

Lucent Technologies
Bell Labs Innovations



DEFINITY[®]
Enterprise Communications Server
CallVisor[®] ASAI Overview

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About This Document

This document is an overview of the CallVisor[®] ASAI interface and applications. Its purpose is to give the reader an understanding of ASAI, its functions, and the services that can be provided using this interface. The related documents listed on the next page provide the details for using ASAI with business applications. These documents also describe the DEFINITY Enterprise Communications Server (ECS) features used by ASAI.

Reason for Reissue

This document covers all the new features up to Release 6.3.

Topics Discussed in this Overview

This document discusses the following topics:

- Typical business applications that use CallVisor ASAI
- Link configurations
- Features and messages provided by CallVisor ASAI
- CallVisor ASAI Links
- Planning considerations for CallVisor ASAI
- Services offered by Lucent Technologies
- Business Partners of Lucent Technologies
- The Application Programming Interface available on the CallVisor PC
- CV/LAN — the software that enables CallVisor PC to work in a client-server (ECS) environment

- CentreVu® Computer-Telephony Server — Lucent Technologies Telephony Services API (TSAPI)

Intended Audiences

This document is an introduction to CallVisor's ASAI features. It is intended for general information. It is the first document one should read before planning or writing an ASAI application. This is the only document intended for translation into other languages. Other documents, written only in English, are available with more complete and detailed information. If you are a non-English-speaking customer interested in writing an application, please obtain skilled computer science staff with a good understanding of the English language to consult the additional ASAI documentation.

Related Documents

NOTE:

The following documents are only available in English.

DEFINITY Enterprise Communications Server CallVisor ASAI Technical Reference, 555-230-220

This document provides detailed information on all ASAI features. It contains examples of applications and also describes how applications can control the ECS.

DEFINITY Enterprise Communications Server CallVisor ASAI Protocol Reference, 555-230-221

This document provides detailed protocol information. It contains bit-level message formats that are passed across the ASAI link. This document is used with document 555-230-220.

DEFINITY ECS CallVisor ASAI DEFINITY LAN Gateway over MAPD Installation, Administration, and Maintenance, 555-230-114

This document covers the CallVisor ASAI DEFINITY LAN Gateway over Multi-Application Platform (MAPD) on the DEFINITY ECS which provides Adjunct Switch Application Interface (ASAI) functionality using an Ethernet transport.

DEFINITY ECS CallVisor ASAI PC LAN over MAPD Installation, Administration, and Maintenance, 555-230-113

This document covers the CallVisor ASAI PC LAN (CV/LAN) application over Multi-Application Platform for the DEFINITY ECS. The MAPD allows CV/LAN to offer ASAI functionality over an Ethernet transport.

DEFINITY Enterprise Communications Server Release 6 Administration and Feature Description, 555-230-522

This Administration and Feature Description document provides a detailed description of the DEFINITY ECS features. It is also a planning, operation, and administration guide for the DEFINITY ECS.

DEFINITY Enterprise Communications Server Installation and Test for Single-Carrier Cabinets, 555-230-894 and DEFINITY Enterprise Communications Server Installation and Test for Multi-Carrier Cabinets, 555-230-112

These documents describe the installation and testing of the *DEFINITY* ECS.

DEFINITY Enterprise Communications Server CallVisor PC ASAI Installation and Reference, 555-230-227

This document provides details on the installation, administration, programming, testing, and troubleshooting of the CallVisor PC.

CallVisor ASAI CD Document Set, 585-246-801

This CD ROM contains four CallVisor ASAI release 6 documents. These are CallVisor ASAI Technical reference, CallVisor ASAI Protocol Reference, CallVisor ASAI Overview, and CallVisor ASAI PC. This CD also contains two Release 5 documents, CallVisor ASAI DEFINITY LAN Gateway (DLG) over MAPD and CallVisor ASAI PC LAN (CV/LAN) over MAPD.

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Overview of CallVisor ASAI

Introduction

CallVisor[®] ASAI is a communication interface. *ASAI* means *Adjunct-Switch Applications Interface*. Application software running on adjuncts can control calls through the ASAI interface. In this document, *adjunct* means a large computer system, a personal computer, or any other intelligent device that can communicate over such an interface.

⇒ NOTE:

The term *server* refers to the DEFINITY Enterprise Communications Server or DEFINITY ECS in this document. Some feature names may contain the term *switch*. Please note that *ECS* has the same meaning as the *switch* or *server*.

To connect to the DEFINITY ECS, CallVisor ASAI uses either an Integrated Services Digital Network (ISDN)-Basic Rate Interface (BRI) link, or an Ethernet Transmission Control Protocol/Internet Protocol (TCP/IP) link.

The following figure illustrates a simple configuration, an adjunct connected to a DEFINITY ECS via a single ASAI-BRI (or ASAI-Ethernet) link.

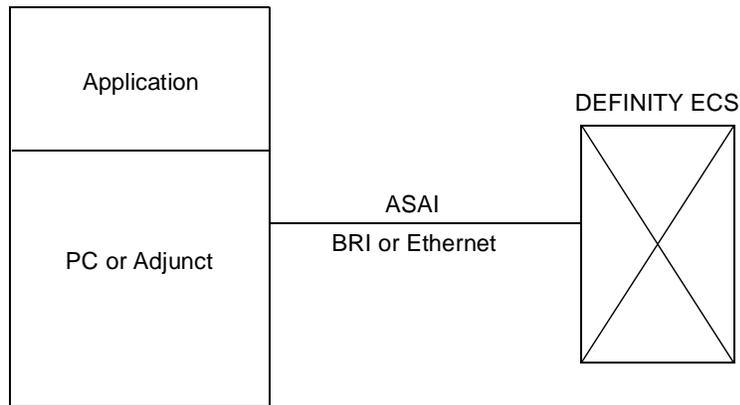


Figure 1. Basic Connection for CallVisor ASAI

Multiple CallVisor ASAI links can be configured on the DEFINITY ECS. This means that more than one application can exist on adjuncts connected to the DEFINITY ECS.

Terms used in this Document

ACD

See Automatic Call Distributor (ACD).

ACD Hunt Group

A group of telephone extensions staffed by agents who are trained to handle a certain type of incoming call.

acknowledgement

A response to an ASAI request.

adjunct

A computer that communicates with the DEFINITY ECS through an ASAI interface.

Adjunct-Switch Application Interface (ASAI)

The protocol supported by the DEFINITY ECS that extends telephony features to adjuncts (computers).

agent

A person who answers customer's calls. Agents usually work in groups, and it is the DEFINITY ECS that selects the next available agent for an incoming call.

alerting

An event to signal the arrival of a call at a telephone. The arrival of the call can be an audible (ringing) or visible (the message lamp is lit) signal.

algorithm

A computer program.

annotate

To make notes or comments.

announcements

Recorded messages that are provided on telephone extensions.

application

A program running on an adjunct (computer). Also a specific way of handling certain tasks.

ASAI

See Adjunct-Switch Application Interface (ASAI).

association

A logical communication channel between an adjunct and the DEFINITY ECS used for the exchange of messages. An active association refers to an existing call on the DEFINITY ECS or to a telephone extension on the call.

attendant

A person who handles incoming calls at the customer's site.

Automatic Call Distributor (ACD)

A DEFINITY ECS feature that routes incoming calls to available agents.

AWOH

Administration without hardware.

Basic Rate Interface (BRI)

The Integrated Services Digital Network (ISDN) standard interface that connects a telephone to the DEFINITY ECS. See Integrated Services Digital Network (ISDN).

Billing Number (BN)

This is the number that is billed when a caller makes a toll call. In North America, this number is composed of ten digits; the number of digits may vary in other areas of the world. Billing Number is usually paired with Calling Party Number to completely identify the caller. See calling party number (CPN).

BN

See Billing Number (BN).

