

Loquendo MRCP Server

(LOQUENDO SPEECH SUITE)

Loquendo MRCP Server is an optimized client-server solution for the large-scale deployment of speech technologies in the telephony field, such as call centres, CRM, news and email-reading, self-service applications, etc.

Loquendo MRCP Server enables you to exploit the entire range of Loquendo speech technologies.

It is the ideal solution for System Integrators looking for high-quality multilingual speech technologies, and willing to boost the performance of existing IVR services using speech.

Simple yet Complete

Loquendo MRCP Server exploits all the benefits of Loquendo's renowned **high-quality Speech Technologies**: Loquendo's lifelike TTS (Text-To-Speech) and robust speaker-independent ASR (Automatic Speech Recognition).

The **client-server architecture** allows speech resources to be hosted on a dedicated server, removing any impact on the customer's equipment.

Integrators do not need technological expertise, and draw the full benefits of Loquendo's high-performance technologies using **standard protocols and languages**.

Easy-to-integrate

Loquendo MRCP Server is a server integrated through the widely adopted standard IETF protocol **MRCP** (Media Resource Control

Protocol). Both MRCP versions are supported: **MRCP v1 (RFC 4463)** which is based on RTSP/RTP and today widely used in the industry, and **MRCP v2** which is the new IETF protocol, based on SIP/RTP and offering the new audio recording and Speaker Verification functionalities. Leveraging these protocols, Loquendo speech technologies can easily interact with a very large number of platforms, IVRs and speech solutions.

Loquendo MRCP Server is fully configurable and makes software components status available to both its onboard Management Console and external **Management Systems** through the **SNMP** protocol.

Flexible and Modular

Its modular architecture leaves Loquendo MRCP Server independent from ASR/TTS engines and language/voice packages, allowing the seamless upgrade to new technology releases, new languages and voices. The choice of Loquendo MRCP Server opens up a whole new world of possibilities to develop and extend your solutions.

For instance:

- Add voice-enabled services to DTMF-based IVRs, even in complex recognition contexts involving large grammars.
- Use high-quality, flexible TTS prompts to exploit all the unique features of Loquendo TTS (mixed-language, expressive cues, audio mixer etc).
- Expand your service into a multilingual one.
- Move from a single server to a multi-server solution according to the complexity of your application.

Full Standard Compliance

Thanks to its complete support of all the relevant speech IETF and W3C standards, Loquendo MRCP Server provides speech technologies to VoiceXML 2.0 and 2.1 compliant applications:

- **ASR** – the **W3C SRGS 1.0** (Speech Recognition Grammar Specification) grammar formats in both XML and ABNF (Augmented Backus-Naur Form) formats, and also complete support of **SISR 1.0** (Semantic Interpretation for Speech Recognition).
- **DTMF** – even DTMF applications can take advantage of the **SRGS 1.0** and **SISR 1.0** standards, so that a voice/DTMF application can be given uniform results from voice and DTMF interactions.
- **TTS** – the **W3C SSML** (Speech Synthesis Markup Language) is the standard for enhancing text-to-speech rendering and for accessing the many unique features of Loquendo TTS.

www.loquendo.com



Loquendo
VOCAL TECHNOLOGY AND SERVICES

Loquendo TTS

TEXT TO SPEECH

The Benefits to You...

Give your users the **best available TTS technology** for IVR (banking, government...), live news, accessing business documents, e-learning, entertainment, automotive telematics, email reading and any embedded application - there are no limits!

Loquendo's truly lifelike TTS means there's no need for costly, time-consuming pre-recording, and it enables the **rapid deployment of vocal services** that customers will love using.

Loquendo's voices are **expressive, clear, natural and fluent**: they have been enriched with a repertoire of "expressive cues" that allow for **highly emotional** pronunciation.

Two ways for creating your own audio files are available:

- **Loquendo TTS Director** – a complete development environment for creating your own voice prompts, tuning them and saving customizations.
- **Loquendo TTS Voice Experience** – designed in a games console style, this is a highly interactive and user friendly environment in which voice parameters can be easily and rapidly adjusted.

With all this at your disposal, you can get Loquendo TTS voices talking just the way you want them to!

A World of Languages & Voices...

Loquendo gives its customers expanded reach in today's global marketplace. Loquendo TTS is a rapidly growing family of expressive voices and personas from around the world.

Loquendo's research and highly efficient methods of development enable the rapid release of new, high-quality voices and languages, as well as customized voices to suit your corporate profile.

To discover more about Loquendo's latest TTS successes, visit our interactive TTS Demos at: www.loquendo.com.

