

User Guide

IRIS Focus
Version 2.1



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1. About This Document

1.1. Version Information

This document provides information for installing, operating, and maintaining IRIS Focus software.

Table 1 Document Versions

Document Code	Date	Description
M211850EN-B	May 2016	This document. Second version of this document.
M211850EN-A	January 2016	First version of this document.

1.2. Related Documents

Table 2 Related Documents

Document Code	Name
M211850EN	IRIS Focus Administrator Guide
M211849EN	IRIS Focus User Guide
M211904EN	IRIS Focus Release Notes

1.3. Trademarks

IRIS^(R) is a registered trademark of Vaisala Oyj.

Windows^(R) is either a registered trademark or trademark of Microsoft Corporation in the United States and other countries.

All other product or company names that may be mentioned in this publication are trade names, trademarks, or registered trademarks of their respective owners.

1.4. Documentation Conventions



WARNING! Warning alerts you to a serious hazard. If you do not read and follow instructions carefully at this point, there is a risk of injury or even death.



CAUTION! Caution warns you of a potential hazard. If you do not read and follow instructions carefully at this point, the product could be damaged or important data could be lost.



Note highlights important information on using the product.



Tip gives information for using the product more efficiently.



Lists tools needed to perform the task.



Indicates that you need to take some notes during the task.

2. IRIS Focus Overview

IRIS Focus provides tools for viewing and analyzing weather data received from weather radars through a web browser quickly and easily.

The displayed data consists of radar products, which are raw signal data from a radar receiver processed to provide information about the current weather conditions. The radar products measure information such as radar signal reflectivity or rain intensity for analysis by meteorologists.

The weather data is overlaid on a geographical vector map that is centered on a selected radar site. Data is gathered from a single weather radar or a network of radar sites. All data is stored for 48 hours, and it can be animated on a timeline.

IRIS Focus provides live and pre-generated radar products, which differ in how they are processed within the IRIS architecture, as well as how they are used by the system end user.

- *Live Radar Products*
Radar signal data that is processed into radar products and displayed in real-time. Live products allow more control over the weather data presentation in the IRIS Focus UI. For example, you can change the reflectivity threshold of the selected radar product in real-time.
- *Pre-generated Radar Products*
Preset radar products defined and produced in IRIS Analysis and displayed by IRIS Focus on request.

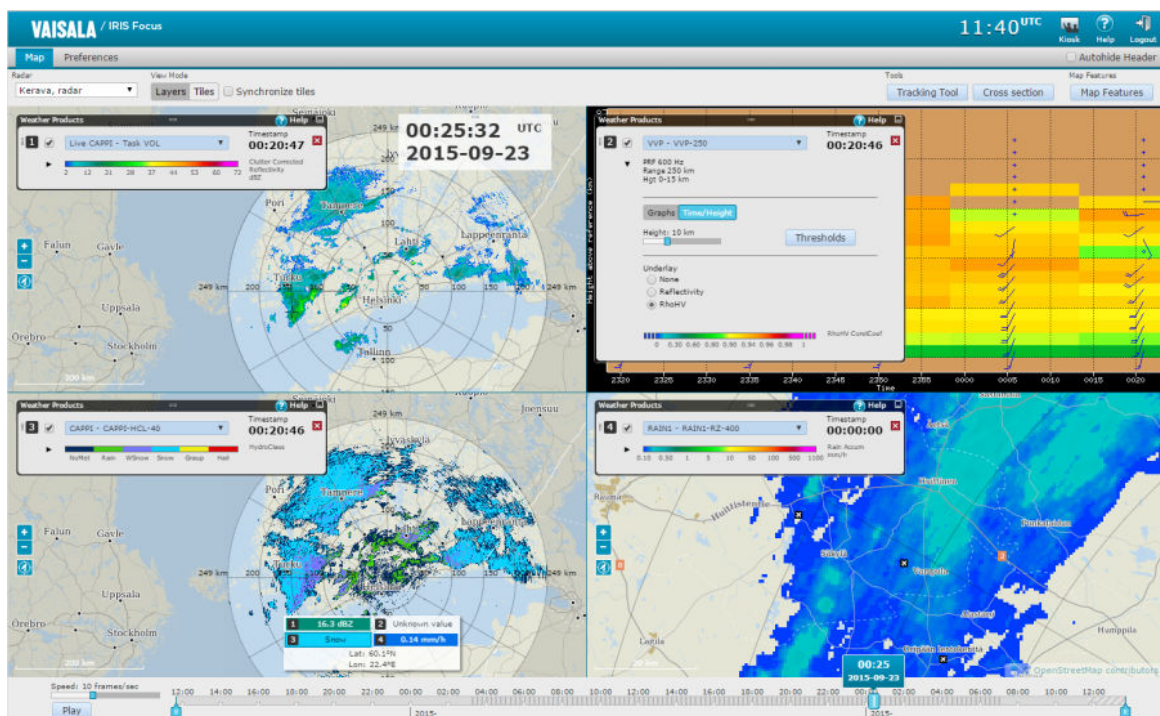


Figure 1 IRIS Focus Main View

More Information

- ▶ [Live Radar Products \(page 31\)](#)
- ▶ [Pre-generated Radar Products \(page 47\)](#)

2.1. IRIS Product Family

IRIS Focus provides an intuitive user experience for professional users, such as meteorologists and analysts. It is closely integrated with [Vaisala Weather Radar Offering](#), where IRIS Focus forms the visualization front-end and other IRIS components handle radar control, radar product generation and data distribution. IRIS Focus retains the proven quality of Vaisala IRIS back-end processing software, while adding a modern user interface.

IRIS Focus runs on a web server that users can connect to in an enterprise intranet or from an external location. Network connections between the IRIS Focus web UI and the data processing back-end go through a secure socket server, a custom protocol over TCP/IP that delivers radar data from the IRIS back-end services to IRIS Focus. The IRIS Focus application polls the server for data and displays it on screen.

The following figure shows a setup where IRIS Focus is used as part of a complete Vaisala weather radar network consisting of 2 radar sites.

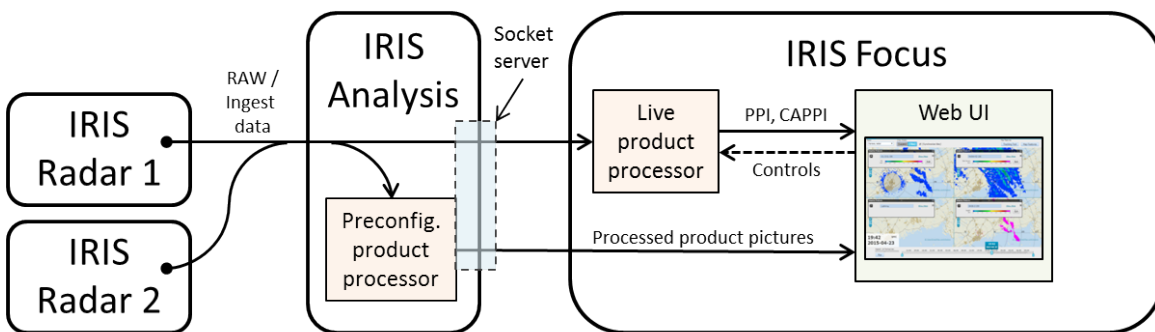


Figure 2 IRIS Focus Data Flow

In this case, IRIS Analysis and IRIS Radar can be considered back-end services for the IRIS Focus front-end interface. IRIS Focus communicates with IRIS Analysis through a secure socket server connection.

The components have the following functions:

- *IRIS Radar* - Operates the radar site and stores data gathered from the radar signals in RAW format.
- *IRIS Analysis* - Receives RAW measurement data from IRIS Radar through an SCP connection and processes it into displayable radar products.
- *IRIS Focus* - Polls pre-generated radar products from IRIS Analysis and displays them on the web interface. Also generates live radar products from RAW data.

2.2. Licensing

IRIS Focus requires a software license to run. To activate the license, you need a product key.

Vaisala sends the product key to you in an e-mail message when you purchase the software. If you have purchased the software and you have not received the product key, please contact Vaisala.

For server deliveries, Vaisala activates the product key in the factory and sends the key to you by email for future reference.

The license is mapped to the hard disk ID of your IRIS Focus server. If your hardware configuration changes and you need to re-install IRIS Focus, you must request a replacement license from your Vaisala customer representative.

License Options

The IRIS Focus license includes the following:

- **IRIS Vision**
The IRIS Vision license has an unlimited number of seats. If the license is missing: users cannot log in, admins can log in but cannot access the map view.
- **IRIS Focus**
The IRIS Focus license is required to use IRIS Focus features and products. IRIS Focus licensing is based on a floating seat count.

IRIS Focus Seat-based License

IRIS Focus licenses are available for pools of 1, 5, 10, and 20 seats. Licenses are not cumulative. To increase your seat count, you must replace the current license with a new one.

The seat count defines how many users can access IRIS Focus at the same time. When a user logs out, the seat is released and the next user can take it. If a user logs in when all the licenses are reserved, the user is shown IRIS Vision until an IRIS Focus license is released.

Seat counts within a workstation are browser-based. For one license reservation, users may view IRIS Focus in as many instances or tabs of one browser as they like. If a user opens IRIS Focus in a different browser, they reserve one license for each browser.

More Information

- [User Management \(page 55\)](#)

3. Using IRIS Focus

IRIS Focus combines an intuitive look-and-feel with powerful processing capability. This section describes how to use the application and its additional features in your work.

3.1. Map View

The IRIS Focus main view displays a scrollable map area centered around the selected radar site. The map around the area is drawn using azimuthal equidistant projection that uses the radar site as a point of origin, which means that all distances and directions measured from the radar site are accurate.

In the map view, you can select multiple simultaneous weather data measurements, and display them on separate tiled windows, or on a combined layer overlay view.

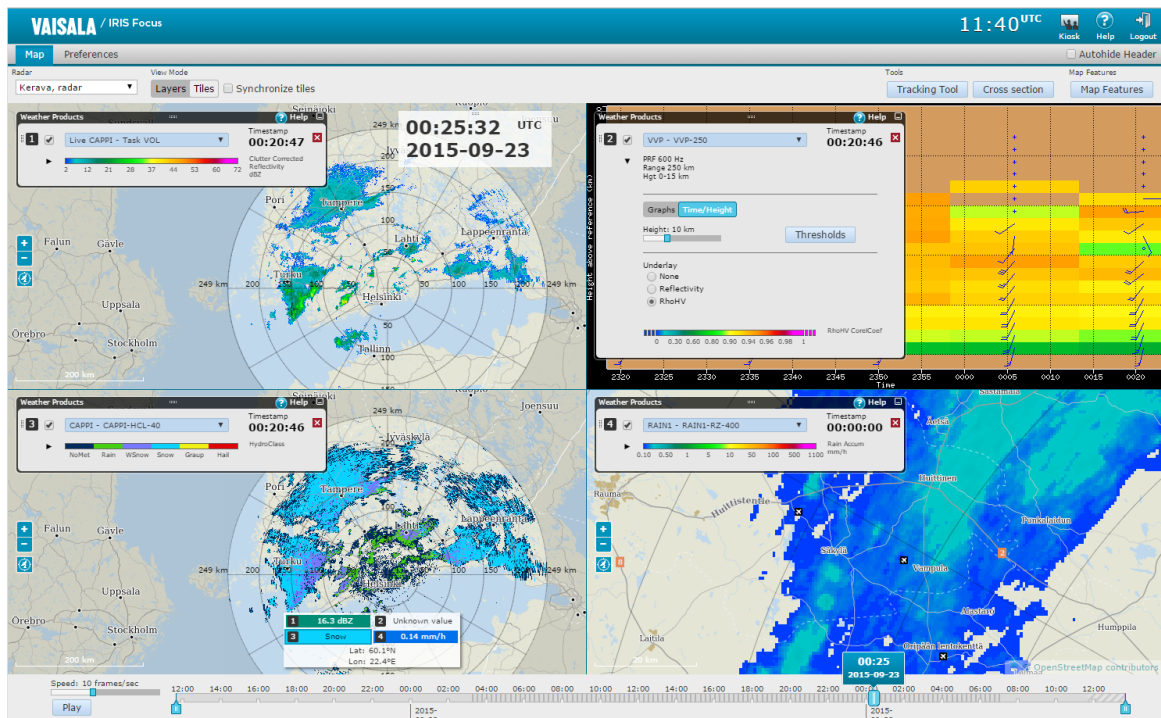


Figure 3 IRIS Focus Map View

The map engine in IRIS Focus runs on the open source [GeoServer](#) map server. The map data is gathered from the collaborative [OpenStreetMap](#) project, and the JavaScript user interface is built with the [OpenLayers](#) library. To improve performance, map data is cached as bitmap tiles with [GeoWebCache](#).

3.1.1. Map Layers

The background map and the weather data visualizations from the radar products are drawn as individual layers and then combined to form an overview of current weather conditions around the radar site.

Base Layers

The background (also known as base) consists of a number of non-interactive layers. At the bottom is a terrain map that can be enhanced with additional layers containing roads, province boundaries, and other similar terrain features.

Radar Product Layers

The interactive radar product layers are drawn on top of the background layers.

3.1.2. Editing Base Layers

To manage map settings such as map style and additional map layers, such as roads, select **Map Features** on top right corner of the UI.

Available **Base Map** styles include:

- **Standard**
Basic terrain with oceans, lakes, rivers, landmasses and islands. All waters are blue and all land areas gray. Cities and dense settlement areas are brown. This is the default map view.
- **Simplified**
Same as Standard, without cities.
- **Terrain**
Same as Standard, with landforms added so mountain ranges and other terrain features are more visible.



Changing from one map style to another takes some time while the new terrain assets are cached.

Table 3 Map Detail Settings

Map Detail	National borders	Province borders	Airports	Roads	Labels
None					
Minimal	x				
Aviation	x		x		
Roads	x			x	
General	x	x			x

Map Detail	National borders	Province borders	Airports	Roads	Labels
Full	X	X	X	X	X

3.1.3. Radar Product Layers

IRIS Focus supports up to 4 simultaneous [4. Radar Products \(page 23\)](#) layers that can be displayed on top of each other (**Layers** mode) or in separate tiles (**Tiles** mode).

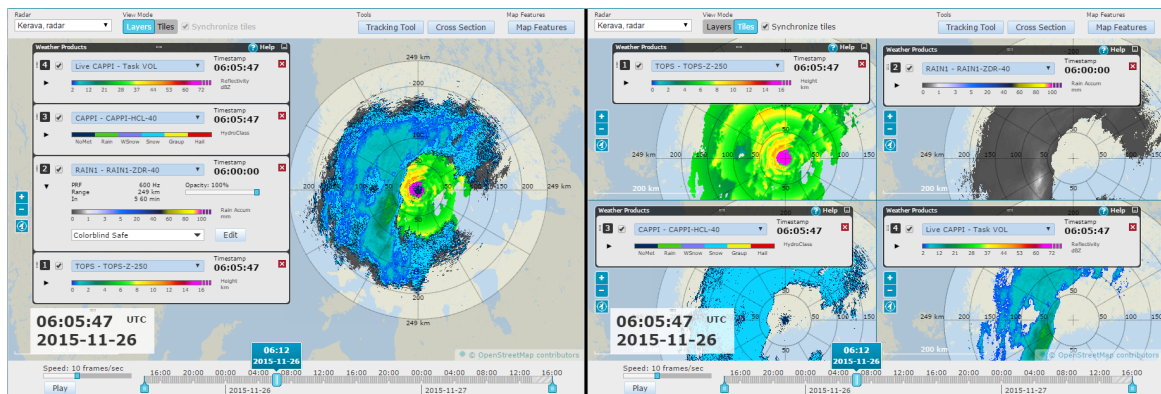


Figure 4 Layered and Tiled view modes

All active radar product layers are listed in the **Weather Products** panel.



Each additional layer requires more processing capacity from the system. To improve performance, avoid having unnecessary background or radar product layers on screen.

Tiles Mode

In **Tiles** mode, the tiles are synchronized by default.

In synchronized mode, all tiles pan and zoom automatically to the same coordinates whenever you move one of the tiles.

To disable the synchronized mode, deselect the **Synchronize tiles** checkbox.

Layers Mode

In **Layers** mode, the layers are drawn on the screen in the same order as they are listed on the **Weather Products** panel. The topmost layer in the panel is also drawn on top in the map view.

To change the order of the layers, drag them to new positions in the panel. IRIS Focus re-draws the radar products on the map view using the new layer order.

In **Layers** mode, layer number 1 always defines the overall presentation of the map view. For example, the range rings around the radar site are based on layer 1, so if the products on layer 1 and 2 have respective ranges of 100 and 250 km, the range rings on the map view are drawn only up to 100 km, which is the maximum range of the product on layer 1. The weather data from layer 2 is still drawn on the map, even though it "appears" to be outside the radar range. This also affects radar products that include some additional UI elements, such as [4.6.5. Maximum Reflectivity \(MAX\) \(page 49\)](#).

3.1.3.1. Radar Product Layer Settings

Settings for radar product layers are found on each product's **Weather Product** panel. To see the full layer-specific settings, select **Show more**.

The contents of the panel depend on the radar product type:

- [4.5. Live Radar Products \(page 31\)](#) are processed in IRIS Focus application, and offer more options to analyze the data in real-time.
- [4.6. Pre-generated Radar Products \(page 47\)](#) are configured in the IRIS Analysis back-end, and their full parameters are only accessible there.

