

# Federate This

## Campaign Document

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## EXECUTIVE SUMMARY

### Objective

To be the backbone of the Federated Servers running the Factom protocol. To take an active part in a role as a Standing Party. To lead development of best practices. To support the community and its growth. To be as efficient as possible whilst meeting our goals. To introduce blockchain technology to the Aviation Industry.

### Operations

'Federate This' has formed with 3 branches of our operations. Our priority is the protocol. That means our first expenditure will always be towards maintaining and developing our infrastructure. Secondly we are developing a suite of applications for the Airline Industry under project name '*Off-Blocks*'. Meanwhile we are coordinating a Factom PR team across a truly global network.

### Infrastructure

We have tested a range of infrastructure on the testnet, including guards and hot spares. We've used an array of host providers, operating systems and locations to maximise diversity. Our preference is to use dedicated bare-metal servers, built with redundancy in mind. A support partner gives us 24/7 backup. On a Zabbix monitoring server, we use a OpsGenie plugin for escalating alerts.

### Community

We continue to contribute to the community. After M3, we will be running 3 nodes on the testnet. Helping newcomers across platforms. Rene (Flying\_Viking) is now Testnet Administrator, planning to apply for the long-term role. Additionally we're offering services to support current and aspiring operators in the set.

### Project Timelines

We've set near-term targets to meet that will drive us forward.

- Weekly team meetings, working group structures.
- Monthly infrastructure reviews/upgrades to remain at the forefront.
- App Development workshop scheduled for June. Produce first '*Off-Blocks*' prototype.
- Team of crew have been sourced. Target list compiled by end of May.

# CORPORATE

## Structure

We have founded two companies in the UK - registered with companies house - that our operations will fall under; 'Federate This' and 'Off-Blocks'.

- - 'Federate This' manages the node operations and PR/Marketing.
- - 'Off-Blocks' is an App being developed for the Aviation Industry.

Both companies are incorporated in London. 'Off-Blocks' holds a registered trademark and has started the filing process for an international patent under the PCT.



\* subsequent name change to Off-Blocks LTD

## Off-Shore

'Federate This' is taking advantage of it's U.A.E base of operations to open an off-shore office. This provides us an environment free of income, capital gains, corporate and sales tax - whilst allowing 100% capital repatriation to the UK under the double tax treaty, applicable to free-trade zone's of the U.A.E.

## Banking

'Federate This' has proactively taken every measure in securing our banking methods, for both Fiat and FCT.

## MEET THE TEAM

Federate This is comprised of a global team - working together to further the Factom protocol, and accomplish our goals.



**Colin Campbell**  
FOUNDER/MANAGER

Our Manager from the UK - Colin is an Airbus A380 Pilot, with additional work in Flight Ops: Risk Analysis department. Previously ran Flight Operations at a private airfield in the UK. Based in Dubai - you'll find him on community Discord as BobbyEK.

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**Shana Cardoso**  
LEAD MARKETING

After studying Strategic Communication and Marketing at Penn State, Shana worked in several countries before settling in Dubai - She leads a targeted, professional marketing campaign; coordinating our efforts across a global network.

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**Robert Nicholls**  
APPLICATION TESTING

A 40 year industry veteran - working in a variety of roles. Today Bob works in Flight Ops: Support; testing new technology, devices and applications in the flight deck. He's mentoring the development from concept to implementation of our 'Off-Blocks' application.



**Rene Pedersen**  
SYSTEMS ENGINEER

Our Systems Admin/Engineer from Denmark - Rene has been building and running servers for 20 years. He brings a wealth of technical expertise to the team. He's also a Boeing 777 pilot - so you'll find him on community Discord under the name Flying\_Viking.

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**Tom Syckelmoore**  
GRAPHIC DESIGNER

Our Graphical Design specialist based in London. From a background in Photography, Tom moved into design - gaining 5 years professional experience in marketing. Tom will be designing our websites, app interfaces and promotional packs for clients.

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**Larsen Data**  
MAINTENANCE SUPPORT

Based in Denmark - Larsen Data is an IT services company, founded 2001. Specialising in internet hosting, they're best known for GratisDNS. Larsen Data gives us a 24/7 systems response team on standby, when other members are not available.

## KEY FACTS

### Community Contact

Name	Email	Phone Number	Discord
Colin Campbell	XXXXXXXXXX	XXXXXXXXXX	BobbyEK
Rene Pedersen	XXXXXXXXXX	XXXXXXXXXX	Flying_Viking
Larsen Data	XXXXXXXXXX	XXXXXXXXXX	
OpsGenie		XXXXXXXXXX	*data protected

In case of emergency maintenance, please phone in order: 1) OpsGenie, 2) Rene, 3) Colin, 4) Larsen Data.

### Node Reliability

We demonstrated reliability on the testnet over 45 days; Persistent uptime outside of known maintenance and proven response to unplanned network issues.

### Response Time

Maximum response time is mandated at 60minutes. However, we endeavour to be reachable at all times.

### Technical Spec

Authority Servers have min.spec; Dual Xeon E5-2620v4; 12 core - 128GB RAM - SSD in RAID10 - 1GBit.

**Please note:** High Spec due to running a roaming Virtual Hot Spare - therefore needs to be comfortable handling 2 instances when asked - overall more cost-effective than having a separate machine running 24/7.

### Efficiency

'Federate This' pledges the maximum 50% efficiency. We think it is of paramount importance to fund development of Factom Core projects - and attract talent to the protocol.

### Location

Our Authority Servers are hosted in Nuremberg, Paris, and Los Angeles. Our Guards are hosted in Strasbourg, London, New York, Sofia, Roubaix, Montreal and California.

## OPERATIONS

### AUTHORITY SET

In keeping with best practices, ‘Federate This’ has built its infrastructure around redundancy, security, performance, and diversity.

We looked at a variety of hosts, locations and server options around the world.

As Governance was subject to change - we’ve prepared for differing scenarios, from 1 up to 3 Authority Servers. We aimed for maximum diversity, to minimise risk to the network.

