VASTECH PROFILE

VERSION 1

VASTech ME (Ltd)

Tel: +971 (4) 222 0780, Fax: +971 (4) 228 4811

Website www.vastech.co.za, Email info@vastech.co.za

Postal Address:	**Physical Address:**
P.O. Box 101	Al Maidan Tower II
Dubai	Suite 204
UAE	Al Maktoum Street
	Dubai
	UAE

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1 VASTECH OVERVIEW

1.1 Introduction

VASTech (Value-Added Services Technologies) is a specialised telecommunications equipment and solutions provider that was established in 1999 and is focussed on the design, manufacture and distribution of ultra-high capacity passive surveillance solutions government intelligence agencies.

The company augments it core competence with selected third party products to offer very large, powerful and sophisticated solutions to intelligence agencies.

Our products are deployed in many countries and various regions in the world, including the EU, Eastern Europe, Middle East, Africa and Asia Pacific.

The majority of our staff was employed in the digital recording industry with some coming from the intelligence fraternity before joining VASTech. Our experience in interception and monitoring spans 20 years as VASTech was born out of DataVoice who manufactured interception and monitoring equipment since 1987 and laid the foundation for the development of our latest platform, codenamed ZEBRA.

ZEBRA is a unique system utilizing open architecture computer and storage platforms with our own 3rd generation packet based recording technology.

VASTech's Development facilities are situated close to Cape Town and our commercial headquarters are in Pretoria, South Africa.

We sell our products into the EMEA, Pacific Rim and Far East markets through a two tier marketing approach. Tier one is for OEM and alliance partners such as Nokia Siemens Networks GmbH & Co. KG and Spectronic Denmark A/S. Tier two is serviced by a combination of in-country resellers and regional subsidiaries to ensure closer proximity to our customer base for after sales service and support. In this case our proposal is submitted by VASTech ME.

1.2 Our Track Record

Although VASTech started in 1999, we have a proud track record going back to 1987 due to VASTech buying the monitor centre line of business including products and customer base and employing former staff from a well known manufacturer of monitor centres and digital voice recorders. The products that preceded the ZEBRA range belongs to VASTech and are still running in many places around the globe.

Our previous generation product for interception and monitoring, are collectively referred to as the VASTech Monitor Centre Solution. The VASTech Monitor Centre Solution, using 2nd generation stand alone digital recorders and TDM switching technology, was a world-class product and is the result of many hundreds of collective man-years of hardware and software development since 1987.

The total suite comprised of switching matrixes, protocol analysers, CIC mapping tools, recording controllers, recorders, a central database and multiple playback stations. Add to that various front-end modules for the different network technologies used by Inmarsat, Intelsat, GSM and Fixed Line networks and it becomes clear that the system was complex as it catered for diverse inputs, yet presented the operator with a single point of access to all information.

VASTech's new ZEBRA range is a result of innovation backed by experience and expertise gained over many years in the interception and recording arena.

Most of our engineering & management staff previously worked in the interception or recording industry and collectively we have experience across the whole spectrum of recording applications. For example, our engineers have been involved in the development and installation (in the USA) of the first Cisco AVVID Voice over Internet Protocol (VoIP) recording platforms, whilst others worked under contract for some of the largest telecommunication companies in the world on recording technologies.

Most of our old installations were for applications with capacities up to 256 x Bi-directional E1 streams (or 7,680 concurrent voice channels). Since the launch of Zebra, installations increased in capacity to systems in excess of 1,000 E1 streams and today we have several large installations with storage capacities in the Petabyte range.

1.3 Our Management Team

Frans Dreyer, our founder and chief executive officer, successfully managed two previous telecommunications companies that were active in value-added services such as voice mail, SMS Centres and call centres before he started VASTech. He holds degrees in commerce and law.

Marius Ackerman, our technical director, heads-up the research and development team consisting of highly qualified and very experienced hardware and software engineers. Marius has extensive experience in product development in both voice and data networks and headed the team that developed the world's first Cisco AVVID VoIP recorder. He holds a masters degree in computer science.

Andre Scholtz, our sales and marketing director is responsible for the distribution of our products and to expand our business. Andre holds BSc (Electro technical); BCompt and MBA degrees.

Anton Matthee is responsible for operations such as installation, commissioning and customer support. Anton holds a BSc Electrical Engineering degree and started his career working for a fixed line network operator. Later in his career he worked for a company that supplied voice mail and other IN platforms to Telco's. Because he gained such a wealth of experience Anton started doing special projects for various telephone companies on revenue assurance, tariff balancing and billing systems.

VASTech employs 50 people of whom at least 40 are engineering and technical staff. Collectively we have hundreds of years of experience in hardware and software development, telecommunications networks and recording technologies.

1.4 Our offering

Drawing from our many years of experience and today's soft switch technologies, VASTech proudly presents its new-generation monitor centre architecture for intelligence agencies.

Zebra is a modular, ultra-high capacity network recording system that may be deployed in clustered and geographically distributed locations. It is software centric, runs on standard servers and scales effortlessly to record and store billions of voice and data sessions.

Legacy systems capture only a small percentage of calls available on the networks due to throughput limitations. Zebra records all the connected traffic for pre-emptive insights and detailed relationship studies.

The intercepts from different networks and geographical sites are stored and metadata collated centrally to present a detailed intelligence view. Tools for language recognition, topic spotting and gender identification can easily be realized to automate analysts tasks.

Zebra is a versatile design with seamless expansion capabilities for today's challenging environments.