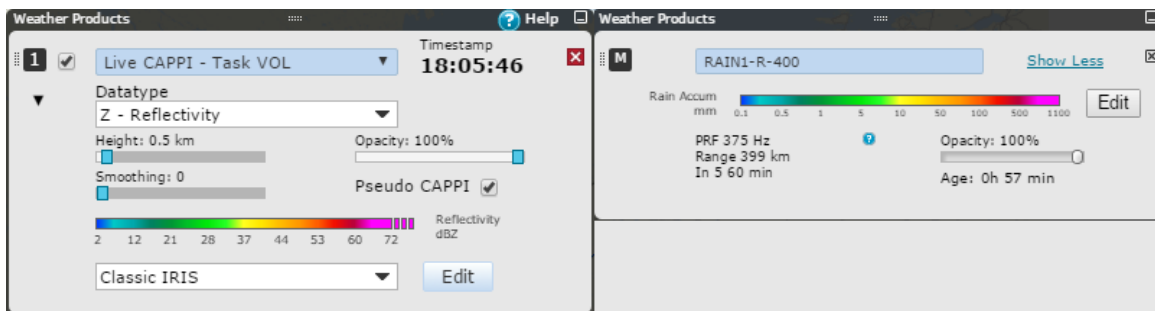


Figure 5 Live and Pre-generated Product Settings

The opacity value is always available for radar product layers. It sets the transparency of a layer.

Live Attributes

Live product layers also include the following additional attributes:

Attribute	Description
Data type	Sets the measured 4.1.3. Data Types (page 26) .
Height (CAPPI) Elevation (PPI)	Defines the height (measured from sea level) of the horizontal cross section being displayed, or elevation of the current radar beam.
Pseudo CAPPI	Toggles pseudo CAPPI on/off. Pseudo CAPPI attempts to visualize those parts within the radar range that are not measured with current settings.

Attribute	Description
4.3. Radar Product Smoothing (page 28)	Blends adjacent pixels closer together depending on their distance from each other.
4.4. Radar Product Reflectivity Threshold (page 29) (BASE, TOPS, THICK)	Defines reflectivity threshold (dBZ) for the amount of data displayed in the image.

3.1.4. Map Units

IRIS Focus supports the following unit sets. To change them, see [3.4. User Preferences \(page 21\)](#).

Unit	Metric	Imperial	Aviation
Distance	km	miles	nmi
Velocity	m/s	mph	kt
Angle change	deg/km	deg/mile	deg/nmi
Altitude	km	ft	ft
Rainfall	mm/h	inch/h	inch/h
4.6.10. Vertically Integrated Liquid (VIL) (page 52)	mm	inch	inch

3.2. Animation and Playback

IRIS visualizes radar data from the last 48 hours. You can jump to any point in that time and view the radar products by clicking or dragging the playback slider on the timeline at the bottom area of the main view.

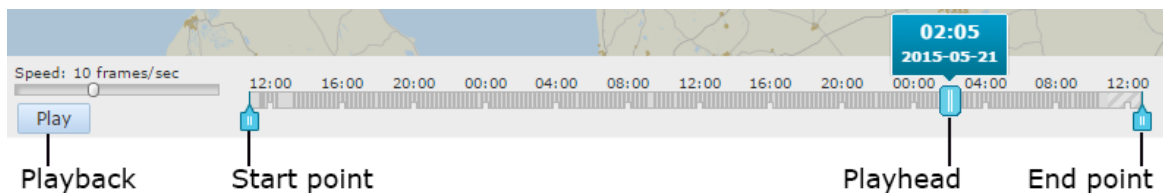


Figure 6 Animation Controls

You can start a looping animation that runs at 1 - 25 frames per second using the playback controls on lower left part of the main UI. To set only a part of the weather history to be animated, drag the start and end points to desired positions on the timeline. The animation settings update in real time.

Most radar products have an update interval of 15 minutes, and some are updated every 5 minutes or every 60 minutes. The length of the animation step is defined by the update interval of layer number 1.

By default, the animation stops for 1 second before looping back to the beginning. To change this, see [3.4. User Preferences \(page 21\)](#).

3.3. Map Tools

3.3.1. Cursor Tool

When you stop the mouse cursor on the map view, a small overlay box is opened next to it. The overlay box contains coordinates and exact radar product values for that location.

If you select are multiple radar products selected, the cursor tool lists values for each product in the same order they are displayed on the screen.

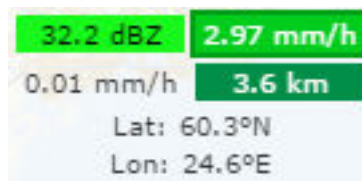


Figure 7 Values from 4 radar products

The cursor tool works in both layered and tiled modes. In tiled modes, the overlay box displays values for each radar product at the current position, even if the tiles are not synchronized.

3.3.2. Radar Product Colors

All radar product visualizations are drawn on the map using an editable color scale gradient, which illustrates the intensity of the detected weather phenomena or values of the received signal. The default color scales are useful for most conditions, and you can edit them further with the built-in color scale editor.

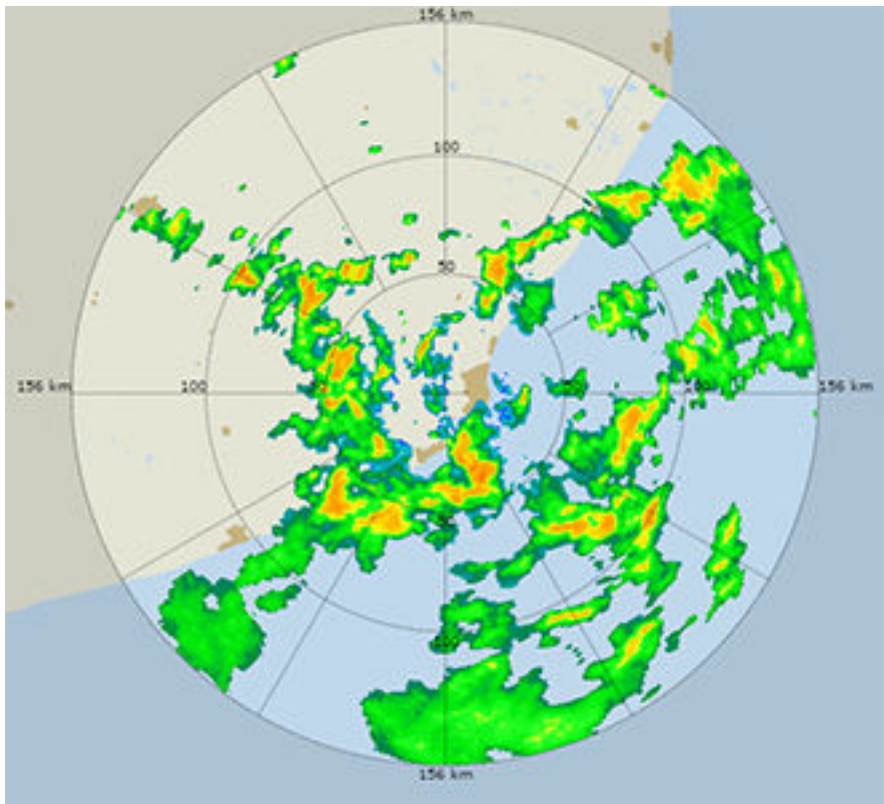


Figure 8 Signal reflectivity in precipitation

3.3.2.1. Color Scale Editor

To access the editor, select **Edit** on a radar product panel.

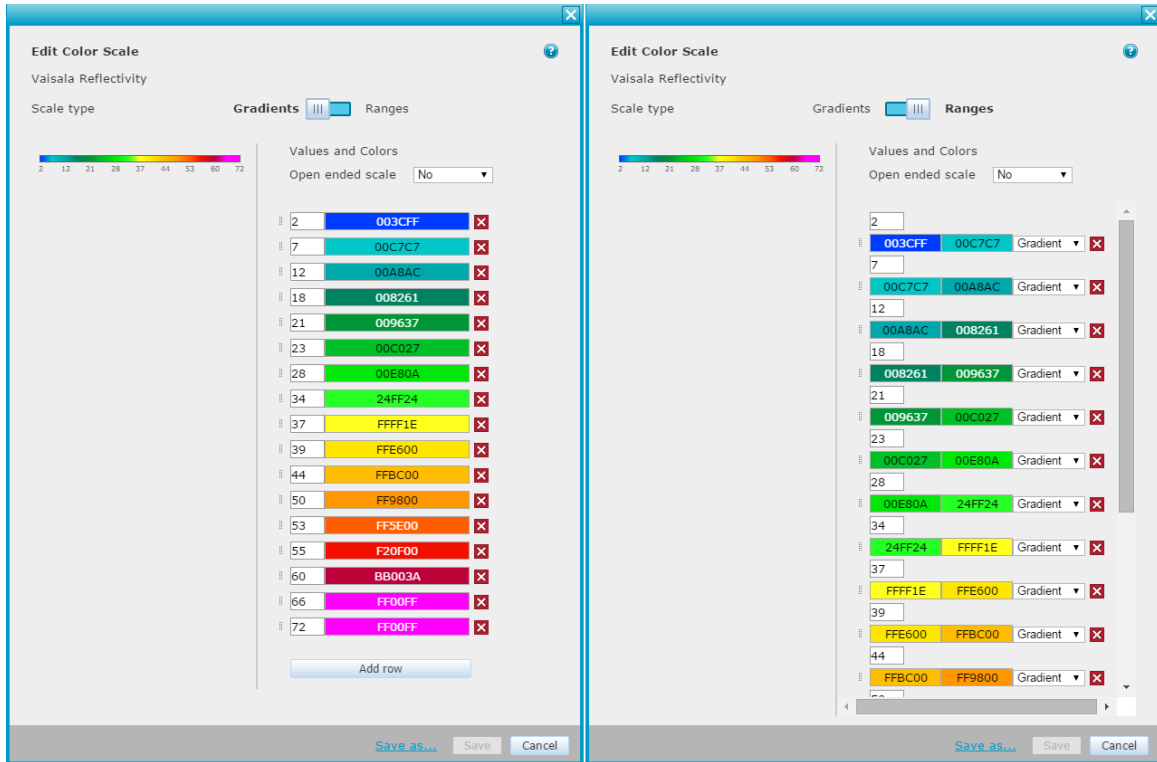


Figure 9 Color Scale Editor Modes

The editor displays the current color scale gradient. On the right side is a list of the keypoints of the color scale. Each keypoint sets the RGB color of a defined value in the radar product, and the values between keypoints are interpolated to make a smooth gradient. By optimizing the keypoints for site-specific conditions, you can make measurement ranges close to each other more distinct, and improve the users' ability to perform visual analysis on the data.

The open-ended scale setting allows you to define how values outside the upper and lower thresholds of the color gradient are displayed on the map. Open-ended scales continue drawing values beyond the thresholds with the same color as the lowest or highest keypoint in the color scale. Non open-ended scales do not draw any values outside the thresholds on the map.

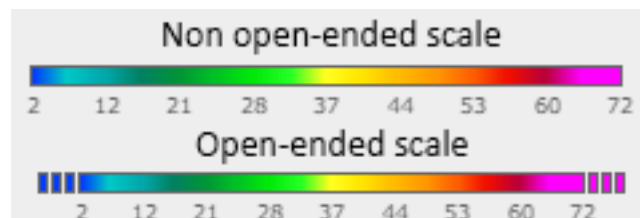


Figure 10 Open and non-open color scales



Using non-open scales, especially for the low end, is an effective way to remove signal noise or clutter from the radar product layer.

The **Ranges** mode allows more fine-tuned options for editing color scales. On the tab you can set each step between two keypoints on the color scale to be either gradients or single solid color.

To change a color in a keypoint, click on it and select a new color from the color picker, or enter a new numerical RGB value directly into the color field.

3.3.3. Tracking Tool

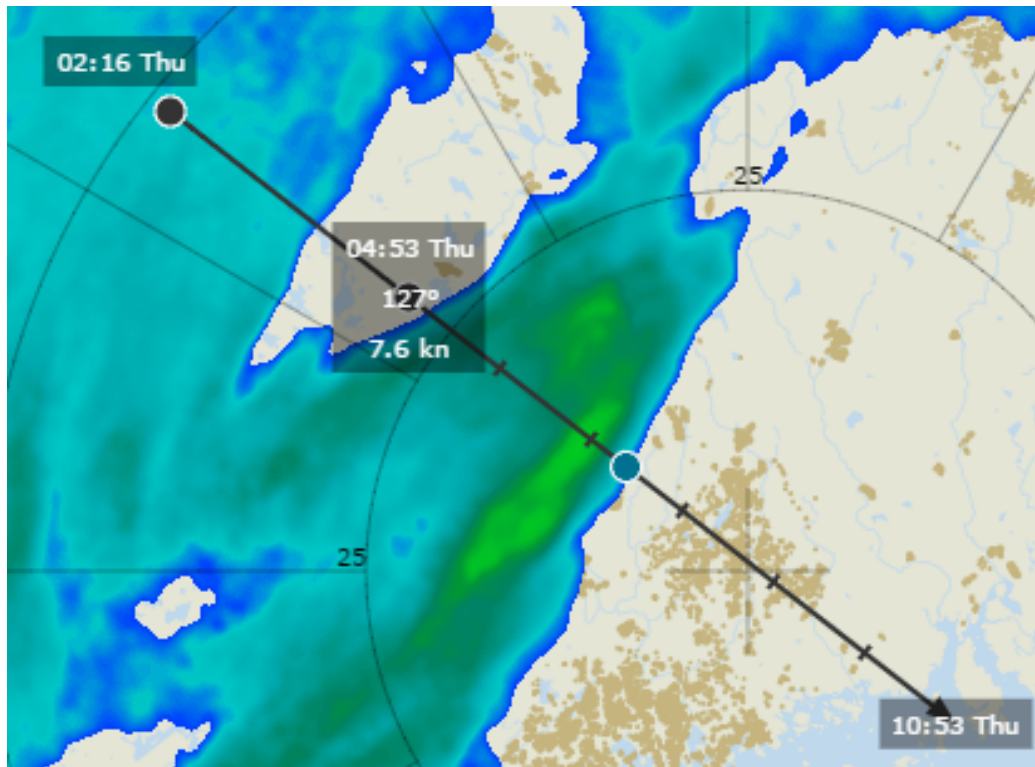
Use the **Tracking Tool** to predict the movement of weather fronts or other visible elements in the radar products.

1. On top right corner of the main UI, select **Tracking Tool**.
2. Drag the playback slider to the time where you want start tracking something.
3. Click on the map view in the position you intend to track.
Usually this is an edge of a weather front or an interesting local weather event.

4. Drag the playback slider forward and add a second tracking point the tracked event appears to have moved.

The **Tracking Tool** draws a line by continuing with the same path and speed. The first 6 estimated hours are always drawn on the screen, and you can run the tracking point even further if you drag the playback slider onwards.

In the following image, the black circles are tracking points and blue is a future estimate point based on the tracking points. The floating overlay box next to the tracking points shows a timestamp



5. When you are finished or want to start another tracking event, clear the tracking points by selecting **Tracking Tool > Clear tracking points**.

3.3.4. Cross Section Tool

IRIS Focus calculates vertical cross sections from the radar product data for all [4.5. Live Radar Products \(page 31\)](#).

The cross section window shows a vertical slice of the atmosphere on the selected line. The dotted lines are beam center lines that show the altitudes where the radar signal has passed at a given distance. The weather phenomena are drawn with the same colors as in the main view. The area outside radar range is greyed out. If you are using a live CAPPI product [4.5.2. Live Constant Altitude Plan Position Indicator \(CAPPI\) \(page 35\)](#), the selected CAPPI altitude is drawn with a red line.

1. Select **Cross section** on top right corner of the main UI to launch the cross section tool.

2. Select a live radar product.
3. Select points on the map:
 - Straight line – click on two points on the map to create endpoints for a vertical cross section of the radar product.
 - Curved line – click on the map and drag the mouse cursor to draw a freeform curved line. The cross section is calculated along the line when you release the mouse button.

The cross section is calculated on a line between those endpoints.
You can move the curve and the endpoints afterwards.



4. If you wish, change the product [4.1.3. Data Types \(page 26\)](#) in the dropdown menu.

3.4. User Preferences

To view and change user-specific settings, select **Preferences**.

You can change:

- Your password
- Default animation settings
- Interface language
- [3.1.4. Map Units \(page 15\)](#) used in IRIS Focus

User Settings

Username: admin

[Change password](#)

Animation

Animation pause seconds (0-3600) **i**

Default animation speed FPS (1-25) **i**

Language

English (en)

Español (es)

Português (pt)

Русский (ru)

Units

Metric

Imperial (miles)

Aviation (nmi / knots)

Figure 11 User preferences window

3.5. Supported Browsers

IRIS Focus data is available through a secure network connection, and can be displayed on multiple client workstations across your organization.

IRIS Focus supports current Internet Explorer, Mozilla Firefox, and Google Chrome browsers.

4. Radar Products

A weather radar transmits pulse signals outwards to the atmosphere and receives reflected echoes of the signal. As the radar rotates around its vertical and horizontal axes, it gathers raw data by sending and receiving signals.

The raw data can be analyzed for signal properties, such as reflectivity and Doppler velocity, that are affected by the atmospheric conditions in the measured area. For example, a dense precipitation area reflects a stronger echo signal back towards the radar. These signal properties are processed further to create radar products that are useful for meteorological purposes.

