



eMedia CT

System Description

Upstream Works Software Ltd.

27 Roytec Rd #7b

Woodbridge ON Canada

L4L 8E3

This document contains information proprietary to Upstream Works. It is submitted in confidence and is to be used solely for the purpose for which it is furnished and must be returned upon request. This document and the information contained herein is not to be reproduced, transmitted, disclosed or used otherwise in whole or in part without the written consent of Upstream Works.

1 OVERVIEW OF COMPUTER TELEPHONY INTEGRATION

1.1 CTI DEFINED

Computer Telephony Integration, or CTI, covers an extremely broad area, referring as it does to the integration of computer and telephone technology within a common domain. With rapid growth in munications bandwidth and the arrival of cross-media connectivity, CTI is being used as an increasingly inclusive term, designating the convergence of two of the most business-critical technologies of our time.

For purposes of this document, the term CTI refers to the following activities:

- Connecting computer systems and telephones
- PSTN and telephone system call information being passed to the computer system
- The CTI Server directing the management of phone calls
- The CTI Server coordinating movement of data on the Local Area Network and associating that data with the corresponding telephone call and delivering it to the workstation associated with the telephone that is the call's destination
- A phone ringing, and data about that call being displayed on the PC monitor next to it
- Logging of all call data after the call is completed

1.1.1 CTI Vocabulary

- PSTN - Public Switched Telephone Network
- ANI - Automatic Number Identification, also referred to as CLID (Calling Line ID); data passed from the PSTN indicating the telephone number of the calling party
- DNIS - Dialed Number Identification Service, also passed through the PSTN, indicating the number the calling party dialed (associated with toll-free services)
- DID - Direct Inward Dial
- DN - Directory Number, also referred to as extension
- Position ID - Agent ACD extension number
- Lines - Lines are the physical or logical telephone lines that go from the switch to the phone.
- ACD Queues - queued group of lines that have a common dialing or pilot number
- Phones - Telephone handsets that sit on an agent desktop
- Stations - Stations are PC workstations on a local area network (LAN)
- Agents - In a call center, Agents are the people who handle calls and operate computer applications through their PCs.

1.2 THE SERVICES OF CTI

Whereas CTI by its nature invites us to see things in terms of the "big picture", EMedia CT is a tightly defined, designed and executed facet of this growing field. EMedia CT is a client/server application intended for use in both formal and informal call centers where agents seated at personal computers handle telephone calls from outside lines. The function of the EMedia CT Server is to coordinate data on the Local Area Network and connect that data with the calls on

the telephone system. In practical terms this means that as a call arrives at a location in the phone system, data associated with that call arrives at the corresponding location on the LAN. A phone rings, and data pops up on the workstation monitor next to that phone.

In order to allow fast and flexible assignment of data to calls, the EMedia CT server must:

- provide an accurate interpretation of activity on the switch so that calls can be tracked from the computer side, and
- maintain an extremely stable messaging system in order to allow data to be obtained from a number of sources and kept synchronized with calls as they travel through the telephone system.

In effect, EMedia CT supplies a networking layer that coordinates the interaction of telephone devices and computer applications.

A CTI client/server system is thus a core technology that sits at the hub of a broad range of services:

- identifying incoming calls and sending information about them to PCs at phone agents' desks
- linking database information to calls and maintaining the association between the call and data throughout their routing history
- identifying the nature of an incoming call and routing it to the most desirable destination
- keeping detailed records of telephony activity and allowing reports to be generated
- allowing supplementary data to be stored for call records

At the most basic level, a CTI server must take the data a switch provides about calls and turn it into useful data on a computer system that can be linked with other data. The tasks of a CTI server are:

- to assign a data structure to a call, or a call event
- to coordinate that structure with other data structures in the computer system
- to allow applications access to the call data in a useful fashion.

1.3 TELEPHONY APIS

CTI capability depends on the capacity of computer component to communicate with and control the switch and associated telephone devices. A third party API, such as IBM CallPath, Dialogic CTConnect, TSAPI, or TAPI, or a switch manufacturer's proprietary API will provide access to the switch and associated phone devices. Telephony APIs can be either First Party or Third Party with respect to Call Control.

Telephone switches have traditionally been designed to be the antithesis of "Open Architecture" when it comes to integrating non-proprietary software or devices to the switch. There have historically been no industry standards as to switch software or hardware interfaces. Each manufacturer uses different switch software from another, and even different switches from the same manufacturer often use completely different hardware and software. The APIs mentioned above have been developed to address this dilemma. The API selected to interface to a particular switch is critical to the functionality that will result from the integration.

1.3.1 First Party Call Control

First party call control refers to software connections to telephone devices that usually do not directly address the switch and cannot see the telephone network beyond the desktop. An example of first party control is the connection of a computer to a telephone set via a serial connection, often done to enable contact management software to dial the telephone.

First party control features can include:

- Emulated dialing pad.
- Programmable directory list software.
- On/Off hook control.
- Extended feature control of a digital handset such as BUSY, HOLD or CONFERENCE

First Party Control offers a very limited view of the phone network. Only a single phone device and the lines 'owned' by that phone are visible to the desktop computer components. Interaction with other phones is seen only through the immediate phone or line, with no view of activity occurring on other phones and lines.

1.3.2 Third Party Call Control

Third party call control refers to a software connection directly to a telephone switch. Third party call control offers a larger view of the phone network. Instead of just a single phone and its lines, a third party system can see a switch and all of its configured lines. First party functionality, such as direct control of a phone device from an associated station, is not lost, but is performed by making requests to the Switch rather than to the phone. Third party call control can be achieved at the desktop provided the controlling intelligence is monitoring the entire network.

The limitations of third party call control are directly dependent upon the functionality offered by both the switch and the API used to access the switch.

1.3.3 EMedia CT and Call Control

EMedia CT uses third party call control. The primary purpose of the EMedia CT server is to monitor switch and call activity. It does provide first party call control capabilities. Upstream Works CTI also offers modules that support sophisticated call control, i.e., Preview Dialing and automated callback functions.

2 EMEDIA CT PRODUCT OVERVIEW

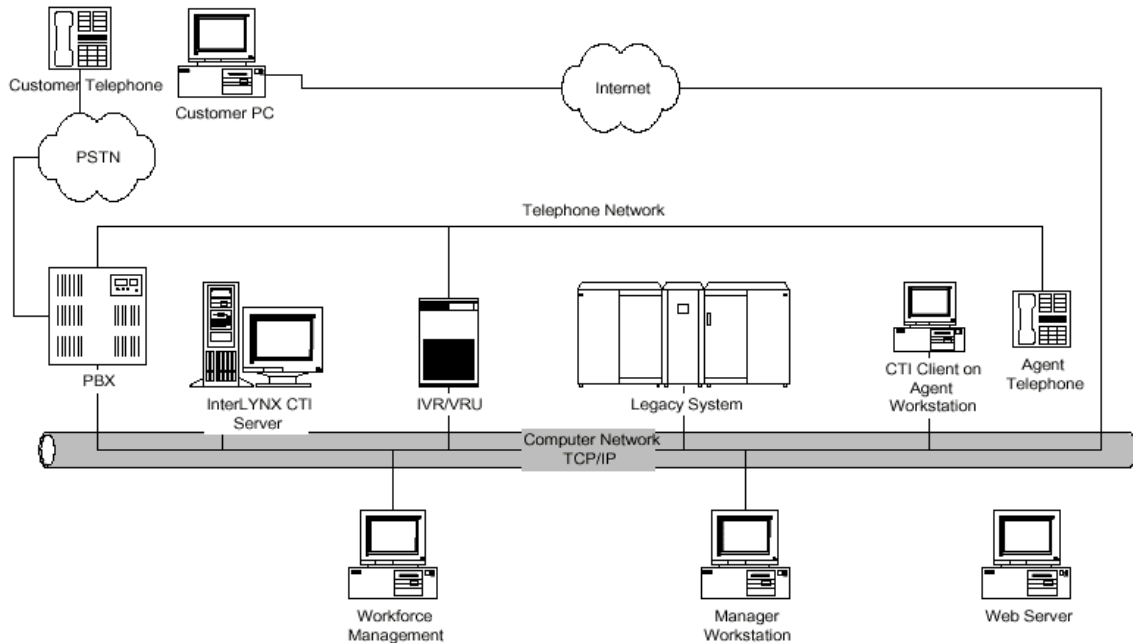
EMedia CT links information from two sources: the PBX and the networked computer system. For all events on the PBX, EMedia CT provides data structures that enable a broad range of information tracking, data attachment and workforce management functions to be performed.

