

Build on  
**Dialogic**

**Installing Dialogic® Diva®  
Software Driver as an  
Asterisk Channel**

A Technical Overview

# Agenda

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- History
  - What is Asterisk?
  - Who is Dialogic?
- Installation and Configuration
  - Installing Dialogic® Diva® Software Driver
  - Installing Asterisk
  - Configuring Diva Software Driver for Asterisk
    - Telling Diva Software Driver to deliver inbound calls to Asterisk
  - Introduction to extended Diva Software Driver features under Asterisk
- Where to go for more info

# What is Asterisk?

# What is Asterisk?

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- Asterisk is a Free, Open Source, PBX based on Linux
  - Allows SIP and other IP calls to be switched without additional hardware
- Allows connectivity to analog and T1/E1 telephony lines via 1<sup>st</sup> and 3<sup>rd</sup> party hardware
- For basic switching and voicemail, it works with virtually no additional configuration

# What is Asterisk? -- continued

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- Answers inbound calls and plays prompts, records messages
- Voicemail implemented
- Provides framework to create customized dial plan
- Basic SIP registrar
- No (C-level) code required to implement these features

# Who is Dialogic?

# Dialogic at a Glance

- Dialogic is the most recognized name in the converged communications enabling industry and remains the market segment leader
- Founded in 1984
  - The company name changed from Eicon Networks Corporation to Dialogic Corporation in October 2006 after completing the acquisition of Intel's Media and Signaling business
  - October 2007, Dialogic completed acquisition of Cantata (Brooktrout, Excel Switching, and SnowShore Networks)
  - March 2008, Dialogic completed acquisition of OpenMediaLabs business and established Dialogic® Media Labs
  - December 2008, Dialogic acquired the NMS Communications Platforms Business
- Stable, Reliable Company
- Global experience and presence
  - Deployed in 90% of Fortune 2,000 companies via our partner communications solutions and in the vast majority of carrier networks in over 80 countries



# Dialogic® Products and Services Overview

## Software

(Signaling Software, Host Media Processing, IP Media Server, TDM/IP Gateway, System Release Software, SDK)



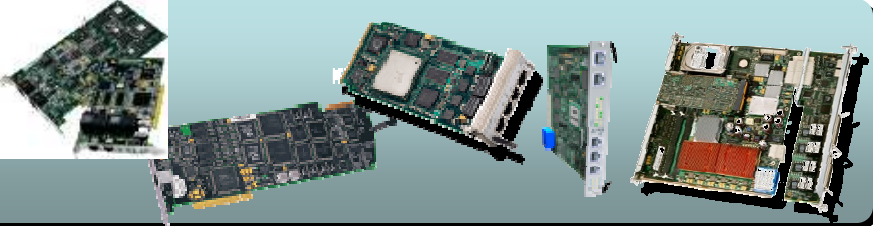
## Integrated Platforms

(Signaling Servers, Signaling Gateways, Media Servers, Media Gateways, Integrated Media and Signaling Gateways)



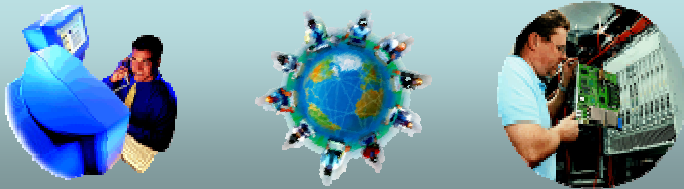
## Boards

(TDM and IP connectivity, Media Processing, Fax, PBX Integration, Line Tapping, Signaling, Video)



## Services

Flexible Dialogic® Pro™ Services, Global Reach, Free Advice and Value Added Service Level Agreements, 24X7





# Dialogic® Products Value Proposition

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## DSP Offload Resource

- Reduce Load on the CPU
- Tone Generation and Recognition
- Packetization
- Conferencing
- More Functionally Planned

# Dialogic® Products Value Proposition -- continued

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Carrier Grade Hardware

World Wide Distribution

Service and Support

International Approvals

# Chan\_DialogicDiva

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- For use with Dialogic® Diva® Products
- Can be used with Standard (free) Asterisk
  - This is an open source project maintained by melware.net
- There are some significant deployments in EMEA using Diva/Asterisk
- Links
  - [http://www.dialogic.com/s/isdn/How2UseDiva4Asterisk\\_with\\_chan\\_dialogicdiva.txt](http://www.dialogic.com/s/isdn/How2UseDiva4Asterisk_with_chan_dialogicdiva.txt)
  - [http://www.dialogic.com/products/docs/techbrief/10959\\_Diva\\_Asterisk\\_tb.pdf](http://www.dialogic.com/products/docs/techbrief/10959_Diva_Asterisk_tb.pdf)

