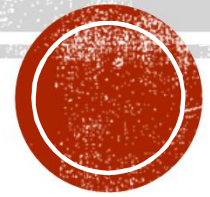


HELLO ELIXIR!

Sameeri Marryboyina





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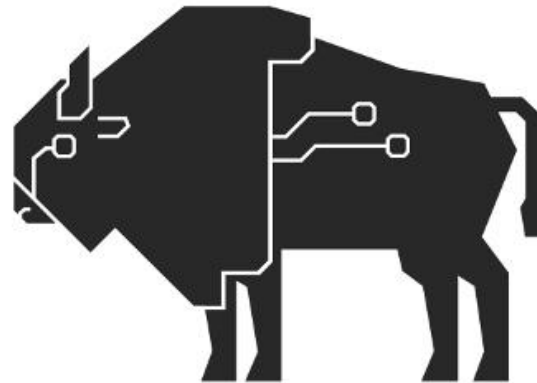
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THANK YOU TECHLAHOMA!



OKC FP



TECHLAHOMA

OKC Elixir

Find Techlahoma on all things social.



TALK AGENDA

- About Me
- Target Audience
- Foundations
- The road to Elixir (How I met Elixir!)
- Elixir



ABOUT ME



HELLO, SAMEERI.

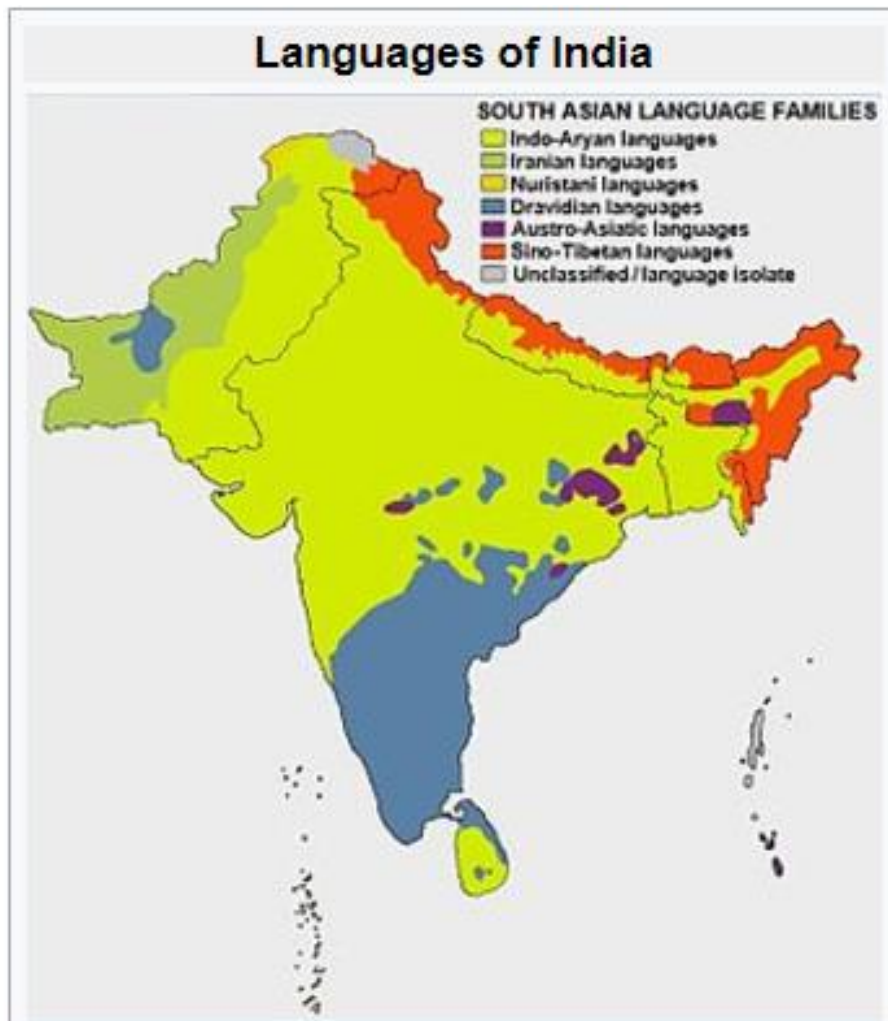
- Sameeri Pavan Kumar Marryboyina
- Hyderabad, India
- I can communicate in Telugu, Hindi, English, German(very little)
- MS in Computer Science, The University of Oklahoma
- Senior Software Engineer, Telogical Systems LLC
- Full Stack JS - React, Redux and its Ecosystem, Node, Express
- Norman, OK



INDIA

- Let us travel to Sameeri's home..
- <https://www.google.com/maps/place/India/@18.2937219,71.4458457,5z/data=!4m5!3m4!1s0x30635ff06b92b791:0xd78c4fa1854213a6!8m2!3d20.593684!4d78.96288>





Language families of the Indian subcontinent;
Nihali, Kusunda, and Thai languages are not shown.

