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The CPI Guide to the Nlets Standardized XML Mandate

The new Nlets Standardized XML Mandate requires that all messages exchanged between the Nlets system and the CTA message broker be fully tagged documents (ideally in the NIEM 4.0 format). This applies to all types of messages, including message types that are typically untagged and unstructured (e.g., database responses).

'Structured' messages (like queries) have always been tagged; converting these messages to NIEM is easily solved by the message broker alone. Converting *unstructured* response messages to NIEM, however, is a challenge. In this paper, we will address common questions to bring further clarity to the mandate and compliance with it.

Understanding Nlets Standardized XML Mandate

Why did Nlets pass the mandate?

Nlets envisions a world where fully tagged messages, adhering to national standards for data content, are shared seamlessly across jurisdictional lines. Nlets needs to receive compliant messages, so that Nlets can share those messages to other jurisdictions. This is a worthy goal that will benefit all users.

Nlets recognizes that this goal shouldn't be met with the message broker alone. If that were possible, Nlets would have handled it themselves. Technology-only solutions carry serious risks (described below), which make the mandate the most sensible path. Second, the mandate will foster participation among users, which will make the benefits of NIEM more readily available to more users faster.

Will simply upgrading the message broker meet the mandate?

Upgrading the message broker is a necessary but not sufficient step toward meeting the mandate; a good approach will not attempt to solve this challenge entirely in the message broker.

In fact, technology alone cannot meet the mandate. It entails participation by and partnership between your agency, Nlets, CPI, and the agencies responsible for producing your in-state data responses (e.g., driver and vehicle registration responses).

As a result, many states require steps above and beyond working with CPI to meet the mandate. For example, in-state data sources may need to be upgraded to be fully tagged; however, upgrading data sources cannot be handled by message broker changes alone, nor should it be. Fully tagged responses should be created by the in-state data sources. Identifying and coordinating that effort is something your organization will need to do.

Can't the message broker map in-state codes to national standards?

No. This is a knowledge problem, not a technology problem. Mapping in-state codes to the national standards requires specialized knowledge. The agencies that produce the data have this knowledge (e.g., the DMV).

Some states want to preserve in-state data codes for their in-state users to minimize the impact on their user community for in-state queries, and thus want to continue providing in-state codes in response to in-state queries. Further, just like message format, these codes are sometimes regulated by legislation. What codes are used and when they change is not under the management authority of Nlets, of CPI, nor of your CTA.



As a result, meeting the mandate requires in-depth knowledge of the current in-state data; that knowledge is held by agencies that produce the data – so the national standard field data must be set at the source level.

Why must fully tagged responses must be created by the data sources themselves?

The true power of XML comes from fully tagged responses; the ability to manipulate and transform and derive data from a message goes up tremendously when it gets tagged. Just look at how the message brokers can, and do, change tagged queries from one format to another. Meeting the mandate will not require terminal software, dispatch centers, or regional systems to change to submitting queries in NIEM format. The message broker will do that for them. Why? Because, the broker is *already* receiving *fully tagged* queries and is very adept at modifying and manipulating and transforming fully tagged messages.

This is not the case with database responses, which are NOT fully tagged. In this case, the best a message broker can do is upscale the text (i.e., “screen scrape”).

Why won't screen scraping work?

The issues with screen scraping are legendary: the screen scrapes are sometimes inaccurate, and they require frequent maintenance, which gets expensive and time consuming.

More catastrophically, consider that every time a data source changes, the screen scraping algorithm breaks, which potentially (likely) breaks those transactions with Nlets. It is a ticking time bomb. This breakage isn't a possibility, it is an inevitability: the format can and WILL change at any time, without notice. These changes are not under Nlet's control nor under CPI's – and often not even under the CTA's. For example, some agencies/data sources fall under regulatory requirements regarding the response formats that they produce, and these regulations can and do change. When and how is decided by an agency that is not under the management authority of Nlets, CPI, or your own CTA.

This is *why* Nlets even issued the Standardized XML Mandate; if Nlets was willing to just screen scrape the text from the states and upscale it to XML, they'd have done so themselves. And they would have had only one message broker to change, instead of fifty or more. But this would have been a bad idea, which is why they set the mandate in the first place.

What is the impact if screen scraping breaks?

The most immediate impact is increased manual labor. For Messenger, users may have to manually copy data fields, or may not have the easy, one-click access to another form. More critically, for the communications interface between Nlets and the State, the breakage potentially interrupts all information shared from that data source. This could endanger the men and women of law enforcement and the public, which contradicts our goals.

Now, consider what this means, if we think the message brokers should just screen scrape: we're just pushing the screen scraping problem from one location, Nlets, to another: the states. Even worse, we've multiplied the amount of work to be done (instead of one screen scraper, we're mandating fifty or more).

This is why looking to the message broker to screen scrape the non-tagged database responses and upscale them into XML is not a good idea, nor one that truly meets the spirit of the mandate. CPI is in a similar position as Nlets and also requires the responses be tagged so they can be sent to Nlets in a tagged format. If CPI could upscale the text, then Nlets could upscale the text and modify one message broker instead of 50.

More directly stated: If the mandate is necessary, the responses must be tagged at the source level.

How will meeting the mandate benefit my organization?

Compliance will facilitate the exchange of critical information in a more efficient and reliable manner.

CPI agrees with, and supports, the Nlets direction and vision to bring fully tagged XML messages to the law enforcement user community. Like Nlets, CPI's purpose is to deliver crucial, life-saving information in real-time to those brave men and women of law enforcement who need it to protect themselves and the public.

We all share the goal of minimizing the risk and maximizing the stability of providing this information and seek to find more effective and reliable means of sharing critical data. The Nlets Standardized XML Mandate will facilitate these shared goals.

