Sangoma Gateways:
Extend the life of your Legacy PBX while benefiting from SIP Trunks

May 21, 2013
Attendee Dashboard

- Type and submit your questions in the Questions Pane
  - Located on the right hand side of your screen

**Control Panel**
- Click plus [+] icon to expand menus
- Click minus [-] icon to collapse menus

**Questions Panel**
- Type and submit your questions in the Questions Pane
  - Located on the right hand side of your screen
Inside this Deck

• About Sangoma
• Integration at the Edge: the benefit of using gateways
• Extending the Life of your Legacy PBX
• Product Line Highlights
• The SNAP TOOL
• Advanced Features and Management Tools
• Portfolio of Gateways
• Review and Questions
About Sangoma

• Industry pioneer with over 25 years of experience is communications hardware and software
• Publicly traded company since 2000
  – TSXV: STC
• One of the most financially healthy companies in our industry
  – Growing, Profitable, Cash on the Balance Sheet, No Debt
• Mid-market sized firm with just under 100 staff in all global territories
  – Offices in Canada (Toronto), US (NJ), EU (UK & Holland), APAC (India), CALA (Miami)
• World Wide Customer base
  – Selling direct to Carriers and OEMs
  – Selling to the Enterprise through a network of distribution partners
Broad Line of Great Products

- Voice Telephony Boards
  - Analog/digital/hybrid, WAN, ADSL, etc
- Software Applications
  - NetBorder Express, Call Progress Analyzer…
- Gateways
  - NetBorder SIP to TDM
  - SS7 to SIP
- Wireless Products
- Session Border Controllers
- Microsoft Lync
- Cloud based monitoring
- Fiber connectivity (STM1)
- Transcoding (boards/appliances)
Vibrant Ecosystem of Clients & Partners

Open Source Telephony
Ready to use drivers for Sangoma boards

- Asterisk
- FreeSWITCH
- Caliweaver
- elastix
- yate
- trixbox

Contact Center
OEM Integration with major software suites

- Oracle
- Genesys
- OreCX
- inConcert

Proprietary PBX and IVR
Plug-in to major soft-PBX and IVRs

- Lync
- Barracuda
- Open Source Telephony
- Sangoma

Carriers, Cloud, Data Ntwks
Proven Infrastructure Technology

- BT
- Verizon
- Cisco
- Ericsson
- Siemens
- NOKIA
- TELUS
- MTT
- Orange
Innovation and Interoperability

Indian Army

BROADSOFT

HIPCOM

Gamma Telecom

AtoS

vanillaIP

ShoreTel

snom

VoIP phones

Asterisk

timico

natural convergence

3CX

rostrvm

CIRPACK

Microsoft Lync

FrontRange Solutions

TELECOM Italia

CISCO

TeleWare

<Gradwell>

SIEMENS

Sangoma Technologies

5/21/2013
THE BENEFIT OF USING VOIP GATEWAYS

Integration at the Edge

CONNECT WITH SANGOMA
Integration at the Edge

• Implementing innovative, cost-effective technologies at the edge of the network

• Manage Uncertainty
  – Minimize Capital Investment
  – Leverage Existing Infrastructure
  – Mitigate Service Disruption

• Still Deliver Advanced Services by connecting disparate networks
Specific Benefits of using VoIP Gateways

• Standardize interconnection points throughout the network to reduce administration and maintenance costs
• Lower cost/minute with access to SIP Providers
• Eliminate inter-office communications costs
• Increase Flexibility
  – Channel count can be changed to match business requirements, burst channels for specific campaigns
  – Adapt to existing customers requirements
  – Integrate existing infrastructure with UC
• Better ROI for the Service Provider and the End User
EXTENDING THE LIFE OF YOUR LEGACY PBX WITH SIP TRUNKING
Defining SIP Trunking

• “The use of SIP service bundled in a familiar business construct to connect a PBX or gateway to the PSTN over the Internet”
• An alternative to T1s, PRIs, and POTS lines
• Pure SIP will allow you to make and receive calls worldwide and should include:
  – E911
  – Directory Assistance
  – CNAM (Caller ID/Name)
SIP Trunking Benefits

• SIP Trunking allows companies to replace physical PSTN trunks with virtual, broadband trunks, deployed over data connections

• Can be
  – Dedicated lines or shared connections
  – Internet connections
  – Burstable

• Introduces more flexibility, more efficiency, reduces operational costs
SIP Trunking

The TDM-Based PBX can use SIP Trunks to reduce cost and improve flexibility.
Vega reroutes all calls to the PSTN if:

- SIP/WAN/Internet fails
- Power Fails to Gateway
Legacy Equipment Connectivity for IP PBXs

