Continuous Speech Processing API for Host Media Processing

Demo Guide

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Revision History

This revision history summarizes the changes made in each published version of this document.

Document No.	Publication Date	Description of Revisions
05-2084-003	April 2005	Demo Description chapter: Added note about channel number that can be used when running the demo. Running the Demo chapter: Updated demo name (now CSPDemo) and demo path information for CSP demo. Demo Details chapter: Added CSPDemo_version.c file to the table.
05-2084-002	September 2004	Added Linux* support for the Continuous Speech Processing for Intel® NetStructure™ Host Media Processing demo.
05-2084-001	September 2003	Initial version of document.

About This Publication

The following topics provide information about this publication:

Purpose

This publication describes the continuous speech processing (CSP) demonstration program for Host Media Processing and provides instructions for running the program on Linux* and Windows* operating systems.

Applicability

This document is published for Intel® NetStructure™ Host Media Processing Software Release 1.3 for Windows operating system.

This document may also be applicable to later software releases (including service updates) on Linux or Windows. Check the Release Guide for your software release to determine whether this document is supported.

Intended Audience

This publication is written for software developers who will use the continuous speech processing (CSP). This may include any of the following:

- Distributors
- System Integrators
- Toolkit Developers
- Independent Software Vendors (ISVs)
- Value Added Resellers (VARs)
- Original Equipment Manufacturers (OEMs)

How to Use This Publication

This publication assumes that you understand computer telephony terms and concepts, and are familiar with the Windows* or the Linux* operating system and the C programming language.

The information in this guide is organized as follows:

- Chapter 1, "Demo Description" provides a brief overview of the continuous speech processing demo.
- Chapter 2, "System Requirements" discusses the requirements for running the demo.
- Chapter 3, "Preparing to Run the Demo" lists tasks to follow before running the demo.
- Chapter 4, "Running the Demo" describes the steps to run the demo, the demo options, the various demo modes of operation, and how to stop the demo.
- Chapter 5, "Demo Details" provides additional information about the demo, such as the files used by the demo.

Related Information

See the following for more information:

- For information about continuous speech processing library features and guidelines for building applications using CSP software, see the *Continuous Speech Processing API Programming Guide*.
- For details on all functions and parameters in the continuous speech processing library, see the *Continuous Speech Processing API Library Reference.*
- For information about voice library features and guidelines for building applications using voice software, see the *Voice API Programming Guide*.
- For details on all functions and parameters in the voice library, see the *Voice API Library Reference*.
- For details on the standard runtime library, supported programming models, and programming guidelines for building all applications, see the *Standard Runtime Library API Programming Guide*. The standard runtime library is a device-independent library that consists of event management functions and standard attribute functions.
- For details on all functions and data structures in the standard runtime library, see the *Standard Runtime Library API Library Reference*.
- For details on compatibility issues, restrictions and limitations, known problems, and late-breaking updates or corrections to the release documentation, see the Release Update for the software release you are using.
- For details on installing the software, see the Installation Guide for the software release you are using.
- For guidelines on building applications using Global Call software (a common signaling interface for network-enabled applications), see the *Global Call API Programming Guide*.
- For details on all functions and parameters in the Global Call library, see the *Global Call API Library Reference*.

Demo Description 1

This chapter describes the continuous speech processing (CSP) demonstration program for Intel® NetStructure™ Host Media Processing (HMP) software, also referred to as the CSP demo.

The CSP demo is a single-threaded program that illustrates key product features such as barge-in, voice activity detection, echo-cancelled recording and echo-cancelled streaming.

You can run the demo in two different modes:

- **Manual mode** - The manual mode is a single-channel, interactive demo. This mode allows you to barge in on a prompt that is being played. Messages are displayed on your screen as the demo progresses. This mode illustrates the operation of the **ec_stream( )** function.
- **Diagnostic mode** - The diagnostic mode is a non-interactive demo that exercises the CSP parameters.

Note: The CSP demo is designed to run on a single channel. The highest channel number that can be specified is 120. Attempts to run the demo using a channel number higher than 120 will cause the demo to fail.

System Requirements 2

The requirements for running the continuous speech processing (CSP) for Intel® NetStructure™ Host Media Processing (HMP) software demo are described in this chapter.

To run the CSP demo, you need the following:

- InterNet ready PC with the HMP software installed
- Microsoft* NetMeeting or an Analog Telephone Adaptor (for example, Cisco* ATA 186)
- Runtime HMP license that supports the CSP feature

Preparing to Run the Demo 3

This chapter provides information on the preparations to follow before running the continuous speech processing (CSP) for Intel® NetStructure™ Host Media Processing (HMP) demo.

Before running the CSP demo, make sure you have completed the following:

1. Adhered to the system requirements listed in Chapter 2, “System Requirements”.
2. Started the system service using the dlstart command on Linux or the configuration manager (DCM) on Windows.

Running the Demo 4

Information on running the continuous speech processing (CSP) for Intel® NetStructure™ Host Media Processing (HMP) demo is provided in the following sections:

4.1 Starting the Demo

The CSP demo is a command-line driven demo.

Linux

To run this demo, follow these instructions:

1. Open a command prompt window and go to the directory where the demo is located. On Linux, the demo is located in */demos/SpeechProcessing/CSPDemo/* under INTEL_DIALOGIC_DIR, the environment variable for the directory in which the HMP software was installed.

2. At the command prompt, type

   ```
   ./CSPDemo -<option>
   ```

   For help on demo options, type

   ```
   ./CSPDemo -?
   ```

   Note: On Linux, the demo name is case-sensitive and must be entered as shown.

   The demo options are described in Section 4.2, “Demo Options”, on page 18. If you don’t specify an option, default options are assumed.

