

微软 ❤️ 开源

使用微软开源技术开发微服务

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自我介绍

- 10届微软最有价值专家MVP
- 长期在成都地区组织和参与社区活动，乐于分享和交流
- 上海启路，开发数据分析和BI相关的SaaS产品
- 个人技术博客为
<http://redmoon.cnblogs.com>
- 微信订阅号：dotNET每日精华文章



分享内容

- “走马观花”
- “Hello World”
- 问答

Linux是威胁微软知识产权的‘毒瘤’

Microsoft ❤️ Linux



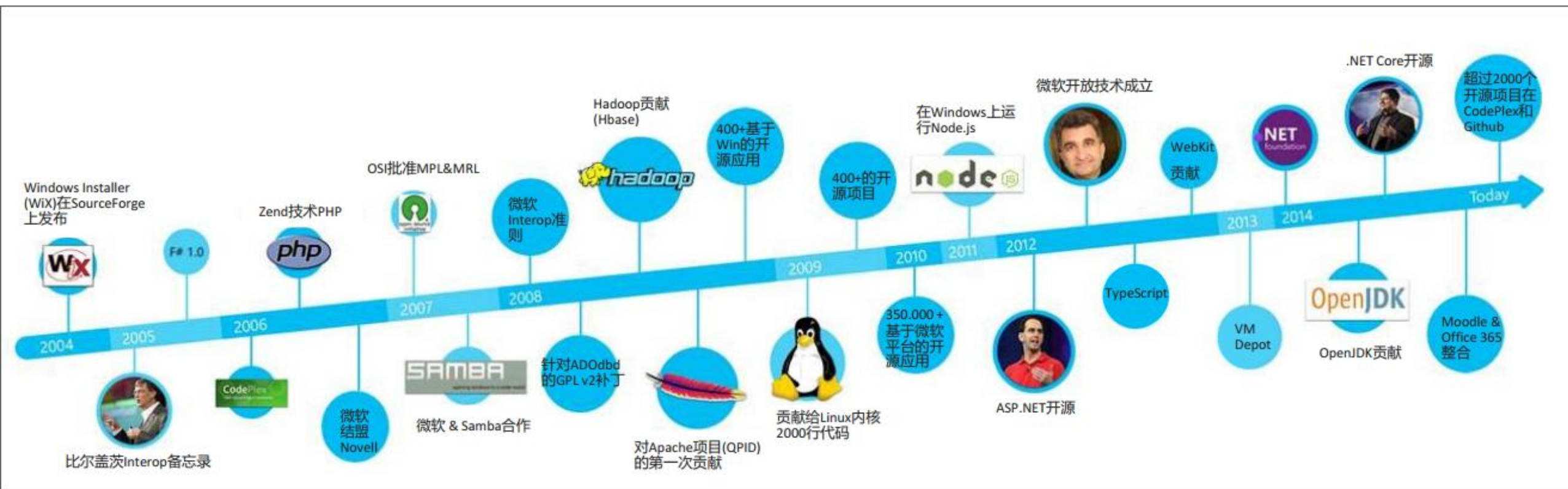
Repositories with the most open source contributors

	FortAwesome/Font-Awesome	10,654
	docker/docker	8,253
	npm/npm	7,041
	jlord/patchwork	6,806
	facebook/react-native	6,250
	Microsoft/vscode	5,855
	atom/atom	5,745
	FreeCodeCamp/FreeCodeCamp	5,622
	angular/material	4,355
	angular/angular	4,217

Organizations with the most open source contributors

	Microsoft	16,419
	facebook	15,682
	docker	14,059
	angular	12,841
	google	12,140
	atom	9,698
	FortAwesome	9,617
	elastic	7,220
	Apache	6,999
	npm	6,815

微软的开源之旅



https://opensource.microsoft.com/



Microsoft

Open source, from Microsoft with love

Redmond, WA [https://opensource.micr...](https://opensource.microsoft.com/)

 **Repositories**

 People 2,666

Overall

2145 Repos	273073 ★ Stars
211484 🍴 Forks	34042 Open Issues

微软开源技术：三位一体

语言/工具

C#、F#、TS、R

VSC

MonoDevelop

MSBuild

XXX Tools for VS

.....

