.

CSPNT is a DCOM application that provides basic functionality such as configuration, management, security and monitoring functions. The other functions are handled by interface objects. The interface objects can handle traffic to ALC, CPARS, and UTS hosts, to various clients such as CCP, MATIP clients, remote CSPNT's, etc. The interface objects are based on the Microsoft DCOM standards.

Principal Features
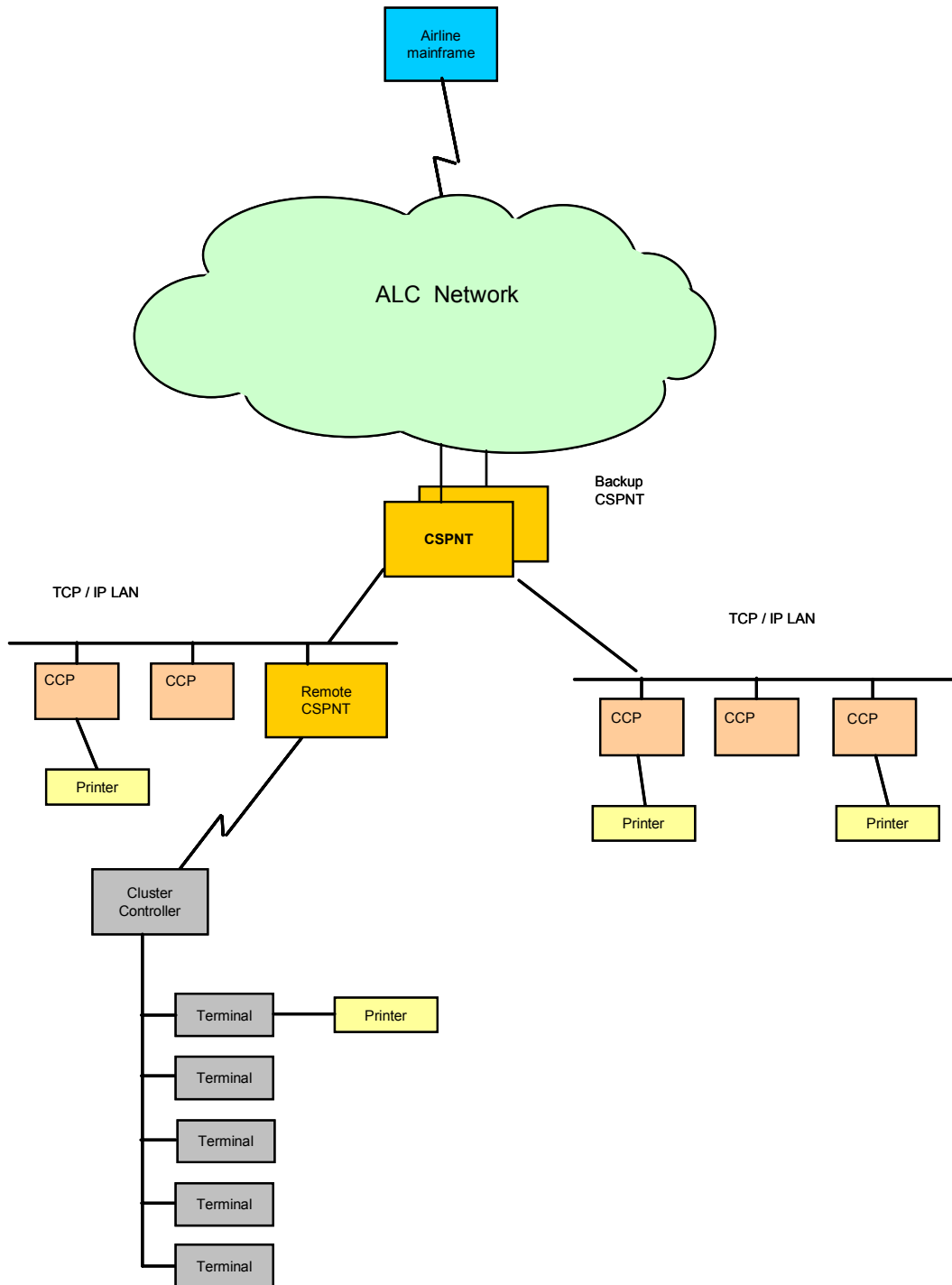
The diagram above illustrates one of the many configurations that CSPNT makes possible in the Global Connect solution. CSPNT enables access to other computer systems over an open TCP/IP network. It takes airline information technology out of the airport environment and onto the world stage.

