

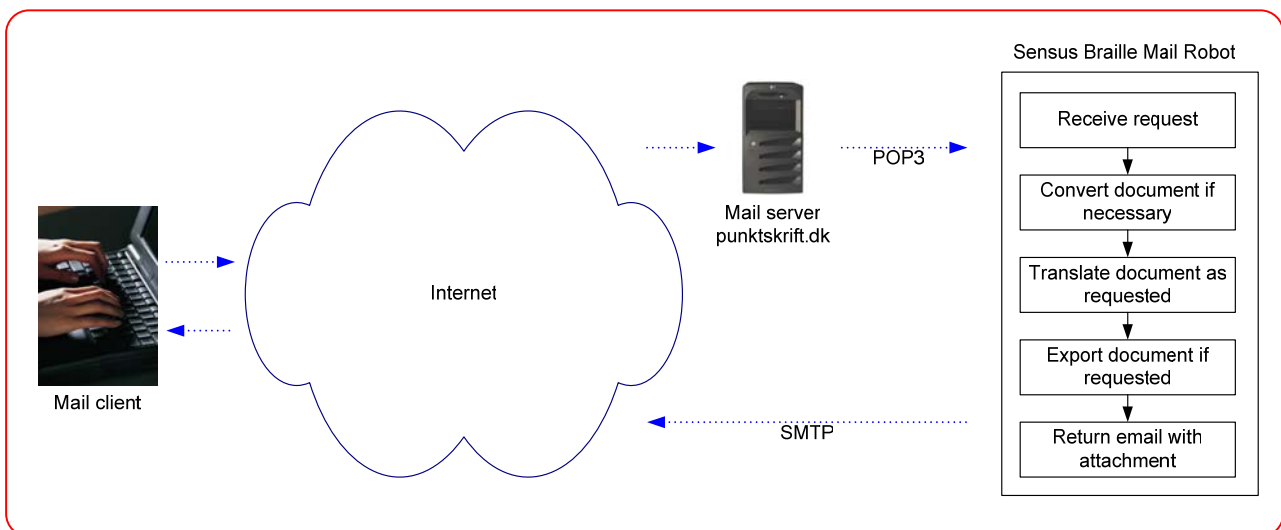
Braille or Speech through Email

Send a document through email and have it returned as contracted Braille or synthetic speech. That's the concept of the Sensus Braille Mail Robot, an email-based translation service developed jointly by Synscenter Refsnæs (www.refsnæs.dk) and Sensus ApS (www.sensus.dk). The service is available free of charge.

Based on the Sensus Braille version 4 translation engine (SB4), the Sensus Braille Mail Robot is capable to translating to and from contracted Braille in both six-dot and eight-dot Braille format. For synthetic speech, a number of commercial and free text-to-speech engines are used to support the translation of written text into speech. By implementing the system as an email-based service, users do not have to install anything on their own computers; the system is always up-to-date; the system is available from all platforms capable of sending and receiving emails; and the system is available to everyone irrespectively of platform or physical location.

Braille Translation

The current version of the Sensus Braille Mail Robot supports a range of popular document formats, including standard text, HTML, Word and Rich Text Format (RTF). Adobe's Portable Document Format (PDF) is expected to be added to the list in the near future. Prior to translation, Word and RTF files are converted into text. The figure below illustrates the information flow and user interaction with the translation system for Braille translation:



Depending on the size of the file, the traffic and server workload, a result is typically returned to the user within 2-3 minutes of submitting a request for translation.

The translation system assumes that the source document is written in the standard Windows character set. Furthermore, the system supports automatic conversion of older ASCII documents with the file-type .asc to Windows text files. Amongst others, these files include eBooks published by the National Danish Library for the Blind.

Once translated, the document is returned in OctoBraille 1252, a Braille adaptation of the standard Windows character set used in Western Europe developed by Synscenter Refsnæs ([www.sensus.dk/sb4/OctoBraille 1252.doc](http://www.sensus.dk/sb4/OctoBraille%201252.doc)). Since few Braille devices share the same character set,

the translation system can convert the translated document into a range of different formats to accommodate Braille note takers and embossers.

The actual translation process is controlled by using different email accounts, whereas export formats and other commands are defined in the subject field of the email.

The translation processes include:

Email account	Process
ottepunkt@punktskrift.dk	Translates the attached document into contracted eight-dot Braille.
sekspunkt@punktskrift.dk	Translates the attached document into contracted six-dot Braille.
fuldtekst@punktskrift.dk	Translates the contracted document into standard text.
filepart@punktskrift.dk	Partitions in file into smaller parts (up to a maximum of 30 parts) to allow it to fit into the memory of older Braille note takers. If no size is specified, the file is divided into parts each approximately 60kbytes. Other sizes may be specified in the subject field.
konverter@punktskrift.dk	Converts the attach file end returns the converted file.
eksport@punktskrift.dk	Converts documents in the standard Windows character set to the character set of a particular Braille device, such as a note taker or embosser.

