

TECHNOLOGIE DE L'INFORMATION

Libération automatisée de wagons – documents XML et WSDL

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1 Introduction

1.1 Objet du document

Ce document sert à décrire les documents WSDL et XML qui se rapportent au service de libération automatisée de wagons en ligne du CN.

2 Service de libération automatisée de wagons en ligne – document WSDL

Le document WSDL permet à un fournisseur de services de préciser les caractéristiques d'un service Web; les caractéristiques ci-dessous concernent le service de libération automatisée de wagons en ligne :

- Nom du service Web et renseignements sur l'adressage.
- Protocole à suivre et encodage à respecter pour accéder à l'**exploitation** publique du service Web.
- Renseignements types : exploitation, paramètres et données types, y compris l'interface du service Web et le nom de l'interface.

Figure 1 : Service de libération automatisée de wagons en ligne – document WSDL en format textuel

```
<wsdl:definitions xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:wsdlsoap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.cn.ca/SRO/"
xmlns:tns="http://www.cn.ca/SRO/"
xmlns:sro="http://www.cn.ca/SRO/Release">
    <wsdl:import namespace="http://www.cn.ca/SRO/Release"
location="http://ecprod.cn.ca/velocity/xml/SRORelease.xsd"></wsdl:import>
    <wsdl:types>
        <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
        elementFormDefault="qualified" targetNamespace="http://www.cn.ca/SRO/"></xsd:schema>
    </wsdl:types>
    <wsdl:message name="sroReleaseReply">
        <wsdl:part name="sroReleaseReplyPart" element="sro:SROReleaseReply"/>
    </wsdl:message>
    <wsdl:message name="sroReleaseRequest">
        <wsdl:part name="sroReleaseRequestPart" element="sro:SROReleaseRequest"></wsdl:part>
    </wsdl:message>
    <wsdl:portType name="SROReleaseProvider">
        <wsdl:operation name="execute">
            <wsdl:input name="sroReleaseRequestInput" message="tns:sroReleaseRequest"/>
            <wsdl:output name="sroReleaseReplyOutput" message="tns:sroReleaseReply"/>
        </wsdl:operation>
    </wsdl:portType>
    <wsdl:binding name="SROReleaseProviderSoapBinding" type="tns:SROReleaseProvider">
        <wsdlsoap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
        <wsdl:operation name="execute">
            <wsdl:input>
                <wsdlsoap:body use="literal"/>
            </wsdl:input>
            <wsdl:output>
                <wsdlsoap:body use="literal"/>
            </wsdl:output>
        </wsdl:operation>
    </wsdl:binding>
    <wsdl:service name="SRORelease">
        <wsdl:port name="SROReleaseProvider" binding="tns:SROReleaseProviderSoapBinding">
            <wsdlsoap:address location="https://automate.cn.ca/ecomsrvc/services/SRORelease"/>
        </wsdl:port>
    </wsdl:service>
</wsdl:definitions>
```

Plusieurs outils d'édition XML offrent la fonction de générateur de documents. Les documents ci-dessous concernent le service de LIBÉRATION AUTOMATISÉE DE WAGONS en ligne – document WSDL. Ils permettent d'identifier les composants principaux du service Web, plus particulièrement les codes d'entrée et de sortie et les messages d'erreurs, décrits dans les sections ci-après réservées aux documents XML.

Figure 2 : Service de libération automatisée de wagons en ligne – documents WSDL produits

WSDL **SROWebService.wsdl**

WSDL location:	**http://ecprod.cn.ca/velocity/xml/SROWebService.wsdl**
targetnamespace:	**http://www.cn.ca/SRO/**

services	bindings	porttypes	messages
SRORelease	**SROReleaseProviderSoapBinding**	**SROReleaseProvider**	**sroReleaseReply**
			sroReleaseRequest

service **SRORelease**

ports	**SROReleaseProvider** binding: **tns:SROReleaseProviderSoapBinding** extensibility: **<wsdlsoap:address location="https://automate.cn.ca/ecomsrvc/services/SRORelease"/>**
source	<wsdl:service name="SRORelease"> <wsdl:port name="SROReleaseProvider" binding="tns:SROReleaseProviderSoapBinding"> <wsdlsoap:address location="https://automate.cn.ca/ecomsrvc/services/SRORelease"/> </wsdl:port> </wsdl:service>

binding **SROReleaseProviderSoapBinding**

type	**tns:SROReleaseProvider**
extensibility	<wsdlsoap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
operations	**execute** extensibility: input: **<wsdlsoap:body use="literal"/>** output: **<wsdlsoap:body use="literal"/>**
Used by	Service **SRORelease** in Port **SROReleaseProvider**
source	<wsdl:binding name="SROReleaseProviderSoapBinding" type="tns:SROReleaseProvider"> <wsdlsoap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/> <wsdl:operation name="execute"> <wsdl:input> <wsdlsoap:body use="literal"/> </wsdl:input> <wsdl:output> <wsdlsoap:body use="literal"/> </wsdl:output> </wsdl:operation> </wsdl:binding>

porttype **SROReleaseProvider**

operations	**execute** input **tns:sroReleaseRequest** output **tns:sroReleaseReply**
Used by	binding **SROReleaseProviderSoapBinding**
source	<wsdl:portType name="SROReleaseProvider"> <wsdl:operation name="execute"> <wsdl:input name="sroReleaseRequestInput" message="tns:sroReleaseRequest"/> <wsdl:output name="sroReleaseReplyOutput" message="tns:sroReleaseReply"/> </wsdl:operation> </wsdl:portType>

message **sroReleaseReply**

parts	**sroReleaseReplyPart** element **sro:SROReleaseReply**
used by	PortType **SROReleaseProvider** in Operation **execute**
source	<wsdl:message name="sroReleaseReply"> <wsdl:part name="sroReleaseReplyPart" element="sro:SROReleaseReply"/> </wsdl:message>

