Technical Bulletin

# Low-cost Media Gateways for deployment with Softdial Contact Center

## October 2011

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# 1. INTRODUCTION

**The Challenge:**

Softdial Contact Center (SCC) is a functionally rich platform for contact center communications. It delivers voice media processing through a host-based media processing stack.

Host-based media processing enables infrastructure costs to be minimized as the platform can be delivered using standard servers, avoiding the need for bespoke, low production volume and therefore *expensive* telephony hardware.

In order to provide end-user solutions at minimal capital cost in a TDM trunking environment, SCC needs to be paired with low-cost media gateways to provide legacy circuit access and legacy endpoint access through PBXs delivering analog or custom digital handsets.

Sytel has validated against the major brand media gateway vendors. At the time of writing, end-user costs for a media gateway to support operations for a medium-sized call center (say 8 E1 trunks) using a major brand solution are approximately 5 times that of a low cost alternative.

These cost differences may be a fraction of total cost of ownership of a contact center platform but because they are capital costs they represent a major barrier to adoption in emerging economies.

Low cost 'home-made' gateways are usually based on the Asterisk open source IP PBX and an inexpensive ISDN telephony board however they are not easily configured and usually unsupported. Sytel has a solution to this problem, providing a fully validated and supported SIP to TDM gateway at comparable cost to 'home-made' alternatives.

# 2. SYTEL'S SOLUTION

Softdial Contact Center includes a SIP based switching and media processing component. To provide a full low cost gateway solution, the media gateway component just needs to be a passthru gateway providing simple protocol conversion.

Sytel's solution is based on the use of Sangoma E1/T1 cards in a standard server using NetBorder Express media gateway firmware from Sangoma.

This provides a standard media gateway solution with the following attributes:

- 1U form factor chassis
- 1, 2, 4 or 8 E1/T1 connections
- Easy to use web-based management
- CCS signaling only on ISDN (CAS signaling is a cost option)
- G.711 muLaw or ALaw companding
- Support for both network-end and user-end ISDN (enabling PBX interop)
- A fully supported solution.

The solution is made up of 4 components:
A standard 1U server from a reputable high volume manufacturer
A Sangoma PCI express telephony card with no echo cancellation / CAS signaling support
A host operating system (Windows 7 Professional)
Sangoma NetBorder Express IP software

This is not dissimilar to a typical Asterisk-based media gateway configuration. The reason for using Windows/NetBorder express rather than Linux/Asterisk is for support and ease of installation / configuration. Setting up Linux and Asterisk with the right driver set for Sangoma can be fraught with difficulty and requires skilled resource. As can be seen from the system build details in §3 & 4 below, installing NetBorder express is a simple exercise.

## 3. PARTS LIST

Note: This information is current as of 30th October 2011.

**Server**
The build information is based on use of a Dell server. Server builds for other major manufacturers will be validated on request by Sytel assuming a suitable server is supplied to Sytel for testing.

The Dell server should be to the following specification:

Dell PowerEdge R210 II
Intel Xeon E3-1230 Processor (4 cores, 8 threads)
2GB memory
250GB SATA drive
NO operating system installed

**Telephony Card & Software**
Depending on trunk capacity required the following Sangoma parts will need to be ordered:

| Number of E1/T1 spans | Telephony Card | NetBorder Express Software |
|---|---|---|
| 1 | A101E | NBE030A |
| 2 | A102E | NBE060A |
| 4 | A104E | NBE120A |
| 8 | A108E | NBE240A |

NetBorder Express version 4.1 is required.

**Operating System**

A Windows 7 Professional (x64) is required. Windows Server 2008 is an option but increases build cost for no appreciable benefit.

## 4. SYSTEM BUILD

System build instructions as follows:

- Install the Sangoma card in the server
- Install the Windows 7 operating system. There is no need to partition the disk.
- After installing Windows 7 make the following configuration changes:
  In advanced system settings / performance options / Visual Effects tab, configure visual effects for best performance
  In advanced system settings / performance options / Advanced tab, configure processor scheduling for best performance of Background Services
  In advanced system settings / performance options / Advanced tab, configure virtual memory to use a fixed-size swap file of 8GB.
- If the server is to be managed as part of a windows domain:
  Make the machine a member of the domain.
  Assign a domain user to be an administrator of the machine.
- Since you are only ever going to log on to the machine as an administrator you should disable User Account Control (UAC).
- Configure the Ethernet controller on the server to have a static IP address.
- Install the Sangoma NetBorder Express software. This will result in the Sangoma card becoming discoverable and the correct drivers will be installed.

After NetBorder Express is installed, you will be presented with the web based Gateway Manager interface. The Quick Setup Wizard will help you setup a new system configuration. Follow the instructions below to configure the card:

Step 1: Hardware configuration. Select your Sangoma board and make sure only one interface is selected.
Step 2: choose your country.
Step 3: PSTN digital configuration.
For Euro-ISDN choose interface type E1, signaling type CCS (PRI ISDN), framing CRC4, encoding HDB3 and ISDN switch variant NET5.
For North American ISDN the interface type will be T1, signaling type CCS. For framing, encoding and switch variants please contact your service provider.
Step 4: SIP configuration. Define on which ports NetBorder Express will listen for UDP and TCP connections. The default are 5066. Choose primary listening IP address as your static IP address.
Step 5: Call routing configuration. SIP transport UDP. Primary SIP server address will be the address of one of your STG servers on port 5060.
Step 6: Services configuration. Select automatic start and restart on failure.

Finally: After the wizard finishes do not start/restart the gateway. Select the Configuration tab, select the PSTN Config tab and tune your card configuration. These settings should be familiar to anyone with a little experience in ISDN telephony.

# 5. TOPOLOGIES

**Normal Use**

The normal use of a media gateway is to work as an access gateway enabling outgoing SIP calls to be mediated to E1/T1 for access to the PSTN, and enabling incoming PSTN calls to be converted to incoming SIP calls.

Normally, contact center agent endpoints will be SIP devices (either hard phones or softphones). SCC can interoperate directly with SIP endpoints or interwork with a SIP server for endpoint registration.

**Legacy Endpoints**

If contact center agents use legacy telephony devices and the customer topology is such that migrating to use SIP agent endpoints is impractical, the media gateway can also be used to mediate SIP calls to non-SIP telephony endpoints.

The non-SIP telephony endpoint will be an analog handset or a digital handset that works with a particular manufacturers PBX. In this case the media gateway will be used to trunk in to the PBX so that SCC can reach the agent endpoint via a DDI on the PBX. In order to achieve this, the E1/T1 trunk(s) on the Sangoma card that connect to the legacy PBX must be configured to use the network end variant of the ISDN protocol.

**Circuit access via tie trunk**

If PSTN trunks are wired to a PBX or premise-based telecom switch and those trunks are 'shared use' between the contact center and the rest of the organization, it may be necessary to trunk into the PBX in order to gain access to the PSTN. In this case the same technique is used as for legacy endpoints.

**Notes:**

1) Sangoma offer telephony cards that support Analog telephone devices. Sytel has not validated these and has no current plans to do so. This will not limit adoption by customers who have an analog infrastructure, but it would mean that any expansion of that infrastructure would need to be made using SIP devices.
2) It is possible to have a single card handle both network end and user end ISDN connections.