IRIS Focus is designed for use with dual polarization Doppler radars that transmit and receive both horizontally and vertically polarized pulses. The combination of differential polarization modes allows for detailed analysis of atmospheric events such as detecting different precipitation types.

IRIS Focus supports:

- Live radar products that are calculated in real-time in IRIS Focus when displayed.
- Pre-generated radar products that are generated on the [2.1. IRIS Product Family \(page 8\)](#) server system backend

For information on the algorithms used to process raw signal data in IRIS, see [IRIS and RDA Dual Polarization Users Manual](#) and [RVP900 Users Manual](#).

More Information

- [Live Radar Products \(page 31\)](#)
- [Pre-generated Radar Products \(page 47\)](#)

4.1. Measuring Radar Data

IRIS Focus uses the data generated by weather radars to detect hydrometeors in the atmosphere such as rain, snow, or hail.

4.1.1. Bins, Sweeps, and Volumes

As the radar rotates around its axis 360° in a sweep, the weather radar transmits microwaves pulses into the atmosphere and receives signals reflected from signals reflected off hydrometeors. After a sweep, the radar usually changes its elevation and starts a new sweep.

The reflection measurements from a pulse are sorted into bins. A bin is a single sample of weather data detected at a known direction, altitude, and distance from the radar site. The radial size of a bin decreases with distance, so bins further from the radar site cover a larger area than nearby bins. Each sweep typically contains the same number of bins independent of the elevation.

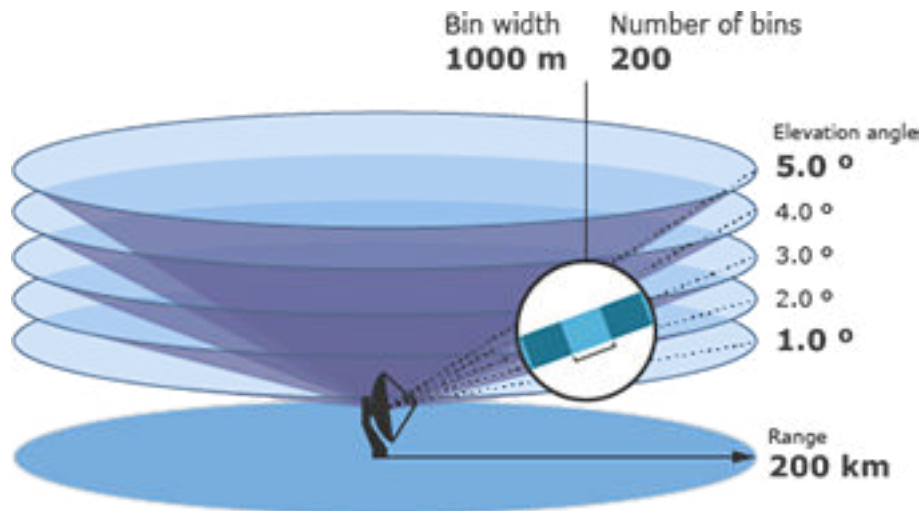


Figure 12 Bins and Sweeps

Volumes, a complete set of raw measurement data collected during sweeps, are used to calculate a model of the atmosphere. The maximum volume is half of a sphere (from 0° elevation upwards), but other shapes are more typical.

4.1.2. Radar Beam

As the distance from the radar site increases, the granularity of the radar beam decreases, which degrades the accuracy of radar products. For example, a 1° wide beam sent at the antenna has a width of 2 km across at 120 km distance. The following image shows how the detected bins grow larger further away from the radar.

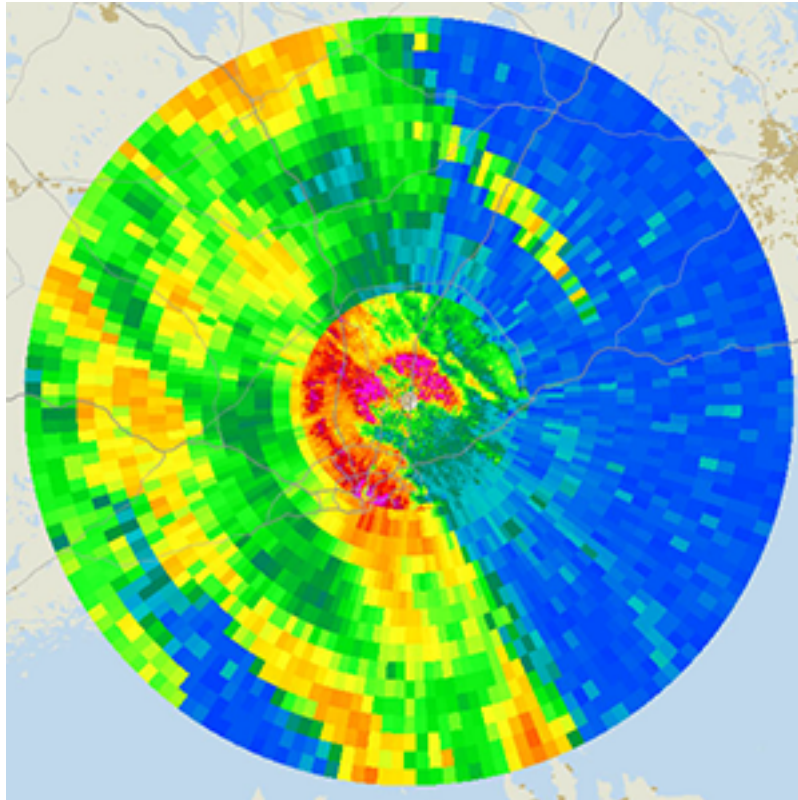


Figure 13 Radar resolution across the detected area

Many radar products are affected by the curvature of the Earth. A radar beam transmitted at a 0° vertical angle from the radar site on a flat environment would be 780 meters above ground at 100 km distance, before accounting for atmospheric refraction. While all IRIS Focus radar products are corrected for curvature and refraction effects, weather phenomena from below the curvature threshold cannot be detected.

The following image shows a vertical cross-section of a typical volume scan action. The image is corrected for earth curvature. Note how the vertical resolution increases with longer horizontal distance. The same applies to horizontal resolution.

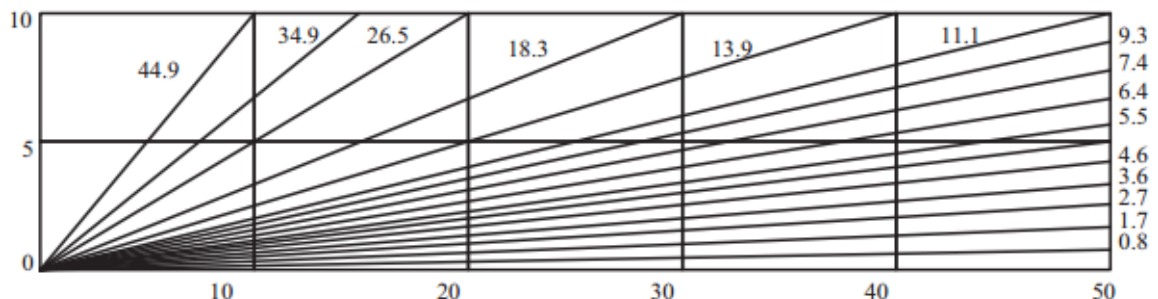


Figure 14 Example of 15-tilt Volume Scan

4.1.3. Data Types

Radar product data type defines what is calculated from the received radar pulse reflections.

The data types are used in both preconfigured and live products:

- In preconfigured products, the data type is indicated in the radar product name.
- In live products, you can select the intended data type from the drop-down menu on the **Weather Product** panel.

Data types in IRIS Focus never use letters from the Greek alphabet, and are always written in uppercase, even when signal processing and meteorological conventions use subscript. For example, instead of Φ_h , IRIS Focus uses PHIH.

Horizontally and vertically polarized pulses are generally abbreviated in the data types as H and V. Data types that use both sent and received signals as input include a combination of letters H and V to describe the process. For example, HV refers to horizontal transmit and vertical receive.

Data type	Definition	Description
HCLASS	Hydrological Classification	Estimated hydrometeor type in the precipitation area.
KDP	Specific Differential Phase	An indicator of the rate of change of the phase difference between horizontally and vertically polarized pulses of the radar. A greater horizontal shift results in a positive KDP value, and a greater vertical shift results in a negative KDP value. Typical cause for a high KDP area is heavy rain.
LDRH (LDRV)	Linear Depolarization Ratio H to V (or V to H).	The ratio of cross-polar to co-polar reflectivity measured in dB.
PHIH (PHIV)	Horizontal (or Vertical) Differential Phase	Phase difference for the total round trip between radar and the volume where the signal is reflected. PHIH is measured between HH and HV channels. PHIV is measured between VV & VH channels.
PHIDP	Differential Phase	The phase difference due to propagation between the HH and VV channels of the radar.
RHOHV (RHOH/RHOV)	Correlation coefficient between HH and VV (or HH & HV / VV & VH) channels)	Higher (>0.95) values indicate uniform precipitation areas and lower values more mixed hydrometeor types, such as melting snow, wet snowflakes, or airborne debris.
SNR	Signal to Noise Ratio	Generic measurement of signal-noise ratio in dB.
SQI	Signal Quality Index	A value between 0-1 that measures the signal's Doppler coherency, that is the correlation between the signal and its doppler lag. <ul style="list-style-type: none"> • 0 indicates white noise • 1 is the perfect doppler point target

Data type	Definition	Description
T	Total Reflectivity	Total power returned to the radar in reflectivity units. It typically represents the horizontal reflectivity without ground clutter correction.
TV (TE)	Total Vertical (HV Enhanced) Reflectivity	Total reflectivity from the vertical polarization channel (TV) and combination of the horizontal and vertical channel (TE).
V	Velocity	Average radial velocity (towards or away from the radar) of detected hydrometeor areas.
VC	Corrected Velocity	Same as Velocity, but corrected for effects of Range folding (page 69) and Velocity folding (page 69) .
W	Spectral Width	Variability of Doppler velocity values within the measurement area.
Z	Reflectivity	Usually referred to as dBZ in professional literature. It is the common data type that measures radar signal reflectivity, and is used to estimate precipitation intensity from that. All Z measurements are corrected for ground clutter.
ZV (ZE)	Vertical (HV Enhanced) Reflectivity	Total reflectivity from the vertical polarization channel (ZV) and combination of the horizontal and vertical channel (ZE). Corrected for ground clutter.
ZC	Corrected Reflectivity	Same as Z, but corrected for attenuation and beam blockage effects.
ZDR	Differential Reflectivity	The ratio of SNR in the horizontal channel to the SNR in the vertical channel. Positive values indicate more prominent horizontal echoes and negative values more prominent vertical echoes. Larger hydrometeor sizes are usually identified by high positive ZDR values.
ZDRC	Corrected Differential Reflectivity	Same as ZDR, but corrected for attenuation and beam blockage effects.

More Information

- › [Radar Product Codes \(page 27\)](#)

4.2. Radar Product Codes

All radar products are identified by their product code. The codes are specified in the [2.1. IRIS Product Family \(page 8\)](#). All radar products should have a code that conveys the relevant characteristics of that product. The common practice in IRIS is to give each product an abbreviated code in the format *[Product type]-[Data type]-[Range]*. For example, a product called PPI-Z-400 is a:

- PPI: [4.6.6. Plan Position Indicator \(PPI\) \(page 50\)](#) radar product

- Z: measuring 4.1.3. Data Types (page 26) in dBZ
- 400: up to horizontal range of 400km

The radar products are listed by their product codes in the **Weather Products** panel.

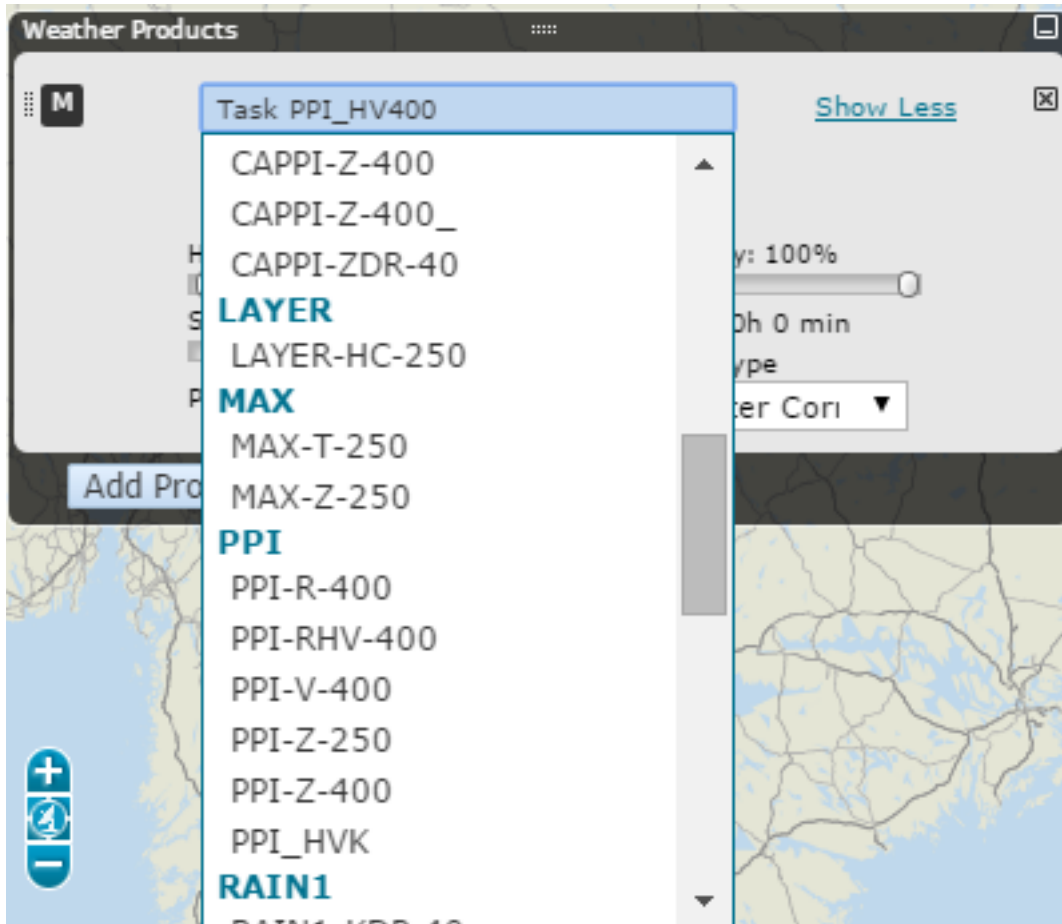


Figure 15 List of Available Radar Products

More Information

- [Live Radar Products \(page 31\)](#)
- [Pre-generated Radar Products \(page 47\)](#)
- [Data Types \(page 26\)](#)

4.3. Radar Product Smoothing

As they are processed, all radar products are rasterized as 2D bitmap images to be displayed on top of the map view area. The bitmap image is calculated by interpolation from the whole three-dimensional volume data.

4.5. Live Radar Products (page 31) allow you to set a smoothing effect on the weather data layer. The smoothing value sets how close the radar product pixels must be in meters before their quantitative values are blended together. Larger values result in a heavily smoothed area, while a value of 0 disables smoothing completely.

Smoothing is only performed on the rasterized bitmap data. It does not take the vertical dimension of measurements into account.

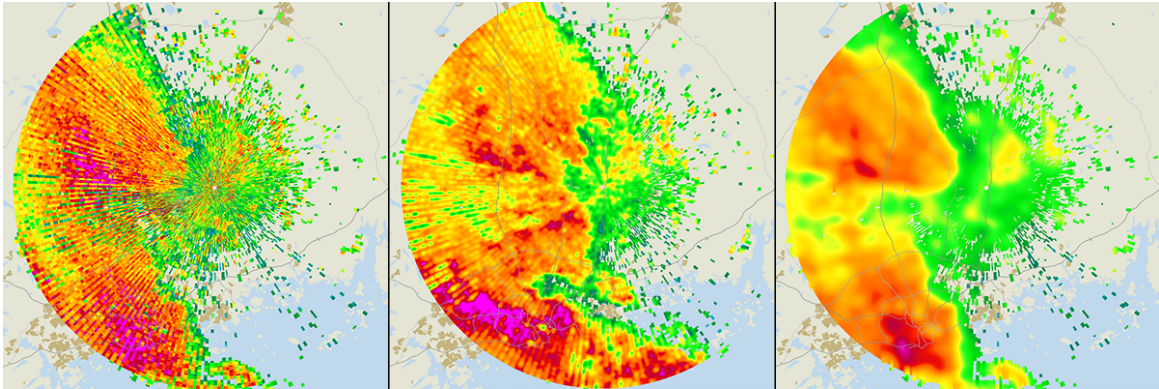


Figure 16 Different smoothing levels



Heavy smoothing may lose details that are detectable on lower smoothing levels.

4.4. Radar Product Reflectivity Threshold

Some live radar products allow you to set a reflectivity threshold (dBZ) for the amount of data displayed in the image.

Use the slider to select a value within the range -32...96 dBZ.

Low reflectivity threshold values display more data, while higher reflectivity threshold values filter out all data with reflectivity below the defined threshold to make it easier to focus on the most important data.