EMedia CT allows data to be attached to a call (through an IVR system or through direct agent entry, for example), and to remain with the call as it is routed through the system. Other business applications are able to access this data in order to provide a variety of services.

2.1 EMEDIA CT

EMedia CT is an open architecture, standards based client/server system that can be scaled to meet the requirements of call centers large or small. EMedia CT integrates fully with third party products such as IVR systems and workforce management applications, and can be networked to provide enterprise-wide CTI capabilities.

Depicted below is an installation of EMedia CT, as well as some of the other hardware and software components of a typical call center.



The EMedia CT system is a powerful and flexible tool engineered to meet specific design requirements:

- Scalability to accommodate hundreds of users and telephone sets.
- Robustness and reliability to provide a high level of availability.
- Distributed functionality for flexibility of configuration and ease of access over LANs and WANs.
- Ease of integration, providing industry standard interfaces to allow legacy and third party applications the ability to work in concert with the system.

By adhering to these requirements, EMedia CT is able to provide a stable platform to integrate business applications with telephone based communications resources. Because of its unique building block approach to design, EMedia CT can deliver comprehensive solutions tailored to specific needs and can provide the following:

- Centralized data registry that stores all configuration information in one location
- Live configuration updates with no impact on performance
- Downloading of switch and line configuration directly from PBX
- A proprietary transport layer providing a universal address definition for all attached modules
- External API that permits custom integration of third party applications
- Built in security features that restrict access to configured agents and work stations
- Configuration options to allow control of telephone lines either from server or client workstations
- Logging of all call related information to database (via EMedia CT Information Capture Module)
- Delivery of information from third party IVR applications to client stations and networked applications (via EMedia CT IVR Module)
- Automated enforcement of workforce management schedules (via Upstream Works TimeOut module)
- Outbound Call Management (via Upstream Works EasyReach module).

2.2 EMedia CT ENVIRONMENT

2.2.1 Minimum Server Requirements

Upstream Works Requires a dedicated server to operate.

Software Operating System Windows NT Server 4.0 ®

PBX Interface **Telephony API, such as TAPI, with Service

Provider obtained from PBX Manufacturer

Hardware Processor Intel Pentium 200MHz or better

RAM 64MB

Disk Space 2.0 GB disk space available

Media 3.5 inch 1.44MB diskette drive

8X or greater CDROM

Display VGA or better

LAN Ethernet or Token Ring LAN 16/4MB Network adapter (supported by Windows NT(R) version in use) (x2)

**Dependent upon switch manufacturer and integration functionality desired

2.2.2 Minimum Client Requirements

Software Operating System Windows 9x ® or Windows NT® Workstation 4.0 or Windows 2000

Hardware Processor Intel 486/66 or better

RAM 16MB (2MB Available)

Disk Space 10MB disk space available

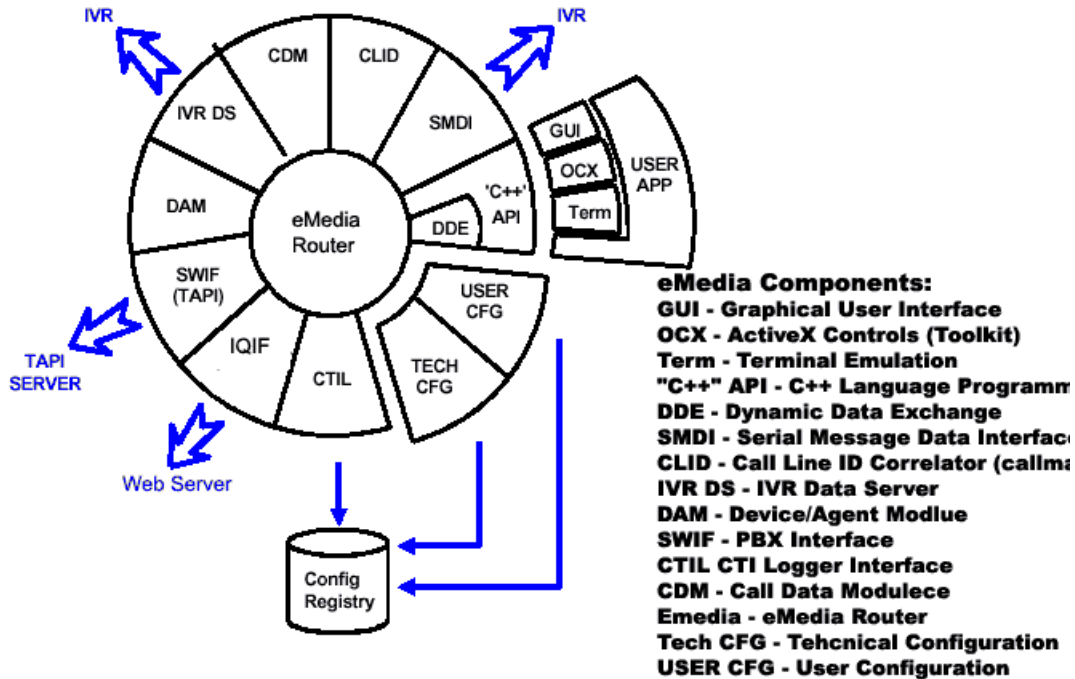
Media 3.5 inch 1.44MB diskette drive

Display VGA or greater

LAN Ethernet or Token Ring LAN 16/4 MB Network adapter (supported by the operating system in use).Upstream Works Proprietary Revised 3/12/98 10

2.3 UPSTREAM WORKS ARCHITECTURE

Engineered to address three areas of performance: Modularity, Flexibility and Reliability. EMedia CT is comprised of a number of components. All components work seamlessly with the core system to provide a wide range of functionality.



2.3.1 Graphical User Interface (GUI)

EMedia CT provides GUIs for configuring the system and for the Client workstation. The System Resource Window opens from its icon on the computer desktop. It contains icons for the three major resource groups: Phone System Devices, Site Set-up, and Agent Management.

2.3.2 OCX ActiveX Controls (OCX)

EMedia CT also provides access to its functionality via ActiveX controls residing on agent desktop computers. These controls provide programmable object oriented interfaces to the Client Station Engine, which can be incorporated into any application development environment that supports VB script, such as Visual Basic, Delphi or Microsoft Outlook. These allow quick user customization of visual display tools for use on agent interfaces and rapid integration of customer's existing business applications.

2.3.3 Terminal Emulation (Term)

EMedia CT can be integrated to access legacy information in a host-mainframe environment using an IBM 3270 terminal or similar emulation.

2.3.4 C++ Language Programming API ('C' API)

The Workstation Engine External API (WSEXTAPI) consists of a set of function calls and messages written in 'C++' that provide third party applications programming access to Upstream Works CTI. Through the API, customized access to EMedia CT messaging and data services is provided for networked applications

2.3.5 Dynamic Data Exchange (DDE)

The Client Workstation Engine includes a DDE server component that allows Client applications to initiate DDE conversations. The DDE component supports delivery of data entered by Client

applications to the Information Capture Database, delivery of data from an IVR system to Client applications, and delivery of DNIS and CLID information to Client applications. All information feeds are by hot link.

2.3.6 Serial Message Data Interface (SMDI)

This interface addresses the limitation in certain switch and IVR combinations in which the switch cannot provide information such as CLID or DNIS to the IVR system. IVR systems often require the DNIS or CLID data to determine which voice menu to play for the caller. For example, the NORTEL Meridian provides the CLID and DNIS through Meridian Link, which the EMedia CT SMDI Interface then passes to the IVR through a serial connection.

2.3.7 Calling Line ID (CLID) Correlator

The CLID Correlator is provided to screen pop applications that do not provide the ability to search on the CLID. CLIDs are matched to Account Numbers by the CLID Correlator. When the CLID for an incoming call is identified, this module performs a lookup in its database. If the CLID has a record, the Correlator requests the server to attach Account Number data to the Call ID. The database table is configured using a GUI on the system administrator's desktop. Records in the database have four additional fields that can be customized to meet specific configuration requirements.