IP-PBX

SIP/VoIP

PSTN

Analog BRI PRI

LAN

SIP/VoIP

FXS

FXS

FXS

IP Phones

Analog endpoints

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Product Positioning

• The Most Resilient VoIP Gateway in its Class
  – SIP Trunking
  – Branch Office Survivability
  – Multi-Dwelling Unit Support
  – Legacy Connectivity for VoIP Installations

• The Easiest to Provision and Deploy Gateway in the market
  – Browser Based GUI and SNAP Tool

• Connecting legacy TMD networks and equipment to a VoIP Network.
PRODUCT HIGHLIGHTS
Product Highlights

• **Interoperability with top SIP Trunking providers**
• **Sangoma Resiliency Enablement Suite (SRES)**
  – Enhanced Network Proxy - Keeps SIP Endpoints Operational in the event that connectivity to the main switch is lost
  – Bypass - Creates physical links between devices connected to the gateway in the event that power to the gateway is lost
  – Failover - Advanced dialplan capabilities that can select a route based on real-time network conditions
• **Browser-Based GUI Interface for quick and easy provisioning**
  – Easy to use with embedded help
  – Quick Config Screen for even easier basic provisioning
• **Sangoma Network Appliance Provisioning (SNAP) Tool simplifies deployment of many similarly configured gateways**
• **Voice traffic prioritization**
• **Advanced Management Tools**
Sangoma Resilience Enablement Suite (SRES)

- **Enhanced Network Proxy** - Keeps SIP Endpoints Operational in the event that connectivity to the main switch is lost
- **Bypass** - Creates physical links between devices connected to the gateway in the event that power to the gateway is lost
- **Failover** - Advanced dialplan capabilities that can select a route based on real-time network conditions
Enhanced Network Proxy

• Top-Line Explanation
  – Keeps SIP Endpoints Operational in the event that connectivity to the main switch is lost

• Technical Explanation
  – There is a SIP Registration Proxy in the Gateway
  – SIP Devices (IP Phones) Register with the Gateway
  – On Behalf of each registered device, the Gateway registers with the upstream switch
  – If the IP Communication with upstream switch is lost, the phones stay active because they are registered to the gateway. If the phones were registered directly to the switch they would fail.
  – Phones can still call each other, make emergency calls or be rerouted by the gateway to another switch or to the PSTN
• Top-Line Explanation
  – Creates physical links between devices connected to the gateway in the event that power to the gateway is lost

• Technical Explanation
  – In the event of power-failure to the gateway, there are metallic contacts that close and “short” the pins of one port to the pins of a different port
  – This takes the gateway out of the circuit when the power is lost
  – When power is restored the relays open and the gateway resumes normal operation
Vega Provisioned for By-Pass

Hot Stand-By Gateway

Primary Gateway

E1/T1 cables

To/From Telco

E1/T1 cables
Operating in By-Pass Mode

Hot Stand-By Gateway

Primary Gateway

T1/E1 cables

Internal relay trips to connect to by-pass ports

To/From Telco
Bypass for Basic SIP Trunking

- Configured for Basic SIP Trunking
- Move calls to SIP over time
- Completely transparent

- Resilience in case of:
  - Power failure to gateway
  - Link to ITSP Fails
Bypass on a Single Gateway

Internal relays trip if power fail

Legacy PBX  ISDN  ISDN  PSTN

SIP

Back of the unit cabling layout
Failover

• Top-Line Explanation
  – Advanced dialplan capabilities that can select a route based on real-time network conditions

• Technical Explanation
  – Vega Gateway are programmable
  – If for any reason a route becomes unavailable, the gateway can automatically reroute calls to a different route
The TDM-Based PBX can use SIP Trunks to reduce cost and improve flexibility.
The Gateway automatically routes calls to the PSTN if IP Connectivity is Lost.
Failover

Switches back to the ITSP when connectivity is restored.
Configuration with Browser-Based GUI Interface

Vega 50 GW Configuration

General

LAN 1 Configuration
Interface
- Obtain IP Settings automatically Using DHCP
- IP Address: 192.168.1.208
- Subnet Mask: 255.255.255.0
- Gateway: 192.168.1.1
- Preferred DNS Server: 192.168.1.1
- Alternate DNS Server: 0.0.0.0
- NTP Time Server: 0.0.0.0

Physical
- Speed: Auto
- Duplex: Full

OnS
- TOS/Diffserv: 0
- 802.1pQ: 0

Login Password
- New Password
- Re-Enter Password
SNAP TOOL

Sangoma Network Appliance Provisioning Tool simplifies provisioning and deployment of gateways for use on Interoperability Partners’ networks

- Sangoma builds standard configuration files for an Interoperability Partner
- Through the Snap Tool, user provides installation specific info (IP Address, User_Name, Password, etc.)
- Snap Tool automatically builds a provisioning template that can be instantly uploaded to the gateway
Step One: Select a Carrier

Select a carrier

The SNAP tool enables Sangoma’s Interoperable Service Providers to quickly and easily provision Sangoma Vega Gateways. This tool can be used to provision a Sangoma Vega Gateway prior to deployment (if the gateway is being provided by the Service Provider) or it can be used at the deployment site to provision the gateway just before installation.

