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Second-level Node (SLN) Data Objects Mapping
[draft-wu-identifier-sln-objects-mapping-02](#)

Abstract

This document specifies the format, contents and semantics of data escrow deposits for Industrial Internet Identifier Second-level Node (SLN). SLN directly serves enterprises and provides services such as identifier registration, identifier resolution, data sharing, etc. The mapping objects in this document mainly refers to the enterprise registration information of the SLN and the Enterprise-level Node (ELN) registered in the SLN.

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1. Introduction

Second-level Node (SLN) Data Escrow is the process by which an SLN periodically submits data deposits to a third-party called an escrow

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agent. These deposits comprise the minimum data needed by a third-party to resume operations if the SLN cannot function and is unable or unwilling to facilitate an orderly transfer of service.

The goal of data escrow is higher resiliency of registration services, for the benefit of Internet users. The beneficiaries of a SLN are not just those registering information there, but all relying parties that need to identify the owners of objects.

This document defines the data escrow structure of the standard set of objects for Industrial Internet Identifier Nodes which include Second-level Node (SLN) and Enterprise-level Node (ELN).

This document defines the following object:

- o Node: Including the enterprise registration information of the SLN and the ELN registered in SLN.

This document defines the following pseudo-object:

- o Header: Used to specify counters of objects in the database at a certain point in time (watermark).

In the context of industry identifier namespace, data escrow is a requirement for SLN. There is also a similar requirement for SLN accredited identifier registration node.

This document specifies a format for data escrow deposits independent of the objects being escrowed. A specification is required for each type of registry/set of objects that is expected to be escrowed.

2. Model

This document defines XML model be used to deposit data escrow objects. The XML model includes all the deposit information (meta-

data and data) in an XML document. The definition of the XML format is fully defined in the XML schemas. As a convention, the objects represented using the XML model are referenced using INDE and an XML namespace that is prefixed with "inde". For example, the SLN enterprise registration information represented using the XML model can be referred to as the INDE Node with the XML namespace including indeNode (urn:ietf:params:xml:ns:indeNode-1.0).

[3.](#) Conventions used in this document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

SECOND-LEVEL NODE (SLN). In the context of this draft the definition will indicate an organization providing Registry Services for a second level identifier.

REGISTRY SERVICES. Services offered by the SLN critical to the following tasks: responding to enterprise node queries for status information relating to the servers for identifier; responding to queries for enterprise information concerning identifier registrations in the SLN. Any other products or services that only an SLN is capable of providing by reason of its designation as a SLN. Typical example of Services is: Identifier Resolving.

[4.](#) General Conventions

[4.1.](#) Date and Time

Numerous fields indicate "dates", such as the creation and expiry dates for objects. These fields SHALL contain timestamp indicating the date and time in UTC, specified in Internet Date/Time Format (see [[RFC3339](#)], [Section 5.6](#)) with the time-offset specified as "Z".

[4.2.](#) IP Address

The syntax for IPv4 addresses described in this document MUST conform to [\[RFC5730\]](#). The syntax for IPv6 addresses described in this document MUST conform to [\[RFC4291\]](#). Practical considerations for publishing IPv6 address information in zone files are documented in [\[RFC2874\]](#) and [\[RFC3596\]](#). A server MAY reject IP addresses that have not been allocated for public use by IANA.

[4.3.](#) Country names

Country identifiers SHALL be represented using two characters identifiers as specified in [\[ISO-3166-1\]](#).

[4.4.](#) Telephone numbers

Telephone numbers (both voice and facsimile) SHALL be formatted based on structures defined in [\[ITU-E164\]](#). Telephone numbers

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described in this specification are character strings that MUST begin with a plus sign ("+", ASCII value 0x002B), followed by a country code defined in [\[ITU-E164\]](#), followed by a dot (".", ASCII value 0x002E), followed by a sequence of digits representing the telephone number.

[4.5.](#) Internationalized and Localized Elements

Some elements MAY be provided in either internationalized form ("int") or provided in localized form ("loc"). This MAY override the form specified for a parent element. A value of "int" is used to indicate the internationalized form and a value of "loc" is used to indicate the localized form. When the internationalized form ("int") is provided, the field value MUST be represented in a subset of UTF-8 that can be represented in the 7-bit US-ASCII character set. When the localized form ("loc") is provided, the field value MAY be represented in unrestricted UTF-8.