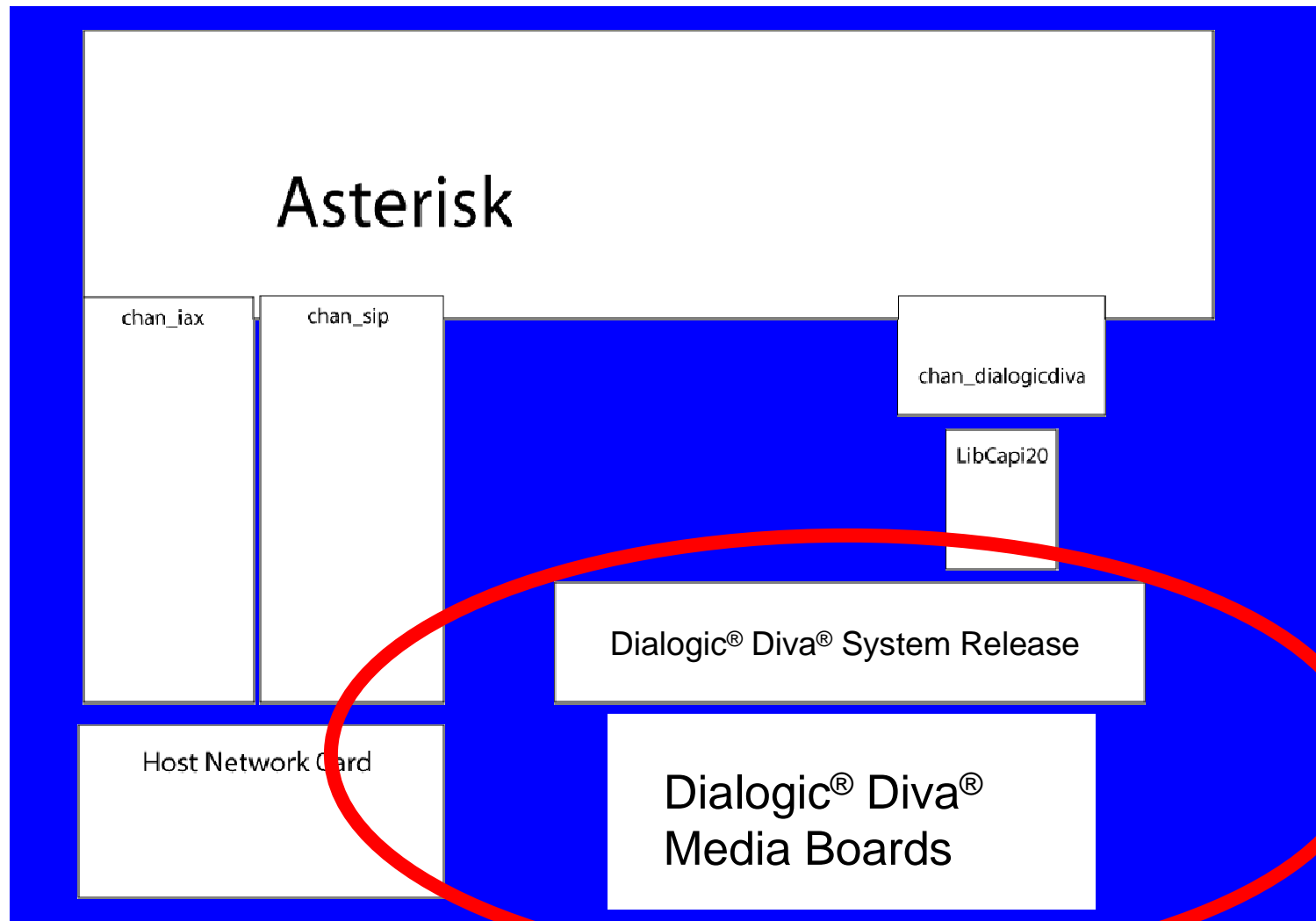
# Chan\_DialogicDiva

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- In Dialogic® Diva® System Release 9.0 for Linux
  - The chan\_dialogicdiva will be installed automatically by the build process
- Check to see if your installation includes chan\_dialogicdiva