运行时/函数库

.NET Core

Mono/Xamarin

EF/EF Core

Orleans

ASP.NET 4 Stack

.....

基础设施

OSS on Azure

SQL Server on Linux

Ubuntu on Windows

Docker on Windows

PowerShell

.....

C#

- C#虽然没有打上开源标签，但是标准开放ECMA，且编译器开源
- 一段代码了解所有C# 7新特性：
<https://blogs.msdn.microsoft.com/visualstudio/2016/08/30/new-c-7-0-features-in-vs15-preview-4>

```

class Program
{
    static void Main(string[] args)
    {
        object[] numbers =
            { 0b1, 0b10, new object[] { 0b100, 0b1000 }, // binary literals
            0b1_0000, 0b10_0000 }; // digit separators

        var (sum, count) = Tally(numbers); // deconstruction

        WriteLine($"Sum: {sum}, Count: {count}");
    }

    static (int sum, int count) Tally(object[] values) // tuple types
    {
        var r = (s: 0, c: 0); // tuple literals

        void Add(int s, int c) { r = (r.s + s, r.c + c); } // local functions

        foreach (var v in values)
        {
            switch (v) // switch on any value
            {

```

```

                switch (v) // switch on any value
                {
                    case int i: // type patterns
                        Add(i, 1);
                        break;

                    case object[] a when a.Length > 0: // case conditions
                        var t = Tally(a);
                        Add(t.sum, t.count);
                        break;
                }
            }
        }

        return r;
    }
}

```

F#

- 开源、跨平台（甚至移动平台）、函数式为先（支持面向对象）的语言
- 机器学习、科学计算和金融行业……

F# on Mac
F# on Linux
F# on Windows
F# on Android
F# on iOS (iPhone/iPad)
F# on JS/HTML5
F# on GPU
F# on FreeBSD

Enterprise Programming
Data Science
Web Programming
Mobile Apps and Games
Machine Learning
Cloud Programming
Financial Computing [↗](#)
Math and Statistics
Data Access
Mac, Linux and Cross-Platform

TypeScript

- 类型化的JavaScript超集，编译为标准JavaScript
- 直接使用ECMAScript 2015及其未来特性
 - 2.0已经正式发布：<http://www.infoq.com/cn/news/2016/09/typescript-release-20>
- 是很多项目的开发语言：Visual Studio Code、Angular2、仙鹤引擎， Azure Portal
- 被多种工具支持：VS 2015/2013、VSC、WebStorm、Eclipse、Sublime

R语言

- 2014年底收购R开发商Revolution Analytics，继续推出开源发行版本Microsoft R Open
- 集成到SQL Server 2016中提供R Services

Visual Studio Code

- Erich Gamma领导的[GitHub明星项目](#)：★18477, Fork2539
- 重新定义代码编辑器：多语言支持、智能感知、调试支持、内置Git、丰富扩展、控制台集成……

editor



IDE

lightweight/fast
keyboard centered
file/folders
many languages
many workflows

project systems
code understanding
debug
integrated build
File>New, wizards
designers
ALM integration
platform tools
...



lightweight/fast
file/folders with project context
many languages
keyboard centered
code understanding
debug
task running



Featured



PHP Debug

Felix Becker 90.6K

Debug support for PHP with XDebug



FREE



Vim

vscodevim 89.1K

Vim emulation for Visual Studio Code



FREE



React Native Tools

Visual Studio Mobil 61.9K

Code-hinting, debugging and integrated commands for React Native



FREE



Nomo Dark Icon Theme

be5invis 14.6K

Nomo Dark Icon Theme



FREE



Language Support for Java

Red Hat 10.3K

Language Support for Java(TM) for Visual Studio Code provided by Red Hat



PREVIEW



Debugger for iOS Web

Microsoft 2.4K

Debug your JavaScript code running in Safari on iOS devices from VS Code.



FREE

Most Popular

[See more](#)



C#

Microsoft 712K

C# for Visual Studio Code (powered by OmniSharp).