message **sroReleaseRequest**

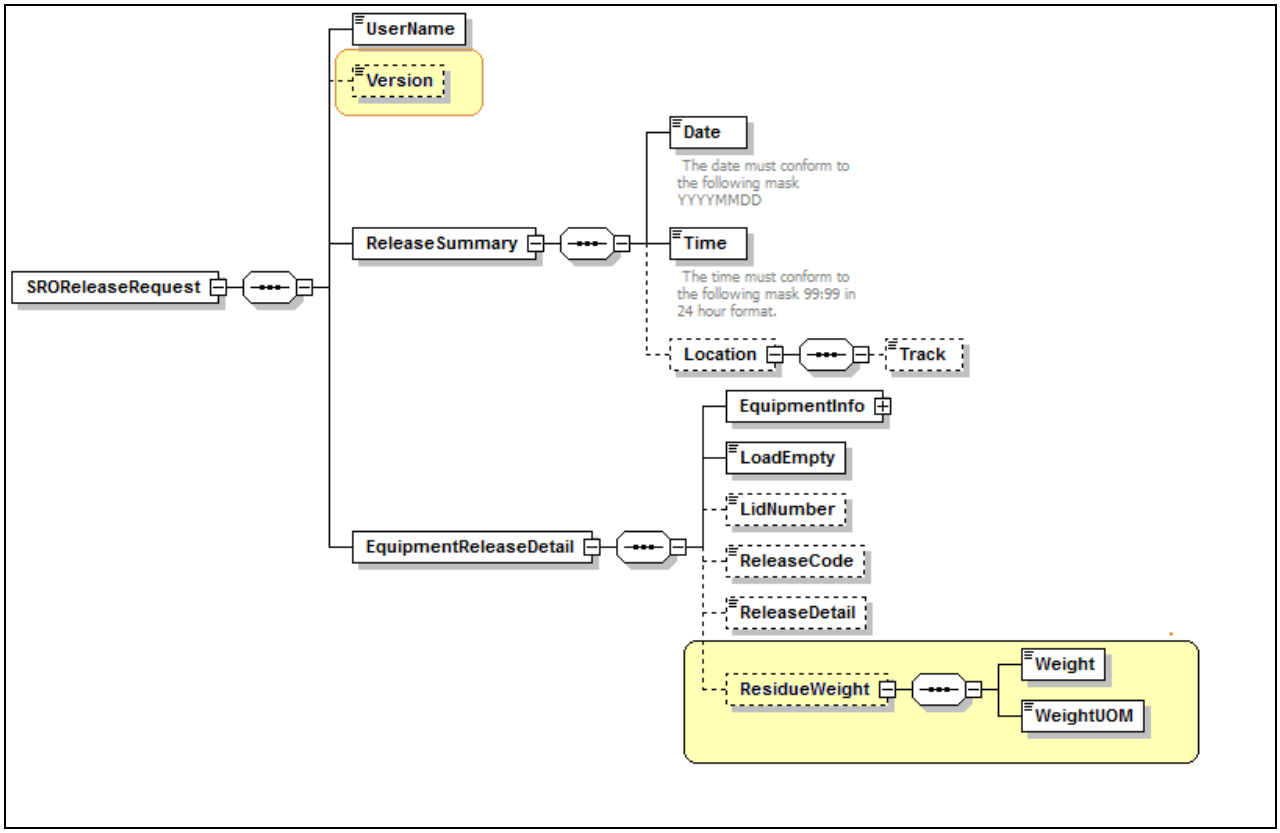
parts	**sroReleaseRequestPart** element **sro:SROReleaseRequest**
used by	PortType **SROReleaseProvider** in Operation **execute**
source	<wsdl:message name="sroReleaseRequest"> <wsdl:part name="sroReleaseRequestPart" element="sro:SROReleaseRequest"/> </wsdl:message>

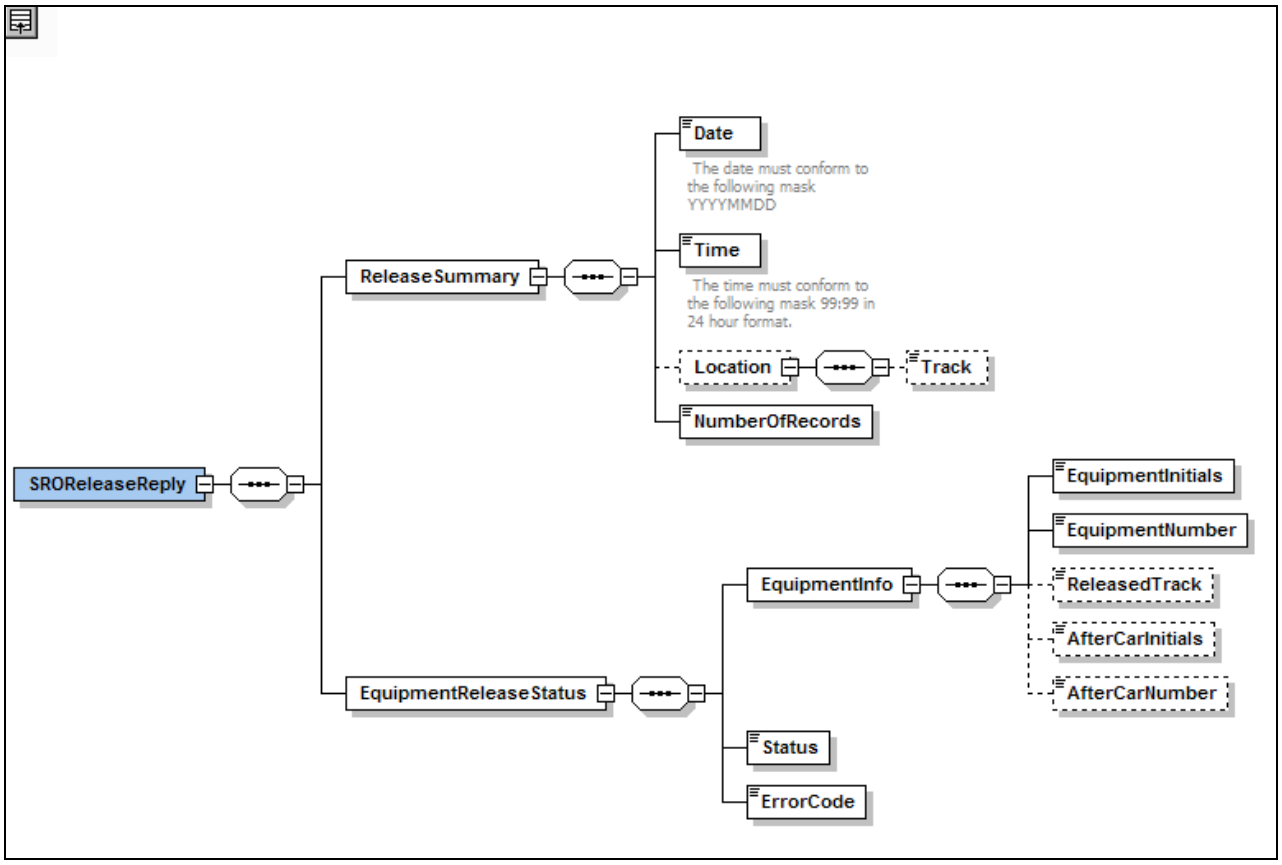
3 Service de libération automatisée de wagons en ligne – document d'entrée et sortie XML

