

TN3270 Server for CIP and CPA

TN3270 Server Overview

The TN3270 Server is an application available on a Cisco Mainframe Channel Connection (CMCC) card, the Channel Interface Processor (CIP) and Channel Port Adapter (CPA). The TN3270 Server allows TN3270 clients access to IBM and IBM-compatible mainframes without the limitations of existing alternatives. It offloads 100 percent of the TCP/IP and TN3270 cycles from the mainframe, and it offers a robust, scalable, and dynamic implementation that meets the stringent requirements of the data center.

TN3270 is being embraced by some of the largest IS organizations. The main reason is that TN3270 is a popular standards-based approach that provides end users with access to existing applications while supporting the goal of a single-protocol backbone based on TCP/IP.

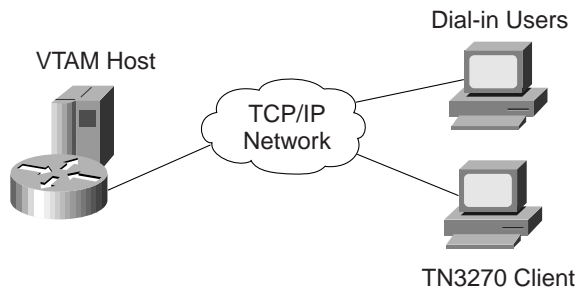
The TN3270 Server is based on the reliability and scalability of the Cisco 7500 and 7200 Series routers and the CIP and CPA cards. Each CMCC card can support up to 30,000 TN3270 sessions. Both bus-and-tag and ESCON channel connections are supported. And the TN3270 Server application can coexist on a single CMCC card with any or all of the other CMCC applications: IP Datagram, TCP/IP Offload, and/or Cisco SNA.

Features at a Glance

The TN3270 Server provides advanced functionality and scalability to meet the needs of the enterprise networking environment.

- Support for up to 30,000 concurrent sessions on each CMCC card. By implementing multiple CMCC cards on a single Cisco 7500 or 7200 Series router, tens of thousands of sessions can be supported on a single router.
- Load balancing and redundancy of sessions across multiple CMCC cards and/or multiple Cisco routers.
- Access to multiple hosts with two alternatives:
 - Configuration of multiple IP addresses or host names at the client.
 - Support for a unique SNA session switching capability that allows session routing within the TN3270 Server. This allows the CMCC card to route traffic without Virtual Telecommunications Access Method (VTAM) intervention, and without adding the complexity of full Advanced Peer-to-Peer Networking (APPN) routing.
- Secure Sockets Layer (SSL) encryption of TN3270 sessions, when used with an SSL-capable TN3270E client.
- Assignment of LU names based on Domain Name Services (DNS) symbolic names, allowing LU names to be nailed in a Dynamic Host Configuration Protocol (DHCP) environment.
- Support for named LUs in a redundant or load-balanced environment.

Figure 1 Cisco's TN3270 Server on CMCC Supports up to 30,000 TN3270 Sessions



- Support for the TN3270E standard (RFC 1647), providing the advanced SNA and printing capability for clients with TN3270E capability.
- Dynamic definition of logical units using the VTAM feature Dynamic Definition of Dependent LUs (DDDLU).
- Dynamic allocation of LUs based on type of session requested. Multiple LU pool types are supported, and these pools do not require predefinition.
- Specific LU allocation for TN3270E clients through use of the CONNECT command as documented in RFC 1647.
- Advanced end-to-end visibility and supportability: view session information based on IP address or LU name, tracing by IP address or LU name, end-to-end response time capability, traps and alerts generated and available to NetView console and/or SNMP station. Manageable from NetView using Cisco NetView Native Service Point.
- Defined to the mainframe as a single 3172 Interconnect Controller with downstream SNA physical units rather than multiple channel-attached 3174 Establishment Controllers.
- Assignment to specific LUs based on client IP address.
- Setting of TCP TOS bits to enable network weighted fair queuing support.
- Capping the number of LUs assigned to a client IP address.

