



The Internet Based Identifier (IBI) and the IBI Network

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- ABSTRACT -

The use of global and persistent identifiers is an imperative for the consistent management of items of information potentially inter-related to any other items. The Internet Based Identifier – IBI, an ABNT/Brazil standard, is the persistent identifier that is consistently used in the existing, now, for many years, fully operational IBI NETWORK, introduced by this presentation. The fundamental principles that justify the application of IBI identifier are introductorally presented, as well. Complementary, also, a brief comparison of the generation and resolution of the Handle Identifier and of the IBI. The basic mechanism that permit the generation and the subsequent resolution of the IBI in the IBI NETWORK, is also presented.



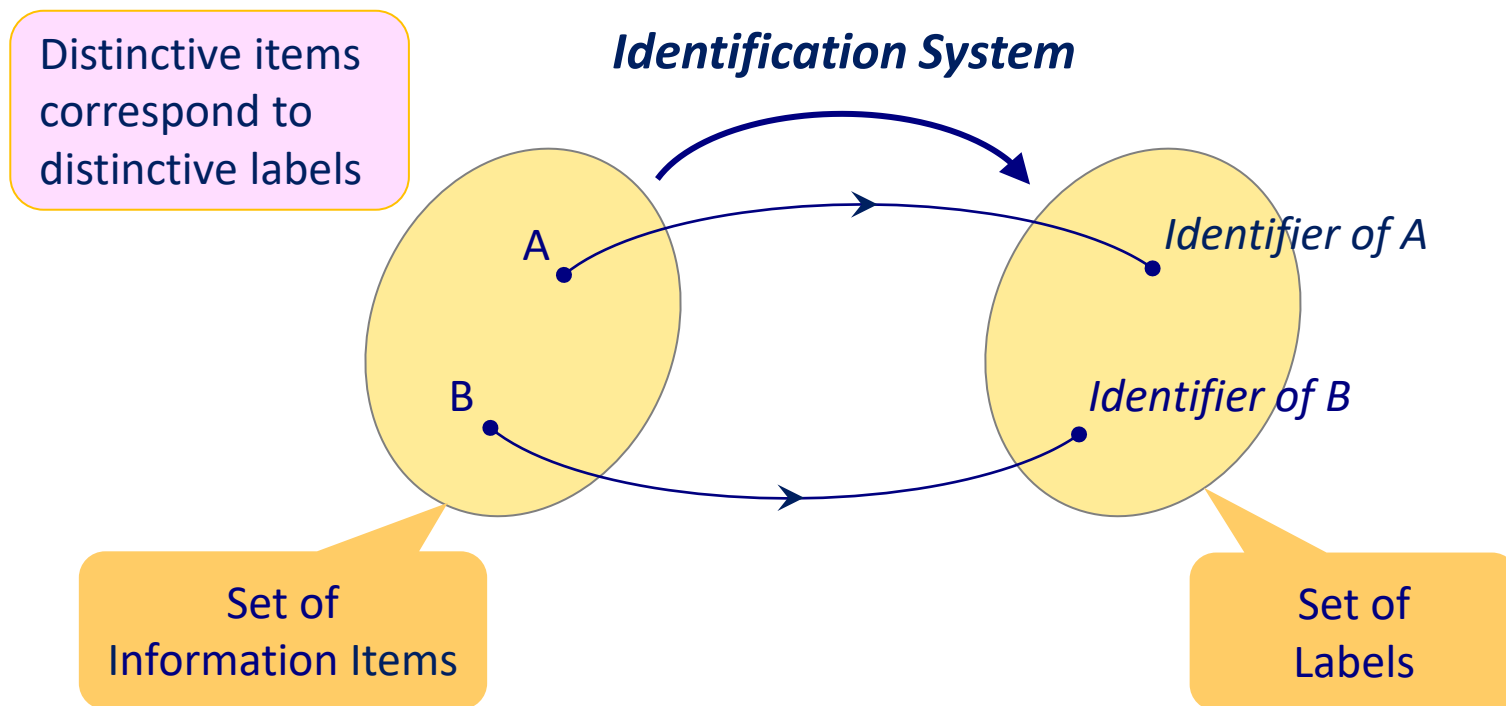
Contents

IBI Related Items

- Definition of Logical Principle
- Examples of Global Identifiers
- Standards for Generation and Resolution of IBI

