

**Intel® Dialogic® System Release Version
5.1.1 Feature Pack 1 on PCI and
CompactPCI for Microsoft* Windows
NT/2000/XP on Intel® Architecture**

Release Guide

Copyright © 2003 Intel Corporation
05-1928-001

Copyright Notice

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. Intel products are not intended for use in medical, life saving, or life sustaining applications.

Intel may make changes to specifications and product descriptions at any time, without notice.

This document as well as the software described in it is furnished under license and may only be used or copied in accordance with the terms of the license. The information in this manual is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by Intel Corporation. Intel Corporation assumes no responsibility or liability for any errors or inaccuracies that may appear in this document or any software that may be provided in association with this document. Except as permitted by such license, no part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means without express written consent of Intel Corporation.

Copyright © 2003 Intel Corporation.

AlertVIEW, AnyPoint, AppChoice, BoardWatch, BunnyPeople, CablePort, Celeron, Chips, CT Connect, CT Media, Dialogic, DM3, EtherExpress, ETOX, FlashFile, i386, i486, i960, iCOMP, InstantIP, Intel, Intel logo, Intel386, Intel486, Intel740, IntelDX2, IntelDX4, IntelSX2, Intel Create & Share, Intel GigaBlade, Intel InBusiness, Intel Inside, Intel Inside logo, Intel NetBurst, Intel NetMerge, Intel NetStructure, Intel Play, Intel Play logo, Intel SingleDriver, Intel SpeedStep, Intel StrataFlash, Intel TeamStation, Intel Xeon, Intel XScale, DM/IP, Itanium, LANdesk, LanRover, MCS, MMX, MMX logo, Optimizer logo, OverDrive, Paragon, PC Dads, PC Parents, PDCharm, Pentium, Pentium II Xeon, Pentium III Xeon, Performance at Your Command, RemoteExpress, Shiva, SmartDie, Solutions960, Sound Mark, StorageExpress, The Computer Inside., The Journey Inside, TokenExpress, Trillium, VoiceBrick, Vtune, and Xircom are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

*Other names and brands may be claimed as the property of others.

Publication Date: February, 2003

Intel Converged Communications, Inc.
1515 Route 10
Parsippany NJ 07054

For **Technical Support**, visit the Intel Telecom Support Resources website:

<http://developer.intel.com/design/telecom/support/>

For **Products and Services Information**, visit the Intel Communications Systems Products website:

<http://www.intel.com/network/csp/>

For **Sales Offices**, visit the Intel Telecom Building Blocks Sales Offices page:

<http://www.intel.com/network/csp/sales/>

Table of Contents

Table of Contents	3
About This Information	5
Purpose	5
Intended Audience	5
How to Use This Publication	5
Related Information	6
Release Overview	7
Release Highlights	7
Product Naming Changes	7
System Requirements	8
Basic Hardware Requirements	8
Minimum Hardware Configuration	8
Recommended Hardware Configuration	8
Basic Software Requirements	8
Supported Compilers	8
SMP Support.....	9
Features by Product	10
New Intel® Dialogic® Analog Loop Start Product	10
New Intel® Dialogic® CPi Fax Product	11
Enhanced Intel® Dialogic® DI/0408-LS-A Product	12
Enhanced Intel® Dialogic® DI/Sixx-R2 Series Products	13
New Intel® NetStructure™ DM/IP Series Features	14
New Intel® NetStructure™ DM/V, DM/N, and DM/T Product Features	16
Intel® NetStructure™ DM/F Fax Series Product	19
Intel® NetStructure™ DM/VF Series Product	20
Intel® NetStructure™ High Density Station Interface (HDSI) Product	22
Intel® NetStructure™ SS7 Product Support	23
Development Software	24
API Libraries	24
Audio Conferencing API Library	24
CSP (Continuous Speech Processing) API Library	25
Fax API Library	25
Global Call API Library	28
IP Media Library API	29
Modular Station Interface API	30
NCM (Native Configuration Manager) API Library	30
PBX Integration.....	31
ISDN API.....	31
Digital Network Interface API	33
Standard Runtime Library API	33
Voice API Library	34
GDK/GRT API.....	35
Demonstration Programs	36
New Demo Programs.....	36
Updated Demo Programs	36
Other Supported Demo Programs	36
Protocol Stacks	37
New Host-Based H.323 Protocol Stack	37
New Host-Based SIP Protocol Stack	38
Other Release Features	39

DM3 Media Loads	39
Dialogic Integrated (DI) Device Enumerations	43
Intel® Dialogic® Analog Loop Start Device Enumerations	44
Operating Software	46
Configuration Software	46
Administrative Software	46
SNMP Agent Administration Software	47
Diagnostics Software	47
Supported Hardware	50
New Intel® Dialogic® Analog Loop Start Product	50
New Intel® Dialogic® DI/0408-LS-A-x	51
New Intel® Dialogic® DI/S1xx Products	51
Intel® Dialogic® CPi Fax Products	51
Intel® Dialogic® CPi Fax Series Products	51
Intel® Dialogic® CPi Fax Resource Only Series Products	51
Intel® Dialogic® Springware Fax Products	52
Intel® Dialogic® Springware Voice Products	52
Intel® Dialogic® Springware Single Span Products	52
Intel® Dialogic® Springware Dual Span Products	53
Intel® NetStructure™ DM/F Fax Products	53
Intel® NetStructure™ DM/F Fax Products	53
Intel® NetStructure™ DM/F Fax Resource Products	53
Intel® NetStructure™ DM/VF Products	53
Intel® NetStructure™ High Density Station Interface (HDSI) Products	54
Intel® NetStructure™ DM/IP Series Products	54
Intel® NetStructure™ DM/IP Resource Products	54
Intel® NetStructure™ DM/V Products	54
Intel® NetStructure™ DM/V-A Multifunction Series Products	54
Intel® NetStructure™ DM/V-A Multifunction Resource Series Products	55
Intel® NetStructure™ DM/V Voice Series Products	55
Intel® NetStructure™ Dual Span HiZ Series Products	55
Intel® NetStructure™ DM/N and DM/T DTI Series Products	55
Intel® Dialogic® PBX Integration Products	56
Intel® Dialogic® Conferencing Products	56
Intel® Dialogic® Analog Network Interface Products	56
Intel® Dialogic® Digital Network Interface Products	56
Intel® Dialogic® Station Interface Products	56
Intel® NetStructure™ SS7 Products	57
Intel® NetStructure™ Signaling Interface Units	57
Separately Orderable Products	58
Release Documentation	59
Documentation Highlights	59
System Release Documentation	59
Development Software Documentation	60
Operating Software Documentation	61

About This Information

The following topics provide information about this publication:

- Purpose
- Intended Audience
- How to Use This Publication
- Related Information

Purpose

This Release Guide provides information about the products and features contained in System Release 5.1.1 Feature Pack 1 for Windows* Operating Systems on Intel® Architecture.

Intended Audience

This release guide 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

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

- Release Overview - describes the highlights of this release
- System Requirements - describes what you need to install and use this release
- Features by Product - describes the hardware products and features supported in this release
- Development Software - describes the software features supported in this release
- Operating Software - describes the configuration, administration and diagnostic software features supported in this release
- Supported Hardware - provides a list of all the hardware supported in this release
- Separately Orderable Products - describes additional software that may be required in order to utilize certain features of this release as well as ordering information
- Release Documentation - provides a list of the documents that accompany this release either on the CD or downloadable from the Intel Telecom Support Resources website

Related Information

See the following for additional information:

- If you are new to Intel® Dialogic® products or some of the latest technology and don't want to search through the documentation to find the information you need, use the Learn About website to get an overview of the products supported in this release and what is required to use them. The URL for Learn About is:
<http://resource.intel.com/telecom/support/documentation/learnabout/index.htm>
- For Technical Support, visit the Intel® Telecom Support Resources website at:
<http://developer.intel.com/design/telecom/support/>
- For Products and Services Information, visit the Intel® Communications Systems Products website at:
<http://www.intel.com/network/csp/>
- For Sales Offices and other contact information, visit the Intel® Telecom Building Blocks Sales Offices page at:
<http://www.intel.com/network/csp/sales/>
- The *System Release 5.1.1 Feature Pack 1 for Windows Operating Systems on Intel® Architecture Release Update* contains information about fixed problems, compatibility issues, restrictions and limitations, known problems, and documentation updates associated with this system release. The Release Update is available at:
<http://resource.intel.com/telecom/support/documentation/releases/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.

Release Overview

This chapter provides a high-level overview of the products and features that are newly supported in the System Release 5.1.1 Feature Pack 1 for Windows* Operating Systems on Intel® Architecture.

This release enables customers to build and deploy higher-density, more cost-effective solutions. This release provides support for several new Intel® Dialogic® building blocks in addition to now enabling solutions to be deployed on Windows XP (in addition to Windows NT and Windows 2000).

Release Highlights

System Release 5.1.1 Feature Pack 1 provides the following new products and features:

- New Intel® Dialogic® Analog Loop Start Product
- New Intel® Dialogic® CPi/400 BRI PCI Product
- New Intel® Dialogic® DI/0408-LS-A Product
- New Intel® Dialogic® DI/SI Series Products
- New Intel® NetStructure™ DM/V Series Features
- New Intel® NetStructure™ DM/IP Series Features

Product Naming Changes

As you use the documentation supporting this release, you will note certain discrepancies regarding the product and feature names. Many of the products supported by this release were re-branded as Intel® products after System Release 5.1.1 became generally available. Many documents that have been revised since System Release 5.1.1 reflect the new brand and product names, while documents that are specific to System Release 5.1.1 and this feature pack release still contain the older branding and naming conventions. The following table indicates old and new names for many of the affected products in an effort to reduce the confusion caused by the branding transition.

Old Product Name	New Product Brand and Name
DM3 MediaSpan	Intel® NetStructure™ DM/V-A, DM/V, DM/N, and DM/T boards
DM3 Fax	Intel® NetStructure™ DM/F boards
DM3 VFN	Intel® NetStructure™ DM/VF boards
DM3 IPLink	Intel® NetStructure™ DM/IP boards
BoardWatch	SNMP software
DCM	Intel® Dialogic® Configuration Manager software
Septel	Intel® NetStructure™ SS7 boards

NOTE: The term "Septel" has been removed from the documentation where possible. However, for technical reasons (mostly relating to backward compatibility), the term continues to be used in the software.

System Requirements

This chapter describes the system requirements for the System Release 5.1.1 Feature Pack 1. This information is provided in the following sections:

- Basic Hardware Requirements
- Basic Software Requirements

Basic Hardware Requirements

Minimum Hardware Configuration

The minimum hardware configuration for this release is:

- 500 MHz Pentium® processor
- 128 MB RAM for a system that contains less than three Intel® NetStructure™ boards
- 256 MB RAM for a system that contains three or more Intel® NetStructure™ boards
- 500 MB free space on hard disk
- CD-ROM drive
- VGA display with 16 colors support
- Keyboard
- Pointing device

Recommended Hardware Configuration

The recommended hardware configuration for this release is:

- 850 MHz or faster Pentium® processor
- 512 MB RAM
- 600 MB free space on hard disk
- CD-ROM drive
- VGA display with 256 colors support
- Keyboard
- Pointing device

Basic Software Requirements

The operating system requirements are:

- Windows NT Version 4.0 (Workstation or Server) with Service Pack 6a
- Windows 2000 (Professional, Server, or Advanced Server) with SP3
- Windows XP Professional with SP1

Supported Compilers

The following compilers are supported:

- Microsoft* Visual C++ Version 5.xx
- Microsoft Visual C++ Version 6.xx with Service Pack 5
- Microsoft Visual C++ .NET

SMP Support

Our drivers are SMP-safe.

Features by Product

This chapter describes the features that are supported on the System Release 5.1.1 Feature Pack. This information is provided in the following sections:

- New Intel® Dialogic® Analog Loop Start Product
- New Intel® Dialogic® CPi Fax Product
- Enhanced Intel® Dialogic® DI/0408-LS-A Product
- Enhanced Intel® Dialogic® DI/Sixx-R2 Series Products
- New Intel® NetStructure™ DM/IP Series Features
- New Intel® NetStructure™ DM/V Product Features
- Intel® NetStructure™ DM/F Fax Series Product
- Intel® NetStructure™ DM/VF Series Product
- Intel® NetStructure™ High Density Station Interface (HDSI) Product
- Intel® NetStructure™ SS7 Product Support

New Intel® Dialogic® Analog Loop Start Product

The new Intel® Dialogic® DMV160LP is a next-generation, high-density analog loop start voice processing board with Universal PCI form factor. Based on DM3 Mediastream architecture, it provides 16 channels of voice processing, 16 analog loop start interfaces, and supports fax as well as continuous speech processing.

Features

The Intel® Dialogic® analog loop start product provides the following key features:

- 16 ports of voice processing and 16 ports of analog loop start interface
- up to 8 boards per chassis
- Universal PCI form factor
- H.100 connector (H.100 TDM Bus support)
- R4 API on DM3 support for voice, fax, continuous speech processing, and Global Call APIs
- Analog Display Services Interface (ADSI) and 2-way FSK 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)
- simultaneous voice record activity with continuous speech processing and fax
- hook-flash through the Global Call API
- voice coders supported:
 - OKI* ADPCM, 6 KHz sampling 24 kbps (4 bits) or 8 KHz sampling 32 kbps (4 bits)
 - G.711 mu-law PCM, 8 KHz sampling 64 kbps (8 bits) or 6 KHz sampling 48 kbps (8 bits)
 - G.711 A-law PCM, 8 KHz sampling 64 kbps (8 bits) or 6 KHz sampling 48 kbps (8 bits)
 - G.726 ADPCM
 - GSM full rate at 13 kbps (ETSI 6.10 and RTP; both Microsoft and TIPHON frame support)
 - linear PCM, 11.025 KHz sampling, 88 kbps (8 bits)
 - TrueSpeech* (8.5 kbps)

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 *Continuous Speech Processing API Programming Guide*.

- pitch-corrected speed control on playback (on 8 KHz coders only)
- automatic gain control configurable on a per-board basis through the configuration file
- global approvals including U.S., Canada, European Union, Australia, China, Hong Kong, India, Korea, Malaysia, New Zealand, Singapore, and Japan
- Caller ID in U.S., Japan, and U.K.
- SNMP supported administration, basic configuration (DLGHWINF MIB and DM3Extended MIB support)

New Intel® Dialogic® CPi Fax Product

The Intel® Dialogic® CPi Fax products support low-density to high-density fax solutions. These products provide access through the GDK/GRT API.

