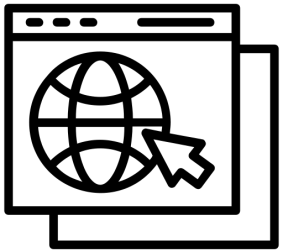
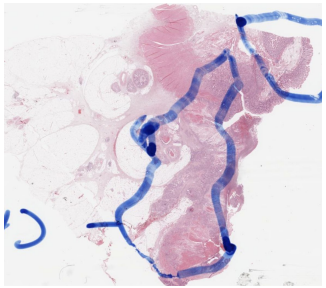
PathOs Pipeline

End-to-End Data Flow : Client, Server, and Model

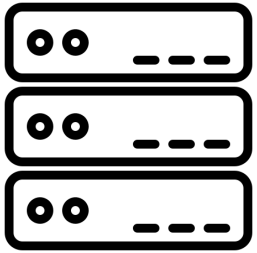
1. SVS File Upload



< Client >

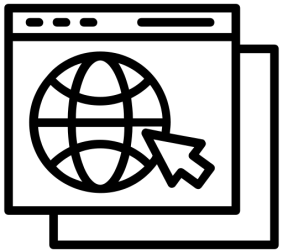


Minimum size : 1GB

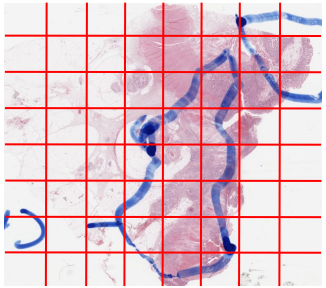


< Server >

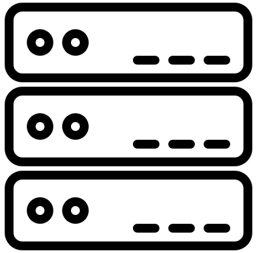
2. Server Side Tiling



< Client >

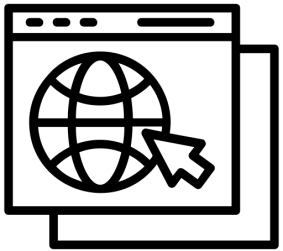


e.g. Web Map Service



< Server >

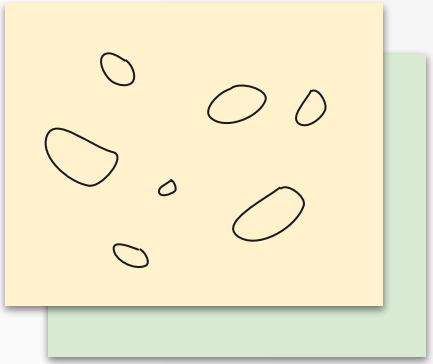