Official languages	Assamese
	Bengali
	Bodo
	Dogri
	English ^{[1][2][3]}
	Gujarati
	Hindi ^{[1][4]}
	Kannada
	Kashmiri
	Konkani
	Maithili
	Malayalam
	Marathi
	Meitei (Manipuri)
	Nepali
	Odia
	Punjabi
	Sanskrit
	Santali
	Sindhi
	Tamil
	Telugu
	Urdu (total: 23, including 22 8th Schedule languages and additional official language, English)
Main foreign languages	<ul style="list-style-type: none"> English – around 125 million speakers^[5] French – approximately 75,000 speakers

source : https://en.wikipedia.org/wiki/Languages_of_India



TARGET AUDIENCE



FOUNDATIONS



BEING A POLYGLOT...

WORK	SCHOOL	LEARNING	RADAR
JavaScript	C	Elixir	Elm
C#	C++/VC++	Erlang	TypeScript
Ruby	COBOL		Python
Java	Assembly		Scala
			Rust
			Go



BUT, WHAT DOES IT MEAN TO BE A LANGUAGE?



WHAT KIND OF A PROBLEM ARE WE TRYING TO SOLVE?

- A language is a tool.
- Problems and Contexts
- We want to use the right tool for a given problem
- Communication



A LANGUAGE...

- Alphabet
- Constructs
- Syntax
- Semantics
- Type System (Static vs Dynamic)
- Translation Model (Compiled vs Interpreted)
- Execution model
- Runtime Mechanics
- Specification
- Implementation



LANGUAGE TOOLS

- Editor
- Compiler
- REPL
- Virtual Machine
- Debugger
- Standard Library
- Dependency Management
- Build tool
- Workflow tools based on processes – Tests, Coverage, Syntax highlighting, Refactoring...

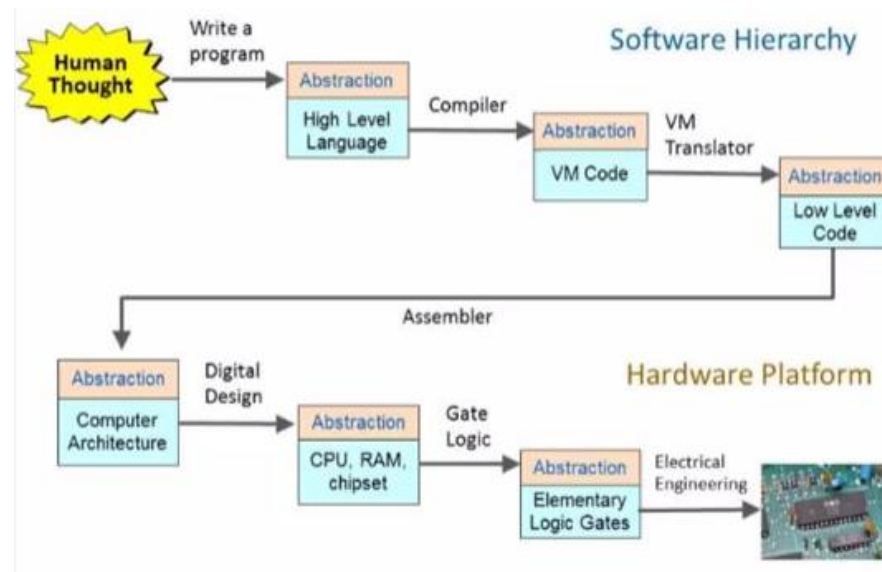


INSIDE THE HEAD OF A SOFTWARE ENGINEER

- Language Syntax
- Types
- Philosophy
- Paradigms
- Standards/Best Practices
- Principles
- Patterns
- Problem + Context
- Crafting solutions



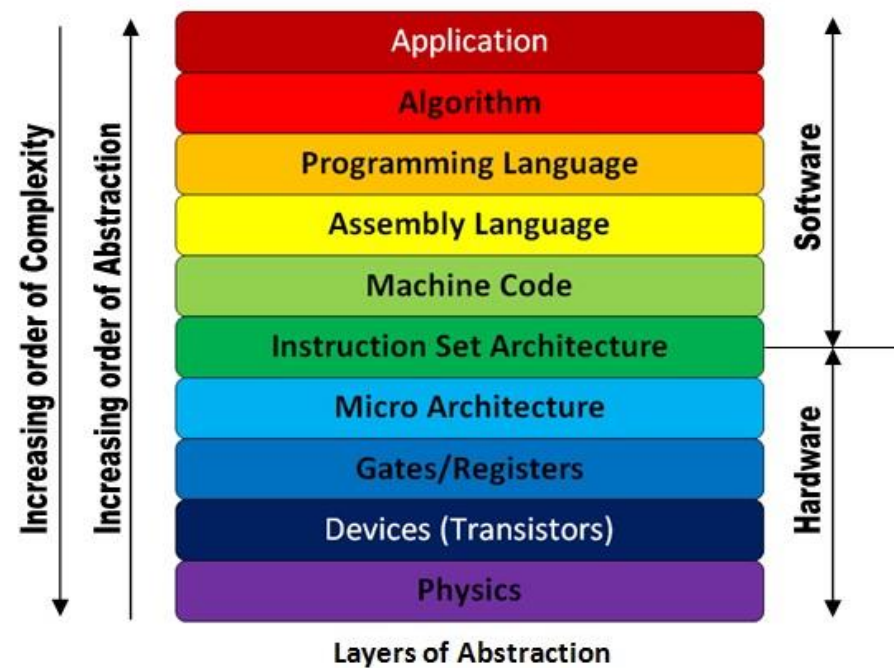
THE PROCESS — FROM HUMAN THOUGHT TO SOMETHING MAGICAL