CSPNT is not a product, not a gateway - but a solution. The way it is designed and implemented goes far beyond the simple box-based technology hardware offerings that abound in the market. Customers can get on with the future of rolling out business-benefiting IT solutions without looking back into the past. It is designed:

- As an end-to-end solution for airlines.

- For local and international networks

- To be open and standards based

- For ease of implementation

- To be simple

- As a homogeneous solution to legacy systems connection

- To be transparent to the user

- For the future
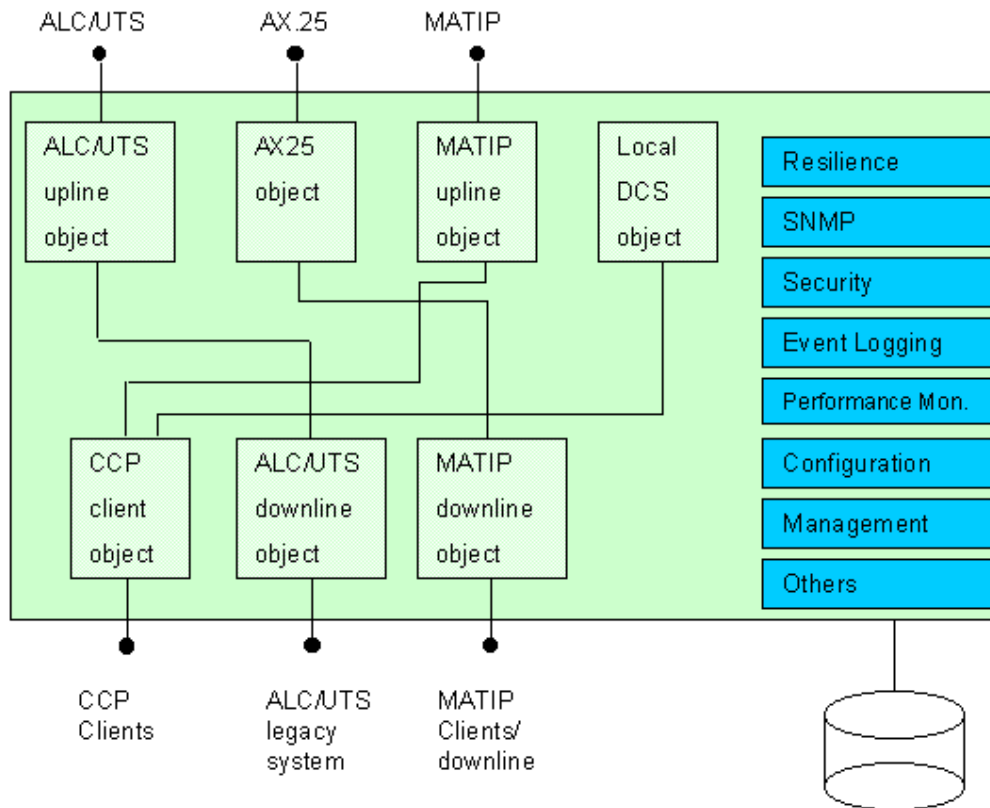
The diagram above illustrates the DCOM objects that are incorporated in CSPNT as well as the available software interfaces.

CSPNT comprises various software objects as well as numerous interfaces with standard Windows NT tools, such as the event log and the performance monitor. In addition to these standard interfaces, there is an SNMP interface that allows use of SNMP monitoring tools. There can be an 'n to n' relation between two objects; e.g., the upline object can connect both to a CCP client object and an ALC-DL or MATIP client object. Sharing is determined by the configuration.

Only compatible objects can be connected together. When two objects are not compatible, a translation object can be placed between the two.

