WIRELINE

PRODUCT OVERVIEW / AUGUST 2017

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SUMMARY

To enable a rich microservices marketplace, Wireline is raising the largest developer fund to invest in open-source projects that are building the next generation of cloud computing.

1. Microservices have revolutionized the delivery of large software service providers at the most advanced companies such as Netflix; serverless compute frameworks are freeing the developer from managing physical or even virtual infrastructure. This produces radically lower costs, faster time-to-value.

2. Although microservices have transformed the advanced Silicon Valley companies, the immaturity of tooling and operational overhead prevents greater traction in the typical Enterprise IT department.

3. In addition, while Open Source software development has revolutionized Enterprise software, the rewards and benefits of producing Enterprise-grade Open Source software has largely been muted by the lack of monetization for Open Source, and by direct competition from Amazon Web Services. This leaves the highly skilled Open Source developers without a significant path to harvesting the value of their work.

4. Wireline is building an ecosystem that will directly enable Enterprise IT to consume microservices at scale. This is a large addressable market, with IT spending projected to grow to $1.5 billion by 2020.

5. The focal point will be a microservices exchange: an opportunity for the vast community of open source developers to monetize Enterprise focused projects; a marketplace for businesses to discover, test and integrate microservices that can be seamlessly combined to build customized solutions.

6. Wireline has developed the necessary framework and systems to host and operate these solutions, and the platform to support this community.

7. Wireline's Token Sale will establish the largest open source developer fund to seed this ecosystem.

OVERVIEW

Every five years or so a new technology emerges that not only changes the technology landscape, but has far-reaching effects across the broader economy.

The foundational technologies that enabled the internet existed for decades, but a new kind of app — the browser — enabled any business to create and deploy services that were immediately available to anyone with an internet connection. As the browser evolved, it enabled the development of more sophisticated Web applications that quickly displaced installed software. Software-as-a-service (SaaS) dramatically lowered the maintenance costs for businesses and brought in the pay-for-what-you-use pricing model.

In the most recent revolution, Cloud platforms — also know as Infrastructure-as-a-Service or IaaS — have freed businesses from the burden of managing their own physical hardware — further driving down maintenance and development costs. But for many enterprises, the complexity, cost and risk of migrating to the Cloud is still to high.

We believe that two current innovations — scalable microservices and crowdsourced funding through token sales — are about to enable another major shift: a marketplace for interoperable business applications.

Indeed, this next technological disruption has already started.

Microservices encompasses a design philosophy and a set of emerging technologies known variously as serverless compute and function-as-a-service (FaaS). To put it simply, it's the ability to rapidly create and deploy applications and APIs without having to manage the underlying hardware and software infrastructure; and to enable these services to be combined as building blocks to create more powerful and customized services and applications.

It is the enterprise-friendly version of the cloud. These technologies will enable the transformation of 'real world' industries such as healthcare, manufacturing, energy, transportation, construction — market sectors not localized in Silicon Valley. It has been called the "third wave" of innovation.

And it's a huge market:
corporate IT spending is approaching
$1.5 trillion globally.

Yet, in the corporate IT world today, innovation is difficult. Cloud-based systems require multiple teams of experts to configure, manage and monitor dozens of different technologies from multiple vendors. Companies have to create capacity and cost models, specify physical infrastructure (CPU, disk, memory and bandwidth for virtual machines and networks), implement security policies, and plan for disaster recovery and backup. They need to stitch together disparate systems to make their current business work; innovation can be an afterthought, or even too risky.

Furthermore, according to many studies the cost of maintenance can be 75% of the total cost of building and managing software projects. This excludes other intangible factors such as security risks, vendor lock-in, and recruiting and retention of highly skilled operators.

OVERVIEW

In response to these pain points, a new experimental software development paradigm has emerged. Instead of building large, unwieldy, monolithic systems, this new architecture enables complex systems to be assembled from small modular components — both from in-house and external open-source projects. This enables different teams to innovate more quickly to address the needs of the business.

The pattern is known as microservices.

Businesses have already started to invest in this new model. Analysts estimate that the IT-as-a- service will grow to $547 billion by 2018, and that 12% of enterprise customers have already begun the move to the next generation of microservices and other serverless technologies.

But while the transition to serverless offers huge benefits — in terms of lowered costs and faster time-to-value — it is still a nascent field. There are lots of technical hurdles, and currently, no established ecosystem.

What is needed for this concept to flourish is an integrated platform that will enable new businesses to get up and running quickly — without the burden of managing complex IT infrastructure. Critically, there is a huge opportunity for a marketplace that would seamlessly connect developers within a growing number of industries that need their skills.

WHOEVER IS ABLE TO CREATE THIS ECOSYSTEM WILL OWN THE FUTURE OF COMPUTING.

Wireline — a startup based in New York and founded by veteran software infrastructure engineers — is developing this platform using proven foundational technologies and currently deployed by businesses around the world.

The Wireline token sale will provide funding to seed the platform. In fact, given the funding gap usually experienced by open-source development projects, it might be impossible to create such a community without the innovation of the token sale. Tokens will be sold for use on the Wireline platform to establish a development fund to be used to build the ecosystem. The Wireline Developer Fund will provide resources for the expansion of the platform, such as essential software modules to seed the marketplace; it will provide opportunities for developers to monetize existing and new classes of solutions.