source : <http://www.nand2tetriz.org/>



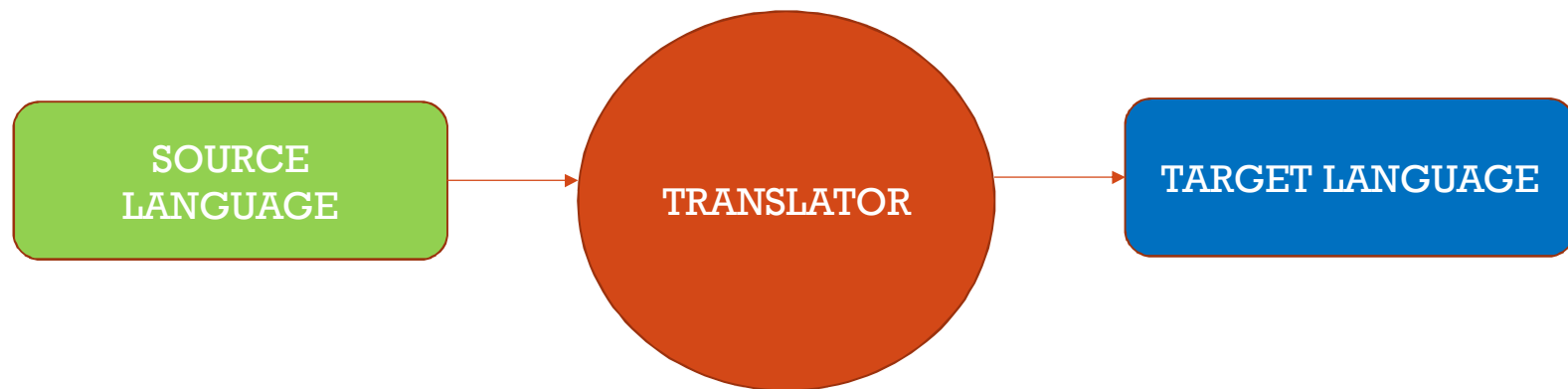
THE MACHINE STACK – LAYERS OF ABSTRACTION



source : <http://theembeddedguy.com/2016/05/15/layers-of-abstraction/>



LANGUAGE TRANSLATION



Based on the language, its philosophy, the translator could be called anything. Say, compiler for instance. A very important observation to make in the context of language translation is whether we can observe the Generation of an intermediary file or not. This also defines the execution/runtime mechanics.



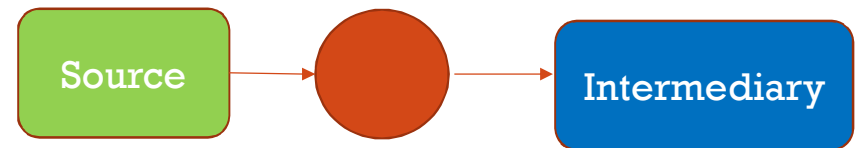
MODERN LANGUAGES

- Roughly after 1985.
- Memory should be managed automatically. aka Garbage Collection
- Provision of higher level abstraction constructs.
- The concept of a runtime, intermediary language => Virtual Machine
- Developers Psychology - Discovery of patterns and anti patterns, How to write good/clean code?



VIRTUAL MACHINES

- Portability
- The notion of Intermediary Language
- Multiple Languages targeting the VM.
- Defines execution semantics



