Blockchain Innovation Foundation

Application for Authority Set

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1 The Blockchain Innovation Foundation

1.1 Introduction and goals

The Blockchain Innovation Foundation (BIF), https://blockchain-innovation.org is a Dutch Non-profit organization, which is legally structured as a Dutch Stichting (Foundation) and is seated in the municipality of De Ronde Venen, Mijdrecht, The Netherlands, a suburb of Amsterdam.

BIF is a foundation that aids in awareness, adoption, usage and development of Distributed Ledger Technology (DLT) with a focus on blockchain.

The Blockchain Innovation Foundation's stated goals are:

- Promoting usage of DLT
- Research and Development of DLT software and protocols
- Hosting and administration of Distributed Ledger infrastructures

The Blockchain Innovation Foundation (BIF) has been founded 03-04-2018 by a notary deed of incorporation and has been registered with the Dutch chamber of commerce under number 71330275, as per the requirement for Dutch foundations.

In the startup phase the companies Sphereon BV, Systems of Trust BV and Centis BV, as well as the individuals N. Klomp, S.F. Boender and M. Boender provide funds, donations and support in the broadest sense for the foundation. This ensures the Foundation is off to a good start.

1.2 Background of aiding companies

Blockchain Innovation Foundation is a spinoff of the startup company Sphereon BV, founded by award winning people with more than 15 years of experience in the Document Processing Industry.

Sphereon provides several content services and blockchain API's and integrations since 2016. The software is blockchain agnostic in the sense that these API's support different blockchain technologies, like Multichain, Hyperledger, Ethereum, BigchainDB, Factom and others. This has been a strategic choice given the immaturity of the DLT landscape. It also doesn't mandate or require public, permissioned of private blockchains. All these types of blockchains are supported, even alongside each other.

Integrations are available for the largest DMS systems, like SharePoint, Alfresco and MS Flow, as well as Case-, Administration-, Workflow- and BPMN systems.

Sphereon has been developing blockchain integrations since mid-2016 and went to production with it at the end of 2017. It is currently doing more than 30 projects with blockchain technology for larger customers and governments in the Netherlands.

Sphereon is a renowned player in the Dutch Blockchain community. It has several partnerships with blockchain related companies and it' s network is growing every week. Sphereon team-members have been invited as speaker on national and international events by the Microsoft and Alfresco communities.

For all public blockchain solutions Sphereon is focused on Factom.

Systems of Trust is a startup company that is focused on blockchain consultancy and software products. It does this with the aid of both internal and external consultants. It is focused on both consultancy and usage of blockchain related products, not on development of software itself.

Centis is a company founded in 2010 that is focused on hosting, infrastructure and application development. It has experience in both providing and maintaining hosting of websites/webapps for customers, software development and GNU/Linux administration, consultancy, including High Availability infrastructures. Currently it's focused on providing consultancy services around its expertise.

1.3 Blockchain Innovation Foundation background

Sphereon and Systems of Trust noticed a recurring pattern in their projects given the nature of their enterprise customers. Given the current state of DLT, most projects start out as Proof of Concepts or Pilots. In these phases customers are experimenting guided by blockchain consultants with their business processes. It is common that a current business process is selected where multiple parties are involved and that is complex, not as transparent or has a lot of overhead.

Most of the time there is a need to start out with infrastructure that is not open to the public, since privacy is out of scope at the start to not form a hindrance. When these projects mature we see a shift from private/permissioned blockchains to public blockchains for some of the information.

The private/permissioned part is where the aiding companies currently cannot provide a good fit for their customers. Most customers are not interested in setting up complete blockchain infrastructures in this phase of project, which results in Sphereon and Centis providing infrastructure in the short term. This is a pragmatic solution of course, but completely against the goal of a distributed ledger. You don't want a single entity to control a distributed network of nodes.

1.4 Providing infrastructure and knowledge

The Blockchain Innovation Foundation (BIF) will create the preconditions for both commercial as well as private parties to take part in creating private, permissioned and public DLT infrastructures. It does this by means of donations, subsidies, registrations of node providers and parties in need of the infrastructures. This means BIF will allow external parties to join its infrastructures.

The most important precondition for joining BIF as an external provider is providing at least a node for the infrastructure being joined. The envisioned goal is to provide several infrastructures and knowledge for parties to bootstrap DLT initiatives so the parties themselves can ease into the distributed nature. It is about bringing together need and demand for both infrastructure and knowledge.

Being a nonprofit organization, the income from providing the infrastructure services will be used mainly to research, development and adoption of various DLT projects and their software.

In the short term the supporting companies, Sphereon, Systems of Trust and Centis, will make sure BIF is off to a good start. Relations with several parties both commercial, private and governmental are in place and are being extended and eventually the roles of the supporting companies will diminish. Longer term we are striving to create a Supervisory Board as well.

The Blockchain Innovation Foundation (BIF) is committed to supporting the Factom protocol as its first infrastructure, since it is a more mature DLT project, lacking adoption unfortunately.

2 People

Most people are part-time involved with BIF currently also have roles in Sphereon and Centis. We will keep these part-time roles in the short term, since BIF is in the startup phase and Factom is the first supported ledger.

The Factoid price is not fixed and given the Dutch labor laws, it wouldn't be wise to hire part- or fulltime employees from the start. This means the aiding companies provide their services in the short time. In the medium term fulltime positions will be opened as well as direct hired personnel.

We are also currently working on creating several advisory roles as well, leveraging our contacts in the Dutch blockchain industry and public services.

2.1 Blockchain Innovation Foundation Board

Niels Klomp

Roles: BIF Chairman, CTO Sphereon BV, CEO Centis BV, Factom Guide, Architecture & Infrastructure

Niels is a serial entrepreneur that has more than 15 years of experience in various CTO roles. He has more than 20 years of experience with GNU/Linux, including High Availability, Clustering and (enterprise) software like, Kerberos, LDAP, Radius, Samba, Apache, Mesos, Heartbeat.

