# VRS X Smart Map Clustering

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## Radar-scale traffic without melting the browser

VRS X can handle very busy airspace without turning the map into an unreadable pile of markers. When you zoom out, the radar switches from individual aircraft to intelligent map clustering, keeping the map fast, readable, and useful even with thousands of live aircraft.

This is especially important for large merged feeds, public radar views, and mobile clients where drawing every aircraft at world or continent scale would waste CPU and make the UI feel frozen.

## Why it is different

A normal aircraft map has a simple problem: the farther you zoom out, the more aircraft compete for the same screen space.

VRS X solves this by changing the visualization mode with zoom level:

1. At low zoom levels, aircraft are grouped into stable grid clusters.
2. The cluster count shows traffic density without covering the whole map with overlapping icons.
3. At closer zoom levels, individual aircraft return with their normal markers, labels, tracks, colors, and details.
4. Selected aircraft and high-priority objects can still stay visible where it matters.

The result is a map that remains responsive at global scale and still becomes detailed when you zoom into a region, airport, or approach corridor.

## Why operators like it

Smart clustering makes VRS X useful as both a radar and an operations overview:

1. You can see where traffic is concentrated without losing the whole map.
2. You can quickly spot feed coverage areas and dense regions.
3. You avoid huge marker overlap at continent scale.
4. Mobile clients remain much more stable under heavy traffic.
5. Large merged feeds stay practical instead of becoming a browser stress test.

# Grid clustering and coverage awareness

The current low-zoom grid style is not only a performance trick. It also gives a quick visual sense of where your network is active. Dense cells show where aircraft are currently being received, while sparse or empty regions can hint at traffic gaps, disabled feeds, or missing coverage.

For deeper historical coverage analysis, use the dedicated Coverage page in the Operator's Handbook.

# The practical win

With smart clustering enabled, VRS X can keep the radar readable while processing heavy real-world traffic. You can start wide, understand the big picture, and then zoom in only where individual aircraft matter.

That is the point: overview first, detail on demand.

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