BRI

See Basic Rate Interface (BRI).

business partner

A company who partners with Lucent Technologies and provides an ASAI library which runs on a specific adjunct that interfaces with the DEFINITY ECS.

call center

A central location where a group of agents (who represent a company) communicate with customers through incoming and outgoing calls.

call classifier

Special hardware that can detect the human voice, tones or an answering machine on an answered call.

call control

The ability to place calls, monitor the status of calls, put calls on hold, and disconnect from an adjunct.

call prompting

A call vectoring feature through which the ECS requests the caller to provide information (such as a credit card number) by using the touchtone keypad on the telephone. The call vectoring feature can then route incoming calls based on information entered by the caller.

call vectoring

A DEFINITY ECS feature that allows customers to program the route of a call.

called party number

The telephone number that the caller used to place the call. In North America, this number is composed of ten digits; the number of digits may vary in other areas of the world.

calling party number (CPN)

The telephone number that identifies the caller. In North America, this number is composed of ten digits; the number of digits may vary in other areas of the world. This number is usually paired with the Billing Number to completely identify the caller.

CallVisor ASAI

Lucent Technologies official product name that is used in conjunction with the DEFINITY ECS. CallVisor ASAI provides interactive communication between the DEFINITY ECS and the application software for the adjunct.

CallVisor PC

CallVisor Personal Computer (PC) software translates ASAI messages to an application programming interface (API) for application software.

cause value

A cause value shows the reason why a message (request) was denied or the reason for an event.

Computer Telephony Integration (CTI)

A technology that acts as an electronic bridge connecting telephones with personal computers.

configuration

The combination of hardware and software that defines a computer or telecommunications system.

contiguous

Connected in an unbroken sequence.

control

To request call features for a telephone or trunk. Some control features are **hold** and **drop**.

coverage

A DEFINITY ECS feature that allows incoming calls for a specific telephone to be sent to another telephone so that the calls can be answered.

CPN

See calling party number (CPN).

CTI

See Computer Telephony Integration (CTI).

data

A representation of facts, concepts or instructions that can be communicated, processed, or interpreted. Data can be read on a screen, or from a document or memo. Information transmitted by voice is not considered data.

data terminal

A device that has a keyboard and a screen. A data terminal can be a personal computer (PC).

database

A structured set of files.

denying a request (message)

Denying a request is the same as a negative acknowledgement. The denial is sent within a Facility Information Element that contains the error condition. A cause value is included to specify the error condition. *See* cause value.

Desk-Top Application

A program that runs on a personal computer (PC) which is typically used by a worker in an office. This program can also be called a Computer Telephony Integration (CTI) application. *See* Computer Telephony Integration (CTI).

Dialed Number Identification Service (DNIS)

A number dialed by the caller that can be used to identify why the caller is calling.

digit string

A sequence of digits.

disable

To remove an option on a form.

domain

An entity that can be controlled or monitored — such as a telephone or a Vector Directory Number (VDN).

DNIS

See Dialed Number Identification Service (DNIS).

drop

To end a call or disconnect a party from a call.

DTMF

See Dual Tone Multi Frequency (DTMF).

Dual Tone Multi Frequency (DTMF)

This term describes touch-tone dialing. A combination of two tones can be heard when a button is pressed on the dial pad — one tone is high frequency and the

other tone is low frequency. The Send DTMF Signals feature allows the DEFINITY ECS to generate the DTMF tones at the adjunct's request.

ECMA

European Computer Manufacturers Association.

enable

To administer an option on a form.

encode

To convert data into code.

Ethernet

A local area network that connects computers, printers and personal computers within the same building.

event

In ASAI, a message that reports on the progress or changing state of a call.

event reports

The ASAI feature that allows the DEFINITY ECS to report call-related information to the adjunct. Events can be specifically defined to collect statistics on calls.

extension number

A 1-to-5 digit number assigned to a device such as a telephone, Vector Directory Number (VDN), Automatic Call Distributor (ACD), etc. Calls are routed through a communications system with extension numbers.

feature access code

A number used to activate a DEFINITY ECS feature.

Flexible Billing

A feature that allows the adjunct to change the billing rate for incoming 900 calls.

handshake

A series of signals between the DEFINITY ECS and the adjunct that sets the parameters for passing data.

heartbeat

An ASAI maintenance feature that checks that the ASAI link is working.

ICM

See Incoming Call Management (ICM).

IE

See Information Element (IE).

II-Digits

See Information Identifier Digits (II-Digits).

in-band

Signals of tones that pass within the voice frequency band.

incoming call

A call that arrives at the DEFINITY ECS from other private telecommunications systems or from the public network.

Incoming Call Management (ICM)

Describes applications that receive incoming calls from callers and assigns these calls to agents according to a set of rules.

Information Element (IE)

A defined structure within an Integrated Services Digital Network (ISDN) message that contains specific information that is related to the call and that message.

Information Identifier Digits (II-Digits)

These are digits that provide information about the origin of the call (for example, the call may originate from a prison or a cellular telephone, etc.).

intraflow

The rerouting of calls from one Automatic Call Distributor (ACD) to a second ACD on the *same ECS* when there is an overload of incoming calls.

Integrated Services Digital Network (ISDN)

A public or private network that provides end-to-end digital communications to support a wide range of voice and data features.

See also Basic Rate Interface (BRI) and Primary Rate Interface (PRI).

interflow

The rerouting of calls from one Automatic Call Distributor (ACD) to a second ACD on *another ECS* when there is an overload of incoming calls.

Internet Protocol (IP)

Software that tracks the Internet addresses of nodes. It also routes outgoing messages and acknowledges incoming messages. *See* Transfer Control Protocol/Internet Protocol (TCP/IP).

IP

See Internet Protocol (IP).

ISDN

See Integrated Services Digital Network (ISDN).

LAN

See Local Area Network (LAN).

library

A set of programs that runs on an adjunct computer to provide the ASAI interface between the DEFINITY ECS and an application program.

link

A channel or system that connects two devices.

load balancing

In ASAI, the even distribution of messages or calls.

Local Area Network (LAN)

Two or more computers that are connected together by cable to exchange and share information and other resources (for example, printers and disk drives). LANs are limited to a locally-defined geographic area.

log in

Describes an agent signing into an Automatic Call Distributor (ACD) when calls are ready to be received.

log out

Describes an agent signing out of an Automatic Call Distributor (ACD) when calls are no longer being taken.

MAPD

See Multi-Application Platform for the DEFINITY ECS.

Multi-Application Platform for DEFINITY

The DEFINITY ECS product name for ASAI-Ethernet.

monitor

To receive event reports for call events that occur on the ECS.

node

A link or port on an ASAI connection.

notification

A feature that allows the adjunct to request and cancel event reports for calls.

OCM

See Outgoing Call Management (OCM).

off-hook

Describes the state of the telephone when the handset is lifted from the cradle. In this state, dial tone can be heard signaling that the telephone has connected to the central office and is ready for a call to be placed.

on-hook

Describes the state of the telephone when the handset is resting in the cradle. In this state, the telephone is not active but is ready to receive incoming calls. Users are alerted to an incoming call by the ringing of the bell in the telephone.

outcome

A result or end state.

outgoing call

A call placed from the DEFINITY ECS to a destination residing on the public network or in another ECS.

Outgoing Call Management (OCM)

Describes an application that places outgoing calls to customers (from agents). Agents can review product or customer information while the call is being placed.

party

A participant on a call.

PC

See personal computer (PC).

personal computer (PC)

A device that has a keyboard and a screen which is used to enter and receive information.

See also data terminal.

Phantom Calls

A call from a station administered without hardware. Phantom Calls are placed at the request of an adjunct (computer). They are used for conference or transfer of trunk to trunk connections.

port

An entrance into an interface board that allows devices to be connected to a system.

predictive call

An outgoing call placed from within the ECS to a destination; the ECS detects the call status (ring, no answer, answer, busy, etc.) and decides what to do with that call. Typically, an answered call is directed to an agent, and a busy call or a call that is not answered, is disconnected.

predictive dialing

This is an Outgoing Call Management (OCM) feature that allows the adjunct to place calls for an agent. Answered calls are sent to an agent and non-answered calls are disconnected.

preview dialing

This is an Outgoing Call Management (OCM) feature that allows the adjunct to display customer information about the call before the call is placed by the agent.

PRI

See Primary Rate Interface (PRI).

Primary Rate Interface (PRI)

The frame format standard of Integrated Services Digital Network (ISDN) that specifies the protocol that is used between two communications systems.

