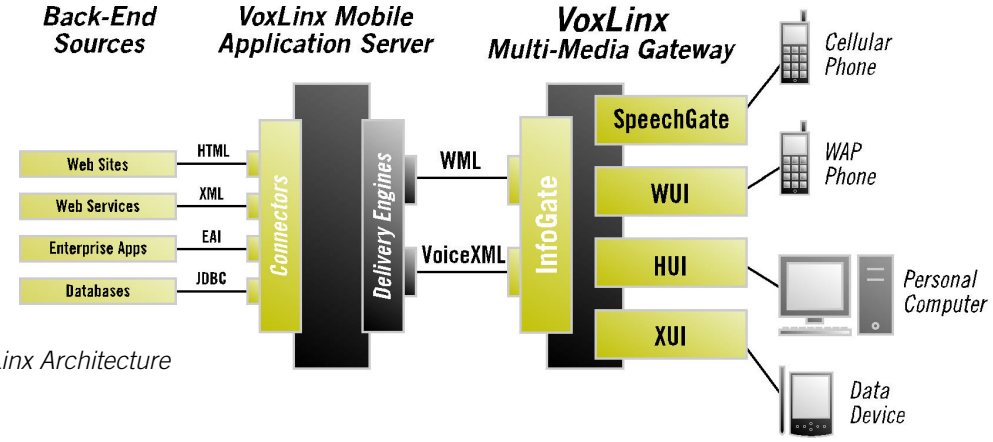
VoxLinx™ Gateway

Enhancing the Way People Remotely Access Information

The LogicTree™ VoxLinx™ Gateway is the first carrier class enhanced services platform that provides simultaneous multi-modal access to IP-based data through a variety of devices, including landline or mobile telephone or WAP/HTML enabled data devices.

VoxLinx has a distributed architecture consisting of four components: SpeechGate, InfoGate, Speech Server, and Application Server. They may be deployed in different configurations, depending on varying requirements of each deployment. The two primary components of VoxLinx are SpeechGate and InfoGate. SpeechGate interfaces with the PSTN as a switch, and performs call processing and dialogue management. InfoGate manages the connection with the IP network; which could be the Internet or a corporate intranet, and acts a server for SpeechGate, or any other data presentation client such as WAP phones HTML browsers.

The platform's "open switch" architecture allows for massive physical/logical scalability, as well as carrier grade performance and functionality. VoxLinx is independent of OS, protocol, speech technology (ASR/TTS), and telephony interfaces, and is designed to easily integrate into current carrier networks.



VoxLinx Architecture

Leading Edge Technology

Mobile Multi-Modal Technology (M³T™)

The VoxLinx Mobile Multi-Modal Technology (M³T) provides the only true delivery environment for next generation applications. M³T offers the optimal experience by allowing users to interact with mobile applications, such as e-mail, navigation assistance and stock quotes, through speech, display, or both; all based on a "single" application stream. M³T handles mobile session management, synchronized data delivery, context handling, and input race conditions. This capability firmly positions the VoxLinx platform as a key component of next generation (2.5G and 3G) networks and telematics systems. More immediately, M³T enables WAP users to interact with WAP applications through Voice or WAP, and switch freely back and forth between the two modes, whichever is most convenient. M³T supports multiple synchronized output sessions to the user, all based on one constant stream from the application.

Hybrid WAP/Voice – The M³T feature of VoxLinx allows current WAP applications to be delivered in Voice and/or WAP mode to users. A user can read an e-mail in WAP mode, switch to voice to reply, continue in voice mode to listen to other messages, and go back to WAP later continuing where voice session was left. This capability frees WAP applications from limitations of the display/keypad, allowing the true potential of the WAP investment to be realized.

Protocol Independence – VoxLinx can handle different types of XML protocols. To date, support for VoiceXML, VoxML, and WML has been deployed. WML support, specifically, opens the way to voice-enable a wealth of WAP applications. Speech interaction will allow carriers to offer these applications to their voice subscribers who do not subscribe to data services, as well as WAP users who find the small keypads on WAP devices difficult to use for some applications.

Transaction Enabled – VoxLinx is the only solution that takes into account the fact that Cellular callers are prone to lost signal and dropped calls. Therefore it allows a caller who has lost signal to call back and continue a session where it was dropped. This allows e-commerce transactions to safely continue despite the challenges introduced by cellular phone limitations.

Open Switch Based – VoxLinx is the only Voice Access gateway based on an "Open Switch" software architecture. Other platforms in the market are closed, outgrown IVR systems, where VoxLinx has been designed from scratch with the needs of carriers and cellular users in mind. The open architecture allows for introduction of new features that are not supported by standards such as VoiceXML or WML, without the need to change the core of the system.