The interface handlers are DCOM objects that control various communication protocols. There are four basic types of objects:

-**Servers**, these control the connection to a host such as ALC, UTS, etc. sometimes called "Upline".

-**Clients**, these control the connection to clients; e.g., CCP, MATIP client, downline terminals, etc. sometimes called "Downline".

-**Translators**, these are objects that connect themselves between a Server and a Client module to provide protocol conversions.

-**Monitors**, these can plug themselves in the data stream to do various monitoring and logging functions.

Standard Objects

SPC Upline Object

The SPC upline object is responsible for communication using the ALC, CPARS, or UTS protocols to a host computer. The object interfaces to the Travsys SPC/USB device. The SPC/USB device is an intelligent WAN communication controller connecting to the USB interface of the PC. The SPC/USB device has it's own memory and processor. The SPC upline components automatically configure the proper firmware on the SPC/USB device for the configured protocol. Towards the client side this component manages a dynamic pool of addresses (IA/TAs or RID/SIDs).

CCP Client Object

The CCP Client object controls the traffic to CCP clients (See PD-TS-002 for detailed specifications). The down stream protocols (ALC, CPARS, UTS) are all embedded in TCP/IP frames. The CCP Client object can communicate with the CCP by using the Travsys full-featured TCP/IP implementation.

SPC Downline Object

The SPC downline object controls connection to dumb terminals using downline polling via the SPC communications device. The supported protocols are ALC, CPARS, and UTS. This object can also handle address translation; addresses can be translated on an individual IA/TA (RID/SID) basis.

MATIP Upline / Downline object

The MATIP upline or downline object can connect to a MATIP host interface via TCP/IP or can function as a MATIP server via a downline connection. For a detailed specification of the MATIP protocol please refer to rfc 2351.

Additional Objects

AX25-Upline Object

This object handles the communication using the ALC, CPARS, or UTS over AX25 protocol. The X25 part of the protocols is handled by the EICON X.25 board. The AX25-UL object packages the ALC/CPARS/UTS data into an AX25 data stream and ships it to the X.25 board. For incoming data the reversed process is followed. The AX25-UL object can also manage a pool of addresses just like the SPC upline object. It is also possible to slave the address pool from a client object, in that case the client object determines the addressing.

Local DCS Object

The Local DCS object is a full-featured Departure Control System. The system user will see this object as if it is an other airline host system. For those airlines wishing to use this feature, the system can be loaded with specific information for a flight. When the flight is open, the user can perform check-in operations. (See PD-TS-100 for detailed specification).

NETBIOS Client Object

The NETBIOS client object controls the traffic to NETBIOS clients. The ALC or UTS data in transferred to the clients by use of NETBIOS session. This is a customer specific implementation.

Interfaces

SNMP

The SNMP and TCP/IP services use a set of objects known as the *management information base (MIB)*. The MIB is a management program that interacts between an administrator and the network management agent running on a host or gateway. The SNMP service allows SNMP-based managers to perform standard SNMP commands, such as reading the counters in the standard MIB included with the service. The Windows NT SNMP service includes MIB II (based on RFC 1213) and LAN Manager MIB II plus a separate MIB for DHCP and WINS servers. At SNMP service startup time, the SNMP service loads all of the extension-agent dynamic link libraries (DLLs) that are defined in the Windows NT registry. Extension-agent DLLs access each of the MIBs. Users can develop or add other MIBs. An extension-agent DLL for the CSPNT exposes the various aspects of the application.

Resilience

It is possible to have a redundancy facility that automatically takes over in case of failure. A server backup facility can provide some resilience with the communication servers. Each communication server can be duplicated, with one in each pair designated as a 'standby' server. A software backup facility can be installed on both machines, where each monitors the operational status of the other. The one having the 'best' status will be considered the active one.

