



DIGI NODES

A DigiByte node crawler

ABSTRACT

DigiNodes is a node viewer where anyone can check the number of peers that forms the DigiByte Network.

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Blockchain developer

Mark McNiel

Product owner

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Sponsor

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Chapter 1: Project information

Abstract

DigiNodes is a node viewer where anyone can check the number of peers that forms the DigiByte Network. It constantly scans the network to find new nodes and check the status of already know peers.

The website provides some reports for better understanding of the network and for public knowledge. Also, there will have a public widget that can be embedded on third party websites.

Team

The DigiByte Alliance has commissioned this project to the developer Renzo Diaz and the intermediary, and the product owner is Mark McNiel.

Name	Email	Role
Renzo Diaz	renzo.diaz@remadi.net	Developer
Mark McNiel	mark@aroundtheblock.us	Product Owner
DigiByte Alliance	-	Sponsor

Purpose and Goals

The DigiByte Alliance has commissioned this project in order to have a public reliable source for people to review the actual state of the DigiByte Network. Also, to have a trusted source for network analytics and comparison with other cryptocurrencies.

There are 3 main goals to be achieved at the end of the project:

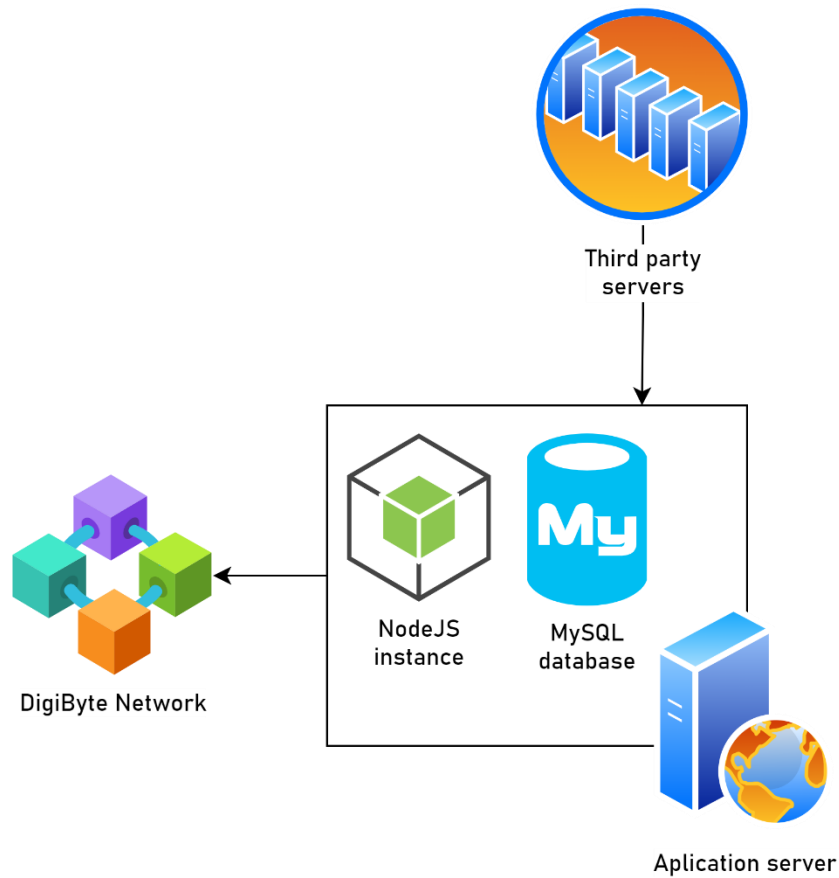
- Have a list of all the public and active DigiByte nodes
- Know the predominant subversion of the DigiByte Core in the network.
- Provide a public widget/API for third party websites.

Description

The DigiNodes software is a node crawler for the DigiByte Network. Is considered as a web spider that retrieve data from DigiByte peers and maps the state of the network.