He has been responsible for projects ranging from the creation of auto configured SMB Linux server/telephony solutions, HA infrastructures, running 2 hosting companies (merged into 1). Development of Online Backup software reseller integration portals, Healthcare software and cloud solutions using docker/kubernetes infrastructures. In the past Niels was one of the moderators of the largest Dutch tech community called "Tweakers", so he has extensive experience in communities and their dynamics.

One of his past companies (CareWorks) provided both Windows and Linux system administration for SMB companies, including critical High Availability Linux & Cisco network systems used in healthcare. He is used to manage teams supporting 24/7 critical system and can do the support himself if needed.

Currently he dedicates 4 days a week to Sphereon BV as CTO and is responsible to create a cloud-based Content Services REST API platform comprised of around 50 servers, using state of the art techniques like MicroServices, Circuit braking, Kubernetes, AI, Machine/Deep Learning for things like content detection, classification, named entity extraction, vision, conversion and blockchain integration. He likes to get his hands dirty and keeping the feel for programming, by still coding now and then. Sphereon is slowly moving from startup phase to scale up phase. This allows Niels to dedicate some more time for other projects as well.

Maarten Boender

Roles: BIF secretary, Product Owner Sphereon BV, Speaker, Evangelist, Marketing

Maarten worked as an international marketing manager for an international software company, Orbit Software, Inc., working and traveling around the world. Maarten, being a serial entrepreneur, ran and sold several companies in the ECM/BPM market in the last 20 years.

Maarten's focus is on product management: recognizing trends, identifying their benefits and translating them to software products and functions. Like spotting Factom in 2015, leading to the first product in 2016: a Proof-of-Existence add-in for MS SharePoint and Office 365.

Maarten is also an experienced speaker at events and conferences. He loves to explain new technologies in simple terms and their benefits for users and organizations.

Sebastian Boender

Roles: BIF treasurer, COO Sphereon BV, Operations

Sebastian is a young entrepreneur, with a Higher Operational Management education, responsible for the commercial and operational side of Sphereon. He is of a new generation that is used to working within the digital world and sharing knowledge with each other. He believes in co-creation with other companies to create the right solution for the right client. His aim is to bring new and disrupting technologies to organizations, for these organizations to better their processes.

2.2 Blockchain Innovation Foundation Employees

As mentioned, the below employees are part-time based and hired at first, to minimize both the financial and legal risk in the short term for the foundation.

Sander Postma

Roles: Development & Infrastructure

A Senior Software Developer with 20 years of experience in the Document Processing, ECM/DMS industry. Sander has created integrations with many external systems and products including AS/400 based banking system. Sander has run production servers for close to 15 years and is part of the Sphereon Devops team.

Laurens van den Brink

Roles: Development & Infrastructure

Laurens is Software developer with a background in AI and his current focus is on AI, Machine Learning and blockchain technology. Laurens is part of the Sphereon Devops team and is the third person that administers the nodes.

Marco Tolhuisen

Roles: Development, Design & Testing

Marco is a senior Software Engineer with background in healthcare and ECM/DMS software. Marco is all about designing software and making sure it is well tested and conforms to specifications.

Jeroen de Sitter

Roles: Blockchain research & advice

Jeroen has a scientific & research background. Currently he is doing research for instance for using blockchain technology to improve oversight within the Dutch healthcare. He will have an advisory and research role within BIF.

2.3 Fallback

ServerMeister BV (https://www.servermeister.com/en/) is a dedicated server and cloud administration company that assists us both with hardware and software incident management. BIF manages the software and operation of its nodes themselves on a day to day basis. If timely support from BIF itself is not available for whatever reason (see monitoring), then ServerMeister is available as a fallback 24/7. They cannot only assist in hardware problems (on site), but also with software problems on both OS level as on Factom level. People from Server Meister will be trained and updated from BIF specially for this task.

ServerMeister will get their own logins and keys on our nodes, meaning an audit trail is always available. The contact info from ServerMeister will also be made available for direct contact, when BIF for whatever reason cannot respond in time.

3 Financial planning

Since the Factom coin, Factoid (FCT), does not have a fixed fiat value, the value in US Dollar (USD) will vary based on macro- and micro-economic trends as well as bitcoin trends.

In fact, the value of the FCT against the USD has had a wide spread over the last 12 months, being as low as USD 6.21 and as high as USD 77.85.

This is not uncommon but requires a prudent financial planning when we're relying on the income from the generated FCTs to cover most of the operation costs, which are, by their nature, not very flexible.

3.1 Grant pool

The Blockchain Innovation Foundation (BIF) pledges that *always* a part of the generated FCTs goes to the Grant pool. There is a dependency on the FCT/USD price, but from an FCT/USD price of $ 13.00 and upwards, BIF will donate 50% of the generated FCTs to the Grant pool.

(For more on Grants, also see 6.4)

3.2 Provisions fund

To be prepared for an extremely low FCT/USD price, we will build up a Provision Fund, which will be partly held in FCT and partly held in fiat money. This fund gets funded by the FCTs the Authority Nodes generate. This starts from an FCT price of USD 13.00 and upwards.

3.3 Expenses

The expenses for operating the Authority Set consist a number of more or less fixed-cost categories:

- Hosting costs for the servers
- Management Services costs for the servers
- Administration costs

We also plan for several more flexible cost categories:

- Personnel costs for development and support
- Promotion costs

3.4 Taxes

Because we have not received a definitive opinion from our advisors nor the authorities (Dutch IRS) on the question if the FCTs generated are taxable as Corporate Tax for a foundation, we believe it is also financial prudent to provision and hold 20% of the Net income for this purpose.

In case no taxes need to be paid, the tax provision will be used as

1. to add to the Provisions Fund and
2. for development and promotion.

3.5 Minimal Viable FCT/USD price

Based on the Revenue, Provisions, Expenses and fluctuating FCT/USD price, we calculated two scenarios for a Minimal Viable FCT/USD price:

1. Minimum USD price for minimum services. (USD 4.00)

   In this scenario we operate only the running of a (fully monitored and managed) single Authentication node, consisting of 5 servers, and basic Admin services.