Translation process

VIRTUAL MACHINE

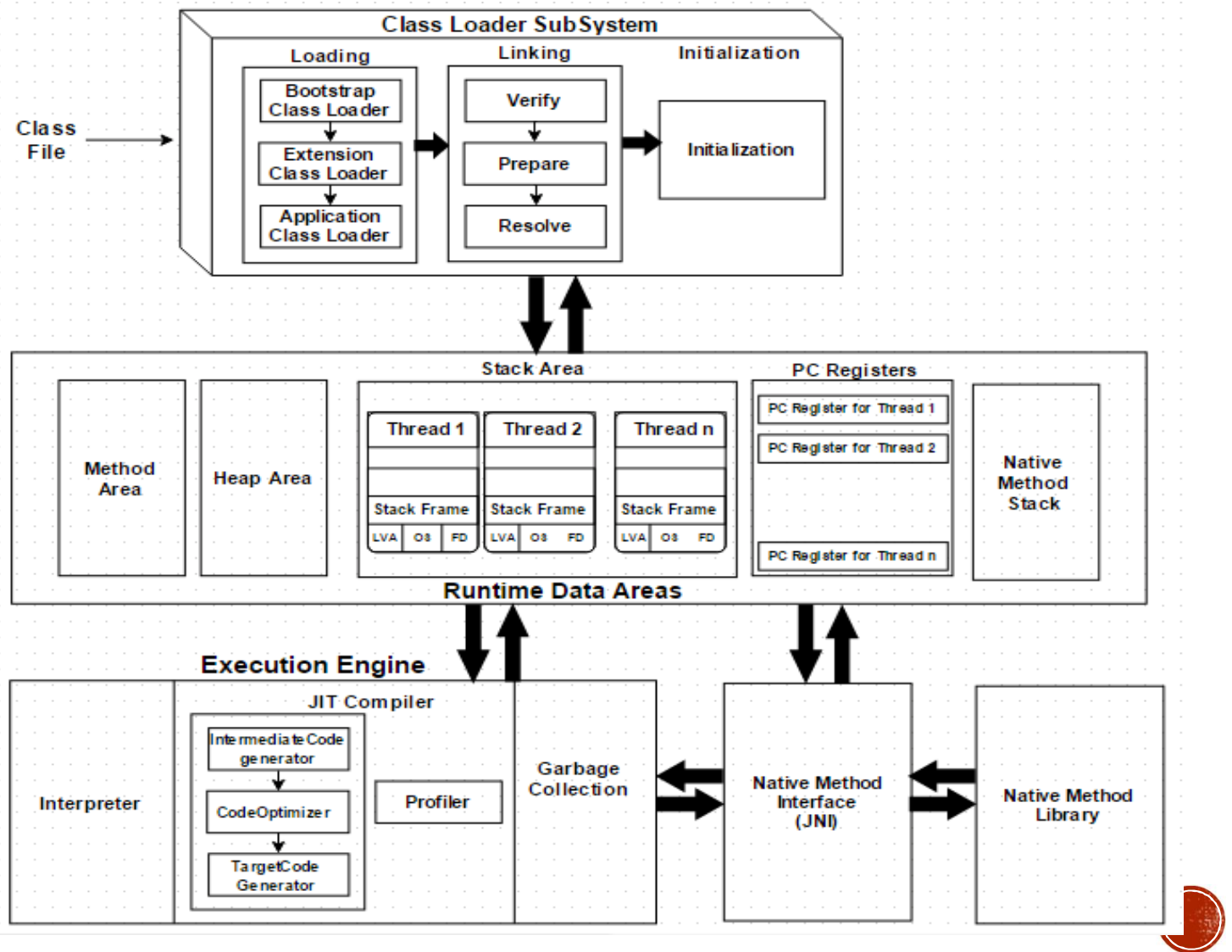


FAMILIAR VIRTUAL MACHINES

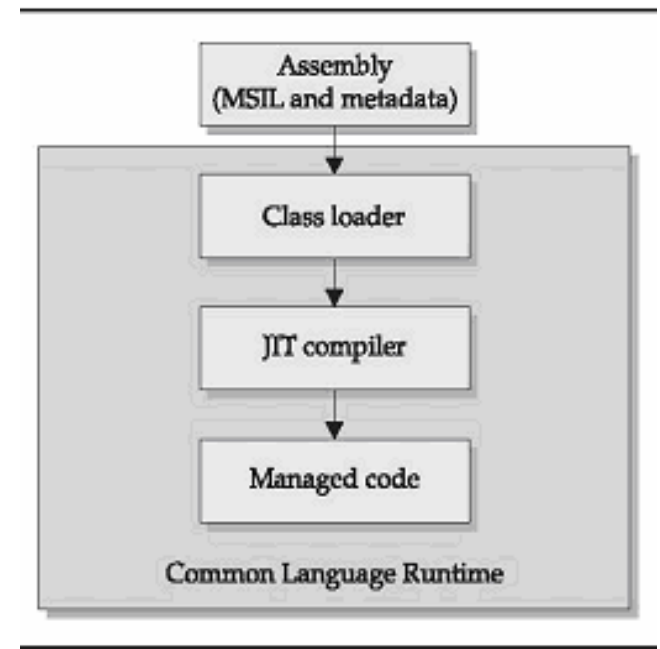
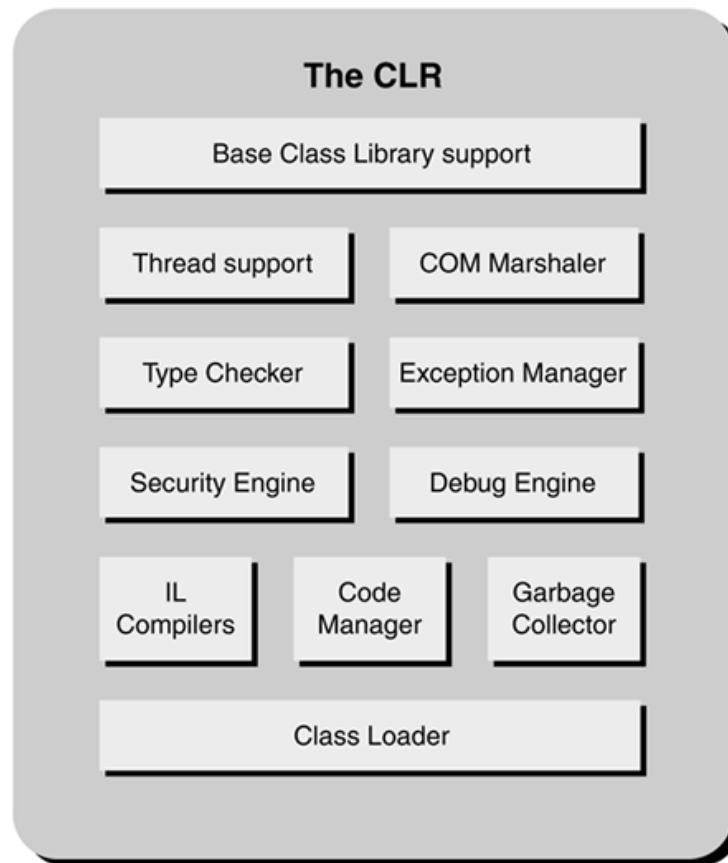
- Java World : Java Virtual Machine (JVM)
- .NET World: Common Language Runtime (CLR)