- Le document principal qui permet d'accéder au service de libération automatisée de wagons est un document XML, soumis par un client SOAP. Voir la figure 5, Service de libération automatisée de wagon en ligne – exemple de document d'entrée XML, pour avoir un aperçu du document. Ce document d'entrée XML correspond à la donnée d'entrée «SROReleaseRequest» décrite dans le document WSDL. Le champ Weight et WeightUOM ont été ajoutés dans le message de EquipmentReleaseDetail

- Le schéma (extension .xsd) du document d'entrée XML (extension .xml) sert à définir de manière plus précise les éléments de données, pour permettre de valider les valeurs d'entrée soumises et de sortie. Les données ci-dessous présentent le schéma de façon graphique et textuelle.

Figure 3: Service de libération automatisée de wagons en ligne – schéma d'entrée XML (extension .xsd) – présentation graphique





Le contenu textuel du document.xsd (schéma) correspond à ce qui suit et est présenté pour donner un exemple de validation effectuée par une interface gérée par un analyseur.

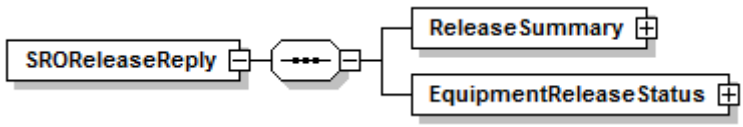
Figure 4 : Service de libération automatisée de wagons en ligne – schéma d'entrée XML (extension .xsd) – présentation textuelle

Schema **SRORelease.xsd**

schema location:	**http://ecprod.cn.ca/velocity/xml/SRORelease.xsd**
targetNamespace:	**http://www.cn.ca/SRO/Release**

Elements
SROReleaseReply
SROReleaseRequest

element **SROReleaseReply**

diagram	
namespace	http://www.cn.ca/SRO/Release
children	**ReleaseSummary EquipmentReleaseStatus**

source

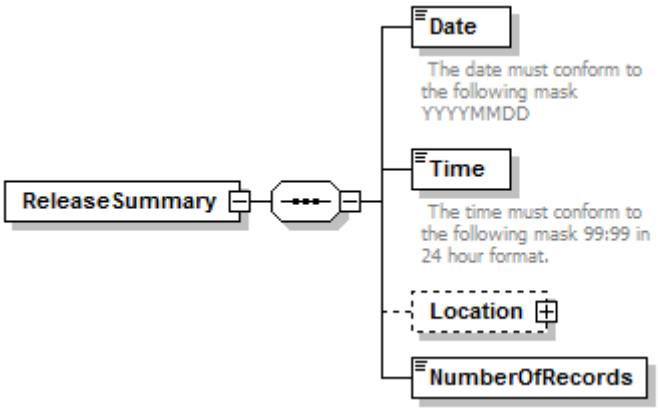
```
<xs:element name="SROReleaseReply">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="ReleaseSummary">
    <xs:complexType>
     <xs:sequence>
      <xs:element name="Date" nillable="true">
       <xs:annotation>
        <xs:documentation> The date must conform to the following mask YYYYMMDD</xs:documentation>
       </xs:annotation>
       <xs:simpleType>
        <xs:restriction base="xs:string">
         <xs:pattern value=".{7}."/>
        </xs:restriction>
       </xs:simpleType>
      </xs:element>
      <xs:element name="Time" nillable="true">
       <xs:annotation>
        <xs:documentation> The time must conform to the following mask 99:99 in 24 hour format.</xs:documentation>
       </xs:annotation>
       <xs:simpleType>
        <xs:restriction base="xs:string">
         <xs:pattern value=".{1}.:.{1}."/>
        </xs:restriction>
       </xs:simpleType>
      </xs:element>
      <xs:element name="Location" nillable="true" minOccurs="0">
       <xs:complexType>
        <xs:annotation>
         <xs:documentation>Location data entity definition</xs:documentation>
        </xs:annotation>
        <xs:sequence>
         <xs:element name="Track" nillable="true" minOccurs="0">
          <xs:simpleType>
           <xs:restriction base="xs:string">
            <xs:minLength value="2"/>
            <xs:maxLength value="4"/>
           </xs:restriction>
          </xs:simpleType>
```

```
            </xs:element>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="NumberOfRecords" type="xs:integer"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="EquipmentReleaseStatus">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="EquipmentInfo">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="EquipmentInitials" nillable="false">
              <xs:simpleType>
                <xs:restriction base="xs:string">
                  <xs:minLength value="2"/>
                  <xs:maxLength value="4"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
            <xs:element name="EquipmentNumber" nillable="false">
              <xs:simpleType>
                <xs:restriction base="xs:integer">
                  <xs:minInclusive value="000000"/>
                  <xs:maxInclusive value="999999"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
            <xs:element name="ReleasedTrack" nillable="true" minOccurs="0">
              <xs:simpleType>
                <xs:restriction base="xs:string">
                  <xs:minLength value="4"/>
                  <xs:maxLength value="4"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
            <xs:element name="AfterCarInitials" nillable="true" minOccurs="0">
              <xs:simpleType>
                <xs:restriction base="xs:string">
                  <xs:minLength value="2"/>
                  <xs:maxLength value="4"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
            <xs:element name="AfterCarNumber" nillable="true" minOccurs="0">
              <xs:simpleType>
                <xs:restriction base="xs:integer">
                  <xs:minInclusive value="000000"/>
                  <xs:maxInclusive value="999999"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="Status" nillable="false">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="Accepted"/>
            <xs:enumeration value="Rejected"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="ErrorCode" type="xs:string" nillable="true"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
</xs:sequence>
```

```
  </xs:complexType>
</xs:element>
```