PREVIEW



Python

Don Jayamanne 529K

Linting, Debugging (multi-threaded, remote), Intellisense, code formatting...



FREE



C/C++

Microsoft 428K

Complete C/C++ language support including code-editing and debugging.



PREVIEW



vscode-icons

Roberto Huertas 341K

Icons for Visual Studio Code



PREVIEW



Debugger for Chrome

Microsoft 332K

Debug your JavaScript code in the Chrome browser, or any other target that supports...



FREE



ESLint

Dirk Baeumer 217K

Integrates ESLint into VS Code.



FREE

Visual Studio Code的幕后英雄

- 开源浏览器编辑器：[monaco-editor](https://github.com/Microsoft/monaco-editor)，还用于Azure、VSTS、OneDrive、Edge和你自己的产品
- 基于大量开源产品：Electron、Node和TypeScript，N多前端工具
- 语言和调试支持：
 - C#：Roslyn和OmniSharp
 - Java：javac或java-language-server(by RedHat)
 - TypeScript/JavaScript：TS/JS Server
 - Go：Go CLI Tools
 - Python：Jedi

MonoDevelop

- 针对.NET/Mono开发人员的跨平台、全功能的IDE
- Xamarin Studio的基础

MSBuild

- Microsoft Build Engine, 一个构建应用程序的平台（类似Ant、Maven），目前主要用于Visual Studio，随着开源会用于VSC和MonoDevelop中，甚至JetBrain的产品中
- 提供了.NET Core版本实现了跨平台
- 开源的目的是为了未来统一.NET Core和.NET Framework的项目格式

XXX Tools for VS

- [Node.js Tools for Visual Studio](#)
- [Python Tools for Visual Studio](#)
- [R Tools for Visual Studio](#)

ASP.NET 4 Stack

- 微软大规模开源的试点项目， [托管在CodePlex](#)
- 可以通过Mono实现跨平台运行
- MVC 5.x、Web API 2.x、Web Pages 3.x、 [SignalR 1.x](#)
- 当然还有OWIN和[Katana](#)

Mono/Xamarin

- Mono, 一个.NET开源实现（之前非官方，现在算是半官方），实现了.NET Framework的大部分内容（也有自己的扩展）
 - 在.NET Core之前，已经可以通过Mono在Linux上完美运行ASP.NET应用
 - Mono将会逐步吸收.NET Core的FX代码
- Xamarin, 基于Mono的移动开发框架，Xamarin SDK[开源](#)
 - 使用熟悉的IDE和语言，共享众多的函数库
 - 原生的用户界面、原生的API访问、原生的性能
 - 包括：Xamarin.iOS（AOT）、Xamarin.Android（JIT）
 - Xamarin.Forms, 使用XAML构建多平台UI

Xamarin + Xamarin.Forms



Traditional Xamarin
Approach



With Xamarin.Forms:
More code-sharing, all native

.NET Core

- .NET Framework的一次重生，微软开源策略的核心和支点
- 定位：Web应用程序和服务
- 跨平台：Windows、Linux（主要发行版本）、Mac和Docker
- 统一：利用.NET Standard函数库实现多个运行时的统一
- 快速：Node.js 8倍，Go 3倍
- 轻量级：模块化开发和部署
- 现代语言支持：C#、VB和F#
- 开源：运行时CoreCLR、函数库CoreFX、编译器Roslyn、语言、工具CLI和ASP.NET Core都在GitHub上

