



Release guide

Octave Alto Browser

2026.1

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About this release

The 2026.1 release of Octave Alto Browser strengthens support for defense and tactical data, with APP-6E military symbology, an NVG codec for the browser and a new Mapbox Vector Tiles client.

It also includes several point cloud rendering improvements, support for 2D video draping and a reworked cartesian view that renders complex strokes accurately under non-uniform scaling.

Alto Browser 2026.1 introduces support for Gaussian splatting, and adds a WFS-T client that lets you persist feature edits straight to a standards-compliant OGC service.

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Additionally, it includes several point cloud rendering improvements, support for 2D video draping and reworked complex strokes that keep their intended size under nonuniform and perspective scaling.



Figure 1. The Octave Alto portfolio

Benefits of the new features

Support for APP-6E military symbology

Alto Browser 2026.1 adds support for version 2 of the NATO APP-6E military symbology standard, in line with Octave Alto Lightspeed and Octave Alto Server. You can now create, style and edit symbols using the latest joint military symbology defined by APP-6E. Alto Browser's support covers air, land, sea, space and cyberspace domains, and includes symbol identifiers for dismounted individuals and stability and civil support operations, as well as the control measure and planning symbols. The cyberspace symbols introduced in the previous release have been upgraded from APP-6E version 1 to version 2.

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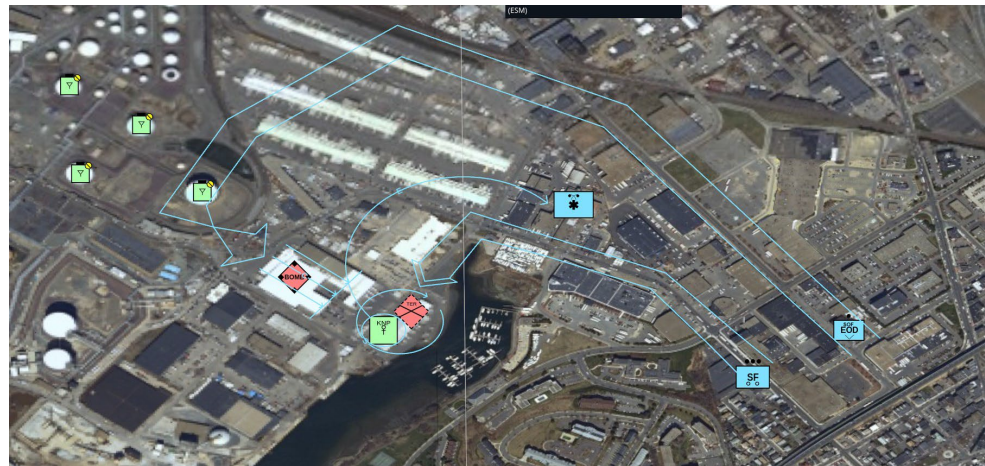


Figure 2. A fictional military scenario visualized in Alto Browser using APP-6E symbology

Sample code/documentation to get you started

The Military Symbology and Military Symbols Overview samples, located in `samples/symbology` in the Alto Browser release, let you explore the new symbols on a map. As before, the Alto Browser release includes the sample code.

For a full overview of the symbology support in this release, see the [release notes](#). The existing [Defense: Military Symbology](#) section has been updated to reflect this addition. Notably, the overview article [What are the supported standards?](#) provides the full and up-to-date list of supported standards and versions.

Integration of Gaussian splat data

Just like Alto Universal, Alto Browser now introduces support for Gaussian splatting, one of the most exciting recent innovations in 3D geospatial visualization. Gaussian splatting reconstructs real-world environments using millions of tiny 3D Gaussian primitives, producing highly detailed and photorealistic digital scenes that bridge the gap between traditional meshes and reality capture data. As the technology rapidly gains traction across the geospatial, simulation and digital twin industries, support for Gaussian splats ensures that Alto Browser remains aligned with the latest state-of-the-art visualization capabilities expected by modern users.