[5.](#) Object Description

This section describes the base objects supported by this specification:

[5.1.](#) Node Object

The node object represents the enterprise registration information

of a Second-level Node or Enterprise-level Node, and this element supports XML Model.

[5.1.1.1. XML Model](#)

There are two elements used in the data escrow in the node objects of the XML model including the `<indeNode:node>`, under the `<inde:contents>` element, and the `<indeNode:delete>` element, under the `<inde:deletes>` element.

A `<indeNode:node>` element substitutes for the `<indeNode:abstractNode>` abstract element to define a concrete definition of a identifier node. The `<indeNode:abstractNode>` element can be replaced by other node definitions using the XML schema substitution groups feature.

[5.1.1.1.1. <indeNode:node> element](#)

The `<node>` element contains a "type" attribute to identify the node is a Second-level Node or Enterprise-level Node. If a Second-level Node (type="sec") is provided, element content MUST be Second-level

Node information. If an Enterprise-level Node (type="ent") is provided, element content be Enterprise-level Node information. The `<node>` element contains the following child elements:

- o A `<prefix>` element contains the node-unique identifier of the node object.
- o A `<name>` element contains the name of the enterprise.
- o A `<nature>` element contains the enterprise nature.
- o An `<addr>` element contains the enterprise address information. This element content MUST be represented in a subset of UTF-8 that can be represented in the 7-bit US-ASCII character set. The `<addr>` element contains the following child elements:
 - One, or two OPTIONAL `<street>` elements contain the enterprise's street address
 - A `<city>` element contains the enterprise's city.

An OPTIONAL <sp> element contains the enterprise's state or province.

A <cc> element contains the enterprise's two-letter country code.

- o Zero or more <ipAddr> elements that contain enterprise's IP address. The <ipAddr> element contains the following child elements:

An <ip> element contains the IP address.

A <port> element contains the network port.

- o A <cred> element. A required "type" attribute is used to identify the credentials owner: Enterprise or Enterprise Legal Person. If a (type="ent") is provided, element content MUST be enterprise's credentials type. If a (type="leg") is provided, element content MUST be enterprise's legal person credentials type. The <cred> element contains the following child elements:

A <credType> element contains the credentials Type.

A <credNo> element contains the credentials Number.

- o A <legName> element contains the enterprise legal person Name.

- o A <profile> element contains the enterprise's brief introduction.
- o A <contact> element contains the enterprise's contact information. The <contact> element contains the following child elements:
 - A <name> element contains the contact name.
 - A <phone> element that contains the contact phone.
 - A <email> element that contains the contact email address.
- o A <crDate> element contains the enterprise's node register date.
- o Zero or One <upDate> element contains the enterprise's node information update date.

Example of <node> object:

...

```
<indeNode:node type="sec">
  <indeNode:prefix>86.100</indeNode:prefix>
  <indeNode:name>CAICT</indeNode:name>
  <indeNode:nature>Research Institute</indeNode:nature>
  <indeNode:addr>
    <indeNode:street>Gaozhang Road</indeNode:street>
    <indeNode:street>No.52 Huayuan North Road
  </indeNode:street>
    <indeNode:city>Beijing</indeNode:city>
    <indeNode:sp>Beijing</indeNode:sp>
    <indeNode:cc>CN</indeNode:cc>
  </indeNode:addr>
  <indeNode:ipAddr>
```

```
    <inedNode:ip>10.23.23.2</indeNode:ip>
    <indeNode:port>8080</indeNode:port>
  </indeNode:ipAddr>
  <indeNode:ipAddr>
    <inedNode:ip>10.23.23.1</indeNode:ip>
    <indeNode:port>8081</indeNode:port>
```



```

</indeNode:ipAddr>

<indeNode:cred type="ent">

    <indeNode:credTyp>BusinessLicense</indeNode:credTyp>

    <indeNode:credNo>62072231123451</indeNode:credNo>

</indeNode:cred>

<indeNode:cred type="leg">

    <indeNode:credTyp>ChineseIDCard</indeNode:credTyp>

    <indeNode:credNo>121333343243223335</indeNode:credNo>

</indeNode:cred>

<indeNode:legName>San.Zhang</indeNode:legName>

<indeNode:profile>

It is the driving force of industrial development to undertake
the top node and the bridge of enterprises

</indeNode:profile>

<indeNode:cotact>

    <inedNode:name>Jonh</indeNode:name>

    <indeNode:phone>15911112222</indeNode:phone>

    <indeNode:email>123@123.com</indeNode:email>