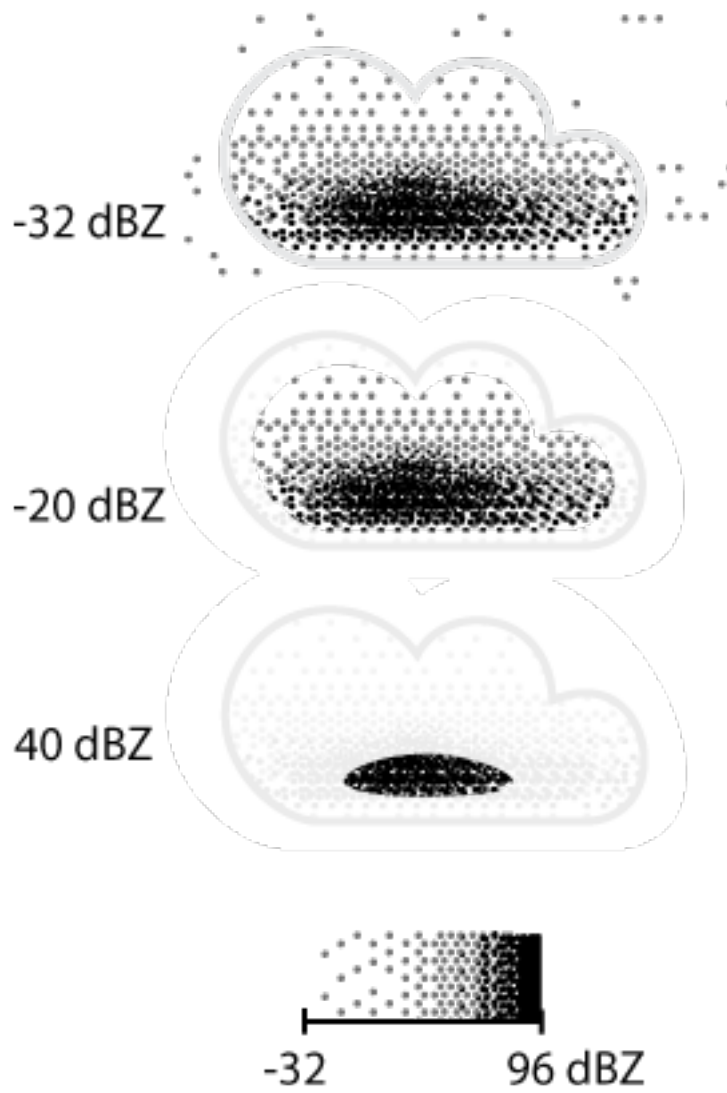


Figure 17 Reflectivity Threshold

More Information

- ▶ [BASE Threshold Value \(page 33\)](#)
- ▶ [THICK Threshold Value \(page 43\)](#)
- ▶ [TOPS Threshold Value \(page 45\)](#)

4.5. Live Radar Products

Live radar products displayed in IRIS Focus receive raw data from the IRIS back-end. The data is manipulated in the IRIS Focus UI with the Scan Service, which is an HTTP service that functions as an interface between IRIS Focus and the radar-side signal processing. Through the Scan Service, IRIS Focus can read the raw volume data and generate radar products in real-time.

As the user pans and zooms the map, the location and size of each pixel changes. The live products recalculate the value of each pixel based on the new geographical definition. This ensures that the data resolution is optimized for viewing.

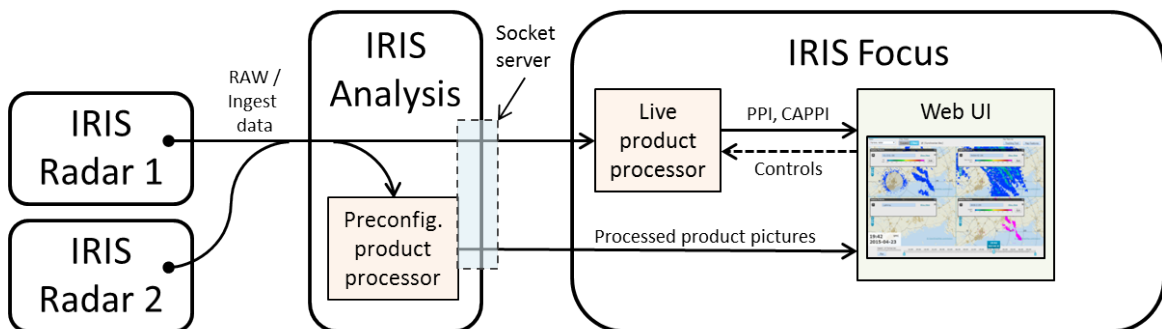


Figure 18 Data Flows in IRIS Focus

The raw volume data from the radar signal processor is stored in the radar scan database, which Scan Service makes accessible for the IRIS Focus UI.

IRIS back-end collects data in several different configurations, that are defined as *Tasks* in IRIS Analysis. Tasks are sets of operating parameters for the radar hardware and signal processing components. Examples of Tasks include:

- Surveillance PPI scan at a single elevation angle
- Complete volume scan at multiple elevation angles
- Wind velocity scan

Each task type provides different source data, and the user can select the task type when selecting a live radar product to display on screen.

4.5.1. Live Echo Base (BASE)

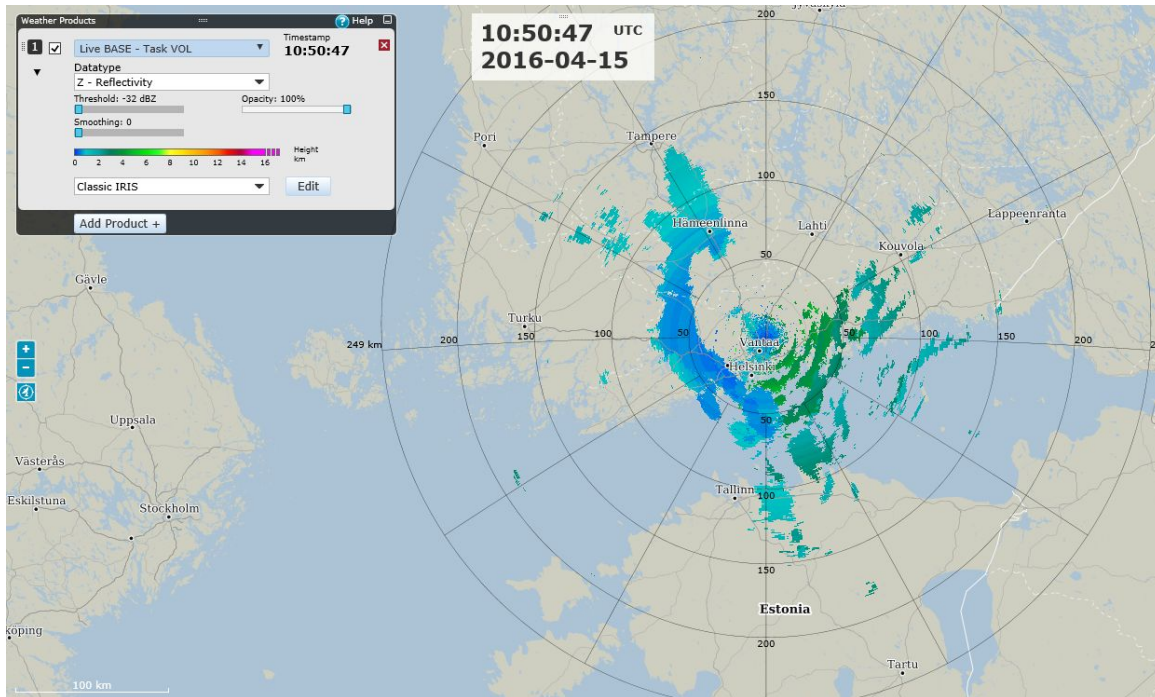


Figure 19 Live BASE Example

BASE (also known as echo Base) is the radar-indicated bottom of an area of precipitation. The system locates the lowest altitude of the defined reflectivity threshold at each pixel location.

BASE displays the base level of detected signal echoes, which usually reflects the bottom of the cloud base or precipitation area.



As the following image shows, the minimum height above ground where echo bases can be detected increases with measurement range due to the curvature of Earth.

The opposite of live **BASE** is the [4.5.5. Live Echo Tops \(TOPS\) \(page 44\)](#) product.

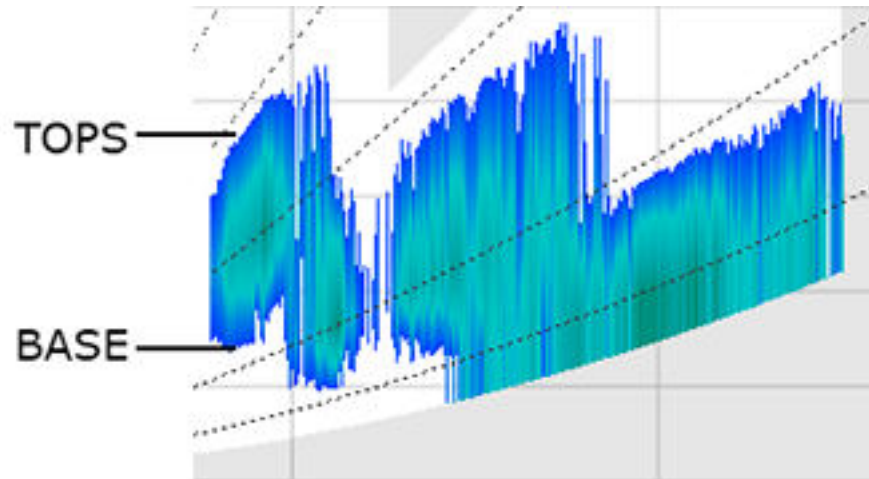


Figure 20 BASE and TOPS Products

More Information

- [Live Echo Tops \(TOPS\)](#) (page 44)
- [Live Echo Thickness \(THICK\)](#) (page 42)

4.5.1.1. BASE Threshold Value

The configurable threshold value defines the minimum reflectivity that must present to be displayed in the image.

The first of the following images shows **BASE** with a -20 dBZ threshold defined. In this image, the lower, less dense cloud is shown in the displayed image.

In the second image, with a 40 dBZ threshold, the lower cloud is not shown in the displayed image because its reflectivity value is lower than the defined threshold.

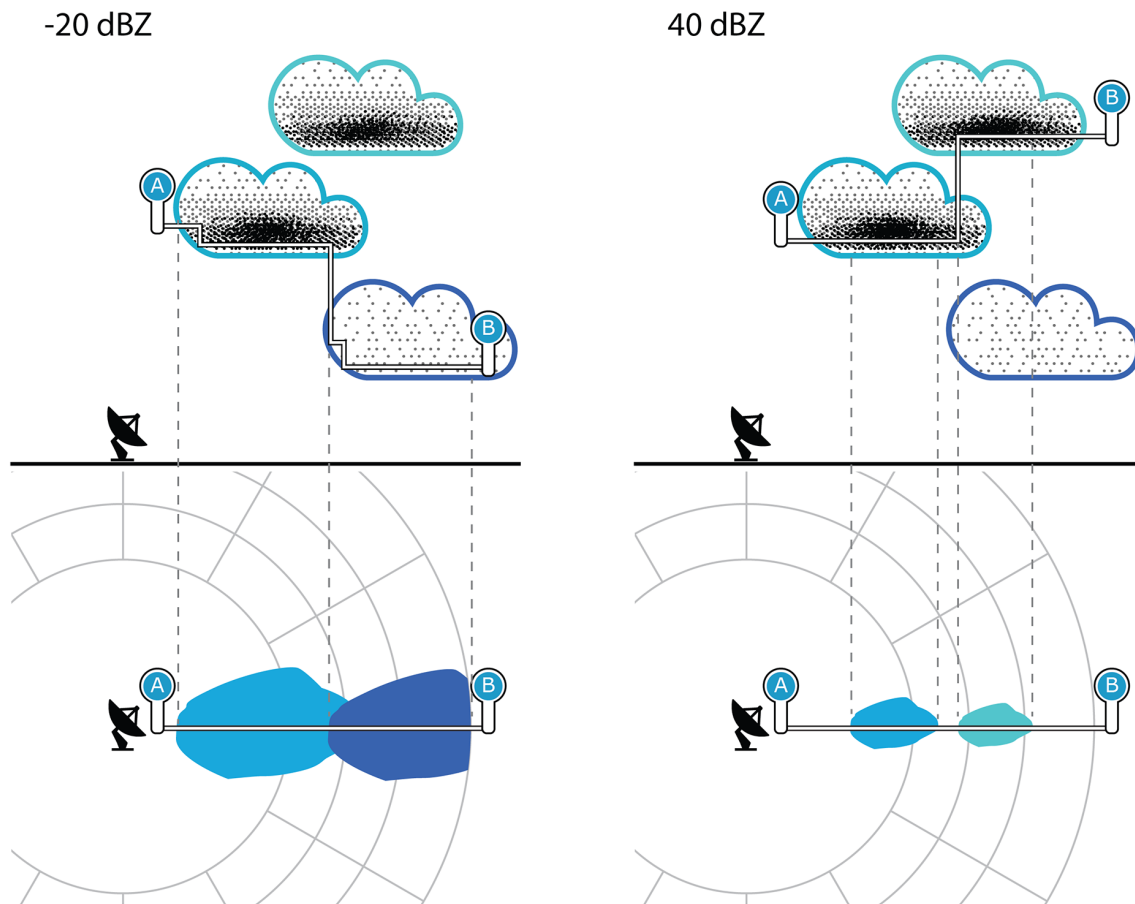


Figure 21 BASE, -20 and 40 dBZ Thresholds

More Information

- [Radar Product Reflectivity Threshold \(page 29\)](#)

4.5.1.2. Calculating Live BASE

For each pixel in the image, the algorithm calculates live **BASE** as follows:

1. Calculates the **AzEQ** point around the radar is calculated.
2. Uses **AzEQ** to calculate the distance from the radar (**vector length**).
3. Checks if the **AzEQ** point is in the radar's range for the **BASE** product.
4. Calculates the azimuth angle to radar (**atan2**).
5. Optimizes the calculation of the maximum height by calculating the height of the highest sweep with reflectivity.
The calculation uses the **minHeightOfSweep** by calculating downwards until reflectivity is no longer present.

The minimum height of a sweep represents the height with the minimum reflectivity as defined in the threshold.

The algorithm starts scanning from the downwards until it finds a height for which there is no reflectivity value over the threshold. The last height with a valid reflectivity value is the result.

The final output of the product is a color-coded map of echo base heights for the selected dBZ threshold.

4.5.2. Live Constant Altitude Plan Position Indicator (CAPPI)

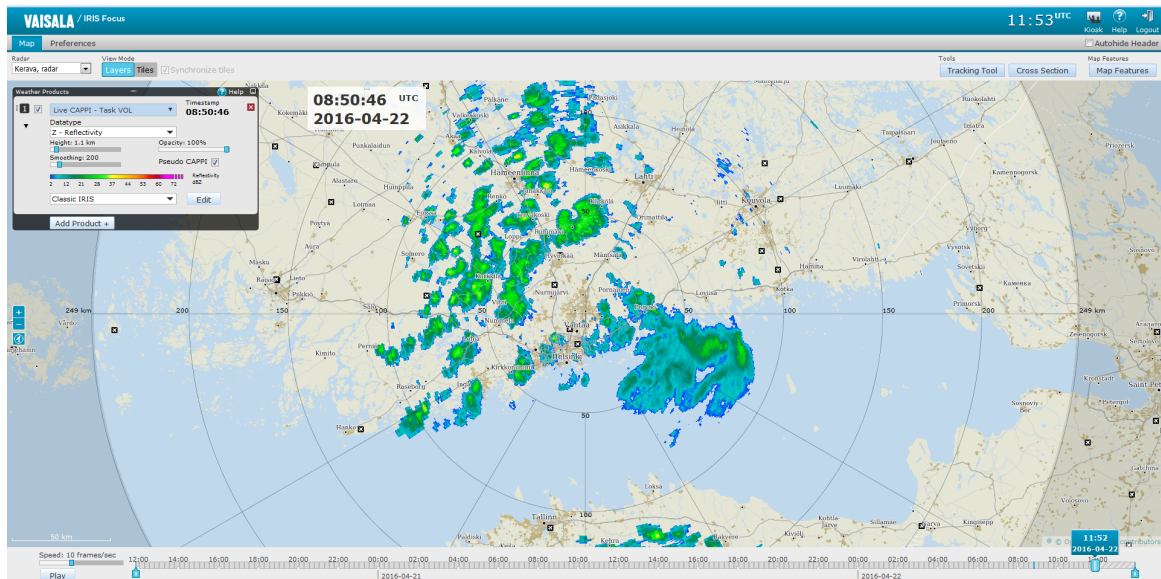


Figure 22 Live CAPPI Example

Live **CAPPI** (Constant Altitude PPI) displays a horizontal cross-section of the signal reflectivity at the selected altitude.

In the following cross-section image, the **CAPPI** product is calculated for a defined 5 km constant altitude. The red lines represent the interpolation from the ray data while the black line represents the constant altitude.

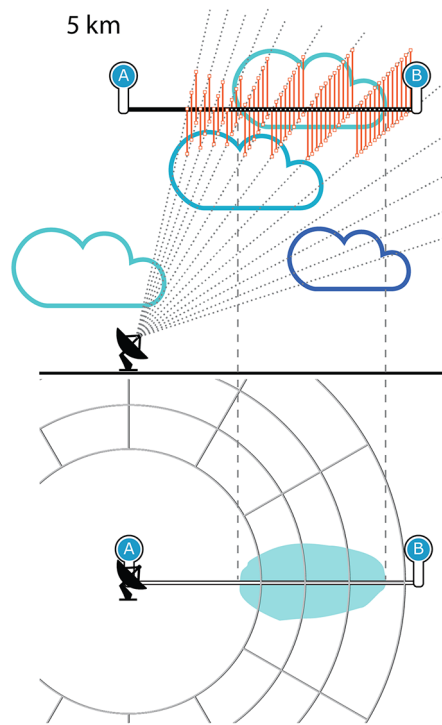


Figure 23 CAPPI Measuring the Defined Altitude



The image does not show the cloud reflectivity values that are included in an actual **CAPPI** product.