2 PRODUCT OVERVIEW

2.1 Zebra

Modern communication networks are migrating from traditional E-carrier to fibre optic carrier systems and packet networks. VASTech' new generation monitor centre was designed on exactly this premise. We have decided to name this product Zebra, because it's so different. '*A horse of a different colour'* one might say.

The VASTech Zebra is a highly scalable, high capacity network interception system. Its modular architecture allows Zebra to intercept terrestrial or satellite TDM, VoIP and other types of communication networks in one system. It supports different interfaces alike, so that circuit and packet switched networks may co-exist in one suite.

The ZEBRA architecture departs from its predecessors in a number of significant ways:-

- Ethernet is used as the common and only switch fabric for the system
- Digital signal processing on commercial off the shelf platforms. Current servers are powerful enough to perform the digital signalling processing required
- Network-based storage – by assuming a network-based storage interface we allow storage mechanisms to be changed transparently e.g., NAS or SAN. This is necessary when scaling up to very large systems as it allows storage consolidation and reduces floor space
- Network-specific media gateways reduce the complexity of the unified recording control of earlier systems. They also result in scalable and flexible system configuration by decoupling unrelated network types
- The data warehousing approach allows the real-time front-end to scale unencumbered by the back-end. It further allows the back-end to be configured without performance implications on the front-end. This enables true distribute ability and scalability

A Zebra system consists of the above components. The system scales up by adding more of these components depending on capacity requirements.

One or more media gateways are assigned for each network interface type, for example E1, DS3, E3, STM1, STM4, OC3 etc. Media gateways are the interface between the telephony world and the computer world to the extent that they use different protocols and interfaces. The rest of the recording and storage process is performed in software. Standard computer hardware, operating systems (Windows and Linux) and databases (MS SQL server) are used.

Software modules can of course be distributed as may be required for throughput, redundancy and geographical distribution. The major benefit is that ZEBRA can effortlessly scale from 240 channels to 3 million simultaneous recording channels.

The ZEBRA can connect passively or actively to E1/T1, E3/DS3, Fibre and VoIP carriers encountered in terrestrial and satellite networks. Lawful Interception solutions typically require active connections.

Intercepts from all these different network types are stored and processed in one system, where they are automatically processed to extract voice, fax and Internet sessions.

The metadata or intercept related information (IRI) is stored in an industry standard database (MS SQL). ZEBRA automatically collates intercepts from different sites or systems in a data warehouse for further processing by intelligence extraction tools.

Because this repository stores information from different front-end sources in an integrated way, querying and analysis can be performed uniformly with a system wide perspective. This makes it far easier and more efficient to run queries over data that originated from different sources.

Key advantages of this approach include:

- Complex queries can be executed easily and efficiently
- One data model and query language may be used by operators
- It isn't necessary to perform query optimization over different sources or multiple autonomous platforms at different locations
- Information is under the control of the administrator and can be stored safely and reliably for as long as necessary
- One integration point for analysis and workflow packages such as I2 Analyst etc

Software tools for fax and modem demodulation, optical character recognition, word spotting, language recognition, speaker and gender identification can easily be incorporated.

The ZEBRA offers a user station for sites where sophisticated back ends are not implemented. From workstations users can search and directly retrieve intercepts.

The time of intercept, source and numbers of all types of intercepts are presented in this graphical user interface. The operator can filter on the attributes of all intercepts using the same controls.

Fax and dial-up internet recordings are automatically processed (demodulated) and the output presented in the same format as seen by the target. This allows operators to focus on the task at hand, rather than utilize valuable time extracting or managing data.

2.2 Architecture and positioning

2.2.1 Multiple Interception Sites & Network Types

Figure 1 shows a system configuration with multiple networks, some SS7 and some H.323 intercepted at different geographical locations. A single back-end is configured to provide users with a unified view.

This type of configuration is expected to be used in configurations of size up to the equivalent of approximately 1000 E1s in a single system.

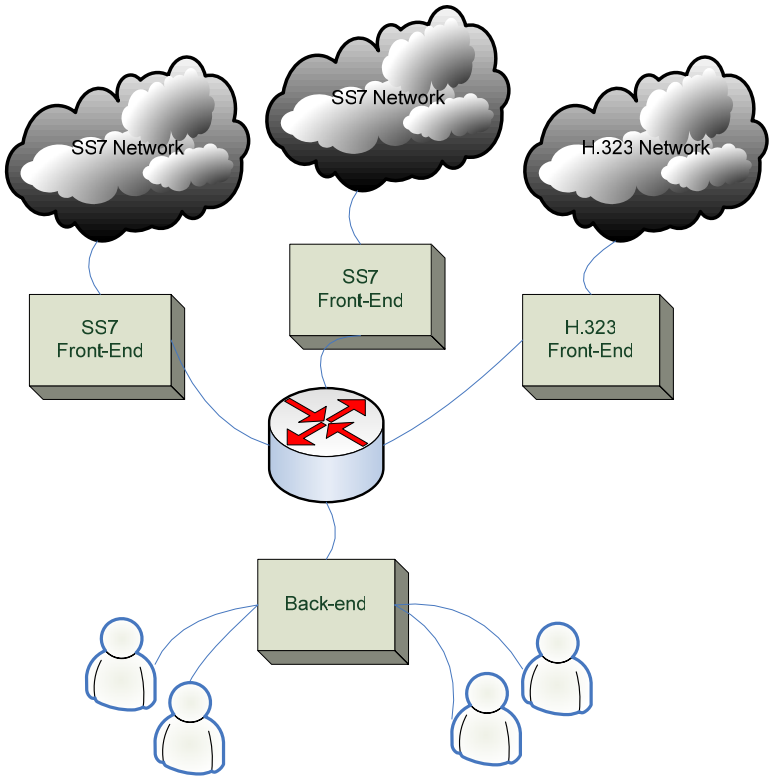

Figure 1 Multiple front ends & network types

2.2.2 Multiple front-ends & multiple back-ends

Figure 2 shows a system with multiple front-ends and multiple back-ends. Each back-end gives its user group a unified view of one or more front-ends, possible of different technologies. It may be possible to configure overlapping user groups although this is not currently expected.

