



Network connectivity paradigm for the large data produced by weather radar systems

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The traffic over Internet is constantly increasing; this is due in particular to social networks activities but also to the enormous exchange of data caused especially by the so-called "Internet of Things". With this term we refer to every device that has the capability of exchanging information with other devices on the web. In geoscience (and, in particular, in meteorology and climatology) there is a constantly increasing number of sensors that are used to obtain data from different sources (like weather radars, digital rain gauges, etc.). This information-gathering activity, frequently, must be followed by a complex data analysis phase, especially when we have large data sets that can be very difficult to analyze (very long historical series of large data sets, for example), like the so called big data. These activities are particularly intensive in resource consumption and they lead to new computational models (like cloud computing) and new methods for storing data (like object store, linked open data, NOSQL or NewSQL).

The weather radar systems can be seen as one of the sensors mentioned above: it transmit a large amount of raw data over the network (up to 40 megabytes every five minutes), with 24h/24h continuity and in any weather condition. Weather radar are often located in peaks and in wild areas where connectivity is poor. For this reason radar measurements are sometimes processed partially on site and reduced in size to adapt them to the limited bandwidth currently available by data transmission systems. With the aim to preserve the maximum flow of information, an innovative network connectivity paradigm for the large data produced by weather radar system is here presented. The study is focused on the Monte Settepani operational weather radar system, located over a wild peak summit in north-western Italy.