How do we meet the mandate?

- **Structured messages:** The process of upgrading messages with already structured content to fully tagged NIEM 4.0 is well within the capacity of a message broker. Transforming structured messages between two different formats is a core capability of what a message broker does. For example, the OpenFox Message brokering System uses configurations to transform queries from user devices, which vary widely across our 39 CTA message broker systems, to the well-known and well-defined NCIC 2000 format.
- **Unstructured messages:** Response type messages are a different case, however. At the time of this writing, many response messages are unstructured and exchanged simply in presentation format. To comply with the Nlets Standardized XML Mandate, your agency may no longer exchange unstructured response messages. It must begin exchanging response messages in a structured format.
- **Receiving messages:** Organizations must be able to receive NIEM-compliant messages to meet the mandate as well. Fortunately, receiving structured responses is another function well within the capacity of a message broker, though enhancing your OpenFox system to receive NIEM responses from Nlets requires our engineering staff to make some configuration changes. For your end-users, your OpenFox system either passes the XML format through if the end-user software is able to consume NIEM, or it styles the NIEM data to a text presentation format for those devices that cannot consume NIEM.
- **Message content:** The Nlets Standardized XML Mandate affects more than just the form of the data; it is also the content itself, which must begin using standardized nationwide codes rather than state-specific codes.

What can the message broker handle on its own?

Tagging structured messages?	✓
Tagging unstructured messages?	✗
Process NIEM-compliant message content?	✓
Create NIEM compliant message content from unstructured message content?	✗

How is message content affected by the Nlets Standardized XML Mandate?

Upscaling the text has issues besides the format, because it isn't just the form of the data, and the fact that it is tagged, that is being mandated; it is also the content itself. One could tag all the data and put it into XML, but unless the NIEM (or GJXDM) standardized codes are used, the response is still not compliant.

Almost all states use in-state data codes for some of these fields, and – *prior to the Nlets Standardized XML Mandate* – this in-state data was sent on as-is to other states. The mandate requires this data to change or map to national standards. The vision of the mandate unifies these codes and vastly enhances information sharing; users don't need to know 49 different codes, just the national set.

Who better to pick which nationalized code their in-state data should be mapped to than the agency that produces the responses to begin with?

So, what does it take to become 100% compliant?

In order to be 100% compliant all the data sources in a state must already be producing NIEM 4.0-compliant, fully tagged responses. The process to upgrade responses must be done at the source-level.

This is something we've seen in previous Nlets projects. We have done AISLE, CANDLE, and CHIEF, for example. All of these were meant to begin getting data sources tagged in standardized XML format. Much as above, none of these would have been necessary if message brokers could simply have "screen scraped" and upscaled the answers, because then the Nlets message broker could have done that.

So, all the messages must be fully tagged and coded into standardized XML. The message broker can do this for all the structured messages (e.g., queries), as they are fully tagged already, and they can pass on the compliant database responses that have both been presented in standardized XML format and have had their in-state data codes mapped to standardized national codes.

Our project *cannot* fix the unstructured database responses that are not compliant, which is why we cannot guarantee that doing our project will result in 100% compliance. All the in-state data sources must also be modified to be fully compliant.

Can we utilize Brodie Assistance Fund (BAF) monies for this project?

Possibly. However, the applicability of BAF funding is determined by Nlets. The states will have to request this from Nlets, and CPI cannot be certain whether the project will qualify or not. We cannot assure a state that upgrading the message broker alone will achieve 100% compliance, since they may have non-compliant data sources in their state. Partial compliance has been funded before, again, by AISLE, CANDLE, and CHIEF, but it is unclear if a message broker-only project that transforms outbound queries to standardized formats is qualified. We can assert that achieving the mandate requires a message broker project, at minimum to transform the outgoing queries into standardized XML.



Conclusion: Where do we go from here?

The owner of the data is the best party suited to create the NIEM compliant content.

CPI's fundamental purpose is to ensure delivery of critical information to those who need it, when they need it, and to enhance the ability to share crucial, life-saving information across law enforcement agencies. We cannot introduce risk or instability to our system. That is why the message broker alone cannot ensure compliance with the Nlets Standardized XML Mandate, the scope of which is wider than just the switch. Only the data source is sure to have sufficient information. This is why Nlets needed the mandate in the first place.

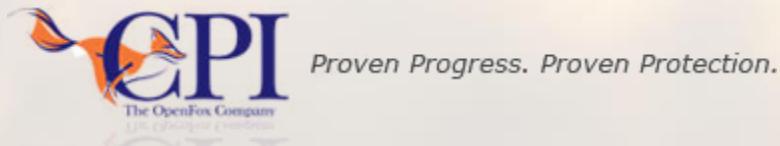
CPI will do everything in our power to help states move toward Nlets' goal, but our upgrade to the message broker may not bring a state to 100% compliance with the mandate. It is likely that other changes will need to be provided by vendors and agencies other than CPI. Consequently, this project may not qualify for BAF funding.

How can you get started?

We encourage states to begin with the following steps:

1. Upgrade your message broker to be able to handle these changes.
2. Coordinate with your other vendors and agencies to start producing tagged data with content that matches national standards.
3. Start this process now, rather than waiting until after the date of the mandate has passed.
4. Contact us at info@openfox.com for more information.





Computer Projects of Illinois, Inc. (CPI)

Headquartered in Bolingbrook, Illinois, CPI is a privately held corporation and an acknowledged leader in information-sharing software systems for the law enforcement and criminal justice community.

CPI's sole focus has been, and will continue to be, this sector. CPI expends all of our energies on the development, installation and maintenance of our software products.

CPI systems are state-of-the-art and cost-effective; ensuring that our customers get the most for their investment.

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