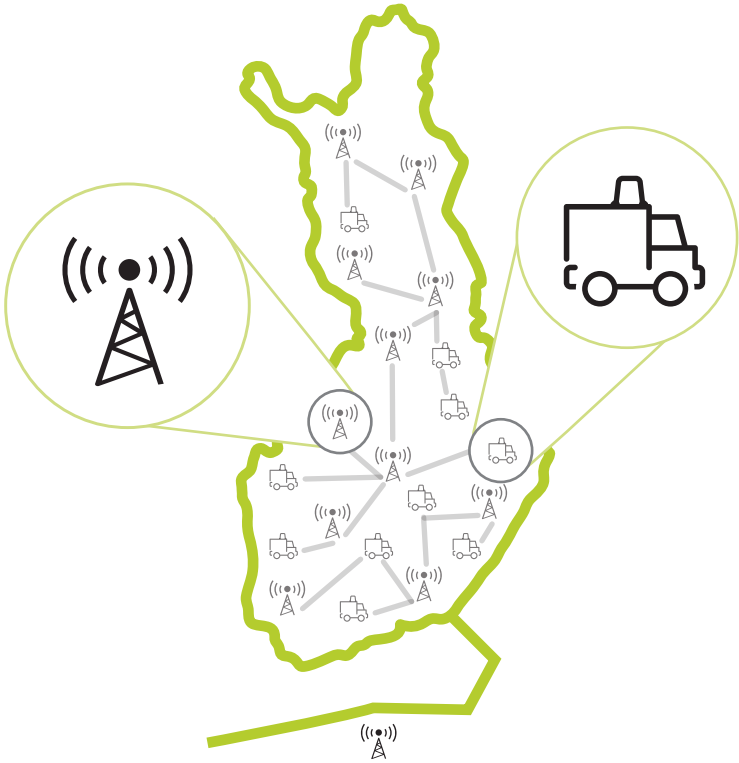
What is Virve?

The State Security Networks Group Finland (Erillisverkot) contributes to securing the functioning of Finnish society by providing secure and reliable ICT services for public authorities and other operators who are of critical importance to national emergency supply. Virve, the administrative security radio network, is one of the services provided.



Virve helps authorities and other safety and security operators

- to communicate efficiently and securely both in their daily work and crisis situations
- to cooperate across organisational boundaries
- to safeguard the safety and security of Finnish citizens in a manner that has aroused a great of international interest as well

In the future, the administrative security radio network will be implemented through collaboration between authorities and commercial operators. Commercial operators implement the infrastructure and Erillisverkot implements services for authorities on top of this platform. Erillisverkot acts as a network operator.

The network covers the whole of Finland, Finnish territorial waters and the Gulf of Finland sea area, since some Virve base stations are also located on the coast of Estonia. Under favourable conditions, at sea for example, the maximum range of Virve base stations is 56 km, which is significantly higher than the base station ranges commercial operators can offer.

The primary users of Virve include

- Rescue services
- Police
- Social services and health care sector
- Finnish Defence Forces
- Finnish Border Guard
- Customs
- Emergency Response Centre Administration
- Finnish Communications Regulatory Authority
- Finnish Broadcasting Company
- Finnish Transport Agency
- Finnish Meteorological Institute
- Finnish Lifeboat Society and contract fire brigades
- Ambulance, security and telecommunications companies
- Energy sector operators

Virve is also used for transmitting emergency messages sent by emergency response centres to all security authorities. Virve contributes to enabling the emergency response centre reform and the centralisation of its services in national emergency response centres.

Virve also secures train traffic

The Finnish Transport Agency and VR will transfer from using the existing Raili (GSM-R) network to using Virve, the administrative security radio network. The transfer of railway operators to using Virve will also save money for the state, because operating and making investments in one network (Virve) will be far cheaper than operating two separate networks (Raili and Virve).

The overlapping coverage provided by Virve differs from commercial operators

Thanks to overlapping coverage, the network has plenty of capacity, and does not lose reception due to disturbances in the operation of an individual base station. In addition, Virve is much better prepared for power shortages and disturbances in the transmission network than the minimum requirements posed on commercial telecommunications operators by the Finnish Communications Regulatory Authority.

