OpenTracing
Do you really know what happens inside ATS?
OpenTracing
“Vendor-neutral APIs and instrumentation for distributed tracing”

- Common use cases
  - Tracing functions - For application code and library code
  - Tracing server endpoints - For distributed systems

![Diagram of OpenTracing use cases]
PR #8495: Add support for OpenTracing

- Build option to use OpenTracing
- Settings to enable tracing
- Code to initialize libraries
- Generic interface for tracing
- Code to trace transactions
Overview

OpenTracing API

opentracing-cpp abstract interface

OpenTracing implementation e.g. jaeger, zipkin, etc.

Dynamically link
--with-opentracing=DIR

dlopen()

proxy.config.opentracing.lib

Send trace data

Remote Servers
Generic interface

**Tracing.h**

```cpp
class Tracing {
public:
    void enable(int value = 1);
    void disable();
    bool is_enabled();
    TRACER *make_tracer(const char *name);
    void delete_tracer(TRACER *tracer);

private:
    std::atomic<int> _enabled;
};
```

```cpp
#define TRACE_TAG(out, category, message)
#define TRACE_LOG(out, category, message)
```

**Tracing_opentracing.h**

```cpp
using TRACER = opentracing::Span;

inline TRACER *
tracing_new(const char *name)
{
    opentracing::Tracer *tracer =
        static_cast<opentracing::Tracer *>(
            ink_thread_getspecific(thread_specific_tracer_key));
    if (tracer == nullptr) {
    ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
    }
    auto span = tracer->StartSpan(name);
    return span.release();
}
```

**Where you use trace**

```cpp
this->_tracer = tracing->make_tracer("ProxyTransaction");
TRACE_TAG(this->_tracer(), "txn_id", this->get_transaction_id());
TRACE_LOG(ua_txn->tracer(), TRACE_CAT_MILESTONE, “SERVER_READ_HEADER_DONE”);
```
Performance

- Non-TLS HTTP/1.1
- 8KB cached object

Test Server

<table>
<thead>
<tr>
<th>Sampling</th>
<th>Req/sec</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracing OFF</td>
<td>N/A</td>
<td>73808.31</td>
</tr>
<tr>
<td>Tracing ON</td>
<td>100%</td>
<td>62339.33</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>69519.02</td>
</tr>
</tbody>
</table>

h2load --h1 -n 3000000 -c 1000 -m 1 -t 10 http://127.0.0.1/8k
To-Do List

- Context propagation
- Selective tracing
- Trace level / tag