Loquendo TTS Director

Loquendo TTS Director is a complete Java environment for creating your own voice prompts. It gives developers complete control over their voice applications so they can really enhance the user experience. Text is written in the edit box and interactively refined through a "listen & edit" procedure, which allows "fine-tuning" for even better TTS performance. Its many features include:

- A repertoire of "**expressive cues**" – commonly used phrases, such as "How are you?" or "You've got to be kidding!" and paralinguistic events such as yawning, coughing and laughing - enable highly expressive pronunciation, creating extremely natural sounding speech.
- "**Plug-in lexicons**" – make possible the reading of specific types of text (e.g. SMS abbreviations, emails).
- **Lexicons Manager** – is the tool to create and edit lexicons.
- **Mixed Language Capabilities** – allows the reading of multilingual texts: it has a built-in **language guesser** that automatically identifies the language of any text so that, through **phonetic mapping**, any of Loquendo's voices can pronounce any foreign word.
- **Audio Mixer** – gives you complete control over all audio sources (for music or other sounds there is a choice of sampling rates and coding): audio files can be mixed, looped, faded in and out, or synchronized with synthetic speech.
- **Voice Creator** – gives you the possibility to modify an existing voice and save it as a new one.

KEY TTS FEATURES:

- » **Expressive TTS**
- » **Mixed Language Capability: Phonetic Mapping, Language guesser**
- » **Dynamic switching between multiple voices**
- » **Pronunciation lexicon - for user definable pronunciation (acronyms, foreign names, etc.)**
- » **Flexible voice control - for creating special effects, modifying speech rate, pitch and timbre**
- » **Audio Mixer**
- » **Built-in audio effects, i.e. reverb and stereo balance**
- » **SMS and E-mail Preprocessing**
- » **Customized voices - for extending corporate image and branding through unique voices**
- » **Support of the phonetic alphabet SAMPA (TeleAtlas® and Navteq™ extensions included)**

Loquendo ASR

AUTOMATIC SPEECH RECOGNITION

Loquendo
MRCP Server

KEY ASR FEATERS:

- » *Speaker independent*
- » *N-Best Decoding*
- » *Confidence Scores at sentence and word level*
- » *Tunable Voice Detection sensitivity*
- » *Improved Barge-In functionalities*
- » *Speech Complete/Incomplete Timeout*
- » *Garbage rules*
- » *Natural Language Processing*
- » *Grammar handling and fast grammar compilation on the fly*
- » *Re-usable Built-in grammar library*
- » *Multilingual grammars*
- » *Voice enrolled grammars*
- » *Optimized for VoiceXML applications*
- » *Loquendo Speaker Verification*

The Benefits to You...

Loquendo ASR gives integrators the freedom to create services that are user-friendly and as complex as they want them to be in terms of vocabulary size, interaction flexibility and number of languages. Loquendo ASR perfectly fits the requirements of each and every application scenario - however complex.

- **Broad Vocabulary & Flexible Recognition** – recognizes up to 1,000,000 words; supports isolated and continuous speech.
- **Highly Accurate Speech Recognition** – thanks to integration of neural networks and hidden Markov models, and detailed acoustic-phonetic units trained on large speech corpora.
- **Extended Standards Support** – optimized for VoiceXML applications; complete grammar standards support, both W3C SRGS 1.0 and SISR 1.0.
- **Highly Accurate Phonetic Transcribers** – specialized for each language (also used in acclaimed Loquendo TTS).

- **High Efficiency** – low-computational power requirements enable a large number of recognition channels to run simultaneously, both with small and large vocabularies.
- **Rapidly Extensible to new languages** – the methodology that has been tuned for our wide range of languages is rapidly extended to any other.
- **Powers Loquendo Speaker Verification** technology.

Simple Yet Powerful Technology...

A complete set of **simple and powerful features** guarantees truly robust speech technology, enabling:

- Improved *barge-in capability* to guarantee high reactivity and robustness to noise and background speech.
- A new patented speech enhancement method for improved recognition performances in *noisy conditions*.
- A *flexible rejection mechanism* which identifies any linguistic expressions that are not acceptable within a specific domain.
- *Dialogue-flow management* which is achieved through confidence values provided for all the *N-best hypotheses* returned on a sentence-by-sentence & word-by-word basis.
- Very effective *Garbage rules* definition to match arbitrary spoken sequences not modeled by the grammar.

A sophisticated **Speech Assistant Toolkit** guarantees the rapid and efficient definition of Recognition Objects (ROs) and Recognition Packages, such as Grammar ROs and Language Modeling ROs. In “unpredictable” situations, ROs can be created, stored and deleted “on the fly”.

Significant memory requirement reduction: ROs can be both *permanent* (and therefore shared by all recognition channels) and *dynamic* (i.e. loaded run-time when required and discarded once they have been used).

Loquendo ASR also provides:

- A **re-usable built-in grammar library** for each language (e.g. date, time, currency, phone numbers, etc.).
- **Phonetic segmentation**, which includes the phonetic representation and related time-stamps for each phoneme within a sentence. This is often a prerequisite, especially in avatar animation.