The Wireline Developer Fund will be the largest open-source developer fund in the world.

BACKGROUND

In the early days of the Web, companies managed their own physical machines on-site. This involved dedicated network infrastructure, servers, databases, backup systems — and for large companies, dedicated buildings to house the equipment and an army of specialists to support and manage operations. Next, colocation providers offered to manage the physical infrastructure at a central location, but companies were still responsible for the specification, set-up and configuration of individual machines.

The emergence of the Cloud — made possible by the commoditization of computers and new fault-tolerant software infrastructure — freed businesses from the burden of managing large networks of physical machines. Competition between Cloud platform providers (Amazon, Google, Azure) brought down hosting costs; and advances in containerization and orchestration technologies (Core OS, Docker, Kubernetes, etc.) made it feasible to build and manage reliable, large-scale systems.

However, Cloud-based systems still require multiple teams of experts to configure, manage and monitor dozens of different technologies from different vendors. Companies have to analyze capacity and cost models; specify CPU, disk, memory and bandwidth for virtual machines and networks; implement security policies; plan for disaster recovery and backup. And these overheads are on top of the actual cost of development. According to many studies, the cost of maintenance can be 75% of the total cost of building and managing software projects. This excludes other intangible factors such as security risks, vendor lock-in, and the recruiting and retention of highly skilled operators.

In response to these pain points, a new experimental software development paradigm emerged. Instead of building large, complex, monolithic systems, developers simplified the process by building smaller autonomous components that could be wired together in different ways. This enabled different teams to innovate more quickly, and for the enterprise to quickly assemble components — both from in-house and external open source projects — to suit the needs of the business. This pattern became known as microservices.

WHAT ARE MICROSERVICES?

Before the introduction of the modern assembly line, cars were built one-at-a-time by teams of skilled laborers of many different trades. If any aspect of the construction encountered a problem, this would delay the entire process. Additionally, the complexity of the product required highly skilled supervisors to oversee every aspect of production and quality control.

Most large companies still build software this way today.

The modern assembly line is a manifestation of the separation of concerns. Different teams are decoupled to focus on the aspect of the system relating to their expertise. They are free from day-to-day dependencies (and delays) from other teams, and able to develop and evolve their own processes.

Indeed, many techniques developed for the mass production of automobiles — e.g., kanban (to improve throughput) and kaizen (continual quality improvement) — are now in vogue within the software development community. These techniques can lead to more agile and productive teams.

Microservices are a pattern for bringing similar efficiencies to the process of developing large complex systems.

Traditionally Cloud systems are large monolithic software projects that are tightly coupled to the physical infrastructure on which they will run. Typically they will involve hundreds of different components, developed by highly skilled, in-house systems engineers, and increasingly, open-source projects from external developers. The development schedule for such projects is typically measured in quarters: for example, Q1: Design; Q2: Prototype; Q3: Beta; Q4: Roll-out. Given the long development time (and complexity), the project is highly vulnerable to slip, mission creep, changes to the original requirements, and attrition. Furthermore, it is not uncommon for entire systems to be scrapped and rebuilt — from the ground up — after a year or two of operation.

Microservices, on the other hand, implement the same functionality by decomposing the system into separate isolated components. They are building blocks that can be created quickly and with specialization into separate modular components. These blocks can be integrated together to create sophisticated systems.

Microservices — unbundling complex systems.

MONOLITHIC APP   MICROSERVICES
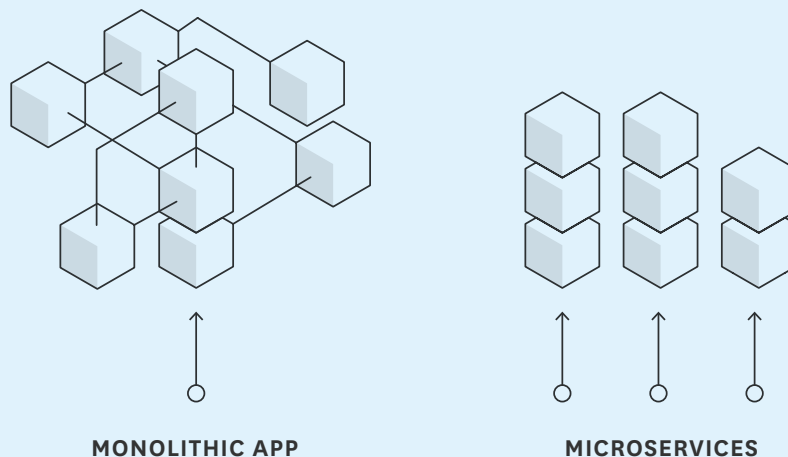
These individual components are less complex and can be developed more quickly, by smaller more agile teams. Testing, debugging, and documentation (major aspects of the total development cost) also become simpler when done on these smaller segments of code, and lead to more reliable systems.

Crucially, large systems can be assembled from components developed by different teams — especially from outside of the organization. For example, there are now thousands of very high quality open source projects — developed and supported by world-class experts — that deliver functionality that would be impossible to develop in-house. The ability to leverage these resources have a profound impact on enterprises that are able to harness these open-source technologies and transition into a more agile, startup model.

Serverless

In the last year or so, experimental technologies from major platform providers (e.g., Amazon's Lambda, Google Cloud Functions) have started to get traction from the software community. Aside from the cost benefits, early adopters from large traditional enterprise customers are experimenting with the technology to increase the pace of innovation. Individual business units are using the technology to rapidly prototype new systems independently from their centralized IT departments.