NOTE: Please go to <http://www.intel.com/design/network/products/telecom/index.htm> for the latest information about our CPi Fax hardware.

New Features

The Intel® Dialogic® CPi/400 BRI PCI fax board is newly supported in this release. The CPi/400 BRI PCI is a DM3 architecture board used in the ISDN BRI marketplace. This board offers a flexible and scalable solution that incorporates computer-based fax into the ISDN environment. It is intended to provide access through the GDK/GRT API.

NOTE: Refer to the *GDK Programming Reference Manual* for additional information

The features supported on this board include the following:

- Two (2) Basic Rate Interface (BRI) ports (each with 2B + D) with Euro compatible connectors (RJ45)
- Four (4) B channels
- Digital Network Interface:
 - Standard Euro-ISDN S/T (CTR4) (Approval in Europe, Australia, and New Zealand)
 - NTT protocol support (implemented by a .config/.fcd file change)
- Point-to-point and point-to-multipoint configurations
- H.100 CT Bus, SCbus compatibility mode
- Universal PCI form factor
- ISDN Support:
 - Restart Procedure
 - Overlap Sending and Overlap Receiving
 - Call Waiting support for BRI
- GDK/GRT API
- V.17 - 14.4 kbps data rate
- Modified Huffman (MH), Modified READ (MR), Modified Modified READ (MMR) Compression modes
- TIFF Data compression
- ITU Error Correction Mode (ECM)
- ITU-T Group 3 compliant (T.4, T.6, T.30)

Other Features

Intel® Dialogic® CPi Fax Series products continue to support the following features:

- V.34 (33.6 kbps) high speed fax
- 2 or 4 channels of fax

System Release 5.1.1 Feature Pack 1 for Windows Release Guide

- T.30 protocol support
- MH, MR, MMR compression
- Access to 24/30 channels of integrated fax on one single board in one single PCI slot; 100% backwards compatible with all applications based on GDK 3.0 or later
- Support for 96 channels in a single chassis (Up to four CPi/2400-1T1-PCIU or three CPi/3000-1E1-PCIU boards)
- GDK 5.0 (combines GDK 3.2x and 4.0x)
- One install for separate dispatchers based on hardware
- Support for the following protocols:
 - 4ESS
 - 5ESS
 - DMS
 - NTT
 - NET5
- Support for resource boards (CPi/2400-PCIU & CPi/3000-PCIU) with DTI as network interface
 - In transparent mode (Fax only application)
 - Transparent ISDN support for network interfaces
 - NT EventViewer support
 - Host and firmware ECR fixes
 - Troubleshooting tips
- Support for resource boards (CPi/2400-PCIU & CPi/3000-PCIU) using GRT SCbus functions
- Answer & Dial
- Error Correction Mode (ECM)
- MH-T.4 Compression
- MR Compression
- MMR-T.6 Compression
- Transmit & Receive
- Overlap Sending is supported by the following hardware:
 - CPi/200-BRI and CPi/400-BRI: CP (BRI - EuroISDN (CTR4))
 - DTI300 + (CP12/SC or CPi/3000-PCIU)
 - Springware: (PRI - EuroISDN (CTR4))
 - CPi/3000-1E1-PCIU: DM3 (PRI - EuroISDN(CTR4))

Enhanced Intel® Dialogic® DI/0408-LS-A Product

The Intel® Dialogic® DI/0408-LS-A-R2 board is an update to the original DM3 architecture, single-slot, PCI form factor, SCbus and CT Bus compatible DI/0408-LS-A board. The new DI/0408-LS-A-R2 board has four analog loop start interfaces and eight analog station interfaces. It has ring capability plus an audio input port, and supports call processing, voice, conferencing, and fax.

New Features

The following new features are supported on the DI/0408-LS-A-R2 board:

- European support including selectable 20, 25, or 50 Hz ringer
- Japanese and UK Caller ID
- CSP support
- Universal PCI compliant

- Support for new DI Media Loads 2 and 4 (See *DM3 Media Loads* for more information.)

Other Features

The following features are supported on both the DI/0408-LS-A-R2 and the DI/0408-LS-A boards:

- R4 on DM3 fax support on Dialogic Integrated Series Products
- Basic Voice: provides play, record, digit generation and detection. (Play & Record are not simultaneously supported on a channel.)
- Supported coders:
 - 64 kbps & 48 kbps G.711 PCM VOX
 - 24 kbps & 32 kbps OKI ADPCM VOX
 - 88/176K Linear PCM VOX and WAV
 - 11 KHz 8 and 16 bit WAV
 - Speed Control on 8 KHz coders
- Volume Control
- GTG/GTD
- Transaction record (DI media load 2 only)
- Basic call control features for loop start interfaces including call analysis and support for analog call ID
- Basic call control features for analog station interfaces including ring, caller ID transmission, and MWI
- Global Call API for trunk call control
- R4 Voice APIs for voice and tone
 - Play/Record
 - Tone Generation/Signal Detection
- R4 MSI API for stations
 - Transmit CallerID/MWI
 - Distinctive ring cadences
- R4 MSI API for conferencing
- R4 DCB API for conferencing with extensions
 - Active Talker
 - Coach/Pupil mode
- R4 FX API for Fax
- Audio Input API for Music on Hold (MOH)

Exceptions:

- DI/0408-LS-A and DI/0408-LS-A-R2 support mu-law only
- No call control or call progress support with `dx_dial()`
- For conferencing, tone clamping and digit detect via the conferencing resource is not supported.

Enhanced Intel® Dialogic® DI/SIxx-R2 Series Products

The Intel® Dialogic® DI/SIxx-R2 series is an update to the original DM3 architecture, single-slot, PCI form factor, SCbus and CT Bus compatible DI/SI32 board. The new DI/SIxx-R2 series is available with 16, 24, or 32 analog station interfaces with associated model names DI/SI16-R2, DI/SI24-R2, and DI/SI32-R2. It has ring capability plus an audio input port, and supports call processing, voice, and conferencing.

New Features

The following new features are supported on the DI/SIxx-R2 series boards:

- 16 conferees with Echo Cancellation
- European support including selectable 20, 25, or 50 Hz ringer
- Japanese and UK Caller ID
- Support for flash hook via the Global Call Tsc_MsgDial feature (FR 2117) on all DI series products

Other Features

The following features are supported on both the DI/SI32 and the DI/SIxx-R2 series boards:

- Basic Voice: provides play, record, and digit generation and detection. (Play & Record are not simultaneously supported on a channel.) See *DM3 Media Loads* for more information.
- Supports multiple coder types, including:
 - 64 kbps & 48 kbps G.711 PCM VOX
 - 24 kbps & 32 kbps OKI ADPCM VOX
 - 88/176K Linear PCM VOX and WAV
 - 11 KHz 8 and 16 big WAV
 - Speed control on 8 KHz coders
- Volume control
- Tone detection/generation:
 - Global Tone Detection (GTD) for user-defined tones
 - Global Tone Generation (GTG) for user-defined tones, including cadenced tone generation
- Basic call control features for analog station interfaces, including ring, caller ID transmission, and MWI
- R4 Voice APIs for voice and tone
 - Play/Record
 - Tone Generation/Signal Detection
- R4 MSI API for stations
 - Transmit CallerID/MWI
 - Distinctive ring cadences
- R4 MSI API for conferencing
- R4 DCB API for conferencing with extensions
 - Active Talker
 - Coach/Pupil mode
- Audio Input API for Music on Hold (MOH)

Exceptions:

- DI/SI32 and DI/SIxx-R2 series boards support mu-law only
- No call control or call progress support with dx_dial()
- For conferencing, tone clamping and digit detect via the conferencing resource is not supported.

New Intel® NetStructure™ DM/IP Series Features

The Intel® NetStructure™ DM/IP platform (formerly known as DM3 IPLink) allows a Voice Over IP (VoIP) call to be connected via the Intel® NetStructure™ platform to the CT Bus. Using DM/IP boards equipped with a PSTN network front end, you can build a single-board digital IP-to-PSTN gateway application. Adding boards for analog connectivity or station interface and technologies such as conferencing, voice recognition, or text-to-speech makes a variety of applications possible.

New Features

The following new features are supported in the System Release 5.1.1 Feature Pack 1:

- Call control implemented on the host with RTP/RTCP implemented on the board (All NIC-enabled). For information about the configuration files that support host-based (or embedded) call control, see the *DM3 Configuration File Reference*.
- GC runtime parm setting on DM/IP boards on embedded H.323 call control
- RFC2833 support on IPVS_EVR_311 configurations
- Support 1.9 IPVSC firmware on cPCI and PCI boards. Besides RFC 2833, this includes the ability to change from voice to fax coder without application intervention, setting DTMF transfer mode on a per call basis and conferencing on Voice Resources.

NOTE: Please go to <http://www.intel.com/design/network/products/telecom/index.htm> for the latest information about our IP hardware.

Other Supported Features

The Intel® NetStructure™ DM/IP platform continues to support the following features:

- Embedded call control on IPT prefixed configurations
- Global Call API support for IP and PSTN
- FCD file generation utility
- PCD file selection
- Support for Flexible Routing (exportable voice resources)
- Simple Network Management Protocol (SNMP): TCP/IP level SNMP
- Support for standard Internet protocols, including TCP/IP, UDP, and RTP/RTCP
- Coder support that includes GSM (TIPHON* and Full Rate), G.729 (G.729 Annex A, G.729 Annex B, and G.729 Annex A with Annex B), G.723.1 (5.3 kbps and 6.3 kbps), and G.711
- Full-duplex communication with all coders
- Voice Activity Detection (VAD) support on G.723 and GSM
- RADVISION* stack; compliant with ITU-T H.323 specification, including provision for periodic registration with gatekeeper
- Comprehensive support for industry-standard H.323 clients including Microsoft* NetMeeting*, VocalTec* Iphone*, Intel® Video Phone, Intel® Internet Phone
- Gatekeeper registration
- Non-standard RAS
- Fax over IP
- H.245 tunneling
- Improved 16 ms Echo Cancellation
- IP Media resource
- IP Precedence (100Base-T)
- Improved Fast Start compatibility
- IP switching (bridging two calls) with minimum latency for use in IP voice mail applications
- IP Voice Stream resource
- Quality of Service (QoS)
- Packet redundancy; complies with RFC 2198 (Redundancy)
- RTCP time parameters
- DTMF volume/gain controls
- Object ID support when sending Non-Standard Command

System Release 5.1.1 Feature Pack 1 for Windows Release Guide

- Q.931 Facility message: Support for non-standard information element in the Facility message over Q.931 port
- Vendor-specific information sending during call setup
- Voice quality parameters
- Volume adjustment
- Volume control
- Gain control
- CauseReason field in H.323 ReleaseComplete message
- Support for digital and on-board PSTN interfaces
- Support for media load 1 (basic voice), media load 2 (enhanced voice), media loads 11 and 11a (conferencing)
- Basic DTMF and MF detection
- Call analysis
- Call control functions
- Call progress analysis
- Continuous Speech Processing (CSP) support (as a shared resource that can be routed to either the IP or PSTN interface)
- NFAS (on NI2 protocol only)
- R2MF hot download protocols
- Support for the following PSTN protocols:
 - 4ESS
 - 5ESS
 - DMS
 - NI2
 - NTT
 - QSIG (T-1)
 - CAS
 - NET5
 - QSIG (E-1)
 - R2MF
- Tone detection/generation

New Intel® NetStructure™ DM/V, DM/N, and DM/T Product Features

The Intel® NetStructure™ DM/V, DM/N, and DM/T products (formerly known as DM3 MediaSpan) that have network interfaces provide access to four T-1 or E-1 digital networking interfaces with up to 120 ports of voice processing and telephony signal processing on a single-slot board. DM/V-A resource products (no network) provide 240 ports of voice processing on a single-slot board.

New Features

The following new features are supported on the Intel® NetStructure™ DM/V, DM/N, and DM/T products:

- Media Load 5 (DM/V960A-4T1-PCI board only). Refer to section DM3 Media Loads for more information.
 - 4 channels of fax
 - 96 channels of enhanced voice (media load 2)

- Universal Media Load (DM/V1200A-4E1-PCI board only). Refer to section *DM3 Media Loads* (found under Development Software) for more information.
 - 60 channels of voice (media load 1)
 - 8 channels of fax (media load 5)
 - 60 channels of conferencing (media load 9b)
- 8 KHz linear PCM coder supported at 64 Kbps (8 bits) and 128 Kbps (16 bits) for play and record, VOX and WAVE file formats. For more information, see the Documentation Updates section in the Release Update document for this system release.
- ETSI compliant Frequency Shift Keying (FSK). For more information, see the Documentation Updates section in the Release Update document for this system release.
- Universal PCI on DM/V, DM/N, and DM/T products
- Activate and de-activate Layer 2 (D-Channel). The Global Call API can now be used to set the logical data link (D-channel) state using the `gc_Extension()` function with extension ID (`ext_id`) of `GDIS_EXID_SETDLINKSTATE`. For more information, see the *Global Call ISDN Technology User's Guide* and *Global Call ISDN Technology User's Guide*.
- Support for Global Call Alarm Management System (GCAMS). See the *Global Call E-1/T-1 CAS/R2 Technology User's Guide* and *Global Call ISDN Technology User's Guide* for further information.