 Security

The security is based on DCOM industry standards; CSPNT provides the basic interface to the underlying security system. DCOM provides security along several crucial dimensions. First, DCOM uses standard operating system permissions to determine whether a client (running in a particular user's security context) has the right to start the code associated with a particular class of object. Second, DCOM uses operating system or application permissions to determine if a particular client can load the object at all, and if so whether they have read-only or read-write access, etc. Finally, DCOM provides cross-process and cross-network object servers with standard security information about the client or clients that are using it so that a server can use security in more sophisticated fashion than that of simple OS permissions on code execution and read/write access to persistent data.

Performance Monitor

Windows NT has a standard performance monitoring application that can monitor the performance of various system components. CSPNT collects various performance data and presents it to the performance monitor.

The type of performance data collected includes:

CSPNT Comms Object

Avg response time	Total time (in seconds) the application or object has been running.
Bytes received	The total number of bytes received.
Bytes sent	The total number of bytes sent.
Bytes/sec received	The number of bytes/sec received.

Bytes/sec sent	The number of bytes/sec sent.
Connections	The number of object connections.
Data errors	Total number of messages received with errors.
Messages received	Total number of messages received.
Messages received/sec	Number of messages received per second.
Messages sent	The total number of messages sent.
Messages sent/sec	The number of messages/sec sent.
Response < 0.5 sec	Number of messages with a response time of less than 0.5 sec.
Response < 1.0 sec	Number of messages with a response time of less than 1.0 sec.
Response < 2.0 sec	Number of messages with a response time of less than 2.0 sec.
Response < 4.0 sec	Number of messages with a response time of less than 4.0 sec.
Response < 8.0 sec	Number of messages with a response time of less than 8.0 sec.
Response > 8.0 sec	Number of messages with a response time greater than 8.0 sec.
Response failed msg count	Total number of messages that did not got a response.
Response msg count	Total number of sampled messages upon which the response times are based.
Sessions	The number of active device sessions.
Total running time	Total time (in seconds) the application or object is running.
Upline status	Status of the uplink is defined as the percentage of clients affected by the uplink status, if 100% then all clients are online.

CSPNT Service

State	State of the application: 1=Loading, 2=WaitingForMaster, 3=Starting, 4=Started, 5=Paused, 6=Stopping, 7=Restarting.
Total running time	Total time (in seconds) the application or object has been running.

You can use Performance Monitor to look at resource use for specific components and

program processes. With Performance Monitor, you can use charts and reports to gauge your computer's efficiency, identify and troubleshoot possible problems (such as unbalanced resource use, insufficient hardware, or poor program design), and plan for additional hardware needs.

Event Logging

CSPNT interfaces to the Windows NT Event Viewer so that the operation of CSPNT itself as well as various objects (X25, SPC upline, CCP CLIENT, SPC Downline, and MATIP connections) can be traced. It is possible to control the level of detail to be logged. Various events are logged; the following gives a partial list of events:

Service Information

The service was installed, removed, could not be removed.

The service was started, was started in sleep mode, received an unsupported request, was stopped.

The service is going active, is starting, is stopping.

Various errors

Installation- control handler could not be installed, initialization process failed, starting interface, installing/uninstalling performance counters, loading object,

Backup- conflict in partner state, connecting to partner, setting partner state, taking over from partner, waiting for backup partner.

Master/Slave- connecting remote server, connecting to remote slave, opening substorage from master, pushing configuration to slave, waiting for configuration from master.

Configuration Changes

Receiving configuration from master.