Usually new paradigms take years before there are mainstream adopters, but the current attention on microservices — driven by Fortune 500 companies — has led to sold-out technical conferences and a flurry of venture capital investments. Pete Johnson, a technical solutions architect at Cisco, recently marveled at a tech conference breakout session in which 2000 people attended, jam-packing a theater meant to house productions of "Phantom of the Opera."

To gain a sense of the productivity benefits provided by serverless approaches, look at the #censusfail phenomenon in Australia. In 2012, the Australian government committed to building a new system to implement the country's census programme. The project was awarded to a large infrastructure solutions provider and was estimated to have cost over AU$10 million, taking two years to deliver. Shortly after its launch, the system was brought down by a DDoS attack due to poor security and capacity planning and testing (possibly costing an additional AU$20M to remedy link). Shortly after that — over the course of a single weekend — two university students were able to fully replicate the functionality of the system using open-source components implemented using Amazon's Lambda serverless platform.

WHAT IS MISSING TODAY?

To understand why large IT projects often fail, consider what is involved today in building a non-trivial software system.

In the best case, a highly skilled agile team will build a quick conceptual prototype using a modern stack, using one of many Platform-as-a-Service (PaaS) technologies and open source projects. In theory, this frees up the developers to focus on the user-experience.

As the project progresses out of the prototyping stage, there is typically a division of labor between, user interface (client), business logic (server), database, and integrations with external systems. Each of these teams are made of up highly skilled specialists. But, in order for the different aspects to come together as a coherent system, there needs to be an architect, product manager, project manager overseeing the entire development project. And all of these functions need to stay aligned with the actual needs of the business sponsor, who is often under complex political pressures to change scope or prioritize some features over others, in ways that can change over time.

What is needed to bring the assembly-line efficiencies of microservices technologies within the grasp of the modern enterprise?

We propose a new model:

Tools & APIs   auto-scaling

WIRELINE ECOSYSTEM

monitoring   orchestration
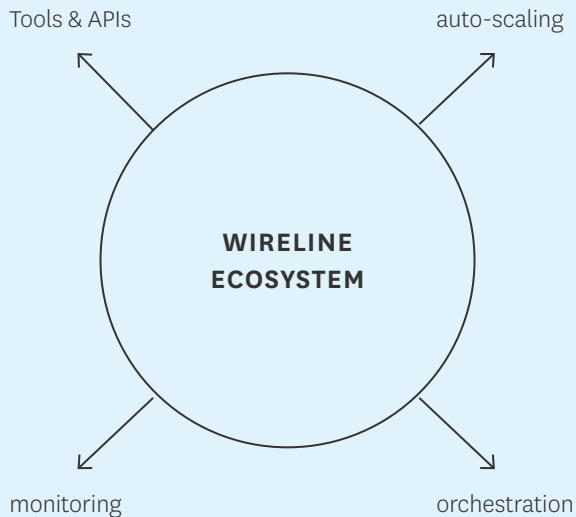
1. **We need better tools to develop and deploy microservices.** These tools must tie together every aspect of the development process: coding, testing, debugging, documentation, staging, deployment, and project management. Above all, it should be easy for a junior developer to get started almost immediately.

2. **Decouple the development process itself from the management of the underlying hardware infrastructure.** In fact, as far as possible, we should make the provisioning of hardware, scaling, and resource utilization completely automatic. Furthermore, the deployment of microservices should be independent of the underlying platform vendor. Platform-specific services should be able to be integrated without lock-in.

3. **Operations must be radically simplified.** Unencumbered by the need to manage the physical hardware infrastructure, the operational environment (aka dashboard) should give greater visibility into the actual business functionality of the system. For example, data flows, business processes, costs, etc.

4. **We need a marketplace.** To unlock the full potential of microservices, it is necessary to be able to assemble systems from a universe of best-in-class components from a thriving marketplace for open source and third-party microservices. Subsequently enterprise will still develop their own core components — but this effort will focus on the core competency of the business — the aspects of the system that directly affect the bottom line and competitive advantages of the company.

PRODUCT

Wireline's suite of solutions unlocks the full potential of microservices. A revolutionary aspect of the product is the Wireline marketplace, an App Exchange where best-in-class microservices, components and professional services are traded in a frictionless environment.

Beyond providing a frictionless ramp to IT organizations it will democratize the use of powerful new technologies — from AI to Predictive Analytics to the Blockchain — by providing an interface for them in the modern enterprise.

THE PLATFORM

Wireline is a full-service platform that ecompasses the entire development process — from design, implementation, and testing, through to deployment and management.

The Toolbox

Wireline Toolbox enables developers to get up and running and launch prototypes quickly; it brings the pace and agility of the startup to large modern enterprises.

Developers can use their existing tools (editors, IDEs, etc.) to create microservices; these are integrated seamlessly with the Wireline Toolbox to provide simple testing, debugging and documentation functionality.

The Wireline Toolbox directly supports a process of test-driven development, which leads to high quality, reusable components. Developers can wire together multiple microservices in a safe testing sandbox to facilitate the rapid prototyping of more complex solutions.

The Framework

The Wireline Framework is the execution environment for microservices and solutions. It provides an operations-free platform that obviates the need to manage the underlying infrastructure. Instead of the up-front configuration of virtual machines, the platform automatically scales with demand so that customers only pay for the resources that are used.