# Installation - Dialogic® Diva® Software Driver

# Asterisk + Dialogic® Diva® Product Architecture Diagram



# Obtaining the Dialogic® Diva® Software Drivers

# Obtaining the Dialogic® Diva® Software Drivers

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- [Dialogic® Diva® System Release 9.0 for Linux download page](#)
- 2 Items available for download
  - Diva4Linux\_installer\_9.0-108-38.bin
    - This is the Dialogic® Diva® Software Development Kit (SDK)
    - This may include chan\_dialogicdiva-1.1.2.tar.gz
      - This file is only required if using Software Driver and Dialogic® Diva® Media Boards as an Asterisk channel
  - A text document describing the installation
    - This presentation is based on that document
- You will have to provide contact information on the website to download the drivers



# Preparing the System

# Preparing the System

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- The Dialogic® Diva® Software Drivers are compatible with most current Linux distributions
  - The source is distributed and is compiled at installation time to work with your running kernel
- You must have kernel sources in /usr/src/linux
- And that kernel source in /usr/src/linux must match the running Linux kernel

# Preparing the System -- continued

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- Kernel versions
  - Compare version returned from:
    - `uname -r`
  - To the folder linked by `/usr/src/linux`
- The kernel source and running kernel **MUST MATCH!**

# Preparing the System -- continued

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- There are pre-requisite packages that must be present to complete the installation
  - These packages should be installed by your distribution's package manager, if available
    - Otherwise, you can get them and compile them from source
      - Modutils (module-init-tools)
      - Ncurses (ncurses-devel or libncurses)
      - C, c++ compiler (gcc)
      - zlib, zlib-devel (zlib, zlib-devel)
      - jpeg-devel, png-devel
      - xinetd (required for web configuration interface)

# Preparing the System -- continued

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- Pre-requisite packages (cont)
  - You can use the commands
    - `rpm -qa | grep <pkg_name>`  
OR
    - `dpkg -l <name*>`
- To list installed packages in order to verify pre-requisites
  - Install missing packages with
    - `yum install <pkg_name>`  
OR
    - `apt-get install <pkg_name>`

# Preparing the System -- continued

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- CAUTION
  - Additional steps are required on systems that are built for cross-compiling
- Please see the file [How2UseDiva4Asterisk\\_with\\_chan\\_dialogicdiva.txt](#) for additional configuration steps when cross-compiling

# Running the Dialogic® Diva® Software Driver Installer

# Dialogic® Diva® Software Driver

## Running the Installer

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- Easiest step is running the installer
- Ensure you are root or have full “root” privileges
  - Insufficient access rights can cause failures
- SELinux or other 2<sup>nd</sup> level access can restrict rights as well



# Dialogic® Diva® Software Driver

## Running the Installer -- continued

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- To run as root:
  - Try:
    - su –
    - OR
    - sudo –i
  
  - To get a “#” or root prompt before executing:
  
  - ./Diva4Linux\_installer\_9.0-108-38.bin

# Dialogic® Diva® Software Driver

## Running the Installer -- continued

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- You may need to set file permissions to executable
  - Most distributions support
    - `chmod 755 Diva4Linux_installer_9.0-108-38.bin`
    - OR
    - `chmod u+x Diva4Linux_installer_9.0-108-38.bin`

# Dialogic® Diva® Software Driver

## Running the Installer -- continued

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- While the installer is running:
  1. You will have to agree to the license agreement
  2. It will ask you if it can uninstall previous versions
  3. It will install files
  
- There are 2 more steps
  - Build the drivers
  - Configure/Start the drivers

# Dialogic® Diva® Software Driver

## Running the Installer -- continued

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- Steps after the installer
  - Build the drivers
  - Configure the software
  - Enable the Web configuration tool (optional)

# Dialogic® Diva® Software Driver

## Running the Installer -- continued

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- Build the drivers
  - Change to the /usr/lib/opendiva/divas/src directory
  - As root, run “./Build”
- Build options:
  - -mrproper forces clean rebuild
  - -rpm selects build of binary rpm
  - -deb selects build of binary deb file
  - -detect-kernel-features
  - -nowait
  - -noinstall
  - -target , allows you to specify different target directory
  - -pci –nopci –usb –no-usb and –no-optimized-capi

# Dialogic® Diva® Software Driver

## Running the Installer -- continued

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- Build the drivers
  - This should result in many “PROCESSING:” lines

Ending in...