Hosts provide all the redundancy features you would expect in a professional facility, as well as 24/7 hardware support. All hosts are minimum Tier 3 or equivalent facilities.

### Monitoring

We have deployed a **Zabbix** server to monitor all of our infrastructure, the Factom process as well as the Factom network itself.

By monitoring Block Heights and Queues directly on the server we will be able to detect possible stalls and be notified as it happens.

Notifications generated either by our own monitoring solution or from external contacts will be handled via Slack as well as **OpsGenie**.

OpsGenie will be able to handle alert escalation, **from sending emails to voice call** and can be customised with schedules for who to contact and when.

Escalation will be done first to our own staff and then to our external support partner after a predefined time.

### Maintenance and Support

Although we can confidently cover any maintenance or restart action required by the protocol, the need for an instantaneous response cannot be **guaranteed** around the clock by any individual over prolonged periods.

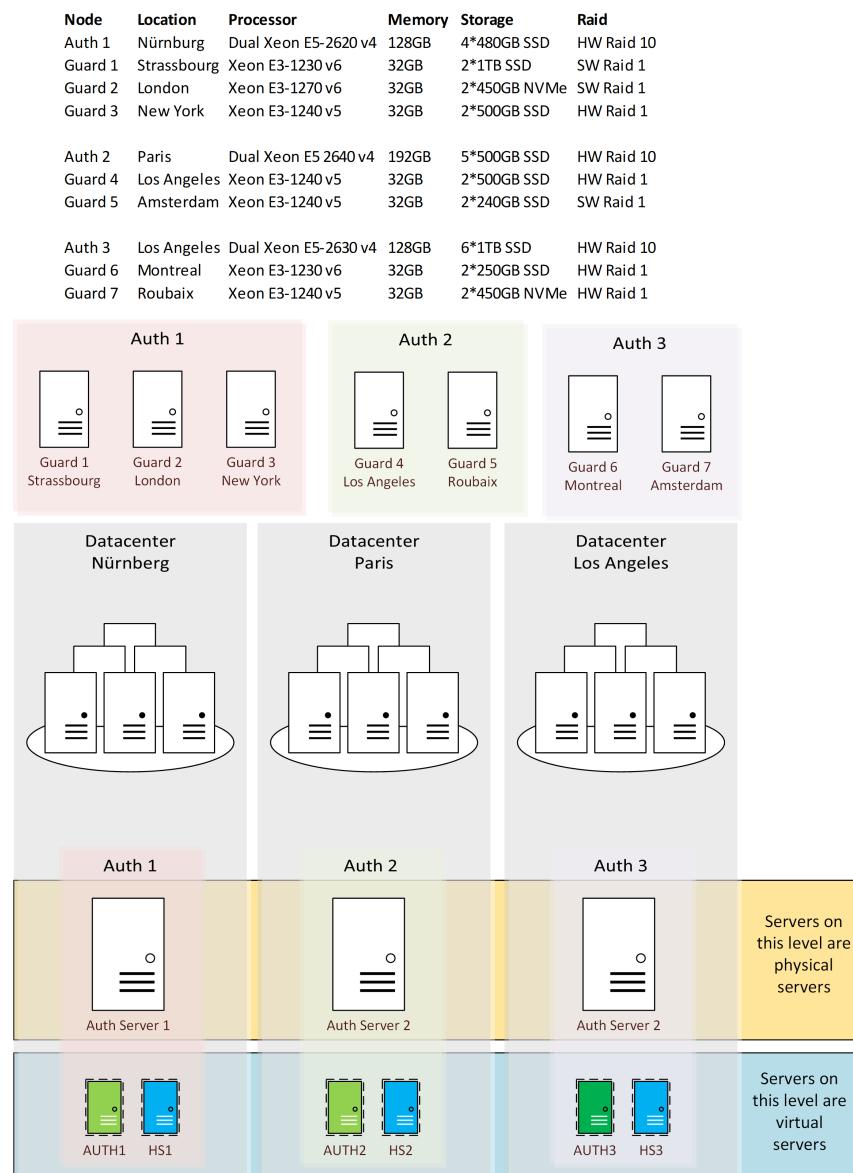
Therefore we engaged the professional services of ‘*Larsen Data*’ to provide a 24/7 support team as backup.

## Arrangement

For this campaign, we propose Authority servers, each of which runs 2 virtual machines. The first virtual machine runs the Authority Node, the second runs a Hot Spare.

In front of our Authority Servers, we'll position Guard Nodes. Guard Nodes are at the recommended highest spec asked by the protocol. Only they connect to outside users, as the public face of '*Federate This*' to protect against attacks.

The Hot Spares enable a blue/green update, or 'brain swaps' during maintenance.



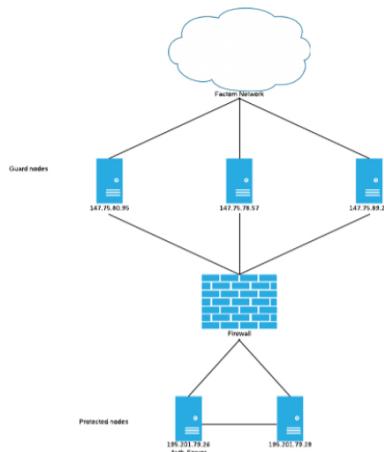
See above for a graphic representation of our infrastructure prepared, including hosts and locations. Please note: This arrangement is adjustable depending on allocation.

## Guard Nodes

'Federate This' has established guard nodes on the testnet - by protecting a server behind 3 guards - Further, we have successfully brain swapped that server whilst maintaining the Guard nodes in front.

It's our opinion that **number** of Guard nodes is more important than spec, alongside diversity. For the guards to best serve their purpose, we've sourced them not only geographically, but from a variety of providers.

Before Factom has released the `-exclusive_in` code, we found a way to make it work through private firewalls, and released this information to the community to benefit them and the protocol. On mainnet we'll gradually introduce these during rollout as the network stabilises.



## Interconnectivity

Our network of Authority and Spare nodes are interconnected behind our private firewall to increase resilience.