Virve has been built **to tolerate disturbances** and exceptional **loads.** Key properties securing the operation of Virve **under any circumstances** – including major public events and accident situations – are:

- **Provision of sufficient capacity for authorities and operators responsible for safety and security at public events**
- **Rapid and uninterrupted group calls and short messages**
- **Significant overlapping of base station coverage**

Virve network services include:

- **Communication in the style of two-way radio** – group and direct channel communication
- **Communication in the style of the general telephone network** – calls between individuals
- **Data communications** – short messages, package data and location data

Virve in numbers

Number of base stations
1,350

Users approx.
40,000

Group calls/week
1.1 million

SDS short messages/week
50 million

HISTORY AND CURRENT SITUATION

When completed in 2002, Virve was the first Tetra standard-based nationwide network in the world built for collaborative use by public authorities. All European countries (excl. Poland and Turkey) have similar digital administrative security radio networks in use. The biggest administrative security radio network was introduced in Germany in January 2016. The German administrative security radio network was built for more than one million administrative users. Our neighbouring countries Sweden, Estonia and Germany are using networks with identical technical properties to ours in Finland.

THE FUTURE OF VIRVE

The volume of images and moving images being transferred through both administrative and civilian communications channels keeps increasing, causing even higher volumes of data traffic and imposing new requirements on all communications networks. Alongside Virve, security authorities use commercial networks and broadband data networks for non-critical activities. In administrative operations, this change means that secure network solutions must be totally reformed. The existing Virve network based on Tetra technology will remain operational until the functioning of the replacement system has been secured in all security critical situations.

2002

1st IN THE WORLD When completed in 2002, Virve was the first nationwide network built for collaborative use by the authorities

2016

GERMANY introduced the world's biggest administrative security radio network, with more than one million users

700 MHz

THE FINNISH MINISTRY OF TRANSPORT AND COMMUNICATIONS auctioned the **700 MHz** frequencies no longer used for television operations to commercial telecom operators

2017

4G LAUNCHES THE NEXT-GENERATION VIRVE
Testing was carried out in real network load situations. Erillisverkot acts as a service operator

FINLAND AND NORWAY IN COOPERATION IN THE USE OF ADMINISTRATIVE SECURITY RADIO NETWORKS.
The authorities will use a joint communications channel in the border area, which will enhance cooperation. Sweden is expected to join the cooperation in 2019

2018

ERILLISVERKOT SELECTED
as the operator of the mobile broadband service for authorities in Finland

PUBLIC TRANSPORT OPERATORS IN THE HELSINKI METROPOLITAN AREA (metros and trams) have transferred to using Virve. National train traffic is expected to introduce Virve as its critical communications medium in 2018

NEW ADMINISTRATIVE SECURITY RADIO NETWORK, transferring also images and videos, will be piloted

THE POSSIBILITY OF INCLUDING GROUP calls to smart phone services is tested

in the 2020s

Erillisverkot acts as a service operator and negotiates the best services for authorities with commercial operators.

WE SEE THAT THE BEST FUTURE SOLUTION IS THE COOPERATION, WHERE authorities and commercial operators implement the administrative security radio network together. Commercial operators implement the infrastructure and Erillisverkot implements the services for authorities on this platform. This new type of cooperation will ensure that Finland has access to first-grade critical communications network and services in the future.

Although, Erillisverkot already engages in a great deal of cooperation with commercial operators, close integration of public and private sector services means a major change of principle that will open up new opportunities in administrative communications.

THE BENEFITS OF THE COOPERATION MODEL

AS A RULE, CONSUMER SOLUTIONS OF COMMERCIAL NETWORKS ARE WORLDWIDE, WHICH PROVIDES OPPORTUNITIES FOR COMMUNICATIONS BETWEEN THE AUTHORITIES OF DIFFERENT COUNTRIES.

COMMERCIAL NETWORKS can live and develop alongside the technology.

AUTHORITIES always have access to the best frequency ranges and can exploit the benefits of technical development.

Speech communication will probably maintain its position as the primary tool of operational activities among security authorities in the future. The current administrative security radio network Virve functions well as a channel for critical speech communication. In addition to the new mobile broadband network, there is an increasing need to transfer narrowband data. For example, sensors measuring radiation, the temperature and water level are increasingly used in security operations and the importance of the network's reliability is being emphasised, because the flow of measurement data on the network is continuous.

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