- “SUCCESS. You can configure and start your Diva adapter now”
- TIPS:
  - This will succeed even if your kernel sources don't match your running kernel. But starting the services will fail.
  - A file, divas.log will be created in the build directory
    - Use this file to troubleshoot errors or failures



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# Configuring the Dialogic® Diva® Software Drivers

# Configuring the Dialogic® Diva® Software Drivers

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- Can be done via
  - Config script
    - In /usr/lib/opensdiva/divas/
  - OR
  - Via Web-page based configuration
  
- Web is more familiar



# Configuring the Dialogic® Diva® Software Drivers -- continued

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- Using the web interface
- Change the login password in:
  - /usr/lib/opensdiva/divas/httpd/login/login
  - Simple passwords will be ignored
    - Use 7 characters and a number or a symbol
- Finally, open your browser and point to:
  - <http://localhost:10005>

# Configuring the Dialogic® Diva® Software Drivers -- continued

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- Using the web interface – potential issues
  - xinetd must be installed and running
  - Firewalls can also block access to web configuration

# Configuring the Dialogic® Diva® Software Drivers -- continued

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- Under “System Configuration”
  - Choose “DIVA API/CAPI 2.0 interface”
- You may want to enable CallerID under “Board Configuration”

# Configuring the Dialogic® Diva® Software Drivers -- continued

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- Under “System/System control”
  - Start/stop the drivers
    - Startup logs loaded right into the web page

# Installation – Asterisk

# Asterisk Installation

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- First, get the package from <http://www.asterisk.org>
  - Most current 1.4.x release (as of May 2009) is 1.4.24.1 at:
    - <http://www.digium.com/elqNow/elqRedir.htm?ref=http://downloads.digium.com/pub/asterisk/releases/asterisk-1.4.24.1.tar.gz>
- Unzip and Untar the archive
- Then compile:
  - ./configure
  - make
  - make install
  - make samples

# Asterisk Installation -- continued

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- The package is not added into the “automatic” startup scripts by default
  - Example scripts for various distributions are provided in the “contrib” directory
- Start Asterisk on the command line:
  - `asterisk -vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvc`
  - The v’s are for verbose operation
  - The trailing ‘c’ is to enable “Console mode”

# Asterisk Installation -- continued

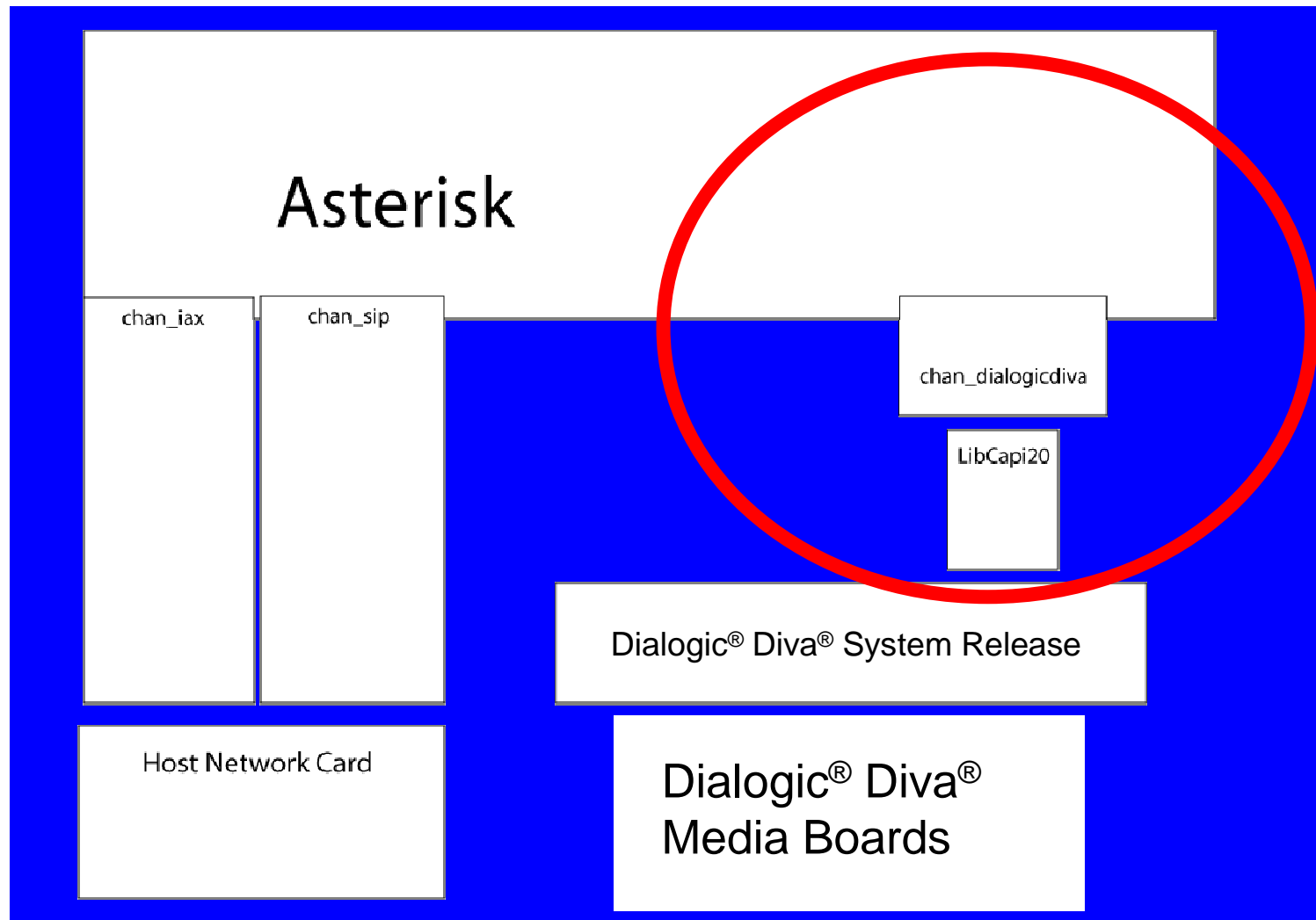
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- Ensure your Operating System's firewall is set to allow access to your SIP signaling and RTP IP/UDP ports
- SELinux can be used but often disabled
  - Especially when doing custom AGI scripting



