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Intel® Dialogic® System Release 6.1 for Linux

Release Guide

August 2005

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Contents

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About This Publication

The following topics provide information about this publication:

Applicability

This document provides information about Intel® Dialogic® System Release 6.1 for Linux. This release merges select CompactPCI* and PCI products and features into one release.

System Release 6.1 for Linux considers the Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux as the two previous "base" releases. Features and products indicated as "new" in this document are compared with what was available in those base releases.

Intended Audience

This document is intended for the following types of customers:

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

How to Use This Publication

The information found in this document is organized into the following sections:

- Chapter 1, "Release Overview" provides a high-level overview of this release.
- Chapter 2, "System Requirements" describes what you need to install and use this release.
- Chapter 3, "New Features by Product" describes the new features of this release.

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- Chapter 4, "Installation and Configuration" describes the installation and configuration software features supported in this release.

- Chapter 5, "OA&M Software" describes the operation, administration, maintenance, and diagnostics supported in this release.

- Chapter 6, "Programming Libraries" describes the programming libraries and tools that are available in this release.

- Chapter 7, "Demonstration Software" describes the demonstration programs provided in this release.

- Chapter 8, "Supported Hardware" provides a list of all the hardware supported in this release.

- Chapter 9, "Documentation" provides a list of the documents that accompany this release (either on CD or downloadable from the Intel® website).

Related Information

Refer to the following for additional information:

- For Technical Support, visit the Telecom Support Resources website at the following link:
  http://developer.intel.com/design/telecom/support/index.htm

- For Products and Services Information, visit the Telecom Products website at the following link:
  http://www.intel.com/design/telecom/index.htm

- For Sales Offices and other contact information, visit the Buy Telecom Products website at the following link:
  http://www.intel.com/buy/networking/telecom.htm

- The *Intel Dialogic System Release 6.1 for Linux Release Update* document contains information about known problems, resolved problems, and documentation updates associated with this release. The Release Update is available at the following link:
  http://www.intel.com/design/network/manuals/telecom/index.htm

  Note: Refer to the Release Update for late-breaking changes or corrections to the release information. Information is updated in the Release Update, as needed, during the lifecycle of the system release.

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Release Overview 1

This chapter provides a high-level overview of the products and features that are supported in Intel® Dialogic® System Release 6.1 for Linux. Products and features described in this document are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

System Release 6.1 for Linux is a release that merges both CompactPCI* and PCI form factors into a single release and introduces new products and features.

Highlights

System Release 6.1 for Linux provides the following new products and features:

Operating System Support

- Red Hat* Enterprise Linux v3
- Mandriva* PowerPack 9.2

  Note: Beginning with Intel® Dialogic® System Release 6.1 for Linux, Intel has adopted support policies for managing Linux operating system distributions (OSDs) and Linux distribution updates. Refer to the Support Policies for Intel® Dialogic® System Releases on Linux website for additional information: *http://www.intel.com/network/csp/products/sr/9467web.htm*

Product and Features Support

- New Intel® Dialogic® D/4PCIUF and D/4PCIU4S products
- New Intel® Dialogic® DMV160LP product
- New Intel® Dialogic® DI products
- New Intel NetStructure® DMT160TEC product
- New Intel NetStructure® DMV-B products and features
- New Intel NetStructure® IPT10000C board
- New Intel NetStructure® SS7 products and SIUs
- New features for Intel NetStructure® IPT products
- New features for Intel® Dialogic® JCT products
- New features for Intel NetStructure® DM/F products
- New features for Intel NetStructure® DMN160TEC products
- New features for Intel NetStructure® DM/V and DM/V-A products
- New features for Intel NetStructure® High Density Station Interface (HDSI) products

Global Call Protocols

- The Global Call Protocols Package is now integrated into the System Release 6.1 for Linux software installation. Previously, it was a separate, installable package. Do not

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install the stand-alone protocols package after installing System Release 6.1 for Linux.

Application Programming Interface Libraries

- New Board Management Library (BML)

Operation, Administration and Maintenance (OA&M)

- Improved installation
  - Global Call Protocols are now installed with the system release software
  - The Redistributable Runtime Files and Software Development Kit (SDK) can be installed together or each item can be installed separately
  - A silent uninstall can be performed with or without data backup
- New Configuration Manager
  - Consolidates configuration for all Intel product families
  - Provides trunk configuration facility
- Improved diagnostics
  - Addition of several new diagnostic tools
  - Enhancements to the *Diagnostics Guide*
- Support for Peripheral Hot Swap (PHS)

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System Requirements   **2**

This chapter describes the hardware and software system requirements for Intel® Dialogic® System Release 6.1 for Linux.

2.1   Basic Hardware Requirements

The minimum hardware requirements for System Release 6.1 for Linux follow. This section is divided by form factor because each form factor has slightly different hardware requirements.

Note: The basic hardware requirements documented in this section may not be sufficient for high-density systems.

CompactPCI* Hardware Requirements

The minimum hardware requirements for CompactPCI* boards follow:

- 700 MHz or faster Intel® Pentium® III Processor
- 512 MB RAM
- CD-ROM drive
- VGA display

PCI Hardware Requirements

The minimum hardware requirements for PCI boards follow. Note that Intel® Dialogic® boards with Springware architecture and Intel NetStructure® boards with DM3 architecture products have their own specific hardware requirements.

Systems using only Intel® Dialogic® boards with Springware architecture require the following:

- 850 MHz or faster Intel® Pentium® III Processor
- 512 MB RAM
- CD-ROM drive
- VGA display

Systems using Intel® Dialogic® boards with Springware architecture and Intel NetStructure® boards with DM3 architecture require the following:

- 1.5 GHz or faster Intel® Pentium® III Processor
- 512 MB RAM

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- CD-ROM drive
- VGA display

Compatibility

The compatibility requirements for System Release 6.1 for Linux follow:

- System Release 6.1 for Linux is designed for 32-bit/33 MHz system PCI slots, but is compatible with 64-bit/66 MHz system slots and PCI-X bus systems, which are 64-bit & 66/100/133 MHz slots. Specifically, this release is able to perform in a system that supports 64-bit/66 MHz or PCI-X system slots; however, it is not optimized for 64-bit/66 MHz or PCI-X.

- System Release 6.1 for Linux supports Intel® Hyper-Threading Technology (HT Technology) and Linux Symmetric Multi-Processor (SMP) machines. Multi-Threaded Applications running on HT Technology enabled platforms and other SMP machines will interoperate safely with this system release.

- System Release 6.1 for Linux operates on servers that utilize multiple IA32 based processors; Symmetric Multiprocessing (SMP) safe.

2.2 Basic Software Requirements

System Release 6.1 for Linux supports the following operating systems:

- Red Hat Enterprise Linux v3 (RHEL v3) (Advanced Server, Enterprise Server and Workstation versions)
- Mandriva PowerPack 9.2

  Note: Beginning with Intel® Dialogic® System Release 6.1 for Linux, Intel has adopted support policies for managing Linux operating system distributions (OSDs) and Linux distribution updates. Refer to the Support Policies for Intel® Dialogic® System Releases on Linux website for additional information: *http://www.intel.com/network/csp/products/sr/9467web.htm*

For your convenience, Linux Streams (LiS) version 2.18.1 is included on the System Release 6.1 for Linux CD-ROM.

LiS is required if you have the Intel® Dialogic® Springware package installed on your system. To determine if your board requires LiS, refer to Chapter 8, "Supported Hardware" of this document (Intel® Dialogic® boards based on Springware architecture are differentiated with an asterisk).

Notes:1. If you had installed LiS Version 2.16.18 when using System Release 6.1 for Linux Feature Release 1 or 2, you must upgrade LiS to Version 2.18.1 before installing this

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release of System Release 6.1 for Linux (the general availability release). See the *Software Installation Guide* for details.

2. Intel® Dialogic® drivers do not support Physical Address Extensions (PAE). Users using the supported Linux version need to restrict memory to 4GB.

3. Intel® Dialogic® drivers do not support more than 4 GB of RAM. This restriction applies to both form factors (cPCI and PCI).

The following table indicates the kernel, compiler and LiS versions for each supported operating system.

	Red Hat Enterprise Linux v3 (RHEL v3) Advanced Server	Red Hat Enterprise Linux v3 (RHEL v3) Enterprise Server	Red Hat Enterprise Linux v3 (RHEL v3) Workstation	Mandriva PowerPack 9.2
Kernel version	kernel 2.4.21-27 EL (SMP and non-SMP versions)	kernel 2.4.21-27 EL (SMP and non-SMP versions)	kernel 2.4.21-27 EL (SMP and non-SMP versions)	kernel 2.4.22-10mdk
Compiler version	gcc version 3.2.3	gcc version 3.2.3	gcc version 3.2.3	gcc version 3.3.1
Linux Streams (LiS) version	LiS version 2.18.1	LiS version 2.18.1	LiS version 2.18.1	LiS version 2.18.1

Kernel Variations

If your Red Hat or Mandriva operating system version uses a different version of the 2.4 kernel, and you will be using Intel® telecom boards with a DM3 architecture, you will need to recompile the CTIMOD source file before you start the Intel® Dialogic® system. The procedure is provided in the *Software Installation Guide*.

Requirements for NetSNMP

If you plan to use SNMP[1] please note the following requirements for NetSNMP[2]:

- SNMP may not be supported if the Linux Distribution does not use NetSNMP Master Agent 5.09. Source code for NetSNMP is included with System Release 6.1 for Linux. Do not use the NetSNMP that is included with Red Hat Linux. Refer to the *Software Installation Guide* for instructions on installing NetSNMP.

- Any NetSNMP distribution that does not support `dlmod` will have to be patched. The *SNMP Agent Software Administration Guide* describes how to patch the NetSNMP 5.0.9 updates on Red Hat Enterprise Linux v3, Advanced Server.

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1. Simple Network Management Protocol, a standard IP network mechanism for exchanging management information between an SNMP agent and an SNMP manager.
2. NetSNMP is a software package that comprises various tools relating SNMP. If you intend to use SNMP agent software for remote monitoring and administration of Intel telecom boards over an IP network, NetSNMP is required on the managed node(s).

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Requirements for Diagnostic Tools

Following are requirements for some of the diagnostic tools:

- If you intend to use any of the graphical diagnostic utilities contained in the *${INTEL_DIALOGIC_DIR}/qscript* directory (such as PSTN Diagnostics), you must install the XFree86, XFree86-libs, and TK RPMs on your system. These RPMs are contained on the Red Hat distribution media. The *Diagnostics Guide* specifies which diagnostic utilities require this.

- A Java Runtime Environment is required for operation of the UDD diagnostics tool. For more information, refer to the *Diagnostics Guide*

Third Party Software

System Release 6.1 for Linux includes Third Party software from a variety of vendors. Refer to the *Software Installation Guide* and the *DM3 Configuration Guide* for more information about Third Party software.

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New Features by Product 3

This chapter describes the new features available in Intel® Dialogic® System Release 6.1 for Linux. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

3.1 New Intel Dialogic D/4PCIU4S and D/4PCIUF Products

The Intel® Dialogic® D/4PCIU4S and D/4PCIUF four-port, half-size DSP-based voice and voice/fax boards have four analog line interfaces.These boards offer enhanced DSP power and memory capacity for future application expansion via software-based technologies. The D/4PCIU4S and D/4PCIUF are Universal PCI form factor. These boards are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

The following is a description of the boards:

D/4PCIU4S
    The D/4PCIU4S is 4-port voice board with basic voice processing, CSP and analog loop start in a single PCI slot.
        Note: The D/4PCIU4S board displays as D/4PCIU in the Intel® Dialogic® Configuration Manager for Linux utility.

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D/4PCIUF
>   The D/4PCIUF is a 4-port voice board with basic voice processing, fax and analog
>   loop start in a single PCI slot.
>   >   ***Note:*** The D/4PCIUF board displays as D/4PCIU in the Intel® Dialogic®
>   >   Configuration Manager for Linux utility.

Features

System Release 6.1 for Linux supports the following features on D/4PCIU4S and
D/4PCIUF boards:

- Continuous speech processing (CSP) support (D/4PCIU4S only). Refer to the *CSP API Programming Guide* and the *CSP API Library Reference* for more information.

- Universal Dialogic Diagnostics (UDD). Refer to the *Diagnostics Guide* for more information.

- SNMP administration support. Refer to the *SNMP Agent Software Administration Guide* for more information.

- Global dial pulse detection (DPD) support. Refer to the *Voice API Programming Guide* for more information.

- DSP-based Group 3 fax support (DSP fax or SoftFax support) on D/4PCIUF only. Refer to the *Fax Software Reference* for more information.

- GSM and G.726 speech coders. Refer to the *Voice API Programming Guide* and the *Voice API Library Reference* for more information.

- A-Law/Mu-Law support. Refer to the *Springware Configuration Guide* for more information.

- Record Automatic Gain Control (AGC). Refer to the *Voice API Programming Guide* and the *Voice API Library Reference* for more information.

- DTMF/MF detection/generation. Refer to the *Voice API Programming Guide* and the *Voice API Library Reference* for more information.

- US/UK/Japan (CLIP) Caller ID. Refer to the *Voice API Programming Guide* and the *Voice API Library Reference* for more information.

3.2   New Intel Dialogic DMV160LP Products

The Intel® Dialogic® DMV160LP and DMV160LPEU are voice processing and analog
interface boards, which provide enhanced capabilities for developing multimedia
communications applications such as Web-enabled contact centers, unified messaging,
and speech-enabled interactive media response (IMR) systems. These products offer
advanced features and support for DSP technology and signal processing algorithms.

DMV160LP
>   The DMV160LP product is a high-density analog loop start voice processing board
>   with a universal PCI form factor. Based on DM3 architecture, it provides 16 channels
>   of voice processing, 16 analog loop start interfaces, and supports fax as well as
>   continuous speech processing.

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DMV160LPEU

The DMV160LPEU product is a high-density analog loop start voice processing board with a universal PCI form factor. Based on DM3 architecture, this board provides 16 channels of voice processing, 16 analog loop start interfaces, and supports fax as well as continuous speech processing. It is the European version of the DMV160LP (the front end impedence has been tuned for European use).