2. Minimum USD price for basic services. (USD 12.50)

   At USD 12.50 we can operate the running of a (fully monitored and managed) Authentication node, consisting of 5 servers and basic Admin services, plus still have one developer working on Factom-protocol related development.

As mentioned in 4.2, we also have included a Provisions Fund to build up a buffer, should the FCT price drops dramatically. This fund gets funded by the FCTs the Auth node generates. This starts from a FCT price of USD 13.00 and upwards.

3.6 Liquidity overview for one Authority Node

The following liquidity overview shows the Revenue, Provisions, Expenses based on the FCT/USD price of $ 26.00 (per 4/18/2018) and a fluctuation in FCT/USD price of -50% and +100%.

(a more detailed breakdown and price fluctuation can be found in Appendix 1)

Blockchain Innovation Foundation
12-Month Cashflow Planning (with FCT/USD price fluctuations)
for 1 node (Amsterdam)

		04/18/2018		-50%		100%	
FCT price		**$ 26**		**$ 13**		**$ 52**	
REVENUE							
	AuthNode FCT funding	$ 350.400		$ 175.200		$ 700.800	
	Left in Grant Pool in FCT	$ (175.200)	50%	$ (78.840)	45%	$ (350.400)	50%
	Provisions Fund	$ (36.000)		$ (12.000)		$ (105.120)	
	Gross revenue	**$ 139.200**		**$ 84.360**		**$ 245.280**	
EXPENSES							
	AMSTERDAM Servers	$ 36.000		$ 36.000		$ 36.000	
	Management Services	$ 6.000		$ 6.000		$ 6.000	
	Personnel	$ 72.000		$ 24.000		$ 144.000	
	Promotion	$ 12.000		$ 6.000		$ 24.000	
	Various	$ 6.000		$ 6.000		$ 6.000	
	Total expenses	**$ (132.000)**		**$ (78.000)**		**$ (216.000)**	
NET REVENUE							
	Income before taxes	$ 7.200		$ 6.360		$ 29.280	
	Taxes	$ (1.440)		$ (1.272)		$ (5.856)	
NET INCOME		**$ 5.760**		**$ 5.088**		**$ 23.424**	

3.7 Liquidity overview for two Authority Nodes

The following liquidity overview shows the Revenue, Provisions, Expenses based on the FCT/USD price of $ 26.00 (per 4/18/2018) and a fluctuation in FCT/USD price of -50% and +100%.

(a more detailed breakdown and price fluctuation can be found in Appendix 2)

Blockchain Innovation Foundation
12-Month Cashflow Planning (with FCT/USD price fluctuations)
for 2 nodes (Amsterdam and Dubai)

		04/18/2018		-50%		100%	
FCT price		**$ 26**		**$ 13**		**$ 52**	
REVENUE							
	AuthNode FCT funding	$ 700.800		$ 350.400		$ 1.401.600	
	Left in Grant Pool in FCT	$ (350.400)	50%	$ (175.200)	50%	$ (700.800)	50%
	Provisions Fund	$ (72.000)		$ (12.000)		$ (280.320)	
	Gross revenue	**$ 278.400**		**$ 163.200**		**$ 420.480**	
EXPENSES							
	AMSTERDAM Servers	$ 36.000		$ 36.000		$ 36.000	
	DUBAI Servers	$ 36.000		$ 36.000		$ 36.000	
	Management Services	$ 10.800		$ 10.800		$ 10.800	
	Personnel	$ 96.000		$ 48.000		$ 192.000	
	Promotion	$ 30.000		$ 18.000		$ 48.000	
	Various	$ 12.000		$ 12.000		$ 12.000	
	Total expenses	**$ (220.800)**		**$ (160.800)**		**$ (334.800)**	
NET REVENUE							
	Income before taxes	$ 57.600		$ 2.400		$ 85.680	
	Taxes	$ (11.520)		$ (480)		$ (17.136)	
NET INCOME		**$ 46.080**		**$ 1.920**		**$ 68.544**	

4 Datacenters, network & deployment

All datacenter locations selected by the Blockchain Innovation Foundation (BIF), will be Tier 3 datacenters that have 24×7 onsite physical security guards, motion detectors, and security cameras. Fitted with entry control through access card and biometric access systems, mandatory visitor registration, as well as CCTV monitoring and recording. Every rack in these datacenters is locked individually.

4.1 The Data Center Group Amsterdam

The Data Center Group (DCG) in Amsterdam is connectivity neutral with more than 200 connectivity partners. It also has direct connections with the second largest Internet Exchange in the world, Amsterdam Internet Exchange (AMS-IX). DCG is a Tier 3 datacenter, meaning a guaranteed uptime of 99,98% and full redundancy of every system. DCG has maintained an uptime of 100% since its inception in 2007! It is a twin datacenter design, with a fallback datacenter roughly 50 KMs away.

DCG is ISO 9001, 27001 and 14001 certified amongst others. It also has certifications for healthcare and payment card industries.

4.2 eHosting Datafort Dubai

The eHosting Datafort (eHDF) in Dubai has its main datacenter located in Dubai Internet City, with fallback datacenter 40 kilometers outside of the city. eHDF is a Tier 3 datacenter, meaning a guaranteed uptime of 99,98% and full redundancy of every system.

eHDF is ISO 9001, 20000, 22301, 27001 and Cloud Security Start certified amongst others. It also has certifications for payment card industries.

4.3 Ansible deployment

Blockchain Innovation Foundation (BIF) will use their system administration experience to create Ansible playbooks to deploy fully functional Factom nodes in minutes. Niels created a similar system already in 2003 using custom scripting for their SMB Linux offering. It has proven itself to be quite useful then, since we could deliver a Linux based SMB server with all kinds of software options in a matter of minutes instead of days. Currently we also have extensive experience with these kind of repeatable infrastructure deployments. We believe that having repeatable processes in place besides fallback and backup procedures makes sure we will be able to handle any incidents with confidence.