Loquendo ASR Tools

Loquendo ASR provides users with a tool package that automatically analyzes data collected in the field to improve service performance, including:

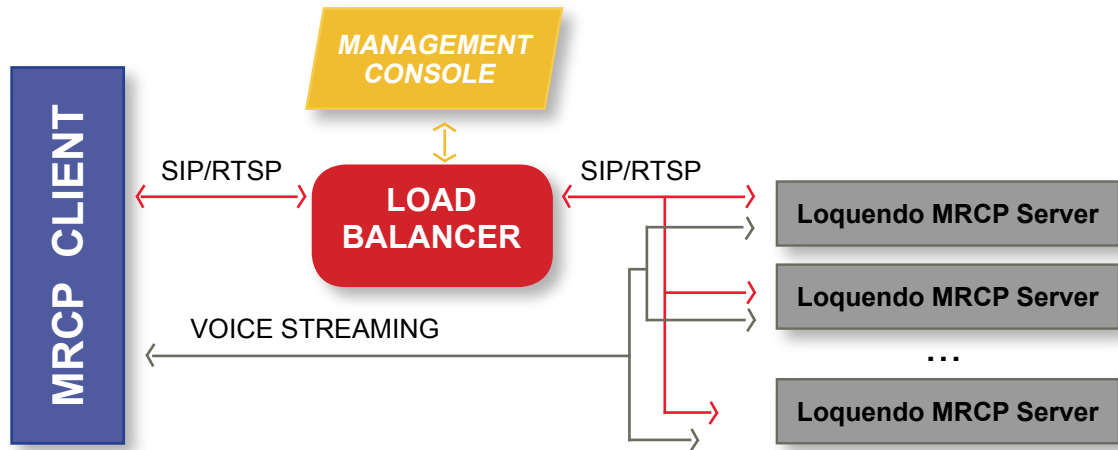
- **Phonetic Learning** – which automatically analyzes application data to identify frequent formulations that have not been covered and additional pronunciation variants, to improve a speech recognition grammar.
- **Acoustic Model Adaptation** – further increases recognition performance by using audio material recorded in the field (environment, speaker, channel adaptation), where a vocal application is used in a particular context.

Loquendo MRCP Server – Profiles and Configurations

Loquendo MRCP Server provides flexible network configurations, which allow a range of possible integrations with the **MRCP v1** and **MRCP v2** profiles.

Loquendo MRCP Server can be configured as TTS-only, ASR-only, or both TTS and ASR. The **MRCP v2** profile provides Recording and Speaker Verification functionalities.

In multiple server configurations, the Load Balancer guarantees the management of several Loquendo MRCP Servers by a single MRCP client.



Loquendo MRCP Server – Technical Specifications

Key Features	<ul style="list-style-type: none"> • Software-only solution • Support for all languages and voices, according to Loquendo TTS and Loquendo ASR technology • Depending on capability of Loquendo technologies: plays audio files or synthesized text, recognizes or records user speech • Grammar can be pre-recorded or compiled from specific sources to create Recognition Objects • Common lexicon for Loquendo ASR and Loquendo TTS • Server negotiation in multiple server configuration
OA&M	SNMP Agent for software modules, Graphic Management console
Supported Languages	American English, Canadian French, Brazilian Portuguese, American Spanish (only TTS), Argentinian Spanish, Chilean Spanish, Mexican Spanish, Mandarin Chinese (only TTS), British English, Castilian Spanish, Catalan, Valencian, Galician, Dutch, French, German, Greek, Italian, Polish, Portuguese, Swedish, Turkish, Russian*, Finnish* (only TTS) and Danish* (only TTS)
OS Supported	<ul style="list-style-type: none"> • US version of MS Windows 2000, 2003 Server, XP • Red Hat Enterprise Linux 3.0
Standard Interfaces	MRCP v1 (RFC 4463), MRCP v2, SNMP
CPU Requirements	<p>For a single CPU Pentium IV at 3 GHz - 1 Gb of RAM:</p> <ul style="list-style-type: none"> • TTS Server configuration: 50 channels • ASR Server configuration: 30 channels when running a vocabulary size of approx. 1,000 words • Technology Server (TTS&ASR) configuration: 20 channels <p>For a Dual Pentium IV at 3.4 GHz - 4 Gb of RAM:</p> <ul style="list-style-type: none"> • TTS Server configuration: 90 channels • ASR Server configuration: 60 channels when running a vocabulary size of approx. 1,000 words • Technology Server (TTS&ASR) configuration: 40 channels

*available during 2008

For more detailed information see the **Loquendo TTS** and **Loquendo ASR** brochures.

To find out how Loquendo's products can position your company for success, please visit www.loquendo.com.

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