Features

The DMV160LP products provide the following key features and functionality in System Release 6.1 for Linux:

Flexible routing support
Flexible routing configuration, also called exportable voice resources, is supported. Refer to the *DM3 Configuration Guide* for more information.

Simultaneous voice, CSP, and fax support
Supports voice record activity with continuous speech processing (CSP) and fax. Refer to the *Voice API Programming Guide* for more information on voice features. Refer to the *CSP API Programming Guide* for more information on CSP features. Refer to the *Fax Software Reference* for more information on fax features.

API support
Support for voice, fax, continuous speech processing, and Global Call APIs. See the relevant API documentation listed in Section 9.5, "Programming Library Documentation", on page 69 for more information on each of these APIs.

Global Call support
The following features are supported through the Global Call API library:

- Blind (unsupervised) and supervised transfer.
- Hook-flash through the Global Call API
- Caller ID in the U.S., Japan, and U.K.

For more information, see the *Global Call Analog Technology User's Guide*.

Voice support
The following key voice library features are supported:

- Analog Display Services Interface (ADSI) and 2-way FSK support
- Pitch-corrected speed control on playback (on 8 kHz coders only)
- Adjustable Automatic Gain Control (AGC) on a channel by channel basis
- Enhancements to the **dx_reciottdata( )** recording function (new modes for initial silence compression and voice activity detection with event notification)
- Enhancements to special information tone (SIT) frequency detection, including broader default SIT sequence definitions, new SIT sequences, and DM3 support for **ATDX_CRTNID( )**.

Refer to the *Voice API Programming Guide* and the *Voice API Library Reference* for more information on voice features.

Voice coders supported
The following voice coders are supported:

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- OKI* ADPCM, 6 kHz sampling 24 Kbps (4 bits) and 8 kHz sampling 32 Kbps (4 bits)
- G.711 mu-law PCM, 8 kHz sampling 64 Kbps (8 bits) and 6 kHz sampling 48 Kbps (8 bits)
- G.711 A-law PCM, 8 kHz sampling 64 Kbps (8 bits) and 6 kHz sampling 48 Kbps (8 bits)
- G.726 bit exact, 8 kHz sampling 16 Kbps (2 bits), 24 Kbps (3 bits), 32 Kbps (4 bits), 40 Kbps (5 bits), ADPCM
- GSM full rate at 13 Kbps (ETSI 6.10 and RTP; both Microsoft and TIPHON frame support)
- Linear PCM, 11 kHz sampling 88 Kbps (8 bits) and 11 kHz sampling 176 Kbps (16 bits)
- TrueSpeech* (8.5 Kbps)

Refer to the *Voice API Programming Guide* and the *Voice API Library Reference* for more information.

Note: When using continuous speech processing, play and record activity is only supported on a subset of these voice coders. For more information, see the *CSP API Programming Guide*.

Fax support
Fax capability for up to four channels of 14.4 Kbps Tx/Rx Group 3 fax resources with recommended T.30, T.4, and T.6 support (MH, MR, MMR with ECM). Refer to the *Fax Software Reference* for more information.

Global approvals
Global approvals including U.S., Canada, European Union, Australia, China, Hong Kong, Korea, New Zealand, Singapore, Japan, and more. For a complete list of global approvals for this product, see the Intel® Telecom Support Resources website at the following link:
http://developer.intel.com/design/telecom/support/index.htm

SNMP support
SNMP supported administration, basic configuration (Hardware Information MIB module and Dm3ExtPlatform MIB support). Refer to the *SNMP Agent Software Administration Guide* for more information.

3.3   New Intel Dialogic DI Products

Intel® Dialogic® DI products are single-slot, trunk and station interface boards designed for server-based PBXs and contact centers. These boards are designed for enterprise switching applications.

System Release 6.1 for Linux supports the following DI products:

DI0408LSAR2
The DI0408LSAR2 is a DM3-based full size board with a single slot, four analog loop start interfaces, eight analog station interfaces with ring capability, an audio input port and voice-over-IP (VOIP) capability. This board is PCI form factor.

DI0408LSAR2EU

The DI0408LSAR2EU is a DM3-based full size board with a single slot, four analog loop start interfaces, eight analog station interfaces with ring capability, an audio input port and voice-over-IP (VOIP) capability. This board is PCI form factor. It is the European version of the DI0408LSAR2.

DI0408LSAR2JP

The DI0408LSAR2JP is a DM3-based full size board with a single slot, four analog loop start interfaces, eight analog station interfaces with ring capability, an audio input port and voice-over-IP (VOIP) capability. This board is PCI form factor. It is the Japanese version of the DI0408LSAR2.

DI0408LSAR2I

The DI0408LSAR2I is a DM3-based full size board with a single slot, four analog loop start interfaces, eight analog station interfaces with ring capability, an audio input port and voice-over-IP (VOIP) capability. It is PCI form factor and includes an internal power supply.

DI0408LSAR2EUI

The DI0408LSAR2EUI is a DM3-based full size board with a single slot, four analog loop start interfaces, eight analog station interfaces with ring capability, an audio input port and voice-over-IP (VOIP) capability. This board is PCI form factor and an includes internal power supply. It is the European version.

DI0408LSAR2JPI

The DI0408LSAR2JPI is a DM3-based full size board with a single slot, four analog loop start interfaces, eight analog station interfaces with ring capability, an audio input port and voice-over-IP (VOIP) capability. This board is PCI form factor and includes an internal power supply. This is the Japanese version.

DISI16R2

The DISI16R2 is a DM3-based full size board with a single slot, 16 station interfaces, and up to 16 conferees. This board is PCI form factor.

DISI16R2JP

The DISI16R2JP is a DM3-based full size board with a single slot, 16 station interfaces, and up to 16 conferees. This board is PCI form factor. It is the Japanese version of the DISI116R2.

DISI24R2

The DISI24R2 is a DM3-based full size board with a single slot, 24 station interfaces, and up to 16 conferees. This board is PCI form factor.

DISI24R2JP

The DISI24R2JP is a DM3-based full size board, single slot, 24 station interfaces, and up to 16 conferees. This board is PCI form factor. It is the Japanese version of the DISI24R2.

DISI32R2

The DISI32R2 is a DM3-based full size board with a single slot, 32 station interfaces, and up to 16 conferees. This board is PCI form factor.

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DISI32R2JP

> The DISI32R2JP is a DM3-based full size board with a single slot, 32 station interfaces, and up to 16 conferees. This board is PCI form factor. It is the Japanese version of the DISI32R2.

Features

The following key features are supported on DI products in System Release 6.1 for Linux:

- Universal PCI
- Fixed routing configuration support. Refer to the *DM3 Configuration Guide* for more information.
- Volume control for conferencing. Refer to the *Audio Conferencing API Programming Guide* for more information.
- Support for continuous speech processing (CSP) API. Refer to the *CSP API Programming Guide* and the *CSP API Library Reference* for more information.
- Audio Input API for Music on Hold (MOH). Refer to the *Voice API Library Reference* for more information.
- 9-16 conferees with Echo Cancellation, depending on the specific board. Refer to the *Audio Conferencing API Programming Guide.*
- European support including selectable 20, 25, or 50 Hz ringer.
- Japanese and U.K. Caller ID. Refer to the *Global Call Analog Technology User's Guide* for more information.
- Basic Voice: provides play, record, and digit generation and detection.

  > ***Note:*** Play and record are not simultaneously supported on a channel. Refer to the *Voice API Programming Guide* for more information.

- Supports multiple coder types, including:
  - 64 Kbps and 48 Kbps G.711 PCM VOX
  - 24 Kbps and 32 Kbps OKI ADPCM VOX
  - 88/176K Linear PCM VOX and WAV
  - 11 kHz 8-bit and 16-bit WAV
  - Speed control on 8 kHz coders

  Refer to the *Voice API Programming Guide* for more information.

- Tone detection/generation:
  - Global Tone Detection (GTD) for user-defined tones
  - Global Tone Generation (GTG) for user-defined tones, including cadenced tone generation

  Refer to the *Voice API Programming Guide* for more information.

- Basic call control features for analog station interfaces, including ring, caller ID transmission, and MWI. Refer to the *Global Call Analog Technology User's Guide* for more information.
- Basic call control features for loop start interfaces including call analysis and support for analog call ID. Refer to the *Global Call Analog Technology User's Guide* for more information.

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- Voice API for voice and tone
  - – Play/Record
  - – Tone Generation/Signal Detection

  Refer to the *Voice API Programming Guide* for more information.

- MSI API for stations
  - – Transmit CallerID/MWI
  - – Distinctive ring cadences

  Refer to the *MSI API Library Reference* for more information.

- Modular Station Interface (MSI) API for conferencing. Refer to the *MSI API Library Reference* for more information.

- Audio Conferencing (DCB) API for conferencing with extensions
  - – Active Talker
  - – Coach/Pupil mode

  Refer to the *Audio Conferencing API Programming Guide* for more information.

- Asynchronous Routing with **ms_listenEx( )** and **ms_unlistenEx( )**: In addition to the functionality provided by **ms_listen( )** and **ms_unlisten( ),** the new **ms_listenEx( )** and **ms_unlistenEx( )** routing functions provide asynchronous routing through the **mode** parameter. The MSEV_LISTEN and MSEV_UNLISTEN events are also added to indicate the successful completion of the asynchronous routing operations, and the MSEV_LISTEN_FAIL and MSEV_UNLISTEN_FAIL events to indicate failure of the asynchronous routing operations. See the *MSI API Library Reference* for details.

In addition, the DI0408LSAR boards support the following specific features:

- Support for DI media loads 2 and 4. Refer to the *DM3 Configuration Guide* for more information.

- Support for R4 on DM3 fax. Refer to the *Fax Software Reference* for more information.

- Support for transaction record (DI media load 2 only). Refer to the *DM3 Configuration Guide* for more information.

- Support for trunk call control using Global Call APIs. Refer to the *Global Call API Programming Guide for more information*.

The DI products have the following limitations:

- No call control or call progress support with **dx_dial( )**.

- For conferencing, tone clamping and digit detect via the conferencing resource is not supported.

3.4   New Intel NetStructure DMT160TEC Digital Telephony Interface Products

System Release 6.1 for Linux introduces support for the Intel NetStructure® DMT160TEC board. This board is new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

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The following provides a description of the DMT160TEC board:

DMT160TEC
   The DMT160TEC board supports up to 16 spans or 480 ports and software-selectable digital telephony interfaces for T1, E1, or a combination, on the same board with the ability to run multiple ISDN protocols or CAS protocols simultaneously. This board also includes support for network tone signaling and control.

Features

System Release 6.1 for Linux supports the following features on the DMT160TEC boards.

- Support for mixed ISDN, CAS and Clear Channel on a trunk by trunk basis. Refer to the *DM3 Configuration Guide* for more information.

- Board Management Library (BML) support, which contains functions that provide runtime fault monitoring and management of configurable boards. The API provides the ability to monitor the host computer for a failure and take boards out of service to prevent the network from offering calls to a failed system. For example, if the host application or operating system fails, the API will take the network interface out of service. Refer to the *Board Management API Library Reference* for more information.

- Tone detection and generation, including GTD/GTG. Refer to the *DM3 Configuration Guide*.

- Ability to query Layer 1 statistics (frame slips). See the **dt_getstatistics( )** function description in the *Digital Network Interface Software Reference* documentation updates section of the *Release Update*.

- Ability to enable/disable D-channel or restart a trunk without bringing down the entire system. Refer to the *DM3 Configuration Guide*.

- Dynamic Protocol Selection allows changes on a trunk by trunk basis within selected front-end configurations (T1 or E1). For example, if a trunk is configured for E1 at download, a user can change that trunk to a different E1 protocol during runtime. Changes to/from Clear Channel or NFAS are excluded. Refer to the *Global Call ISDN Technology Guide and the Global Call E1/T1 CAS/R2 Technology Guide*.

    Note: The number of channels per trunk must remain the same as originally configured.This means you can not dynamically change a span from T1 to E1 or vice-versa. This functionality is only provided at download.

- Dynamic Line Coding and Frame Selection provides new parameter values for **gc_SetConfigData( )**, allowing dynamic configuration of the following trunk parameters at runtime.
    - CRC4 ON or CRC4 OFF
    - Selecting between user and network modes
    - Line Type (E1 or T1)
    - Frame Selection (ESF, SF)

    Refer to the *Global Call ISDN Technology Guide and the Global Call E1/T1 CAS/R2 Technology Guide*.

- A Law/Mu Law conversion. Refer to the *DM3 Configuration Guide* for more information.

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3.5   New Intel NetStructure DM/V-B Products

The Intel NetStructure® DM/V-B combined media boards offer the same features as the combined media DM/V-A boards, as well as enhancements such as universal media loads, software selectable T1/E1 network interfaces (per network interface), A-Law/Mu-Law conversion, the ability to mix selected protocols and improved media densities. The DM/V-B boards are available in both CompactPCI* and PCI form factors.

System Release 6.1 for Linux provides support for the following Intel NetStructure DM/V-B products:

CompactPCI* Form Factor DM/V-B Products

DMV600BTEC
    The DMV600BTEC is a Dual span DM/V-B board with software selectable T1/E1 (per network interface). Two digital network interfaces with 60+ channels of media processing. New universal media load offers simultaneous voice, fax and conferencing. Provides A-law/mu-law conversion and the ability to mix selected protocols on the board. cPCI form factor.

DMV1200BTEC
    The DMV1200BTEC is a Quad span DM/V-B board with software selectable T1/E1 (per network interface). Four digital network interfaces with 120+ channels of media processing. New universal media load offers simultaneous voice, fax and conferencing. Provides A-law/mu-law conversion and the ability to mix selected protocols on the board. cPCI form factor.

DMV4800BC
    The DMV4800BC is a media resource DM/V-B board supporting 240-704 channels of media processing with no network interface. Includes media load with 480 channels of basic voice and tone processing. New universal media loads offer simultaneous voice, fax and conferencing. cPCI form factor.

PCI Form Factor DM/V-B Products

DMV600BTEP
    The DMV600BTEP is a Dual span DM/V-B board with software selectable T1/E1 (per network interface). Two digital network interfaces with 60+ channels of media processing. New universal media load offers simultaneous voice, fax and conferencing. Provides A-law/mu-law conversion and the ability to mix selected protocols on the board. Universal PCI form factor.