2.3.8 IVR Data Server (IVR)

The task of the IVR Data Server is to match IVR data with the associated call. The IVR Data Server maintains a list of active IVR ports configured on the system. For all active IVR ports, it monitors the switch messages and registers call events. When a call arrives for one of the IVR ports, the IVR Data Server creates an entry for the call. It then awaits arrival of the IVR data packet that the IVR unit issues for the call, and matches the packet with the call.

2.3.9 Call Data Module (CDM)

The server Call Data Module (CDM) acts as a repository for any data that is associated with a given call. As calls progress through the Upstream Works Server and are delivered to the various client workstations, the call data module automatically forwards the data packet to the corresponding monitored CTI stations. As data is modified, updates are delivered to any current parties involved with the call.

2.3.10 Device/Agent Module (DAM)

The Device/Agent Module or DAM authorizes agent logons and logoffs. All logon or logoff requests are addressed to the DAM. The DAM automatically distributes unsolicited messages on forced changes in logon status, such as those due to configuration changes. The DAM also maintains a dynamic record of agent associations to workstations and phone system devices. DAM also verifies that the configured number of concurrent users is not exceeded. DAM will also verify the Windows NT Network Machine Name against the configuration, and deliver all configuration information pertaining to the phones and lines at that client CTI station.

DAM allows all telephone configuration data to be maintained centrally and allows agents to sign on to the CTI server from any configured CTI station.

2.3.11 Switch Interface Module (SWIF)

The switch interface connects to a standard telephony API. It translates status and progress messages from the switch into EMedia CT data formats and provides control of the switch from a computer application. Through the switch, SWIF is the source of all telephony data supplying information on:

- Switch status
- Line and phone device status
- Call Events
- Identity and role of participants in call events
- Attaching call data to an existing call

2.3.12 CTI Logger (CTIL)

This information capture module is responsible for recording EMedia CT activities to a database that makes them available to any third party ODBC compliant report generator. The module retrieves and stores data from the variety of resources that are linked in the Upstream Works CTI system. Among the data the CTI Logger can make available are call activity on the switch, agent activity, transaction records entered by agents, and information from IVR, third party applications and legacy systems that is attached to call records.

2.3.13 eMedia Router

eMedia Router plays the role of message director, allowing sharing of a TCP/IP socket by multiple modules within a process space without knowledge of each other. It maintains strict control over message formats. This serves several purposes, including allowing platform independence, message documentation, version control of messages, and standard APIs for message descriptions. (In a large system, with possibly hundreds of different message types, knowing what a message is, what it contains and where it came from can be a challenge if not managed.) This also allows for translation between platform specific dependencies, such as byte ordering of integers.)

eMedia Router allows for a degree of module independence within the system architecture. Thus, the physical location of an entity within the communication network is not important to the user of eMedia Router. This is the "post office" type concept. Messages are addressed much like letters, in that it is irrelevant to the sender where the addressee is located, so long as the letter (message) is addressed properly. Courier allows modules using its services to send directed messages to specific modules or externally connected programs.

eMedia Router also allows modules using its services to send broadcast messages to non-specific modules that have registered for those message types. In this situation, the source module has no knowledge of the receiving module or program.

eMedia Router is an event-driven, asynchronous, multi-threaded model, with each user having its own thread. This allows the to handle several hundred simultaneous connections and requests from CTI Station Client Service Agents, or other external device enablers.

2.4 EMEDIA CT CONFIGURATION

EMedia CT has two GUIs for viewing and manipulating configuration data:

- The Standard Configuration Tool graphically displays the definition of configured entities in the system.
- The Configuration GUI provides a Windows® environment for a system administrator to enter and view configuration information. The Configuration GUI is discussed the Configuration GUI Section.

2.4.1 The Standard Configuration Tool

The Standard Configuration Tool uses a branching tree structure to display the definition of all configured entities. Users expand and contract entries by clicking on them with their mouse or pointing device. When an entry has been fully expanded the tree screen displays the key values.

by which it is defined, and the parameters for which it receives configurable values. If a configurable parameter is selected on the tree screen, the value with which it is configured is displayed in the small screen to the right.

The Standard Configuration Tool also allows system administrators to add, delete and edit values for configurable parameters. Editing commands are arranged in a line below the tree screen. The commands are enabled for the configurable parameter that is currently selected on the tree screen. Below the command buttons the configuration tool presents further information on the currently selected item.

2.4.2 The Configuration GUI

EMedia CT System Resource Window shows three major resource groups:

- Phone System Devices
- Site Setup (Workstation Management)
- Agent Management

2.4.2.1 Phone System Devices

- For configuration purposes, lines, ACD queues and phones are grouped together as phone system devices.
- Lines, ACD queues, and phones each have their own icon under the 'Phone System' window for easy viewing of the switch configuration
- Connections among the three elements are configured on the telephone switch, prior to installation of the EMedia CT server
- The switch configuration is then loaded into the server via a text file - the 'Switch Information File'

2.4.2.2 Site Set-up

- Once phone system device information has been successfully loaded, The 'Site Setup' icon can be used to add workstations and assign phones to workstations. The system associates each workstation with the phone(s) assigned to that station.
- The name assigned to a workstation should be the same as its computer name (TCP/IP host name) on the LAN.

2.4.2.3 Agent Management

- The system administrator should prepare a list of the agents to add, with the Login ID for each agent
- Agents are added using the 'Agent Properties' dialog box, which can be accessed from the Agent window.

2.4.3 Relations among Configured Entities

2.4.3.1 Lines

Lines are the physical or logical telephone lines that go from the switch to the phone. Each line is an extension number on the switch. Lines can be of two types:

- Direct Lines are extensions that can be dialed directly from an outside location.
- ACD Lines are on a queue that is dialed from an outside location. Lines are not directly assigned to or associated with stations. Lines are connected to phones.

Phones are assigned to stations.

2.4.3.2 ACD Queues

ACD Queues are queued groups of ACD lines that have a common dialing or pilot number. An ACD queue handles and assigns all of the calls for its number. ACD queues are used to establish traffic groups for different kinds of calls.

For example, if language is a queue differentiator, separate ACD queues can be established for calls associated with each particular language. Another use of ACD Queues would be to establish separate queues for different customer needs – one queue for accounting, one for sales, and another for customer service.

2.4.3.3 Phones

Phones are the telephone handsets that sit on the agent desktop. Phones are an important element in EMedia CT configuration because it is through phones that lines and ACD queues are associated with workstations.

- A phone can have several lines connected to it.
- A line can belong to only one phone.
- Several phones can be assigned to the same workstation.

2.4.3.4 Workstations

Workstations are PC workstations on the local area network (LAN). Each workstation will have one or more phones assigned to it. For configuration purposes a workstation is a collection of phones. Workstations are not associated with agents in the EMedia CT configuration database.

2.4.3.5 Agents

Agents are the people who handle telephone calls and operate computer applications through their PC's.

- Agents are not assigned to stations in the configuration database.
- Agents become associated with workstations by logging in, using their Login ID's on the LAN.

2.5 CLIENT WORKSTATION ENGINE

The Client Workstation Engine is a component of the EMedia CT system that resides on the agent's workstation. It is through this engine that EMedia CT delivers call information and attached call data for all the lines associated with the workstation. This component connects to the server via TCP/IP and is responsible for the management of the flow of messages to and from the server. The Client Workstation Engine will automatically attempt reconnect with configures CTI Server(s) if connection is lost.

2.5.1 Call Display

An agent call display GUI (Graphical User Interface) application is responsible for the delivery of information associated with a telephone call to the agent desktop. The agent GUI notifies the agent of an incoming call and at the same time displays any information provided by the PBX or IVR system. This GUI is a standard offering with the EMedia CT software.

In most installations, integration of EMedia CT with the desktop customer care application eliminates the need for this display, as the information is provided as part of the "popped" customer care application screen. This integration allows the client engine to run in the system task tray, freeing up screen space for the integrated application.

2.5.2 Upstream Works ScreenPhone

The Upstream Works ScreenPhone GUI enables agents to control the telephone call from within the screen displaying the call information. With this feature users can perform basic telephony functions such as transfer, hold, and conference, all from the workstation without using the telephone set. In addition, using this application, agents can program follow-up calls to be made at a specific date and time via the outbound dialing module of EMedia CT.