4.4 Blue/Green deployment

Running a Microservices API platform targeted at enterprise customers and integrators, we have a lot of experience running Blue/Green deployments and Canary releases using Continuous Delivery techniques and tools. We will utilize this experience to run Blue/Green deployments for Factom.

4.5 Guard nodes

We will strive to connect our Auth and Guard servers to selected, trusted and good performing operators to make the amount of guards protecting the Auth servers bigger. Leveraging our infrastructure, we are even looking at converting follower nodes and standby nodes on the spot when we would be in an attack. We do believe that every node operator should be ready for attacks. As the protocol grows in popularity, attacks will follow.

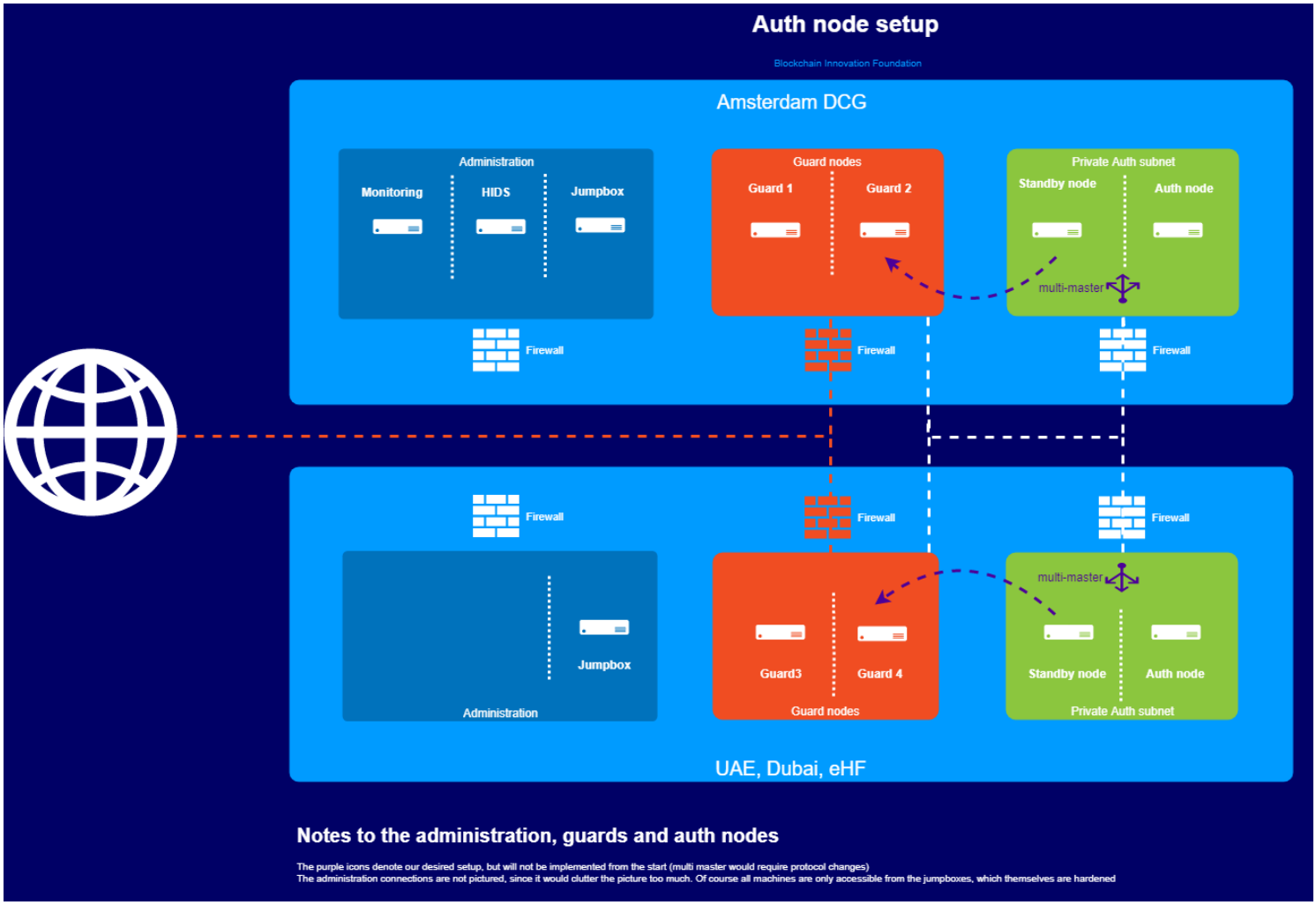
4.6 Networks & architecture

Since the initial 2 Auth nodes could be scaled back to 1 Auth node in the future, we have chosen to architect both the above sites completely as separated instances. This makes sure we don't have any dependencies between them. Of course, our Auth nodes and Guard nodes on both locations can talk to each other, to make sure the attack resilience is greater.

The picture below shows the architecture. Since the networks of both datacenters can handle vast amounts of traffic, we have not opted to add another datacenter for extra guard nodes. Access to the servers is of course only possible using one of the 2 hardened jumpboxes. Courtesy and testnet nodes are left out on purpose to not clutter the image.

The purple lines show a more ideal setup, where we could use the standby auth node as an extra guard or courtesy node on demand. Basically, it would have this role in normal operation and then with a flip of the switch we would promote it to standby node for the auth node, to do blue/green deployments (updates for instance). This setup should be technical feasible without protocol changes.

The multi-master setup must be resolved in the protocol itself. Of course, we could work around certain problems using reverse proxies with session affinity, but we rather see direct support in the protocol for multi-master deployments. This would make the need for guard nodes much less needed, since you could scale the auth nodes, as well as move auth nodes from server to server inside your network. The blue/green deployments would also be much easier and efficient. Lastly the need for brainswaps would take a different role.



The above picture is also added as appendix in landscape mode!

