

SANGOMA TECHNOLOGIES CORPORATION
MANAGEMENT DISCUSSION AND ANALYSIS OF FINANCIAL
CONDITION AND RESULTS OF OPERATIONS FOR THE THREE
AND SIX MONTH PERIODS ENDED DECEMBER 31, 2021

February 10, 2022

INTRODUCTION

The Management Discussion and Analysis (“MD&A”) provides a detailed analysis of the financial condition and results of operations of Sangoma Technologies Corporation (hereinafter referred to as “Sangoma” or the “Company”). The MD&A compares the financial results for the fiscal second quarter of 2022 with those of the same period in the previous year. Please note that Sangoma changed its presentation currency on July 1, 2021 and so, unless otherwise noted, all amounts shown are in United States dollars. Also, the Company undertook a 7:1 share consolidation on November 2, 2021, and the share count, option count, exercise prices and earnings per share reflect this share consolidation for all periods reported. This MD&A should be read in conjunction with Sangoma’s audited annual consolidated financial statements and related notes for the year ended June 30, 2021 (“Financial Statements”) and Sangoma’s unaudited condensed consolidated interim financial statements and related notes for the three and six months ended December 31, 2021, both of which are available at www.sedar.com.

BASIS OF PRESENTATION

The Company reports in accordance with International Financial Reporting Standards (“IFRS”).

NON-IFRS MEASURES

This MD&A contains references to certain non-IFRS financial measures such as Adjusted Operating Income, Adjusted EBITDA and Adjusted Cash Flow. Non-IFRS financial measures are used by management to evaluate the performance of the Company and do not have any meaning prescribed by IFRS and therefore may not be comparable to similar measures presented by other reporting issuers. Non-IFRS financial measures used herein have been applied on a consistent basis. “Adjusted Operating Income (Loss)” means IFRS income (loss) before interest expense (net), business integration costs, one-time exchange listing expense, change in fair value of consideration payable, business acquisition costs, and income taxes. “Adjusted EBITDA” means earnings before income taxes, interest expense (net), share-based compensation, depreciation (including for right-of-use assets), amortization, business integration costs, one-time exchange listing expense, business acquisition costs, and change in fair value of consideration payable. Adjusted EBITDA is a measure used by many investors to compare issuers. “Adjusted Cash Flow” means cash flow from operations as defined by IFRS less the capitalized development costs that Sangoma amortized during the period, plus interest expense (net), business acquisition costs, business integration costs, and the one-time exchange listing expense. We believe that Adjusted Operating Income, Adjusted EBITDA and Adjusted Cash Flow are useful supplemental information as they provide an indication of the results generated by the Company's main business activities before taking into consideration how they are financed, taxed, depreciated or amortized. Investors are cautioned that non-IFRS financial measures, such as those presented herein, should not be construed as an

alternative to net income or cash flow determined in accordance with IFRS.

FORWARD-LOOKING STATEMENTS

This report contains forward-looking statements, including statements regarding the expected fiscal 2022 financial results and the future success of our business, development strategies and future opportunities.

Forward-looking statements include, but are not limited to, statements relating to management's guidance on revenue and Adjusted EBITDA, statements relating to future lease and interest payments, statements relating to the impact of the continuing COVID-19 pandemic, statements concerning estimates of expected expenditures, statements relating to expected future production and cash flows, and other statements which are not historical facts. When used in this document, the words such as "could", "plan", "estimate", "expect", "intend", "may", "potential", "should" and similar expressions indicate forward-looking statements.

Although Sangoma believes that its expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties and no assurance can be given that actual results will be consistent with these forward-looking statements. Forward-looking statements are based on the opinions and estimates of management at the date that the statements are made, and are subject to a variety of risks and uncertainties and other factors that could cause actual events or results to differ materially from those projected in forward-looking statements.

Readers are cautioned not to place undue reliance on forward-looking statements, as there can be no assurance that the plans, intentions or expectations upon which they are based will occur. By their nature, forward-looking statements involve numerous assumptions, known and unknown risks and uncertainties, both general and specific, that contribute to the possibility that the predictions, forecasts, projections and other events contemplated by the forward-looking statements will not occur. Although Sangoma believes that the expectations represented by such forward-looking statements are reasonable, there can be no assurance that such expectations will prove to be correct as these expectations are inherently subject to business, economic and competitive uncertainties and contingencies. Some of the risks and other factors which could cause results to differ materially from those expressed in the forward-looking statements contained herein include, but are not limited to risks and uncertainties associated with the continuing integration of Star2Star, the impact of the continuing COVID-19 pandemic, changes in exchange rate between the United States dollar and other currencies, changes in technology, changes in the business climate, changes in the regulatory environment, the decline in the importance of the PSTN, new competitive pressures, the impact of global supply chain delays, the retention of key staff, the increase in cost of our components and materials and the impact of changes to interest rates. See also "Guidance" below for more information on certain of these risks and uncertainties.

The forward-looking statements contained in this management's discussion and analysis are expressly qualified by this cautionary statement. Sangoma undertakes no obligation to update forward-looking statements if circumstances or management's estimates or opinions should change except as required by law.

DESCRIPTION OF THE BUSINESS

General (also refer to the Glossary of Terms at the end of this document)

Sangoma's products and services are used by leading companies throughout the world and in leading UC, PBX, IVR, contact center, carrier networks, and data communication applications worldwide. Sangoma's portfolio of products also enable service providers, carriers, enterprises, SMBs, and OEMs alike to leverage their existing infrastructure for maximum financial return, while still delivering the most advanced applications and services from the latest technologies available.

Sangoma's Communications as a Service (CaaS) Portfolio

Sangoma Technologies is a trusted leader in delivering value-based Communications as a Service solutions for businesses of all sizes. The value-based communications segment includes small businesses to large enterprises who are looking for all the advantages of cloud-based communications at a fair price. Sangoma's current Communications as a Service offerings are typically offered with monthly, yearly, or multi-year contracts and include:

- Unified Communications as a Service ("UCaaS")
- Trunking as a Service ("TaaS")
- Contact Center as a Service ("CCaaS")
- Communications Platform as a Service ("CPaaS")
- Video Meetings as a Service ("MaaS")
- Collaboration as a Service ("CollabaaS")
- Desktop as a Service ("DaaS")
- Access Control as a Service ("ACaaS")

Unified Communications as a Service (UCaaS)

Sangoma's UC solutions are business communication systems (PBX's with advanced UC features, such as presence/chat, conferencing, mobility, fax, and more) that can be deployed on-premise or hosted in the Cloud, allowing businesses to select the best option for their needs. Unified Communication systems, because of their mobility features such as having the business phone number ring on an app on your smartphone and/or desktop and instant messaging capability, enable remote work and work from home much more efficiently. Sangoma's Unified Communication solutions fully integrate with our phones, soft clients, and network interoperability products to provide a fully interoperable solution from a single vendor.