APP
MODELS

BASE
LIBRARIES

.NET FRAMEWORK

WPF

Windows
Forms

ASP.NET

Base Class Library

.NET CORE

UWP

ASP.NET Core

Core Library

XAMARIN

iOS

Android

OS X

Mono Class Library

COMMON INFRASTRUCTURE

Compilers

Languages

Runtime components

.NET FRAMEWORK

WPF

Windows
Forms

ASP.NET

.NET CORE

UWP

ASP.NET Core

XAMARIN

iOS

OS X

Android

.NET STANDARD LIBRARY

One library to rule them all

COMMON INFRASTRUCTURE

Compilers

Languages

Runtime components

.NET Standard

.NET Platform	.NET Standard							
	1.0	1.1	1.2	1.3	1.4	1.5	1.6	2.0
.NET Core	→	→	→	→	→	→	1.0	vNext
.NET Framework	→	4.5	4.5.1	4.6	4.6.1	4.6.2	vNext	4.6.1
Xamarin.iOS	→	→	→	→	→	→	→	vNext
Xamarin.Android	→	→	→	→	→	→	→	vNext
Universal Windows Platform	→	→	→	→	10.0	→	→	vNext
Windows	→	8.0	8.1					
Windows Phone	→	→	8.1					
Windows Phone Silverlight	8.0							

絕代雙驕和 .Net Core



.NET Core

A general purpose managed framework

```
project WebAPIvNext (.NETCoreApp,Version=v1.0) was previously compiled. Skipping compilation.  
Server GC  
Hosting environment: Development  
Content root path: /home/hzlidabin/codeForMS_rc2/WebAPIvNext  
Now listening on: http://*:7070/  
Application started. Press Ctrl+C to shut down.
```



Unity

3月31日下午 3:40 · 赞

We're joining the .NET Foundation! That means we'll be working with Microsoft and other foundation members on shaping the future of the .NET ecosystem. Learn more:



Unity joins the .NET Foundation – Unity Blog

Today at Build, Microsoft announced that Unity is joining the .NET Foundation. Quoting from the ann...

BLOGS.UNITY3D.COM

1,636次赞 69条评论 311次分享

分享



- 前端 : Unity3D , C#
- 后端 : .Net Core , C#





前后端开发语言一致性带来的好处

好处：

- 通用模块和工具丰富
- 可复用性高，减少逻辑冗余
- 跨平台，开发Windows，部署Linux

价值：

- 降低30%人员成本
- 加快20%的项目开发速度
- 帮助码农聚焦本质



Modular

.NET Core is a set of runtime, library and compiler components. Microsoft uses these components in various configurations for device and cloud workloads. You can do the same for your app or service.



Managed

Managed runtimes make code easy to write and guarantee safe execution. .NET Core manages memory with a garbage collector, compiles your code with a JIT compiler or ahead of time with .NET Native.



Cross-platform

You can create .NET Core apps that run on multiple OSes and CPUs. .NET Core runs on Windows. Ports are in progress for Linux, OS X and FreeBSD, as is integration with the LLVM compiler.



Modern

.NET Core brings with it a set of languages, led by C#, with VB and F# with support for modern language features, like generics, Language Integrated Query (LINQ), async support and more. It is backed by a managed compiler called "Roslyn" that is exposed to the runtime, usable as a service.



Interoperable

The managed runtime of .NET Core allows for a streamlined and easy interoperability with native code through several ways. Each of them allows for a rich set of scenarios not to mention great performance.



Extensible

Runtime modularity allows for an extensibility model through a good set of abstractions for adding new components to the actual runtime and its class library, but also through its package manager NuGet, which allows for a powerful componentization strategies.



Adaptable

.NET Core is versatile in multiple scenarios, from client applications, across web, server workloads to mobile apps. With its "pay as you go" model, .NET Core can be adapted easily to perform great and provide a rich experience developing for each of these.



Portable

.NET Core is portable across various platforms, both in terms of operating systems and processor architectures. Code written for it is also portable across application stacks, such as Mono, making it feasible to move applications across app stacks as well.



Open

.NET Core is backed by an open ECMA standard that outlines all of its capabilities which can be used to make a new reference implementation. A lot of projects did exactly this, and there are various implementation out there, Mono and Unity being the most popular, non-Microsoft ones.