Optional radar product smoothing is performed on the bitmap image, not on the volume data.

More Information

- [Live Plan Position Indicator \(PPI\) \(page 39\)](#)
- [Radar Product Layer Settings \(page 14\)](#)

4.5.2.1. CAPPI Height Value

The configurable height (km) defines the altitude of the cross-section displayed in the image.

Use the height slider to define the displayed **CAPPI** height.

The first of the following images shows the weather displayed in a **CAPPI** with an altitude of 3 km.

The second image shows the weather displayed in a **CAPPI** with an altitude of 5 km.



A and B in the image indicate start and end of a vertical cross section through the radar's scan volume.

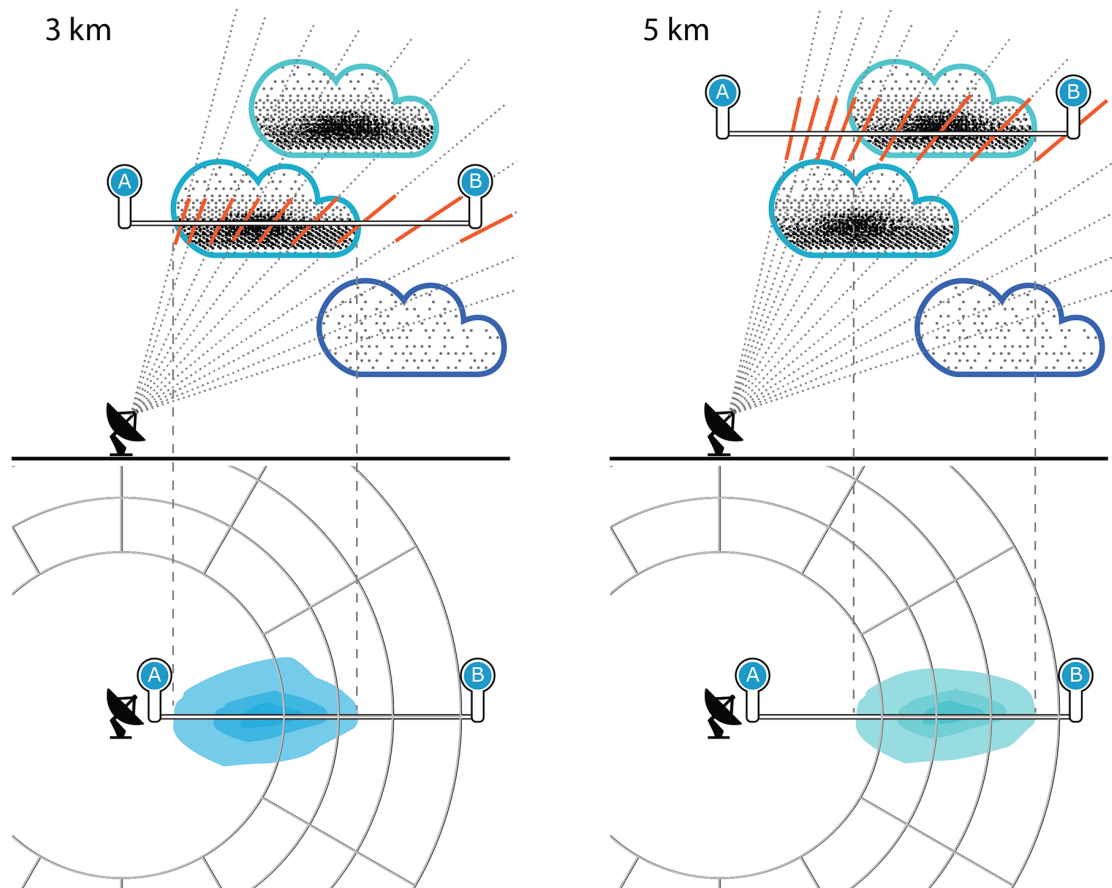


Figure 24 CAPPI with 3 km and 5 km Heights

4.5.2.2. Pseudo CAPPI

Select the **Pseudo CAPPI** option to add pseudo CAPPI calculations to your CAPPI product.

Pseudo CAPPI attempts to visualize those parts within the radar range that are not measured directly, including, for example, the area immediately around the radar, and the volume border with the highest altitude.

In the first cross-section image, the **CAPPI** product is calculated from ray data for a defined constant altitude. The red lines represent the interpolation from the ray data while the black line represents the constant altitude.

The heavy red red lines in the second cross-section image indicate how the **Pseudo CAPPI** product uses the value of the closest ray to extend the **CAPPI** product above and below the constant altitude.

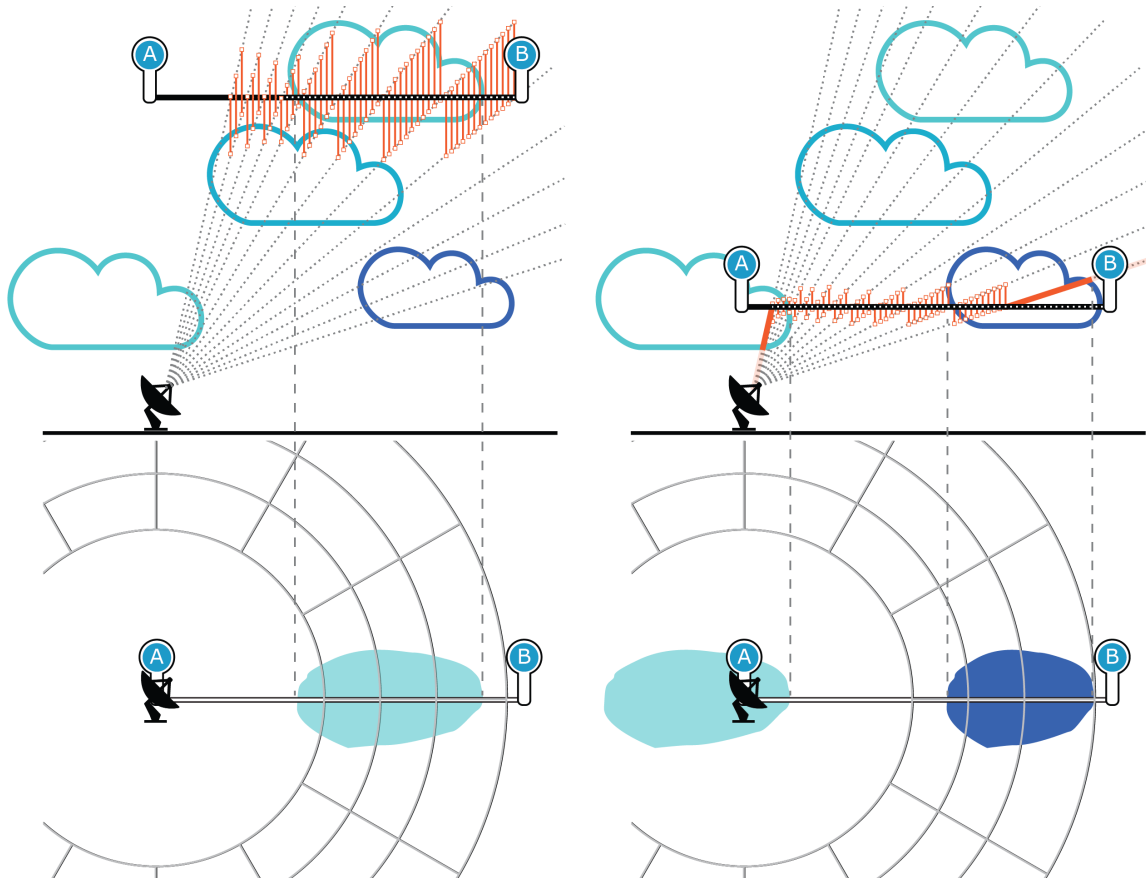


Figure 25 Pseudo CAPPI Extending from CAPPI



The image does not show the cloud reflectivity values that are included in an actual **CAPPI** product.



For **Pseudo CAPPI**, not all data comes from the cappi height and may be quite far from the actual height.

4.5.2.3. Calculating Live CAPPI

A **CAPPI** product is displayed on screen by reading the whole scan volume data and calculating a horizontal cross-section at the selected altitude. The cross-section is drawn as a rasterized bitmap. The directly measured data is only from the areas where radar pulses intersect the selected altitude layer. The rest of the bitmap is interpolated both horizontally and vertically from known values.

Calculating a **CAPPI** product requires that a full **PPI** volume scan is completed first. A **CAPPI** product is only updated when the whole volume has been scanned and processed.

For each pixel in the image, the algorithm calculates live **CAPPI** as follows:

1. Checks the Azimuthal Equidistant (AzEq) cylinder volume from the 2 nearest (in elevation) volume data points of the CAPPI constant altitude plane point.
2. Linearly interpolates the volume data points at the nearest elevations to define a single CAPPI plane data point value.

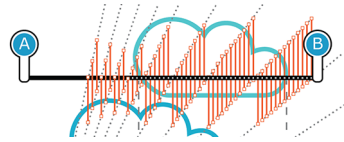


Figure 26 Calculating the AzEq Cylinder Volume From 2 Nearest Data Points

More Information

- [Calculating Live PPI \(page 41\)](#)

4.5.3. Live Plan Position Indicator (PPI)

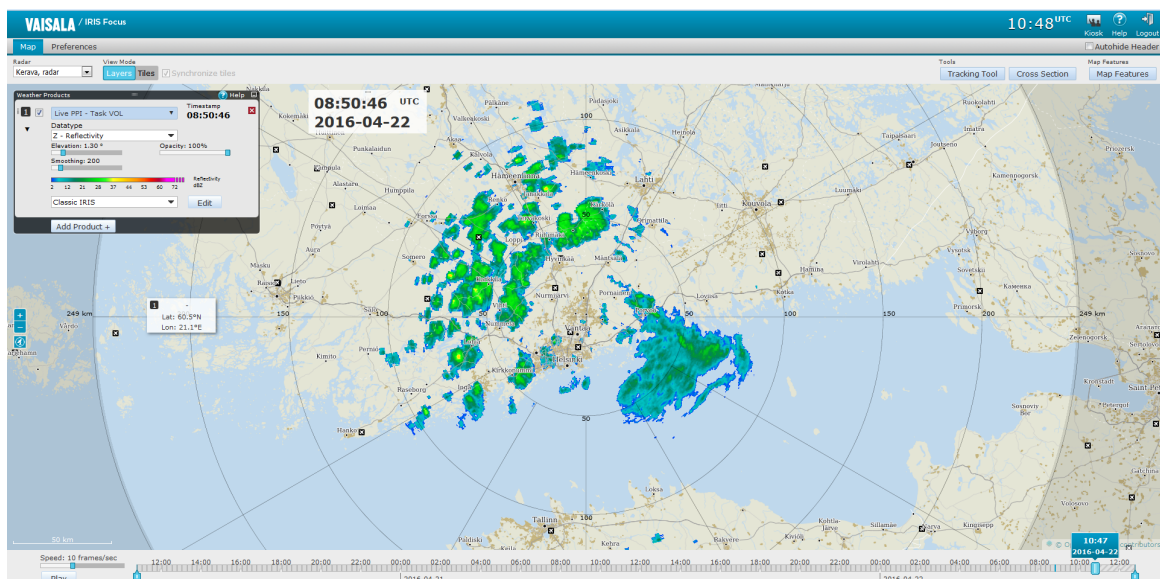


Figure 27 Live PPI Example

PPI (Plan Position Indicator) displays the signal reflectivity on a surface layer that is formed as the radar performs a full 360° horizontal sweep at a constant elevation.

PPI is the classical radar view that is used for visual weather surveillance and air traffic control, among other uses. The products are refreshed as soon as the sweep is completed instead of waiting for the end of a full volume scan.

In the following image, the **PPI** scan is performed on the highlighted elevation.

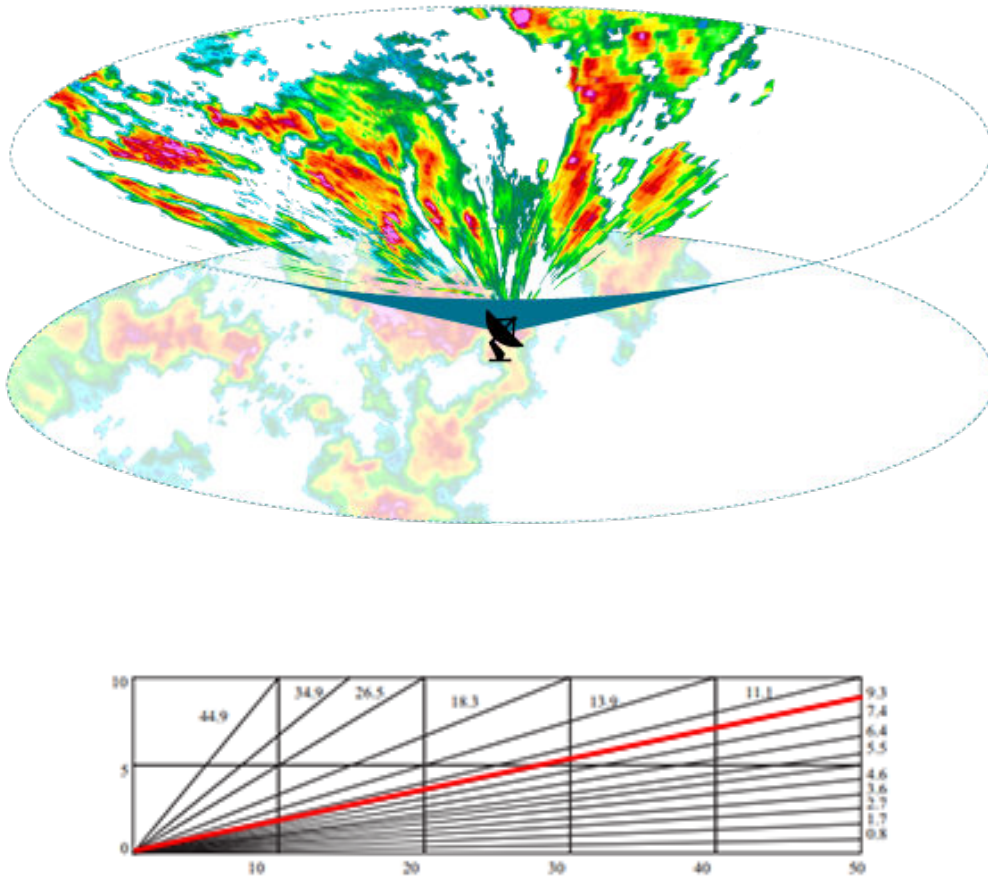


Figure 28 PPI Measuring the Defined Elevation

4.5.3.1. PPI Elevation Angle Value

The configurable elevation angle defines which elevation angle sweep is displayed in the image.

Use the elevation slider to define the displayed **PPI** elevation.

The first image shows **PPI** with a 45° elevation angle defined. In this image, the high-level clouds are displayed in the IRIS product.

The second images shows **PPI** with a 20° elevation angle defined. In this image, the lower-level clouds are displayed in the IRIS product.



A and B in the image indicate start and end of a vertical cross section through the radar's scan volume.

