Report for worker 2018-07-infrastructure   24.01.2018

The development of the infrastructure nodes and elastic search API has been completed. The Stress test could not be executed as intended due to the bear market and thus lack of funding. This report concludes the worker and will give some statistics.

Distributed Network of BitShares nodes

Three load-balanced nodes have been deployed. Due to the load-balanced approach the users perceived a 99% uptime of the three nodes. Traffic estimates are given below

	GB traffic per hour	Sessions per hour
https://eu.nodes.bitshares.ws/stats	~2.55	~1510
https://sg.nodes.bitshares.ws/stats	~0.2	~340
https://us.nodes.bitshares.ws/stats	~0.2	~1330

Usage of the testnet node was negligible (likely due to the testnet web wallet provided by BitShares Europe). The deployment of the BitShares backend nodes with docker was well adopted. Exact statistics are not available.

Elastic Search

An Elastic Search cluster has been deployed with direct read-only access and python wrapper

Login BitShares:Infrastrucure for direct access

https://elasticsearch.bitshares.ws

Python Wrapper

https://wrapper.elasticsearch.bitshares.ws/apidocs/

The cluster contains of three separate instances that are each fed blocks by a local node to increase the redundancy. The above domain is a loadbalancer between all 3 instances of the cluster. This Elastic Search endpoint is e.g. used in the Reference UI to export account history and one of the BitShares explorers (http://open-explorer.io/).

Traffic statistics are below

	GB traffic per hour	Sessions per hour
https://elasticsearch.bitshares.ws	<0.1	~140

BitShares Funded Faucet

As of today the faucet account held 137,455 BTS (holdings and claimable, before burn) that have been accumulated through fees

https://wallet.bitshares.org/#/account/onboarding.bitshares.foundation/vesting

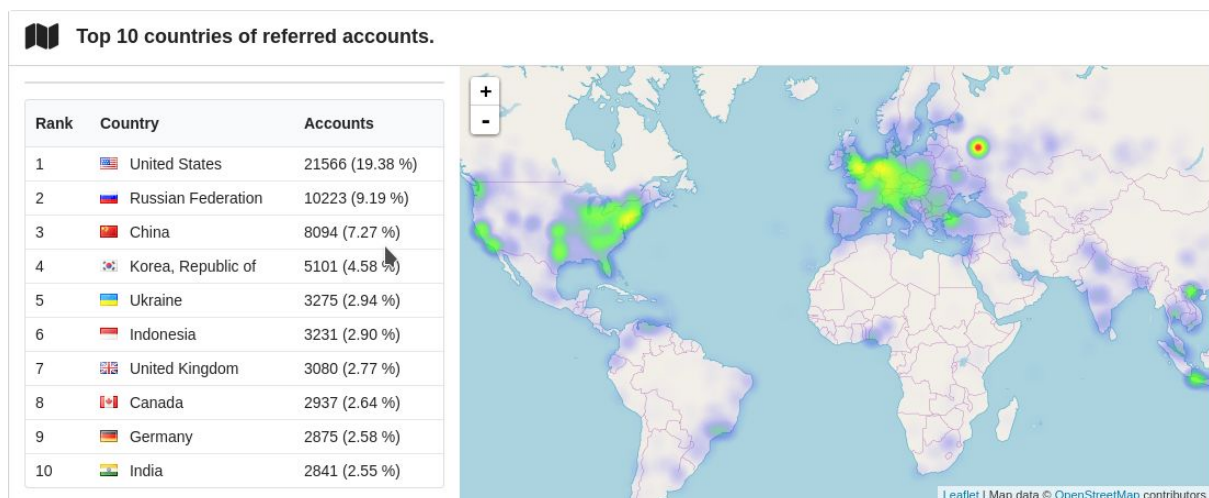https://wallet.bitshares.org/#/account/onboarding.bitshares.foundation

The faucet is running smoothly with no report of malfunctioning. Since its deployment it is more than self-sustaining. It has created 111261 accounts with 475 life time upgrades

https://bitshares.eu/referral/onboarding/onboarding.bitshares.foundation

Worldwide distribution as indicated below

Top 10 countries of referred accounts.

Rank	Country	Accounts
1	United States	21566 (19.38 %)
2	Russian Federation	10223 (9.19 %)
3	China	8094 (7.27 %)
4	Korea, Republic of	5101 (4.58 %)
5	Ukraine	3275 (2.94 %)
6	Indonesia	3231 (2.90 %)
7	United Kingdom	3080 (2.77 %)
8	Canada	2937 (2.64 %)
9	Germany	2875 (2.58 %)
10	India	2841 (2.55 %)

Leaflet | Map data © OpenStreetMap contributors

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Stress test

The development of the stress test software has been an ongoing process and has consumed almost 60 hours so far. The architecture allows for one overseer (control server) that remote controls the beacons (stress inducing instances). We were able to conduct preliminary stress tests using 273 beacons and could support ongoing theories where the bottleneck of the network is, namely the P2P module.

In our test we were able to create full blocks in the local buffer, which is an equivalent of 18690 transactions with one single operation. This number could even be increased with several operations per transactions.

| #20,504,840 | 4:57:21 PM | init1 | 18,690 |

Of those transactions in the buffer only 231 made it into the actual block due to network latency (next witness was across the globe).

The highest number of transactions (still only one operation) is shown below and can be seen here, this test was with a realistic distribution of nodes all around the globe and targeted broadcasting

| #20,504,934 | 9:04:42 PM | delegate.ihashfury | 11,508 |

Furthermore we were able to produce blocks with a steady amount of transactions per second over a longer period, ranging from 200 up to 1000 transactions per second. We have not attempted to push the limit in that test.

The setup of the stress test is completed and can be easily executed. The main organization effort is to setup a realistic distribution of nodes, and the bottleneck is given by the scalability of the P2P layer and the bandwidth of the testnet witnesses (many run a low-cost setup compared to the mainnet, very much understandable).

We have not repeated the stress test in a more professional manner (excuse the sloppy pictures above) for two reasons:
1. We do not expect a vastly different outcome even with more preparation, and a stress test on an academic distribution of nodes (for example, witnesses all in-house in the same datacenter) is not of additional value in our opinion
2. The bear market is cutting the funding short and we will not be able to properly invoice the hours already spent so far

Escrow overview

The worker collected a total of 436627 BTS up until now. A total of 25631 bitUSD have been bought in the open market and paid out (see here). Roughly 97,000 BTS remain at the moment, which are roughly 4,800 bitUSD at the current market price and covers the server and maintenance costs until the end of the worker.

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