EUMETCast data dissemination

EUMETSAT's real-time data access system delivers several terabytes of satellite data per day for weather forecasting and safety-critical operations. It employs multicast technology to transport near real-time data to reception stations with guaranteed timeliness, using either EUMETCast satellite or terrestrial. This ensures comprehensive coverage and reliable delivery to a broad user community.

EUMETCast features

EUMETCast satellite serves users in Europe, Africa, South America, and parts of Asia, while EUMETCast terrestrial offers global coverage. Currently, over 4,000 user reception stations are installed. The key features of the system are:

- secure delivery of data, allowing file transmissions to be targeted to a specific user or group of users, thus supporting any required distribution/access data policy;
- handling of any file format, allowing the dissemination of a broad range of products;
- no limitations on file sizes;
- one-stop-shop delivery mechanism allowing users to receive many data streams via one reception station;
- use of off-the-shelf, commercially-available DVB-S2 reception equipment;
- use of high-bandwidth managed global terrestrial networks;
- highly scalable system architecture.

Contributing to the IGDDS and the GEOSS

EUMETCast satellite is the operational, near-real-time data delivery service for the World Meteorological Organization (WMO) user community in Region VI (Europe) and Region I (Africa). It is a component of the WMO Integrated Global Data Dissemination Strategy (IGDDS) and is integrated into the WMO Information System (WIS).

EUMETCast satellite is the EUMETSAT contribution to GEONETCast, a milestone in the Global Earth Observation System of Systems (GEOSS).

Services available via EUMETCast

Services from EUMETSAT include:

- **level 1 satellite data:** space-based observations from the Meteosat, Metop, Jason and Sentinel-3 satellites. At their most frequent, these data are delivered to users within five minutes of processing;
- **weather monitoring:** products to support nowcasting and short-range weather forecasting applications;
- **ocean monitoring:** global and regional marine meteorological and ocean surface products;
- **atmospheric composition:** specific observational products to support operational monitoring and forecasting of atmospheric composition including air quality;
- **land applications:** vegetation, surface radiation, wildfire and snow cover products.

In addition, a wide range of third-party meteorological and environmental products are available on EUMETCast, including:

- level 1 satellite data and derived products from a range of atmospheric, marine and land monitoring satellites (e.g. Sentinel, GOES, S-NPP, FY-2/-3, SARAL, Aqua/Terra, SMOS and GPM);
- European Commission Copernicus-funded data and products;
- Numerical Weather Prediction.

A user reception station can receive the full complement of data collections provided on EUMETCast, which can exceed 350 daily collections, depending on the service selected.

A full list of all products available on EUMETCast can be found via EUMETSAT's Data Catalogue: https://user.eumetsat.int/catalogue

Easy service selection

One of the advantages of using channels is that these can be filtered at the DVB receiver or the client software, allowing the user to select the channels they wish to receive.

By default, the control of which channels to receive is done by changing the subscription via the Earth Observation (EO) Portal as described below.

Registration

To gain access to EUMETCast, you need to first register on the Earth Observation (EO) Portal. Once an EO Portal account has been created, you can log in to view and modify your profile, subscribe to services and request data licensing arrangements. The client package (software and EUMETSAT Key Unit "EKU") can also be ordered through the EO Portal.

High volume service

EUMETCast Europe in Ku-band allows access to a High Volume Service (HVS) which provides high volume data at high delivery speeds (up to 70 Mbps per transponder (3 transponders plus non restorable). A larger antenna is recommended for the EUMETCast Europe HVS service, e.g. 1.2 to 1.8m in the core footprint.

User reception station

A typical EUMETCast satellite reception station comprises a consumer-grade PC with typical 2.8 GHz CPU, 8 Gb RAM, 500 Gb internal disk (or more, depending on storage required), fast disk interface, compatible DVB-S2 reception device and a satellite antenna with:

- universal V/H LNB in Ku-band;
- for EUMETCast Africa service circular polarisation feedhorn, C-band LNB, bandpass filter recommended (in areas with radar interference) in C-band;
- recommended antenna size, according to location.

In addition to the front-end equipment, EUMETCast client software and a USB device, the EUMETCast Key Unit (EKU), are required. EKU-less solutions for virtual system, where USB ports are not available, will be available next year. Together, these items facilitate the decoding and decryption of the DVB signal. EUMETSAT recommends setting up a dedicated PC as a receiving station and ftp or file server only and not to install and run other application software on this PC.

For EUMETCast terrestrial, connectivity to national research and education networks (NREN) is needed and the PC (hardware/software) as specified for the satellite reception.

For detailed information, please refer to the EUMETSAT user guide https://user.eumetsat.int/resources/user-guides/eumet-cast-europe-user-guide.

EUMETCast system overview
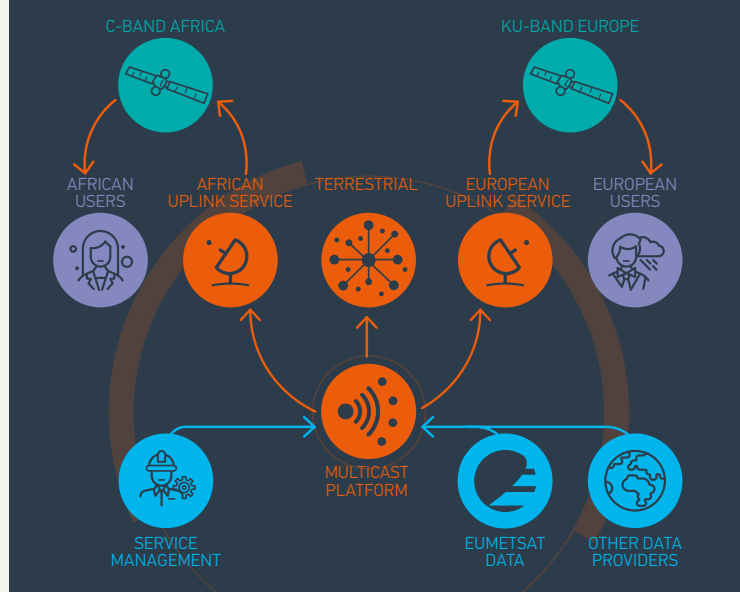
System overview

Within the current EUMETCast configuration, the multicast system for file distribution is based on the client/server software package TelliCast. The server side is implemented at the EUMETSAT headquarters in Darmstadt, Germany, and the client side installed on the individual EUMETCast reception stations.

Files are encoded into an IP multicast stream on the EUMETCast platform. The multicast stream is then transported to the user via two main networks: EUMETCast satellite and EUMETCast terrestrial.

On EUMETCast satellite the multicast is transferred via a dedicated communications line from EUMETSAT to the uplink facility. There the multicast is encoded into a DVB signal and transmitted to a geostationary communications satellite for broadcast to user receiving stations. Each receiving station decodes the signal and recreates the original multicast stream.

On EUMETCast terrestrial, the multicast is delivered to users through a multicast-enabled dedicated network, currently utilizing research networks. Users must be eligible to connect to their national research networks. For those on non-multicast enabled networks, tunneling solutions are provided, allowing multicast to be delivered as unicast. Apart from using terrestrial networks as the transport layer, EUMETCast terrestrial follows the same principles as the satellite service.

The EUMETCast client stations decode the multicast back into files according to the subscription of the user. Notes: As of 2024 the EUMETCast Europe backup satellite (Hotbird-13) will be used to provide non-restorable HVS, in parallel to the restorable service on Eutelsat-10B.

Users are recommended to have their reception system ready to receive the prime and backup satellite at the same time.

Find out more

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