### PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: See form PCT/ISA220  WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43 bis.1)  Date of mailing (disprimitiyear) see form PCT/ISA210 (second sheet)  Applicant's or agent's file reference see form PCT/ISA220  International application No. International filing date (daymonthylear) IT.06.2021 International Patient Classification (PC) or both national date (daymonthylear) IT.06.2020 International Patient Classification (PC) or both national classification and PC INV. H04L2308 H04L3052 H04L3052  Applicant BTCORP S.R.L.  International indications relating to the following items: BTCORP S.R.L.  International indications relating to the following items: BTCORP S.R.L.  International indications are applicability: classification and explanations supporting such statement BTOCORP S.R.L.  International Comments indications relating to the following items: BTCORP S.R.L.  International Comments indications relating to the following items: BTCORP S.R.L.  International Comments indications are applicability: BTCORP S.R.L.  International provided abatement under Rule 43 <i>bis.</i> f(a)(i) with regard to novely, inventive step and industrial applicability: BTCORP S.R.L.  International Patient Classification and explanations supporting such statement BTCORP S.R.L.  International Patient Provention BTCORP S.R.L.  International Patient Pat	INTEF	RNATIONAL SEARCHIN	G AUTHORITY					
See form PCLASA220       INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)         Applicants or agent's life reference see form PCTASA220       Date of mailing (daymonthylear) see form PCTASA210 (second sheet)         Applicants or agent's life reference see form PCTASA220       FOR FURTHER ACTON See paragraph 2 below         International application No. PCTAB2021055250       International filing date (daymonthylear)         PCTAB2021055250       15.06.2021         International Patent Classification (PC) or both national classification and IPC INV. H04L2908 H04L392H04L2906         Applicant         BTCORP S.R.L.         1.         This opinion contains indications relating to the following items:         Box No. I       Basis of the opinion Box No. IV         Box No. I       Non-establishment of opinion with regard to novelty, inventive step and industrial applicability applicability. Citations and explanations supporting such statement applicability. Citation documents site!         Box No. V       Creatin documents site!         Box No. VI       Certain documents ide!         Box No. VII       Cortain documents ide!         Box No. VII       Certain document site!         Box No. VII       Certain docects in the	То:				PCT			
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Applicant's or agent's file reference see form PCT/ISA220       EOF FURTHER ACTION See paragraph 2 below         International application No. PCT/IB20210552550       International filing date ( <i>daymonthylear</i> )       Priority cate ( <i>daymonthylear</i> )         International Patent Classification (IPC) or both national classification and IPC       Priority cate ( <i>daymonthylear</i> )       17.06.2020         Applicant       Bit CORP S.R.L.       International filing date ( <i>daymonthylear</i> )       Priority cate ( <i>daymonthylear</i> )         1       This opinion contains indications relating to the following items:       Box No. I       Priority         Box No. III       Basis of the opinion       Box No. III       Non-establishment of opinion with regard to novelty, inventive step and industrial applicability applicability; citations and explanations supporting such statement         Box No. VIII       Certain documents cited       Box No. VIII Certain documents cited         Box No. VIII       Certain documents on the international application         Box No. VIII       Certain documents cited       Box No. VIII Certain documents cited         Box No. VIII       Certain documents cited       Songinon of the international application         Box No. VIII       Certain documents cited       Songinon of the international region and priorithy the this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the thremational region and the international application <td></td> <td></td> <td></td> <td></td> <td colspan="3"></td>								