This configuration is expected in large interception systems of size comparable to multiples of 1000 E1s. Such interception systems and its user groups are most likely to be distributed geographically.

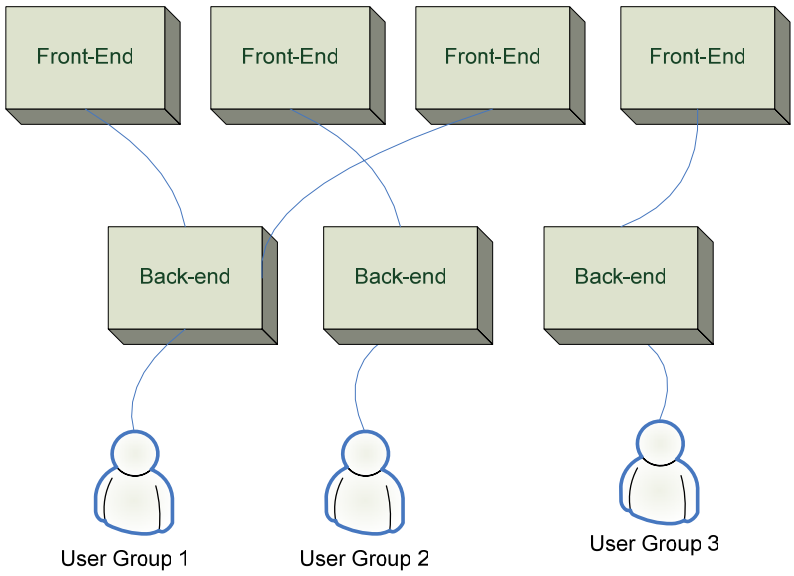

Figure 2 Multiple front & back-ends

2.2.3 Distributed Capture Units

The Zebra system supports many different configurations of distribution. The following are some examples.

Figure 3 shows a central site with remote front-ends. All users work at the central site. Intercepts of interest captured at the remote sites are propagated to the central site where they are available to users and integrated processes.

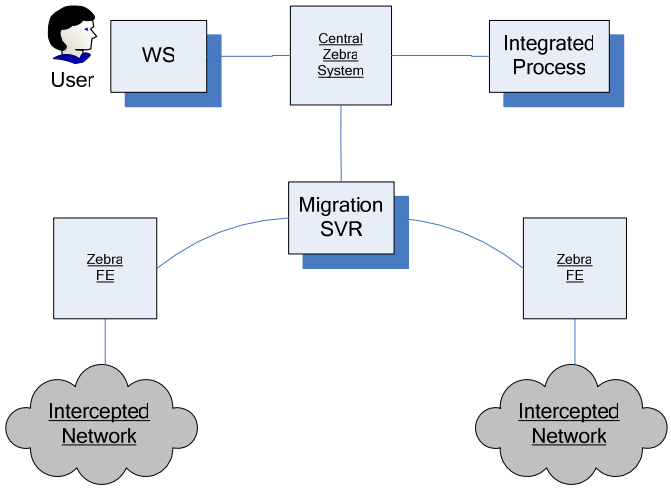

Figure 3 Central site with remote front-ends

Figure 4 shows a system with remote front-ends. Users at the central site also access one of the remote sites directly via the WAN, while the other remote site has its own set of users.

Users and processes at the remote site can only see data at that site, while users and processes at the central site have access to the data at all the sites.

All access to data is subject to access control.

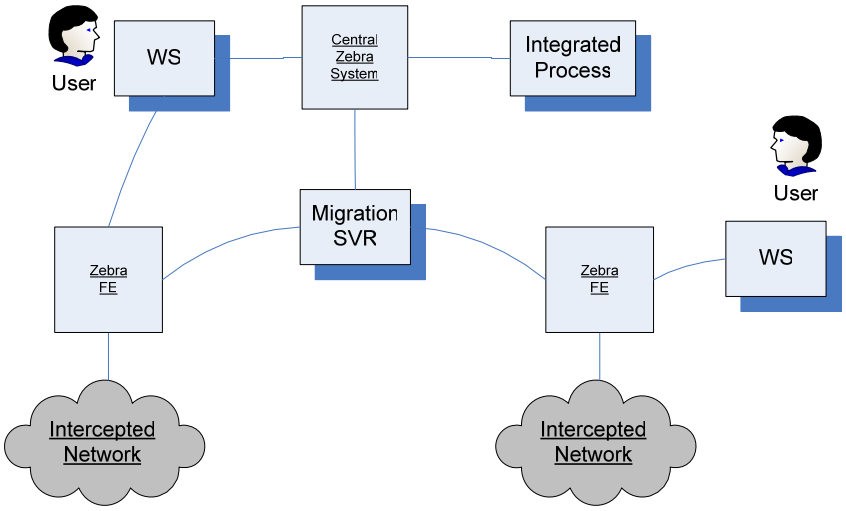

Figure 4 Remote front-end with users

2.2.4 Split intercept recombination

In a distributed Zebra system is possible to capture both halves of an intercept between two parties in separate satellite spot beams. This is achieved by having a Zebra capture unit or front end in each spot beam, as shown below. When both mono intercepts are propagated to a common Zebra BE, it becomes possible to combine the two halves into a single complete intercept.