Physical architecture

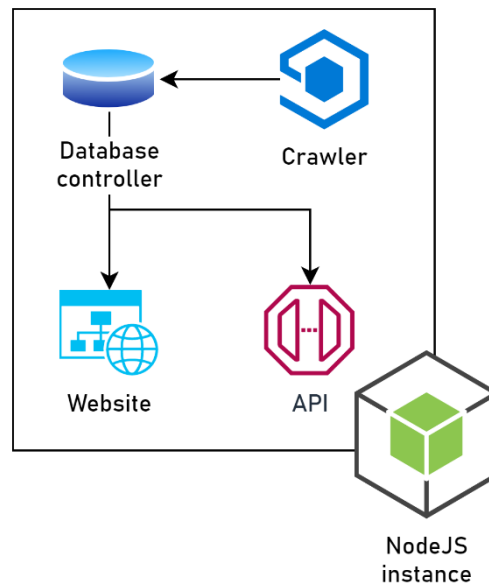
The physical architecture which describes the hardware topology is represented in the next diagram:



It consists in a central application server that host a NodeJS instance and a MySQL database that connects via TCP/IP protocol to the DigiByte Network through its peers. Additionally, it provides endpoints for third party servers to connect via a public API.

Logical architecture

The logical architecture which describes the software internals is represented in the next diagram:



The crawler is a module of the project and scans the network while saving the retrieved data using the database controller. There are two consulting endpoints for the information, the website, and an API rest.

The website is for human interactions and the API is intended to be consumed by third party services and a widget.

Project modules

Node crawler

A piece of code designed to constantly ping a list of IPs to check the presence of a DigiByte Node. If a peer is detected the crawler will proceed to retrieve all the IPs that are known by it. It's able to read and write into a relational database and keep track of already known peers re-scanning them time to time.

Website

User friendly interface to visualize the data retrieve by the crawler. It contains some useful diagrams to represent the information for better understanding. It's only capable to write into the database through a node tester.

Public API

A JSON format http endpoint that contains the data retrieve by the crawler. Each of the reports showed on the website has their equivalent calls in this API. It's only capable to write into the database by registering the calls made by third party services.

Requirements

Characteristics that the project must fulfill.

Functional requirements

ID	Descriptions	Type
FR01	Ping IP address and port to check a DigiByte node	Back-end
FR02	Retrieve version and subversion of a DigiByte node	Back-end
FR03	Save the DigiByte nodes in a table	Back-end
FR04	Check the status of a known peer	Back-end
FR05	Query the network information in an API	Back-end
FR06	Show the number of active nodes	Front-end
FR07	Show the number of active nodes per subversion	Front-end
FR08	Show the peers in a world map	Front-end
FR09	Query a single DigiByte Node	Front-end
FR10	Have a public widget with the number of active nodes	Front-end

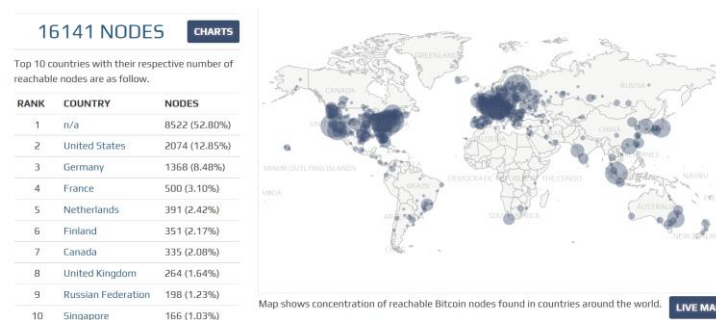
Nonfunctional requirements

ID	Descriptions	Type
NFR01	Back-end developed in NodeJS	Back-end
NFR02	Have the nodes scanned every 24h	Back-end
NFR03	Bootstrap like UI front-end	Front-end

Comparable products

Sub-version		Protocol	Count	Network Share	
● /DigiByte:7.17.2/	node list	70017	96	53.9 %	53.9 %
● /DigiByte:7.17.3/	node list	70017	50	28.1 %	82.0 %
● /digiwallet:1.0.0/	node list	70017	24	13.5 %	95.5 %
● DigiByte:7.17.3	node list	70017	4	2.2 %	97.8 %
● DigiByte:7.17.3	node list	70018	2	1.1 %	98.9 %
● /DigiByteHost:0.1/	node list	70017	1	0.6 %	99.4 %
● /open-nodes:0.1/	node list	70019	1	0.6 %	100.0 %

Chainz crypto explorer



Bitnodes.io

Premises and restrictions

This project will be developed under the premise that the sponsor will maintain the service created during its expected lifetime. Is under the DigiByte Alliance responsibility to provide the servers and the environment for the execution of the DigiNodes software. Also, the future maintenance costs such as server expenses and API keys provided by third party services to fulfill the functional requirements. And finally, the deployment of the software and configuration of the server has to be provided by the sponsor.

