

CS2014

Systems Programming

Lectures:

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Programming Languages

We need Moar! Or do we?

- We've looked at Bash, C and C++
 - Mostly C in this course but we can only cover so much
- All old but hugely (Bash,C) or less hugely (C++:-) relevant
 - I admit my bias against C++ in case you haven't noticed:-)
- Systems however also change
 - Waterfall -> DevOps
 - Virtualisation of anything that can be virtualised
 - Everything-over-HTTP
 - Hyperscalers (and their accolytes)
 - Less capable devices not on "standard" OSes (so-called IoT)
- As systems change, so do the requirements/constraints on the programs needed and hence on the programming languages needed

Requirements changes...

- Systems need to work at much larger scale
 - Replacement/fault-tolerance
 - $O(10^7)$ programmers?
- Deployment cycle changes
 - Annual/license update -> ... -> daily updates
- CompSci theory becomes Engineering reality (ahem:-)
 - Always more CVEs (training is hard)
 - No more flag-days ever!
- Centralisation/balkanisation of the Internet
 - The (so-called) “big” players (of today) control lots (again)
- Ossification due to middleboxes
 - Fashionable debate and a fun one!

So which languages?

- Bash/C/C++ as we've seen
- C# and objective-C
 - I don't know much about 'em sorry
- PHP
 - Integrated with web servers (like everyone does)
- Python
 - Choice-de-jure for scripting it seems despite whitespace silliness
- Rust/Go
 - Consciously aiming at (ultimately) replacing C
- Node.js/Javascript
 - JS isn't only for in-browser use
- Ruby (on rails)
- ...

Caveat Lector

- Some of this is opinionated
- Much of this is forward-looking
- Both are indicative of non-factual things you ought doubt
- Ideally – you'll form your own soundly based opinions, based on writing and maintaining code
- You need to figure out which tools are best for which jobs, but live with it when the wrong tool (according to you) was chosen in the past by someone else