

STINA guidelines

Automated reporting

1. Introduction

The guidelines are intended for technicians in enterprises wishing to automate their reporting to Danmarks Nationalbank, and describe the reporting process in STINA (STINA: STatistics Indberetning (reporting) to Danmarks Nationalbank).

Other materials required for creating a correct XML file are:

1. Guidelines for the relevant type of reporting
2. Reporting forms with XML names
3. XML Schema (*.xsd file) for the XML report file.

The materials are available at Danmarks Nationalbank's website.¹

Is your enterprise contemplating an automated solution, we recommend that you contact Danmarks Nationalbank for further advice and guidance before commencing your development work. Please call +45 33 63 68 14, or send an e-mail to stina@nationalbanken.dk. Also you may need to fill in a special form, see section 2, item 4.

2. Reporting process in STINA

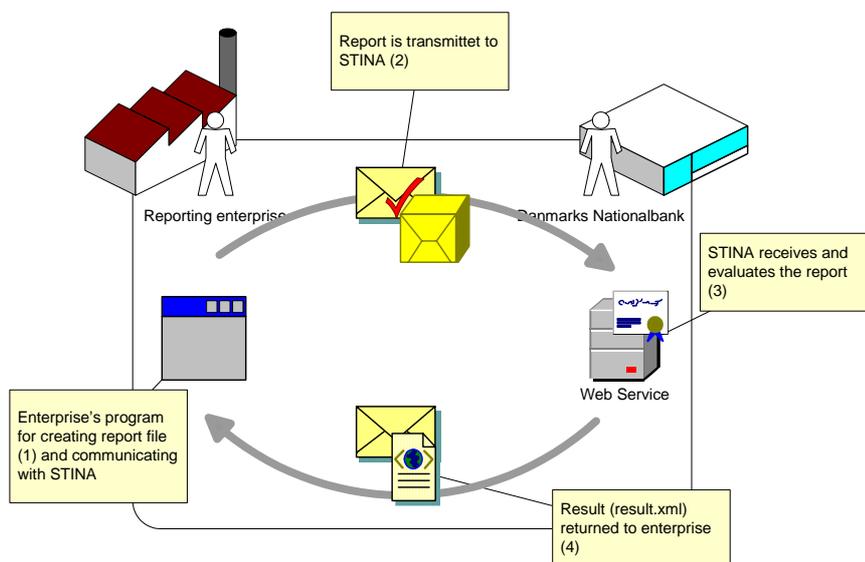
The reporting process comprises 4 steps, cf. Chart 1:

1. The enterprise creates a report file in the XML format defined by Danmarks Nationalbank for the reporting type in question.
2. The enterprise transmits the XML file to STINA via software (a web service client) communicating with STINA.
3. STINA evaluates the reporting file by running a number of rules and controls regarding data format, validity and data consistency. This is to ensure that Danmarks Nationalbank can receive and read the file. The first report of a given period is called an ordinary report.
4. STINA returns a result file (result.xml) which is sent to the enterprise's web service client. If errors are found they must be corrected and the report sent again. Errors are described in the result file. If the report does not contain control errors, the result file states that there are 0

¹ www.nationalbanken.dk under Rules > Statistics – Electronic reporting (STINA), under the relevant reporting type (if it exists in English, otherwise you only find it under the Danish part of the website).

errors in the report. In addition, this information can also be sent by e-mail (a so-called result mail) to one or more e-mail addresses specified by the enterprise on a special form when connecting to STINA. Appendices 2 and 3 show sample results from STINA for reports with and without errors, respectively.

Chart 1: Reporting to STINA



When Danmarks Nationalbank has received a report free of control errors, it is automatically checked for other types of objective errors. The check may result in an e-mail to the contact at the enterprise informing about errors in the report. The errors must be corrected and a new report sent.

Furthermore the report will undergo a number of automated and manual analytic controls. The result will be assessed by an employee at Danmarks Nationalbank who may, subsequently, get in touch with the contact of the enterprise.