Image: International application No.       International filing cate (day/month/year)       Priority date (day/month/year)         PCTIB202101055250       15:6:2021       17:0:6:2020         International Patent Classification (PC) or both national classification and IPC       17:0:6:2020         INV: H04L29:08 H04L9:32 H04L29:06       Priority       17:0:6:2020         Applicant       BITCORP S.R.L.       Priority       17:0:6:2020         1.       This opinion contains indications rolating to the following items:						(POT Rule 43DIS.1)		
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See form PCT/ISA/220       See paragraph 2 below         See paragraph 2 below       Priority date (day/month/year)       17.06.2020         International application No.       PCT/IB2021.055250       15.06.2021       17.06.2020         International Patent Classification (IPC) or both national classification and IPC       IXV. H04L29.08 H04L9.032 H04L29.06         Applicant       BITCORP S.R.L.       Image: Second Seco					(day/month/year) see form PCT/ISA/210 (second sheet)			
See form PCT/ISA/220       See paragraph 2 below         International application No.       International ling cale (day/monthy/ear)       Priority cale (day/monthy/ear)         PCT/IB2021.055250       15.06.2021       17.06.2020         International Patent Classification (IPC) or both national classification and IPC       IXV. H04L29.08 H04L9.932 H04L29.06         Applicant       BITCORP S.R.L.         1.       This opinion contains indications relating to the following items:         Box No. I       Basis of the opinion         Box No. I       Priority         Box No. II       Non-establishment of opinion with regard to novelty, inventive step and industrial applicability         Box No. IV       Lack of unity of invention         Box No. VI       Certain decuments side         Box No. VI       Certain decuments ofted         Box No. VI       Certain defects in the international application         Box No. VI       Certain defects in the international application         Box No. VI       Certain defects in the international application         Box No. VI       Certain defects in the international application         Box No. VI       Certain defects in the international application         Box No. VI       Certain defects in the international application         Box No. VII       Certain defects in the international application	Applicant's or agent's file reference							
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Applicant BITCORP S.R.L.         1. This opinion contains indications relating to the following items:         Box No. 1       Basis of the opinion         Box No. 1       Priority         Box No. 11       Non-establishment of opinion with regard to novelly, inventive step and industrial applicability         Box No. 11       Non-establishment of opinion with regard to novelly, inventive step and industrial applicability         Box No. 17       Lack of unity of invention         Box No. 10       Reasoned statement under Rule 43 <i>bis</i> .1(a)(i) with regard to novelly, inventive step and industrial applicability; citations and explanations supporting such statement         Box No. V1       Certain documents cited         Box No. V11       Certain defects in the international application         Box No. V11       Certain observations on the international application         If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Preliminary examined to the appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCTI/SA220 or before the expiration of 22 months from the priority date, whichever expires later.         For further options, see Form PCTI/SA220.       Date of completion of       Authorized Officer				classification	and IPC			
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Box No. VIII Certain observations on the international application         2. FURTHER ACTION         If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1 <i>bis</i> (b) that written opinions of this International Searching Authority will not be so considered.         If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.         For further options, see Form PCT/ISA/220.         Name and mailing address of the ISA:       Date of completion of         Authorized Officer								
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Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016		Tel. +31 70 340 - 2	2040			Telephone No. +31 70 340-0		