Configuration

CSPNT provides a standard configuration utility. A small part of the configuration is stored in the Windows NT registry, the main part is in a file. The interface handlers are also configured via the configuration interface.
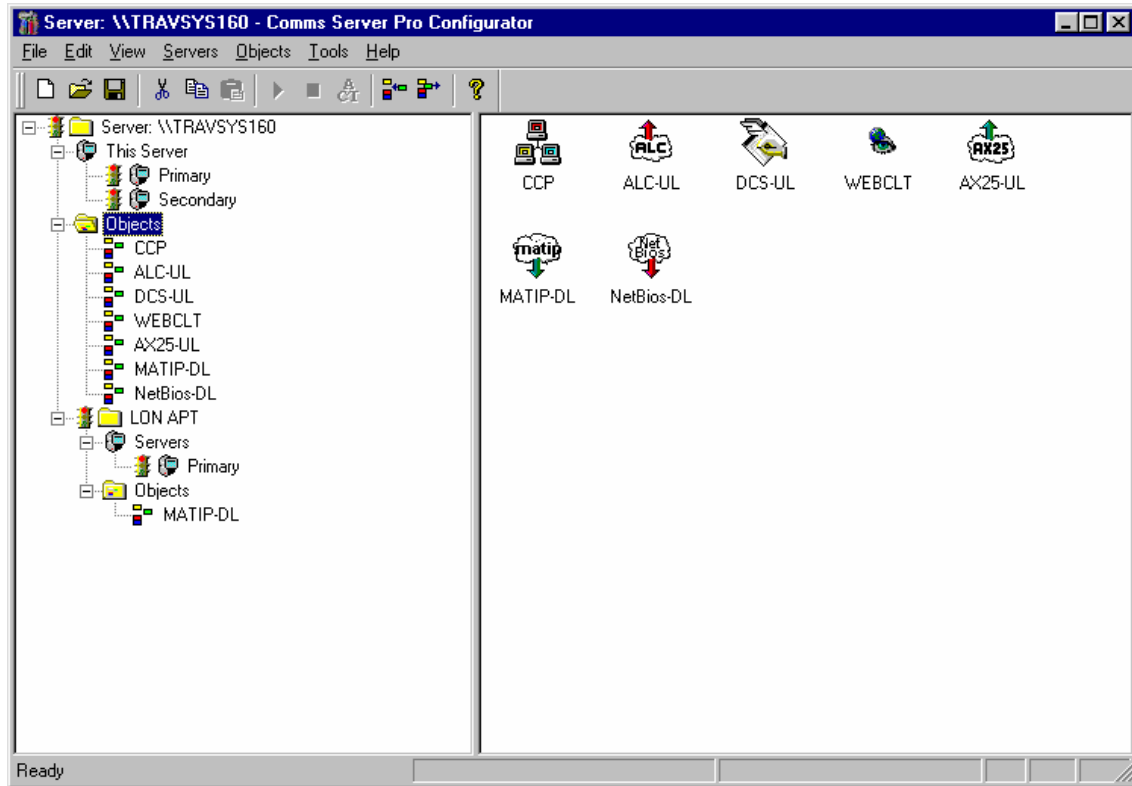
The diagram above illustrates the Configuration Program screen. The right-hand panel shows the various object, while the left hand pane displays the details of the selected tree element.

The configuration program has the following features:

- Configuration can be done locally or remotely.

- Graphical presentation of system.

- Built in security.

- Keeps a log of changes and made by who.

- Makes a configuration, which will activate on a specified time.