The Wireline Framework provides a number of core services and APIs that make it easy to quickly develop sophisticated microservices. Built-in APIs provide basic security, authentication, external network requests, and database capabilities. Built-in value-added services enable payments, messaging, analytics, and access to third-party blockchains.

The Dashboard

The Wireline Dashboard allows customers to configure, manage and monitor services and solutions. This user interface enables developers and enterprises to roll out new services and configure who has access (e.g., beta users, internal user groups, individual customers).

The Console also audits service usage, system healthchecks, cost modeling, billing thresholds, and application deployment.

App Exchange

The Wireline App Exchange is the marketplace, or the hub, of the Wireline ecosystem (below). Microservices are made available much like package managers (Javascript's NPM), such that they can be composed into larger applications. It enables customers to manage their own in-house microservices, find and evaluate third-party microservices, and assemble and configure sophisticated solutions made up from best-in-class microservices across from multiple vendors.
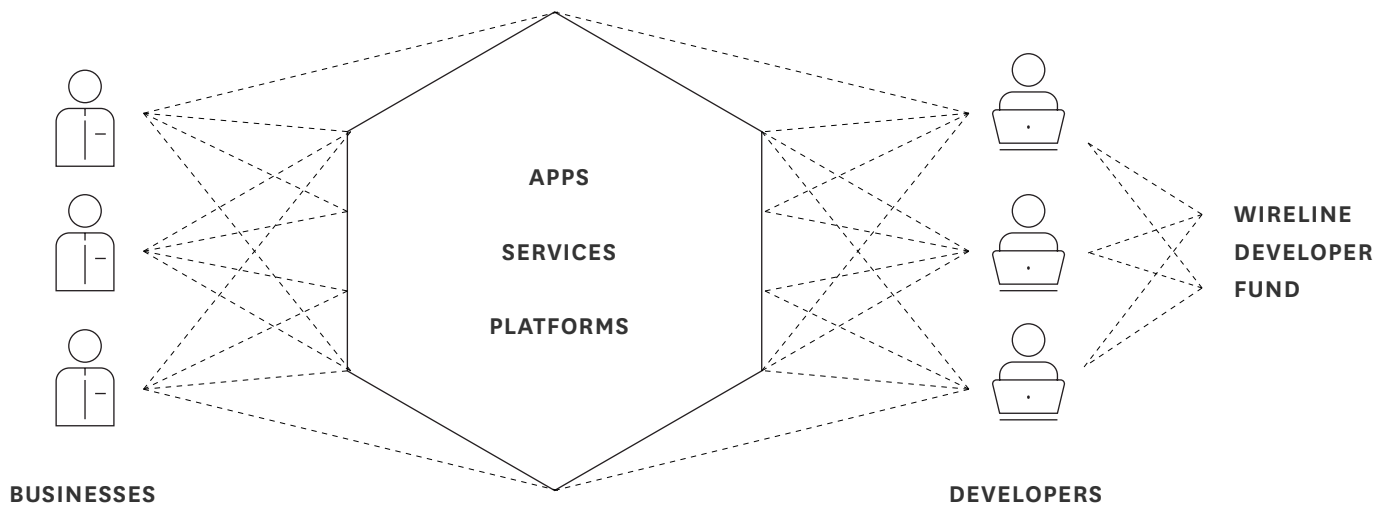
THE WIRELINE APP EXCHANGE

Wireline is more than the sum of its parts.

The App Exchange introduces a new marketplace for microservices, components, applications, and professional services. It is the means by which developers get rewarded for their efforts — and incentivised to create new service offerings, maintain existing code, answer questions, and provide support.

From Wireline's inception, there are many thousands of services that could be quickly built or adapted to run within on the Wireline platform, and be listed in the App Exchange. In fact many services already exist on the platform.

For example, the Programmable Web lists over 6,500 individual APIs from as many different vendors. They encompass application integration APIs from leading software providers (Google Maps, Twitter, LinkedIn), horizontal technology integrations (EXAMPLE), information services (EXAMPLE: local government info), and vertical-specific and niche applications (ranging from currency conversion to genome sequencing). Note, the list merely provides a brief description of the service and a link to the provider's Web site. The list is a digital form of Yellow Pages.

However, the opportunity is to create the iTunes App Store for microservices: a seamless marketplace that brings together all microservices across the entire Web.

APPS

SERVICES

PLATFORMS

WIRELINE DEVELOPER FUND

BUSINESSES   **DEVELOPERS**

The Wireline App Exchange brings together all of the aspects needed to enable such a marketplace:

Future

Benefits

Seamless integration
Standardization of service endpoints so that any service can be instantly connected to existing applications. Multiple sources can easily be combined into hybrid services.

Frictionless micropayments
The ability for any developer immediately to monetize services, without implementing and managing custom payment systems. Massively reduced transaction costs within the Wireline token ecosystem; this changes the fundamental economics of developing services.

Historical and real-time service status
Immediate visibility of service interruptions and metrics that represent the reliability and performance of all services.

Usage statistics
Individual API usage metrics (and implied revenues).

Ratings
Community contributed ratings and comments.

Consistent documentation
A comprehensive reference manual for all services. This encourages the emergence of standards that improve reliability and interoperability.