3. Step-by-step review

The following is a step-by-step review of the reporting process:

3.1. Enterprise creates XML report file

The enterprise creates the XML file on the basis of extracts from its own IT systems and a program creating it. The file is defined in the so-called XML Schema (*.xsd file).

The first report file submitted for a given period (ordinary report) is always assigned serial number 1. If the report contains errors it must be resubmitted (substitute report) and in most cases assigned serial number 2, etc. See more details below in section 6 Correction process.

3.2. Enterprise transmits report file to STINA

To communicate with the STINA web service, the enterprise may use either a communication program developed and supplied by Danmarks Nationalbank or proprietary software (a web service client).

From a PC with the enterprise Danmarks Nationalbank's communication program can transmit a report file to STINA's web service and receive the result.xml file. This program requires Windows XP SP3 (or later), and Microsoft.Net 1.1 must be installed. The program source code is open, and enterprises wishing to send report files from other IT environments are free to seek inspiration in the code when developing their own programs.

For enterprises wishing to develop their own web service client, STINA's two web services are described below. Well-defined descriptions of the two web services can be downloaded as WDSL files from Danmarks Nationalbank's website (Rules > Statistics – Electronic reporting (STINA) > STINA – Technical requirements).

3.2.1. Web services in STINA

STINA includes two web services for receiving report files. One receives compressed report files (zip archives) while the other receives uncompressed report files. Apart from this, they have identical functionalities.

Their URL addresses are:

XML file: <https://stina.nationalbanken.dk/StinaWS/xml.asmx>, and

Zip file: <https://stina.nationalbanken.dk/StinaWS/zip.asmx>

The web service receiving zipped report files is called "zip", while the web service receiving uncompressed report files is called "xml".

*If the enterprise's report file exceeds 2 MB before compression, it **must** be zipped.*

A zip file (i.e. a zip archive, cf. above) transmitted to STINA can *only* contain *one* XML file.

Please note that communication to and from both STINA web services are based on the HTTPS protocol. This means that communication is encrypted in both directions.

3.2.2. Functionality of the STINA web services

Each of the two STINA web services comprises a test functionality (test method) and a production functionality (submit method).

3.2.2.1. Test method

The test method is solely intended for the enterprise's development process.

Danmarks Nationalbank encourages enterprises – before the first ordinary report – to use the test method to test proprietary software for creating and sending the report file to STINA and subsequently receiving the result.xml file from STINA.

When the test system for a reporting type becomes available, Danmarks Nationalbank informs the reporting enterprises. The test method remains available for receiving report files after the test period has expired, and may be used freely by the enterprise. Calling the *test* method entails that the report file submitted (and decompressed if required) is checked for data format. Information about enterprise, reporting period and serial number in the Masterdata sheet of the report is *not* checked. Therefore, errors may occur when a report file, having passed the test method free of errors, is subsequently submitted. The objective and analytic controls are not available in the test method.

The enterprise will always receive a result.xml file stating the result of the controls. The test web service, however, cannot return a result e-mail.

Reports sent to the test web service are not stored by Danmarks Nationalbank and thus do not "count" as reports.

3.2.2.2. Submit method

The *submit* method is Danmarks Nationalbank's production web service. It is to be used for reporting to Danmarks Nationalbank. The reports are checked for data format, validity and data consistency.

3.3. Receiving and evaluating reports in STINA (rules and controls)

Immediately upon receipt of a report file, STINA initiates an automated control process aimed at ensuring the quality of the data reported, as well as the relevance (correct period and known enterprise) and format of the report.

The report file goes through the following successive controls (I-V):

- I *Format control* (consistency with the XML schema): STINA checks that the report file is both 'wellformed XML' and consistent with its XML schema (supplied by Danmarks Nationalbank).
- II *Validity*: STINA checks that the enterprise is known and the period and serial number are correct.
- III For some reporting types *additional format controls* are performed, before the result is returned via the result.xml file. These controls are described in the reporting guidelines.

Irrespective of the outcome of the controls, the enterprise is always informed about the result, since STINA web service automatically sends an XML file (result.xml) to the enterprise's web service client outlining the results of the controls. If errors are found in terms of consistency with the XML schemas, they are described in the result.xml file, and the remaining

controls (valid reporting and any additional format controls) are not performed. Likewise additional format controls will only be performed if no errors have been detected in the two preceding controls.