## Testnet Community

We started on the testnet March 6th - we quickly expanded up to 7 nodes. 5 published and 2 for testing. We've taken part in the Slack community, the original Discord and now the latest version.

Next - we successfully **rebuilt factomd on FreeBSD** - and have carried out regular **brain swap** of our 2 Federated Servers and Followers nodes, including the FreeBSD node - proving the concept. We **trialled guard nodes** on the testnet, for which we happily shared documentation.

Rene (Flying\_Viking) is now jointly **interim testnet administrator**, and will apply for the full-time role after M3.

Rene has 20 years experience in the field.

## BUDGET

### Flexible budget -> Flexible Plan

The reward is fixed. However the fiat value of that is subject to large variance. We sourced a lean operation to support our Authority Servers. We've hidden data as we deem it commercially sensitive:

Description	Quantity	Av. Price/M	Cost
Authority Server	A	US\$B	US\$AB
Guard Node	C	US\$D	US\$CD
Overflow Bandwidth*	E	\$F/gb	US\$EF
Testnet Server	G	US\$H	US\$GH
OpsGenie Users	R	US\$S	US\$RS
Aux Server	J	US\$K	US\$JK
Website	M	US\$N	US\$MN
<b>Total</b>			<b>Data protected</b>

Cost savings of up to WW% have been identified via long-term contracts with our hosts. Some hosts provide limited bandwidth.\*

Fixed Reward	FCT	(1)(2)(3) x 1123	
Fixed Expenditure	US\$	Protected	
Breakeven FCT Price	US\$	Protected	

Efficiency %	3 Server B/E	2 Server B/E	1 Server B/E
30	\$XX/2358fct	\$YY/1572fct	\$ZZ/786fct
40	\$XX/2022fct	\$YY/1348fct	\$ZZ/674fct
50	\$XX/1686fct	\$YY/1123fct	\$ZZ/562fct
60	\$XX/1347fct	\$YY/898fct	\$ZZ/449fct
70	\$XX/1011fct	\$YY/674fct	\$ZZ/337fct

## SUPER NUMERARY OPS

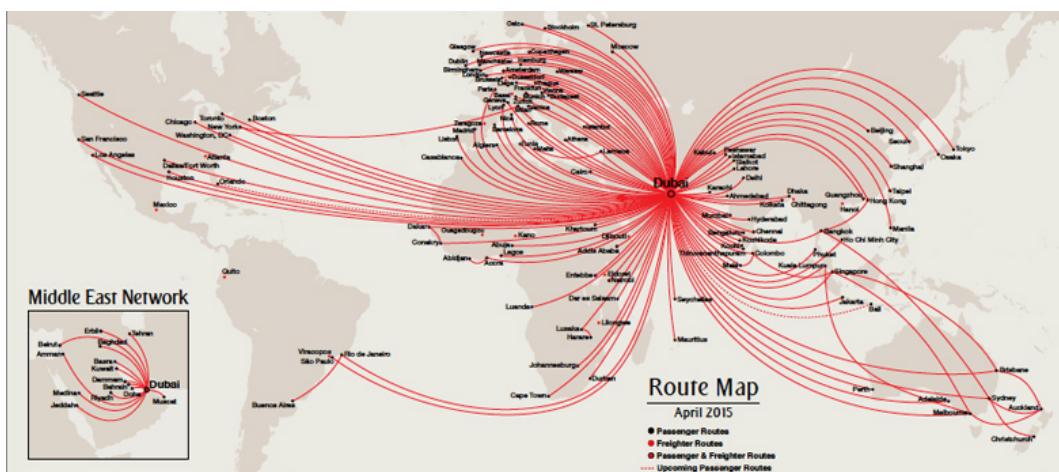
### Introduction

Our 'Supy's' are select Flight Attendants who fulfil two roles for us; language specialty - and international services. They are our feet on the ground in 84 countries, with local knowledge and contacts.

With a team of Flight Attendants ready on an ad-hoc basis - 'Federate This' shows it's competitive advantage; Combined we travel to 40-50 cities globally per MONTH across the network. This gives us unparalleled access to key markets.

Those chosen are again, people we already know and trust. Together we can speak a multitude of languages - including Mandarin, Japanese, Hindi and Arabic. This team can be quickly scaled up or down to match our operations.

Led by Shana, 'Federate This' will be bringing Factom to the world.



### Aim

Our hope is to build traction amongst key markets well ahead of the Factom Inc team. We'll be putting in the leg work, to establish name recognition and generate enquiries from around the world. Connecting them with the right people, in a facilitatory role, and on-boarding users to the testnet through our admin position.

The campaign will work in three global sweeps:

- 1) Global brand awareness - Factom.
- 2) Targeted promotional packs - list of developers/clients.
- 3) Follow-up meetings - direct contact.

### **Targeted Strategy**

We are putting first efforts into the biggest economies; United States, China, Japan, Germany, U.K, India, France, Brazil, Italy, Canada.

Also high GDP/capita economies like Hong Kong, South Korea, Singapore, Australia, NZ, UAE, Switz, N Eur.

We are actively building a list of hundreds of targets in these markets, primarily around the existing products of Factom Harmony/dLoc. This comprises mostly Fortune 1000 companies, governments, IT solution providers but of course any potential user of Factom, no matter their size.

Outside of Factom Harmony - we'll additionally target developers to build awareness, training, and new solutions using Factom.

## **How it Works**

Through our crew, with their language skills and local knowledge we can easily establish and maintain new relationships in foreign markets, usually difficult to access.

Whilst our focus is on furthering usage of the protocol, we anticipate it to be beneficial for FCT investors.

### **Organic Marketing**

We plan to take advantage of our footprint to promote the protocol via organic marketing where possible - this means generating real interest in Factom without paid advertisements to grow an authentic audience. We can do this through our active physical presence, to make direct contact with our list of targets. We aren't just tagging online - we're visiting their offices and progressively engaging them, **based on interest**.

### **Inorganic Marketing**

We also plan to use our footprint to effectively manage and oversee a series of paid marketing efforts around the world. This can include everything from Billboards, to TV, Radio and event sponsorship. Our advantage is speaking the local language, allowing us to avoid inflated 'foreigner rates' - as well as facilitate relationships.