Golden Dial Tone for the Next Generation Network – VoxLinx is designed by Telecom experts for the Telecom Market. VoxLinx can act as Enhanced Service Platform for mobile and landline networks in conjunction with Next Generation IP based switches or existing circuit switches.

A True Carrier Class Platform

Monitoring – VoxLinx provides live and stored monitoring of all System Health, Traffic, and CDR information. Data is stored in in the database of your choice, and can be monitored via web-based agents. VoxLinx system can support other monitoring protocols such as SNMP and HP OpenView by using appropriate adapters.

Massively Scalable Architecture – Typical IVR-based solutions have a 400-port limitation. VoxLinx architecture is designed to support up to 10,000 port installations in a distributed cluster of Compact PCI (CPCI) racks. VoxLinx takes advantage of advanced Switch Design software paradigms that enable all applications running on VoxLinx to logically expand beyond the boundaries of one single processor. LogicTree™ considers scalability a two faceted issue:

- Physical Scalability: Stacking racks or computers on the top of each other, thereby increasing the load handling capacity of a call center. LogicTree, and all other companies in the market, can provide this type of scalability.
- Logical Scalability: Treating all applications running across multiple platforms as if they were all running on one monolithic logical system. LogicTree provides the only software architecture with this capability.

Availability – VoxLinx has a distributed architecture with multiple instances of critical objects present at any given time. All objects run periodic sanity and health tests, and report the result to the OAM&P console. Maintenance modules monitor all internal objects constantly to avoid a gradual degradation of service. When system resources start to run low, alarms are generated, and if deemed necessary, system objects are restarted automatically to avoid a fatal shut down. To increase availability, VoxLinx architecture supports N+M redundancy or load sharing for its InfoGate and Speechgate subsystem components, and Automatic Speech Recognition (ASR)/Text-To-Speech (TTS) servers.

Reliability – The core VoxLinx environment allows complex application processing in a time efficient fashion. Furthermore, automatic monitoring and health reporting functions are built into every object in VoxLinx system. This allows the operator and the monitoring modules to have a constant view into the health of the system. LogicTree has a dedicated engineering team that has developed an in-house "Enhanced Bulk Voice Call Generator" for testing those aspects of the platform that existing bulk calls generators cannot normally test.

Network Integration – VoxLinx SpeechGate supports a variety of network interfaces such as Digital PRI, CAS, and SS7. The architecture is designed to allow distribution of call control so that each SpeechGate box behaves as a dumb switch with central intelligence ported to an SS7 connected processor. This allows the network operator to have a central point of control, and avoid having to deploy multiple SS7 nodes one per SpeechGate machine.

Modular – VoxLinx is a plug-and-play system that allows clients to select from multiple solution providers for specific tasks associated with voice access. Using VoxLinx, clients will not be constrained to particular TTS and ASR engines, telephony hardware, or third party plug-ins for functions such as location based services. Clients can choose the optimum engines and hardware for their specific application needs. VoxLinx is designed to allow quick integration of modules into its voice access platform.

Flexibility – VoxLinx is designed to handle value-added functionality such as alerting users or conferencing a call with other users without reliance on any additional switching fabric. IVR based solutions cannot perform switching functions without an adjunct switch.

Deployment Configurations – VoxLinx may be deployed on a single processor or distributed on multiple machines. This allows VoxLinx to be adapted to different network configurations depending on the nature of service.

Rapid Service Creation – LogicTree's open API (Application Programming Interface) enables development to create customized applications for voice access. This allows clients to focus on developing applications for their business needs while LogicTree handles the intricacies of voice access.

InfoGate

InfoGate is the basic component at the center of VoxLinx. It manages all user interactions with web based data, and provides simultaneous multi-modal interaction capability (M³T).

InfoGate is in charge of accessing content from the Internet, parsing the content, creating and maintaining user sessions, and managing interactions among different clients and each user session. InfoGate can parse VoiceXML, WML, and VoxML types of content, and use that to drive any type of output from InfoGate to clients (such as VoiceXML for Voice through SpeechGate, HTML for Internet Browsers, WML/HDML for WAP devices, or other types of XML).

InfoGate is based on Java technology, and is designed to support high scalability/high availability/high performance in mind.

