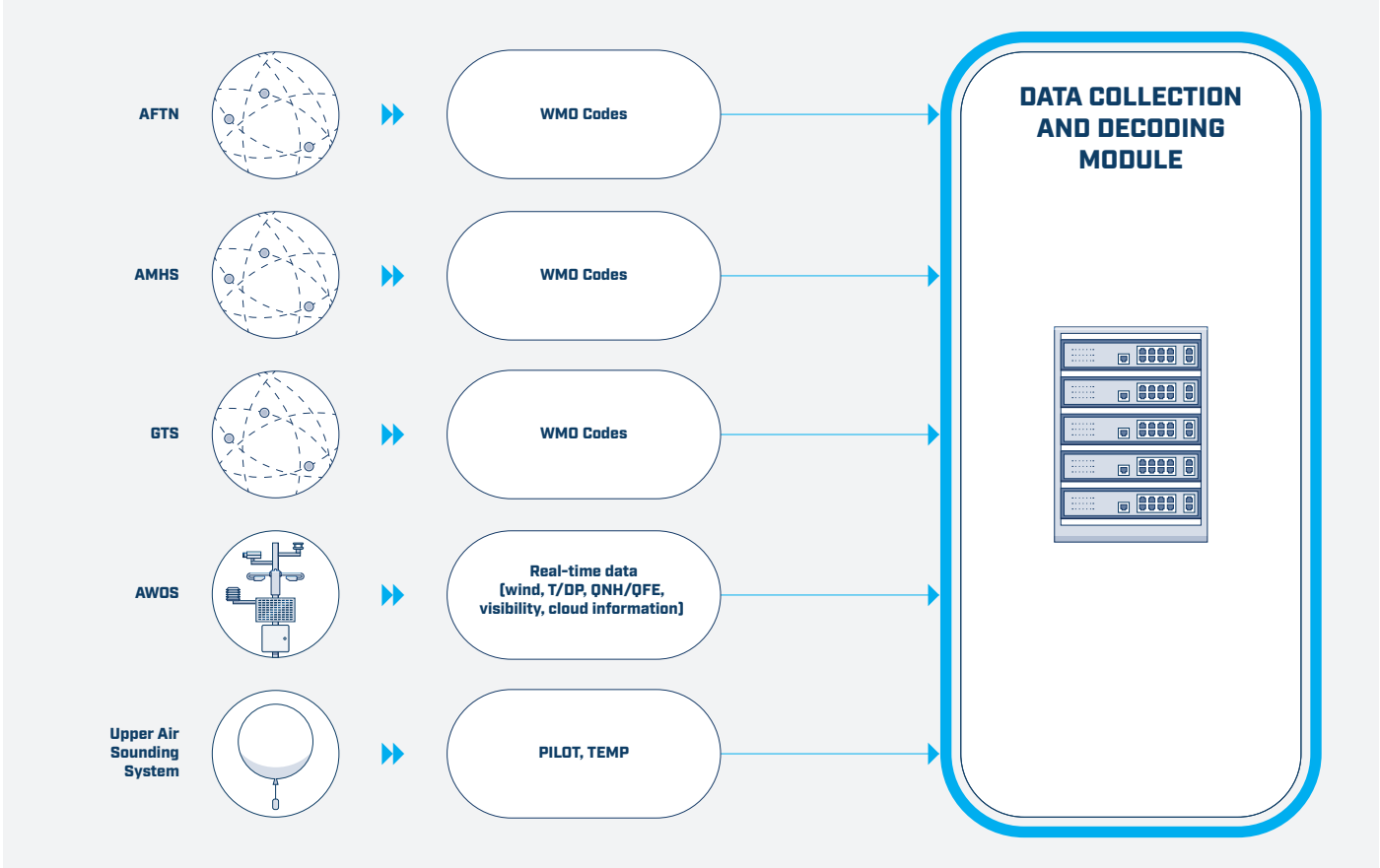
Aero CLDB

Aeronautical Climatological Database

Climatological database (CLDB) is a MicroStep-MIS database system addressing the needs of the meteorological institutes to store the high-volume long-term meteorological, climatological and environmental data. The CLDB stores all collected data in one unified structure, thus avoiding data inconsistencies and discrepancies and enabling standard comfortable data access for all users and other software systems. No additional data storage and no different and confusing data formats are needed.



