

GloBUS

Decoding meteorological messages



The decoding of incoming messages requires efficient, high performance software which is not only able to handle current formats, but which will also be able to cope with new formats developed in the future. The GloBUS system, which is designed for the efficient decoding of more than one million incoming messages every day, fully meets these requirements.

The GloBUS software for decoding meteorological messages integrates various codes and the conversion into a number of output formats, such as for example GRIB or BUFR. The decoding is either completed in a batch process or via a graphical user interface.

GloBUS can be used universally, on notebooks as well as in a client/server environment on supercomputers.

The existing version of GloBUS is being up-dated to include the new GRIB Edition 2 and BUFR Edition 4 formats developed by the WMO.

Prominent features of GloBUS are:

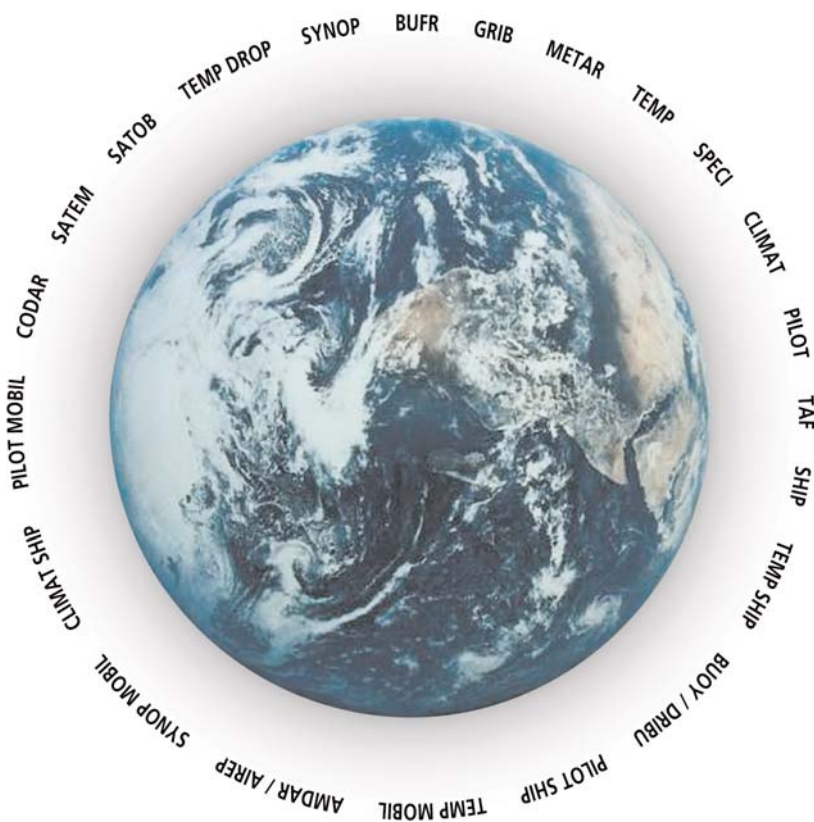
- OS-independent client/server or stand-alone application
- Developed in the programming language Java
- parallel read-, convert- and output-modes
- designed to include new keys and output formats
- several input/output media (file system, database, Internet, etc.)

This results in a highly scalable system for input and processing of coded weather reports

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Basically, all WMO codes can be used as input formats for GloBUS. Currently, a selection of WMO and ICAO codes have been implemented. These include SYNOP, SYNOP MOBIL, METAR, SPECI, TAF, AIRMET, GAMET, SIGMET, CODAR, AMDAR/AIREP, TEMP, TEMP SHIP, TEMP DROP, TEMP MOBIL, SATEM, SATOB, BUFR, SHIP, BUOY, PILOT, PILOT SHIP, PILOT MOBIL, CLIMAT, CLIMAT SHIP, GRIB as well as GAFOR, MREP and WEHI. In addition, several NATO codes are implemented.



The introduction of new reporting formats, such as developed in 2002 at the meetings of the COMMISSION FOR BASIC SYSTEMS of the WMO, is fully supported by the modular software architecture of GloBUS.

Also, GloBUS is the optimum choice for efficient processing of BUFR coded Radar data.

The system is not bound to one or more fixed output formats. Basic formats are FM 94 BUFR and FM 92 GRIB as well as raw data and a universal CORBA object. The inclusion of further formats is planned.

Output is independent of input. Each incoming report in an implemented input format can be converted into any implemented output format.

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During decoding, the data is analysed by scanners and parsers. Each implemented key has its own compiler that processes the data in several stages and generates an internal standard object.

This standard object decouples input format from output format. Because of this each output format needs only a single converter instead of one for every input format.

Together with the software tools comprised by the product BUFR-World a full range of software systems for reading, interpreting, editing, and viewing BUFR coded data is available.

The image shows two windows from the BUFR-World software. The left window, titled 'BUFR-Baum', displays a hierarchical tree view of a BUFR message. The tree is organized into sections (Section 0, Section 1, Section 2, Section 3, Section 4) and data subsets. The right window, titled 'BUFR-Ausgabe [TWNA_gts01-CSSP04_LEMM_051256-0112051256-afsv-79-ascii-]', displays a table of decoded data fields. The table has three columns: field number, field name, and value. The values are either numerical, text, or 'Missing'.