DMV1200BTEP
    The DMV1200BTEP is a Quad span DM/V-B board with software selectable T1/E1 (per network interface). Four digital network interfaces with 120+ channels of media processing. New universal media load offers simultaneous voice, fax and conferencing. Provides A-Law/Mu-Law conversion and the ability to mix selected protocols on the board. Universal PCI form factor.

DMV3600BP
    The DMV3600BP is a media resource DM/V-B board supporting 120-576 channels of media processing with no network interface. Includes media load with 360 channels of

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basic voice and tone processing. New universal media loads offer simultaneous voice, fax and conferencing. Universal PCI form factor.

Features

The DM/V-B boards support the same features as the DM/V-A boards, in addition to the following new features in System Release 6.1 for Linux:

Note: The CompactPCI* and PCI versions of the DM/V-B products support the same features, but not necessarily the same media loads because of possible differences in densities between the form factors (CompactPCI* boards typically have higher densities than PCI boards and therefore support more media). Refer to the *DM3 Configuration Guide* for more information about media loads and board support.

- Support for mixed ISDN, CAS and Clear Channel on trunk by trunk basis. Refer to the *DM3 Configuration Guide* for more information.

- Ability to send alarm state to the network at all times from powerup to application startup (i.e., trunk preconditioning). Refer to the *DM3 Configuration Guide* for more information.

- Universal load available (simultaneous voice + speech + fax + conferencing) on all DM/V-B boards. Refer to the *DM3 Configuration Guide* for more information.

- Support for ML 9D (conferencing only with no echo cancellation) on DMV3600BP and DMV4800BC boards only. Refer to the *DM3 Configuration Guide* for more information.

- Software selectable T1/E1 (per network interface). Ability to mix T1 and E1 on a board. Refer to the *DM3 Configuration Guide*.

- The ability to combine protocols on the same board. Refer to the *DM3 Configuration Guide* for more information. Protocols within a group can be mixed on the same board; however, protocols from different groups cannot be mixed on the same board.
  - Group 1: Mix any combination of 4ESS (T1), 5ESS (T1), NTT (T1) NI2 (T1), DMS (T1),QSIGT1 (T1), QSIGE1 (E1), NET5 (E1), T1CC (T1 Clear Channel), CAS (T1) E1CC (E1 Clear Channel), R2MF(E1) protocols on the same board.
  - Group 2: Mix any combination of DPNSS(E1) or DASS2 (E1) protocols on the same board.

- A-Law/Mu-Law conversion (DM/V-B boards with network interfaces). Refer to the *DM3 Configuration Guide*.

Note: Fixed routing configuration is not supported on DM/V-B products. Refer to the *DM3 Configuration Guide*.

3.6 New Intel NetStructure IPT10000C Board

System Release 6.1 for Linux introduces support for the Intel NetStructure® IPT10000C product. This product provides carrier-grade, open, standards-based platforms that offer a highly scalable and flexible solution for IP telephony gateways and media servers. The boards provide IP services, enabling the optimal utilization of the next generation network (NGN) architecture.

This board is new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

The following provides a description of the IPT10000C product:

IPT10000C
>   The IPT10000C is a 1000 channel IP gateway board supporting G.711 only, RFC2833, and two 1-Gigabit on-board data network interfaces.

Features

System Release 6.1 for Linux provides the following features on the IPT10000C board:

Support for IP Media devices
>   Provides up to 1000 ports of IP telephony to facilitate scalability and reduce the overall system footprint.

Ethernet interfaces
>   Dual 100Base-TX and dual 1000Base-T Ethernet* interfaces. Indicators on the front panel of the board provide an indication of Ethernet interface link status.

DTMF processing
>   Provides the following DTMF support:
>
>   - Ability to generate DTMF to, and receive notification of DTMF from, the IP side via UII Alphanumeric messages (out-of-band).
>   - Ability to generate DTMF to, and receive notification of DTMF from, the TDM side inband.
>   - In-band DTMF pass-through.
>   - RFC 2833 pass-through.

Quality of Service (QoS) support
>   Supports the setting and retrieving of QoS thresholds and the handling of a QoS alarm when it occurs. The QoS thresholds supported include:
>
>   - Lost packets
>   - Jitter
>   - Roundtrip latency
>   - *Note:* IPT boards also support the Type of Service (ToS) byte, and related inferences. The 8-bit ToS field in the IP header (RFC 791) is settable on a per channel basis. The first three bits of this field define IP Precedence, and the next three bits define delay, throughput, and reliability. IP Differentiated Services (RFC 2474) is also supported to the extent that the ToS field is redefined for IP Differentiated Services, and thus completely settable on a per channel basis.

Voice over IP support
>   The following features for Voice Over IP (VoIP) applications are supported:
>
>   - RTP processing
>   - RTCP processing
>   - Jitter buffer management

SIP protocol stack support
Support the host-based SIP RADVISION* protocol stack included with the system release software. The SIP protocol stack provides IP signaling capabilities for establishing calls over an IP network. The features provided by the SIP protocol stack are accessible only when using the Global Call API for call control.

Support for third-party IP signaling stacks
IPT boards can also be used with third-party signaling stacks. In this case, the Global Call API cannot be used for call control, but the IP Media Library (IPML) API must be used to manage the media resources on the board.

SNMP support
SNMP board monitoring and control is provided.

Application interface support
IPT boards support the R4 programming environment and use the following application programming interfaces:

- Global Call API for call control (when the supplied RADVISION* H.323 or SIP stack is used)
- IP Media Library (IPML) API for media management (when another signaling stack is used)

IPT Board Firmware Update Utility (*iptfwupdate*)
The *iptfwupdate* utility allows you to update the firmware that resides in flash memory on an Intel NetStructure IPT board. Removal or disassembly of the board is not necessary to perform the update. For more information on this utility, refer to the *Administration Guide*.

3.7 New Intel NetStructure SS7 Boards and SIUs

Intel NetStructure® SS7 boards provide on-board support for SS7 common channel signaling protocols with a number of digital line interfaces (E1/T1/J1) and a H.100 or H.110 PCM highway that supports connection to a wide range of voice, data, and fax boards. System Release 6.1 for Linux provides support for the following SS7 boards:

SS7HDPD4TE
The SS7HDPD4TE is a high-density, multi-port, SS7 signaling interface PCI board that supports up to 64 SS7 links and provides four software-selectable T1/E1 interfaces. This board has four T1/E1 connections and dual signaling processors.

SS7HDCS8
The SS7HDCS8 is a high-density, multi-port, SS7 signaling interface CompactPCI* board that supports up to 32 SS7 links and provides eight software-selectable T1/E1 interfaces.

SS7HDCD16
The SS7HDCD16 is a high-density, multi-port, SS7 signaling interface CompactPCI* board that supports up to 64 SS7 links and provides 16 software-selectable T1/E1 interfaces.

SS7HDCQ16

The SS7HDCQ16 is a high-density, multi-port, SS7 signaling interface CompactPCI* board that supports up to 128 SS7 links and provides 16 software-selectable T1/E1 interfaces.

SS7SPCI4

The SS7SPCI4 is a SS7 signaling interface board that supports four SS7 links and provides four T1/E1 interfaces.

SS7SPCI2S

The SS7SPCI2S is a SS7 signaling interface board that supports four SS7 links and provides two T1/E1 interfaces and a dual V.11 serial network interface (offering V.35 interworking).

SS7CPM8

The SS7CPM8 is a SS7 signaling interface board that supports up to four SS7 links and provides eight T1/E1 interfaces.

Intel NetStructure® Signaling Interface Units (SIUs) are SS7 server solutions that provide a convenient and cost-effective way to add SS7 connectivity to an existing multi-chassis system or to enable an application with the necessary protocols for mobile wireless or intelligent networks. System Release 6.1 for Linux provides support for the following SIUs:

SS7G21 (in SIU Mode)

The SS7G21 is fitted with Intel NetStructure® SPCI4 or SPCI2S boards with a system maximum of 12 SS7 links and provides a form, fit, and function replacement for the Intel NetStructure SIU520 signaling gateway on a higher performance platform. An SS7G21 may be purchased with either:

- 1, 2, or 3 SPCI2S boards (4 SS7 links, 2 T1/E1 interfaces, two V.11 serial ports per board)
- 1, 2, or 3 SPCI4 boards (4 SS7 links, 4 T1/E1 interfaces per board)

Supplied in a 2U carrier-grade chassis, the SS7G21 provides SS7 connectivity for multichassis call control, wireless, or Intelligent Networking (IN) applications.

SS7G22 (in SIU Mode)

The SS7G22 is fitted with Intel NetStructure® SS7HDP boards and offers significantly greater performance and link density than the SS7G21. An SS7G22 may be purchased with 1, 2, or 3 SS7HDP boards (64 SS7 links, 4 T1/E1 interfaces per board) with a system maximum of 128 SS7 links. Supplied in a 2U carrier-grade chassis, the SS7G21 provides SS7 connectivity for multichassis call control, wireless, or Intelligent Networking (IN) applications.

SIU520

The SIU520 is a carrier-grade programmable 2U server that provides signaling for multiple clients over a local area network (LAN). It supports up to 12 SS7 links and provides up to 12 T1/E1 digital network interfaces and up to six V.11 interfaces (offering V.35 interworking).

SIU231

The SIU231 is a modular design SIU enabling SS7 signaling boards to be added as needed. It supports up to 16,384 circuit identification codes (CICs), up to 32 SS7 links in eight linksets and handles 100 calls/second. It can connect to 32 host platforms

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(significantly more using a host-clustering arrangement) and is suitable for creating fault-resilient configurations.

SIU131

The SIU131 is an SIU that supports up to 4096 circuit identification codes (CICs), up to six SS7 links in six linksets and handles 100 calls/second. It can connect to 32 host platforms (significantly more using a host-clustering arrangement) and is suitable for creating fault-resilient configurations.

Features

System Release 6.1 for Linux provides the following features for SS7 boards and SIUs:

Global Call API support

Supports the development of call control applications that use SS7 technology. See the *Global Call SS7 Technology Guide* for more information.

Note: System Release 6.1 for Linux works in conjunction with the SS7 Development Package, which is not part of the System Release software. The SS7 Development package is available from the following URL:
http://resource.intel.com/telecom/support/ss7/cd/genericinfo/index.htm. This package must be installed to provide support for the following SS7 layers and protocols:

- MTP2
- MTP3
- ISUP
- TUP (ITU and China GF001-9001 variants)
- SCCP
- TCAP
- IS41
- MAP
- INAP

3.8   New Features for Intel NetStructure IPT Products

The Intel NetStructure® IPT products provide carrier-grade, open, standards-based platforms that offers a highly scalable, flexible, carrier-grade solution for IP telephony gateways and media servers. The boards provides IP services, enabling the optimal utilization of the next generation network (NGN) architecture. These products also provide scalability with up to 1000 IP telephony channels on a single CompactPCI* board. The IPT products provide many optimized, low-bandwidth coder algorithms for transmitting audio over an IP network. These coder algorithms use a variety of coding techniques, bit rates, and frame sizes to compress audio for managing data network bandwidth. Supported coder algorithms enable developers to deploy IP-based applications throughout the world.

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New Features

Intel NetStructure® IPT products provide the following features. These features are new since Intel® Dialogic® System Release 6.0 for CompactPCI on Linux:

Media LAN disconnect alarm
> Applications can configure the generation of an IPML alarm and optionally a Global Call GCAMS alarm if the media LAN cable becomes disconnected from an IPT board or if an external hardware failure occurs on that network. Refer to the *Global Call IP Technology Guide, IP Media Library API Programming Guide* and *IP Media Library API Library Reference* for more information.

Multiple IP addresses per media network port
> Users can configure the on-board network interface ports to have up to four different IP addresses, and Global Call applications can select to use any of those preconfigured addresses. One application of this multiple address capability is trunk grouping. Refer to the *Global Call IP Technology Guide* for more information.

Support for early media
> Unidirectional media streaming can be established during the pre-connection phase to allow the calling party to hear signaling tones or prompts, then changed to full-duplex streaming when the connection is completed. The Global Call library transparently supports early media, and non-Global Call applications can implement early media using the **ipm_ModifyMedia( )** API in the IP Media Library. Refer to the *Global Call IP Technology Guide* and the *IP Media Library API Library Reference* for more information.

3.9 New Features for Intel Dialogic JCT Products

The Intel® Dialogic® JCT combined media boards are based on Springware architecture and are available in Universal PCI form factor. The JCT combined media boards are available in resource only, single span, dual span, PBX integration and analog loop start models. The boards provide basic voice along with low-bit rate coders like GSM and G.726. In addition, JCT boards also support advanced features such as automatic speech recognition (through the CSP API) and/or fax. For a complete list of JCT boards supported in this release, refer to Section 8, "Supported Hardware", on page 63.

New Features

System Release 6.1 for Linux provides the following new features on the JCT boards. These features apply to all JCT boards unless indicated otherwise. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

NFAS (non-facility associated signaling) support
> This feature extends D Channel control to B channels not resident on the same PBX or PC system. See the "Using Non-Facility Associated Signaling (NFAS)" section in the *Global Call ISDN Technology Guide* for more information.
>
> *Note:* This feature does not apply to D/42JCT-U and D/82JCT-U boards.

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Bellcore and ETSI-compliant 2-way frequency shift keying (FSK) support
> The **dx_RxIottData( )**, **dx_TxIottData( )**, and **dx_TxRxIottData( )** functions are now supported on single span and dual span JCT boards. For more information, see the *Voice API Programming Guide* and *Voice API Library Reference*.

Board Management Library (BML)
> The Board Management Library (BML) contains functions that provide runtime fault monitoring and management of configurable boards. The API provides the ability to monitor the host computer for a failure and take boards out of service to prevent the network from offering calls to a failed system. For example, if the host application or operating system fails, the API will take the network interface out of service. Refer to the *Board Management API Library Reference* for more information. The Board Management API is supported on digital Springware JCT single span and dual span boards (D/240JCT-T1, D/480JCT-1T1, D/480JCT-2T1) using the following protocols: T1 North American ISDN (4ESS, 5ESS, DMS100, DMS250, and NI2).
>> ***Note:*** E1 protocols are not supported.

