Solution Document

IPPBX SOLUTION (3CX)

Table of Contents

Document Management

Version	Date	Author	Description
1	18-12-2020	Shashi Shahi	Solution Overview
2	18-12-2020	Shashi Shahi	In section 5: Scalable up to 1000 simultaneous calls has been updated
3	03-02-2021	Shashi Shahi	1) Solution Overview Updated 2) SOW updated 3) Remove Speech analysis part 4) SMS gateway integration added 5) Solution Overview architecture updated 6) BOQ updated 7) Responsibility Matrix updated 8) Deployment plan updated
4	30-04-2021	Amit Kumar Pal	1) Revised call flow design

1. Acronyms & Definitions

Acronym	Definition
PBX	Private Branch Exchange
SIP	Session Initiated Protocols
VOIP	Voice Over IP
SOW	Scope of Work
CRM	Customer Relationship Management
SBC	Session Border Controller
IVR	Interactive Voice Response
BSS	Billing Support System
HTTP	Hyper Text Transfer Protocols
IPPBX	Internet Protocol private branch exchange

2. Project Introduction:

2.1 Project Overview:

Neoteric Nepal is a value added distribution company involved in Information, Communication and Entertainment Technologies (ICET). IT is one of the oldest companies involved in the ICET distribution in Nepal and boasts itself as one of the leading companies in terms of revenue, experience and reputation.

Neoteric Nepal is required on-premise IPPBX solution integrated with their CRM component. Outbound & inbound call will be part of the solution. Also PBX will required to do internal communication within the organization.

2.2 Scope of Work:

Below is the Scope of the Work:

Solution to deploy a system at premises with following features:

1) Complete SIP based IPPBX & Contact Center solution
2) Solution should be capable to do both Inbound & Outbound call
3) Solution should be integrated with CRM system, which is part of BSS component
4) Solution should be integrate with SMS gateway
5) Solution should have campaign (outbound) capability
6) High Availability

3. Requirement Overview

3.1 System Requirement Overview:

TechBridge identified the below component for the solution requirements:

1) 3CX for the Complete IPPBX & Call center feature (Telephony Server)
2) Dashboard for the Administration
3) Voice Gateway(SBC)

3CX (Telephony Server):

What is the 3cx?

3CX is a software-based private branch exchange (PBX) based on the SIP (Session Initiation Protocol) standard. It enables extensions to make calls via the public switched telephone network (PSTN) or via Voice over Internet Protocol (VoIP) services. 3CX for Windows, Linux,
It is an IP business phone system that supports standard SIP soft/hard phones, VoIP services and traditional PSTN phone lines.

3CX Phone System consists of a number of software-based components. The PBX, accessed and managed via a web-based management console, softphones for Windows and MacOS, and smartphone clients for iOS and Android. The phone system can be used with either SIP phones or the clients, or a combination of the two. The PBX provides unified communications functionality including presence, chat, and voicemail to email, fax to email, integrated video conferencing, call conferencing, and CRM integration.
3CX is responsible for the making both inbound & outbound calls. This can be also integrated with any third part application.

Why 3CX?

- A Pure software based PBX
- Upgrading is easier
- Monitoring your PBX
- Low processor usage
- Easily provision and manage gateways, trunks and IP phones from 3CX
- Softphones included for Windows, Mac, Android and iOS
- 3CX scales easily to more than 1,000 simultaneous calls per server
- Easy installation
- Easy management
- Better integration
- Lower cost

Dashboard for the Administration:

This will be the web based dashboard for reporting & other analytics. It will only accessible to authenticated user.

3.2 System Functional Scope:

3CX (PBX/SIP based call):

PBX stands for Private Branch Exchange, which is a private telephone network used within a company or organization. The users of the PBX phone system can communicate internally (within their company) and externally (with the outside world), using different communication channels like Voice over IP, ISDN or analog. A PBX also allows you to have more phones than physical phone lines (PTSN) and allows free calls between users.