```

```

</indeNode:cotact>

<indeNode:crDate>2019-12-11T11:49:00.0Z</indeNode:crDate>

<indeNode:upDate>2019-12-12T17:51:00.0Z</indeNode:upDate>

```

</indeNode:node>

...

[5.1.1.2](#). <indeNode:delete> object

The <indeNode:delete> element contains the SLN identifier that was deleted.

Example of <indeNode:delete> object:

...

<inde:deletes>

...

<indeNode:delete>

<indeNode:prefix>86.200.2</indeNode:prefix>

</indeNode:delete>

<indeNode:delete>

<indeNode:prefix>86.200.1</indeNode:prefix>

</indeNode:delete>

...

</inde:deletes>

...

[5.2](#). Header Object

The Header Object is a pseudo-object that is used to specify the number of objects in the repository at a specific point in time (watermark) regardless of the type of deposit: differential or full. The Header Object may also be used to provide additional information

on the contents of the deposit. The Header Object is only defined as

XML, but one header object MUST always be present per escrow deposit regardless of using XML Model. The Header Object is defined using the <indeHeader:header> element.

[5.2.1.](#) <indeHeader:header> object

The <indeHeader:header> contains the following elements:

- o A choice of one of the elements defined in the "repositoryTypeGroup" group element that indicates the unique identifier for the repository being escrowed. Possible elements:
 - A <indeHeader:slnp> element that defines Second-level Node Prefix being escrowed.
 - A <indeHeader:node> element that defines Enterprise-level Node prefix registered in Second-level.
 - A <indeHeader:reseller> element that defines the provider ID corresponding to a Reseller data escrow deposit.
- o A <count> element that contains the number of objects in the SLN System at a specific point in time (watermark) regardless of the type of deposit: differential or full. The <count> element supports the following attributes:
 - An "uri" attribute to reflect the XML namespace URI of the primary objects of the XML Model. For example, the "uri" is set to "urn:ietf:params:xml:ns:indeNode-1.0" for Node objects using the XML Model.
 - An OPTIONAL "inp" attribute indicates the identifier node prefix of the object included in the <count> element.
- o An OPTIONAL <contentTag> element that contains a tag that defines the expected content in the deposit. The producer and consumer of the deposits will coordinate the set of possible <contentTag> element values

Example of <indeHeader:header> object referencing only the XML Model objects:

...

<indeHeader:header>

```
<indeHeader:slnp>86.200</indeHeader:slnp>

<indeHeader:count
  uri="urn:ietf:params:xml:ns:indeNode-1.0">2
</indeHeader:count>

</indeHeader:header>

...
```

[6.](#) Profile

Different business models of SLN exist, therefore the SLN is responsible to define a profile that matches its particular business model. The profile mechanism allows an SLN to extend this specification.

A profile is the process of:

- o Extending base objects with the mechanisms defined for XML model.

For XML model, abstract elements could be used to extend the object <node> using XML schema substitution groups feature.

- o Adding new escrowed objects using the <inde:contents> and <inde:deletes> elements.
- o Providing the XML schemas to third parties that require them to validate the escrow deposits.

[7.](#) Data escrow agent extended verification process

A Data Escrow Agent SHOULD perform an extended verification process that starts by creating a dataset to be tested.

- o If a full deposit is to be tested, the full deposit is the dataset.
- o If a differential deposit is to be tested, the dataset is created by using the differential deposit plus all the required deposits leading to the last previous full deposit.

The following are the minimum suggested tests on the dataset:

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- o Validate the escrow deposits using the definition agreed with the SLN.