Firmware assert notification
> This feature provides a new unsolicited event in the Voice library that is generated when a detectable firmware assert occurs in a JCT board. The event is TDX_FWASSERT. With this feature, the application is notified when a firmware assert takes place, so the application can stop sending calls to the board. Previously, the application had to wait for time-outs and open failures to determine that a board was not working. For more information on this event, see the "Events" chapter in the *Voice API Library Reference*.
>> ***Note:*** This feature is applicable only when using an asynchronous programming model.

Retrieval of Call Waiting LED status on ROLMphone 400
> The **d42_indicators( )** function can now be used to retrieve the Call Waiting LED status on ROLMphone 400 units. See the "Siemens ROLM PBX" section in the *PBX Integration Board User's Guide* for more information.
>> ***Note:*** This feature only applies to the D/42JCT-U and D/82JCT-U PBX Integration boards.

Continuous speech processing (CSP) support
> System Release 6.1 for Linux supports continuous speech processing (CSP) on the D/160JCT and the D/320JCT boards. Refer to the *CSP API Programming Guide* and the *CSP API Library Reference* for more information.
>> ***Note:*** This feature only applies to the D/160JCT and the D/320JCT boards.

DPNSS support
> Users can modify a bit in the firmware to facilitate the download of the ISDN DPNSS V1.07 protocol. In previous releases, download of DPNSS required special licensing. The new firmware file for DPNSS support is spisdpns.fwl. To configure the board to use the DPNSS protocol, set **ISDNProtocol=DPNSS** in the dialogic.cfg file.
>> ***Note:*** This feature only applies to the D/300JCT and D/600JCT boards.

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3.10　New Features for Intel NetStructure DM/F Products

The Intel NetStructure® DM/F products provide voice, fax, and an on-board network interface. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

Features

System Release 6.1 for Linux provides the following new DM/F features:

- Universal PCI support
- Provides the ability to transmit a customized T.30 non-standard facilities (NSF) message. For more information, see the *Fax Software Reference*.

3.11　New Features for Intel NetStructure DMN160TEC Digital Telephony Interface Products

System Release 6.1 for Linux supports the Intel NetStructure® DMN160TEC boards. These digital telephony interface boards provide a high-density network interface on a CompactPCI* form factor.

New Features

System Release 6.1 for Linux supports the following new features on the DMN160TEC boards. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

- Ability to query Layer 1 statistics (frame slips). See the **dt_getstatistics( )** function description in the *Digital Network Interface Software Reference* documentation updates section of the *Release Update*.
- Support for mixed ISDN and Clear Channel on a trunk by trunk basis. Refer to the *DM3 Configuration Guide* for more information.
- Ability to enable/disable D-channel or restart a trunk without bringing down the entire system. Refer to the *DM3 Configuration Guide* for more information.
- Dynamic Protocol Selection allows changes on a trunk by trunk basis within selected front-end configurations (T1 or E1). For example, if a trunk is configured for E1 at download, a user can change that trunk to a different E1 protocol during runtime. Changes to/from Clear Channel or NFAS are excluded.

  Note: The number of channels per trunk must remain the same as originally configured. This means you can not dynamically change a span from T1 to E1 or vice-versa. This functionality is only provided at download.

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- Dynamic Line Coding and Frame Selection provides new parameter values for **gc_SetConfigData( )**, allowing dynamic configuration of the following trunk parameters at runtime:
    - CRC4 ON or CRC4 OFF
    - Selecting between user and network modes
    - Line Type (E1 or T1)
    - Frame Selection (ESF, SF)

3.12   New Features for Intel NetStructure DM/V and DM/V-A Products

The Intel NetStructure® DM/V and DM/V-A boards are based on DM3 architecture and available in Universal PCI and CompactPCI* form factors. DM/V boards provide 48-120 ports of basic voice and call progress analysis as well as 4 T1 and 4 E1 network interfaces. DM/V-A boards are available in resource-only, two and four network interfaces. The DM/V-A boards provide additional enhanced media such as speech recognition, fax and conferencing, as well as low bit rate coders like GSM, G.726 and TrueSpeech. Refer to the *DM3 Configuration Guide* for more information on media loads.

Note: Fixed routing configuration is no longer supported on DM/V and DM/V-A boards in System Release 6.1 for Linux. Refer to the *DM3 Configuration Guide*.

New DM/V Product Features

System Release 6.1 for Linux offers the following new features on DM/V products. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

- Ability to send alarm state to the network at all times from powerup to application startup (i.e., trunk preconditioning). Refer to the *DM3 Configuration Guide* for more information.

- Support for TF_SETINIT flag in DV_TPT structure. Refer to the *Voice API Library Reference*.

- D Channel backup support for 5ESS, 4ESS and NI2. Refer to the *DM3 Configuration Guide* for more information.

- Board Management Library (BML) support, which contains functions that provide runtime fault monitoring and management of configurable boards. The API provides the ability to monitor the host computer for a failure and take boards out of service to prevent the network from offering calls to a failed system. For example, if the host application or operating system fails, the API will take the network interface out of service. Refer to the *Board Management API Library Reference* for more information. The Board Management API is supported on digital DM3 boards (the board must have a network interface for the API to be supported) using the following protocols:
    – T1 North American ISDN (4ESS, 5ESS, DMS100, DMS250, NI2, NTT, QSIG)
    – E1 ISDN (NET5, QSIG)
    – E1/T1 CAS (PDK protocols)

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            – E1 DPNSS and DASS2

- Enhancements to the **dx_reciottdata( )** recording function (new modes for initial silence compression and voice activity detection with event notification). For more information, see the Recording and Playback chapter in the *Voice API Programming Guide*.

- Enhancements to special information tone (SIT) frequency detection, including broader default SIT sequence definitions, new SIT sequences, and DM3 support for **ATDX_CRTNID( )**. For more information, see the Call Progress Analysis chapter in the *Voice API Programming Guide*.

- Call progress analysis enhancements, including consistent APIs across ISDN and CAS protocols. See the *Global Call API Programming Guide* for details.

- NFAS (non-facility associated signaling) on 5ESS, DMS100 and DMS250 have been added in addition to the previously supported NI2 and 4ESS. Refer to the *DM3 Configuration Guide* for more information.

- Clear Channel support for T1 and E1 boards. Refer to the *DM3 Configuration Guide* for more information.

- DPNSS and DASS2 protocol support. See the *Global Call ISDN Technology Guide* for details.

- Virtual calls on DPNSS. See the *Global Call ISDN Technology Guide* for details.

- Hold and retrieve for all supported ISDN protocols. See the *Global Call ISDN Technology Guide* for details.

- Support for 2B Channel Transfer (2BCT). See the *Global Call ISDN Technology Guide* for details.

- Blind transfer support on the pdk_usmf_t1_cas, pdk_fxs_t1 and pdk_fx_e1 Global Call protocols. Blind transfer (also called unsupervised transfer) is transfer of a call to a third party without any consultation or announcement by the person transferring the call. See the *Global Call API Programming Guide* and *Global Call E1/T1 CAS/R2 Technology Guide* for details.

- Supervised transfer on the pdk_usmf_t1_cas, pdk_fxs_t1 and pdk_fx_e1 Global Call protocols. Supervised transfer is the transfer of a call to a third party where the person transferring the call stays on the line, announces the call, and consults with the party to whom the call is being transferred before the transfer is completed. See the *Global Call API Programming Guide* and *Global Call E1/T1 CAS/R2 Technology Guide* for details.

- Cached prompt management. Refer to the *Voice API Programming Guide* and *Voice API Library Reference* for more information.

- Playback pause and resume feature. Refer to the *Voice API Programming Guide* and *Voice API Library Reference* for more information.

- 8 kHz linear PCM coder support. Refer to the *Voice API Programming Guide* and *Voice API Library Reference* for more information.

- Ability to change bulk queue buffer size (player transfer buffer size) using the **dx_setchxfercnt( )** function. Refer to the *Voice API Library Reference* for more information on this function.

- Streaming to board feature. Refer to the *Voice API Programming Guide* and *Voice API Library Reference* for more information.

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- D-Channel enable/disable, which provides the ability to set the data link (D-Channel) state using the **gc_Extension( )** function with an extension ID (ext_id) of GCIS_EXID_SETDLINKSTATE. See the *Global Call ISDN Technology Guide* for details.

- Ability to suspend/resume calls when using the pdk_us_mf_io protocol. Callers can hang-up a call, and then pick-up the same call (within a configurable time-out) without the call terminating. See the *Global Call CDP Configuration Guide* for details.

New DM/V-A Product Features

Intel® Dialogic® System Release 6.1 for Linux offers new features on DM/V-A products. The DM/V-A boards support all the same features as the DM/V products as well as the following:

- Additional GCAMS (Global Call Alarm Management System) alarms, which are provided through Global Call. See the See the *Global Call ISDN Technology Guide*, *Global Call E1/T1 CAS/R2 Technology Guide* and the *DM3 Configuration Guide* for more information.

- Conference volume control and conference monitoring features. See the *Audio Conferencing API Programming Guide* and the *Audio Conferencing API Library Reference*.

- Conference bridging. See the *Audio Conferencing API Programming Guide* and the *Audio Conferencing API Library Reference*.

- Conference DTMF clamping on a per party basis. See the *Audio Conferencing API Programming Guide* and the *Audio Conferencing API Library Reference*.

- Enhanced voice + fax media loads added for DM/V960A-4T1-PCI (media load 5), DM/V480A-2T1-PCI (media load 5BC), DM/V600A-2E1-PCI (media load 5BC) and DM/V2400A-PCI (media load 5). Refer to the *DM3 Configuration Guide* for more information.

- Universal load 1 added (simultaneous voice, speech, fax and conferencing) for DM/V960A-4T1-PCI. Refer to the *DM3 Configuration Guide* for more information.

- Increase media load 1B (ML1B) density on DM/V2400A boards to 240 channels. Refer to the *DM3 Configuration Guide* for more information.

- ETSI-compliant 2-way frequency shift keying (FSK) support with new configurable parameters. Refer to the *Voice API Programming Guide*, *Voice API Library Reference* and *DM3 Configuration Guide* for more information.

- Silence compressed streaming feature allows for silence data to be removed from data being streamed to the host during CSP operation. Refer to the *CSP API Programming Guide* and *CSP API Library Reference* for more information.

- Ability to stream echo-cancelled data over the CT Bus to another board during CSP operation (on selected media loads). Refer to the *CSP API Programming Guide*, *CSP API Library Reference* and *DM3 Configuration Guide* for more information.

- Up to 64 ms enhanced echo canceller (EEC) tap length on CSP on selected media loads. Refer to the *DM3 Configuration Guide* for details about media load support for specific boards.

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- Support for the IMA ADPCM (32.443 Kbps) coder (VOX and WAVE file formats). IMA is an acronym for the Interactive Multimedia Association, which defined and published the ADPCM algorithm. This feature is supported on DM3 boards only. Refer to the *Voice API Library Reference*.

- Fax only media load supporting 32 of fax on DM/V960A-4T1-PCI. Refer to the *DM3 Configuration Guide* for more information.

3.13 New Features for Intel NetStructure High Density Station Interface (HDSI) Products

System Release 6.1 for Linux supports the Intel NetStructure® High Density Station Interface (HDSI) products. These products integrate large-scale switching and voice processing resources under a single hardware and software architecture and are offered in both PCI and CompactPCI* configurations. The HDSI solution provides high-density analog station connectivity in a single computer chassis slot.

New Features

The following new feature is available on HDSI products. This feature is new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux or Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

Asynchronous Routing with **ms_listenEx( )** and **ms_unlistenEx( )**
  In addition to the functionality provided by **ms_listen( )** and **ms_unlisten( ),** the new **ms_listenEx( )** and **ms_unlistenEx( )** routing functions provide asynchronous routing through the **mode** parameter. The MSEV_LISTEN and MSEV_UNLISTEN events are also added to indicate the successful completion of the asynchronous routing operations, and the MSEV_LISTEN_FAIL and MSEV_UNLISTEN_FAIL events to indicate failure of the asynchronous routing operations. See the *MSI API Library Reference* for details.

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Installation and Configuration   **4**

This chapter describes the installation and configuration software features that are supported in Intel® Dialogic® System Release 6.1 for Linux.

4.1   Installation

The installation of System Release 6.1 for Linux is a complete installation. You can perform an upgrade installation if Feature Release 1 or 2 of System Release 6.1 for Linux is already on your system. If you have an Intel® Dialogic® System Release that is older than System Release 6.1 for Linux, you must uninstall it before you can install System Release 6.1 for Linux.

If you are using a CompactPCI* system and the Red Hat operating system and want to use Peripheral Hot Swap functionality, it is strongly recommended that you install the Hot Swap Kit software before you install System Release 6.1 for Linux. Full details about installing the system release are provided in the *Software Installation Guide*.

Note: Redundant Host functionality is not supported in this release.

Following are installation-related changes since the last releases (Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux):

New names for installation components on the installation menu
   A table mapping the old names to the new names is provided in the *Software Installation Guide*.

New options on the installation menu
   The following new options are now shown on the installation menu:
   - Intel NetStructure® DMN160/DMT160
   - Intel NetStructure® IPT
   - Global Call Protocols

Global Call Protocols are now installed with the system release software
   In previous releases, the Global Call Protocols had to be installed separately from the system release software. If you already have the Global Call protocols installed, and select Global Call Protocols during installation of System Release 6.1 for Linux, the Global Call Protocols RPM will be updated.

New options for installing the software
   The *Software Installation Guide* now includes procedures for the following:
   - Installing the Redistributable Runtime Files and the Software Development Kit

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- Installing the Redistributable Runtime Files Only
- Installing the Software Development Kit Only
- Performing a Silent Install
- Redistributing the Runtime Files

New options for uninstalling the software
   The *Software Installation Guide* now includes procedures for the following:

- Performing a Silent Uninstall with No Data Backup
- Performing a Silent Uninstall with Data Backup

New environment variables
   Intel plans to eliminate a set of environment variables used to locate certain
   directories in the Intel Dialogic system release hierarchy. These existing variables will
   be replaced with a new set of environment variables that reflects Intel Dialogic
   directory names and structure. This system release will support both the old and new
   environment variables to allow you time to migrate to the new standard. In the next full
   system release, the old variables will be eliminated. It is strongly recommended that
   you begin using these new variables as soon as possible. Refer to the *Software
   Installation Guide* for details.