Other Supported Features

Intel® NetStructure™ DM/V, DM/N, and DM/T products continue to support the following features:

- Tone detection/generation:
 - Dual Tone Multi Frequency (DTMF)
 - Multi Frequency (MF)
 - Global Tone Detection (GTD) for user-defined tones
 - Global Tone Generation (GTG) for user-defined tones, including cadenced tone generation
- Audio digitizing for play and record:
 - OKI* ADPCM at 6 KHz with 4-bit samples (24 kbps) and 8 KHz with 4-bit samples (32 kbps), VOX and WAVE file formats
 - G.711 PCM at 6 KHz with 8-bit samples (48 kbps) and 8 KHz with 8-bit samples (64 kbps) using A-law or mu-law coding, VOX and WAVE file formats
 - G.721 at 8 KHz with 4-bit samples (32 kbps), VOX and WAVE file formats
 - PCM at 11 KHz with 8-bit samples (88 kbps) and 11 KHz with 16-bit samples (176 kbps) using linear coding, VOX and WAVE file formats
 - TrueSpeech* at 8 KHz with 16-bit samples (8.5 kbps), VOX and WAVE file formats
 - GSM 6.10 full-rate voice coder at 13 kbps using Microsoft* format (VOX and WAVE file formats) and TIPHON* format (VOX file format only)
 - G.726 bit-exact voice coder at 8 KHz with 2-, 3-, 4-, or 5-bit samples (16, 24, 32, 40 kbps), VOX and WAVE file formats
- Playback speed control
- Volume control
- Automatic gain control (AGC)
- Transmit/receive Analog Display Services Interface (ADSI)
- Transaction record
- Silence compressed record
- Conferencing
 - Flexible routing of conferencing resources
 - Coach/pupil feature

System Release 5.1.1 Feature Pack 1 for Windows Release Guide

- Active talker status
- On-board digit detection
- Echo cancellation for each active talker
- High port density
- Continuous Speech Processing (CSP), featuring:
 - Full duplex operation
 - Echo cancellation (EC)
 - Voice activity detector (VAD)
 - Barge-in
 - Voice event signaling
 - Pre-speech buffering
- PerfectCall call progress analysis, featuring:
 - Positive voice detection (PVD)
 - Positive answering machine detection (PAMD)
 - Frequency detection
 - Special information tones (SIT) frequency detection
- Busy tone detection
- Fax modem tone detection
- Silence detection
- Flexible and fixed routing. Flexible routing is supported on the following protocols:
 - 4ESS
 - 5ESS
 - DMS
 - NI2
 - NTT
 - QSIG (T-1)
 - CAS
 - NET5
 - QSIG (E-1)
 - R2MF
 - Clear Channel
- Any Message/Any IE to support various Supplementary Services. The messages support include:
 - Information
 - Congestion
 - UUI, Facility
 - Notify
 - Status (not available on DM3)
 - Status Enquiry (not available on DM3)
- Layer 2 access
- NFAS on NI2
- 2-way FSK
- Clear channel signaling support on T-1 and E-1
- H.110 (cPCI) CT Bus support

- Interoperability with Simple Network Management Protocol (SNMP)
- Support for the following media load configurations:
 - **Media load 1:** Basic voice
 - **Media load 1b:** Basic voice (media load 1) plus ADSI/2-way FSK
 - **Media load 2:** Enhanced voice
 - **Media load 9b:** Conferencing only
 - **Media load 10:** Enhanced voice (media load 2) plus conference resource

NOTE 1: For more information about the media loads supported by each board, see the *DM3 Configuration File Reference*.

NOTE 2: For information about conferencing, see the *Dialogic Audio Conferencing Programmer's Guide for Windows*.

Intel® NetStructure™ DM/F Fax Series Product

The Intel® NetStructure™ DM/F Fax Series Product (formerly known as DM3 Fax) gives fax-intensive applications robust processing power and messaging flexibility. Compatibility with Network Interface products enables world-wide deployment of high-density fax solutions.

New Features

The Intel® NetStructure™ DM/F products newly support Universal PCI in this release.

Other Supported Features

The Intel® NetStructure™ DM/F Fax Series Product continues to support the following features:

- ITU-T Group 3 (T.30) fully compliant
- Hardware-independent fax resource model (T.30, MH, MR, MMR, ECM, image conversion, v.17, v.21, v.27, v.28, etc.)
- The boards support the R4 programming environment and use R4 and Global Call application programming interfaces (APIs)
- Shareable fax resources
- High-density fax solution (up to 240 channels in a single chassis; maximum density is 8 boards for E-1 or T-1)
- Fax resource boards compatible with Intel® NetStructure™ Network Interface products
- Downloadable firmware allows simple software upgrades instead of hardware replacement when new features are introduced
- Protocols supported:
 - T-1 Robbed bit
 - 4ESS
 - 5ESS
 - DMS
 - NTT
 - NI2
 - QSIG (T-1)
 - R2MF
 - NET5
 - QSIG (E-1)
- Advanced Call Progress Analysis features (integrated T-1 and E-1 versions only)
 - PerfectCall call progress analysis

System Release 5.1.1 Feature Pack 1 for Windows Release Guide

- Positive Voice Detection (PVD)
- Positive Answering Machine Detection (PAMD)
- Frequency detection
- Special Information Tones (SIT) frequency detection
- Busy Tone detection
- Fax Modem tone detection
- Silence Detection
- Tone Detection/Generation software (integrated T-1 and E-1 versions only)
 - R2MF Signaling (based on GTD and GTG)
 - PerfectDigit DTMF signaling
 - Global Tone Detection (GTD)
 - Global Tone Generation (GTG)
 - Disconnect Tone Supervision
 - Dual Tone Multi Frequency (DTMF)
 - Multi Frequency (MF) Dial and Detect
 - Selectable Dual-Tone Resolution
- Serial # and Silicon Serial # retrieval
- T.30 state transition and resource trace
- Diagnostic tools (qscript files)

Intel® NetStructure™ DM/VF Series Product

The Intel® NetStructure™ DM/VF Series Product (formerly known as DM3 VFN) consists of integrated T-1 and E-1 boards providing a full span of feature-rich voice and fax processing in a single PCI slot. The availability of 24 or 30 universal voice and fax channels on each DM3 VFN Series board ensures that applications will be able to process any incoming or outgoing voice and/or fax transaction at any time, provided there is an open channel. Four DM3 VFN Series products may be combined in a single chassis, enabling applications to support up to 120 channels of high-performance voice and fax.

New Features

The Intel® NetStructure™ DM/VF products newly support Universal PCI on in the System Release 5.1.1 Feature Pack 1.

Other Supported Features

The Intel® NetStructure™ DM/VF Series Product continues to support the following features:

- V.17 Fax
- Basic Voice (equivalent to Media Load 1 - for more information, see the Media Load Table located in the Other Release Features section)
- SCbus
- H.100 CT Bus
- Single board start/stop
- The boards support the R4 programming environment and use Fax and Global Call application programming interfaces (APIs)
- Pre-built clusters: Voice and fax features are clustered together and dedicated to network interface channels. In this release, both fixed and flexible routing are supported depending on the cluster configuration (.pcd file) that is used.

- Support for the following protocols:
 - Robbed bit
 - 4ESS
 - 5ESS
 - DMS
 - NTT
 - NI2
 - QSIG (T1)
 - R2MF
 - NET5
 - QSIG (E1)
- Simple Network Management Protocol (SNMP) provided through BoardWatch
- Basic play and record: Allows recording and playback of 48 kbps and 64 kbps mu-law and A-law G.711 PCM, 32 kbps OKI* ADPCM, and 24 kbps OKI ADPCM
- Basic DTMF and MF detection
- Serial number and silicon serial number retrieval (of Intel® Dialogic® boards)
- T.30 state transition and resource trace
- DLL version number retrieval
- Call analysis software
 - PerfectCall call analysis
 - Positive Voice Detection (PVD)
 - Positive Answering Machine Detection (PAMD)
 - Frequency detection
 - Special Information Tones (SIT) frequency detection
 - Ringback detection
 - Busy tone detection
 - FAX or modem tone detection
 - Silence detection
- Tone detection/generation software (integrated T-1 and E-1 versions only)
 - R2MF signaling (based on GTD and GTG)
 - PerfectDigit DTMF signaling
 - Global Tone Detection (GTD)
 - Global Tone Generation (GTG)
 - Dual Tone Multi Frequency (DTMF)
 - Multi Frequency (MF) dial and detect
- DM3 fax software
- 14.4 Kb transmit/receive
- ITU T.30 compliant
- 100% Group 3 compatibility
- Error Correction Mode (ECM)
- Bad scan line detection and correction
- Image concatenation, compression formats, and resolutions
- Scaling to and from all supported page sizes, compression formats, and resolutions
- Support for A3, A4, and B4 page sizes
- Receive MH, MR, and MMR advanced compression
- Send MH, MR, and MMR advanced compression

- Normal (100dpi) and fine (200dpi) resolution
- Image conversion: TIFF-F and ASCII
- Simple header overlay

Intel® NetStructure™ High Density Station Interface (HDSI) Product

The Intel® NetStructure™ High Density Station Interface (HDSI) is an open-architecture platform for computer telephony that integrates large-scale switching and voice processing resources under a single hardware and software architecture. The HDSI offers the industry's highest-density analog station connectivity in a single PCI slot. This solution is also offered in a Compact PCI (cPCI) configuration using a single HDSI-cPCI board assembly, consisting of a cPCI Baseboard and a Rear I/O Module.

The HDSI is an Intel® NetStructure™ assembly consisting of a Station Interface Box (SIB) connected to an HDSI-PCI board with H.100-compliant CT Bus connectivity (or to an HDSI-cPCI board assembly with H.110-compliant CT Bus connectivity). The CT Bus provides switching between trunks and stations and also allows expansion for additional Dialogic network and resource boards. Utilizing just one Intel® NetStructure™ PCI board (or one Intel® NetStructure™ HDSI-cPCI board assembly), this solution can support up to 120 stations with tone detection and generation, and FSK Caller ID transmission. This product uses the following application programming interfaces:

- Modular Station Interface (MSI) R4 API
- Voice (dx_) R4 API

The Intel® NetStructure™ Station Interface Box is a single unit that supports 48 stations in the base model configuration. However, the SIB is a modular unit that is designed to accept plug-in components to accommodate 72, 96, and 120 stations. The SIB features a "hot swap" capability, which allows you to break and re-establish connections to the HDSI-PCI board (or to the HDSI-cPCI board assembly) without powering down or rebooting the system.

NOTE: For more detailed information about the Intel® NetStructure™ High Density Station Interface product, refer to the *High Density Station Interface Series Hardware Installation Guide*.

New Features

There are no new Intel® NetStructure™ HDSI Software features in the System Release 5.1.1 Feature Pack 1.

Other Supported Features

System Release 5.1.1 Feature Pack 1 continues to support the following features:

- An optional PCD configuration that adds play and record support similar to that found now in media load 1 with the following limitations:
 - Fixed routing only
 - No transaction record support
- The 20 Hz, 25 Hz and 50 Hz ring frequencies are supported using the country-specific configuration files.

NOTE: For more detailed information, refer to the *DM3 Configuration File Reference*.
- Configurations of 48, 72, 96, and 120 station interfaces using a single slot
- H.110-compliant CT Bus connectivity for switching between trunks and stations and sharing resources
- On-board tone generation
- On-board DTMF detection
- FSK send Caller ID support
- FSK Message Waiting Indicator (MWI) support (on-hook only)
- Programmable ring cadence options
- The capability to ring telephones with a Ringer Equivalence Number (REN) of two, per station
- SIB battery power provided to station sets

- Unobtrusive monitoring of connections
- International support of the HDSI/1200. Since HDSI does not have a PSTN interface, there are no protocols such as T-1 CAS. Refer to the MSI Boards Country Specific Parameter Files section in the *DM3 Configuration File Reference* for a list of the supported countries and country codes.

NOTE 1: *(country)_hdsi configurations provide station with dedicated tone-only channels (fixed routing). Tone-only channels provide dialing and digit detection but cannot perform play or record.*

NOTE 2: *(country)_hdsi_96_play configurations provide 96 stations with dedicated voice channels (fixed routing). These voice channels provide Media Load equivalent functionality however (1) they use fixed routing and (2) don't support transaction record.*

- The following telephone sets are supported on the HDSI/1200:

- AT&T* model 706
- Cidcon* model CT 250 (FSK enabled)
- ITT* 2500 Series
- Lucent* model 210
- Lucent* model 925
- Master* model MT-001
- Nortel* model 390 (FSK enabled)
- Panasonic* model KX-2315
- Southwestern Bell* Freedom Phone*

NOTE: *Most analog phones will work with the Intel® NetStructure™ High Density Station Interface. However, for displaying messages like Caller ID, only the telephones listed above have been tested.*

Intel® NetStructure™ SS7 Product Support

The Global Call software in this release provides a call control interface that enables applications to perform basic call control on SS7 telephony circuits. Global Call supports both single-board SS7 solutions provided by Intel® NetStructure™ SS7 boards, and server solutions provided by Intel® NetStructure™ Signaling Interface Units (SIUs).

Development Software

This chapter describes the features of the API libraries, demonstration programs, and protocol stacks that are available in the System Release 5.1.1 Feature Pack 1. The development software is divided into the following categories:

- API Libraries
- Demonstration Programs
- Protocol Stacks
- Other Release Features

API Libraries

This section describes the features of the following API libraries that are available in the System Release 5.1.1 Feature Pack 1:

- Audio Conferencing API Library
- CSP (Continuous Speech Processing) API Library
- Fax API Library
- Global Call API Library
- IP Media Library API
- Modular Station Interface API
- NCM (Native Configuration Manager) API Library
- PBX Integration
- ISDN API
- Digital Network Interface API
- Standard Runtime Library API
- Voice API Library

Audio Conferencing API Library

The Audio Conferencing API library supports development of host-based conferencing applications on Springware DCB Series boards and certain Intel® NetStructure™ 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 *Dialogic Audio Conferencing Software Reference for Windows and the Compatibility Guide for Dialogic R4 API on DM3 Products* for more information.

New Features

No new audio conferencing features have been implemented in the System Release 5.1.1 Feature Pack 1.

Other Supported Features

The following audio conferencing features, which were supported in System Release 5.1.1 for Windows, continue to be supported in this release:

- Coach/pupil feature allows two selected conferees to establish a private communication link with respect to the overall conference. The coach is a private member of the conference and is only heard by the pupil. However the pupil cannot speak privately to the coach.

