WHITE PAPER

Improving the Efficiency of the Proactive Contact Center

SANGOMA

Contents

EXECUTIVE SUMMARY 3
WHAT IS THE PROACTIVE CONTACT CENTER? 4
WHAT IS CALL PROGRESS ANALYSIS? 5
TRADITIONAL METHODS 7
A DIFFERENT APPROACH TO CPA 8
INTEGRATION IN THE IP CONTACT CENTER 10
CONCLUSION 13

Executive Summary

Over the last few years, contact centers have evolved from being cost centers within corporations to playing a central part in customer relationship strategies. Yet, most contact center operation investments are targeted at handling inbound traffic in a reactive fashion. It is now crucial for corporations to incorporate proactive strategies in their contact centers in order to actively reach their customer base and prospects, and improve customer satisfaction and retention as well as the overall performance of the resources at hand. To properly execute proactive dialing campaigns and strategies, contact centers must combine and optimize a number of key technologies; one of which is Call Progress Analysis (CPA). This paper explores some of the ways that Sangoma NetBorder adds value to the proactive contact center by improving Call Progress Analysis (CPA) technology and making its integration very simple.

What is the Proactive Contact Center?

Call Center operations have become central to customer satisfaction strategies. They are no longer seen as costs centers. Yet, most contact center investments are built around inbound traffic: other than human resources, Automatic Call Distribution (ACD) and Interactive Voice Response (IVR) create the bulk of contact center investments. Inbound traffic is also reactive to customers. The customers initiate the call to you and your center simply tries to address it properly and efficient, in a reactive fashion. While it is important to address the inbound traffic – after all, the customer may be calling to buy a product or a service from you – proactive contact centers try to build from existing investment by reaching out proactively to customers via voice, e-mail or text messages (SMS), either during slow inbound traffic periods or at specific times dictated by business requirements. Proactive contact centers create and execute outbound dialing campaigns for proactive contact, telemarketing, debt collections, user callback and other customer communications, as such improving productivity with a better use of resources and an increase in customer satisfaction.

What is Call Progress Analysis?

OUTBOUND DIALING INVOLVES THE FOLLOWING STEPS:

1. **Reaching Out To Customers**
   This is done with an automated dialer. This is typically a server that has been pre-configured to make calls automatically to a list of customers, as per campaign scripts.

2. **Performing Call Progress Analysis (CPA)**
   As the call is being established, a CPA engine “listens on the line” and will determine “who” is answering the call. Is it a human? Is it a voice mail greeting? Is it a busy tone? Is it a telephone company operator (i.e. If the number is de-listed)? While this is an easy process for the human ear, for a machine to perform this task accurately is extremely complex.

3. **Applying Treatment to Calls, Based on CPA Results**
   For example, when the CPA detects that the call was answered by a human; the call needs to transfer to an available agent. Or, when the CPA determines that the call was answered by voice mail, the treatment plays a pre-recorded message – after the beep, not an easy task for a machine – to inform the customer that you have called, or to try another contact number.

Out of these operations, two very important factors emerge in the success and efficiency of outbound dialing operations:

1. **CPA Accuracy**
   If the CPA engine determines that a call is answered by a human while it is in fact voice-mail greeting, the agent receiving the call will spend an amount of time handling the call before he or she becomes available to answer another call. While this may be under a minute or so, it becomes a considerable loss of productivity when accumulated over time and in large volume call centers, especially if you consider that less than 30% of outbound call attempts actually reach a live person. This loss of productivity is compounded even further by a loss of sales opportunity when dealing with the sales of products and services.

2. **Time to Transfer to Next Available Agent**
   When it takes too much time connecting to the agents, there is an increased risk of not being able to deliver the service at all, whether the CPA engine is accurate or not. Customers may hang-up on the call (the infamous “dead air”) or the contact center operator may be faced with stiff penalties for non-compliance of nuisance calls regulations (in most countries, this typically needs to be under 2 seconds from the time there is a live answer). Note that these elements are not mutually exclusive. For example, a contact center operation may “tune” the CPA for faster detection but may have a negative impact on overall productivity because of an increased error rate of the CPA. Conversely, if the CPA is tuned for better accuracy, it may take too much time before an agent can take the call, which can result in the customer dropping the line.