Knowledge base and community-led support
The collective wisdom of the ecosystem becomes a shared knowledge base. This will include tutorials, templates, and code fragments.

Professional resources
The repository also lists professional services offered by the community. Experts themselves build reputation based on the quality and frequency of their contributions, which can be directly measured by their token transaction records.

Discoverability
The entire registry itself is in fact a microservice. The API make available all resources (services, experts, knowledge articles, etc.) and can be integrated directly into other systems.

Throughout the web there are a growing number of extremely sophisticated service offerings spanning artificial intelligence and machine learning, natural language processing, voice recognition, translation services, and predictive analytics. Companies like Google and Amazon can invest hundreds of millions of dollars to develop these systems. The opportunity is to apply these technologies to businesses, where no individual player could have the resources to develop the individual components themselves.

For example, imagine a new kind of customer support application — something that most people regard as broken today (and for the operator, extremely expensive to manage). Instead of frustrating automated systems, a developer could combine Google's Speech Recognition API with Amazon's Predictive Analytics API to assist human operators to find the most relevant information to quickly handle customer issues. A separate team might use Google's Text Analysis APIs to provide an additional

support channel. The outputs from both systems can be used to train a Machine Learning model that feeds back into the system. The business might then develop an Alexa Skill to provide the same service to consumers — over time reducing the load on human-led customer support.
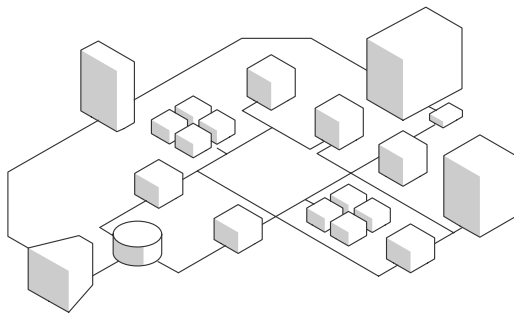
Today, this would be a major research project — even for an extremely sophisticated technology company. Within a microservices ecosystem, an IT department would be able to quickly prototype the different parts of the system — assembling best-in-class components from a number of vendors — and contracting out individual components (e.g., the machine learning model) to experts that can tailor state-of-the-art APIs into a bespoke microservice.

The App Exchange takes existing expert communities to the next level, enabling participants to be directly compensated for their contributions.

VALUE PROPOSITION

Wireline frees customers from the overhead and complexity of designing applications.

More than half of tech decision-makers say the current technology in place at their companies is a hindrance to innovation, underlined according to market researcher Insight Enterprises, and two-thirds of those managers are fearful of being disrupted. But yet, the largest part of their budget will go towards maintenance of existing equipment and infrastructure.

With the existing cloud development model, customer have to manage separate engineering and support departments, separate from the core business. With Wireline, customers focus on their business needs, rather than technology infrastructure.

THE CLOUD

The customer manages (and pays for) a complex network of virtual machines, databases, file systems, load balancers, and other arcane technologies — requiring an army of hard-to-find (and expensive) experts.
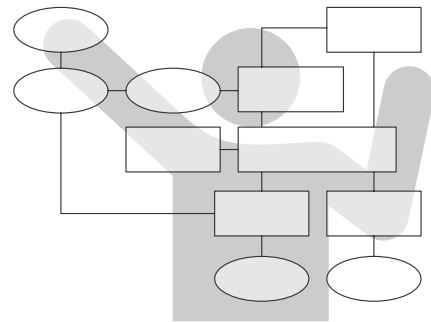
WIRELINE

WIRELINE is an ecosystem where applications can be assembled from thousands of existing, supported components.

For example, in response to a customer product enquiry, a developer could create a quick prototype, submit this to the App Exchange and work with the customer to refine the solution. The customer would be able to connect their own data and test integrations with their existing solutions.

Distributed Benefits
All participants within the ecosystem benefit
from the shared marketplace.

Businesses
> Lowered operational costs.
> Faster innovation cycles: frees individual business units from the centralized IT development bureaucracy.
> Reduced development and execution risk.
> Access to a broad expert community for support, professional services, and recruiting.

Developers
> Better tools to quickly develop and test services.
> A broad marketplace to monetize solutions and professional services.
> Access to a broad expert community for support and collaboration.

Service Providers
> Massively increased demand for infrastructure and high-value services by bringing access within reach of entirely new classes of customers and market segments.

The ecosystem narrows the gap between developers and businesses. This will fundamentally change the economics of enterprise software.

Businesses are already making the transition to serverless technologies. Wireline enables them to get started quickly, without deep in-house expertise, and without the cost and complexity associated with Cloud infrastructure.

Developers are already creating technologies that extend the capabilities of the serverless architecture. Wireline enables them to quickly monetize these efforts and find new customers and markets.

As new components, services and solutions are developed, more customers (from different industries) will be attracted to the platform. As the number of customers grow, more developers will be incentivized to create additional products and technologies.