Integration of the Upstream Works ScreenPhone controls with the customer care application allow the associated telephony functions mentioned to appear as part of the application's GUI. Through the use of EMedia CT Toolkit's ActiveX controls, custom screen appearances can be configured for any application the customer may desire. This can be accomplished through the use of any object-oriented programming environment, such as Microsoft's Visual Basic.

2.5.3 Application Interface

The data delivered to the agent desktop can be used to automate many aspects of the processing of the call. Application interfaces built upon the Agent Desktop module API allow for the coordination of other applications with the telephone call. This facility is offered in two ways:

- As a DDE server interface
- As an ActiveX interface

Using these interfaces, third party and/or in house applications can:

- Be notified of incoming calls, allowing for the execution of processes such as the retrieval of customer data
- Acquire and act upon the data associated with the call to suggest to the agent the best method of handling the call, e.g., if DNIS indicates customer has called to inquire about his bill, the billing system will be displayed
- Send data from third party and legacy applications to the CTI server, enabling reports to detail the interaction with these applications

2.6 EXTERNAL DEVICE INTERFACE ENABLERS

External Device enablers are designed to establish and maintain a generic communications path between an external workstation device and a CTI server. It differs from the CTI station engine in that it requires no agent or line configuration information to operate.

This module provides an Application programming bi-directional interface to multiple third party applications supporting all telephone status messages received from and telephony commands supported by the PBX switch. It does not require a UPSTREAM WORKS defined user interface program for data delivery; it operates as a fully minimized task.

The EDIE program client program can support up to 64 simultaneous third party application connections to the server, and allows any connected program to register with CTI server to receive any specified system Events.

3 UPSTREAM WORKS EASYREACH PREVIEW DIALER

3.1 INTRODUCTION

This chapter provides an introduction to the core concepts of Upstream Works EasyReach Preview Dialer. Upstream Works EasyReach manages outbound telephone campaigns, allowing the call center agent to launch an outbound call to the customer while simultaneously providing delivery of customer information to the agent's workstation. Through its ActiveX component, Upstream Works EasyReach allows client applications to be customized to meet the precise requirements of its environment through the telephony functionality provided by EMedia CT.

The following is a list of concepts and definitions:

- **Campaign** - A campaign is a strategic grouping of call records that is managed by Upstream Works EasyReach to provide maximum effectiveness in reaching target groups. Upstream Works EasyReach can run 32 campaigns simultaneously. An agent must attach to a campaign in order to receive records. A campaign is divided into several calling periods. All records must be assigned to a calling period.
- **Record** - A record in the Upstream Works EasyReach database, containing customer information. Call records are loaded from formatted ASCII files. During loading, a record is assigned to a campaign. Records when loaded are assigned values for the campaign, job and any associated restrictions. All call records loaded into the system must belong to a campaign.
- **Job** - A grouping of call records within a campaign, according to some useful criteria. All records belong to a job, and jobs can be set up to define records by type, priority, or time period defined for a campaign during which records can be called.
- **Calling Period** - An independent subgrouping of records within a campaign according to dial times. Designed for time zone support.
- **Workflow** - A grouping of agents according to some useful criteria, essentially a map of which job to work, in which specific order. Workflows are defined for campaigns, and attach to specific jobs within a campaign. This allows groups of agents, defined by some useful criteria (e.g. skill set, experience, department, etc.), to receive records from specified jobs.
- **Job Bin** - The subset of call records within a job, for a given calling period, allowing cross-referencing of job and calling period (i.e., the active set of calling records at the current time)
- **Call Strategy** - Call Strategy allows call records to be rescheduled intelligently for repeated call attempts. Call Strategy is a configurable decision making tool that uses a text based call strategy file to determine when to make a repeat call attempt. The Call Strategy file is delivered with two standard variations, along with documentation as to how to develop new call strategies

3.2 THE UPSTREAM WORKS EASYREACH RECORD SERVER

The Upstream Works EasyReach Record Server supplies all configured agents with a steady supply of call records from which to launch calls. Agents receive records on a request basis: an agent finishes work with a current record, then requests a fresh Work Item. The server extracts a record for the agent. To do so, the server runs a search algorithm that finds an eligible record by examining the following criteria:

1. **Campaign** - The server searches only campaigns to which the agent is attached. Campaigns are searched in priority order.
2. **Agent Specification** - The server searches first for records assigned specifically to the agent. If none are found the server makes a general search.

3. **Job** - The server searches only in jobs to which the agent is attached, either individually, or by workflow. Jobs are searched in order of priority.

4. **Calling period** - The server searches in the Current Calling period.

5. **Job Bin** - For any job bin, the server searches a mix of the following record types in accordance with a predetermined ratio of:

- Initial Records that have not yet been dialed
- Quick Redials - Records that have been scheduled for redial within a recent timeframe.
- Long Redials - Records that have been scheduled for redial within a longer time frame.

The record mix is calculated to provide maximum exposure of records, and to minimize aging of records.

3.3 SYSTEM INTERFACES AND TOOLS

Customer records are loaded from a formatted ASCII file using the Upstream Works EasyReach Loader Interface. Records are formatted according to specifications in the Loader technical documentation (various commonly accepted formats are acceptable). The loader parses the data, and loads the records into campaigns that have been defined in the campaign window.

All Records in a campaign are assigned to a job. Jobs group records according to factors that are significant to the execution of the campaign. Each Job is assigned configurable job end criteria that determine when the Job is complete. (Grouping records in jobs allows the records to be ranked within Workflows.)

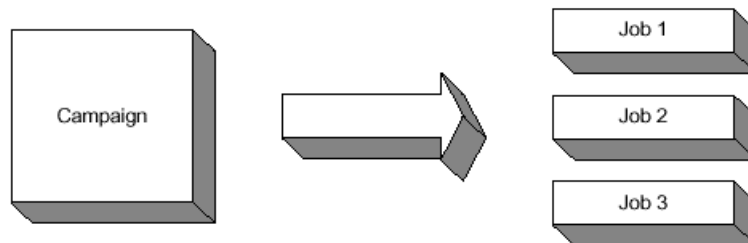
3.4 FUNCTIONALITY

3.4.1 Campaigns

Campaigns are the fundamental building blocks of Upstream Works EasyReach Preview Dialing. A campaign is a strategic grouping of call records that can be managed for maximum effectiveness in reaching target groups.

3.4.2 Jobs

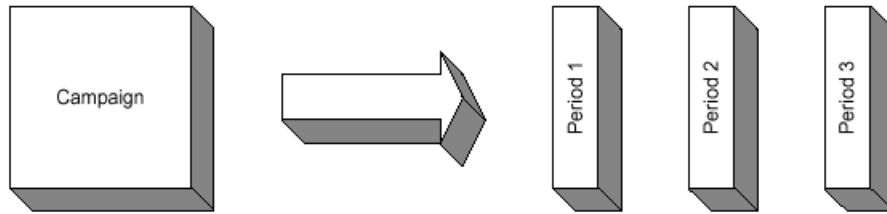
Campaigns are divided into jobs to allow the classification of target groups into useful categories. The server can run multiple campaigns, and each campaign can be divided into multiple jobs. The illustration below shows how campaign is divided into separate jobs.



3.4.3 CALLING PERIODS

Campaigns are also divided into calling periods to set the allowable calling times for groups of customer records. All records in a campaign are assigned a Calling Period.

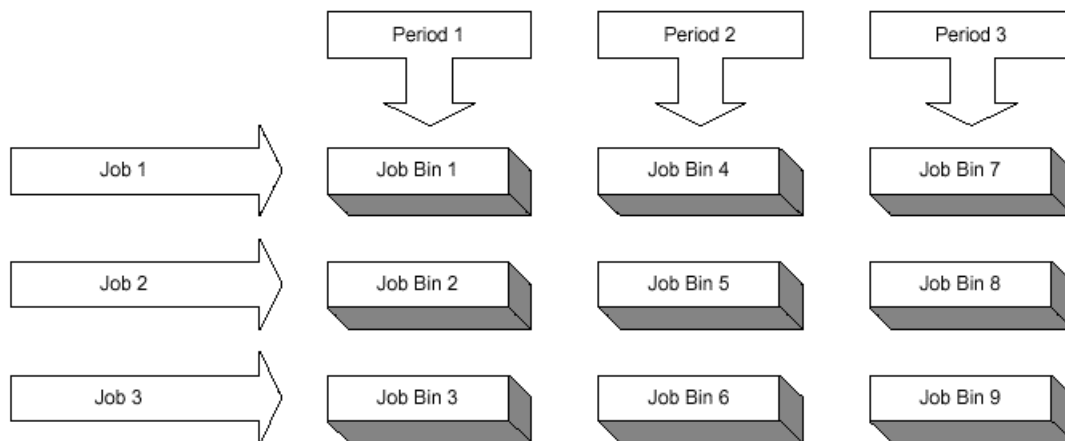
Calling Periods set the allowable time span during which a call can be placed. When retrieving a record, the server will only select records from the current Calling Period.