To understand how critical these elements are, Figure 1 below shows various call volume scenarios. The table illustrates the EXTRA savings when moving from a CPA technology that provides 90% accuracy versus a technology that provides 95% accuracy, given a fixed agent connection time. As one can see, the benefits of a 5% accuracy gain in CPA have a dramatic impact on the cost model.

90% vs. 95% CPA accuracy[1]	
Daily Call Volumes	**Annual Savings**
5,000	$ 52,000
75,000	$ 780,000
120,000	$ 1,248,000

Figure 1: Annual Savings with 5% Increased CPA Accuracy

[1]Assumptions:

Live Answers:	30%	Cost per hour per agent:	$10
Voicemail:	60%	Average Sale:	$100
Busy, no answer, SIT:	10%	Average Conversion rate:	10%

Traditional Methods

Automating CPA is a very complex problem to resolve accurately. Traditional methods for performing Call Progress Analysis (CPA) involved a set of heuristics (rules of thumb), mainly implemented on specialized hardware running on digital signal processors (DSPs). The optimization of the performance of heuristics often resembles “black art” to determine, as best as one can, the outcome of an outbound call attempt. This “black art” approach causes a number of issues:

- **Poor “Out-of-the-Box” Accuracy**
  Limitations in the set of heuristics used make the out-of-the-box accuracy of the method are very poor. As discussed, a poor accuracy figure will have a strong negative impact on the (ROI) application.
- **Poor Adaptation to Varying Network Conditions**
  Since decisions are taken by comparing the observed call data with sets of pre-determined energy and duration thresholds, the technology is not robust enough to varying network conditions, volume variations and geographies. For instance, legacy technologies respond poorly in conditions where a lot of call targets are wireless users. The noise conditions, varying ringback patterns and other environmental conditions greatly impact the heuristics.
- **Long Response Time**
  These causes problems from a regulatory perspective, as well as from a perspective of lost opportunities.
- **Complex Optimization**
  Tuning the parameters for a specific deployment requires time, effort and a bit of luck. Often, changing parameters slightly will help in certain conditions, but degrade the system performance on others. Furthermore, tuning at one site does not help improve the systems performance in other conditions. However, with traditional technologies, the tuning process resembles “black magic”. One modification to one parameter may improve certain use cases while degrading others. Both the tuning process itself and the analysis of its impacts are extremely hazardous.
- **Fixed Set of Operations**
  Once one has selected the optimal set of parameters for a deployment, then a single point of operation is achieved in the Accuracy versus Response Time graph. No matter the operating conditions of the contact center at one particular moment, or the particular type of campaign, application or specific customer one is trying to reach, the operating point will be the same.

TECHNOLOGIES FOR CALL PROGRESS ANALYSIS

A Different Approach to CPA

Sangoma Technologies proposes a different approach to call progress analysis. Instead of heuristics, we propose the use of statistical models based on Neural Networks to represent the potential outcome of an outbound call attempt. The result is a virtual machine that "learns" the behaviors that represent the different conditions representing call progress events. This method provides CPA results with far superior accuracy and flexibility compared to traditional approaches:

☑ **Improved Accuracy and Response Time**
Benchmarks have shown that the statistical approach reduces error rates by 50%, compared to leading traditional products while reducing the call transfer timing by 40%.

☑ **More Resilience Against Various Network Conditions**
This approach provides superior robustness against volume variations, background noises and other network conditions. This is highly important because applications are being now deployed in more heterogeneous conditions than ever before. Also, since contact centers are starting to use automated dialing for a much different set of applications (callback, automated notification proactive campaigns), as opposed to a single application, the CPA platform must allow for per–call optimization of the calling parameters.

☑ **Streamlined Tuning Process**
The statistical approach helps streamline the tuning process. Data can be gathered from a deployment and used to re-train the statistical models. Tuning data from all sites helps to improve the baseline performance over time.

