



Bringing voice technology to electronic devices

IBM Embedded ViaVoice feature comparison:

Features:	Standard	Advanced	Enterprise
Active vocabulary size	500 Words*	500 Words*	16,000*
Continuous recognition	Yes	Yes	Yes
Speaker independent vocabularies	Yes	Yes	Yes
Synthesis-based Text-To-Speech (TTS)	Yes	Yes	Yes
Acoustic add word	Yes	Yes	Yes
Multiple acoustic environments	Yes	Yes	Yes
Dynamic unlimited vocabulary	No	Yes	Yes
Dynamic multi-language support	No	Yes	Yes
JAVA™ application support	No	Yes	Yes
Large database support	No	No	Yes
N-Best technology	No	No	Yes
Homonym support	No	No	Yes

* Maximum number of words for all active vocabularies.

Highlights

- **Enhances electronic devices by voice enabling applications**
- **Offers basic core features that enable human-speech commands and provide text and audible speech output**
- **Available in Standard and Advanced Multiplatform Editions**
- **See related product Embedded ViaVoice Enterprise Edition designed for larger database access**
- **Enhanced accuracy**

IBM Embedded ViaVoice

IBM strengthens its portfolio of pervasive computing products by extending and integrating embedded voice functionality into mobile devices and networks. IBM is bringing the functionality of Embedded ViaVoice to the billions of interconnected devices making these devices easier to use for millions of mobile users. Embedded ViaVoice's pervasive tools add functionality and mobility to IBM end-to-end solutions in a technology transparent infrastructure that integrates the device to a server. This enables IBM customers to increase profitability and provide new services while mobilizing their operations.

Hands-free access to everyday devices

Today's consumers need constant access to information. With the e-business technology behind cell phones, Personal Digital Assistants (PDAs) and other smart devices, voice access to this information is becoming more and more popular for users at work, home, school or on the road. Strategic Analysts, Inc. predict that by 2004, 35% of all e-business transactions will be completely voice-enabled—for consumers it will be all about being hands-free.

Voice-enabled technology

"Call Dr. Toth." "When is my next appointment?" "Order more milk." With voice-enabled technology, these everyday devices can understand these human-speech commands and respond. This usability makes them easier to use and even more attractive to own. By offering this voice technology, manufacturers and developers can generate new revenue streams, differentiate their products and gain a competitive edge with innovative service packages.

IBM Embedded ViaVoice Standard & Advanced Multiplatform Edition Functional Overview:

Features	Low Resource Command & Control applications	TTS applications
Active vocabulary size (multiple vocabularies supported)	Standard Multiplatform Edition: 500 words speaker independent Advanced Multiplatform Edition: 500 words speaker independent	Standard Multiplatform Edition: Unlimited vocabulary capability Advanced Multiplatform Edition: Dynamic unlimited vocabulary capability
Features	Standard Multiplatform Edition: Continuous recognition Speaker independent Total words/phrases limited only by memory Single language support Advanced Multiplatform Edition: Continuous recognition Speaker independent Total words/phrases limited only by memory Multi-language support JAVA-JSAPI	Standard Multiplatform Edition: Local TTS Format synthesis-based Single language support Multiple voices available Advanced Multiplatform Edition: Local TTS Format synthesis-based Multi-language support Multiple voices available JAVA-JSAPI
MIPS required	50	25
Minimum memory required (subject to change)	472-510 KB DRAM 540-826 KB ROM or Flash	281-311 KB DRAM 1.5-2.3 MB ROM or Flash
Specified microphone	Lucent SDM100 or equivalent AKGQ400MK3 VoiceTIMES audio specifications	N/A
Specified CODEC	16 bit sample, 11.025 KHz, mono channel, signed linear PCM	16 bit sample, 11.025 KHz, mono channel, signed linear PCM
Software Developers Kit (SDK)	Supports ASR and TTS	Supports ASR and TTS
Run Time Kits	Standard Multiplatform Edition: IBM Embedded ViaVoice Command and Control Run Time Kit Standard Multiplatform Edition Advanced Multiplatform Edition: IBM Embedded ViaVoice Command and Control Run Time Kit Advanced Multiplatform Edition	Standard Multiplatform Edition: IBM Embedded ViaVoice TTS Run Time Kit Standard Multiplatform Edition Advanced Multiplatform Edition: IBM Embedded ViaVoice TTS Run Time Kit Advanced Multiplatform Edition
Realtime operating systems and processors*	Windows 2000, Windows CE.NET, QNX 6.1.0, QNX 6.2.0	Windows 2000, Windows CE.NET, QNX 6.1.0, QNX 6.2.0

* Can support any processor but porting fees are required for processors that are not Customer Ready Platforms.

IBM embedded software can enhance these devices by voice-enabling their applications. With leading-edge technology and end-to-end solutions based on open standards, our family of voice products offers a consistent programming model to extend e-business applications to electronic devices. We can help you streamline the production and rollout of these applications today, so you can offer your customers the services of tomorrow.