Benefits

Scalability to Support the Entire Enterprise

Unlike most TN3270 server solutions, the Cisco TN3270 Server easily supports up to 30,000 sessions on each CMCC card. This is possible because the CMCC implementation of both TCP/IP and SNA is streamlined for efficiency and designed to support thousands of users. Unlike implementations based on general-purpose operating systems, whether host- or PC server-based, the Cisco approach offers a streamlined and super-efficient path to the mainframe. This allows a single CMCC card to cost-effectively support thousands of users.

But many organizations are planning to support tens of thousands of TN3270 sessions, and they want to bring load balancing and redundancy to their individual TN3270 servers. This allows all TN3270 servers to act as a pool of resources to end users, load-balancing sessions evenly across multiple servers. In addition, if one of the servers should fail, new session requests are directed to the remaining active servers, providing redundancy between servers.

End-to-end visibility at a session level is also critical in large environments. The Cisco TN3270 Server provides a network management application that provides detailed session and event logging. In addition, powerful searching, sorting, and filtering tools provide extremely flexible views into the status of the network and individual sessions. Couple these features with response time to the client, and the obvious end-to-end visibility advantages of the Cisco solution are clear.

Multiple Mainframe Support

Each CMCC card can support up to two mainframe channel connections, either bus-and-tag or ESCON. In the case of bus-and-tag, each connection can be attached to a different mainframe, providing access to two mainframes from a single CMCC card simultaneously. Each ESCON channel, however, can be connected to an ESCON director, allowing a dual-ESCON CMCC card to connect to up to 128 ESCON director-attached mainframes.

And with support of the new SNA application switching feature for TN3270 sessions, the CMCC card can provide session routing between multiple local or remote-attached mainframes. This capability avoids added CPU cycles for session routing from the mainframe.

Ease of Definition

By utilizing the VTAM DDDLU feature, individual LUs and LU pools are created dynamically rather than predefined. The configuration on both the router and the mainframe is decreased significantly. And, because different LU pools do not need to be preallocated and predefined, the TN3270 Server makes the most efficient use of session resources and CMCC memory.

Support for Standards

To support LAN-attached printers, LAN-attached PCs, and dedicated LUs, Cisco supports the TN3270E (RFC 1647) standard. Cisco will add future extensions to support the installed base of pre-RFC 1647 clients.

Applications

Mainframe Offload

Customers are increasingly installing TCP/IP stacks and applications on their mainframes. In fact, in the year 2000, more than 80 percent of mainframes were running TCP/IP. The key factor driving this trend is interoperability between network users and servers and the mainframe. Since TCP/IP is so prevalent on network-based end systems, and with TCP/IP increasingly becoming the network backbone of choice, installing TCP/IP on the mainframe is a natural evolutionary move. The most common TCP/IP applications used on the mainframe are File Transfer Protocol (FTP) and Telnet 3270 (TN3270). FTP provides for the efficient transfer of files of information between the mainframe and network-attached end stations. TN3270 allows users running emulators to maintain 3270 sessions with the mainframe over a TCP/IP backbone.

The problem with running TN3270 on the mainframe is one of efficiency. A 3270 session is typified by small packets carrying less than one screen of characters, followed by small responses. Each one of these TN3270 packets must be processed twice by the mainframe. An inbound packet is processed by the mainframe TCP/IP stack, then the TN3270 application. The TN3270 application converts the packet into an SNA frame and hands it to VTAM. After the frame makes it through VTAM, it is finally processed by the destination application, such as the Customer Information Control System (CICS). The response follows the same path in reverse. With hundreds or thousands of TN3270 sessions, the number of mainframe interrupts and the amount of processing overhead skyrockets.

Mainframe cycles are valuable, and they should be spent doing what the mainframe does best—processing mission-critical enterprise applications. The Cisco TN3270 Server offloads the mainframe by implementing the TCP/IP stack and the TN3270 server application on the CMCC card. TN3270 packets are converted into SNA frames on the CMCC card and then presented directly to VTAM over the channel interface. Valuable mainframe cycles are freed up to process applications.