☑ **Simple Optimization and Tuning**
The process of tuning CPA parameters for a given deployment adds significant value, as it ensures that CPA will provide the best possible operating points, given the specific deployment conditions. The statistical approach takes the guesswork out of the equation. The tuning process consists of gathering data from the field and using this data to further train the statistical model of CPA. This ensures a smooth and predictable outcome. Furthermore, as more and more tuning is performed at different sites, the field data collected will also serve to improve the performance of the base models.

☑ Dynamic Operations

One of the major difficulties of call progress analysis is to set the trade-offs between response times versus CPA accuracy. The more time that is allocated to the CPA algorithms, the more accurate (on average) the results will be. Of course, if the response time is too slow, the person called might hang-up, or the system could violate regulations. The statistical approach provides an alternative model (see Figure 2). It is possible for the automated dialing application to select the particular operation point on a per call basis. This means that the accuracy versus response time trade-off is locally optimized to provide the best possible results, given the specific applications, campaign, customers or any other dynamic condition currently observed in the contact center.

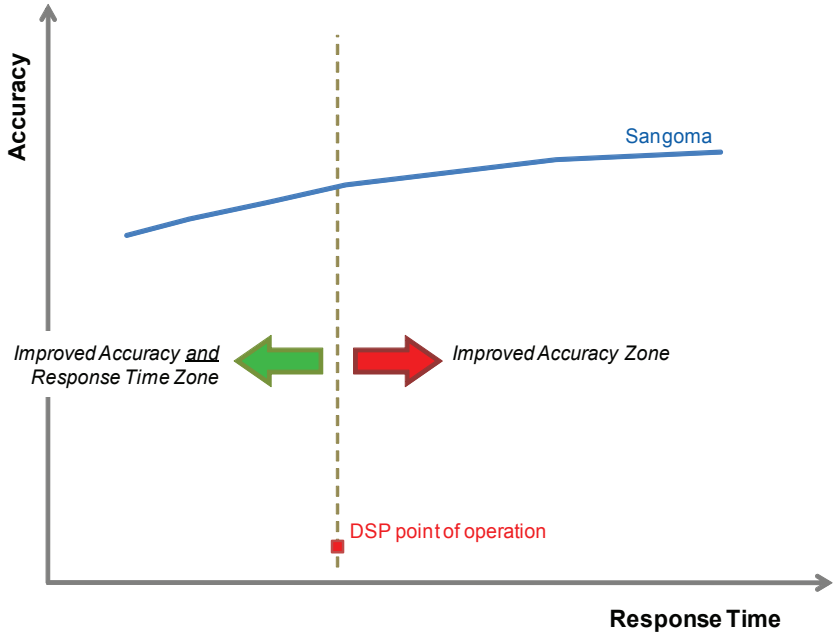

Figure 2: Dynamic Call Progress Analysis Performance

Integration in the IP Contact Center

In the past, technology components such as CPA have required complex integrations, often requiring special hardware, operating systems and the integration of custom APIs. Now that Enterprise and Contact Center communications are rapidly embracing the power of VoIP and SIP, it becomes much easier to introduce the technology within multi-vendor architectures. Sangoma proposes a unique approach and architecture based on software platforms and SIP. Let's look at IP outbound dialing from an implementation point-of view.

A typical IP contact center is shown in Figure 3 below. On the left side of the diagram are the network interconnections of the contact center. This can be delivered over traditional interfaces (T1/E1) or via SIP Trunking, which is becoming a popular option. For the delivery of SIP services, the SIP trunk can interconnect directly on the customer LAN/WAN. As for TDM traffic, VoIP gateways can be used to convert to SIP/RTP.