As detailed in the next chapter, the virtuous cycles created by these participants in the market produce a progressively a richer application ecosystem to grow, and a knowledge base to to expand. A vibrant ecosystem will lead to new categories of applications being developed. Specialty applications merging data from corporate systems and machine learning service would not necessarily be a high-risk medium-term corporate IT experiment, but rather assembling of components. Similarly in the emerging blockchain and smart contracts revolution, a variety of implementation of oracles - compute resources with access to data off of the blockchain - could be developed by third-party developers. Furthermore, there may be compute use-cases and models not yet contemplated by the Wireline staff.
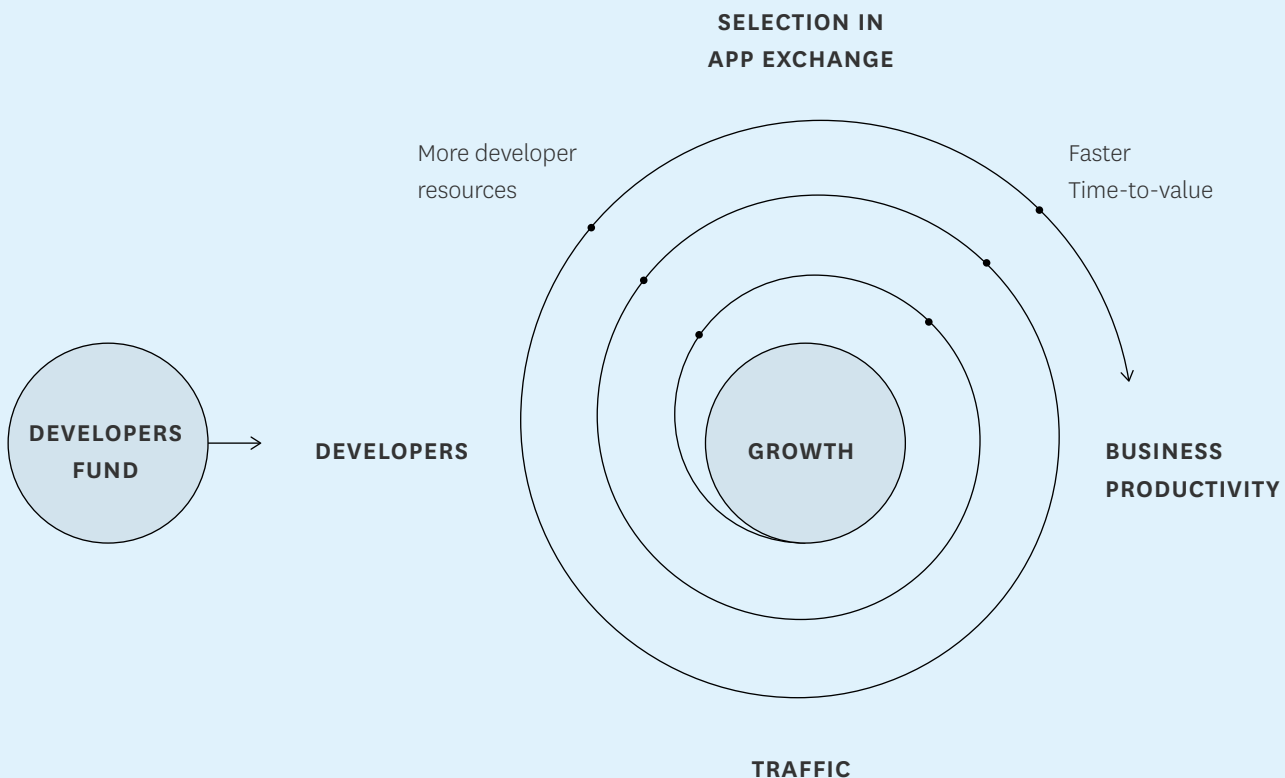
THE WIRELINE ECOSYSTEM

At its core, Wireline is a platform for Cloud-scale business applications. However, the Wireline's principal innovation is to narrow the gap between developers and businesses via the Wireline App Exchange. This enables open source developers to monetize their efforts, and businesses to gain leverage from the extended open source community. In addition, the Wireline Development Fund (described below) will act as a catalyst.

The combined effect of this strategy is to create a thriving ecosystem for business applications.

However, that natural synergies between the different agents creates a positive feedback loop that acts like a flywheel.

Most open source projects today do not receive direct funding. The Wireline App Exchange enables successful projects to bring in revenues — either based on pay-per-usage models, or for premium features and support. In turn, businesses derive immediate benefits from being able to quickly onboard new technologies, and influence the priority of the development of new features. As more businesses join to the platform, this creates greater opportunities for developers.

SELECTION IN
APP EXCHANGE

More developer resources

Faster Time-to-value

DEVELOPERS FUND

DEVELOPERS

GROWTH

BUSINESS PRODUCTIVITY

TRAFFIC

THE TOKEN ECONOMY

A token-based economy has direct benefits for
all participants within the ecosystem.

First, tokens lower friction within the marketplace. There are lower set-up costs (for producers) and lower transactional overheads (for consumers); there are no currency conversion costs (and, therefore, greater stability across currency fluctuations); and there is the ability to create micropayment and sharing-pricing models (across multiple vendors).

For example, developers may bundle multiple services (natural language processing, translation, sentiment analysis) and split revenues; this is currently extremely impractical (the need to set-up individual payment accounts with each service supplier).

Second, the token blockchain brings transparency. All participants can view all transactions. They can see who the most successful developers are; the businesses (and industries) that have the largest demand for services — and what kinds of services are in demand (or underserved).