Windows

To run this demo, follow these instructions:

1. Open a command prompt window and go to the directory where the demo is located. On Windows, the demo is located in *\demos\SpeechProcessing\CSPDemo* under INTEL_DIALOGIC_DIR, the environment variable for the directory in which the HMP software was installed.

2. At the command prompt, type

```
CSPDemo -<option>
```

For help on demo options, type

```
CSPDemo -?
```

Note: On Windows, the demo name is not case-sensitive.

The demo options are described in Section 4.2, "Demo Options", on page 18. If you don't specify an option, default options are assumed.

4.2 Demo Options

You can choose from several options when running the CSP demo as shown in Table 1. If an option is not specified when running the CSP demo, a default value applies.

The format for specifying options at the command prompt is:

```
<demo name> -<option1> -<option2> -<optionx>
```

For example, to run a test on channel 10 with the voice activity detector, echo canceller and barge-in turned on, type:

```
CSPDemo -c10 -v -e -b
```

For detailed information on functions and parameters mentioned in the table, see the *Continuous Speech Processing API Library Reference*.

Notes: ***1.*** The order in which you specify demo options is not important.

2. In the table, N represents an integer.

Table 1. CSP Demo Options

Demo Option	Default Value	Description/Value
-?	none	Displays command line options.
-b	disabled	Enables barge-in mode. In this mode, the outgoing prompt will be terminated when the voice activity detector (VAD) is triggered.
-cN	-c1	Specifies the channel number to use in manual mode. Channel number cannot be higher than 120. **Note:** This value is ignored for the diagnostic mode. See -d option for information on setting diagnostic mode.
-d	disabled	Enables diagnostic mode. When running in diagnostic mode, it is recommended that you turn on logging (-l) to have a written record of the findings. In this mode, the demo tests all parameters available in **ec_setparm( )**. After the tests are completed, the demo resets all values to their original setting.

Table 1. CSP Demo Options (Continued)

Demo Option	Default Value	Description/Value
-e	disabled	Enables echo cancellation mode. In this mode, the incoming energy is echo-cancelled.
-l	disabled	Enables logging of results to a text file called *CSPdemo.log*. **Note:** This option is available for diagnostic mode only. For manual mode, the results are displayed on the screen.
-pN	-p1	Specifies the network interface channel for Global Call. The default value is 1, for H.323. A value of 2 is used for IP.
-tN	-t-40	Specifies the speech threshold value while a prompt is playing. This setting overrides the value in DXCH_SPEECHPLAYTHRESH. The default value is -40 dBm. The range is +3 to -54 dBm.
-v	disabled	Enables voice-activated record mode (ECCH_VADINITIATED). Enables or disables voice-activated record in the application. If enabled, streaming of data to the application begins only after energy is detected. If disabled, streaming begins when **ec_setparm( )** is called.

4.3 Using the Demo

The following topics provide more information on using the CSP demo:

- Manual Mode
- Diagnostic Mode

4.3.1 Manual Mode

To run the CSP demo in the manual mode, type:

```
CSPDemo -p2 -b
```

The manual mode is a single-channel demo that uses the specified channel to allow you to listen to a prompt and interrupt as the prompt is playing. Messages are displayed on your screen as the demo progresses. This mode illustrates the operation of the **ec_stream( )** function. It also contains code for the **ec_reciottdata( )** function.

In manual mode, the demo runs as follows:

1. After the demo starts, a welcome prompt, *sample.pcm*, is played.

2. This part of the demo illustrates the operation of the **ec_stream( )** function. As the prompt is playing, you can interrupt the prompt or barge in through the NIC connection.

   As soon as you speak, the prompt stops playing and echo-cancelled recording begins. TDX_BARGEIN, TEC_VAD, and TDX_PLAY events are generated. The demo records your

message for 6 seconds and stores the message in *ec_stream.pcm*. At the end of this time, the TEC_STREAM event is generated to indicate termination of recording.

The demo then plays back the echo-cancelled recording of your message.

3. The demo is completed.

4.3.2 Diagnostic Mode

To run the CSP demo in diagnostic mode, type:

```
CSPDemo -d -l
```

The diagnostic mode is a single-channel demo that can be used to verify operation of all parameters available through the **ec_setparm( )** function. The demo alternatively sets each parameter to the minimum value, maximum value, and an out-of-range value and returns the appropriate message. After the demo is completed, parameters are reset to their original values (see demo source code).

A summary of the results is reported in the log file.

Note: Because diagnostic mode includes a test for invalid parameter values, you will see error messages in the log file. This is expected. For example, you will see a message such as "FAIL: diagnostic test found 16 errors."

4.4 Stopping the Demo

Typically the CSP demo runs to completion and stops automatically.

If necessary, you can press **Ctrl-C** at any time to exit the demo. The channel and files are properly closed by the demo.

Demo Details 5

The following section provides further detail on the continuous speech processing (CSP) for Intel® NetStructure™ Host Media Processing (HMP) demo. You do not need this information to run the demo successfully.

5.1 Files Used by the Demo

Table 2 lists the files used by the CSP demo.

Table 2. Files Used by the CSP Demo

File Name	Purpose
CSPDemo_version.c	Version control file. Contains version number of the demo.
CSPdemo.log	Log file. This ASCII text file logs the results of the CSP demo run. For example, the log lists the test mode, channel used, and the activities that occur as the demo progresses.
ec_stream.pcm	File generated by the **ec_stream( )** function. Contains an echo-cancelled recording of your speech in response to the second prompt when you run the demo in manual mode.
sample.pcm	Welcome prompt used when the demo begins. Used when running the demo in either the manual or diagnostic mode.

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