See *also* Integrated Services Digital Network (ISDN) and Basic Rate Interface (BRI).

protocol

A set of rules or standards that describes how information is organized and how this information is transmitted and received.

queue

An ordered sequence of calls.

relinquish

A term that means to surrender or give up. For example, to relinquish control of a call.

resume

A term that means to start again or to restore. For example, to resume alarms.

routing

Directing a call to a specific destination.

screen pop

A screen that is displayed temporarily to request or display information.

selective

A term that refers to a specific choice or action. For example, the Selective Listening feature in ASAI indicates that a specific party can be disconnected from listening to a second party, and still be connected to listen to other parties on the call.

server

The equipment used to connect calls; in this document *server* refers to the DEFINITY Enterprise Communications Server (ECS).

set value

This is an ASAI feature that allows the adjunct to define values for certain items such as a billing rate or for the message waiting lamp on the telephone.

skill

In a call center, a skill is a specific business requirement. Agents in Automatic Call Distributor (ACD) hunt groups are assigned to specific skills. For example, an agent may be assigned to a skill that provides customer service for a specific product.

split

This is an ACD hunt group. See “ACD Hunt Group.”

suspend

This is a term that means to stop (for example, to suspend alarms or to suspend a process).

Telephony Server Applications Program Interface (TSAPI)

This is a programming interface that is used for call control, call monitoring, and call routing.

threshold

A numeric value that sets upper limits for performance.

touch-tone detector

A hardware component that collects the Dual Tone Multi Frequency (DTMF) digits entered by the caller.

Transfer Control Protocol/Internet Protocol (TCP/IP)

A set of protocols that can link together different types of computers across many types of networks.

See also Internet Protocol (IP).

trunk

A communication line between the telephone network and the DEFINITY ECS.

TSAPI

See Telephony Server Applications Program Interface (TSAPI).

UCID

See Universal Call Identifier.

Universal Call Identifier

A unique ID created for every call by the DEFINITY ECS. It is used by an application to track a call for its life, from origination to disconnect.

User-to-User Information (UUI)

The Integrated Services Digital Network (ISDN) information element that is used to carry customer-specific data between the devices or applications.

UUI

See User-to-User Information (UUI).

VDN

See Vector Directory Number.

vector

A DEFINITY ECS program that describes how a call should be handled. A vector has one or more vector steps (vector commands).

vector command

A single vector step for an incoming call.

Vector Directory Number (VDN)

Vector Directory Number is a special extension number that provides access to a vector.

version

This refers to an ASAI link. Newer link versions support more features. A specific link version includes all the features that were included in all the previous link versions. A link version used for a particular trunk is negotiated by the ECS and the adjunct when the link is re-started.

Voice Response Unit (VRU)

A communications device that works in conjunction with the DEFINITY ECS. This device can speak instructions. In some cases the VRU can replace humans to collect information from callers.

VRU

See Voice Response Unit.

work modes

These are the various states that an agent in an Automatic Call Distributor (ACD) can enter after logging into an ACD hunt group. The following are work modes: when agents are ready to take ACD calls, when agents are not taking ACD calls but are working on ACD-related tasks, and when agents are not taking ACD calls because they are at lunch or on a coffee break.

CallVisor ASAI Applications

The following are examples of the types of applications that are possible using CallVisor ASAI. This is not a complete list, but only examples of possibilities. Two types of applications are described:

- **Desk-top applications** — These are used by individuals in an office. Typically, desk-top applications integrate the personal computer (PC) with the telephone and allow a worker to control the telephone from the PC. Although a PC is not required (a simple data terminal is sufficient), a PC is often used for this type of application.
- **Applications for Call Centers** — These are used by agents talking to customers. Call Center applications handle either incoming or outgoing calls, or both. For example, they route incoming calls to a group of agents, place outgoing calls, or enhance the agent's productivity by delivering a screen pop together with the voice call. This type of application does not require a personal computer (PC) for each agent (a simple data terminal is sufficient).

Screen Pop and Voice/Data Transfer

A Screen Pop and Voice/Data Transfer application can use the calling party number or the called party number (or any other information received with the call) to obtain data needed for display on the agent's data terminal. When an agent conferences or transfers a call to another agent, the application can use the information received to automatically transfer the screen to the receiving agent.

An example of a Screen Pop and Voice/Data Transfer application follows:

1. The application monitors calls arriving at the target Vector Directory Number (VDN) or Automatic Call Distributor (ACD).
2. When a call reaches the monitored ACD hunt group or VDN, the ECS informs the adjunct with an event report. Information received from the network with the call (such as Calling Party Number, Dialed Number, User-to-User Information, collected digits, etc.) is also passed to the application in the event report.
3. The application does a database search using this information and collects the data which is displayed to the agent at a later time.
4. When the call is alerting an available agent, the ECS sends an event report containing the agent's extension. The application then delivers the assembled data screen to the agent's data terminal.
5. If the agent conferences or transfers the call to another agent, the ECS sends an event report indicating the new destination. The application can duplicate or re-create the information and display it at the new destination.
6. When someone disconnects from the call, an event report is sent so that the application can clear its records.

Screen Pop with Call Prompting

The application can use the Call Prompting feature to obtain additional information (for example, account number) from the caller. This information can be used to display the correct screen pop.

An example of a Screen Pop with Call Prompting application follows:

1. The customer administers a vector with a “collect digits” command as part of the Call Prompting feature.
2. The application monitors the Vector Directory Number (VDN).
3. When a call arrives at the monitored VDN, the ECS sends an event report containing the digits that have been collected in the “Collect digits” vector command.
4. The application does a database search, based on the digits that were collected and obtains the data to display on the screen.
5. When the call is delivered to an available agent, the ECS sends an event report containing the agent’s extension. The application then delivers the assembled data to the screen associated with the agent.

Speech Processing Integration

Speech Processing Integration is possible when a Voice Response Unit (VRU) is used to communicate with the caller. Calls are routed to VRU ports for announcements and the collection of information from the caller. The VRU sends this information to the ASAI application. The ASAI application can use this information to prepare the data screen or to route the call to the appropriate destination.

An example of a Speech Processing Integration application follows:

1. The customer administers the VRU ports as agents [members of an Automatic Call Distributor (ACD) hunt group].
2. The application monitors all incoming calls to the ACD hunt group associated with the VRU ports.
3. The VRU login, logout and change of work modes are done by the ASAI application.
4. When a call arrives at the monitored ACD hunt group, the ECS sends event reports to the adjunct. These event reports contain information about the calling number, called number, or other information related to the call.
5. When a call is answered by the VRU, the application uses the VRU’s voice processing to communicate with the caller. After listening and responding to the VRU, the caller can choose to talk to an agent (for example, after listening to account balances, the caller could transfer funds).
6. The application transfers the call to the agent or ACD hunt group appropriate for this type of caller.

7. When an available agent is selected, the ECS sends an event report containing the agent's extension to the application. The application then delivers the assembled data to the screen associated with the agent. Typically, the VRU sends the information to the adjunct through the ECS or by using the local area network (LAN).

Incoming Call Management

Monitoring of Automatic Call Distributor (ACD) Call Activity

The Monitoring of ACD Call Activity is an application that uses event reports to follow the calls arriving at Vector Directory Numbers (VDNs), ACD hunt groups, or individual agents. The application may use these event reports to generate ACD reports containing information such as:

- The call distribution by Calling Party and Billing Number for each Dialed Number
- The total number of calls that were handled by each VDN, ACD hunt group, and/or agent
- The total number of calls that were dropped by the caller while in queue (in other words, a record is kept of the Calling Number that disconnected from the queue)
- Total number of ACD, agent-to-agent, agent-to-supervisor, and personal calls that were placed and received by each agent
- The average and maximum time the call stayed in queue
- The average and maximum length of the queue
- The average and maximum time a call was on hold
- The average time that each agent spent on a call
- The total number of calls that interflowed or intraflowed

In addition, reports about each agent's login and logout activity could be generated.

An example of an ACD Call Activity Monitoring application follows:

1. The application monitors the calls arriving at certain ACDs and agents.
2. The ECS sends event reports (for example, Call Initiated, Call Alerting, Call Connected, Call Transferred, or Call Dropped) to the application for each call.
3. The event reports allow the application to generate the ACD Call Activity reports that were previously described.

Adjunct Routing

The Adjunct Routing application helps the DEFINITY ECS route calls to the proper destination. This is useful when the rules for routing the call change frequently (it is much easier to change the information on an adjunct than to change it on the DEFINITY ECS).