element **SROReleaseReply/ReleaseSummary**

diagram



namespace: http://www.cn.ca/SRO/Release

children: **Date Time Location NumberOfRecords**

source

```
<xs:element name="ReleaseSummary">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="Date" nillable="true">
    <xs:annotation>
     <xs:documentation> The date must conform to the following mask YYYYMMDD</xs:documentation>
    </xs:annotation>
    <xs:simpleType>
     <xs:restriction base="xs:string">
      <xs:pattern value=".{7}."/>
     </xs:restriction>
    </xs:simpleType>
   </xs:element>
   <xs:element name="Time" nillable="true">
    <xs:annotation>
     <xs:documentation> The time must conform to the following mask 99:99 in 24 hour format.</xs:documentation>
    </xs:annotation>
    <xs:simpleType>
     <xs:restriction base="xs:string">
      <xs:pattern value=".{1}.:.{1}."/>
     </xs:restriction>
    </xs:simpleType>
   </xs:element>
   <xs:element name="Location" nillable="true" minOccurs="0">
    <xs:complexType>
     <xs:annotation>
      <xs:documentation>Location data entity definition</xs:documentation>
     </xs:annotation>
     <xs:sequence>
      <xs:element name="Track" nillable="true" minOccurs="0">
       <xs:simpleType>
        <xs:restriction base="xs:string">
         <xs:minLength value="2"/>
         <xs:maxLength value="4"/>
        </xs:restriction>
       </xs:simpleType>
      </xs:element>
     </xs:sequence>
    </xs:complexType>
   </xs:element>
   <xs:element name="NumberOfRecords" type="xs:integer"/>
  </xs:sequence>
```

```
  </xs:complexType>
</xs:element>
```

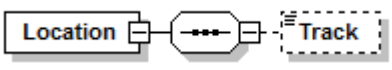
element **SROReleaseReply/ReleaseSummary/Date**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	pattern .{7}.
annotation	documentation The date must conform to the following mask YYYYMMDD
source	<xs:element name="Date" nillable="true"> <xs:annotation> <xs:documentation> The date must conform to the following mask YYYYMMDD</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:pattern value=".{7}."/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseReply/ReleaseSummary/Time**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	pattern .{1}.:.{1}.
annotation	documentation The time must conform to the following mask 99:99 in 24 hour format.
source	<xs:element name="Time" nillable="true"> <xs:annotation> <xs:documentation> The time must conform to the following mask 99:99 in 24 hour format.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:pattern value=".{1}.:.{1}."/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseReply/ReleaseSummary/Location**

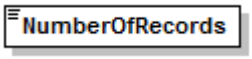
diagram	
namespace	http://www.cn.ca/SRO/Release

children	**Track**
source	<xs:element name="Location" nillable="true" minOccurs="0"> <xs:complexType> <xs:annotation> <xs:documentation>Location data entity definition</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Track" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

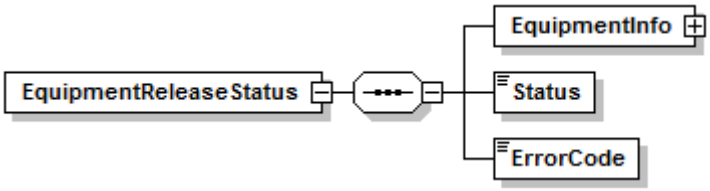
element **SROReleaseReply/ReleaseSummary/Location/Track**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 2 maxLength 4
source	<xs:element name="Track" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseReply/ReleaseSummary/NumberOfRecords**

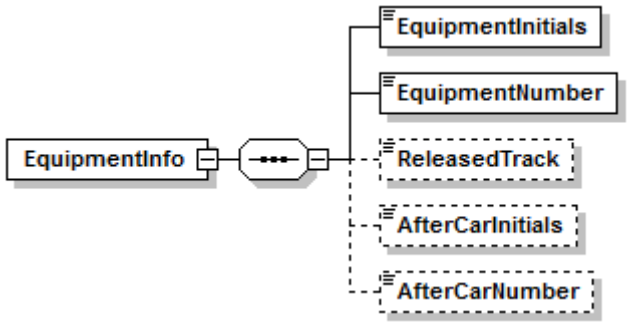
diagram	
namespace	http://www.cn.ca/SRO/Release
type	**xs:integer**
source	<xs:element name="NumberOfRecords" type="xs:integer"/>

element **SROReleaseReply/EquipmentReleaseStatus**

diagram	
namespace	http://www.cn.ca/SRO/Release

children	**EquipmentInfo Status ErrorCode**
source	<xs:element name="EquipmentReleaseStatus"> <xs:complexType> <xs:sequence> <xs:element name="EquipmentInfo"> <xs:complexType> <xs:sequence> <xs:element name="EquipmentInitials" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="EquipmentNumber" nillable="false"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="ReleasedTrack" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="4"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="AfterCarInitials" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="AfterCarNumber" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element> </xs:sequence> </xs:complexType> </xs:element> <xs:element name="Status" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="Accepted"/> <xs:enumeration value="Rejected"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="ErrorCode" type="xs:string" nillable="true"/> </xs:sequence> </xs:complexType> </xs:element>