5 Security, monitoring, backup & assessment

Since operating an Auth Node and especially a federated node means a lot of responsibility within the Factom network, we take security seriously. Of course, things like key based access with non-admin user accounts from hardened jumpboxes are prerequisites. Every operator has its own account, so audit trails will be available.

5.1 Host-based and managed firewalls

Every host deployed will use an IPtables based firewall BIF is currently developing. Besides this software firewall additional managed firewalls will be used at key points in BIFs network. The host-based firewalls are primarily used for granular access to the services provided by the host, whilst the managed firewalls are being used for cross cutting traffic within the network.

5.2 Host Intrusion Detection System

We will employ an OSSEC derivative Host Based Intrusion Detection system on all its hosts.

This allows us to detect intrusions, file integrity, software misuse, rootkits, weak security configurations and do policy enforcement. We will be running an integrated OSSEC with Logstash, Elasticsearch and Kibana, to create a full-fledged Software Incident Event Management System environment with dashboards needed for CIS/PCI DSS compliance

5.3 Zabbix monitoring

Besides the HIDS system mentioned above we will employ Zabbix to do Factom network monitoring. Both port/network availability as well as Factom network metrics monitoring will be done, using Factom. In case anything happens our staff or 24/7 backup staff will be notified immediately.

5.4 PagerDuty

We use PagerDuty to make sure our staff is notified instantly when something happens. This accounts to both the HIDS as well as the Zabbix monitoring system. So, both urgent security related incidents as well as network/Factom related incidents will be handled with the highest possible response. The PagerDuty event workflow allows us to notify staff immediately and even incorporates our hired fallback administration company ServerMeister in case our staff would not be available or react in a timely manner on priority calls.

5.5 Snapshots & Backups

We will make sure snapshots on disk level are always available. This allows us to go back in time when needed.

We will also incorporate an automated backup procedure for the blockchain database using a special node that will be integrated with our contentious integration infrastructure. This node first will be check, then Factom will be stopped, a backup of the database will be made offline and then deployed to another node after which it will be tested. This will make sure that we have full consistent database backups ready for deployment.
In a later stage we will make these backup images available to others for fast onboarding or disaster purposes.

5.6 Continuous learning & improvement

The combination of our HIDS system, Zabbix, PagerDuty and all metrics gathered, will allow us to detect patterns and perform continuous learning. Postmortem reports allow us to analyze system efficiency and employee agility both when handling threats as well as Factom network outages.

We will be employing continuous learning techniques utilizing our tools like incident management, knowledge base and the above-mentioned systems.

5.7 ISO certification & sharing of knowledge

The Blockchain Innovation Foundation (BIF) takes security seriously and is aiming to be ISO 27001 (security) certified in a year. During the certification process BIF will share a lot of its knowledge and operating procedures with the community, since we believe all node operators involved should take security and operations seriously and we can learn from each other.

6 Factom

The Blockchain Innovation Foundation (BIF) wants to support the Factom project and protocol by various means to both increase the Factom ecosystem and adoption.

6.1 Participate in the Authority Set

The people behind the Blockchain Innovation Foundation (BIF) have extensive experience themselves and relationships with parties providing hosting in several countries. Niels has both run and bought a small hosting company in the past. These two hosting companies were merged successfully into one. Hosting will be solely done using powerful infrastructure provided by ISO-27001 accredited, Tier-III rated parties using redundant power feeds, networking and storage. More information about the datacenters is available in a separate chapter.

BIF will make sure that nodes are geographically spread, to gain maximum distribution of the nodes and to decrease the potential of internet exchange outages to interrupt the Auth Set.

The people behind BIF have been responsible for several hundreds of production and critical servers and networks including Highly-Available systems, both on Windows and Linux. Currently Sphereon operates around 50 servers and even more Kubernetes/Docker containers for their infrastructure. Current Factom hosting requirements should prove no problem.

6.2 Participating in the community Testnet

The Blockchain Innovation Foundation (BIF) will participate in the Community Testnet with at least the below nodes

6.2.1 Testnet candidate Auth node

A Node per Mainnet Auth node with, as much as needed, similar specifications for the Testnet. At minimum we will provide a node with specifications of the current lowest specified Auth nodes. This node has this type of specification since this is a candidate Testnet Auth node. Once the Mainnet increases in adoption, the Mainnet Auth set nodes will have to scale massively. We believe that given the nature of Factom the Testnet Auth set must be almost on par with Mainnet nodes for Factom development to have meaning full application, node and stress testing.

6.2.2 Courtesy node

At least one courtesy node for the Testnet. Since Auth nodes have dedicated roles, at least one follower node will be made available to the community Testnet

6.2.3 Grants for community Testnet

Proposing grants for the community Testnet. Although it is a community Testnet, we believe that for the community Testnet to thrive, some initiative is needed for some roles and projects that will need remuneration for its long-time survival as well as the target audience of Factom

6.2.4 Participation

Self-explanatory: Participate in the community in the broadest sense

6.3 Develop software with focus on adoption and improvement

The Blockchain Innovation Foundation (BIF) wants to further both the Factom protocol as well as adoption of Factom by organizations worldwide.

6.3.1 Factom protocol

This means we will participate both in proposals as well as grants that improve the Factom protocol itself. We aim to support development of the core software in the future in cooperation and co-creation with other parties. We think that in the long term it wouldn't be healthy if Factom Inc would be supplying all core development, since core development would be centralized basically (of course standing parties would have influence using the grant system, but Inc would do the implementation).

6.3.2 Develop software for the Factom ecosystem

We want to develop software partially using the grant system and partially using node income. See the chapter on 'Development & Support projects' for projects we are currently researching.

Since Sphereon has been creating software integrations with Factom for more than 2 years, we have extensive experience with running mainnet nodes, as well as knowledge about the protocol itself. We created the Java integration in our API Microservices platform from scratch, meaning we also do the lower level computations needed in the protocol. This means we are confident in developing applications on top of Factom.