### **Paid Social**

The internet is a powerful digital marketing platform with huge potential reach, yet the cost of this 'paid social' still falls behind traditional methods. Outside of our own local marketing campaigns - we'll be adding to community efforts, via social media platforms, ad placements, and in-search results such as adwords etc.

## Scalable Operation

This will be a completely flexible plan. Our team for example, live in a company building with +400 other Flight Attendants - they are readily sourced. Further, we have access to 23,000 Flight Attendants in Dubai with 120 nationalities and every spoken language.

We can see who is operating each flight in advance, so we can obtain services to any of our 146 destinations to match specific needs. We have cost effective staff travel, allowing us to personally visit targets on a whim.

This is to say, we will be constantly travelling around the globe, staying in 84 countries - a truly worldwide footprint with or without the protocol - So let's use that!

## Promotional Material

As part of our organic marketing, our Graphic Designer Tom Syckelmoore, will be producing professional presentation packs to be directly delivered into the hands of our targets. Our team of are will be translating this for us, without risk of non-sensical google translations.

**Having this personal touch, delivered in native language, will be the most effective means of marketing the protocol worldwide.** Tom's also going to design larger advertisements, to be placed on a variety of visual mediums - such as Billboards. Some examples of his work are below.

We simply plan to highlight the use-cases and its benefits over other platforms - whilst pointing towards existing solutions such as Factom Harmony and dLoc. All official licensing will be obtained prior.

With Lead Marketing, Shana Cardoso building these contacts **prior** to solicitation - we hope to stimulate organic growth over time.



Through the combination of our campaigns, we'll be generating awareness, knowledge and interest in the Factom protocol - **to be connected with Factom Inc.** for follow-up. We hope to be a global extension of the community with view to organising information sessions for targets, and live demos with the Factom Inc. team.

## VARIABLE EXPENDITURE

### Scalable Business

As we are subject to the fluctuations in FCT price - we have designed a business plan that can scale, that isn't tied down with contracts, can be dissolved, and that can match our budget at any time.

Any 'big ticket' items will be applied for through the grant pool to be ratified by the community.

Please note: We do not take any salary. Our financial incentive is in completing 'Off-Blocks' and existing investments in Factom Inc (FFWD) and FCT.

	Quantity*	Price per Unit**		Cost	
Promo Pack Production	300	US\$	X	US\$	300X
Travel (free)	100	US\$	0.00	US\$	0.00
Expenses	100		Y FCT		100Y FCT

\*variable rate  
\*\*data protected

The format is to assign a manageable 3 targets in each city for our crew to visit. They have 3 packs and a business card per target to leave with our established contact. To collect FCT, they must take a picture with the pack inside the identifiable locations and Shana will follow up with the contact.

Our crew are willing to take 'compensation for expenses' in FCT:

- 1) This avoids contractual issues with their employer.
- 2) Incentivises them to do a good job, keep FCT invested.
- 3) Budget stays inline with income.
- 4) Adjustable FCT Exchange rate. Capped at \$100. Minimum at \$20 equiv.

We hope they can share in our success.

## OFF-BLOCKS

### Foreword

'Off-Blocks' is a suite of applications in development for the Aviation Industry.

Air-Traffic statistics show an average of 103,000 commercial flights, carrying 12 million passengers per day; Aviation continues to be one of the biggest growth sectors worldwide with demand in Asia set to double by 2036. On top of this airlines annually carry over 50 million tons of freight.

Airlines are subject to regulation and audit from all angles; government agencies, air-traffic control, airport operators, aircraft/engine manufacturers, insurance, financiers as well as consumer protection bodies. Airlines are faced with intense scrutiny and held to a variety of standards between jurisdictions.

Every flight, every aircraft, every pilot, must prove compliance on a daily basis. Failure to do so can result in fines and commercial penalties up to \$billions in implied damages from major accidents. With so much at stake - the matter of liability is central to the industry.

Blockchain technology gives us the opportunity to increase transparency, ensure compliance and ultimately safety for invested parties. '*Federate This*' is working to develop several prototypes using real data and real usage that can be rolled out across commercial and private operators. Just as Bitcoin gives the most benefit to the under/unbanked, 'Off-Blocks' will provide the biggest boost to small airlines/start-ups or those in developing countries.

We also see great benefit to flying clubs and schools as well as private pilots and other commercial activities (flying doctors/crop dusting/skydive/glider tugs etc), who still must comply with regulators but without the benefit of a large organisation behind them.

At '*Federate This*' - we have the insight and relevant experience of developing and testing applications within the industry. We have established working relationships with airlines, airports and government agencies.

Rob Nicholls is a veteran of tech testing who will mentor the project - and '*Federate This*' continues to work with Senior Airline executives on how to implement blockchain solutions.

Importantly, we have the people, data - and with Factom, the technology to build on.

'Off-Blocks' has the potential to transform the Aviation Industry - Powered by Factom.

## Applications

While we can identify many uses for blockchain on the business side, we have focussed on the operational. We've split this into 4 independent applications.

1. Flight Documents (Plans, Loadsheets, Fuel Receipts, Techlog etc)
2. Crew/Acft Documents (AoC, Medical, License etc)
3. Aviation Security
4. Maintenance

## 1. FLIGHT DOCUMENTS

Every commercial flight generates a lot of paperwork. For regulatory compliance, all required documents are filed and stored mandatorily for a period of 6 months. This is in case of investigation or audit.



This is clearly an imperfect system. Documents are readily lost, forgotten - or 'conveniently misplaced' as often happens after an incident in the industry, to avoid scrutiny. No-one can afford any fault apportioned.