4.2   Configuration

This section describes the configuration software capabilities that are supported in
System Release 6.1 for Linux. These capabilities are new since Intel® Dialogic® System
Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for
CompactPCI on Linux.

Configuration is performed after the system release software is installed, using the SCD
and CONFIG files. Different configuration methods are used for different product families
because of differences in the underlying architecture. Products are distributed with
preconfigured default settings.

The following new configuration capabilities are provided in System Release 6.1 for Linux:

New Configuration Utility for DM3 and Springware Architecture
   The Intel® Dialogic® Configuration Manager for Linux is a new configuration utility that
   replaces the previous configuration utility for both DM3 and Springware architecture
   boards. The new Configuration Manager provides a series of screens that guide the
   user through the configuration process for both the DM3 and Springware architecture
   boards, as well as the TDM bus. Each configuration screen is supported by a Help
   screen that provides detailed information about that step of the configuration process.

*Notes:**1.* The new configuration utility also allows you to invoke the pmac_cfg.sh utility, but no
       changes have been made to the IPT Series configuration utility itself.

2. The previous configuration utility is being deprecated with this Linux release and will not
       be supported in subsequent Linux releases. For this reason, the previous release *DM3
       Configuration Guide* (05-1876-002) and *Springware Configuration Guide* (05-2399-002)
       are included in the bookshelf as well as the new *DM3 Configuration Guide* (05-1876-
       003) and *Springware Configuration Guide* (05-2399-003) that support this release.

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Refer to the Configuration Procedures chapter in each *Configuration Guide* for information about using the respective configuration utility.

Caution: Once you have completed the initial configuration process, do <u>not</u> use the config.sh command to perform any additional configuration. Instead following a system software installation of any type, start the Intel Dialogic Configuration Manager for Linux utility by executing the CFG command. Executing the config.sh command, once the system has been initially configured, will cause the driver files to be re-loaded and interrupt system operation.

Automatic FCD File Generation

The FCD files are not required in the system release software. When you download a PCD file and its corresponding CONFIG file to a board, the FCD file is automatically generated and also downloaded to the board. The FCD file is also copied into the data directory. Refer to the *DM3 Configuration Guide* for additional information.

TDM Bus Clock Master Fallback Changes

The TDM bus clocking daemon no longer promotes slave boards to the role of clock master if the Primary or Secondary Clock Master fails or is stopped. (This represents a change from the clocking daemon operation in Intel® Dialogic® System Release 6.0 for CompactPCI on Linux). This fallback behavior was removed because it is not controllable through configuration and occurs implicitly. The clocking daemon continues to allow fallback to a secondary board as long as that board is operational and is configured as a Secondary Clock Master prior to system services start-up. If the system was not configured with a Secondary Clock Master, and the Primary Master failed or was stopped, the system clocking will be compromised because there will be no clocking signal in the bus. For configuration procedures, see the *DM3 Configuration Guide* or *Springware Configuration Guide* for information on configuring the TDM bus. For clock master board replacement procedures and fallback, see the *Administration Guide* for information on peripheral hot swap.

Automatic A-Law/Mu-Law Conversion

For DM/V-B boards (excluding DM/V-B resource-only boards), DMN160TEC, and DMT160TEC boards, you can set their network interfaces to either T1 or E1 in the same system, regardless of the CT Bus PCM encoding method.

> ***Note:*** Network interfaces are configured based on the media load specified for downloading that board.

For example, if the PCM encoding method on the CT Bus is set to A-law, a DM/V-B board that has some or all of its network (front end) interfaces configured for T1, will automatically convert the A-law data sent to and received from the CT Bus to Mu-law for transmitting and receiving on the T1 configured front ends. The board will always transmit to and receive from each front end using the PCM encoding method determined by the network interface setting. For all other boards, the CT Bus PCM encoding method selected by the user must match the PCM Encoding of the network interface or the board will not start properly. For information about the PCM Encoding parameter, see the SCD File Parameter Reference chapter in the *DM3 Configuration Guide*.

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OA&M Software 5

This chapter describes the OA&M (operation, administration and maintenance) software features that are supported in Intel® Dialogic® System Release 6.1 for Linux.

5.1 Administration Software

This section describes the system administration software capabilities that are supported in System Release 6.1 for Linux. Administrative software allows the administrator to perform such tasks as starting and stopping the Intel Dialogic System, running demo programs, monitoring performance, and replacing a board in an active system with the same board type.

System Release 6.1 for Linux supports the following administrative capabilities:

Note: High Availability is not supported on the Mandriva operating system.

Peripheral Hot Swap (PHS)

    PHS is supported on the following chassis/SBC (Single Board Computer):
- Intel NetStructure® ZT5085/ZT5524A-1A (Dual CPU)
- Intel NetStructure® ZT5085/ZT5524A-1B (Single CPU)
- Intel NetStructure® MPCHC5091/ZT5524A-1A
- Intel NetStructure® MPCHC5091/ZT5524A-1B
- Advantech MIC-3081/MIC-3369
- Advantech MIC-3038/MIC-3358
- Advantech MIC-3041/MIC-3389

Notes: **1.** Peripheral Hot Swap is only supported on Red Hat Enterprise Linux v3, Advanced Server.

    2. Redundant Host functionality is not supported in this release.

For information about installing the Hot Swap Kit, refer to the *Pigeon Point Systems Linux Hot Swap Kit User Guide*, which is a PDF file located in the *redistributable-runtime/pps* directory. For information about using Peripheral Hot Swap, refer to the *Administration Guide* and the *High Availability Demo Guide*.

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New Tools

System Release 6.1 for Linux introduces the following new administration tool:

Intel NetStructure® IPT Series Board Firmware Update Utility (*iptfwupdate*)
The *iptfwupdate* utility allows you to update the firmware that resides in flash memory on an Intel NetStructure IPT Series board. Removal or disassembly of the board is not necessary to perform the update. For more information on this utility, see the *Administration Guide*.

New API Libraries

System Release 6.1 for Linux introduces support for the following API library. This API library is new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

Board Management Library (BML)
The Board Management Library (BML) contains functions that provide runtime fault monitoring and management of configurable boards. The API provides the ability to monitor the host computer for a failure and take boards out of service to prevent the network from offering calls to a failed system. For example, if the host application or operating system fails, the API will take the network interface out of service. Refer to the *Board Management API Library Reference* for more information.

Support for the Board Management API is as follows:

- The Board Management API is supported on digital Springware JCT single span and dual span boards (D/240JCT-T1, D/480JCT-1T1, D/480JCT-2T1**)** using the following protocols: T1 North American ISDN (4ESS, 5ESS, DMS100, DMS250, and NI2). (E1 protocols are not supported).
- The Board Management API is supported on digital DM3 boards (the board must have a network interface for the API to be supported), including the DMT160TEC and DMN160TEC boards, using the following protocols:
  - T1 North American ISDN (4ESS, 5ESS, DMS100, DMS250, NI2, NTT, QSIG)
  - E1 ISDN (NET5, QSIG)
  - E1/T1 CAS (PDK protocols)
  - E1 DPNSS and DASS2
- The Board Management API is *not* supported on the Intel NetStructure® IPT series boards.

OA&M API Library
The OA&M API Library, which was introduced in Intel® Dialogic® System Release 6.0 for CompactPCI on Linux, now supports PCI boards as well. The OA&M API Library provides a set of C++ classes, functions and events that support the development of customized system administration and clock management applications. For example, an automated CT Bus clock management application can be developed that controls and monitors clocking actions that occur on the CT Bus.

The classes available in the OA&M library allow instantiation of objects that represent the various components of the Intel Dialogic system (node, boards, clocking agents). After an object has been instantiated, the member functions of its class can be used

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to programmatically obtain, and in some cases change, the object's attributes. Refer to the *OA&M API Library Reference* and the *OA&M API Programming Guide* for additional information.

The following OA&M API features are available in System Release 6.1 for Linux:

OA&M Event Notification
Any application can register to receive and handle events from the OA&M event notification framework. An OA&M event is generated when certain activities take place in the system. Some examples of activities that generate OA&M events are board stop or start, CT Bus line failures and T-1/E-1 trunk network alarms.

System Release Information
The library includes a function which returns information about the Intel® Dialogic® system software that is installed in your system. The returned information includes the system release number, system release build number, feature pack number, service update number, feature release number and more.

    Note: The CTPLATFORMVERSIONINFO data structure stores information about the Intel Dialogic system software that is installed on a node. For System Release 6.1 for Linux, the data structure has been updated to include the following fields:

- lServicedUpdateNumber
- lServiceUpdateBuildNumber
- lFeatureReleaseNumber
- lFeatureReleaseBuildNumber

Because these new data fields have been added to the data structure, existing applications developed with the Intel® Dialogic® System Release 6.0 for CompactPCI on Linux versions of the OA&M API must be recompiled.

Board Identification
The ICTBoard class member functions allow you to get identification information (serial number, PCI slot number, cPCI physical slot number, number of network interface trunks, etc.) about a given Intel NetStructure® board that is installed in your system.

TDM bus capabilities
The library includes a function that gets the TDM bus settings supported by an individual board's clocking agent.

TDM bus configuration
The ICTClockAgent::**GetTDMConfiguration( )** function allows you to get the TDM bus settings of an individual board's clocking agent. The ICTClockAgent::**SetTDMConfiguration( )** function allows you to reconfigure the TDM bus settings of an individual board's clocking agent.

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Discontinued Administrative Tools

The following administrative utilities previously documented in the *Administration Guide* (05-1845-001) have been discontinued and are not supported in System Release 6.1 for Linux. However, their functionality is now provided by other utilities as indicated:

  – The alarms utility is discontinued and its function is replaced by the lineadmin utility.
  – The pbl utility is discontinued and its function is replaced by the listboards utility.

The administrative utilities are documented in the *Administration Guide* (05-1845-003).

Note: You must install the DLGCdmdev RPM to use the listboards utility regardless of the type of board (that is, you must install the DLGCdmdev RPM to use listboards for Springware architecture boards). To install the DLGCdmdev RPM, select an Intel NetStructure® menu item during installation of System Release 6.1 for Linux (Springware and DM3).

SNMP Agent Administration Software Features

SNMP stands for Simple Network Management Protocol, a standard IP network mechanism for exchanging management information between an SNMP agent and an SNMP manager. SNMP agent administration software for System Release 6.1 for Linux supports the following Management Information Bases (MIBs):

- DM3 Extended Platform (proprietary)
- DS1 (proprietary and standard: RFC 2495)
- Hardware Information (proprietary)
- ISDN (proprietary)
- MIB II (standard: RFC 1213)
- R4 Resource (proprietary)
- Springware Performance (proprietary)

Notes: 1. System Release 6.1 for Linux does not support every option for the listed MIBs. Refer to the *SNMP Agent Software Administration Guide* for a detailed description of the various MIB modules and their limitations.

2. SNMP may not be supported if the Linux Distribution does not use NetSNMP Master Agent 5.09. Source code for NetSNMP is included with System Release 6.1 for Linux. **Do not use the NetSNMP that is included with Red Hat Linux**. Refer to the *Software Installation Guide* for instructions on installing NetSNMP.

3. Any NetSNMP distribution that does not support `dlmod` will have to be patched. The *SNMP Agent Software Administration Guide* describes how to patch the NetSNMP 5.0.9 updates on Red Hat Enterprise Linux v3, Advanced Server.

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5.2   Diagnostics Software

This section describes the new diagnostic capabilities and tools available for System Release 6.1 for Linux. For more information about the diagnostics software, refer to the *Diagnostics Guide*.

Diagnostics documentation improvements
>   The *Diagnostics Guide* now includes more information on performing specific diagnostic tasks, as well as a glossary of terms.

New Tools

The following tools are new. For more information on these tools, refer to the *Diagnostics Guide*.

DebugAngel
>   The DebugAngel diagnostics tool replaces DM3Stderr. The DebugAngel tool provides low level firmware tracing to aid in low level debugging. Running as a Linux daemon, it polls the DM3 boards in the system and posts qPrintf( ) statements from the resources and DM3 kernel to a log file.

dlgsnapshot tool is now available for Linux systems
>   Dlgsnapshot uses Intel® Dialogic® system software fault monitoring components to generate a core dump file when a Control Processor (CP) or Signal Processor (SP) fault is detected on a DM3 board. When a fault is detected, the board that the fault occurred on is taken out of service (stopped) without causing any other interruptions to the system. This core dump file can be sent to Intel® Telecom Support Resources for debugging purposes.

dm3post
>   The dm3post tool allows you to perform diagnostics on a stopped board at any time to detect and isolate possible hardware faults. But dm3post also provides an option to run POST on all the DM3 boards in a chassis.

Intel Telecom Subsystem Summary Tool (its_sysinfo) tool
>   The its_sysinfo tool provides a simple way to collect information about systems built using Intel® telecom products.The its_sysinfo tool collects data from the system on which you execute it and provides you with information about the system environment: the operating system, computer architecture, Intel Dialogic System Release, and operational logs.

PDK Trace
>   The PDK Trace tool allows those who use a DM3 PDK protocol to log specific information related to the operation of the protocol.

PSTN Diagnostics tool (pstndiag)
>   Pstndiag can be used for diagnosing and troubleshooting public switched telephone network (PSTN) connectivity problems on specific hardware products based on DM3 architecture. The pstndiag tool allows you to perform the following:
>   - Query the system for board information
>   - View all boards in the system that have been downloaded

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- Monitor all components (boards, trunks, channels) in the system, and view trunk and channel information, such as trunk status, alarm status, channel state, and call state
- Display the protocol family running on a channel (ISDN or CAS)
- Produce a consolidated log file for all components that are being actively monitored in the system
- Display a previously saved log file
- Launch the ISDNtrace and CAStrace tools to perform further diagnostic tests
- Receive immediate notification when a D Channel goes down.

Runtime Trace Facility (RTF)

The RTF tool provides a mechanism for tracing the execution path of various runtime libraries. The resulting log file/debug stream output helps troubleshoot runtime issues for applications that are built with Intel Dialogic software.