In addition to the result.xml file the enterprise can choose to receive the same information by e-mail to one or more contacts selected by the enterprise – a so-called result e-mail. This must be stated on a special form when connecting to STINA. STINA will not send a result e-mail before the report has been checked for consistency of data format and validity.

IV *Objective controls*: A number of logic/objective controls are performed on the reported data. If errors are found the contact of the enterprise will receive an e-mail describing the errors.

V *Analytic controls*: A number of both automated and manual analytic controls are performed on the reported data. They may result in an employee at Danmarks Nationalbank getting in touch with the contact of the enterprise.

4. Description of XML report file structure

The following outlines the overall structure of the XML file which is to be created and sent to STINA. The structure is identical for all reporting types.

In order to be able to create a correct XML file for a specific reporting type, the specific requirements for the reporting type in question *also* have to be observed. They are described in the following material:

- ◆ Reporting guidelines for the reporting type in question
- ◆ XML Schema file (*.xsd) for the reporting file
- ◆ List of XML names in the report.

The material can be found at Danmarks Nationalbank's website².

It may be helpful to imagine that the structure of the XML file mirrors the structure of a spreadsheet: The first sheet corresponds to the 'masterdata' of the XML file, in which are stated information about the enterprise and one or more rows with information about the contact(s). After that follows a number of schema elements, corresponding to a number of sheets, containing rows or columns with reported data.

4.1.1. Overall structure of XML report file

The elements of the XML file comprise four embedded levels. The structure of the elements is shown in Example 1, and is more or less identical for all reporting types. Appendix 1 shows an example of a hypothetical report file of the reporting type 'BOP' (Balance of payments).

² www.nationalbanken.dk under Rules > Statistics – Electronic reporting (STINA), under the relevant reporting type (if it exists in English, otherwise you only find it under the Danish part of the website).

Example 1

Element structure in the XML file (for understanding only: English translation if necessary of XML names is listed in the body text in brackets and grey type):

```
<Report_type_name version="1" language="danish">
  <masterdata idno="value" refperio="value" loebenr="value" fir-
    manavn="value" gadenavn="value" postnr="value"
    boks="value" by="value" tlf="value" >
    <kontaktpersoner>
      <person fuldtnavn="value" tlf="value" email="value" />
      <person fuldtnavn="value" tlf="value" email="value" />
    </kontaktpersoner>
  </masterdata>
  <form_element_name>
    <row_type_name_1>
      <data attr1="value1" attr2="" ... attrn="value" ...>
      <data attr1="value1" attr2="" ... attrn="value" ...>
    </row_type_name_1>
    <row_type_name_2>
      <data attr3="value1" attr4="" ... attrn="value" ...>
    </row_type_name_2>
  </form_element_name>
</Report_type_name>
```

Danmarks Nationalbank defines the number of the version. A new reporting type will always be version 1, at some point there may be a version 2, etc. The attribute 'language' can assume the values "danish" or "english".

Embedded in the outermost element are the elements *masterdata* and a number of *form* elements. They represent the sheets of the report in which data is to be entered.

Embedded in the *masterdata* element is the element *kontaktpersoner* (contacts) which includes one or more *person* elements. Here the reported information is entered as attributes to the *masterdata* element and as attributes to the *person* elements.

Embedded in the other *form* elements are *row type* elements and if required *column type* elements. These two types of element are also called groups. Embedded in them are *data* elements. The reported data solely occur here as attribute values to the *data* elements.

All reported data occur in the report XML file as values to attributes, cf. also Appendix 1. Thus, the elements themselves are empty, i.e. they have no independent values. The convention chosen implies that where no values can be stated for a non-mandatory attribute, the attribute in its entirety (i.e. the attribute name and its value) must be omitted from the XML file. Consequently, it is not permitted to state the attribute name with an empty value attached (e.g. `attname=""`) in the XML file.