Additionally, it provides features like transfer calls, voicemail, call recording, interactive voice menus (IVRs) and call queues.

IVR: Interactive Voice Response or IVR Technology, is a telephone technology that allows customers to interact with the company's host system through configurable voice menus, in real time, using DTMF tones, without the need of human intervention. IVR systems allow you to record customized greetings and prompts for a personalized customer experience.
In an Interactive Voice Response system, callers are given the choice to select options by pressing digits. The press of the digit on the telephone keypad sends a DTMF tone to the company's host system which then selects the appropriate action / response according to the digit pressed.

General Features:

- On premise
- User extension management
- Configuring your IP Phone
- Call routing
- Inbound rules
- Contact center
- IVR play
- Live chat
- Ring group
- Paging Intercom
- Click to call
- Call forwarding
- Call recording
- Integrated Video conferencing
- SIP trunking
- VOIP Call
- Click to call
- Enterprise Phone supported

3CX supports various codecs which is listed below:

Audio Codecs:

- **GSM** – 13 Kbps (full rate), 20ms frame size.
- **iLBC** – 15Kbps,20ms frame size: 13.3 Kbps, 30ms frame size.
- **ITU G.711** – 64 Kbps, sample-based. Also known as A-law/µ-law.
- **ITU G719** – 32/48/64/128 Kbps, 28 ms Frame Size.
- **ITU G.722** – 48/56/64 Kbps.
- **ITU G.723.1** – 5.3/6.3 Kbps, 30ms frame size.
- **ITU G.726** – 16/24/32/40 Kbps.
- **ITU G.728** – 16 Kbps.
- **ITU G.729** – 8 Kbps, 10ms frame size.
- **Speex** – 2.15 to 44.2 Kbps.
- **LPC10** – 2.5 Kbps.
- **DoD CELP** – 4.8 Kbps

Call Center Modules:

3CX integrates call center features that help you satisfy the most demanding of customers. What's more 3CX's CRM integration and call work flows eliminate tedious and time intensive tasks for your agents allowing them to focus on what's important.

- Call Queue
- Call Back option
- Agents can answer calls from anywhere – at the office or remote
- Check agent performance with the built-in reports.
- See longest wait time and abandoned calls
- Real Time monitoring of the queue
- Call recording
- Integration with CRM or any third party application
- Call transfer
- Voice mail

Below is the scope for the 3cx:
- Making inbound & outbound call
- IVR play
- Auto attendant
- Call queues
- Voice mail
- Call broadcast
- Customized IVR
- Call center features

Dashboard for the Administration:

Following functionality will be available in Dashboard:
1) Reporting
2) Event status
3) PBX status
4) Event log
5) Activity Log
6) Phone management