In the case of the XML model, the contents of the escrow deposits MUST be validated using the XML schemas of the profile.

- o Count the objects and validate that the number of objects is equal to the number objects reported in the <header> element of the escrow deposit of that point in time (watermark).
- o The elements listed as required in the <policy> element MUST be present.
- o Providing the XML schemas to third parties that require them to validate the escrow deposits.
- o The watermark is not in the future.

[8.](#) Formal Syntax

[8.1.](#) INDE Node Object

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LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN
ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE
POSSIBILITY OF SUCH DAMAGE.

BEGIN

```
<?xml version="1.0" encoding="UTF-8"?>

<schema targetNamespace="urn:ietf:params:xml:ns:indeNode-1.0"

  xmlns:indeNode="urn:ietf:params:xml:ns:indeNode-1.0"

  xmlns:inde="urn:ietf:params:xml:ns:inde-1.0"

  xmlns="http://www.w3.org/2001/XMLSchema"

  elementFormDefault="qualified">

  <!-- Import common element types. -->

  <import namespace="urn:ietf:params:xml:ns:indeNode-1.0"/>

  <import namespace="urn:ietf:params:xml:ns:inde-1.0"/>

  <annotation>

    <documentation>

      Identifier Second-level Node Data Escrow provisioning Schema

    </documentation>
```

</annotation>

<element name="abstractNode"

type="indeNode:abstractContentType"

substitutionGroup="inde:content" abstract="true"/>

<element name="node"

substitutionGroup="indeNode:abstractNode"/>

<element name="delete" type="indeNode:deleteType"

substitutionGroup="inde:delete"/>

<!-- Content Type -->

<complexType name="abstractContentType">

<complexContent>

<extension base="inde:contentType">

<sequence>

<element name="prefix"

type="indeNode:prefixType"/>

<element name="name"

type="indeNode:nameType"/>

<element name="nature"

type="indeNode:natureType"/>

<element name="addr"

type="indeNode:addrType"/>

```

<element name="ipAddr"
  type="indeNode:ipAddrType"/>
<element name="cred"
  type="indeNode:credType"/>
<element name="credType"
  type="indeNode:credTypeType"/>
<element name="credNo"
  type="indeNode:credNoType"/>

```

```

<element name="legName"
  type="indeNode:nameType"/>
<element name="profile"
  type="indeNode:profileType"/>
<element name="contact"
  type="indeNode:contactType"/>
<element name="crDate" type="dateTime"/>
<element name="upDate" type="dateTime" minOccurs="0"/>
</sequence>
</extension>
</complexContent>
</complexType>
<simpleType name=" prefixType">
  <restriction base="token">

```



```

    <pattern value="[A-Za-z1-9]+\.[A-Za-z0-9]+" />

    <enumeration value="86.100" />

</restriction>

</simpleType>

<simpleType name="nameType">

    <restriction base="normalizedString">

        <minLength value="1" />

        <maxLength value="255" />

    </restriction>

</simpleType>

```

```

<simpleType name="natureType">

    <restriction base="normalizedString">

        <minLength value="1" />

        <maxLength value="512" />

    </restriction>

</simpleType>

<complexType name="addrType">

    <sequence>

        <element name="street"

            type="indeNode:streetType"

            minOccurs="1" maxOccurs="2" />

```

```

    <element name="city" type="indeNode:cityType" />
    <element name="sp" type="indeNode:spType"/>
    <element name="cc" type="indeNode:ccType" />
  </sequence>
</complexType>
<simpleType name="streetType">
  <restriction base="normalizedString">
    <minLength value="1" />
    <maxLength value="255" />
  </restriction>
</simpleType>
<simpleType name="cityType">
  <restriction base="normalizedString">

```

```

    <minLength value="1" />
    <maxLength value="255" />
  </restriction>
</simpleType>
<simpleType name="spType">
  <restriction base="normalizedString">
    <maxLength value="255" />
  </restriction>
</simpleType>

```

```

<simpleType name="ccType">
  <restriction base="token">
    <length value="2" />
  </restriction>
</simpleType>
<complexType name="ipAddrType">
  <sequence>
    <element name="ip" type="indeNode:ipType"/>
    <element name="port" type="indeNode:portType" />
  </sequence>
</complexType>
<simpleType name="ipType">
  <restriction base="token">
    <enumeration value="v4"/>
    <enumeration value="v6"/>