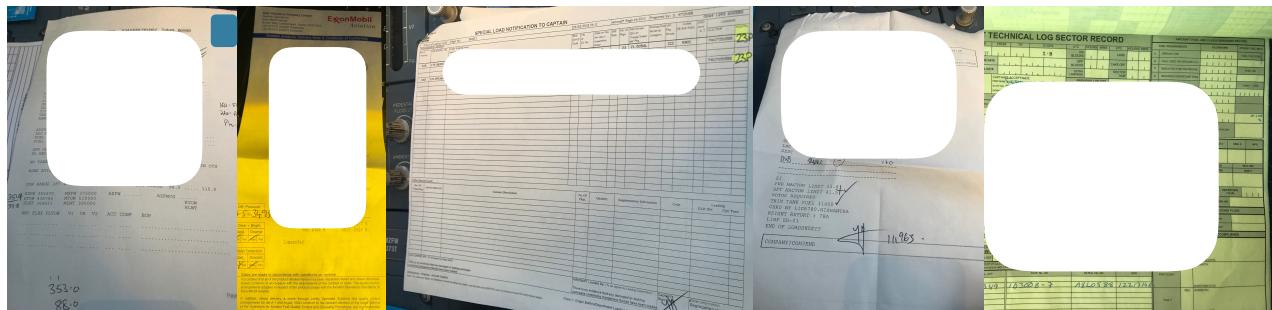
Immediately after 'filing' - the documents become impossible to track or manage. They're off radar!

With such a vast number of flights you can understand the industry is continually swamped with documents, that are required to be stored, yet have every incentive to go missing when questioned. Too bad?

### Solution

## FEDERATE THIS

Thankfully the industry has the bones of a solution in place already. There is a ‘dispatcher’ who collects the paperwork from the flight deck in the moments before a plane departs. Most of these documents are **already digitally produced**, just requiring a signature, an acknowledgement of acceptance before being hand filed.



\*commercial data protected

There is an industry move towards an e-techlog which will complete the digitisation of mandatory documents.

The solution we envisage is to simply have a **QR code** on these digitally produced documents, **let's create a digital identity for them**. When the dispatcher ‘collects’ the paperwork before the flight departs - instead of carrying it off and distributing for filing - they just scan the QR code of each document after its been signed/ accepted by the commander, and it enters onto a Factom chain created for that flight.

The application will have an open checklist - with the documents to scan getting ticked off. The Dispatcher can therefore easily audit a flight in real-time.

With time pressure, and delays punished - often aircraft dispatch without having the signed mandatory paperwork. What happens in industry today? Signatures are forged/scribbled, and numbers are fudged to avoid hassle. Missing documents that are known about are quickly forgotten about under the sheer volume.

Our application not only provides a **proof of work** of these mandatory documents for regulators - but serves as an **audit trail in real time**, allowing for omissions to be caught - ultimately increasing safety.

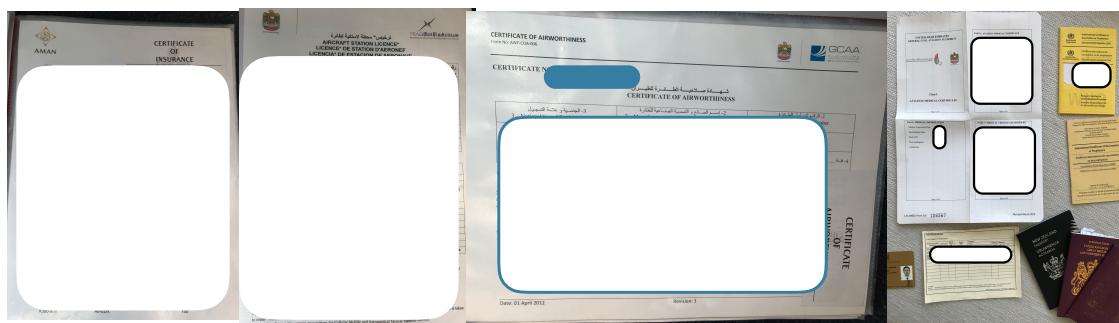
It also allows for confirmation, in the event of an accident investigation, that these were the documents/ information used - removing the ability of an airline/individual to corrupt data and avoid blame.

It makes operators accountable tomorrow - so they must comply today.

## 2. CREW/AIRCRAFT DOCUMENTS

There is another set of documents, that are associated with each crew member and each aircraft. These are fixed, and must stay with the entity. The first thing pilots do at work, is check each others documents for validity. The first thing pilots do on the aircraft, is check its documents for validity. Why?

Without valid documents a pilot cannot legally fly - without valid documents an aircraft cannot legally fly.



\*commercial and personal data protected

These documents are subject to outside audit - via real-time ramp inspection at any airport, of any country. E.g The US regulator, FAA, wants to know airlines operating into their country are complaint.

The issue is, documents are not industry standard. They are produced by the issuing authority. How can a US regulator possibly authenticate a Pakistani Airworthiness Certificate on the spot? Or Indonesian Pilot license? Especially under time constraints, where they have much to inspect in limited time.

In fact this is part of the reason why many airlines are banned from flying into the US. Their operations cannot be accurately audited, are not trusted - and so there is a legitimate safety question over their practices.

### Solution

dLoc Systems by Linxens - provide stickers to digitise documents, allowing for easy authentication and verification on the Factom blockchain. <https://www.factom.com/products/dloc>

From this we can easily track document expiry - amendments - and crucially provide verification to any regulator from around the world, that these are the authentic, valid documents.

Currently if just one of these certificates is missing, or damaged or expired the flight is cancelled, and plane grounded. Or if a pilot forgot his license at home for example, he cannot fly causing large delays; this comes at significant cost to an airline.

Our vision is, using this technology - regulators will allow the operation to continue in the event of lost/invalid documents, reducing cost of delay, as well as save the time it takes crew to manually verify every individual document prior to flight, as they do now.

### 3. AVIATION SECURITY

With Passenger safety, terrorism, drug smuggling, human trafficking - the term 'Aviation Security' is often replaced by 'National Security'. Airports work closely with airlines and regulators to establish best practices to counter these threats.

Yet we continue to see notable examples of failures. Whether it's the recent bombing of an aircraft in Egypt - a policewomen's gun accidentally carried across the world - kids ending up alone on the wrong flight - people travelling on fake passports - cleaning staff planting drugs onboard for cabin crew to smuggle in.