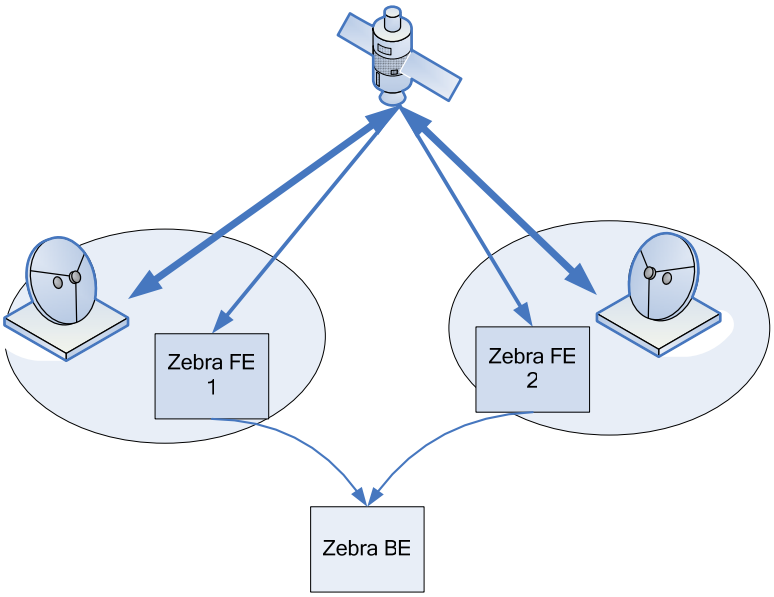

Figure 5 Combining split intercepts

The Zebra is able to match channels and automatically generate a CIC map for channels that are split between two capture units. The system automatically combines two mono recordings that were made on paired channels in separate capture units. The IRI of the combined intercepts will indicate both front ends in its source system id.

2.3 Benefits

Zebra offers distinct advantages over 2nd generation technologies such as our previous DVX2000 based monitor centre. From a technology strategy point of view, it ensures seamless upgrade and expansion into the future, catering for TDM and IP traffic in capacities of up to 10,000 stereo E1 streams.

Zebra has an extremely small footprint with a small component of high density hardware. The product is software centric and uses commercial off-the-shelf Intel based processors. The only custom hardware is the gateway that connects to input signals. The gateway serves as the interface between the telephony and computer domains.

If the need arises to incorporate new protocols and signals only the electrical interface has to be accommodated for in hardware. Copper streams (E1) require different gateways to those on fibre optic carriers (OC3). Protocol analysis, CIC mapping, recording control and other signalling specific events are implemented in software.

Listed below are a few obvious technological advantages of ZEBRA. We are confident however that you'll discover many benefits pertinent to your very own business processes and operational requirements. Advantages realised include:

- Far less floor space required – only 3% of an equivalent second generation system, e.g. an earlier solution for 1,000 Stereo E1's would consist of 32 separate systems installed in 160 cabinets, compared to only 5 cabinets for a similarly equipped Zebra
- Commensurate lower power consumption
- Lower heat generation and therefore less air conditioning
- No proprietary skills to manage the system – certified network engineering skills will suffice
- Modern network technology
- System-wide view of intercepts vis-à-vis portioned view over separate and autonomous systems
- Industry standard computer platforms
- One technology platform for all network types
- All intercepts centrally collated
- Improved intelligence picture
- One interface for easy integration of word spotting, OCR, language & gender separation
- One architecture for circuit, packet and wireless networks
- Software based solution
- Central administration, configuration and maintenance

As the Zebra uses standard, commercial-off-the-shelf computer hardware, you benefit from Moore's law as you can implement more powerful computers as and when they become available.

2.4 Considerations Regarding the Automation of Intelligence Extraction

When VASTech introduced the power and flexibility of 3rd generation recording technology to the market, we realised that because the new technology is so much more powerful and flexible, it will impact on the way intelligence is extracted from the unprecedented volumes of potential information the new technology creates. From the outset it was clear to us that it would not be feasible for people to sift through captured data in an effort to extract intelligence value from it – the volumes would simply be overwhelming.

With the growth in broad band services the trend is towards more communication options (Applications such as internet telephony, multimedia messaging, video streaming on mobile phones comes to mind) at more frequent intervals (The tremendous growth in SMS communications is a good example) leading to even larger volumes of data.

The challenge to any intelligence agency is to identify and/or develop computer programs that can sift through captured information and identify files with a high probability of intelligence-relevant content. Once this is done, a revised workflow diagram will have to be compiled that incorporate processes and procedures to deal with intelligence-relevant content. Automating and computerising these processes will substantially reduced volume of captured data that is rich in intelligence-relevant content.

In essence, what we are saying is that we expect the requirement for analysis and extraction tools to evolve over the next few years as clients moves towards unlocking the full intelligence value of ultra-high volumes of data. Closely linked to this is that some content tools, most notably speech related tools are still maturing and one can expect significant improvements in software applications as the technology matures leading to frequently changing user requirements in sync with the availability of better tools. Our submission is therefore that it is very important to ensure that the acquired solution provides for easy integration with new tools as and when they become available. It is our further submission that VASTech's Zebra platform provides such a solution.

A more analytical view of this matter may better serve to illustrate the argument so we took the liberty to go into a more detailed analysis, described below.

All captured information consists of two broad categories of information regardless if it was a telephone call, fax transmission, SMS/MMS, internet session, e-mail or chat session etc:

- The intercept related information (IRI), sometimes also referred to as the metadata, contains all information about a specific communication and is stored in a database. A typical database can contain several hundred million entries.

