

1 *Abstract* *XE "Abstract" §*

NetWare® Telephony Services integrates *XE "Integration" §* server-based telephony control with desktop (client) or server applications on enterprise-wide networks. More specifically, Telephony Services logically integrates the existing telephones currently on the user's desktop (analog, ISDN, or those specific to a switch) with telephony-enabled applications running in a client or server. Server and client software create and maintain this logical association *XE "Logical:Association" §*; no special telephones, special telephone connectors, PC boards, or other hardware is necessary at a client's desktop. Server hardware terminates the physical control link between the server and the switch (typically a Private Branch Exchange, or PBX) that provides telephony services to the user. The link between Telephony Services and the switch is a *Computer Telephony Integration (CTI) link* *XE "Computer Telephony Integration:See CTI" §*.

Software integration gives customers flexibility in deploying CTI applications *XE "Applications" §* in environments as varied as the multimedia desktop and call centers. The Telephony Services Application Programming Interface (**TSAPI**) supports telephony applications for many different environments.

Telephony Services and TSAPI support telephony control capabilities in a generic, switch independent *XE "Switch:Independent" §* way (e.g., support PBXs from various vendors). The architecture *XE "Architecture" §* allows the incorporation of vendor-specific switch drivers *XE "Switch:Specific" §* to deliver Telephony Services across various switch environments.

The Telephony Services API is based on international standards for CTI telephony services. Specifically, the European

Computer Manufacturers Association XE "European Computer Manufacturers Association: See ECMA" \t " § XE "ECMA" § (ECMA) CTI standard definition of *Computer-Supported Telecommunications Applications* XE "Computer-Supported Telecommunications Applications: See CSTA" \t " § XE "CSTA" § (CSTA) is the foundation for TSAPI. The CSTA standard is a technical agreement reached by an open, multi-vendor consortium of major switch and computer vendors. Since CSTA Services and Protocol definitions are the basis for TSAPI, TSAPI provides a generic, switch-independent XE "Switch:Independent" § API.

Various vendors XE "Switch:Specific" § may support a subset of the TSAPI programming interface on their CTI links. Programmers should consult corresponding vendor documentation for application development.

The TSAPI programming interface definition incorporates ECMA CSTA telephony call control services XE "Call control service" §, call/device monitoring services XE "Call monitoring service" § XE "Device:Monitoring service" §, query services XE "Query service" §, and application call routing services XE "Call routing service: See Routing" \t " § XE "Routing service" §. CSTA services logically integrate XE "Integration" § the two most common pieces of equipment on users' desktops, the telephone and personal computer.

Security administration XE "Security: See Administration" \t " § XE "Administration" § for Telephony Services allows administrators to restrict user access to TSAPI features in various ways. For example, an administrator may restrict a user to control and monitoring of the telephone at their desktop. Similarly, an administrator can restrict a user to call control and monitoring of the telephone at any desktop where they log in. Expanded security permissions XE "Permissions: See Administration" \t " § can increase a user's control in support of

work group or departmental telephony applications^{XE} "Applications"§. Administrators can expand user permissions even further to include any telephone or device that it is possible to control on a CTI link. An administrator might assign an unrestricted security permission level to a server application that processes calls before call delivery to user desktops in a call center environment. Of course, an administrator can assign different users different permissions.

The Telephony Services API presently supports Microsoft® Windows™ client^{XE} "Client:Supported"§, Novell® NetWare® client, and Novell® NetWare® server environments^{XE} "Server:Supported"§. The Telephony architecture^{XE} "Architecture"§ permits future growth into other client and server environments while preserving the TSAPI programming interface.

Future releases might extend Telephony Services to include desktop communication services available from non-switch servers. Possible enhancements are providing desktop voice messaging capabilities from a voice messaging server, facsimile capabilities from a fax server, voice response capabilities from a voice response server, etc.