



Product Description

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MATIP router for Windows NT

Product Identity

Order code: 010035

MATIP router for Windows NT

Outline Description

The MATIP router for Windows* NT is the bridge between the IP network, utilizing the MATIP protocol, and an ALC or UTS down line. It uses intelligent communication peripherals to handle low-level communication details for the required ALC or UTS protocol. It can also act as server for IP clients directly connected to the MATIP router. The MATIP router is part of the Global Connect solution.

Host Protocols Supported

The following host protocols are currently supported by the MATIP router:

MATIP as up line protocol

ALC, UTS, or CPARS as down line protocol

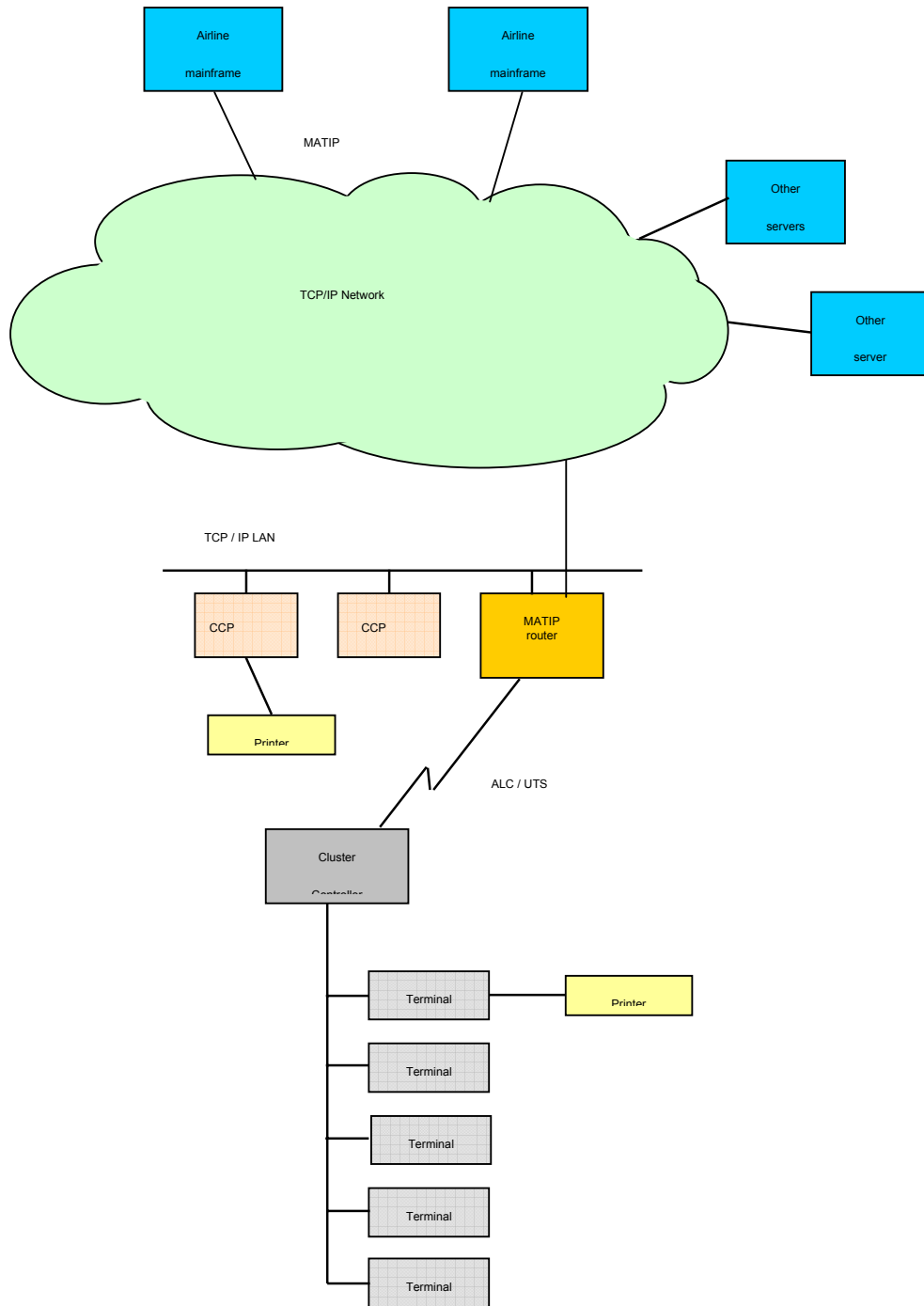
TCP/IP for CCP clients

General

The MATIP router 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.

The MATIP router 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 MATIP, ALC, CPARS, and UTS down lines, to various clients such as CCP, etc. The interface objects are based on the Microsoft DCOM standards.

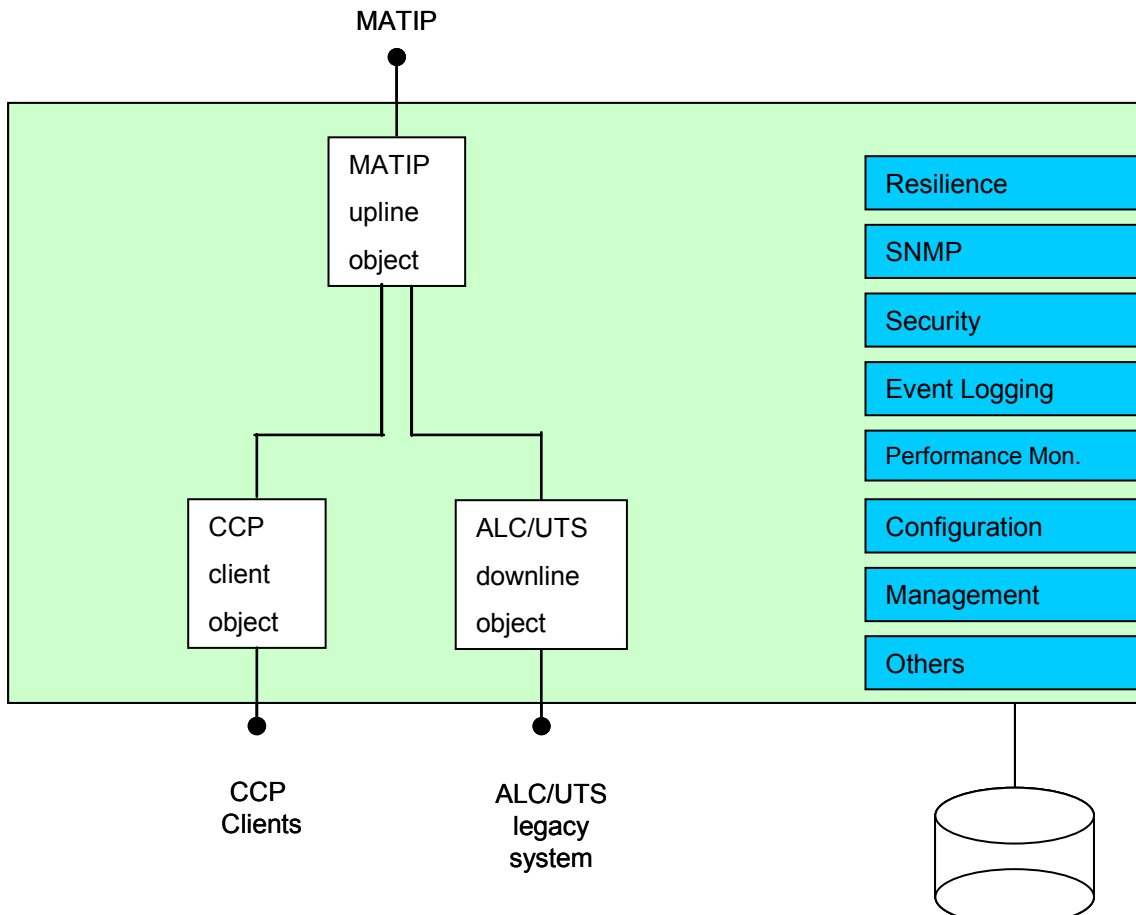
Principal Features



The diagram above illustrates a configuration with the MATIP router solution.

