The world is changing.

In Wuxi, Hongshan Small Town — the first IoT town in China, has quietly come up, and it has realized intelligent online management of multiple urban projects such as transportation, environment, water-related affairs and energy.

As the “Information Highway” in the 21st century, the IoT will play a decisive role in the evolution of the world and the decisiveness of the future intelligent life.

Ruff, since the IoT was still in the muddled phase, has already seen the road ahead, has been linking with and guiding the development of the IoT.

# ****The Revolution and the Barrier in the LoT Era****

From the second-generation ID cards to the electronic toll collection (ETC) system, from logistics & transportation to industrial manufacturing… The IoT has flooded in every aspect of our life. It is estimated that by 2020, 34 billion devices will be connected to the Internet, 70% of those devices will be IoT devices, and more than US$ 6 trillion will be invested in the development of IoT solutions.

The era of loT has arrived.

However, as an important evolution in this era, the IoT is facing an unprecedented difficulty, that is, the unprecedented fragmentation. In this regard, the entire IoT market, including such large companies as Google, Microsoft, Apple and Intel have been involved, and they all have built their own ecosystems, let alone different equipment standards of various types of equipment manufacturers.

While intelligent life, intelligent production, intelligent society, etc. are constantly expected by everyone, they are facing the ineffective communication between all parts and incompatibility brought about by fragmentation, as well as the chasm of missing specialties between hardware and software developers.

# ****Ruff: To Be the Android of the IoT****

How to solve all this? Let the application of IoT really benefit the developers and users? Is it possible to have a standard and a platform to minimize the fragmentation of the IoT and make it more efficient for people? And at the same time allow developers of IoT applications to break through the underlying fragmentation barriers and develop a variety of IoT applications?

Those are what Ruff considered in the early days and are the original intention of the development of Ruff.

With those ideas, Ruff was established. As a technology-driven company, Ruff’s technology R&D personnel accounts for more than 70%.

Roy Li, Ruff CEO and one of the core members, was formerly the technical director of Nokia in North America and responsible for the OVI open platform and the Symbian operating system, and Zhou Aimin, Chief Architect, was formerly Alipay’s business architect and Wandoujia’s chief architect.

After two years of continuous R&D, experimentation, innovation and improvement, on April 29, 2016, Ruff 1.0 was officially released. The pioneered Javascript hardware development allowed software developers who develop IoT applications to focus on only application logic other than the underlying hardware, and allowed the testing to be done only on the PC. An open, efficient and agile IoT application development platform was born, and it is called the best IoT operating system in the world.

Then, what are the technical advantages of Ruff?

Just as mentioned before, one of the biggest problems in the IoT era is communication — the communication between different standards of different devices, the communication between software and hardware, but Ruff has realized the feasibility of such communication and can guarantee the effectiveness and high efficiency of the communication.

By allowing the hardware to be software-based and standardized and allowing Ruff to be applicable to the IoT operating system composed of entirely different hardware categories, the problem of the communication between different devices has been solved. Ruff can be compatible with most of the commonly used hardware vendor systems in the market at present, and it perfectly connects these systems in series, forming a complete whole and truly realizing the unity among hardware.

In addition, Ruff has broken down the barriers to the communication between hardware and software by encapsulating the underlying hardware, so that software application developers can, without any hardware knowledge, design an IoT application just like the mobile phone application, which will be applicable to all hardware adaptive to the Ruff system.

# ****Block Chain Technology Keeping Increasing, and the Ruff IoT Ecology Continuously Improving****

With the emergence and continuous warming of the block chain technology, the block chain has become a topic of widespread public concern.

How to use the block chain? Where to use the block chain? These have become the focus.

IBM has reported that: the IoT will be the best application scenario of the block chain technology, and at the same time, a technology is also required to realize and guarantee the consistency, security, and tamper-resistance of the IoT data. The combination of the block chain and the IoT has become inevitable to solve the information isolated island.

Therefore, Ruff, which focuses on the IoT, has strongly launched the Ruff Chain with the guarantee of the strong technology and experience to implement a distributed and decentralized IoT application scenario, satisfying the elastic demand of the IoT for timeliness to the maximum extent. Since above the Ruff Chain is a hardware abstraction layer, which can abstract all the hardware and lower the threshold of its own development, the Ruff Chain is more practical and more in line with value demands.

Take an example of a specific application: The control side can be bound to one customized smart contract, to achieve the affirmation of the right to use the device. The structures of such contracts are similar to the formatted contract. “If you pay me 50 Tokens, then within the next one hour, I will accept the following control orders that you send.” “If you pay me 100 Tokens, then within the next 3 hours, I will deduct 1 of your Tokens every 10 minutes.” The chain support does not update or expand the contracts in such formats, which is more suitable for the block chain commercial projects than smart contracts.

The ultimate purpose of any technology is to apply it. However, to develop excellent applications, you must first have good infrastructures, and the block chain is no exception. For this reason, the existence of the Ruff Chain is even more important.

# ****Setting off the Wave of the Change of the IoT and Uniting all IoT Practitioners to Change Life****

Ruff, as an open IoT operating system, has a large number of development API interfaces, and can run on common development boards such as Rapsbury Pi to realize multi-platform compatibility. In addition, developers can share and download various driven applications and devices in the open software repository of Ruff. And any programs they write can be published directly in Ruff’s community.

From the easy-to-use and practical Ruff IoT operating system that has broken through communication barriers to the decentralized, safe, efficient and convenient Ruff Chain that guarantees the IoT, Ruff has continuously improved and refined its own IoT ecosystem.