```

```

  </restriction>
</simpleType>
<simpleType name="portType">
  <restriction base="token">
    <pattern value="[1-9]+" />
  </restriction>

```

```

</simpleType>

<complexType name=" credType">
    <attribute name="type"
        type="indeNode:credTypeEnumType" use="required" />
</complexType>

<simpleType name="credTypeEnumType ">
    <restriction base="token">
        <enumeration value="ent"/>
        <enumeration value="leg"/>
    </restriction>
</simpleType>

<complexType name=" credTypeType">
    <restriction base="token">
        <enumeration value="ChineseIDCard"/>
        <enumeration value="passport"/>
        <enumeration
            value="MainlandTravelPermitForHongKongAndMacaoResidents"/>
        <enumeration
            value="MainlandTravelPermitForTaiwanResidents"/>

```

```

        <enumeration
            value="ResidencePermitForHongKongMacaoTaiwanResidents"/>
    <enumeration value="BusinessLicense"/>
    <enumeration value="TaxCertificate"/>

```

```

    <enumeration value="OrganizationCodeCertificate"/>

    <enumeration value="SafetyProductionLicense"/>

    <enumeration
      value="ProductionLicenseOrLicenseOfIndustrialProducts"/>

  </restriction>

</complexType>

<simpleType name="credNoType">

  <restriction base="normalizedString">

    <maxLength value="255"/>

  </restriction>

</simpleType>

<simpleType name="profileType">

  <restriction base="normalizedString">

    <maxLength value="2048" />

  </restriction>

</simpleType>

<complexType name="contactType">

  <sequence>

    <element name="name" type="indeNode:nameType"/>

    <element name="phone" type="indeNode:minTokenType" />

    <element name="email" type="indeNode:minTokenType"/>

```

```

</sequence>

```

```

</complexType>

<simpleType name="minTokenType">
  <restriction base="token">
    <minLength value="1"/>
  </restriction>
</simpleType>

<!-- Delete Type -->

<complexType name="deleteType">
  <complexContent>
    <extension base="inde:deleteType">
      <sequence>
        <element name="prefix"
          type="indeNode:prefixType" minOccurs="0"
          maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

</schema>

END

```

8.2. Header Object

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BEGIN

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<schema targetNamespace="urn:ietf:params:xml:ns:indeHeader-1.0"
```

```
  xmlns:indeHeader="urn:ietf:params:xml:ns:indeHeader-1.0"
```

```
  xmlns:inde="urn:ietf:params:xml:ns:inde-1.0"
```

```
  xmlns="http://www.w3.org/2001/XMLSchema"
```

```
  elementFormDefault="qualified">
```

```
    <import namespace="urn:ietf:params:xml:ns:inde-1.0"/>
```

```
    <annotation>
```

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```
<documentation>

  Identifier Second-level Node Escrow Deposit Header Schema

</documentation>

</annotation>

<!-- Root Element -->

<element name="header" type="indeHeader:contentType"
  substitutionGroup="inde:content"/>

<!-- Content Type -->

<complexType name="contentType">
  <complexContent>
    <extension base="inde:contentType">
      <sequence>
        <group ref="indeHeader:repositoryTypeGroup"/>
        <element name="count" type="indeHeader:countType"
          maxOccurs="unbounded"/>
        <element name="contentTag" type="token" minOccurs="0"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<group name="repositoryTypeGroup">
```



```
<choice>

    <element name="prefix" type="indeNode:prefixType" />

    <element name="ppsp" type="token"/>


```

```

    <element name="reseller" type="token"/>

</choice>

</group>

<complexType name="countType">

    <simpleContent>

        <extension base="long">

            <attribute name="uri" type="anyURI" use="required"/>

            <attribute name="slnp" type="prefixType"/>

        </extension>

    </simpleContent>

</complexType>

</schema>


```

END

[9.](#) Internationalization Considerations

Data escrow deposits are represented in XML, which provides native support for encoding information using the Unicode character set and its more compact representations including UTF-8. Conformant XML processors recognize both UTF-8 and UTF-16. Though XML includes provisions to identify and use other character encodings through use of an "encoding" attribute in an `<?xml?>` declaration, use of UTF-8 is RECOMMENDED.