Cloud-Based Business Phone Solution

Sangoma offers its customers full-scale cloud-based Unified Communications solutions. With Sangoma, businesses can get contact center, mobility, softphone, call control, and productivity features included for every user at a reasonable price. Sangoma's hosted phone service delivers the customer experience businesses demand at an affordable price point. Customers can also choose pre-provisioned phones that customers simply plug into their network.

On-Premise Business Phone Solution

Sangoma also offers the more traditional on-premise UC phone system, for businesses still wanting to deploy their business phone system on premise. Whether deployed on a dedicated appliance or in the customer's virtual environment, Sangoma provides the power and connectivity necessary.

- **IP Deskphones, Headsets and UC Clients:** Sangoma provides desktop and softphone collaboration clients that integrate seamlessly with our UC solution offerings and deliver UC features (presence, contacts, chat, calling, audio and video conferencing, etc.) from a single application, on any device, at any location.
- **IP Deskphones:** Sangoma offers a full line of phones that work with both our cloud and on-premise systems that are perfect for every user type, from casual to call center to managers and executives. Sangoma's product line includes entry-level, mid-range, and executive-level phones. All models include HD Voice and plug-and-play deployment. Sangoma's range of IP phones are customized to seamlessly integrate with all of our UC Systems and provide zero touch installation, simplified system management, and instant access to a wide range of features.
- **Headsets:** Sangoma also offers headsets that either work in conjunction with the desktop phones (by plugging into the phone) or work in conjunction to our desktop soft client (by plugging directly into the computer). These headsets enable roaming of up to 325 feet from the phone or desk computer.
- **UC Clients and Softphones:** Unified Communication Clients (or softphones) are used to make or receive phone calls with your business phone number and can be used as your main phone or as an extension of your desk phone. They are available as an app on your smartphone or computer. These UC clients have enabled employees to work remote seamlessly by enabling phone calls to customers and other employees as if they were in a physical office. Sangoma offers UC clients with all of our Unified Communication / Business phone system product lines.

Trunking as a Service (TaaS)

SIP trunks deliver Internet-based telephony services to businesses using their existing internet connection, eliminating the need for separate traditional PSTN or digital telecom connections. SIP trunking is fast becoming the technology of choice to interconnect an IP PBX system to a telephone company. The main drivers are cost efficiencies (over fixed lines such as ISDN or analog lines from incumbent telcos) and end-to-end UC features/transparency. Cost efficiencies are realized because SIP trunking uses already-available broadband connections at customer premises. Sangoma offers both retail and wholesale SIP Trunking which allows our customers to choose the service that best meets their needs. Either service offers DIDs and number porting.

- **Retail SIP Trunking**

Retail SIP trunking offers predictable monthly expenses with pricing based per trunk. SIPStation, Sangoma's retail SIP trunking service, is seamlessly integrated into our various UC platforms, making it easy to get up and running. It also includes an integrated fax service option, enabling a business to send and receive faxes from a web interface or from a local fax machine. Typically, small to mid-sized businesses and enterprises would utilize this type of service.

- **Wholesale SIP Trunking**

Sangoma's wholesale SIP trunking offer is now available following the acquisition of VoIP Innovations. Pricing for wholesale SIP trunking is usage-based but with a larger monthly minimum commitment. This includes origination, termination, SMS/MMS, e911, and fraud mitigation. Typically, very large businesses or service providers who resell SIP trunks would utilize this type of service.

- **Fax as a Service**

Faxing remains an important communications tool, yet VoIP networks are sometimes unable to send faxes reliably because fax standards are based on very specific timing that can be interrupted in VoIP systems, especially where there is substantial latency. Sangoma's FoIP service, FaxStation, is a hosted service to remedy this problem, available with our TaaS. It features a telecom appliance with up to four analog connections for fax machines and operates in concert with Sangoma's fax server data center to encrypt and package the fax communication to make it fail-safe. This is particularly useful for small businesses that rely on fax communications but also for industries with challenging network conditions, such as mining, oil rigs, and ship-to-shore over satellite.

Contact Center as a Service (CCaaS)

Contact Center as a Service (CCaaS) is our cloud-based contact center, or customer experience, offering. It provides robust contact center capabilities running in various ways: either standalone, in conjunction with our other cloud services (such as UCaaS), or integrated "inside" our UCaaS product in a simplified version. This latter solution is intended for 'departmental' type usage, by companies that are not pure-play contact centers, but that might have a department such as customer service or technical support that operate inside that company almost like a mini contact center.

Communications Platform as a Service (CPaaS)

Communications Platform as a Service (CPaaS) allows developers to easily build services and applications using real-time communication features, such as voice, video, chat, and SMS, via the cloud. Our platform enables Sangoma, our integrator/developer partners, and advanced customers to build new communications services based on voice, rest APIs, WebRTC, and SMS. When running an application on a CPaaS platform, performance is critical. To ensure peak performance, Sangoma offers its own SIP trunking service, providing optimized connectivity in addition to easy access to phone numbers. Sangoma also sells a series of 'applications' (or Apps) based upon our CPaaS product that customers can purchase.

Video Meetings as a Service (MaaS)

Sangoma Meet is our video meetings, cloud-based service accessible from any device, be it desktop or mobile. It enables file sharing on screen so collaboration with co-workers is enhanced, integrates seamlessly with your calendar, and enables PSTN phone calls. Sangoma Meet is available in free and chargeable tiers.

Collaboration as a Service (Collab aaS)

Collaboration as a Service (Collab aaS) is Sangoma's cloud-based offering for enabling people to work together more productively. This service is called TeamHub. It allows users to interact using any of the various forms of communications, including chatting, calling, and video. TeamHub integrates Sangoma's softphone client software applications (desktop and mobile) and is designed to allow communications to start in one mode (such as chat), and move through different modes very elegantly, in effect 'upgrading' that mode of communications to a voice call in real time, and/or upgrading that voice call to a video meeting.

Desktop as a Service (DaaS)

Sangoma's Desktop as a Service helps companies adapt to today's modern, flexible, and remote workforce. It is the most secure method for staff to access their tools and applications from any location to do their work, delivers simplified IT administration and cuts down on the CapEx of deploying PCs. Sangoma is one of the only companies that can offer communications capability inside a DaaS product.

Access Control as a Service (ACaaS)

At Sangoma, this product offering is called SmartOffice Access. The SmartOffice product line is to be a family of IoT based services, and it was launched first with Access Control. Access Control is a means of controlling access to one's office or parts of an office, and was traditionally done via the well-known white 'swipe cards' or fobs. Sangoma is innovating in that space by eliminating the need for such older technologies and extending our experience with mobile apps that so many of our customers and their employees already get from us, as a Softphone. This new mobile allows one to open doors using your smartphone and the app from Sangoma, wirelessly using IoT protocols. No more swipe cards, no more readers, no more wiring behind the walls. This is one of Sangoma's first forays into cloud services that extend our CaaS suite beyond the strict definition of 'communications'.