- The communication content (CC) contains the actual conversation, fax, e-mail, attachment, chat session, SMS etc that was exchanged between the communicating parties and is stored in a large network attached storage system. A typical network attached storage system can be as big as 50 to 60 Terabytes.

Different applications can play a role in enhancing IRI and CC that makes automated intelligence extraction easier.

IRI can be enriched by adding information about a communication to the database:

- For voice calls, it is now possible to use computer programs to determine ①the gender and ②the biometric speaker identity of the communicating parties and ③the language used. All of these enhance the IRI.
- For fax and modem calls it is possible to demodulate/decode the call and then add the fax/modem identification, user names, passwords and a host of other information to the IRI.
- For internet browsing, internet telephony and internet chat sessions it is possible to add user names, passwords IP addresses website addresses etc to the IRI.

CC can be enriched by converting the content to machine readable format and then searching for topics, words, pictures etc.

- For voice calls, it is now possible to convert spoken words to phonetic syllables and, by using a phonetic dictionary, to search for specific words and phrases. In the near future it will be possible to convert entire conversations to text making it much easier to search for specific topics and phrases through large volumes.
- For fax calls (already implemented for some time) images are converted to text with OCR technology to make it possible to search for topics and words. The latest developments are now to highlight hit words on the original image to make it easy for users to see these words in context. This is a good example of how content can be enriched in an environment where the basic technology was implemented several years ago.
- For internet related content, programs are becoming available that can analyze pictures and classify it for example as potential child pornography etc.
- With encryption applications becoming commercially available, decrypting CC become more and more important. Decryption can be as simple as opening a password protected file to as complex as deciphering an entire files that was encrypted with strong encryption algorithms.

Once IRI and CC are enriched, a third set of programs can be used to extract meaningful intelligence from identified intelligence-relevant or intelligence bearing files. Link and relationship analysis tools can search through IRI and determine statistical relationships between parties. Geographical, spatial and timeline information can be added to this. Once these relationships are established, intelligence extraction efforts can be focused on the CC of newly identified related parties. In this way intelligence gathering becomes pro-active again as it should be.

The last step in the automation process is to present the information gathered by all the above programs to a user in a meaningful and easily digestible format.

As one can gather, the above mentioned applications and processes will be strongly influenced by the end-user. An intelligence organisation has different needs to a law enforcement agency.

Furthermore, language and dialect requirements for the Middle East region is unique therefore speech tools developed for Europe or the USA may not work equally well in the Middle East. The UAE may have already done its own developments on speech tools and the MOI may wish to use indigenous applications in these area's. Another example may be password cracking and decryption of encrypted content. Once again the MOI may prefer to use locally developed applications for these more sensitive applications. All these factors make the requirement for an open platform and flexible integration environment even more important and once again we wish to flag Zebra's open architecture and API as important decision criteria.

2.5 Other tools and Capture units

Over and above our 3rd generation Zebra capturing platform, we offer our customers a much wider variety of products that all follow the same software centric design philosophy, using as little as possible proprietary hardware and making maximum use of commercially available off-the-shelf computer hardware. The implication of this is that, although these products can function in a stand alone mode, they can easily integrate with the Zebra capturing platform to provide a single data repository for intelligence extraction tools and operators to work from. These products are:

- Software based DCME solutions for Intelsat applications including DTX240, DTX 360, DX3000, TC2000, IESS501 and Celtic 3G. DTX600 and DX7000 will be available during 2008.

- A Thuraya interception system that can intercept up to 128 duplex channels of Thuraya communications, display target locations on a map and decrypt (software based) encrypted content.

- An Inmarsat interception system that can intercept up to 128 duplex channels of Inmarsat communications (all types of sessions i.e. speech, fax, modem, telex and Internet including VoIP H.323 and SIP) from Inmarsat B, C, M, mini-M and M4 terminals (including the 64 Kb/s high speed data channel from M4), BGAN and R-BGAN.

- A VSAT interception system that can process all sessions from Hughes VSAT signals (Speech, fax, modems, VoIP, SIP, Internet sessions).

3 ACQUISITION CRITERIA

In the final analysis, we realise that the MOI must decide which acquisition criteria carries the most weight when acquiring new technology.

We would like to highlight three criteria, well knowing that there may be many others, to try and motivate our offer to the MOI.

	Acquisition Criteria	Zebra Feature that plays a role	Comment
1.	Intelligence Value	Accepts intercepts from all types of networks, Satellite, fixed line and mobile in one system	Provides intelligence services a unified view of all the different forms of communication that can lead to the discovery of new links and relationships.
		Process TDM and Packet traffic in the same system in line with the fact that people can use both to communicate.	Provides intelligence services a unified view of all the different forms of communication that can lead to the discovery of new links and relationships.
		Power to record everything allows for pro-active intelligence gathering and reconstruction of intelligence picture after an incident	Previously, only communications from known targets could be recorded due to capacity limitation of 2nd generation equipment. 3Rd generation equipment makes it possible to record everything and store it for a long enough period to mine for intelligence. Known targets are still monitored in real time by what we term "Persistent filters" Data mining on metadata and content is performed in parallel to persistent filters and for the first time provides the ability to re-construct an incident after the fact. Over and above this, dynamic filters can be used to look at any sub-set of metadata and content that may be required by analysts or users
		Open platforms and API allows for integration with best of breed analysis, extraction and decryption tools.	The end-user is free to choose the best extraction tools available on the market or to develop his own applications knowing that it can be integrated with the collection platform. VASTech does not decide for the customer what intelligence extraction applications to use.