Note: When RTF logging is enabled, users should be aware that logs are stored in the *${INTEL_DIALOGIC_DIR}/log* directory and take necessary precautions to ensure that the directory never fills.

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Programming Libraries 6

This chapter describes the features of the programming libraries and other development software features and tools that are supported in Intel® Dialogic® System Release 6.1 for Linux.

Note: If you are upgrading to Intel® Dialogic® System Release 6.1 for Linux from Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux or Intel® Dialogic® System Release 6.0 for CompactPCI on Linux (or any earlier versions), you should recompile all of your applications to avoid any compatibility issues between releases due to differences in compiler versions used. In addition, you should also recompile your applications under the following conditions:

- If your applications use the dlgctypes.h file, you must recompile your applications after upgrading to System Release 6.1 for Linux.
- Because new data fields have been added to the CTPLATFORMVERSIONINFO data structure in System Release 6.1 for Linux, existing applications developed with previous versions of the OA&M API must be recompiled. Refer to Section 5.1, "Administration Software", on page 37 for more information.

6.1 New Learn Mode and Tone Set File API Libraries

The learn mode and tone set file API libraries are designed to help you integrate tone learning capability in your computer telephony application. The learn mode API enables an application to learn the unique call progress tones of a PBX. The tone set file API provides an interface to handle tone set data and tone set files.

The learn mode and tone set file API libraries are supported on all Springware boards; the libraries are supported on one DM3 board only, namely the Intel® Dialogic® DMV160LP.

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These libraries are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

Note: For more information about the learn mode and tone set file APIs, refer to the *Learn Mode and Tone Set File API Software Reference*.

Features

The learn mode API provides the ability to characterize a call progress tone from a PBX, key system or PSTN and to obtain a complete tone description.

The tone set file API provides the following features:

Integration with learn mode API
    Ability to store unique call progress tone data obtained from the learn mode API

Integration with the voice library
    Ability to change default tone definitions that are provided by the voice library

Defining new tones
    Ability to create a new tone definition and add it to the tone template for use with call progress analysis

Storing tone sets
    Ability to store an unlimited number of tone sets on your system (subject to storage constraints)

Creating a consolidated tone set
    Combine up to 10 sets of tone characteristics into a single, consolidated tone set

Storing several sets of tone characteristics
    Store up to 10 sets of tone characteristics (that is, for up to 10 different PBX or key systems)

6.2 Audio Conferencing (DCB) API Library

The Audio Conferencing (DCB) API library supports development of host-based conferencing applications on certain Intel telephony boards. The Audio Conferencing API library provides many features that can be used to develop customized audio conferencing servers.

The Audio Conferencing software includes library functions, device drivers, and firmware.

Note: Refer to the *Audio Conferencing API Library Reference* and *Audio Conferencing API Programming Guide* for more information.

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New Features

The Audio Conferencing API library provides the following new features in System Release 6.1 for Linux. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

Conference Bridging
  All parties in two or more established conferences can speak to and listen to one another, enabling large conferences to be built.

Volume Control
  Any conferee can control volume by issuing pre-programmed DTMF digits. This feature is added for DM3.

Conference Monitoring
  Enables many participants to monitor a single conference without interrupting the conference. This feature is added for DM3.

6.3 Continuous Speech Processing (CSP) API Library

The continuous speech processing (CSP) API library supports development of host-based automatic speech recognition (ASR) applications. CSP provides many features such as high-performance echo cancellation, voice energy detection, barge-in, voice event signaling, pre-speech buffering, and full-duplex operation.

The CSP software includes library functions, device drivers, firmware, and demonstration programs.

Note: Refer to the *CSP API Library Reference* and *CSP API Programming Guide* for more information.

New Features

The following new CSP features are available in System Release 6.1 for Linux. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

New CSP board support
  The following boards now support CSP:

  - D/160JCT
  - D/320JCT
  - D/4PCIU4S

DX_MAXTIME termination condition
  The **ec_stream( )** and **ec_reciottdata( )** functions now support the DX_MAXTIME termination condition, which is set in the DV_TPT data structure. Previously, this feature was supported on Springware boards only.

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Streaming echo-cancelled data to the CT bus
> The **ec_stream( )** and **ec_reciottdata( )** functions now support streaming of echo-cancelled data to the TDM bus. The **ec_getxmitslot( )** function retrieves the number of the time slot that transmitted the echo-cancelled data. Previously, this feature was supported on Springware boards only.
>> *Note:* This feature is supported on select boards and media loads. Refer to the *DM3 Configuration Guide* for more information.

Enhanced Echo Canceller (EEC) tap length of up to 64 ms (512 taps)
> Tap lengths of 32 ms and 64 ms are now supported by the CSP library. Previously, the maximum tap length was 16 ms.

Notes: 1. This feature is supported on select boards and media loads. Refer to the *DM3 Configuration Guide* for more information.

2. This tap length must be set up in the config file. Refer to the *DM3 Configuration Guide* for more information.

Silence compressed streaming
> This feature allows for silence data to be removed from data being streamed to the host. This feature is available on DM3 boards only.

6.4   Fax API Library

The fax API library supports development of a wide variety of fax applications such as fax mail, fax broadcasting and fax-on-demand. The fax software library includes functions, device drivers, firmware and demonstration programs.

Note: Refer to the *Fax Software Reference* for more information.

New Features

The following Fax API library feature is implemented in System Release 6.1 for Linux. This feature is new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

T.30 Non-Standard Facilities (NSF)
> Ability to transmit a customized T.30 non-standard facilities (NSF) message. This feature is available on DM3 boards only.

6.5   Global Call API Library

The Global Call API library provides a uniform call control interface for developing applications for multiple network interface technologies. The Global Call API library supports a variety of protocols operating on Intel NetStructure DM3 and Springware architectures.

Note: Refer to the *Global Call API Library Reference* and *Global Call API Programming Guide* for more information.

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New Features

System Release 6.1 for Linux supports the following new Global Call features. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

Note: The Global Call Protocols Package is now integrated with the System Release 6.1 for Linux software installation. Previously, this was a separate, installable package.

The Global Call API Library provides the following new features that apply to more than one technology:

Call progress analysis
> A unified method of call progress analysis (CPA) for CAS and ISDN all protocols is now supported on DM3 boards. See the "Call Progress Analysis when Using DM3 Boards" section in the *Global Call API Programming Guide* for more information.

GCAMS
> The Global Call Alarm Management System (GCAMS) functions are now supported on DM3 boards. These functions provide the ability to management layer 1 alarms. See the "Operation and Configuration of GCAMS" section in the *Global Call API Programming Guide* for more information.

New Global Call Features for Analog Technology

The Global Call API Library provides the following new features that apply to Analog technology:

Call transfer support on DMV160LP board
> Supervised call transfer is now supported on the Intel® Dialogic® DMV160LP Combined Media Board. Supervised call transfer is a feature that enables a controller (party A) already in a call with another party (party B) to transfer the call to a third party (party C). The end result is a call between party B and party C. This feature is a common requirement in IVR and voicemail applications. For further information, see the *Global Call Analog Technology User's Guide*.

New Global Call Features for E1/T1 Technology

The Global Call API Library provides the following new features that apply to E1/T1 CAS technology:

Dynamic protocol selection
> Allows dynamic configuration (post download) on a trunk-by-trunk basis within selected front-end configurations (T1 or E1). For example, if a trunk is configured for E1 at download, a user can change that trunk to a different E1 protocol during runtime. Changes to/from Clear Channel are excluded. This feature is supported on Intel NetStructure® DMT160TEC boards only. For further information, see the *Global Call E1/T1 CAS/R2 Technology Guide*.

Dynamic line coding and frame selection
> Allows dynamic configuration (post download) of the following trunk parameters:
> * Line Type (E1 or T1)

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- Frame Selection (ESF, SF)
- CRC4 on/off
- Selecting between user/network modes

This feature is supported on Intel NetStructure DMT160TEC boards only. For further information, see the *Global Call E1/T1 CAS/R2 Technology Guide*.

Blind transfer
Blind transfer is now supported when using the PDK USMF T1 CAS, PDK FXS T1, PDK FXS E1, and MELCAS Lineside protocols. For further information, see the "Unsupervised Transfer" section in the *Global Call API Programming Guide* and *Global Call E1/T1 CAS/R2 Technology Guide*.

Supervised transfer
Supervised transfer is now supported when using the PDK USMF T1 CAS, PDK FXS T1, PDK FXS E1, and MELCAS Lineside protocols. For further information, see the "Supervised Transfer" section in the *Global Call API Programming Guide* and *Global Call E1/T1 CAS/R2 Technology Guide*.

Overlap send/receive
Overlap send/receive is now supported for CAS protocols. For further information, see the "Call State Models" section in the *Global Call API Programming Guide*.

Suspend and resume calls
The ability to suspend/resume calls is now supported when using the PDK USMF T1 CAS. Callers can hang up a call, and then pick up the same call (within a configurable time-out) without the call terminating. For further information, see the *Global Call CDP Configuration Guide*.

Support for ANI category digit retrieval
The **gc_GetCallInfo( )** function, which retrieves information associated with a call, can now be used to retrieve the category digit for DM3 boards. Formerly, the **gc_GetCallInfo( ) CATEGORY_DIGIT** parameter was supported for Springware boards only. For further information about **gc_GetCallInfo( )**, see the *Global Call API Library Reference*.

Support for new PDK protocols
The following new protocols are supported:

- Korea T1/R2
- Lebanon R2
- Poland R2
- Samsung Lineside E1

For further information about these protocols, see the *Global Call CDP Configuration Guide*.

Send blocking pattern for OOS channel
A new parameter, CDP_BlockOnLOOS, has been added to the CDP files for several protocols to send a blocking pattern when a channel is put out-of-service. For further information, see the *Global Call CDP Configuration Guide*.

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Querying ABCD bits
> The Direct Signaling protocol now provides the ability to retrieve the current state of the ABCD signaling bit values by using the **gc_Extension( )** function. For further information, see the *Global Call CDP Configuration Guide.*

New Global Call Features for IP Technology

The Global Call API Library provides the following new features that apply to the IP technology in general (that is, both H.323 and SIP protocols):

Early media support
> Media streaming is established as early as possible in the call connection process to allow transfer of signaling tones or system announcements. Full early media support using initial half-duplex streaming is only supported on Intel NetStructure® IPT Series boards.

Support for multiple IP addresses for Ethernet* ports on Intel NetStructure IPT Series boards
> Applications can implement trunk groups or assign an RTP address from a pre-configured set of up to four addresses per port on a call-by-call basis.

Network disconnection alarms
> GCAMS alarms to report cable disconnection or network failure for the on-board media ports (Intel NetStructure IPT Series boards only) and the host LAN signaling connection.

RTF-based logging
> New logging capabilities for the IP call control library use the same Runtime Tracking Facility that is used in other Intel telephony API libraries.

Busy Reason codes
> Applications can configure the H.323 and SIP busy reason codes that will be sent when a virtual board is unable to accept additional calls.

Media streaming status
> Applications can retrieve RTP addresses and streaming status after connecting.

In addition to the general IP technology features, System Release 6.1 for Linux supports the following features that are specific to the **H.323 protocol**:

Call Transfer
> H.450.2 supplementary service for blind and supervised call transfer.

Access to message fields and Information Elements
> Applications have ability to access several additional message fields and Information Elements, including:
> - Ability to set Bearer Capabilities
> - Ability to set Facility IE
> - Ability to set/get CallID (GUID) field in SETUP messages
> - Ability to set/get PresentationIndicator field in SETUP messages
> - Ability to set/get MediaWaitForConnect field in SETUP messages
> - Ability to get Progress Indicator IE from PROGRESS message

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- Ability to set/get Q.931 message IEs

Terminal type
    Applications can configure the terminal type that is used during RAS registration (H.323 terminal type) and Master/Slave determination (H.245 terminal type) for each virtual board.

Optional H.245 channel
    When using H.323 fast start mode, applications can make the establishment of the H.245 channel optional to complete connections faster.

H.323 Annex M tunneled signaling messages
    Applications can encapsulate DSS/QSIG/ISUP messages in common H.225 call signaling messages.

In addition to the general IP technology features, System Release 6.1 for Linux supports the following features that are specific to the **SIP protocol**:

Call Transfer
    Supplementary service for unattended and attended call transfers compliant with IETF RFC 3515

Message header access
    Applications can set/get any standard or proprietary header field in any supported SIP message type (as permitted by IETF standards). Size of header field content is not limited to 255 bytes.

SIP-T support
    Applications can include multi-part MIME bodies in SIP messages to send and receive SIP Telephony (SIP-T) information or other types of non-SDP content.

SIP outbound proxy
    Applications can configure the Global Call library to use a proxy for all outbound messages sent from each virtual board.

Support for TCP and UDP transport protocols
    The Global Call IP call control library can be configured to accept incoming messages that use the TCP transport protocol rather than UDP. When TCP support is enabled, the library can be configured for which transport protocol to use as the default for SIP requests, and this default transport protocol can be overridden by the application on a message-by-message basis. The library can also be configured for how to handle transport failures for SIP requests that are sent using UDP.

Support for INFO method
    Applications can send or receive INFO requests and responses to allow transport of application-level, session-related control information after the setup of a SIP session has begun.

Support for OPTIONS method
    Applications can send or receive OPTIONS requests and responses to allow a SIP User Agent to query the capabilities of another UA or proxy either within or outside of a SIP dialog.

Support for SUBSCRIBE and NOTIFY methods
    Applications can send or receive SUBSCRIBE and NOTIFY requests and responses to support event notification between nodes outside of a SIP dialog. Unsubscribed

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NOTIFY messages (commonly used for MWI) are supported as well as subscribed NOTIFY messages.

Expanded registration capabilities
The Global Call library now allows applications to query the SIP registrar for current bindings as well as adding, changing, and deleting the bindings. The maximum number of registrations can be configured when starting each virtual board to allow users to be registered with multiple registrars or registered using multiple transport addresses.

Support for digest authentication
The Global Call library supports the SIP digest authentication mechanism, which allows a remote endpoint to challenge and authenticate the identity of a User Agent which has sent it a request.