To support a particular Braille device, such as a Braille note taker or Braille embosser, it may be necessary to develop a new export filter. The following export filters have already been defined:

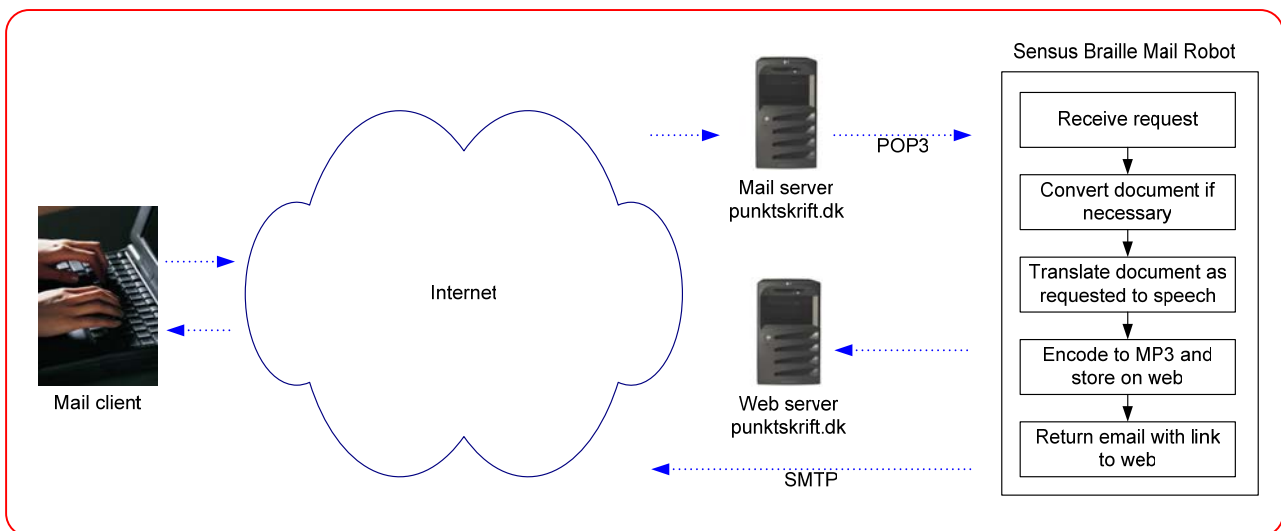
Export filter in Subject	Description
logtext5	Defines the mapping between the OctoBraille 1252 character set and the character set of the LogText version 5 note taker.
braillelite	Defines the mapping between the OctoBraille 1252 character set and character set of the Braille Lite note taker. It is a preliminary filter that only supports sex-dot Braille due to current limitations in the Braille Lite character set.
test-space-til-a	Test export filter that – amongst others - replaces all spaces with capital A's.

The export filters are selected by writing logtext5, braillelite or test-space-til-a, respectively, in the subject field of the mail containing the document for translation.

The translation currently supports the Danish rule sets for contracted Braille in six and eight dot. Furthermore, the system has been prepared for multi-lingual support and modules for British English and Swedish contracted Braille have been developed for previous versions of Sensus Braille. The modules can be adapted to the current version of the Sensus Braille translation system with limited effort.

Synthetic Speech

In addition to contracted Braille, the Sensus Braille Mail Robot supports translation of text into synthetic speech. First, the translation system translates an attached document into a WAVE file. WAVE files are rather large and unsuitable for transmission via the Internet. Therefore, the WAVE file is subsequently encoded and compressed into an MP3 file. The resulting audio file is stored with a unique name on a web server and a link to the file is returned to the user. The figure below illustrates the flow and user interaction with the translation system for translation into synthetic speech:



Depending on the traffic and server workload, a result is typically returned to the user within 2-3 minutes of submitting a request for translation. As for supported file types and character sets of source documents, these are identical to the file types and character sets described in the previous section.

The text-to-speech translation process is controlled by a separate email account:

Email account	Process
tale@punktskrift.dk	Translates the attached document into synthetic speech.

The correct text-to-speech language module is selected by specifying the language in the subject field of the email containing the document for translation:

Language in Subject	Description
Danish	The attached document is translated into synthetic speech using the Danish text-to-speech language module.
English	The attached document is translated into synthetic speech using the (American) English text-to-speech language module.

There are no practical limits as to the number of text-to-speech language modules, and new modules can be added to the solution with a minimum of effort.

Administrative features

In addition to the translation services provided by the Sensus Braille Mail Robot, a range of administrative features are included in the solution. These are controlled by a separate email account:

Email account	Process
sb4admin@punktskrift.dk	Sensus Braille Administrator account.

Administrative commands are passed on to the system by keywords in the subject field of the email:

Command in Subject	Description
status	Returns status information and log files. The user must be registered with special privileges.
undtag	The attached file updates the exception list on the server. The changes become effective when the server is automatically restarted at midnight. The user must be registered with special privileges.
streng	The attached file updates the exception fragment list on the server. The changes become effective when the server is automatically restarted at midnight. The user must be registered with special privileges.

The sb4admin@punktskrift.dk account is shared by all Sensus Braille Mail Robots. E.g., a mail request to update the exception list will cause the exception list to be updated on all robots.

More information

Please contact Svend Thougaard (sth@refsnaes.dk, +45 59 57 02 98) or Lars Ballieu Christensen (lbc@sensus.dk, +45 48 22 10 03) for further information.

Additional information about Sensus Braille and the Sensus Braille Mail Robot is available (mostly in Danish) on www.sensus.dk/sb4 and www.sensus.dk/sb4/sb4amr.htm.

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Version 1.3/08/2005