	Acquisition Criteria	Zebra Feature that plays a role	Comment
		Distributed deployment with central collation allows for collection points across the world and unobtrusive and small capturing equipment only at sensitive locations that enhance system security	It is even possible to deploy systems in other countries with whom the end-user may have a cooperation agreement and still view all intercepts from a central point. By deploying only the capture unit at a sensitive site such as a switching system, the system security is enhanced greatly as very little information of the complete system is available on the capture unit
2.	Protection of Investment	Caters for legacy TDM network and new IP networks in a unified suite on the same hardware	With the bulk of new telecom technology being packet network based, the end user has peace of mind that Zebra caters for packet networks in the same hardware. No costly replacements are needed. New protocols are implemented in software making system upgrades for the future easy and viable.
		Future proof investment - 3rd generation technology will become the de-facto standard in the future	The power and flexibility of 3rd generation equipment surpasses that of 2nd generation equipments by such a distance that it is only a matter of the competition catching-up before it becomes the de-fact standard for the foreseeable future.
		Ultra-dense hardware ensures small footprint and easy deployment, requires less floor space, electricity, air conditioning and support.	Less hardware means less system administrators, less electricity, cooling, floor space and hence on-going savings in operational costs.
		Open and flexible software platform makes it possible to cater for evolving user requirements and new tools that becomes available.	.
		Seamless capacity expansion to cater for growth requirements into the future	No fork lifting of old equipment. Simply add more gateways, processing power and storage. Capacity upgrades becomes a non-event
		System's power grows with Moor's Law. As computer processing power increases, more can be achieved with less hardware.	COTS hardware allows users to reap the benefiots of Moore's Law. As computers becomes more powerfull, you can utilize the power to run more applications without replacing everything. COTS hardware is also cheaper and readily available

	Acquisition Criteria	Zebra Feature that plays a role	Comment
			compared to proprietary hardware.
		Proven in deployments in excess of 1,000 x bi-directional E1 systems	Zebra was designed in anticipation of the requirement to intercept more and more traffic in line with the growth in electronic communications and the need of intelligence organisation to be aware of any possible bit of intelligence.
3.	Supportability	Software centric	Less hardware means less equipment that musty be maintained or that can break.
		COTS hardware	Hardware is readily available meaning it is easy to support and end-users have a wide choice of hardware suppliers. System administrators need no specialised skills. Windows, Linux and LAN/WAN network skills are all that is required
		Open Source OS is used throughout except for the Database and demodulation servers.	Abundant supply of skills
		High speed Ethernet backbone	Runs on G/Bit Ethernet fibre or copper network. This technology is widely deployed in the world, tried and proven and requires almost no support. Component failures can be fixed easily as components are readily available and cheap.

4 INSTALLED SYSTEMS

4.1 Confidentiality of sites and limitations of descriptions

The VASTech Zebra system is used for intelligence on a national and strategic level in a number of countries. Due to the unique characteristics of the Zebra system, such as the capability to record all calls in a highly dense and expandable solution, VASTech recently also received a number of additional contracts in other countries. In addition to this, it is important to note that some of these are follow-up expansion orders for existing Zebra installations.

It will be appreciated that these customers request the utmost confidentiality and secrecy of detailed functionality and the scope of installations. VASTech is obliged to protect the customers' confidential information. The information pertaining to MOI will be treated with the same confidentiality and respect.

Given the above confidentiality, VASTech is allowed to describe some completed sites only on a high level. Even the capacity and distribution of these sites are considered confidential.

The following are some cases, selected from a number of countries, where the same product architecture as proposed for MOI is used. The product architecture use a number of 64 bi-directional E1 (128 E1 input) gateways to connect to the telecommunications environment, and Dell blade servers to do the processing.

4.2 Examples from finished sites

With a new technology and a new product comes the challenge to establish an installed base and proven track record. VASTech launched the Zebra system in 2004. Initial take-up was understandably slow as intelligence agencies had to assess the value and desirability of simply recording all traffic and then filter out content files of know targets or content with intelligence value from unknown targets.

After this initial digestive period, we started to experience high demand for our products to the extend that today we have several installations in different parts of the world ranging in size from 128 x E1s with several terabytes of storage to systems in excess of 1,000 x Bi-directional E1's with Petabytes of storage.

As the saying goes; 'a picture is worth a thousand words'. Following are some examples from installed systems.