Definition of Logical Principle

Identification System: One-to-one mapping, between a set of information items and a set of labels, that associates to each item an identifying label.





Examples of Global Identifiers

(1/3)

- **Basic Structure:** <Prefix / Suffix>
- **Example of HANDLE:** <10.1016 / j.isprsjprs.2019.01.019>
- **Example of IBI:** <QABCDSTQQW / 3ST4GN8> (COMPACT version)



Examples of Global Identifiers

(2/3)

Non-Profit Entities

Name	Date	Prefix	Suffix	Maintenance
Handle (DOI)	1995 (2000)	Proprietary Identifier	Local Space of Names	CNRI (DOI Foundation)
		It depends of the creation of a Central Authority		
IBI	1995	Internet Encoded Address	Uses the Date of Creation of the IBI	AMI (Under formation)
		It derives from Internet Central Authority		

CNRI: Corporation for National Research Initiatives

AMI: Association for the Maintenance of IBI



Examples of Global Identifiers

(3/3)

Name	Fees for the user (Archive)
Handle DOI	US\$ 50 per year and for prefix US\$ 1 per DOI (CrossRef)
IBI	0 (t.b.d.)

(as of November 2015)



Standards for Generation and Resolution of IBI (1/8)

ABNT (Brazil) Standards for the IBI Identifier

1) ABNT NBR 16066:2012

System for generation of identifier based on the internet (IBI)

2) ABNT NBR 16709:2018

System for resolution of identifier based on the internet (IBI)

NOTE: The two above listed ABNT Standards were elaborated by mean of two ABNT Projects under the responsibility of Gerald J. F. Banon, in his role as a Member of the Commission of Study ABNT CE:08.010.70 in *Space Data and Information Transfer Systems*.

Standards for Generation and Resolution of IBI (2/8)

Complementary Nature of the Two ABNT Standards

ABNT NBR 16066:2012 Standard

System for generation of identifier based on the internet (IBI)