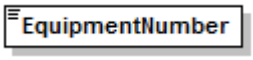
element **SROReleaseReply/EquipmentReleaseStatus/EquipmentInfo**

diagram	
namespace	http://www.cn.ca/SRO/Release
children	**EquipmentInitials EquipmentNumber ReleasedTrack AfterCarInitials AfterCarNumber**
source	<xs:element name="EquipmentInfo"> <xs:complexType> <xs:sequence> <xs:element name="EquipmentInitials" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="EquipmentNumber" nillable="false"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="ReleasedTrack" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="4"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="AfterCarInitials" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="AfterCarNumber" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

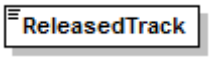
element **SROReleaseReply/EquipmentReleaseStatus/EquipmentInfo/EquipmentInitials**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 2 maxLength 4
source	<xs:element name="EquipmentInitials" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element>

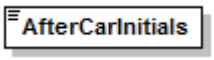
element **SROReleaseReply/EquipmentReleaseStatus/EquipmentInfo/EquipmentNumber**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:integer**
facets	minInclusive 000000 maxInclusive 999999
source	<xs:element name="EquipmentNumber" nillable="false"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element>

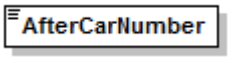
element **SROReleaseReply/EquipmentReleaseStatus/EquipmentInfo/ReleasedTrack**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 4 maxLength 4
source	<xs:element name="ReleasedTrack" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="4"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseReply/EquipmentReleaseStatus/EquipmentInfo/AfterCarInitials**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 2 maxLength 4
source	<xs:element name="AfterCarInitials" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element>

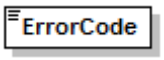
element **SROReleaseReply/EquipmentReleaseStatus/EquipmentInfo/AfterCarNumber**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:integer**
facets	minInclusive 000000 maxInclusive 999999
source	<xs:element name="AfterCarNumber" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element>

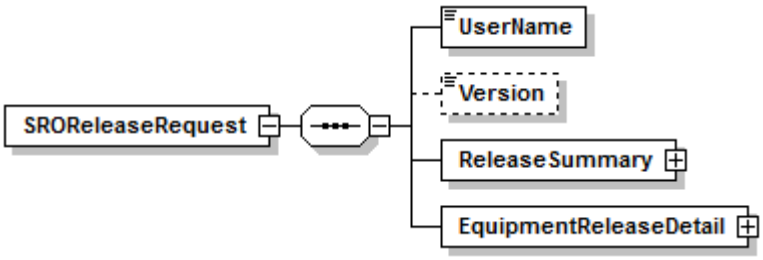
element **SROReleaseReply/EquipmentReleaseStatus/Status**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	enumeration Accepted enumeration Rejected
source	<xs:element name="Status" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="Accepted"/> <xs:enumeration value="Rejected"/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseReply/EquipmentReleaseStatus/ErrorCode**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	**xs:string**
source	<xs:element name="ErrorCode" type="xs:string" nillable="true"/>

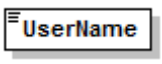
element **SROReleaseRequest**

diagram	
namespace	http://www.cn.ca/SRO/Release
children	**UserName Version ReleaseSummary EquipmentReleaseDetail**
source	<xs:element name="SROReleaseRequest"> <xs:complexType> <xs:sequence> <xs:element name="UserName" type="xs:string"/> <xs:element name="Version" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="1"/> <xs:maxLength value="20"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="ReleaseSummary"> <xs:complexType> <xs:sequence> <xs:element name="Date" nillable="true"> <xs:annotation> <xs:documentation> The date must conform to the following mask YYYYMMDD</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:pattern value=".{7}."/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="Time" nillable="true"> <xs:annotation> <xs:documentation> The time must conform to the following mask 99:99 in 24 hour format.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:pattern value=".{1}.:.{1}."/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="Location" nillable="true" minOccurs="0"> <xs:complexType>

```
            <xs:annotation>
              <xs:documentation>Location data entity definition</xs:documentation>
            </xs:annotation>
            <xs:sequence>
              <xs:element name="Track" nillable="true" minOccurs="0">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:minLength value="2"/>
                    <xs:maxLength value="4"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="EquipmentReleaseDetail">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="EquipmentInfo">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="EquipmentInitials" nillable="false">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:minLength value="2"/>
                    <xs:maxLength value="4"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="EquipmentNumber" nillable="false">
                <xs:simpleType>
                  <xs:restriction base="xs:integer">
                    <xs:minInclusive value="000000"/>
                    <xs:maxInclusive value="999999"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="ReleasedTrack" nillable="true" minOccurs="0">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:minLength value="4"/>
                    <xs:maxLength value="4"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="AfterCarInitials" nillable="true" minOccurs="0">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:minLength value="2"/>
                    <xs:maxLength value="4"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="AfterCarNumber" nillable="true" minOccurs="0">
                <xs:simpleType>
                  <xs:restriction base="xs:integer">
                    <xs:minInclusive value="000000"/>
                    <xs:maxInclusive value="999999"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="LoadEmpty" nillable="false">
          <xs:simpleType>
            <xs:restriction base="xs:string">
```

```
                <xs:enumeration value="LOAD"/>
                <xs:enumeration value="Load"/>
                <xs:enumeration value="load"/>
                <xs:enumeration value="EMPTY"/>
                <xs:enumeration value="Empty"/>
                <xs:enumeration value="empty"/>
              </xs:restriction>
            </xs:simpleType>
          </xs:element>
          <xs:element name="LidNumber" nillable="true" minOccurs="0">
            <xs:simpleType>
              <xs:restriction base="xs:string"/>
            </xs:simpleType>
          </xs:element>
          <xs:element name="ReleaseCode" nillable="true" minOccurs="0">
            <xs:simpleType>
              <xs:restriction base="xs:string">
                <xs:minLength value="0"/>
                <xs:maxLength value="2"/>
              </xs:restriction>
            </xs:simpleType>
          </xs:element>
          <xs:element name="ReleaseDetail" nillable="true" minOccurs="0">
            <xs:simpleType>
              <xs:restriction base="xs:string">
                <xs:minLength value="0"/>
                <xs:maxLength value="215"/>
              </xs:restriction>
            </xs:simpleType>
          </xs:element>
          <xs:element name="ResidueWeight" nillable="true" minOccurs="0">
            <xs:complexType>
              <xs:sequence>
                <xs:element name="Weight" nillable="false">
                  <xs:simpleType>
                    <xs:restriction base="xs:integer">
                      <xs:minInclusive value="0"/>
                      <xs:maxInclusive value="99999999"/>
                    </xs:restriction>
                  </xs:simpleType>
                </xs:element>
                <xs:element name="WeightUOM" nillable="false">
                  <xs:simpleType>
                    <xs:restriction base="xs:string">
                      <xs:minLength value="0"/>
                      <xs:maxLength value="2"/>
                    </xs:restriction>
                  </xs:simpleType>
                </xs:element>
              </xs:sequence>
            </xs:complexType>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
</xs:element>
```