SNAP leads the user through a series of screens to properly identify the Service Provider and the Model of the Vega Gateway to be provisioned. The user will then be prompted to provide their network credentials or other information that are to be applied to the provisioning template.

SNAP will then generate a file that, once uploaded to the gateway, will properly provision the gateway for use on the selected service provider’s network.

Select the Carrier Network from the drop-down list below and then click SELECT. If your carrier of choice does not appear on this list, please contact b.morrison@sangoma.com for assistance.
Step Two: Select Gateway

SNAP
Sangoma Network Appliance Provisioning Tool

Select Product

Click on the name of the Vega Model from the list below that is to be configured. Once a Vega is selected, a second list showing all available configurations for that model will be displayed. Click the SELECT button next to the desired configuration to proceed.

If the required Vega Model or Configuration is not on this list, please contact bmorrison@sangoma.com for assistance.

Vega100: E1/T1 Digital Gateway
The Vega 100 VoIP gateway connects digital telephony equipment to IP networks with a single E1/T1 interface.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23chan-dhcp</td>
<td>23 channels DHCP</td>
</tr>
</tbody>
</table>

Select
Step Three: Add Specifics

SNAP
Sangoma Network Appliance Provisioning Tool

1. Select Carrier
2. Select Product
3. Provision

Virtility / Vega100: E1/T1 Digital Gateway / 23 channels DHCP

Fill In Form

Please fill in ALL FIELDS in the form below and then click SUBMIT.

23 channels DHCP

Public IP address: 123.123.123.123
SIP User Name: user@sangoma.com
Password: sangoma
SIP Proxy: 123.123.123.123

Submit

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### Step Four: Download Template

- Select Carrier
- Select Product
- Provision
- Download

#### Configuration Files


<table>
<thead>
<tr>
<th>Parameters</th>
<th>File</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public IP address</td>
<td>123.123.123.123</td>
</tr>
<tr>
<td>SIP User Name</td>
<td><a href="mailto:user@sangoma.com">user@sangoma.com</a></td>
</tr>
<tr>
<td>Password</td>
<td>sangoma</td>
</tr>
<tr>
<td>SIP Proxy</td>
<td>128.123.123.123</td>
</tr>
</tbody>
</table>

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Interoperability Partners
Voice Traffic Prioritization

- Voice traffic to ITSP over the WAN takes priority over LAN to WAN data traffic.
- When no voice calls are in progress, full bandwidth is provided to data traffic.

2 LAN interfaces option is software configurable.
Advanced Management Tools

• Selection of interfaces
  – Browser Based Interface: HTTP, HTTPS
  – Command Line Interface: Serial (RS-232), Telnet, SSH

• Built in logging functions
  – Realtime Debug
  – Syslog

• SNMP

• Automated Configuration
  – Autoexec
  – Cron
  – SIP NOTIFY
PORTFOLIO OF GATEWAYS
Vega Series: Telecom Appliances

- **Vega 50**
  - H.323 / SIP
  - Up to 8 port BRI
  - Up to 10 ports FXO/FXS combos

- **Vega 5000**
  - H.323 / SIP
  - 24 or 50 ports FXS
  - 2 FXO failover to PSTN

- **Vega 100, 200, 400**
  - 8 to 120 VoIP calls H.323 / SIP
  - Up to 4 T1/E1 (PRI, CAS)
  - Power fail hardware
  - Expandability and upgrades
    - DSP modules
    - Software license
Features – All Gateways

- Enhanced Network Proxy
- VoIP Protocols
  - SIP or H.323
  - TLS / SRTP for security
- Dual LAN + Console Port
- Management
  - Web GUI
  - CLI
  - RADIUS
  - SNMP
  - Syslog
  - Billing logs
- Powerful call routing capabilities
- Remote Firmware Upgrade
- Vocoding
  - G.711, G.729, G.723 G.726
- G.168 Echo Cancellation
- T.38 Fax relay
- Non Concentrating
VEGA X00 SERIES
Vega 100 – 30 Calls (1 E1/T1)