	Model VLPS-IG4	*Model VLPS-IG3*	*Model VLPS-IG2*	*Model VLPS-IG1*
Hardware				
Server	Compaq Proliant DL380	Compaq Proliant DL380	Compaq Proliant DL380	Compaq Proliant DL380
Processor	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz
Memory	2 x 512 MB	2 x 512 MB	2 x 512 MB	2 x 512 MB
Hard Drive	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,
Packaging	Industrial Grade PC or Ziatech CPCI Chassis	Industrial Grade PC or Ziatech CPCI Chassis	Industrial Grade PC or Ziatech CPCI Chassis	Industrial Grade PC or Ziatech CPCI Chassis
Software				
Operating System	Windows NT, Windows 2000, or Solaris	Windows NT, Windows 2000, or Solaris	Windows NT, Windows 2000, or Solaris	Windows NT, Windows 2000, or Solaris
Data Control	VoxLinx IG – 4 T-1 License	VoxLinx IG – 3 T-1 License	VoxLinx IG – 2 T-1 License	VoxLinx IG – 1 T-1 License

SpeechGate

SpeechGate is one of two major components of the VoxLinx™ platform. It interfaces with the PSTN as a switch, and performs call processing and dialogue management. In its simplest sense, call processing refers to answering an incoming call, maintaining the connection for an active call, initiating an outgoing call, and performing advanced functions such as switching or feature handling. Once a call has been initiated by the user, SpeechGate acts as a data presentation device, which uses speech to communicate with the user.

SpeechGate uses an object-oriented and event-driven call handling mechanism instead of the traditional state driven telephony mechanisms. This allows code to be highly modularized, resulting in smaller and simpler code that executes faster. Programmers can easily replace any module with a compatible one without having to change the rest of the code. This design also allows customers to conveniently "plug in" commercially available engines for specific tasks.

SpeechGate manages the activities of both the ASR and the TTS to create a voice dialogue with the user, and its unique design allows LogicTree to rapidly activate systems in over 40 languages.

	Model VLPS-SG4	*Model VLPS-SG3*	*Model VLPS-SG2*	*Model VLPS-SG1*
Hardware				
Server	Compaq Proliant DL380	Compaq Proliant DL380	Compaq Proliant DL380	Compaq Proliant DL380
Processor	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz
Memory	2 x 512 MB	2 x 512 MB	2 x 512 MB	2 x 512 MB
Hard Drive	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,
Telephony Board	NMSAG4000 #80298 – 96 Ports[1]	NMSAG4000 #80469 & #80466 – 72 Ports[1]	NMS AG4000 #80469 – 48 Ports[1]	NMSAG4000 #80466 – 24 Ports[1]
Packaging	Industrial Grade PC or CPCI Chassis	Industrial Grade PC or CPCI Chassis	Industrial Grade PC or CPCI Chassis	Industrial Grade PC or CPCI Chassis
Software				
Operating System	Windows NT, Windows 2000, or Solaris	Windows NT, Windows 2000, or Solaris	Windows NT, Windows 2000, or Solaris	Windows NT, Windows 2000, or Solaris
TTS[2]	L&H RealSpeak or Fonix/Nuance –	L&H RealSpeak or Fonix/Nuance –	L&H RealSpeak or Fonix/Nuance –	L&H RealSpeak or Fonix/Nuance –
Telephony Control	VoxLinx SG – 4 T-1 License	VoxLinx SG – 3 T-1 License	VoxLinx SG – 2 T-1 License	VoxLinx SG – 1 T-1 License

1 Similar port Intel/Dialogic JCT Digital Boards can be substituted for NMS Telephony Boards.
2 In some configurations, the TTS engine may be hosted on the Speech Server.

Speech Engine Server

The Speech Engine Server hosts the Customer selected Automatic Speech Recognition (ASR) and/or Text-To-Speech (TTS) engines. The ASR engine translates audio sounds into recognized words, and provides this information to the VoxLinx platform for reformatting into web-based protocols. VoxLinx then uses the reformatted information to interface with the appropriate web application. VoxLinx also reformats information from web applications into TTS engine text protocols; then requests the TTS engine to translate the information into speech sound. VoxLinx then presents this speech information to the user.

Applications can be implemented without speech recognition or text to speech technology. An application may choose to only use pre-recorded audio as well as DTMF or keypad selection for interaction with the user.

	Model VLSS-4	*Model VLSS-3*	*Model VLSS-2*	*Model VLSS-1*
Hardware				
Server	Compaq Proliant DL380	Compaq Proliant DL380	Compaq Proliant DL380	Compaq Proliant DL380
Processor	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz	2 – Intel Pentium III 1GHz
Memory	2 x 512 MB	2 x 512 MB	2 x 512 MB	2 x 512 MB
Hard Drive	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,	9.1 GB, Ultra 3 SCSI, 10,000 RPM,
Packaging	Industrial Grade PC or CPCI Chassis	Industrial Grade PC or CPCI Chassis	Industrial Grade PC or CPCI Chassis	Industrial Grade PC or CPCI Chassis
Software				
Operating System	Windows NT, or Solaris[1]	Windows NT, or Solaris[1]	Windows NT, or Solaris[1]	Windows NT, or Solaris[1]
ASR[2]	L&H, Nuance, or Phillips	L&H, Nuance, or Phillips	L&H, Nuance, or Phillips	L&H, Nuance, or Phillips
TTS[3]	L&H RealSpeak or Fonix/Nuance –	L&H RealSpeak or Fonix/Nuance –	L&H RealSpeak or Fonix/Nuance –	L&H RealSpeak or Fonix/Nuance –

1 Operating System selection may be determined by choice of ASR Application.
2 Number of ASRlicenses may vary depending upon vendor and/or load requirement of application.
3 In some configurations, the TTS engine may be hosted on the same machine as SpeechGate.