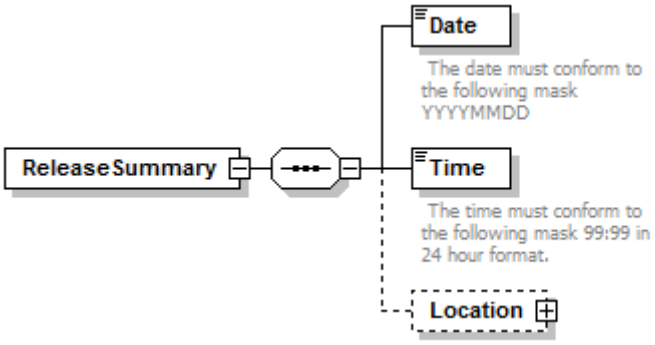
element **SROReleaseRequest/UserName**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	**xs:string**
source	<xs:element name="UserName" type="xs:string"/>

element **SROReleaseRequest/Version**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 1 maxLength 20
source	<xs:element name="Version" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="1"/> <xs:maxLength value="20"/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseRequest/ReleaseSummary**

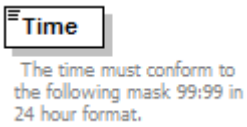
diagram	
namespace	http://www.cn.ca/SRO/Release
children	**Date Time Location**
source	<xs:element name="ReleaseSummary"> <xs:complexType> <xs:sequence> <xs:element name="Date" nillable="true"> <xs:annotation> <xs:documentation> The date must conform to the following mask YYYYMMDD</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:pattern value=".{7}."/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="Time" nillable="true"> <xs:annotation> <xs:documentation> The time must conform to the following mask 99:99 in 24 hour format.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:pattern value=".{1}.:.{1}."/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="Location" nillable="true" minOccurs="0"> <xs:complexType>

```
        <xs:annotation>
          <xs:documentation>Location data entity definition</xs:documentation>
        </xs:annotation>
        <xs:sequence>
          <xs:element name="Track" nillable="true" minOccurs="0">
            <xs:simpleType>
              <xs:restriction base="xs:string">
                <xs:minLength value="2"/>
                <xs:maxLength value="4"/>
              </xs:restriction>
            </xs:simpleType>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
 </xs:complexType>
</xs:element>
```

element **SROReleaseRequest/ReleaseSummary/Date**

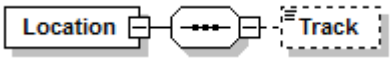
diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	pattern .{7}.
annotation	documentation The date must conform to the following mask YYYYMMDD
source	<xs:element name="Date" nillable="true"> <xs:annotation> <xs:documentation> The date must conform to the following mask YYYYMMDD</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:pattern value=".{7}."/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseRequest/ReleaseSummary/Time**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	pattern .{1}.:.{1}.
annotation	documentation The time must conform to the following mask 99:99 in 24 hour format.
source	<xs:element name="Time" nillable="true"> <xs:annotation> <xs:documentation> The time must conform to the following mask 99:99 in 24 hour format.</xs:documentation> </xs:annotation>

```
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:pattern value=".{1}.:.{1}."/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

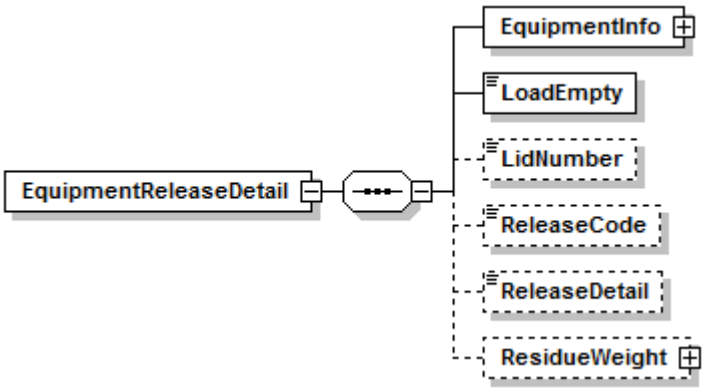
element **SROReleaseRequest/ReleaseSummary/Location**

diagram	
namespace	http://www.cn.ca/SRO/Release
children	**Track**
source	<xs:element name="Location" nillable="true" minOccurs="0"> <xs:complexType> <xs:annotation> <xs:documentation>Location data entity definition</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Track" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

element **SROReleaseRequest/ReleaseSummary/Location/Track**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 2 maxLength 4
source	<xs:element name="Track" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element>

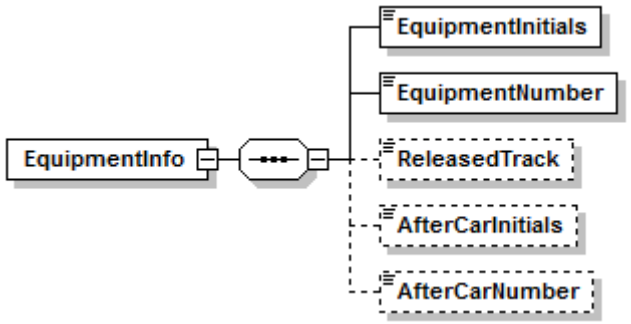
element **SROReleaseRequest/EquipmentReleaseDetail**

diagram	
namespace	http://www.cn.ca/SRO/Release
children	**EquipmentInfo LoadEmpty LidNumber ReleaseCode ReleaseDetail ResidueWeight**
source	

