

Facebook Thrift

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Abstract - Thrift is a software library and a set of code generation tool which was developed at the Facebook Office at Palo Alto, California, to expedite development and implementation of scalable and efficient backend services. The primary goal of thrift is enabling efficient and reliable communication across programming languages by abstracting the portions of each language that tend to require the most customization into a common library that is implemented in each language. This is done by allowing the users to define the data types and service interfaces in a common Interface Definition Logic File (IDL File) which is supposed to be language neutral file and it generates all the necessary code to build Remote Procedure Calls to clients and servers. This report explains the design choices and implementation level details and also tries to demonstrate a sample Thrift Service

keywords - IDL

I. INTRODUCTION

As Facebook's thrift and network structure have scaled, the re-source demands of many operations on the site (i.e. search, ad se-lection and delivery, event logging) have presented technical requirements drastically outside the scope of the LAMP framework. We found that most available solutions were either too limited, did not offer sufficient datatype freedom, or suffered from subpar performance. Surprised that a robust open solution to these relatively common problems did not yet exist, we committed early on to making the Thrift implementation open source. In evaluating the challenges of cross-language interaction in a net-worked environment, some key components were identified.

II. ARCHITECTURE

Runtime Library

The protocol and transport layer are part of the runtime library. This means that it is possible to define a service and change the protocol and transport without recompiling the code

Protocol Layer

T Binary Protocol - A straight-forward binary format encoding numeric values as binary rather than converting to text.
 T Compact Protocol - Very efficient, dense encoding of data.
 T Dense Protocol - Similar to T Compact Protocol but strips off the meta information from what is transmitted, and adds it back in at the receiver.
 T Dense Protocol is still experimental and not yet available in the Java implementation.

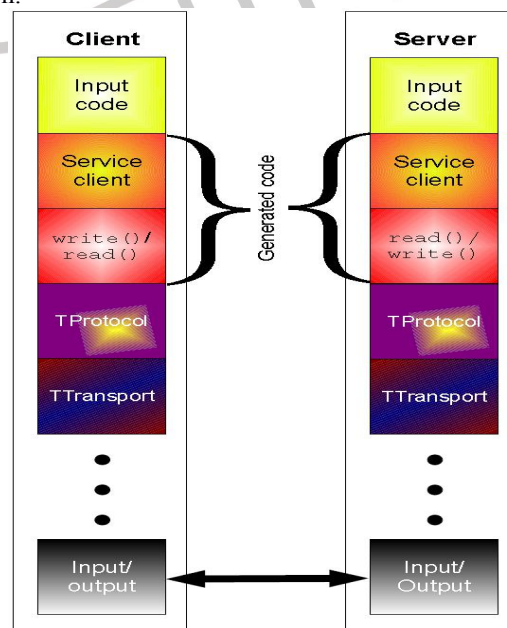


Figure 1: Facebook Thrift Architecture

Transport Layer

T Socket - Uses blocking socket I/O for transport. T Framed Transport - Sends data in frames, where each frame is preceded by a length. This transport is required when using a non-blocking server. T File Transport - This transport writes to a file. While this transport is not included with the Java implementation, it should be simple enough to implement.

Processor

The processor takes as arguments an input and an output protocol. Reads data from the input, processes the data through the Handler specified by the user and then writes the data to the output

Supported Servers

T Simple Server - A single-threaded server using stud blocking io. Useful for testing. TT head Pool Server - A multi-threaded server using stud blocking io. TN on blocking Server - A multi-threaded server using non-blocking io (Java implementation uses NIO channels). T Framed Transport must be used with this server

Facebook Thrift Services

Thrift has been employed in a large number of applications at Facebook, including search, logging, mobile, ads and the developer platform. Two specific usages are discussed below.

Search

Thrift is used as the underlying protocol and transport layer for the Facebook Search service. The multi-language code generation is well suited for search because it allows for application development in an efficient server-side language (C++) and allows the Facebook PHP-based web application to make calls to the search service using Thrift PHP libraries.

Logging

T File Transport functionality is used for structured logging. Each service function definition along with its parameters can be considered to be a structured log entry identified by the function name.

III. TECHNOLOGY

Li-Fi Technology

In simple terms, Li-Fi can be thought of as a light-based Wi-Fi. That is, it uses light instead of radio waves to transmit information. And instead of Wi-Fi modems, Li-Fi would use transceiver-fitted LED lamps that can light a room as well as transmit and receive information. Since simple light bulbs are used, there can technically be any number of access points.

How Li-Fi Works?