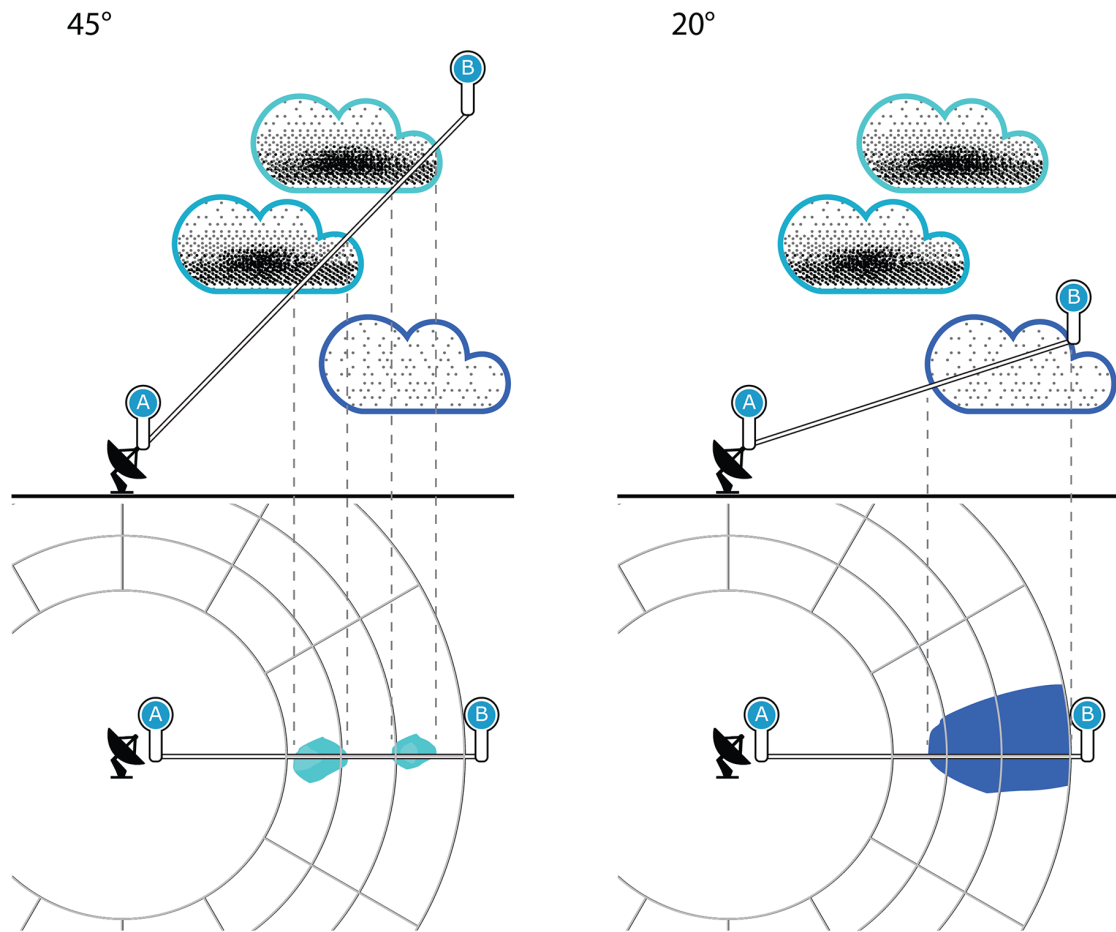


Figure 29 PPI With Elevation Angles of 45° and 20°

4.5.3.2. Calculating Live PPI

For each pixel in the image, the algorithm calculates live **PPI** as follows:

1. Convert pixel coordinates to map coordinates.
2. Convert the map co-ordinates to Azimuthal Equidistant (AzEq) around the radar.
3. Calculate distance to radar (vector length) and azimuth angle to radar atan2 .
4. Calculate the actual value at that point using a sweep parameter.

4.5.4. Live Echo Thickness (THICK)

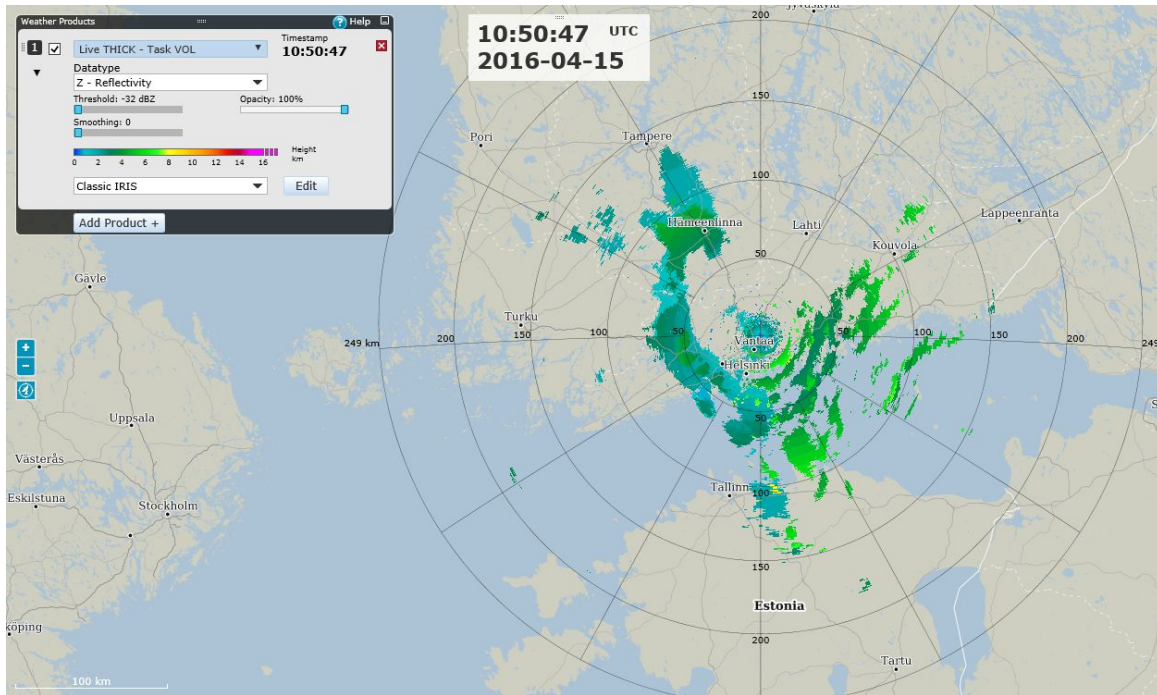


Figure 30 Live THICK Example

THICK is the radar-indicated cloud cover thickness of an area of precipitation.
THICK calculates the difference between the live BASE and TOPS products.

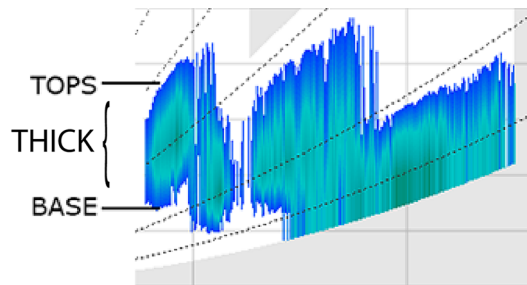


Figure 31 THICK with BASE and TOPS

More Information

- ▶ [Live Echo Base \(BASE\) \(page 32\)](#)
- ▶ [Live Echo Tops \(TOPS\) \(page 44\)](#)

4.5.4.1. THICK Threshold Value

The configurable threshold value defines the minimum reflectivity that must present to be displayed in the image.

The first of the following images shows **THICK** with a -20 dBZ threshold defined. In this image, more data is displayed in the image, including the lower, less dense cloud content.

In the second image, with a 40 dBZ threshold, a much smaller set of data comprising only cloud cover with a reflectivity of 40 dBZ or higher, is displayed.

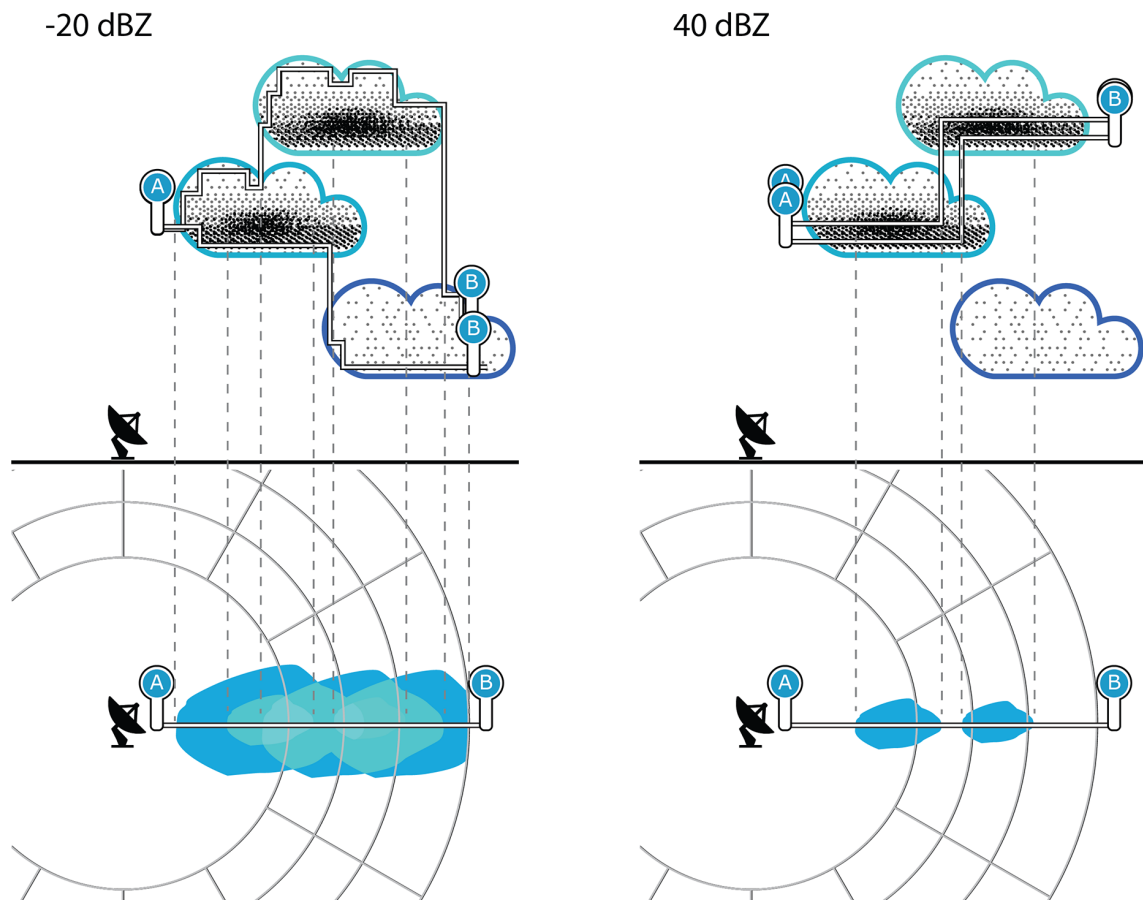


Figure 32 THICK with -20 dBZ and 40 dBZ Thresholds

More Information

- [Radar Product Reflectivity Threshold \(page 29\)](#)

4.5.4.2. Calculating Live THICK

THICK is calculated by calculating both TOPS and BASE at a point and subtracting [4.5.1.2. Calculating Live BASE \(page 34\)](#) from [4.5.5.2. Calculating Live TOPS \(page 46\)](#).

4.5.5. Live Echo Tops (TOPS)

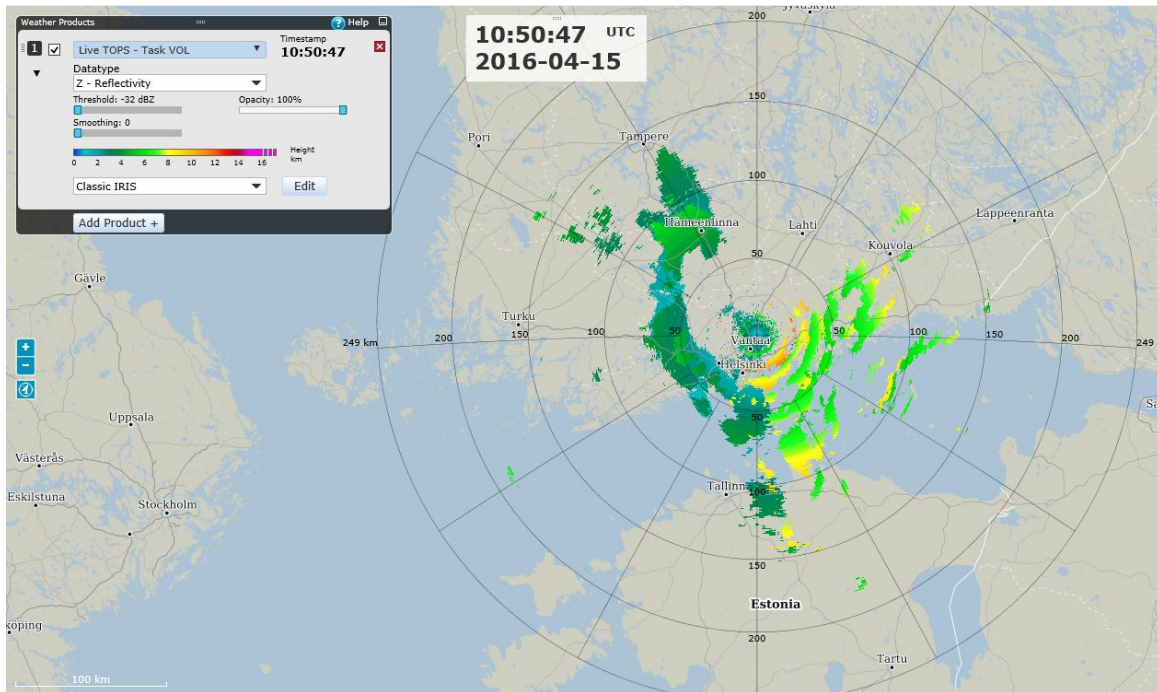


Figure 33 Live TOPS Example

TOPS (also known as echo Tops) is the radar-indicated top of an area of precipitation. The system locates the highest altitude of the defined reflectivity threshold at each pixel location.

Live **TOPS** displays the detected signal echoes above the value defined in the **Threshold** (dBZ), which usually measures the top of the precipitation area or cloud cover.

TOPS can be useful when identifying strong updrafts, severe weather, and hail.

The opposite of TOPS is the BASE product.

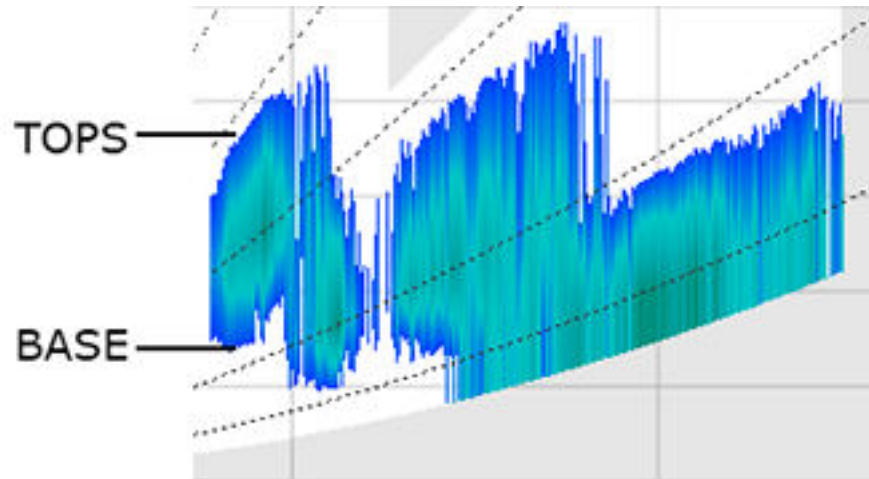


Figure 34 BASE and TOPS Products

More Information

- [Live Echo Base \(BASE\) \(page 32\)](#)
- [Live Echo Thickness \(THICK\) \(page 42\)](#)

4.5.5.1. TOPS Threshold Value

The configurable threshold value defines the minimum reflectivity that must present to be displayed in the image.

The first of the following images shows **TOPS** with a -20 dBZ threshold defined. In this image, the higher, less dense parts of the cloud are shown in the displayed image. In TOPS, using lower threshold values can help determine the height of surrounding precipitation. For example, a 50 dBZ TOP 1 km above the freezing level can be produced only by a vigorous convective storm, and is probably caused by the presence of hail.

In the second image, with a 40 dBZ threshold, higher part of the cloud is not shown in the displayed image because its reflectivity value is lower than the defined threshold.

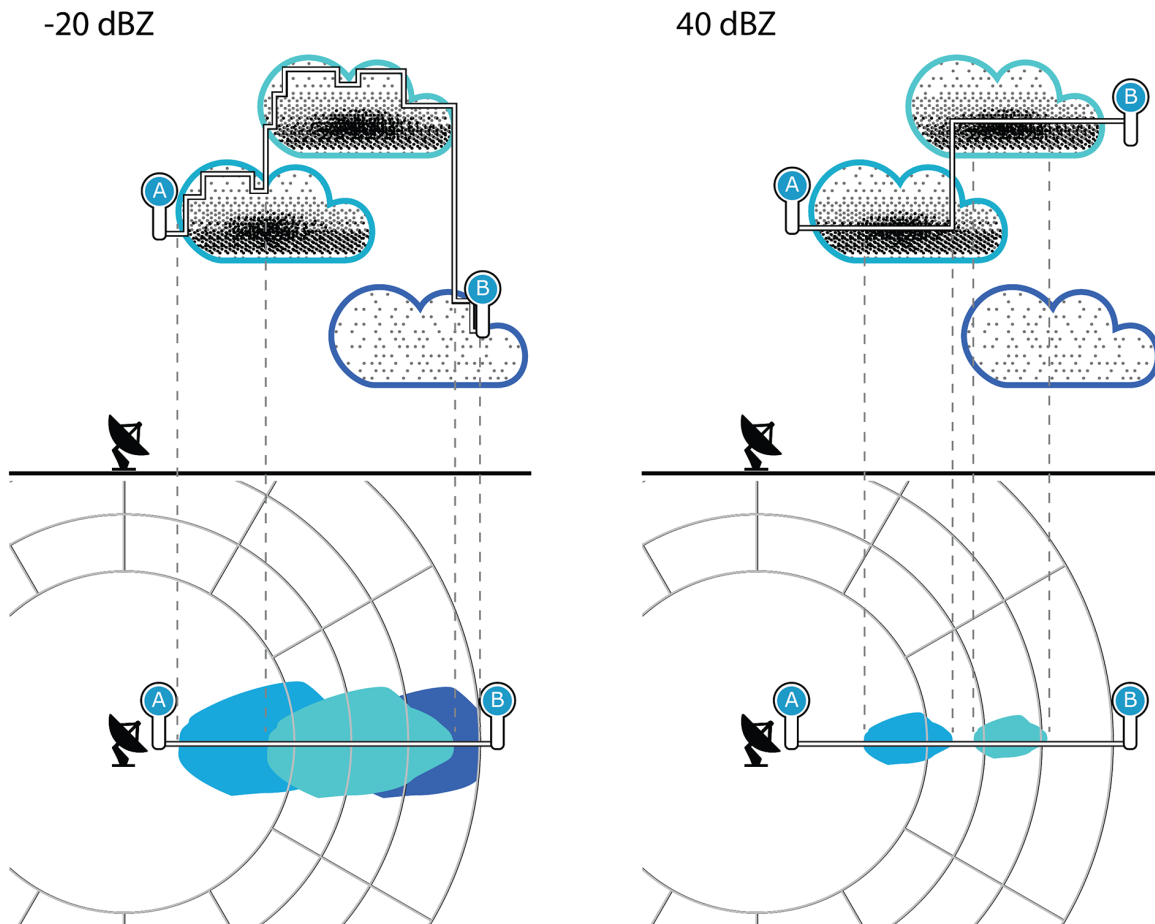


Figure 35 TOPS with -20 dBZ and 40 dBZ Thresholds

More Information

- [Radar Product Reflectivity Threshold \(page 29\)](#)

4.5.5.2. Calculating Live TOPS

For each pixel in the image, the algorithm calculates live **TOPS** as follows:

1. Calculates the **AzEQ** point around the radar is calculated.
2. Uses **AzEQ** to calculate the distance from the radar (**vector length**).
3. Checks if the **AzEQ** point is in the radar's range for the **TOPS** product.
4. Calculates the azimuth angle to radar (**atan2**).
5. Optimizes the calculation of the maximum height by calculating the height of the highest sweep with reflectivity.
The calculation uses the **maxHeightOfSweep** by calculating higher until reflectivity is no longer present.