3.3 System Integration Scope:
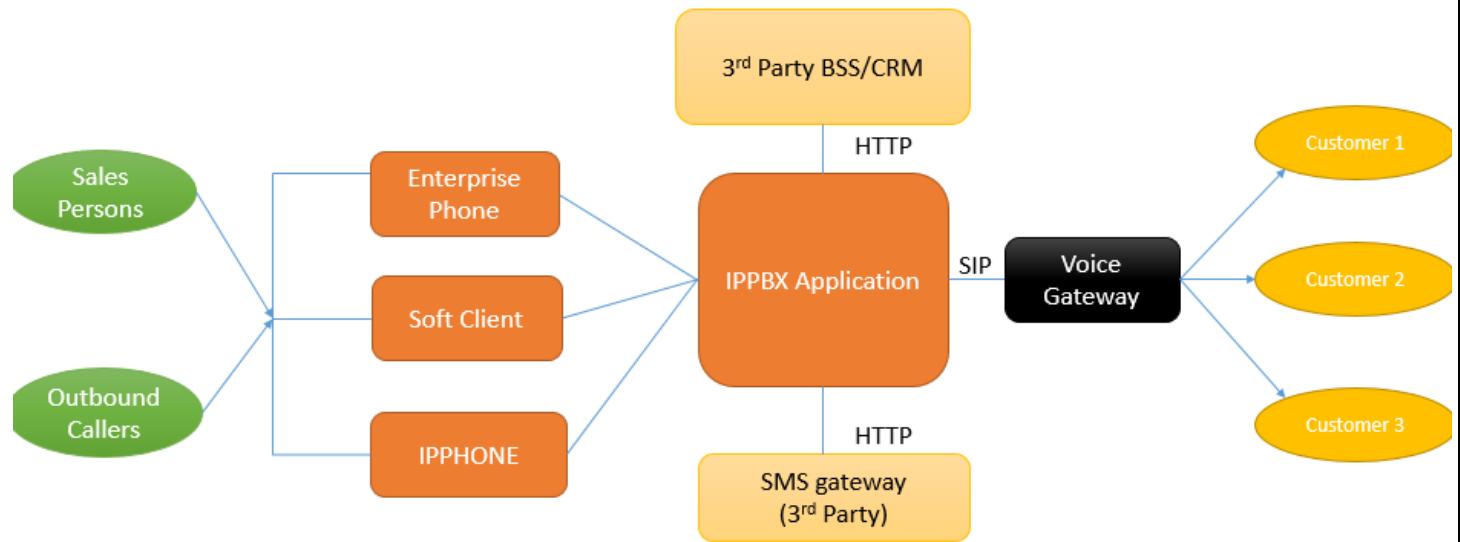
Sno	Solution Module (From)	Application Module (To)	Comments (Integration Brief)
1	IPPBX Application	CRM/BSS	Responsible for handling the inbound & outbound call
2	SBC	IPPBX application	This is the voice gateway
3	IPPBX application	SMS gateway	Responsible to handle the sending/ broadcasting the SMS

3.4 Application Component Matrix details:
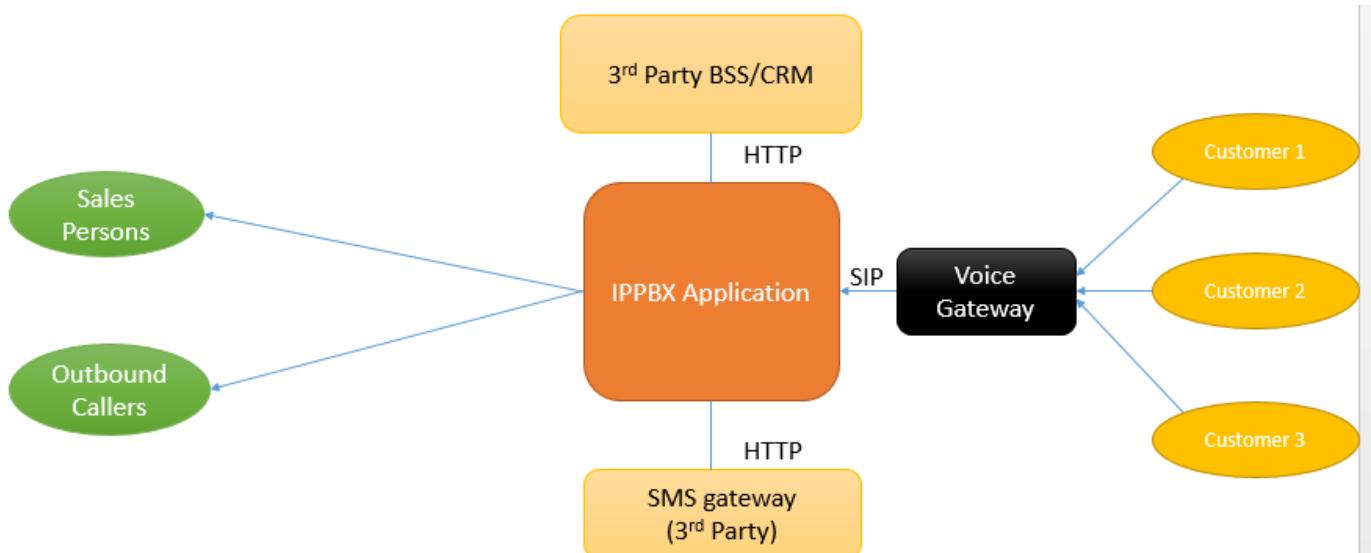
Sno	Component	Details	Supports Details
1	Telephony Server(IPPBX application)	3CX	In house support capability
2	SBC	TelcoBridges	In house support capability