6.3.3 Increase adoption

We believe we can play a role in increasing the adoption of Factom. Part of the funds of BIF will be used to fund projects/products that increase adoption of Factom. For instance, we are working with Dutch Government agencies and even a Dutch government datacenter, to host infrastructure for a growing list of Dutch municipalities.

6.3.4 Marketing and presence

We will be using part of our funds to increase adoption and awareness using marketing and things like hosting meetups, website, social media promotion, speaking sessions and boots at conferences, etc. For instance, we have held sessions at major Microsoft conferences, AIIM.org, and have been invited by Alfresco's CEO to participate in a Blockchain Roundtable forum during their US Government Day in Washington in May.

We have good relationships with Marketing agencies and personal relations with a former international Marketing Agency owner.

6.4 Grants

The Blockchain Innovation Foundation (BIF) strives to defer 50% to the grant pool for efficiency but this will somewhat depend on the FCT/USD price (for more, see 4.1 Grant pool).

For long term stability of our operations, as well as the Factom ecosystem at large, we think it is necessary to create reserves. BIF will create a provision fund to safeguard our continued operations also with a dramatically lower FCT/USD price. We will be using these reserves for times when the price of Factoids is dramatically lower. Surplus of this fund can be used for investments to further the protocol, hardware or ecosystem. Remember that BIF is a foundation. The reserve funds will not be used for profit in the future.

BIF will actively take part in development through grants. Provided that the grantpool is available in the protocol and its legal status is clear. We believe the checks and balances provided by the grant pool make sure for the continued success of development projects.

6.5 Transparency

The Blockchain Innovation Foundation (BIF) is set up as a non-profit organization. Since we believe in transparency we will provide regular reports about our income and expenses to the community.

A deliberate choice was made for the non-profit as explained earlier. It also means that besides reserves you won't see profit optimizations in our projections, since a Dutch non-profit shouldn't have a goal of profit.

This doesn't mean that that current companies and future companies joining the Blockchain Innovation Foundation (BIF) will not indirectly profit from activities BIF employs. Sphereon for instance has a commercial benefit to have an independent Foundation that can hosts its projects infrastructure needs.
Another example of this is that BIF could decide to create a free public service to increase adoption of Factom using parts of software already created by commercial parties. This is in line with its stated goals to increase adoption. We are open about that both in this document as well as our quarterly reports.

But to be clear: by law a Dutch foundation is required that its profits, reserves and capital, must be dedicated to a cause as described in the foundation's bylaws as were passed and notarized by a public notary during foundation. This also means that any profits, reserves or funds from the foundation cannot just be signed over to the board members.

7 Development & Support projects

The list below is non-exhaustive. Some of these projects will need more thought and design. It merely reflects what we are thinking about in the short term. The projects are roughly listed in order of priority for the Blockchain Innovation Foundation (BIF).

7.1 Iptables firewall

We are creating a Linux Iptables firewall that can be run both on test- as well as on Mainnet.

The firewall is fully configurable for different operating scenarios and allows for rapid and secure deployment of nodes that do not have or solely rely on external firewalls.

7.2 Zabbix monitoring integration

We are creating a Zabbix integration, since we ourselves deploy and rely on Zabbix. Its integration will be made available to the community for their monitoring needs.

7.3 Java API enhancement

Factom currently has a Java API. We noticed that enhancements are possible in the following areas:

- Enhance/refactor the javaAPI and make it enterprise ready
- Code duplicates, not adhering to java coding standards, single responsibility
- Proper Design Patterns, for instance using command patterns
- Support multiple Json libraries
- Spring integration
- JEE integration
- Add Asynchronous support
- Maven/Gradle module support
- Documentation

7.4 Document scanning integration

Create integration with popular document scanning solutions, including the Sphereon ORION ScanIT software product. Document scanning is still being used heavily in enterprises and SMB markets. Scans however can be changed easily in the digital world. By leveraging our Document scan experience and Factom experience we believe we can make solutions that can lead to large numbers of transactions for the Factom protocol.

7.5 Hyperledger, BigchainDB and Multichain public witness

Create a public witness support for well-known private blockchain software products.

This means these private blockchains will be able to anchor into the public Factom network at set intervals for added security to the private blockchain. This adds trust that the private blockchain has

not been altered in any way without exposing any private information outside the private blockchain.

7.6 Canary, proof of living

Create a system that leverages Factom to show proof of living or warrant canary. During war or in regimes where there is a lot of repression several parties want to let other parties know that they still are alive. Examples: Journalists, aid workers, refugees. BIF wants to provide a service and system backed by Factom free of charge. Since it will be backed by Factom it means it won't be possible to alter the proof after the fact. It seems that at least one other team has taken on a similar project after our publication in the meantime as well. BIF is more than willing to work together with these team(s) of course, provided that these teams agree to provide this service completely free of charge, given its nature.

7.7 Distributed file storage integration

Leverage distributed storage systems like SIA/IPFS/StorJ to create automatic audit/trace possibilities with Factom using the hash of the stored files

- Just by storing a file, you can later prove that a file has been stored at a certain point in time and has not been modified since;
- Depending on the support of the file storage optionally anchor deletions, retrievals, etc.;
- Search the storage locations based on the hash of a file (or its contents).

7.8 Voting / election

Add app and API to support voting and elections on top of Factom. Optionally separating the reveal phase from the voting period. Allowing anyone to cast it's vote or only a specific subset of identities to cast a vote. The app should at least allow non-technical people to vote, not knowing anything about Factom. Other teams seem to be working on this as well. We are more than willing to help these teams

7.9 Logger support

Create a system where logs of systems/applications are backed by hashes using Merkle trees and Factom. This would allow you to prove that a log-file or part of log-file is authentic and has not been tampered with.

7.10 Content/identifier based white-/blacklists

Add support for parties to create whitelists, greylists or blacklists based on content or other identifiers.