The maximum height of a sweep represents the height in a certain point of the highest sweep that has a value over threshold.

The maximum height of a sweep is calculated upwards, starting from the sweep with the highest elevation and going downwards until a value over the defined threshold is found.

The algorithm scans upwards until it finds a height for which there is no reflectivity value over the threshold. The last height with a valid reflectivity value is the result.

4.6. Pre-generated Radar Products

IRIS Focus provides a set of radar products that are pre-generated in the IRIS Analysis back-end.

The pre-generated radar products can display additional weather data that are not covered with live products.

4.6.1. Constant Altitude Plan Position Indicator (CAPPI)

CAPPI displays a horizontal cross-section of the signal reflectivity at the selected altitude.

In the following image, the CAPPI scan is calculated from the PPI data on the highlighted altitude.

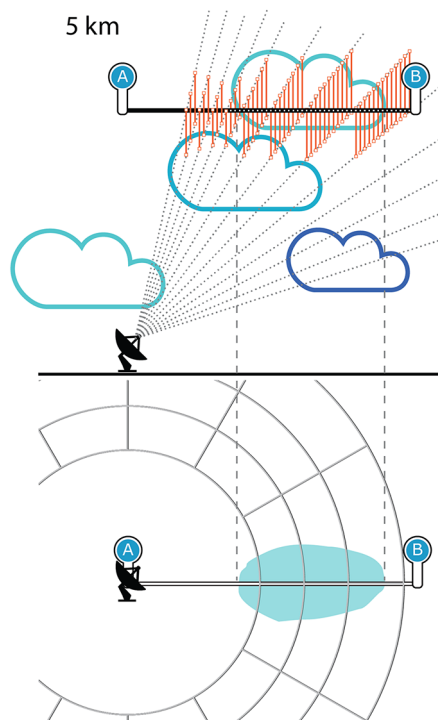


Figure 36 CAPPI Measuring the Defined Altitude

Calculating a **CAPPI** product requires that a full **PPI** volume scan is completed first. A **CAPPI** product is only updated when the whole volume has been scanned and processed.

A **CAPPI** product is displayed on screen by reading the whole scan volume data and calculating a horizontal cross-section at the selected altitude. The cross-section is drawn as a rasterized bitmap. The directly measured data is only from the areas where radar pulses intersect the selected altitude layer. The rest of the bitmap is interpolated both horizontally and vertically from known values.

4.6.2. Echo Base (BASE)

Displays the base level of detected signal echoes, which in most situations reflects the bottom of the cloud base or precipitation area. Note that the minimum height above ground where echo bases can be detected increases with measurement range due to the curvature of Earth.

The opposite of BASE is the TOPS product.

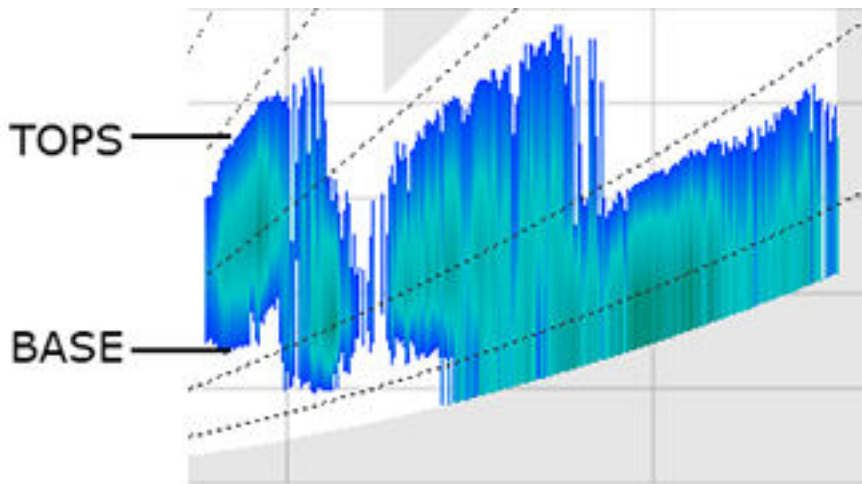


Figure 37 BASE and TOPS Products

More Information

- ▶ [Echo Tops \(TOPS\) \(page 52\)](#)

4.6.3. Antenna Beam Pattern (BEAM)

A system testing product. Used for calibration and alignment purposes and for verifying antenna pattern.

4.6.4. Layer Average (LAYER)

Used to compute layer averages of any polar data types in the ingest files. In addition, it generates the base data for computing VIL (vertically integrated liquid) density.

More Information

- ▶ [Vertically Integrated Liquid \(VIL\) \(page 52\)](#)

4.6.5. Maximum Reflectivity (MAX)

An easy-to-interpret presentation of the echo height and intensity in a single display used for depicting areas of severe weather. MAX determines the maximum reflectivity in all points of the measured area. In addition MAX draws two horizontal projections next to the main map view: east-west and north-south.

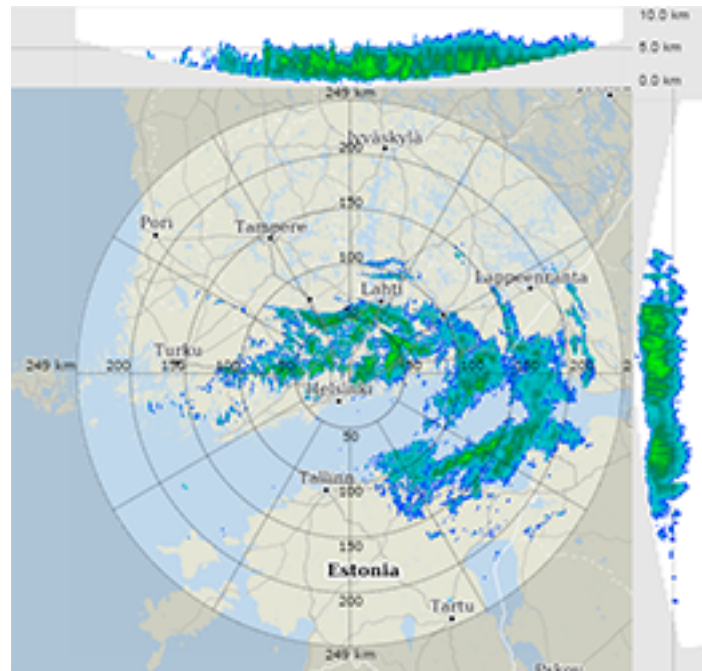


Figure 38 MAX Product and projections

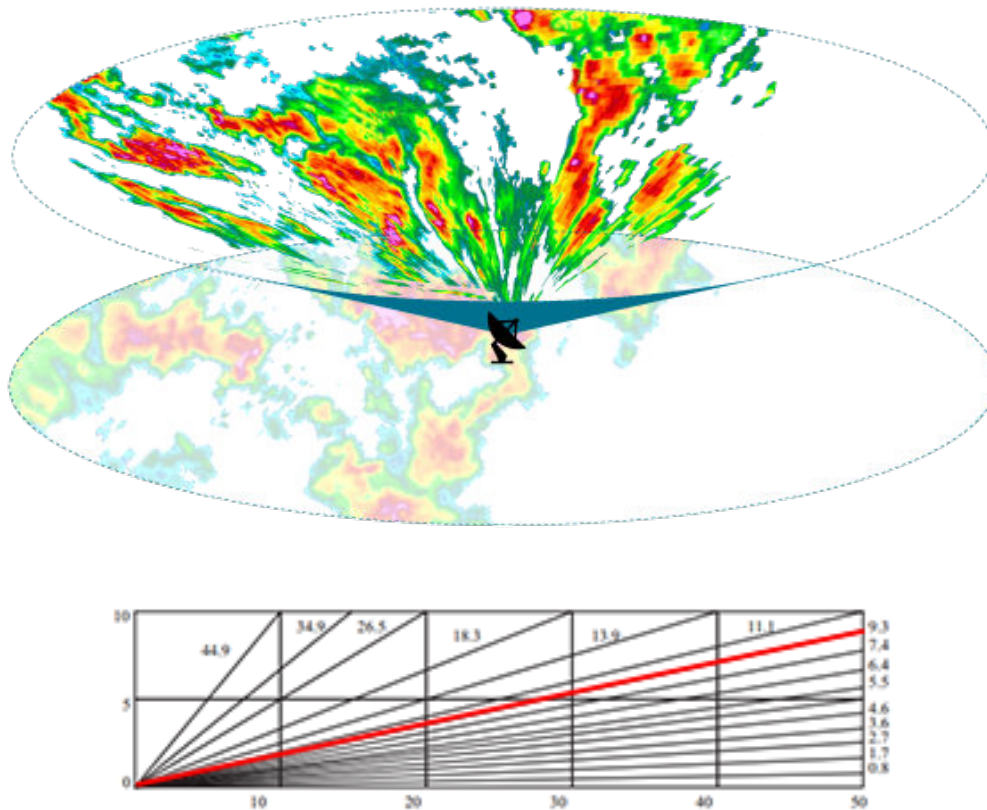


Figure 40 PPI Measuring the Defined Elevation

4.6.7. X Hour Running Precipitation (RAINN)

Displays an estimated running precipitation amount over the last N hours. For example, RAIN1 displays the precipitation from the last hour. Used for estimating rainfall intensity.

4.6.8. Echo Thickness (THICK)

Calculates the difference between [4.6.9. Echo Tops \(TOPS\)](#) (page 52) and [4.6.2. Echo Base \(BASE\)](#) (page 48) products.

TOPS measures the full thickness of cloud cover.

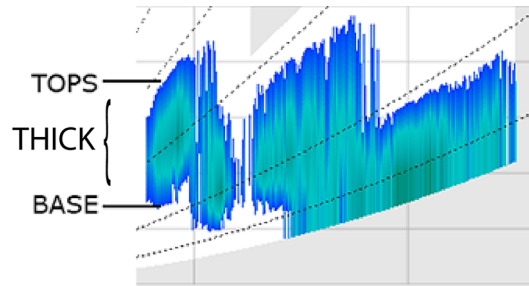


Figure 41 THICK with BASE and TOPS

4.6.9. Echo Tops (TOPS)

Displays the maximum height of the detected signal echoes, which usually measures the top of the precipitation area or cloud cover. TOPS can be useful when identifying strong updrafts.

The opposite of TOPS is the BASE product.

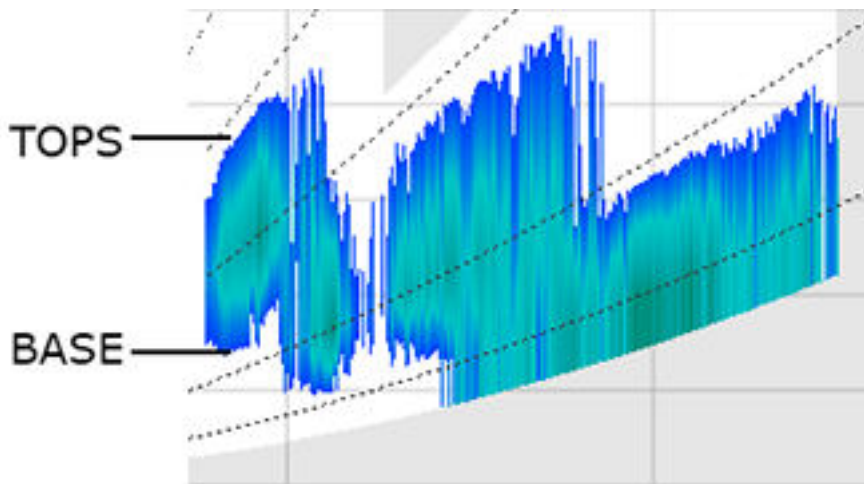


Figure 42 BASE and TOPS Products

More Information

- ▶ [Echo Base \(BASE\) \(page 48\)](#)

4.6.10. Vertically Integrated Liquid (VIL)

Displays the estimated total amount of liquid water in a vertical column of air. The data is calculated from the complete volume scan, and indicates the total amount of rainfall (in millimeters) that is present in the vertical area. As VIL measures the entire depth of the atmosphere, it performs well in detecting precipitation that has not yet reached the ground. High values may be indicative of heavy rainfall, thunderstorms, or hail.

The VIL product also includes the VIR (Vertically Integrated Reflectivity) product that displays the calculated reflectivity value of the vertical air column area measured in dBZ. The results tend to be close to VIL values.

More Information

- [Layer Average \(LAYER\) \(page 48\)](#)

5. Administration

All administration tasks such as managing licensing and users, are done from the **Administrator** panel, which is enabled when you are logged in with an administrator account.

To access the Administrator panel, select **Admin**.



If the **Admin** button is not visible, you are not logged in as an administrator.

5.1. Administrator Panel

The Administrator panel has the following subsections:



Figure 43 Administrator Panel

- User - User and organization
- Map - Map layer management
- System - License management and notification texts for the front page
- Licenses - Lists the software license

5.2. User Management

Access to different features in IRIS Focus depends on what roles have been enabled for a user account. For example, the administration features are available to user accounts with administrator role.

IRIS Focus uses the following roles:

- *administrator* - Can access administration features
- *focus* - Can access the full IRIS Focus feature set
- *kiosk* - Can only access the non-interactive full screen Kiosk mode
- *poweruser* - Not used
- *user* - Can access limited application features



To enable all IRIS Focus features for an account, set both *user* and *focus* roles for that account.

IRIS Focus builds on earlier Vaisala IRIS software. The release preceding IRIS Focus was IRIS Vision, which is included in IRIS Focus as a limited environment that users without a *focus* role or a valid IRIS Focus license can use. A user account that has *user administrator* or role without *focus* role set enters the IRIS Vision mode. IRIS Vision does not include features such as cross-section or live radar products.

Each logged-in user account with *focus* role reserves one IRIS Focus seat from the license pool. When the user logs out, the seat is released. If a user with *focus* role logs in and there are no IRIS Focus seats left, the user enters the restricted IRIS Vision mode. When a seat is again available, the user receives a pop-up message that offers the option to switch to IRIS Focus.

Each user account belongs to one or more organizations. Each organization can have a subscription to a selected software for a selected number of users. However, you can use organizations to create subgroups that have separate license pools and manage the license availability that way.



By default, an *administrator* account does not have the *focus* role set to avoid reserving an IRIS Focus license when performing administration tasks.

More Information

- [Licensing \(page 9\)](#)

5.2.1. Users View

The currently defined user accounts are listed in the **Administrator > Users** view.

User accounts have the following parameters:

- Username - Permanent ID for the user. Used when logging in.
- Password - User password. Must conform to password requirements.
- State - Set as **Active** to enable login for that account. Set as **Locked** to disable the account without deleting it.
- Personal details - Email, first name, last name, city, country, time zone, language
- Organization membership - Which organization(s) the user belongs to
- Roles - What features of the application the user can access

Username	State	Email	First name	Last name	Organizations and roles	Time zone	Language	Actions
admin	Active	admin@vaisala.com			root (administrator)			
kiosk	Active	kiosk@email.com			root (kiosk)			Edit Delete
poweruser	Active	poweruser@email.com			root (poweruser)			Edit Delete
user	Active	user@email.com			root (focus, user)		en	Edit Delete
vision-user	Active	vision-user@email.com			root (user)			Edit Delete

Figure 44 Users View

When adding or editing a user, you can assign multiple roles for the user account by holding down **SHIFT** or **CTRL** and selecting roles from the list.

If a user account belongs to multiple organizations, the user roles are applied according to the organization that has the highest Rank.

The 'Edit User' dialog box contains the following elements:

- Fields for Country, Time zone (set to UTC), and Language (set to Default).
- A search bar.
- A table with columns: Selected, Organization, Roles, and Rank.

Selected	Organization	Roles	Rank
<input type="checkbox"/>	Department A		3
<input checked="" type="checkbox"/>	Example Inc.	focus, poweruser	1
<input type="checkbox"/>	root		3
- A 'Selected organization' dropdown menu showing 'Example Inc.'.
- A 'Roles' dropdown menu with options: administrator, focus, kiosk, and poweruser.
- A 'Rank' input field containing the value '1'.
- 'Save' and 'Cancel' buttons at the bottom right.