The system heavily relies on trust. The problem being a human one - we are naturally trustful and inherently lazy. Is that really you in the passport picture? Has that baggage scanner been tampered with? Did they actually check your plane ticket? Were the duty-free, cargo or catering items tracked securely - what does their supply chain look like? With so many contractors being given access to an operation of such scale - it's full of security gaps that ARE exploited.

A simple inside job or one complacent moment and the entire system is bypassed without reproach. ID's and secure areas? A man with a high-vis can easily enter secure areas without suspicion. Give him a clipboard and pair of chinos, he is unstoppable.

DHS's tests revealed 67 out of 70 attempts to smuggle weapons through US airport checkpoints were successful. Moving internationally, trying to protect your citizens and assets abroad - the scale of the challenge becomes clear. How do you trust a foreign security agency to do its job?

'Off-Blocks' can build a better system - using the blockchain - where proof of work and data integrity will enhance Aviation Security today, across international borders.

## Problems

After all we go through at airports, how do people still end up on the wrong planes, travel on fake passports, stolen credit cards, carry guns through security and smuggle drugs? Answer; not all at the same time!

Let's break it down:

1. You're all familiar with API , Advance Passenger Information. Every airline is required to collect this of you and hand it over to the government agencies, example US Customs and Border Protection.

At time of booking, you must submit your passport info, country of residence, and for US, address staying (foreigners).

This assumes you are acting faithfully, have an authentic passport belonging to you, and will use the same passport to leave the country with. Many people look fairly similar at a foreigners glance. Corruption of this central database?

Without established fingerprint, dental, blood records - how do we know who comes in to the country?

**Proposal - Factomise API - Track Boarding ticket - Verify that the person documented in the system is the one presenting themselves at check-in.** A glance at the ID picture is not enough. (Only some airports use fingerprint tech, and this only helps flag previous offenders logged in the system - not ID verification).

Combined with our long-term aim - **dLoc stickers on passports by issuing authorities, loaded with biometrics** that can be checked - we can restrict problems such as Human Trafficking, and Terrorism.



2. Think about your journey through an airport. You check in, pass immigration, security checkpoint, scan ticket at gate, board the aircraft. Your baggage also has a similar journey out of sight. As does duty-free and catering items. Are the IoT security devices tampered with? Are they working correctly?

Every stage is vulnerable to gaming, insiders, malfunction or complacency.

**Proposal - By modelling passengers/containers journey as a supply chain on Factom,** we can ensure procedural compliance at each security stage and close the holes by ensuring proof of work, and in turn, remove the opportunity for rogue actors. We can start this by tracking their boarding pass.

3. **Hacks.** (Tech in Development) You usually submit credit cards, addresses, email and phone numbers. And this database is subject to corruption or hacks like anything else. Anyone with access to this database can bypass National Security by changing this Advance Passenger Information, or commit fraud by changing payment details, or upgrading themselves, or even change flight by amending the booking reference.



Once hacked - How do you go back? With 12 million passengers in the skies, how do Border Protection quickly know what passenger information is correct and what isn't? Who is really arriving at their borders? It becomes a matter of National Security.

#### Other Airline Hacks:

<https://null-byte.wonderhowto.com/how-to/hackers-use-hidden-data-airline-boarding-passes-hack-flights-0180728/>

<https://www.independent.co.uk/news/world/americas/computer-expert-hacks-into-plane-and-makes-it-fly-sideways-according-to-fbi-10256145.html>

<http://www.scmp.com/tech/enterprises/article/1845102/united-airlines-hacked-china-linked-group-believed-responsible>

<https://thepointsguy.com/2016/09/college-student-earned-15-million-miles-hacking-united/>

Proposal: Stop root access to Airline databases. Combine Identity Ledgers and multi-factor Authentication tools on the Factom Blockchain— with decentralised end-to-end encrypted storage using STORJ's private lockbox - We can then hash each identity and piece of information - using Multi-Signature tools (in development) we can assign different information at different levels.

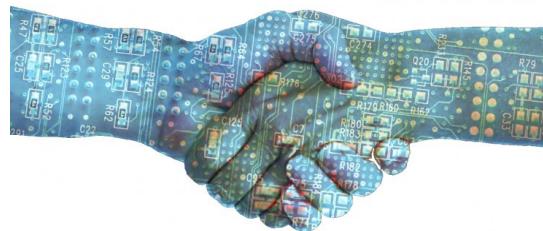
As demonstrated here - <https://www.factom.com/blog/factom-use-case-protecting-sony-pictures-with-blockchain-technology> - again please note - this is conceptual tech in development by Factom Inc.

4. Trust across borders - So assuming we trust the database, and the foreign security procedures, there is an Automated Targeting System for inbound passengers - This takes all the data collected and assigns passengers a score for how likely they are to be a 'person of interest'.

Well the problem is as I found out, flying from Copenhagen to London - over the coast of UK we got a message saying LAND ASAP at Nearest Airport- Security Alert!! So we diverted and were instructed to a remote location... armed police storm the aircraft and drag off a 12 year old boy..... who happens to share a name with a known terrorist. He was on a school football trip.

My immediate reaction was: This kid provided his advance information, checked in, went through immigration, a security checkpoint, scanned at the gate, boarded the plane and got airborne - and yet the UK still thought there could be a problem. Was there no easier way for the UK Border Agency to trust his identity?

Even with all the info available, and checks in place, the level of trust across borders is non-existent.



## Solutions - TLDR

'Off-Blocks' has a lot of work to do in this space, we need to:

- Confirm Identity by factomising API and one day dLoc Passports
- Create Supply Chains for Passengers/Containers going Airside.
- Tamper proof IoT devices at checkpoints.
- Secure databases with Identity Ledgers and Multi-Sig tools (in development)
- Allow Trust across Borders
- Combat culture and language differences

Through Factom, 'Off-Blocks' can strengthen Aviation Security, and with it, National Security.

## 4. MAINTENANCE

The documentation of an aircraft's maintenance is critical to stakeholders. Aircraft are expensive assets - e.g list price of an A320 is \$110m. This pales in comparison to the total cost of an accident - in terms of compensation, insurance and brand image.

