# **Ad Serving Short-Form Test**

# Introduction

This page describes a short systems programming exercise used in the hiring process for the Ad Serving team.

# The test

## Objective

Take nweb (a tiny C web server), and build a web server that can read in JSON and return it as XML. Expect this to take 3 hours.

## Preparation

Prior to starting the test, confirm you have a personal environment in which you can compile a program with gcc 4.2.x.

As needed, follow the links to Ubuntu VM setup and the Vagrant setup links below in the *Reference* section.

## Deliverables

The deliverables are:

* C/C++ code that can be compiled with gcc 4.2.x on either Linux or MacOS X:
  + For the latter, include:

|  |
| --- |
| #ifndef SIGCLD  #define SIGCLD SIGCHLD  #endif |

* Whatever static data files are needed.
* A README with clear instructions to build and run the application.
* If the code requires third-party libraries, include either:
  + Instructions on how to install them (and where the compiler expects them to be found), or
  + The source code of the libraries themselves.

It is expected that the deliverable will be able to be compiled and run on Unix/Linux. Note that if you don't have access to a Unix based system, you can use a VM via either Windows or Cygwin.

## Requirements

The web server should:

* Take a request like [http://localhost:8080/foo/bar.json](http://localhost/foo/bar.json):
  + If the file extension is not json, stream back the file as usual.
  + Otherwise, parse the file as JSON and output the contents as XML.

## Deliverable

Please deliver your code in a tar/zip with absolutely everything required to compile, run, and verify the requirements of the assignment.

Upon delivery of your test the ad serving team will do the following:

* Compile your code based on the README instructions you've provided.
* Run your code based on the instructions on the README.
* Verify the functionality of the requirements listed above.
* Code review everything you have delivered.

Please treat the deliverable as a professional piece of code you are submitting for review.

## Reference

* The nweb code is at <http://www.ibm.com/developerworks/systems/library/es-nweb/index.html>.
  + If the link above does not work, this is an alternative: <http://people.cs.nctu.edu.tw/~cjtsai/courses/ics/homework/nweb.c>.
* If a Unix based platform is not available at your disposal at home, use the following as a reference to install Ubuntu on Virtualbox. Note that it is not required to develop your application in a VM. this is meant as a guide for those unfamiliar with installing a VM on a non Unix based platform.
  + <http://askubuntu.com/questions/142549/how-to-install-ubuntu-on-virtualbox>
* Another option is Vagrant, which automates much of process of setting up a VM:
  + <https://docs.vagrantup.com/v2/getting-started/>.