An example of an Adjunct Routing application follows:

1. The customer administers a vector with an “adjunct routing” command (part of the Call Vectoring feature).
2. When a call reaches an “adjunct routing” command, the DEFINITY ECS sends a message to the adjunct requesting a route for the call. This message includes the Calling Number, the Vector Directory Number (VDN) reached by this call, and any other information available for this call.
3. The application selects the destination (based on the call information that has been passed) and sends a message to the DEFINITY ECS with the selected destination. The DEFINITY ECS then routes the call as indicated by the application.
4. The DEFINITY ECS informs the application whether the call was successfully sent to the destination. If it was not successfully sent, the reason for the failure is provided.

The Call Prompting feature can also be used to collect additional information from the caller before the ECS requests a route from the application. The application can use the collected digits (for example, Sales, Parts, or Service department selection) to select the appropriate destination for the call.

When requesting a route from an application, the ECS may do the following:

- Pass User-to-User Information. This type of information is typically received from the network or stored in the call by an ASAI application.
- Inform the adjunct if Flexible Billing is available on an incoming call. This information could be used to route calls.
- Pass Caller Information that has been provided by the network (and collected through a “collect digit” command) to the application.
- Pass Information Identifier Digits (II-Digits) received from the network.

The server can request routing information from multiple applications at the same time. This is useful when two or more adjuncts are used for load balancing or as a backup when another adjunct is not working. The first adjunct to respond determines the route, the others are ignored. This feature is called Multiple Outstanding Route Requests.

When selecting a route, the application can:

- Request that Dual Tone Multi Frequency (DTMF) digits are collected from the caller. This feature is called “ASAI-Requested Digit Collection.” The digits collected in this manner are passed to the ASAI application within an event report. Vector Processing is not used in this case.

- Pass digits to the server. These digits can then be passed by the server to another application. This feature is called “ASAI-Provided Digits” and is useful when two or more applications need to share information about a call.

Digits collected through ASAI-Requested Digit Collection or passed directly by the application using the ASAI-Provided Digits feature can be used later by vector processing.

Logging for Call Back

The Logging for Call Back application uses the Calling Number and any digits collected using the Call Prompting Feature. This allows the recording of the telephone number for any caller who had disconnected after waiting in queue (before the call was answered by an agent). The application can then call back when there are agents available to speak with the customer.

An example of a logging for Call Back application follows:

1. The application monitors the target Vector Directory Number (VDN) or Automatic Call Distributor (ACD) hunt groups.
2. During periods of increased call activity with many queued calls, the caller receives an announcement with some options: to leave a phone number where the caller can be reached, to simply hang up (if the ECS already has the caller's number), or wait in queue.
3. After the caller enters the telephone number for call back, the ECS sends the information to the application and disconnects the call.
4. When agents are available, the adjunct can use either a Predictive or a Preview Dialing application to return calls to the disconnected callers.

Automatic Reconfiguring of Agents

The Automatic Reconfiguring of Agents application uses login and logout through the ASAI application. Based on the call activity levels (for example, queue length, time in queue), the application can increase the number of agents available in some Automatic Call Distributor (ACD) hunt groups. This is done by logging out agents from ACD hunt groups that have decreased activity levels and logging those agents into ACD hunt groups with increased activity levels.

An example of an automatic Reconfiguring of Agents follows:

1. The application monitors the target ACD hunt groups.
2. The application tracks the number of calls in queue and the number of available agents for each ACD hunt group.
3. Based on thresholds built into the application (for example, the number of calls in queue), the application logs agents in and out of ACD hunt groups.

Sequence Dialing using ASAI

Sequence dialing can be done by using the “ASAI-Requested Digit Collection” feature. [This is a combination of ASAI and Return Destination for Vector Directory Number (VDN).] In this application, the call is routed by ASAI adjunct routing. The application requests digit collection, and the ECS inserts a touch tone detector to collect digits. When the call is routed to a number that is busy (or does not answer), the caller can enter a digit (or digit string), which is passed to the application. The application can interpret this as a request to disconnect the busy party and allow the call to return to vector processing for repeat dialing.

Outgoing Call Management

Preview Dialing

1. The agent uses a data terminal to log into the adjunct that runs the outgoing call management application. The application monitors the activity at each agent’s telephone.
2. The agent enters information indicating readiness to preview the data (at the data terminal).
3. The adjunct application displays a screen of data to the agent.
4. When the agent enters information, the application uses ASAI to place an outgoing call from the agent’s telephone to the number shown on the data screen. There are two ASAI features that can be used here (see later sections on “Third Party Auto Dial” and “Third Party Make Call”).
5. The ECS sends the adjunct event reports about the call until the call disconnects.

Predictive Dialing

Predictive dialing uses special hardware, called a call classifier. The call classifier can detect ringing, voice energy, special tones, and answering machines on outgoing calls. Predictive dialing saves time for the agents because they do not have to listen to busy signals or ringing with no answer. Agents only receive calls that have been answered.

1. An agent uses a data terminal to log into the adjunct that is running the outgoing application.
2. The application (through ASAI) places a call to the destination number. Typically, these numbers come from a calling list maintained for the outgoing telemarketing application. The application usually has a pacing algorithm that dials calls ahead of available agents.

3. When the call classifier detects an answer or an answering machine, the ECS's Automatic Call Distributor (ACD) software distributes the call to an available agent or queues the call if no agent is available. The ECS software can be configured to disconnect calls if an answering machine is detected.
4. The ECS provides the application with event reports for calls that reach an ACD. The application also can display related information on the agent's display terminal when the call is given to that agent.

Office Automation (Computer Telephony Integration)

Office Automation applications benefit customers by combining the features of the desk-top personal computer (PC) with those of the telephone:

- The customer can view the status of the telephone or call on the PC screen.
- The customer can place calls through the PC, or can transfer or put calls on hold, etc., through the PC.
- The customers can enable the DEFINITY ECS features for their telephone (call forward, call coverage, etc.) through the PC.
- The customer is notified when a message is present (through the Message Waiting lamp on the telephone which can be controlled through the PC).

Incoming Call Identification

The Incoming Call Identification (ICI) application displays the calling party name and telephone number on the data terminal. Based on the displayed information, the customer can decide what to do with the call.

An example of an incoming Call Identification application follows:

1. The application monitors the customer's telephone.
2. When an incoming call arrives, the DEFINITY ECS sends an event report with the Calling Number.
3. The application searches the database (for example, a corporate directory or a customers' database) of names and telephone numbers, and displays the calling party name and number on the data terminal.
4. Based on the information displayed at the data terminal, the customer or the application can answer the call or request the "Send All Calls" feature from either the data terminal or the telephone. The application can request that the call be sent somewhere else.

Telephone Management and Directory Services

A Telephone Management and Directory Services application allows customers to do the following by using their data terminal [personal computer (PC)]:

- Dial, answer, and control calls at their telephone by using hold, transfer, reconnect, answer, conference, and drop
- Dial a call by using the called party name (instead of the number)
- Create a personal directory list (the customer can define any directory to be used by the application when searching for a telephone number)
- Send calls to the message desk, to coverage, or anywhere else they wish

An example of a Telephone Management and Directory Services application follows:

1. The application monitors the telephone.
2. A customer invokes the telephone management application on the screen and enters the name of the person he or she wants to call.
3. The application searches the customer's personal directory or corporate directory for the telephone number associated with the called name. As soon as a telephone number is found, the application dials the call for the customer.
4. The application receives event reports for the call indicating the status of the call. The application displays the status of the call at the customer's data terminal.
5. The customer can hold, transfer, conference, or drop the call by entering commands at the PC.
6. The customer can send incoming calls to the message desk, coverage, or anywhere else.

Message Desk

A Message Desk application provides customers with dialing and messaging services. These services allow customers to take messages from callers, search for numbers in a directory database, and use on-screen commands to dial, receive, and control calls (for example, hold, transfer). In addition, the Message Desk application can control the state of the message waiting lamp on the telephone to notify customers when there is a message (voice or text) waiting.

An example of a Message Desk application is as follows:

1. The application monitors the group of telephones defined as the message desk (for example: a secretary or another coverage point could be the message desk).
2. When a call is sent to the message desk (by using Send All Calls or call coverage), the application receives an event report containing the original dialed number, the calling party number, the alerting telephone number, and the reason the call was sent to the message desk.