Importantly, remote CSPNT applications can be configured as "slaves" from a master CSPNT station. This means that all configuration management is done at one location. The "slave" configurations are built from the 'master' station and pushed over the TCP/IP network to the remote CSPNT station(s).
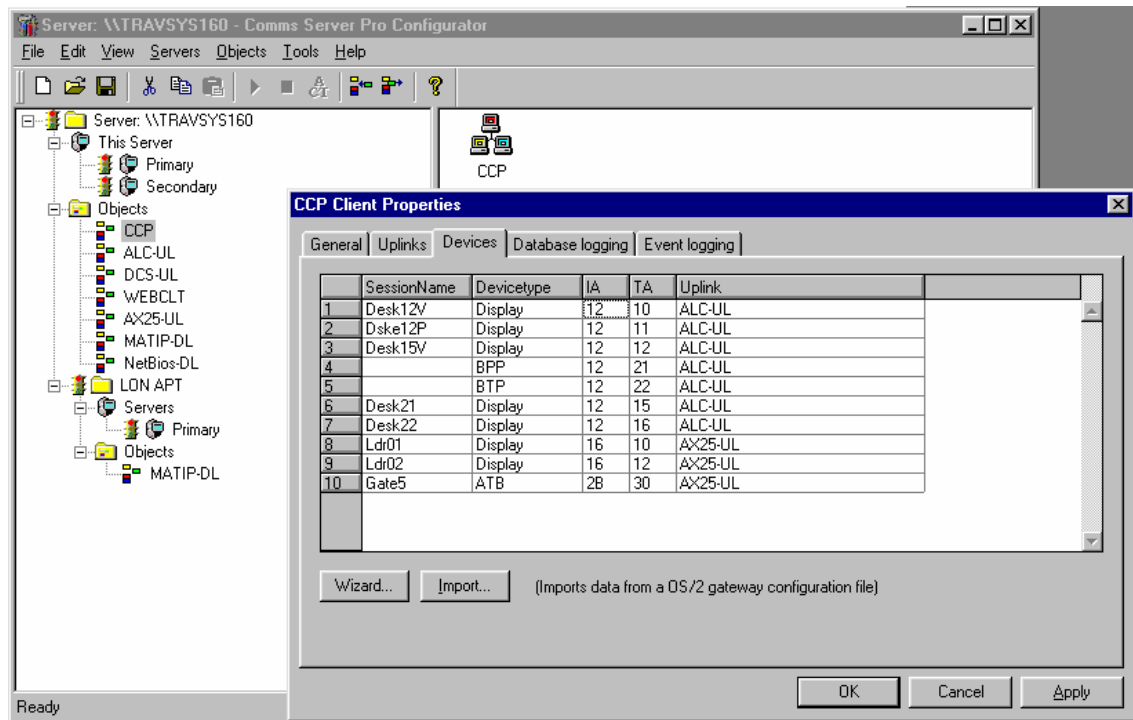
In the example above, a detailed configuration window is shown. In this case the CCP object configuration. Other objects have a similar configuration window with specific elements as required for that object.

Server Monitor

The application provides the following functions:-

- Displays a configuration list of servers

- Displays detailed information about a selected communication server

- Line status

- Response time monitor

- Client connection status

- Backup status

- Displays status information about a selected printer server

- Requests a change of communication server operating status (active, backup)

Name	Cua	Tua	Device	Mode	State	Uplink	UplState	Wkst Id
EI1510	15	10	Display	Enabled	Pending		No connection	
EI1511	15	11	Display	Enabled	Pending		No connection	
EI1512	15	12	Display	Enabled	Pending		No connection	
EI1513	15	13	Display	Enabled	Pending		No connection	
EI1514	15	14	Display	Enabled	Pending		No connection	
EI1515	15	15	Display	Enabled	Pending		No connection	
EI1516	15	16	Display	Enabled	Pending		No connection	
EI1517	15	17	Display	Enabled	Pending		No connection	
EI1518	15	18	Display	Enabled	Pending		No connection	
EI1519	15	19	Display	Enabled	Pending		No connection	
DCS1510	15	10	Display	Enabled	Connected	DCS-UL	Online	193.79.148.153
SUN1511	15	11	Display	Enabled	Connected	DCS-UL_SUNT	No DSR	193.79.148.153
DCS1512	15	12	Display	Enabled	Pending		No connection	
DCS1513	15	13	Display	Enabled	Pending		No connection	
DCS1514	15	14	Display	Enabled	Pending		No connection	
DCS1515	15	15	Display	Enabled	Pending	DCS-UL	Lost connection	193.79.148.170
DCS1516	15	16	Display	Enabled	Pending	DCS-UL	Lost connection	193.79.148.170
DCS1517	15	17	Display	Enabled	Pending		No connection	
DCS1518	15	18	Display	Enabled	Pending	DCS-UL	Lost connection	193.79.148.170
DCS1316	13	16	Display	Enabled	Connected	TestHost	Online	193.79.148.170
DCS1314	13	14	Display	Enabled	Connected	TestHost	Online	193.79.148.170
DCS1312	13	12	Display	Enabled	Connected	TestHost	Online	193.79.148.170
RES1310	13	10	Display	Enabled	Connected	TestHost	Online	193.79.148.170
DCS1519	15	19	Display	Enabled	Pending		No connection	

