

Telemetry for getting statistics for which features are used the most in Krita

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1. CONTACT INFORMATION

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2. PROBLEM

Krita contains a large number of tools for painters, a large number of settings and features. Their number increases every year, but not all of them are popular. More precisely, the critics want to know which of the options are popular. Based on this information, you can determine the vector of further work, finalize popular, but not too well-implemented features, remove old, useless functions. Use of clickstream analytics will help to learn the popularity of features.

The collection of statistics will help to create achievements to the Steam. Achievements for Krita is good marketing solution, which help us to find new users. It would be reasonable to make two versions: Steam version and non-Steam version.

3. IMPLEMENTATION

3.1 Client-side

The main idea is to use Google Protobuf logs to write out necessary information. All information is stored in the logs and as necessary (too large log file, not sent for a long time, etc.) is sent to the server. Sending in the original form the information is irrational, so before sending, the information from the log is analyzed and only the "squeeze" from this information is sent to the server.

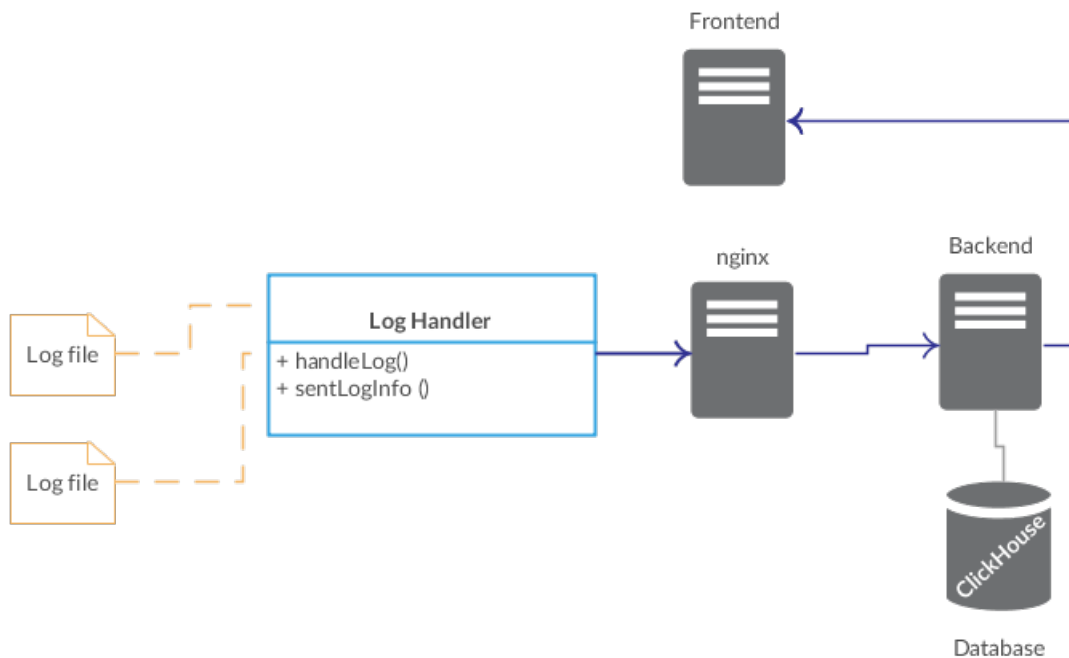
Main data that we want to analyze:

Information about	Source	Data
Tools	KisTool::activate, KisTool::deactivate, etc, overloaded in specific tools	int32 activationTime; int32 useTime; int32 kindTool;
Strokes	KisToolFreehandHelper::initPaintImpl KisToolFreehandHelper::endPaint etc	int32 distance; int32 time; int32 opacity; double currentExposure; double effectiveZoom; double pressure; double drawingDistance; string currentFgColor; string compositeOpId;

Presets	KisToolFreehandHelper::initPaintImpl	string koid; double paintOpFlow; string compositeMode; double savedBrushSize; int32 hashCode;[1]
Actions	KisMainWindows actioncollection()	string name; string actionSource;[2]

[1]: It is required to save presets into map structure for less size of log. [2]: Hotkey, menu of something else

3.2 Server-side



3.2.1 Own stats

Unfortunately, clickstream services are focused on gathering information from websites. Own implementation allows you to create a convenient api for yourself, and also leaves room for further development and expansion.