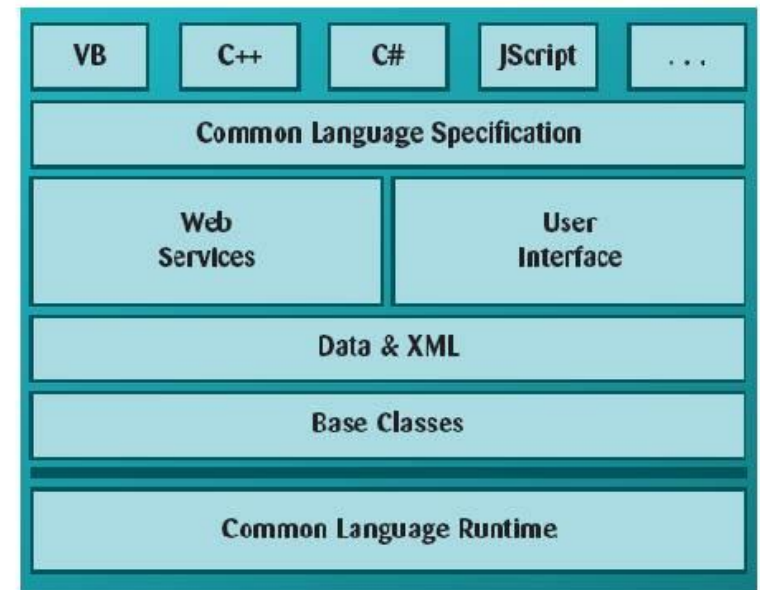
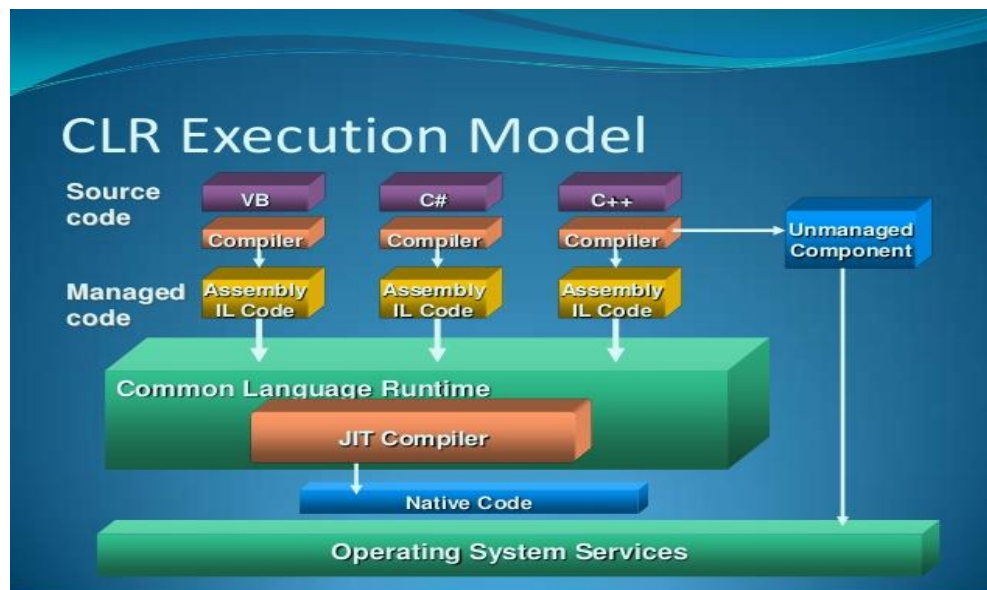
JVM



CLR



THE POWER OF AN INTERMEDIARY LANGUAGE & VM



Multiple languages can now target the intermediary language. They can also all use the Services that the runtime has to offer. A high degree of reusability.