# Configuring the Dialogic® Diva® Channel Drivers

# Overview of Asterisk + Dialogic® Diva® Product Architecture



# Configuring the Dialogic® Diva® Channel Drivers -- continued

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- Modify dialogicdiva.conf as appropriate
  - 2 main sections of configuration file
    - [general]
      - Driver level configurations
    - [ISDNx]
      - Adapter specific configurations

# Configuring the Dialogic® Diva® Channel Drivers -- continued

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- [general] defaults are usually appropriate
- [ISDNx]
  - isdnmode=msn
  - controller=1
  - context=isdn-in
    - Most important: set “context=” to be the name of the context in the extensions.conf file where you want inbound calls delivered

# Configuring the Dialogic® Diva® Channel Drivers -- continued

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- Integrate new channels into dialplan
  - Now modify the dial plan
    - Route inbound calls to the demo context
      - [isdn-in]
      - exten => s,1,Goto(Demo, s, 1)

# Configuring the Dialogic® Diva® Channel Drivers -- continued

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- Add `chan_dialogicdiva.so` to `module.conf`
- Modify `dialogicdiva.conf` as appropriate
- Integrate new channels into dialplan

# Configuring the Dialogic® Diva® Channel Drivers -- continued

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- Add chan\_dialogicdiva.so to module.conf
  - Edit /etc/asterisk/modules.conf
  - Add the following lines:
    - load => chan\_dialogicdiva.so
    - chan\_dialogicdiva.so=yes

# Configuring the Dialogic® Diva® Channel Drivers -- continued

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- Add `chan_dialogicdiva.so` to `module.conf`
  - Asterisk can be started



# Introduction to Dialogic® Diva® Software Driver Extended Features under Asterisk

# Dialogic® Diva® Software Driver Extended Features under Asterisk

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- In addition to being a simple network interface, Diva Software Drivers can:
  - Offload much of the media processing from the Asterisk server
    - Beneficial in terms of reliability and scalability
  - Provide media and call control features to the Asterisk developer that are currently unavailable
- Call control enhancements include
  - QSIG extensions for ISDN
  - ISDN supplemental services such as explicit call transfer, call hold and retrieve
  - Conventional SS7 and SIGTRAN (SS7 signaling over IP) using Dialogic® Distributed Signaling Interface Components

# Dialogic® Diva® Software Driver Extended Features under Asterisk

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- Media enhancements include
  - Hardware based Fax
  - Hardware-based conferencing
  - Hardware-based echo cancelation
  - Fax over IP (T.38)
  - DTMF clamping
  - Audio pitch control
  - Audio volume control via DTMF
  - Noise suppression
  - Automatic gain control
- Accessed from Asterisk dialplan using unique “dialogicdivacommands”:
  - `exten =>`  
`s,1,dialogicdivacommand(receivefax|/tmp/${UNIQUEID}|`  
`+49 6137555123|Asterisk|k)`

# Where to go for more info

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- The README.TXT that ships with the chan\_dialogicdiva software has examples of using commands specific to the Dialogic® Diva® Software Driver
- [www.asterisk.org](http://www.asterisk.org)
- [www.voip-info.org](http://www.voip-info.org)



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05/09