The only time restriction specified for this project is that the crawler and some requirements of the website (specified in the Gant's diagram) must be completed in late June 2022.

Tasks schedule

DigiByte Node Crawler	Phase 1															Phase 2					Phase 3				
	Week 1				Week 2					Week 3					Week 4					Week 5					
Dates	7	8	9	10	13	14	15	16	17	20	21	22	23	24	27	28	29	30	1	4	5	6	7	8	
DataBase modeling																									
ER Design																									
SQL DDL Scripts																									
Node Crawler Backend																									
Node ping function																									
Reiterative scanning																									
Save nodes in DB																									
Node startup																									
Communication API Rest																									
Node Crawler Frontend																									
Bootstrap UI																									
Node list																									
Node version pie chart																									
Node Map																									
Node tester																									
Node Crawler Widget																									
Offline Design																									
Node count - Last 24h																									
Public endpoint																									

Chapter 2: Deployment information

Server specifications

The application server must fulfill some basic characteristics in order to provide a correct execution environment for the DigiNodes software:

Feature	Basic	Recommended	Best
Storage	3GB of SSD	5GB of SSD	15GB of SSD
CPU Cores	2 Cores	3 Cores	3 Cores
RAM	2GB	3GB	5GB
N of Processes	40	60	80
Inodes	250'000	250'000	250'000
SSL Creation	Yes	Yes	Yes
DNS management	Yes	Yes	Yes
Bandwidth	unlimited	unlimited	unlimited

Execution environment

The software required to run the DigiNodes software:

- NodeJS v16.14.2 or more
- MySQL v8.0.29 or more

Recommended providers

Providers for web infrastructure (not sponsored) if the DigiByte Alliance does not have the require servers:

- Fastcomet: <https://www.fastcomet.com/>
- Chemicloud: <https://chemicloud.com/>

Chapter 3: Cost estimations

Development cost

Based on the requirements listed earlier and an effort estimation showed in the timeframe specified on the tasks schedule the development costs of the project will be 1'000 USD and will be paid in four separate payments of 250 USD.

The amount will be paid in DigiByte (DGB) using the last conversion rate at the time of the payment.

Scheduled payments

Date (UTC)	Amount (DGB)	Address	TXID
May 26 th 2022	22'064.98225534	dgb1qh6wewyld4y guggxa96n4n3w82 ml60p945d7hjc	096cd1c6fe11a7e99 b03ac8803035c8a ac46b1c963c4ee9b 95ef85c0303b818e
June 3 rd 2022	22'879.12773783	dgb1qh6wewyld4y guggxa96n4n3w82 ml60p945d7hjc	657fb4783fddfcde7 058b1a83bd088fa5 6369e52afef3dc64 5d56884ee3ab4cc
June 22 nd 2022	20000.00000000	dgb1qh6wewyld4y guggxa96n4n3w82 ml60p945d7hjc	31f478cd5a93bda5 0c0970458b06439 db1cfc8b6cc8fc922 7a9007872e0ce5f8
June 22 nd 2022	6225.49360382	dgb1qh6wewyld4y guggxa96n4n3w82 ml60p945d7hjc	efd000b0decf228e 570efdd2c47782d7 5e92d5f7aa5a375b e2cb7f943d439758
July 4 th 2022			

Maintenance cost

There is no extra cost for the project (except if the sponsor has contracted a web provider)

Change control

Committed changes in the document:

Date	Approved by	Changes
June 5 th 2022	Renzo Diaz	Document creation
June 22 nd 2022	Renzo Diaz	Updated payment