享受Linux的成熟生态便利

简要性能数据

- Time taken for tests: 26.438373 s
Total calls: 30000
Failed calls: 4
Calls per second: 1134.714303 calls/s
- Percentage of time elapsed for 10000 calls of Reward/Get(ms)
50% : 787.688971
60% : 864.703178
70% : 930.547953
80% : 997.092009
90% : 1062.759876
95% : 1110.659838
ALL : 1299.689054
- Percentage of time elapsed for 10000 calls of Game/End (ms)
50% : 1050.109148
60% : 1066.173077
70% : 1087.543011
80% : 1118.543148
90% : 1165.433884
95% : 1196.574926
ALL : 1310.335875

典型游戏服务器性能要求：

- 单台服务器万人同服，千人并发
- 响应延迟在1.5秒以下

.NET Core 的优势：

- 性能稳定，性能分化不明显
- 失败率低
- 充分利用CPU硬件优势

ASP.NET Core

- ASP.NET的完全重写，可以运行在.NET Core和.NET Framework
- 把MVC和Web API合二为一，特性比ASP.NET 4有所加强
- 基于libuv实现跨平台KestrelHttpServer
- 模块化、内置依赖注入、可集成任意前端框架
- 依然可以使用OWIN组件

第三方对.NET Core和ASP.NET Core的支持

- [gRPC](#)、[protobuf](#)、[NancyFx](#)……
- [IBM Bluemix](#)
- [AWS Elastic Beanstalk](#)
- [Google Cloud Platform](#)

Entity Framework 6.x/EF Core

- 微软官方的ORM
- Entity Framework 6.x也是[开源](#)的，通过Mono实现跨平台
- EF Core不是6的升级而是重写，更加轻量级更易扩展
- EF Core内置支持SQL Server和SQLite，以及用于测试目的的内存数据库
- 当然第三方已经提供对MySQL等数据库的支持
 - Pomelo.EntityFrameworkCore.MySql