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Figure 3. A Gaussian splatting dataset of a restaurant visualized in Alto Browser

The new capability allows developers to seamlessly visualize Gaussian splatting datasets delivered as OGC 3D Tiles, making them easy to integrate into existing 3D workflows. Advanced styling options enable fine-grained control over visual quality, performance, depth interaction and rendering behavior, allowing applications to scale from lightweight operational systems to high-fidelity digital twins. The result is an immersive viewing experience that combines exceptional realism with the flexibility, performance and engineering robustness required for professional geospatial applications.



Figure 4. A Gaussian splatting dataset of a museum visualized in Alto Browser

Sample code/documentation to get you started

The new Gaussian splats sample shows how to load and style a Gaussian splatting dataset. As before, the Alto Browser release includes the sample code.

For more information on how to integrate Gaussian splatting datasets, see the new article [Visualize Gaussian splatting data](#). The documentation on expression-based styling for 3D data helps you tune the visual appearance of the data.

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Mapbox Vector Tiles client

A lot of business data is modeled as vector data or feature data. Most of this data can be loaded as-is. For larger data sources, the use of scale ranges and smart filtering ensures a smooth experience. However, a few types of vector data cover large areas, offer very detailed information and serve as context or background information. Because of the detail and the large size of individual objects, filtering and scale ranges are not sufficient. Some examples are world shorelines, country borders or contour lines.

In a process that is similar to how 3D data is processed into 3D Tiles, these contextual feature layers can be processed into vector tiles or feature tiles. A common format is Mapbox Vector Tiles, a tile format for tile sets of 2D data. The specification is open, which makes it a good exchange format.

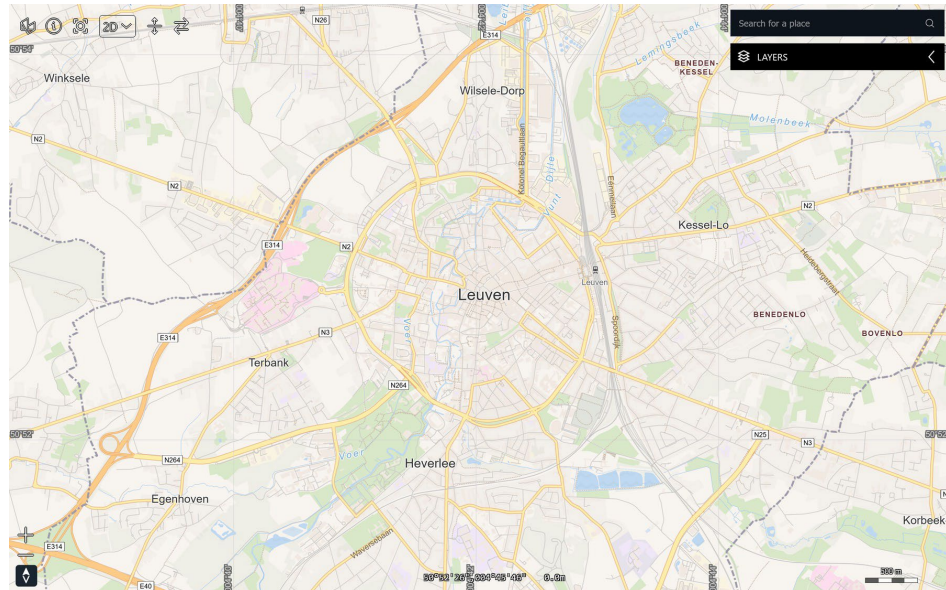


Figure 5. An MBTiles dataset

Alto Browser 2026.1 introduces a client for Mapbox Vector Tile datasets, aimed at using them as a background layer. You can load them as TileJSON, the most common way to serve vector tiles on the web and exactly what an MBTiles service from Alto Server serves, or straight from a web-hosted PMTiles archive. PMTiles is a useful addition, because the server only has to host a single file: any server with plain file hosting will do. The SQLite-based `.mbtiles` format itself is not supported, as it is optimized for local file access rather than for the web.