In the *masterdata* element are stated general enterprise information (incl. names of contacts), reporting period and serial number. Together *idno* attribute, *refperio* attribute and *loebenr* (serial number) attribute are sufficient to uniquely identify the individual report. The first report of a reporting period is always assigned serial number 1, and for each consecutive substitute report the serial number must be augmented by 1. The e-mail in the *kontaktpersoner* (contacts) element will be used when Danmarks Nationalbank wishes to get in touch with the responsible employee at the enterprise. For some reporting types, besides the *masterdata* element, yet one or more *form* element exist containing information about the enterprise.

Under the *form* elements are the other data reported by the enterprise. It depends on the reporting type which *form* elements, *row type* elements, *column type* elements and attributes to *data* elements exist. This information can be obtained from the reporting guidelines for the reporting type in question, and also from its schema file (*.xsd file).

5. Content and structure of the result.xml file

The response from STINA's web service is an XML file, result.xml, containing a message about any errors in the reporting file.

The result.xml file gives the enterprise a basis for correcting any errors.

Section 5.1.1 describes the structure of the file and section 6 the correction process.

Examples of result.xml can be found in Appendices 2 and 3.

5.1.1. Structure

The file comprises two levels. The first level is the *resultat* (result) root element which does not contain attributes. The second level consists of four element types: the *statistik* element identifying the statistics, language and statistics version, the *masterdata* element for unique identification of the enterprise and report, the *fejl* (error) elements containing any detected errors, and a *fejlsammendrag* (error summary) with a summary of the XML schema controls. All four are described below.

5.1.1.1. Statistik element

The *statistik* element comprises the name of the statistics, language (danish/english) as well as the version of the statistics, all three of them in the form of attributes.

5.1.1.2. Masterdata element

The *masterdata* element containing the necessary information appears in the report file and will be copied directly from there with all information – provided the element is consistent with its XML schema. The *masterdata* element in the result.xml file complies with the same rules that also apply to

the general XML structure (since it was taken from there), and consequently it can only appear once.

5.1.1.3. Fejl element

Each *fejl* (error) element includes information for unique identification of the field containing the error in the report, as well as an error description. Error descriptions in any given result.xml file are in either Danish or English. The language depends on the *language* attribute on the root element in the report file. Each *fejl* (error) element has the following attributes (XML names in brackets):

- ◆ Error description (*fejlbeskrivelse*): The field is mandatory and provides a description of the error. Can be in Danish or English as explained above.
- ◆ Type of error/error location (*type*): Explains where the error in question was found. The options are:
 - ◆ **System error** (used when and internal error occurred in STINA)
 - ◆ **Warning** (invalid XML, invalid zip file, etc.)
 - ◆ **Schema** (XML file does not comply with XML schema)
 - ◆ **Master data** (error in master data)
 - ◆ **Objective control** (error in objective control).
- ◆ Position in XML structure (*position*): A four-digit indication of where in the XML structure the error was found. Example: 1.2.3.1. First digit indicates the root element (always 1); second digit the sheet where the error was found; third digit the group, etc. Always counted from the top.
- ◆ Field/attribute in which the error was found (*felt*): The name of the attribute where the control error was found.
- ◆ Group in which the error was found (*gruppe*): The name of the group containing the error (this information can also be found on the basis of position).
- ◆ Sheet in which the error was found (*ark*): The name of the sheet containing the error (this information can also be found on the basis of position).
- ◆ Value causing the error (*vardi*): The value of the attribute causing the error.

Fejl (error) elements only contain attributes.

5.1.1.4. Fejlsammendrag

The last element before the root element is closed is *fejlsammendrag* (error summary). The element sums up the outcome of the controls. It always occurs – irrespective of the outcome – and has two attributes:

- ◆ Number of errors found (*antalfejl*).
- ◆ A description of the control result (*samletfejlbeskrivelse*). If the number of errors exceed the predefined number (typically 100) this will be stated here.

Appendices 2 and 3 include sample result.xml files for reports with and without errors, respectively.

6. Correction process

If errors are found, the enterprise must submit a full new report with *all* data, not merely the corrected sections of the report. There are two ways to correct.