- DTMF digit detection for any conferee, allowing the application to determine when or if any party has generated a DTMF digit.
- Volume control for any conferee by issuing pre-programmed DTMF digits.
- Tone clamping that allows each conferee to reduce the amount of DTMF tones heard during a conference.
***NOTE:** DTMF tones may be heard by conferees if the application encourages the user to repeatedly press DTMF tones, for example, press 9 to raise the volume.*
- Automatic Gain Control (AGC) for all conferees. AGC is an algorithm for normalizing an input signal to a target level. The AGC algorithm discriminates between voiced and unvoiced signals within a conference.
- Active talker indication to determine which conferees in any given conference are currently talking. The active talker feature can be set to indicate which conferees are talking the loudest or for the longest amount of time.
- Monitoring feature enabling many participants to monitor a single conference without interrupting the conference.
- Echo cancellation for each active talker
- Flexible routing of conferencing resources on Intel® NetStructure™ boards

CSP (Continuous Speech Processing) API Library

The 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 *Continuous Speech Processing API Programming Guide* and *Continuous Speech Processing API Library Reference* for more information.*

***NOTE:** To run CSP on DM3 boards, please refer to the *DM3 Media Loads (under Development Software)* section of this document.*

New Features

The CSP API Library offers the following new feature in the System Release 5.1.1 Feature Pack 1:

- Enhanced CSP demo that supports the new Intel® Dialogic® DMV160LP board

Other Supported Features

The following Continuous Speech Processing features, which were supported in System Release 5.1.1 for Windows, continue to be supported:

- Full duplex operation
- Echo cancellation (EC)
- Barge-in
- Voice event signaling
- Pre-speech buffering
- Barge-in and play event generation
- Ability to re-arm the VAD
- Ability to send an echo-reference signal (also called external reference signal) from another device across the TDM bus to the CSP voice channel
- Unified API
- Echo canceller convergence event notification (supported on DM3 boards only)
- More powerful Voice Activity Detector (VAD) (supported on DM3 boards only) including the ability to modify certain parameters on the fly

Fax API Library

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

NOTE: Refer to the *Fax Software Reference and the Compatibility Guide for Dialogic R4 API on DM3 Products* for more information.

New Features

No new fax features have been implemented in the System Release 5.1.1 Feature Pack 1.

Other Supported Features

The following fax features continue to be supported and are divided into:

- R4 Fax
- DSP-Based Fax
- VFX Features
- BRI/2VFD

R4 Fax

The features for R4 Fax are:

- V.17 Fax
- ITU-T Group 3 (T.30) compliant
- Data rate
 - Up to 14.4 kbps transmission
 - Up to 14.4 kbps reception
 - Selectable preferred data transmission and reception rates
- File storage format
 - Raw MH, MR, and MMR encoded data
 - TIFF/F MH, MR, and MMR encoded data
 - ASCII for transmit only
- Data transmission encoding scheme with advanced compression
 - MH, MR, and MMR
 - ASCII
 - Selectable data transmission encoding scheme
- Data reception encoding scheme with advanced compression
 - MH, MR, and MMR
 - Selectable data reception encoding scheme
- T.30 Error Correction Mode (ECM)
- T.30 Phase B event notification
- T.30 Phase D event notification
- Polling and turnaround polling
- Bad scan line detection and correction
- Image concatenation, compression formats and resolutions
- Scaling to and from all supported page sizes, compression formats and resolutions
- Support for A3, A4 and B4 page sizes
- Normal (100 dpi), fine (200 dpi), and superfine (400 dpi) resolution
- Simple header overlay
- Image bit order (MSB/LSB) conversion
- ASCII configuration:
 - Left/right/top margin

- Line spacing
- Tab stop
- Wrapping
- Extended characters (above ASCII #127)
- Enhanced Color Fax
 - Support for **fx_originate()** function
 - Transmission and reception of JPEG-encoded color facsimile images to and from color fax devices
 - Encoding of color fax images using the JPEG format as specified in ITU Rec. T.85 standard and the ITU Rec. T.4 Annex E standard (ITU Rec. T.85 defines a specific color profile for color fax images. ITU Rec. T.4 Annex E defines the specific JPEG profile for color fax.)

DSP-Based Fax

The features for DSP-Based Fax (formerly known as SoftFax) are:

- International standards support: ITU-T Group 3 fax (T.4 and T.30) and ETSI NET/30.
- Software-based modem: Fax modem capability implemented in software rather than in hardware.
- Maximum channels in a system: Up to 8 DualSpan boards can be put in a system, allowing up to 64 (8x8) DSP-Based Fax resources or 480 (8x60) voice resources.
- Data transmission rate: Up to 14.4 Kbps.
- Data reception rate: Up to 9.6 Kbps.
 - NOTE:** 14.4 Kbps receive and enhanced error correcting schemes are available when enhanced DSP-Based Fax is being used. Currently, only the VFX/41JCT-LS has this capability.*
- Data transmission encoding scheme: Modified Huffman (MH) and Modified Read (MR).
- Data reception encoding scheme: Modified Huffman (MH) and Modified Read (MR).
- File data format: TIFF/F (Tagged Image File Format) for transmit/receive MH and ASCII text transmit.
- ASCII to fax conversion: Performed on the host CPU rather than in the firmware. Supports multiple fonts and language character sets, including all Windows fonts.
- File transfer: T.434 Binary File Transfer (BFT)

DSP Fax Sample Code

In addition to demos, sample code for using the DSP Fax Resource Allocation feature is provided. This feature allows your application to allocate and de-allocate DSP Fax channels. The code can be found at:

`<install drive>:\program files\Dialogic\samples\fax\sample.cpp`

VFX Features

VFX features for transmit and receive are as follows:

- Raw
- ASCII-to-FAX (transmit only)
- Fax Error Correction Mode (ECM) Switch
- Scan Line Error Correction
- MR and MMR Advanced Compression
- Subaddress Fax Routing
- Downloadable font file for VFX/40ESC+
- Single TIFF/F file
- Multi-page TIFF
- Fine Resolution
- Zero-fill ASCII-to-Fax conversion on the fly

BRI/2VFD

BRI/2VFD features are as follows:

- Support for R4 Fax API or GRT API

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.

The Global Call API library has the following fundamental characteristics:

- It is designed to support a variety of protocols, including E-1 CAS, T-1 robbed bit, analog loop start, ISDN, IP H.323, and SIP interfaces.
- It provides a consistent application interface for the various protocols and technologies.
- It uses the same input and output parameters at the application level to configure and control the different interfaces.

NOTE: *The generic functionality of Global Call is documented in the Global Call API Library Reference and the Global Call API Programming Guide. Technology-specific functionality is documented in the various Global Call Technology User's Guides.*

New Features

The Global Call API library provides the following new features in the System Release 5.1.1 Feature Pack 1:

- H.323 and SIP host-based stacks
Global Call supports the development of applications that use the host-based H.323 and SIP RADVISION* stacks supplied with the system software.
NOTE: *For more information on porting an existing Global Call H.323 application developed for the embedded stack in System Release 5.1.1 for Windows to the host-based stack implementation in this release, see the Porting Global Call H.323 Applications from Embedded Stack to Host-Based Stack Application Note included with the system release documentation.*
- Multi-protocol support on Global Call devices when using host-based stacks
Applications can open and use devices that support the H.323 protocol, the SIP protocol, or both protocols.
- Registration via application when using host-based stacks
Applications using one of the host-based stacks can use Global Call to register with a Gatekeeper (H.323) or Registrar (SIP).
- Support for DTMF modes when using host-based stacks
Applications can configure the preferred DTMF mode: UII Alphanumeric (H.323 only), RFC 2833, or Inband. In addition, applications can initiate the generation of DTMF, and receive notification of DTMF detection.
- Support for fax transmission and reception when using host-based stacks
Global Call supports the sending and receiving of fax information by the inclusion of the T.38 UDP coder in the capability exchange. Applications can be configured to receive notification of audio-to-fax and fax-to-audio transition as well as notification of T.38 status changes.
- Support for Global Call Alarm Management System (GCAMS) on Intel® NetStructure™ boards that use DM3 architecture. See the *Global Call E-1/T-1 CAS/R2 Technology User's Guide* and *Global Call ISDN Technology User's Guide* for further information.

Other Supported Features

The following Global Call features continue to be supported in the System Release 5.1.1 Feature Pack 1:

- Support for PSTN and IP interfaces on Intel® NetStructure™ boards
- Support for PSTN and IP protocols including E-1 CAS, T-1 Robbed Bit, ISDN, R2MF, and H.323 via embedded call control stack
- Basic call control that includes the ability to make a call, detect a call, answer a call, release a call etc. The implementation of these capabilities is based on a generic call state model that maintains a consistent call control paradigm across all technologies supported by Global Call.

- Call progress and call analysis, including the ability to handle pre-connect (Call Progress) information that reports the status of the call connection and post connect (Call Analysis) information that reports the destination party's media type.
- Call hold and transfer for ISDN and PDK protocols. Support includes the ability to place a call on hold in order to answer a third party and/or transfer a call to the third party.
- Support for supplementary services for applications that use ISDN protocols including Any Message, Any IE, and User-to-User messaging.
- Feature Transparency and Extension (FTE), that is, the ability to extend the capabilities of Global Call to handle features that are technology-specific so that those features are accessible via the Global Call interface.
- Global Call Alarm Management System (GCAMS) that provides the ability to manage alarms.
- Real Time Configuration Management (RTCM) that allows the modification of call control and protocol elements in real time, providing a single common user interface for configuration management.
- A generic service request facility that allows an application to send a request for a service to a remote device. Examples of the types of services that this feature supports are device registration, channel setup, call setup, and information requests.
- Easy access to error information using **gc_ErrorInfo()** for function failures and **gc_ResultInfo()** for event information.
- Selective call control library initialization using **gc_Start()** that allows applications to control which call control libraries are started during initialization.
- Library information functions that enable an application to get information about the call control libraries being used.
- Signal System 7 (SS7) is a public network signaling system used for call control, routing and billing. Global Call provides a call control interface that enables applications to perform basic call control on SS7 telephony circuits. Global Call supports both single-board SS7 solutions and Signaling Interface Unit (SIU) solutions. Global Call support for SS7 helps programmers develop applications without needing a detailed knowledge of the underlying SS7 technology.

NOTE: System Release 5.1.1 for Windows required the use of Third Party Support software to manage the CT Bus. In Feature Pack 1, this Third Party Support software is no longer required. The equivalent CT Bus management capability is provided using the Intel® Dialogic® Configuration Manager (DCM). See the Global Call SS7 Technology User's Guide for Windows for more information.

IP Media Library API

The IP Media Library (IPML) API is used to control media on IP devices. Voice over IP applications that use IP signaling stacks other than those supplied with Intel® products may use this library for application development.

NOTE: IP Media Library functionality is documented in the *IP Media Library API for Linux and Windows Operating Systems Library Reference* and the *IP Media Library API for Linux and Windows Operating Systems Programming Guide*.

New Features

The IP Media Library (IPML) provides the following new features in the System Release 5.1.1 Feature Pack 1:

- Support for RFC 2833
Applications can configure the preferred DTMF mode: UII Alphanumeric, RFC 2833, or Inband. In addition, applications can initiate the generation of DTMF, and receive notification of DTMF detection.
- Support for T.38 Fax
IPML provides an event when CNG or CED tone is detected allowing applications to switch to T.38.
- IP Media Gateway (IPML) Demo
The IP Media Gateway (IPML) Demo demonstrates using the IPML API to build a PSTN-IP gateway.

NOTE: Refer to the *IP Media Gateway (IPML) Demo Guide* for complete information on the demo.

Other Supported Features

The following IPML features continue to be supported in the System Release 5.1.1 Feature Pack 1:

- Media resource management and media resource operations functionality
- Quality of Service (QoS) threshold alarm configuration and status reporting
- Support of Standard Runtime Library (SRL) event management routines for error retrieval

Modular Station Interface API

The Modular Station Interface (MSI) API is used by the following products:

- Intel® Dialogic® DI/0408-LS-A-R2 boards
- Intel® Dialogic® DI/SI Series boards
- Intel® NetStructure™ High Density Station Interface (HDSI) boards

New Features

The following new MSI features have been implemented in the System Release 5.1.1 Feature Pack 1:

- Three new APIs: `ms_SendData()`, `ms_ResultMsg()`, `ms_ResultValue()`
- One new data structure: `MS_DataInfo`

For more information on these new features, refer to the *MSI API for Linux and Windows Library Reference* and the *MSI API for Linux and Windows Programming Guide*.

Other Supported Features

The following MSI features, which were supported in System Release 5.1.1 for Windows, continue to be supported in this release:

- Conference Management functions to control conferencing features
- Configuration functions to set and retrieve device parameters
- Device Management functions to open and close devices
- Diagnostic functions to test devices
- Routing functions to allow communication between devices connected to time slots on the CT Bus
- Station functions to control station interfaces

NCM (Native Configuration Manager) API Library

The NCM API library provides an interface for developing customized system configuration and administration applications. The NCM API functions operate on the complete Intel® Dialogic® system, individual Intel® NetStructure™ and Intel® Dialogic® boards or the TDM bus settings.

NOTE: Refer to the *Customization Tools for Installation and Configuration for Windows* document for complete information about the NCM API.

New Features

The NCM API provides the following new features in the System Release 5.1.1 Feature Pack 1:

- Add third-party devices to a system with Intel® Dialogic® boards
The NCM library includes functions that allow third-party devices to be added to a system with Intel® Dialogic® boards. You can set the TDM bus capabilities of the third-party device and define a third party device as the primary or secondary clock master.
- Reserve TDM bus time slots for exclusive use by third party devices
You can dynamically allocate and deallocate TDM bus time slots for use by third party devices. This allows Intel® Dialogic boards to share the TDM bus with third party devices. The reserved time slots can be arbitrary (i.e. determined by the system software) or specific (i.e. determined by the user).

Other Supported Features

The following NCM API features, which were supported in System Release 5.1.1 for Windows, continue to be supported in this release:

- Modifying board-level and system-level configuration data
- Querying board-level and system-level configuration data
- Starting, stopping and checking the status of the Intel® Dialogic® system
- Starting and stopping individual boards
- Setting the TDM bus clock master fallback list
- Getting Intel® Dialogic® System Software version information

PBX Integration

Intel® Dialogic® PBX Integration products offer direct connectivity to the most popular private branch exchanges (PBXs) for unified and Internet-ready call, voice, and fax processing applications .

New Features

No new PBX integration features have been implemented in the System Release 5.1.1 Feature Pack 1.

Other Supported Features

The PBX Integration products (D/82JCT-U and D/42JCT-U) continue to provide the following PBX integration features:

- Nortel Norstar, Nortel Meridian 1, Mitel SX-50, SX-200, SX-2000 (with Superset 430 support), Lucent Definity, Siemens ROLM, and Siemens Hicom 150E/300E switch support
- D/42 R4 API
- Software-controlled configuration
- Universal digital interface with downloadable firmware for different phone emulations
- Support for PBX functions
 - Call/Called party ID
 - Message Waiting lamp control
 - Loop current detection
 - Disconnect supervision
 - Ring detection
 - Link status detection
 - Read display
- WAVE, A-law and Mu-law PCM, ADPCM, GSM 610 or G.726 audio encoding

ISDN API

NOTE: *The Global Call API is the preferred call control API for all technologies including ISDN. However, certain features that are not supported by Global Call may be supported by the underlying ISDN API. See the ISDN Software Reference for more information.*

NOTE: *The ISDN API is not supported when using DM3 boards.*

New Features

No new features have been enabled for the ISDN API in the System Release 5.1.1 Feature Pack 1.