You can create a model and layer for the vector tiles, and Alto Browser picks up the associated Mapbox GL style to render lines, areas, icons, complex strokes and labels. The client uses the existing label rendering pipeline, and removes overlapping tile boundaries for clean rendering. Tiles are decoded on web workers, and the resulting draw commands are replayed across several frames, so that loading a lot of tiles does not cause frame rate drops. Your datasets are not restricted to the usual Web Mercator tiling scheme either; Alto Browser derives the tiling scheme from the TileJSON descriptor, so you can also visualize vector tilesets that are tiled in another projection.

Sample code/documentation to get you started

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For more information on how to use Mapbox Vector Tiles data in your application, see [Visualize Mapbox Vector Tiles](#).

NVG codec for the browser

Alto Browser 2026.1 adds a codec for the NATO Vector Graphics (NVG) format, so you can decode and encode NVG content directly in the browser. NVG is widely used to exchange tactical overlays and operational data between command-and-control systems, and bringing it to Alto Browser lets web applications consume and produce these overlays natively.

The Alto Browser NVG support is complete, including:

- Integration with all supported APP-6 standard versions
- Intuitive on-map scenario creation and editing
- Consumption and preparation of NVG updates suitable for integration with the latest NVG streaming specification



Figure 6. The Alto Browser NVG Sample showing a fictional invasion scenario

Sample code/documentation to get you started

The Nato Vector Graphics sample, located in `samples/symbology` in the Alto Browser release, demonstrates the decoding, visualization, creation and editing of NVG content. As before, the Alto Browser release includes the sample code.

For more information, see the [release notes](#) and the [NVG Support in Alto Browser](#) article.

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Editing WFS data with WFS-T

Until now, Alto Browser could read features from a WFS service, but not write them back. Applications that needed to persist edits had to fall back on a custom REST service, such as the annotation service that is part of the Alto Browser samples.

Alto Browser 2026.1 adds support for Transactional WFS (WFS-T), so that you can persist feature edits straight to a standards-compliant OGC service. `WFSFeatureStore` now implements the full editing cycle: inserting, updating and deleting features, and locking them so that concurrent editing sessions do not overwrite each other's work. Because the store reads the capabilities that the service advertises upfront, it knows which operations the server actually supports. New API, such as the `WFSOperationName` enumeration and the `isStoreOperationSupported` helper, lets your application enable or hide editing functionality accordingly. WFS-T requires a WFS 2.0 service.

Sample code/documentation to get you started

For more information on how to edit WFS data in your application, see the new article [Edit WFS data with WFS-T](#).

The Data Formats sample has been updated to include on-map editing of WFS-T data. As before, the Alto Browser release includes the sample code.

Point cloud rendering improvements

Alto Browser 2026.1 includes several improvements to point cloud rendering.

A global point budget across layers

You can now set a global limit on the number of points rendered across the whole map, through the new `RIAMap.performanceHints.maxPointCount` property. This budget is balanced across all point cloud layers in view, so that loading many point cloud layers no longer degrades the frame rate, while a single point cloud can still use the full budget when it's the only one in view. The global point count limit works together with the existing per-layer point count limit, per-layer quality factor and global memory limit. That global memory limit is now part of the same object: `RIAMap.maxMemoryUsageHint` has been deprecated in favor of `RIAMap.performanceHints.maxMemoryUsage`.

Sample code/documentation to get you started

For more information on managing point cloud performance, see [Tuning the performance of point clouds](#).

Support for HSPC point clouds with normals encoded as a single 16-bit unsigned integer attribute

Alto Browser 2026.1 supports HSPC point clouds with normals encoded as a single 16-bit unsigned integer attribute, instead of the usual three 32-bit floats. This more compact encoding reduces the data footprint while preserving the lighting and shading quality of the point cloud.