Support for 3xx responses
Applications will be notified of incoming 3xx responses

Support for DNS
A SIP server can be located using a DNS record (e.g., "sip11.intel.com"), which can be resolved without an IP Address of the remote.

New Global Call Features for ISDN Technology

The Global Call API Library provides the following new features that apply to ISDN technology:

Call hold and retrieve
Call hold and retrieve functionality is now supported on all ISDN protocols. See the "Implementing Call Hold and Retrieve" section in the *Global Call ISDN Technology Guide*.

2B Channel Transfer
2B Channel Transfer (2BCT) is now supported. See the "Network Facility Request - Two B Channel Transfer" section in the *Global Call ISDN Technology Guide*.

D-Channel enable/disable
This new feature provides the ability to set the data link (D-Channel) state using the **gc_Extension( )** function with an extension ID (ext_id) of GCIS_EXID_SETDLINKSTATE. See the "Set the Logical Data Link State" section in the *Global Call ISDN Technology Guide*.

D-Channel backup
D-Channel backup is now supported for the NI2, 4ESS and 5ESS protocols. Refer to the *DM3 Configuration Guide* for more information.

NFAS support on additional ISDN protocols
NFAS is now supported for the 5ESS, 4ESS, DMS250, DMS100, and NI2 protocols. Refer to the *DM3 Configuration Guide* for more information.

Dynamic Protocol Selection
Allows dynamic configuration (post download) on a trunk-by-trunk basis within selected front-end configurations (T1 or E1). For example, if a trunk is configured for E1 at download, a user can change that trunk to a different E1 protocol during runtime. Changes to/from Clear Channel or NFAS are excluded. See the "Using

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Dynamic Trunk Configuration" section in the *Global Call ISDN Technology Guide* for more information. This feature is supported on Intel NetStructure DMT160TEC boards only.

Dynamic Line Coding and Frame Selection
Allows dynamic configuration (post download) of the following trunk parameters:

- Line Type (E1 or T1)
- Frame Selection (ESF, SF)

See the "Using Dynamic Trunk Configuration" section in the *Global Call ISDN Technology Guide* for more information. This feature is supported on Intel NetStructure DMT160TEC boards only.

New Global Call Features for SS7 Technology

The Global Call API Library provides the following new features that apply to SS7 technology:

Support for the development of applications that use SS7 Signaling Interface Units (SIUs)
This system release provides support for developing applications that incorporate call control using the ISUP and TUP (ITU and China GF001-9001 variants) protocol layers for the following Intel NetStructure® SS7 products (see the *Global Call SS7 Technology Guide* for details):

- SS7G21 (in SIU Mode)
- SS7G22 (in SIU Mode)
- SIU520
- SIU231
- SIU131

Support for the development of applications that use SS7 PCI boards
This system release provides support for developing applications that incorporate call control using the ISUP and TUP (ITU and China GF001-9001 variants) protocol layers for the following Intel NetStructure SS7 boards (see the *Global Call SS7 Technology Guide* for details):

- SS7HDPD4TE
- SS7SPCI4
- SS7SPCI2S

Support for the development of applications that use SS7 CompactPCI* boards
This system release provides support for developing applications that incorporate call control using the ISUP and TUP (ITU and China GF001-9001 variants) protocol layers for the following Intel NetStructure SS7 products:

- SS7HDCS8
- SS7HDCD16
- SS7HDCQ16
- SS7CPM8

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6.6   IP Media API Library

The IP Media Library (IPML) is used to control media on IP devices. Voice over IP (VoIP) applications that use IP signaling stacks other than those supplied with Intel products may use this library for application development. VoIP applications that use the Global Call library for call control will have limited need to use the IP Media Library directly.

Note: IP Media Library functionality is documented in the *IP Media Library API Library Reference* and the *IP Media Library API Programming Guide*.

New Features

System Release 6.1 for Linux provides the following new features in the IP Media Library:

Support for "Early Media" capabilities
>   RTP stream can be started in unidirectional mode on Intel NetStructure IPT series boards prior to completing the connection in order to pass network tones back to the calling party, then changed to full-duplex mode when the connection is complete.

Network disconnect alarm
>   Support for an alarm event to notify applications using IPML or Global Call when the on-board network connection on an Intel NetStructure IPT series board is disrupted (due to cable disconnection or network hardware failure, for example) and when the connection is restored.

RFC2833 support
>   RFC2833 is supported to handle DTMF tones in event format. End-of-Event (EoE) redundancy and native codec frame rates are also supported.

6.7   Modular Station Interface API Library

The Modular Station Interface (MSI) API is used by the Intel NetStructure® High Density Station Interface (HDSI) boards, which provide high density analog station connectivity. The HDSI board can support up to 120 stations with tone detection and generation, and FSK Caller ID transmission.

Note: Refer to the *MSI API Library Reference* and the *MSI API Programming Guide* for more information.

New Features

The following new MSI API library feature is implemented in System Release 6.1 for Linux.

Asynchronous Routing with **ms_listenEx( )** and **ms_unlistenEx( )**
>   In addition to the functionality provided by **ms_listen( )** and **ms_unlisten( ),** the new **ms_listenEx( )** and **ms_unlistenEx( )** routing functions provide asynchronous routing through the **mode** parameter. The MSEV_LISTEN and MSEV_UNLISTEN events are also added to indicate the successful completion of the asynchronous routing operations, and the MSEV_LISTEN_FAIL and MSEV_UNLISTEN_FAIL

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events to indicate failure of the asynchronous routing operations. See the *MSI API Library Reference* for details.

6.8 PBX Integration Unified API Library

The PBX Integration Unified API provides a common PBX-integration interface for all of the Private Branch Exchanges (PBXs) and Key Telephony Systems (KTSs) supported by PBX integration boards (Intel® Dialogic® D/42JCT-U and D/82JCT-U). This API is used to develop computerized voice and call processing applications.

Note: Refer to the *PBX Integration Software Reference* and *PBX Integration Board User's Guide* for more information.

New Features

The PBX Integration Unified Library API library provides the following new feature in System Release 6.1 for Linux:

Retrieval of Call Waiting LED status on ROLMphone 400
The **d42_indicators( )** function can now be used to retrieve the Call Waiting LED status on ROLMphone 400 units. See the "*Siemens ROLM PBX*" section in the *PBX Integration Board User's Guide* for more information.

6.9 Standard Runtime Library

The Standard Runtime Library (SRL) API provides a common interface for event handling and other functionality common to all Intel Dialogic and Intel NetStructure devices. The Standard Runtime Library provides the framework for implementing the supported programming models and serves as the central dispatcher for events that occur on all devices. Through the Standard Runtime Library, events are handled in a standard manner.

Note: Refer to the *SRL API Library Reference* and *SRL API Programming Guide* for more information.

New Features

The SRL API library provides the following new features in System Release 6.1 for Linux. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

Support for an alternative variant of the extended asynchronous programming model
A set of functions called the device grouping API has been added to support a more efficient alternative to the **sr_waitevtEx( )** variant of the extended asynchronous model.

Device mapper API update
A new function, **SRLGetPhysicalBoardName( )**, has been added to the SRL device mapper API.

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6.10   Voice API Library

The Voice API library provides a rich set of features for building a wide range of high-density call processing applications such as voice messaging, interactive voice response, telemarketing/call center, operator services, and more. Features include tone signaling, global tone detection and generation, call progress analysis, and a variety of voice encoding algorithms selectable on a channel-by-channel basis.

Note: For more information, refer to the *Voice API Library Reference* and *Voice API Programming Guide*.

New Features

The Voice API library provides the following new features in System Release 6.1 for Linux. These features are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

Cached prompt management
    Prompts can be stored in on-board memory rather than in the host computer to improve system performance for frequently used prompts. The **dx_getcachesize( )** and **dx_cacheprompt( )** functions and the TDX_CACHEPROMPT event have been added to the Voice library to support cached
    prompt management. This feature is supported on DM3 boards only.

IMA ADPCM (32.443 kbps) coder
    The IMA ADPCM coder (VOX and WAVE file formats) is supported. IMA is an acronym for the Interactive Multimedia Association, which defined and published the ADPCM algorithm. This feature is supported on DM3 boards only.

Support for **ATDX_BUFDIGS( )**
    This function, which returns the number of uncollected digits, is now supported on DM3 boards. However, it must be manually enabled. For more information, see the function description in the *Voice API Library Reference*.

8 kHz linear PCM coder
    The linear PCM coder is supported, at 8 kHz with 8-bit samples (64 kbps) and 8 kHz with 16-bit samples (128 kbps), in VOX and WAVE file formats. This feature is now supported on DM3 boards.

Enhancement to Multi-Frequency (MF) signaling
    MF tone detection is now supported in this release. Previously, only MF tone generation was supported. This feature is now supported on DM3 boards.

Increased granularity for DX_MAXSIL and DX_MAXNOSIL termination conditions (DV_TPT structure)
    The range of valid values for DX_MAXSIL and DX_MAXNOSIL is now 10 ms to 250 seconds (1 to 25000 in 10 ms units). There are no further restrictions within this range. Previous range of time was 1 second to 30 seconds, with step values. This feature is now supported on DM3 boards.

DX_MAXSIL termination condition
    This termination condition is now supported by **dx_getdig( )** on DM3 boards.

Streaming to board

This feature enables streaming to a network interface in real time, which is essential in applications such as text-to-speech and IP gateways. Several new functions have been added to the Voice library.

Enhancements to call progress analysis

Enhancements include the ability to modify call progress analysis tone definitions on DM3 boards. The **dx_createtone( )**, **dx_deletetone( )**, **dx_querytone( )** functions have been added to the Voice library.

Automatic gain control (AGC) configurable on a per-channel basis through new **dx_setparm( )** parameters

The new parameters for AGC have the prefix DXCH_AGC_. Previously AGC was configurable on a board basis.

Playback pause and resume

This feature allows a playback to be paused and then resumed at the exact point it was stopped without loss of data. The **dx_pause( )** and **dx_resume( )**functions have been added to the Voice library. This feature is only available on DM3 boards.

Enhanced CT_DEVINFO structure

This structure contains device and device configuration information.

ETSI-compliant Frequency Shift Keying (FSK) support

The new parameters include DXCH_FSKSTANDARD, DXCH_FSKCHSEIZURE and DXCH_FSKMARKLENGTH, set through **dx_setparm( )**. This feature is only available on DM3 boards.

Support for TF_SETINIT flag in DV_TPT structure

This termination flag, used by DX_MAXSIL termination condition only, is now supported on DM3 boards (on standard play/record functions). This flag was previously supported on Springware boards only.

Configurable bulk queue buffer size

This feature allows you to change the bulk queue buffer size (player transfer buffer size) using the **dx_setchxfercnt( )** function. This feature is now supported on DM3 boards.

Support for **ATDX_CRTNID( )**

This function, which returns the last call progress analysis termination, is now supported on DM3 boards. This function was previously supported on Springware boards only.

Enhancements to **dx_reciottdata( )**

Two new modes have been added. These modes are supported on DM3 boards only.

- Voice activity detector (VAD) with event notification (RM_VADNOTIFY).
- Initial silence compression (RM_ISCR)

Enhancements to SIT frequency detection

Improvements, supported on DM3 boards only, include the following:

- Broader default SIT sequence definitions to allow greater coverage for SIT sequences detected in the field.
- New SIT sequence definitions in the SIT tone set for DM3 boards: TID_SIT_NO_CIRCUIT_INTERLATA (or TID_SIT_NC_INTERLATA),

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TID_SIT_REORDER_TONE_INTERLATA (or TID_SIT_RO_INTERLATA), and TID_SIT_INEFFECTIVE_OTHER (or TID_SIT_IO).

- New catch-all SIT sequence definition to cover SIT sequences that fall outside the range of the defined SIT sequences (TID_SIT_ANY).

- Support for the **ATDX_CRTNID( )** function to allow retrieval of the SIT IDs.

Note: In this release, the new SIT sequences are not supported by the **dx_querytone( )**, **dx_deletetone( )**, and **dx_createtone( )** functions.

Support for two-way FSK on Springware boards

The **dx_RxIottData( )**, **dx_TxIottData( )**, and **dx_TxRxIottData( )** functions are now supported on Springware boards. These functions were previously supported on DM3 boards only.

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Demonstration Software 7

This chapter describes the demonstration programs that are provided in Intel® Dialogic® System Release 6.1 for Linux. Demonstration programs are provided to demonstrate the functionality and features of Intel® telephony products and serve as examples of application programming using Intel® Dialogic® API libraries. All demo programs are supplied as source code which users may modify to explore other capabilities of the products. This chapter is divided into two sections:

7.1   New Demo Programs

System Release 6.1 for Linux introduces support for several new demonstration programs. These demo programs are new since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

CSP Demonstration Programs

Three new Continuous Speech Processing (CSP) demonstration programs are provided. These demo programs are located in the /demos/ec_demos directory under INTEL_DIALOGIC_DIR (the environment variable for the directory in which the system release software was installed). The CSPAuto and CSPLive demo programs cover the functionality of the cspdemo program which is no longer available. The CSPdemoSTB illustrates new functionality.

The following describes the new CSP demonstration programs:

CSPAuto
    A multi-channel, non-interactive (automatic) CSP demo that illustrates key features of the CSP API library, including barge-in, voice activity detection, and echo-cancelled recording. CSPAuto runs in automatic mode or diagnostic mode.This demo is supported on Springware and DM3 boards.

CSPLive
    A multi-channel, interactive CSP demo that illustrates key features of the CSP API library, including barge-in, voice activity detection, and echo-cancelled recording. CSPLive runs in interactive mode or diagnostic mode. This demo is supported on Springware and DM3 boards.

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CSPdemoSTB
> A single-channel, interactive demo that illustrates the streaming to board (real time streaming) feature. CSPdemoSTB runs in interactive or diagnostic mode. This demo is supported on DM3 boards only.

Note: For more information about the CSPAuto, CSPLive and CSPdemoSTB demonstration programs, refer to the *CSP API Demo Guide*.

IP Demonstration Programs

Two new IP demonstration programs are provided in this release. These demo programs are located in the /demos/ipt_demos directory under INTEL_DIALOGIC_DIR (the environment variable for the directory in which the system release software was installed).

gateway_r4
> Using the Global Call API, this program demonstrates how to build a PSTN-IP gateway using the H.323 and SIP protocol stacks in the C programming language.This demo is available on the Intel NetStructure® IPT Series boards.
>
> > *Note:* For more information on this demo, refer to the *IP Gateway (Global Call) Demo Guide*.