Third, tokens confer status. Developers who have earned large token holdings will be recognized as experienced and reliable contributors, who have a stake in the ecosystem. They can be incentivized and retained with a variety of rewards.
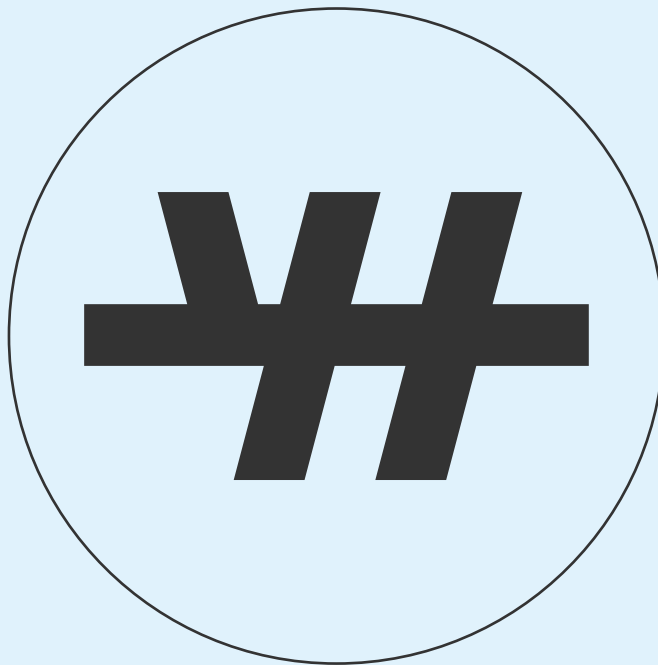
AGENTS & PARTICIPANTS

Agents within the ecosystem will use tokens in different ways. Fundamentally, customers will use tokens to pay for usage of services, and for developer effort (custom development, support, training, etc.) Developers receive tokens as compensation, but will also use tokens for the use of other services.

The marketplace itself will determine the value of the tokens in use.

(A) **Activity**   (T) Token Utility

Developers

Developers receive tokens for the use of services deployed to the registry, and for professional services (support, training, etc.) They are free to set their own pricing models (e.g., freemium, pay-per-usage, volume discounts, support-tiers, etc.)

Token holdings confer reputational status to developers. Participants can see individual developers' "earnings", which imply customer satisfaction, level and frequency of participation, and commitment to the platform.

Reputational systems are common within open source community (Stack Overflow, Github, npm, etc.) In fact, it's an essential mechanism for discovery and quality-control.

(A) **Development of microservices**
(T) Payment based on usage.
(T) Tokens confer status within the community (e.g., most trusted developer).

(A) **Custom development and integration**
(T) Direct compensation for client-specific work.
(T) Compensation for additional services (support, training, etc.)

(A) **Wireline infrastructure development**
(T) WDF incentives for the development of critical (strategic) components for the platform.

(A) **Good citizenship** (forum contributions and moderation, bug fixes, educational articles, etc.)
(T) Donations from the community.
(T) Grants proportional to the value to the community (e.g., positive ratings.)

Businesses

Businesses use tokens to pay for services and custom development. Amazon AWS has a concept of reserved instances: prepayment for compute time at a later date. Wireline's model maps to this, by giving businesses with higher stakes in the ecosystems (holding tokens) progressive discounts on compute time.

(A) **Microservices**
(T) Transactional (per-usage) payments.
(T) Tiered pricing for premium features.

(A) **Custom development**
(T) RFPs (bids) for proprietary development and
(T) integration.

(A) **Professional services**
(T) Support, maintenance, and training.

Platforms Providers

Wireline infrastructure and services run on external platforms, of which there will be multiple vendors (e.g., AWS, Google Compute Cloud, Microsoft Azure, IBM Cloud, Digital Ocean, etc.)

(A) Infrastructure services (hosting, compute time, database, proprietary APIs, etc.)
(T) Wireline pays wholesale rates for compute time, in fiat currency.

Wireline Inc.

The Wireline Corporation will also be a major agent within the ecosystem. As the maintainer of the platform, Wireline Inc's business model is to source compute time and resell the compute time with the value-added services and applications to business users. These services and apps are bundled in the corporate price. Wireline has supplementary revenue from service marketplace fees for procurement and service offerings. Sourcing compute time, and developing value-add services effectively, and distributing royalties are Wireline Inc's principle costs.

(A) Infrastructure resources
(T) Receives payments from Corporate for compute
(T) time in WIRE token and fiat.

(A) Application royalties
(T) Pay royalties to developers in WIRE token.

(A) Service Brokerage
(T) Service Marketplace fees are collected from Buyers and disbursed to providers in Wire Token (minus Wireline Inc's service fee).

(A) Advocacy and platform development
(T) WDF grants.

Other Agents

While not part of the existing ecosystem. There are other, more speculative, use-cases relevant to the ecosystem which involve the WIRE token.

Application End-users
A Wireline payments service would allows corporate users to collect payments from its end-users.

(A) An end-user of the Business pays for services (SaaS service or other)
(T) Business accepts WIRE token alongside fiat from end-users.

Complementary Ecosystems
Over time, Wireline may not be the only platform using WIRE as a rewards incentive for a developer community. Wireline may fund grants to organizations besides Wireline to implement

(A) A third-party organization devises a rewards system using WIRE token.
(T) WIRE tokens would be exchangeable for services on third-party organizations complementing the Wireline Ecosystem.

THE WIRELINE DEVELOPER FUND

The Wireline Developer Fund (WDF) was conceived of to support the long-term sustainability of the ecosystem.