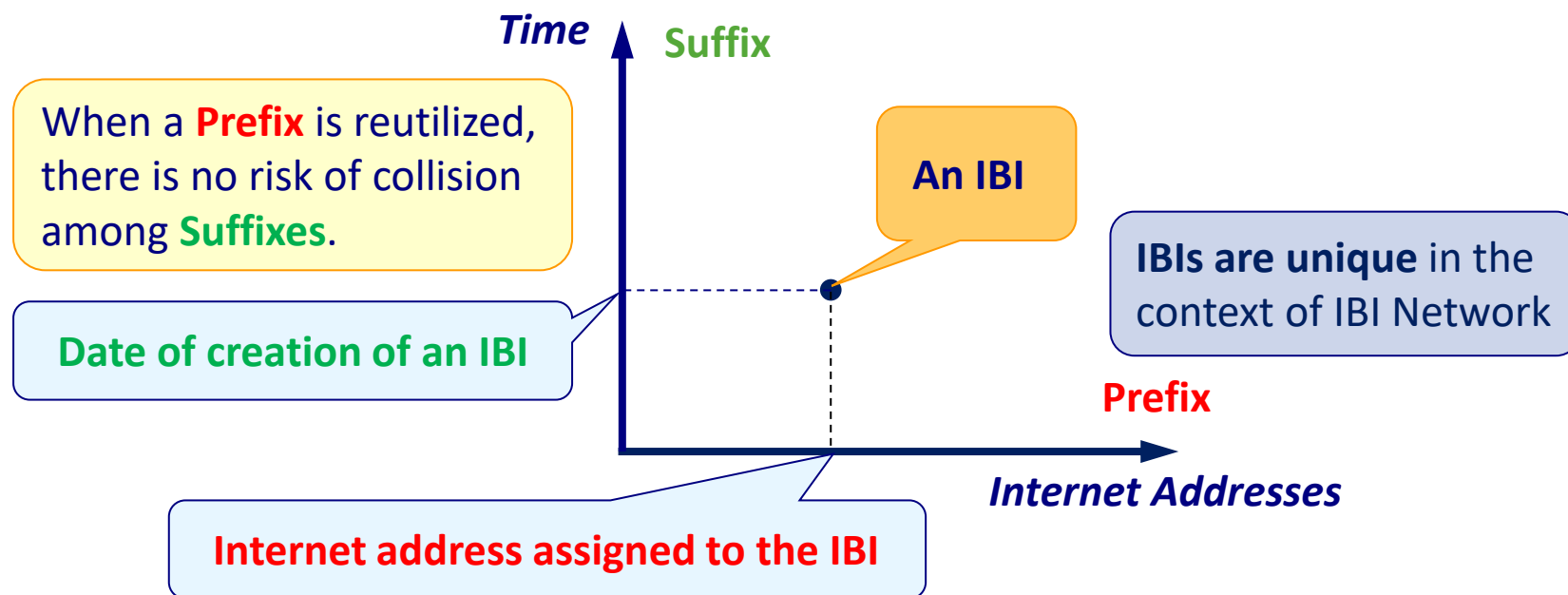
ABNT NBR 16709:2018 Standard

System for resolution of identifier based on the internet (IBI)

Standards for Generation and Resolution of IBI (3/8)

Complementary Nature of the Two ABNT Standards

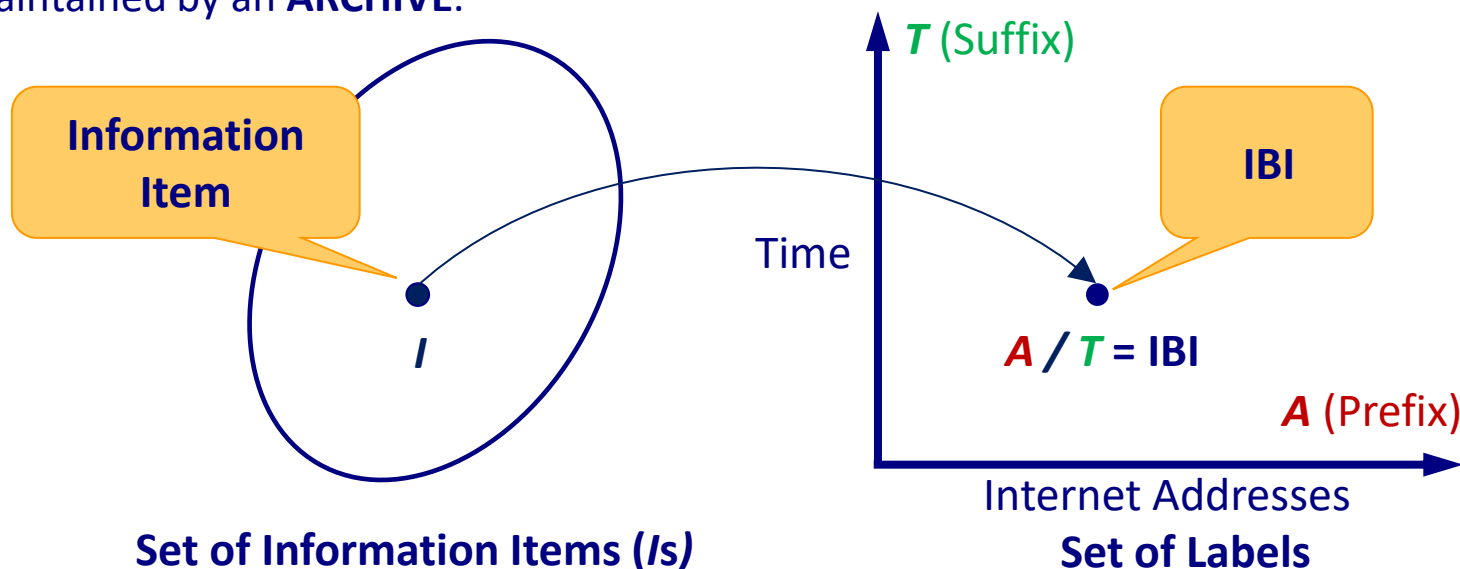
An IBI is a point in the space-time where the space is the set of all possible *Internet Addresses* and where the time is the set of fractional numbers of second of time, accounted for by departing from UTC zero hour of August 1, 1995.