3. The application uses these numbers (calling party, dialed, and alerting) to search and display (on the data terminal of the message desk) the messages left by the originally called party. The called party had used electronic mail to create and send these messages to the message desk application. These messages are delivered to callers by the message desk attendant. If no message was provided, a standard message is given to the caller.
4. Messages left by callers are entered as text by the message desk attendant. The application sends electronic mail to the called person. Each message contains the calling party number. The application then enables the message waiting lamp at the telephone.
5. After the customer has read the messages left at the message desk, the application disables the message waiting lamp at the telephone.
6. If the application provides voice mailboxes, the customer can listen to voice mail messages. This is possible when the application places a call between the customer's telephone and the customer's voice mailbox. The customer can listen, delete, forward, annotate, skip, or save the voice mail messages.
7. The customer can also request to dial a call back to the person that left the message. The application can place the call while the customer continues to read the messages.

Link Configurations

Depending on the size of the system, DEFINITY ECS supports up to sixteen ASAI links. Each link is allowed to connect to a different adjunct, or all the links can connect to the same adjunct (this depends on the customer's application). Up to 8 links can be ISDN-BRI and up to 16 can be Ethernet Local Area Network (using TCP/IP). If the link is ISDN-BRI, an ISDN-BRI interface is required at each end (one in the DEFINITY ECS, one in the adjunct). Ethernet requires a MAPD (Multi-application Platform for DEFINITY) board in the DEFINITY ECS and a standard LAN card in the adjunct. The following diagram shows how ASAI links can be connected.

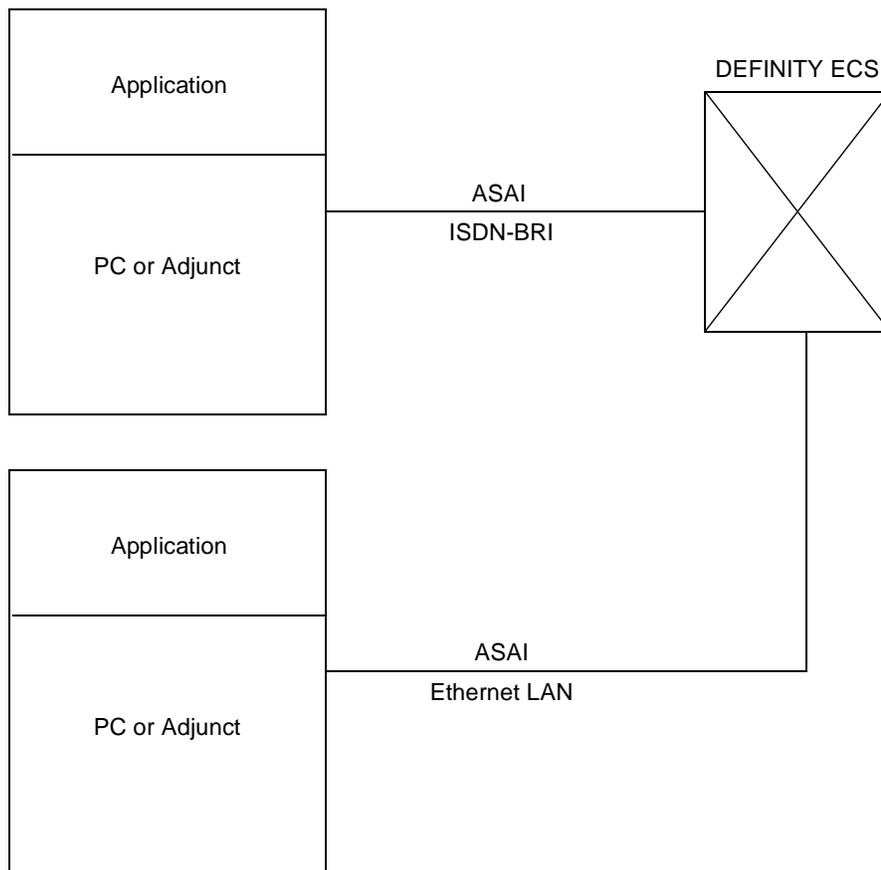


Figure 2. Example: Connectivity of ASAI Links

When using the Ethernet LAN, one MAPD board can support multiple ASAI links. For reliability, more than one MAPD board may be used.

ASAI Features and Event Reports

ASAI provides the following features to an adjunct:

- Call Control
- Domain Control
- Notification
- Adjunct Routing
- Request Feature
- Value Query
- Set Value
- Maintenance

Each feature is described in the next paragraphs.

Call Control Features

The Call Control features allow the adjunct to place a call, monitor a call, and control a call as it moves through the DEFINITY ECS. With call control, an adjunct can control any and all parties that are participating in that call. "Control" means that the adjunct can tell the DEFINITY ECS what to do with the call (for example, hold, transfer, drop). "Control" also implies the DEFINITY ECS sends call event reports to the adjunct. The following are features available with Call Control:

- Third Party Make Call
- Third Party Take Control
- Third Party Selective Hold
- Third Party Reconnect
- Redirect Call
- Third Party Merge
- Third Party Selective Drop
- Third Party Selective Listening
- Third Party Single-Step Conference
- Third Party Relinquish Control
- Third Party Clear Call
- Third Party Send DTMF Signals
- Third Party Call Ended

Third Party Make Call

There are five different ways of making a call using Third Party Make Call:

- **Switch-classified calls** — these are used for predictive dialing. With a switch-classified call, the destination is alerted first. When the destination party answers, the call is transferred to an agent. Calls that are not answered are disconnected. Usually these calls require that a call classifier port be inserted to determine the outcome of the call (answered, busy, no answer, etc.).

A new capability, Global Call Classification supports recognition and classification of progress tones, special information tones, answering machines, and modem tones in most countries. The accuracy of classification varies with the type of tone and method of tone generation.
- **user classified calls** — these are normal calls placed on behalf of a telephone. They are called “user classified” because the user (human being) determines the outcome of the call (by listening to the in-band call progress tones).
- **Phantom Calls** — these can be initiated through ASAI as user-classified calls. The user-classified Third Party Make Calls can only be originated from physical stations but Phantom Calls can be originated either from a station AWOH (Administered Without Hardware) or from a non-ACD Hunt Group made up of AWOH stations.
- **direct agent calls** — these are an Automatic Call Distributor (ACD) type of calls which are intended for a specific agent. These are used when an application selects a specific agent for a call.
- **supervisor assist calls** — these are ACD, priority calls that are placed by an agent to a supervisor to request assistance.

All of the above Third Party Make Call requests contain information about the calling party, called party, and various call options. In addition, the adjunct can include special information (User-to-User Information) that is delivered with the call when it arrives at the destination.

When an adjunct places a third party make call, the events that flow as a result of that call are provided to the adjunct. In addition, that adjunct can control the call and each party in the call.

Third Party Take Control

This is a feature that allows an adjunct to control a call (or all parties in a call) even though it did not place the call through a third party make call. The adjunct must have known about the call through some other event report. Only one adjunct (through one link) can control a call at any given time.

Third Party Selective Hold

This feature allows an adjunct to put a party on the call on hold (just as if the HOLD button was used at the telephone). This feature is also used when holding a call that is to be conferenced or transferred.

Third Party Reconnect

This feature allows an adjunct to restore the connection for a held party and allow the party to be reconnected to others on the call.

Redirect Call

This feature allows an adjunct to take a call that is alerting at a telephone and redirect it to another destination. The alternate destination can be locally or remotely connected to the DEFINITY ECS. Redirecting is useful when the adjunct needs to keep track of un-answered calls so that it knows where to send these calls.

Third Party Merge

This feature is used to combine two calls that exist at a telephone in order to create a conference or accomplish a transfer. One of the calls must be in the held state, while the other is in the active state at the controlling party's telephone. With the "conference" option, this feature combines two calls and places all the parties in the conferenced call. With the "transfer" option, this feature combines the two calls, but disconnects the controlling party from the call.

Third Party Selective Drop

This feature allows an adjunct to drop (or disconnect) a selected party from a call. This can be a telephone or a trunk connected in a call.

Third Party Selective Listening

This feature allows the adjunct to temporarily disconnect a specific party from listening to other parties on the call. Using this feature, it is also possible to reconnect a specific party back to the original state, so that this party can listen to other parties in the call.