- Fixed PSTN Combination
  - 1 E1/T1 main ports
  - 1 E1/T1 failover relay ports
- VoIP Density
  - 30 calls

- Internal Power Supply
- Desktop or 19” rack mount
- Dimensions
  - 1U
  - 17.2” x 1.7” x 10.8”
Vega 200 – 60 Calls (2 E1/T1)

- Fixed PSTN Combination
  - 2 E1/T1 main ports
  - 2 E1/T1 failover relay ports
- VoIP Density
  - 60 calls

- Internal Power Supply
- Desktop or 19” rack mount
- Dimensions
  - 1U
  - 17.2” x 1.7” x 10.8”
Vega 400 – 8 to 120 Calls (4 T1/E1)

• Fixed PSTN Combination
  – 4 T1/E1 main ports
  – 4 T1/E1 failover relay ports
  – All 4 ports always active

• VoIP Density
  – 8 to 120 calls

• DSP Modules for upgrades
• Internal Power Supply
• Desktop or 19” rack mount
• Dimensions
  – 1U
  – 17.2” x 1.7” x 10.8”
Vega 400 – DSP Modules

- Base Vega 400 comes with enough DSP capacity for up to 30 calls
- Over 30, more DSPs are required to support density
- Adding DSP is very straightforward
  - Insert expansion modules in rear-accessible PCMCIA slots
- 2 types of modules are available:
  - 1 DSP module
  - 3 DSP module

- Provisioning:
  - 8-30 calls: No module
  - 31-60 calls: 1 x 1 DSP module
  - 61-90 calls: 2 x 1 DSP modules
  - 91-120 calls: 1 x 3 DSP module
Vega X00 Series

- E1 Protocols
  - Euro-ISDN
  - ISO QSIG
  - VN4
  - QSIG Feature Transparency (H.323)
  - CAS R2MFC
  - Private Wire

- T1 Protocols
  - NI1/NI2
  - AT&T 5ESS
  - DMS100
  - ISO QSIG
  - Private Wires
  - QSIG Feature Transparency (H.323)
  - CAS (RBS)
    - E&M wink start
    - Loop start
    - Ground start

- 4 PRI / CAS trunks (always on!)
- NT / TE configurable
  - Including pin switching
- Fractional E1/T1 support
- MFCR2
VEGA 5000
HIGH DENSITY FXS GATEWAY
Vega 5000 – High Density FXS Gateway

- Port Combinations
  - 24 FXS + 2 FXO
  - 50 FXS + 2 FXO
  - Fully functional FXO ports
  - FXO failover

- FXS Capabilities
  - 8km loop length support
    - Best in Industry
  - Secondary protection included
  - 80Vrms ringing

- Internal Power Supply
- Dimensions (rack mountable)
  - 17.2” x 1.7” x 10.8”
Vega 50 – Low Density Gateway

- **FXS**
  - 4 FXS + 2 FXO
  - 8 FXS + 2 FXO
  - Fully functional FXO ports
  - FXO failover

- **FXO**
  - 4 FXO
  - 8 FXO

- **BRI**
  - 2 BRI
  - 4 BRI
  - 8 BRI
  - NT, TE Support
  - Phantom power
  - Pin switching

- **External Power Supply**
- **Dimensions (rack mountable)**
  - 11.8” x 1.75” x 9.33”
ALL GATEWAYS
All Cables and Mounting Hardware Included

• All gateways
  – Rack mount kit
  – Quick start guide
  – License agreement
  – Power cord (country specific)
  – Ethernet cable
• Vega 400 & 5000
  – Console cable
• Vega 400
  – 4 x E1T1 cables
• Vega 50
  – External power brick
Documentation


- Frequently updated wiki
  - HTML/pdf based documentation

- Includes:
  - Admin guide
  - Step-by-step configuration
  - Technical documents
  - Firmware
  - Vega Tools
    - How to Guides
Product Highlights - Review

• **Sangoma Resiliency Enablement Suite (SRES)**
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• **Browser-Based GUI Interface for quick and easy provisioning**
  – Quick Config Screen for even easier basic provisioning

• **Sangoma Network Appliance Provisioning (SNAP) Tool** simplifies deployment of many similarly configured gateways

• **Voice traffic prioritization**

• **Interoperability with a growing list of SIP Trunking providers**

• **Advanced Management Tools**
The Sangoma Vega Advantage

• Focus on Ease of Installation and Operation
• Proven High Reliability
• 25+ years of industry experience
• Available Professional Support
• Dedicated to Highest Quality Products at Reasonable Price Points
QUESTIONS
For More Info

• Guide to Vega Gateways
  http://wiki.sangoma.com/vega

• For future training, visit
  http://sangoma.com/resources/training
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