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Drape video onto a 2D map

Alto Browser 2026.1 adds support for draping video onto a 2D map, extending the video draping capability to the 2D case. This is useful for displaying full-motion video, such as a drone or camera feed, in its correct geographic context on the map. Video is draped as a single-level, single-tile panorama in pinhole projection, oriented downwards towards the Earth. Draping onto a 2D cartesian map is not supported.

Sample code/documentation to get you started

For more information on visualizing panoramas on a 2D map, and on the limitations that apply, see the 2D support section of the [Panorama tutorial](#). The article [How to visualize panoramic video footage](#) covers the handling of video footage in more detail.

Correct complex strokes under non-uniform and perspective scaling

When a cartesian map uses a different scale on its X and Y axes, complex stroke styling could appear distorted, because the complex stroke rendering assumed a uniform scale on all axes. Alto Browser 2026.1 reworks the complex stroke implementation so that pixel-sized complex strokes keep their intended size regardless of the scale of each axis. You can see the difference most easily on the bordered map from the Alto Browser Toolbox.

The same rework benefits 3D maps. Non-draped, pixel-sized complex strokes are now evaluated in screen space, so a pattern such as the dashes of a dashed line keeps a constant on-screen size, wherever the camera is. Previously, the pattern was deformed by the perspective as the distance to the camera grew.

Sample code/documentation to get you started

For more information on the cartesian view, see [Visualizing data in a non-geospatial view](#). The Complex Stroking sample demonstrates complex stroke styling. As before, the Alto Browser release includes the sample code.

Other improvements

This Alto Browser release also features a number of smaller improvements, for example:

AI-assisted development

Modern development teams increasingly rely on AI-powered coding assistants to accelerate onboarding, reduce development effort, and improve code quality. To support this trend, Alto Browser 2026.1 [helps you set up](#) dedicated skills files that help AI coding tools understand the Alto Browser architecture, APIs, samples, and development patterns. The AI skills guide developers towards the most relevant documentation and code examples, enabling faster and more accurate application development. Such skills can be integrated into a variety of popular development environments and AI-assisted workflows.

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Faster development server and build

The Alto Browser development server and build setup has been reworked to a Vite-based setup, making it faster and simpler to develop and build Alto Browser applications.

Map effects expressed in real-world units

`FogEffect` now expresses fog in metric units: `visibility` is the distance in meters at which the fog fully obscures the scene, and `halvingHeight` the altitude over which it thins by half. `DepthOfFieldEffect` and `LightScatteringAtmosphere` received clearer property names as well, and the latter gained a `mieAnisotropy` property. The old names are deprecated but keep working.

Labels no longer block interaction with the map

Touch and mouse input on labels no longer prevents the map from panning, zooming or picking. The HTML label layer is transparent to input by default, so a click or a touch on label text falls through to the map. This is a noticeable improvement on touch devices, where a finger resting on a label used to block the map from receiving touch events. Interactive label content keeps working; native elements such as links, buttons and input fields receive input automatically, and you can make custom content interactive with the new `lcd-label-interactive` CSS class. For more information, see [How to add interactive content to labels](#).

Alto Browser Toolbox documentation in the product documentation

The documentation of the Alto Browser Toolbox components is now part of the Alto Browser product documentation. The information that used to live in the component README files has been moved to a dedicated [Alto Browser Toolbox](#) documentation section, which makes the Toolbox components much easier to discover.

WMS requests over HTTP POST

You can now configure a `getMapPostRoot`, a `getFeatureInfoPostRoot` and a `maxRequestURLSize` on `WMStyleSetModel` and `WMSImageModel`. When a `GetMap` or `GetFeatureInfo` request URL exceeds `maxRequestURLSize`, Alto Browser sends the request as an HTTP POST instead of an HTTP GET, with all request parameters in the body. This unblocks the use of large request parameters, such as an inline SLD style, that would otherwise overflow the URL length limits of the server or the browser.

Engagement bar for military symbology

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Alto Browser now visualizes the engagement bar modifier on all military symbology icons to which it applies. You can configure its style through `MilSymStyle.engagementBar`, or disable its visualization by setting that property to `null`.

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