Third Party Single-Step Conference

This feature allows applications to add a telephone (or a similar device) into an existing call. This can be a recording device, or an announcement. It can also be a telephone administered with or without hardware. This is done with a single ASAI request, without the need for placing a call on hold or initiating a new call. Third Party Single-Step Conference can be used to transfer or conference a call even if the call has only trunks connected. This is done by first adding a station (with or

without hardware) to the call. Then the call can be conferenced or transferred on behalf of that station using (Third Party Hold, Third Party Make Call, then Third Party Merge).

Third Party Relinquish Control

Once an adjunct no longer wants to control a call or receive call event reports, this feature can be requested to relinquish such control. After requesting this feature, no more event reports about the call are sent to the adjunct.

Third Party Clear Call

An adjunct uses this feature to immediately disconnect all parties from a controlled call.

Third Party Send DTMF Signals

This feature is used by an adjunct to provide Dual Tone Multi Frequency (DTMF) digits for transmission to all parties in a call.

Third Party Call Ended

This feature is used by the DEFINITY ECS to inform the adjunct that a call has ended (all parties have disconnected).

Domain Control Features

This feature allows the adjunct to place, monitor, and control all calls at a specific telephone. Domain control is similar to Call Control, except that the adjunct can only manipulate calls at a single telephone (the one that is domain controlled). The following are services available with Domain Control:

- Third Party Domain Control Request
 - for telephone extension
 - for Automatic Call Distributor (ACD) hunt group extension
- Third Party Answer
- Third Party Auto Dial
- Third Party Selective Hold
- Third Party Reconnect
- Redirect Call
- Third Party Merge
- Third Party Selective Drop
- Third Party Relinquish Control

- Third Party Send Dual Tone Multi Frequency (DTMF) Signals
- Third Party Single-Step Conference
- Third Party Domain Control Ended

Third Party Domain Control Request

The adjunct uses this to start monitoring and controlling a domain. In this case, “domain” refers to either a telephone extension or an Automatic Call Distributor (ACD) hunt group extension. If used with a telephone extension, this allows the adjunct to receive event reports about any of the calls arriving at that telephone extension. In addition, the adjunct can control these calls.

If used with an ACD hunt group extension, the monitoring results in events related to the agent’s logging into and logging out from the domain controlled ACD hunt group.

⇒ NOTE:

The following features are available with both Call Control and with Domain Control: Third Party Hold, Third Party Reconnect, Redirect Call, Third Party Merge, Third Party Selective Drop, Third Party Send DTMF Signals, and Third Party Single-Step Conference. See the descriptions in the previous Call Control section. However, remember that domain control features are only applicable to the telephone that is domain controlled. In addition, the next list of features are only available with Domain Control:

Third Party Answer

When a call is alerting at an extension that is domain controlled, the adjunct can use this feature to answer the call. This assumes that the telephone has a speakerphone and that it can be taken off hook to answer.

Third Party Auto Dial

This is similar to Third Party Make Call. Unlike a Third Party Make Call, which can be dialed on behalf of any party, Third Party Auto Dial can only be done from the telephone extension that is domain controlled.

Third Party Relinquish Control

Once the adjunct no longer wants to receive events about any (and all) calls at a specific telephone extension, it can use this feature to relinquish its control.

Third Party Domain Control Ended

This feature is used by the DEFINITY ECS to notify the adjunct that the domain controlled association has ended. Usually, the association is ended because the telephone has been removed or changed from the domain-controlled state.

Event Notification

The Event Notification feature allows the adjunct to request events for certain calls from the DEFINITY ECS. Calls entering the domain for which notification was requested [Vector Directory Number (VDN), Automatic Call Distributor (ACD)] cause event reports to be sent to the adjunct. With notification, the adjunct can only observe a call, but can not control it. The following are features available with Notification:

- Event Notification Request
- Event Notification Cancel
- Stop Call Notification
- Event Notification Ended

Event Notification Request

The adjunct uses Event Notification Request to request event reports for calls entering domains of Vector Directory Numbers (VDNs) and Automatic Call Distributor (ACD) hunt groups. Calls entering these types of domains generate event reports that allow the adjunct to follow the call as it is processed or transferred.

The adjunct requests Event Notification on all trunk groups (a single Event Notification Request) to request that ISDN Advice of Charge information be sent to the adjunct. This feature allows the adjunct to keep a meter running for the cost of each active, outgoing call. Charge information about the call is returned to the DEFINITY ECS in the form of message units that are sent during the call or at the end of the call as a total count of charges to the call. This feature is supported in Australia, France, Germany, Italy, and Spain as well as other European countries.

Event Notification Cancel

The adjunct uses Event Notification Cancel when it no longer needs to receive event reports for any of the calls entering the notification domain.

Stop Call Notification

The adjunct uses Stop Call Notification when it no longer needs to receive event reports for a specific call.

Event Notification Ended

The adjunct uses Event Notification Ended to inform the adjunct that notification has ended for a particular domain (usually because of the ECS administration changes).

Adjunct Routing

The DEFINITY ECS uses this feature to request and receive routing instructions for a call. These instructions, issued by the adjunct, are based on information received about the call. A sequence of three messages is included in adjunct routing:

- Route Request
- Route Select
- Route End

Route Request

This is a message sent by the DEFINITY ECS to the adjunct when it must obtain a route for a call. A Route Request provides any available information about the incoming call, such as: Calling Party Number, Called Party Number, caller-entered digits, User-to-User Information (UUI), Information Identifier Digits (II-Digits), and Flexible Billing information.

Route Select

The adjunct uses the information received in the Route Request to select the destination for the call, and then provides a response to the DEFINITY ECS in the Route Select. While providing the new destination for the call, the adjunct can insert up to 24 digits which can be stored with the call as dial-ahead digits. UUI can also be attached to a call through the Route Select message.

Route End

This message is used to end the route dialog. It is normally sent by the DEFINITY ECS after the Route Select message was processed and the call was routed. However, it can also be sent by the adjunct to end routing (for example when a valid destination can not be located).

Request Feature

The adjunct uses Request Feature to request or cancel the DEFINITY ECS features such as Agent Login, Work Mode Changes, Call Forwarding, Send All Calls. These are a subset of features that are available on the DEFINITY ECS and can be used when Feature Access Codes are dialed from the telephone. There is only one message for Request Feature. The following features are supported:

- Agent Login
- Agent Logout
- Change Agent Work Modes
- Call Forwarding

- Send All Calls

Agent Login

This feature allows the adjunct to log an agent into an Automatic Call Distributor (ACD) hunt group or skill and to specify an initial work mode.

Agent Logout

This feature allows the adjunct to log an agent out from an Automatic Call Distributor (ACD) hunt group or skill.

Change Agent Work Mode

This feature allows the adjunct to request a change in the agent's work mode for an Automatic Call Distributor (ACD) hunt group or skill.

Call Forwarding

This feature allows the adjunct to request that Call Forwarding be enabled for a telephone; all calls that arrive at the telephone will be forwarded to a specified destination.

Send All Calls

This feature allows the adjunct to request that currently alerting calls and subsequent calls arriving at the telephone be sent to coverage.

Value Query

This feature allows the adjunct to query for information about the DEFINITY ECS resources; for example, number of agents logged in, the trunks being used, the call classifiers being used, etc. The DEFINITY ECS provides information based on the request. The following are features available with Value Query:

- Automatic Call Distributor (ACD) Agent Login Query
- ACD Agent Status Query
- ACD Hunt Group Status Query
- Call Classifier Status Query
- Call Information Query
- Date/Time Query
- Extension Type Query
- Integrated Directory Database Query

- Party Identification (ID) Query
- Station Feature Query
 - Call Forwarding
 - Message Waiting Lamp
 - Send All Calls
- Station Status Query
- Trunk Group Status Query
- UCID (Universal Call ID) Query

ACD Agent Login Query

This query responds with the physical extension for each agent logged into the ACD Hunt Group.

ACD Agent Status Query

This query responds with the work mode and the state (idle or busy) of an agent.

ACD Hunt Group Status Query

This query responds with the number of ACD agents that are available to receive calls, the number of calls that are in queue, and the number of agents that are logged in.

Call Classifier Status Query

This query responds with the number of ports that can be used for call classification. Ports that are idle as well as those currently in use are provided in the message.

Call Information Query

This query responds with a list of calls present at a telephone.

Date and Time Query

This query responds with the year, month, day, hour, minute, and second.

Extension Query

This query responds with information about the type of extension.

Integrated Directory Database Query

When the extension number is provided, the DEFINITY ECS responds with the name administered in the ECS for that number.

