



## AOL MARKETPLACE REAL TIME BIDDING AD PLATFORM POWERED BY ERLANG



### THE CHALLENGE

AOL Platforms enables the world's top marketers and media brands to reach consumers across desktop, mobile and TV through premium experiences, programmatic buying and performance-driven campaigns. In 2013 AOL revolutionised the Real Time Bidding (RTB) ad market by launching the real-time ad exchange platform Marketplace by AdTech.

Three years ago the existing ad serving platform relied on a Java frontend and on C++ for the backend. Introducing a RTB system in the infrastructure meant that AOL needed to significantly reduce request processing time. RTB allows for advertising inventory to be bought and sold on a per-impression basis, via programmatic instantaneous auction. RTB platforms are built on the backbone of large exchanges similar to those in the financial markets, where bidders require high performance, short response times, and high volumes of transactions.

AOL realised that their technology stack was not sufficient. After an extensive search for better technologies, they found Erlang. The new system proved perfect in terms of scale, maintainability, load and deployment.

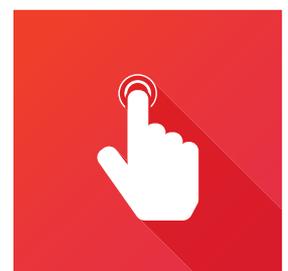
**ISSUES WITH:  
JAVA & C++  
REQUEST TIME  
HIGH VOLUME  
SCALIBILITY**

### AOL MARKETPLACE

AOL Marketplace started as a very small Alpha version connected to a one-demand partner, with a few hundred placements and only a dozen requests per minute.

Three years later, Marketplace has a million placements per minute over many different publisher sites, and the requests coming into the system generate up to 40 billion auction requests per day. The platform is integrated to approximately 60 demand partners, each of them introducing more economics into the system and increasing revenue for publishers. The data center has expanded on the East Coast and West Coast of the US and is now expanding in Europe. Each auction part of the system has around 100 nodes in the US and over 64 in Europe.

[www.aol.com](http://www.aol.com)





## SOLUTION

---

Our Erlang Solutions team has been involved in the Marketplace project right from the beginning. We were brought in by AOL to train the core team in advanced Erlang techniques, and later on we cross-trained other AOL developers. After the success of the product launch, our consultants joined the Marketplace developers, working on new feature development and on enhancing stability and scalability.

The current team includes AOL developers and our Erlang Solutions consultants. They are continually scaling, optimising and refining the platform as it to be integrated further into their offer.

## WHY ERLANG FOR REAL TIME BIDDING?

---

The Marketplace system is a merger of C++, Erlang and Java. The RTB sector, the configuration servers and part of the support system are written in Erlang. From an engineering perspective, Erlang brings AOL a series of unique advantages:

- The team deploys new features and system improvements every week, and using Erlang allows them to build and distribute safer and quicker. Most of the OPS/Admin tasks related to system deployment are covered with ease by the same team.
- Erlang's 'let it crash' approach means that handling third party data is easy and the code that handles it is much shorter to write. One DSP process crashing cannot affect the entire auction or any other ongoing auctions.
- Using Test Driven Development allows them to find bugs easily and refactor code with a high degree of confidence.
- AOL can profile the system while it is live in production without having to do any special rebuild of the code and without affecting any of the traffic.
- With Erlang, every new process spawned can be traced, so finding root causes in any auction delay takes only a couple of hours.
- Moving from 16 core machines to 24 core machines was done without writing any extra code, and the load was balanced equally across all cores in the system.
- Preemption in the Erlang scheduler means the team can keep adding new features (with blocking calls) which work in parallel with RTB auctions without worrying about blocking delivery requests.

We support companies from many emerging industries. From New Media sector 9 of the top 10 Ad Auction/placement systems are written in Erlang, and we shared our expertise with 3 of them: AOL, Chitika and OpenX.

Our work ensures they deliver the right content in the right format, at the right time to the right place, but at a significantly lower cost. Please contact us for more information or to discuss your project requirements [general@erlang-solutions.com](mailto:general@erlang-solutions.com).

We develop and build trusted, fault-tolerant systems that can scale to billions of users. Our HQ are in London and our team has worked with over 300 clients from our offices in Stockholm, Krakow, Budapest, Berlin, San Francisco, Seattle and Buenos Aires.

## OUR EXPERTISE

---

*Erlang*  
SOLUTIONS



e: [info@erlang-solutions.com](mailto:info@erlang-solutions.com)  
w: [www.erlang-solutions.com](http://www.erlang-solutions.com)