Network Interconnection Products

In addition to the Communications as a Service (CaaS) offerings described above, Sangoma also offers network interconnection products. These products connect different types of networks together, such as VoIP networks to PSTN networks, or VoIP networks to mobile networks or different types of VoIP networks.

Session Border Controllers (SBCs)

Anytime two VoIP networks interconnect, issues of security and interoperability arise. SBCs can manage these issues, including provider-to-provider connections, provider-to-enterprise connections, and enterprise-to-enterprise connections. Sangoma's SBCs are available as hardware appliances, as software-only solutions running on a virtual machine in hosted environments, or as a hybrid of both. The hybrid solution is unique to Sangoma and provides all the flexibility expected from virtual machine capability coupled with the scalability that is found in hardware-based solutions. Sangoma's SBCs have broad interoperability certifications.

VoIP Gateways

VoIP gateways are needed any time voice traffic moves from a VoIP network to a traditional PSTN telephone network. As the traffic traverses these networks, there are issues that need to be resolved regarding both the media (the sound of the caller's voice) and the signaling (the method used to control the media traveling over that connection).

In a service provider or carrier network, much larger gateways perform these same tasks. In addition, there are signaling protocols that are only used when carrier networks communicate with other carrier networks that are not included in the enterprise product line.

All Sangoma's gateways have broad interoperability certifications.

PSTN Interface and Media Processing Boards

Sangoma's complete line of boards connect and interface to the PSTN. Even though IP networks are growing and quickly becoming the standard, the PSTN still exists and new communication solutions often need to connect to the PSTN. These boards are primarily used by communications solution developers in PC/Server based telecommunications systems that connect to the PSTN. They perform a very similar task to VoIP gateways, but are installed inside the server rather than being stand-alone devices. By providing customers with the option of using a PSTN interface board or a VoIP gateway, Sangoma maximizes flexibility based on installation requirements, particularly when space and power are at a premium. They may also be used in harsh conditions that require ruggedized servers.

Open-Source Software Products

Asterisk and FreePBX

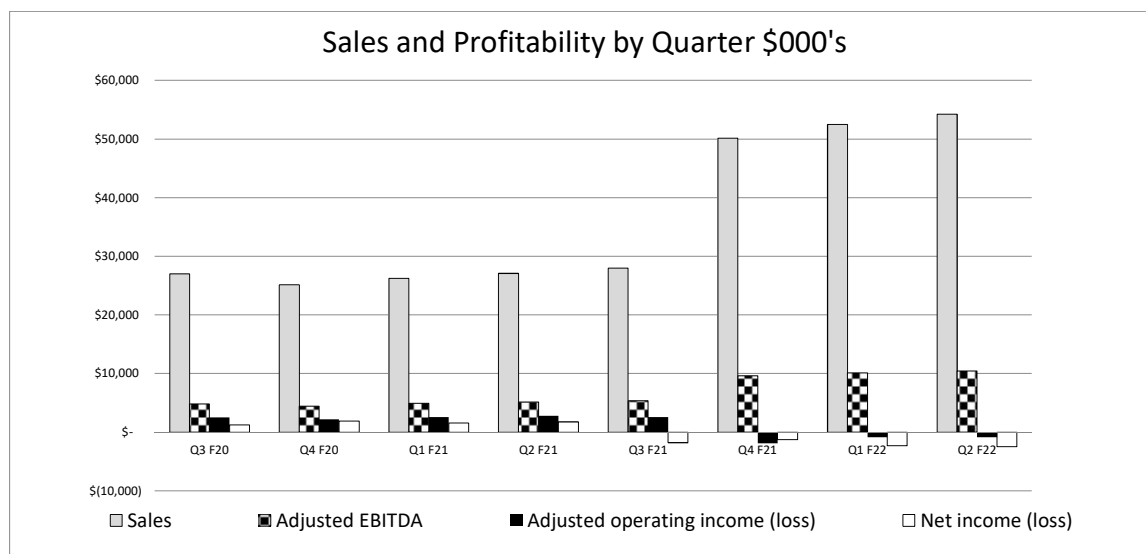
Sangoma is the primary developer and sponsor of the Asterisk project, the world's most widely used open-source communications software, and the FreePBX project, the world's most widely used open-source PBX software with an average of approximately 50,000 downloads per month.

Sangoma also offers revenue-generating products and services, beyond the open-source Asterisk or FreePBX software, to users of these open-source software products. The types of products and services Sangoma offers includes software add-ons beyond what is offered in Asterisk or FreePBX, IP phones, SIP trunking, cloud-based fax, training, technical support, maintenance, PSTN cards, VoIP gateways, session border controllers, and commercial/hardened versions of the PBX/UC software they have downloaded.

OVERALL PERFORMANCE

Financial

Please note that these results are presented in United States dollars so all comparable numbers have been converted from Canadian dollar where applicable.



Sales for the second quarter of fiscal 2022 were a record \$54.24 million, twice that of the same quarter last year and 3% higher than in the first quarter of fiscal 2022.

Gross profit for the second quarter of fiscal 2022 was \$39.40 million, delivering gross margin over 72% of sales, up from 66% in the same quarter last year.

Operating expenses were \$40.24 million for the second fiscal quarter of 2022, up 4% sequentially over the most recent first quarter of fiscal 2022. When compared to last year, operating expenses are materially higher, primarily because of the addition of the Star2Star team, the associated spending, and the non-cash intangible asset amortization arising from the acquisition.

Adjusted EBITDA was \$10.43 million in the second quarter of fiscal 2022, more than twice that of the same quarter last year, and at about 19% of revenue, is consistent with expectations for this point in the fiscal year.

Net loss for the second quarter of fiscal 2022 was \$2.48 million, which includes the additional non-cash intangible asset amortization, together with the one-time \$1.05 million expense associated with the listing on the TSX and Nasdaq exchanges during the quarter.

Sangoma continues to maintain a healthy balance sheet, finishing the second quarter of fiscal 2022 with a cash balance of \$16.95 million on December 31, 2021 and remains comfortably within its debt covenants. Adjusted Cash Flow from Operations during the second quarter was \$3.90 million, compared to \$4.87 million in the same quarter of fiscal 2021.

Operational

Sangoma Technologies is a trusted leader in delivering cloud-based “Communications as a Service” (or CaaS) solutions for businesses of all sizes. Customers include companies from small/medium businesses (SMB’s) right up to large enterprises who are looking for all the advantages of cloud-based communications at a fair price. In addition to those cloud-based Services, Sangoma also has a broad suite of Products to complement its Services.

Enterprises, SMBs and carriers in over 150 countries rely on Sangoma’s technology as part of their mission-critical infrastructures. Through a worldwide network of distribution partners, Sangoma delivers high-quality services and products, some of which carry the industry’s first lifetime warranty.