The MATIP router 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.

The MATIP router 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 a 'n to n' relation between two objects; e.g., the upline object can connect both to a CCP client object and an ALC-DL client object. Sharing is determined by the configuration.

Only compatible objects can be connected together.

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 like the MATIP server, sometimes called "Upline".

-**Clients**, these control the connection to clients; e.g., CCP, ALC or UTS, 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

MATIP Upline object

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

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.

ALC / UTS Downline Object

The ALC / UTS 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.

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 MATIP router 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; The MATIP router 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. The MATIP router collects various performance data and presents it to the performance monitor.

The type of performance data collected includes:

MATIP router Comms Object

| | |
|---------------------------|--|
| Avg response time | Average response time. |
| 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 get 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. |
| Uplink status | Status of the uplink is defined as the percentage of clients affected by the uplink status, if 100% then all clients are online. |

MATIP router 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.

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Event Logging

The MATIP router 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.

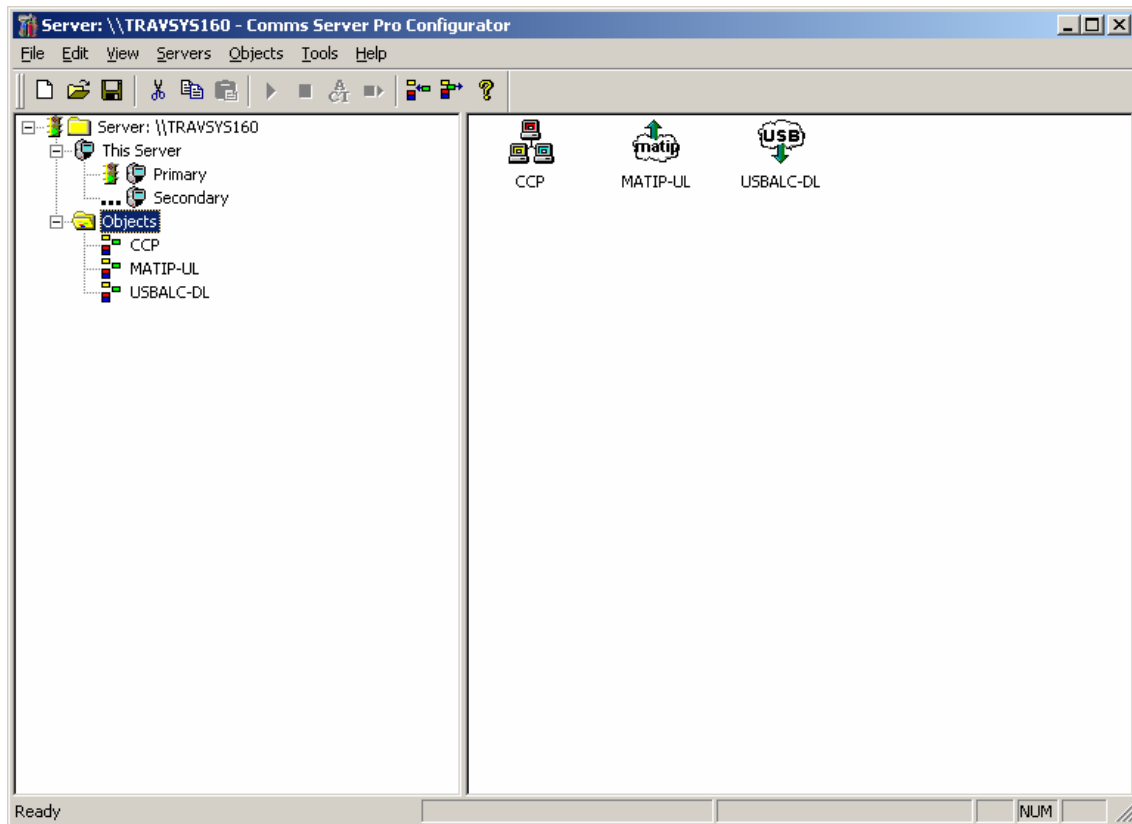
Master/Slave- connecting remote server, connecting to remote slave, opening substorage from master, pushing configuration to slave, waiting for configuration from master.