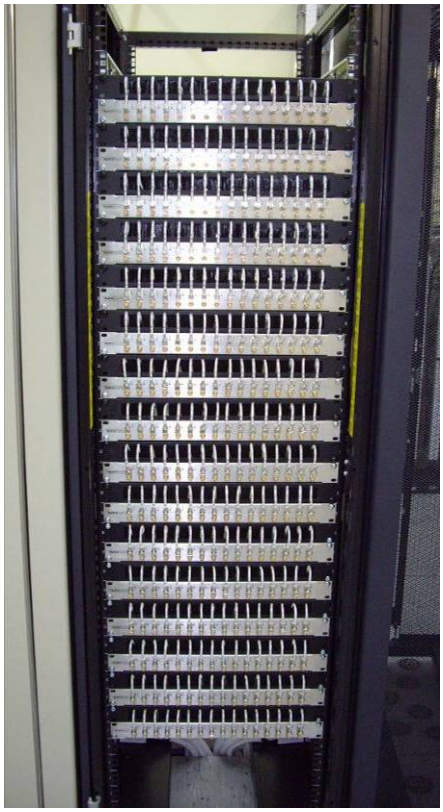

Figure 6: High impedance E1 buffers connected to a switching centre

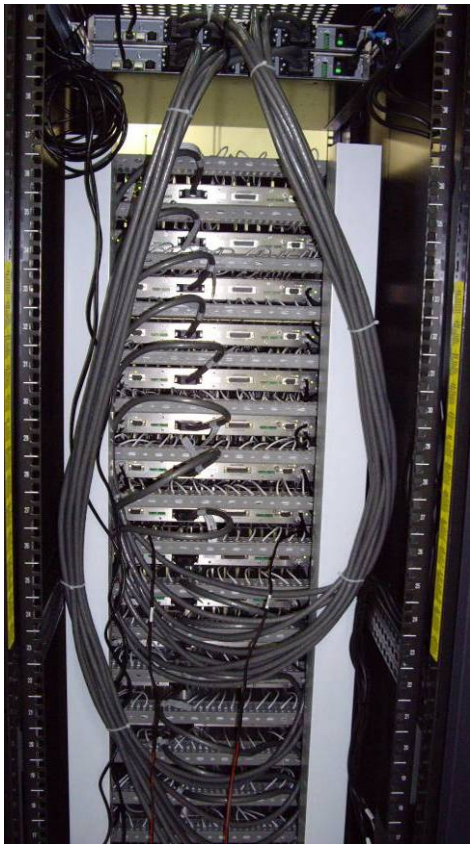

Figure 7: Buffer to Gateway connections – rear view

Figure 8: Zebra system during installation – note storage units in 5 racks to the right

Figure 9: The Data Centre of distributed deployment - empty rack space due to installation in progress

Figure 10: Fully populated processing and storage racks

4.3 Customer P1

4.3.1 System overview

A high level system overview of the installation at Customer P1 is provided in Figure 11. The system intercepts data from a combination of satellite and fixed line installations with a total capacity in excess of 1,000 x Bi-Directional E1s.

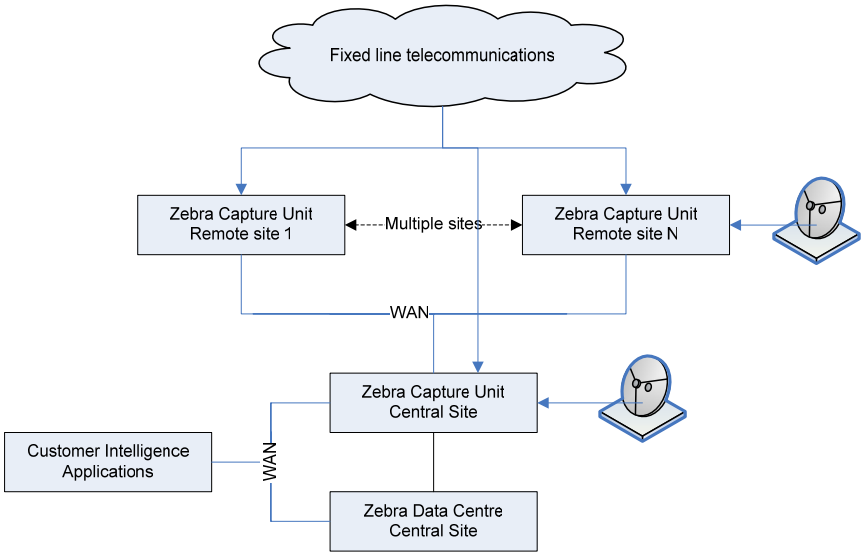

Figure 11: System Overview - Reference P1

Capturing of all connected traffic is done on a number of remote sites as well as on a central site. All IRI data and content is migrated to a Zebra Data Centre at the central site. To reduce bandwidth requirements, fax and data demodulation is done at the remote sites and the audio files (excluding fax and data audio files) are compressed before migration is done.

At the Central Site, customer workflow and analysis processes have been integrated to the Zebra System, via the Zebra API. In addition, integration was implemented between the Zebra system and the ETI data demodulation system (data is exported to the ETI system).

4.3.2 Multi-E1 Signalling Processing Subsystem

The Zebra system captures all data and then allows filtering of selected targets. The filters (targets) can be prioritized. All IRI data is stored in a database to allow filtering and further analysis. Security rules are used to allow only selected operator groups to listen to targets. Classification of recorded transmissions is done into voice and non-voice types (fax and data). The fax and data recordings are demodulated and decoded.

A powerful CIC mapping capability is used for the SS7 signalling. The Zebra CIC mapping capability has proven to be essential for the correct operation of a complex and large system as installed at Customer P1. SS7 Signalling E1s and channels are routed via Zebra Gateways to the various locations where CIC mapping has to be done. The CIC maps that have been

automatically generated are displayed to the system administrator, who can then select to implement it in the CIC table. It is possible to save the CIC maps for later re-use. Changes in the CIC maps are monitored via monitoring the traffic on the different channels.

4.3.3 Voice Processing Subsystem

The compression of voice recordings is selectable. All voice recordings are stored in RAID 1/0 configuration as standard wave files, requiring no special hardware. Different user definable tags are associated with each recording. This is used to allow different management rules to be applied to the recording, e.g. storage, user access and workflow. Tags are also used to mark recordings as e.g. target recordings, priorities, seen by users, etc. The use of tags provides additional benefits and more flexibility, as opposed to saving the recordings in different folders.

Together with the customer, VASTech integrated the Zebra system with the customer intelligence applications. This allows detailed workflow management and intelligence analysis, transcription and intelligence gathering.

4.4 Customer P2

A high level system overview of the installation at Customer P2 is provided in Figure 12. The system intercepts data from satellite installations.