For instance, a list could contain DCMA protected content or illegal material encountered. Another list could for instance contain official press releases for an organization. The above would allow you to check files/content against known white/blacklists. Adding information to the lists could either be open or protected by identities. Lists like these are useful for legal purposes, but also could form the base for content/spam protection systems.

7.11 Decentralized Trust and Reputation support

Create a decentralized trust and reputations system where agents/identities in the broadest sense store and retrieve trust and reputation information using Factom.

The base will be decentralized Trust and Reputation models. We believe this is very useful for P2P and IoT reputation scenarios.

Blockchain Innovation Foundation
Monthly Cashflow Planning (with FCT/USD price fluctuations)

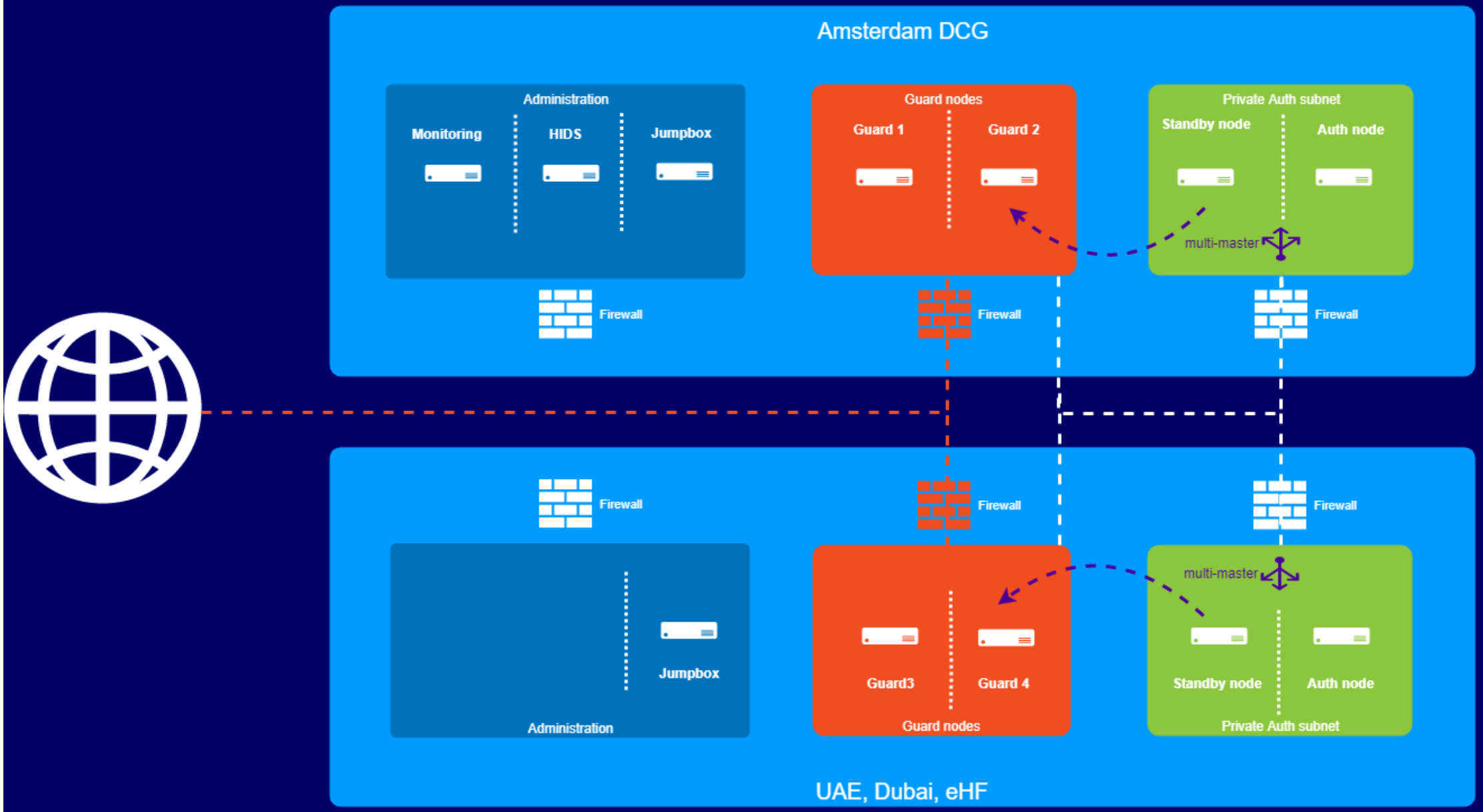
		04/18/2018	-80%	-75%	-50%	-25%	25%	50%	100%	150%	200%	300%
REVENUE												
FCT price		**$ 26,00**	**$ 5,20**	**$ 6,50**	**$ 13,00**	**$ 19,50**	**$ 32,50**	**$ 39,00**	**$ 52,00**	**$ 65,00**	**$ 78,00**	**$ 104,00**
AuthNode FCT	1.123	$ 29.200	$ 5.840	$ 7.300	$ 14.600	$ 21.900	$ 36.500	$ 43.800	$ 58.400	$ 73.000	$ 87.600	$ 116.800
Left in Grant Pool in FCT		$ 14.600	$ 584	$ 1.460	$ 6.570	$ 10.950	$ 18.250	$ 21.900	$ 29.200	$ 36.500	$ 43.800	$ 58.400
:: % of FCT Received		50%	10%	20%	45%	50%	50%	50%	50%	50%	50%	50%
Provisions to cover costs												
Provisions fund	$ 108.000											
Towards Provisions		$ 3.000	$ -	$ -	$ 1.000	$ 2.000	$ 3.000	$ 5.000	$ 8.760	$ 14.600	$ 17.520	$ 23.360
		10%	0%	0%	7%	9%	8%	11%	15%	20%	20%	20%
GROSS REVENUE		$ 11.600	$ 5.256	$ 5.840	$ 7.030	$ 8.950	$ 15.250	$ 16.900	$ 20.440	$ 21.900	$ 26.280	$ 35.040
EXPENSES												
AMSTERDAM Servers	5	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 4.000	$ 4.000	$ 4.000
:: 4 Core Xeon												
:: 32 Gb RAM												
:: OS 2x 100 Gb SSD Raid 1												
:: Data 2x 500 Gb SSD Raid 1												
Management Services		$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 900	$ 900	$ 900
:: 24/7 Managed hosting												
:: Snapshots												
:: Backups												
Personnel		$ 6.000	$ -	$ -	$ 2.000	$ 3.000	$ 6.000	$ 9.000	$ 12.000	$ 12.000	$ 16.000	$ 20.000
:: Employees												
:: Contractors												
:: Office												
Promotion		$ 1.000	$ -	$ -	$ 500	$ 1.000	$ 1.000	$ 2.000	$ 2.000	$ 3.000	$ 3.000	$ 3.500
:: Events												
:: Travel												
:: Web & SM												
Various		$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500
:: Admin												
:: Legal, etc.												
Total expenses		$ 11.000	$ 4.000	$ 4.000	$ 6.500	$ 8.000	$ 11.000	$ 15.000	$ 18.000	$ 20.400	$ 24.400	$ 28.900
NET REVENUE												
Income before taxes		$ 600	$ 1.256	$ 1.840	$ 530	$ 950	$ 4.250	$ 1.900	$ 2.440	$ 1.500	$ 1.880	$ 6.140
Taxes	20%	$ 120	$ 251	$ 368	$ 106	$ 190	$ 850	$ 380	$ 488	$ 300	$ 376	$ 1.228
NET INCOME		**$ 480**	**$ 1.005**	**$ 1.472**	**$ 424**	**$ 760**	**$ 3.400**	**$ 1.520**	**$ 1.952**	**$ 1.200**	**$ 1.504**	**$ 4.912**