Party ID Query

This query responds with a list of identifiers for the endpoints on the call.

Station Feature Query

Call Forwarding

This query indicates whether this feature is enabled or disabled at a telephone. If the feature is enabled, the telephone number used to answer forwarded calls is also provided.

Message Waiting Lamp

This query responds with the status of the Message Waiting Lamp (enabled or disabled) for ASAI, Property Management, Message Center, Voice Messaging, and Leave Word Calling.

Send All Calls

This query indicates if this feature is enabled or disabled at a telephone.

Station Status Query

This query indicates the state (idle or busy) for a telephone.

Trunk Group Status Query

This query responds with the number of trunks in a trunk group. Trunks that are idle as well as trunks that are currently in use are provided in the message.

UCID Query

This query responds with the Universal Call ID assigned to the call by the DEFINITY ECS. Each call is assigned a unique call id.

Set Value

This feature allows the adjunct to set specific values in the DEFINITY ECS for the following items:

- Message Waiting Lamp
- Billing Rate

Message Waiting Lamp

This feature allows the adjunct to turn the message waiting lamp *on* or *off* at a telephone.

Billing Rate

This feature allows the adjunct to set (or to change) the billing rate of a 900-type call that is received over an Integrated Services Digital Network-Primary Rate Interface (ISDN-PRI) trunk.

Maintenance

The Maintenance feature allows the ECS and the adjunct to communicate about the status of the end-to-end connection. The following are features available with Maintenance:

- Heartbeat
- Suspend Alarms
- Resume Alarms
- Restart

Heartbeat

This feature allows either the ECS or the adjunct to verify that the other end is functional and that the ASAI link is working.

Suspend Alarms

This feature allows the adjunct to turn off alarms raised on the ASAI link. It can be used before using routine maintenance procedures, or before removing the ASAI link from service.

Resume Alarms

This feature allows the adjunct to turn on alarms raised on the ASAI link.

Restart

This feature allows the adjunct or the ECS to start an application from the beginning. All data structures and resources that are associated with the link are cleared, both at the sending and receiving end. The restart message allows the adjunct to negotiate a link version number with the DEFINITY ECS. Currently, three link version numbers are supported.

Event Reports

Event Reports are one-way messages sent by the ECS to the adjunct. Event reports inform the adjunct about the state of the call or agent. They are provided when the following features are active:

- Call Control Group
- Domain Control Group
 - Telephone
 - Automatic Call Distributor (ACD) Hunt Group
- Notification Group

The adjunct does not respond to event reports.

Call Control Event Reports

Call control event reports are provided when an application monitors or controls a call. The following reports are available for controlled calls:

- Alerting
- Answered
- Busy/Unavailable
- Call Conferenced
- Call Transferred
- Connected
- Cut-Through
- Disconnect/Drop
- Entered Digits
- Hold
- Queued
- Reconnected
- Reorder/Denial
- Trunk Seized

Domain Event Reports for the Telephone

Domain event reports are provided when an application monitors or controls a telephone. The following reports are available for telephones:

- Alerting
- Answered

- Busy/Unavailable
- Call Conferenced
- Call Initiated
- Call Originated
- Call Redirected
- Call Transferred
- Connected
- Cut-Through
- Disconnect/Drop
- Hold
- Queued
- Reconnected
- Reorder/Denial
- Trunk Seized

Domain Control Event Reports for Automatic Call Distributor (ACD) Hunt Group

These events are sent by the ECS to an adjunct when the application monitors an ACD hunt group. Agent activity (login and logout) is reported as “agent login” or “agent logout” event reports. Currently, a change in the agent’s work mode is not reported. These “agent” reports are not related to call activity.

- Login
- Logout

Notification Event Reports

These event reports are sent by the ECS to the adjunct for calls that use telephones that are assigned to Vector Directory Numbers (VDNs) or Automatic Call Distributor (ACD) hunt groups:

- Alerting
- Busy/Unavailable
- Call Conferenced
- Call Ended
- Call Offered to Domain
- Call Redirected
- Call Transferred

- Connected
- Cut-Through
- Disconnect/Drop
- Entered Digits
- Hold
- Queued
- Reconnected
- Reorder/Denial
- Trunk Seized

Descriptions of Event Reports

Each event report is presented in alphabetical order in the following list. See the *DEFINITY Enterprise Communications Server CallVisor ASAI Technical Reference* for additional information about each report. The *DEFINITY Enterprise Communications Server CallVisor ASAI Protocol Reference* provides information about how to encode each message.

Alerting

This event report is generally provided when a call arrives and is alerting at a telephone.

Answered

This event report is only provided for predictive dialing calls, when the DEFINITY ECS has detected that someone has answered the call.

Busy or Unavailable

This event report is provided when a call placed (or monitored) through an ASAI link has reached a busy destination.

Call Conferenced

This event report is provided when two calls (one held, the other active) have been merged together to form a conference.

Call Ended

This event report is provided when the last party has disconnected from the call and the entire call record has been cleared (no other parties remain on the call).

Call Initiated

This event report is provided when a telephone is taken off hook and dial tone is provided.

Call Offered to Domain

This event report is provided when a call enters a monitored domain such as a Vector Directory Number (VDN) or an Automatic Call Distributor (ACD) hunt group.

Call Originated

This event report is provided when an internal caller has completed dialing all the digits for a call.

Call Redirected

This event report is provided when a call is removed from a telephone because the call has been redirected (using call coverage, redirection, etc.), but not because it has been disconnected.

Call Transferred

This event report is provided when two calls are merged and the user is disconnected as a result of the transfer.

Connected

This event report is provided when a call has been answered and the ECS has knowledge of the answered call. It is also provided when a telephone is Single-Step Conferenced into a call.

Cut-Through

This event report is provided for Integrated Services Digital Network (ISDN) trunks when the call goes from an ISDN trunk to a non-ISDN trunk.

Disconnect/Drop

This event report is provided when a party disconnects (drops) from a call.

Entered Digits

This event report is provided when the DEFINITY ECS has collected a specified number of digits as a result of the ASAI-Requested Digits option of Adjunct Routing.

Hold

This event report is provided when a party puts a call on hold.

Login

This event report is provided when an agent logs into an Automatic Call Distributor (ACD) hunt group.

Logout

This event report is provided when an agent logs out of an Automatic Call Distributor (ACD) hunt group.

Queued

This event report is provided when a call has entered an Automatic Call Distributor (ACD) queue.

Reconnected

This event report is provided when a party reconnects from a held state.

Reorder/Denial

This event report is provided when a call is placed to an incorrect telephone number.

Trunk Seized

This event reported is provided for non-Integrated Services Digital Network (ISDN) trunks for outgoing calls as the equivalent of "trunk off hook."

CallVisor ASAI Links

CallVisor ASAI Link Versions

Currently, three versions of CallVisor ASAI are supported in the DEFINITY ECS. Each version supports all the features for the previous version plus extra ones specific to that version. Using versions is useful when an older release of the DEFINITY ECS must communicate with a newer adjunct or vice versa. The version used by the ECS (server) and the adjunct (computer) is negotiated when the link is brought up. A “handshake” takes place between the ECS and the adjunct, in which the two agree on the version that should be used. This is typically the most recent version supported by both the ECS and the adjunct.

CallVisor ASAI Link Administration

Up to sixteen ASAI links can be administered for one DEFINITY ECS. Each link is administered on the “add station” form on the System Access Terminal for the DEFINITY ECS.

Planning for ASAI Applications

This section describes the considerations, decision points, and planning tasks required to implement a DEFINITY ECS CallVisor ASAI application. It is provided as a general guide for the person planning and coordinating the implementation of CallVisor ASAI. The first step in planning a CallVisor ASAI configuration is to define the application. You and your Lucent Technologies representative must be able to describe the business needs addressed by the application and provide in words or diagrams a general description of the application. You should consider each part of your current operation and how it can be improved. Examples of improvements in operations are shown in the next table.