Innovation

As a technology company, Sangoma is continuously working on a large number of projects across its broad portfolio of existing products and services. While the Company has introduced several new additions to its portfolio over the last few years, the majority of the Company’s investment in Research and Development (“R&D”) is dedicated to sustaining, improving on and enhancing its broad portfolio of existing products and services. Sangoma believes that innovation is essential to a technology company’s future. The Company also believes that R&D investment is necessary in order to address the needs of the Company’s wide-ranging group of customers (which include business of all sizes including service providers, carriers, enterprises, small and medium-sized businesses, and original equipment manufacturers) in over 150 countries, to keep pace with technology developments in the cloud communications industry, to meaningfully compete in that industry, and to achieve and maintain market acceptance.

The Company focuses on creating and introducing products to the market as soon as commercially practical and, thereafter, focuses on enhancements to further improve its products. Such product introductions enable the Company to validate product acceptance to some degree, and to get products to market efficiently to start generating revenue. Furthermore, the Company focuses on keeping its product development costs for new projects under control in a number of ways, including by reusing its existing code base where applicable and by leveraging open-source software.

Sangoma continues to invest in R&D to develop new products and to improve existing offerings with spending on R&D increasing each year.

Sales and marketing

R&D is important, but without Sales and Marketing, customers can be too unaware of the advancements that Sangoma has made in innovation. So, Sangoma continues to increase its investment in both Sales and in Marketing, to promote awareness of the Company, to communicate the critical shift from single products to full solutions to cloud, and to drive customer acquisition.

Sales

Sangoma uses a dual sales path ‘go to market’ approach: direct sales to large customers and indirect distribution to other small and medium businesses (SMBs).

- **Large Customers** typically include ‘service providers’, OEM’s and larger enterprise type businesses. This is the customer segment that we can sell to directly.

Service Providers is a broad category of customers that included telcos, ISPs, ITSPs, wireless/mobile operators, MSPs, UCaaS operators, etc. These types of organizations are potential customers for Sangoma.

OEM partners are companies that “design in” Sangoma products as a component of their solutions. OEM customers tend to be committed participants in their given markets and have longer-term focus. It is important to reach these potential customers in the early days of any project to secure ‘design wins’ and to have sales and marketing programs that will ensure close collaboration during product and sales development cycles.

Enterprise customers are the classic ‘larger’ companies who buy products or services for their own use. This type of customer has similar ‘use cases’ to a SMB type customer but is large enough that they prefer to do business directly with Sangoma, the Company wants a direct relationship with them as well, and they are buying enough for Sangoma to cost effectively service them directly.

- **SMB Customers:** In other cases, the customer is commonly referred to as a Small-Medium Business. Here, it is not usually cost-effective to travel to meet with such customers in a typical sales cycle. Sangoma then utilizes an indirect distribution model to reach the full breadth of customers, using a network of ‘channel partners’. This indirect distribution approach can often be based upon a two-tier Channel model:

The ‘upper tier’ of the indirect model is typically made up of Distributors or Master Agents, who normally sell not to the end customer, but to the ‘second tier’ of the channel. This upper tier of the channel tends to be larger organizations and cover broader geographic regions.

The ‘second tier’ of the indirect model is normally made up of Resellers and Agents. Distributors typically sell to resellers, and Master Agents typically sell to Agents. The Resellers and Agents then sell, install, and support end users. The second tier tend to be smaller organizations (though not always) and are usually more ‘local’ in nature.

Sangoma has parts of its sales team that focus on Direct customers, whereas the majority focuses on the Channel. In the channel, partners require frequent attention to keep Sangoma ‘on their mind’ in a crowded product marketplace. Therefore, a portion of the Channel sales team services the distributors and master agents as the upper tier of the channel, while a different part of the team focuses on the resellers/agents. Finally, Sangoma has professional sales teams across all our key geographic regions as well.

Marketing

Sangoma also continues to increase its efforts in marketing. The Company has assembled corporate marketing programs with two key objectives in mind:

- to promote the Sangoma brand and positioning, which included conveying the message about the Company's full solutions and its Cloud-First approach.
- lead generation as one of the front-end steps in customer acquisition

Sangoma is now using various marketing techniques typical of technology firms to accomplish those two objectives. This includes participation in tradeshow, speaking at selected industry events, attending specialized seminars run by Sangoma's distribution channel and other partners, investing in electronic marketing strategies (e.g. web presence, social media and blogging, online advertising, search engine campaigns, etc.), conducting lead generation campaigns via email/social media/etc., webinars, creating thought leadership pieces, PR, etc.

In addition to the overall corporate messaging, in support of the above two objectives, Sangoma has developed a comprehensive set of channel promotion programs, aimed at the Company's indirect partners described above, both distributors/master agents as well as resellers/agents. The Company seeks to attract new channel partners and to grow the business with existing partners. Sangoma has implemented several incentive programs to reward its channel partners for performance and behaviours that Sangoma believes will grow revenues.

RESULTS OF OPERATIONS

SUMMARY OF RESULTS FOR THE SECOND QUARTER OF FISCAL 2022

Sales

Sales for the second quarter of fiscal 2022 ended December 31, 2021 were \$54.24 million, double that of the \$27.09 million in the comparable second quarter of fiscal 2021.

The increase primarily resulted from the Star2Star acquisition contributing to sales this quarter, as well as our existing Services business continuing to grow and compound, together with an uptick in Product versus the comparable second quarter of fiscal 2021. As a result, our Services revenue represented 70% of total sales this quarter, up from 56% in the same quarter of the prior year, and consistent with our strategic objective.

Cost of sales and gross profit

The cost of sales for the quarter ended December 31, 2021 was \$14.83 million compared to \$9.16 million last year, driven primarily by the addition of the Star2Star business. In addition, Sangoma's COGS has been impacted by the COVID-19 related supply chain pressures, for both electronic components and for shipping. In some cases, Sangoma has needed to order further ahead, pay more for electronic components, and to ship product by air versus by sea (at higher cost). Nevertheless, Sangoma was able to fill most customer orders in the second quarter, and still meet our gross margin expectation, despite these supply chain pressures.

Gross profit for the quarter ended December 31, 2021 was \$39.40 million, more than double the \$17.93 million realized in the quarter ended December 31, 2020. Gross margin for the second quarter of fiscal 2022 was over 72% of revenue, up from 66% in the same quarter last year. This is driven primarily by higher margins attributable to Star2Star revenues, the larger fraction of revenue coming from higher margin services year over year, all partly offset by the supply chain pressures described above.

Operational expense

As permitted under IFRS, costs are allocated by function except for the impact of foreign exchange, which can result in material swings between time periods.

Sales and marketing

Sales and marketing expense was \$14.24 million for the second quarter of fiscal 2022, significantly higher than the \$4.13 million incurred in the same quarter of fiscal 2021. This was primarily the result of the addition of the Star2Star sales team, the incremental marketing staff, the accompanying marketing program spend, and the channel partner commissions. Sangoma is growing sales and marketing investment in absolute dollars, to help drive growth, while controlling total operating expense as a percentage of revenue.

