Esri Optimized LAS (zLAS) FAQ

Esri has developed technology to optimize point cloud data originating in the industry standard ASPRS LAS format. Esri's Optimized LAS format, also referred to as zLAS, enables fast and efficient access to LAS structured lidar and is well suited both for direct use in desktop applications as well as for archiving, storage, and cloud based data distribution. zLAS was built from the ground up with attention paid both to the different modes of use and compression.

What is Esri Optimized LAS?

Esri zLAS is a file format that contains all the information stored in the standard LAS file format, but has a structure that is optimized for many different uses and is also compressed to reduce the files sizes. Both access performance and size are important considerations in relation to the massive volumes of lidar data that are being collected and used in a wide range of geospatial applications. In addition to storing all the standard LAS specified attributes, zLAS also includes statistics of the points and indices that enable fast access. zLAS applies lossless compression of the data so as to reduce the file sizes typically to about 20% of the original LAS file. This compression reduces storage cost, while the optional reordering of the points speeds up data access especially over slower network connections. Optimized LAS files are given the file extension .zLAS.

Why did Esri create Optimized LAS?

In the past, standard format LAS files were kept directly on disk for quick desktop access. More recently, organizations have become interested in consuming lidar data over shared networks and on cloud platforms, such as ArcGIS Online. It is a major challenge to store and manage these LAS files in a manner that allows fast and efficient access to the data because they were originally designed for data exchange, not direct use. The ability to check for data corruption is also important in the context of data archiving and transfer. Standard LAS does not have a mechanism to support this. The zLAS format addresses these issues.

What is the Esri LAS Optimizer?

The LAS Optimizer is a software executable that improves the archiving, sharing and overall use of LAS lidar data through methods previously described. It is a freely available tool that Esri has created to convert LAS files to and from zLAS.

What is the Esri zLAS I/O Library?

The zLAS I/O Library is a C++ library for reading and writing zLAS as well as converting between zLAS and LAS. Third party developers can use this to add support for zLAS to their applications. The library has an Apache 2.0 license which permits use and redistribution at no cost.

Do you need to be a licensed ArcGIS user?

No, anyone, with or without ArcGIS, can take advantage of zLAS. Licensed ArcGIS users have the added benefit of being able to work with zLAS files directly in ArcGIS without needing to decompress them first. This benefit can be extended to other applications that use the zLAS I/O library.

Does this mean Optimized LAS data can be used directly in ArcGIS?

The zLAS data can be used directly without need to decompress it first. The ArcGIS platform has been enhanced to support reading of zLAS. This benefit can be extended to other applications that use the zLAS I/O library.

Is data lossless?

The lidar point record data is preserved exactly. There is no loss of information so the full integrity of the data is maintained. An optional part of the optimization is to re-arrange the point ordering, but this does not result in any loss of point accuracy or attributes. Attributes such as time of the pulse are maintained if available in the source LAS files.

How does the LAS Optimizer make data access more efficient?

Statistics and spatial indexing are added during the optimization process. This makes the resulting files easier to use and the data is accessed more efficiently for both spatial and thematic queries. An option to sort point records to improve the I/O efficiency of queries on the optimized files is included.

Is there a cost?

No, you can use Esri LAS Optimization free of charge. ArcGIS is not required. This means any client can download a zLAS file, decompress it, and use the resulting LAS file in their application of choice. Clients with ArcGIS get the added benefit of being able to use the files directly without the need to decompress. The same holds true for applications that use the zLAS I/O Library.

What is Esri's support for standard LAS?

There is one standard for LAS, that specification comes from the ASPRS. Esri and ArcGIS applications fully support the LAS standard up through the latest version, LAS 1.4. There is no requirement for users to convert their LAS format data into Esri's zLAS format in order to use it in ArcGIS applications. However, Esri believes that for many applications the experience will be improved by using zLAS. It's easy and free to convert between standard LAS and zLAS in a lossless manner.