- Li-Fi is typically implemented using white LED light bulbs at the downlink transmitter.
- These devices are normally used for illumination only by applying a constant current.

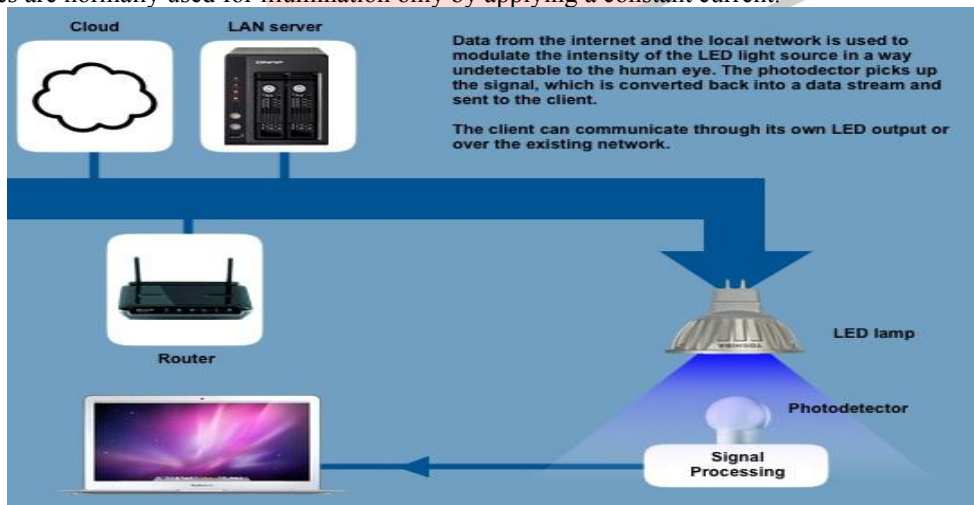


Figure 3: li-fi Technology

Gesture Recognition Technology:

- Gesture recognition is a topic in computer science and language technology with the goal of interpreting human gestures via mathematical algorithms.
- Gestures can originate from any bodily motion or state but commonly originate from the face or hand. Current focuses in the field include emotion recognition from the face and hand gesture recognition.

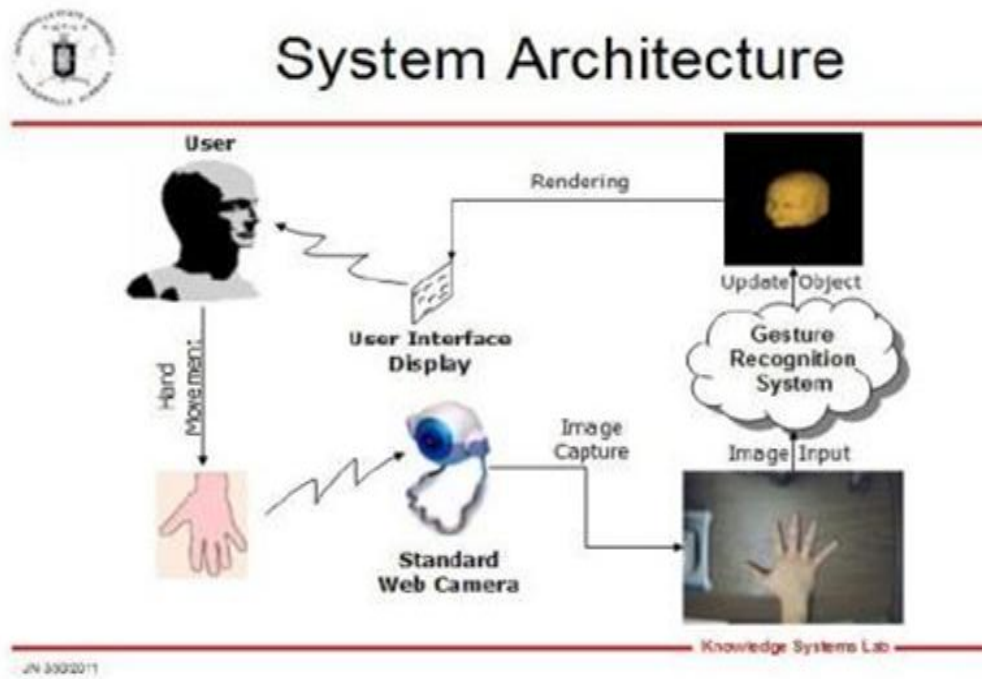


Figure 4: Gesture recognition Technology

IV. REFERENCE

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