```
<xs:element name="EquipmentReleaseDetail">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="EquipmentInfo">
    <xs:complexType>
     <xs:sequence>
      <xs:element name="EquipmentInitials" nillable="false">
       <xs:simpleType>
        <xs:restriction base="xs:string">
         <xs:minLength value="2"/>
         <xs:maxLength value="4"/>
        </xs:restriction>
       </xs:simpleType>
      </xs:element>
      <xs:element name="EquipmentNumber" nillable="false">
       <xs:simpleType>
        <xs:restriction base="xs:integer">
         <xs:minInclusive value="000000"/>
         <xs:maxInclusive value="999999"/>
        </xs:restriction>
       </xs:simpleType>
      </xs:element>
      <xs:element name="ReleasedTrack" nillable="true" minOccurs="0">
       <xs:simpleType>
        <xs:restriction base="xs:string">
         <xs:minLength value="4"/>
         <xs:maxLength value="4"/>
        </xs:restriction>
       </xs:simpleType>
      </xs:element>
      <xs:element name="AfterCarInitials" nillable="true" minOccurs="0">
       <xs:simpleType>
        <xs:restriction base="xs:string">
         <xs:minLength value="2"/>
         <xs:maxLength value="4"/>
        </xs:restriction>
       </xs:simpleType>
      </xs:element>
      <xs:element name="AfterCarNumber" nillable="true" minOccurs="0">
       <xs:simpleType>
        <xs:restriction base="xs:integer">
         <xs:minInclusive value="000000"/>
         <xs:maxInclusive value="999999"/>
        </xs:restriction>
       </xs:simpleType>
```

```
            </xs:element>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="LoadEmpty" nillable="false">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="LOAD"/>
            <xs:enumeration value="Load"/>
            <xs:enumeration value="load"/>
            <xs:enumeration value="EMPTY"/>
            <xs:enumeration value="Empty"/>
            <xs:enumeration value="empty"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="LidNumber" nillable="true" minOccurs="0">
        <xs:simpleType>
          <xs:restriction base="xs:string"/>
        </xs:simpleType>
      </xs:element>
      <xs:element name="ReleaseCode" nillable="true" minOccurs="0">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:minLength value="0"/>
            <xs:maxLength value="2"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="ReleaseDetail" nillable="true" minOccurs="0">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:minLength value="0"/>
            <xs:maxLength value="215"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="ResidueWeight" nillable="true" minOccurs="0">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="Weight" nillable="false">
              <xs:simpleType>
                <xs:restriction base="xs:integer">
                  <xs:minInclusive value="0"/>
                  <xs:maxInclusive value="99999999"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
            <xs:element name="WeightUOM" nillable="false">
              <xs:simpleType>
                <xs:restriction base="xs:string">
                  <xs:minLength value="0"/>
                  <xs:maxLength value="2"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

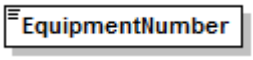
element **SROReleaseRequest/EquipmentReleaseDetail/EquipmentInfo**

diagram	
namespace	http://www.cn.ca/SRO/Release
children	**EquipmentInitials EquipmentNumber ReleasedTrack AfterCarInitials AfterCarNumber**
source	<xs:element name="EquipmentInfo"> <xs:complexType> <xs:sequence> <xs:element name="EquipmentInitials" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="EquipmentNumber" nillable="false"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="ReleasedTrack" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="4"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="AfterCarInitials" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="AfterCarNumber" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

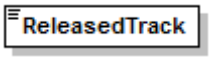
element **SROReleaseRequest/EquipmentReleaseDetail/EquipmentInfo/EquipmentInitials**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 2 maxLength 4
source	<xs:element name="EquipmentInitials" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element>

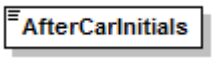
element **SROReleaseRequest/EquipmentReleaseDetail/EquipmentInfo/EquipmentNumber**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:integer**
facets	minInclusive 000000 maxInclusive 999999
source	<xs:element name="EquipmentNumber" nillable="false"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element>

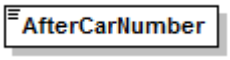
element **SROReleaseRequest/EquipmentReleaseDetail/EquipmentInfo/ReleasedTrack**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 4 maxLength 4
source	<xs:element name="ReleasedTrack" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="4"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element>

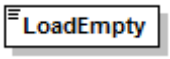
element **SROReleaseRequest/EquipmentReleaseDetail/EquipmentInfo/AfterCarInitials**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 2 maxLength 4
source	<xs:element name="AfterCarInitials" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="2"/> <xs:maxLength value="4"/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseRequest/EquipmentReleaseDetail/EquipmentInfo/AfterCarNumber**

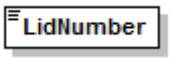
diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:integer**
facets	minInclusive 000000 maxInclusive 999999
source	<xs:element name="AfterCarNumber" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="000000"/> <xs:maxInclusive value="999999"/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseRequest/EquipmentReleaseDetail/LoadEmpty**