3.5 Solution Overview Architecture

**Architecture Diagram for the outbound call:**
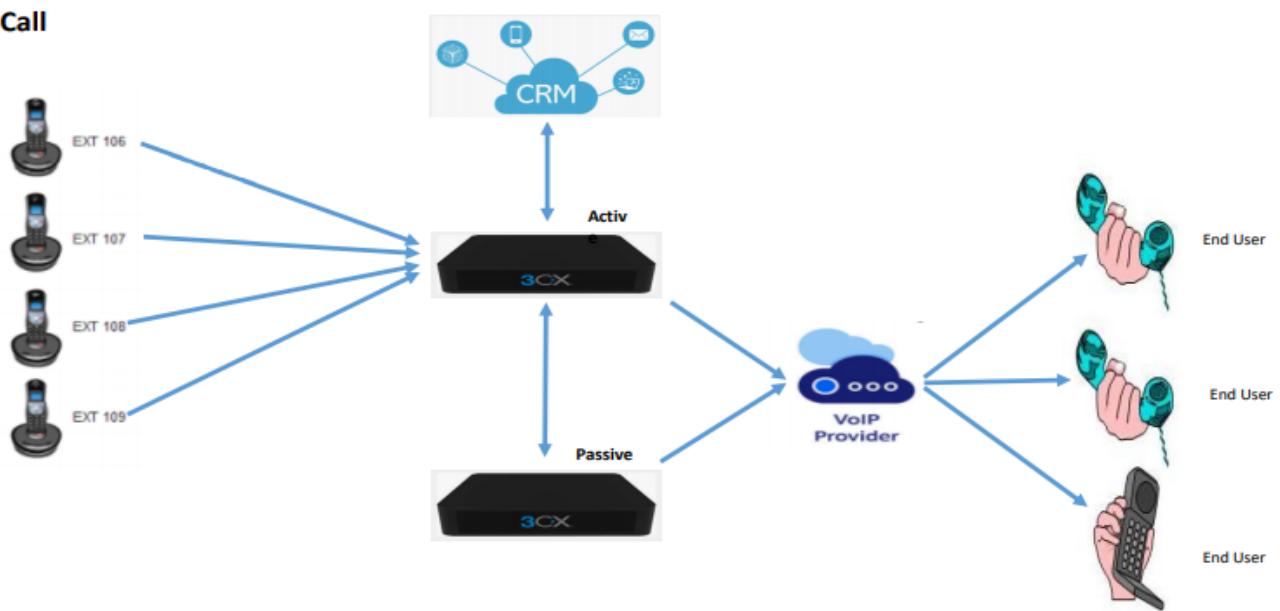

Architecture Diagram for the inbound call:
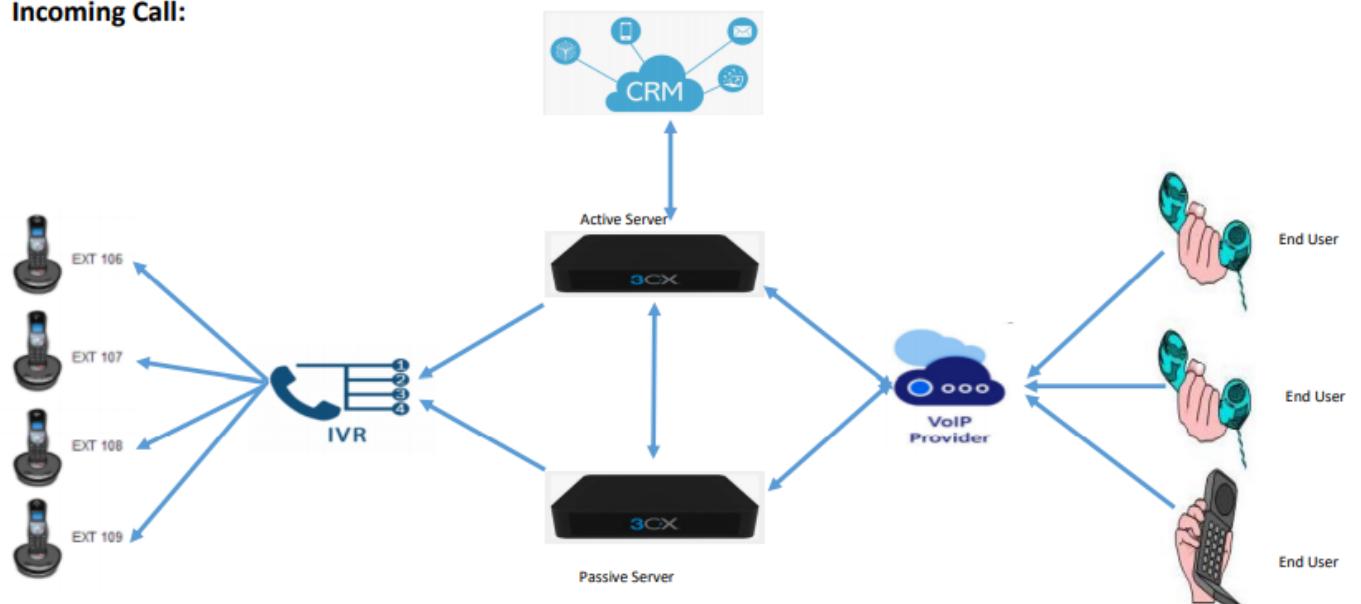
3.6 Call Flow Design

Outgoing Call

Incoming Call:

4   Redundancy & Failover Mechanism:

Solution will uses an active - passive approach using built-in configuration replication with a maximum offset of 24h. The active host processes calls and presence information, while the passive host monitors the active host. In case of a failure of the active host (independent of application, OS or hardware failure), the passive host stops its monitoring role and takes over as the active host. The passive host's configuration determines in which state the active host is declared failed in order to initiate the failover switch.

5   Solution Key Feature:

- Web based application dashboard for the management & reporting
- Scalable upto 1000 simultaneous calls
- Can generate various reports, for business intelligence
- Scalable & High Performance solution
- Supports both on premise
- High Availability & Redundant Solution
- Secured HTTPS interface
- Role based security

6 Solution Infrastructure:

6.1 Hardware Requirement for the Telephony Server:

- Number of server required 2

Sr.no	Component	Specification
1	CPU	3.2GHz
2	RAM	2GB
3	Hard disk	50 GB
4	Webserver	IIS 7
5	NETWORK	100/1000 Mbit/s

6.2 Hardware Requirement for the Gateway:

- Number of Server required 2:

Server 1:

Sr.no	Component	Specification
1	CPU	2 Core
2	RAM	4 Gb
3	Hard disk	40GB
5	LAN/WAN SBC Ethernet ports	1 Gbps

Note* 1: Storage sizing may be change as per requirement
Note*2: Data Retention Period would be 6 Month