Standards for Generation and Resolution of IBI (4/8)

Principle of the Identification by an IBI

The identification of an **Information Item** I by an **IBI** is the pair A/T , where A , the **Prefix**, is the **Internet Address** of the ARCHIVE at the moment of storage of I , and where T , the **Suffix**, represents the **Time** when the storage occurs in the mentioned ARCHIVE.
FUNDAMENTAL CONCEPT: An **IBI** is a combined code conceived for assigning a unique and persistent code strictly correspondent to an unique **INFORMATION ITEM**, as maintained by an **ARCHIVE**.





Standards for Generation and Resolution of IBI (5/8)

The Two Different Encodings of an Unique IBI

Considering that an **IBI** comprises the pair of encoded information **A/T**, where **A**, is the **Prefix**, where **T**, is the **Suffix**, in order to uniquely identify an **INFORMATION ITEM** designated by **I**, as kept by an ARCHIVE, in fact, for the benefit of practical purposes, an IBI NETWORK depending on the finality, uses TWO DIFFERENT strictly equivalent encodings of the IBI that identify strictly the **-same-** INFORMATION ITEM. The two different encodings of IBI in this case, named **IBI Type 1** or **LONG LABEL IBI**, and **IBI Type 2** or **COMPACT LABEL IBI**, rely on the following definitions:

- 1) **IBI TYPE 1** or **LONG LABEL IBI** <**PREFIX**: Internet Address code / **SUFFIX**: ARCHIVE UTC time encoding at the time the IBI is generated>
- 2) **IBI TYPE 2** or **COMPACT LABEL IBI** <**PREFIX**: Internet Address Compact code / **SUFFIX** : ARCHIVE UTC time Compact code generated from the UTC time encoding that is generated when the IBI is generated>



Standards for Generation and Resolution of IBI (6/8)