IPMediaServer (replaces iptmail_r4)
> This program demonstrates how to build a PSTN-IP gateway using the IPML API. The demo must use a proprietary IP protocol stack. This demo is available on the Intel NetStructure® IPT Series boards.
>
> > *Note:* For more information on the IPMedia Server demo, refer to the *IP Media Server (Global Call) Demo Guide*.

7.2 Updated Demo Programs

The following demo programs have been updated, modified, or enhanced since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux and Intel® Dialogic® System Release 6.0 for CompactPCI on Linux:

Fax Demonstration Program

The following describes the updated fax demonstration program, which is located in the /demos/fx_demos directory under INTEL_DIALOGIC_DIR (the environment variable for the directory in which the system release software was installed):

faxdemo
> This enhanced demo is designed for customers new to fax programming. Fax calls are established using analog GlobalCall API functions in asynchronous mode. This demo program accepts command line options to send and receive faxes. The faxdemo is supported on Springware boards only.
>
> > *Note:* For more information on this demo, refer to the *Fax Software Reference*. For information on other supported fax demos, see Section 7.3, "Other Supported Demo Programs", on page 60.

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7.3   Other Supported Demo Programs

System Release 6.1 for Linux continues to support the following demonstration programs. These demo programs have not changed since Intel® Dialogic® System Release 5.1 Feature Pack 1 for Linux or Intel® Dialogic® System Release 6.0 for CompactPCI on Linux.

CT Bus Clock Fallback Demonstration Program

cdaemon_demo
> The CT Bus Clock Fallback demo shows how to use the OA&M API to develop a CT Bus clocking daemon that is capable of clock master fallback, network reference fallback and T1/E1 network alarm reception.The demonstration program is located in the /demos/ha_demos directory under INTEL_DIALOGIC_DIR (the environment variable for the directory in which the system release software was installed).
>
>> *Note:* Refer to the *CT Bus Clock Fallback Demo Guide* for more information about this demo.

Fax Demonstration Programs

The following fax demonstration programs are supported in System Release 6.1 for Linux. These demo programs are located in the /demos/fx_demos directory under INTEL_DIALOGIC_DIR (the environment variable for the directory in which the system release software was installed).

faxasync
> Illustrates the use of the fax library functions in asynchronous mode

faxsr
> Sends and receives faxes using the fax API on a single voice/fax channel

Note: For more information on fax demos, refer to the *Fax Software Reference*.

Global Call Demonstration Program

The following Global Call demonstration program is supported in System Release 6.1 for Linux. This demonstration program is located in the /demos/gc_demos directory under INTEL_DIALOGIC_DIR (the environment variable for the directory in which the system release software was installed).

Global Call Basic Call Control Demo
> A demonstration program that exercises some of the basic call control capabilities of the Global Call API.
>
>> *Note:* For more information about the Global Call Basic Call Control demonstration program, refer to the *Global Call API Demo Guide*.

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High Availability (HA) Demonstration Programs

The following High Availability demo programs are supported in System Release 6.1 for Linux. These demonstration programs are located in the /demos/ha_demos directory under INTEL_DIALOGIC_DIR (the environment variable for the directory in which the system release software was installed).

hscfgdemo
   The hot swap configuration demo provides step-by-step instructions for performing a peripheral hot swap of CompactPCI* boards.

rgademo/pfmdemo
   The Revenue Generating Application (RGA)/Peripheral Fault Manager (PFM) program set illustrates how to develop a highly available, fault-tolerant call control application using the following libraries:
   - Global Call API Library
   - OA&M API Library
   - Standard Runtime API Library
   Note: The rgademo and pfmdemo programs must be run simultaneously.

Note: For more information about the hscfgdemo, refer to the *Administration Guide*. For more information about the rgademo/pfmdemo, refer to the *High Availability Demo Guide*.

Voice Demonstration Programs

The following voice demonstration programs are supported in System Release 6.1 for Linux. These demo programs are located in the /demos/dx_demos directory under INTEL_DIALOGIC_DIR (the environment variable for the directory in which the system release software was installed).

dpddemo (Dial Pulse Detection)
   A multi-channel voice application that uses the asynchronous polled programming model. The demo illustrates the voice recording and playback feature. It is similar to the pansr demo, but can accept both dial pulses and DTMF tones. This demo is supported on Springware boards only.

d40demo
   A simple order entry application that uses the synchronous programming model. This demo is supported on Springware boards only.

custserv (Customer Service)
   Customer service demo that transfers calls to the proper customer service representative based on the caller's input. This demo is supported on Springware boards only.

pansr (Asynchronous Polled Mode)
   A demonstration program based on the asynchronous polled programming model that illustrates play and record functionality. This demo is supported on Springware boards only.

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cbansr (Asynchronous Callback Mode)

A demonstration program based on the asynchronous callback programming model that illustrates play and record functionality. This demo is supported on Springware boards only.

Note: For more information about voice demo programs, refer to the *Voice API Demo Guide*.

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Supported Hardware 8

This chapter describes the boards supported in Intel® Dialogic® System Release 6.1 for Linux. The boards are organized into the following categories:

Notes:1. Intel® telecom boards developed using Springware architecture are distinguished with an asterisk.

2. System Release 6.1 for Linux will not prevent you from installing a non-supported board. If a non-supported board (for example, a board that is not supported in this release, but will be supported in later versions) is detected, you will be notified (after the board is downloaded) via a screen message stating that the board is unsupported by this release.

8.1 Media Processing - Combined Media Boards

The Media Processing Combined Media boards consist of the following subcategories:

- Voice with Conferencing + Speech + Fax (universal media load) Boards
- Voice with Speech Boards
- Voice with Speech and Conferencing Boards
- Voice with Fax Boards
- Voice with Fax and/or Speech Boards

Voice with Conferencing + Speech + Fax Boards

- DMV600BTEP
- DMV600BTEC
- DMV1200BTEP
- DMV1200BTEC
- DMV3600BP
- DMV4800BC
- DM/V960A-4T1-PCI

Voice with Speech

- DM/V960A-4T1-PCI

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- DM/V960A-4T1-cPCI (Rev 1 and Rev 2)
- DM/V1200A-4E1-PCI
- DM/V1200A-4E1-cPCI (Rev 1 and Rev 2)

Voice with Speech and Conferencing Boards

- DM/V480A-2T1-PCI
- DM/V480A-2T1-cPCI (Rev 1 and Rev 2)
- DM/V600A-2E1-PCI
- DM/V600A-2E1-cPCI (Rev 1 and Rev 2)
- DM/V2400A-PCI
- DM/V2400A-cPCI

Voice with Fax Boards

- D/4PCIUF*
- D/300JCT-E1*

Voice with Fax and/or Speech Boards

- DMV160LP
- DMV160LPEU
- D/160JCT*
- D/320JCT*
- D/4PCIU4S*
- D/41JCT-LS*
- VFX/41JCT-LS*
- D/120JCT-LS*
- D/240JCT-T1*
- D/300JCT-E1*
- D/480JCT-1T1*
- D/600JCT-1E1*
- D/480JCT-2T1*
- D/600JCT-2E1*

8.2   Media Processing - Single Media Boards

The Media Processing Single Media Boards consist of the following subcategories:

- Fax boards
- Voice boards

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Fax Boards

- DM/F300-PCIU
- DM/F240-T1-PCIU
- DM/F300-E1-PCIU
- DM/F300-cPCI

Voice Boards

- DM/V480-4T1-PCI
- DM/V600-4E1-PCI
- DM/V960-4T1-PCI
- DM/V1200-4E1-PCI
- DM/V1200-4E1-cPCI
- DM/V960-4T1-cPCI
- DMV600-4E1-cPCI
- DM/V480-4T1-cPCI

8.3 Signaling Products

Signaling Products consist of the following subcategories:

- Digital Telephony Interface Boards
- IP Boards
- PBX Integration Boards
- SS7 Boards
- Signaling Gateways (SS7 Signaling Interface Units [SIUs])

  Note: Global Call SS7 can be installed as part of the System Release 6.1 for Linux software installation. However, you must install the SS7 Development Package to use the Global Call API with SS7 boards or SIUs. Refer to the documentation provided with your SS7 board or SIU for installation instructions and other information. The SS7 Development Package and associated documentation can be obtained via this URL:
  http://resource.intel.com/telecom/support/ss7/cd/index.htm

Digital Telephony Interface Boards

- DMT160TEC
- DMN160TEC
- DM/N960-4T1-PCI
- DM/N1200-4E1-PCI
- DM/N960-4T1-cPCI

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- DM/N1200-4E1-cPCI

IP Boards

- IPT10000C
- IPT6720C
- IPT4800C
- IPT2400C
- IPT1200C

PBX Integration Boards

- D/42JCT-U*
- D/82JCT-U*

SS7 Boards

- SS7HDPD4TE
- SS7SPCI4
- SS7SPCI2S
- SS7HDCS8
- SS7HDCD16
- SS7HDCQ16
- SS7CPM8

Signaling Gateways (SS7 Signaling Interface Units [SIUs])

- SS7G22 (in SIU Mode)
- SS7G21 (in SIU Mode)
- SIU520
- SIU231
- SIU131

8.4 Switching Boards

The Switching Boards consist of the following subcategories:

- Conferencing + Speech + Station Interface + Voice Boards
- Station Interface Boards

Conferencing + Speech + Station Interface + Voice Boards

- DI0408LSAR2

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- DI0408LSAR2EU
- DI0408LSAR2JP
- DI0408LSAR2I
- DI0408LSAR2EUI
- DI0408LSAR2JPI
- DISI16R2
- DISI16R2JP
- DISI24R2
- DISI24R2JP
- DISI32R2
- DISI32R2JP

Station Interface Boards

- HDSI/480-PCIU
- HDSI/720-PCIU
- HDSI/960-PCIU
- HDSI/1200-PCIU
- HDSI/1200-cPCI
- HDSI/960-cPCI
- HSDI/720-cPCI
- HDSI/480-cPCI

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Documentation 9

This chapter lists all of the documents that are included as part of Intel® Dialogic® System Release 6.1 for Linux. The documentation is divided into the following categories:

9.1 Documentation Highlights

The new documentation uses a new presentation format and a more customer-focused information architecture. There will be a transition period during which some documents will be in the new format and structure, while others will remain in the old format and structure. You will notice the changes in a variety of ways: some documents may be re-titled, some may be split into several documents, and some may be retired altogether. As this migration takes place, the changes will be highlighted in this section.

Among the more notable changes in the System Release 6.1 for Linux are the following:

- The *Compatibility Guide for the Dialogic R4 API on DM3 Products* has been retired. The R4 on DM3 compatibility information contained in the guide is now incorporated in the appropriate individual API library references.

9.2 System Release Documentation

The following system release documentation is provided to support this release:

- *Intel Dialogic System Release 6.1 for Linux Release Guide* (this document) †
- *Intel Dialogic System Release 6.1 for Linux Release Update* (available on web only) †

Note: A dagger (†) next to a document title indicates that the document is new or has been updated since the previous release.

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9.3 Installation and Configuration Documentation

The following installation and configuration documentation is provided to support this release:

- *Intel Dialogic System Release 6.1 for Linux Software Installation Guide* †
- *Intel DM3 Architecture Products on Linux Configuration Guide* †
- *Intel NetStructure IPT Series Products on Linux Configuration Guide* †
- *Intel Springware Architecture Products on Linux Configuration Guide* †
- *Global Call Country Dependent Parameters (CDP) Configuration Guide* †

Note: A dagger (†) next to a document title indicates that the document is new or has been updated since the previous release.

9.4 OA&M Documentation

The following operation, administration and maintenance documentation is provided to support this release:

- *Intel Dialogic System Release 6.1 for PCI and CompactPCI on Linux Administration Guide* †
- *SNMP Agent Software for Linux Administration Guide* †
- *Intel Dialogic System Software Diagnostics Guide* †
- *Board Management API Library Reference* †
- *OA&M API for Linux Programming Guide* †
- *OA&M API for Linux Library Reference* †

Note: A dagger (†) next to a document title indicates that the document is new or has been updated since the previous release.

9.5 Programming Library Documentation

The following programming libraries documentation is provided to support this release:

Call Control

- *Global Call API for Linux Programming Guide* †
- *Global Call API Library Reference* †
- *Global Call Analog Technology User's Guide* †
- *Global Call E1/T1 CAS/R2 Technology Guide* †
- *Global Call IP Technology Guide* †
- *Global Call ISDN Technology Guide* †
- *Global Call SS7 Technology Guide* †

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- *Porting Global Call H.323 Applications from Embedded Stack to Host-Based Stack Application Note*
- *Digital Network Interface Software Reference*
- *ISDN Software Reference*

Conferencing

- *Audio Conferencing API Programming Guide* †
- *Audio Conferencing API Library Reference* †

Continuous Speech Processing

- *Continuous Speech Processing API Programming Guide* †
- *Continuous Speech Processing API Library Reference* †

Fax

- *Fax Software Reference* †

IP Media

- *IP Media Library API Programming Guide* †
- *IP Media Library API Library Reference* †

Modular Station Interface

- *Modular Station Interface API Programming Guide* †
- *Modular Station Interface API Library Reference* †

PBX Integration

- *PBX Integration Board User's Guide* †
- *PBX Integration Software Reference* †

Standard Runtime Library

- *Standard Runtime Library API for Linux Programming Guide* †
- *Standard Runtime Library API Library Reference* †

Voice

- *Voice API Programming Guide* †
- *Voice API Library Reference* †

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- *Learn Mode and Tone Set File API Software Reference* †

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9.6 Demonstration Program Documentation

The following demonstration software documentation is provided to support this release:

- *Continuous Speech Processing API Demo Guide* †
- *CT Bus Clock Fallback for Linux Demo Guide* †
- *Global Call API Demo Guide* †
- *High Availability for Linux Demo Guide* †
- *IP Gateway (Global Call) Demo Guide* †
- *IP Media Server (Global Call) Demo Guide* †
- *Voice API for Linux Demo Guide* †

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