3. Annotation



< Client >

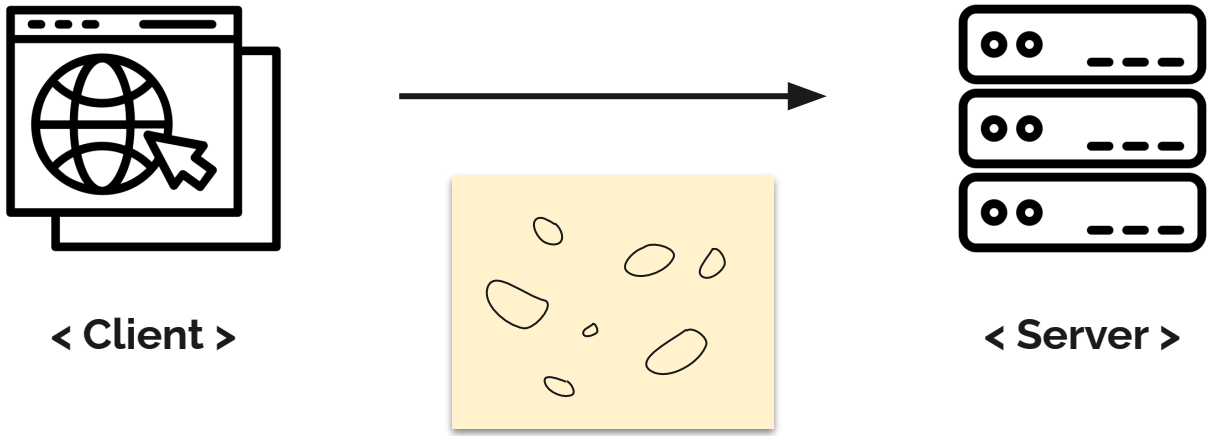
Library Overlay

Canvas Instance



OSD Viewer

4. PNG Export (Estimated Case)



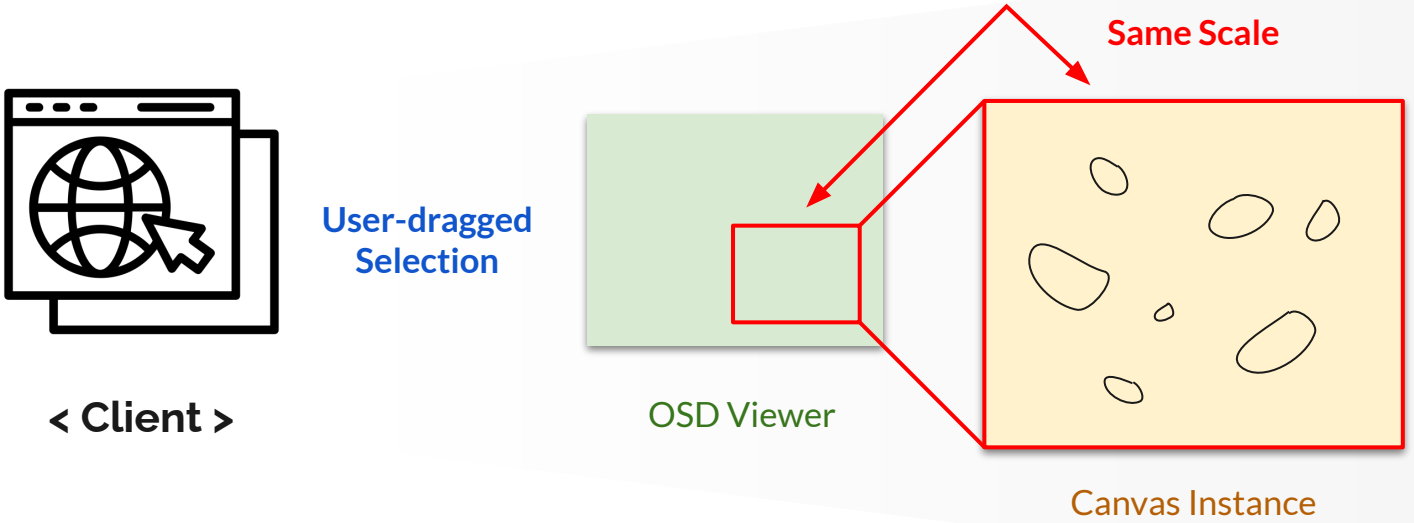
4. PNG Export (Estimated Case)

SVS File Size	1.4GB
Image Dimensions	102,816 x 90,985 pixels
Color Channels	RGB (3 bytes per pixel)
Uncompressed Size	102,816 x 90,985 x 3 = 28GB
Estimated Compressed Size	**102,816 x 90,985 x 2 = 18.7GB**

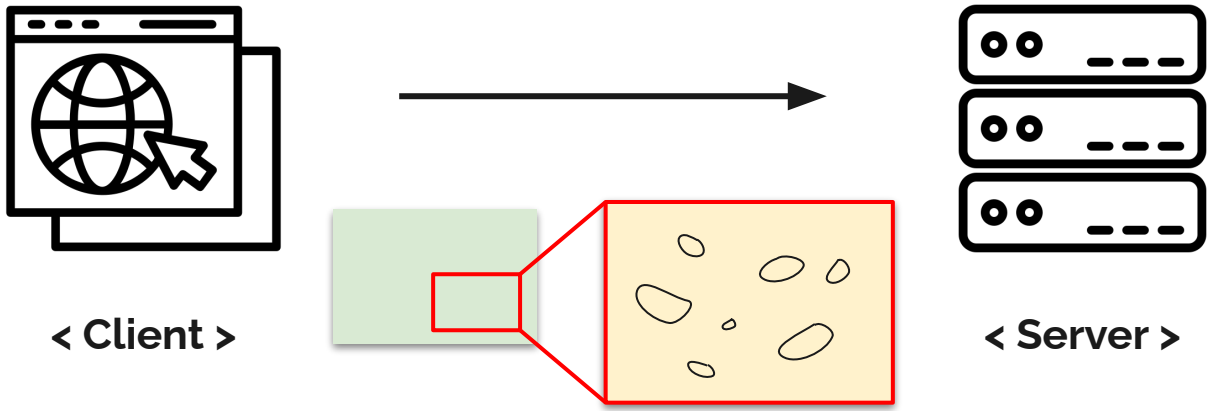
4. PNG Export (Estimated Case)

