

NEX Addressing & Routing Guidelines

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1 Introduction

1.1 Purpose of document

There are generally two questions that arise when using ECP/EDX:

- How to properly send a message so that it arrives at the correct endpoint? In technical term the question is "how to properly specify the header/field 'receiverCode'?"
- How to properly receive a message so that it is dispatched to the correct business system? In technical term the question is "how to specify the routes-configuration in edx.yml?"

This is what the document will try to answer as succinctly as possible.

1.2 What the document does not offer

The document does NOT answer "how to install ECP/EDX" (see installation guide found here: <https://ediel.org/nordic-ecp-edx-group-nex/market-actor-onboarding/>), nor "how to connect my Business application to ECP/EDX" (you can find some information about that in the EDX User Guide which is part of the large software package download from ENTSO-e).

1.3 Important terminology

EDX is a "layer" on top of ECP which among other things offers somewhat "fancy" addressing possibilities, which also is why things get a little bit complicated. Hence this document. In the EDX layer the component used in message exchange is named *Toolbox* (also commonly referred to as just 'EDX'). In EDX there also exist a central component called a *Service Catalogue* (SC), hosted by the TSO. In the SC it's possible to specify a particular *Service Name* and map that to a particular ECP-code. This is what we call a *EDX Service*. All EDX Toolboxes have a copy of this SC and will use the copy for Service Name to ECP-code resolving whenever messages are sent and received.

Provider (P): One single EDX Toolbox that offers a so-called "EDX Service", so that the address "SERVICE-<NAME>" will be routed to this particular Toolbox. A Provider usually represents the central system in a star-shaped topology with multiple Consumers.

Consumer (C): All other EDX Toolboxes (besides the Provider) using a specific EDX Service are said to be a Consumer of that Service. There are usually multiple consumers on each EDX Service.

1.4 Service catalogue codes in NEM

These are the ECP-codes or SC-codes for each Service Catalogue in each TSO in each NEM-network.

TSO	Test/Preprod	Production
Fingrid	44V00000000023M	44V00000000024K
Energinet	45V00000000059N	45V00000000055V
SvK	46V00000000016Q	46V00000000021X
Statnett	50V00000000113S	50V00000000120V

Every EDX Toolbox has one or more SCs listed on the Settings page in EDX-GUI. You can download and study the content of the SC if you like – it's basically a mapping of ECP-codes to EDX-services + list of toolboxes known by the SC.

2 Sending a message – how to specify "receiverCode"

2.1 Summary

	To Provider (P)	To Consumer (C)
From Consumer (C)	SERVICE-<NAME>	ECP-CODE@SERVICE-<NAME>
From Provider (P)	N/A	ECP-CODE@SERVICE-<NAME>@SC-<SC-ECP-CODE>

2.2 Examples

C2P: **SERVICE-NO-MFRRCAP** – The 'NO-' prefix tells you that the service is hosted by a Provider with a ECP-code in Statnetts Component Directory. This is by far the most common addressing. The SC will contain the proper ECP-code for the Provider of the 'NO-MFRRCAP' Service and translate the *Service Code* to this ECP-code before sending the message into the ECP-network.

C2C: **50V000000000115O@SERVICE-NO-NBM-COMMONDATA** – This is a very rare situation and makes sense only if you understand the routing upon receiving the messages. This address says 'send the message to 50V...115O, but make sure to tag the envelope with 'NO-NBM-COMMONDATA'. The 'SERVICE-<NAME>' part is *not* used for address translation in this case.

P2C: **45V000000000095J@SERVICE-NO-MFRRCAP@SC-45V000000000055V** – This form is used by developers of a Provider Business application. In this situation the provider must add the SC- syntax at the end. The SC-code must point to the *primary* EDX Service Catalogue for the **receiving** toolbox/endpoint (the one used at the start of the address). There are 4 different SC each of the ECP-networks NEM-Test/Preprod and NEM-Production. The primary SC is the one where the first three letters of the SC-code are the same as for the toolbox/endpoint ECP-code.