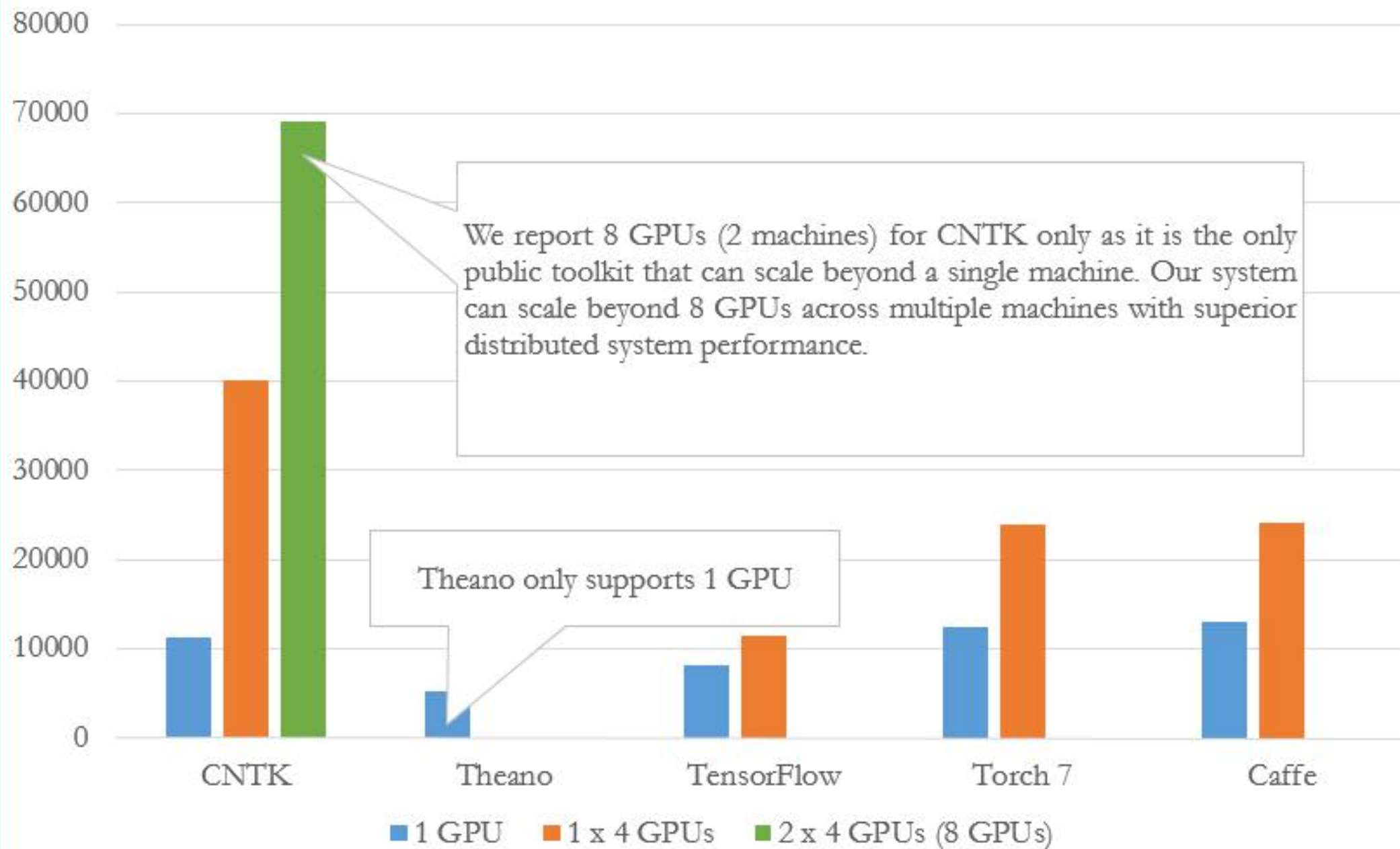
Orleans

- 不用学习和应用复杂并发或其他缩放模式，构建分布式、高伸缩应用程序的一种直接方式
- 微软研究院出品，实现Virtual Actor Model，官方版的Actor框架
- 被Azure和很多微软或第三方产品使用：
 - Halo 4和Halo 5的游戏后端

后面有彩蛋



Speed Comparison (Frames/Second, The Higher the Better)



OSS on Azure

- 常见的Linux发行版本镜像已经在Azure上提供
 - Azure中国版运行的VM超过一半是Linux
- MySQL、Hadoop、Spark、HBase、Storm、Redis、Docker、Mesos、Marathon、Kubernetes
- Cloud Foundry 8月份[在Azure中国版发布](#)
- App Service支持.NET、NodeJS、PHP、Python 或 Java

SQL Server on Linux

- 没有什么好说了
- 关于原因大家可以看我这位朋友的分析：
<http://www.cnblogs.com/lyhabc/p/5255763.html>

Ubuntu on Windows

- Bash on Ubuntu on Windows
- 提供一个原生运行的命令行工具方便开发人员在Windows上开发Linux的程序
- Windows 10周年更+开发人员模式

Docker on Windows

- 和Docker Inc.合作，把命令行工具带到Windows
- Docker发行了Docker for Windows
 - 跑在Hyper-V中的MobyLinux作为Host OS
- 微软在Windows 10周年更和Windows Server 2016提供了容器功能（抽象层），并基于Docker作为实现
 - 兼容Docker的一切（CLI、Hub、Registry、Dockerfile等）
 - Windows Server 容器 vs Hyper-V 容器
 - Nano Server vs Windows Server Core

PowerShell

- 移植到.NET Core, 支持跨平台
- 口号是 : PowerShell for every system
- 8月份开源, 现在★ 5286

基于.NET Core构建微服务

为什么选择微服务？

- .NET Core的定位决定了它更适合开发服务端
- 微服务的特点让.NET Core的试用成本更低
 - 主要好处之一：技术异构性。微服务可以帮助我们更快地采用新技术。——《微服务设计》
- .NET Core能很好的适应——微服务的主要托管环境——容器。

基于.NET Core开发微服务的图书

- Microservices in .NET Core :
<https://www.manning.com/books/microservices-in-net-core>
- Building Microservices with ASP.NET Core——Develop, Test, and Deploy Cross-Platform Services in the Cloud :
<http://shop.oreilly.com/product/0636920052074.do>