IBM Embedded ViaVoice, Standard Multiplatform Edition

Multiplatform Edition delivers IBM speech technology to mobile devices such as smart phones, handheld PDAs and automobile components. This Edition supports a variety of realtime operating systems and microprocessors, and is also available in a Standard and Advanced version as well.

Core features of both Multiplatform Editions include:

- *Active vocabulary size – up to 500 words or phrases*
- *Continuous recognition – users can speak to their devices using natural speech patterns*
- *Speaker independent vocabularies – no training required – just start giving commands and the device responds*

Text-To-Speech

IBM Embedded ViaVoice technology takes advantage of the memory constraints of small devices by performing its voice processing in both Random Access Memory (RAM) and Read-Only Memory (ROM). When developing TTS for small devices, memory constraints are a critical factor both in feasibility and cost. We have utilized Embedded ViaVoice technology to develop IBM Embedded TTS for handheld devices to create one of the smallest memory footprints in the industry.

Developed to convert words from a computer document (e.g. word processor document, Web page) into audible speech, IBM Embedded TTS synthesizes input text to human audible speech on a handheld device. Not only can the TTS output words for all of the 13 supported languages; it can also parse the text. This allows TTS to correctly pronounce words like "DR," which could be perceived as drive or doctor.

Acoustic add word support

Acoustic add word support allows an application to create the pronunciations for words and phrases, and add them to the active vocabulary. For example, when adding the phone number for Jane Zankuitz to your cell phone, you can type in her name and phone number, then say "Jane Zankuitz" to train the phone. The next time you want to call her, simply say, "Call Jane Zankuitz," and your cell phone will automatically dial her number.

Multiple acoustic environments

Multiplatform Edition currently support two acoustic models for the automotive and PDA devices.

Customer Ready Platform (CRP) support

Embedded ViaVoice is portable to any device, on any operating system, with applicable porting charges. However, IBM has created CRP platforms that allow customers to develop and deploy Embedded ViaVoice applications with no porting costs. The customer simply pays for the SDK and the Run Time Kit licenses. CRP supports the following operating system and processor combinations:

Platform	Operating System	Processor	Supported Languages
Intel®	Windows® 2000	Pentium®	All 13 languages
Lubbock	Windows CE.NET	XScale	All 13 languages
Daytona	Neutrino 6.1.0	XScale	9 languages (single byte)
BigSur/Amanda	QNX 6.2.0	SH4	9 languages (single byte)

Note: JAVA-JSAPI is supported for US English only on Windows 2000 and Daytona.

Included in the CRP platform is our Customer Ready Test Suite (CRTS). The CRTS allows the developers to test their audio devices, create gain maps and measure recognition performance and accuracy.

Language independent

Multiplatform Edition vocabularies may be customized by the user or manufacturer to operate in nine or 13 supported languages, depending on the platform. The nine supported languages are: US English, UK English, German, French, Spanish, Italian, North American Spanish, French Canadian and Brazilian Portuguese. The 13 supported languages are: US English, UK English, German, French, Spanish, Italian, North American Spanish, French Canadian, Brazilian Portuguese, Korean, Japanese, Simplified Chinese and Traditional Chinese.

Embedded ViaVoice, Advanced Multiplatform Edition

IBM Embedded ViaVoice, Advanced Multiplatform Edition includes all the features of the Standard Multiplatform Edition plus the following:

- *Dynamic unlimited vocabulary capability*
- *Dynamic multi-language support*
- *JAVA application support – JSAPI 1.0*

Dynamic unlimited vocabulary capability

Unlimited vocabulary support allows the Advanced Multiplatform Edition to dynamically create new grammars while the application is running. For example, if the device accesses a Web page from the wireless Internet, any of the words on the page can be activated and added to the active vocabulary. The user does not have to exit from the page to add the words. The user simply selects the word or phrase and provides the command to activate it.

Dynamic multi-language support

Advanced Multiplatform Edition has the support to switch languages while the application is running. It can be as easy as saying the language name, at which point the device will expect the commands to be in the new language, making the device ideal for international use.

JAVA application support

JAVA application support is integrated into the Advanced Multiplatform Edition. The IBM JSAPI Focus technology allows multiple Java voice-enabled applications to run in the same Java Virtual Machine, sharing the speech engine. This also provides TTS arbitration to prevent two applications from trying to speak at the same time.

IBM stands ready to help

We offer SDK training, solutions design workshops, and development and deployment of our speech engine to your device. With worldwide resources and an extensive Business Partner network, we can provide custom voice-enabled solutions to expand your portfolio of services and speed your time to Return On Investment (ROI). Our ViaVoice products are supported by over 150 voice patents and over 30 years of extensive research. At IBM, we stand ready to help.

For more information

To learn more about IBM pervasive computing software solutions, visit ibm.com/pvc or call your local IBM representative.



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