Research and development

A portion of the Company's R&D costs are capitalized each period and amortized on a straight-line basis over three years (see the audited consolidated financial statements and related notes for the fiscal year ended June 30, 2021 available at www.sedar.com). The engineering expenses incurred, and the development costs amortized during the second quarter of fiscal 2022 were \$7.76

million or approximately 14% of sales, higher than the \$4.20 million in the same quarter last year, mostly as a result of the addition of Star2Star. For the quarter ended December 31, 2021, the Company did not have any significant projects that have not yet generated revenue, nor did it have any products or services that are not fully developed, and which are material to the Company.

General and administration

General and administration expenses were \$18.15 million for the quarter ended December 31, 2021 compared to \$6.80 million in the same period of fiscal 2021. The incremental spending is driven primarily by the addition of the Star2Star team and the non-cash expense of the additional amortization of the intangible assets acquired.

Foreign exchange

There were no material foreign exchange gains or losses in the second quarter of either year.

Total expenses

Total operating expense for the second quarter of fiscal 2022 was \$40.24 million versus \$15.13 million during the same period last year. The primary driver of the increase was the incremental expense associated with the addition of the Star2Star business.

Adjusted Operating Income (Loss)

Adjusted Operating loss for the quarter ended December 31, 2021 was \$0.84 million, compared to the \$2.80 million profit in the same period last year, again affected by the addition of Star2Star and the incremental amortization of intangible assets.

Interest

Net interest expense for the quarter ended December 31, 2021 was \$0.60 million, higher than the \$0.37 million in the same period last year, because of the additional interest on the new debt from the acquisition of Star2Star.

Business acquisition and integration costs

None.

TSX and Nasdaq fees

During the quarter ended December 31, 2021, the Company graduated from the TSX Venture exchange and commenced trading on the TSX on November 1, 2021 and Nasdaq on December 16, 2021 and incurred a one-time \$1.05 million expense associated with the listing.

Consideration payable

In the second quarter of fiscal 2022, the change in the value of the consideration payable gave rise to a gain versus the amount existing on September 30, 2021 with an almost equivalent offset included in deferred tax expense.

Net income (loss)

Net loss for the second quarter was \$2.48 million (\$0.078 loss per share fully diluted), compared to a net income of \$1.77 million (\$0.110 earnings per share fully diluted) for the equivalent quarter ended December 31, 2020.

Adjusted EBITDA

For the second quarter of fiscal 2022, Adjusted EBITDA at \$10.43 million, was more than double the \$5.14 million of the same quarter last year, primarily resulting from the addition of the Star2Star business.

The derivation of Adjusted EBITDA and the reconciliation of net income to Adjusted EBITDA for the quarter is shown in the table below.

US\$ Thousands	Three months ended	
	December 31, 2021	December 31, 2020
Net income (loss)	(2,477)	1,772
Tax	130	653
Interest expense (net)	597	372
Share-based compensation	2,333	130
Depreciation of property and equipment	541	151
Depreciation of right-of-use assets	756	596
Amortization of intangibles	7,643	1,466
Exchange listing expense	1,051	-
Business acquisition costs	-	1
Change in fair value of consideration payable	(143)	-
Adjusted EBITDA	10,431	5,141
Percentage of revenue	19.2%	19.0%

QUARTERLY RESULTS TRENDS

Sangoma's quarterly revenue has now exceeded the same period in the prior year for each of the last twenty-five quarters. Selected financial information over the prior 8 quarters is shown in the table below.

Sales and Net Income by Quarter

US\$ Thousands	Third quarter 2019-2020	Fourth quarter 2019-2020	First quarter 2020-2021	Second quarter 2020-2021	Third quarter 2020-2021	Fourth quarter 2020-2021	First quarter 2021-2022	Second quarter 2021-2022
Sales	\$26,998	\$25,133	\$26,223	\$27,087	\$27,952	\$50,121	\$52,479	\$54,236
Gross Profit	\$17,449	\$16,341	\$17,315	\$17,930	\$18,315	\$35,885	\$37,853	\$39,403
Expenses	\$14,942	\$14,171	\$14,767	\$15,131	\$15,755	\$37,778	\$38,707	\$40,244
Adjusted operating income (loss)	\$2,507	\$2,170	\$2,548	\$2,799	\$2,560	\$(1,893)	\$(854)	\$(841)
Net income (loss)	\$1,263	\$1,899	\$1,580	\$1,772	\$(1,779)	\$(1,290)	\$(2,301)	\$(2,477)
Net earnings (loss) per share								
Non-diluted basis	\$0.120	\$0.177	\$0.111	\$0.112	\$(0.112)	\$(0.041)	\$(0.073)	\$(0.078)
Fully diluted basis	\$0.115	\$0.177	\$0.109	\$0.110	\$(0.112)	\$(0.041)	\$(0.073)	\$(0.078)
Adjusted EBITDA	\$4,843	\$4,464	\$4,946	\$5,141	\$5,346	\$9,615	\$10,093	\$10,431

SUMMARY OF RESULTS FOR YEAR TO DATE FISCAL 2022

Sales

Sales for the six months ended December were \$106.71 million, double that of the \$53.31 million in the same period of fiscal 2021 ended December 31, 2020.

The increase primarily resulted from the Star2Star acquisition continuing to contribute to sales, as well as our existing Services business continuing to grow and compound, together with an uptick in the Product business. Overall, our Services revenue as a percentage of total revenue was at 70% in the first six months of fiscal year 2022 compared to 56% in the same period of fiscal year 2021.

Cost of sales and gross profit

The cost of sales for the six month period ended December 31, 2021 was \$29.46 million compared to \$18.07 million for the same period of fiscal 2021, reflecting the global supply chain pressures and the additional costs associated with the addition of the Star2Star business. Sangoma's COGS has been impacted by the COVID-19 related supply chain pressures, for both electronic components and for shipping. In some cases, Sangoma has needed to order further ahead, pay more for electronic components, and to ship product by air versus by sea (at higher cost). Nevertheless, Sangoma was able to fill most customer orders in the second quarter, and still meet our gross margin expectation, despite these supply chain pressures.

Gross profit for the six month period of fiscal 2022 was \$77.26 million, more than double the \$35.24 million realized in the first six months of fiscal 2021. Gross margin for the first six months was over 72% of revenue, up from 66% in the same period in fiscal year 2021. This is driven primarily by higher margins attributable to Star2Star revenues, the larger fraction of revenue coming from higher margin services year over year, all partly offset by the supply chain pressures described above.

Operational expense

As permitted under IFRS, costs are allocated by function except for the impact of foreign exchange, which can result in material swings between time periods.

Sales and marketing

Sales and marketing expense was \$27.33 million for the first six month period of fiscal 2022, significantly higher than the \$7.96 million for the same period of fiscal 2021. This increase was primarily the result of the addition of the Star2Star sales team, the incremental marketing staff, the accompanying marketing program spend, and the channel partner commissions. Sangoma is growing sales and marketing investment in absolute dollars, to help drive growth, while controlling total operating expense as a percentage of revenue.