- Based on cutting edge technologies (Oracle Database, Java)
- Scalability up to thousands of stations and variables
- Compatible with various servers and web clients
- Extensible to dual architecture with replicated server or cluster
- Component-based software design

Within the database, the above mentioned unified structure is based on SQL Database Server and the standard data access is based on SQL language.

CLDB is based on WMO recommended practices for climatological data processing (WMO Guide No. 100). It follows the WMO suggestion of a RDBMS (Relation Database Management System) application with wide use in climatology (World Climate Program efforts concerning new Climate Data Management Systems - CDMSs).

The Aeronautical Climatological Database is a CLDB variant fully compliant with the ICAO / WMO requirements related to the preparation of the Aerodrome Climatological Summaries.

In addition, the database is an ideal tool for the advanced statistical data post processing and with the incorporated sophisticated quality control modules it is ready to serve for the evaluation of the quality of service indicators for the particular MET service provider.

Having been integrated into the IMS4 Aviation Weather Decision Support System, Aero CLDB serves as the data source for the data mining models (fog detection and forecasting, cloud coverage, etc.).

Aerodrome climatological summaries:

- for planning of aerodrome operations
- indicate probability of occurrence of low visibility, low cloud base etc. throughout the year and for a specific hours of a day

Basic ICAO / WMO prescribed forms:

- Frequencies of the occurrence of RVR / visibility and / or height of lowest cloud base of BKN or OVC extent below specified values at specified times
- Frequencies of visibility below specified values at specified times
- Frequencies of the height of the base of the lowest cloud layer of BKN or OVC extent below specified values at specified times
- Frequencies of occurrence of concurrent wind direction (in 30 degrees sectors) and speed within specified ranges
- Frequencies of surface temperature (screen) in specified ranges of 5 degrees Celsius at specified times

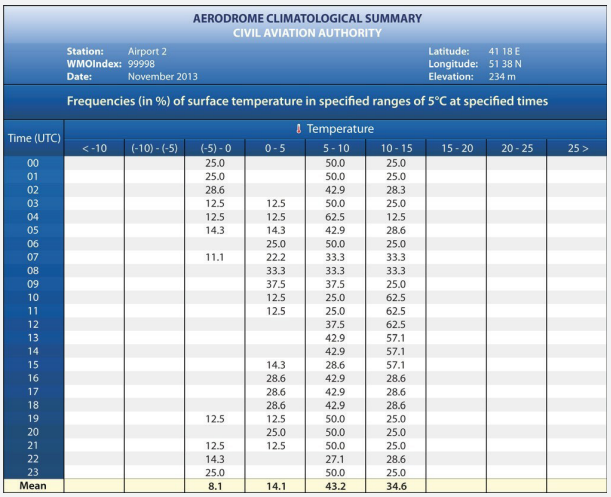
Applications:

- Select
- Reports
- Manual Data Entry
- Thermodynamical diagram
- Wind Rose
- DB Manager
- Web Interface
- Image Viewer
- Import of historical data

WMO message collection and switching capabilities

The optional message switching module supports wide choice of protocols defined by the WMO Manual on the GTS or other applicable documents:

- file transfer (FTP, SCP, different formats)
- TCP / IP sockets as defined by the Attachment II/15 of the WMO 386 Manual on the GTS
- legacy asynchronous lines
- AFTN ITA-2, IA-5, AMHS