微服务多小算小？

- 微服务->实现单一功能->满足某个业务
- 领域驱动设计->基于聚合来切分业务领域
- 一个微服务==一个聚合

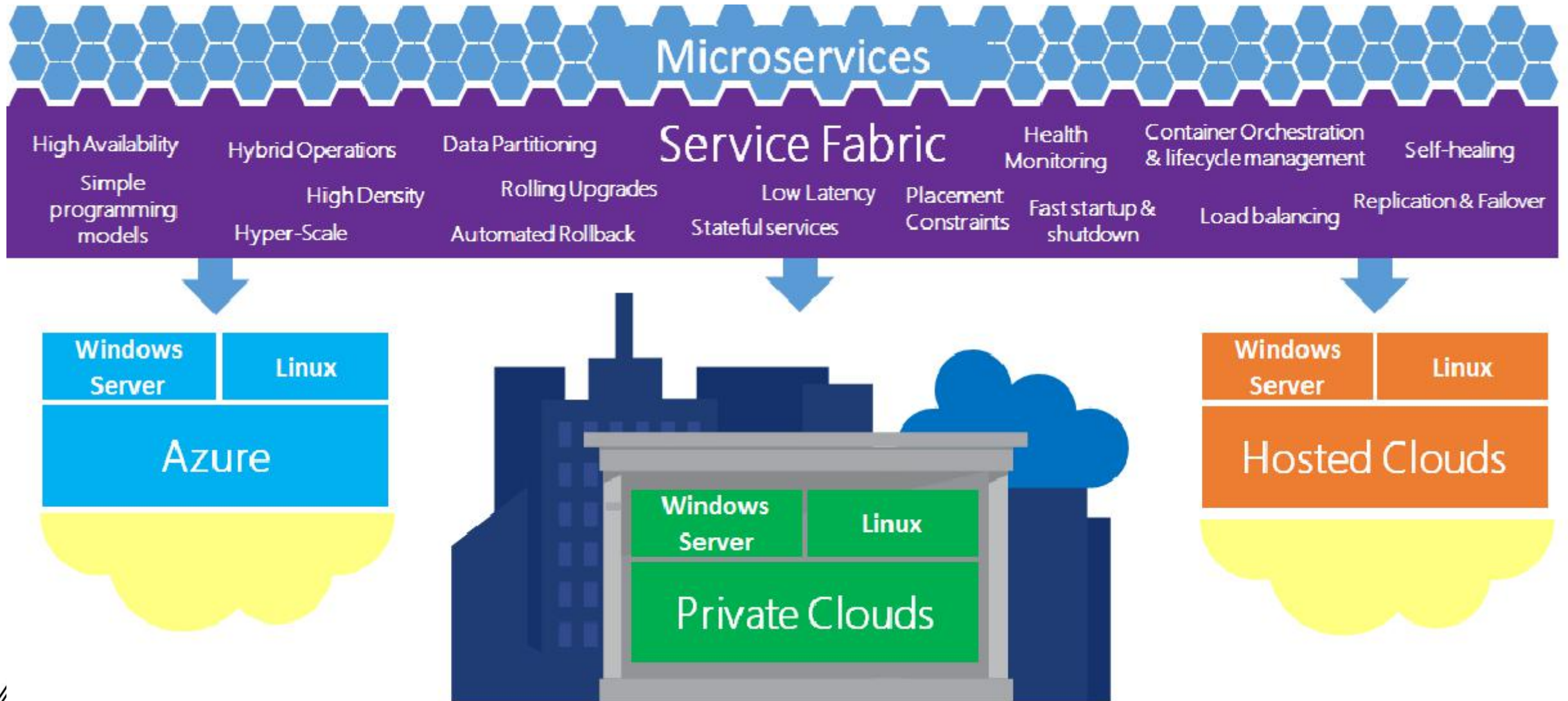
撸码ing

- 技术栈：
 - .NET Core
 - NancyFx
 - Visual Studio Code
 - Docker
- 源代码：
 - <https://github.com/heavenwing/WeatherMicroservice>

微服务应用平台

- Docker Swarm and Docker Compose
- Kubernetes
- Mesosphere DCOS, with Apache Mesos and Marathon
- OpenShift
- Pivotal Cloud Foundry
- **Service Fabric**

Service Fabric



CI/CD

- <http://devopshub.cn/>
 - 使用VSTS/TFS搭建基于容器的持续交付管道

谢谢大家



参考资料