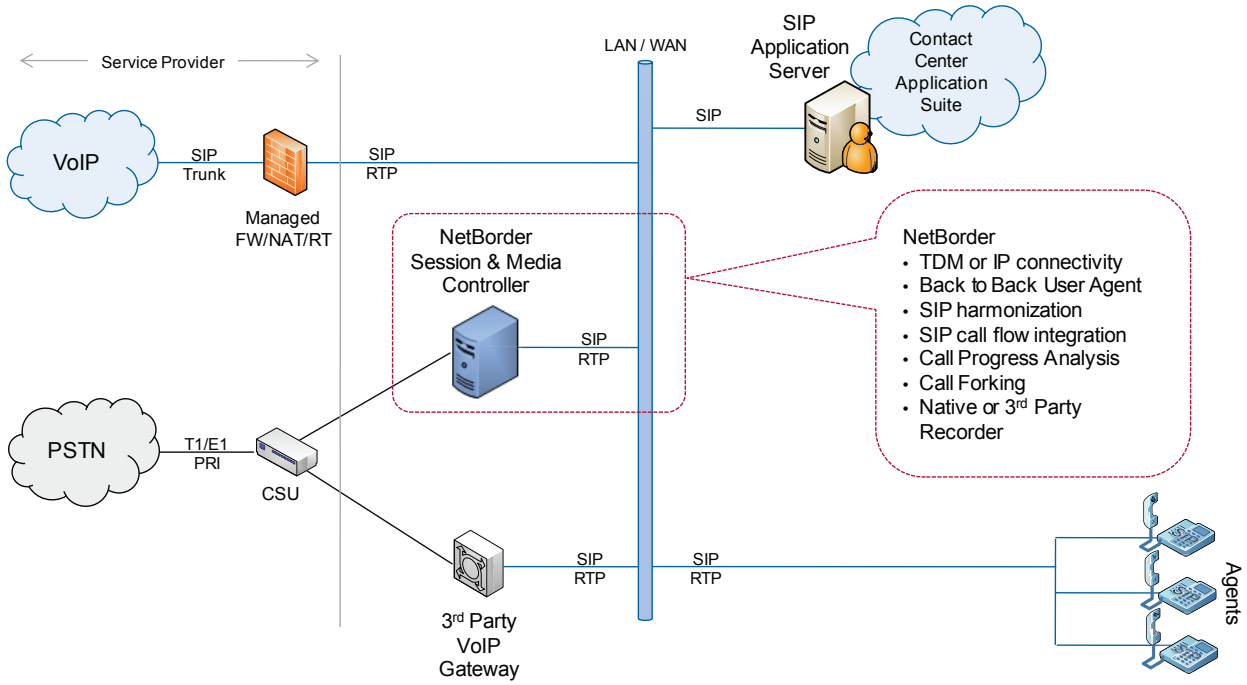

Figure 3: Typical IP Contact Center Architecture

The right side of Figure 3 are the various users and applications:

- Application server(s) delivering a complete suite of contact center applications (ACD, Dialer, IVR, etc.)
- SIP agents, registered (as part of the SIP protocol) to the Application Server. Note that with VoIP, these agents can be located just about anywhere.
- NetBorder Suite (shown inside the dotted line), provides the necessary session and media control mediation to deliver the complex call control required in contact center applications.

Let's now take a look at how these elements interact in an outbound dialing scenario, more specifically, the SIP trunking delivery. Note that the scenario with T1 trunking and VoIP gateways would be the same; making NetBorder very agile to deploy in mixed or hybrid environments (See Figure 4 below).

1. Agents register (using SIP REGISTER) to notify the SIP Application Server of availibility to receive calls.
2. Predictive Dialer initiates the outbound call – via SIP Application Server.
3. NetBorder receives the request and redirects (with its back-to-back user agent – or B2BUA) the outbound call towards the VoIP provider network. Note that as soon as media flows (also known as "early media" in SIP lingo), NetBorder CPA engine starts processing call information.
4. NetBorder passes CPA results to the SIP Application Server. The SIP Application Server looks for the next available agent (CPA result = Human).
5. SIP Server invites the selected agent.
6. After proper acknowledgements, NetBorder re-invites the VoIP provider's network to point the session towards the selected agent.
7. Media flows between the agent and customer. Throughout the call, NetBorder stays in line with the SIP call control path, but gets out of the loop on the audio stream as soon as the call progress is completed.