Research and development

A portion of the Company's R&D costs are capitalized each period and amortized on a straight-line basis over three years (see the audited consolidated financial statements and related notes for the fiscal year ended June 30, 2021 available at www.sedar.com).

The engineering expenses incurred, and the development costs amortized during the six months ended December 31, 2021 were \$16.12 million or approximately 15% of sales, higher than the \$8.78 million in the same period last year, mostly as a result of the addition of Star2Star.

General and administration

General and administration expenses were \$35.41 million for the six months ended December 31, 2021 compared to \$13.17 million over the same period ended December 31, 2020. The increase is primarily due to the addition of the Star2Star team and the non-cash expense of the additional amortization of the intangible assets acquired.

Foreign exchange

There were no material foreign exchange gains or losses in the six months ended December 31, 2021 and 2020.

Total expenses

Total operating expense for the first six months of fiscal 2022 was \$78.95 million versus \$29.90 million during the same period last year. The primary driver of the increase was the incremental expense associated with the addition of the Star2Star business and the company's continuing investments to drive growth.

Adjusted Operating Income (Loss)

Adjusted Operating loss for the six months ended December 31, 2021 was \$1.70 million, compared to the \$5.35 million profit in the same period last year, again affected by the addition of Star2Star and the incremental amortization of intangible assets.

Interest

Net interest expense for the six months ended December 31, 2021 was \$1.25 million, higher than the \$0.76 million in the same period last year, as a result of new debt from the acquisition of Star2Star.

Business acquisition and integration costs

During the six months ended December 31, 2021, the Company incurred \$0.84 million in integration costs related to the Star2Star acquisition.

TSX and Nasdaq fees

During the six months ended December 31, 2021, the Company graduated from the TSX Venture exchange and commenced trading on the TSX on November 1, 2021 and Nasdaq on December 16, 2021. A one-time \$1.05 million expense associated with the listing was incurred.

Consideration payable

During the six months ending December 31, 2021, the change in fair value of consideration payable resulted in a loss of \$0.10 million.

Net income (loss)

Net loss for the six months ended December 31, 2021 was \$4.78 million (\$0.151 loss per share fully diluted), compared to a net income of \$3.35 million (\$0.219 earnings per share fully diluted) for the equivalent period ended December 31, 2020.

Adjusted EBITDA

For the first six month period of fiscal 2022, Adjusted EBITDA at \$20.52 million, was more than double the \$10.09 million of the same period last year, primarily resulting from the addition of the Star2Star business.

The derivation of Adjusted EBITDA and the reconciliation of net income to Adjusted EBITDA for the six month period of fiscal 2022 and fiscal 2021 is shown in the table below.

US\$ Thousands	Six months ended	
	December 31, 2021	December 31, 2020
Net income (loss)	(4,778)	3,352
Tax	(162)	1,233
Interest expense (net)	1,253	760
Share-based compensation	4,452	284
Depreciation of property and equipment	984	304
Depreciation of right-of-use assets	1,486	1,222
Amortization of intangibles	15,298	2,931
Business integration costs	836	-
Exchange listing expense	1,051	-
Business acquisition costs	-	1
Change in fair value of consideration payable	104	-
Adjusted EBITDA	20,524	10,087
Percentage of revenue	19.2%	18.9%

LIQUIDITY

As of December 31, 2021, Sangoma had current assets of \$54.02 million, current liabilities of \$50.90 million, and closed the second quarter with \$16.95 million of cash.

Sangoma generated \$3.90 million of Adjusted Cash Flow from operations during the second fiscal quarter of 2022 ended December 31, 2021, compared to \$4.87 million in the same quarter last year. For the first six months of fiscal 2022, on a year-to-date basis, Sangoma generated \$9.06 million, compared to \$7.88 million in the same period last year. The reconciliation of net cash flows from operating activities to Adjusted Cash Flow for the three and six month periods ended December 31, 2020 and 2021 is shown in the table below.

	Three month periods ended December 31,		Six month periods ended December 31,	
\$ Thousands	<u>2021</u>	<u>2020</u>	<u>2021</u>	<u>2020</u>
Net cash flows from operating activities	2,645	4,903	6,653	7,885
Less capitalization of development costs	(394)	(403)	(736)	(766)
Interest expense (net)	597	372	1,253	760
Business acquisition costs	-	1	-	1
Exchange listing expense	1,051	-	1,051	-
Business integration costs	-	-	836	-
Adjust cash flow from operations	3,899	4,873	9,057	7,880

Accounts receivable of \$15.98 million on December 31, 2021 were slightly higher than the \$14.73 million on June 30, 2021.

Inventories were \$14.34 million on December 31, 2021, \$2.52 million higher than as at June 30, 2021, reflecting the supply chain pressures described earlier. Sangoma expects this elevated inventory level to continue for the next few quarters until the supply chain stabilizes.

There are no existing or anticipated defaults or arrears on lease payments or interest payments and Sangoma is in full compliance with all debt covenants. Management of the Company believes that the current working capital and expected funds generated from operations will be sufficient to meet the operating and planned capital expenditures of the Company for the foreseeable future.

CAPITAL RESOURCES

There are no material commitments for capital expenditures at this time.

CONTRACT LIABILITIES

The following table shows the movement in Contract Liabilities:

	\$
Opening balance, June 30, 2020	10,820,098
Revenue deferred during the year	19,775,691
Deferred revenue amortized into income during the year	(20,374,484)
Additions through business combinations	5,532,426
Ending balance, June 30, 2021	15,753,731
Revenue deferred during the period	19,803,663
Deferred revenue amortized into income during the period	(21,780,229)
Ending balance, December 31, 2021	13,777,165
Contract liabilities - Current	9,451,854
Contract liabilities – Non-current	4,325,311
	13,777,165

USE OF PROCEEDS FROM EQUITY FINANCINGS

As of the date of this MD&A, there has not been, and the Company does not anticipate, any changes to its previously made disclosure about the Company's intended use of proceeds from the Offerings.

Offering	Previously Disclosed Proposed Use of Proceeds	Actual Use of Proceeds and Explanation of Variances
Prospectus Supplement dated July 24, 2020 to the Short Form Base Shelf Prospectus Dated June 29, 2020	The Company intends to use net proceeds of the Offering for future acquisitions, with any unused net proceeds to be used for working capital and other general corporate purposes, including to reduce debt. The Company will have discretion in the actual application of Net Proceeds.	Substantially all of the proceeds were used in the Company's acquisition of StarBlue Inc. and its wholly-owned operating subsidiary Star2Star Communications, LLC completed on March 31, 2021.

OFF-BALANCE SHEET ARRANGEMENTS

There are no off-balance sheet arrangements that have, or are reasonably likely to have, a current or future effect on the results of operations or financial condition of Sangoma.

RELATED PARTY TRANSACTIONS

Except as disclosed in the notes to the consolidated financial statements, the Company is not party to any material transactions with related parties.

PROPOSED TRANSACTIONS

None.