Field Number	Field Name	Value
004005	MINUTE	0
end Sequence 301012		
301021	Sequence	
005001	LATITUDE (HIGH ACCURACY)	24.43
006001	LONGITUDE (HIGH ACCURACY)	54.65
end Sequence 301021		
007030	HEIGHT OF STATION GROUND ABOVE MEAN SEA	16.0
007031	HEIGHT OF BAROMETER ABOVE MEAN SEA LEVEL	27.0
007007	HEIGHT	Missing
033024	STATION ELEVATION QUALITY MARK (MOBIL)	Missing
031021	ASSOCIATED FIELD SIGNIFICANCE	6
ASSOCIATED FIELD (Significance: 6; data width: 9)		
022043	SEA/WATER TEMPERATURE	Missing
ASSOCIATED FIELD (Significance: 6; data width: 9)		
008002	VERTICAL SIGNIFICANCE (SURFACE OBSERV.)	0.0
ASSOCIATED FIELD (Significance: 6; data width: 9)		
020011	CLOUD AMOUNT	Missing

The implementation of new input codes requires the implementation of an appropriate new compiler for processing reports. The codes format needs to be analysed and the appropriate parser created.

Currently, output is possible as BUFR and GRIB as well as CORBA objects. A component is also planned for generating application-specific formats (e.g. XML). Basically any output format may be implemented, so that the reports may be imported into other programs and processed there.

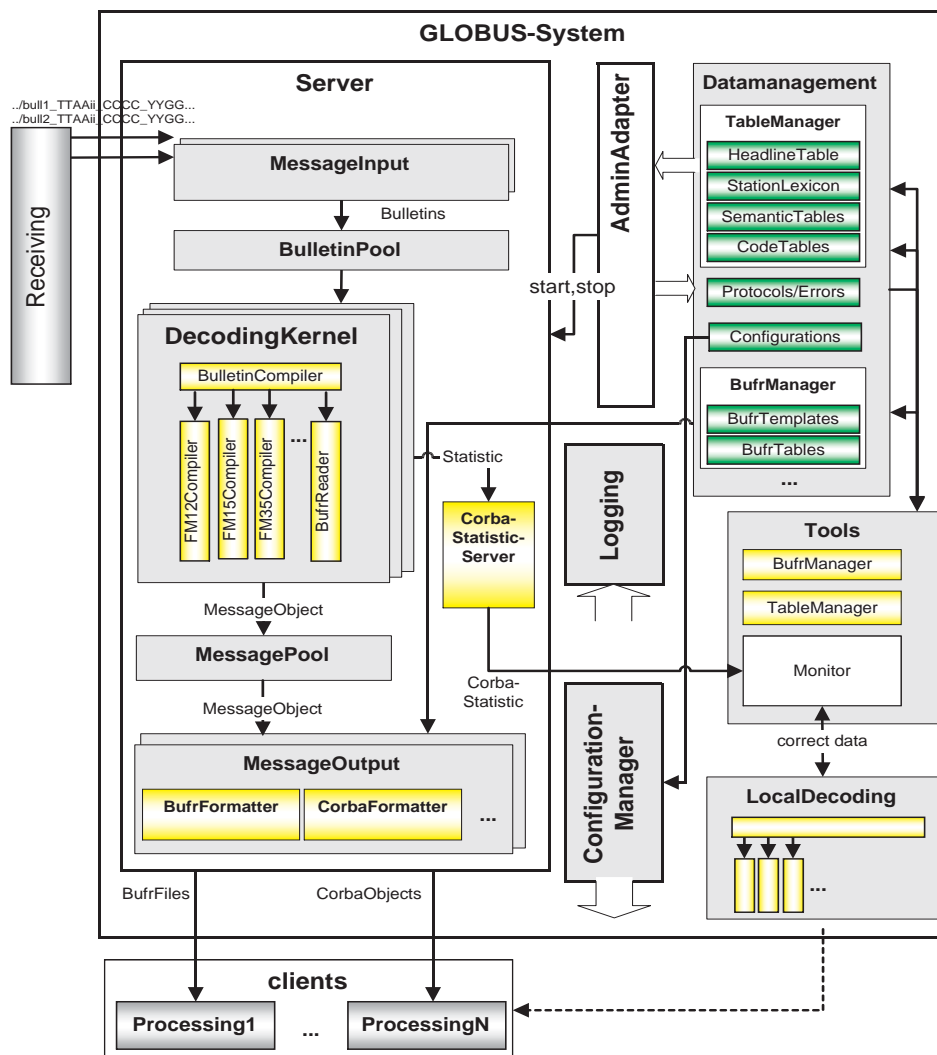
The modular architecture and high scalability make GloBUS an extremely flexible and adaptable system for decoding meteorological messages.

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GloBUS contains the following components: decoding server, data storage, tools and local decoding. The decoding server contains the input module for receiving the data, the decoding core and the output module with standard formats.

GloBUS is designed to be integrated in the processing chain from the assimilation of meteorological data to archiving.



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