Other Supported Features

The following features continue to be supported:

- BRI Call Waiting

System Release 5.1.1 Feature Pack 1 for Windows Release Guide

- PRI Support
 - Generic support for supplementary services
 - Programmable start-up conditions
 - Access to protocol timers for performance tuning
 - Support for all specified PRI messages
 - Two B Channel Transfer (TBCT)
 - Non-Call-Associated Signaling (NCAS)
 - Vari-A-Bill
 - ANI-on-demand
 - User-to-user information
 - Dialed Number Identification (DNIS)
 - Non-Facility Associated Signaling (NFAS)
 - Supported under Global Call for Springware and DM3 products
 - B channel negotiation
 - Multinational approvals with all popular protocols
 - Automatic Number Identification (ANI)
 - LAP-D Layer 2 access
 - DialView Suite:
 - ISDN Diagnostic Program (isdiag)
 - ISDN Trace Utility (isdtrace)
 - ISDN Network Protocol Firmware (NT1, NE1, ETN, VNNT, TPHNT, QNT, QTE)
- BRI/SC Support
 - ISDN API
 - User-to-user information
 - Dialed Number Identification (DNIS)
 - Multinational approvals with all popular protocols
 - Automatic Number Identification (ANI)
 - LAP-D Layer 2 access
 - DialView Suite:
 - ISDN Diagnostic Program (isdiag)
 - ISDN Trace Utility (isdtrace)
 - ISDN Network Protocol Firmware (NT1, NE1, ETN, VNNT, TPHNT, QNT, QTN)
 - Basic Call Control
 - Makecall
 - Rejectcall
 - Layer 2 Access
 - Layer 3 Access
 - 8 or 16 S/T interface supporting the following protocols:
 - National ISDN-1
 - Euro-ISDN
 - INS64
 - 5ESS
 - DMS

- Layer 3 supplementary services
 - Hold and Retrieve
 - Messaging
 - In-band tone generation
 - Multiple D channel configuration
 - 5ESS custom messages
- Broadcast handling in point-to-multipoint configuration
 - NOTE:** Each BRI is configurable as a TE (station) or as an NT (PSTN)
- BRI/2VFD Support
 - ISDN API
 - Basic Call Control
 - Makecall
 - Rejectcall
 - Layer 2 Access
 - Layer 3 Access
 - 2 S/T interfaces supporting 4 voice/data channels:
 - Euro-ISDN
 - TE (Station) side
- Springware PRI Protocol Support

Digital Network Interface API

New Features

No new Network Interface Support features have been enabled in the System Release 5.1.1 Feature Pack 1.

NOTE: Refer to the *Digital Network Interface Software Reference and the Compatibility Guide for Dialogic R4 API on DM3 Products* for more information.

Other Supported Features

The following features continue to be supported:

- T-1 digital telephony signaling
- E-1 digital telephony signaling
- Digital Network Interface API (dt_ functions) including alarm, diagnostic, extended attribute, parameter request and setting, resource management, SCbus routing, and time slot audio and signaling functions.
- CAS DTI signal pattern transmission and detection functions:
The CAS DTI extensions permit higher-density systems to perform the signaling operations needed for CAS protocols within strict protocol time specifications.

Standard Runtime Library API

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 *Voice Software Reference – Standard Runtime Library and the Compatibility Guide for Dialogic R4 API on DM3 Products* for more information.

New Features

No new Standard Runtime Library (SRL) features have been implemented in the System Release 5.1.1 Feature Pack 1.

Other Supported Features

The following Standard Runtime Library (SRL) features, which were supported in System Release 5.1.1 for Windows, continue to be supported in this release:

- Support for the following programming models:
 - Synchronous model
 - Synchronous with SRL callback model
 - Asynchronous polled model
 - Asynchronous with SRL callback model
 - Asynchronous with Windows callback model
 - Asynchronous with Win32 Synchronization
 - Extended asynchronous model
- Device event management
- Device information retrieval using ATDV_ prefixed functions
- The ability to set and retrieve user-specific context using the **sr_setparm()** and **sr_getparm()** functions

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, see the *Voice Software Reference documentation set (which includes the Features Guide, the Programmer's Guide, and the Standard Runtime Library Guide) and the Compatibility Guide for Dialogic R4 API on DM3 Products. Also see the Documentation Updates section in the Release Update for this system release.*

New Features

The Voice API library provides the following new features and enhancements in the System Release 5.1.1 Feature Pack 1:

- New 8 KHz linear PCM coder
The 8 KHz linear PCM coder is supported at 64 Kbps (8 bits) and 128 Kbps (16 bits) for play and record, VOX and WAVE file formats. This coder is newly supported on DM3-based boards. For more information, see the Documentation Updates section in the Release Update document for this system release.
- ETSI compliant Frequency Shift Keying (FSK) support
The following parameters, set through **dx_setparm()**, have been added to comply with ETSI requirements: **DXCH_FSKSTANDARD**, **DXCH_FSKCHSEIZURE**, **DXCH_FSKMARKLENGTH**. For more information, see the Documentation Updates section in the Release Update document for this system release.
- Enhanced CT_DEVINFO structure
The CT_DEVINFO structure used by **xx_getctinfo()** routing functions is now defined in its own header file, called *ctinfo.h*. For more information, see the Documentation Updates section in the Release Update document for this system release.

Other Supported Features

The following Voice software features, which were supported in System Release 5.1.1 for Windows, continue to be supported:

- Tone detection/generation:
 - Dual Tone Multi Frequency (DTMF)
 - Multi Frequency (MF)
 - Global Tone Detection (GTD) user-defined tones
 - Global Tone Generation (GTG) user-defined tones, including Cadenced Tone Generation

- Global Dial Pulse Detection (not supported on DM3 boards)
- Tone set file (not supported on DM3 boards)
- Adjustable built-in beep tone length through **dx_settonelen()** (not supported on DM3 boards)
- Data formats for play and record:
 - OKI* ADPCM at 6 KHz with 4-bit samples (24 kbps) and 8 KHz with 4-bit samples (32 kbps), VOX and WAVE file formats
 - G.711 PCM at 6 KHz with 8-bit samples (48 kbps) and 8 KHz with 8-bit samples (64 kbps) using A-law or mu-law coding, VOX and WAVE file formats
 - G.721 at 8 KHz with 4-bit samples (32 kbps), VOX and WAVE file formats (not supported on Springware boards)
 - PCM at 11 KHz with 8-bit samples (88 kbps) and 11 KHz with 16-bit samples (176 kbps) using linear coding, VOX and WAVE file formats
 - TrueSpeech* at 8 KHz with 16-bit samples (8.5 kbps), VOX and WAVE file formats (not supported on Springware boards)
 - GSM 6.10 full-rate voice coder at 13 kbps using Microsoft* format (VOX and WAVE file formats) and TIPHON* format (VOX file format only)
 - G.726 bit-exact voice coder at 8 KHz with 4-bit samples (32 kbps), VOX and WAVE file formats (WAVE file format not supported on Springware)
 - G.726 bit-exact voice coder at 8 KHz with 2-, 3-, or 5-bit samples (16, 24, 40 kbps), VOX and WAVE file formats (not supported on Springware boards)

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 Continuous Speech Processing API Programming Guide.
- Speed Control (not all coders supported)
- Volume Control (not all coders supported)
- Transmit/receive Analog Display Services Interface (ADSI) 2-way FSK through the **dx_Rxlottdata()**, **dx_Txlottdata()**, and **dx_TxRxlottdata()** functions (supports FSK Bellcore and ETSI standards)
- Call Progress Analysis
- Transaction Record
- Bulk data buffer sizing through the **dx_setchxfercount()** function
- Silence Compressed Record (not all coders supported)
- Echo Cancellation

NOTE: For enhanced echo cancellation, use the Continuous Speech Processing software.
- Caller ID (international caller ID support varies by board)

GDK/GRT API

New Features

No new features have been implemented in the System Release 5.1.1 Feature Pack 1.

NOTE: For more information about the API, refer to the GDK Version 5.0 Programming Reference Manual for Windows for more information. For information about installing the GDK software, refer to the GDK Version 5.0 Installation and Configuration Guide for Windows.

Other Supported Features

The following features, continue to be supported:

- Interactive and batch programming models
- GDK system service (the Dispatcher)
- Queue file database

- Status files
- Device drivers for ISA and PCI
- Firmware Download Utility

Demonstration Programs

Demonstration programs are provided to demonstrate the functionality and features of Intel® Dialogic® and Intel® NetStructure™ 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.

All demo programs listed below are located in `C:\Program_Files\Dialogic\samples` following standard installation of the System Release 5.1.1 Feature Pack 1.

New Demo Programs

The following new demo programs are included in the System Release 5.1.1 Feature Pack 1:

- IP Gateway (Global Call) Object Oriented Demo (two separate demos for host based and embedded stack)
The IP Gateway (Global Call) Object Oriented demo demonstrates using the Global Call API to build a PSTN-IP gateway. The demo implements an object-oriented design.
NOTE: Refer to the *IP Gateway (Global Call) Object Oriented Demo Guide* for complete information.
- IP Media Gateway (IPML) Demo
The IP Media Gateway (IPML) demo demonstrates using the IPML API to build a PSTN-IP gateway. The demo illustrates how to add a proprietary host-based protocol stack and implements an object-oriented design.
NOTE: Refer to the *IP Media Gateway (IPML) Demo Guide* for complete information.

Updated Demo Programs

The following demo programs have been updated, modified, or enhanced since System Release 5.1.1 for Windows:

- Continuous Speech Processing (CSP) demo
The Continuous Speech Processing (CSP) demo is a single-threaded program that illustrates key CSP features such as barge-in, voice activity detection, echo-cancelled recording and echo-cancelled streaming. This demo was enhanced to support the DMV160LP board.
NOTE: For more information, see the *Continuous Speech Processing Demo Guide*.
- IP Gateway (Global Call) Demo
The IP Gateway demo shows how to use the Global Call API to build a PSTN-IP gateway. New features include support for Quality of Service (QoS) and RAS. A new state, gateRelease, was added. This demo was called the IPT Media Gateway Demo in System Release 5.1.1 for Windows.
NOTE: For complete information, refer to the *IP Gateway (Global Call) Demo Guide*.
- IP Mail (Global Call) Demo
The IP Mail demo illustrates how to build a simple Internet telephony voice mail application using the Global Call API.
NOTE: For more information, see the *IP Mail (Global Call) Demo Guide*.

Other Supported Demo Programs

The following demo programs continue to be supported in the System Release 5.1.1 Feature Pack 1. These programs have not changed since System Release 5.1.1 for Windows.

- DSP Fax Sample Code
In addition to demos, sample code for using the DSP Fax Resource Allocation feature is provided. This feature allows your application to allocate and de-allocate DSP Fax channels. The code can be found at:
<install drive>:\program files\Dialogic\samples\fax\sample.cpp
- Fax demos
The following fax demonstration programs are supported. See the *Fax Software Reference* for more information.

- faxsr—sends or receives faxes on a single voice/fax channel (not supported on DM3 boards)
- scfaxdem—sends or receives faxes using the SCbus configuration (only supported on VFX40ESCplus boards)
- dspfaxsr—sends or receives faxes using DSP Fax (SoftFax) on a single voice/fax channel
- Global Call Basic Call Control Demo Program
A demonstration program that exercises some of the capabilities of Global Call. See the Global Call API Demo Guide for more information.

Protocol Stacks

System Release 5.1.1 Feature Pack 1 includes new implementations of two IP signaling protocol stacks which enable the establishment of calls over an IP network. These stacks include:

- New Host-Based H.323 Protocol Stack
- New Host-Based SIP Protocol Stack

New Host-Based H.323 Protocol Stack

The host-based H.323 RADVISION* protocol stack, which is new to the System Release 5.1.1 Feature Pack 1, provides features that enable the establishment of calls over an IP network using the H.323 protocol. This IP signaling stack is compliant with ITU H.323 Revision 2.0 and supports some of the features of revision 3.0 and 4.0. Refer to the features section of each product family in this document to identify the products that support the host-based H.323 protocol stack and for any deviations from the feature support described here.

Features

The features provided by the host-based H.323 protocol stack include:

- Slow start
Slow start is the original call setup method proposed in H.323 Revision 1.0 and continues to be supported in subsequent versions. Using this method several steps (up to 18) were involved in setting up the connection for a call. An alternative connection method, known as *fast connect*, that involves fewer steps was adopted in H.323 Revision 2.0 (see below).
- Fast connect
Fast connect (also known as fast start) is a method of call setup that bypasses some of the usual steps in order to reduce the connection setup time. A fast connect setup can be achieved in as little as one round trip. Fast Connect enables the media channels to be operational before the CONNECT message is sent, which is a requirement for certain billing procedures.
NOTE: *The audio is enabled only when the application gets GCEV_CONNECTED event.*
- Tunneling
Tunneling is the process of sending H.245 Protocol Data Units (PDUs) through the Q.931 channel (that is, the signaling channel).
- Call identifier
The call identifier is a globally unique ID that can be used to always correctly identify which call a packet is referencing, even when going through a gatekeeper.
- Progress message
The Progress message is used to indicate that a Gateway in the call is inter-working with the switched-circuit network (SCN) or to indicate the presence of in-band information.
- Alias type support
The following alias types are supported:
 - E-mail
 - H.323 ID
 - IP Address
 - Phone Number

- URL
- Time to live
Time to live is a parameter that can be requested by an endpoint or specified by the gatekeeper during registration. It indicates the duration (in seconds) for which that registration is valid. Using this mechanism, a gatekeeper does not need to be concerned about its database filling up with entries from endpoints that are no longer active.
- Keep alive
The keep alive parameter is sent in a lightweight Registration Request from an endpoint to its gatekeeper to indicate a desire to keep the registration active for a given amount of time. This is useful if the registration is about to expire based on the endpoint's time to live value described above.
- Caller ID
Caller ID is a feature found in traditional telephone networks. It also includes the ability of the caller to request that the name and address information be withheld from the called party and the ability of network equipment (for example, the gatekeeper) to screen caller information.
- Real-time fax
Real-time fax enables fax devices to initiate a voice call and then switch to fax at some point during the call. Along with the obvious benefit of allowing an IP-based fax device to operate in a manner similar to today's PSTN fax devices, the media switch is performed in such a way that DSP resources are conserved, which reduces the overall cost of equipment. Support for carrying fax data over TCP is also included. Previously, UDP provided the only viable option for carrying fax data.
- Gatekeeper support
Functionality for interaction with a gatekeeper including the ability to:
 - locate a gatekeeper via a multicast or unicast
 - specify one-time or periodical registration
 - register with a gatekeeper
 - change registration information
 - remove registration information by value
 - send non-standard registration messages
 - deregister
 - handle calls according to the gatekeeper policy for directing and routing calls
- RFC 2833
The ability to advertise support for RFC 2833. Also, the ability to use RFC 2833 on the media when enabled at the local side and supported at the remote side. This capability also includes the ability to use the same RFC 2833 payload type number as the remote side.