FINANCIAL INSTRUMENTS AND OTHER INSTRUMENTS

The fair values of the cash and cash equivalents, trade receivables, contract assets, other current assets, accounts payable, accrued liabilities, consideration payable and derivative liability approximate their carrying values due to the relatively short-term nature of these financial instruments or as these financial instruments are fair valued at each reporting period. The fair values of operating facility and loans approximate their carrying values due to variable interest loans or loans at market rates.

OUTSTANDING SHARE DATA

As of February 10, 2022, there were 19,061,208 issued and outstanding common shares of Sangoma, with a further 12,695,600 shares to be issued in accordance with the terms of the StarBlue acquisition, and as of the same date there were outstanding options to acquire 1,705,559 common shares. The share and options counts reflect the 7:1 share consolidation that came into effect on November 2, 2021. In accordance with the International Financial Reporting Standards (“IFRS”), the change has been applied retrospectively.

SIGNIFICANT EVENTS

COVID-19:

In December 2019, there was a global outbreak of COVID-19 (coronavirus), which has had a significant impact on businesses through the restrictions put in place by the national, provincial and municipal governments around the world regarding travel, business operations and isolation and quarantine orders. At the commencement of the COVID-19 pandemic, Sangoma was designated as an essential business in many of the jurisdictions in which it operates and continued to receive factory shipments and make deliveries to customers around the world throughout fiscal years 2020, 2021, and 2022.

As indicated in previous business updates, there continues to be uncertainty regarding the full impact, duration and pace of recovery from the COVID-19 pandemic on Sangoma’s operations and markets. While these effects are mitigated through vaccinations, the effectiveness of vaccines against variant strains of COVID-19 (including the Delta and Omicron variants) and the severity of variant strains, the duration of the various disruptions to businesses locally and internationally and the related financial impact cannot be reasonably estimated at this time.

In addition to the varying government responses in each of the countries that Sangoma operates in, there have been global electronic component supply shortages with associated higher prices, longer lead times for the supply of both components and finished goods, delays in and increased cost of shipping the company’s products to its warehouses and customers. Sangoma has responded though seeking to lock in component supply for as far out as is possible but remains dependent on these components being delivered in the agreed quantities and timelines. As a result, Sangoma has needed to use more air freight than it normally would to get products into its warehouses in order to meet customer demand.

Going forward, the COVID-19 pandemic's impact on the continuing recovery of the global economy; the Company's manufacturing, labour and shipping costs; global exchange rates; Company's customers' business operations; the availability and costs of components required by the Corporation for the production of its products; the Company's manufacturers and supply chain delivering the required quantities of finished products on schedule; the continued ability for the Company's operations employees to work at the Company's internal and outsourced facilities; and other employees being able to work from home as required without any material impact on productivity remains uncertain.

The outbreak of the novel strain of coronavirus, specifically identified as "COVID-19", has resulted in governments worldwide enacting emergency measures to combat the spread of the virus. Government Canada and the Bank of Canada have responded with significant monetary and fiscal interventions designed to stabilize economic conditions as temporary measures and one of them is the Canada Emergency Wage Subsidy (CEWS). The CEWS program offers assistance in the form of wage subsidy for qualifying businesses faced with specified levels of revenue decline, and the subsidy is targeted to either retain workforce on payroll or to re-hire furloughed employees. The CEWS program is applicable from March 15 to December 19, 2020 for eligible entities that experienced a reduction in gross revenue for the period as determined by the program. The Company received \$nil under the CEWS for the three and six month periods ended December 31, 2021 (three and six month periods ended December 31, 2020 - \$nil and \$106,899, respectively) which was recorded as an offset against salaries and wages in operating expenses in the condensed consolidated interim statements of income (loss) and comprehensive income (loss).

Stock Exchange Transition:

During the quarter, Sangoma graduated from the TSX Venture Exchange to the Toronto Stock Exchange on November 1, 2021 and on December 16, 2021 cross listed and commenced trading on the Nasdaq Global Select Market exchange under the trading symbol SANG representing a major milestone in the Company's development.

Share Consolidation (reverse stock split):

On November 2, 2021, the Company implemented a consolidation (the "reverse stock split") of its outstanding Common Shares on the basis of one new Common Share for every seven currently outstanding Common Shares (the "Consolidation Ratio"). At the special meeting of the Company's shareholders held on September 23, 2021, the Company's shareholders granted the Company's Board of Directors discretionary authority to implement a consolidation of the issued and outstanding common shares of the Company on the basis of a consolidation ratio of up to 20 pre-consolidation common shares for one post-consolidation common share. The Board of Directors selected a share consolidation ratio of seven pre-consolidation common shares for one post-consolidation common share. The Company's common shares began trading on the TSX on a post-consolidation basis under the Company's existing trade symbol "STC" on November 8, 2021. In accordance with International Financial Reporting Standards ("IFRS"), the change has been applied retrospectively.

The reverse stock split did not cause an adjustment to the par value or the authorized shares of the common stock. As a result of the reverse stock split, the Company further adjusted the share amounts and exercise prices under its option plans and outstanding options.

IAS 33 Earnings per Share (paragraph 64) requires retrospective restatement of earnings per share

for a reverse stock split that occurs subsequent to the balance sheet date but before the date of authorization of the statements. As a result, all disclosures of common shares, per common share data and data related to options in the accompanying condensed consolidated interim financial statements and related notes reflect this reverse stock split for all periods presented.

POST REPORTING EVENTS

None.

GUIDANCE

Based upon the results for the second quarter, and upon the assumptions outlined below, Sangoma is increasing guidance for its fiscal year 2022. Prior guidance for this year, as disclosed in the MD&A for the first quarter of fiscal 2022 dated November 12, 2021, had been for revenue of between \$209 and \$213 million, and Adjusted EBITDA in a range of \$41 to \$43 million. The Company now expects revenue of between \$215 and \$219 million, and Adjusted EBITDA of \$42 to \$44 million, for fiscal 2022.

The above outlook and modified guidance constitute forward-looking information and are based on the Company's assessment of many material assumptions, including:

- The continuing revenue trends the Company has experienced in the fiscal year to date
- The continuing recovery of the global economy, decreased government restrictions, and increased customer demand as a result of COVID-19
- The successful integration of the Star2Star business and such business continuing to operate and generate results in a manner consistent with its business preceding its acquisition by the Company
- There being continuing growth in the global UCaaS and cloud communications markets more generally
- There being continuing demand and subscriber growth for the Company's cloud offerings
- Changes in global exchange rates do not disrupt demand for the Company's Products and Services
- The ability of the Company's customers to continue their business operations without any material impact on their requirements for the Company's Products and Services
- The Company's forecasted revenue from its internal sales teams and via channel partners will meet expectations, which is based on certain management assumptions, including continuing demand for the Company's products and services, no material delays in receipt of products from its contract manufacturers, no material increase to the Company's manufacturing, labour or shipping costs
- There being no material further increase to the Company's cost of goods sold
- The Company's manufacturers and supply chain delivering ongoing quantities of finished products on schedule
- That the Company can continue to secure electronic components and parts to support a largely uninterrupted supply chain
- That the Company is able to attract and keep the employees needed to maintain the current momentum
- The continued ability for the Company's operations employees to work at the Company's internal and outsourced facilities
- Other employees being able to work from home as required without any material impact on productivity

ADDITIONAL INFORMATION

Additional information relating to the Company is filed on SEDAR at www.sedar.com.