Figure 45 Creating New Users



To enable IRIS Focus features for a user account, you must select both the **user** and **focus** roles.

5.2.2. Managing User Accounts

- ▶ 1. Log in with an *administrator* account
2. Select **Admin** in the upper right corner.
The **Users** window opens with tools for adding, editing, and deleting users.

5.2.3. Creating User Accounts After First Install

After a fresh installation, start creating user accounts.

- ▶ 1. Choose which organization you want to create your users in:
 - Use the default **root** organization.
 - For more control over license seat allocation, create a new organization in the **Organizations** tab.

2. Subscribe the organization to a license pool in the **Application Subscriptions** tab:
 - a. Select the *radarsw* organization.
 - b. Enter the validity period.
 - c. Enter the maximum allocated users (licenses).

3. Add users to the organization in the **Users** tab:
 - a. Add user details.
 - b. Select an organization for user.
 - c. Add roles to user
 - d. Add both focus and user roles to make IRIS Focus features available.
 - e. To select multiple roles, press **CTRL**.

The default administrator account does not have the focus role set. This is to avoid reserving an IRIS Focus license when performing administration tasks.

Username	State	Email	First name	Last name	Organizations and roles	Time zone	Language	Actions
admin	Active	admin@vaisala.com			root (administrator)			
kiosk	Active	kiosk@email.com			root (kiosk)			Edit Delete
poweruser	Active	poweruser@email.com			root (poweruser)			Edit Delete
user	Active	user@email.com			root (focus, user)		en	Edit Delete
vision-user	Active	vision-user@email.com			root (user)			Edit Delete

Figure 46 Users List

5.2.4. Logged In Users View

Logged In Users view displays all the currently logged in user accounts.

To force individual users to log out, select **Log Off User** at the end of each non-administrator user account.

Users Logged In Users Identity Configuration Password Configuration Organizations Application Subscriptions							
Logged In Users							
Search <input type="text"/>							
▲ Username	Host	Primary organization	Application	Last login time	Last access time	Login duration	Actions
admin	127.0.0.1	root	radarsw	2015-10-21 09:58	2015-10-21 09:58	24 mins	
admin	127.0.0.1	root	radarsw	2015-10-21 10:04	2015-10-21 10:04	18 mins	
admin	172.25.122.86	root	radarsw	2015-10-21 10:00	2015-10-21 10:23	23 mins	
admin	127.0.0.1	root	radarsw	2015-10-21 10:06	2015-10-21 10:06	17 mins	
anonymous	127.0.0.1			2015-10-21 10:22	2015-10-21 10:22	1 min	Log out user
anonymous	127.0.0.1			2015-10-21 10:22	2015-10-21 10:22	50 secs	Log out user
anonymous	127.0.0.1			2015-10-21 10:22	2015-10-21 10:22	43 secs	Log out user
user	127.0.0.1	root	radarsw	2015-10-21 10:04	2015-10-21 10:04	18 mins	Log out user
user	127.0.0.1	root	radarsw	2015-10-21 10:10	2015-10-21 10:10	12 mins	Log out user
user	127.0.0.1	root	radarsw	2015-10-21 10:03	2015-10-21 10:03	19 mins	Log out user

Figure 47 Logged In Users view

5.2.5. Identity Configuration

Identity Configuration view defines the following user account security settings:

- Lock on failure - Enable to lock user accounts after too many login failures
- Max attempts before lock - How many times a user can attempt logging in before being locked out
- Lock duration - How long (in seconds) the lockout time lasts
- Expire password - Enable to set an expiration counter for the password
- Password validity - How many days the password is valid before the user is prompted to change it

Identity Configuration	
Lock on failure	<input checked="" type="checkbox"/>
Max attempts before lock	<input type="text" value="4"/>
Lock duration (seconds)	<input type="text" value="60"/>
Expire password	<input type="checkbox"/>
Password validity (days)	<input type="text" value="0"/>
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

Figure 48 Identity Configuration view

5.2.6. Password Configuration View

Password Configuration view defines requirements for password complexity. The settings for the password are:

- Minimum and maximum length
- What combination of (upper and lower case) letters or digits the password must contain
- Whether the password must contain special characters (!"#%&'()*+,-./:;<=>?@[]^_`{|}~)
- Whether the password must conform to a defined regular expression
- How many previous passwords are forbidden to reuse

Users Logged In Users Identity Configuration Password Configuration Organizations Application Subscriptions

Password Configuration

Min length

Max length

Must contain letters

Must contain digits

Must contain upper and lower case

Must contain special characters

Must validate regular expression

Number of previous passwords to exclude

Figure 49 Password Configuration view

5.2.7. Organizations View

Organizations view lists all the organizations that have been set up in the application. Organizations have the following parameters:

- Code - Title of the organization. This is visible when assigning users to organizations
- Description - Full text description of the organization

Users Logged In Users Identity Configuration Password Configuration Organizations Application Subscriptions

Organizations

Search

Code	Description	Actions
Department A	Department A	Edit Delete
Example Inc.	Example organization	Edit Delete
root	Root organization	Edit Delete

Figure 50 Organizations View

More Information

- [Licensing Management \(page 66\)](#)

5.2.8. Application Subscriptions View

Application Subscriptions view lists all active and expired subscriptions. Each subscription creates a relationship where the organization subscribes to the application for a defined length of time. By subscribing, the organization reserves a pool of licenses to allocate for users in that organization.

Currently the IRIS Focus application *radarsw* is the only available application to subscribe organizations for. Subscriptions are a way to manage available licenses between different organizations.

Code	Description	Organization	Application	Start date	End date	Max user	Actions
IRIS Focus	Subscription to IRIS Focus	Example Inc.	radarsw	2015-10-20	2016-10-20	5	Edit
FireSubscription	Subscription for the root organi root		radarsw	2014-09-22	2114-09-22	500	Edit

Figure 51 Application Subscriptions view

Add Application Subscription

Application Subscription

Code:

Description:

Organization:

Application:

Start date:

End date:

Max number of users:

Figure 52 Creating a new Subscription

More Information

- [Licensing Management \(page 66\)](#)

5.2.9. Removing User Accounts

When user accounts are removed from the system database using the **Delete** button in [5.2.1. Users View \(page 56\)](#), the user name of the deleted account remains in the system database. This keeps log files intact, as references to deleted users remain in the audit logs.

IRIS Focus does not allow you to create a new user with a similar user name as an existing one. This applies even when the account has been removed beforehand, because the account name remains in the database.

5.3. Map Management

The standard installation of IRIS Focus includes a complete world map that is suitable for most scenarios.

The map consists of many separate layers that are further separated into base layers and non-base layers. One base layer and one non-base layer are always rendered on the screen. Typically, base maps contain the underlying terrain and the non-base layers contain additional details that can be displayed on top of the base map.

Map data is served to the IRIS Focus web interface by GeoServer map server using Web Map Service (WMS) protocol. To improve performance, instead of calling for new map data each time the map view changes, the maps are cached in pre-rendered PNG tiles using GeoWebCache .

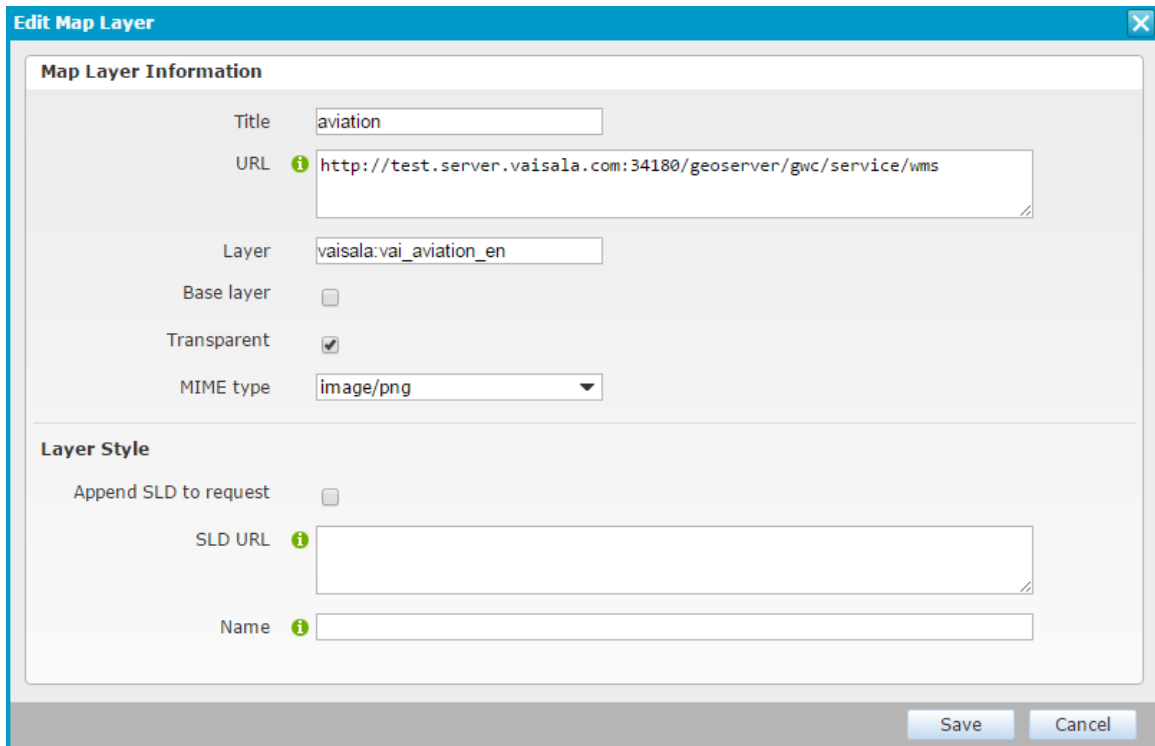
You can select the layers from the **Map Features** menu in the map view.

You can add custom map layers or edit the existing layers in the **Map** panel.

5.3.1. Map Layers

The **Map Layers** view lists the available map data layers. Each layer has the following properties:

- Title - Layer name
- URL - Address for the WMS server
- Layer - Title of the layer on the server
- Base layer - Enable to set this layer as a base layer
- Transparent - Enable to use PNG or GIF alpha channel for transparency
- MIME type - Select image type
- Layer style - Add SLD (Styled Layer Descriptor) parameters for styling the layer in more detail



Edit Map Layer

Map Layer Information

Title

URL

Layer

Base layer

Transparent

MIME type

Layer Style

Append SLD to request

SLD URL

Name

Save Cancel

Figure 53 Editing a Map Layer

5.3.2. Map View Context

The **Map View Context** view lists all defined maps.

Only the default **TheMap** context is available.



You perform all map layer customization in the default **TheMap** context, you do not create new map contexts for custom map layers.

- To set which layers are enabled and which are disabled for users in the map view, edit **TheMap**.
- To set the order in which multiple map layers are rendered on screen, change the **Z level** of map layers.
The lowest number is rendered first, and higher numbers rendered on top of that.

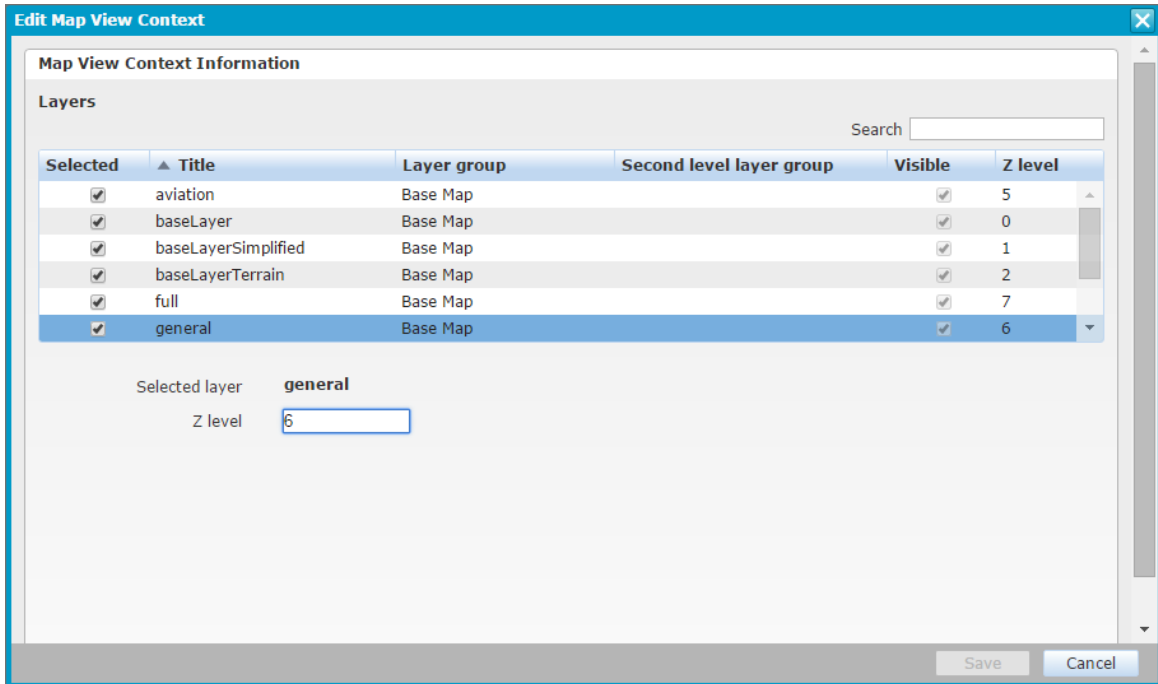


Figure 54 Editing the Map Context

5.4. System Management

System Management lets you set status messages for the login page and verify the licensing status.

5.4.1. System Properties

The application login page contains 2 text fields where you can publish status messages or other notifications.

You can write the messages in the **System Properties** view. Empty fields are not displayed on the login page.

The screenshot shows the 'System Properties' dialog box. It has two text input fields:

- Notification text:** Notification Message
- Welcome text:** Welcome Message

At the bottom, there are 'Save' and 'Cancel' buttons.

Figure 55 Entering Status Texts

Welcome Message

Login Version DEV-SNAPSHOT_7710

User name

Password

Login

Notification Message

Figure 56 New Login Page

5.4.2. Licensing Management

The **Licensing Management** view displays the allocation status of the current license pool.

- Total seats - Size of the active license pool. This depends on your licensing plan
- Used seats - Number of seats currently in use.

Note that due to restrictions you might have set for organizations or application subscriptions, an organization can run out of licenses even when there are available seats in the total license pool.

License Management Status

Total seats: 1000, used seats: 4

Figure 57 Licensing Management Status

More Information

- [Application Subscriptions View \(page 61\)](#)
- [Organizations View \(page 61\)](#)
- [Licensing \(page 9\)](#)

5.4.2.1. Licensing on Server Restart

Active sessions and their licenses are not stored when the IRIS Focus server is shut down.

When the server restarts, the licensing seats are allocated from scratch to users who log in. The total number of seats in the license pool is unaffected.

More Information

- [Licensing \(page 9\)](#)

Glossary

Bin

A single sample of weather data detected at a known direction, altitude, and distance from the radar site. The radial size of a bin depends on and decreases with distance, so bins further from the radar site cover a larger area than nearby bins.

Hydrometeor

A particle of condensed water vapor in the atmosphere. Rain, snow, and hail are examples of hydrometeors.

Nowcasting

Weather forecasting within the next 6 hours.

PRF

Pulse Repetition Frequency measured in Hz (pulses per second). When measuring PRF, a [Pulse \(page 69\)](#) contains transmit, receive, and dead time phases. PRF affects [Range folding \(page 69\)](#) and [Velocity folding \(page 69\)](#) detection. Normal PRF values for Doppler radars are up to 1000 Hz. Vaisala radars generally operate around 400-700 Hz. In Vaisala IRIS products, PRF limits the area displayed in radar images and the maximum measurable wind speed.

Pulse

A short burst transmission signal sent by the radar, used to measure the weather activity in atmosphere. The reflection measurements from a pulse are sorted into bins. See also [Bin \(page 69\)](#).

Range folding

Radar signal echoes from outside the radar maximum range that are incorrectly displayed within the radar measurement area. Also called range aliasing.

Sweep

A collection of pulses at a constant elevation as the radar rotates around its axis 360°. After a sweep, the radar usually changes its elevation and starts a new sweep. Each sweep typically contains the same number of bins independent of the elevation. See also [Bin \(page 69\)](#).

Velocity folding

Erroneous readings due to particles in the measurement area exceeding the maximum velocity detection threshold of the radar system. The measured velocity "wraps around" to the other end of the scale, resulting in discontinuous readings. Also called velocity aliasing.

Volume

Complete set of raw measurement data collected from sweeps, that is used to calculate a model of the atmosphere. The maximum volume is half of a sphere (from 0° elevation upwards), but other shapes are more typical.

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Technical Support



Contact Vaisala technical support at helpdesk@vaisala.com. Provide at least the following supporting information:

- Product name, model, and serial number
- Name and location of the installation site
- Name and contact information of a technical person who can provide further information on the problem

For Vaisala Service Center contact information, see www.vaisala.com/servicecenters.

Warranty

For standard warranty terms and conditions, see www.vaisala.com/warranty.

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

Recycling



Recycle all applicable material.



Follow the statutory regulations for disposing of the product and packaging.

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