The use of calling periods makes sure that calls are placed only at times suitable for the recipient. (Suitability may be determined by such factors as the recipient's time zone, business hours, etc.)

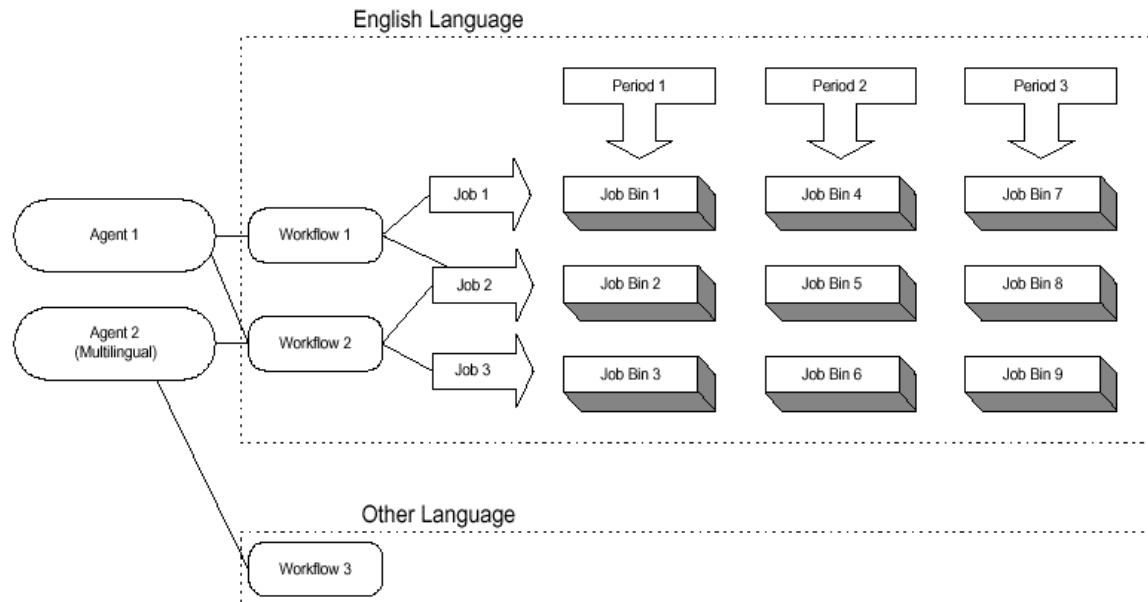
3.4.4 Job Bins

The cross-referencing of jobs and calling periods group records into job bins. A job bin defines which records for a given job can be selected in a given time period.



3.4.5 Workflows

Workflows provide a link between agents and Jobs. Campaigns are configured with Workflows to match agent groups to jobs, and to allow the priority ranking of jobs for agent groups. Agents logon to a campaign, through one or more Workflows in order to receive customer records. Agents can log onto more than one campaign. Workflows attach to a set of jobs and rank them according to priority. Jobs are searched for records in order of priority, according to configurable settings. Agents, either as Agent groups or as individual agents, are assigned to Workflows. This provides skills-based assignment of agents to jobs.



The figure above shows the general relation among Agents, Workflows, Jobs, Calling Periods, and Job Bins. Agents will be actively part of a single workflow. Agent workflow assignment overrides agent group assignment.

3.5 REPORTING

The supervisory monitoring program is capable of displaying the following information:

- Active Campaign List
- Number of agents logged on to any specific Campaign
- Total records in a campaign and/or job
- Total new open records in a campaign and/or job
- Total new targeted records in a campaign and/or job
- Total redial open records in a campaign and/or job
- Total redial targeted records in a campaign and/or job
- Total completed records in a campaign and/or job

The program will also display the following agent statistics:

- Current agent state for all agents of a specified group including agent ID, campaign/job, customer info
- Total calls processed by any agent within a group
- Total calls assigned to varying dispositions for any agent within a specific group, per campaign
- Average length of time with call record for any agent within a group.

Note: A targeted record is a record that is assigned to a specific agent

Note: An open record is a record that will be forwarded to the first available agent

Agent historical information is logged cumulatively both for the agent's current session and for the duration of the campaign.

3.6 UPSTREAM WORKS EASYREACH FREQUENTLY ASKED QUESTIONS

3.6.1 How does an agent interact with various campaigns while working on a campaign?

Each agent is assigned two current campaigns. One is designated as the agent's Master Campaign, and any outbound calls to be placed from this campaign are given highest priority. Agents are assigned master campaigns through the system configuration utility. If no calls are available to be made currently from the Master Campaign, the agent will receive preview calls from the Basic Campaign. Agents can connect to any currently operational Basic Campaigns.

3.6.2 How do jobs work?

Each campaign can be subdivided into multiple sub groups (called jobs), that are processed in a priority order. If no calls are currently available in the top priority job, then calls are processed in jobs of lower priority (up to 64 levels). As calls become available in higher priority jobs, they are processed automatically ahead of lower priority calls.

3.6.3 Can I run different agent scripts for different campaigns on the workstation?

Yes. Campaign and Job information is delivered to the user application. Thus, each campaign or job being processed can connect to a separate customer supplied call script. EMedia CT can easily be interfaced with a customer scripting application using either the C Language Programming API or the supplied OCX components in the EMedia CT Developer's Toolkit.

3.6.4 What are Calling Periods?

Each Campaign is divided into multiple time restrictions, which allow for specific calls to be made only during certain times of the day. This allows for daytime/nighttime calling or time zone scheduling.

3.6.5 Does the system support a "Do Not Call" (DNC) list?

Yes. Upstream Works EasyReach maintains a DNC list, and allows agents to add records to the DNC list immediately upon notification from the called party. This feature helps call centers to comply with government regulations applicable to telemarketing.

3.6.6 How does Preview Dialing work?

Preview dialed calls are presented to the agent, who then has the option of placing the call immediately, canceling the call, or doing nothing. If the agent does nothing, the call can be placed by the system after a configured timeout period.

3.6.7 Do you support progressive dialing?

Yes. Progressive dialing is achieved by setting the timeout value mentioned above to zero.

3.6.8 Do you support Blended agents?

Yes. Call blending is achieved by logging an agent onto an ACD Queue, and leaving their phone in the ready state. Preview or Progressive calls will be delivered to the agent, and if any ACD calls come in, they override the preview/progressive call in progress. Agents can be made outbound only, by configuring the system to place the phone set in "Make Busy" mode while logged in to the preview dialer module.

3.6.9 What about return calls to customers who require call backs or who are not contacted the first time?

At any time during a telephone call, an agent has the option of returning the call to the call list. As part of this action, agents have the option of selecting the call disposition (busy, no answer, etc), as well as rescheduling the call to a future time or date. Calls that have been returned to the campaign will be treated by the call strategy module, which will automatically determine the future call treatment (call back in 90 seconds, call back after 6 PM, delete from list, etc.) based on system administrator configuration entries. The call strategy is cumulative, as illustrated by the following example:

A call is placed to a number at 3 PM, and agent determines she/he is receiving a fax tone. The agent selects the 'fax/modem' disposition, and the call is processed. The call strategy module automatically reschedules the call for the same day, after 6 PM (normal business hours). At 7 PM, the call is delivered to another agent, who receives a fax tone. That agent again selects 'fax/modem' and proceeds to the next call. The call strategy module at this point determines that the number is actually a fax number, and marks the record as completed. Note: This is an example of how call strategy can be configured to work, and not specific rule applied to any specific situation.

3.6.10 What happens to calls that are cancelled by the agent?

Cancelled calls are placed back into the call list and treated by the Call Strategy module.