New Host-Based SIP Protocol Stack

The host-based SIP RADVISION* protocol stack, which is new to the System Release 5.1.1 Feature Pack 1, provides features that enable the establishment of calls over an IP network using the SIP protocol. Refer to the features section of each product family in this document to identify the products that support the SIP protocol stack and for any deviations in feature support described here.

Features

The features provided by the host-based SIP protocol stack include:

- UDP support
The ability to convey SIP messages over a UDP/IP transport and to deploy a retransmission mechanism that assures reliability and that duplicated packets are ignored.
- Audio support
The ability to start Audio media sessions using RTP.
- Registration
The ability to register and un-register with SIP registrar using the REGISTER method.
- Re-Invite capability

The ability to generate a modification request internally to switch to T.38 after detecting a CNG/CED tone. Also, the ability to process an incoming modification request to switch to T.38. The parameters currently supported by re-invite are the parameters used to switch between Audio and T.38 fax.

- SRV support
The ability to locate a SIP server using a DNS record, for example “sip11.intel.com”, and to resolve it without an IP address for the remote side. Adding a record to the DNS is outside the scope of SIP.
- RFC 2833
The ability to advertise support for RFC 2833. Also, the ability to use RFC 2833 on the media when enabled at the local side and supported at the remote side. This capability also includes the ability to use the same RFC 2833 payload type number as the remote side.

Other Release Features

The Development software provided with the System Release 5.1.1 Feature Pack 1 also includes the following features:

- DM3 Media Loads
- Dialogic Integrated (DI) Device Enumerations
- Intel® Dialogic® Analog Loop Start Device Enumerations

DM3 Media Loads

The media loads provided in this release are for the DM3 products. There are new PCD/FCD files for different media loads. A media load consists of Product Configuration Description (PCD) and Feature Configuration Description (FCD) files and associated firmware loads, which are downloaded to each DM3 board. The PCD/FCD files are customized by feature set as well as by protocol. The feature sets are available in different media loads as shown in the following section. Refer to the *DM3 Configuration File Reference* accompanying this release for information regarding the DM3 configuration files applicable to each board.

Intel® NetStructure™ DM/V, DM/N, DM/T, DMF, DM/VF, and DM/IP Media Loads

The following media loads are supported in the System Release 5.1.1 Feature Pack 1:

Media Load	Description
1 Basic Voice	<ul style="list-style-type: none"> • Provides play, record, digit generation and detection • All half duplex voice operations • Supported Coders: 128 kbps, 64 kbps, & 48 kbps G.711 PCM VOX and WAV 24 kbps & 32 kbps OKI ADPCM VOX and WAV 88/176Kbps Linear PCM VOX and WAV • Speed Control on 8 KHz coders • Volume Control • GTG/GTD • dx_dial() for call analysis (post connect only) • Transaction Record • All call control features when using a board with a network interface
1b 2-Way FSK	Basic Voice (Media Load 1) plus ADSI/2-way FSK

Media Load	Description
2 Enhanced Voice	Basic Voice (Media Load 1) plus: <ul style="list-style-type: none"> • CSP • Enhanced Coders: <ul style="list-style-type: none"> • G.726 at 16K, 24K, 32K and 40K • GSM (TYPHON and MS) • Silence Compressed Record: <ul style="list-style-type: none"> • G.711 • ADPCM • G.726
5 Fax †	Enhanced Voice (Media Load 2) plus V.17 Fax
6 Ultra Voice	Enhanced Voice (Media Load 2) and TrueSpeech coder
9b Conferencing Resource	Conferencing only resource. It is very much like a traditional DCB with added conferencing capabilities like Echo Cancellation: <ul style="list-style-type: none"> • Conferencing with Echo Cancellation and basic DTMF and basic tariff tone support. • Conferencing (up to 60 conferences per DCB DSP device) • No Voice channels • Adds 16 ms Echo Cancellation
10 Voice and Conferencing	Enhanced Voice (Media Load 2) plus Conference Resource. Conferencing and Voice devices are independent (not mutual exclusion). This Media Load instantiates both enhanced voice devices as well as DCB DSP conferencing resources.
11 Enhanced Voice Plus Conferencing †	Enhanced Voice (Media Load 2) plus Conferencing resources NOTE: Media Load 11 applies to IPLink boards only.
Universal Media Load †	<ul style="list-style-type: none"> • Basic Voice (Media Load 1) • Fax (Media Load 5) • Conferencing Resource (Media Load 9b)

† These media loads are new to the Feature Pack 5.1.1 Feature Pack 1 for Windows Operating Systems on Intel ® Architecture.

The following tables shows product configurations based on the media loads supported in this release:

DM/V Board Density and Media Load

Board	Basic Voice (1)	Two Way FSK (1b)	Enhanced Voice (2)	Fax (5)	Ultra Voice (6)	Conf Only (9b)	Voice/ Conf (10)	Universal (1+5+9b)
DM/V480-4T1-PCI	48							
DM/V600-4E1-PCI	60							
DM/V960-4T1-PCI	96							
DM/V1200-4E1-PCI	120							
DM/V480-4T1-cPCI	48							
DM/V600-4E1-cPCI	60							

Board	Basic Voice (1)	Two Way FSK (1b)	Enhanced Voice (2)	Fax (5)	Ultra Voice (6)	Conf Only (9b)	Voice/ Conf (10)	Universal (1+5+9b)
DM/V960-4T1-cPCI	96							
DM/V1200-4E1-cPCI	120							
DM/V480A-2T1-PCI		48	48		48		48 / 60	
DM/V600A-2E1-PCI		60			60		60 / 60	
DM/V960A-4T1-PCI		96	96	96 / 4	96			
DM/V1200A-4E1-PCI		120	120		120	120		60 / 8 / 60
DM/V480A-2T1-cPCI							48 / 60	
DM/V600A-2E1-cPCI							60 / 60	
DM/V960A-4T1-cPCI		96	96		96			
DM/V1200A-4E1-cPCI		120	120		120	120		
DM/V2400A-PCI	240					120	60 / 60	
DM/V2400A-cPCI	240					120	120 / 60	

The channel densities for media loads 5, 10 and Universal are additive; in addition to the number of voice channels supported on a board, an additional number of fax or conferencing channels can run simultaneously with the voice channels. On the DM/V1200A-4E1-PCI board, the Universal Media Load can simultaneously run 60 channels of voice, 8 channels of fax, and 60 channels of conferencing.

DM/IP Board Density and Media Load

Board	Basic Voice (1)	Enhanced Voice (2)	Voice/ Conferencing (11)
DM/IP241-1T1-PCI	24 / 24		
DM/IP241-1T1-cPCI	24 / 24		
DM/IP2431A-1T1-PCI	24 / 24		
DM/IP301-1E1-PCI	30 / 30		
DM/IP301-1E1-cPCI	30 / 30		
DM/IP3031A-1E1-PCI	30 / 30		
DM/IP241-1T1-PCI-100BT	24 / 24	24 / 24	24 / 24 / 30
DM/IP301-1E1-PCI-100BT	30 / 30	30 / 30	30 / 30 / 30
DM/IP481-2T1-PCI-100BT	48 / 48	48 / 48	
DM/IP481-2T1-cPCI-100BT	48 / 48	48 / 48	48 / 48 / 60
DM/IP601-2E1-PCI-100BT	60 / 60	60 / 60	60 / 60 / 60 *
DM/IP601-2E1-cPCI-100BT	60 / 60	60 / 60	60 / 60 / 60
DM/IP601-cPCI-100BT		60 / 60	60 / 60 / 60
DM/IP0821A-T1	8 / 24		
DM/IP0821A-E1-120	8 / 30		

Board	Basic Voice (1)	Enhanced Voice (2)	Voice/ Conferencing (11)
<p>For media loads 1 and 2, the table indicates the number of IP and voice instances supported on the board. For media load 11, the table indicates the number of IP and voice instances supported on the board and the number of conferencing channels that can run simultaneously with the voice channels.</p> <p>* A special load is available that supports 60 channels IP (G.711 only), 60 channels of voice with CSP (G.711 only), and 60 channels of conferencing (no echo cancellation). To implement this load, use the ipvs_evt_r_ml10.pcd file.</p>			

Dialogic Integrated (DI) Media Loads

This release contains DI media loads specific to the Dialogic Integrated DI/Slxx boards and DI/0408-LS-A-x boards. There are three DI media loads provided for the DI/0408-LS-A-x boards, and there is a single DI media load provided for the DI/Slxx boards. This section describes the DI media loads and the device enumeration rules which take effect upon successful download.

DI media loads that are supported in this release include:

Media Load	Description
DI Media Load 1 for DI/0408-LS-A and DI/0408-LS-A-R2	<ul style="list-style-type: none"> • Trunks: call control, Caller ID, and dedicated voice (player, recorder, tone generator, signal detector) for the 4 analog loop start interfaces. • Stations: call control, Caller ID, and dedicated voice (player, recorder, tone generator, signal detector) for the 8 analog station interfaces. • Capability to switch the signal from the audio input to the CT Bus / SCbus. • Support for up to three conferences with a total of 9 parties max between all conferences. Conference resources are shareable across the system via the CT Bus / SCbus. • Two channels of V.17 fax sharable across the system via the CT Bus / SCbus.
DI Media Load 2 for DI/0408-LS-A-R2 only	<ul style="list-style-type: none"> • Eight (8) channels of voice (player, recorder, tone generator, signal detector) sharable across the system via the CT Bus / SCbus. • Trunks: call control, Caller ID, and dedicated tone generation and signal detection capability for the 4 analog loop start interfaces. • Stations: call control, Caller ID, and dedicated tone generation and signal detection capability for the 8 analog station interfaces. • Capability to switch the signal from the audio input to the CT Bus / SCbus. • Support for up to three conferences with a total of 9 parties max between all conferences. Conference resources are shareable across the system via the CT Bus / SCbus. • Two channels of V.17 fax sharable across the system via the CT Bus / SCbus.
DI Media Load 4 for DI/0408-LS-A-R2 only	Same as DI media load 2 with the addition of four channels of continuous speech processing (CSP) resources, which are shareable across the system via the CT Bus / SCbus.

Media Load	Description
DI Media Load 1 for DI/SI32, DI/SI16-R2, DI/SI24-R2, and DI/SI32-R2	<ul style="list-style-type: none"> • Call control and dedicated voice (player, recorder, tone generator, signal detector) for the appropriate number analog station interfaces. That is, for DI/SI32 there are 32 voice resources and MSI devices. • Capability to switch the signal from the audio input to the CT Bus / SCbus. • For DI/SI32 only: support for up to five conferences with a total of 16 parties max between all conferences, without echo cancellation. Support for up to five conferences with a total of 12 parties max between all conferences, with echo cancellation. • For DI/SIxx-R2: support for up to five conferences with a total of 16 parties max between all conferences, with or without echo cancellation. • Caller ID transmission to stations

Intel® Dialogic® Analog Loop Start Media Load

The Intel® Dialogic® DMV160LP board uses the DMV160LP media load, which supports the following features:

- Play, record, digit generation and detection
- All half duplex voice operations
- Supported coders:
 - OKI* ADPCM at 6 KHz with 4-bit samples (24 kbps) and 8 KHz with 4-bit samples (32 kbps), VOX and WAVE file formats
 - G.711 PCM at 6 KHz with 8-bit samples (48 kbps) and 8 KHz with 8-bit samples (64 kbps) using A-law or mu-law coding, VOX and WAVE file formats
 - PCM at 11.025 KHz sampling with 8-bit samples (88 kbps), using linear coding
 - G.726 ADPCM
 - GSM full-rate voice coder at 13 kbps (ETSI 6.0 and RTP; both Microsoft and TIPHON frame support)
 - TrueSpeech* at 8 KHz with 16-bit samples (8.5 kbps), VOX and WAVE file formats
- Speed control on 8 KHz coders
- Volume control
- GTG/GTD
- **dx_dial()** for call analysis (post connect only)
- Transaction Record
- All call control features when using a board with a network interface
- Silence compressed record (G.711, ADPCM, G.726)
- ADSI/2-way FSK
- Caller ID in U.S., Japan and Europe
- Fax

Dialogic Integrated (DI) Device Enumerations

This section describes the device enumeration rules which take effect upon successful download.

Device Enumerations for DI/0408-LS-A and DI/0408-LS-A-R2:

For the DI/0408-LS-A and DI/0408-LS-A-R2 DI media loads, device enumeration follows the rules listed below:

NOTE: The scenario below assumes that the DI/0408-LS-A-x is the only board in the system. Call the **dx_getfeaturelist()** function to return information about the features supported on the device. (Refer to the Voice Software Reference - Programmer's Guide for function details.)

- The four loop start analog interfaces are enumerated as dtiB1T1-dtiB1T4. Trunk call control is supported via Global Call APIs.