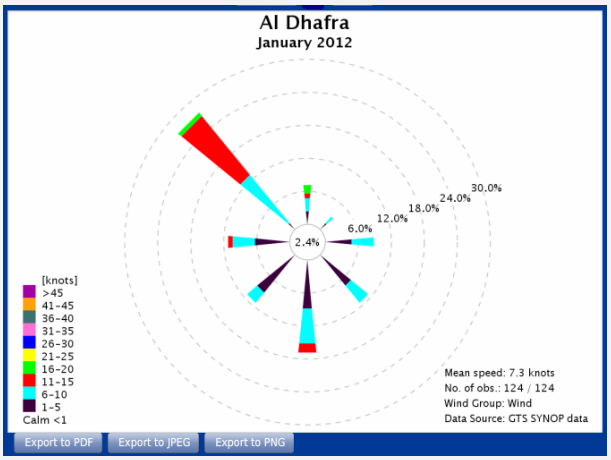


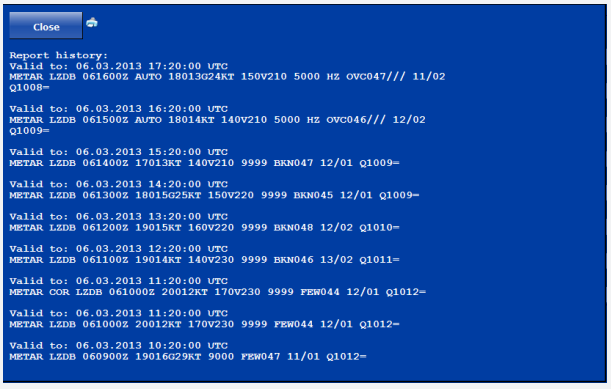
AERODROME CLIMATOLOGICAL SUMMARY
CIVIL AVIATION AUTHORITY

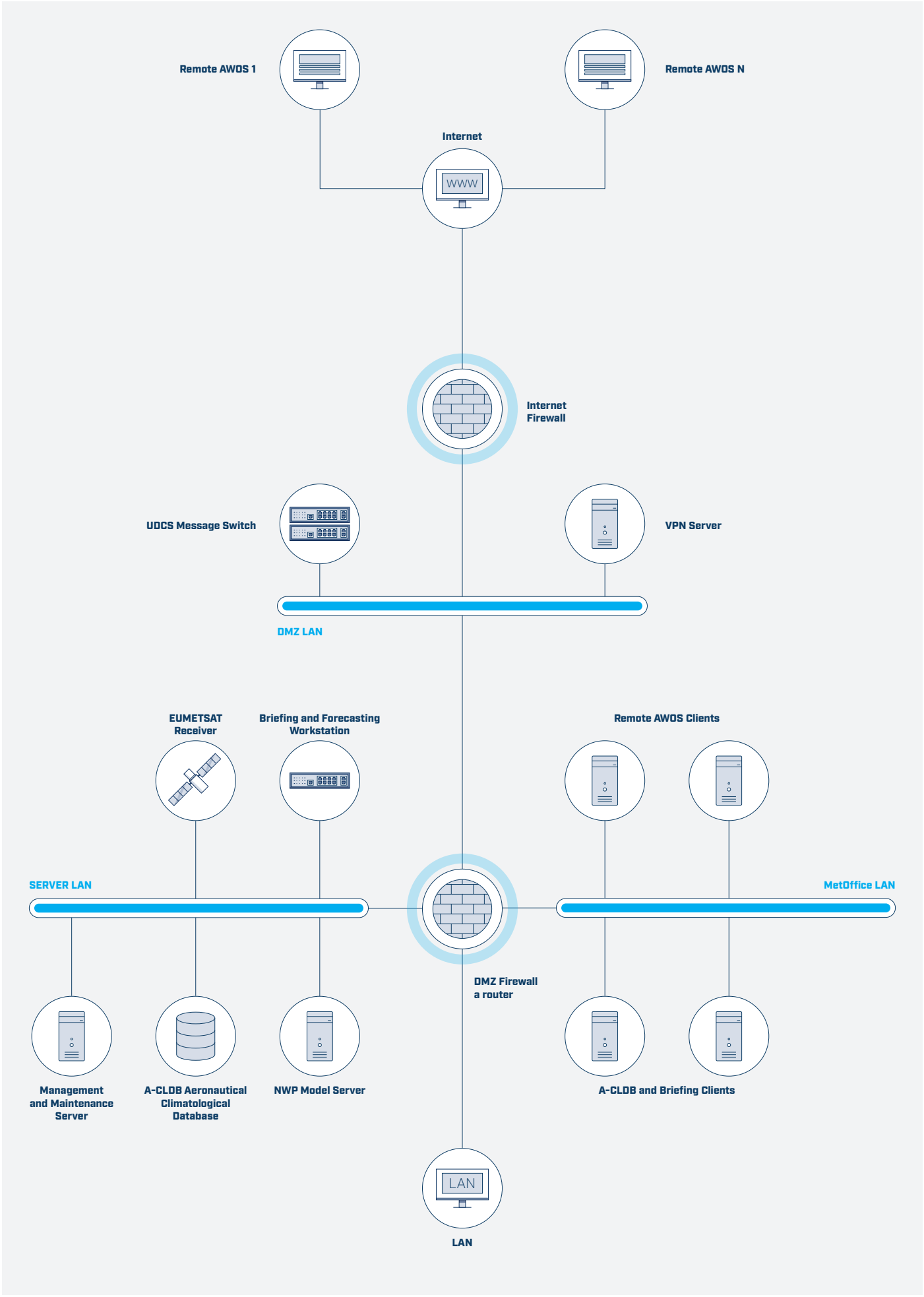
Station: Airport 2 — Latitude: 41 18 E
WMOIndex: 99998 — Longitude: 51 38 N
Date: November 2013 — Elevation: 234 m