Open-source software faces certain economic challenges impairing the long-term maintenance of applications, documentation, and developer support. The most successful open-source initiatives have corporate sponsors or an umbrella foundation (such as the Apache and Linux foundations). The Wireline fund serves as a hybrid model where developer advocacy is achieved by the distribution of funds to the community.

The WDF will be established through the token crowdfunding event described below. The principal advantage is sourcing contributions from the economic agents most interested in the development of the Wireline ecosystem: Businesses and Developers.

Seeding the Registry

Wireline has already developed a core platform and tools to enable the development of Cloud-scale applications. In order to broaden the reach of the platform, the WDF will encourage the development of foundational components, through a transparent RFP process.

During In the procurement process all bids from applicants will be public. Wire token holders will be able to ask question and comment on the proposals to signal the relative quality and value of the applicant's services. All bids will be evaluated by the WDF committee and payments to fund the winning projects will be publicly visible on the Ethereum blockchain (using the WRL Token).

Some of the foundational components which will be seeded in this process will include:

Category	Examples
Tools	IDE integration, deployment, testing, documentation.
Infrastructure	Message queue, event scheduler. state management.
Integration services	OAuth providers, adapters to existing SaaS providers.
Database services	Database-as-a-service bindings, query and synchronization protocols.
Transactional services	Payment systems, blockchain integration.
Monitoring and Security	Logging, alerts, encryption.
Applications	Content management, CRM.

Note, in many cases, these components may be adapted from existing high-quality open source projects.

Growth

Sustaining the growth of the ecosystem will require the WDF to directly engage with and support corporate users.

Function	WDF-sponsored initiatives
Vertical integration	Development of vertical-specific business components and integration services.
Maintenance and Support	Development and support of a professional services marketplace.
Training and Education	Conferences, workshops and webinars.

As the Wireline Ecosystem matures the WDF will act to expand the stakeholders in WRL token and the Wireline Ecosystem. For example, a forum or message board focusing on Node.js or Python server applications, could implement a rewards-based systems on WRL tokens, and the WDF may fund an initial grant of tokens to establish this economy.

Governance

Projects selected for participation and funding determination will be conducted through the WDF steering committee. The committee will initially be made up of current Wireline employees and advisors. Over time, the committee will include active members of the community.

TOKEN LAUNCH

Wireline will mint and distribute an ERC-20 Ethereum token, which will be the unit of account for the Wireline Marketplace.

Guiding Principles

The platform's guiding principles have been designed to establish stability and transparency for all participants. These are not intended to be an exhaustive codex of interactions regarding Wireline's use of WRL Tokens, but rather a framework for maximum transparency and good stewardship of the developer community.

1. **Token Cap:** At launch, Wireline will mint 100% of the tokens. No further tokens can be created.

2. **Release Schedule:** Wireline Inc. will drawdown no more than 2.5% of outstanding tokens every three months from the WDF. The tokens will be allocated by Wireline to independent developers (and other participants) who are working on core parts of the ecosystem.

3. **Post-Sale Liquidity:** Tokens are locked for trading until the platform reaches general availability, targeted Q1 2018.

Issuance

LAUNCH EVENT

The token launch is scheduled for Q4 2017. The Wireline Development Fund (WDF) will mint a total of 3 billion WRL tokens (1 USD = 10 WRL); no additional tokens will be created after this first issuance.

Distribution of Proceeds

The funding goal for technical development is $20 million (200,000,000 WRL). Upon completion of the token sale, those funds will be disbursed from the WDF to Wireline, inc. to execute the Wireline development plan above. Funds transferred to Wireline Inc. will be used for internal engineering, external platform service fees, acquisitions, and other capital expenditures relating to the ecosystem.

Developer Fund Tokens

Unsold Wireline WRL tokens will be held by the Wireline Developer Fund and will be governed by a scheduled release of 2.5% per quarter. Those funds are exclusively destined to developer evangelism, open-source software grants, and ecosystem development by the Wireline Developer Community.

Team Tokens

Employees, founders and advisors incentivised by a token vesting schedules of four years with a one year cliff (no tokens distributed until first anniversary). Two percent of issued tokens will be allocated to the team token pool. Any tokens not disbursed from the token pool, will remain for future hires.

TEAM

Founding Team

Lucas Geiger
Co-founder
Keyscores, Founder
Reddo Consulting,
Managing Partner

Rich Burdon
Co-founder
Google, Staff Engineer
Google Cloud, Google Inbox
BEA/Oracle, VP Product

John Merrells
Co-founder
StartX, Lead Mentor
Shape, Consulting Architect
Sencha, Architect

Dr. Massimo Di Pierro
Professor DePaul University
High Performance Computing
Creator Web2Py Framework

Nicole Miller
Media & Investor Relations
Thomson Reuters, Global Head
of New Ventures

Advisors

William Harris
Salesforce, Director
Product Management
Yahoo, Product Manager

Bruno Orsini
Google, Sr. Business
Development Manager
Android, Chrome & VR

Paulo Kaiser
IBM Bluewolf, COO
Thomson Reuters, Global
Head Business Operations

Ron Quaranta
Wallstreet Blockchain
Association, Chairman

Saul Hudson
Call42, CEO
Thomson Reuters News,
General Manager Americas

Shehriyar Antia
US Federal Reserve,
Senior Policy Advisor
Macro Insight Group