System Release 5.1.1 Feature Pack 1 for Windows Release Guide

- Voice devices associated with the four loop start interfaces are dxxxB1C1-dxxB1C4.
For DI media load 1: a subset of the dx_ APIs provides support for basic voice functionality.
For DI media load 2 and DI media load 4: a subset of the dx_ APIs provides tone generation and detection support.
- The eight analog station interfaces are enumerated as msiB1C1-*msiB1C8*. Station call control is supported via the msi_ APIs.
- Voice devices associated with the eight analog station interfaces are dxxxB2C1-dxxB2C4, and dxxxB3C1-dxxB3C4.
For DI media load 1: a subset of the dx_ APIs provides support for basic voice functionality.
For DI media load 2 and DI media load 4: a subset of the dx_ APIs provides tone generation and detection support.
- For DI media load 2 and DI media load 4: eight channels of voice are enumerated as dxxxB4C1-dxxB4C4, and dxxxB5C1-dxxB5C4. A subset of the dx_ APIs provide support for basic voice including transaction record.
- The audio input is enumerated as aiB1. Switching is controlled via the ai_ APIs.
- Conferencing is enumerated as dcbB1D1. Application control of conferencing is provided by either the dcb_ APIs or the ms_ conferencing APIs.
- The two fax channels are enumerated as described below. Application control is provided by the fx_ APIs.
For DI media load 1: dxxxB4C1 & dxxxB4C2
For DI media load 2: dxxxB6C1 & dxxxB6C2
For DI media load 4: dxxxB7C1 & dxxxB7C2
- For DI media load 4 only: the four channels of Continuous Speech Processing (CSP) are enumerated as dxxB6C1-dxxB6C4. Application control is provided by the ec_ APIs.

Device Enumerations for DI/SI32 and DI/SIxx-R2:

For the DI/SI32 and DI/SIxx-R2 DI media load, device enumeration follows the rules listed below:

NOTE: *The scenario below assumes that the DI/SI32 or DI/SIxx-R2 is the only board in the system.*

- The analog station interfaces are enumerated as msiB1C1-*msiB1Cxx*, where xx may be 16, 24, or 32 depending on the board type. Station call control is supported via the ms_ APIs.
- Voice devices associated with the analog station interfaces follow the convention dxxxBnCn. The following example shows enumeration for 32 analog station interfaces: dxxxB1C1-dxxB1C4, dxxxB2C1-dxxB2C4, dxxxB3C1-dxxB3C4, dxxxB4C1-dxxB4C4, dxxxB5C1-dxxB5C4, dxxxB6C1-dxxB6C4, dxxxB7C1-dxxB7C4, dxxxB8C1-dxxB8C4.
A subset of the dx_ APIs provide support for basic voice.
- The audio input is enumerated as aiB1. Switching is controlled via the ai_ APIs.
- Conferencing is enumerated as dcbB1D1. Application control of conferencing is provided by either the dcb_ APIs or the ms_ conferencing APIs.

Intel® Dialogic® Analog Loop Start Device Enumerations

For the Intel® Dialogic® DMV160LP board, device enumeration follows the rules listed below:

Note: *This scenario assumes that the DMV160LP is the only board in the system. Call the `dx_getfeaturelist()` function to return information about the features supported on the device. (Refer to the Voice Software Reference – Programmer's Guide for function details.)*

- The sixteen loop start analog interfaces are enumerated as:

dtiB1T1 to dtiB4T4

Trunk call control is supported via the Global Call API (gc_ functions).

- Voice devices associated with the sixteen loop start interfaces are enumerated as:

dxxxB1C1 to dxxB4C4

- The four fax channels are enumerated as:

dxxxB5C1 to dxxxB5C4

Application control is provided by the Fax API (fx_ functions).

Operating Software

This chapter describes the operating software features that are supported in the System Release Version 5.1.1 Feature Pack 1. This information is organized into the following sections:

- Configuration Software
- Administration Software
- SNMP Agent Administrative Software
- Diagnostics Software

Configuration Software

This section describes the configuration software that is supported in the System Release Version 5.1.1 Feature Pack 1. Configuration is performed after the system release software is installed, using the Intel® Dialogic® Configuration Manager (DCM). Detailed procedures are given *Intel® Dialogic System Release Version 5.1.1 Feature Pack 1 on PCI and CompactPCI for Microsoft* Windows NT/2000/XP on Intel® Architecture Installation & Configuration Guide*.

New Features

The Intel® Dialogic® Configuration Manager (DCM) provides the following new feature in the System Release 5.1.1 Feature Pack 1:

- Adding third-party devices to an Intel® Dialogic® system and reserving TDM bus time slots for third-party devices. You can use the ThirdPartyTech family in the DCM's Add Hardware Wizard to set the TDM bus capabilities of third party devices and reserve TDM bus resources (time slots) for third-party devices. This allows third-party devices to co-exist on the TDM bus with Intel® NetStructure™ and/or Intel® Dialogic boards. You can also define the third party device as either the primary or secondary TDM bus clock master.

NOTE: *In System Release 5.1.1, third party device support was provided by a standalone Third Party Configuration GUI and documented in the Third Party Hardware TDM Bus Administration for Windows guide. Third party device support has been integrated into the DCM for System Release 5.1.1 Feature Pack 1. Refer to the Intel® Dialogic System Release Version 5.1.1 Feature Pack 1 on PCI and CompactPCI for Microsoft* Windows NT/2000/XP on Intel® Architecture Installation & Configuration Guide for more information about reserving TDM bus resources for third party devices.*

Other Supported Features

The following configuration features, which were supported in the System Release 5.1.1 for Windows release, continue to be supported in this release:

- DCM for configuring boards and TDM bus clocking setup
- Media loads and configuration file sets for board feature selection
- PDKManager for downloading Global Call protocol firmware and country-dependent parameter (CDP) configuration files

Administrative Software

This section describes the system administration software that is available in the System Release Version 5.1.1 Feature Pack 1. 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.

New Features

Administrative software features that are new since System Release 5.1.1 for Windows include:

- Managing a system remotely using Windows 2000 Terminal Services. This feature allows you to manage a server that contains the Intel® Dialogic® System Software and associated boards from a remote client computer using Windows 2000 Terminal Services on both the client and server computers.

Other Supported Features

The following administration features, which were supported in System Release 5.1.1 for Windows, continue to be supported in this release:

- Like-for-Like Replacement of any Intel® NetStructure™ CompactPCI (cPCI) board. This feature allows you to physically remove an Intel® NetStructure™ cPCI board from the system and replace it with an identical device model without shutting down the Intel® Dialogic® System Service.
- The Selective Startup Mode (Start Devices Preference) provides the ability to continue initializing a group (or set) of Intel® NetStructure™ boards regardless of a single board failure. This means that firmware download and initialization of the system will occur even if one or more Intel® NetStructure™ boards fail to initialize properly.
 - Selecting **Start All Device(s) or Start None** causes the Intel® Dialogic System Service to run only if all Intel® NetStructure™ devices have downloaded the firmware. If at least one device fails to download, the Intel® Dialogic System Service will not start.
 - Selecting **Start Selective (Good Devices Only)** causes the Intel® Dialogic System Service to run even if one or more devices fail to download the firmware. The system will bypass the problematic device(s) and the Intel® Dialogic System Service will start.

SNMP Agent Administration Software

New Features

There are no new SNMP Agent Administration Software features in System Release 5.1.1 Feature Pack 1.

Other Supported Features

The following SNMP Agent administration software features, which were supported in System Release 5.1.1 for Windows, continue to be supported in this release:

- Detection and monitoring of Intel® Dialogic® boards, including model, type, firmware name and version, memory address, IRQ, BLT ID, PCI slot ID, and current operational status
- Detection and monitoring of Intel® Dialogic® devices, including voice channels, DTI time slots, ISDN B channels, and MSI station sets
- Tracking of information common to all devices, such as name, type, open count, TDM bus transmit and receive time slot, and physical device table
- Automatic pinging to detect failed hardware or firmware
- Remote resetting of the Intel® Dialogic® System Service
- Tracking of lost messages and errors
- Maintenance of statistics over a user-specified interval

Diagnostics Software

This section describes the diagnostics software that is available in System Release 5.1.1 Feature Pack 1.

Diagnostics software allows the administrator to perform such tasks as determining the status of Intel® NetStructure™ boards, printing standard errors that are produced by Intel® NetStructure™ boards and verifying the network connections of Intel® NetStructure™ boards. The diagnostics software provides a number of tools that are useful when troubleshooting a board or a system.

NOTE: Refer to the *DM3 Diagnostic Utilities Reference* for more information. However, this document does not contain information about the new Snapshot Tool.

New Features

The following new diagnostic utility for Intel® NetStructure™ DM/IP Series and Intel® NetStructure™ DM/V Series boards has been added in the System Release 5.1.1 Feature Pack 1:

- snapshot tool -The snapshot tool uses Intel® Dialogic system software fault monitoring components to generate a core dump file when a Control Processor (CP), Signal Processor (SP) or Shared RAM (SRAM) fault is detected on certain Intel® NetStructure™ board models. When a fault is detected, a core dump file is created in the *Program Files\Dialogic\LOG* directory and the board that the fault occurred on is taken out-of-service (stopped) without causing any other interruptions to the system. To reactivate the out of service board, you must restart it.

Each core dump file is named according to the type of fault detected and the date/time the fault occurred. The naming convention of the core dump files is *faulttype MM_DD_YY HH_NNxx .bin*, where:

- *faulttype* denotes the type of fault (CPDump, SPDump or SRAM)
- *MM* is a two digit number indicating the month
- *DD* is a two digit number indicating the day
- *YY* is a two digit number indicating the year
- *HH* is a two digit number indicating the hour
- *NN* is a two digit number indicating the minute
- *xx* indicates whether the fault occurred in the AM or PM

When a core dump file is generated, you can send a .zip file containing the contents of the *Program Files\Dialogic\LOG* directory along with the Windows* event viewer system log file (*.evt) to Intel® Dialogic support services for debugging purposes.

Other Supported Features

The following diagnostic utilities, previously supported in System Release 5.1.1 for Windows, continue to be supported on Intel® NetStructure™ boards in this release:

- Alarms utility—monitors the alarms on a T-1 or E-1 line
- Audio Control utility—controls the Player and Recording resources
- CallInfo—detects call information using the Telephony Service Provider (TSP) resource
- CAS Signal Editor utility—allows you to dynamically view and modify CAS signal identification parameters (transitions, pulses, trains, or sequences) so you can test them before changing the config file.
- DebugView—allows you to monitor debug output on the local system or any networked system that can be reached via TCP/IP
- DigitDetect—provides the ability to detect digits at the local end of a channel connection
- Dm3Insight— allows you to capture message and stream traffic from the DM3 driver
- Dm3KDebug—queries the kernel of DM3 boards for debug information
- Dm3post—performs Power On Self Test (POST) for a specified board
- Dm3StdErr—polls the board and posts statements from the board's resources and kernel to the screen and a designated output file
- DM3Trace—polls the board and posts statements from the board's resources and kernel to the screen and a designated output file
- GetVer—prints the version of a DM3 binary file to the screen
- LineAdmin utility—puts lines into service so you can run a number of the other utilities. Also, monitors T-1 and E-1 alarms
- Listboards utility—displays information for boards present in the system and recognized by the device driver
- ISDNtrace—provides the ability to track Layer 3 (Q.931) messages on the ISDN D channel of Intel® NetStructure™ products. ISDNtrace prints the messages on the screen in real time. This trace information also can be captured into a file

- Phone—provides control for a single DM3 resource channel (make calls, wait for calls, etc.), monitors channel and call states, and sends call control operations to the DM3 Global Call resource
- Qerror—displays error code strings for DM3 Kernel errors
- STD Config utility—compares component parameters
- StrmStat—displays the status of specified DM3 streams
- TSP Config utility—allows you to change T-1 CAS or ISDN protocol variant parameters
- TSP Monitor utility—allows you to monitor the Global Call Resource protocol
- TSP Tracer utility—allows you to trace CAS protocol operations and includes timing information

Supported Hardware

This chapter describes the hardware products that are supported in System Release Version 5.1.1 Feature Pack 1. This information is organized into the following categories:

- New Intel® Dialogic® Analog Loop Start Product
- New Intel® Dialogic® DI/0408-LS-A-x
- New Intel® Dialogic® DI/Slxx Products
- Intel® Dialogic® CPi Fax Products
- Intel® Dialogic® Springware Fax Products
- Intel® Dialogic® Springware Voice Products
- Intel® Dialogic® Springware Single Span Products
- Intel® Dialogic® Springware Dual Span Products
- Intel® NetStructure™ DM/F Fax Products
- Intel® NetStructure™ DM/VF Products
- Intel® NetStructure™ High Density Station Interface (HDSI) Products
- Intel® NetStructure™ DM/IP Series Products
- Intel® NetStructure™ DM/IP Resource Products
- Intel® NetStructure™ DM/V Products
- Intel® NetStructure™ DM/N and DM/T DTI Series Products
- Intel® Dialogic® PBX Integration Products
- Intel® Dialogic® Conferencing Products
- Intel® Dialogic® Analog Network Interface Products
- Intel® Dialogic® Digital Network Interface Products
- Intel® Dialogic® Station Interface Products
- Intel® NetStructure™ SS7 Products
- Intel® NetStructure™ Signaling Interface Units

NOTE 1: Those boards formerly known as DM3 boards: DM3 Fax (now known as DM/F products), DM3 VFN (now known as DM/VF products), DM3 IPLink (now known as DM/IP products), and DM3 MediaSpan (now known as DM/V products), are now known as Intel® NetStructure™ boards. For more detailed information about these products, please refer to the datasheets found at: <http://developer.intel.com/design/network/products/telecom/boards/index.htm>

NOTE 2: Those boards formerly known as Septel boards are now known as Intel® NetStructure™ SS7 boards.