3.6.11 Can the agent override the treatment given by the Call Strategy module?

Yes. Calls rescheduled to a specific date and time by an agent are not treated by call strategy, because the agent reschedule overrides call strategy.

3.6.12 Can an agent take over ownership of a call scheduled for the future?

Yes. Calls rescheduled to a specific date and time can be optionally directed back to the specific agent who rescheduled the call. Any agent can take ownership of a call by scheduling a callback specifically for himself. Callbacks for specific agents are given a higher priority than non-specific calls within a given job priority. Calls can also be assigned to specific agents at the time the call list is generated.

3.6.13 Can I support multiple telephone numbers using the Preview Dialer?

Yes. Upstream Works EasyReach supports 4 telephone numbers for each record, and different numbers can be called depending on the history of what has happened so far to the call in the call list.

3.6.14 What has priority for a blended agent – inbound calls or outbound calls?

The PBX delivers inbound calls to an agent whenever that agent is not busy, if they are configured in blend mode. Outbound calls only take priority over inbound calls if the outbound call is placed (i.e., goes 'off hook') before the inbound call is received.

3.6.15 What are workflows?

Although agents connect to a specific basic campaign, each agent can be assigned only specific jobs within that campaign. This agent workflow is accomplished using agent groups, with specific jobs assigned in priority order to specific groups. Multiple groups can work simultaneously on any job, and one group can be defined to work on multiple jobs in priority order. For example, if you had a campaign subdivided into four smaller jobs, workflow A can be assigned to work first on jobs 1 through 4 in order. Workflow B can be assigned to work on jobs 2, then 4 only. A third workflow can be configured to work only on job 1.

3.6.16 What options exist for updating a campaign that is running?

The Upstream Works EasyReach Record Server module will allow telephone numbers to be added to specific Campaign / Job / Time Restriction group by any authorized client application. Thus, agents can manually add telephone numbers into the call list, as can external processes such as web servers, IVR's, or Voice Mail systems, depending upon the capability of the external application. New telephone numbers can also be added into a campaign from the Campaign Management user interface module.

3.6.17 What happens when I transfer a customer to another agent?

Integrated voice and data transfer is supported between all agents configured on the Upstream Works CTI server, subject to any specific limitations of the switch data interface.

4 UPSTREAM WORKS IVR

4.1 OVERVIEW

Upstream Works IVR allows the systems to capture data collected from incoming callers by Interactive Voice Response (IVR) units, and attach it to a data structure that can be delivered on the network. When used with other Application Modules, the IVR Module provides a comprehensive solution for call centers and telephony-intensive business environments.

4.2 IVR CONFIGURATION

To use an IVR system in conjunction with EMedia CT, the IVR device(s) must be connected to the switch and the LAN according to the manufacturer's instructions. Normally IVR devices are configured using a telephony connection to the switch and a TCP/IP connection to the LAN.

EMedia CT must be installed according to the instructions provided in the EMedia CT Installation Guide, with the Upstream Works IVR Module installed. IVR support can then be configured within EMedia CT. IVRs are then configured on EMedia CT using the Windows®-style interface provided by the System Resource Manager.

4.3 IVR INTERFACE EXAMPLE

The EMedia CT user has an IVR, and the inbound calling party has gone through the menu choices as presented by the IVR script. The calling party has accessed one or more of the categories, decides the information provided is insufficient or incorrect, and wants to talk to a live agent.

Calling party indicates this decision by selection of the option in the IVR script that connects the caller with an agent (normally "0").

The IVR sends data to EMedia CT using DLL (dynamic link library) calls. These DLL calls map the port number of the IVR and the port number of the switch and associated agent that receives the transferred call. EMedia CT then sends the appropriate data (both IVR entry and legacy data, as determined by specific system configuration for that user) to the agent workstation, and assigns a call ID within EMedia CT to attach all actions associated with the call transaction for logging in the database.

This operation is fully customizable through use of the EMedia CT Toolkit, allowing the capture of IVR data that precedes the call transferring from the IVR to an agent. When combined with legacy data, this allows the agent to answer the call with prior knowledge of the caller's intentions, enhancing service, reducing call length, and increasing productivity.

5 UPSTREAM WORKS CALLMATCH

5.1 OVERVIEW

Upstream Works CallMatch matches the Calling Line ID (CLID) for an incoming call to an account number in its database. It can be used in conjunction with Calling Line ID (CLID) service, or an IVR system, or both, in order to match inbound calls to account numbers.

5.2 UPSTREAM WORKS CALLMATCH WITH CLID

When used with a CLID service, Upstream Works CallMatch matches the CLID provided by the switch for an incoming call to a corresponding account number. Along with the notification of the call, the account number is sent to the agent's station, allowing the system to perform a legacy database lookup and the information to be "popped" on the agent's workstation.

5.3 UPSTREAM WORKS CALLMATCH WITH IVR

The calling number can also be obtained by IVR. The IVR unit requests the customer to enter his or her number (the number from which they usually do business with the institution). The calling line number obtained by the IVR is sent to Upstream Works CallMatch, which matches it to the caller's account number. Along with the notification of the call, the account number is sent to the agent's station, allowing the system to perform a legacy database lookup and the information to be "popped" on the agent's workstation..Upstream Works Proprietary Revised 3/12/98 25

6 UPSTREAM WORKS TIMEOUT

6.1 OVERVIEW

Upstream Works TimeOut maintains a record of agent schedule, as provided by either:

- Integration with Workforce Management Software, or
- Entry of the data into the Agent Schedule File

Client applications use the schedule information to provide agents with screen notification at the time of their breaks and at the end of their shift or work period. The system can be configured to "make busy" the agent's extension on the PBX/ACD at break time or at the end of their shift, enforcing schedules and helping to maintain customer service levels.

6.2 UPSTREAM WORKS TIMEOUT OPERATION

6.2.1 Workforce Management System Integration

Agent schedule information may be exported from Workforce Management software, allowing for real-time updating of schedule information in the EMedia CT server. This helps call center managers take full advantage of their Workforce Management Software investment.

6.2.2 The Agent Schedule File

Agent schedule information is loaded from a formatted ASCII file, following the instructions provided in the system administrator's manual. Schedule information can only be loaded for agents who are configured in the EMedia CT configuration registry..