Blockchain Innovation Foundation
Monthly Cashflow Planning (with FCT/USD price fluctuations)

			04/18/2018	-80%	-75%	-50%	-25%	25%	50%	100%	150%	200%	300%
REVENUE													
	FCT price		**$ 26,00**	**$ 5,20**	**$ 6,50**	**$ 13,00**	**$ 19,50**	**$ 32,50**	**$ 39,00**	**$ 52,00**	**$ 65,00**	**$ 78,00**	**$ 104,00**
	AuthNode FCT	2.246	$ 58.400	$ 11.680	$ 14.600	$ 29.200	$ 43.800	$ 73.000	$ 87.600	$ 116.800	$ 146.000	$ 175.200	$ 233.600
	Left in Grant Pool in FCT		$ 29.200	$ 1.168	$ 2.920	$ 14.600	$ 21.900	$ 36.500	$ 43.800	$ 58.400	$ 73.000	$ 87.600	$ 116.800
	:: % of FCT Received		50%	10%	20%	50%	50%	50%	50%	50%	50%	50%	50%
	Provisions to cover costs												
	Provisions fund	$ 216.000											
	Towards Provisions		$ 6.000	$ -	$ -	$ 1.000	$ 3.000	$ 8.000	$ 13.140	$ 23.360	$ 29.200	$ 35.040	$ 46.720
			10%	0%	0%	3%	7%	11%	15%	20%	20%	20%	20%
GROSS REVENUE			$ 23.200	$ 10.512	$ 11.680	$ 13.600	$ 18.900	$ 28.500	$ 30.660	$ 35.040	$ 43.800	$ 52.560	$ 70.080
EXPENSES													
	AMSTERDAM Servers :: 4 Core Xeon :: 32 Gb RAM :: OS 2x 100 Gb SSD Raid 1 :: Data 2x 500 Gb SSD Raid 1	5	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 4.000	$ 4.000	$ 4.000
	DUBAI Servers :: 4 Core Xeon :: 24 Gb RAM :: OS 2x 100 Gb SSD Raid 1 :: Data 2x 500 Gb SSD Raid 1	5	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 3.000	$ 4.000	$ 4.000	$ 4.000
	Management Services :: 24/7 Managed hosting :: Snapshots :: Backups		$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 1.500	$ 1.500	$ 1.500
	Personnel :: Employees :: Contractors :: Office		$ 8.000	$ -	$ -	$ 4.000	$ 8.000	$ 8.000	$ 12.000	$ 16.000	$ 20.000	$ 24.000	$ 30.000
	Promotion :: Events :: Travel :: Web & SM		$ 2.500	$ -	$ -	$ 1.500	$ 2.000	$ 3.000	$ 4.000	$ 4.000	$ 4.000	$ 4.000	$ 4.000
	Various :: Admin :: Legal, etc.		$ 1.000	$ 1.000	$ 1.000	$ 1.000	$ 1.000	$ 1.000	$ 1.000	$ 1.000	$ 1.000	$ 1.000	$ 1.000
Total expenses			$ 18.400	$ 7.900	$ 7.900	$ 13.400	$ 17.900	$ 18.900	$ 23.900	$ 27.900	$ 34.500	$ 38.500	$ 44.500
NET REVENUE													
	Income before taxes		$ 4.800	$ 2.612	$ 3.780	$ 200	$ 1.000	$ 9.600	$ 6.760	$ 7.140	$ 9.300	$ 14.060	$ 25.580
	Taxes	20%	$ 960	$ 522	$ 756	$ 40	$ 200	$ 1.920	$ 1.352	$ 1.428	$ 1.860	$ 2.812	$ 5.116
NET INCOME			**$ 3.840**	**$ 2.090**	**$ 3.024**	**$ 160**	**$ 800**	**$ 7.680**	**$ 5.408**	**$ 5.712**	**$ 7.440**	**$ 11.248**	**$ 20.464**

Auth node setup

Blockchain Innovation Foundation



Notes to the administration, guards and auth nodes

The purple icons denote our desired setup, but will not be implemented from the start (multi master would require protocol changes)
The administration connections are not pictured, since it would clutter the picture too much. Of course all machines are only accessible from the jumpboxes, which themselves are hardened