Basic FUNCTIONAL ENTITIES of the IBI Network System

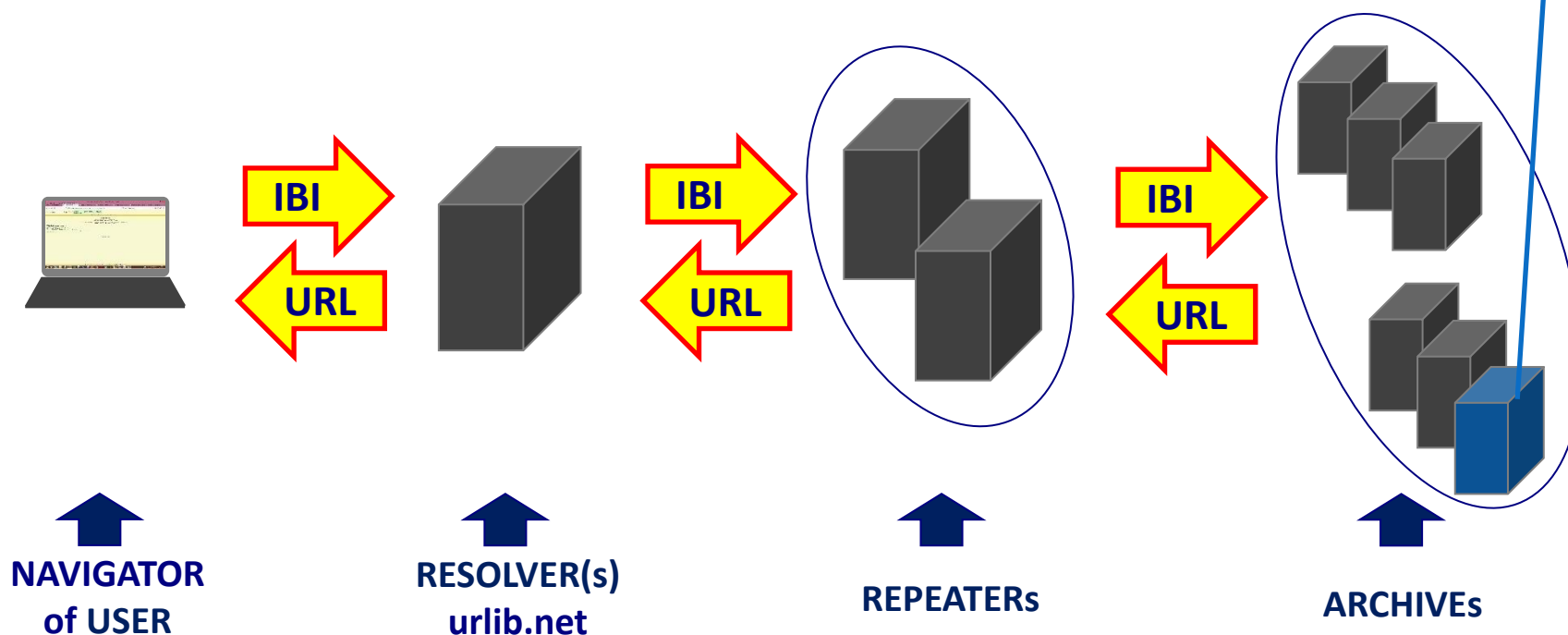
- 1) **USER:** Entity characterised by the person that submit to the RESOLVER the IBI of an Information Item resident in an ARCHIVE of the IBI Network with the purpose of receiving the content of this Information Item.
- 2) **RESOLVER:** Central entity of the IBI Network that receives from an USER request for resolution of an IBI that identifies the Item of Information of interest. Upon request from the USER the RESOLVER is capable of communicating with the ARCHIVES with the support of the intermediating REPEATERS. Finally, the REPEATER that, in a 1st place, identified the requested Item of Information in one of its associated ARCHIVES, will report his finding to the RESOLVER which, in turn, will inform the requesting USER the exact ARCHIVE and associated URL where the content derived from his submitting IBI, can be found.
- 3) **REPEATER:** Entity of the IBI Network that redistributes to the ARCHIVES the Request for Resolution of an IBI received from a RESOLVER. Optionally, a REPEATER can also accumulate the function of an ARCHIVE.
- 4) **ARCHIVE:** Entity dedicated to storage, generation of IBI identifiers, and preservation of the corresponding Items of Information, that are of interest of USERS of the IBI Network.