[10.](#) Security Considerations

This specification does not define the security mechanisms to be used in the transmission of the data escrow deposits, since it only specifies the minimum necessary to enable the rebuilding of an IIIN from deposits without intervention from the original IIIN.

Depending on local policies, some elements or most likely, the whole deposit will be considered confidential. As such the IIIN transmitting the data to the escrow agent SHOULD take all the

necessary precautions like encrypting the data itself and/or the transport channel to avoid inadvertent disclosure of private data.

It is also of the utmost importance the authentication of the parties passing data escrow deposit files. The escrow agent SHOULD properly authenticate the identity of the IIIN before accepting data escrow deposits. In a similar manner, the IIIN SHOULD authenticate the identity of the escrow agent before submitting any data.

Additionally, the IIIN and the escrow agent SHOULD use integrity checking mechanisms to ensure the data transmitted is what the source intended. Validation of the contents by the escrow agent is RECOMMENDED to ensure not only the file was transmitted correctly from the IIIN, but also the contents are also "meaningful".

11. IANA Considerations

This document uses URNs to describe XML namespaces and XML schemas conforming to a registry mechanism described in [[RFC3688](#)]. Four URI assignments need to be registered by the IANA.

Registration request for the INDE namespace:

URI: urn:ietf:params:xml:ns:indeNode-1.0

URI: urn:ietf:params:xml:ns:indeHeader-1.0

Registrant Contact: See the "Author's Address" section of this document.

XML: None. Namespace URIs do not represent an XML specification.

Registration request for the INDE XML schema:

URI: urn:ietf:params:xml:schema:indeNode-1.0

URI: urn:ietf:params:xml:schema:indeHeader-1.0

Registrant Contact: See the "Author's Address" section of this document.

XML: See the "Formal Syntax" section of this document.

[12.](#) Privacy Considerations

This specification defines a format that may be used to escrow personal data. The process of data escrow is governed by a legal

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document agreed by the parties, and such legal document must regulate the particularities regarding the protection of personal data.

[13.](#) Example of a full deposit using the XML model

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<inde:deposit type="FULL" id="20191222001" prevId="20191215001"
```