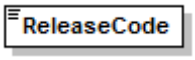
diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	enumeration LOAD enumeration Load enumeration load enumeration EMPTY enumeration Empty enumeration empty
source	<xs:element name="LoadEmpty" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="LOAD"/> <xs:enumeration value="Load"/> <xs:enumeration value="load"/> <xs:enumeration value="EMPTY"/> <xs:enumeration value="Empty"/> <xs:enumeration value="empty"/>

```
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

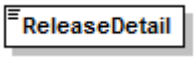
element **SROReleaseRequest/EquipmentReleaseDetail/LidNumber**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
source	<xs:element name="LidNumber" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"/> </xs:simpleType> </xs:element>

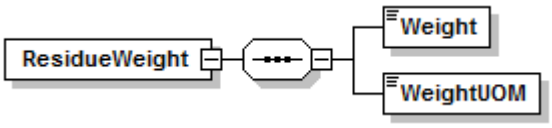
element **SROReleaseRequest/EquipmentReleaseDetail/ReleaseCode**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 0 maxLength 2
source	<xs:element name="ReleaseCode" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="0"/> <xs:maxLength value="2"/> </xs:restriction> </xs:simpleType> </xs:element>

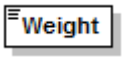
element **SROReleaseRequest/EquipmentReleaseDetail/ReleaseDetail**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 0 maxLength 215
source	<xs:element name="ReleaseDetail" nillable="true" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="0"/> <xs:maxLength value="215"/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseRequest/EquipmentReleaseDetail/ResidueWeight**

diagram	
namespace	http://www.cn.ca/SRO/Release
children	**Weight** **WeightUOM**
source	<xs:element name="ResidueWeight" nillable="true" minOccurs="0"> <xs:complexType> <xs:sequence> <xs:element name="Weight" nillable="false"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="0"/> <xs:maxInclusive value="99999999"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="WeightUOM" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="0"/> <xs:maxLength value="2"/> </xs:restriction> </xs:simpleType> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

element **SROReleaseRequest/EquipmentReleaseDetail/ResidueWeight/Weight**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:integer**
facets	minInclusive 0 maxInclusive 99999999
source	<xs:element name="Weight" nillable="false"> <xs:simpleType> <xs:restriction base="xs:integer"> <xs:minInclusive value="0"/> <xs:maxInclusive value="99999999"/> </xs:restriction> </xs:simpleType> </xs:element>

element **SROReleaseRequest/EquipmentReleaseDetail/ResidueWeight/WeightUOM**

diagram	
namespace	http://www.cn.ca/SRO/Release
type	restriction of **xs:string**
facets	minLength 0 maxLength 2
source	<xs:element name="WeightUOM" nillable="false"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:minLength value="0"/> <xs:maxLength value="2"/> </xs:restriction> </xs:simpleType> </xs:element>

4 Erreur – SOAP

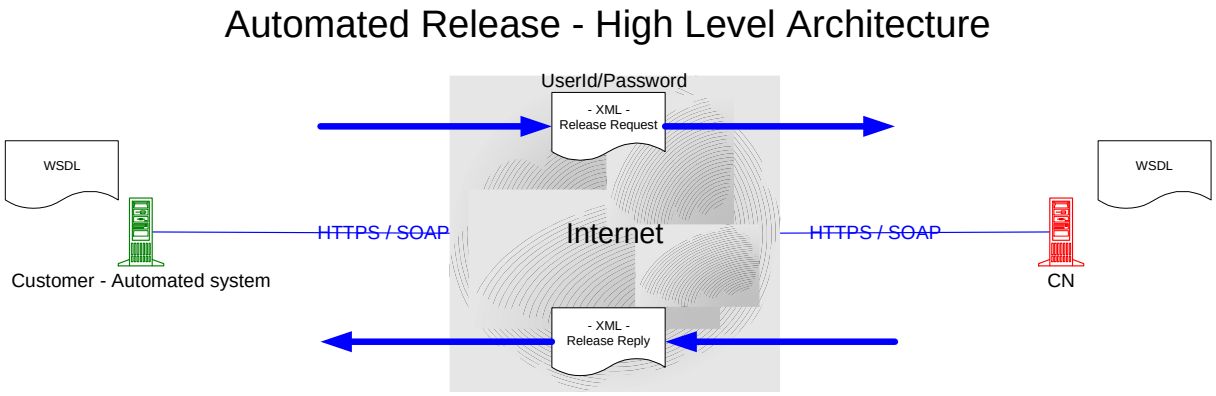
Les erreurs SOAP seront traitées par le système de traitement des exceptions standard des services Web. Les erreurs seront saisies avec :

. un code d'erreur
. une chaîne de caractères

Une liste des erreurs SOAP se trouve dans le document http://www.cn.ca/-/media/Files/Customer%20Centre/Customer-Centre-Documents/automated-railcar-release-error-codes-fr.pdf (Libération automatisée de wagons – codes d'erreurs).

5 Sécurité

5.1 Schéma



5.2 Authentification

Les clients doivent utiliser le même code d'usager et le même mot de passe qu'ils utilisent pour effectuer des transactions en ligne à partir du site des Affaires électroniques. Pour ce faire, ils doivent être inscrits au site des Affaires électroniques.

5.3 Confidentialité

Comme pour toutes les applications des Affaires électroniques, les données sont chiffrées (serveur sécurisé, chiffrement 128 bits).

5.4 Configuration client

L'authentification de base sera utilisée pour ce service. L'infrastructure du CN se chargera de l'authentification et de l'autorisation. En principe, tous les clients du service Web devront fournir les renseignements ci-dessous dans l'en-tête HTTP.

- AUTH_TYPE = "basic"
- USERNAME = "joe123"
- PASSWORD = "mypassword"

Important : Les renseignements ci-dessus doivent se trouver dans l'en-tête HTTP et non dans le document XML.

6 Références

Aperçu des services Web et de leur architecture, IBM Corporation 2002.
Services Web : http://www.w3.org/2002/ws/
WSDL : http://www.w3.org/TR/wsdl12/
SOAP : http://www.w3.org/TR/soap12-part0/