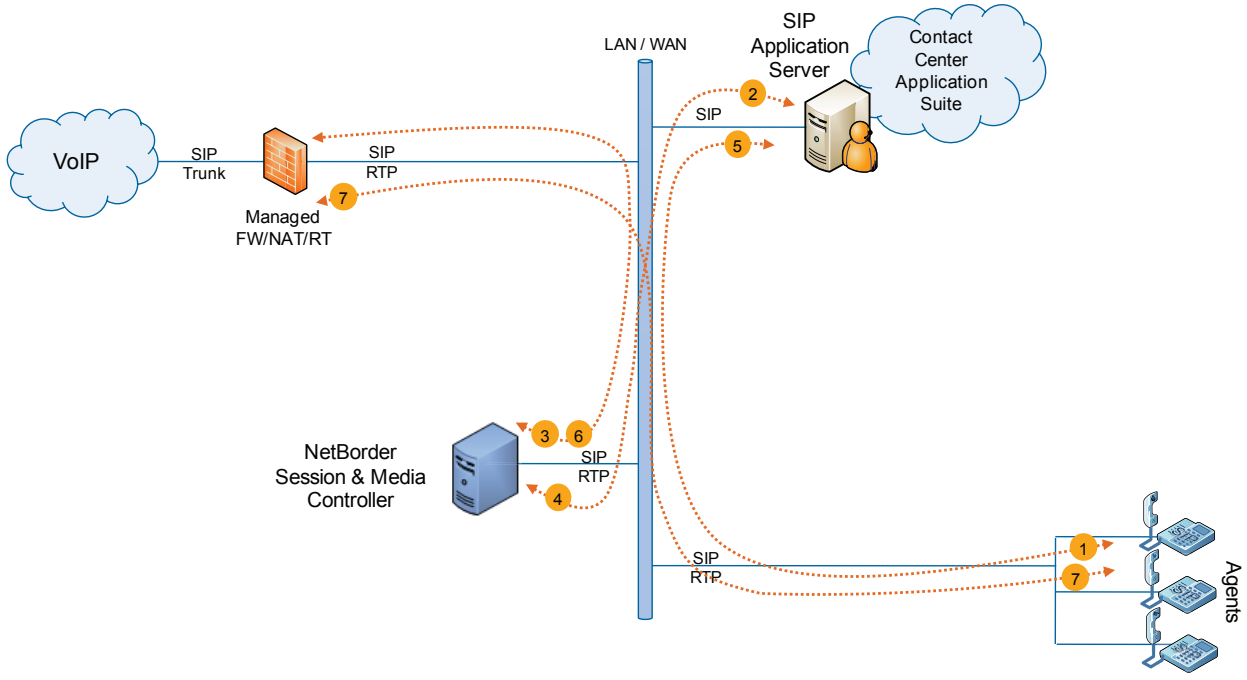

Figure 4: SIP Call Flow in Outbound Dialing

Another way to represent the same interaction is with a call flow diagram (see Figure 5 below).

While this diagram shows the same basic interactions between the end-points as the previous page, it also provides a sense of time and duration between the events happening between the various entities.

As such, the two areas labelled, “Call Progress Analysis Period” and the “Agent Selection Period” should be as short as possible – while maintaining proper accuracy – as to meet regulations, and to avoid the dreaded dead-air scenario, where customers simply hang-up before it is possible to render the service.