Format	Compression Method	Estimated File Size
PNG (Grayscale)	DEFLATE (Lossless)	**3–8GB**
TIFF (LZW, Grayscale)	LZW (Lossless)	**3–10GB**
TIFF (Uncompressed, Grayscale)	None	**28GB**
HDF5 (Gzip, LZF)	Lossless (Gzip, LZF)	**1–5GB**
NumPy (.npy, Uncompressed)	None	**28GB**
Zarr (LZ4, Blosc)	Lossless (LZ4, Blosc)	**1–5GB**

Solution - 3. Annotation *With User-defined Range*

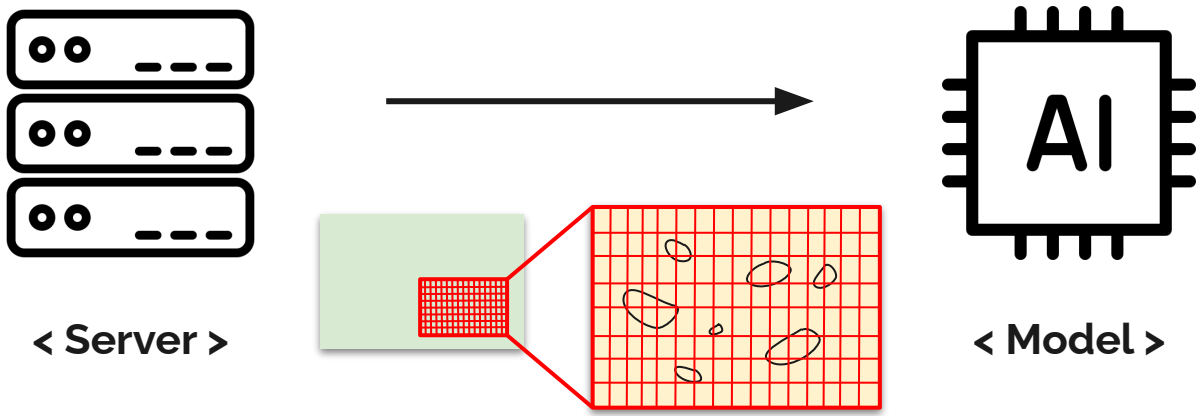


4. PNG Export



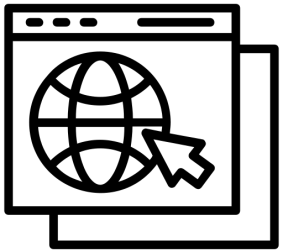
a. Range Details (x, y, w, h)
b. Annotation Output - PNG File

5. Training Data Transfer

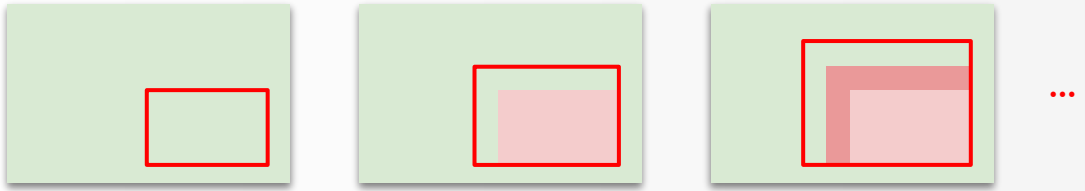


Server Side Tiling
(≠ Frontend Web Map Service)