6.1. Create a new XML file and submit it from the web service client

The enterprise creates a new, corrected report and submits it to STINA from its web service client. The report must be assigned a serial number as follows:

6.1.1. Errors in data consistency and validity

If the errors in the previous report concerned data consistency or validity, Danmarks Nationalbank has not registered the report in question as having been received. Consequently the corrected report is assigned the same serial number as the previous report.

6.1.2. Errors in objective or analytic controls: serial number one higher

If the errors in the previous report concerned additional format controls as well as objective or analytic controls, the report has been registered as received by Danmarks Nationalbank. Thus the new report is to substitute the previous report and is therefore assigned a serial number one higher than the serial number in the previous report.

6.2. Correction via STINA Online³

A report will only be available in STINA Online if it has passed the controls for data consistency and validity and has thus been registered as received by Danmarks Nationalbank, cf. above. In other words, only errors identified in the objective and analytic controls can be corrected via STINA Online.

³ STINA Online is an IT system which enables enterprises to report directly from Danmarks Nationalbank's website. See separate guidelines.

7. Appendices: Examples of XML files

(For understanding only: English translation if necessary of XML names is listed in the body text in brackets and grey type).

Appendix 1

Sample XML report file for the reporting type BOP (not all of the report is listed)

In the report file occur the sheets: 'masterdata', 'virksomhedsdata' (enterprise data), 'APF_AKIS' and 'APF_AKEJ'.

Within each of the *form* elements 'virksomhedsdata' (enterprise data), 'APF_AKIS' og 'APF_AKEJ' occur *row type* elements such as e.g. 'DIU'. Within the *row type* elements *data* elements occur with reported data.

```
<?xml version="1.0" encoding="utf-8" ?>
<BOP version="1" language="danish">

  <masterdata loebenr="1" firmanavn="Andeby auto A/S" gade-
    navn="Andevej 1" postnr="1234" by="Andeby"
    tlf="12345678" idno="99999999" refperio="201101">

    <kontaktpersoner>

      <person fuldtnavn="Anders And" tlf="12345678"
        email="anders@andeby.dk" />

    </kontaktpersoner>

  </masterdata>

  <virksomhedsdata>

    <regnskabsdata>

      <data mastervaluta="DKK" regnskfraperio="010510" regnskskilperio="300411" />

    </regnskabsdata>

    <modervirksomhed>

      <data modernavn="Andeby Auto A/S" mo-
        dercvr="99999999" />

    </modervirksomhed>

    <konsoliderede>

      <data virknavn="Andeby Auto Consulting A/S"
        virkgadeognr="Andevej 2" virkpostnr="1234"
        virkby="Andeby" virkcvr="12345679" />

    </konsoliderede>

  </virksomhedsdata>

  <APF_AKIS>

    <DIU>
```

```

<data isin="SE0001065137" bprimo="32684"
  bstigning="31000" bnedgang="35510" bulti-
  mo="65698" udbytte="25000" fritekst="ISIN-
  kode er testkode" />

<data isin="CA7459101092" bprimo="122356"
  bstigning="27330" bnedgang="35510" bulti-
  mo="152813" udbytte="5689" />

<data isin="AT0000785407" bprimo="4015825"
  bstigning="37530" bnedgang="35510" bulti-
  mo="4258932" udbytte="2359" />

<data isin="CH0005819724" bpri-
  mo="18862774" bnedgang="0" bulti-
  mo="20156897" udbytte="236" />

<data isin="NL0000008951" bpri-
  mo="15001922" bnedgang="35510" bulti-
  mo="15235987" />

<data isin="IE0009156104" bprimo="0" bstig-
  ning="56987" bnedgang="35510" bulti-
  mo="56235" />

<data isin="XS0092760841" bprimo="89652"
  bnedgang="89652" bultimo="0" />

<data isin="SE0001065137" bprimo="431277"
  bnedgang="35510" bultimo="391436" udbyt-
  te="15897" />

</DIU>

<AKU>

  <data isin="HU0000016522" bprimo="1685241"
    bultimo="1600000" udbytte="10000" fri-
    tekst="ISIN code is test code" />

</AKU>

</APF_AKIS>

<APF_AKEJ>

  <DIU>

    <data sektor="1100" land="DE" bstig-
      ning="100000" bnedgang="200000" udbyt-
      te="5000" />

  </DIU>

  <AKU>

    <data land="GB" bprimo="401556" bnet-
      totrans="-19572" bvalutaaendring="-24566"
      bprisaendring="45708" bultimo="403126" ud-
      bytte="25000" />

  </AKU>

</APF_AKEJ>

</BOP>