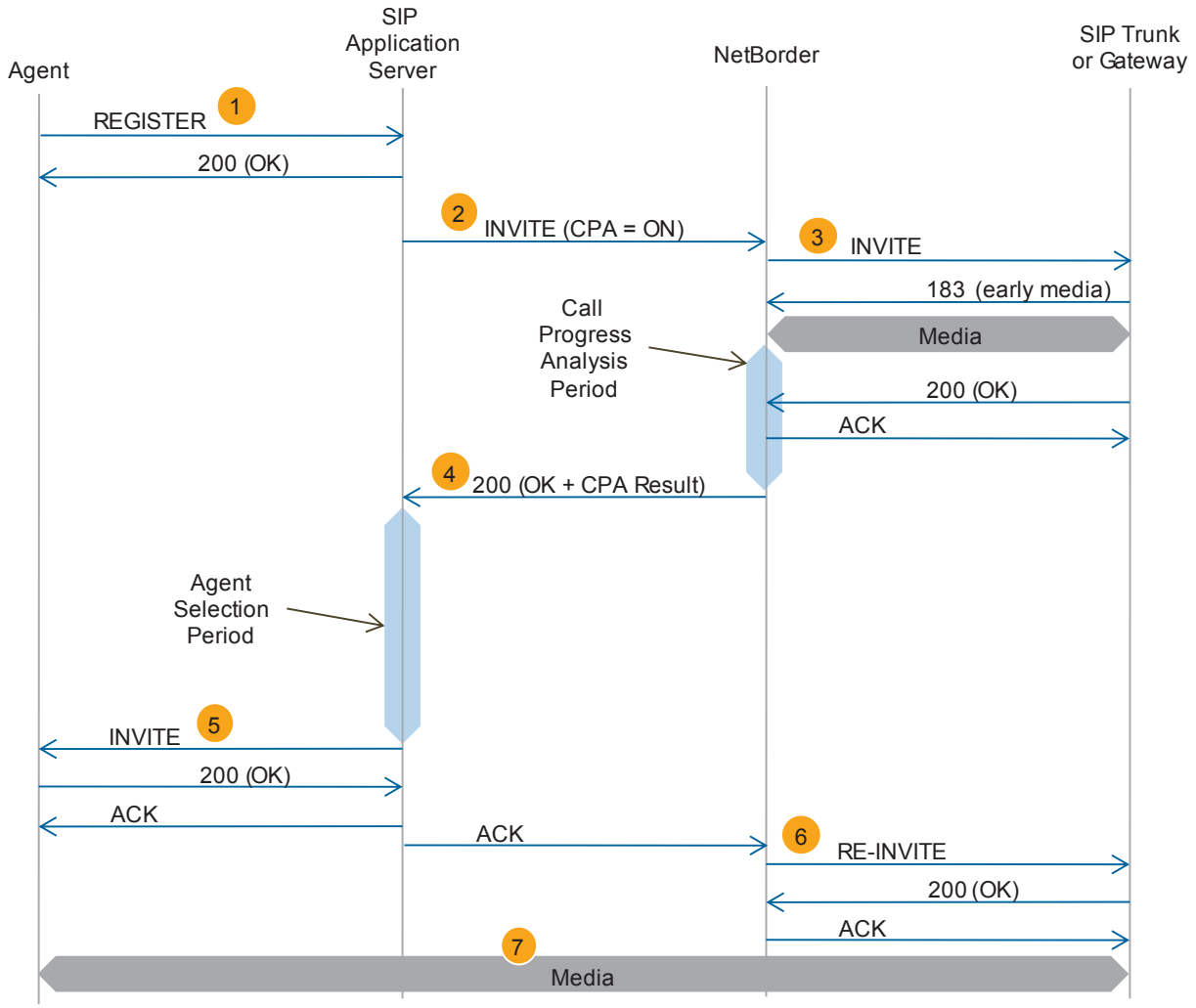

Figure 5: SIP Call Flow Diagram in Outbound Dialing

Conclusion

It is crucial for corporations to incorporate proactive strategies in their contact centers in order to actively reach their customer base and prospects, thus improving customer satisfaction and retention as well as the overall performance of the resources at hand.

To properly execute proactive dialing campaigns and strategies, contact centers must combine and optimize multiple key technologies, one of which is Call Progress Analysis (CPA). Traditional methods are based on heuristics (rules of thumb) that deliver limited performance, difficult optimization process and long response time. A new approach, based on statistical models and SIP-based integration delivers many improvements:

- **Improved Accuracy**
- **Improved Response Time**
- **More Resilience Against Varying Network Conditions**
- **Streamline Optimization (Tuning) Process**
- **Faster Integration Using SIP Interworking**
  – Without Custom APIs and Hardware

About Sangoma

Sangoma is the premium provider of voice and data connectivity components for software-based communication applications. Sangoma's data cards, voice cards, gateways and connectivity software are used in leading PBX, IVR, Contact Center and data communication applications worldwide. The product line represents a comprehensive toolset for deploying cost-effective, powerful, and flexible software communication applications.

Founded in 1984, Sangoma Technologies Corporation is publicly traded on the TSX Venture Exchange (TSX VENTURE:STC). For more information, please visit: www.sangoma.com