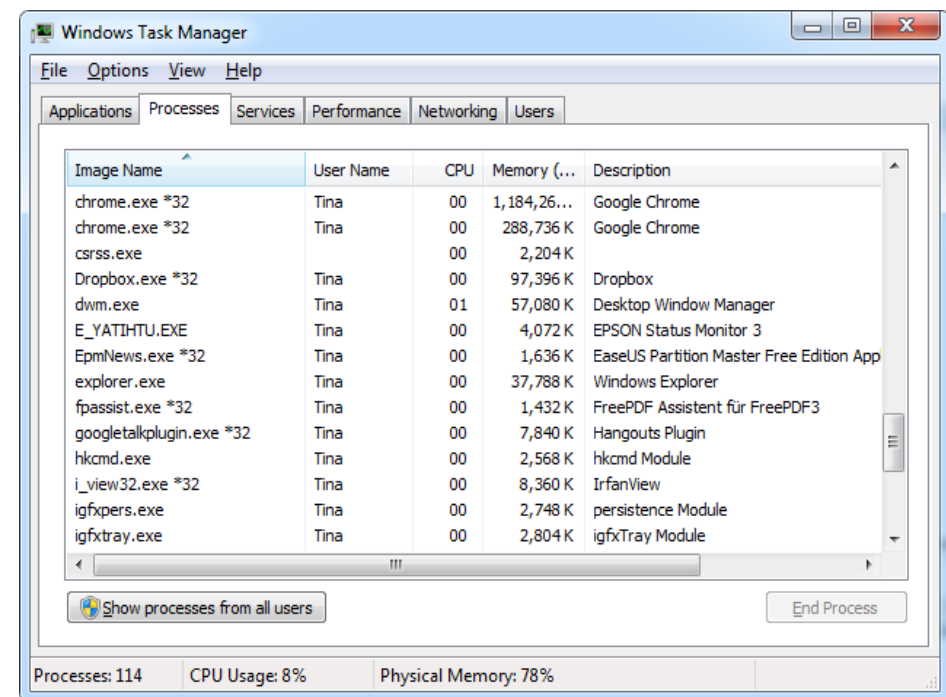
WHERE DOES THE OS FIT IN?

- VM/Runtime is all good.
- But...
- The fundamental way to run a program is via the OS.
- All hail the OS!!