Several years ago, easyJet calculated that the total assumed cost to their company of a catastrophe was £7-800m for an A320 with 180 fatalities. The board carelessly boasted to its staff that with £1.6billion in the bank they could now afford 2 crashes! That's accountants for you.

The race to establish liability in any incident is worth a lot of money.

The regulator blames the manufacturer. The manufacturer blames the airline. The airline blames the pilot. Each is invested in manipulating the records to their benefit in a number of crafty ways.



Maintenance schedules all revolve around flight cycles, days or flying hours. So the legality of each part, each engine, and each crew depends strictly on an accurate audit trail of an aircraft's movements.

Without it, it could invalidate insurance, leasing arrangements, manufacturer warranty or second-hand value.

But an aircraft is an expensive asset to keep on the ground, full of people that just want to get to their destination.

## PROBLEMS

### Flight Times

Flight hours logged vary from Aircraft Techlog, to Aircraft Detected hours, to the Pilot logged hours. So with all invested parties dependent on accurate time keeping, it's easy to lose track.

The Techlog and Pilot Logbook are done by hand, subject to human error or manipulation. The Aircraft Detected Log is often lost in a glitch or can be corrupted by the pilot. So which of these 3 numbers is correct?



\*hmmmm, do i write what actually happened, or what I want to have happened?

A pilot is incentivised to 'round the figures up' - and an airline is incentivised to 'round the figures down'. This happens both in the present and post-date.

An aircraft with lower hours is a more valuable asset, and requires less maintenance. On the other hand, a Pilot with higher hours is more experienced, which can affect salary, and career prospects.

It may only be a few minutes per flight - but this accumulating error can soon grow into hours worth of discrepancy - which has a critical effect on the validity of an aircrafts airworthiness, insurance or crew legality.

Through **consensus** we can find discrepancies before they are forgotten. As this data would be **held accountable** tomorrow, it would have to be entered accurately today.

Flight hours are lost in a world of deceptive rounding errors. With so many counter parties invested in this one piece of data - Isn't it better for all involved, if we just kept to the truth?

"Factom - Making the Worlds Systems Honest. And Honesty is good for business". Sounds good to us.

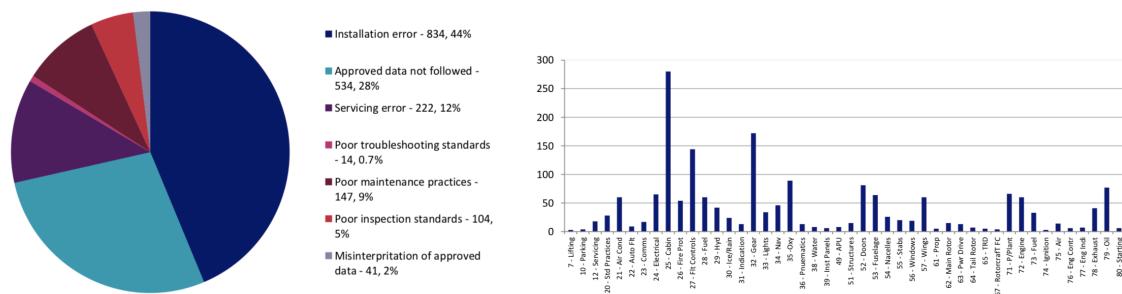
## Scheduled Checks

An Airbus A380, for example, has 4 million individual parts to track during manufacture, assembly, operation, repair, through to sale or replacement. Each part has its own lifecycle which is documented from the start.

On top of regular maintenance, there are scheduled checks - an A, B, C, 3C (Interiors) and every ~10 years, a 'D-check' - where the aircraft is almost entirely dismantled to have every part inspected, cleaned and re-assembled.

<https://www.youtube.com/watch?v=3hLXP1R8y6o> - Here's an example 3C Check. Taking 55 days for just the interiors.

The continued Airworthiness Certificate being dependent on the successful audit of each part during these scheduled checks. This is a very time intensive effort, takes many months to complete and comes with a lot of risk of error. See below:



\*maintenance errors in 2015. Right graph is the numbers of errors found per category. Left chart shows how they happened.

Culture and language are a big problem amongst an international workforce. Most errors shown above pointed to incorrect use of procedure, lack of knowledge or falling back on old habits from a previous company or aircraft type.

Not complying with procedure can lead to a part being incorrectly installed, and causing a critical failure.  
[https://www.skybrary.aero/index.php/Maintenance\\_Error](https://www.skybrary.aero/index.php/Maintenance_Error)

Under such time pressure to finish asap and get it flying again, you can understand mistakes will happen.

Additionally the risk of loss or corruption of this database could result in the removal of the Airline Operator Certificate - and the whole fleet would be grounded pending investigation.

Proposal: By modelling parts using data on the Factom blockchain - we can create an effective real-time audit trail of each part through its lifecycle and scheduled checks - making this data accountable, parts authentic, and ensuring compliance of maintenance procedures.

## Pilot Logbooks

We touched on Pilot logbooks above, and how it can affect them within an airline. What about when pilots change employer? Logbook forgery is unfortunately a very real thing in the industry.

<https://www.telegraph.co.uk/news/worldnews/europe/sweden/7733861/Fake-pilot-who-flew-for-13-years-without-licence-fined-1700.html>

Whether it's doctors, engineers, coders, or pilots - companies are inundated by forged applications who embellish their qualifications in hope of a step up the ladder.



Whenever a pilot applies for a job - he must present a logbook of flying experience. The only 'proof' presented is from a previous employer who may flick through and stamp a lengthy paper logbook, or send copy/paste email verifying the hours claimed.

There are of course many loopholes, and they are actively exploited - from exaggerating experience, hiding incidents, down to pure forgery of licenses. The whole thing relies on trust, with competing interests.

E.g Does Air India care about taking the time to verify a logbook of its pilots for British Airways benefit?

**How can an airline know who they are trusting its aircraft, passengers and brand to?** How can it satisfy regulators? Especially with applicants from different jurisdictions, countries, or competitors. It's a huge recruitment headache.