```
  xmlns:inde="urn:ietf:params:xml:ns:inde-1.0"
```

```
  xmlns:indeHeader="urn:ietf:params:xml:ns:indeHeader-1.0"
```

```
  xmlns:indeNode="urn:ietf:params:xml:ns:indeNode-1.0">
```

```
<inde:watermark>2019-12-22T00:00:00Z</inde:watermark>
```

```
<inde:indeMenu>
```

```
  <inde:version>1.0</inde:version>
```

```
  <inde:objURI>urn:ietf:params:xml:ns:indeHeader-1.0
```

```
</inde:objURI>
```

```
<inde:objURI>urn:ietf:params:xml:ns:indeNode-1.0
```

```
</inde:objURI>

</inde:indeMenu>

<!-- Contents -->

<inde:contents>

  <!-- Header -->

  <indeHeader:header>

    <indeHeader:prefix>86.100</indeHeader:prefix>

    <indeHeader:count

      uri="urn:ietf:params:xml:ns:indeNode-1.0">2

    </indeHeader:count>
```

```
</indeHeader:header>

<!--SLN -->

<indeNode:node type="sec">

  <indeNode:prefix>86.100</indeNode:prefix>

  <indeNode:name>CAICT</indeNode:name>

  <indeNode:nature>Research Institute</indeNode:nature>

  <indeNode:addr>

    <indeNode:street>ChangAn Road</indeNode:street>

    <indeNode:street>HuaYuan Road</indeNode:street>

    <indeNode:city>Beijing</indeNode:city>

    <indeNode:sp>Beijing</indeNode:sp>
```

```

    <indeNode:cc>CN</indeNode:cc>

</indeNode:addr>

<indeNode:ipAddr>

    <inedNode:ip>10.23.23.2</indeNode:ip>

    <indeNode:port>8080</indeNode:port>

</indeNode:ipAddr>

<indeNode:ipAddr>

    <inedNode:ip>10.23.23.1</indeNode:ip>

    <indeNode:port>8081</indeNode:port>

</indeNode:ipAddr>

<indeNode:cred type="ent">

    <indeNode:credType>BusinessLicense</indeNode:credType>

    <indeNode:credNo>62072231123451</indeNode:credNo>

```

```

</indeNode:cred>

<indeNode:cred type="leg">

    <indeNode:credType>ChineseIDCard</indeNode:credType>

    <indeNode:credNo>121333343243223335</indeNode:credNo>

</indeNode:cred>

<indeNode:legName>San.Zhang</indeNode:legName>

<indeNode:profile> It is the driving force of industrial
development to undertake the top node and the bridge of
enterprises

</indeNode:profile>

```

```

<indeNode:cotact>

  <inedNode:name>Jonh</indeNode:name>

  <indeNode:phone>15911112222</indeNode:phone>

  <indeNode:email>123@123.com</indeNode:email>

</indeNode:cotact>

<indeNode:crDate>2019-11-23T11:49:00.0Z</indeNode:crDate>

<indeNode:upDate>2019-12-12T17:51:00.0Z</indeNode:upDate>

</indeNode:node>

<!--ELN -->

<indeNode:node type="ent">

  <indeNode:prefix>86.100.1</indeNode:prefix>

  <indeNode:name>Tele</indeNode:name>

  <indeNode:nature>Research Institute</indeNode:nature>

  <indeNode:addr>

    <indeNode:street>ChangAn Road</indeNode:street>

```

```

  <indeNode:street>HuaYuan Road</indeNode:street>

  <indeNode:city>Beijing</indeNode:city>

  <indeNode:sp>Beijing</indeNode:sp>

  <indeNode:cc>CN</indeNode:cc>

</indeNode:addr>

<indeNode:ipAddr>

```

```

    <indeNode:ip>10.23.21.1</indeNode:ip>

    <indeNode:port>8080</indeNode:port>

</indeNode:ipAddr>

<indeNode:ipAddr>

    <indeNode:ip>10.23.23.1</indeNode:ip>

    <indeNode:port>8081</indeNode:port>

</indeNode:ipAddr>

<indeNode:cred type="ent">

    <indeNode:credType>BusinessLicense</indeNode:credType>

    <indeNode:credNo>62072231124321</indeNode:credNo>

</indeNode:cred>

<indeNode:cred type="leg">

    <indeNode:credTyp>ChineseIDCard</indeNode:credTyp>

    <indeNode:credNo>1213333432431213456</indeNode:credNo>

</indeNode:cred>

<indeNode:legName>San.Zhang</indeNode:legName>

<indeNode:profile> It is the driving force of industrial
development to undertake the top node and the bridge of
enterprises

```

```

</indeNode:profile>

<indeNode:cotact>

    <indeNode:name>Jonh</indeNode:name>

    <indeNode:phone>15911114321</indeNode:phone>

```

```

    <indeNode:email>1233@123.com</indeNode:email>

  </indeNode:cotact>

  <indeNode:crDate>2019-04-23T11:49:00.0Z</indeNode:crDate>

  <indeNode:upDate>2019-12-12T17:51:00.0Z</indeNode:upDate>

</indeNode:node>

</inde:contents>

</inde:deposit>

```

[14](#). Example of differential deposit using the XML model

```

<?xml version="1.0" encoding="UTF-8"?>

<inde:deposit type="DIFF" id="20191222002" prevId="20191221002"

  xmlns:inde="urn:ietf:params:xml:ns:inde-1.0"

  xmlns:indeHeader="urn:ietf:params:xml:ns:indeHeader-1.0"