7 UPSTREAM WORKS INFORMATION CAPTURE

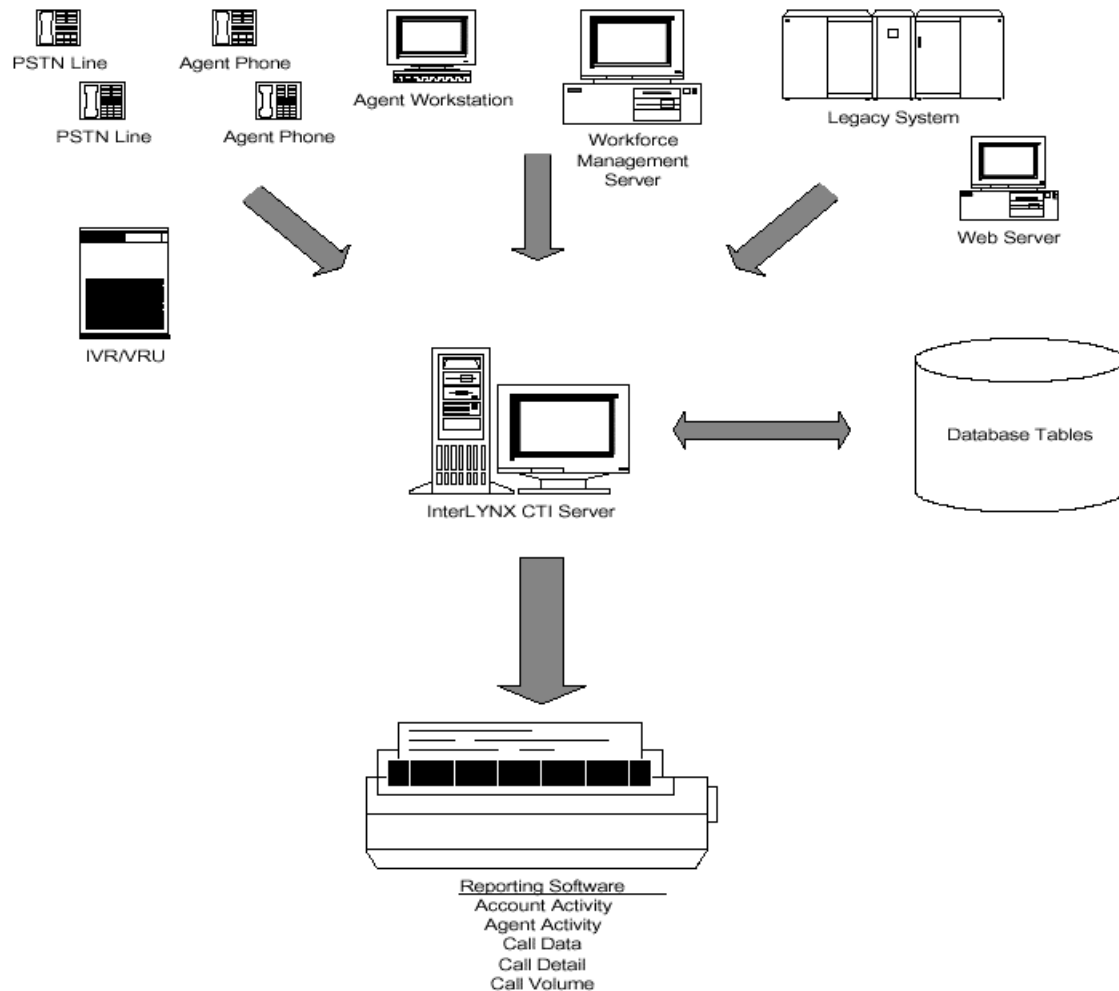
7.1 OVERVIEW

EMedia CT Information Capture provides a reporting database for the EMedia CT system. The module's data tables are populated with data provided by EMedia CT server processes.

Additional tables are provided to receive user-defined data logged from client workstations. The Information Capture Module is installed on the same server as the EMedia CT Server software. All connections to CTI processes are internal and require no additional configuration on the part of the user. A third party reporting tool can be installed locally or remotely to generate reports. The recommended reporting tool is *Seagate Crystal Reports 5.0®*, and it is assumed to be the reporting tool in use throughout this documentation.

7.2 DATA SOURCES

EMedia CT Information Capture retrieves and stores data from the variety of resources that are linked in the EMedia CT system. Among the data it can make available for reporting is call activity on the switch, agent activity, transaction records entered by agents, and information from IVR, third party applications and legacy system data that is attached to call records.



7.3 CTI DATA

The following information is provided by processes internal to the server:

- **Call Data** - All call events on the associated switch are logged by Call ID, time and address (line number). Call events include supplementary data on the roles of call participants.
- **Configuration Data** - Associations among phones, lines, stations and agents are recorded using the configuration registry and logon data.
- **Workforce Data** - Agent logons and logoffs are logged by Agent ID, ACD position (when relevant), time and location (workstation). The tables map a complex set of relationships between agent and call activity.
- **User-Defined Data** - Three tables are provided for customization by users. These tables can be used to store information provided by agent interaction with phone correspondents, or information derived from third party applications or legacy systems.
- **Database Tables** - EMedia CT Information Capture stores data in a number of database tables. The tables are contained in BTRIEVE data files.
- **Formatted Reports** - EMedia CT Information Capture features a number of prepared report formats for use with Crystal Reports. These can be easily loaded to provide a full set of detailed reports on call center activity.

7.4 EMedia CT REPORTS

The Information Capture Module features a number of prepared report formats for use with Crystal Reports. These can be easily loaded to provide a full set of detailed reports on call center activities. Listed below are some of the reports that are standard with EMedia CT.

Report Title Function

Call Tracking Report Lists the Call Segment IDs that comprise a complete call transaction

Abandoned Call Report Tracks calls which were not answered or were otherwise abandoned

Agent Call Details Returns a list of the calls handled by each agent during the period for which the report is requested

Account Activity Report Gives a report on call activity, grouped by account. Account is a user-defined value.

Associated Data Report Returns data that has been entered by user applications, grouping the data by user-defined account number.

Call Segment ID Details For each switch event registered for a Call Segment, returns an entry for each call participant, indicating his or her role in the call. Groups information in three sub-reports based on the type of participant:

Call Extension Details Parties on direct call center lines

Call Position Details Parties on ACD lines

Call Party Details Parties on external lines

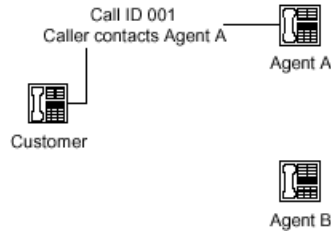
7.5 CALL INFORMATION CONCEPTS

This section introduces definitions and concepts used in the database tables and reports.

7.5.1 Call ID

A Call ID is a unique identifier assigned by EMedia CT to differentiate between telephone calls. A new Call ID is issued when the server receives notification (by switch event) of a call transaction of which it has no previous record. In the simplest case, a new Call ID will be issued when an alerting event is registered for an idle agent phone.

Call IDs are used to track calls in the system. A call is tracked by recording the switch events that occur for a call, and matching them to their Call ID. For the EMedia CT Information Capture system, a call is defined by the set of switch events correlated to its Call ID. Once a Call ID has



been issued, it is maintained for all subsequent switch events occurring in that call transaction, or until the Call ID is replaced with a new one.

Two cases in which a Call ID will be replaced are:

- when a caller is transferred from one agent to another, or
- when members of one call conference into another call.

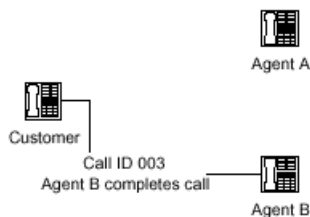
In such cases, one Call ID will be superceded by another Call ID during the course of a continuous transaction. This situation is illustrated below. Please note that there are in fact three Call IDs as the transfer notification from Agent A to Agent B generates another Call ID.

Take the case in which Agent A takes a call from a customer, then transfers the call to Agent B. From an agent point of view there are two calls.

Agent A receives the call; upon finding it is not appropriate for him to handle it, he transfers it to Agent B.



Agent A may now take another call, while Agent B takes what is for her a new call.



The system recognizes this by assigning a new Call ID. From the customer's point of view, however, there is only one call in what from a business point of view may be all one transaction.

7.5.2 Call Transaction

Call transaction refers to the entire process illustrated above. A Call transaction is a linked series of switch events, involving two or more parties, in which from the initial connect event to the final connect event at least two of the parties are in a state of connection. A transaction can include any number of transfers and conferences. The parties involved at the end of the transaction need not be the same as those involved at the beginning. A continuous call transaction can correspond to more than one Call ID, as in the example depicted above:

One call transaction involving three Call ID's

Call ID 001 Customer contacts Agent A

Call ID 002 Transfer Notification

Call ID 003 Agent B completes transaction with customer

Enterprise CTI does not issue identifiers for call transactions. Call transactions involving more than one ID are tracked using Call Ancestors.

7.5.3 Call Ancestor

A Call Ancestor is the Call ID of a prior call that has been superseded by a new Call ID, usually through a transfer or conference event. Call Ancestors are tracked using the Call Ancestor table.

7.5.4 Agent Calls

An agent call is the portion of a telephone transaction handled by an individual agent, and corresponding to a single Call ID. Agent calls are tracked using the Agent Calls table.

7.5.5 Switch Events

Switch events are events occurring on the switch that correspond to a change in the state of a phone connection. Switch events are correlated with the Call ID to which they correspond.

EMedia CT tracks telephone activity by registering switch events for the phone devices configured on its system.

8 UPSTREAM WORKS DEVELOPER'S TOOLKIT

8.1 OVERVIEW

The Upstream Works Integration Tool Kit provides a series of programming tools allowing for easy integration of agent desktop applications (such as customer care software and sales force automation software) with call center telephony resources. It also allows customization of user interfaces (GUIs) for specific customer applications.

The Upstream Works Integration Tool Kit consists of three components. The first component is the Upstream Works Workstation Engine External Telephony API (WSEXTAPI). Through WSEXTAPI, customized access to Upstream Works messaging and data services is provided for networked applications.

The second component of the Upstream Works Integration Tool Kit consists of the Upstream Works ActiveX Controls. The Upstream Works ActiveX Controls provide programmable object-oriented interfaces to the Client Station Engine, which can be incorporated into any application development environment that supports VB Script, such as Visual Basic, Delphi, or Microsoft Outlook.