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.

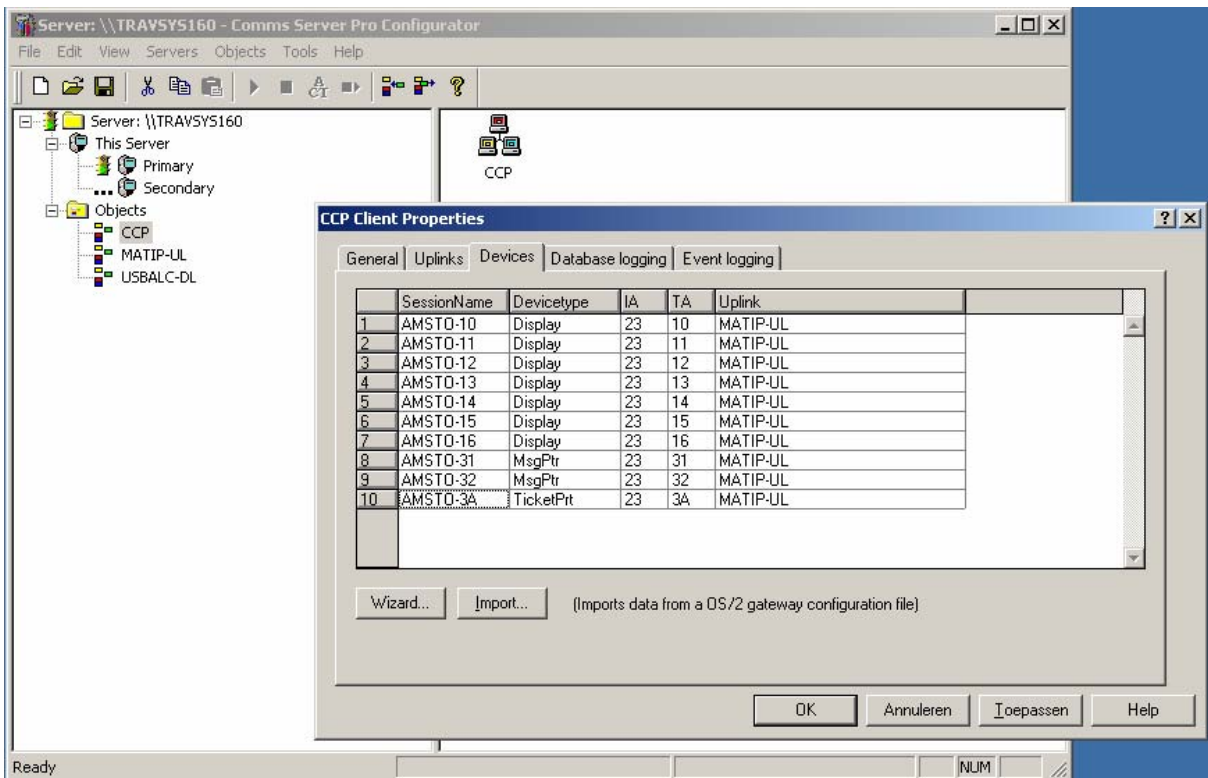


The diagram above illustrates the Configuration Program screen. The right-hand panel shows the various object, while the left hand pane displays the details of the selected tree element.