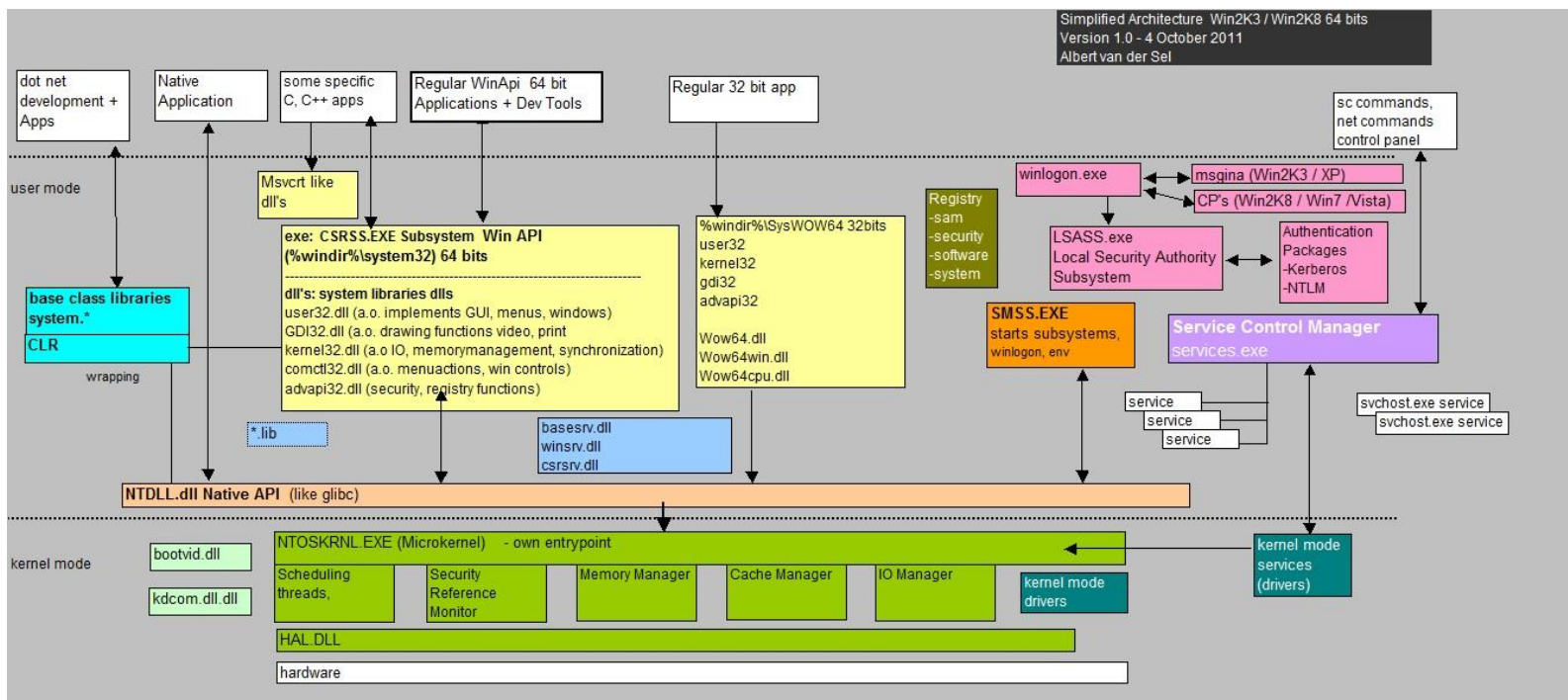


OPERATING SYSTEM CONSTRUCTS

- Process
- Thread
- Concurrency
- Context Switching
- Schedulers
- Scheduling Algorithms
- The user is tricked. But that is good.
- Everyone loves Magic!



OPERATING SYSTEM OPERATION



HOW LANGUAGES ♥ EACH OTHER

- “ Languages influence one another.
- “ That means language designers(people) are constantly trying to improve the language
- “ They do this by exploring other languages/environments trying to find good ideas and bring them aboard.

JavaScript	
Paradigm	Multi-paradigm: object-oriented (prototype-based), imperative, functional, event-driven ^[1]
Designed by Developer	Brendan Eich Netscape Communications Corporation, Mozilla Foundation, Ecma International
First appeared	December 4, 1995; 21 years ago ^[2]
Stable release	ECMAScript 2017 ^[3] / June 2017; 1 month ago
Preview release	→←
Typing discipline	dynamic, duck
Filename extensions	.js
Website	Mozilla
Major implementations	
V8, JavaScriptCore, SpiderMonkey, Chakra	
Influenced by	
Lua, Scheme, Perl, Self, Java, C, Python, AWK, HyperTalk	
Influenced	
ActionScript, AtScript, CoffeeScript, Dart, JScript .NET, LiveScript, Objective-J, Opa, Perl 6, QML, TypeScript	
 JavaScript at Wikibooks	

THOUGHTS ON LANGUAGES

- I consider language as a tool, method to communicate our thoughts.
- Since it is a tool, it is a matter of preference.
- But, People are highly opinionated.
- People are programmed to think in one way, when they are in one environment.
- If we step out, we will find commonalities and find love for the language.
- Studying a lot of languages help us grow and think better.
- Languages are mostly multi-paradigm. That means we have a lot of thinking hats to put on and find the best way to solve a problem.
- We should continuously discover and enjoy
- Tooling is very important to build products quickly.
- Tooling has a “happy developer factor” associated with it.
- We should invest time in learning and learning is continuous.
- We should try to craft clean code.



THE ROAD TO ELIXIR...



CORE LEARNING INTERESTS

- Distributed Systems
 - Event Oriented Architecture
 - Message Oriented systems
 - Highly scalable systems
 - Reactive Architectures
-
- “All the vocabulary is great! How should we learn these? What’s the plan?” I said to myself.



THE BUS

- Service Bus
- Enterprise Service Bus
- Message Bus
- I encountered a lot of terms.
- I worked on NServiceBus in my .NET days!