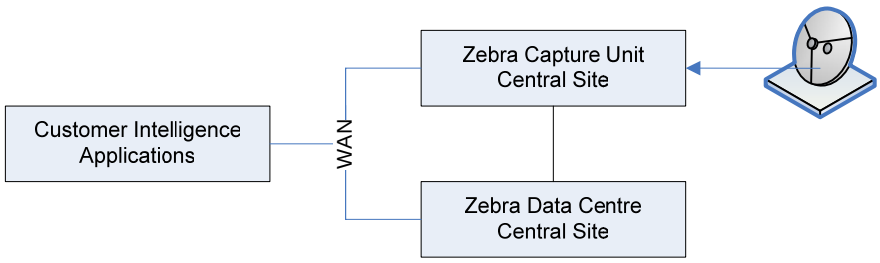

Figure 12: System Overview - Reference P2

Capturing of all connected traffic is done at the central site. All IRI and content is migrated to the Zebra Data Centre at the central site, where it stored for a longer period.

At the Central Site, customer workflow and analysis processes have been integrated to the Zebra System, via the Zebra API. In addition, integration exists between the Zebra system and the ETI data demodulation system.

The features of the Voice Processing Subsystem at Customer P2 are similar to the features described for Customer P1, above.

Together with the customer, VASTech integrated the Zebra system with the customer intelligence applications. This allows detailed workflow management and intelligence analysis, transcription and intelligence gathering.

4.5 Customer S1

At Customer S1, the Zebra system intercepts data on fixed line installations.

Interception is done at a number of remote sites. All the intercepted E1s are multiplexed at the remote sites. The multiplexed E1s are de-multiplexed at the central site, where it is connected to Zebra E1 gateways.

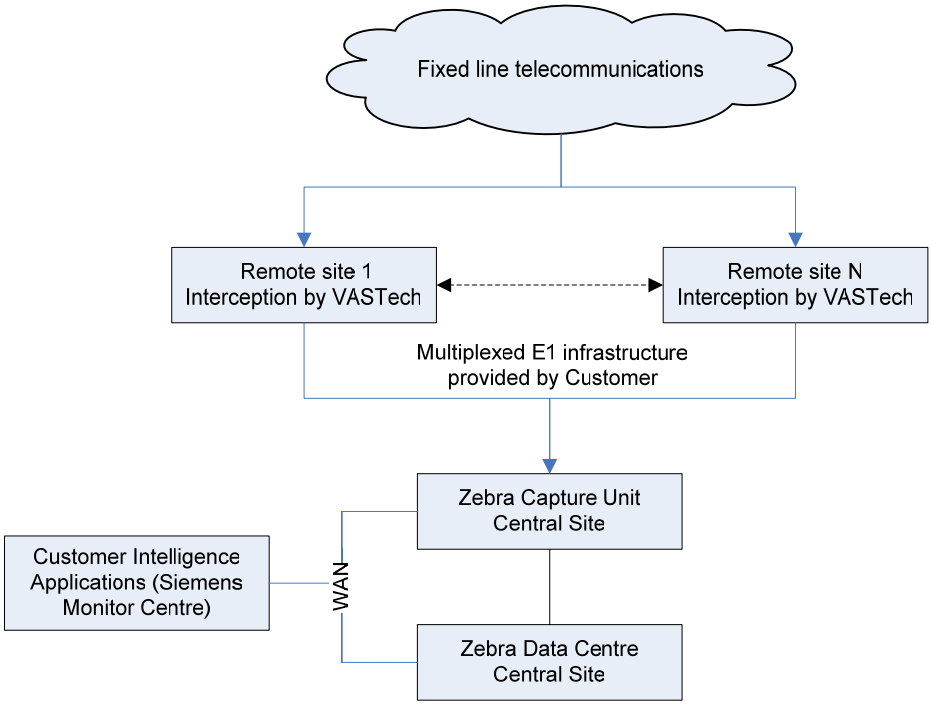

Figure 13: System Overview - Reference S1

Protocols include SS7, SS5, R2MFC (VOX is used where these protocols are not available). Currently no H.323 or SIP is utilized, but further upgrades are expected.

VASTech assisted Siemens to have the Zebra system tightly integrated to the Siemens Monitor Centre via the Zebra Open API.

The Zebra system captures all data. Target filters are set by the customer. Filters can be prioritized to allow hot-monitoring and higher priority processing of recorded information. Selected targets are filtered and also migrated to the Zebra Data Centre.

All CRI data is stored in a database to allow filtering and further analysis. All filtered data is stored, after migration in the Zebra Data Centre, with RAID 1/0 redundancy. All CRI data is stored for a period measured in years, while the filtered call content is stored for a period measured in months.

Security rules are used to allow only selected operator groups to listen to targets. Classification of recorded transmissions is done into voice and non-voice types (fax and data). The fax and data recordings are demodulated and decoded.

A powerful CIC mapping capability has again proven essential for recording of the SS7 bearers. The CIC maps that have been automatically generated are displayed to the system administrator, who can then select to implement it in the CIC table. It is possible to save the CIC maps for later re-use. Changes in the CIC maps are monitored via monitoring the traffic on the different channels.

The compression of voice recordings is selectable. All voice recordings are stored in RAID 1/0 configuration as standard wave files, requiring no special playback hardware. Different user-definable tags are associated with each recording. This is used to allow different management rules to be applied on the recording, for instance storage, user access and workflow. Tags are also used to mark recordings as e.g. target recordings, priorities, seen by users, etc. The use of tags provides additional benefits to saving the recordings in different folders.

Together with Siemens, VASTech integrated the Zebra system with the Siemens Monitor Centre. This allows detailed workflow management and intelligence analysis, transcription and intelligence gathering. In addition, the VASTech operator stations are used for filtering, playback and exporting of calls where required.

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