  xmlns:indeNode="urn:ietf:params:xml:ns:indeNode-1.0">

  <inde:watermark>2019-12-22T00:00:00Z</inde:watermark>

  <inde:indeMenu>

    <inde:version>1.0</inde:version>

    <inde:objURI>urn:ietf:params:xml:ns:indeHeader-1.0

    </inde:objURI>

    <inde:objURI>urn:ietf:params:xml:ns:indeNode-1.0

  </inde:indeMenu>

```



```

<inde:deletes>

  <indeNode:delete>

    <indeNode:prefix>86.200</indeNode:prefix>

  </indeNode:delete>

</inde:deletes>

<!-- Contents -->

<inde:contents>

  <!-- Header -->

  <indeHeader:header>

    <indeHeader:prefix>86.202</indeHeader:prefix>

    <indeHeader:count

      uri="urn:ietf:params:xml:ns:indeNode-1.0">1

    </indeHeader:count>

  </indeHeader:header>

  <!--SLN -->

  <indeNode:node type="sec">

    <indeNode:prefix>86.202</indeNode:prefix>

    <indeNode:name>CAICT</indeNode:name>

    <indeNode:nature>Research Institute</indeNode:nature>

    <indeNode:addr>

      <indeNode:street>ChangAn Road</indeNode:street>

      <indeNode:city>Beijing</indeNode:city>

      <indeNode:sp>Beijing</indeNode:sp>

```

```
<indeNode:cc>CN</indeNode:cc>

</indeNode:addr>

<indeNode:ipAddr>

  <inedNode:ip>10.23.23.2</indeNode:ip>

  <indeNode:port>8080</indeNode:port>

</indeNode:ipAddr>

<indeNode:ipAddr>

  <inedNode:ip>10.23.23.1</indeNode:ip>

  <indeNode:port>8081</indeNode:port>

</indeNode:ipAddr>

<indeNode:cred type="ent">

  <indeNode:credType>BusinessLicense</indeNode:credType>

  <indeNode:credNo>62072231123451</indeNode:credNo>

</indeNode:cred>

<indeNode:cred type="leg">

  <indeNode:credTyp>ChineseIDCard</indeNode:credTyp>

  <indeNode:credNo>121333343243223335</indeNode:credNo>

</indeNode:cred>

<indeNode:legaName>San.Zhang</indeNode:legName>

<indeNode:profile> It is the driving force of industrial
development to undertake the top node and the bridge of
enterprises

</indeNode:profile>

<indeNode:cotact>

  <inedNode:name>Jonh</indeNode:name>
```

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```
<indeNode:phone>15911112222</indeNode:phone>

<indeNode:email>123@123.com</indeNode:email>

</indeNode:cotact>

<indeNode:crDate>2019-04-23T11:49:00.0Z</indeNode:crDate>

<indeNode:upDate>2019-12-12T17:51:00.0Z</indeNode:upDate>

</indeNode:node>

</inde:contents>

</inde:deposit>
```

[15. References](#)

[15.1. Normative References](#)

- [ISO-3166-1] 3166, I. S., "Codes for the representation of names of countries and their subdivisions -- Part 1: Country codes", ISO Standard 3166, November 2006.
- [ITU-E164] International Telecommunication Union, "The international public telecommunication numbering plan", ITU-T Recommendation E.164, February 2005.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [[RFC3339](#)] Klyne, G. and C. Newman, "Date and Time on the Internet: Timestamps", [RFC 3339](#), DOI 10.17487/RFC3339, July 2002, <<https://www.rfc-editor.org/info/rfc3339>>.
- [[RFC8174](#)] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

[15.2. Informative References](#)

- [RFC3688] Mealling, M., "The IETF XML Registry", [BCP 81](#), [RFC 3688](#), DOI 10.17487/RFC3688, January 2004, <<https://www.rfc-editor.org/info/rfc3688>>.

- [[RFC4291](#)] Hinden, R. and S. Deering, "IP Version 6 Addressing Architecture", [RFC 4291](#), February 2006.
- [[RFC5730](#)] Hollenbeck, S., "Extensible Provisioning Protocol (EPP)",

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STD 69, [RFC 5730](#), August 2009.

- [[RFC2874](#)] Crawford, M. and C. Huitema, "DNS Extensions to Support IPv6 Address Aggregation and Renumbering", [RFC 2874](#), July 2000.

- [[RFC3596](#)] Thomson, S., Huitema, C., Ksinant, V., and M. Souissi, "DNS Extensions to Support IP Version 6", [RFC 3596](#), October 2003.

16. Acknowledgments

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