Frequencies (in %) of surface temperature in specified ranges of 5°C at specified times

Time (UTC)	Temperature								
	< -10	(-10) - (-5)	(-5) - 0	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 >
00			25.0		50.0	25.0			
01			25.0		50.0	25.0			
02			28.6		42.9	28.3			
03			12.5	12.5	50.0	25.0			
04			12.5	12.5	62.5	12.5			
05			14.3	14.3	42.9	28.6			
06				25.0	50.0	25.0			
07			11.1	22.2	33.3	33.3			
08				33.3	33.3	33.3			
09				37.5	37.5	25.0			
10				12.5	25.0	62.5			
11				12.5	25.0	62.5			
12					37.5	62.5			
13					42.9	57.1			
14					42.9	57.1			
15				14.3	28.6	57.1			
16				28.6	42.9	28.6			
17				28.6	42.9	28.6			
18				28.6	42.9	28.6			
19			12.5	12.5	50.0	25.0			
20				25.0	50.0	25.0			
21			12.5	12.5	50.0	25.0			
22			14.3		27.1	28.6			
23			25.0		50.0	25.0			
Mean			8.1	14.1	43.2	34.6			







Aero CLDB forecasting office scheme

OPMET database

The OPMET database automates the storage and retrieval of observations (METAR / SPECI), forecasts (TAF) and warnings (SIGMET).

Quality of service indicators

An optional highly configurable module performs the statistical analysis of the meteorological products and calculates the indicators, whose values serve for the quality of service evaluation of the respective MET services provider:

- Dissemination success rate: rate of the successful dissemination / reception of the selected products (METAR / SPECI, TAF, etc.) from the originator message switch
- Format / coding compliance:
  - METAR / SPECI
  - TAF
  - SIGMET
  - etc.
- Forecast (TAF) quality of service indicators – verification against METAR and SPECI observations:
  - Frequency of occurence / miss frequency
  - Relative bias
  - Skill scores:
    - Hanssen-Kuiper's Skill Index
    - Reliability tables and SQI score
    - Nordic TAF scheme
- Availability of (web) services for disseminating Annex 3 services.

The quality of service indicators reports provide the computed statistics for the selected products, airport / station or a group of those.

Compliance with standards

- ICAO Annex 3 Meteorological Service for International Air Navigation
- WMO Technical Regulation No. 49, Volume II Meteorlogical Service for International Air Navigation
- WMO No. 100 Guide to Climatological Practices
- WMO No. 1001 Guide to the Quality Management System for the Provision of Meteorological Service for International Air Navigation
- ISO 9001: 2015 for quality assurance