Standards for Generation and Resolution of IBI (7/8)

The FUNCTIONAL ENTITIES and the Communication Among Them

Differently from Handle there is no indexing outside of the ARCHIVES

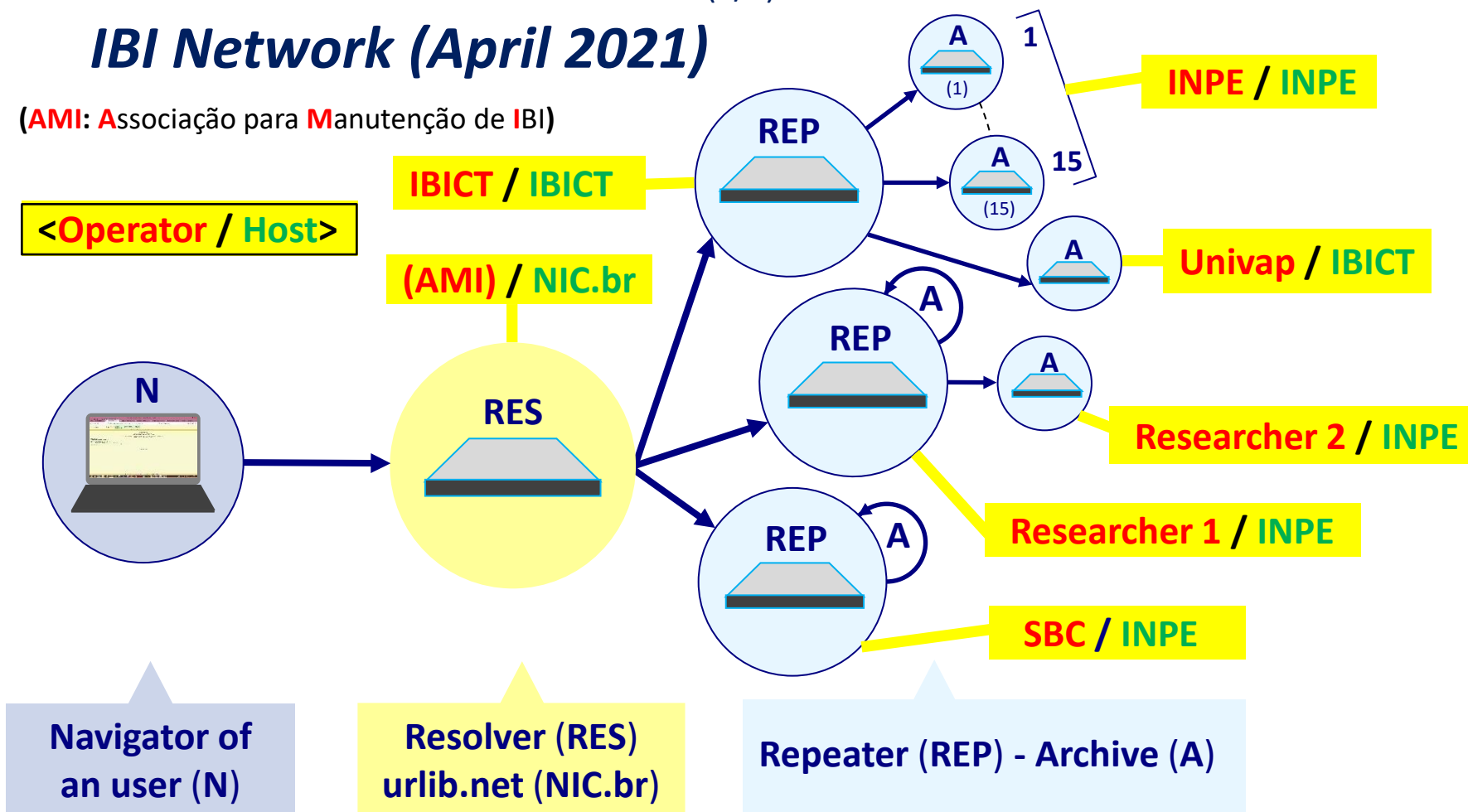
The ARCHIVE that contains the IBI returns the URL where the Information Item is located



Standards for Generation and Resolution of IBI (8/8)

IBI Network (April 2021)

(AMI: Associação para Manutenção de IBI)



Navigator of
an user (N)

Resolver (RES)
urlib.net (NIC.br)

Repeater (REP) - Archive (A)



Thank you!