In some cases, these airlines will stamp a logbook they know is incorrect in order to get rid of 'bad apples' who are protected by unions, much to the relief of stakeholders. Yup.

We can build a Pilot Logbook Application on Factom - with consensus that cannot be altered - that can easily be authenticated and audited - and trusted by current and prospective employers across borders.

## Solutions - TLDR

'Off-Blocks' has a lot to achieve surrounding maintenance

- Consensus of Flight Times
- Model lifecycle of parts on the blockchain
- Prevent errors, and ensure compliance during Maintenance checks
- Build Pilot Logbooks we can trust for recruitment

## DEVELOPMENT

'Off-Blocks' is an iterative software project being developed in three stages

- 1) Working prototype for real-world testing
- 2) Regulatory approval allowing substitution of tech
- 3) Final Product -> Industry rollout

We're commissioning multiple leading App Agencies to facilitate developer training. We'll work actively to provide them with the knowledge and experience they need to develop on the Factom blockchain. **We hope to include Factom devs in this process.**

Each developer will be given a separate prototype to produce. After rounds of testing and feedback, we will then select the most accomplished developer to build the final product.

Working with feedback from our App Implementation consultant Rob Nicholls, this will not only provide the best version of 'Off-Blocks', but introduce and promote Factom to the wider development community.

Our first developer is Nodes Agency - <https://www.nodesagency.com>

'Federate This' is in contract negotiation to produce our first mobile app for Flight Documents through them - we are scheduling a workshop in London during June. See picture above.

## OFF-BLOCKS TLDR

The industry is drowning under a mountain of data; data that's constantly audited from all angles and borders. The cost of compliance is high, but the cost of failure can run into the \$billions. Yet, corruption is rife.

Whilst established airlines have systems in place to 'manage' this data - like the mortgage industry - blockchain technology offers us a chance to drastically update, and make these systems honest.

Additionally, It lets small operators or private clubs build trust to facilitate business. We can authenticate license and aircraft validity around the globe, eliminate corruption, and appropriate fault.

It allows a private pilot from Mumbai to prove he's truly experienced. It allows sale/return of an aircraft confident in the lifecycle of every individual part. We can increase safety through enhanced maintenance procedures, with real-time audit.

We can strengthen National Security by tackling problems such as Terrorism and Border Control. We can trust the information and work our neighbours have done. We can investigate accidents, confident in the facts, and without suffering 'lost' documents.

This only covers some of the use cases - and we will start with the low hanging fruit that can be easily applied.

Our ambition is apply blockchain technology across the industry. This all centres around modelling problems with data - and for this, Factom is the perfect fit.



Happy Landings.

## DEVELOPMENT BUDGET

Application Developers, especially with Blockchain specialities are expensive. ‘Off-Blocks’ is an iterative project, that could take time and therefore money to develop. We hope to fund this through a combination of our FCT and the grant pool, where appropriate.

Whilst we can take advantage of our international position to work with developers from a low cost base - we also want to work with well known and experienced people that will go on to further the protocol themselves.

To illustrate, our quote is structured as below: Commercially sensitive data protected.

5 day workshop	£ A One-off	Produce prototype
Follow-on support	£ B	Iterations
Europe Dev	£ Y daily	Per person/role
Asia Dev	£ Z daily	Per person/role

### Protocol Usage Estimates

**Flight documents;** 5 complex documents with 150+ data points, every dispatch for 103,000 daily flights = over 15 million data points to mandatorily track daily.

**Crew/Acft documents;** Pilots must carry 4 mandatory documents with them, Acft have 3 mandatory docs.

39000 commercial +military aircraft. 312,000 light aircraft, 120,000 helicopters commercial+military = ~1.4m documents/year = ~40m data points per year.

130,000 commercial pilots. Over 1m Private Pilots ~3.4m documents/year = ~90m data points per year.

**Passenger Documents** - Mandatory API data + a small supply chain ~20 data points per person. 12 million daily passengers = ~240m data points per day.

**Maintenance Documents** - Hundreds of Billions of Acft parts need their lifecycle tracked in some capacity.

Whilst the above are rough figures from available statistics - it's clear that the Aviation Industry would require vast numbers of data points secured individually.

We cannot say exactly how many Entry Credits would be required to secure these data points. Consider that each new chain requires 10 Entry Credits just to be created - with a subsequent Entry Credit per 1kb.

## FEDERATE THIS

### First Month

- Working with Factom to stabilise mainnet through rollout. Introducing our Guard Nodes to mainnet.
- Full-time Testnet Admin position applied for.
- Website development. Currently a placeholder - need time to build it out.
- List of Targets identified across the world. Promo Packs produced, and translated.
- Design of '*Off-Blocks*'- *Flight Documents* evolved.

### 6 Months

- Marketing campaign in full flow. Large team of reliable, multinational crew on standby.
- Generating interest, following up, and connecting them.
- Produce '*Off-Blocks*' - *Flight Documents* prototype - testing in real-world.
- Continue to take meetings with Senior Airline Execs regarding blockchain implementation.

### Future

- We expect to eventually get replaced by large players demanding a position in the Authority Set. We hope to serve the protocol until this point. We anticipate getting squeezed in efficiency as the price of FCT rises. Therefore our plans will be kept fluid, and our stance competitive.
- We'll be constantly addressing and matching the growing infrastructure needs of the protocol. We have a key connection at *Equinix* who can offer us Enterprise-Level solutions, in a choice of 175 datacenters.
- Once Factom brand reaches a critical point, there will be less need for our marketing campaign. We see Factom as a household name, like Bitcoin is today, as it has the chance to become a better store of value.
- We expect to evolve into holding information sessions, and the on-boarding of clients/users from foreign locations through the testnet; Our global footprint will still play a part in Factom's growth.
- The '*Off-Blocks*' Applications we hope will transform the Aviation Industry, with better working practices held to account, that make for safer travel for us all. We know the industry well, so will be closely working as consultants with other airlines and Factom to help them implement this technology.

Many thanks for your attention - *Federate This*