```

Appendix 2

Example of result.xml file from a BOP report – no errors

```
<?xml version="1.0" encoding="utf-8" ?>
<resultat xmlns:exObj="urn:xslt-funk">

  <statistik navn="BOP" version="1" language="english">

    <masterdata loebenr="1" firmanavn="Company J" gade-
      navn="Vestergade 999" postnr="1000" boks="1234"
      by="Copenhagen" tlf="12345678" idno="99999999" refpe-
      rio="201101">

      <kontaktpersoner>

        <person fuldtnavn="Anders And" tlf="12345678"
          email="Anders@Andeby.com" />

      </kontaktpersoner>

    </masterdata>

  </statistik>

  <fejlsammendrag antalfejl="0" samletfejlbeskrivelse="There were 0
    errors in the document" />

</resultat>
```

The *fejlsammendrag* (error summary) element indicates that no errors were found in the report.

Appendix 3

Example of result.xml file from a BOP report – with errors

```

<?xml version="1.0" encoding="utf-8" ?>
<resultat>
  <statistik navn="BOP" version="1" language="danish" />
  <masterdata loebenr="1" firmanavn="Company Z" gade-
    navn="Vestergade 999" postnr="1000" by="København"
    tlf="12345678" idno="99999999" refperio="201101">
    <kontaktpersoner>
      <person fuldtnavn="Anders And"
        email="Anders@Andeby.com" tlf="12345678" />
    </kontaktpersoner>
  </masterdata>
  <fejl type="Skema" fejlbeskrivelse="Attributten isin mangler."
    position="1.2.1.1" felt="isin" gruppe="DIU" ark="APF_AKIS"
    værdi="" />
  <fejl type="Skema" fejlbeskrivelse="Værdien i feltet bprimo
    overholder ikke de angivne krav" position="1.2.1.2"
    felt="bprimo" gruppe="DIU" ark="APF_AKIS" værdi="-
    431277" />
  <fejl type="Skema" fejlbeskrivelse="Værdien i feltet bultimo
    overholder ikke de angivne krav" position="1.2.2.1"
    felt="bultimo" gruppe="AKU" ark="APF_AKIS" vær-
    di="1.153.135" />
  <fejl type="Skema" fejlbeskrivelse="Værdien i feltet land over-
    holder ikke de angivne krav" position="1.3.1.1" felt="land"
    gruppe="NED" ark="ALI_FILA" værdi="A3" />
  <fejl type="Skema" fejlbeskrivelse="Værdien i feltet land over-
    holder ikke de angivne krav" position="1.3.2.1" felt="land"
    gruppe="TAN" ark="ALI_FILA" værdi="USA" />
  <fejlsammendrag antalfejl="5" samletfejlbeskrivelse="Der var 5
    fejl i dokumentet" />
</resultat>

```

The *fejlsammendrag* (error summary) element indicates that there are 5 errors. The errors are described in the five *fejl* (error) elements. All errors are of the "Skema" type, i.e. the report file is not consistent with its XML schema. As a consequence the report has not gone through the subsequent controls for validity and data consistency. The *fejlbeskrivelse* (error description) attribute in the first error explains that the field *isin* contains no value, while the rest explains that the values in fields *bprimo*, *bultimo* and *land* contain invalid values. The attributes *gruppe* (group), *ark* (sheet) and *værdi* (value) show where the invalid attribute value is found in the report, i.e. where the error is. The missing *isin* value can thus be found in the group *DIU* in sheet *APF_AKIS*.