Upstream Works DDE is the third component of the Upstream Works Integration Tool Kit. Upstream Works DDE provides client applications (for example, third party customer care software) with DDE access to messages coming to and from the EMedia CT server.

8.2 UPSTREAM WORKS WORKSTATION ENGINE EXTERNAL TELEPHONY API

WSEXTAPI consists of a set of function calls and messages written in C that provide third party applications (for example, a customer care application) programming access to Upstream Works's core messaging and routing services. Through WSEXTAPI, customized access to Upstream Works's messaging and data services is provided for networked applications.

EMedia CT uses an internal messaging system to coordinate activity and data delivery among modules and networked applications. The access to Upstream Works services provided by WSEXTAPI is through this messaging system.

All calls in WSEXTAPI are handled through the Client Workstation Engine, which is installed as a component on all EMedia CT client stations.

The application's interaction with the server is regulated by two callback functions that the application provides the server upon opening a connection. The Client-Workstation Engine calls one of these callback functions (by reference) whenever an event arrives for which the application is registered or is the addressee. These functions must handle all of the events and messages for which the application registers. At the end of a session the application must cancel all of its registrations with the server and close the connection.

WSEXTAPI provides functions to accomplish the following tasks:

- Opening, closing, and regulating the connection with the CTI server
- Creating, copying, and deleting messages, and writing messages to the server
- Entering and retrieving data from different formats of Upstream Works messages
- Creating filter key lists in order to register for events

Messages provided with WSEXTAPI allow the following CTI functions to be customized:

- The reception of switch information and call related data from the switch
- Computer control of telephone resources connected to the switch
- Delivery of data to the Information Capture Database
- Attachment of data to calls using their Call IDs. Upstream Works Proprietary Revised 3/12/98 31
- Reception of data attached to calls by other applications, such as IVR systems.

8.3 UPSTREAM WORKS ACTIVE X CONTROLS

The Upstream Works ActiveX Controls comprise the second component of the Upstream Works Integration

Toolkit. They are fully compatible with Microsoft's Visual Basic and the Component Object Model (COM).

The following are the four Upstream Works ActiveX Controls currently available:

- EMedia CTStation ActiveX Control
- Upstream Works CLID ActiveX Control
- Upstream Works TimeOut ActiveX Control
- Upstream Works EasyReach ActiveX Control

8.3.1 EMedia CTStation ActiveX Control

The EMedia CTStation ActiveX Control can be used by desktop applications that require detailed PBX activity information for the agent currently logged onto an EMedia CT enabled workstation. The EMedia CTStation ActiveX Control provides core objects that represent basic telephony items such as phones, lines, and call information. This control allows agents to (via integrated third-party application) place calls, make busy or unbusy, answer calls, transfer or conference calls, and log in and out of ACD queues.

8.3.2 Upstream Works CLID ActiveX Control

The Upstream Works CLID ActiveX control provides a group of programmable objects that can be used to register a workstation for data attached to calls as a result of a lookup on Calling Line ID

("CLID"). Calling Line ID is a Local Exchange Carrier provided service that supplies the calling number for an incoming call. The EMedia CT server provides a data attachment service for CLID. The CLID ActiveX control provides programmable access to this service in an object-based environment. This control allows integration of third-party applications and delivery to those applications of CLID, DNIS, and account numbers that are received from IVR entries or converted from CLID by Upstream Works via internal database lookup.

8.3.3 Upstream Works TimeOut ActiveX

The ActiveX components in the TimeOut Control allow a client station to maintain an updated work schedule for the logged-in agent, and to receive notification of the agent's breaks.

Break notifications are read from a schedule that is maintained by the TimeOut module on the server. This control supports delivery of agent schedule information to all connected applications.

8.3.4 Upstream Works EasyReach ActiveX

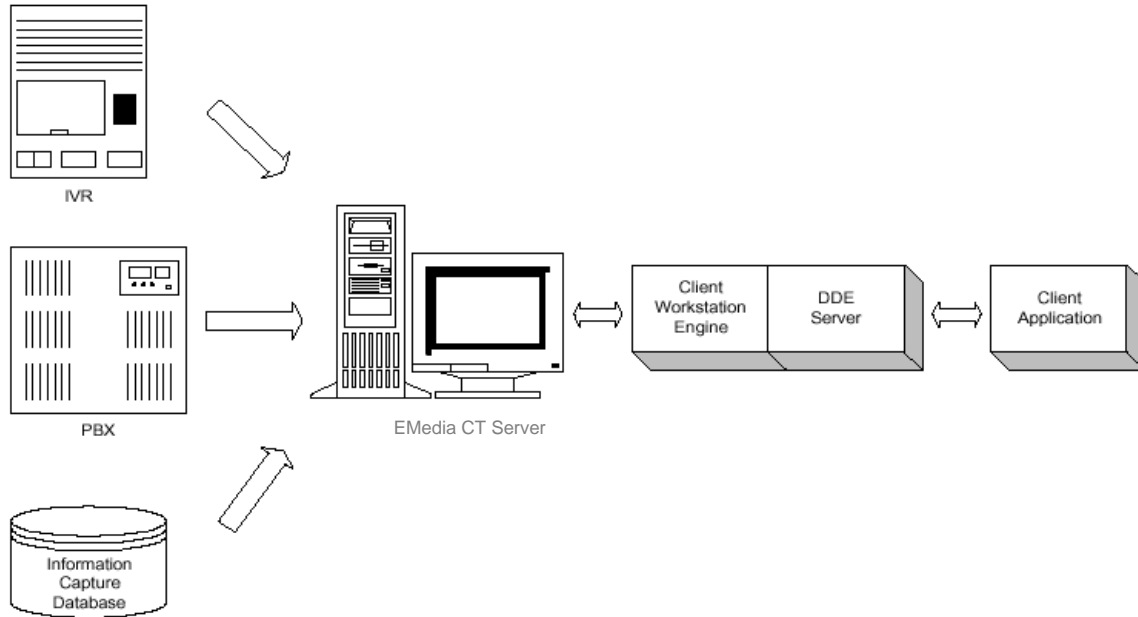
The Upstream Works EasyReach ActiveX Control provides a set of objects that allow a programmer to build Upstream Works EasyReach client applications in object-based programming environments such as Visual Basic. It also allows full integration with third party applications to facilitate delivery of call record data to those applications. This control also allows agents to set callback times, specify callback numbers, disposition calls, and add or update customer specific information, including adding records to the Do Not Call (DNC) List.

8.4 UPSTREAM WORKS DDE

The Upstream Works DDE is the third component in the Upstream Works Integration Tool Kit.

DDE is a form of inter-process communication for the Microsoft Windows® and OS/2® operating systems. When two or more programs that support DDE are running simultaneously, they can exchange information, data, and commands. The purpose of Upstream Works DDE is to provide client applications (for example, third party customer care software) with DDE access to EMedia CT messaging. For example, a DDE conversation would require passing DNIS (Dialed Number Identification Service, associated with toll-free service, indicating the number called) information from the EMedia CT server to a customer care or other client application.

The illustration below depicts the interfacing of Upstream Works DDE, the client application, and EMedia CT:



Upstream Works DDE supports inter-process data delivery in three situations:

- For data entered into a client application that is required to be sent to the Upstream Works Information Capture Database (refer to the Upstream Works System Architecture for more information on this module);
- For the delivery of data (such as an account number) from an IVR system, through the EMedia CT server to a customer care or some other client application, and
- For delivery of ANI (“Automated Number Identification”), DNIS (“Dialed Number Identification Service”) and CLID (Calling Line Identification) information to client applications.

Data sent to the Upstream Works Information Capture Database can be either agent specific or non-agent specific. All information feeds are by hot link.

The information presented within this document is an overview of the functionality of the EMedia CT product and its associated optional modules. This document is not intended to be a complete description of the product, and should not be regarded as such. Please refer to the system manuals for further information as to the capabilities of the products mentioned herein.

The foregoing documentation is intended for use by customers and prospective customers of Upstream Works and its subsidiaries. It is not to be distributed outside the confines of the business relationship established by and between the aforementioned.

It is the responsibility of the end user of this product to comply with all governmental regulations that relate to the use of this product.