Table 1. Proposed CallVisor ASAI Improvements (Example)

Operation	Proposed Change with CallVisor ASAI
Credit Verification	Use Calling Party Number/Billing Number (CPN/BN) to automatically search for accounts.
New Accounts	Save CPN/BN to analyze advertising effectiveness.
Credit Extension	Use Dialed Number Identification Service (DNIS) to allow agents to handle both credit extension and verification calls.
Voice Response	Use DNIS to automatically invoke a voice script, thereby saving Voice Response Unit (VRU) ports. Use CPN/BN to verify caller identification.
Collections	Use past due records of 90 days to call customers automatically when there are fewer incoming calls.
Customer Service	Have User to User Information (UUI) pass customer information to an Automatic Call Distributor (ACD) or another DEFINITY ECS that has less load to handle.
Priority Routing	Note: Based on Information Identifier Digits (II-Digits) and possibly CPN/BN. Route calls that arrive from special places to the appropriate agent.

Once you have selected areas for improvement, identify the impact these changes will have on current operations. Agents and personnel involved in current operations may need additional training as a result of the impact of CallVisor ASAI.

Your Lucent Technologies representative can work with you to define the DEFINITY ECS CallVisor components needed for your application. The computing platform, application provider and configuration must next be selected. If you do not have a preferred computer platform or software provider, your Lucent Technologies representative can provide additional options.

A Project Coordinator is then selected to prepare the master plan for the design, implementation, maintenance, and monitoring of all products involved in your application. Lucent Technologies also offers (under a separate contact) a service for planning and installation of CallVisor ASAI applications.

Next, a detailed configuration is prepared. The Project Manager verifies that the detailed configuration can be supported by all the proposed components. Lucent Technologies provides consultation services for ASAI applications.

The ordering of components takes place next. At this point, you should consider purchasing one of the Lucent Technologies service offerings as part of the ongoing maintenance of your ASAI application. This is particularly recommended if you plan on using multiple software applications, multiple ASAI links, if you plan to integrate your application with Voice Response Units (VRUs) or other network features.

The ASAI application should be installed and tested before putting the ASAI application in service. It is recommended that the ASAI application be put into service gradually so that the features can be tested on a limited basis.

Maintenance Support Services are available from Lucent Technologies on an on-going basis.

ASAI System Capacities

Table 2. System-Wide ASAI Limits

Capacity	R6si, R6vs	R6r
ASAI Links	8	16 ¹
Notification Associations	300	10,000
Adjunct-Control Associations	300	3,000
Domain-Control Station Associations	2,000	6,000
Domain-Control Split /Skill Associations	99	600
Simultaneous Call-Classification Originators	80	600
Simultaneous Billing Change Requests	100	1,000
Simultaneous Selective Listening Disconnected Paths	75	300
Domain-Controllers per Station Domain	2	4

Table 2. System-Wide ASAI Limits — (Continued)

Capacity	R6si, R6vs	R6r
Active Notifications per Split Domain	3	6
Domain Controllers per Split Domain	1	1
Active Notifications per VDN Domain	3	6
Adjunct-Control Associations per Call	1	1
Active Notification Associations per Call	3	6
Domain Control Associations	12	24
CRVs ECS-to-adjunct	127	127

1. Requires a MAPD (maximum 8 links supported on BRI links).

Hardware Installation Needs

The hardware needed depends on the link type and other specific application needs. Two possible link types are listed below.

Integrated Services Digital Network-Basic Rate Interface (ISDN-BRI)

Install the following hardware in the DEFINITY ECS cabinet for the connections that use ISDN-BRI:

1. The circuit pack for ISDN-BRI
2. The circuit card for the packet controller
3. The circuit card for packet maintenance.

⇒ NOTE:

The adjunct also requires an ISDN-BRI board.

MAPD

For connections using Ethernet or TCP/IP, a new circuit pack, MAPD (Multi-application Platform for DEFINITY) should be installed. For this hardware, two new software applications are available.

DEFINITY LAN Gateway application (1273-LAN) provides ASAI functionality using an Ethernet transport.

PC LAN (CV/LAN) application (1273-CVL) allows CallVisor PC client applications to access ASAI functionality on the MAPD.

Either or both of the above two applications can be installed on the MAPD system assembly (1273-MPD). This system assembly consists of a TN801 MAPD board and a Pentium processor card. This system assembly is inserted into a DEFINITY ECS carrier. It requires three contiguous slots.

Install the following hardware in the DEFINITY ECS cabinet for the connections that use ASAI-Ethernet.

1. MAPD circuit pack
2. The circuit card for the packet controller
3. The circuit card for packet maintenance.



NOTE:

The adjunct also requires a LAN card.

Software Installation Needs

The software for CallVisor ASAI is optional and must be purchased to enable the link to work. Once the ASAI software is enabled, the ASAI features can be individually configured. The following are the features and options that can be configured:

- Call Control
- Adjunct Routing
- Domain Control
- Event Notification
- Request Feature
- Set Value
- Answering Machine Detection
- Selective Listening
- Switch-classified Outgoing Calls
- Call Classification after Answer Supervision
- Send UCID to ASAI

ASAI Administration

Each ASAI link (up to sixteen per system) can be configured, using either ISDN-BRI or Ethernet as the link. One MAPD can handle up to eight links. The options for each link depend on the device on the other end the link is connecting to.

In addition to administering the ASAI link, other administration could be necessary for some DEFINITY ECS features. This additional administration depends on the

specific application. For example, Call Vectoring must be administered as an option before using the ASAI feature Adjunct Routing.

ASAI Link Testing

Test the ASAI link by using standard DEFINITY ECS commands; for example, "Status Station," "Status bri-port" or "Test Port."

Service Offerings

Lucent Technologies offers three types of installation and maintenance services as described below.

Basic Installation

Specialized and experienced people are available to ensure that CallVisor ASAI is correctly installed, administered, connected to the adjunct, and tested.

Consultation Services

Technical expertise is available to help you with the following activities:

- identify the project objectives
- identify the call center applications
- identify the call examples and review them with the application vendor
- finalize and document the call examples
- integrate the call flows with the ECS configuration
- develop the Busy Hour Call Completion specifications and the ASAI link capacity
- develop and configure the DEFINITY ECS configuration
- finalize and document the ASAI application
- provide recommendations about the best way to achieve a business goal through the use of ASAI

Single Point of Contact

Lucent Technologies can serve as your single point of contact during the installation and implementation of all components of an ASAI application. In addition, Lucent Technologies can act as your agent in solving problems after your application is placed in service.

Business Partners of Lucent Technologies

The following business partners have signed development agreements with Lucent Technologies to share information about each other's products and to establish working relationships among companies.

⇒ NOTE:

This list of business partners is up-to-date at the time of this document's publication. However, the number of business partners could increase in the future. For a current list and more detailed information, contact your Lucent Technologies representative.

- Dialogic CT-Connect™
- International Business Machines (IBM)
- Hewlett-Packard (HP)
- Aristacom
- NCR
- Stratus
- Tandem
- Passageway® Telephony Services for Netware

⇒ NOTE:

When this product is sold by Novell, it is known as NetWare® Telephony Services.

- Electronic Information Systems (EIS)

CallVisor PC

One of the ways that applications can be written to make use of ASAI's features is through the CallVisor PC Application Programming Interface (API). This is available from Lucent Technologies in the form of a C-language kit called the Software Developers Kit. This kit is installed on the PC or adjunct. This library offers a programming interface which maps each ASAI message into a specific function call for the application. There are also other application development options (see the section on Business Partners). Many independent software vendors offer applications for call centers and Computer Telephony Integration (CTI) that are based on the CallVisor PC and CentreVu application processor interfaces. Consult your Lucent Technologies representative for further information.

CV/LAN

CV/LAN software runs on the CallVisor PC Applications Programming Interface (API) in a client-server environment. The standard CallVisor PC software runs on the *same personal computer (PC)* as the application. However, CV/LAN server can reside on the same PC as the application or it can reside on a different PC from the application. The server requires the CallVisor protocol stack to run properly. The clients and server communicate through Transfer Control Protocol (TCP) connections. For more information on CV/LAN, see the *DEFINITY Enterprise Communications Server CallVisor PC ASAI Installation and Reference*, 555-230-227.

CentreVu Computer Telephony

CentreVu Computer Telephony is a product offered by Lucent Technologies. It provides a standard Telephony Service API (TSAPI) interface for writing applications. TSAPI supports the same features as the API for the CallVisor PC. It is compatible with standards of the European Computer Manufacturers Association (ECMA). It works in a client-server environment. In addition, the CentreVu Telephony Services software can be configured to interface with servers other than the DEFINITY ECS. A JTAPI interface is also available.

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