Simplified Network Backbone

Many organizations are trying to reduce network costs and complexity by moving to a single-protocol backbone, and TCP/IP is the choice for many. At the same time, network users still require access to existing, legacy applications on the mainframe. The 3270 datastream is the primary datastream that these applications understand, so the 3270 datastream must be preserved. This does not mean that SNA needs to be supported on the network backbone.

TN3270 is an accepted standard that defines the transport of 3270 datastreams across a TCP/IP backbone. The client, typically emulator software, packages the 3270 datastream into a TCP/IP packet for transmission across the network. To nodes in the network, the packet appears as normal TCP/IP traffic. The TN3270 server strips the TCP/IP information and converts the packet into an SNA frame for transmission to VTAM. Since the Cisco TN3270 Server is directly attached to the mainframe channel, the only SNA involved is between the CMCC card and the mainframe. The rest of the network is pure TCP/IP. And, more importantly, the users still have access to the mission-critical legacy applications that they require.

Availability and Orderability

The TN3270 Server software, FR-CIP-TN3270 and FR-CPA-TN3270, and the optional SNA Session Switch, FR-CIP-SNASWITCH and FR-CPA-SNASWITCH, are separately licensed features of the CMCC cards. The TN3270 Server is available on Cisco IOS® Release 11.2 and later releases.

TN3270 Server Features and Benefits Summary

Feature	Comment/Description	Benefits
SSL Encryption	<ul style="list-style-type: none"> Encrypts TN3270 sessions 	<ul style="list-style-type: none"> Protects confidentiality and integrity of data
Server Defined DDDLU	<ul style="list-style-type: none"> TN3270 Server dynamically provides LU name and session parameters to VTAM 	<ul style="list-style-type: none"> Allows named LUs to be created by multiple TN3270 Servers in a redundant or load-balanced environment
LU Naming in a Dynamic IP Environment	<ul style="list-style-type: none"> Assign LU names by DNS host name, instead of by IP address 	<ul style="list-style-type: none"> Allows users to get a specific LU name in a DHCP environment where the user's IP address changes frequently
High Session Density	<ul style="list-style-type: none"> 30,000 sessions per CMCC card support 	<ul style="list-style-type: none"> Minimizes expenditure for external boxes and gateway software Simplified network definition and management
Load Balancing and Redundancy	<ul style="list-style-type: none"> Load balances sessions across multiple CMCC cards Provides redundancy in the event of failure of one of the CMCC cards, routers, or unique paths 	<ul style="list-style-type: none"> Effective utilization of CMCC resources and more consistent response times Enhances network availability and avoids single point of failure
End-to-End Session Visibility	<ul style="list-style-type: none"> Logs MIB information about each session Provides mapping between LU name and IP address Provides flexible searching, sorting, and filtering based on session identifiers or event types Provides end-user response time 	<ul style="list-style-type: none"> Enhanced network management
SNA Session Switching	<ul style="list-style-type: none"> Switches sessions between multiple mainframes without intervention from VTAM 	<ul style="list-style-type: none"> Offloads switching decisions from VTAM
Support for TN3270E Standard (RFC 1647)	<ul style="list-style-type: none"> Standard printer support Specific device negotiation support Advanced SNA functions and responses 	<ul style="list-style-type: none"> Standard Telnet support for both terminals and printers Devices can be identified by a predetermined name rather than a dynamically assigned name Enhanced SNA management and SNA functionality
Dynamic Definition of Dependent LUS	<ul style="list-style-type: none"> Router configuration is required only of PUs, not each LU 	<ul style="list-style-type: none"> Simplified configuration, network definition, and management
Dynamic Allocation of LUS	<ul style="list-style-type: none"> LU allocation is done at session setup time based on model type and number requested 	<ul style="list-style-type: none"> Multiple model types supported Efficient use of LU pool resources



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