New Intel® Dialogic® Analog Loop Start Product

The following new Intel® Dialogic® analog loop start product is supported:

- DMV160LP

New Intel® Dialogic® DI/0408-LS-A-x

The following DI/0408-LS-A-x boards are supported:

- DI/0408-LS-A-R2 (new)
- DI/0408-LS-A

New Intel® Dialogic® DI/SIxx Products

The following Intel® Dialogic® DI/SIxx Station Interface boards are supported:

- DI/SI32
- DI/SI16-R2 (new)
- DI/SI24-R2 (new)
- DI/SI32-R2 (new)

Intel® Dialogic® CPi Fax Products

Intel® Dialogic® CPi Fax Series Products

The following Intel® Dialogic® CPi fax products are supported:

- CPi/200BRI
- CPi/400BRI
- CPi/200PCI
- CPi/400PCI
- CPi/2400CT-T1
- CPi/3000CT-E1
- CPi/2400-1T1-PCIU
- CPi/3000-1E1-PCIU
- CPi/100
- CPi/200
- CPi/400
- CPi/200B
- CPi/400B
- CPi/200B2
- CPi/400B2
- CPD/220
- XPi/200

Intel® Dialogic® CPi Fax Resource Only Series Products

The following Intel® Dialogic® CPi fax resource-only products are supported:

- CP6/SC
- CP12/SC
- CPi/2400CT
- CPi/3000CT
- CPi/2400-PCIU
- CPi/3000-PCIU

Intel® Dialogic® Springware Fax Products

The following Intel® Dialogic® Springware fax products are supported:

- VFX/40ESCplus
- VFX/40PCI
- VFX/41JCT-LS

Intel® Dialogic® Springware Voice Products

The following Intel® Dialogic® Springware voice products are supported:

- Dialog4
- ProLine/2V
- D/21E
- D/41ESC
- D/41EPCI
- D/41JCT-LS
- D/41H
- D/4-PCI
- D/80SC
- D/80-PCI
- D/160SC
- D/160SC-HS
- D/160SCLS-HiZ
- D/160JCT
- D/240SC
- D/320SC
- D/320SC-IDPD
- D/320-PCI
- D/320JCT
- D/640SC

Intel® Dialogic® Springware Single Span Products

The following Intel® Dialogic® Springware single span products are supported:

- D/80SC-4LS
- D/160SC-LS
- D/160SC-LS-IDPD
- D/160SC-8LS
- D/120JCT-LS
- BRI/2VFD
- D/240SC-T1
- D/240SC-T1-IDPD
- D/300SC-E1

- D/300SC-E1-IDPD
- D/240JCT-T1
- D/300JCT-E1
- D/240PCI-T1
- D/300PCI-E1
- D/480JCT-1T1
- D/600JCT-1E1

Intel® Dialogic® Springware Dual Span Products

The following Intel® Dialogic® Springware dual span products are supported:

- D/240SC-2T1
- D/300SC-2E1
- D/480SC-2T1
- D/600SC-2E1
- D/480JCT-2T1
- D/600JCT-2E1

Intel® NetStructure™ DM/F Fax Products

Intel® NetStructure™ DM/F Fax Products

The following Intel® NetStructure™ DM/F Fax products are supported:

- DM/F240-1T1-PCI
- DM/F300-1E1-PCI
- DM/F240-1T1-PCIU
- DM/F300-1E1-PCIU

Intel® NetStructure™ DM/F Fax Resource Products

The following Intel® NetStructure™ DM/F Fax resource products are supported:

- DM/F240-PCI
- DM/F300-PCI
- DM/F240-PCIU
- DM/F300-PCIU
- DM/F240-cPCI
- DM/F300-cPCI

Intel® NetStructure™ DM/VF Products

The following Intel® NetStructure™ DM/VF products are supported:

- DM/VF240-1T1-PCI
- DM/VF300-1E1-PCI
- DM/VF240-1T1-PCIU
- DM/VF300-1E1-PCIU

Intel® NetStructure™ High Density Station Interface (HDSI) Products

The following Intel® NetStructure™ High Density Station Interface Series products are supported:

- HDSI/480-cPCI
- HDSI/720-cPCI
- HDSI/960-cPCI
- HDSI/1200-cPCI
- HDSI/480-PCI
- HDSI/720-PCI
- HDSI/960-PCI
- HDSI/1200-PCI

Intel® NetStructure™ DM/IP Series Products

The following Intel® NetStructure™ DM/IP Series products are supported:

- DM/IP241-1T1-PCI
- DM/IP301-1E1-PCI
- DM/IP241-1T1-cPCI
- DM/IP301-1E1-cPCI
- DM/IP2431A-T1
- DM/IP3031A-E1-120
- DM/IP241-1T1-PCI-100BT
- DM/IP301-1E1-PCI-100BT
- DM/IP481-2T1-PCI-100BT
- DM/IP481-2T1-cPCI-100BT
- DM/IP601-2E1-PCI-100BT
- DM/IP601-2E1-cPCI-100BT

Intel® NetStructure™ DM/IP Resource Products

The following Intel® NetStructure™ DM/IP resource products are supported:

- DM/IP241-1T1
- DM/IP601-cPCI-100BT
- DM/IP0821A-1T1
- DM/IP0821A-E1

Intel® NetStructure™ DM/V Products

Intel® NetStructure™ DM/V-A Multifunction Series Products

The following Intel® NetStructure™ DM/V-A Multifunction Series products are supported:

- DM/V480A-2T1-PCI
- DM/V600A-2E1-PCI

- DM/V960A-4T1-PCI
- DM/V1200A-4E1-PCI
- DM/V480A-2T1-cPCI
- DM/V600A-2E1-cPCI
- DM/V960A-4T1-cPCI
- DM/V1200A-4E1-cPCI

Intel® NetStructure™ DM/V-A Multifunction Resource Series Products

The following Intel® NetStructure™ DM/V-A Multifunction Resource Series products are supported:

- DM/V2400A-PCI
- DM/V2400A-cPCI

Intel® NetStructure™ DM/V Voice Series Products

The following Intel® NetStructure™ DM/V Voice products are supported:

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

Intel® NetStructure™ Dual Span HiZ Series Products

The following Intel® NetStructure™ DualSpan HiZ products are supported:

- DM/V480-2T1-PCI-HiZ
- DM/V600-2E1-PCI-HiZ

Intel® NetStructure™ DM/N and DM/T DTI Series Products

The following Intel® NetStructure™ DM/N and DM/T Digital Telephony Interface (DTI) Series products are supported:

- DM/N960-4T1-PCI
- DM/N1200-4E1-PCI
- DM/N960-4T1-cPCI
- DM/N1200-4E1-cPCI
- DM/T960-4T1-PCI
- DM/T1200-4E1-PCI
- DM/T960-4T1-cPCI
- DM/T1200-4E1-cPCI

Intel® Dialogic® PBX Integration Products

The following Intel® Dialogic® PBX integration products are supported:

- D/42JCT-U
- D/82JCT-U
- D/82JCTUPCIUNIV

Intel® Dialogic® Conferencing Products

The following Intel® Dialogic® conferencing products are supported:

- DCB/320SC
- DCB/640SC
- DCB/960SC

Intel® Dialogic® Analog Network Interface Products

The following Intel® Dialogic® analog network interface products are supported:

- LSI/81SC
- LSI/161SC

Intel® Dialogic® Digital Network Interface Products

The following Intel® Dialogic® digital network interface products are supported:

- DTI/240SC
- DTI/241SC
- DTI/300SC
- DTI/301SC
- DTI/480SC
- DTI/481SC
- DTI/600SC
- DTI/601SC

Intel® Dialogic® Station Interface Products

The following Intel® Dialogic® station interface products are supported:

- MSI/80SC-Global
- MSI/160SC-Global
- MSI/240SC-Global
- MSI/80PCI-Global
- MSI/160PCI-Global
- BRI/80SC
- BRI/160SC
- BRI/80PCI
- BRI/160PCI

Intel® NetStructure™ SS7 Products

The following Intel® NetStructure™ SS7 products are supported:

- Intel® NetStructure™ PCCS6 (ISA form factor)
- Intel® NetStructure™ SPC14 (PCI form factor)
- Intel® NetStructure™ CPM8 (CompactPCI* form factor)

Intel® NetStructure™ Signaling Interface Units

The following Intel® NetStructure™ Signaling Interface Units (SIUs) are supported:

- Intel® NetStructure™ SIU131
- Intel® NetStructure™ SIU231
- Intel® NetStructure™ SIU520

Separately Orderable Products

This chapter describes separately orderable products that are not part of the System Release Version 5.1.1 Feature Pack 1 but are required to perform some of the functions supported by the system release.

The Intel® Dialogic® Global Call Protocols Version 3.00 for Linux and Windows introduces support for PDK protocols on Intel® NetStructure™ boards. This release also includes enhancements to the PDK protocols to support additional countries and switches.

The Global Call Protocols Version 3.00 Package contains:

- Global Call PDK and ICAPI protocol binaries and country-dependent parameter (CDP) files
- *Intel® Dialogic® Global Call Protocols Version 3.00 for Linux and Windows Release Notes* , which provides information about installing and using the Global Call protocols
- *Global Call Country Dependent Parameters (CDP) Reference* , which describes the parameters associated with each of the countries needed for utilizing Global Call protocols

NOTE: The Global Call Protocols Version 3.00 package can be downloaded from the Intel® Telecom Support Resources web site at <http://developer.intel.com/design/telecom/support/> .

Release Documentation

This chapter provides information about the documentation that has been developed to accompany the System Release Version 5.1.1 Feature Pack 1. This information is organized into the following sections:

- Documentation Highlights
- System Release Documentation
- Development Software Documentation
- Operating Software Documentation

Documentation Highlights

The System Release Version 5.1.1 Feature Pack 1 documentation referenced in this Release Guide is available only on CD or downloadable from the support website located at:

<http://resource.intel.com/telecom/support/documentation/releases/index.htm>

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 Version 5.1.1 Feature Pack 1 are the following:

- The *GlobalCall API Software Reference for Linux and Windows* has been re-titled to the *Global Call API for Linux and Windows Operating Systems Library Reference*.
- The *GlobalCall Application Developer's Guide for Linux and Windows* has been re-titled to the *Global Call API for Windows Operating Systems Programming Guide*.
- Two versions of the *Global Call IP Technology User's Guide for Linux and Windows Operating Systems* are provided in this release:
 - The *Global Call IP over Embedded Stack Technology User's Guide for Linux and Windows Operating Systems* provides information for the development of Global Call applications where the IP protocol stack is running on the board. This configuration, supported in System Release Version 5.1.1, continues to be supported in Feature Pack 1.
 - The *Global Call IP over Host-based Stack Technology User's Guide for Linux and Windows Operating Systems* provides information for the development of Global Call applications where the IP protocol stack is running on the host. This configuration is new in System Release Version 5.1.1 Feature Pack 1.
- The *Global Call E-1/T-1 Technology User's Guide for Linux and Windows* has been renamed the *Global Call E-1/T-1 CAS/R2 Technology User's Guide for Linux and Windows*.

If you are new to *Intel® Dialogic®* products or some of the latest technology and don't want to search through the documentation to find the information you need, use the Learn About website to get an overview of our products and what is required to use them. The URL for Learn About is:

<http://resource.intel.com/telecom/support/documentation/learnabout/index.htm>

System Release Documentation

The following system release documentation is provided to support System Release Version 5.1.1 Feature Pack 1:

- *Intel® Dialogic System Release Version 5.1.1 Feature Pack 1 on PCI and cPCI for Microsoft® Windows NT/2000/XP on Intel® Architecture Release Guide (this document)* †

System Release 5.1.1 Feature Pack 1 for Windows Release Guide

- *Intel® Dialogic System Release Version 5.1.1 Feature Pack 1 on PCI and cPCI for Microsoft* Windows NT/2000/XP on Intel® Architecture Release Update (Web download only) †*
- *Intel® Dialogic System Release Version 5.1.1 Feature Pack 1 on PCI and CompactPCI for Microsoft* Windows NT/2000/XP on Intel® Architecture Installation & Configuration Guide †*

NOTE: A dagger (†) next to a document title indicates that the document has either been updated since System Release 5.1.1 for Windows or is an entirely new document.

Development Software Documentation

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

- *BRI/2 User's Guide*
- *Call Logging API Software Reference for Windows*
- *Compatibility Guide for Dialogic R4 API on DM3 Products for Linux and Windows*
- *Continuous Speech Processing API for Linux and Windows Library Reference*
- *Continuous Speech Processing API for Linux and Windows Programming Guide*
- *Continuous Speech Processing API for Linux and Windows Demo Guide*
- *Customization Tools for Installation and Configuration for Windows †*
- *Error and Status Code Guide (05-7034-001)*
- **NOTE:** This manual is available online only and can be found at <http://resource.intel.com/telecom/support/download/gammalink/links.htm>
- *D/42 Software Reference*
- *D/42 User's Guide*
- *Dialogic Audio Conferencing Programmer's Guide for Windows*
- *Digital Network Interface Software Reference for Linux and Windows*
- *Fax Software Reference for Windows*
- *GDK Version 5.0 Programming Reference Manual for Windows*
- *Global Call Analog Technology User's Guide for Linux and Windows †*
- *Global Call API for Linux and Windows Operating Systems Demo Guide †*
- *Global Call API for Linux and Windows Operating Systems Library Reference †*
- *Global Call API for Windows Operating Systems Programming Guide †*
- *Global Call E-1/T-1 CAS/R2 Technology User's Guide for Linux and Windows †*
- *Global Call IP over Embedded Stack Technology User's Guide for Linux and Windows Operating Systems †*
- *Global Call IP over Host-based Stack Technology User's Guide for Linux and Windows Operating Systems †*
- *Global Call ISDN Technology User's Guide for Linux and Windows Operating Systems †*
- *Global Call SS7 Technology User's Guide for Windows Operating Systems †*
- *IP Gateway (Global Call) Demo Guide for Linux and Windows †*
- *IP Gateway (Global Call) Object Oriented Demo Guide †*
- *IP Mail (Global Call) Demo Guide for Linux and Windows Operating Systems †*
- *IP Media Library API for Linux and Windows Operating Systems Library Reference †*
- *IP Media Library API for Linux and Windows Operating Systems Programming Guide †*
- *IP Media Gateway (IPML) Demo Guide for Linux and Windows †*
- *IPTMail_R4 Demo Guide for Windows and Linux*
- *ISDN Software Reference*
- *Learn Mode API Software Reference for Windows †*

- *MSI API for Linux and Windows Library Reference †*
- *MSI API for Linux and Windows Programming Guide †*
- *PBX Integration Software Reference †*
- *PBX Integration User's Guide*
- *Porting Applications from Host-based H.323 to SIP †*
- *Porting Applications from IPVSC to IPML †*
- *Porting Global Call H.323 Applications from Embedded Stack to Host Based Stack Application Note †*
- *SCbus Routing Guide*
- *SCbus Routing Software Reference for Windows*
- *SCX160 SCXbus Adapter's User's Guide for Windows*
- *Voice Software Reference: Features Guide for Windows*
- *Voice Software Reference: Programmer's Guide for Windows*
- *Voice Software Reference: Standard Runtime Library for Windows*

NOTE: A dagger (†) next to a document title indicates that the document has been updated since System Release 5.1.1 for Windows or is an entirely new document.

Operating Software Documentation

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

- *Dialogic Universal Hardware Diagnostics Guide*
- *DM3 Configuration File Reference †*
- *DM3 Diagnostic Utilities Reference Guide*
- *GDK Version 5.0 Installation & Configuration Guide for Windows*
- *SNMP Agent Software for Windows Operating Systems Administration Guide †*

NOTE: A dagger (†) next to a document title indicates that the document has been updated since System Release 5.1.1 for Windows or is an entirely new document.