2.3 Troubleshooting

If you use C2C or P2C it might happen that the sending or the receiving fails. This might be because of a problem with the Service Catalogue, in particular because a certain SC has not listed the correct Service, Provider or Consumer. The problem will be fixed by contacting the ECP-responsible for the TSO. The installation guide (see link earlier in document) contains email addresses to ECP-responsible. **The problem shall not be fixed by deviating from the above addressing scheme.**

3 Receiving a message – how to specify the routes in edx.yml

Chapter 12.6.3 in the installation guide describes different ways to set up EDX Toolbox Routing. One of the main parts of a route is the routing criteria. It is possible to use *ECP Message Type* as routing criteria. A better way is to use *EDX Service* as routing criteria since then it is possible to use a common EDX Service for a group of related Message Types, which means you need to define only a single route for this group of Message Types. This also have the benefit that the route is unaffected when the Message Types changes.

3.1 Receive from Producer (the usual case)

The pattern will be like this:

```
routing:
  routes:
    - {code: R1, start: toolbox-gateway, end: I-amqp-inbox, service: {serviceCode: NO-MFRRCAP, domainCode: DEFAULT_DOMAIN, serviceCatalogueCode: 50V00000000113S } }
```

Most of this configuration has been explained in the aforementioned chapter 12.6, so here we will focus on the specific parts related to Service-routing. The interpretation of this line of configuration goes like this:

IF a message is received with the SERVICE-header **NO-MFRRCAP** and the SC-header **50V00000000113S**

THEN route the message to **I-amqp-inbox** (which is in turn is referring to a specific AMQP-queue in edx.yml, but not shown in the example above)

NB! The serviceCatalogueCode (SC-Code) should **always** be your own TSO's SC-code (see table in Introduction chapter). Basically, Danish toolboxes specify Energinet SC-code, Finnish toolboxes specify Fingrid SC-code, etc. The reason why this will work is because of how Producers are sending to Consumers (see previous chapter).

3.2 Receive from Consumer (the unusual case)

The pattern will be like this:

```
routing:
  routes:
    - {code: R1, start: toolbox-gateway, end: I-amqp-inbox, service: {serviceCode: NO-MFRRCAP, domainCode: DEFAULT_DOMAIN, serviceCatalogueCode: 44V00000000023M } }
    - {code: R2, start: toolbox-gateway, end: I-amqp-inbox, service: {serviceCode: NO-MFRRCAP, domainCode: DEFAULT_DOMAIN, serviceCatalogueCode: 45V00000000059N } }
    - {code: R3, start: toolbox-gateway, end: I-amqp-inbox, service: {serviceCode: NO-MFRRCAP, domainCode: DEFAULT_DOMAIN, serviceCatalogueCode: 46V00000000015Q } }
    - {code: R4, start: toolbox-gateway, end: I-amqp-inbox, service: {serviceCode: NO-MFRRCAP, domainCode: DEFAULT_DOMAIN, serviceCatalogueCode: 50V00000000113S } }
```

If your toolbox is a Provider, this is how the routing will look like for that provided service. In the rare case where your toolbox receive messages from another Consumer on a service, you will also need to have all these routes. It's unfortunate that it's not possible to specify serviceCatalogueCode as ALL or *, but that will hopefully be the case in the future. To understand how to read one line here, just look at the explanation for the previous sub chapter.

4 Motivation for these guidelines

This is not necessary to read, but if you're of the curious type – read on. The motivation behind all of the EDX Services and the guidelines following it, is to make it as easy as possible to integrate business applications across the network and not to stand in the way of changes in communication that occur over time. At the same time, we need some flexibility in how traffic is routed – where service are provided. This can be summarized in the following bullets:

- A Toolbox should only be listed in the primary SC if possible (not possible for Providers)
- Complexity should reside at the TSO side, rather than at the BSP side
- Avoid that SC-codes are spread around in BA-systems hosted by BSPs.
- Troubleshooting should ideally only involve the Toolbox and local TSO (not remote TSO)
- BA should be able to change message types without affecting routing/communication
- An EDX administrator should easily find all communication between to BA systems

With these guidelines we're aiming to lower the 'dependency' on many Service Catalogues for each toolbox. It will in turn make it much easier to understand problems and even in certain cases reset the EDX-toolbox completely. We also make it so that if we need to change codes or Service Catalogues or anything else, it's more likely that we're able to do that, since most complexity and configuration are found inside the TSOs.

In an ideal world, each party would look up these guidelines, and send/receive according to this pattern – and never experience any trouble, while at the same time offering the possibility to change whatever needs to change, both in BA systems and in the ECP/EDX networks.