Application Server

VoxLinx can utilize any VoiceXML or WML application that is accessible via the web (as a web-page). The LogicTree Application Server allows application provisioning and delivery on a user level basis. It provides a web-based user/administrator interface for application provisioning. The server allows an administrator to deploy new applications which may be accessed by system users, and also provides detailed access logs for every application.

Currently, LogicTree provides a number of applications that include: VoxMail, VoxDialer, VoxAlert and VoxAssistant. (See product sheets on each)

	Model VLAS-1
Hardware	
Server	Compaq Proliant DL380
Processor	2 – Intel Pentium III 1GHz
Memory	2 x 512 MB
Hard Drive	9.1 GB, Ultra 3 SCSI, 10,000 RPM
Packaging	Industrial Grade PC or CPCI Chassis
Software	
Operating System	Windows NT, Solaris, Linux
JSP/Servlet Engine	Allaire JRun Server 3.1 Advanced[1] – 2 CPU License
Web Server	Apache HTTP Server
Database Server	Oracle, Microsoft SQL
JAVA SDK	Sun Java SDK Standard Edition 1.3

1 Tomcat from the Apache Group or other JSP engines can be substituted for Allaire.

Note: *Specifications, terms and conditions are subject to change without notice.*

U.S. Office:
8400 Baltimore Avenue, Suite 301
College Park, MD 20740

Phone: (301) 220-3520
Fax: (301) 220-3524
www.logictree.com

Specifications

Application Protocols

From content provider to VoxLinx Gateway:
WML, VoiceXML, and VoxML

From SpeechGate: Telephony (Voice)

From InfoGate: HTML, WML, HDML, and any type of XML

Physical Layer PSTN Interfaces

T1 – 1, 2, and 4 T1s

E1 – 1, 2 and 4 E1s

Analog – 4, 8, and 16 Ports

Signaling

PSTN – SS7 (ANSI T1.113, 226 - 1995 ISUP, ETSI, ETSI ISUP v1, 2 & 3, ITU-T, Sigtran), T1/E1 CAS, T1 (ANSI T1.102, ANSI T1.403), E1 (G.703 2048 kbps), ISDN PRI, Analog (LS, GS, DID, E&M, Subscriber Loop)

IP – ITU-T H.323, SIP, Megaco/MGCP RTP (Audio)

Internet – TCP/IP

Capacity

Single Shelf – T1: 96 ports
E1: 120 ports

Platform – Scalable up to 10,000 ports

Performance

Up to 12,000 transactions per hour per server

Speech Technology

ASR: Nuance, L&H, and Philips.
TTS: Fonix/Nuance, L&H RealSpeak.

Operating System

Windows NT, Solaris

Standards

Interface – T1.102, T1.403, EN 300-356-1, ETS 300-356-1, Q.784, T1.113, G.703 2948

IP – TCP, IP, RTP, MGCP, SIP

EMI – CFR47 Part 15 A (FCC)

Safety – Ziatech CPCI: UL 1950, EN 60950

Management – SNMP v3

Management

Capabilities – Event log, configuration, performance, accounting, billing (CDR), and provisioning

Interfaces – HTTP & Proprietary socket

Physical Characteristics (per component)

Power –

Range Line Voltage: 90 to 132 VAC/180 to 265 VAC

Nominal Line Vltg: 100 to 120 VAC/220 to 240 VAC

Rated Input Current: 4.8A (110V) to 2.4A (220V)

Rated Input Frequency: 50 to 60 Hz

Rated Input Power: 432W

Dimensions: 5.1 X 19 x 24.6 in/ 13.1 x 48.3 x 62.5 cm

Temperature Range –
Operating: 50˚ to 95˚ F/10˚ to 35˚ C
Shipping: -22˚ to 122˚ F/-30˚ to 50˚ C

Humidity –
Operating: 8% to 90% non-condensing
Shipping: 5% to 95% non-condensing

Weight – 55 lbs/25 kg

Note: *Specifications, terms and conditions are subject to change without notice.*

U.S. Office:
8400 Baltimore Avenue, Suite 301
College Park, MD 20740

Phone: (301) 220-3520
Fax: (301) 220-3524
www.logictree.com