6. Expected Benefits



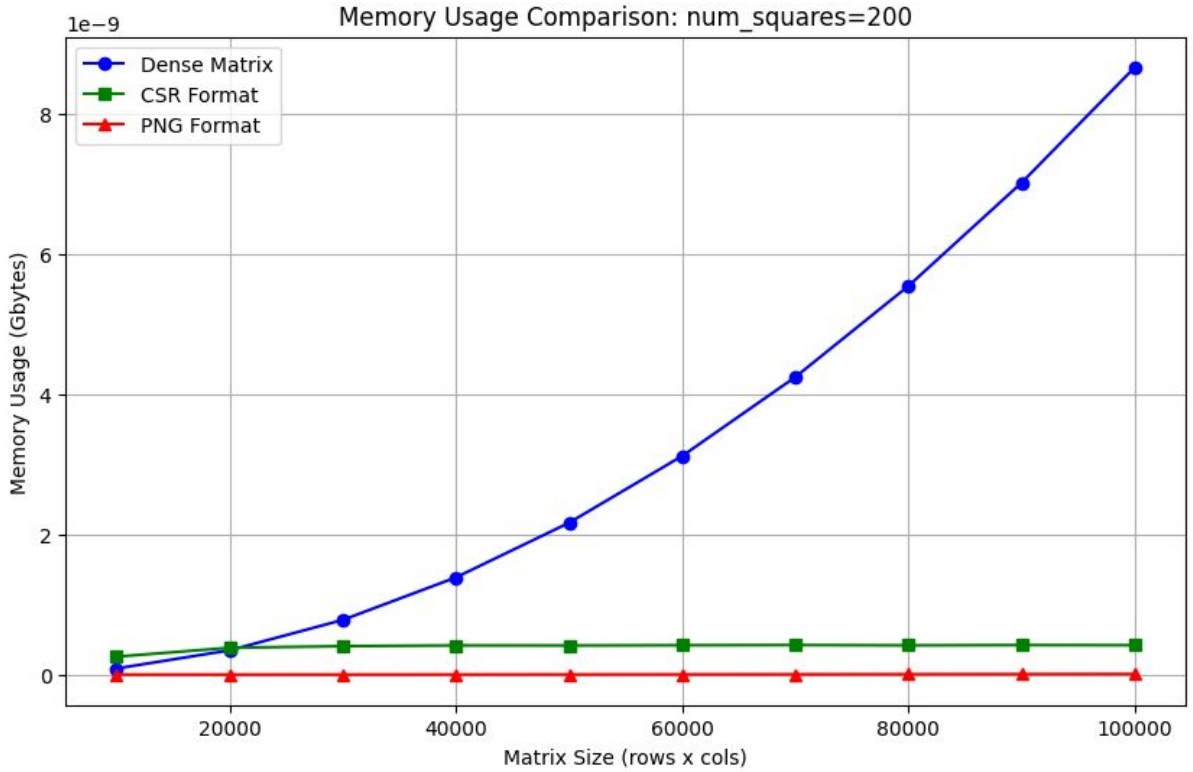
< Client >



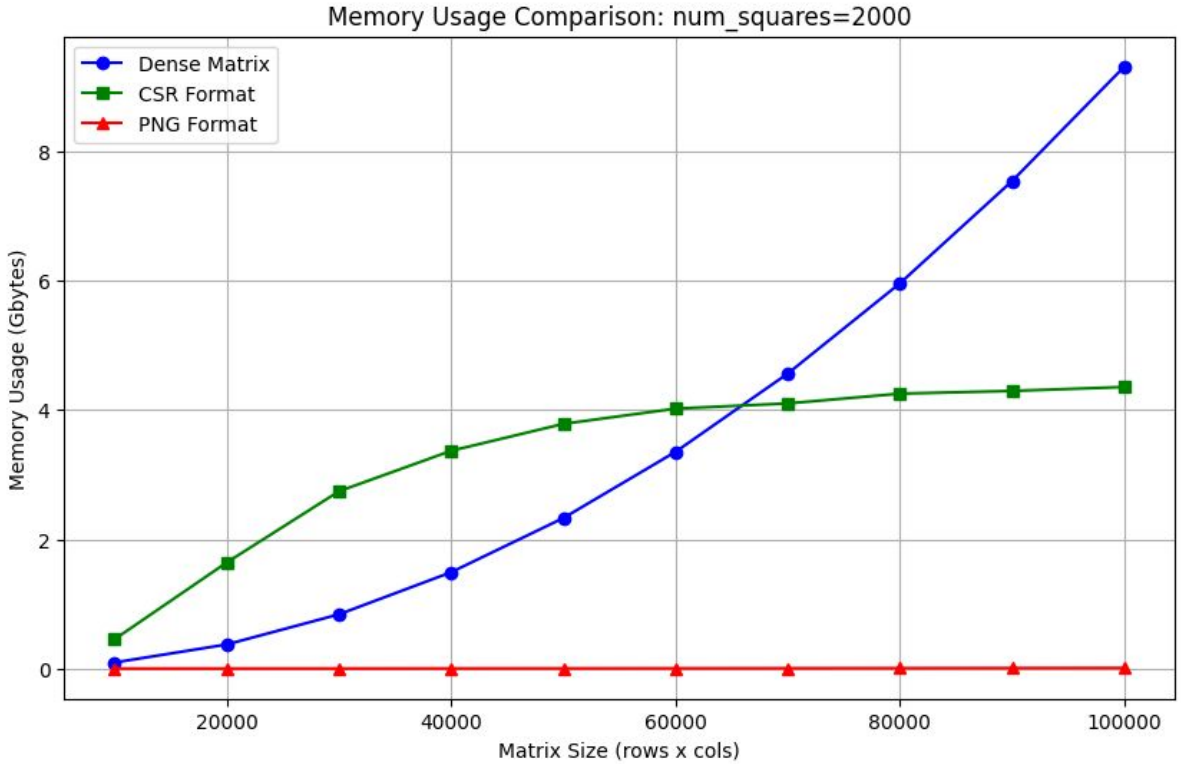
< Step 1 > < Step 2 > < Step 3 >

Patch-based Processing

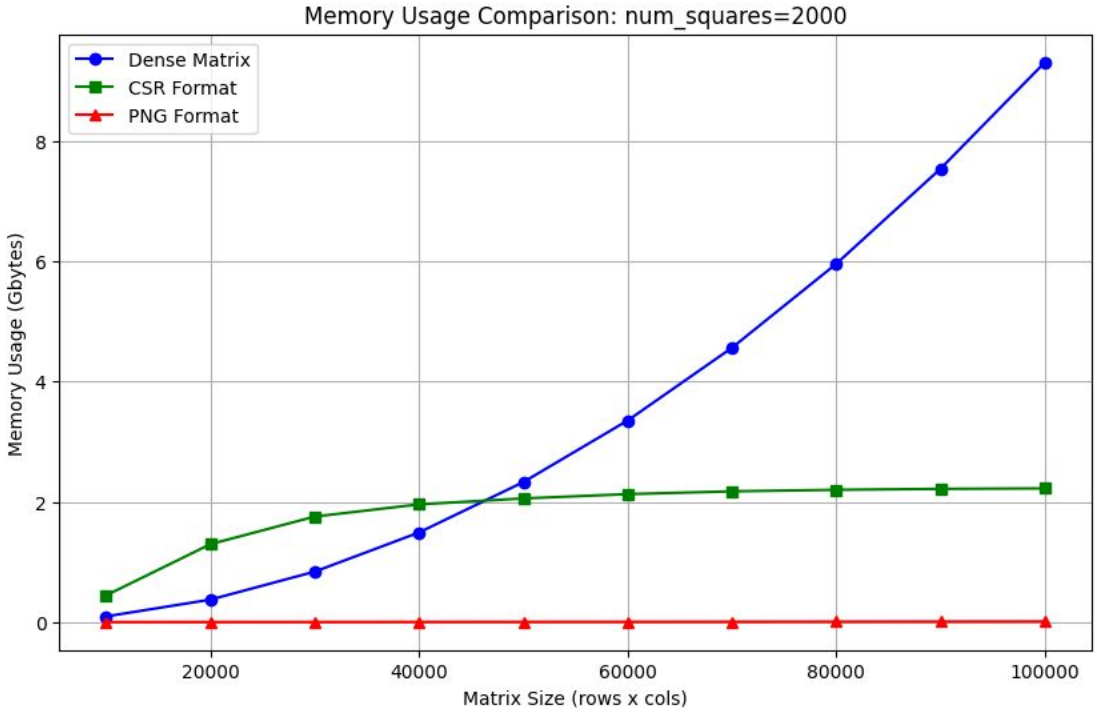
Num_classes: 5



Num_classes: 5



...


Memory Usage Comparison: num_squares=2000
Dense Matrix
CSR Format
PNG Format
Memory Usage (Gbytes)
0
2
4
6
8
20000
40000
60000
80000
100000
Matrix Size (rows x cols)