Today, tens of thousands of IoT ecological persons have joined the ecosystem of Ruff and the number is growing continuously. Together with Ruff, they will contribute to the development and advancement of the IoT.

世界正在发生变化。

在无锡​​，中国第一个物联网小镇——洪山小镇悄然崛起，实现了交通、环境、水务、能源等多个城市项目的智能化在线管理。

物联网作为21世纪的“信息高速公路”，将在世界的演进和未来智能生活的决定性中发挥决定性作用。

Ruff，由于物联网还处于迷茫阶段，已经看到了前进的道路，一直在链接和指导物联网的发展。

# ****LoT时代的革命与壁垒****

从二代身份证到电子收费（ETC）系统，从物流运输到工业制造……物联网已经充斥着我们生活的方方面面。预计到 2020 年，将有 340 亿台设备接入互联网，其中 70% 的设备将是物联网设备，超过 6 万亿美元将用于物联网解决方案的开发。

物联网时代已经到来。

然而，作为这个时代的重要演进，物联网面临着前所未有的困难，即前所未有的碎片化。对此，整个物联网市场，包括谷歌、微软、苹果、英特尔等大公司都参与其中，都建立了自己的生态系统，更不用说各类设备厂商的不同设备标准了。

智能生活、智能生产、智能社会等在大家不断期待的同时，也面临着碎片化带来的各部分沟通不畅、不兼容，以及软硬件开发者专业缺失的鸿沟。

# ****Ruff：成为物联网的安卓系统****

如何解决这一切？让物联网的应用真正让开发者和用户受益？是否有可能有一个标准和一个平台来最大限度地减少物联网的碎片化并使其对人们更有效率？并且同时让物联网应用的开发者突破底层碎片化壁垒，开发多种物联网应用？

这些都是 Ruff 早期所考虑的，也是 Ruff 发展的初衷。

有了这些想法，Ruff 成立了。作为一家技术驱动型公司，Ruff的技术研发人员占比超过70%。

Ruff CEO、核心成员之一李立，曾任诺基亚北美技术总监，负责OVI开放平台和Symbian操作系统，首席架构师周爱民，曾任支付宝业务架构师、玩豆家首席架构师建筑师。

经过两年的不断研发、试验、创新和改进，2016年4月29日，Ruff 1.0正式发布。开创性的 Javascript 硬件开发使开发物联网应用程序的软件开发人员可以只关注底层硬件以外的应用程序逻辑，并允许仅在 PC 上进行测试。一个开放、高效、敏捷的物联网应用开发平台诞生了，被称为世界上最好的物联网操作系统。

那么，Ruff有哪些技术优势呢？

如前所述，物联网时代最大的问题之一就是通信——不同设备不同标准之间的通信，软件和硬件之间的通信，但Ruff已经意识到这种通信的可行性，可以保证有效性和高效率的通讯。

通过让硬件软件化和标准化，让Ruff适用于完全不同硬件类别组成的物联网操作系统，解决了不同设备之间的通信问题。Ruff可以兼容目前市场上大部分常用的硬件厂商系统，并将这些系统完美的串联起来，形成一个完整的整体，真正实现硬件之间的统一。

此外，Ruff通过对底层硬件的封装，打破了硬件和软件之间的通信壁垒，让软件应用开发者无需任何硬件知识，就可以设计出像手机应用一样的物联网应用，适用于所有硬件都适应 Ruff 系统。

# ****区块链技术不断提升，Ruff物联网生态不断完善****

随着区块链技术的出现和不断升温，区块链已经成为大众广泛关注的话题。

如何使用区块链？在哪里使用区块链？这些都成了焦点。

IBM曾报道：物联网将是区块链技术的最佳应用场景，同时还需要一种技术来实现和保证物联网数据的一致性、安全性和不可篡改。区块链与物联网的结合成为解决信息孤岛的必然选择。

因此，专注于物联网的Ruff强势推出Ruff Chain，以强大的技术和经验为保障，实现分布式、去中心化的物联网应用场景，最大程度满足物联网对时效的弹性需求。由于 Ruff Chain 之上是硬件抽象层，可以将所有硬件抽象出来，降低自身开发的门槛，因此 Ruff Chain 更实用，更符合价值需求。

以具体应用为例：控制端可以绑定一个定制的智能合约，实现对设备使用权的肯定。此类合同的结构类似于格式化合同。“如果你付给我 50 代币，那么在接下来的一小时内，我将接受你发出的以下控制命令。” “如果你付给我 100 代币，那么在接下来的 3 小时内，我会每 10 分钟扣掉你的 1 个代币。” 链支持不更新或扩展此类格式的合约，比智能合约更适合区块链商业项目。

任何技术的最终目的都是应用它。但是，要开发出优秀的应用，首先要有好的基础设施，区块链也不例外。正因如此，Ruff Chain 的存在就显得尤为重要。

# ****掀起物联网变革浪潮，团结所有物联网从业者，改变生活****

Ruff作为一个开放的物联网操作系统，拥有大量的开发API接口，可以运行在Rapsbury Pi等通用开发板上，实现多平台兼容。此外，开发者可以在 Ruff 的开放软件仓库中共享和下载各种驱动的应用程序和设备。他们编写的任何程序都可以直接在 Ruff 的社区中发布。

从易用、实用、突破通信壁垒的Ruff物联网操作系统，到去中心化、安全、高效、便捷的物联网保障Ruff Chain，Ruff不断完善和完善自己的物联网生态。

如今，已经有数以万计的物联网生态人加入了Ruff的生态系统，并且数量还在不断增长。他们将与 Ruff 一起为物联网的发展和进步做出贡献。