#### Box No. I Basis of the opinion

- 1. With regard to the language, this opinion has been established on the basis of:
  - the international application in the language in which it was filed.
  - a translation of the international application into English, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
- 2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
- 3. U With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
  - a.  $\Box$  forming part of the international application as filed:
    - $\Box$  in the form of an Annex C/ST.25 text file.
    - $\Box$  on paper or in the form of an image file.
  - b. D furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
  - c.  $\Box$  furnished subsequent to the international filing date for the purposes of international search only:
    - $\Box$  in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
    - □ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
- 4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
- 5. Additional comments:

## Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement	Statement							
Novelty (N)	Yes: Claims No: Claims	<u>1-13</u>						
Inventive step (IS)	Yes: Claims No: Claims	<u>1-13</u>						
Industrial applicability (IA)	Yes: Claims No: Claims	<u>1-13</u>						

2. Citations and explanations

### see separate sheet

- 1 The applicant has requested to have the present application processed under PCT Direct (PCT Guidelines B-IV, 1.2.1). Account taken of the applicant's comments submitted with the PCT Direct letter of 15-06-2021, received on 24-07-2021, this Authority considers that the claims meet the requirements of the PCT for the following reasons:
- 2 Re Item V

# Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 2.1 Reference is made to the following documents:
  - D1 US 2019/334697 A1 (WINSLOW MATTHEW [US] ET AL) 31 October 2019 (2019-10-31)cited in the application

DAN BONEHJOSEPH BONNEAUBENEDIKT BUNZBEN FISCH: "Reliable Delay functions" advances in Cryptology",

- D2 CRYPTO, vol. 10991, 2018, XP002801992, cited in the application
- 2.2 Claim 1:
- 2.2.1 D1 is regarded as being the prior art closest to the subject-matter of independent claim 1, and discloses (references apply to this document):

A method of communication between nodes of a telecommunications network, each node maintaining a copy of a distributed ledger,

(§0006)

the method comprising that each sending node of a plurality of data packets, for each data packet to be transmitted, executes the steps of:

- a. identifying a receiver node to which to transmit said data packet,
- b. generating the data packet to be delivered to a recipient node,
- c. transmitting to the receiver node the data packet,

d. issuing a request to the nodes of the telecommunication network to record said data packet transmission on the distributed ledger,

(§0006, §0021, §0061-0062, §0027)

and when a data packet is received, the method requires that each receiver node, other than the recipient node of the data packet, repeat at least the steps a., and c., (if intermediate nodes forward a message, the same steps are taken)

and wherein each node of the telecommunication network performs the steps of:

e. generating recursively a data block of the distributed ledger, each data block being identified by a progressive count number

(this is considered to be implicitly disclosed by the feature "blockchain" of D1, e.g., in 0006)

and by a hash value calculated through an hashing algorithm that entails the sequential execution of a predetermined number of operations,

(§0035)

and

f. recording the transmission of the data packet in the data block for which the hash value is being calculated at the time of the issuing of the request to record the data packet transmission,

(since in a blockchain, the hash value of a block is based also on the content of this block, the transmission is by necessity recorded in the block for which the hash value is calculated at that moment, as previous blocks have already been completed)

characterized in that the recipient node of the plurality of data packets performs the step of:

-ordering the data packets received based on the position in the distributed ledger of the data block in which the transmission of each data packet by the sending node is recorded.

2.2.2 The subject-matter of claim1 therefore differs from this known D1 in that

the recipient node of the plurality of data packets performs the step of: - ordering the data packets received based on the position in the distributed ledger of the data block in which the transmission of each data packet by the sending node is recorded,

and is therefore new (Article 33(2) PCT).

2.2.3 The technical effect achieved by these distinguishing features is to provide a reliable manner to order data packets independent of the protocol or content of the packets.

- 2.2.4 The problem to be solved by the present invention may be regarded as how to provide a reliable manner to order data packets independent of the protocol or content of the packets.
- 2.2.5 The solution to this problem proposed in claim1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: Nowhere in D1 is packet (re-)ordering mentioned as a potential problem, or are any mechanisms related to packet (re-)ordering discussed. The purpose of using the blockchain in D1 for storing packet transmission is rather to increase network security, and to monitor the health and data integrity of the network.

The skilled person thus would have no hint as to how to solve the technical problem. The particular solution of using the blockchain in order to determine a packet order is thus not considered to be obvious to the skilled person, and therefore to fulfil the requirements of Art. 33(3) PCT.

- 2.3 Claim 13: The argument made w.r.t. claim 1, see point 2.2, is applied, mutatis mutandis, to corresponding apparatus claim 13, the subject-matter of which is therefore also considered to fulfil the requirements of Art. 33(2) and Art. 33(3) PCT.
- 2.4 Claims 2-12 are dependent on one or more independent claims whose subjectmatter is considered as being new and inventive, as discussed above, and as such said dependent claims also meet the requirements of the PCT with respect to novelty and inventive step.