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)

Servmonw Windows Application - Serv

File View Help

TRAVSYS156@193.79.148.156 TRAVSYS153@193.79.148.153

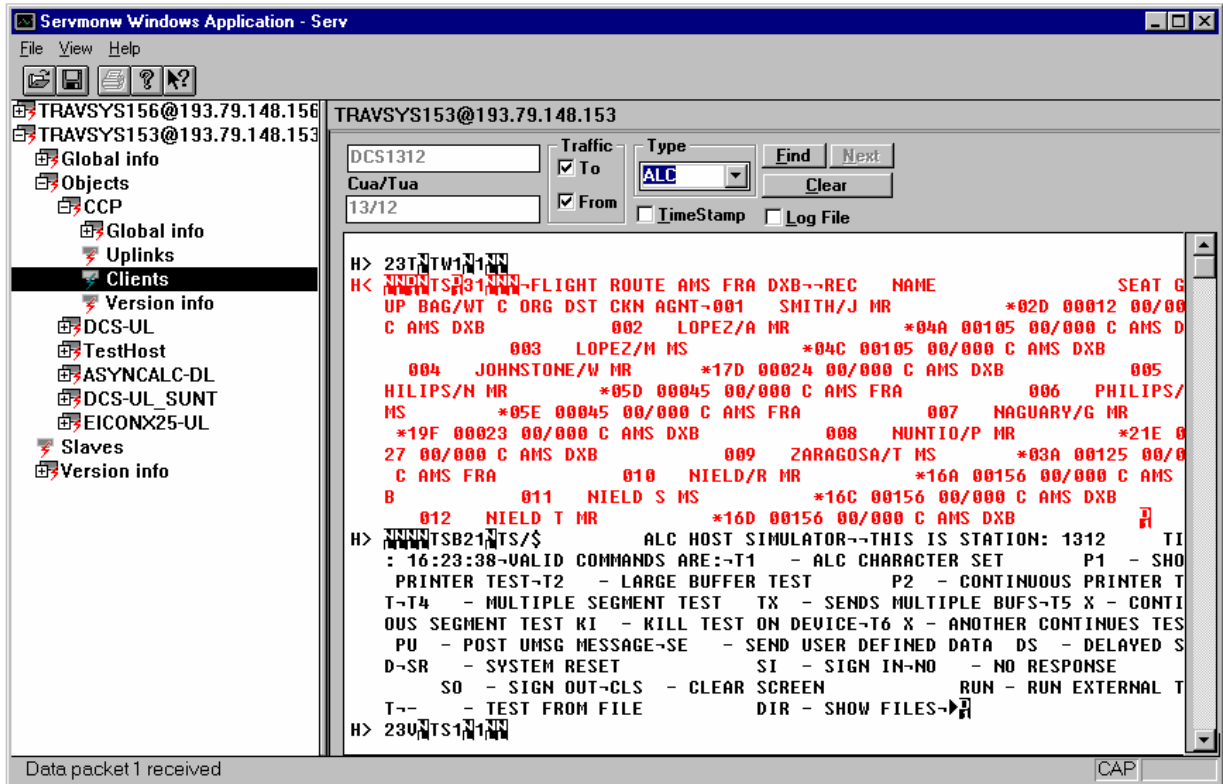
Global info
 Objects
 CCP
 Global info
 Uplinks
Clients
 Version info
 DCS-UL
 TestHost
 ASYNCALC-DL
 DCS-UL_SUNT
 EICONX25-UL
 Slaves
 Version info

| DataScope | | Apply | | Enabled | | | | | |
|-----------|-----|-------|---------|---------|-----------|-------------|-----------------|----------------|--|
| 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 | | |

Data packet 1 received

CAP

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
- 64 MB RAM
- 20 MB free Hard Disk space
- Windows 2000 NT workstation or server or Windows XP, Windows 2003 or later
- SPC/USB device if ALC, CPARS, or UTS link is used
- LAN adapter board with TCP/IP connection for MATIP support

Standard Deliverables

- CSPNT server including standard objects
- CSPNT Configurator
- CSPNT Server monitor

Standard object

- ALC / UTS downline objects
- MATIP object
- CCP object

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