7 Deployment Plan of action:

Sr.No	Action item	Responsible	Time required	Dependency if any
1	SOW closer & signoff	TechBridge/ Neoteric	T0+2 days	
2	Pre-requisite closer	Neoteric	T0+5 days	
3	Design Document creation & Test cases document readiness	TechBridge	T0+7days	
4	Design Document & Test cases document approval	Neoteric	T0+8days	
5	Hardware Readiness for deployment	Neoteric	T0+10days	
6	Verification of hardware provided & remote access method	TechBridge/ Neoteric	T0+ 10 days	
7	Installation of Telephony Server	TechBridge	T0+ 15days	
8	Installation of Voice Gateway	TechBridge	T0+17 days	
9	Configuration of the Telephony Server & Voice gateway & Integration with CRM/BSS	TechBridge	T0+25Days	
10	Dashboard readiness for the Admin	TechBridge	T0+30 Days	
11	Installation of telephony server(Redundant)	TechBridge	T0+32 days	
12	Installation of voice Gateway	TechBridge	T0+34 days	
13	Configuration of the Telephony Server & Voice gateway (Redundant)	TechBridge	T0+36 days	
14	Making the solution redundant	TechBridge	T0+40 days	
15	Internal Testing	TechBridge	T+ 42 days	
16	UAT Testing for the telephony server & Integration of the CRM/BSS	Neoteric	T0+ 45 days	
17	Bug fixing	TechBridge	T0+47 days	
18	Integration with SMS gateway	TechBridge/ Neoteric	T0+57 days	
19	Dashboard creation for the reporting & analytics	TechBridge	T0+ 62 days	
20	Final signoff	TechBridge/Neoteric	T0+ 64 days	

Note: T0 is project start

8   Proposed BOQ:

Sr. No.	IP-PBX solution BOQ/BOM	QTY
1	3cx IP-PBX with 16 con call Ent license 3 yrs price with AMC, perpetual.	1
	Hardware/Cloud	
2	Customer will give VM space	NA
	Sip trunk	
3	60 channel sip trunk provider line from Nepal provider	NA
	Gateway/SBC	
4	30 Channel sw SBC 3 yrs price with AMC-HA	3
	Professional Services TechBridge	
5	Deployment services & Feature Enablement (30 days warranty):	1
6	Day 1 Platinum support on call and email with 24X7 SLA response - 30 days - Included	
7	Email support post Day 1 support – included	
8	Analog integration and user enablement: Qty-64	
	CRM	
9	OSS integration, SMS gateway	1
	TechBridge Support & AMC	
10	TechBridge Post deployment Support 24*7 for 3 years	3
11	TechBridge Post deployment Support 8*5 for 3 years (Optional)	3
	Remote Training(Knowledge Transfer Session)	
12	User on-boarding and training -Remote	1
13	Administrator basic training - Remote	1
14	User on-boarding and training -On-Site (Optional, either remote or on-site)	1
15	Administrator basic training - On-Site (Optional, either remote or on-site)	1

9   Maintenance Support Service:

TechBridge/OEM provides Level 3 Support as described below:

Level 3 Support, from TechBridge/OEM

Level 3 support resources will be responsible for resolution of complex questions and problems requiring engineering analysis:

- Responsible for resolution of all technical escalations from Level 2.
- Will provide support to qualify shipment of hardware Advance Replacements for RMA cases.
- Will provide access for Level 2 technical resources to the Level 3 service ticket system.
- Will provide access to all software releases/patches as per the maintenance agreement.
- Will provide access to all Technical Tips (best practices), warnings, alerts and bulletins.
- Will be accessible 8*5 or 24x7x365 for escalations based on the severity of cases and contract type
- Will escalate into OEM management, OEM engineering (Level 4), and third party vendors as required.

Support Details:

- All issues to be reported by sending an email to: **support@tech-bridge.biz**

- Support mobile number to reach: +91-8595032057

- Support team will assign a ticket id and respond.

- Issue to be tracked via support ticket id.

- Support will be available 24* 7.

10 Responsibility Matrix:

Sr.No	Actionable Item	Responsible	Comment if any
1	SOW Signoff	Neoteric	
2	Design Document preparation	TechBridge	
3	Design document signoff	Neoteric	
4	Required Hardware	Neoteric	Hardware specification is already mentioned in Solution infrastructure section
5	Remote access for the deployment	Neoteric	
6	SIP trunk lines	Neoteric	
7	Installation and configuration of solution component	TechBridge	
8	Integration with BSS/CRM system	Neoteric/ TechBridge	
9	SMS gateway	Neoteric	
11	UAT	Neoteric	
12	Final sign off & Go Live	Neoteric/ TechBridge	