In the example above, shows the Server Monitor screen. The right hand pane details the elements as configured for the selected object and their current status. The left hand pane illustrates all the active servers on the network while one server is in expanded view detailing the elements and objects in that particular server.
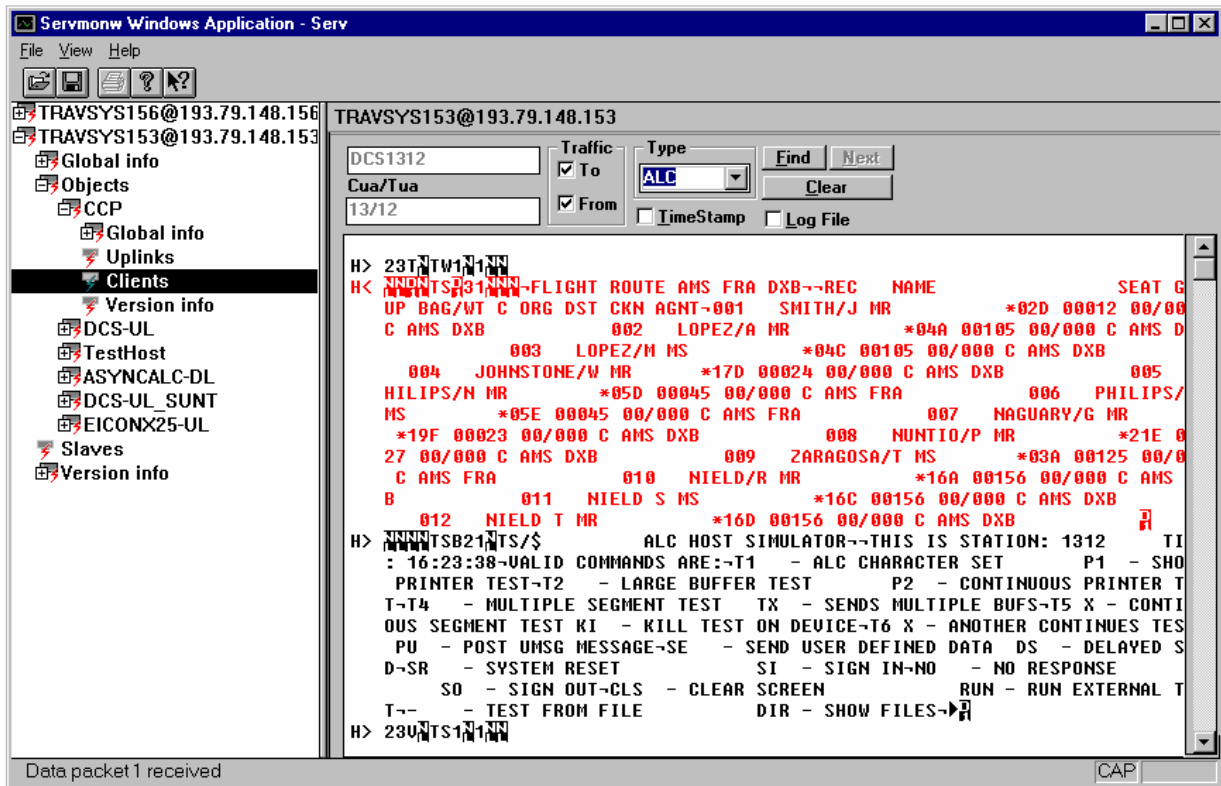
In the example above, a line monitor trace is shown for a selected Client device of the CCP object. Each device can be monitored as well as whole object. Depending on the line protocol a specific translation can be selected. In this case the data is translated from an ALC data stream.

Hardware and Software Prerequisites

- IBM Pentium PC or compatible with USB port

- Processing speed: 166 MHz or higher

- 128 MB RAM

- 20 MB free Hard Disk space

- Windows 2000 workstation or server or Windows XP

- SPC/USB device if ALC, CPARS, or UTS link is used

- X.25 board (PCI) if AX.25 link is used including the Travsys X.25 object

Standard Deliverables

- CSPNT server including standard objects

- CSPNT Configurator

- CSPNT Server monitor

Standard object

- ALC / UTS upline objects

- ALC / UTS downline objects

- MATIP upline objects

- CCP object

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