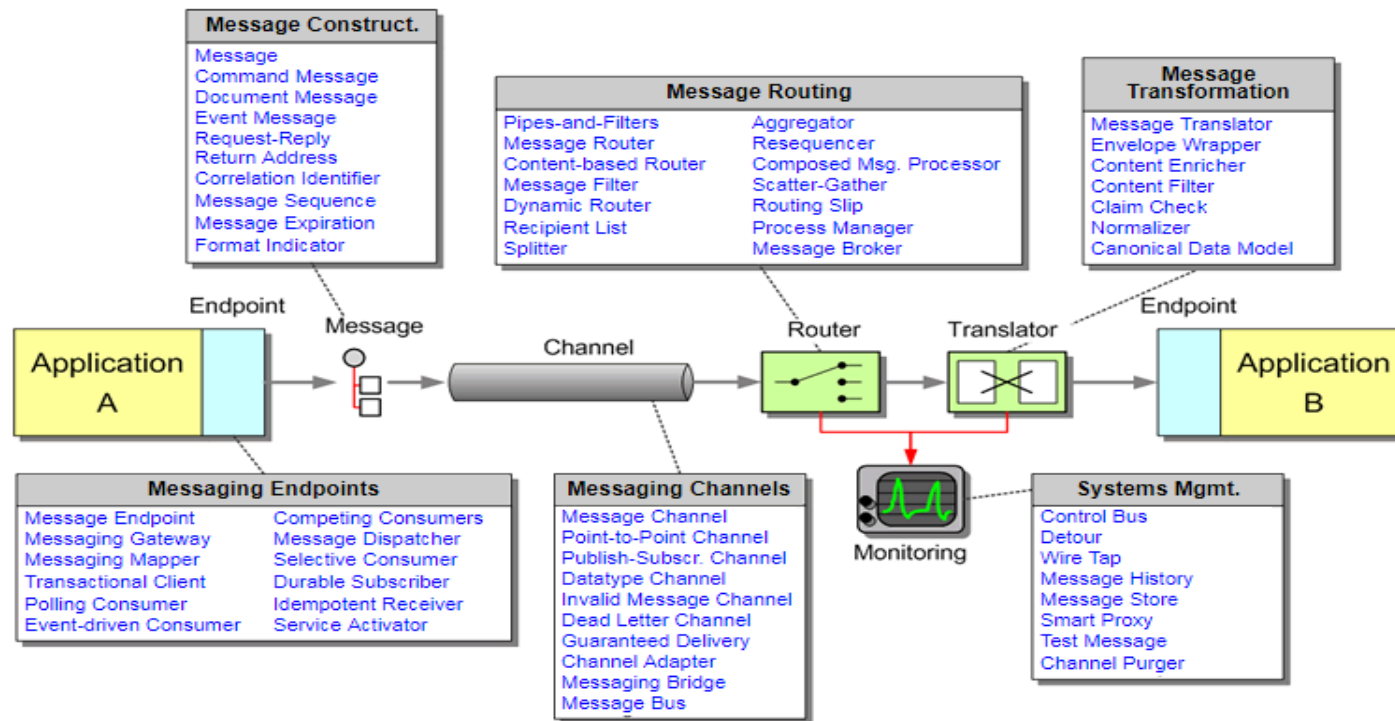
WHAT DOES IT MEAN TO BE A DISTRIBUTED SYSTEM?

- The 8 Fallacies of Distributed Computing
- https://en.wikipedia.org/wiki/Fallacies_of_distributed_computing
- Networks
- Interprocess communication
- Communication, Collaboration, Coordination.
- Application integration



INTEGRATION PATTERNS

We have documented [65 messaging patterns](http://www.enterpriseintegrationpatterns.com/patterns/messaging/), organized as follows:

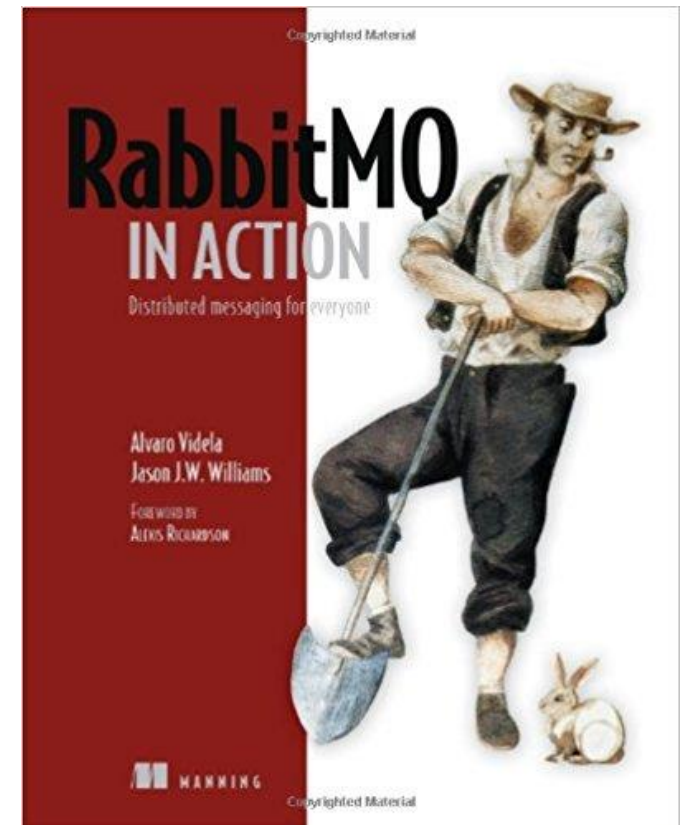


<http://www.enterpriseintegrationpatterns.com/patterns/messaging/>



RABBITMQ ADVENTURES

- AMQP
- RabbitMQ history
- RabbitMQ Constructs
- RabbitMQ examples/patterns
- <https://www.rabbitmq.com/getstarted.html>



ERLANG