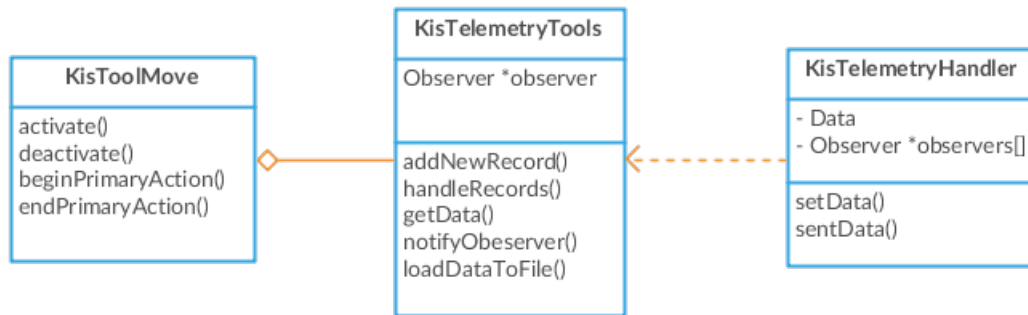
Scheme description: The data from the user is serialized and sent to our nginx, which proxy requests to the backend. On the backend, there is deserialization and recording of information in the database. The information from the database returns to the backend, where it then goes to the front-line. This scheme seems somewhat redundant, but it has an extensible architecture and is capable of withstanding highloads. Nginx is an optional element, but with increasing load, this architecture will allow you to scale horizontally

3.2.2 Steam achivments

It is required to add Steam Sdk. We should to create achievements via Steam web interface. Filling in the list of achievements will be discussed with community. Before any functions can be used, first `SteamAPI_Init()` must be called. After that we can call `SteamUserStats()->SetAchievement("Draw_the_length_of_the_equator")` and set specific achivment.

3.3 Example

Here is an example of how data storage for a class will be implemented. KisTelemetryTools is singleton.



When events triggered by KisToolMove::activate, KisToolMove::beginPrimaryAction, KisToolMove::endPrimaryAction, information is written to the appropriate structure. When the KisToolMove::deactivate event triggers, information from this structure about usage will be sent to the class KisTelemetryTools, where it will be written to the corresponding protobuf-generated class. When the information reaches a certain size, a notification is triggered to read the information. Information using the function KisTelemetryTools::handleRecords is processed and sent to the class KisTelemetryHandler. From the information a post-request is created and sent via http to nginx. Using nginx, information is proxied and sent to the backend server. Information on the backend is checked for correctness and recorded in the database. This is a simplified model that does not show many nuances, but gives an idea of the general mechanism

3.4 Technologies

Protocol Buffers (a.k.a., Google protobuf) are Google's language-neutral, platform-neutral, extensible mechanism for serializing structured data. For C++ language it provides a runtime multi-platform library. Nginx is widespread server, which is used by nearly 70% percents of top-100 worldwide side. ClickHouse allows you to perform analytical queries interactively on real-time data. The system is scalable to very large amounts of data.

4. TIMELINE

Work schedule	
Period	Work
22 May - 4 June	End of the academic year. I can to work 7-10 hours per week.
4 June - 18 June	Exams in university. I can start working 25-30 hours per week.
18 June - 29 Aug.	During this period I can work full-time on the project.
29 June - 15 Sept.	During this period I can work full-time on the project and this period serves as compensation for the first periods.

Implementation timeline	
Period	Work
22 May - 4 June	I study a code of a client part, I begin to do system of logging.
4 June - 15 June	Impelementing logging system for tools.
15 June - 29 June.	Impelementing logging system for strokes and presets without taking care of memory. Unstable work is possible
29 June - 20 Jul.	End of the implementation of the logging system. Memory optimizations. Investigate communication between server and client
20 Jul - 1 Aug.	Creation of Steam-version. Discussion of achievements with community.
1 Aug - 29 Aug.	Creation of server-side. Load testing.
29 Aug - 15 Sept.	Buffer time for issues that may take longer than expected.

5. ABOUT ME

I'm Alexey Kapustin, a 3rd year student of Bauman Moscow State Technical University of Software Engineering Faculty. I'm interested in C++, Python, Javascript, web development. I also study at the Technopark Mail.ru in the 3rd semester. (Russian School of Web Architects).

I did projects using Django, Nodejs. Within the semester project in the second year of education, I made a simple tower-defense game on SFML C++ library. In the third year I made an API for working with the "Forums" database, which withstood high

loads. To create this api, I used the libraries Wt, Qt, Libzdb. Since last summer I have committed to Krita. You can also see my [github](#).