GLOSSARY OF TERMS

Analog

Analog telephony is the telephone system that dates back to the original experiments by Alexander Graham Bell. The voice signal is picked up by a microphone and transmitted to the central office. Voice signals from the central office consist of voltages that drive a headset to produce sound. Analog means that the voice pressure signals are represented by voltages levels on the line.

API

Application Program Interface: An API is a purpose-built interface that allows fourth party software to interact with a particular application. A typical API is the user interface for Windows that allow programmers to write programs for Windows that use all its built-in utilities. APIs do not depend on revealing source code, in general. They are usually well documented and include sample programs that make development easy.

Codec

In the telephony context a codec is a mechanism of digitally encoding voice. On the PSTN a voice channel takes up 64kbps in a codec standard called G.711. Cell phones use a codec called GSM that compress the voice further so that a GSM call consumes about 24kbps. Other compressed codecs are used in VoIP to conserve bandwidth. These include standards such as G.729, G.723. Most audio codecs are lossy, in that some of the voice quality is degraded by the compression. On the other hand, as bandwidth becomes cheaper, VoIP allows one to use other codecs that in fact use more bandwidth than the PSTN, the so-called broadband codecs that have DVD-like voice quality.

Digital telephony

In the modern PSTN only the “last mile” line to the customer is still analog, all other internal parts of the network are digital. Digital in this case means that at the central office the analog signal from the subscriber’s telephone is sampled digitally, converting the line voltages to a series of numbers that can be easily transmitted error free over long distances. See T1, E1 below.

DID

Direct Inward Dialing (“DID”) is a virtual phone number that uses the existing phone lines to route incoming calls. Callers can connect to a phone extension directly without an operator. This offers convenience for both employees and callers alike. DID offers a cost saving on its own, and is less expensive when purchased with a SIP trunk.

Gateway

In the telephony context this is typically a separate unit with its own case and power supply that provides VoIP-to-PSTN services for a VoIP network. Almost all gateway devices use SIP interfaces to the VoIP system over Ethernet and have analog or digital telephony interfaces that connect to the PSTN. VoIP gateways are available from many manufacturers including Audiocodes, Cisco, Grandstream, Patton Electronics and many others.

ISDN

Integrated Services Digital Network (“ISDN”) is a set of communications standards for simultaneous digital transmission of voice, video, data, and other network services over the traditional circuits of the public switched telephone network. Of the many variations of ISDN, Sangoma supports BRI (Basic Rate Interface) which is essentially an all-digital replacement for ordinary analog lines and PRI (Primary Rate Interface) which is used over T1 and E1 lines. BRI is very popular outside of North America. PRI is used worldwide.

IoT

Internet of Things (“IoT”) refers to a system of interrelated, internet-connected objects that are able to collect and transfer data over a wireless network without human intervention.

IP

The Internet Protocol (“IP”) is the primary protocol in the internet layer of the Internet protocol suite, and delivers data packets from the source host to the destination host solely based on the IP address.

ISP

Internet Service Provider

ITSP

Internet Telephony Service Provider who offer telecommunications service including voice over internet type connections.

IVR

Interactive Voice Response: IVR systems use the phone to navigate a menu, for example those used by banks to allow access to customer's account information. IVR systems have typically been driven by dial tones as the buttons on your phone are pressed, but increasingly they are using voice recognition for navigation.

Open Source

Open Source software is distributed free subject to certain conditions. Open Source licenses usually stipulate that source code must always be distributed or made available, and any improvements in the code have to be donated back to the community. It is possible to have dual licensing: Open Source to the community and also a closed, commercial license of the same or similar software.

NetBorder

This is the trade name of a Sangoma SIP to PSTN gateway product. It includes several other functions in addition to the PSTN gateway function. The mass marketed version is known as NetBorder Express or NBE.

PBX

Private branch exchange. A PBX is a premised basis device to deliver calls from the PSTN or VOIP network to phones in a single or multiple locations.

PSTN

Public Switched Telephone Network: This is the standard telephone network that has been in operation for many decades. A telephone or FAX or PBX or other telephony device is generally connected to an analog line at a wall plug, which is connected by "last mile" cabling to the central office. The analog signal from the device is converted to a digital signal at the Telco central office and is multiplexed, 24 simultaneous voice channels per line (in North America) onto a T1 for onward transmission. At the other end of the line the digital channel is reconverted to analog for transmission over the "last mile" to the receiving phone or other device.

SBC

A Session Border Controller ("SBC") is a device deployed in Voice over Internet Protocol ("VoIP") networks to exert control over the signaling and usually also the media streams involved in setting up, conducting, and tearing down telephone calls or other interactive media communications. SBCs are deployed as demarcation points between enterprises and service providers and between service provider networks.

Signalling

Call setup and tear down is remarkably complicated, involving such things as responding to the different tones as well as generating them, caller identification and handling the different features like hook-flash and voicemail properly. There are different signalling mechanisms for different types of circuits. Analog circuits use tones such as out-of-order, busy, ringing as well as the dialling tones. T1 lines often use a data protocol called ISDN PRI, where packets of control data are exchanged on a separate data channel. ISDN PRI is a simplification of the general signalling protocol used internally by the telecommunications networks known as SS7. In all cases signalling has to be exactly compatible with what the Telco expects, so interoperability and standards are important.

SIP

Session Initiation Protocol: SIP is the emerging standard signalling protocol for VoIP, though it has much broader applications. SIP is responsible for setting up and teardown of two party and multiparty calls, as well as a host of management features. To a great and increasing extent, VoIP calls are SIP based. The term SIP Trunk is used to describe the provision of a SIP line to an end customer.

T1, E1

A T1 line is a circuit that carries 24 digital telephone calls simultaneously. At higher densities, 28 T1s are aggregated into a T3 line carrying 672 calls. Larger offices can also connect to the central office via T1 directly, so as to have only one circuit for up to 24 calls. T1 is standard in North America and Japan while E1 is the standard in the rest of the world. E1 carries 30 channels of digitized voice per line.

TDM

Time Division Multiplexing ("TDM") is used in circuit switched networks to increase the number of calls carried simultaneously on any one circuit and formed the basis for the digital telephony networks.

Unified Communications

Unified communications is a concept in which voice, email, messaging, video and any other type of communication are all considered forms of data that can be combined, manipulated and used in intelligent applications in a seamless way.

VoIP

Voice over IP: The transfer of voice traffic over the Internet Protocol. IP is used universally for all networking including local area networks and private networks, not just the Internet. VoIP is not necessarily voice over the Internet, but voice over general data networks.